

Vital Minerals and Metals (Pty) Ltd:

Draft Basic Assessment and Environmental Management Programme Report

Submitted for Environmental Authorisation in terms of the National Environmental Management Act No.107 of 1998, as amended, in respect of listed activities that have been triggered by a Prospecting Right Application in terms of the Mineral and Petroleum Resources Development Act No. 28 of 2002, as amended

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Executive summary

Vital Minerals and Metals (Pty) Ltd lodged an application for a Prospecting Right in terms of section 16 of the Mineral and Petroleum Resources Development Act No. 28 of 2002, as amended (**MPRDA**) for Rare Earth Metals (**RE**) and Monazite (**Mz**) on a portion of Portion 1 and the Remaining Extent of the farm Steenkamps Kraal No. 70, a portion of the Remaining Extent of the farm Brandewyns Kraal No. 69 and a portion of the Remaining Extent of the farm Nabeed No. 102, all located within the Magisterial District of Van Rhynsdorp in the Western Cape Province.

An application for Environmental Authorisation in terms of the National Environmental Management Act No. 107 of 1998, as amended (**NEMA**), and the Environmental Impact Assessment Regulations, 2014, as amended (**EIA Regulations**) was submitted to the Department of Mineral Resources and Energy (**DMRE**) together with the prospecting right application on the 10th of August 2021 on the South African Mineral Resources Administration System (**SAMRAD**). The application for the Prospecting Right was accepted on the 23 of August 2021 with the exclusion of the portion of Portion 1 of the farm Steenkamps Kraal No. 70, as there is allegedly an existing mining right issued for the same minerals over this portion. An acknowledgment of receipt of the application for Environmental Authorisation was received from the DMRE on the 13th of September 2021. The aforementioned acknowledgement letter stipulated that the timeframes will be triggered by an acceptance letter issued in terms of the MPRDA for the prospecting right and the environmental assessment must focus on the properties and commodities indicated in the acceptance letter.

The Environmental Authorisation Application therefore focusses on the Remaining Extent of the farm Steenkamps Kraal No. 70, a portion of the Remaining Extent of the farm Brandewyns Kraal No. 69 and a portion of the Remaining Extent of the farm Nabeed No. 102. Planned non-intrusive activities such as a Drone Aerial Survey (site mapping, contour mapping, 3D terrain models, and digital elevation maps), desktop research and review of historical exploration records as well as detailed geological mapping will be implemented for the proposed project.

As the proposed project will entail prospecting activities, a Basic Assessment Process is required in compliance with the NEMA for the authorisation of listed activities contained in GNR 983 of 4 December 2014, published in terms of Sections 24(2), 24 (5), 24D, 44 and 47(A) (1)(b) of the NEMA, as amended (**Listing Notice 1**).

This Basic Assessment and Environmental Management Programme Report (**BA&EMPr**) is therefore submitted in terms of the NEMA, in respect of listed activities that will be triggered by a Prospecting Right Application in terms of the MPRDA and have been compiled in terms of Appendix 1 and Appendix 4 of the EIA Regulations, respectively.

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Abbreviations

Abbreviation	Meaning
BA	Basic Assessment
BA&EMPr	Basic Assessment and Environmental Management Programme Report
BID	Background Information Document
DFFE	Department of Forestry, Fisheries and the Environment
DMRE	Department of Mineral Resources and Energy
Du	Duration
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
EIA Regulations	Environmental Impact Assessment Regulations 2014, as amended
EMPr	Environmental Management Programme
Ext	Extent
Freq	Frequency
GDP	Gross Domestic Product
I&APs	Interested and Affected Parties
IEM	Integrated Environmental Management
Listing Notice 1	GNR 983 of 4 December 2014, published in terms of Sections 24(2), 24 (5), 24D, 44 and 47(A) (1)(b) of the NEMA, as amended
LUPO	Land Use Planning Ordinance 15 of 1985
MPRDA	Mineral and Petroleum Resources Development Act No. 28 of 2002, as amended
Mz	Monazite
Nat	Nature
NEMA	National Environmental Management Act No. 107 of 1998, as amended
NNR	National Nuclear Regulator Act No. 47 of 1999, as amended
OS	Overall significance
PAIA	Promotion of Access to Information Act No. 2 of 2000, as amended
Pr.Sci.Nat	Professional Natural Scientist
Prob	Probability
RE	Rare Earth Metals
SACNASP	South African Council for Natural Scientific Professions
SAMRAD	South African Mineral Resources Administration System
WCDM	West Coast District Municipality

