



ENVIRONMENTAL & ENGINEERING

REPORT

TRENTRA (PTY) LTD

DRAFT FOR SECOND REVIEW BASIC
ASSESSMENT REPORT FOR PROSPECTING RIGHT
APPLICATION – REF: NC30/5/1/1/2/12586 PR





REPORT REF: 20-1263-AUTH (ADAMS 12586PR)

PROSPECTING RIGHT APPLICATION FOR MANGANESE HAS BEEN ACCEPTED IN RESPECT OF THE REMAINING EXTENT OF FARM ADAMS NO.328: WITHIN THE ADMINISTRATIVE DISTRICT OF KURUMAN.

VERSION 0.0

Updated- 28/4/2021

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DISCLAIMER:

This is a legally binding document and many of the actions and recommendations remain the responsibility of the client (as the owner/lessee of the property).

EAP - was independent and performed the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the application; have expertise in conducting environmental impact assessments or undertaking specialist work as required, including knowledge of the Act, these Regulations and any guidelines that have relevance to the proposed activity; ensure compliance with these Regulations;

Take into account, to the extent possible, the matters referred to in regulation 18 when preparing the application and any report, plan or document relating to the application; disclose to the proponent or applicant, registered interested and affected parties and the competent authority all material information in the possession of the EAP and, where applicable, the specialist, that reasonably has or may have the potential of influencing-

The findings, results, observations, conclusions and recommendations provided in this report are based solely on the information provided to Eco Elementum (Pty) Ltd by the Client and other external sources (including previous site investigation data and external scientific studies). The opinions expressed herein apply to the site conditions and features which existed at the time of commencement of the investigations and production of this report.

The author has utilised his/her best scientific and professional knowledge in preparing this report and the content herein contained is and remains confidential in nature, save where otherwise ordered by a Court of law.

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EXECUTIVE SUMMARY

Trentra (Pty) Ltd (the applicant) applied for a prospecting right of Manganese to the Regional Department of Mineral Resources and Energy (“DMRE” Kimberley) in respect of the remaining Extent of the Farm Adams 328, Kuruman, within the Joe Morolong Local Municipality and the John Taolo Gaetsewe District Municipality in the Northern Cape Province, South Africa. The study area is located 20 km south southeast of Hotazel, 42 km west-northwest of Kuruman and 36 km north of Kathu.

The proposed project aims at determining if economically viable mineral deposits exist within the application area. In order to undertake prospecting activities Trentra, requires a Prospecting Right in terms of the Mineral and Petroleum Resources Development Act (MPRDA, Act No.28 of 2002). The Applicant is also required to obtain an Environmental Authorisation (EA) in terms of the National Environmental Management Act (NEMA, Act No. 107 of 1998) which involves the submission of a Basic Assessment Report (BAR).

Eco Elementum (Pty) Ltd (EcoElementum) has been appointed by Trentra to compile the BAR (this report) in support of the Prospecting Right application.

Table 1: Basic Assessment Timeline followed

Date	Basic Assessment timeline
N/A	Prospecting Right Application on SAMRAD
02/09/2020	Acceptance received from DMR
08/01/2021	30-day Public Participation started for the Basic Assessment Process
09/02/2021	Submission of the Final Basic Assessment Report to the DMRE
28/04/2021 – 28/05/2021	DMRE requested

The DMRE has requested for the Public Participation Process conducted under the COVID Regulation to be redone again with a public meeting.

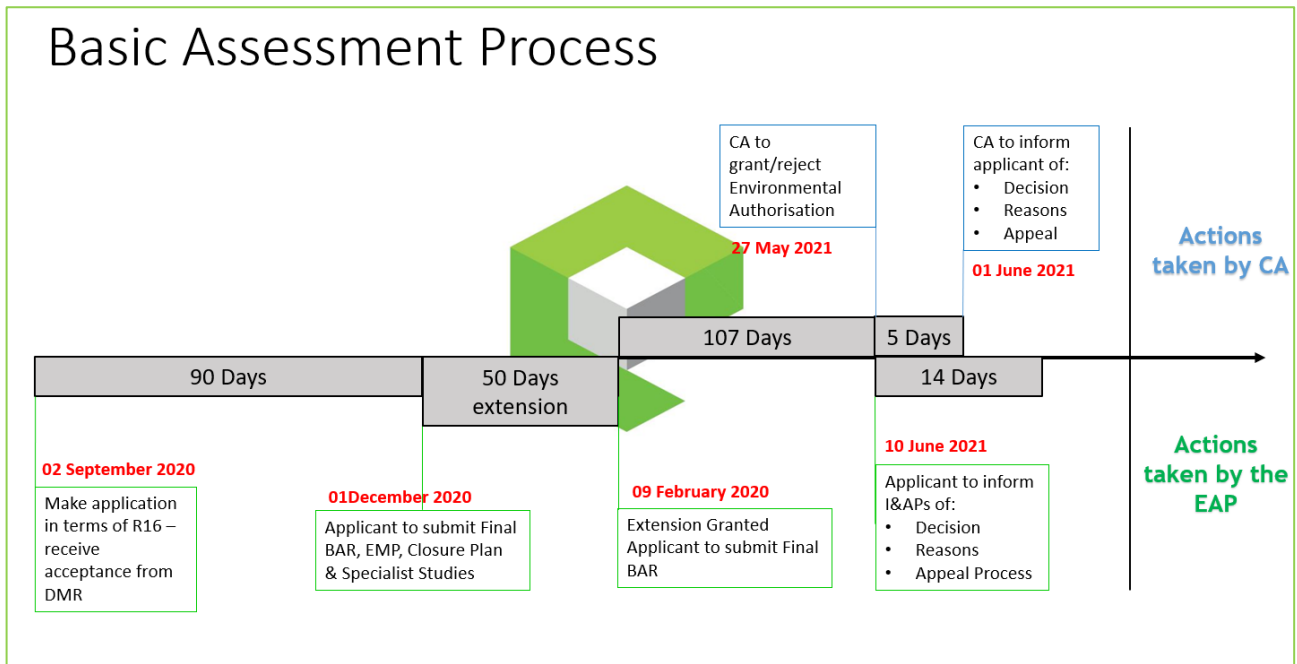
The obtaining of a prospecting right from the DMRE is governed by the Mineral Petroleum Resources Development Act (MPRDA, no 28 of 2002). The MPRDA requires compliance with related legislation, specifically the National Environmental Management Act of 1998. This Basic Assessment Report includes, amongst others, the following information as required in terms of the MPRDA:

- A description of the environment likely to be affected by the proposed prospecting activities;
- An assessment of potential impacts on the environment, socio-economic conditions, and cultural and heritage aspects;
- A summary of the potential significance of identified impacts;
- Proposed mitigation and management measures to minimise adverse impacts and to optimise benefits; and
- Planned monitoring and performance assessment of the EMP and Rehabilitation measures of areas disturbed during prospecting.

Project Schedule

The BA process should be undertaken for project activities that are included under Listing Notices 1 and 3. Impacts of these activities are more generally known and can often be mitigated or easily managed. The BA process is generally shorter and less onerous than the S&EIR process. The BA process must follow the procedure as prescribed in Regulations 19 to 20. The following diagram outlines the steps that should be followed in undertaking a BA process. This diagram process takes into consideration the lockdown period. Once approved as based on the basic assessment process timeline. The prospecting can take a year to three years. Then, after prospecting the mining right application process is another 300 days before the mining right application is approved or not approved.





This is the original project schedule indicating that the BAR was submitted on the 09/February 2021. However, the Competent Authority (CA) which is the DMRE requested additional information including another public participation process with new review dates and a public meeting.

The following specialist studies were undertaken and recommendations included:

List of Studies Undertaken	Recommendations of Specialist Reports
<p>Archaeological Desktop study</p>	<ul style="list-style-type: none"> - It is recommended that the areas demarcated as ‘Sensitive Areas’ be excluded from potential prospecting sites due to the possible presence of surface/subsurface culturally significant material. - It is recommended that the areas demarcated as ‘Sensitive Areas’ on Figure 4 be excluded from potential prospecting sites due to the possible presence of surface/subsurface culturally significant material. - Should the prospecting outcome result in further development or construction, a full Phase 1 Archaeological Impact Assessment must be conducted on the affected area if triggered. Also, a full Phase 1 AIA must be done should the cumulative impact of the proposed prospecting exceed 0.5 ha. - Because archaeological artefacts generally occur below surface, the possibility exists that culturally significant material may be exposed during the prospecting phase, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist. Also, should skeletal remains be exposed, all activities must be suspended and the relevant heritage resources authority contacted (See National Heritage Resources Act, 25 of 1999 section 36 (6)).
<p>Ecological Desktop Study</p>	<ul style="list-style-type: none"> - Although some of the area has been modified by a Solar PV facility, the remainder of the land portion consists of primary vegetation in which at least 3 protected tree species have been confirmed, and a 4th protected herbaceous species could occur. - It is anticipated that due to historical disturbance levels, alien invasive plant species will be present. A full alien invasive plant survey is thus also recommended, as part of an analysis of the risk of potential mining in spreading and/or further establishing such undesirable plants. - Although the risk of fauna to prospecting is considered low, there is a likelihood that threatened species may frequent the area on occasion. It will be imperative that staff will be strictly prohibited from deliberately collecting, snaring or in other ways entrapping fauna.



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Due to the fact that the prospecting right application covers the area of a very high sensitivity on CBA1, CBA2 and Ecological support area as indicated on the screening report. The ecological desktop study attached to the BAR is recognised but it is not sufficient since the prospecting right area covers the area of high sensitivity on terrestrial biodiversity, strategic water resource area, wetland, and estuaries. The DMRE has requested that a full ecological specialist study is conducted.

Registered Landowner

The registered owners of the farms were listed as follows:

Table 2: Directly affected landowners

	Landowner	Farm Portion
1.	SALTRIM RANCHES PTY LTD	in respect of portion 0 of the farm ADAMS No. 328.

Project Description

Table 3: Project description

Item	Detail
Type of mineral	Manganese
Prospecting method	Diamond drilling to test defined targets. Geotechnical drilling of 20 boreholes to an average depth of 100 - 150 meters.
Depth of the mineral below surface	To be established.
Geological formation	Kimberlite intrusions in the locality was placed in the dolomites of the Campbell Group
Mining Area Size	1651 hectares,
Mineral Reserve	To be established.
Prospecting Right Properties	The remaining extent of farm Adams NO.328: within the administrative district of Kuruman, Joe Morolong Local Municipality.
Property Applicable to current application (SG Codes)	The remaining extent of farm Adams NO.328: within the administrative district of Kuruman, Joe Morolong Local Municipality. - C0410000000032800000
Existing Authorisations	N/A
Life of mine	The prospecting right will only be valid for 2-year period.



PUBLIC PARTICIPATION PROCESS FOLLOWED & OUTCOME OF CONSULTATION

Table 4: Public participation process followed

Date	Public Participation Process
N/A	Lodging of Prospecting Right Application.
02/09/2020	Acceptance received from DMR.
08/02/2021	30-day Public Participation started for the Basic Assessment Process.
08/01/2021	Announcement phase - notification e-mails was sent, telephone calls to the I&AP.
08/01/2021	Draft Basic Assessment Report will be made available: <ul style="list-style-type: none"> - Eco Elementum Website; - Electronic copies to (landowner upon request); - Sent via email on request.
16/11/2020	<ul style="list-style-type: none"> - Site notices was placed at various access points along the secondary road which transverses the site. - At the entrance of the proposed sites; - Outside DWS municipal office - Hotazel Library and - On the main access road towards the site.
20/11/2020	English adverts were also placed in 1 local newspaper, Diamond Field Advertiser (DFA), on the 8 th of January 2021 The advert included a brief project description, location of the project, date of public meeting, methods to register as an IAP and review period of the BA report.
09 February 2021	Submission of the final Basic Assessment Report.

PROSPECTING PROCESS

DESCRIPTION OF PLANNED NON-INVASIVE ACTIVITIES

The Non-Invasive methods which will be used during the exploration program span all the four phases in different time frames. They are outlined in the following text.

Literature Study – During this stage information pertaining to the geological, geographical, environmental and geomorphological including the topographical and infrastructural systems of the area will be studied with the aim of designing the prospecting program and also the impact that the programs will have in the environmental and the ecosystem of the area. Information will be gathered from relevant areas including the Council of the Geoscience and other commercial areas where it may be available. Sources of information will include geological reports, general geological text books and geological maps, topographical maps, agricultural and land use maps. Visits to the area will also be conducted in order to acquire information that might not be available in literature. Detailed geological information will then be gathered which will be used in planning further prospecting and exploration strategy.

Geological Mapping – This stage will include the field traverse in the farm collecting geological information. Lithological contacts, outcrops, faults, dykes, folds will be mapped including their attitude and characteristics like dip and strikes, thickness etc. this information will be correlated with the literature study information in order to correlate with the correct stratigraphy and lithological units.

Geophysical Survey – a decision will be taken to conduct geophysical observation or procure geophysical data from commercial sources and organizations that collect them. The information that will be acquired will be chiefly magnetic which will be aimed at delineating structures of higher or lower magnetic susceptibility than the surrounding country rocks. If the company conducts the observations, it will be airborne surveys conducted with the use of a contractor.



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Interpretation of Information and decision making – This item appears in all the phases towards the end of the data gathering sub-programs. In Phase 1, this will mean that maps will be drawn depicting the data which is of the geological nature of the area. Using all other information, a decision will then be taken as to whether it is feasible to carry on or if the project should be abandoned

Sampling and resource modelling. This stage entails sampling the core from drilling as well as data manipulation to produce drilling results information. Resource modelling is conducted which will result in tonnages and grade distribution. However, this is still in low geological confidence. From the results, a decision will be taken if prospecting will be continued.

During the non-invasive methods, additional information is gathered in the form of prefeasibility studies. This includes the determination of the suitable mining method and its costs. Other information that is gathered includes the macro and the micro economics that will determine the feasibility of the project.

DESCRIPTION OF PLANNED INVASIVE ACTIVITIES

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

Planned invasive prospecting methods entail conducting drilling to ascertain the existence of the expected minerals, its thickness and distribution. Samples will be taken and analysed. The number of boreholes planned is 20:

- Reconnaissance drilling: 5
- Resource drilling: 6
- Feasibility drilling: 9

The depths will be to a depth of approximately 50 meters. The exact depths of the boreholes will be determined while the drilling program is underway as influenced by the depths and dips measured in the previous boreholes.

Trenching will be conducted where the orebody occurs very close to the surface. Trenches will not be conducted any deeper than 2m for all intents and purposes.

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.

Feasibility studies will be conducted in two stages as pre-feasibility studies and feasibility studies where some commonly call it definitive feasibility studies. Information gathered during feasibility studies includes but is not limited to macro and micro economics, mining methods, human resources, environmental, financial, metallurgical etc. in the prefeasibility studies, a series of mining methods are evaluated with the orebody and a most suitable one is chosen. Costs relative to the mining methods are estimated and financial models are built. In the feasibility studies, more information is gathered around the chosen mining method and again models are built to determine the feasibility of the project.

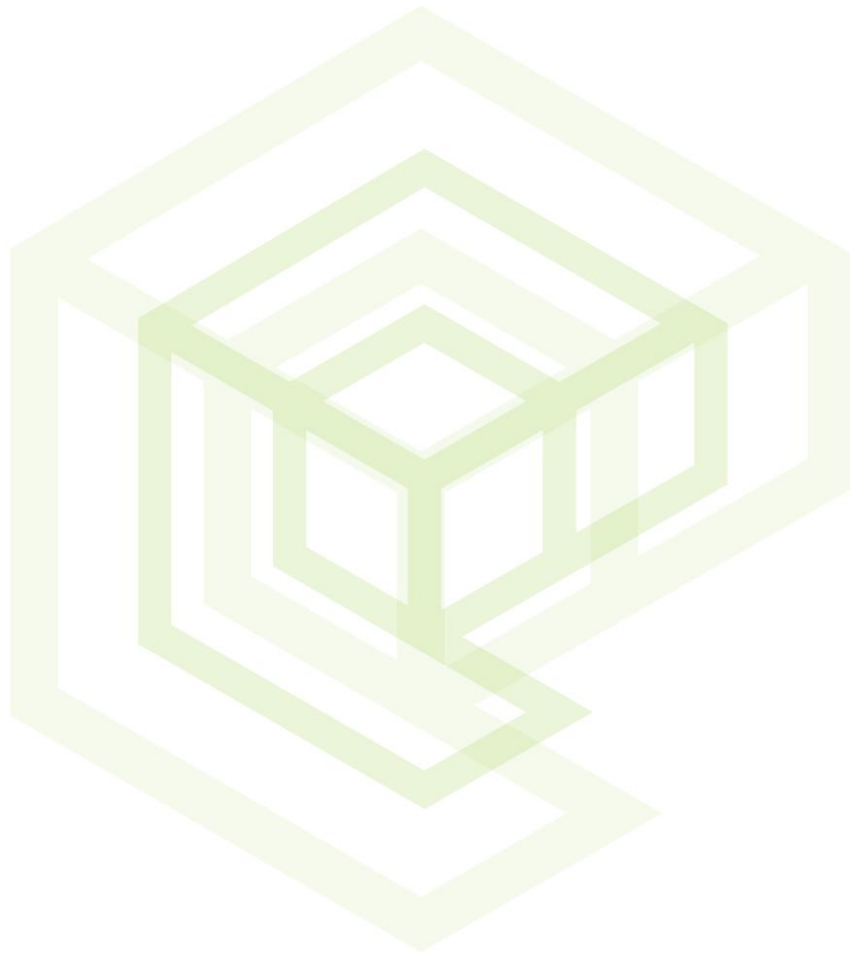


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ALTERNATIVES AND PROJECT MOTIVATION

The option of not approving the activities will result in a significant loss to valuable information regarding the various mineral reserve status on this property.

In addition to this, should economical reserves be present, and the applicant does not have the opportunity to prospect, the opportunity to utilize these reserves for future phases will be lost.



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Definition of Terms

Audit	a systematic, independent and documented review of operations and practises to ensure that relevant requirements are met. Qualified professionals with relevant auditing experience should conduct audits and, where possible, independent external auditors should also be used.
Borehole	is a narrow <u>shaft bored</u> in the ground, either vertically or horizontally. A borehole may be constructed for many different purposes, including the extraction of water or other liquid (such as <u>petroleum</u>) or gases (such as <u>natural gas</u>), as part of a <u>geotechnical investigation</u> , <u>environmental site assessment</u> , <u>mineral exploration</u> , temperature measurement, as a pilot hole for installing piers or underground utilities, for geothermal installations, or for underground storage of unwanted substances, e.g. in <u>Carbon capture and storage</u> .
Clean Water	clean water is any water that has maintained the chemical, physical, and biological integrity of the waters by preventing point and nonpoint pollution sources.
Compliant Conservation	a full achievement of the performance requirement of a particular condition of the license or programme in relation to a water resource means the efficient use and saving of water, achieved through measures such as water saving devices, water-efficient processes, water demand management and water rationing;
Construction	the time period that corresponds to any event, process, or activity that occurs during the Construction phase (e.g., building of site, buildings, and processing units) of the proposed project. This phase terminates when the project goes into full operation or use.
Corrective Action Plan	an action plan developed by the proponent, contractor, or facility owner and approved by the external auditor that describes how the contractor or facility owner intends to resolve the non-conforming item. The Corrective Action Plan should be specific, measurable, achievable, realistic, and timely.
Director-General Effluent	means the Director-General of the Department; is defined by the <u>United States Environmental Protection Agency</u> as “wastewater - treated or untreated - that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters”. The <u>Compact Oxford English Dictionary</u> defines effluent as “liquid waste or sewage discharged into a river or the sea”. Effluent in the artificial sense is in general considered to be <u>water pollution</u> .
Environmental Audit Report	a summary report prepared after an environmental audit that describes the attributes of the audit and the audit findings and conclusions.
Environmental Authorisation Environmental Component	is an environmental authorisation issued by a state department. an attribute or constituent of the environment (i.e., air quality; marine water; waste management; geology, seismicity, soil, and groundwater; marine ecology; terrestrial ecology, noise, traffic, socio-economic) that may be impacted by the proposed project.
Environmental Impact	a positive or negative condition that occurs to an environmental component as a result of the activity of a project or facility. This impact can be directly or indirectly caused by the project’s different phases (i.e., Construction, Operation, and Decommissioning).
Groundwater	is the <u>water</u> located beneath the earth’s surface in <u>soil pore</u> spaces and in the <u>fractures</u> of <u>rock formations</u> . A unit of rock or an unconsolidated deposit is called an <u>aquifer</u> when it can yield a usable quantity of water. The depth at which soil pore spaces or fractures and voids in rock become completely saturated with water is called the <u>water table</u> . <u>Groundwater is recharged</u> from, and eventually flows to, the surface naturally; natural discharge often occurs at <u>springs</u> and <u>seeps</u> , and can form <u>oases</u> or <u>wetlands</u>
Non-conformance	constitutes a non-compliance or an action plan or initial actions taken without tangible deliverables. Non-conformance may also be associated with activities breaching legislation. Non-Conformance findings therefore have a high priority and mitigation measures are mandatory.
Operation	the time period that corresponds to any event, process, or activity that occurs during the Operation (i.e., fully functioning) phase of the proposed project or development. (The Operation phase follows the Construction phase, and then terminates when the project or development goes into the Decommissioning phase.)
Partially Compliant	achievement with shortcomings (such as documented proof and or work in progress) and achievement where there is an obvious shortcoming in the delivery of the performance requirement.
Pollution	is the introduction of <u>contaminants</u> into the natural environment that cause adverse change. Pollution can take the form of <u>chemical substances</u> or <u>energy</u> , such as noise, heat or light. <u>Pollutants</u> , the components of pollution, can be either foreign substances/energies or naturally occurring contaminants. Pollution is often classed as <u>point source</u> or <u>nonpoint source pollution</u> .
Protection	in relation to a water resource, means - (a) Maintenance of the quality of the water resource to the extent that the water resource may be used in an ecologically sustainable way; (b) Prevention of the degradation of the water resource; and (c) the rehabilitation of the water resource;
Proponent	the person, company, or agency that is the primary responsible party for a development project and that is the permit applicant/holder for the project.
Rehabilitation Responsible Authority	is the act of restoring something to its original state; in relation to a specific power or duty in respect of water uses, means - (a) if that power or duty has been assigned by the Minister to a catchment management agency, that catchment management agency; or (b) if that power or duty has not been so assigned, the Minister;
Water Resource	includes a watercourse, surface water, estuary, or aquifer;



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Wetland means 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.

Abbreviations

CARA:	Conservation of Agricultural Resources Act, 43 of 1983
DEA:	Department of Environmental Affairs (The former Department of Environmental Affairs and Tourism)
DMR:	The Department of Mineral Resources (The former Department of Minerals and Energy)
DWA:	Department of Water Affairs (Is now referred to the Department of Water and Sanitation – DWS)
EA:	Environmental Authorisation
ECO:	Environmental Control Officer
EIA:	Environmental Impact Assessment
ELCA:	Environmental Legal Compliance Assessment
EMP:	Environmental Management Plan
EMPPA:	Environmental Management Programme Performance Assessment
EMPR:	Environmental Management Programme
EMS:	Environmental Management System
GM:	General Manager
GN:	Government Notice
I&AP:	Interested & Affected Parties
IEM:	Integrated Environmental Management Series
ISO:	International Standards Organisation
IWULA:	Integrated Water Use Licence Application
IWUL:	Integrated Water Use License
IWWMP:	Integrated Water and Waste Management Plan
KG:	Knowledge Gap
MOC:	Management of Change
MPRDA:	Mineral and Petroleum Resources Development Act, 28 of 2002
MR:	Mining Right
N/R:	Applicable, but not required at the time of the audit
NEMA:	National Environmental Management Act, 107 of 1998
NEMAQA:	National Environmental Management: Air Quality Act, 39 of 2004
NEMBA:	National Environmental Management: Biodiversity Act, 10 of 2004
NEMWA:	National Environmental Management: Waste Act, 59 of 2008
NC:	Non-conformance
NHRA:	National Heritage Resources Act, 25 of 1999
NWA:	National Water Act, 36 of 1998
RWD:	Return Water Dam
ROM:	Run of Mine
SAHRA:	South African Heritage Resources Authority
SHEQ:	Safety, Health, Environment and Quality
SLP:	Social and Labour Plan
SOP:	Standard Operating Procedure
SWMP:	Strategic Water Management Plan
WSA:	Water Services Act, 108 of 1997
WUL:	Water Use Licence





mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

FINAL BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT: Trentra (Pty) Ltd
FAX NO: 086 575 1718
POSTAL ADDRESS: P O Box 90512, Garsfontein 0042

AUTHORITY: Department of mineral resources & energy (Kimberley)

POSTAL ADDRESS: Private Bag X 6093, Kimberley, 8300

PHYSICAL ADDRESS: 65 Phakamile Mabija Street, Perm Building, Kimberley, 8301

TEL: 053 807 1722

Fax: 053 832 5671

FILE REFERENCE NUMBER SAMRAD: NC 30/5/1/1/2/12586 PR



Updated- 28/4/2021

1. IMPORTANT NOTICE

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

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

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has 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.



2. OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

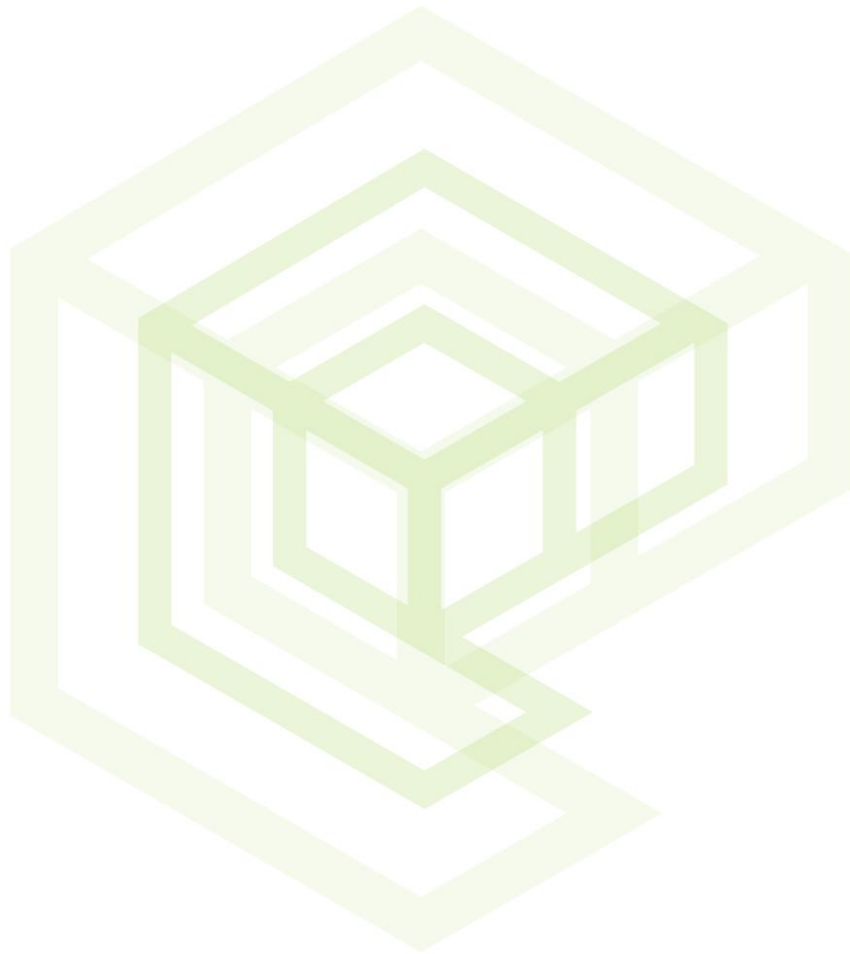
The objective of the basic assessment process is to, through a consultative process—

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



PART A

SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT



3. CONTACT PERSON AND CORRESPONDENCE ADDRESS

3.1 A. DETAILS OF

i. Details of the EAP

Name of The Practitioner: Mr. Vernon Siemelink / Ms. Kelebhone Sekonyela
 Tel No.: 012 807 0383
 Fax No. : 086 714 5397
 e-mail address: vernon@ecoe.co.za ; kele@ecoe.co.za

ii. Expertise of the EAP.

(1) The qualifications of the EAP
 (with evidence).

Name	Vernon
Surname	Siemelink
Company	Eco Elementum (Pty) Ltd
Position	Director – Senior Environmental Consultant
Location	361 Oberon Ave, Glenfield Office Park, Nikka Building, 1 st Floor, Farerie Glen, Pretoria, 0081
Email	vernon@ecoe.co.za
Telephone Number	072 196 9928/ 012 348 5214
Education	<p>M (EnvMan) - Master's in environmental management Master's Degree at University of Pretoria in Pretoria, South Africa (Gauteng)</p> <p>BSSc. GeoScience - Honours in Geographical Science Honours Degree at University of Pretoria in Pretoria, South Africa (Gauteng)</p>
Professional skills	<ul style="list-style-type: none"> - Vernon Siemelink is a Director at Eco Elementum (Pty) Ltd Environmental and Project Management Professionals and has been involved in the field of environmental science and environmental management for the past 9 years. - Vernon is a SGS IRCA Certified EMS Lead Auditor and a SETA accredited assessor. He has also completed the CEM auditor conversion training for ISO 9001, ISO 14001 and OHSAS 18001 Integrated Management Systems. - Vernon Siemelink has been an environmental consultant and professional since 2008, specialising in the fields of: <ul style="list-style-type: none"> • Environmental Impact Assessments and Authorisations. • Water use license application. • Waste use license application. • Environmental Monitoring and Control. • Mine Closure and Rehabilitation. • Environmental Compliance and Audits. • Environmental Management Systems; and Specialist Impact Studies. - During this time, he has provided quality, environmental, and health and safety consulting and auditing services in nearly every industry sector. - Furthermore, Vernon holds a Master's Degree in Environmental Management and an Honours Degree in Geosciences from the University of Pretoria.

Please refer to the CVs attached in Appendix A.

(2) Summary of the EAP's past experience.
 (In carrying out the Environmental Impact Assessment Procedure)



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Table 5: Qualifications of EAP

<p>Skills</p>	<ul style="list-style-type: none"> - Environmental Impact Assessments. - Basic assessments, WULA reports. - Water use license application. - Prospecting and Mining Right Authorizations. - Environmental Management Plans. - Public Participation. - Environmental Authorizations. - ISO 14001:2004 Environmental Management System Auditor. - FSC Forest Management Auditing. - Geographic Information System Support (ArcGISv9.2). - SETA Accredited Assessor. - EMSware software Administrator. - Integrated Management System Auditor.
<p>EAP Experience</p>	<p>Mr. Vernon Siemelink has been an Environmental Assessment Consultant for 9 years, during this time he has conducted S/EIA's, Basic Assessments, rehabilitation planning, developed EMPr (This includes conducting screening and scoping exercises, baseline studies, impact assessments, monitoring, and management planning and implementation) environmental legal assessments, ISO 14001:2004 management systems, due diligence, EMPr Performance Assessments and Integrated Water Use License Audits for clients in nearly every industry sector.</p>

<p>Name</p>	<p>Kelebone</p>
<p>Surname</p>	<p>Sekonyela</p>
<p>Company</p>	<p>Eco Elementum (Pty) Ltd</p>
<p>Position</p>	<p>Junior Environmental Practitioner (EAP)</p>
<p>Location</p>	<p>361 Oberon Ave, Glenfield Office Park, Nikka Building, 1st Floor, Farerie Glen, Pretoria, 0081</p>
<p>Email</p>	<p>kele@ecoe.co.za</p>
<p>Telephone Number</p>	<p>072 83 78813/ 012 348 5214</p>
<p>Education</p>	<p>MSc(EnvMan) - Masters in Environmental Management Master's Degree at University of Johannesburg in Johannesburg, South Africa (Gauteng) BA. Geography - Honours in Geographical Science Honours Degree at University of Johannesburg in Johannesburg, South Africa (Gauteng)</p>
<p>Professional skills</p>	<ul style="list-style-type: none"> - Kelebone Sekonyela is an EAP at Eco Elementum (Pty) Ltd and has been involved in the field of environmental science and environmental management for about 3 years. - Kelebone Sekonyela has been an environmental consultant since 2018, focusing in the fields of: <ul style="list-style-type: none"> • Environmental Impact Assessments and Authorisations. • Water use license application. • Waste use license application. • Environmental Monitoring and Control. • Environmental Compliance and Audits. - During this time, she has provided quality, environmental, and auditing services in nearly every industry sector. - Furthermore, Kelebone holds a master's degree in Environmental Management from the University of Johannesburg.



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3.2 B. LOCATION OF THE OVERALL ACTIVITY.

Table 6: Location of the activity

Farm Name:	The remaining extent of farm Adams NO.328: within the administrative district of Kuruman, Joe Morolong Local Municipality, Northern Cape province of South Africa.
Application area (Ha)	1651 ha
Magisterial district:	John Taolo Gaetsewe District Municipality
Distance and direction from nearest town	The study area is located 20 km south southeast of Hotazel, 42 km west-northwest of Kuruman and 36 km north of Kathu.
21 digit Surveyor General Code for each farm portion	- C03100000000030400006
Locality map	Attach a locality map at a scale not smaller than 1:250 000 and attach as Appendix C.
Description of the overall activity. (Indicate Mining Right, Mining Permit, Prospecting right, Bulk Sampling, Production Right, Exploration Right, Reconnaissance permit, Technical co-operation permit, Additional listed activity)	The remaining extent of farm Adams NO.328: within the administrative district of Kuruman, Joe Morolong Local Municipality, Northern Cape province of South Africa.

Table 7: Property location and coordinates

Property	Portion	Lat (y)	Lon (x)
Farm Adams 328	Remaining Extent	-27.377211	23.030747

The study area is characterised by mining, natura grassland, manufacturing, and open woodland.



3.3 C. LOCALITY MAP

(Show nearest town, scale not smaller than 1:250000)

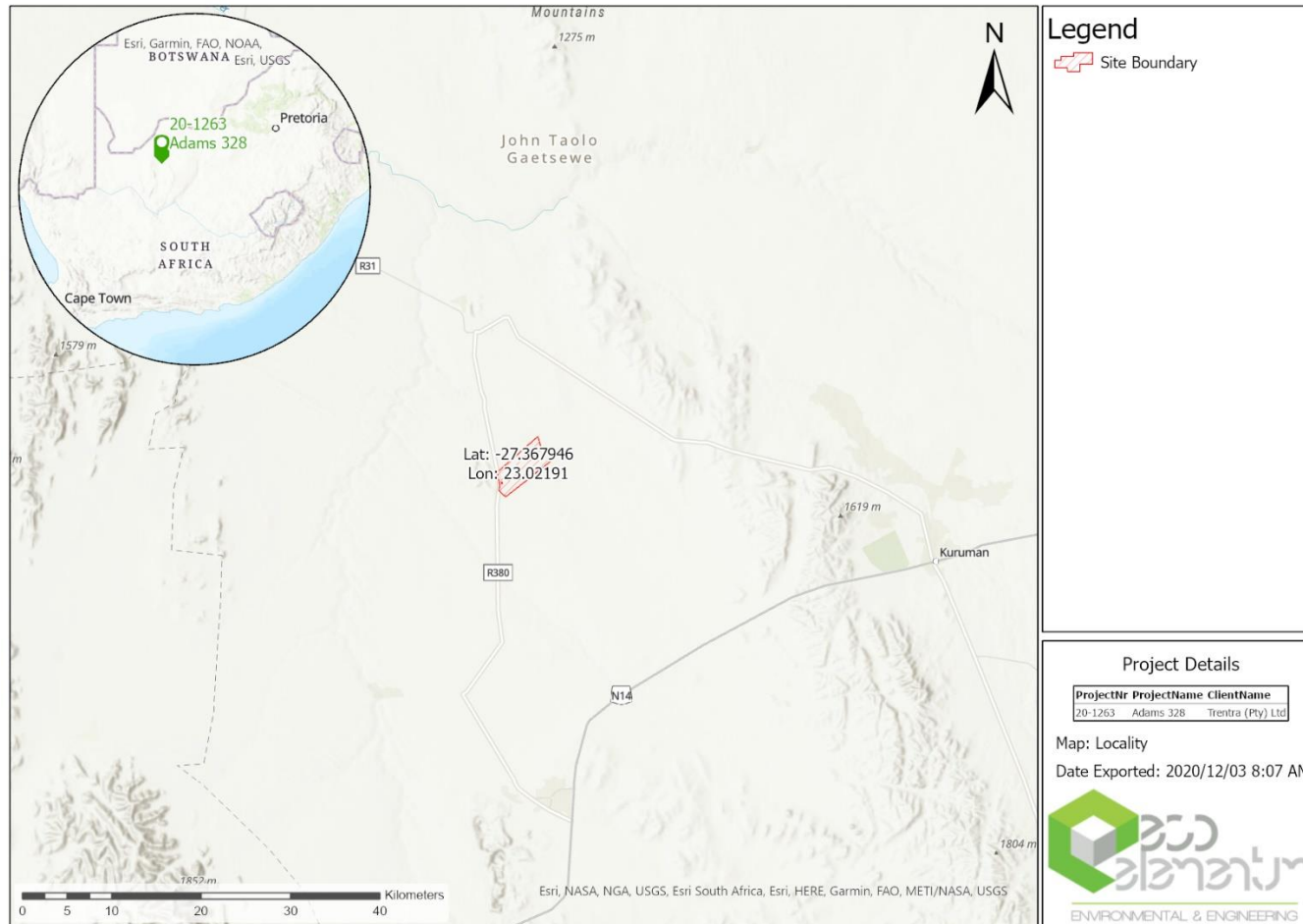


Figure 1: Locality Map



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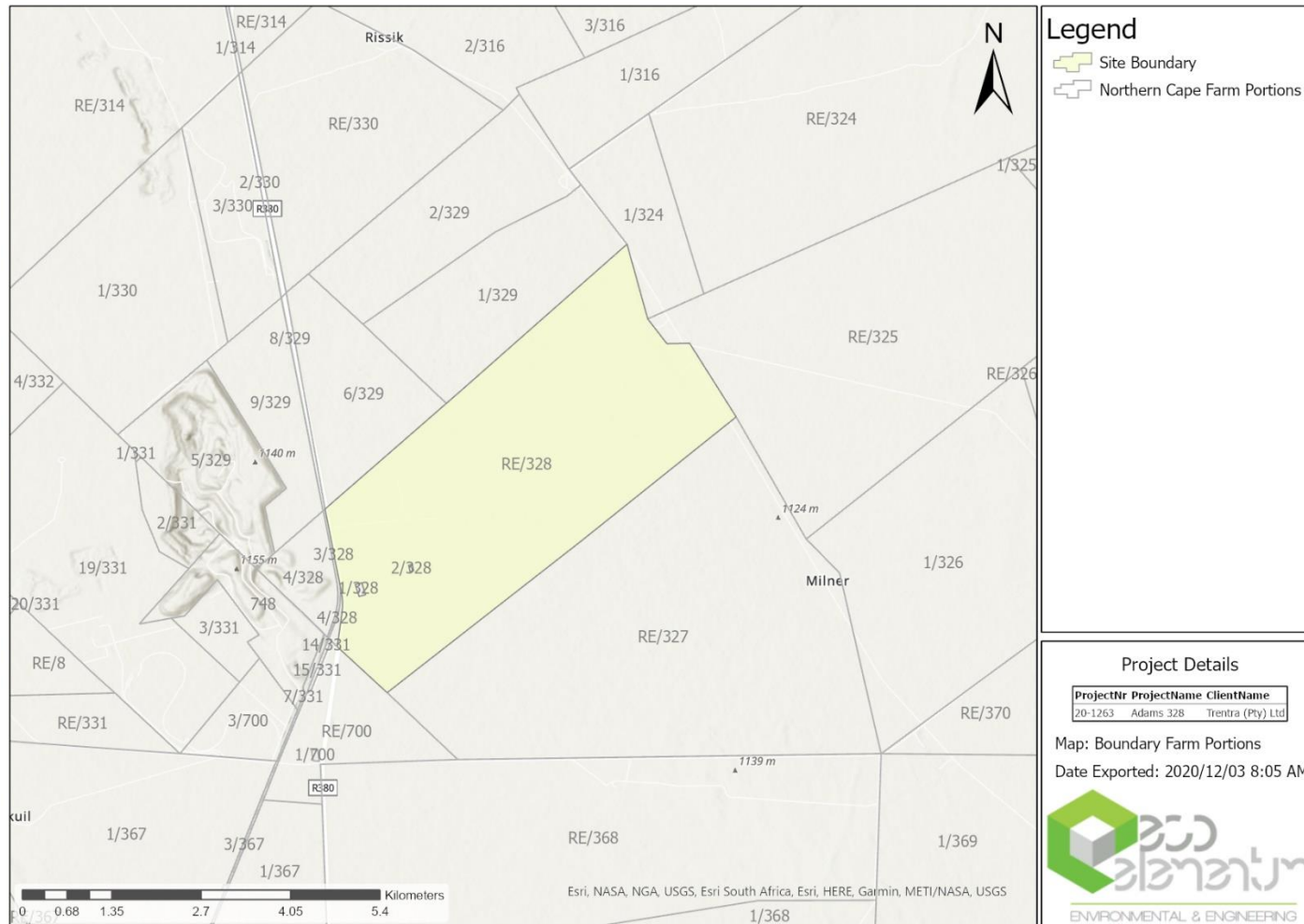


Figure 2: Boundary Farm Portions of the study area



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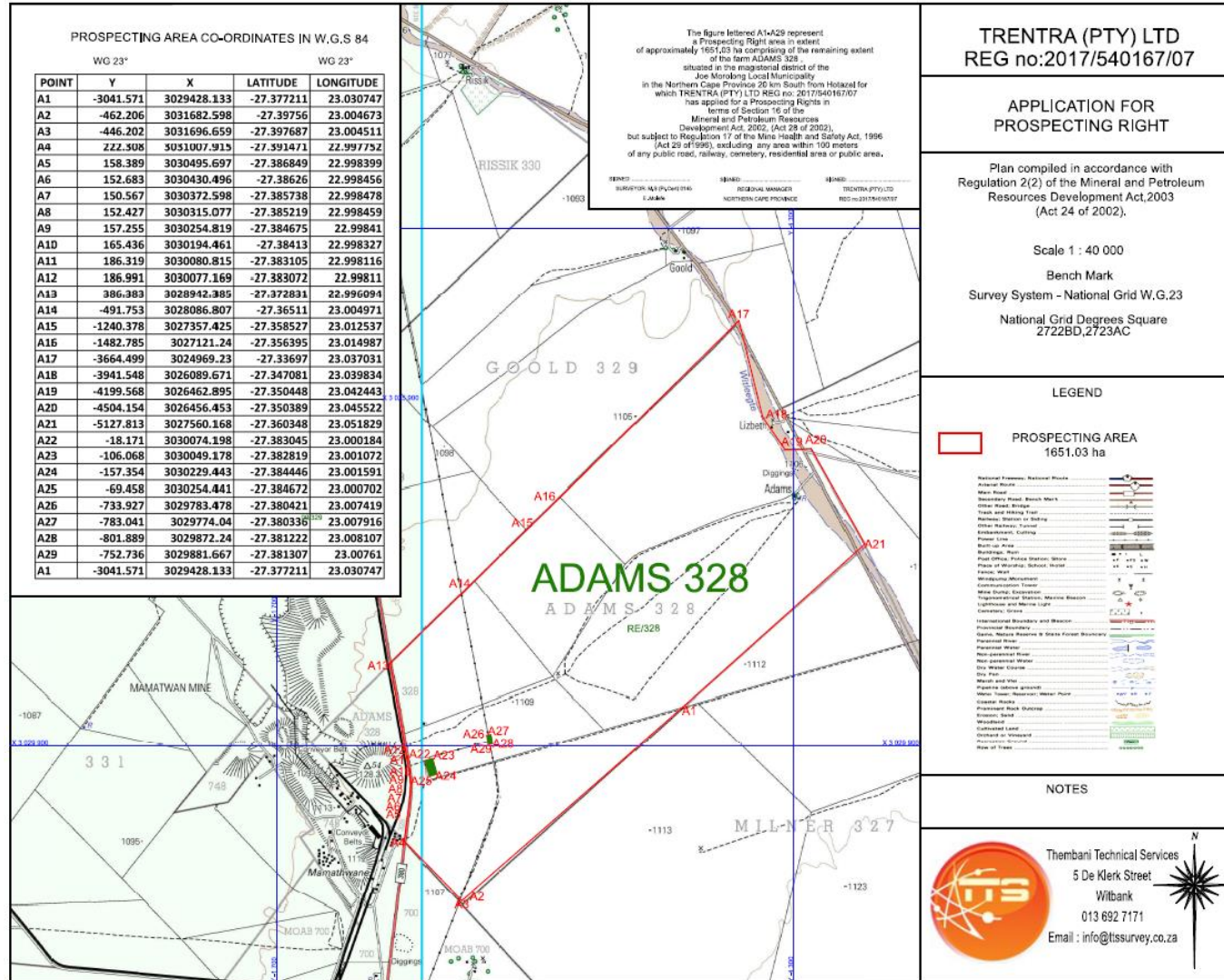


Figure 3: Regulation 2 (2) Map



4. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

Both non-invasive and invasive prospecting activities will be undertaken as part of the proposed Prospecting Work Programme (PWP). The application will follow a phased approach, where the prospecting work program is divided into several sequential phases.

Figure 4 depicts the current land cover and farm portions of the proposed prospecting area, the proposed areas of interest within the application area will be defined within the course of prospecting activities. It is anticipated that the invasive program will consist of 10 - 20 boreholes with a footprint of approximately 300 m² each. Vegetation will be cleared at the borehole locations within the application area. Minor access tracks will be created to access the proposed borehole sites where there are no existing roads. The total length of the access routes is anticipated to be 5 000 m and the approximate width is 3m.

At the end of each phase there will be a brief period of compiling and evaluating results. The results will not only determine whether prospecting proceeds, but also the manner in which it will go forward. The applicant will only action the next phase of prospecting, once satisfied with the results obtained in the previous phases. In addition, smaller, non-core parts of the prospecting work program will be undertaken, if warranted. A description of the planned invasive and non-invasive activities is detailed below.

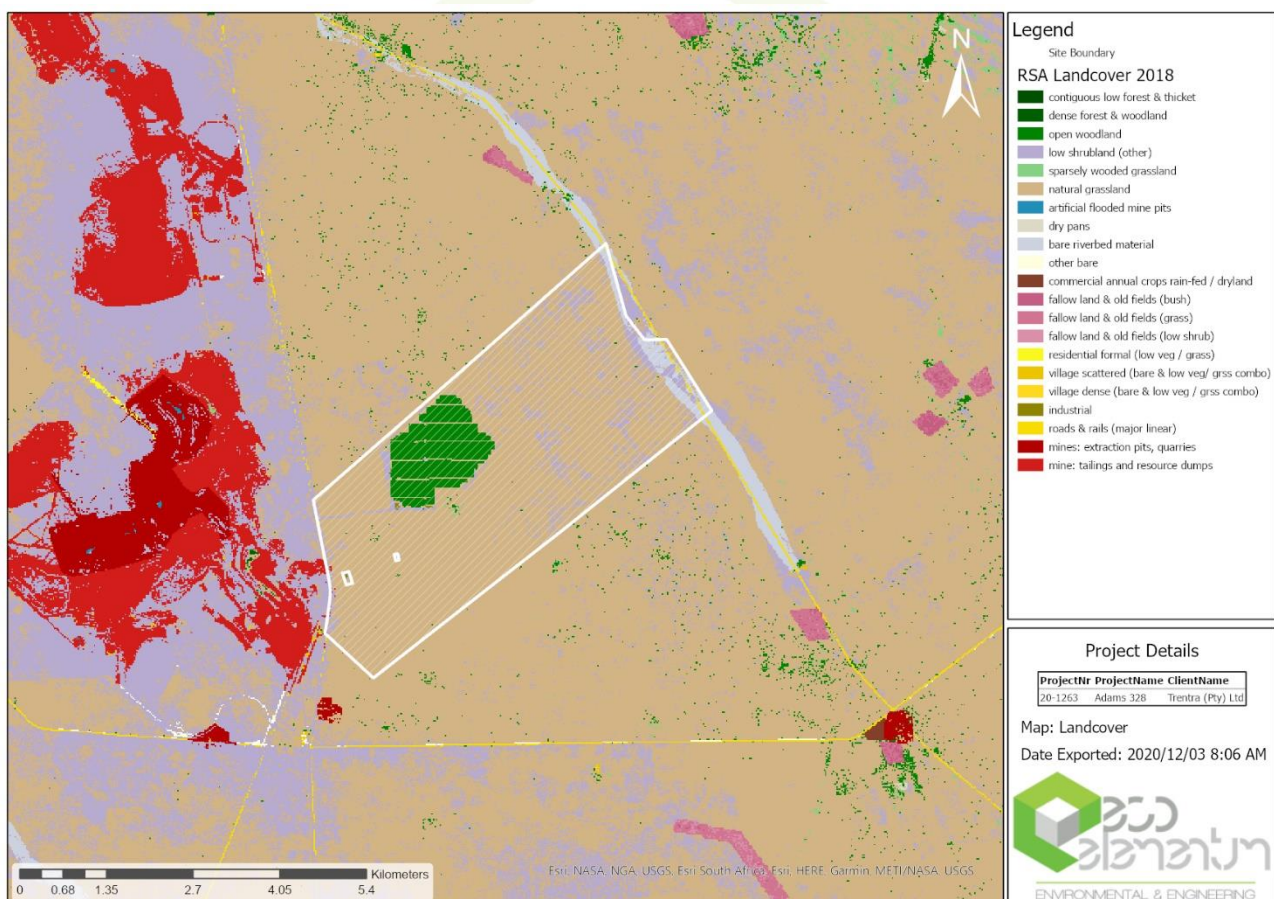


Figure 4: Current land cover Map – Farm portions



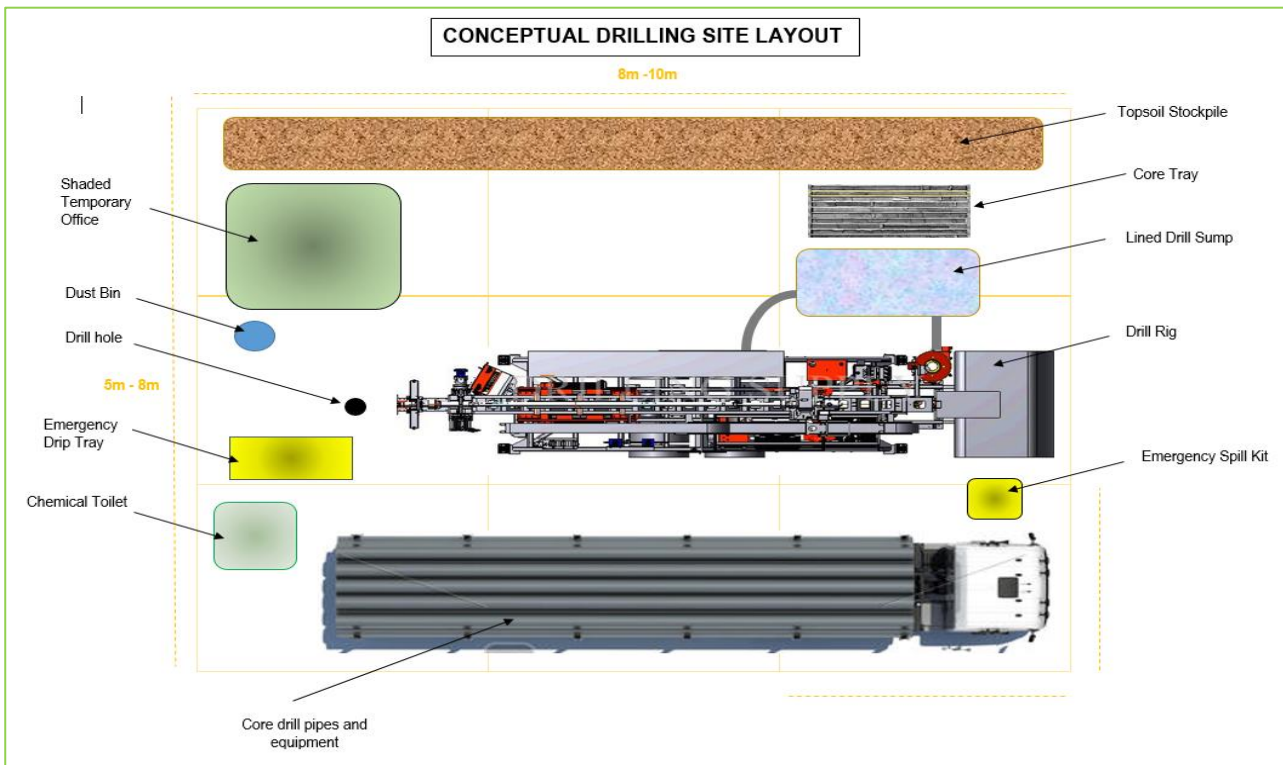


Figure 5: Conceptual drilling site layout

4.1 DESCRIPTION OF PLANNED NON-INVASIVE ACTIVITIES

The detailed geology of the proposed area is relatively unknown, and as such exploration work will commence from a very basic level. The Prospecting Work Programme will therefore be designed in phases, each phase conditional on the success of the previous phase and will include:

Literature Study – During this stage information pertaining to the geological, geographical, environmental and geomorphological including the topographical and infrastructural systems of the area will be studied with the aim of designing the prospecting program and also the impact that the programs will have in the environmental and the ecosystem of the area. Information will be gathered from relevant areas including the Council of the Geoscience and other commercial areas where it may be available. Sources of information will include geological reports, general geological text books and geological maps, topographical maps, agricultural and land use maps. Visits to the area will also be conducted in order to acquire information that might not be available in literature. Detailed geological information will then be gathered which will be used in planning further prospecting and exploration strategy.

Geological Mapping – This stage will include the field traverse in the farm collecting geological information. Lithological contacts, outcrops, faults, dykes, folds will be mapped including their attitude and characteristics like dip and strikes, thickness etc. this information will be correlated with the literature study information in order to correlate with the correct stratigraphy and lithological units.

Geophysical Survey – a decision will be taken to conduct geophysical observation or procure geophysical data from commercial sources and organizations that collect them. The information that will be acquired will be chiefly magnetic which will be aimed at delineating structures of higher or lower magnetic susceptibility than the surrounding country rocks. If the company conducts the observations, it will be airborne surveys conducted with the use of a contractor.

Interpretation of Information and decision making – This item appears in all the phases towards the end of the data gathering sub-programs. In Phase 1, this will mean that maps will be drawn depicting the data which is of the geological nature of the area. Using all other information, a decision will then be taken as to whether it is feasible to carry on or if the project should be abandoned



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Sampling and resource modelling. This stage entails sampling the core from drilling as well as data manipulation to produce drilling results information. Resource modelling is conducted which will result in tonnages and grade distribution. However, this is still in low geological confidence. From the results, a decision will be taken if prospecting will be continued.

During the non-invasive methods, additional information is gathered in the form of prefeasibility studies. This includes the determination of the suitable mining method and its costs. Other information that is gathered includes the macro and the micro economics that will determine the feasibility of the project.

As is clear from the information provided above, each of the phases is dependent on the results of the preceding phase. The location and extent of possible drilling can therefore not be determined at this stage. Mapping of the prospecting activities could thus not be undertaken. For the purposes of this report, the overall prospecting area is presented in Figure 4 and 5. In the subsequent sections more details are provided in terms of each of the prospecting activities. The applicant must submit a plan indicating the location of drilling activities, once these areas have been finalized to at least all land owners, as well as the Department of Mineral Resources. Please refer to Section 6 of the PWP for further details on these methods. No bulk sampling work is to be carried out during this prospecting program.

4.2 DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN

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

The minerals that will be prospected in the proposed site is Manganese. this section presents a detailed description of all the activities associated with the proposed prospecting application. Due to the nature of the Prospecting Works Programme, and the fact that the specific prospecting activities required are dependent on the preceding phase, assumptions are presented where required.

Access Roads

Access to the site will be required during mapping and drilling activities (Phase2). Access requirements can only be determined after Phase 1 has been concluded. A number of existing roads and tracks already traverse the proposed prospecting site and where practicable, these roads will be used. All access on farms will be conducted in terms of a written agreement with the land owner. In instances where no access roads are available to the site location a single track will be selected as the best alternative on the basis of least environmental impact with natural habitat considered the last option.

During mapping activities, vehicle access will be gained to site through the veld and the establishment of a track to gain repeated access to a mapping site will not be required.

Once the drill sites have been identified, temporary access roads may be established for repeated access to the prospecting site if the identified drill site cannot be accessed via existing roads and tracks.

Vegetation and topsoil stockpile areas (if required)

Vegetation and topsoil will only be stockpiled in instances where settling sumps are required i.e. core drilling. During the excavation process the topsoil and available vegetation will be placed adjacent to the sumps. This will also serve as a storm water diversion berm. The excavated material will be backfilled into the rehabilitated sumps on completion of the drilling process.

Water Supply

For the prospecting phase, several sites will be selected for geotechnical drilling. These boreholes and its associated activities will impact on a surface area of between 250 and 640 m². The full extent of the drill site will also be demarcated and no drilling will be done outside of the boundary.

Currently it is not known whether there are any water boreholes located on the site and whether access and supply will be granted by the landowner.

Continuous water supply will be required during drilling, and on-site water storage tanks with a capacity of 15,000 ℓ for water supply to the drill, will be used.



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When core drilling will be undertaken, a number of settling sumps will be excavated and lined with impervious plastic sheets. The purpose of these sumps are to recycle water and drilling fluids by means of gravity which leads to heavier materials (e.g. drill cuttings) to settle and clean water being produced for re-use. The drill cuttings form a sludge which will be collected in the sumps. These sumps will be fenced, where required, to prevent livestock and public access. The plastic-lined sumps will be used to recycle water through a filter process in order to maintain a constant clean water source for the purpose of drilling. The plastic sheets will be removed and sumps will be backfilled on completion of drilling. If required, the remaining sludge in sumps is to be treated with a suitable bio-remediation product prior to backfilling or disposal.

Additional water requirements relate to the potable water supply for employees and workers. A temporary 15 000 ℓ will be stored in tanks for drinking water and generalise by persons will be provided at the drill site. Additional facilities will include temporary portable toilets, berms on the upstream side of the mini-pit to divert clean water around the pit.

Ablution

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

Accommodation

No accommodation for staff and workers will be provided on- site. Workers will be transported to and from the prospecting site on a daily basis. No equipment will be stored onsite.

Storage of Dangerous Goods

During the diamond drilling activities limited quantities of diesel fuel, oil and lubricants will be used onsite, all chemicals and dangerous goods will be stored on the drilling trucks and be packed up at night and removed. The only dangerous good that will be stored in any significant quantity is diesel fuel. A maximum amount of 60 m³ will be stored in above ground diesel storage tanks located on an impermeable surface with bunds. Storage and use of hydrocarbons and other chemicals may only take place on impermeable surfaces with bunds to contain any accidental spills.

Hazardous material will be stored in appropriate containers and clearly marked. Drip trays and or impermeable surfaces with bunds must be placed under machinery that has the potential to leak. Material Safety Data Sheets will be available for all drilling and other chemicals kept on site.

Drill rig

In most cases, the drill rig will be a self-contained, truck-mounted unit that will be accompanied by a compressor and a generator. The drill rig will be driven to site and mobilised in the desired location, positioned over the hole site and will be stabilised.

The footprint of disturbance for a prospecting rig and associated equipment is generally smaller than 25 - 64 m². Plastic sheets and trip trays will be placed underneath the rig for the duration of the drilling process at each site in order to avoid hydrocarbon spills and contamination. The full extent of the drill sites will be staked out and the drill crew will not operate beyond these boundaries. Depending on the locality, this perimeter may be fenced, marked with bunting or barricading. Please refer to Figure 6 for a layout plan of the drilling site.

Drill core storage area

During core drilling, a laydown area for the extracted core samples will be established within the footprint of the drill site. This area is usually 5 m × 2 m and is used to place the extracted core in sequence (according to depth) for later analysis by an appointed geologist. Core trays will be used to contain the core samples.

4.3 DESCRIPTION OF PLANNED INVASIVE ACTIVITIES

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

Planned invasive prospecting methods entail conducting drilling to ascertain the existence of the expected minerals, its thickness and distribution. Samples will be taken and analysed. The number of boreholes planned is 20:

- Reconnaissance drilling: 5



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- Resource drilling: 6
- Feasibility drilling: 9

The depths will be to a depth of approximately 50 meters. The exact depths of the boreholes will be determined while the drilling program is underway as influenced by the depths and dips measured in the previous boreholes.

Trenching will be conducted where the orebody occurs very close to the surface. Trenches will not be conducted any deeper than 2m for all intents and purposes.

4.4 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.

Feasibility studies will be conducted in two stages as pre-feasibility studies and feasibility studies where some commonly call it definitive feasibility studies. Information gathered during feasibility studies includes but is not limited to macro and micro economics, mining methods, human resources, environmental, financial, metallurgical etc. in the prefeasibility studies, a series of mining methods are evaluated with the orebody and a most suitable one is chosen. Costs relative to the mining methods are estimated and financial models are built. In the feasibility studies, more information is gathered around the chosen mining method and again models are built to determine the feasibility of the project.

i. Listed and specified activities

Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) requires, upon request by the Minister that an Environmental Management Plan be submitted and that the applicant must notify and consult with Interested and Affected Parties (I&APs). Section 24 of the NEMA requires that activities, which may impact on the environment must obtain an environmental authorisation from a relevant authority before commencing with the activities. Such activities are listed under Regulations Listing Notice 10 the proposed prospecting activity triggers:

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



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Table 8: Listed and specific activities

<p>NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablation facility, accommodation, equipment storage, sample storage, site office, access route etc... Etc... etc. E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablation, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc... Etc... Etc.)</p>	<p>Aerial extent of the Activity Ha or m²</p>	<p>LISTED ACTIVITY (Mark with an X where applicable or affected).</p>	<p>APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)</p>	<p>WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)</p>
<p>Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.</p>	<p>640 m²</p>	<p>X</p>	<p>GNR 983 – Listing 1, Activity 20</p>	<p>n/a</p>
<p>Drill site clearing and establishment, mobile chemical ablation facility, drill rig equipment, return water lined sump, and sample storage trays.</p>	<p>640 m²</p>	<p>X</p>	<p>GNR 983 – Listing 1, Activity 20</p>	<p>n/a</p>
<p>Soil Sampling Activities (A typical sampling site will be approximately 25 m²). It is unlikely that more than 10 samples will be taken, however, this will be confirmed on site as part of the prospecting activities.</p>	<p>64 m² per prospecting drill site</p>	<p>X</p>	<p>GNR 985 – Listing 3, Activity 12</p>	
<p>Roads (roads will be temporary gravel roads, not exceeding 3,5 m in width)</p>	<p>Approx. 20 000 m²</p>	<p>-</p>	<p>-</p>	<p>-</p>
<p>Temporary Camp Site</p>	<p>Approx. 100 m²</p>	<p>-</p>	<p>-</p>	<p>-</p>
<p>Site Clearance</p>	<p>Less than 20 ha</p>	<p>X</p>	<p>GNR 983 – Listing 1, Activity 27</p>	<p>-</p>
<p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>Less than 20 ha</p>	<p>X</p>	<p>GNR 324 – Listing 3, Activity 12</p>	
<p>Hydrocarbon Storage</p>	<p>Less than 30 m³</p>	<p>-</p>	<p>-</p>	<p>-</p>



5. POLICY AND LEGISLATIVE CONTEXT

Table 9: Policy and legislative table

<p>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</p> <p>(a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)</p>	<p>REFERENCE WHERE APPLIED</p>	<p>HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.</p> <p>(E.g. In terms of the National Water Act a Water Use License has/ has not been applied for)</p>
<p>Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)</p>	<p>The project requires a prospecting right authorisation from the Department of Mineral Resources</p>	<p>A prospecting right was lodged with the DMR The application was accepted by DMR on 6th of August 2020.</p>
<p>NEMA Environmental Impact Assessment (EIA) Regulations, as Amended 2017</p>	<p>This Basic Assessment and Environmental Management Plan to be conducted. Baseline environmental information of the project area will be assessed. Mitigation measures and recommendations where provided according to best practice standards.</p>	<p>An Application for Environmental Authorisation will be submitted to the Northern Cape (Kimberly) DMR with the prospecting right application lodgement on SAMRAD. The DMR also requested the submission of the updated NEMA application forms and PWP with 60 days of the approved application.</p>
<p>The South African Constitution The South African Constitution (Act 108 of 1996) constitutes the supreme law of the country and guarantee the rights of all people in South Africa</p>	<p>Applied at potential impacts identification as well as mitigation measures and public participation.</p>	<p>A public participation process will be followed and consultations will be done regarding the proposed project. An EMPr and awareness plan will be designed according to the issues raised during this process.</p>
<p>National Environmental Management: Biodiversity Act , 2004</p>	<p>Presence of critically endangered species, if permit is required. To be determined by ecologist prior to prospecting activities.</p>	<p>The EMP will regulate the applicant to apply for Tree Removal Permit from the Relevant authority prior to the potential removal of any sensitive and/or protected species.</p>
<p>National Environmental Management: Waste Act</p>	<p>Provisions of the waste act were consulted to determine whether a waste license was required for any aspect of the proposed development.</p>	<p>The project activities do not trigger a waste management license but proper waste management measures will be addressed in the EMPr.</p>
<p>National Environmental Management Act 107 OF 1998 GNR 324 – Listing 3, Activity 12</p>	<p>Added the triggered Listed activity 12 of GNR 324 of Listing Notice 3 on the specified activities.</p>	<p>Prospecting right application included the Listed activity 12 of GNR 324 of Listing Notice 3 which allows to conduct</p>



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		prospecting activities on an area of high biodiversity sensitivity in terms of 2014 EIA Regulation as amended.
Section 38 of the National Heritage Resources Act (Act No. 25 of 1999)	Legislation consulted during the impact assessment process, to determine what legal requirements with regards to the management of national heritage resources were relevant to this application.	An upload of the BAR was done on the SAHRIS online system for comment.
National Environmental Biodiversity Act The National Environmental Management Biodiversity Act (NEM:BA), 2004 (Act No.10 of 2004), provides for: (i) the management and conservation of South Africa’s biodiversity within the framework of the National Environmental Management Act, 1998; (ii) the protection of species and ecosystems that warrant national protection; (iii) the sustainable use of indigenous biological resources; (iv) the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; (v) the establishment and functions of a South African National Biodiversity Institute;	Baseline review of the biodiversity.	Sections of the proposed prospecting right area falls under NEMBA Section 52 - Alien and Invasive Species Lists, 2014 (GN R599 in GG 37886 of 1 August 2014, updated 2016).
National Water Act The NWA (Act No. 36 of 1998)	Triggered activities will be identified according to the Section 21 of the NWA.	The department has been notified of the proposed project and comments will be addressed. A water use license will be lodged immediately upon approval.
National Environmental Management: Air Quality Act, 2004 (Act no.39 of 2004);	Dust monitoring on site during the operation.	As part of the EMP dust suppression methods will be used.
Mine Health and Safety Act, 1996 (Act No. 29 of 1996);	Health and Safety Policy.	Risk Impact Assessment to be conducted.
The Northern Cape Nature Conservation Act / NCNCA (Act No 9 of 2009)	Used to identify Specially Protected/Threatened Species: o Schedule 1 o Protected Species: Schedule 2.	Specialists have been appointed to undertake studies to determine if the application are falls within any CBAs and recommend mitigation measures where applicable.
CBAs are terrestrial (land) and aquatic (water) features (e.g. vleis, rivers and estuaries) in the landscape that are critical for conserving	Used to identify possible mitigation measures	Specialists have been appointed to undertake studies to determine if the application are falls within any CBAs and recommend mitigation measures where applicable.