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1. Introduction

Vital Minerals and Metals (Pty) Ltd.'s application for a Prospecting Right in terms of section 16 of the Mineral and Petroleum Resources Development Act No. 28 of 2002, as amended (**MPRDA**) and the application for Environmental Authorisation has been applied for Rare Earth Metals (**RE**) and Monazite (**Mz**) on a portion the Remaining Extent of the farm Steenkamps Kraal No. 70, a portion of the Remaining Extent of the farm Brandewyns Kraal No. 69 and a portion of the Remaining Extent of the farm Nabeed No. 102, all located within the Magisterial District of Van Rhynsdorp in the Western Cape Province. Planned non-intrusive activities such as a Drone Aerial Survey (site mapping, contour mapping, 3D terrain models, and digital elevation maps), desktop research and review of historical exploration records as well as detailed geological mapping will be implemented for the proposed project.

As the proposed project will entail prospecting activities, a Basic Assessment Process is required in compliance with the National Environmental Management Act No. 107 of 1998, as amended (**NEMA**) for the authorisation of listed activities contained in GNR 983 of 4 December 2014, published in terms of Sections 24(2), 24 (5), 24D, 44 and 47(A) (1)(b) of the NEMA, as amended (**Listing Notice 1**).

This Basic Assessment and Environmental Management Programme Report (**BA&EMPr**) has been compiled in terms of Appendix 1 and Appendix 4 of Environmental Impact Assessment Regulations 2014, as amended (**EIA Regulations**), respectively.

Table 1: Legal requirements for the content of the Basic Assessment Report

Section in report	Appendix 1 of the EIA Regulations
Section 14	1. <i>Basic Assessment Process</i> <i>The environmental outcomes, impacts and residual risks of the proposed activity must be set out in the basic assessment report.</i>
	2. <i>Objective of the basic assessment process</i> <i>The objective of the basic assessment process is to, through a consultative process-</i>
Section 6	(a) <i>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;</i>
Section 9	(b) <i>identify the alternatives considered, including the activity, location, and technology alternatives;</i>
Section 10	(c) <i>describe the need and desirability of the proposed alternatives;</i>
Section 14	(d) <i>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> <i>(i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and</i> <i>(ii) the degree to which these impacts-</i> <i>(aa) can be reversed;</i> <i>(bb) may cause irreplaceable loss of resources; and</i> <i>(cc) can be avoided, managed or mitigated;</i>
Section 9 and 13	(e) <i>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> <i>(i) identify and motivate a preferred site, activity and technology alternative;</i> <i>(ii) identify suitable measures to avoid, manage or mitigate identified impacts; and</i> <i>(iii) identify residual risks that need to be managed and monitored.</i>
	3. <i>Scope of assessment and content of basic assessment reports</i> <i>(1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include-</i>

Section 2	(a) details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;
Section 3	(b) the location of the activity, including: (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;
Section 4	(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;
Section 5	(d) a description of the scope of the proposed activity, including- (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure;
Section 6	(e) a description of the policy and legislative context within which the development is proposed including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;
Section 10	(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;
Section 9	(g) a motivation for the preferred site, activity and technology alternative;
Section 9	(h) a full description of the process followed to reach the proposed preferred alternative within the site, including-
Section 9	(i) details of all the alternatives considered;
Section 7	(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;
Section 7	(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;
Section 11	(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
Section 14	(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;
Section 13	(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;
Section 14	(viii) the possible mitigation measures that could be applied and level of residual risk;
Section 9	(ix) the outcome of the site selection matrix;
Section 9	(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and
Section 9	(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;
Section 13 and 14	(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including- (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and

	<i>(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;</i>
Section 14	<i>(j) an assessment of each identified potentially significant impact and risk, including- (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;</i>
Section 8	<i>(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;</i>
Section 19	<i>(l) an environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;</i>
Section 14	<i>(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;</i>
Section 20	<i>(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;</i>
Section 18	<i>(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;</i>
Section 21	<i>(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;</i>
Section 22	<i>(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;</i>
Section 25	<i>(r) an undertaking under oath or affirmation by the EAP in relation to- (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any 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;</i>
	<i>(s) [repealed]</i>
Section 23	<i>(t) any specific information that may be required by the competent authority; and</i>
Section 24	<i>(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.</i>