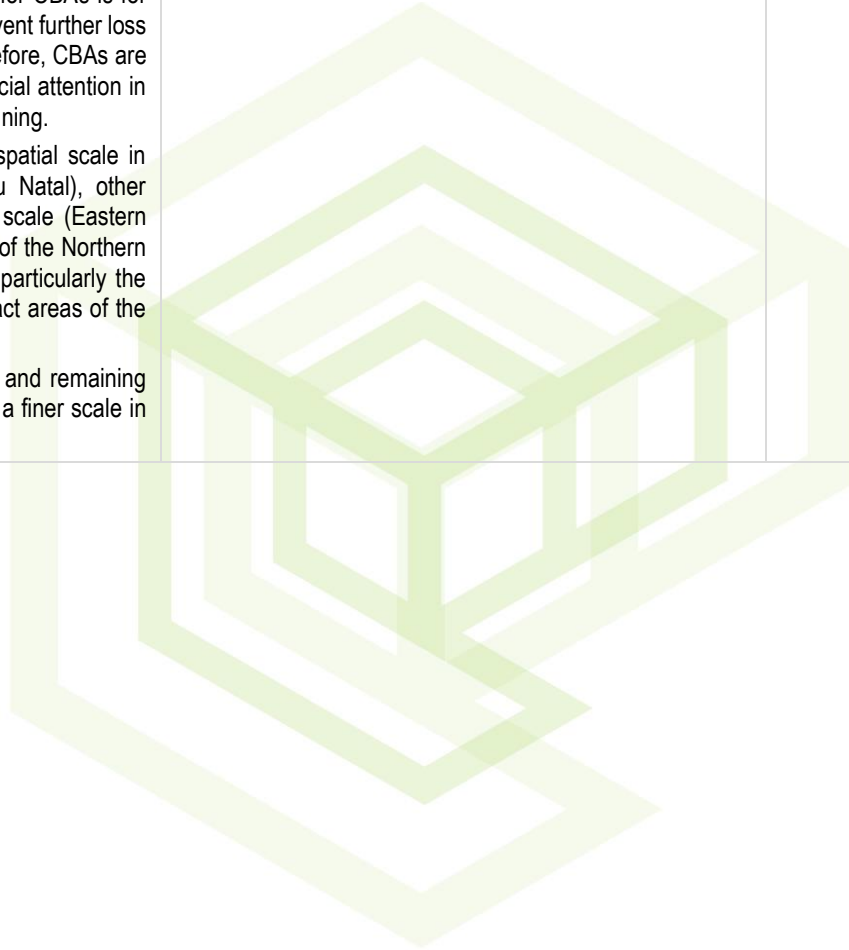


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biodiversity and maintaining ecosystem functioning in the long term (which is particularly important in the face of climate change). The desired management objective for CBAs is for them to remain in a natural or near- natural, i.e. to prevent further loss or degradation of natural habitat in these areas. Therefore, CBAs are biodiversity request priority that must be afforded special attention in assessing and evaluating impacts of prospecting or mining.

Although CBAs have been identified at a very fine spatial scale in some provinces (Gauteng, Western Cape, Kwazulu Natal), other areas they have been identified more at a broader scale (Eastern Cape, Northwest, Limpopo and the Namakwa district of the Northern Cape). All CBAs require field verification, but this is particularly the case for broad scale CBAs where it is only in the intact areas of the CBA that mining should be prohibited.

Over time, CBAs will be identified in the Free State, and remaining areas of the Northern Cape, and may be identified at a finer scale in additional provinces.



6. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

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

South African economy heavily relies on the mining sector. Successful prospecting for these minerals will boost the current struggling national economy as the project will advance to mining phase. The mining sector has provided more employment opportunities for the citizens in general. The Project is in line with the relevant IDP, SDF, EMF and PDP. There is no reason why this development should not be considered at this particular point in time considering the high probability of a reserve as proved by other resources in the vicinity of the area.

Although prospecting is not seen as an activity that significantly and sustainably contributes to an area's economy, it is a precursor to possible mining activities. The activity of mining has numerous social and economic benefits in local, regional and national context. These include: 1. Job creation 2. Skills development 3. SMME development 4. Local economic development 5. Contribution to local and national tax income (royalties, company's tax etc.) 6. Contribution to the national gross domestic product, and 7. Future business opportunities.

South African economy heavily relies on the mining sector. Successful prospecting for these minerals will boost the current struggling national economy as the project will advance to mining phase. The mining sector has provided more employment opportunities for the citizens in general. There is no reason why this development should not be considered at this particular point in time considering the high probability of a reserve as proved by other resources in the vicinity of the area.



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7. MOTIVATION FOR THE OVERALL PREFERRED SITE, ACTIVITIES AND TECHNOLOGY ALTERNATIVE.

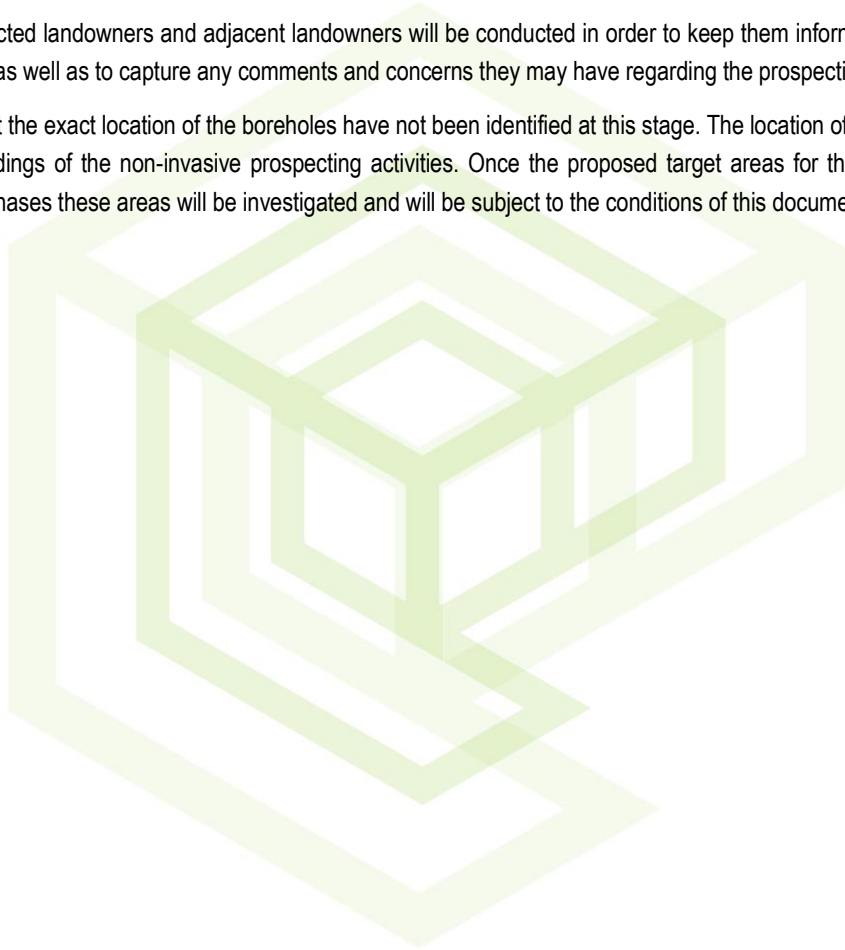
The application area has been selected as the preferred site based on the the geological formations in the area.

Some of the techniques employed in the non-invasive prospecting activities will include a literature survey, field reconnaissance/mapping, and geophysical survey of the geology, outcrops. Some of the invasive prospective activities include prospecting boreholes, boreholes to confirm continuity of mineralization & potential deposit size and resource definition drilling.

In terms of the technologies proposed, these have been chosen based on the long term success of the company in terms of their prospecting history. The prospecting activities proposed in the Prospecting Works Programme is dependent on the preceding phase as previously discussed, therefore no alternatives are indicated, but rather a phased approach of trusted prospecting techniques.

Consultation with affected landowners and adjacent landowners will be conducted in order to keep them informed about the proposed prospecting activities as well as to capture any comments and concerns they may have regarding the prospecting activity.

It should be noted that the exact location of the boreholes have not been identified at this stage. The location of these boreholes will be dependent on the findings of the non-invasive prospecting activities. Once the proposed target areas for the boreholes have been identified during the phases these areas will be investigated and will be subject to the conditions of this document.



8. FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVES WITHIN THE SITE.

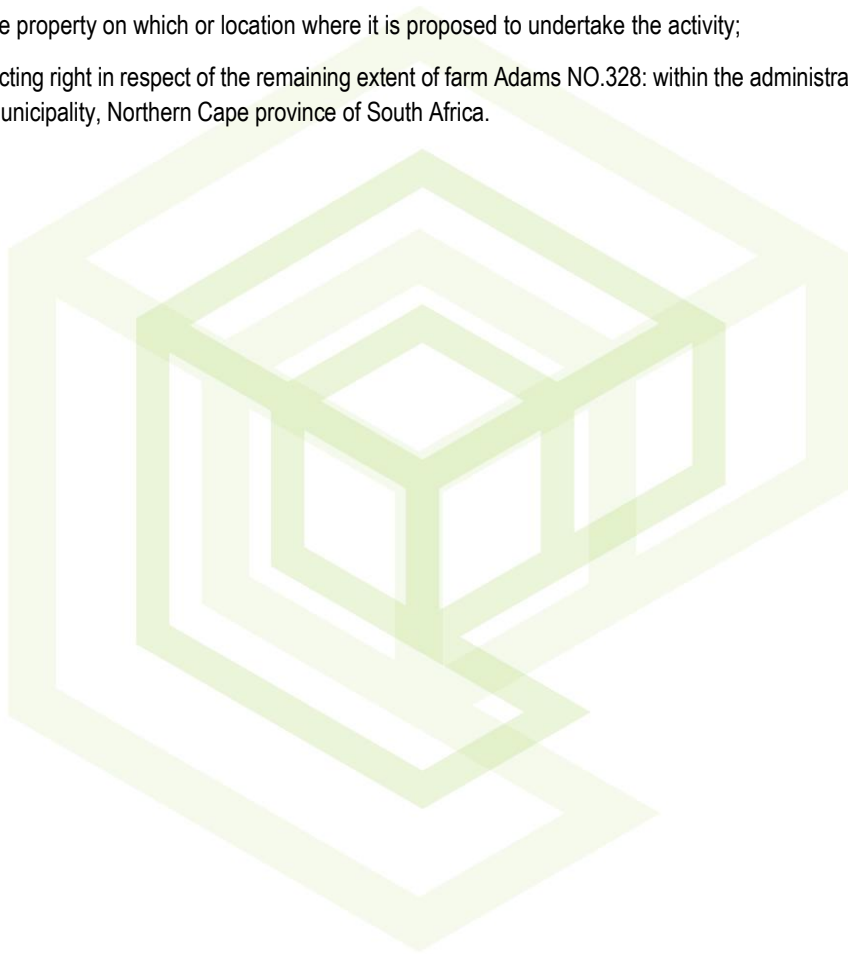
NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

8.1 DETAILS OF THE DEVELOPMENT FOOTPRINT ALTERNATIVES CONSIDERED.

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

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

Application for Prospecting right in respect of the remaining extent of farm Adams NO.328: within the administrative district of Kuruman, Joe Morolong Local Municipality, Northern Cape province of South Africa.



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- b. the type of activity to be undertaken;

Minerals that will be prospected in the proposed site is Manganese. This section presents a detailed description of all the activities associated with the proposed prospecting application. Due to the nature of the Prospecting Works Programme, and the fact that the specific prospecting activities required are dependent on the preceding phase, assumptions are presented where required.

Phase 1 (month 0 to 6): Desktop study

- Review of all published and unpublished literature and maps pertaining to geological and structural interpretations based on existing remote sensing data such as aerial photography, satellite imagery and existing borehole information.
- On records by the council for geosciences there are numerous historical boreholes in adjacent properties.
- Reconnaissance field investigations.
- Redesign and refine exploration program based on results of desktop studies.
- Stream sediment and soil sampling.
- Geophysical and geochemical survey.
- Only non-invasive prospecting activities will take place in the first phase of prospecting.
- Ground geophysical survey to follow up airborne anomalies.
- Geological mapping using grid lines and remote sensing and geophysical survey results as a guide.
- Grid controlled geochemical surveys followed by trenching aimed at supplementing and confirming geological and remote sensing studies.
- Preliminary socio economic program.

If there is indication of resource potential, then from Phase 1, the prospecting work program will proceed as follows:

Phase 2 (month 6 to 12): Regional Airborne Geophysical Survey

- Abort or continue depending on the success of the program.
- Reverse circulations and diamond drilling to test defined targets.
- Geotechnical drilling of 10 - 20 boreholes to an average depth of 100 - 150 meters.

Airborne Surveys/Geophysical Surveys will be conducted upon issue of the Prospecting Right, to give an overview of the geophysical properties of the prospecting area. Drilling will commence six months later and the process will be determined by local conditions but can generally be based on about 25 m² -64 m² per rig per day for a week. 10 -20 diamond drill holes will be drilled in the strategic locations to fill the gaps and confirm existing holes and information derived from the geophysical field survey.

The drill cores will be geologically logged and sampled and analysed at an accredited facility to determine the economic viability. All core logging will be completed concurrently with the drilling programme to assist in determining the spectrum of viable mineral resources. The drill wells will then be geo-physical logged for structural and geotechnical interpretation. After this, the holes will be cased, capped and marked to make it noticeable safe for people and animals but also allow for future access by the exploration team. Updating of data base, recording of borehole logs, evaluation and geological modelling.

- Environmental Monitoring and Rehabilitation.
- Pre-feasibility study and planning of phase 3 exploration drilling.
- Phase 3 would depend on the laboratory results; it usually takes between 7 to 15 days to obtain the laboratory report.

Phase 3 (month 12 - 24): Semi-Regional Geophysical Survey (ground based)

Depending on the results of phase 2, the following preliminary program might be followed:

- Updating of data base, recording of borehole logs, evaluation and geological modelling.
- Additional drilling.
- Geohydrological studies.
- Environmental Monitoring, Rehabilitation and future Mining Right EIA's.
- Conceptual mine planning.
- Preliminary economic analyses.



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As is clear from the information provided above, each of the phases is dependent on the results of the preceding phase. The location and extent of possible drilling can therefore not be determined at this stage. Mapping of the prospecting activities could thus not be undertaken. For the purposes of this report, the overall prospecting area is presented in Figure 4 and 5. In the subsequent sections more details are provided in terms of each of the prospecting activities. The applicant must submit a plan indicating the location of drilling activities, once these areas have been finalized to at least all land owners, as well as the Department of Mineral Resources. Please refer to Section 6 of the PWP for further details on these methods. No bulk sampling work is to be carried out during this prospecting program.

DESCRIPTION OF PLANNED INVASIVE ACTIVITIES

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

Drilling

The targeting of all drilling activities will be dependent on the results obtained during the preceding phases of prospecting, namely the geological mapping and geophysical surveying.

Diamond drilling will be of the standard HQ or NQ size. Down hole surveys will be done every 50m in each hole. Core will be marked, logged, photographed and sampled according to the standard of the applicants logging and sampling procedures.

Down the hole geophysical surveying will take place upon completion of the exploratory boreholes along with Ground EM surveys to determine positions of conductors.

Rehabilitation of drill sites will be done according to an approved Environmental Management Programme.

Percussion Rotary Air Blast (RAB) drilling may be carried out for pre-collaring of diamond drill boreholes or for obtaining samples if significant depth of cover is encountered over particular targets.

Assaying

Rock chip / soil samples will be sent to a laboratory of the applicant's choice to be crushed, split, pulverized and assayed. Samples from core will be split using a core cutter before being sent to the laboratory for analysis.

Metallurgical Test Work

Metallurgical test work would start during phase 7 of the prospecting work programme. These tests will be done by and in consultation with a preferred and accredited Laboratory of the applicant's choice.

Phase 4 (month 24 - 34): Boreholes

The initial planned invasive prospecting activities will consist of diamond drill boreholes drilled to appropriate depths to target any anomalies identified during Phases 2 & 3 of the non-invasive portion of the prospecting work plan. The work will consist of:

- Access and drill site preparation
- Diamond core drilling
- Sampling and assaying
- Quality assurance and quality control programs
- Down hole geophysics
- Rehabilitation of drill sites
- Recording & Integration of data

Phase 7 (month 42 - 48): Boreholes

This phase of boreholes would determine the continuity of mineralization & potential deposit size. The work will consist of:

- Access and drill site preparation
- Widely spaced diamond drilling and analyses to confirm grade / tonnage potential
- Sampling and assaying



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- Quality assurance and quality control programs
- Metallurgical test work
- Rehabilitation of drill sites
- Recording & Integration of data

Phase 8 (month 48 - 60): Boreholes

This phase of boreholes would provide enough information to be able to calculate an inferred resource. The work would consist of:

- Access and drill site preparation
- Close spaced infill diamond drilling and analyses to determine actual grade / tonnage
- Sampling and assaying
- Quality assurance and quality control programs
- Metallurgical test work
- Geotechnical drilling program
- Rehabilitation of drill sites
- Recording & Integration of data

8.2 THE DESIGN OR LAYOUT OF THE ACTIVITY.

The location of activities will be determined based on the location of the prospecting activities, which will only be determined during Phase 1 of the Prospecting Works Programme.

Final borehole sites to be determined after phase one of the prospecting.

8.3 THE TECHNOLOGY TO BE USED IN THE ACTIVITY.

All equipment to be used will be provided by contractors

1. Geochemical Techniques

It is used to determine values of elements that are higher than the normal background value. Samples that should be analysed include:

- a. Rock samples from surface outcrops.
- b. Soil samples from surface pits.
- c. Stream sediments.
- d. Stream water.
- e. Leaves and roots of predominant vegetation.

2. Exploration Drilling

After an anomaly or a presumed anomaly has been detected, it is necessary to define its limits and to determine mineral content of any ore present. After determination of these factors, it is necessary to evaluate the ore in terms of its physical characteristics for:

- Mining operating parameters.
- Geotechnical design, and
- Metallurgical extraction.

The type of drilling program required to evaluate the Rock is primarily dependent upon the depth of the Rock and the strength of the material to be drilled. Generally, shallow Rocks are sampled using:

- Geotechnical drilling.
- Pitting / trenching.



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Deep ore bodies are most commonly evaluated by diamond drilling techniques. The essential part of exploratory drilling and pitting is that material broken out of the borehole must be recovered for analysis.

8.4 THE OPERATIONAL ASPECTS OF THE ACTIVITY; AND

No feasible alternative technologies are available to conduct the prospecting due to the basic nature of the processes. Alternative technologies to the management of water, dust, and noise will be considered as mitigation measures in this report.

Water Supply

Currently it is not known whether there are any water boreholes located on the site and whether access and supply will be granted by the landowner.

Continuous water supply will be required during drilling, and on-site water storage tanks with a capacity of 15,000 ℓ for water supply to the drill, will be used.

When core drilling will be undertaken, a number of settling sumps will be excavated and lined with impervious plastic sheets. The purpose of these sumps are to recycle water and drilling fluids by means of gravity which leads to heavier materials (e.g. drill cuttings) to settle and clean water being produced for re-use. The drill cuttings form a sludge which will be collected in the sumps. These sumps will be fenced, where required, to prevent livestock and public access. The plastic sheets will be removed and sumps will be backfilled on completion of drilling. If required, the remaining sludge in sumps is to be treated with a suitable bio-remediation product prior to backfilling or disposal.

Additional water requirements relate to the potable water supply for employees and workers. A temporary 260 ℓ on-site vertical water storage tank for drinking water and generalise by persons will be provided at the drill site.

8.5 THE OPTION OF NOT IMPLEMENTING THE ACTIVITY.

The option of not approving the activities will result in a significant loss to valuable information regarding the mineral reserve status on this property.

In addition to this, should economical reserves be present and the applicant does not have the opportunity to prospect, the opportunity to utilize these reserves for future phases will be lost.

8.5.1 Details of the Public Participation Process Followed

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

Section 41 of NEMA Regulation 982 set out the Legal and Regulatory Requirement for Public Participation. The Public Participation Process (PPP) aims to involve the authorities and I&APs in the project process, and determines their needs, expectations and perceptions which in turn ensures a complete and comprehensive environmental study. An open and transparent process has and been followed at all times and is based on reciprocal dissemination of information. The following was undertaken during the PPP:

1. Identification of Interested and Affected Parties (IAPs);
2. Notification of IAPs regarding the proposed project;
3. A public information meeting with IAPs;
4. Gathering comments, issues and concerns from IAPs;
5. Responding to IAP comments, issues and concerns;
6. Compilation and submission of results of consultation report to the DMRE; and
7. Providing IAPs with the opportunity to review and comment on the basic assessment report.

Each of the processes is described in detail in the sections 1-7 below.



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8.5.2 Identification of Interested and Affected Parties

The application area extends over approximately extent 1651 (ha) of rural farmland consisting of several properties.

Various landowners were identified within the project area as per the Commission of Restitution of Land Rights – Please refer to APPENDIX B.

The registered owners of the farms were listed as follows:



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Table 10: Directly affected landowners

1.	SALTRIM RANCHES PTY LTD	ADAMS, 328, 0	Land owner
2.	"Mr Rene De Briun (ELECTRICITY SUPPLY COMMISSION)"	ADAMS, 328, 1	Adjacent landowner
3.	"Mr Rene De Briun (ELECTRICITY SUPPLY COMMISSION)"	ADAMS, 328, 2	Adjacent landowner
4.	TRANSNET LTD Mr Sam Fiff	ADAMS, 328, 3	Adjacent landowner
5.	HOTAZEL MANGANESE MINES PTY LTD(Ms Dineo Peta)	ADAMS, 328, 4	Adjacent landowner

8.5.3 Interested and affected parties (IAPs) that were identified include the following: -

- Landowners and legal occupiers within the project area – as indicated in the table above.
- Joe Morolong Local Municipality.
- John Taolo Gaetsewe District Municipality
- Organs of State:
 - Department of Mineral Resources and Energy Kimberly
 - Department of Environment and Nature Conservation
 - NC Department of Agriculture, Land Reform and Rural Development Directorate: Sustainable Resource Management
 - Department of Water Affairs Director Water Regulation
 - South African Heritage Resources Agency

The details of all the IAPs were compiled into a database that is included as APPENDIX B.

8.5.4 Notification of Interested and Affected Parties

Eco Elementum notified IAPs by providing each person with an information letter (written notice) and Background Information Document (BID) that included a description of the project, the public participation process and how they can get involved in the process. The notification letter also included a comment sheet whereby all IAPs can respond with issues, concerns or comments. Due to the rural nature of the project area, it was decided to provide physical and electronic methods of sending the notification letter as well as gathering responses.

Other forms of notification included the placement of Site Notices (as per the Regulation required size) at various locations. 4 x Site notices were placed at various access points along the secondary road which transverses the site.

The site notices are available for a period of 30 days whereby IAPs can register to be provided with more information on the project. Photos of the site notices are provided in APPENDIX B.

English adverts were also placed in 1 local newspaper, Diamond Field Advertiser (DFA), on the 8th of January 2021. The advert included a brief project description, location of the project, date of public meeting, methods to register as an IAP and review period of the BA report.

A copy and proof of the newspaper adverts are provided in APPENDIX B.



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8.5.4.1 Public Information Meeting

A scheduled Zoom/Teams meeting will be communicated closer to the time for all registered Interested and Affected Parties.

8.5.4.2 Gathering Comments, Issues and Concerns from IAPs

IAPs have been provided with the opportunity to register as IAPs and raise issues and concerns from the of 08 January 2021 to 08 February 2021 to form part of the public consultation report.

8.5.4.3 Responding to Comments, Issues and Concerns from IAPs

All comments, issues and concerns will be compiled and responded at the open day, also by email.

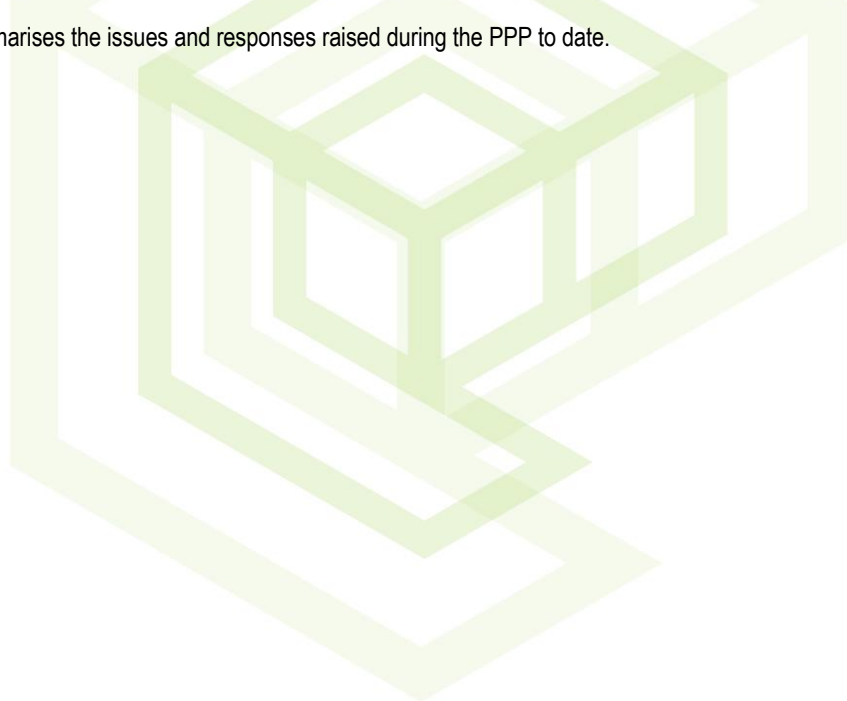
8.5.4.4 Compilation of a Report on the Results of the Public Participation Process

The public consultation process is documented in accordance with the DMRE standard template for results of public consultation.

8.5.4.5 Review and Commenting on the Basic Environmental Impact Assessment Report (BAR)

The draft BAR was available for review and comment from the of 28 April 2021 to 28 May 2021. The IAPs were notified in the written notices and site notice that the BAR will be made available for review at the library and electronically on www.ecoelementum.co.za.

The table below summarises the issues and responses raised during the PPP to date.

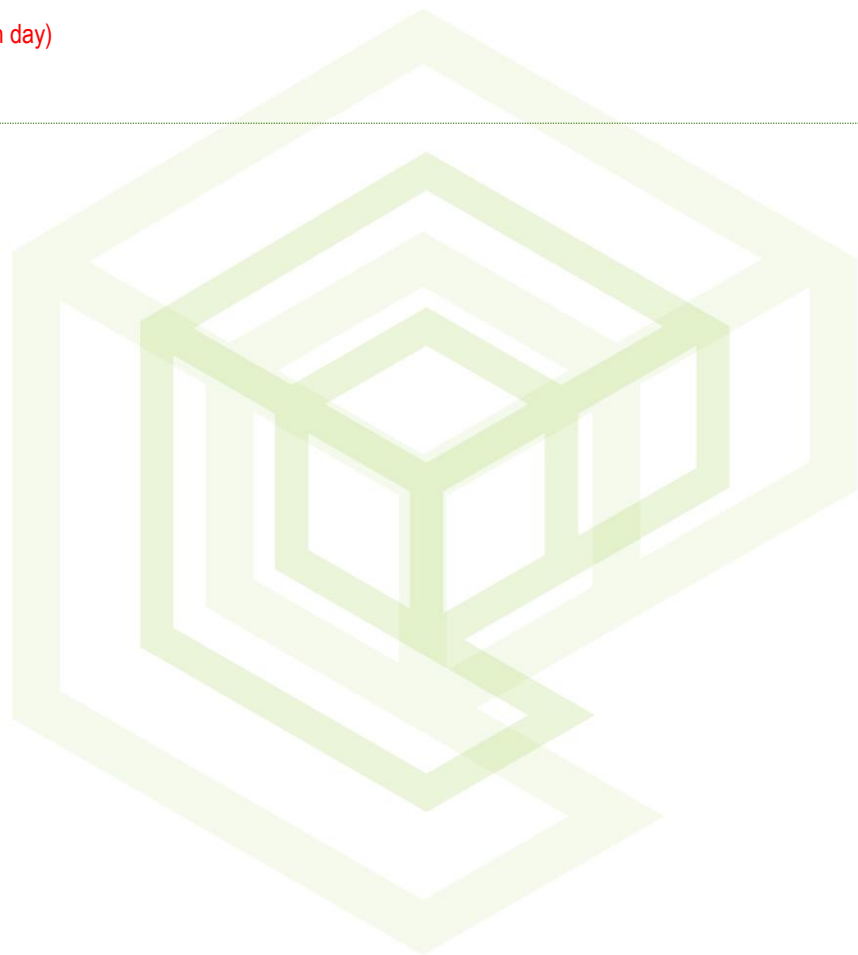


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8.5.5 Summary of issues raised by I&APs

(To be updated after the second public review and open day)

Table 11: Identified Interested & Affected Parties



9. BASELINE ENVIRONMENT

a. Type of environment affected by the proposed activity.

Table 12: Summary of Baseline Environment

Environmental Aspect	Environmental Variable	Description
CLIMATE (derived from climatic records of Hotazel)	TEMPERATURE	<ul style="list-style-type: none"> Summers are warm to hot with a mean monthly maximum temp. for January around 26°C (but can reach up to 40°C) Winters are cold with a mean monthly minimum temp. of just below 2°C in July in the morning, day temp averaging ±11°C
	RAINFALL	<ul style="list-style-type: none"> 320 - 420 mm of rain per annum, summer rainfall area Majority of the rainfall during late summer, winters generally very dry Frequent thunderstorms during periods of rainfall
	FROST	<ul style="list-style-type: none"> Frequent and restricted to winter months.
HISTORICAL VEGETATION	<p>Kathu Bushveld</p> <p>Conservation Status: Least concern</p>	<p>The vegetation on the land portion consists of an open shrub layer, interspersed with patches of taller trees. Taller trees may consist of Vachellia erioloba, Vachellia haematoxylon and Boscia albitrunca (all protected by NFA). The herbaceous layer is highly variable, depending on timing and amount of rain, but can consist of a dense grass layer dominated by <i>Stipagrostis</i> and <i>Schmidtia</i> species.</p> <p>Other common low trees and high shrubs: <i>Senegalia mellifera subsp. detinens</i>, <i>Terminalia sericea</i>, <i>Diospyros lycioides subsp. lycioides</i>, <i>Dichrostachys cinerea</i>, <i>Grewia flava</i>, <i>Gymnosporia buxifolia</i>, <i>Rhigozum brevispinosum</i>.</p> <p>Common low shrubs: <i>Aptosimum decumbens</i>, <i>Grewia retinervis</i>, <i>Nolletia arenosa</i>, <i>Sida cordifolia</i>, <i>Tragia dioica</i>.</p> <p>Common grasses (which will have a highly reduced cover in dry seasons): <i>Aristida meridionalis</i>, <i>Brachiaria nigropedata</i>, <i>Centropodia glauca</i>, <i>Eragrostis lehmanniana</i>, <i>Schmidtia pappophoroides</i>, <i>Stipagrostis ciliata</i>, <i>Aristida congesta</i>, <i>Eragrostis biflora</i>, <i>E. chloromelas</i>, <i>E. heteromera</i>, <i>E. pallens</i>, <i>Melinis repens</i>, <i>Schmidtia kalahariensis</i>, <i>Stipagrostis uniplumis</i></p> <p>Common forbs include <i>Acrotome inflata</i>, <i>Erlangea misera</i>, <i>Gisekia africana</i>, <i>Heliotropium ciliatum</i>, <i>Hermbsstaedtia fleckii</i>, <i>H. odorata</i>, <i>Limeum fenestratum</i>, <i>L. viscosum</i>, <i>Lotononis platycarpa</i>, <i>Senna italica subsp. arachoides</i>, <i>Tribulus terrestris</i>. The TOPS protected Harpagophytum procumbens subsp. procumbens has been recorded in the area.</p>



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

Key aspects of the baseline environment that are likely to impact on the scope of the impact assessment and management measures that are implemented as well as project decisions regarding alternatives are listed below. The climate information was obtained from the internet and extracted from the specialist studies undertaken as well as readily available information for the study area.

9.1 BASELINE ENVIRONMENTAL CHARACTERISTICS

A preliminary desktop study was conducted to focus on topology, surface water, wetlands, soils, land capability, noise, socio-economic and habitat availability for species of vegetation, mammals, and avifauna (birds) of the study area. The data was supplemented by previous surveys conducted in the area, literature investigations, specialist studies, personal records and historic data.

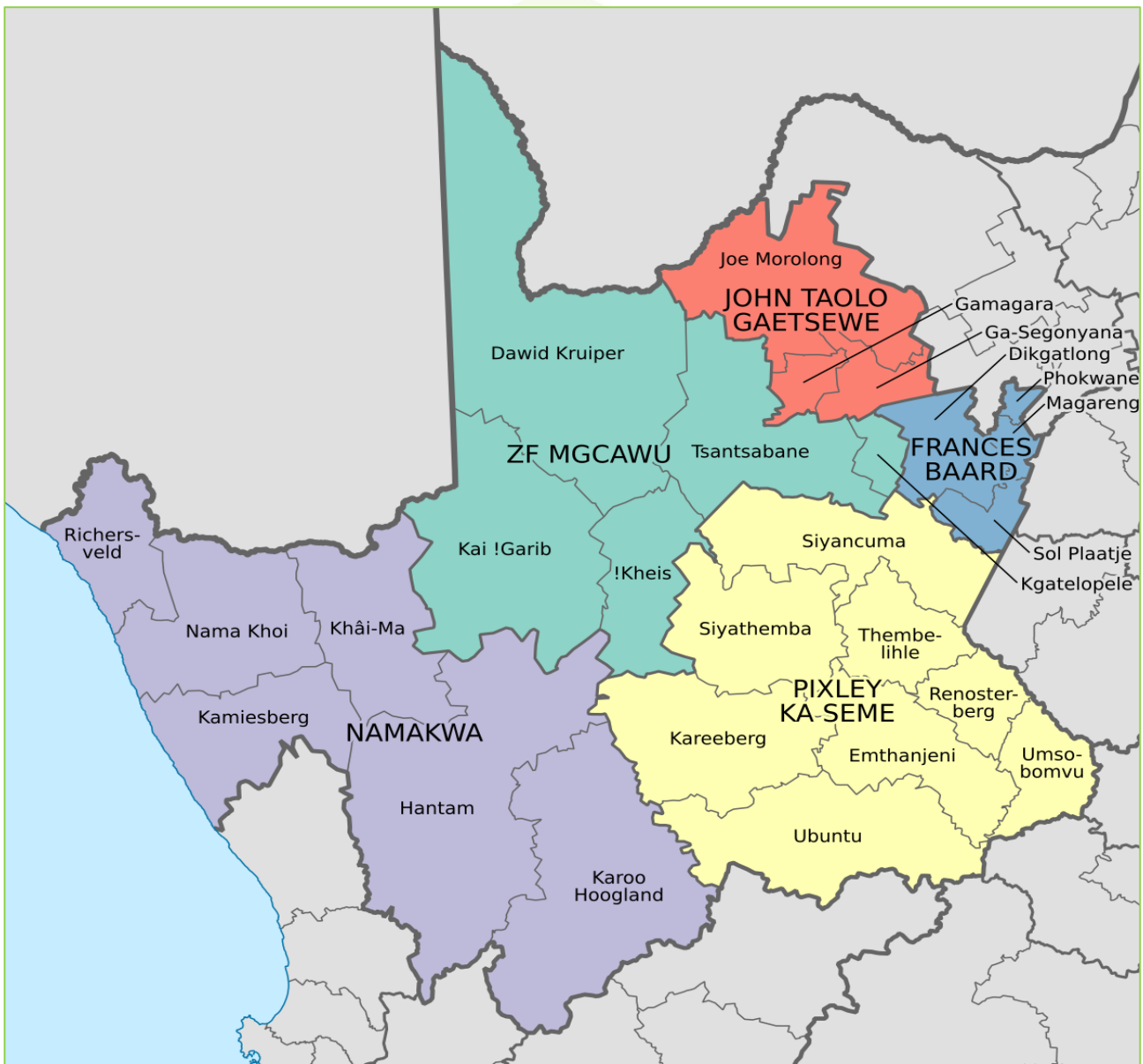


Figure 6: Northern Cape Province Municipalities

The Northern Cape is the largest province in terms of land size and the least densely populated province in South Africa. The province was formed on 27 April 1994 after the split from the Cape Province. It is demarcated into five districts and twenty-six local municipalities. The province shares borders with four other provinces, namely Western Cape, Eastern Cape, Free State and North West. It also shares



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borders with the states of Namibia and Botswana, respectively. The Orange River flows through this province and it forms borders with the Free State and Namibia. The capital of the Northern Cape is Kimberley. The Kalahari Gemsbok National Park is one of the many interesting places in the province; it forms part of the Kgalagadi Transfrontier Park which is an international park shared with Botswana. A large part of the land in the province is desert, including Namaqualand, great parts of the Karoo and parts of the Kalahari Desert. The Khoi and San groups used to live in these deserts, and it is where examples of San Rock Art is still in existence to this day. The province is also well known for its diamonds. The majority of the population residing in the province are black Africans, followed by coloureds, and the most spoken languages are Afrikaans, Setswana, Xhosa and English, while a small part of the population speaks other South African official languages.

The study area is located within the Joe Morolong Local Municipality (JMLM), in the John Taolo Gaetsewe District Municipality in the Northern Cape Province.

JMLM is mostly rural, with virgin land surface comprising about 60% of the surface. Agriculture, mining and community services are the primary economic sectors. JMLM has three main nodes where relatively higher economic activity takes place, namely Vanzylsrus, Hotazel and Blackrock. Mining is the predominant economic activity in Hotazel and Blackrock. Vanzylsrus operates as service centre for the surrounding area. Setswana is the most prevalent language spoken in the community with 90.1% of people listing it as their first language. Afrikaans and English are the first languages of 3.6% and 1.9% of the population respectively. According to 2011 Census data, there are 12 740 people that are economically active (employed or unemployed but looking for work), and of these, 38.6% are unemployed. Of the 6 323 economically active youth (15–34 years) in the area, 49.5% are unemployed. According to the 2011 Census, JMLM has a total population of 89 530 people. The majority of the population in the municipality are black African (96.4%), 2.0% are coloured, with the other population groups making up the remaining 1.6%. There are 168 schools, 4 police stations, 24 clinics and 3 community health centres located in JMLM. There is no hospital in JMLM. According to the IDP, there are 23 707 households with a population growth of 0.9%. The average household size is 3.4 persons per household.

JMLM conducts Environmental Awareness campaigns in all of the wards annually. The communities are given information on issues that need to be taken care of in their respective environmental areas. The most challenging issue of environmental management in JMLM is veld fires and to minimize that the municipality has entered into an agreement with Working on Fire through Expanded Public Works Programme.

9.1.1 Climate

o Methodology and Data Sources

The climate information was obtained from the John Taolo Gaetsewe District Municipality - Climate Change Vulnerability Assessment and Response Plan. Previous studies conducted within the local municipality as well as readily available information for the study area.

o Regional Description

The study area falls within the summer rainfall region and the average annual rainfall is roughly 472 mm per year. The average maximum temperature for the study area is recorded during January when an average of 24.4 °C is reached. The average minimum temperature is recorded during July when an average of 9.6 °C is reached (Climate-data.org 08/12/2020).

John Taolo Gaetsewe District Municipality is situated within the Vaal Hydrological Zone, one of six hydrological zones in South Africa. These hydrological zones not only reflect water management areas but have been grouped according to common climatic and hydrological characteristics (Department of Environmental Affairs 2013c). Based on a range of data and projections, four possible climate scenarios have been identified for South Africa:

- warmer/wetter (with greater frequency in extreme rainfall events),
- warmer/drier (with an increase in frequency of drought and somewhat increased frequency of extreme rainfall events),
- hotter/wetter (with substantially greater frequency of extreme rainfall events), and,
- hotter/drier (with a substantial increase in the frequency of drought events and greater frequency of extreme rainfall events).



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Projections on rainfall have also been developed for each of the hydrological zones (Department of Environmental Affairs 2013c).

The following four climate change scenarios have been described for the Vaal Hydrological Zone in the Department of Environmental Affairs' Long Term Adaptation Scenarios Reports:

- WARMER WETTER SCENARIO: Increased rain in spring and summer
- HOTTER WETTER SCENARIO: Increased rain in spring and summer
- WARMER DRIER SCENARIO: Decreased rain in summer & spring & strongly decreased in autumn
- HOTTER DRIER SCENARIO: Decreased rain in summer & spring & strongly decreased in autumn
- Sensitivities

There are no foreseen climatic sensitivities associated with the site or the proposed activity.

9.1.2 Geology and Soils

- Methodology and Data Sources

The geological information was obtained from J. Almond and John Pether (2009). Palaeontological Heritage of the Northern Cape, SAHRA Palaeotechnical Report

- Regional Description.

The Northern Cape spans a wide range of geology. On a regional scale, the project area is located on the relatively young Kalahari Group. Rock types of the Kalahari include fluvial gravels, sands, lacustrine and pan mudrocks, evaporites, aeolian sands, pedocretes. Due to the arid conditions, which began approximately 15 million years ago (Miocene Epoch), the region only has sparse fossilised areas and these areas are usually ancient pans, lakes and river systems. Late Cretaceous to Paleogene fluvial and lacustrine sediments towards the base of the succession contain such fossils, but these fossils are rarely exposed. Arid-adapted fossils include land snails, ostrich eggs, plant root casts as well as pockets of lake sediments with molluscs, diatoms and freshwater stromatolites. The palaeontological significance of the Kalahari Group is low, in terms of a recommended action for projects in the region, the SAHRA Palaeotechnical Report recommends that no action is required, however any fossil finds should be reported. Locally, within the bounds of the PRA, only the Hotazel Formation and overlying Kalahari Group Sediments are preserved, with all three manganese units (UB, Middle Body and LB) present. The PRA is unique in that both ore types of the Kalahari Manganese field (i.e. Wessels Type and Mamatwan Type) appear to be present. There are also numerous fractures and potential faults which have allowed for deleterious ferruginization (replacement of manganese by iron).

- Sensitivities

There are no foreseen geological sensitivities posed upon the site or the proposed activity.

9.1.3 Topography and Land Capability

- Methodology and Data Sources

Land Use and topography information data was obtained the specialist studies undertaken as well as readily available information for the study area.

- Regional Description

On a local scale, the proposed prospecting area is associated with relatively flat terrain and a solar farm measuring roughly 217 ha along the north-western boundary. The remaining extent appears to be open veldt of which the use is unknown. The heritage study done by Pelser (2012), however, mentions that the demarcated portion of the Remaining Extent of the Farm Adams 328 has extensively been used for cattle grazing in the past and that at the time of surveying, cattle grazing still occurred in certain areas. Also, the Mamatwan Manganese Mine borders the demarcated study area to the southwest and partially intersects the parent farm. Several structures were identified on historical aerial images and topographical maps falling within the area demarcated for prospecting. Pelser (2012) states that evidence of mining activities were observed, as well as the presence of an Eskom substation, powerline and pylons.



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- Sensitivities

There are no foreseen topographical sensitivities in the study area.

9.1.4 Surface Drainage Features

- Methodology and Data Sources

The Surface Drainage information was obtained from the specialist studies conducted for the project including the Archaeological Desktop Report 2021.

- Regional Description

The majority of the study area falls within the D41K Quaternary Catchment within the Vaal Water Management Area. The closest perennial river to the study area is the Harts River that flows 180 km to the southeast of the proposed prospecting area, while several non-perennial rivers are located within the general vicinity. One such dry watercourse, Witleegte, forms the north-eastern boundary of the proposed study area. The Spitskop Dam is located 185 km to the southeast of the study.

- Sensitivities

The land portion drains in an easterly direction, with the Witleegte River creating the north-eastern border. This contributes to the High Aquatic Sensitivity Rating of the area, but in practical term would mean that runoff or seepage through the sands from any prospecting-related activities should not enter the river. For further details, please refer to attached Ecological Desktop Screening Report 2020.



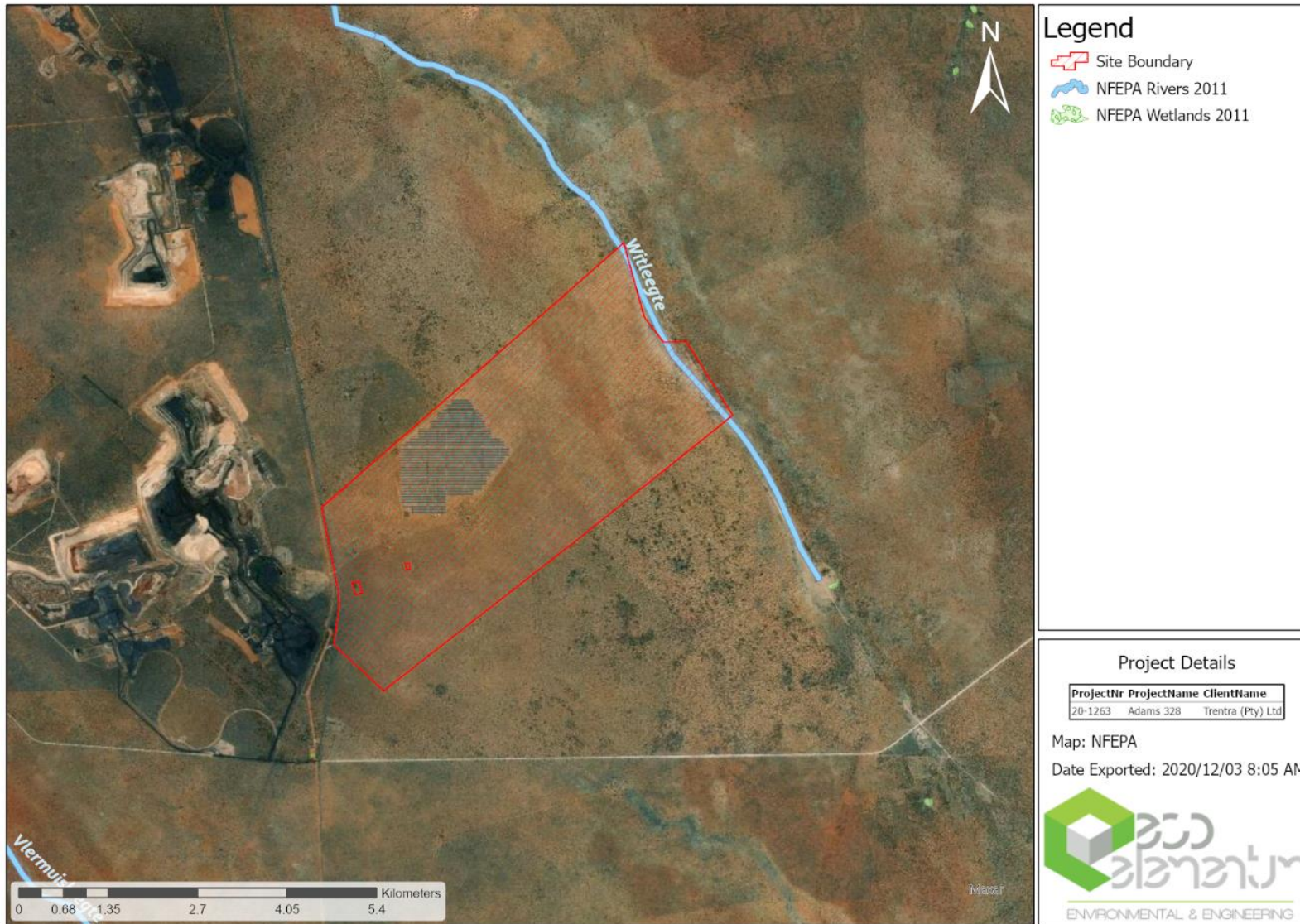


Figure 7: NFEPA Wetlands and River



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Flora

- Methodology and Data Sources

A literature review and desktop study of the biodiversity that may occur in the area was conducted by Marianne Strohbach, Biodiversity specialists. A desktop ecological study was conducted as part of the final report.

- Regional Description

In terms of vegetation, the study area falls within the Savanna Biome and Eastern Kalahari Bioregion. On a local scale, the study area falls within Kathu Bushveld. According to Mucina & Rutherford (2006), Kathu Bushveld is associated with the plains from Kathu and Dibeng in the south, through Hotazel, covering the area between Van Zylsrus and McCarthysrus to the Botswana border in the north. This vegetation unit is considered least threatened with a conservation status of 16%. More than 1% has been transformed and erosion is considered to be low.

The average elevation for Kathu Bushveld varies between 960 and 1300 MASL (Mucina & Rutherford 2006). The elevation for the study area varies between 1104 MASL in the west and 1114 MASL in the east.

- Sensitivities

Although some of the area has been modified by a Solar PV facility, the remainder of the land portion consists of primary vegetation in which at least 3 protected tree species have been confirmed, and a 4th protected herbaceous species could occur.

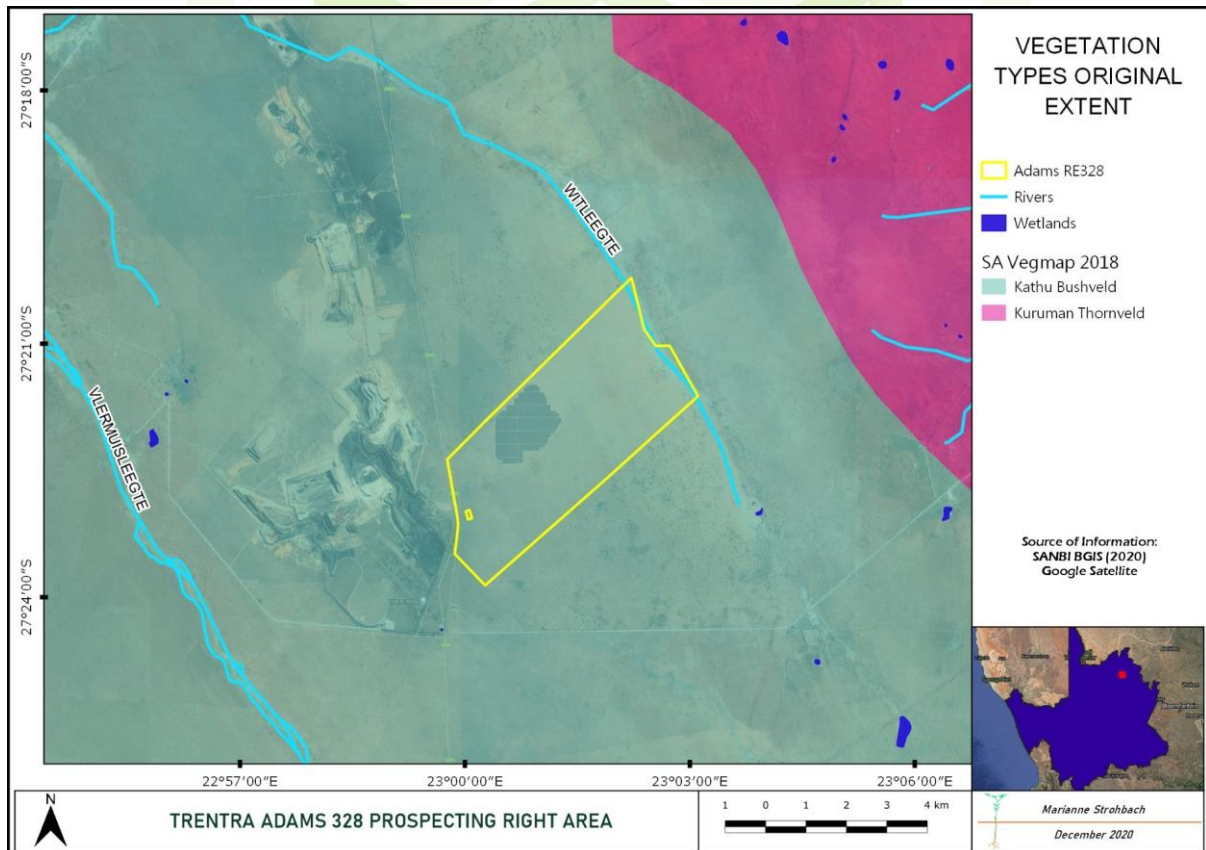


Figure 8: Map of the extent of historical vegetation types on and around the study area.

For further details please refer to Ecological Desktop Screening Report 2021 which forms part of the specialists studies.

Provincial Conservation Planning

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The 2016 Northern Cape Critical Biodiversity Areas differentiates between Critical Biodiversity Areas (CBA) and Ecosystem Support Areas (ESA) as follows:

“Critical biodiversity areas (CBAs) are areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. If these areas are not maintained in a natural or near-natural state then biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity-compatible land uses and resource uses.

For CBAs, the impact on biodiversity of a change in land-use that results in a change from the desired ecological state is most significant locally at the point of impact through the direct loss of a biodiversity feature (e.g. loss of a populations or habitat).

Ecological support areas (ESA's) are areas that are not essential for meeting biodiversity representation targets/thresholds but which play an important role in supporting the ecological



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functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio- economic development, such as water provision, flood mitigation or carbon sequestration. The degree of restriction on land use and resource use in these areas may be lower than that recommended for critical biodiversity areas.

For ESAs a change from the desired ecological state is most significant elsewhere in the landscape through the indirect loss of biodiversity due to a breakdown, interruption or loss of an ecological process pathway (e.g. removing a corridor results in a population going extinct elsewhere or a new plantation locally, results in a reduction in stream flow at the catchment’s exit which affects downstream biodiversity).”

Additionally, Other Natural Areas (ONAs) are delineated. These areas are assumed to have largely natural vegetation, but the vegetation either has a low presence of threatened species and/or ecosystems, or is not required to meet conservation thresholds.

CBA areas are further divided into CBA 1 and CBA 2, depending on the level of protection, ecosystem functionality and -services and current intactness. Most of the areas within the land portion have been designated ONA **Error! Reference source not found.**, with only the north-eastern extent of the area designated as ESA (around the Witleegte River). Development options related to prospecting and mining for the different CBA and ESA areas have not been specifically formulated for the Northern Cape, but based on national recommendations, which are best summarised by the North West Provincial Biodiversity Sector Plan (2015) are shown in Table 13.

Table 13: Development option recommendations following clearer guidelines as presented by the North West Biodiversity Conservation Assessment Report for CBA-, ESA, and Other Natural (ONA) Areas

Land Use	Associated Activities	CBA 1	CBA 2	ESA	ONA
Quarrying and Mining	Prospecting and Underground Mining	N	R	R	R
	Quarrying and open-cast mining (includes surface mining)	N	N	N	R

Notes:

- Guidelines apply only to natural or near-natural land with natural (primary) vegetation cover within each category on site.
- N: NO, not permitted, actively discouraged activity
- R: RESTRICTED to compulsory, site-specific conditions and controls when unavoidable, not usually permitted.



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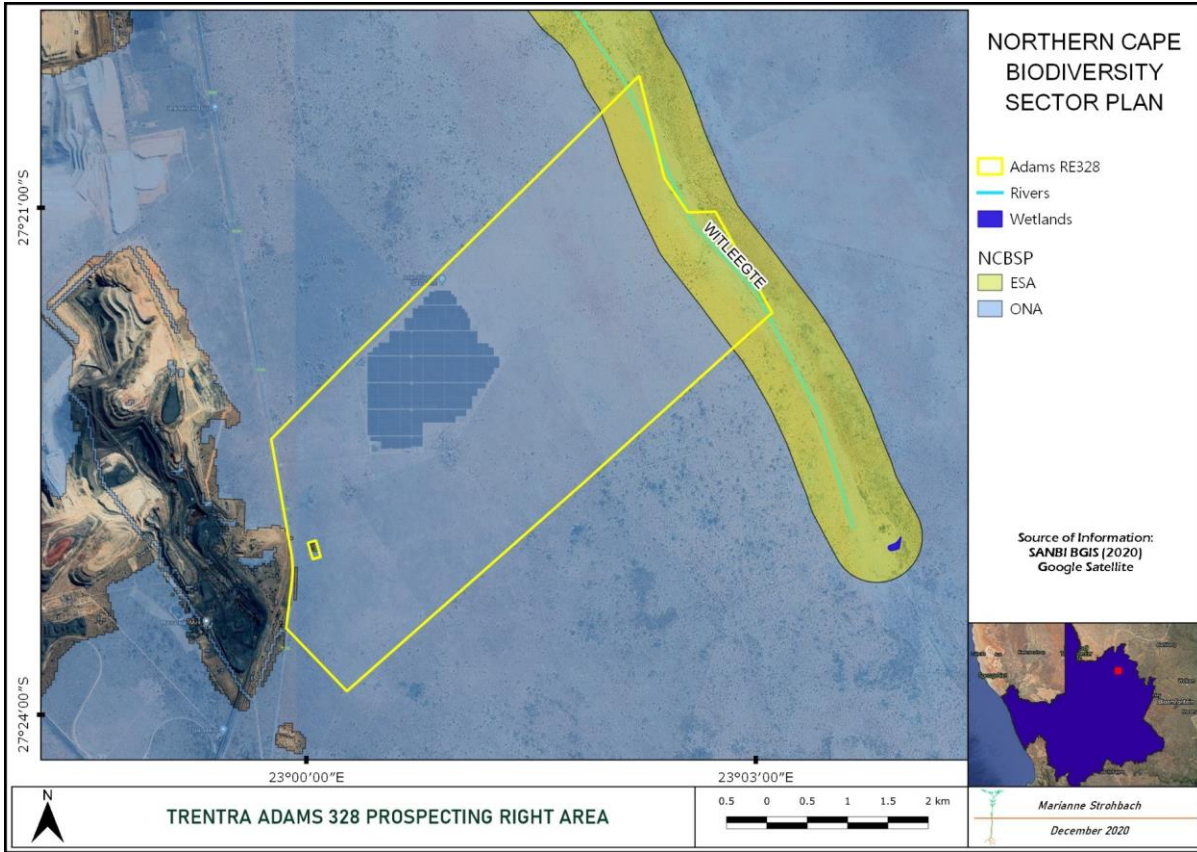


Figure 9: Map of Terrestrial CBA classification of areas in and around the study area.



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Within the land portion, a solar PV facility has been constructed. Within the area envisaged for the prospecting, however, are no CBA 1 areas or *known* occurrences of *threatened* species, **yet the presence of numerous individuals of protected trees has been confirmed for the land portion.**

It is recommended that the number of protected trees within the study area, which will be directly affected be established to obtain the required clearance permits, whilst the presence and number of the TOPS protected *Harpagophytum procumbens* subsp. *procumbens* (Devil's Claw), be verified during the peak growing season (December to April/May) prior to any large-scale prospecting or mining taking place.

Plant species of conservation concern

According to BODATSA, no threatened plant species have been observed on and around the study areas, as part of over 350 species recorded within 5 km of the area. A survey of a portion of the prospecting site could confirm the presence of several protected species. It is thus of important that a thorough protected plant survey be carried out during the peak growing season (January to April) prior to the initiation of any large-scale prospecting or mining activity.

The known threatened plant species observed in the area or for which suitable habitat may exist on or near the study areas are listed below:

Table 14: Known threatened plant species

Family	Species	Protection status
Apocynaceae	<i>Fockea angustifolia</i>	NCNCA 2
Apocynaceae	<i>Microlooma sp.</i>	NCNCA 2
Apocynaceae	<i>Raphionacme velutina</i>	NCNCA 2
Capparaceae	<i>Boscia albitrunca</i>	NFA
Celastraceae	<i>Gymnosporia buxifolia</i>	NCNCA 2
Fabaceae	<i>Vachellia erioloba</i>	NFA
Fabaceae	<i>Vachellia haematoxylon</i>	NFA
Iridaceae	<i>Lapeirousia littoralis subsp. caudata</i>	NCNCA 2
Pedaliaceae	<i>Harpagophytum procumbens</i>	NEMBA
Scrophulariaceae	<i>Jamesbrittenia atropurpurea subsp. atropurpurea</i>	NCNCA 2

Fauna of conservation concern

The Animal Demographic Unit (ADU, 2020) listed several indigenous species of fauna that had been recorded within the Quarter Degree Grids 2722 BD and 2723AC since 2000. *Threatened* species (with threat status updated according to IUCN 2020-2) listed by ADU and/or DEFF as having been observed within the above grid, or for which possible suitable habitat exists within a 10 km radius of the study areas, are listed below. Apart from those listed, a greater diversity of fauna is expected to be resident on or frequent the study areas, especially due to the presence of rivers and diverse rocky niches. A thorough faunal survey should thus be undertaken, including nearby riparian habitats, prior to potential mining being initiated in the area.



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Table 15: Known threatened animal species

Mammals:

Species	Common Name	IUCN Status
<i>Atelerix frontalis</i>	Southern African Hedgehog	NT
<i>Felis nigripes</i>	Black-footed Cat	VU
<i>Mellivora capensis</i>	Ratel/Honey Badger	LC (RSA NT)
<i>Rhinolophus denti</i>	Dent's Horseshoe Bat	NT
<i>Smutsia temminckii</i>	Ground Pangolin	VU (TOPS)

Herpetofauna:

Species	Common Name	IUCN Status
<u>Amphibians</u>		
<i>Pixicephalus adspersus</i>	Giant Bull Frog	NT locally, LC internationally
<u>Reptiles</u>		
no threatened reptiles observed, but all indigenous reptiles protected provincially		

Avifauna:

Species	Common Name	IUCN Status
<i>Falco biarmicus</i>	Lanner Falcon	NT
<i>Falco naumanni</i>	Lesser Kestrel	VU
<i>Sagittarius serpentarius</i>	Secretary bird	VU

9.1.5 Noise

The congestion of different types of vehicles and associated increased noise levels takes place along these roads during the day and to a lesser degree during the night. There are noise sensitive areas such as guest houses, houses, schools, entertainment areas along the road network.

- The Noise Receiving Environment

The prevailing ambient noise levels along this proposed road vary between built-up areas with high prevailing ambient noise levels to areas where there are low prevailing ambient noise levels because of the rural type district of the area. Certain areas with high levels of ambient noise are located in close proximity to existing roads. The prevailing ambient noise levels are made up out of traffic noise, domestic noise, built-up area noise, industrial type noises and residential type noises. The proposed prospecting right is not a linear type noise source with only high noise levels during work hours and low noise levels night.

- Current Noise Sources

The prospecting area is located in open veldt and the surrounding land is used for grazing and farming purposes and in this regard livestock, birds and human voices have been identified as the main sources of sound in the prospecting right area. In terms of the broader area, the prospecting area falls within a predominantly well-developed area due to the substantial mining activities.

The ambient noise level is proportional to the type of activity i.e. traffic and industrial type noise far and near field, wind direction, inversion conditions, additional sounds i.e. frogs, animals, insects, etc. present at the time in a specific area. The alleged noise impact on the environment and the residents living in the vicinity of the roads will be investigated.

9.1.6 Cultural and Historical Environment



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- Methodology and Data Sources

The Surface Drainage information was obtained from the specialist studies conducted for the project including the Archaeological Desktop Report 2021.

- Regional Description

As can be seen from previous research done in the area, the general region is significant from a heritage perspective. Heritage sites are likely to include Middle Stone Age (MSA)/ Later Stone Age (LSA) material, cemeteries/graves, Iron Age and historical sites. Since heritage sites, such as burial sites, are not always clearly identifiable due to disturbed/removed surface features, care must be exercised when prospecting.

- Sensitivity

The areas demarcated as 'Sensitive Areas' must be excluded from potential prospecting sites due to the possible presence of surface/subsurface culturally significant material.

9.1.7 Social and Economic Environment

- Methodology and Data Sources

A literature review of the socio-economics John Taolo Gaetsewe District Municipality and Joe Morolong Local Municipality was conducted through a desktop study of available data through an internet search and the use of John Taolo Gaetsewe District Municipality -FINAL IDP 2017-2022 report.

- Regional Description

The John Taolo Gaetsewe District Municipality (previously Kgalagadi) is located to the north east of the province and borders Botswana. John Taolo Gaetsewe is the second smallest district in the Northern Cape, occupying only 6% of the Province (27 293 km²). The largest area within JT Gaetsewe is the former District Management Area (DMA) with over 10 000 km². Joe Morolong covers the next largest area of 9 477 km² (KDM, IDP 2006). The JT Gaetsewe District comprises of 186 towns and settlements of which the majority (80%) are villages in the Joe Morolong Municipality. The official unemployment rate of the District Municipality is 29.7%, while the youth unemployment rate is 37.2%.