Table 2: Legal requirements for the content of the Environmental Management Programme

Section in report	Appendix 4 of the EIA Regulations
	<i>(1) An EMPr must comply with section 24N of the Act and include-</i>
Section 2	<i>(a) details of- (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;</i>
Section 14	<i>(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;</i>

Section 12	<i>(c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;</i>
Section 14	<i>(d) a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-</i> <i>(i) planning and design;</i> <i>(ii) pre-construction activities;</i> <i>(iii) construction activities;</i> <i>(iv) rehabilitation of the environment after construction and in the case of a closure activity, closure; and</i> <i>(v) where relevant, operation activities;</i>
	<i>(e) [repealed]</i>
Section 14	<i>(f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to-</i> <i>(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;</i> <i>(ii) comply with any prescribed environmental management standards or practices;</i> <i>and</i> <i>(iii) comply with any applicable provisions of the Act regarding closure, in the case of a closure activity.</i>
Section 15	<i>(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);</i>
Section 15	<i>(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);</i>
Section 14	<i>(i) an indication of the persons who will be responsible for the implementation of the impact management actions;</i>
Section 14	<i>(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;</i>
Section 15	<i>(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);</i>
Section 15	<i>(l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;</i>
Section 16	<i>(m) an environmental awareness plan describing the manner in which-</i> <i>(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and</i> <i>(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and</i>
Section 23	<i>(n) any specific information that may be required by the competent authority.</i>

2. Details of the EAP

Table 3: Details and expertise of the EAP

EAP	Minnette Le Roux
Professional affiliation/registration	Registered Environmental Assessment Practitioner (EAP) with Environmental Assessment Practitioners Association of South Africa (EAPASA) and a registered Professional Natural Scientist (Pr.Sci.Nat) with the South African Council for Natural Scientific Professions (SACNASP).
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Expertise	<p>Minnette Le Roux is a Principal Environmental Specialist and Head of the Environmental Department at NSDV. She obtained her B.Sc. Hons degree in Environmental Science (with specialisation in Wildlife Management) from the University of Pretoria and has more than 13 years' experience in environmental management and the consultancy field.</p> <p>Minnette has extensive integrated environmental management experience in the industrial, construction, agriculture and mining sectors, including amongst others; Environmental Impact Assessments, Scoping Reports, Basic Assessments, Environmental Management Plans, Environmental Management Programmes, Integrated Water Use Licence Applications, Integrated Water and Waste Management Plans, Waste Tyre Abatement plans, Biodiversity Action Plans, Screening Reports, Gap-Analysis, Due Diligence Reports, Waste Management Licence Applications, Mining and Prospecting Right Applications and various other Application forms as part of the Environmental Application Process. She also has experience in Environmental Management Programme Report Performance Assessments and Environmental Authorisation Compliance Audits, Legal Compliance Audits, Water Use Licence Compliance Audits, Regulation GN 704 Audits and Environmental Management Systems Audits (ISO 14001), Applications for exclusion of a waste stream or a portion of the waste stream from the definition of waste, Legal Reviews, EMPr Peer Reviews, and technical input and involvement in Legal Opinions and Reviews, and Greenhouse Gas verification reports.</p> <p>She is a registered EAP and a registered <i>Pr.Sci.Nat</i> in the fields of Environmental Science and Conservation Science.</p> <p>See her Curriculum Vitae attached hereto in Annexure 3.</p>
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3. Location of the proposed activity

Table 4: Location of the proposed activity

Farm Name	Portion of the Remaining Extent of the Farm Steenkamps Kraal No. 70 Portion of the Remaining Extent of the farm Brandewyns Kraal No. 69 Portion of the Remaining Extent of the farm Nabeeb No. 102
Application area (Ha)	245 Ha
Magisterial district	Matzikama Local Municipality which is under West Coast District Municipality
Distance and direction from nearest town	The project site is located approximately 70 km north of Vanrhynsdorp and 77 km north-east from the town of Vredendal. The town of Loeriesfontein is situated about 76 km east of the study area
21-digit Surveyor General Code for each farm portion	C07800000000007000000 C07800000000006900000 C07800000000001020000

4. Locality map

The following maps shows the locality of the proposed Prospecting Right area and the properties on which the Prospecting Right area is located.