The prospecting area is situated within the Joe Morolong Local Municipality. According to the 2011 Census, JMLM has a total population of 89 530 people. The majority of the population in the municipality are black African (96.4%), 2.0% are coloured, with the other population groups making up the remaining 1.6%. There are 12 740 people that are economically active (employed or unemployed but looking for work), and of these, 38.6% are unemployed. Of the 6 323 economically active youth (15–34 years) in the area, 49.5% are unemployed.

The household sizes decreased from 2011 to 2016 in all local municipalities within the district. The low decrease in Joe Morolong LM and Ga-Segonyana LM is as a result of increase in number of households and high dependency due to level of poverty within the areas, especially in Joe Morolong LM where high number of outmigration is experienced.

b. Description of the current land uses.

Terrain and Land use



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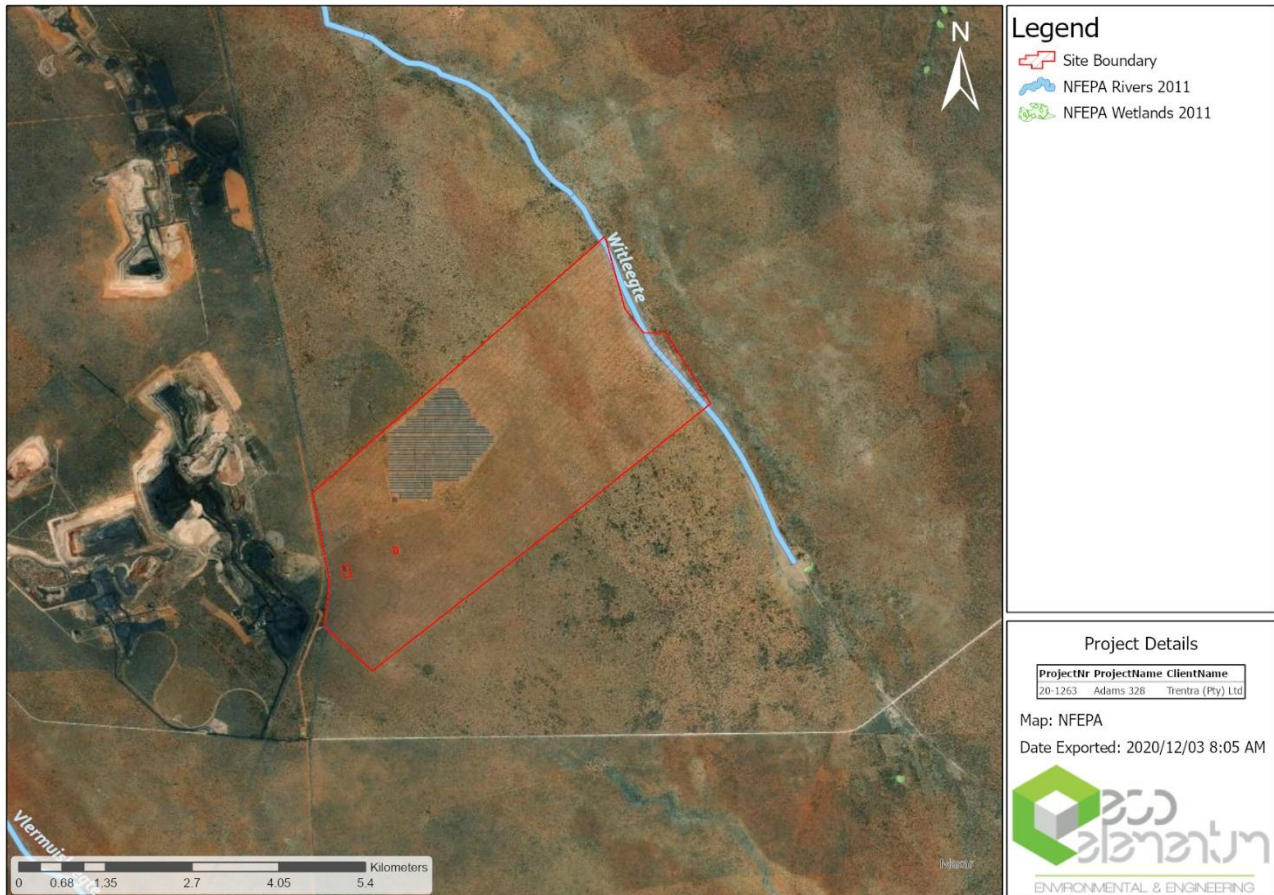


Figure 11: Wetlands and Rivers on and near the study area.

d. Environmental and current land use map.

A conceptual map showing topographical information as well as land uses on and immediately surrounding the prospecting site is provided in Figure 12.



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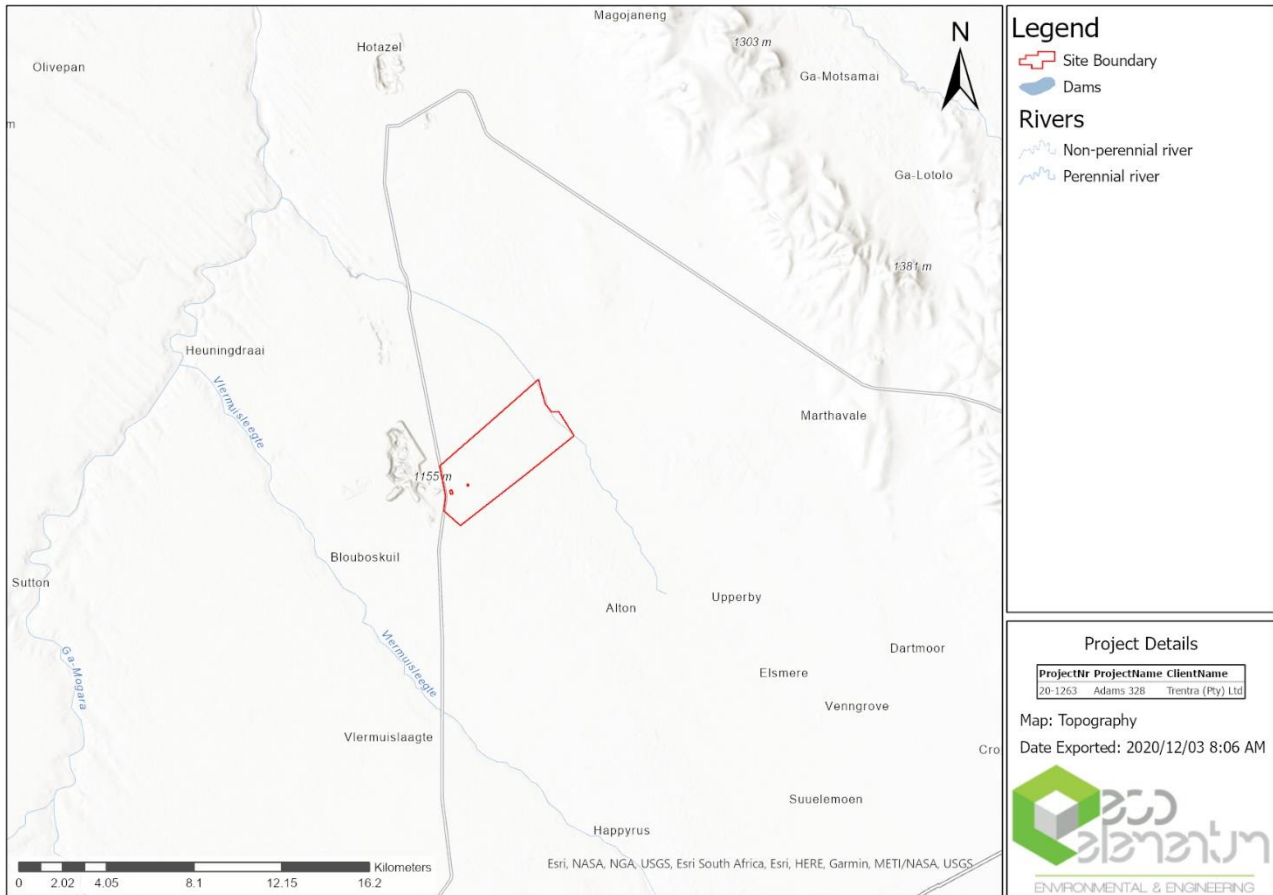


Figure 12: Topography of the Trenta prospecting area

Please refer to Land Use (Figure 4).



10. Environmental Impacts and Risks

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



Table 16: Impact Assessment Register

ASSESSMENT OF IMPACTS AND MITIGATION MEASURES						POTENTIAL IMPACTS (without mitigation)						RESIDUAL IMPACTS (without mitigation)					
A	B	C		D	E	F						G					
Impact	Activity/ Impact Source	Mitigation Measures/ Enhancement Measures	Mitigation Failure Risk	Risk of Mitigation Failure	Impact Status	Intensity (I)	Duration (D)	Frequency (F)	Severity (I+D+F)	Extent	Significance (Consequence + Probability)	Intensity (I)	Duration (D)	Frequency (F)	Severity (I+D+F)	Extent	Significance (Consequence + Probability)
Topography																	
Change in natural topography of the site	Levelling of drilling sites	Stockpile soils removed for rehabilitation. Rehabilitate to original form.	1	Low risk	Negative	1	1	1	Neg Low	1	Neg Low	1	0	0	Neg Low	1	Neg Low
Geology																	
Creation of conduits between geological strata	Drilling of borehole	Boreholes to be sealed with concrete	1	Low risk	Negative	1	1	1	Neg Low	1	Neg Low	1	0	0	Neg Low	1	Neg Low
Soils																	
Potential loss of topsoil	Erosion from soil disturbance at drilling sites	Keep the footprint of disturbance as small as practicable. Vegetation to be left in place to protect soils where possible. Where vegetation clearance cannot be avoided storm water management measures to be put in place if there is a risk of soil erosion. Erosion protection where cut and fill and levelling of the drill site occurred.	2	Moderate risk	Negative	1	1	2	Neg Low	1	Neg Low	1	1	1	Neg Low	1	Neg Low
Potential loss of soil resource	Erosion from soil disturbance of access roads	Utilize exiting access roads as far as possible. Keep the footprint of disturbance as small as practicable. Access roads to follow slope contours where possible. Vegetation to be left in place at the sides of the road to protect the soils.	1	Low risk	Negative	1	1	2	Neg Low	1	Neg Low	1	1	2	Neg Low	1	Neg Low
Risk of soil contamination	Oil and diesel spills due to inappropriate storage, vehicle maintenance and washing operations	Impermeable liners or surfaces to be provided in areas where hydrocarbons are managed. Diesel storage areas to be bunded and regularly checked. Drip trays to be used when any vehicle maintenance is undertaken. Spill kits to be available at drill sites.	1	Low risk	Negative	1	1	2	Neg Low	1	Neg Low	1	1	2	Neg Low	1	Neg Low
Hydrology (Surface Water)																	
Contamination of surface water	Spillage from fuels, oils and lubricants	Implement measures to protect soils from pollution. Boreholes to be outside of the 1 in 50 year floodline or 100m from the edge of a watercourse whichever is greater.	1	Low Risk	Negative	2	2	1	Neg Low	2	Neg Low	1	1	1	Neg Low	1	Neg Low
	Increase in sediment loads as a result of erosion and heavy rainfall	Implement measures for soil erosion control in accordance with risk assessment. Boreholes to be outside of the 1 in 50 year floodline or 100m from the edge of a watercourse whichever is greater.	0	No Risk	Negative	2	2	1	Neg Low	2	Neg Low	1	2	1	Neg Low	1	Neg Low
	General and human waste	Contractors may only use designated toilets and waste disposal facilities	1	Low risk	Negative	2	1	2	Neg Low	2	Neg Low	1	1	2	Neg Low	1	Neg Low



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Hydrogeology (Groundwater)																	
Contamination of ground water	Seepage of fuels, oils and lubricants	Implement measures to protect soils from pollution. Boreholes to be outside of the 1 in 50 year floodline or 100m from the edge of a watercourse whichever is greater.	1	Low risk	Negative	2	3	1	Neg Moderate	1	Neg Moderate	1	3	1	Neg Low	1	Neg Low
	Cross contamination of aquifers due to borehole construction	Boreholes that will not be used again will be backfilled with cement and sealed.	0	No Risk	Negative	2	2	1	Neg Low	2	Neg Low	2	2	1	Neg Low	2	Neg Low
Noise																	
Increase in ambient noise levels. Disturbance to people and animals	Machinery and drilling operations. Movement of vehicles	Avoid travelling past residences. Speed limit of 40km/h will be enforced. Liaise with landowner on areas sensitive to noise. Provide a buffer of 100m from households. Drilling to take place during daylight hours. Borehole site and access route selection to give cognisance to the location of noise receptors and efforts must be taken to minimise such disturbance.	0	No Risk	Negative	1	1	3	Neg Low	2	Neg Moderate	1	1	3	Neg Low	2	Neg low
Air Quality																	
Release of gaseous emissions	Exhaust fumes from vehicles and machinery related to prospecting activities.	No unnecessary revving of vehicles should take place. No vehicle must stand idling when not in use.	0	No Risk	Negative	1	1	1	Neg Low	1	Neg low	1	1	1	Neg Low	1	Neg Low
Dust fallout and fine particular matter emissions	Vehicles travelling on gravel roads. Windblown dust from bare surfaces.	Restrict travelling speed of vehicles to reduce vehicle entrainment of dust. Wet gravel roads if dust is found to be excessive.	0	No Risk	Negative	1	1	2	Neg Low	1	Neg Low	1	1	2	Neg Low	1	Neg Low
Land Use and Land Capability																	
Land use conflict	Intrusion due to drilling and prospecting activities in an area where agricultural land uses are prominent	Drilling sites must be selected to minimise disturbance of current land use. Relevant agreements must be in place with land owners to define location and extent of drilling sites and rehabilitation measures that will be undertaken at the end of drilling. Rehabilitation of drill sites and access roads.	2	Moderate risk	Negative	2	3	3	Neg Moderate	2	Neg Moderate	1	1	1	Neg Low	1	Neg Low
Reduction in land capability	Land clearing and transformation	Drilling sites must be selected to minimise disturbance of current land use. Relevant agreements must be in place with land owners to define location and extent of drilling sites and rehabilitation measures that will be undertaken at the end of drilling.	1	Low risk	Negative	1	1	3	Neg Low	1	Neg Low	1	1	3	Neg Low	1	Neg Low



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Fauna, Flora and Ecology																	
Removal/ damage of natural vegetation	Establishment of drilling sites and access routes	Site selection aimed at minimising disturbance to natural vegetation - proposed prospecting area is dominated by Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs).	2	High risk	Negative	2	3	2	Neg Moderate	3	Neg Moderate	2	3	2	Neg Moderate	2	Neg Moderate
	Accidental fires	No smoking at the drilling sites. Code of conduct to include measures for the prevention of fires. Emergency equipment and procedures for firefighting to be in place. Adhere to emergency procedures.	2	Moderate risk	Negative	2	3	2	Neg Moderate	2	Neg moderate	2	2	2	Neg Moderate	2	Neg Moderate
Disturbance of suitable habitats of animals	Establishment of drilling sites and access routes	Site selection aimed at minimising disturbance to sensitive animal habitats and breeding areas	2	Moderate risk	Negative	2	3	2	Neg Moderate	3	Neg Moderate	2	3	2	Neg Moderate	2	Neg Moderate
	Movement of drilling contractors	Drilling contractors are only allowed to move within the designated drilling area. Environmental awareness training should include poaching and disturbance of animals	2	Moderate risk	Negative	2	3	2	Neg Moderate	3	Neg Moderate	2	3	2	Neg Moderate	3	Neg Moderate
Sensitive and Protected Areas																	
Degradation and destruction of sensitive biodiversity- Suitable habitat for the globally threatened red data avifaunal species	Establishment of drilling sites and access routes	Site selection by environmental scientists, detailed avifaunal surveys as well as detailed sensitive habitat mapping will have to be conducted for any potential development in the region. GDARD Biodiversity Stewardship Unit & EWT found this specific farms to be of high biodiversity value, as well as vital to the effective provision of ecosystem goods and services in the province. The GBSP intends to proclaim the site as a Protected Environment, which provides a legal mechanism that aims to guide and improve land use management on the properties proclaimed.	3	Moderate risk	Negative	2	3	2	Neg Low	3	Neg Moderate	2	3	2	Neg Moderate	3	Neg Moderate
Heritage Resources																	
Cultural heritage resources may be found within the study area	Drilling of boreholes will damage/ destroy heritage resources in the area	Site selection by environmental scientists aimed at minimising disturbance to heritage resources once the positions have been finalised.	0	No Risk	Negative	3	3	1	Neg Moderate	1	Neg Moderate	1	1	1	Neg Low	1	Neg Low
Economic Development																	
Contribution to the economy	Employment and use of contractors and purchasing of local goods.	Preference to be given to the use of local employment, contractors and local suppliers	0	No Risk	Positive	2	1	1	Pos Low	0	Pos Low	2	1	1	Pos Low	2	Pos Moderate
Creation of nuisance and disturbance to surrounding activities.	Dust and noise from prospecting activities	Implement measures to minimise air quality and noise impacts. Surrounding neighbours and land owners must be allowed to raise issues and complaints associated with prospection activities. Their issues must be addressed properly.	1	Low risk	Negative	2	1	2	Neg Low	1	Neg Low	2	1	2	Neg low	1	Neg Low



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Visual and Sence of Place																	
Impact on sence of place due to prospecting activities	Visual intrusion due to drilling and prospecting activities	Implement measures to reduce the visual impacts of prospecting activities, i.e. rehabilitation of drill sites and access roads.	1	Low risk	Negative	1	2	3	Neg Low	2	Neg Moderate	2	1	2	Neg Low	2	Neg Low
Safety and Security																	
Increase in crime	Movement of drilling contractors and influx of workers	Drilling contractors not allowed moving outside of designated areas. Access of personnel related to the prospecting operations will only be allowed on approval by the project manager. All personnel that have access to the property will be provided with access cards. All personnel that have access to the property needs to be made visible.	2	Moderate risk	Negative	2	1	1	Neg Low	3	Neg Moderate	1	1	1	Neg Low	1	Neg Low
	Overnight accomodation of drilling contractors	Drilling contractors to be housed off the drilling property	1	Low risk	Negative	2	1	1	Neg Low	3	Neg Moderate	4	1	1	Neg Moderate	1	Neg Low
Stakeholder Acceptability																	
Prospecting on private property	Prospecting activities.	Comply with the MPRDA and NEMA and implement and comply with the EMP	2	Moderate risk	Negative	2	1	1	Neg Low	3	Neg Moderate	4	1	1	Neg Moderate	3	Neg Moderate
Prospecting is seen as a predecessor to mining and this raises a risk to various environmental impacts	Prospecting activities. Mining right application	An application for a mining right will require a separate public participation process and IAP's will be provided the opportunity to raise their concerns. This report should form part of the feasibility study towards a mining right application to ensure the current information and sensitivities identified in this process is considered.	2	Moderate risk	Negative	2	1	1	Neg Low	3	Neg Moderate	4	1	1	Neg Moderate	3	Neg Moderate



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

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

Criteria of assigning significance to potential impacts

The identification and assessment of environmental impacts is a multi-faceted process, using a combination of quantitative and qualitative descriptions and evaluations. It involves applying scientific measurements and professional judgement to determine the significance of environmental impacts associated with the proposed project. The process involves consideration of, inter alia: the purpose and need for the project; views and concerns of interested and affected parties; social and political norms, and general public interest.

The methodology used for assessing impacts associated with the proposed project follows the philosophy of environmental impact assessments, as described in the booklet Impact Significance, Integrated Environmental Management Information Series 5 (DEAT, 2002b). The philosophy is summarised by the following extracts:

- The impact magnitude [or intensity] and significance should as far as possible be determined by reference to legal requirements, accepted scientific standards or social acceptability. If no legislation or scientific standards are available, the EIA practitioner can evaluate impact magnitude based on clearly described criteria. Except for the exceeding of standards set by law or scientific knowledge, the description of significance is largely judgemental, subjective and variable. However, generic criteria can be used systematically to identify, predict, evaluate and determine the significance of impacts (DEAT, 2002b).
- Determining significance [of impacts] is ultimately a judgement call. Judgemental factors can be applied rigorously and consistently by displaying information related to an issue in a standard worksheet format (Haug et al., 1984 taken from DEAT, 2002b).

The criteria and systematic approach to identify, describe and assess impacts are outlined below.

Impact Ranking Criteria

The criteria used for assessing the significance of the impacts are given in Table 17. Cognisance was given to both positive and negative impacts that could result from prospecting.

Although the criteria used for the assessment of impacts attempts to quantify the significance, it is important to note that the assessment is generally a qualitative process and therefore the application of these criteria is open to interpretation. The assessment thus largely relies on the experience of the EAP and the information provided by specialists appointed to undertake studies for the EIA.

Where the consequence of an event is not known or cannot be determined, the precautionary principle is adhered to and the worst-case scenario assumed. Where possible, mitigation measures to reduce the significance of negative impacts and to enhance positive impacts are recommended. The detailed actions, which are required to ensure that mitigation is successful, will be given in the EMPr which will form part of the BA report.

Consideration will be given to the phase of the project during which the impact occurs. This identification of the phase is provided to assist with the schedule for the implementation of the management measure.

Mitigation Measures

Mitigation measures were identified for significant impacts. The impacts were ranked before and after the implementation of the mitigation measures. Mitigation potential (risk of mitigation failure) was ranked as per the criteria in found in Table 17 below.



Table 17: Rating Criteria

Rating Criteria and Symbol / Short Description				Qualitative Description / Explanation of Rating Criteria	
Environmental Impact Description				Description of the direct and indirect effect of human actions and project activities on the environment	
Mitigation Measures				Measures designed to avoid, reduce or remedy adverse potential negative impacts. Includes measures to compensate for residual impacts.	
Enhancement Measures				Measures designed to expand and augment the effect of potential positive impacts.	
Project Phase		Planning		Activities, impacts and mitigation measures applicable to the planning (or pre-implementation) phase.	
		Construction		Activities, impacts and mitigation measures applicable to the construction phase.	
		Operational		Activities, impacts and mitigation measures applicable to the operational (invasive prospecting) phase.	
		Rehabilitation and Closure		Activities, impacts and mitigation measures applicable to rehabilitation and closure (includes progressive rehabilitation over time leading up to and including rehabilitation at the end of the life of the project). For this project it also covers activities, impacts and mitigation measures applicable to post-closure.	
		Post Closure		Activities, impacts and mitigation measures that would be present after closure. For this project, due to the long life of the project, these are addressed under the Rehabilitation and Closure phase.	
Impact Status		Negative		Impacts with a potential negative / adverse effect.	
		Neutral		Neutral, no impact.	
		Positive		Impacts with a potential positive / beneficial effect.	
Consequence (Severity + Scale)	Severity (Intensity + Duration + Frequency)	Intensity (Negative Impacts)	1	low	Slight change, disturbance or nuisance. Targets, limits and thresholds of concern never exceeded. Impacts are rapidly and easily reversible. Require no or only minor interventions or clean-up actions. No complaints expected when the impact takes place.
			2	moderate	Moderate change, disturbance or discomfort. Real but not substantial. Targets, limits and thresholds of concern may occasionally be exceeded. Impacts are reversible but may require some effort, cost and time. Sporadic complaints can be expected when the impact takes place.
			3	high	Prominent change, disturbance or degradation. Real and substantial. May result in illness or injury. Targets, limits and thresholds of concern regularly exceeded. Regular complaints can be expected when the impact takes place.
			4	very high	Severe change, disturbance or degradation. May result in illness, injury or death. Targets, limits and thresholds of concern continually exceeded. Interest group / community mobilisation against project can be expected when the impact takes place. May result in legal action if impact occurs.
		Intensity (Positive Impacts)	1	low	Slight change or improvement. Minor benefits.
			2	moderate	Moderate change or improvement. Real but not substantial benefits.
			3	high	Prominent change or improvement. Real and substantial benefits. General community support.
			4	very high	Considerable and large-scale change or improvement. Real and considerable benefit. Widespread support.



Rating Criteria and Symbol / Short Description			Qualitative Description / Explanation of Rating Criteria		
Precautionary Weighting (Value Judge based on (Negative Impacts))	Duration	Refers to the total length of time (i.e. number of years) that the impact would or the impact source or risk will be present.			
		1	low	Short-term. May occur for hours and are rapidly reversible.	
		2	moderate	Medium-term. May occur for a couple of days. Impacts reversible within a three day period.	
		3	high	Long-term. May occur throughout the life of the project, but will cease after operations ceases either because of natural processes or human intervention.	
		4	very high	Permanent and irreversible. Residual impacts will remain after rehabilitation.	
		Frequency	Refers to the time intervals and how often (i.e. number of days per year) the impact would manifest over the entire duration of the impact.		
			1	low	Seldom. Impact would be intermitted (occurs 0-10 % of the time).
			2	moderate	Occasional. Impact would occur now and again (occurs 10-25% of the time).
	3		high	Often (occurs >50% of the time).	
	Scale	4	very high	Continuous. Impact would occur all the time (occurs 100% of the time).	
		0	none	None. Impact will not occur anywhere.	
		1	low	Site impact. No effect beyond the prospecting site. Small area. No sensitive receptors outside prospecting area affected.	
		2	moderate	Local. Seldom occurs beyond prospecting site. May affect immediate neighbours, never nearby townships. Small area or small number of sensitive receptors affected.	
	Probability	3	high	Regional. Widespread impact. Extends beyond the prospecting boundary. Affects nearby townships. Large area or large numbers of sensitive receptors affected.	
		4	very high	Local or regional impact. Impacts over a vast area or over vast numbers of sensitive receptors.	
		0	none	Never (0 % likelihood).	
1		low	Conceivable. Will only happen in exceptional circumstances (<10 % likelihood).		
2		moderate	Plausible. Could happen and has occurred here or elsewhere (11-40 % likelihood).		
Significance (Consequence + Probability)	3	high	Probable (>40-80 % likelihood).		
	4	very high	Expected. Highly likely to happen (>80 % likelihood).		
	Neg Very High		Widespread negative effect. Negative impact that is of the highest order. Potential fatal flaw.		
	Neg High		Substantial negative impact.		
	Neg Moderate		Negative impact that is real but not substantial.		
	Neg Low		Low to negligible negative impact with little real effect.		
	Pos Low		Low to insignificant positive impact.		
(Negative Impacts)	Pos Moderate		Positive impact that is real but not substantial.		
	Pos High		Substantial positive impact.		
	Pos Very High		Widespread / substantial beneficial effect. An alternative means to achieve the same benefits not possible.		
	Used when there is a potential understatement of the significance of a negative impact to increase the significance rating.				
	0	none	No weighting required. Significance rating is a true reflection of the potential effect of the impact.		



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Rating Criteria and Symbol / Short Description			Qualitative Description / Explanation of Rating Criteria	
		1	low	There may be a slight understatement of the significance of the impact. Impact significance adapted to be slightly higher.
		2	moderate	There may be a moderate understatement of the significance of the impact. Impact significance adapted to be higher.
		3	high	The impact significance rating is highly understated. Impact significance adapted to be higher.
		4	very high	The impact significance rating is severely understated. Impact significance adapted to be higher.
	(Positive Impacts)	Used when there is a potential overstatement of the significance of a positive impact to reduce the significance rating.		
		0	none	No weighting required. Significance rating is a true reflection of the potential effect of the impact.
		1	low	There may be a slight understatement of the significance of the impact. Impact significance adapted to be lower.
		2	moderate	There may be a moderate understatement of the significance of the impact. Impact significance adapted to be lower.
		3	high	The impact significance rating is highly understated. Impact significance adapted to be lower.
		4	very high	The impact significance rating is severely understated. Impact significance adapted to be lower.
Risk of Mitigation Failure	The likelihood of mitigation failure rated based on: - research and technology, - timing, and thus secondary potential of outside influences occurring over time (i.e. climate change, political instability, inter/national economic instability).- financial considerations,- skills and labour availability and potential for human error.			
	0	Very Low Risk	Less than 10% likelihood that mitigation measures could fail. Mitigation implemented quickly, mitigation easy to implement, proven technology used, no special labour skills required.	
	1	Low Risk	10-30% likelihood that mitigation measures could fail.	
	2	Moderate Risk	30 to 60% likelihood that mitigation measures could fail.	
	3	High Risk	60 to 80% likelihood that mitigation measures could fail.	
	4	Very High Risk	>80% likelihood that mitigation measures could fail. May need research and new technologies to be developed, and/or may have to take place over many years after closure, and/or may involve exorbitant/prohibitive expenses to implement successfully, and/or may require highly skilled personnel with special training, and/or have a high risk of human error during the execution of the mitigation.	
IAP Interest	Neg Very High		Widespread concern and/or concerns of very high importance. Concerns difficult to be addressed to satisfaction of authorities or concerned parties. Appeals against project anticipated if not addressed.	
	Neg High		Several concerns and/or concerns of high importance. Real and substantial.	
	Neg Moderate		Limited concerns. All concerns addressed. Real but not substantial.	
	Neg Low		Very minor or minor concerns.	
	Neutral		No interest.	
	Not defined		Level of interest has not been tested.	
	Pos Low		Very little support for project.	
	Pos Moderate		Limited support for project.	
Pos High		General support. May be associated with high community expectations.		



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Rating Criteria and Symbol / Short Description			Qualitative Description / Explanation of Rating Criteria	
	Pos Very High		Widespread support. May be associated with extremely high community expectations.	
	Diverse Low		Minor interest. Some support. Some concerns.	
	Diverse Moderate		Limited interest. Some support. Some concerns.	
	Diverse High		General interest. Some support. Some concerns.	
	Diverse Very High		Widespread interest. Some support. Some concerns.	
Assessment Confidence	Complete		No information gaps exist. Decision-making can go ahead.	
	Adequate		Minor information deficiencies exist but this does not affect decision-making. Decision-making can still go ahead.	
	Incomplete		Not enough information for decision-making. Current data to be supplemented with further monitoring or research.	
Impact Rating Methodology	Weighting	Formula	Example	Rating Criteria
	1.0	I	1.0	Intensity (I)
	1.0	D	1.0	Duration (D)
	1.0	F	1.0	Frequency (F)
	1.0	$S=(I+D+F)/3$	1.0	Severity (S)(Intensity + Duration + Frequency)
	1.0	E	4.0	Scale (Extent) (E)
	1.0	$C=(S+E)/2$	2.5	Consequence (Severity + Extent) (C)
	0.5	P	3.0	Probability (P) WEIGHING OF 0.5 USED TO INCREASE THE CONSERVANCY OF THE ASSESSMENT
		$S1=(C+P)/2$	2.7	Significance (S1) (Consequence + Probability)
		W	0.0	Precautionary Weighting (W)
	$S2=(S+W)$	2.7	Significance with Precautionary Weighting (S2)	
Impact Rating	Formula	Level	Level	
	<=	-3.6	Neg Very High	
	<=	-3.0	Neg High	
	<=	-2.0	Neg Moderate	
	<	0.0	Neg Low	
	>	0.0	Pos Low	
	>=	2.0	Pos Moderate	
	>=	3.0	Pos High	
>=	3.6	Pos Very High		



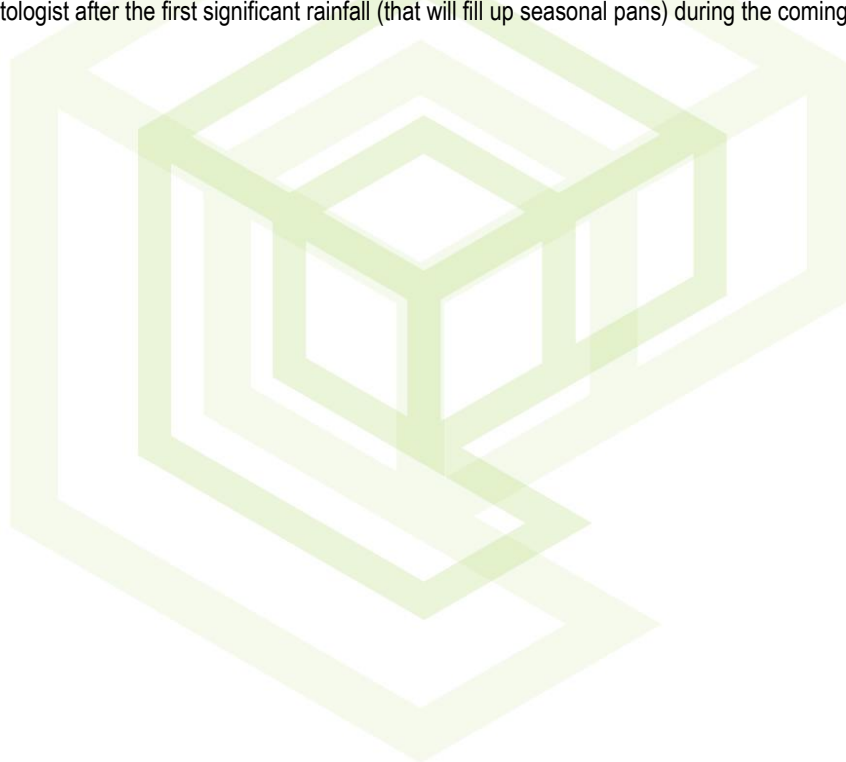
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vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

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

The following key concerns have been identified:

- Although at least a quarter of the study area has been modified by past mining and tracks, all remaining primary vegetation, including riparian areas should be considered as primary vegetation, with the potential of protected plant species – including trees - being present. The primary vegetation overall could be anticipated to be of low sensitivity, acting merely as a support area for the larger pan systems to the east of the study area.
- It is anticipated that due to historical disturbance levels, alien invasive plant species will be present on all sites. A full alien invasive plant survey is thus also recommended, as part of an analysis of the risk of potential mining in spreading and/or further establishing such undesirable plants.
- A slight risk to prospecting and mining may be due to the potential presence of African Bull Frogs: although these frogs breed in seasonal pans for a short period, which are mostly outside the study area, these animals will use heaps of ground (as may have been left by past mining operations) in the vicinity to establish their burrows for aestivating during the dry season. It is recommended that the presence of such animals be investigated by a herpetologist after the first significant rainfall (that will fill up seasonal pans) during the coming rainfall season.



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The following management and mitigation measures will be implemented for on high sensitivity areas:

- Prospecting machinery and associated vehicles may not be allowed to enter wetlands. Strictly no re-fueling of vehicles or machinery should be allowed to take place in any area close to a wetland.
- During and after construction areas of exposed soil can easily erode and subsequently end up in the wetlands. A well-designed storm water system must be put in place to avoid erosion into wetlands. Natural runoff from the natural terrestrial habitat surrounding the wetlands should however not be restricted unnecessarily.
- Destruction of natural wetland vegetation must be avoided at all cost.
- Special attention should be paid to alien and invasive control within the whole study area. Alien and invasive vegetation control should take place throughout all development phases to prevent loss of habitat of indigenous fauna and flora.
- Movement of vehicles and construction workers in wetlands and buffer zones should be strictly prohibited. No harvesting of plants or animals should be allowed.
- Any specimens of protected plant species known to occur in the wetlands and the delineated buffer zone and may potentially be impacted by the prospecting activities, are to be fenced off for the duration of the activity. Conservation of these specie and their natural habitat must be a high priority.
- If at any point prospecting activities encroach on wetlands, it is strongly advised that a wetland/aquatic specialist is appointed during all phases to monitor impacts and related mitigation measures regarding wetland habitats. Red Data listed and protected species as well as sensitive habitats related to wetlands should be strictly monitored. Any conservation recommendations and measures that aim to mitigate the impacts of this development must also be monitored by such a specialist during the construction, operational and decommissioning phases.

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 must be aimed at minimising disturbance to natural vegetation;
- The site selection should be overseen by environmental scientists. Due to the sensitivity of the area detailed avifaunal surveys as well as detailed sensitive habitat mapping should be conducted before any potential development in the region occurs.
- No-go areas are to be identified where habits 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 drill sites are still located within the community land but agreement or compensation will need to be sought should the specific site be developed.
- The drilling sites themselves will be provided with safety netting, fencing and signage to ensure no person or animal can access these site.
- Workers and operators will not be housed on site. In addition, rehabilitation objectives will include ensuring that the site is safe
- **Motivation where no alternative sites were considered.**

No Alternative drill site locations were considered during the study. The project location was however bound to the current location due to the underlying geology. The prospecting right is dependent on the area chosen being susceptible to possible mineral deposits and therefore no alternative site could be considered.

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

The final layout for the drilling can only be completed once the non-invasive aerial geological surveys have been completed. Invasive prospecting (drilling) will avoid servitudes, suitable habitat for the Globally threatened Red Data avifaunal species, wetlands and 100 m buffer zones, rivers and 100 m buffer zones / 1:100-year flood lines (whichever is greatest), and 50 m buffer zones from potential historical sites, graves and identified protected plants. A detailed terrestrial ecological assessment will be required when the drilling locations are identified and before any construction or operations may occur. Drill site locations are not fixed and need approval by an environmental control officer before drilling. The ECO will, as a minimum, consider:

- The Protected Environment;
- Plant and animal (avi faunal) sensitivity;



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- Current land use;
- Servitudes;
- Sensitive features such as households;
- Heritage sites (including graveyards).



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11. FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE (IN RESPECT OF THE FINAL SITE LAYOUT PLAN) THROUGH THE LIFE OF THE ACTIVITY.

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

The same impact ranking criteria and methodology was employed as discussed in Section VI of this report.

11.1 ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

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

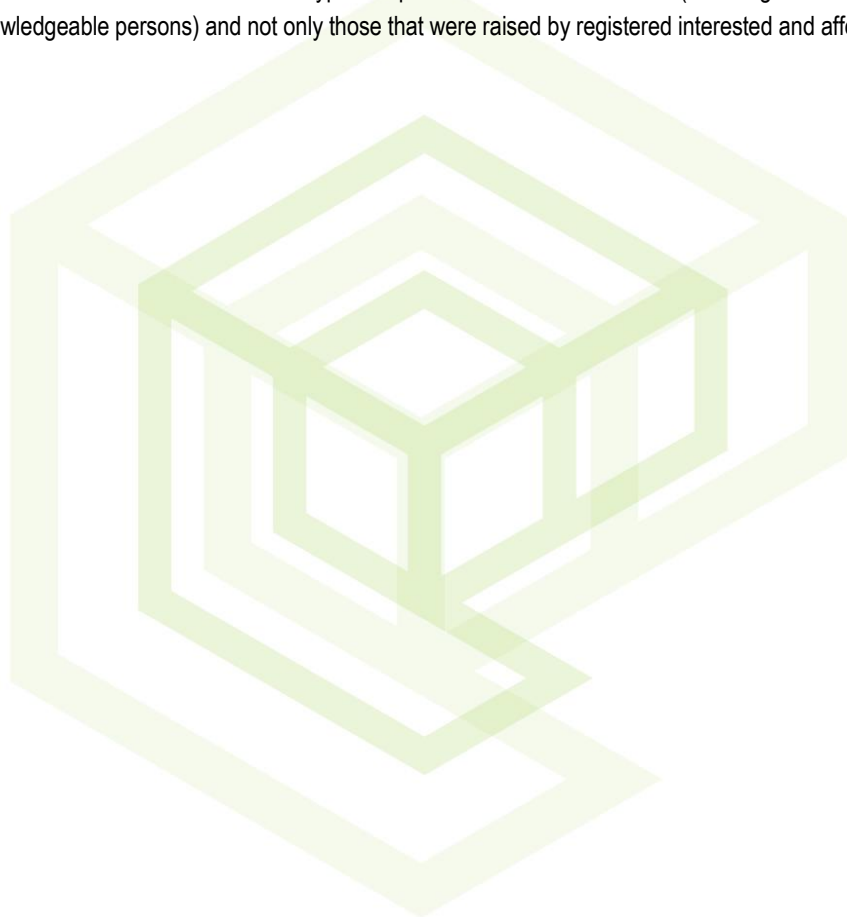


Table 18: Impact Assessment Table with Mitigation

ASSESSMENT OF IMPACTS AND MITIGATION MEASURES					POTENTIAL IMPACTS (without mitigation)	RESIDUAL IMPACTS (with mitigation)
Activity	Potential impact	Affected Aspects	Phase	Mitigation Measures / Enhancement Measures	Significance (Consequence + Probability)	Significance (Consequence + Probability)
Topography						
Levelling of drilling sites	Change in natural topography of the site.	Topography	Construction	Stockpile soils removed for rehabilitation. Rehabilitate to original landform.	Neg Low	Neg Low
Geology						
Removal of geological core	Creation of conduits between geological strata.	Geology	Operations	Boreholes to be sealed with concrete.	Neg Low	Neg Low
Soils						
Erosion from soil disturbance at drilling sites	Potential loss of topsoil	Soils	Operations	Keep the footprint of disturbance as small as practicably possible. Vegetation to be left in place to protect soils where possible. Where vegetation clearance cannot be avoided, storm water management measures to be put in place if there is a risk of soil erosion. Erosion protection where cut and fill and levelling of the drill site occurred.	Neg Low	Neg Low
Erosion from soil disturbance on access roads	Potential loss of soil resource.	Soils	Construction & Operation	Utilise existing access roads as far as possible. Keep the footprint of disturbance as small as practicably possible. Access roads to follow slope contours where possible. Vegetation to be left in place at sides of the road to protect the soils.	Neg Low	Neg Low



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Oil and diesel spills due to inappropriate storage, vehicle maintenance and washing operations.	Risk of soil contamination.	Soils	Construction, Operation and Closure	Impermeable liners or surfaces to be provided in areas where hydrocarbons are managed. Diesel storage areas to be bunded and regularly checked. Drip trays to be used when any vehicle maintenance is undertaken. Spill kits to be available at drill sites.	Neg Low	Neg Low
Hydrology (Surface Water)						
Spillage from fuels, oils and lubricants	Contamination of surface water.	Surface Water	Construction, Operation and Closure	Implement measures to protect soils from pollution. Boreholes to be outside of the 1 in 50-year flood line or 100 m from the edge of a watercourse, whichever is greater.	Neg Low	Neg Low
Increase in sediment loads as a result of erosion and heavy rainfall		Surface Water	Construction, Operation and Closure	Implement measures for soil erosion control in accordance with risk assessment. Boreholes to be outside of the 1 in 50-year flood line or 100 m from the edge of a watercourse, whichever is greater.	Neg Low	Neg Low
General and Human Waste		Surface Water	Construction, Operation and Closure	Contractors may only use designated toilets and waste disposal facilities.	Neg Low	Neg Low
Hydrogeology (Groundwater)						
Seepage of fuels, oils and lubricants.	Contamination of groundwater.	Groundwater	Construction, Operation and Closure.	Implement measures to protect soils from pollution. Boreholes to be outside of the 1 in 50 year flood line or 100 m from the edge of a watercourse, whichever is greater.	Neg Low	Neg Low
Cross contamination of aquifers due to borehole construction.		Groundwater	Operation and Closure.	Boreholes that will not be used again will be backfilled with cement and sealed.	Neg Low	Neg Low



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Noise						
Machinery and drilling operations. Movement of vehicles.	Increase in ambient noise levels. Disturbance to people and animals.	Noise	Construction, Operation and Closure.	Avoid travelling past residences. Speed limit of 40 km/h will be enforced. Liaise with landowner on areas sensitive to noise. Provide a buffer of 100 m from households. Drilling to take place during daylight hours. Borehole site and access route selection to give cognisance to the location of noise receptors and efforts must be taken to minimise such disturbance.	Neg Moderate	Neg Low
Air Quality						
Exhaust fumes from vehicles and machinery related to prospecting activities.	Release of gaseous emissions	Air Quality	Construction, Operation and Closure	No unnecessary revving of vehicles should take place. No vehicles must stand idling when not in use.	Neg Low	Neg Low
Vehicles travelling on gravel roads	Dust fallout and fine particular matter emissions	Air Quality	Construction, Operation and Closure	Restrict traveling speed of vehicles to reduce vehicle entrainment of dust. Wet gravel roads if dust is found to be excessive.	Neg Low	Neg Low
Land use and Land Capability						
Intrusion due to drilling and prospecting activities in an area where agricultural land uses are prominent	Land use conflict	Land use	Construction & Operation	Drilling sites must be selected to minimise disturbance of current land use. Relevant agreements must be in place with land owners to define location and extent of drilling sites and rehabilitation measures that will be undertaken at the end of drilling.	Neg Moderate	Neg Low
Land clearing and transformation.	Reduction in land capability	Land use	Construction		Neg Low	Neg Low



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Fauna, Flora and Ecology						
Establishment of drilling sites and access routes.	Removal / damage of natural vegetation	Fauna, Flora and avifaunal.	Construction	Site selection aimed at minimising disturbance to natural vegetation - Within the land portion, a solar PV facility has been constructed. Within the area envisaged for the prospecting, however, are no CBA 1 areas or <i>known</i> occurrences of <i>threatened</i> species, yet the presence of numerous individuals of protected trees has been confirmed for the land portion.	Neg Moderate	Neg Moderate
Accidental fires.		Fauna, Flora and avifaunal	Construction, Operation and Closure	<ul style="list-style-type: none"> No smoking at drilling sites. Code of conduct to include measures for the prevention of fires. Emergency equipment and procedures for firefighting to be in place. Adhere to emergency procedures. 	Neg Moderate	Neg Moderate
Establishment of drilling sites and access routes.	Disturbance/ poaching of animals.	Fauna, Flora and avifaunal	Construction	Site selection aimed at minimising disturbance to sensitive animal habitats and breeding areas.	Neg Moderate	Neg Moderate
Movement of drilling contractors.		Fauna, Flora and avifaunal	Construction, Operation and Closure	Drilling contractors are only allowed to move within the designated drilling area. Environmental awareness training should include poaching and disturbance of animals.	Neg Moderate	Neg Moderate
Sensitive and Protected Areas						
Establishment of drilling sites and access routes.	Degradation and destruction of sensitive biodiversity- Suitable habitat for the globally threatened red data avifaunal species.	Biodiversity	Construction, Operation and Closure	Site selection by environmental scientists, detailed avifaunal surveys as well as detailed sensitive habitat mapping will have to be conducted for any potential development in the region.	Neg Moderate	Neg Moderate
Heritage Resources						



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Drilling of boreholes will damage / destroy heritage resources in the area.	Cultural heritage resources may be found within the study area.	Heritage Resources	Construction and Operation	Site selection by environmental scientists are aimed at minimising disturbance to natural vegetation once positions have been finalised.	Neg Moderate	Neg Low
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Economic Development						
Employment and use of contractors and purchasing goods.	Contribution to the economy.	Economic Development	Construction and Operation	Preference to be given to the use of local employment, contractors and local suppliers.	Pos Low	Pos Moderate
Dust and noise from prospecting activities.	Creation of nuisance and disturbance to surrounding activities.	Economic Development	Construction, Operation and Closure	Implement measures to minimise air quality and noise impacts. Surrounding neighbours and land owners must be allowed to raise issues and complaints associated with prospecting activities. Their issues must be addressed promptly.	Neg Low	Neg Low
Visual and Sense of Place						
Visual intrusion due to drilling and prospecting activities.	Loss of sense of place due to prospecting activities	Visual and Sense of Place	Construction and Operation	Implement measures to reduce the visual impacts of prospecting activities, i.e. rehabilitation of drill sites and access roads.	Neg Moderate	Neg Low
Safety and Security						
Movement of drilling contractors and influx of workers.	Increase in crime.	Safety and Security.	Construction and Operation.	<ul style="list-style-type: none"> Drilling contractors not allowed moving outside of designated areas. Access of personnel related to the prospecting operations will only be allowed on approval by the project manager. All personnel that have access to the property will be provided with access cards. All personnel that have access to the property needs to be made visible. 	Neg Moderate	Neg Low
Overnight accommodation of drilling contractors.		Safety and Security	Construction, Operation and Closure.	Drilling contractors to be housed off the drilling property.	Neg Moderate	Neg Low
Stakeholder Acceptability						
Prospecting activities is a predecessor to mining.	Prospecting on private property.	Stakeholder Acceptability.	Construction, Operation and Closure.	Comply with the MPRDA & NEMA Implement and Comply with the EMP.	Neg Moderate	Neg Low

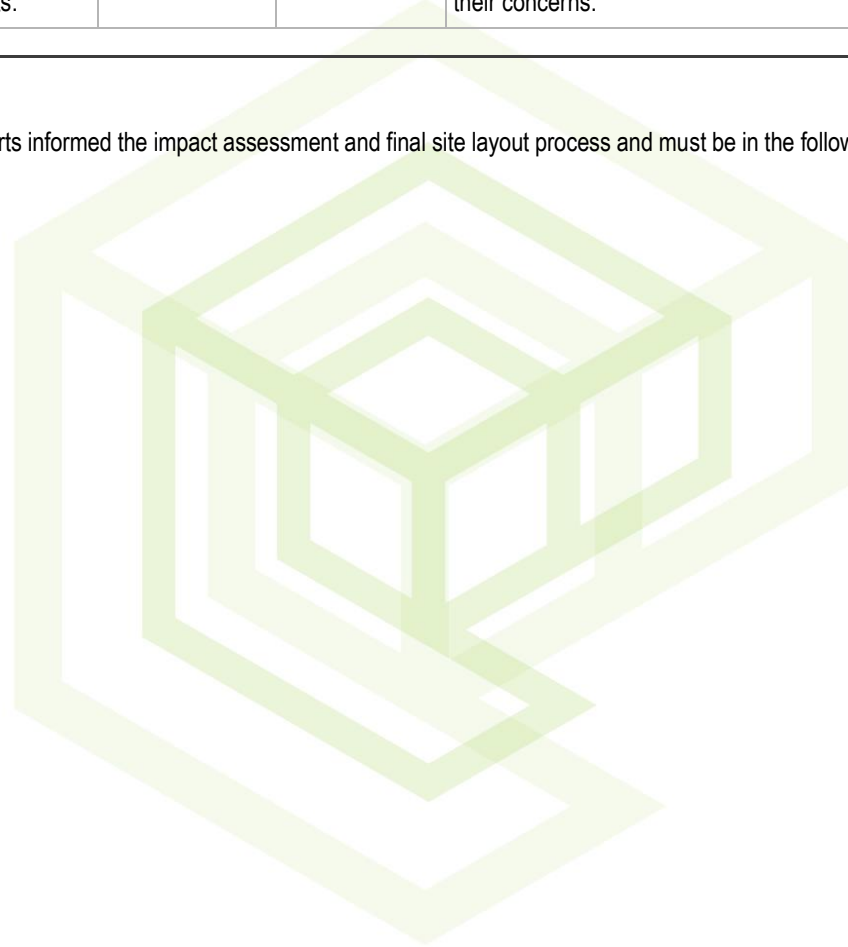


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Prospecting activities is a predecessor to mining.	Prospecting seen as a predecessor to mining and this raises a risk to various environmental impacts.	Stakeholder Acceptability.	Construction, Operation and Closure	An application for a mining right will require a separate public participation process and IAP's will be provided with the opportunity to raise their concerns.	Neg Moderate	Neg Moderate
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11.2 SUMMARY OF SPECIALIST REPORTS.

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



12. ENVIRONMENTAL IMPACT STATEMENT

12.1 SUMMARY OF THE KEY FINDINGS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

The environmental impacts associated with the proposed project are largely **low**, **moderate** with high impacts anticipated. The most significant impacts are:

Table 19: Summary of key findings

IMPACT	SIGNIFICANCE – WITHOUT MITIGATION	SIGNIFICANCE – WITH MITIGATION	COMMENT	MITIGATION
Negatively affecting the Ecological Support Areas (ESAs)	Moderate	Negative low	In light of the The 2016 Northern Cape Critical Biodiversity Areas most of the areas within the land portion have been designated Other Natural Areas (ONA), with only the north-eastern extent of the area designated as ESA (around the Witteegte River).	Although the risk of fauna to prospecting is considered low, there is a likelihood that threatened species may frequent the area on occasion. It will be imperative that staff will be strictly prohibited from deliberately collecting, snaring or in other ways entrapping fauna.
Negatively affecting sensitive bird species and the Biodiversity in the area.	Moderate	Negative Low	Apart from those listed, a greater diversity of fauna is expected to be resident on or frequent the study areas, especially due to the presence of rivers and diverse rocky niches.	A thorough faunal survey should thus be undertaken, including nearby riparian habitats, prior to <u>potential mining being initiated</u> in the area.
Negatively affecting the Heritage sites.	Moderate	Negative Low	As can be seen from previous research done in the area, the general region is significant from a heritage perspective. Heritage sites are likely to include MSA/LSA material, cemeteries/graves, Iron Age and historical sites. Since heritage sites, such as burial sites, are not always clearly identifiable due to disturbed/removed surface features, care must be exercised when prospecting.	<ul style="list-style-type: none"> - It is recommended that the areas demarcated as 'Sensitive Areas' be excluded from potential prospecting sites due to the possible presence of surface/subsurface culturally significant material. - It is advised that a qualified archaeologist be contacted whenever uncertainty regarding potential heritage remains are encountered.
Negatively affecting the surface water quality.	Moderate	Negative Low	The land portion drains in an easterly direction, with the Witteegte River creating the north-eastern border. This contributes to the High Aquatic Sensitivity Rating of the area, but in practical term would mean than runoff or seepage through the sands from any prospecting-	<ul style="list-style-type: none"> - ,100-meter buffer has been established from any surface water resources - Storm water diversion measures and containment will be implemented. - Runoff from prospecting and mining operations into the pan-cluster will be prevented.



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			related activities should not enter the river.	- Water will be recycled as far as possible using a closed loop sump system.
Conflicting land uses (agriculture and prospecting).	Moderate	Negative Low	A closer inspection of available satellite imagery shows that about a quarter of the study area has already been variably modified by past mining activities.	<ul style="list-style-type: none"> - Prospecting will be planned to take place outside of farming activities where possible. - where not possible compensation will be discussed and agreed with the affected party. - rehabilitation will consider further use of the land.

The nature of prospecting involves invasive drilling of sites not exceeding 64 m². The drill sites are not fixed and can be relocated by 1-50 meters. Due to the flexibility of the drill sites and small size the key mitigation is to approve each site on environmental factors by a competent environmental officer. Each active site will be rehabilitated to its natural status before sampling and trenching. The success of the proposed mitigation is high.

i) Final Site Map

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

12.2 PLEASE REFER TO THE CONCEPTUAL MASTER PLAN

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



Table 20: Impact Assessment summary

ASSESSMENT OF IMPACTS AND MITIGATION MEASURES					POTENTIAL IMPACTS (without mitigation)	RESIDUAL IMPACTS (with mitigation)
Activity	Potential impact	Affected Aspects	Phase	Mitigation Measures / Enhancement Measures	Significance (Consequence + Probability)	Significance (Consequence + Probability)
Topography						
Levelling of drilling sites.	Change in natural topography of the site.	Topography	Construction	Stockpile soils removed for rehabilitation. Rehabilitate to original landform.	Neg Low	Neg Low
Geology						
Removal of geological core.	Creation of conduits between geological strata.	Geology	Operations	Boreholes to be sealed with concrete.	Neg Low	Neg Low
Soils						
Erosion from soil disturbance at drilling sites.	Potential loss of topsoil	Soils	Operations	Keep the footprint of disturbance as small as practicably possible. Vegetation to be left in place to protect soils where possible. Where vegetation clearance cannot be avoided, storm water management measures to be put in place if there is a risk of soil erosion. Erosion protection where cut and fill and levelling of the drill site occurred.	Neg Low	Neg Low
Erosion from soil disturbance on access roads	Potential loss of soil resource.	Soils	Construction & Operation	Utilise existing access roads as far as possible. Keep the footprint of disturbance as small as practicably possible. Access roads to follow slope contours where possible. Vegetation to be left in place at the sides of the road to protect the soils.	Neg Low	Neg Low



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Oil and diesel spills due to inappropriate storage, vehicle maintenance and washing operations.	Risk of soil contamination.	Soils	Construction, Operation and Closure.	Impermeable liners or surfaces to be provided in areas where hydrocarbons are managed. Diesel storage areas to be bunded and regularly checked. Drip trays to be used when any vehicle maintenance is undertaken. Spill kits to be available at drill sites.	Neg Low	Neg Low
Hydrology (Surface Water)						
Spillage from fuels, oils and lubricants.	Contamination of surface water.	Surface Water	Construction, Operation and Closure	Implement measures to protect soils from pollution. Boreholes to be outside of the 1 in 50 year floodline or 100 m from the edge of a watercourse, whichever is greater.	Neg Low	Neg Low
Increase in sediment loads as a result of erosion and heavy rainfall.		Surface Water	Construction, Operation and Closure.	Implement measures for soil erosion control in accordance with risk assessment. Boreholes to be outside of the 1 in 50 year floodline or 100 m from the edge of a watercourse, whichever is greater.	Neg Low	Neg Low
General and Human Waste.		Surface Water	Construction, Operation and Closure.	Contractors may only use designated toilets and waste disposal facilities.	Neg Low	Neg Low
Hydrogeology (Groundwater)						
Seepage of fuels, oils and lubricants.	Contamination of groundwater.	Groundwater	Construction, Operation and Closure.	Implement measures to protect soils from pollution. Boreholes to be outside of the 1 in 50 year flood line or 100 m from the edge of a watercourse, whichever is greater.	Neg Low	Neg Low
Cross contamination of aquifers due to borehole construction.		Groundwater	Operation & Closure.	Boreholes that will not be used again will be backfilled with cement and sealed.	Neg Low	Neg Low



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Noise						
Machinery and drilling operations. Movement of vehicles.	Increase in ambient noise levels. Disturbance to people and animals.	Noise	Construction, Operation and Closure	Avoid travelling past residences. Speed limit of 40 km/h will be enforced. Liaise with landowner on areas sensitive to noise. Provide a buffer of 100 m from households. Drilling to take place during daylight hours. Borehole site and access route selection to give cognisance to the location of noise receptors and efforts must be taken to minimise such disturbance.	Neg Moderate	Neg Low
Air Quality						
Exhaust fumes from vehicles and machinery related to prospecting activities.	Release of gaseous emissions.	Air Quality	Construction, Operation and Closure.	No unnecessary revving of vehicles should take place. No vehicles must stand idling when not in use.	Neg Low	Neg Low
Vehicles travelling on gravel roads.	Dust fallout and fine particulate matter emissions.	Air Quality	Construction, Operation and Closure.	Restrict traveling speed of vehicles to reduce vehicle entrainment of dust. Wet gravel roads if dust is found to be excessive.	Neg Low	Neg Low
Land use and Land Capability						
Intrusion due to drilling and prospecting activities in an area where agricultural land uses are prominent.	Land use conflict.	Land use	Construction & Operation.	Drilling sites must be selected to minimise disturbance of current land use. Relevant agreements must be in place with land owners to define location and extent of drilling sites and rehabilitation measures that will be undertaken at the end of drilling.	Neg Moderate	Neg Low
Land clearing and transformation.	Reduction in land capability.	Land use	Construction		Neg Low	Neg Low



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Fauna, Flora and Ecology						
Establishment of drilling sites and access routes.	Removal/ damage of natural vegetation.	Fauna, Flora and Ecology.	Construction	Site selection aimed at minimising disturbance to natural vegetation - Most of the areas within the land portion have been designated Other Natural Areas (ONA), with only the north-eastern extent of the area designated as ESA (around the Witteegte River).	Neg Moderate	Neg Moderate
Accidental fires		Fauna, Flora and Ecology.	Construction, Operation and Closure.	No smoking at drilling sites. Code of conduct to include measures for the prevention of fires. Emergency equipment and procedures for firefighting to be in place. Adhere to emergency procedures.	Neg Moderate	Neg Moderate
Establishment of drilling sites and access routes.	Disturbance / poaching of animals.	Fauna, Flora and Ecology	Construction	Site selection aimed at minimising disturbance to sensitive animal habitats and breeding areas.	Neg Moderate	Neg Moderate
Movement of drilling contractors.		Fauna, Flora and Ecology	Construction, Operation and Closure.	Drilling contractors are only allowed to move within the designated drilling area. Environmental awareness training should include poaching and disturbance of animals.	Neg Moderate	Neg Moderate
Sensitive and Protected Areas						
Establishment of drilling sites and access routes	Degradation and destruction of sensitive biodiversity- Suitable habitat for the globally threatened red data avifaunal species	Biodiversity	Construction, Operation and Closure	Site selection by environmental scientists, detailed avifaunal surveys as well as detailed sensitive habitat mapping will have to be conducted for any potential development in the region	Neg Moderate	Neg Moderate
Heritage Resources						
Drilling of boreholes will damage / destroy heritage resources in the area.	Cultural heritage resources may be found within the study area.	Heritage Resources	Construction and Operation	Site selection by environmental scientists are aimed at minimising disturbance to natural vegetation once the positions have been finalised.	Neg Moderate	Neg Low
Economic Development						



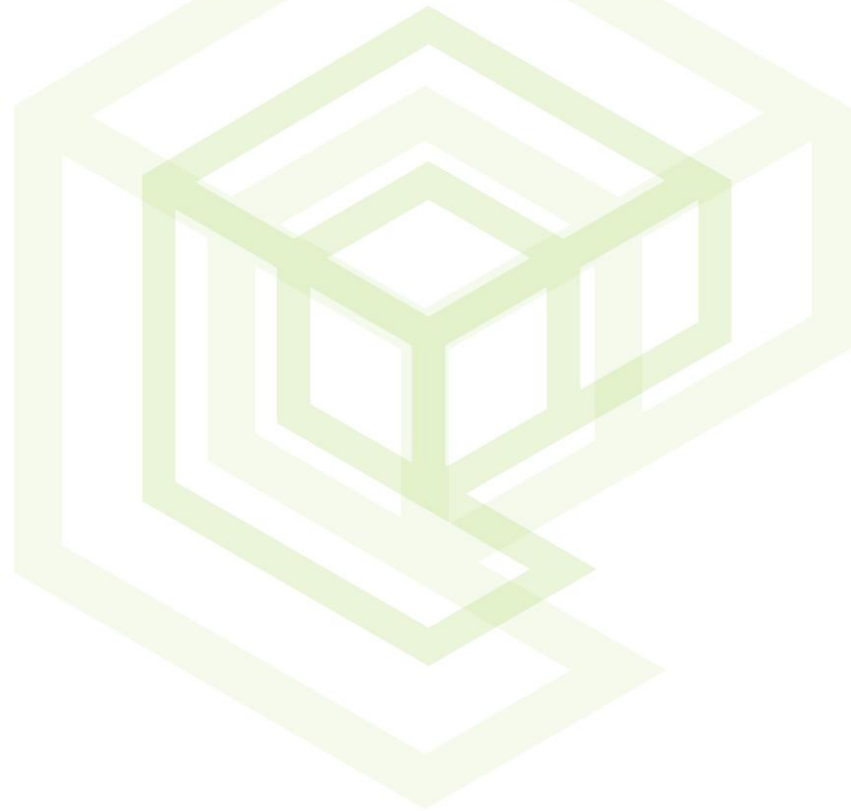
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Employment and use of contractors and purchasing goods.	Contribution to the economy.	Economic Development	Construction and Operation	Preference to be given to the use of local employment, contractors and local suppliers.	Pos Low	Pos Moderate
Dust and noise from prospecting activities.	Creation of nuisance and disturbance to surrounding activities.	Economic Development	Construction, Operation and Closure	Implement measures to minimise air quality and noise impacts. Surrounding neighbours and land owners must be allowed to raise issues and complaints associated with prospecting activities. Their issues must be addressed promptly.	Neg Low	Neg Low
Visual and Sense of Place						
Visual intrusion due to drilling and prospecting activities.	Loss of sense of place due to prospecting activities.	Visual and Sense of Place.	Construction and Operation.	Implement measures to reduce the visual impacts of prospecting activities, i.e. rehabilitation of drill sites and access roads.	Neg Moderate	Neg Low
Safety and Security						
Movement of drilling contractors and influx of workers.	Increase in crime.	Safety and Security.	Construction and Operation.	Drilling contractors not allowed moving outside of designated areas. Access of personnel related to the prospecting operations will only be allowed on approval by the project manager. All personnel that have access to the property will be provided with access cards. All personnel that have access to the property needs to be made visible.	Neg Moderate	Neg Low
Overnight accommodation of drilling contractors.		Safety and Security.	Construction, Operation and Closure.	Drilling contractors to be housed off the drilling property.	Neg Moderate	Neg Low
Stakeholder Acceptability						
Prospecting activities is a predecessor to mining.	Prospecting on private property.	Stakeholder Acceptability.	Construction, Operation and Closure.	Comply with the MPRDA & NEMA Implement and Comply with the EMP.	Neg Moderate	Neg Low



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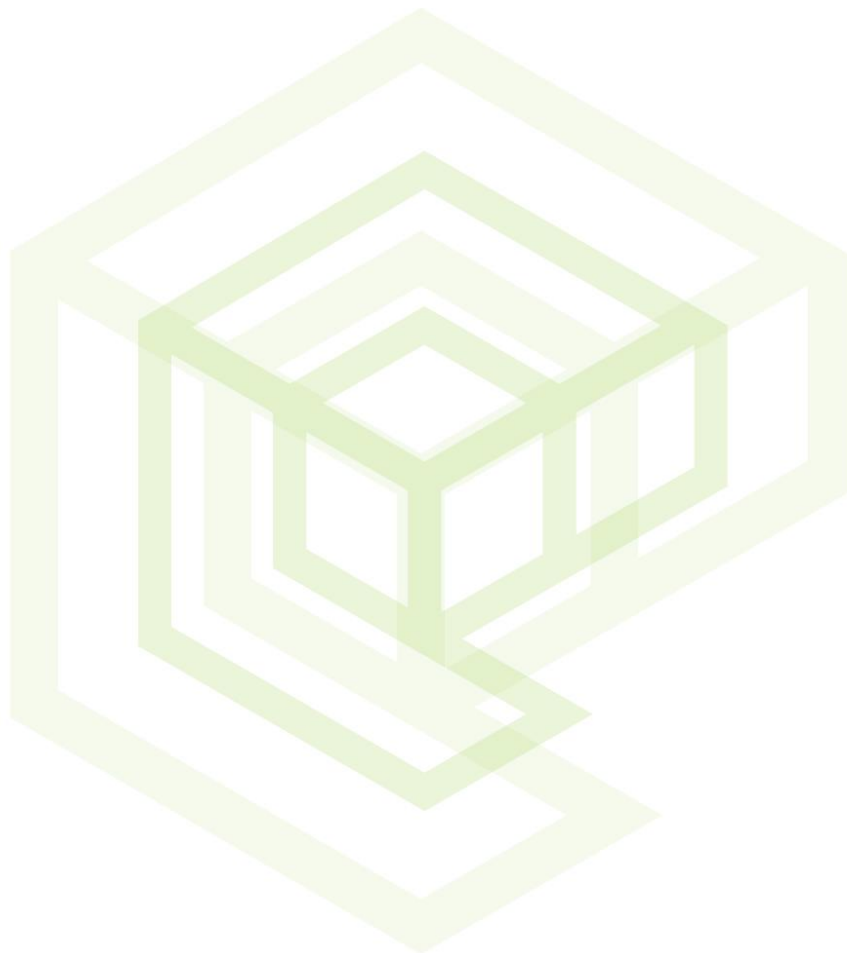
<p>Prospecting activities is a predecessor to mining.</p>	<p>Prospecting seen as a predecessor to mining and this raises a risk to various environmental impacts.</p>	<p>Stakeholder Acceptability.</p>	<p>Construction, Operation and Closure.</p>	<p>An application for a mining right will require a separate public participation process and IAP's will be provided with the opportunity to raise their concerns.</p>	<p>Neg Moderate</p>	<p>Neg Moderate</p>
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The risks of the project are potential negative impacts on the ecological support area and increased urban sprawl into rural areas

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



13. PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPR;

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

The objectives of impact mitigation and management are to:

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

Environmental impact management outcomes are:

- Conduct prospecting activities responsibly and ensure operation is compliant with legislative requirements.
- Protect the biophysical environment as far as possible, specifically wetlands and riverine areas and any protected species observed on site.
- Protect the water resources in the area as far as possible.
- Ensure atmospheric pollution is kept to a minimum:
- Ensure adequate rehabilitation to allow continued grazing land use.
- Ensure socially responsible activities.
- Protect historical and cultural sites if they are observed on site.



14. ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION.

Any aspects which must be made conditions of the Environmental Authorisation

- Although some of the area has been modified by a Solar PV facility, the remainder of the land portion consists of primary vegetation in which at least 3 protected tree species have been confirmed, and a 4th protected herbaceous species could occur.
- It is anticipated that due to historical disturbance levels, alien invasive plant species will be present. A full alien invasive plant survey is thus also recommended, as part of an analysis of the risk of potential mining in spreading and/or further establishing such undesirable plants.
- Although the risk of fauna to prospecting is considered low, there is a likelihood that threatened species may frequent the area on occasion. It will be imperative that staff will be strictly prohibited from deliberately collecting, snaring or in other ways entrapping fauna.
- Heritage sites and 50 m buffer zones will be preserved at all times unless the necessary permits are obtained under SAHRA.
- No activity is to occur within 100 m of any road servitude, wetlands and their 100 m buffer zones, within rivers and their 100 m buffer zone / 1:100-year flood line without the necessary authorisation under NEMA and NWA.
- Planning before carrying out prospecting activities in a particular area, and surveying the area before conducting invasive prospecting, is critical to ensure the sensitive areas are preserved and to ensure prospecting proceeds in a manner compliant with national legislation.
- Rehabilitation must be applied on an on-going basis and no sites must be left exposed for more time than necessary to obtain the necessary data. All areas disturbed during the drilling process must be rehabilitated to previous land use capability.

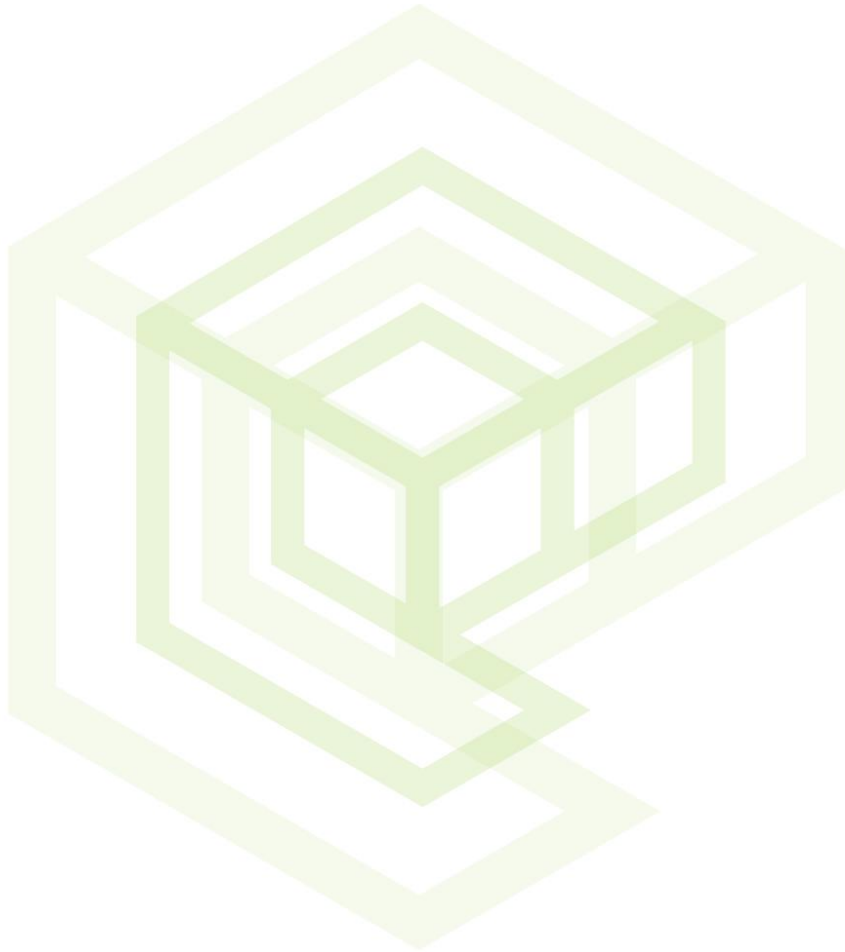


15. DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE.

(Which relate to the assessment and mitigation measures proposed)

At this stage the exact locations of the invasive prospecting are unknown due to the fact that the locations will be dependent on the findings of the non-invasive techniques. This is not seen as a major gap as the lack of this knowledge has been worked into the EMP as well as the proposed conditions stipulated above. In general, the approach will be as follows for invasive prospecting:

- The exact depths of the boreholes will be determined while the drilling program is underway as influenced by the depths and dips measured in the previous boreholes. Trenching will be conducted where the chrome seam occurs very close to the surface. Six trenches are planned to be excavated and the length of the trenches will be determined by the dip of the seam and the burial depth. Trenches will not be conducted any deeper than 2m for all intents and purposes.



16. REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

16.1 REASONS WHY THE ACTIVITY SHOULD BE AUTHORIZED OR NOT.

- A full alien invasive plant survey is thus also recommended, as part of an analysis of the risk of potential mining in spreading and/or further establishing such undesirable plants.
- From an ecological perspective, prospecting could proceed but the destruction of protected trees should be avoided, and will only be permissible with the relevant permits from the responsible authorities. It will be essential to conduct a protected species survey prior to any groundworks taking place.

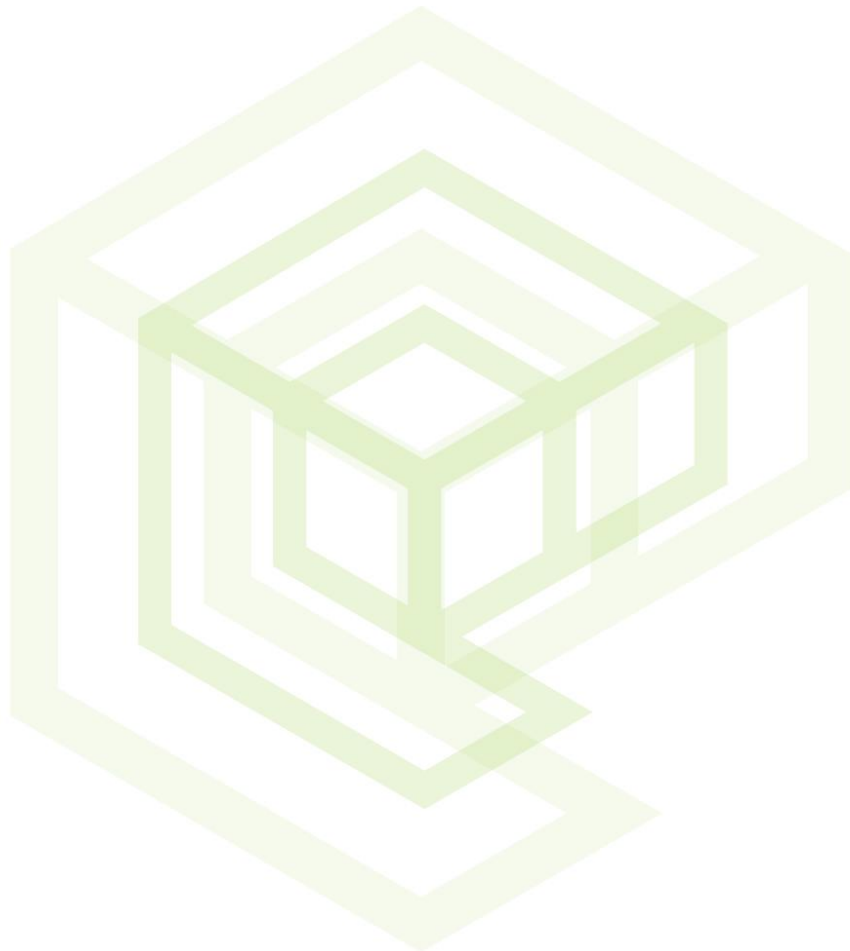
16.2 CONDITIONS THAT MUST BE INCLUDED IN THE AUTHORISATION

- It is thus of important that a thorough protected plant survey be carried out during the peak growing season (January to April) prior to the initiation of any large-scale prospecting or mining activity.
- A thorough faunal survey should thus be undertaken, including nearby riparian habitats, prior to potential mining being initiated in the area.
- No activity is to occur within 100 m of any road servitude.
- No activities to occur within 100 m of any wetlands and their 100 m buffer zones, within rivers and their 100 m buffer zone / 1:100 year flood line without the necessary authorisation under NEMA and NWA.
- Heritage sites and 50 m buffer zones will be preserved at all times unless the necessary permits are obtained under SAHRA.
- Planning before carrying out prospecting activities in a particular area, and surveying the area before conducting invasive prospecting, is critical to ensure the sensitive areas are preserved and to ensure prospecting proceeds in a manner compliant with national legislation.
- Rehabilitation must be applied on an on-going basis and no sites must be left exposed for more time than necessary to obtain the necessary data. All areas disturbed during the drilling process must be rehabilitated to previous land use capability.



17. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED.

3 Three Years.



18. UNDERTAKING

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

The applicant representative, Mr. Douglas Mongwe hereby confirms the undertaking to ensure implementation and compliance with the basic assessment report and environmental management programme.



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19. FINANCIAL PROVISION

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

19.1 EXPLAIN HOW THE AFORESAID AMOUNT WAS DERIVED.

The Quantum was calculated using the guideline document developed by the Department of Mineral Resources in 2005. In addition, consideration has been given to Section 41 of the Mineral & Petroleum Resource Development Act, N0 28 of 2002.

The quantum has been aligned with the rehabilitation and allows for the site to be rehabilitated back to the original status of the site. This will include:

1. Ensuring all pollution generating activities are eliminated.
2. Ensuring all infrastructure is removed from site.
3. Ensuring that the existing land use can continue.
4. Ensuring that the site is safe for humans and animals.

The rehabilitation sites will have a footprint of 64 m² for 20 sites as this is the area determined that needs to be cleared for drilling from previous experience. The maps and illustrations attached therefore indicate the site layout and sizes associated in order to do prospecting drilling.

19.2 CONFIRM THAT THIS AMOUNT CAN BE PROVIDED FOR FROM OPERATING EXPENDITURE.

Application for Prospecting right in respect of the Remaining Extent of the Farm Adams 328 within the Joe Morolong Local Municipality and the John Taolo Gaetsewe District Municipality in the Northern Cape Province with minimum of 10 drill boreholes are required to determine the available resource. Only one prospecting site will be active at a time as there is only one drill rig that will be used. This therefore allows minimum exposure and impact as concurrent rehabilitation can be carried out. Once drilling is complete at one site (usually within one day) the rehabilitation can be done immediately and soils and vegetation replaced.

Existing roads will be used as far as possible and it is not possible to identify any new access roads at this stage as its route will be determined in conjunction with the landowner and activities on the property at that time. No other infrastructure, offices or housing, will be present within the prospecting area and all employees will be housed in nearby towns. Vegetation establishment is monitored after the first rain to ensure sustainability in the rehabilitation efforts.

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

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

The provision forms part of the capital expense of the project and is not included in the operational budget allocated in the prospecting works programme. Allowance has been made for environmental reporting in the operational budget.



20. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

20.1 COMPLIANCE WITH THE PROVISIONS OF SECTIONS 24(4)(A) AND (B) READ WITH SECTION 24 (3) (A) AND (7) OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998). THE EIA REPORT MUST INCLUDE THE:-

20.2 IMPACT ON THE SOCIO-ECONOMIC CONDITIONS OF ANY DIRECTLY AFFECTED PERSON.

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

The proposed prospecting activities are expected to be limited and thus opportunities for employment will be low. However, consideration will be given to local procurement of goods and services where practicable.

There may be concern that the introduction of the prospecting workforce into the farm communities can result in disputes. The prospecting workforce is not to interfere with any farm labourers or communities. No persons are to reside on the properties during prospecting activities.

20.3 IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NATIONAL HERITAGE RESOURCES ACT.

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

Section 3(2) of the National Heritage Resources Act, No. 25 of 1999 provides a description of all items that is classified as national estate. The EAP has evaluated the list in comparison with the project site. The results of the assessment are provided below with recommendations to the environmental officer where there was uncertainty. A heritage assessment must be initiated prior to invasive drilling.



21. OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT.

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

Section 24(4)(b)(i) of the Act requires the EAP to conduct an investigation of the potential consequences of impacts of alternatives to the activity on the environment and assessment of the significance of those potential consequences. Alternatives to the project are limited to the location of drill sites within the project area. Prospecting sites are not fixed and will only be confirmed during the desktop study if the prospecting right is awarded. The EAP has however provided a grid of possible drill site locations. The prospecting site locations were amended on consideration of watercourses and biodiversity. This consideration has given value to alternative sites by removing sites that pose a high significance impact to the project.

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PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT



22. DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

22.1 DETAILS OF THE EAP

(Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

Name of The Practitioner: Mr. Vernon Siemelink / Ms Kelebhone Sekonyela
 Tel No.: 012 807 0383
 Fax No. : 086 714 5397
 e-mail address: vernon@ecoe.co.za

Name	Vernon
Surname	Siemelink
Company	Eco Elementum (Pty) Ltd
Position	Director – Senior Environmental Consultant
Location	361 Oberon Ave, Glenfield Office Park, Nikka Building, 1 st Floor, Farerie Glen, Pretoria, 0081
Email	vernon@ecoe.co.za
Telephone Number	012 348 5214
Education	<p>M(EnvMan) - Masters in Environmental Management Master's Degree at University of Pretoria in Pretoria, South Africa (Gauteng)</p> <p>BSSc. GeoScience - Honours in Geographical Science Honours Degree at University of Pretoria in Pretoria, South Africa (Gauteng)</p>
Professional skills	<ul style="list-style-type: none"> - Vernon Siemelink is a Director at Eco Elementum (Pty) Ltd Environmental and Project Management Professionals and has been involved in the field of environmental science and environmental management for the past 9 years. - Vernon is a SGS IRCA Certified EMS Lead Auditor and a SETA accredited assessor. He has also completed the CEM auditor conversion training for ISO 9001, IS O 14001 and OHSAS 18001 Integrated Management Systems. - Vernon Siemelink has been an environmental consultant and professional since 2008, specialising in the fields of: <ul style="list-style-type: none"> • Environmental Impact Assessments and Authorisations; • Water use license application • Waste use license application • Environmental Monitoring and Control; • Mine Closure and Rehabilitation; • Environmental Compliance and Audits; • Environmental Management Systems; and Specialist Impact Studies. - During this time, he has provided quality, environmental, and health and safety consulting and auditing services in nearly every industry sector. - Furthermore, Vernon holds a Master's Degree in Environmental Management and an Honours Degree in Geosciences from the University of Pretoria.

Please refer to the CVs attached in Appendix A.

Skills	<ul style="list-style-type: none"> - Environmental Impact Assessments - Basic assessments, WULA reports - Water use license application - Waste use license application - Prospecting and Mining Right Authorizations - Environmental Management Plans
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	<ul style="list-style-type: none"> - Public Participation - Environmental Authorizations - ISO 14001:2004 Environmental Management System Auditor - FSC Forest Management Auditing - Geographic Information System Support (ArcGISv9.2) - SETA Accredited Assessor - EMSware software Administrator - Integrated Management System Auditor
EAP Experience	<p>Mr. Vernon Siemelink has been an Environmental Assessment Consultant for 9 years, during this time he has conducted S/EIA's, Basic Assessments, rehabilitation planning, developed EMPr (This includes conducting screening and scoping exercises, baseline studies, impact assessments, monitoring, and management planning and implementation) environmental legal assessments, ISO 14001:2004 management systems, due diligence, EMPr Performance Assessments and Integrated Water Use License Audits for clients in nearly every industry sector.</p>

Name	Kelebone
Surname	Sekonyela
Company	Eco Elementum (Pty) Ltd
Position	Junior Environmental Practitioner (EAP)
Location	361 Oberon Ave, Glenfield Office Park, Nikka Building, 1 st Floor, Farerie Glen, Pretoria, 0081
Email	kele@ecoe.co.za
Telephone Number	072 83 78813/ 012 348 5214
Education	<p>MSc (EnvMan) - Masters in Environmental Management Master's Degree at University of Johannesburg in Johannesburg, South Africa (Gauteng)</p> <p>BA. Geography - Honours in Geographical Science Honours Degree at University of Johannesburg in Johannesburg, South Africa (Gauteng)</p>
Professional skills	<ul style="list-style-type: none"> - Kelebone Sekonyela is an EAP at Eco Elementum (Pty) Ltd and has been involved in the field of environmental science and environmental management for about 2 years. - Kelebone Sekonyela is an environmental consultant since 2018, focusing in the fields of: <ul style="list-style-type: none"> • Environmental Impact Assessments and Authorisations. • Water use license application. • Waste use license application. • Environmental Monitoring and Control. • Environmental Compliance and Audits. - During this time, she has provided quality, environmental, and auditing services in nearly every industry sector. - Furthermore, Kelebone holds a Master's Degree in Environmental Management from the University of Johannesburg.

In terms of section 13 (2&3) of the 2014 National Environmental Management Act EIA regulations (GNR. 982 of 2014): In the event where the EAP or specialist does not comply with sub regulation (1)(a) (which is the independence clause), the proponent or applicant must, prior to conducting public participation as contemplated in chapter 5 of these Regulations, appoint another EAP or specialist to externally review all work undertaken by the EAP or specialist, at the applicant's cost. The external reviewer however needs to be independent. To satisfy the above requirements Trentra (Pty) Ltd appointed Eco Elementum (Pty) Ltd as the Independent Environmental Assessment Practitioners (EAP) to review the BA Report and to oversee the PPP for the Prospecting Right Application.

Please refer to Appendix A for the detailed CV's.



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22.2 DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

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

The following section presents a detailed description of all the activities associated with the proposed prospecting application. Due to the nature of the Prospecting Works Programme, and the fact that the specific prospecting activities required are dependent on the preceding phase, assumptions are presented where required.

Access Roads

Access to the site will be required during mapping and drilling activities (Phase2). Access requirements can only be determined after Phase 1 has been concluded. A number of existing roads and tracks already traverse the proposed prospecting site and where practicable, these roads will be used. All access on farms will be conducted in terms of a written agreement with the land owner. In instances where no access roads are available to the site location a single track will be selected as the best alternative on the basis of least environmental impact with natural habitat considered the last option.

During mapping activities, vehicle access will be gained to site through the veld and the establishment of a track to gain repeated access to a mapping site will not be required.

Once the drill sites have been identified, temporary access roads may be established for repeated access to the prospecting site if the identified drill site cannot be accessed via existing roads and tracks.

Vegetation and topsoil stockpile areas (if required)

Vegetation and topsoil will only be stockpiled in instances where settling sumps are required i.e. core drilling. During the excavation process the topsoil and available vegetation will be placed adjacent to the sumps. This will also serve as a storm water diversion berm. The excavated material will be backfilled into the rehabilitated sumps on completion of the drilling process.

Water Supply

Currently it is not known whether there are any water boreholes located on the site and whether access and supply will be granted by the landowner. Water will be trucked from identified sources to the identified drill sites, water bowsers will be deployed to these sites as and when required.

Continuous water supply will be required during drilling, and on-site water storage tanks with a capacity of 15,000 ℓ for water supply to the drill, will be used.

When core drilling will be undertaken, a number of settling sumps will be excavated and lined with impervious plastic sheets. The purpose of these sumps are to recycle water and drilling fluids by means of gravity which leads to heavier materials (e.g. drill cuttings) to settle and clean water being produced for re-use. The drill cuttings form a sludge which will be collected in the sumps. These sumps will be fenced, where required, to prevent livestock and public access. The plastic sheets will be removed and sumps will be backfilled on completion of drilling. If required, the remaining sludge in sumps is to be treated with a suitable bio-remediation product prior to backfilling or disposal.

Additional water requirements relate to the potable water supply for employees and workers. A temporary 260 ℓ on-site vertical water storage tank for drinking water and generalise by persons will be provided at the drill site.

Ablution

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

Accommodation

No accommodation for staff and workers will be provided on- site. Workers will be transported to and from the prospecting site on a daily basis. Night security staff will be employed once equipment has been established onsite.



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Storage of Dangerous Goods

During the diamond drilling activities limited quantities of diesel fuel, oil and lubricants will be used onsite, all chemicals and dangerous goods will be stored on the drilling trucks, and be packed up at night and removed. The only dangerous good that will be stored in any significant quantity is diesel fuel. A maximum amount of 60 m³ will be stored in above ground diesel storage tanks. Storage and use of hydrocarbons and other chemicals may only take place on impermeable surfaces with bunds to contain any accidental spills.

Hazardous material will be stored in appropriate containers and clearly marked. Drip trays and or impermeable surfaces with bunds must be placed under machinery that has the potential to leak. Material Safety Data Sheets will be available for all drilling and other chemicals kept on site.

Drill rig

In most cases, the drill rig will be a self-contained, truck-mounted unit that will be accompanied by a compressor and a generator. The drill rig will be driven to site and mobilised in the desired location, positioned over the hole site and will be stabilised.

The footprint of disturbance for a prospecting rig and associated equipment is generally smaller than 25 m² -64 m². Plastic sheets and trip trays will be placed underneath the rig for the duration of the drilling process at each site in order to avoid hydrocarbon spills and contamination. The full extent of the drill sites will be staked out and the drill crew will not operate beyond these boundaries. Depending on the locality, this perimeter may be fenced, marked with bunting or barricading. Please refer to Figure 5 for a layout plan of the drilling site.

Drill core storage area

During core drilling, a laydown area for the extracted core samples will be established within the footprint of the drill site. This area is usually 8 m × 2 m and is used to place the extracted core in sequence (according to depth) for later analysis by an appointed geologist. Core trays will be used to contain the core samples.

Storm water berms

Berms will be constructed on the upstream side of the mini-pit to divert any clean water around the pit and into the natural environment.



22.3 COMPOSITE MAP

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

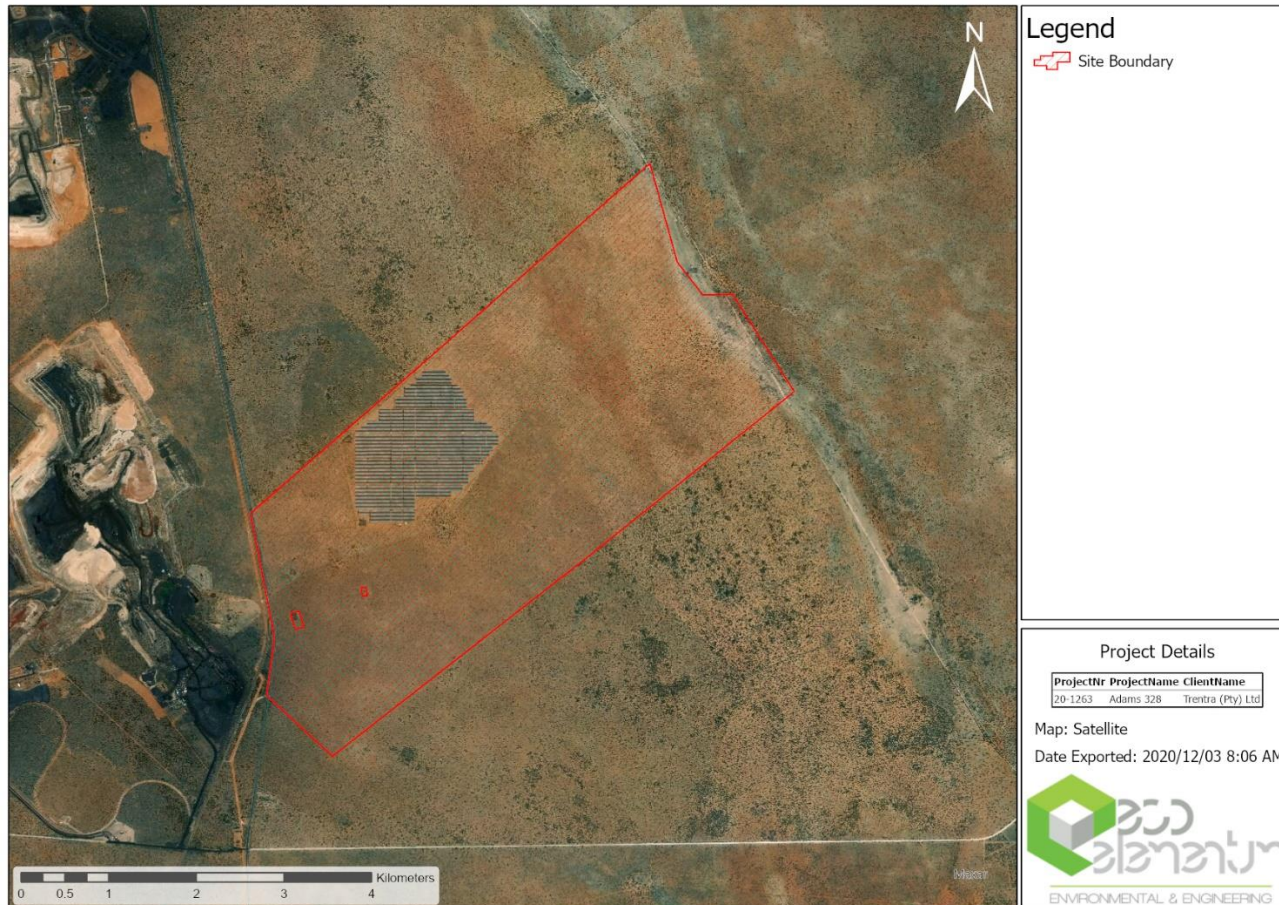


Figure 13: Conceptual prospecting site proposed layout

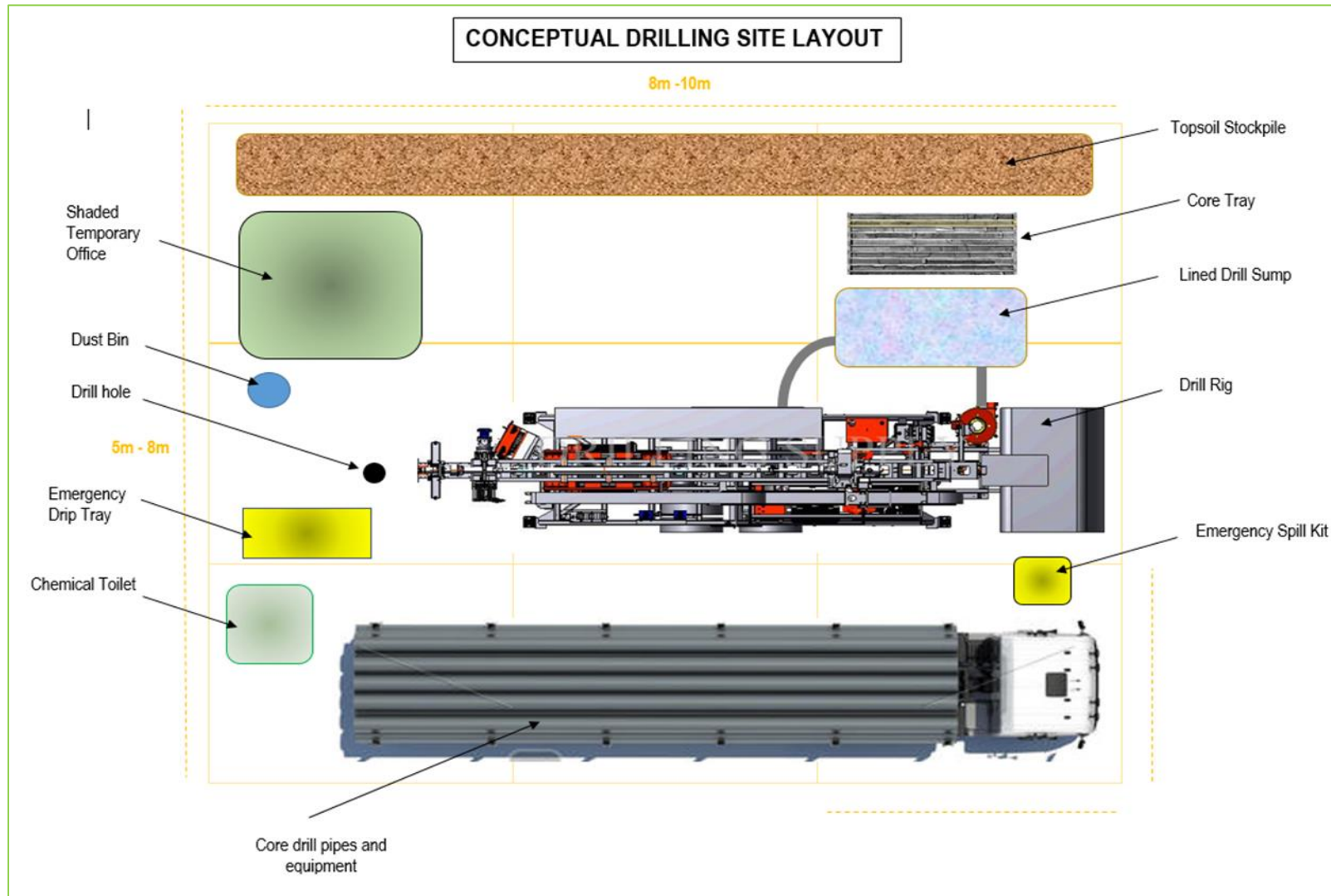


Figure 14: Conceptual drilling site layout



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22.4 DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

The closure objective allows for the site to be rehabilitated back to the original status of the site. This will include:

1. Ensuring all pollution generating activities are eliminated.
2. Ensuring all infrastructure is removed from site.
3. Ensuring that the existing land use can continue.
4. Ensuring that the site is safe for humans and animals.

Vegetation establishment is monitored after the first rain to ensure sustainability in the rehabilitation efforts.

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

Only a small volume of water will be required during drilling. Approximately 15 m³ of water will be used per day for a maximum of 20 days. This amounts to a total maximum of 300 m³.

Water will also be brought onto site for potable use, this is estimated at 5 litres per person / day.

22.4.2 Has a water use licence has been applied for?

Water use licence will be applied for upon approval of this project. All the water uses triggered under the Section 21 of NWA.

22.4.3 Impacts to be mitigated in their respective phases. Measures to rehabilitate the environment affected by the undertaking of any listed activity

22.4.3.1 Objectives

This section provides for the environmental management of all prospecting activities to be undertaken in the prospecting area. The objective of this section is to detail actions required to address the potential impacts resulting from the identified activities to be undertaken during the establishment, operation and rehabilitation of drilling sites within the prospecting right area. This section elaborates on the implementation of the mitigation measures documented in the detailed impact assessment.

22.4.3.2 Environmental Impacts

The aim of this section is to reduce the significance of negative impacts and enhance positive impacts as far as practicably possible. The overall objectives are thus to:

- Minimize disturbance on the physical environment including the protection of soils, surface water and groundwater during drilling operations;
- Minimize disturbance to the ecological environment and prevent disturbance to sensitive sites;
- prevent disturbance of sites of cultural and historical importance;
- Minimize disturbance to current land uses and neighbouring activities;
- Provide for a forum for consultation with land owners and affected parties; and
- Facilitate socio-economic development where practicable.



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22.4.4 Rehabilitation

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

- Removal of all infrastructure and material introduced to site;
- Removal of all wastes and their appropriate disposal;
- Promotion of the rapid re-establishment of natural vegetation and the restoration of site boreholes;
- Facilitation of the re-establishment of the land use and land capability to as close as reasonably possible to the original conditions.

22.4.4.1 Action Plan

The various actions that need to be implemented, to ensure that the environmental objectives are met, are detailed in this section. The actions are aimed at preventing or mitigating environmental impacts and implementing the rehabilitation plan. The management actions are stated in a manner that ensures that they can be audited during the performance assessment programme.

22.4.4.2 Time Schedule

- Time-frames detail the implementation schedule of management actions. The successful implementation and commencement within the timeframes is to be monitored as part of the performance assessment programme.

22.4.4.3 Requirements for Implementation

Additional measures that will need to be put in place to allow for the successful implementation of the action plan are listed where relevant. The table below presents the actions that need to be implemented to address the potential impacts resulting from the identified activities to be undertaken during the establishment, operation and rehabilitation of drilling sites within the prospecting right area. The management actions are stated in a manner that ensures that they can be audited during the performance assessment programme. Once approved by the relevant authorities, the provisions of the EMP are legally binding on the project applicant and all its contractors and suppliers.



Table 21: Impacts to be mitigated in their respective phases

ACTIVITIES (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc. E.g. For mining, - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	PHASE (Of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).	SIZE AND SCALE of disturbance (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Prospecting (drill) site clearance	Construction	640 m ²	Site selection by environmental scientists, detailed avifaunal surveys as well as detailed sensitive habitat mapping will have to be conducted for any potential development in the region, aimed at minimising disturbance to natural vegetation once the positions have been finalised. No-go areas to be identified. Environmental awareness training of all employees responsible for drilling. A heritage assessment and paleontological impact assessment need to be undertaken prior to any invasive site activities. ECO to approve drill site location considering biodiversity, water resources, heritage and land use, Consult with landowner on drill site location , demarcates drill site for safety, Create an upstream berm to divert, clean	NEM: BA SANBI Resources Act Implementation of the Impact management hierarchy to avoid, minimise, mitigate and rehabilitate. Compliance to GN704 of the National Water Act	Prior to construction



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			stormwater around the site, Create a downstream berm to contain any dirty water.		
Establish water recycling sumps	Construction	2 m ²	Remove topsoil where sumps will be placed for rehabilitation. Line drill sumps with plastic to limit groundwater seepage.	- to meet rehabilitation Standards. - to limit groundwater contamination	During construction.
Clearance of access roads	Construction	800 m ²	ECO to approve access road Route. Limit clearance to two lane tracks.	-Implementation of the Impact management hierarchy to avoid, minimise, mitigate and rehabilitate.	During construction.
Establish prospecting site	Construction	25 – 64 m ²	Chemical toilets need to be placed in close proximity to the drill site. - All chemicals and fuels need to be stored in a bunded area. - bins for general waste need to be provided. - signage indicating hazards need to be placed at the entrance of the site. - drill rig operators and labourers need to be provided with identification cards. - no labourers are to be housed on site.	Occupation Health requirement. Management of hazardous substances.	During construction.
Operation of the drill site	Operation	25 – 64 m ²	General waste need to be collected and disposed at a licensed facility. - during rainfall events the drilling sumps need to be covered with plastic. - no employee are allowed outside of the drill site barricading without permission from the site manager. - water is to be sourced from existing users. - working hours is only permitted during daytime hours. - vehicles are not permitted to exceed 30 km/h within the drill properties.	- impact mitigation.	During operations.
Decommissioning and rehabilitation of the drill site Access roads.	Rehabilitation	25 – 64 m ²	- All infrastructure need to be removed from the site. - All waste and spillage need to be cleaned and disposed of appropriately.	- Rehabilitation standards and objectives.	Rehabilitation.



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		<ul style="list-style-type: none"> - drill sump water should be reused or allowed to evaporate. - plastic from drill sumps need to be removed. - Chemical toilets need to be cleaned before I can be moved to the following drill site. - The drill hole must be capped or sealed to limit water ingress and ensure safety for humans and animals. - vehicles are not permitted to exceed 30 km/h within the drill properties. 		
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Table 22: Impact Management outcomes

ACTIVITY	POTENTIAL IMPACTS	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
(Whether listed or not listed)	(e.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution, etc...)		In which impact is anticipated	(modify, remedy, control, or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.)	(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, Powerlines, conveyors, etc...)			(E.g. Construction, commissioning, operational Decommissioning, closure, post-closure).	E.g. •Modify through alternative method. •Control through noise control. •Control through monitoring and management. •Remedy through rehabilitation.	
Prospecting (drill) site clearance	Dust pollution	Air quality	Construction	Control through dust suppression Control through minimisation of vehicle movement.	Conduct dust suppression techniques to ensure that applicable standards for PM10 and PM2.5 are not exceeded.
	Soil erosion, compaction and contamination.	Soil		Prevent through restricting the disturbed area Prevent through restricting spillage from haulage vehicles. Control through removal of all utilisable soil and storage of the same. Control through implementation of storm water management measures. Remedy through treatment of contaminated soils.	Rehabilitation standards/objectives.
	Degradation and destruction of sensitive biodiversity- Suitable habitat for the globally threatened red data avifaunal species.	Biodiversity Avifaunal.		Site selection by environmental scientists, detailed avifaunal surveys as well as detailed sensitive habitat mapping will have to be conducted for any potential development in the region, aimed at minimising disturbance to natural vegetation once the positions have been finalised. No-go areas to be identified.	As per detailed avifaunal survey and report- with the necessary recommendations



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				Environmental awareness training of all employees responsible for drilling.	
	Visual impact	Visual receptors		Avoid / prevent leaving any building material or waste on site.	Rehabilitation standards/objectives.
	Heritage	Archaeological or heritage features		Prevent through reporting and evaluation of any archaeological or heritage features found.	Impact avoided
	Social impact	Noise and visual Health, safety and security		Control through appropriate management measures; Prevent through SHE management measures.	Objectives of Social & Labour plan
Clearance of access roads	Dust pollution	Air quality	Construction	Control through dust suppression Control through minimisation of vehicle movement.	Conduct dust suppression techniques to ensure that applicable standards for PM10 and PM2.5 are not exceeded.
	Soil erosion, compaction and contamination.	Soil		Prevent through restricting the disturbed area. Prevent through restricting spillage from haulage vehicles. Control through removal of all utilisable soil and storage of the same. Control through implementation of storm water management measures. Remedy through treatment of contaminated soils	Rehabilitation standards/objectives.
	Degradation and destruction of sensitive biodiversity- Suitable habitat for the globally threatened red data avifaunal species.	Biodiversity Avifaunal.		Site selection by environmental scientists, detailed avifaunal surveys as well as detailed sensitive habitat mapping will have to be conducted for any potential development in the region, aimed at minimising disturbance to natural vegetation once the positions have been finalised. No-go areas to be identified. Environmental awareness training of all employees responsible for drilling.	As per detailed avifaunal survey and report- with the necessary recommendations.
	Visual impact	Visual receptors		Avoid / prevent leaving any building material or waste on site.	Rehabilitation standards/objectives.



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	Heritage	Archaeological or heritage features		Prevent through reporting and evaluation of any archaeological or heritage features found.	Impact avoided.
	Social impact	Noise and visual Health, safety and security		Control through appropriate management measures; Prevent through SHE management measures.	Objectives of Social & Labour plan.
Operation of the drill site	Dust pollution	Air quality	Operational	Control through dust suppression Control through minimisation of vehicle movement. Control through monitoring of dust fall to determine if measures are effective.	Conduct dust suppression techniques to ensure that applicable standards for PM10 and PM2.5 are not exceeded.
	Soil erosion, compaction and contamination.	Soil		Prevent through restricting the disturbed area Prevent through restricting spillage from haulage vehicles. Control through removal of all utilisable soil and storage of the same. Control through implementation of storm water management measures. Remedy through treatment of contaminated soils. All infrastructure need to be removed from the site. All waste and spillage need to be cleaned and disposed of appropriately. Prevent - drill sump water should be reused or allowed to evaporate. Plastic from drill sumps need to be removed. Control - Chemical toilets need to be cleaned before it can be moved to the following drill site. Prevent - The drill hole must be capped or sealed to limit water ingress and ensure safety for humans and Animals.	Rehabilitation standards/objectives.



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Table 23: Potential Impact Mitigation type

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Whether listed or not listed.				
(E.g. Excavations, blasting, stockpiles, discard dumps or dams, loading hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors etc...)	(e.g. Dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution, etc...)	(modify, remedy, control, or stop) through (e.g. Noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity, etc...)	Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard th rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.	(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by competent authorities)
Prospecting (drill) site clearance.	Dust pollution	Control through dust suppression Control through minimisation of vehicle movement.	Construction.	Conduct dust suppression techniques to ensure that applicable standards for PM10 and PM2.5 are not exceeded.
	Soil erosion, compaction and contamination.	Prevent through restricting the disturbed area Prevent through restricting spillage from haulage vehicles Control through removal of all utilisable soil and storage of the same. Control through implementation of stormwater management measures Remedy through treatment of contaminated soils.		Rehabilitation standards / objectives.



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	Degradation and destruction of sensitive biodiversity- Suitable habitat for the globally threatened red data avifaunal species Loss of vegetation. Invasion by alien invasive species.	Site selection by environmental scientists, detailed avifaunal surveys as well as detailed sensitive habitat mapping will have to be conducted for any potential development in the region, aimed at minimising disturbance to natural vegetation once the positions have been finalised. No-go areas to be identified. Environmental awareness training of all employees responsible for drilling. Modify by vegetating soil stockpiles Control through alien invasive eradication programme.		As per detailed avifaunal survey and report- with the necessary recommendations.
	Visual impact	Avoid/prevent leaving any building material or waste on site.		Rehabilitation standards / objectives.
	Heritage	Prevent through reporting and evaluation of any archaeological or heritage features found.		Impact avoided.
	Social impact	Control through appropriate management measures; Prevent through SHE management measures.		Objectives of Social & Labour Plan
Clearance of access roads	Dust pollution	Control through dust suppression Control through minimisation of vehicle movement.	Construction	Conduct dust suppression techniques to ensure that applicable standards for PM10 and PM2.5 are not exceeded.
	Soil erosion, compaction and contamination.	Prevent through restricting the disturbed area Prevent through restricting spillage from haulage vehicles Control through removal of all utilisable soil and storage of the same. Control through implementation of storm water management measures. Remedy through treatment of contaminated soils.		Rehabilitation standards / objectives.
	Degradation and destruction of sensitive biodiversity- Suitable habitat for the globally threatened red data avifaunal species. Loss of vegetation Invasion by alien invasive species.	Site selection by environmental scientists, detailed avifaunal surveys as well as detailed sensitive habitat mapping will have to be conducted for any potential development in the region, aimed at minimising disturbance to natural vegetation once the positions have been finalised. No-go areas to be identified. Environmental awareness training of all employees responsible for drilling. Modify by vegetating soil stockpiles.		As per detailed avifaunal survey and report- with the necessary recommendations.



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		Control through alien invasive eradication programme.		
	Visual impact	Avoid / prevent leaving building material or waste on site.		Rehabilitation standards / objectives.
	Heritage	Prevent through reporting and evaluation of any archaeological or heritage features found.		Impact avoided.
	Social impact	Control through appropriate management measures; Prevent through SHE management measures.		Objectives of Social & Labour Plan.
Operation of the drill site	Dust pollution	Control through dust suppression Control through minimisation of vehicle movement. Control through monitoring of dust fall to determine if measures are effective.	Operation	Conduct dust suppression techniques to ensure that applicable standards for PM10 and PM2.5 are not exceeded.
	Soil erosion, compaction and contamination	Prevent through restricting the disturbed area Prevent through restricting spillage from haulage vehicles Control through removal of all utilisable soil and storage of the same. Control through implementation of storm water management measures Remedy through treatment of contaminated soils. All infrastructure need to be removed from the site. All waste and spillage need to be cleaned and disposed of appropriately. Prevent - drill sump water should be reused or allowed to evaporate plastic from drill sumps need to be removed. Control - Chemical toilets need to be cleaned before it can be moved to the following drill site. Prevent - The drill hole must be capped or sealed to limit water ingress and ensure safety for humans and Animals.		Rehabilitation standards / objectives.



23. FINANCIAL PROVISION

The project closure and rehabilitation vision is founded on the following principles:

- Sustainable exploitation of natural resources without limiting the ability of future generations to live off the same land.
- Limiting to the greatest extent possible, disruption of natural ecosystems, and where necessary and possible, restoring the environment to its original state (baseline environment) after cessation of activities. Alternatively, restore all land to a status and land-use agreed upon between Trentra (Pty) Ltd and the relevant authorities, communities and other stakeholders.
- To transfer all useful infrastructure to local authorities and communities should they be required by such authorities or communities.
- To ensure that the safety of people and animals is not compromised at any stage during and after any activities.

The closure objective allows for the site to be rehabilitated back to the original status of the site. This will include:

- Ensuring all pollution generating activities are eliminated.
- Ensuring all infrastructure is removed from site.
- Ensuring that the existing land use can continue.
- Ensuring that the site is safe for humans and animals.

23.1 CONFIRM SPECIFICALLY THAT THE ENVIRONMENTAL OBJECTIVES IN RELATION TO CLOSURE HAVE BEEN CONSULTED WITH LANDOWNER AND INTERESTED AND AFFECTED PARTIES.

The basic assessment report and environmental management programme will be provided to IAPs for review and comment between 28 April 2021 to 28 May 2021. The objective to communicate to IAP's during the public consultation process. Please refer to Appendix C for more details.

- (a) **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.**



Figure 15: Conceptual prospecting plan and rehab plan

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23.2 EXPLAIN WHY IT CAN BE CONFIRMED THAT THE REHABILITATION PLAN IS COMPATIBLE WITH THE CLOSURE OBJECTIVES.


The rehabilitation plan aims to provide a project site that is similar to the pre-prospecting environment through the removal of infrastructure, capping of boreholes, closing of trenches and vegetating of disturbed areas (where not within cultivated lands).

23.3 CALCULATE AND STATE THE QUANTUM OF THE FINANCIAL PROVISION REQUIRED TO MANAGE AND REHABILITATE THE ENVIRONMENT IN ACCORDANCE WITH THE APPLICABLE GUIDELINE.

The total provision amounts to the number of holes requiring rehabilitation at any given moment. This ensures that should the project application become insolvent prematurely the costs of rehabilitation can be recovered. Existing roads will be used as far as possible and it is not possible to identify any new access roads at this stage as its route will be determined in conjunction with the landowner and activities on the property at that time. No other infrastructure, offices or housing, will be present within the prospecting area and all employees will be housed in nearby towns. The quantum as calculated using the Department's guideline is provided in the Table below.



Table 24: Closure Quantum

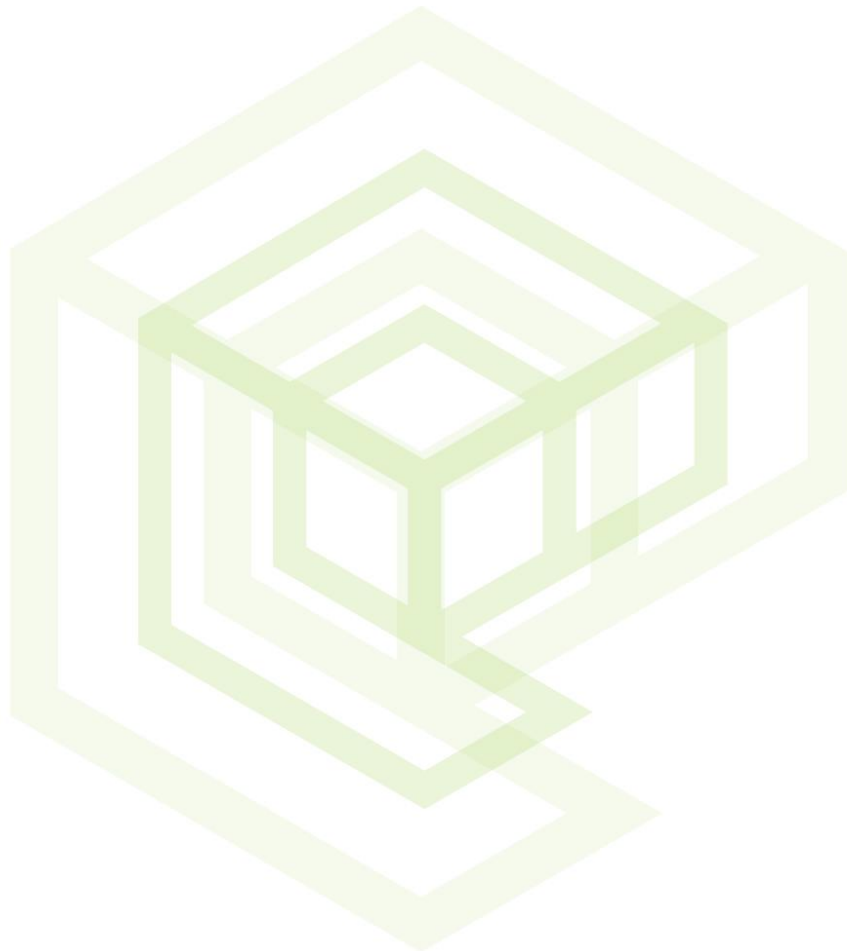
CALCULATION OF CLOSURE QUANTUM								Version 1.0: Closure Quantum for FY2020	
Prospecting Right Ref: NC30/5/11/2/12586 PR						Province: Northern Cape			
Evaluators: Eco Elementum (Pty) Ltd						Date: January 2021			
General Information	Risk Class	High (A)						Trentra (Pty) Ltd Prospecting Right	 www.ecoelementum.co.za
	Environmental Sensitivity	Medium							
	WF 1: Nature of Terrain Weighting Factor	Flat 1.00							
	WF 2: Proximity to Urban Area Weighting Factor	Peri-Urban 1.05							
Component No	Main Activities Itemized Descriptions	[B] CPI Adjusted Master Rate	[A] Quantity	Units	[C] Multiplication Factor	[D] Weighting Factor 1: Nature of Terrain	Sub Totals [E = A*B*C*D]	NOTES & SUPPORTING EXPLANATIONS	
		STEP 4.3	STEP 4.5		STEP 4.3	STEP 4.4			
1	Dismantling of processing plant and structures	R 15.13	0.00	m3	1.00	1.00	R 0.00		
2(A)	Demolition of steel buildings and structures	R 210.74	0.00	m2	1.00	1.00	R 0.00		
2(B)	Demolition of reinforced concrete buildings and structures	R 310.57	0.00	m2	1.00	1.00	R 0.00		
3	Rehabilitation of access roads	R 37.71	850.00	m2	1.00	1.00	R 32 054.97	Existing gravel roads to be used mainly - contingency provided for offroad areas	
4(A)	Demolition and rehabilitation of electrified railway lines	R 366.03	0.00	m	1.00	1.00	R 0.00		
4(B)	Demolition and rehabilitation of non-electrified railway lines	R 199.65	0.00	m	1.00	1.00	R 0.00		
5	Demolition of housing and facilities	R 421.48	0.00	m2	1.00	1.00	R 0.00		
6	Opencast rehabilitation including final voids and ramps	R 214 513.17	0.00	ha	0.52	1.00	R 0.00		
7	Sealing of shafts, adits and inclines	R 113.14	0.00	m3	1.00	1.00	R 0.00		
8(A)	Rehabilitation of overburden and spoils	R 147 297.56	0.00	ha	1.00	1.00	R 0.00		
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	R 183 456.45	0.00	ha	1.00	1.00	R 0.00		
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	R 532 844.50	0.00	ha	0.80	1.00	R 0.00		
9	Rehabilitation of subsided areas	R 123 339.53	0.00	ha	1.00	1.00	R 0.00		
10	General surface rehabilitation, including grassing of denuded areas	R 116 684.52	0.30	ha	1.00	1.00	R 35 005.35	Entire disturbed footprint 10x boreholes 300m3 each (10x300=3000m2)	
11	River diversions	R 116 684.52	0.00	ha	1.00	1.00	R 0.00		
12	Fencing	R 133.10	0.00	m	1.00	1.00	R 0.00		
13	water and managing the impact on groundwater, including treatment, when required)	R 44 366.74	0.00	ha	0.67	1.00	R 0.00		
14	2 to 3 years of maintenance and after care	R 15 528.36	0.30	ha	1.00	1.00	R 4 658.51	Entire disturbed footprint	
15	Specialist study	R 45 000.00	1.00	report	1.00	1.00	R 45 000.00	Final closure study: GNR1147 Format	
Subtotal (1 to 15 above)							R 116 718.83		
Subtotal 1		Weighting Factor 2				1.05	R 122 554.77		
1	Preliminary and General	12% of Subtotal 1 if less than R100mil					R 14 706.57		
		6% of Sub Total 1 if more than R100mil							
2	Contingency	10% of Sub Total 1					R 12 255.48		
Subtotal 2 (Subtotal 1 plus sum of management and contingency)							R 26 962.05		
Subtotal 3							R 149 516.82		
GRAND TOTAL (Subtotal 3 plus 15% VAT)							R 171 944.34		



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

The applicant, Trentra (Pty) Ltd, hereby commits to undertaking to provide the calculated amount of R 171 944.34 (excl. VAT) in the form of either method provided in section 53 of the MPRD Regulations and the financial provisioning regulations, 2015 Published under Government Notice R1147 (GN R. 39425 of 2015). It should however be noted that no new guideline for determining the quantum for closure and rehabilitation has been published and therefore the guideline published under the MPRDA regulation was used to assess the quantum for closure liability.



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

- a) Monitoring of Impact Management Actions
- b) Monitoring and reporting frequency
- c) Responsible persons
- d) Time period for implementing impact management actions
- e) Mechanism for monitoring compliance

Table 25: Monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Drill site establishment, moving and rehabilitation	Disturbance of vegetation, Degradation and destruction of sensitive biodiversity- Suitable habitat for the globally threatened red data avifaunal species. Contamination of ground and surface water. Disturbance of heritage Resources. Land use conflicts Noise and dust generation Rehabilitation sustainability	Pre-site establishment, with no go areas and approval by EO and avifaunal specialist. The following portion will then be excluded/buffered as the Gauteng Visual assessment. Pre-site establishment risk Assessment Pre-site establishment risk assessment. Complaint register. Rehabilitation closure report.	Project environmental officer. Site manager Project environmental officer Project environmental officer	Prior to site establishment. (once off) During operations and closure. (bi-monthly) Prior to site establishment Prior to site establishment (once off) During operations and closure (continuous) Post closure
Entire operational site	All activities and impacts identified.	Auditing all site activities in compliance with the management commitments.	Project environmental officer.	During life of project. (monthly)



24. INDICATE THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT / ENVIRONMENTAL AUDIT REPORT.

A performance assessment/ Environmental audit will be undertaken as stipulated in the Environmental Authorisation OR once in Phase 2 and in rehabilitation, which should include the assessment of the financial provision. The performance assessment will be conducted by an external consultant throughout the life of prospecting as required under NEMA. This is conducted to assess the adequacy and compliance to the EMP, EA and the relevant legislation. The reports should be submitted to the DMRE.



25. ENVIRONMENTAL AWARENESS PLAN

25.1 MANNER IN WHICH THE APPLICANT INTENDS TO INFORM HIS OR HER EMPLOYEES OF ANY ENVIRONMENTAL RISK WHICH MAY RESULT FROM THEIR WORK

An environmental awareness training manual will be developed for the prospecting project.

All employees must be provided with environmental awareness training to inform them of any environmental risks that may result from their work and of the manner in which the risks must be dealt with to avoid pollution or the degradation of the environment.

Employees should be provided with environmental awareness training before prospecting operations start. All new employees should be provided with environmental awareness training. Environmental awareness and training is an important aspect of the implementation of the EMP. The onus is on the different parties involved in the various stages of the life cycle of the project to be environmentally conscious. Hence, it is suggested that all members of the project team are familiar with the findings of the site-specific EA report and the EMP. For instance, the contractor is responsible for the lack of environmental knowledge of his/her crew members. The contractor could forward internal environmental awareness and training procedures to the project manager and environmental officer for comment prior to the commencement of the project. Likewise, the above is applicable to the programming, design, operations and maintenance, and decommissioning teams. Environmental awareness ensures that environmental accidents are minimized and environmental compliance maximized.

All staff and contractors will be submitted to an annual training / awareness course as to inform the staff of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment.

Section 39 (3) (c) requires that an applicant who prepares an Environmental Management Programme or Environmental Management Plan must “develop an environmental awareness plan describing the manner in which the applicant intends to inform his or her employees of any environmental risks which may result from the work and the manner in which the risks must be dealt with in order to avoid pollution and degradation of the environment”. Environmental Awareness is required not only for management and employees (as described in Section 39 (3) (c) but also for visitors to the site. the following strategies and plans will be put into place for each of the parties.

25.2 VISITOR ENVIRONMENTAL AWARENESS

Visitor / sub-contractor environmental awareness will be generated through the provision of a signboard describing very briefly the environmental considerations applicable to them. The signboard should contain the following information:

- Statement of the applicant’s commitment to environmental principles;
- List of the “rules” to which the visitor must abide. This will include:
 - No littering. Dispose of all waste in the bins provided;
 - No fires;
 - Stay on demarcated roadways and paths only;
 - Kindly report any environmental infringements they may notice;
 - Check your vehicle/equipment for diesel/oil leaks.

25.3 SENIOR AND MIDDLE MANAGEMENT ENVIRONMENTAL AWARENESS:

Achieving environmental awareness at upper levels of management is slightly different from the process at the operational level. There is often a fair level of the general value of environmental awareness but site-specific issues will most often need to be communicated. This will be achieved by:

- Management must make themselves fully familiar with the EMP;
- Ensuring that there is a spare copy of the approved EMP at his / her disposal; management is encouraged to make notes in the document regarding the difficulty / ease of implementing the environmental management measures. These notes should be sent to the consultants to assist in future revisions of the EMP;



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- The manager must ensure that the operators perform regular monitoring of their workstations / areas.

During the management's execution of their activities/being at the site, the management must be constantly be aware of and observant of especially the following:

- Dust levels - movement outside of demarcated areas;
- Litter management - general housekeeping;
- Erosion during rainy season.

Topsoil management – fuel / oil management / leaks / changes;

- Success of operational re-vegetation; and
- Alien vegetation.

25.4 OPERATOR / WORKFORCE ENVIRONMENTAL AWARENESS:

Achieving environmental awareness amongst the operators and labour is probably the most important because they are usually present at the place where most environmental transgressions take place or in fact cause them. It is the aim of increased environmental awareness to reduce any such environmental transgressions.

Increasing environmental awareness at these levels can be achieved through the following strategies:

- Induction environmental training must take place prior to any contract period.
- Training: Each and every employee (contractor or not) must go through an environmental training process where at least the following items area covered:
 - The oil/fuel management policy must be explained to the employees. The reason for the policy must also be explained (i.e. to not impact on groundwater, surface water, soil quality etc.);
 - The domestic and industrial waste management policy & method must also form part of the training;
 - The topsoil handling method and the reasons for preserving topsoil (i.e. post prospecting re vegetation, erosion prevention etc.);
 - Alien vegetation management: How to recognize and remove such species;
 - Protection of the natural veld by not driving/manoeuvring or walking through the demarcated protection areas. Reporting that demarcation posts/tape is broken or removed;

Emergency management procedures such as dealing with oil spills or fires must also be drilled; and

- Such training will, in this case, be carried out by the site manager/resident engineer.

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

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

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

25.6 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

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

The following specific information will be required by the competent authority:

- The financial provision will be reviewed annually.



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26. UNDERTAKING

The EAP herewith confirms

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

Signature of the Environmental Assessment Practitioner:

Name of Company:

Date:

-END-



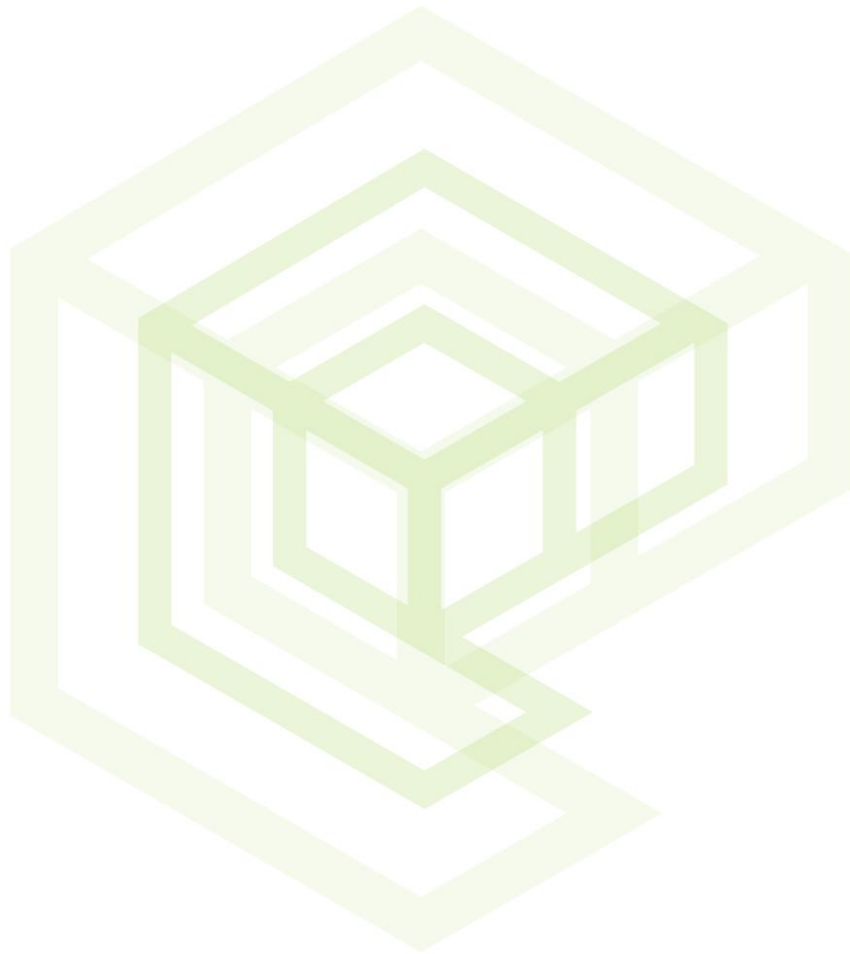
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APPENDIX A: EAP CV



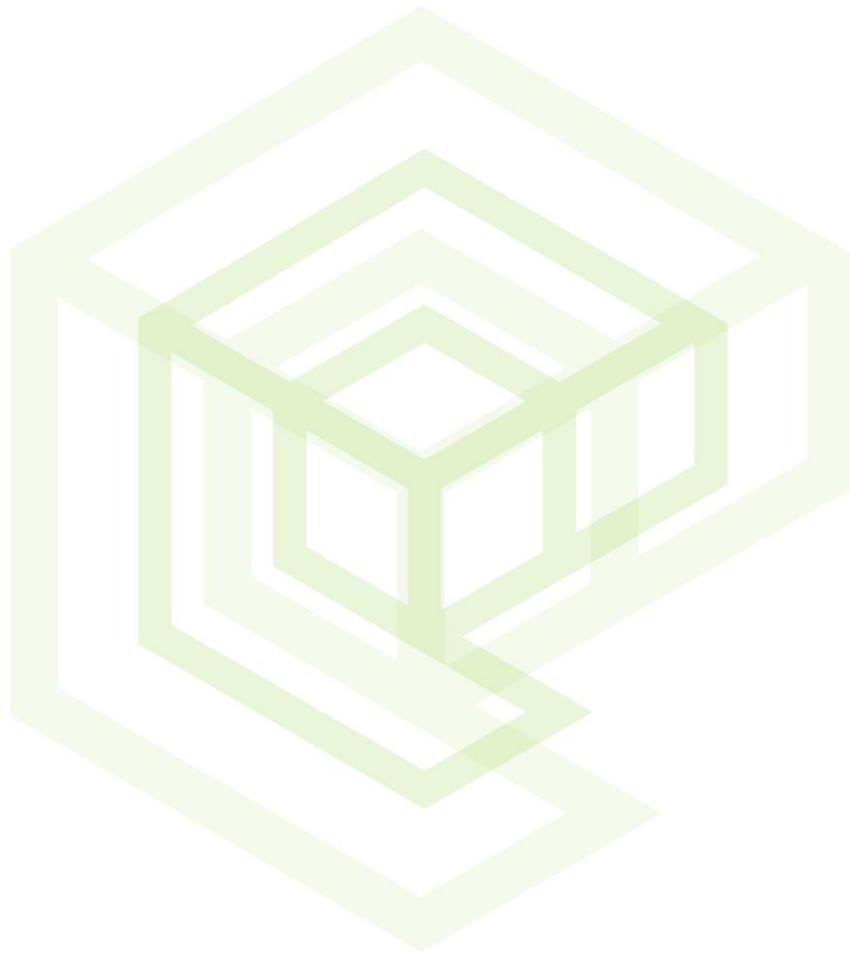
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APPENDIX B: PUBLIC PARTICIPATION REPORT



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APPENDIX C: CONCEPTUAL LAYOUT AND SENSITIVE RECEPTORS MAP



Updated- 28/4/2021

APPENDIX D: SPECIALIST STUDIES



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APPENDIX E: SCREENING TOOL REPORT