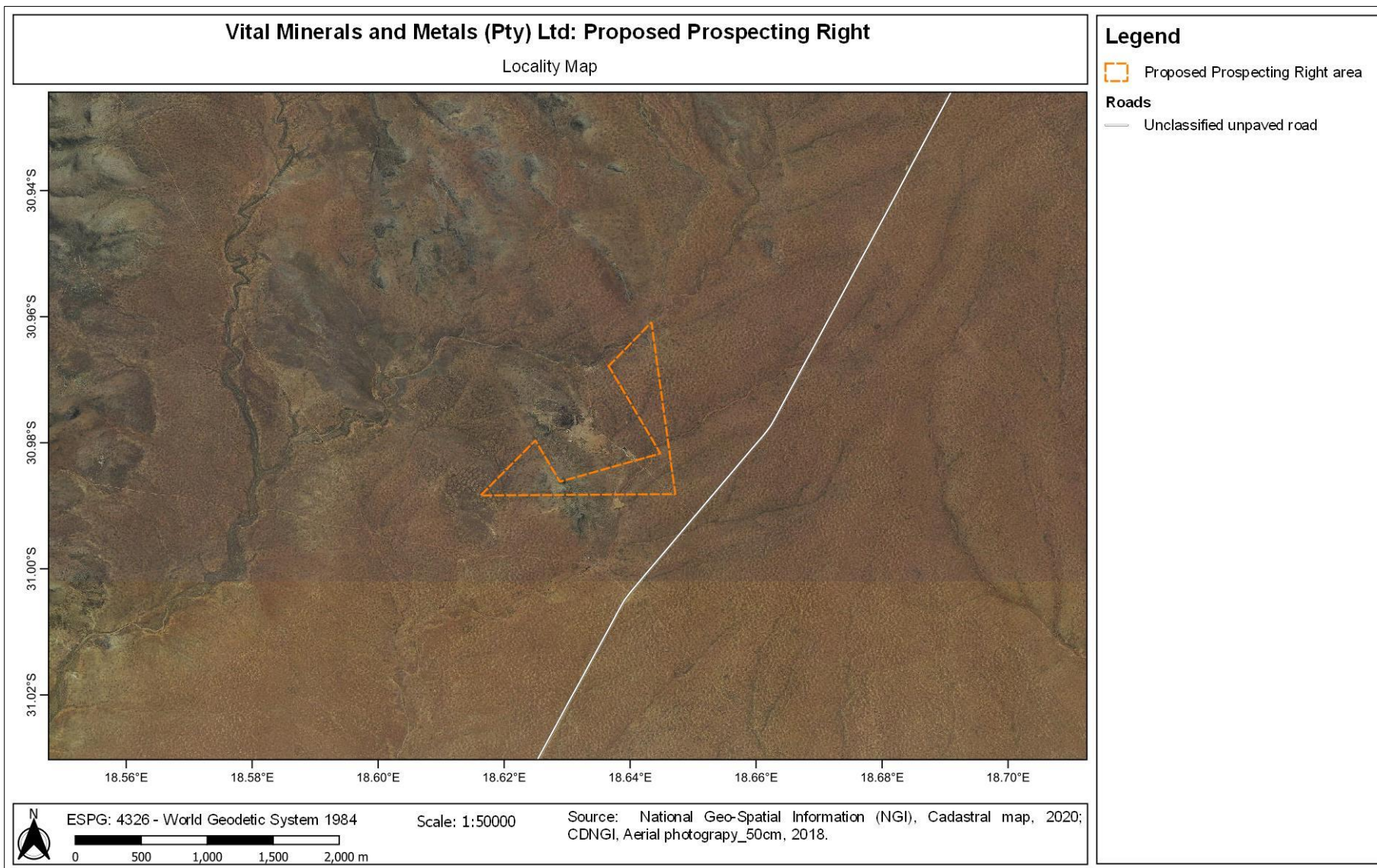


Figure 1: Locality map

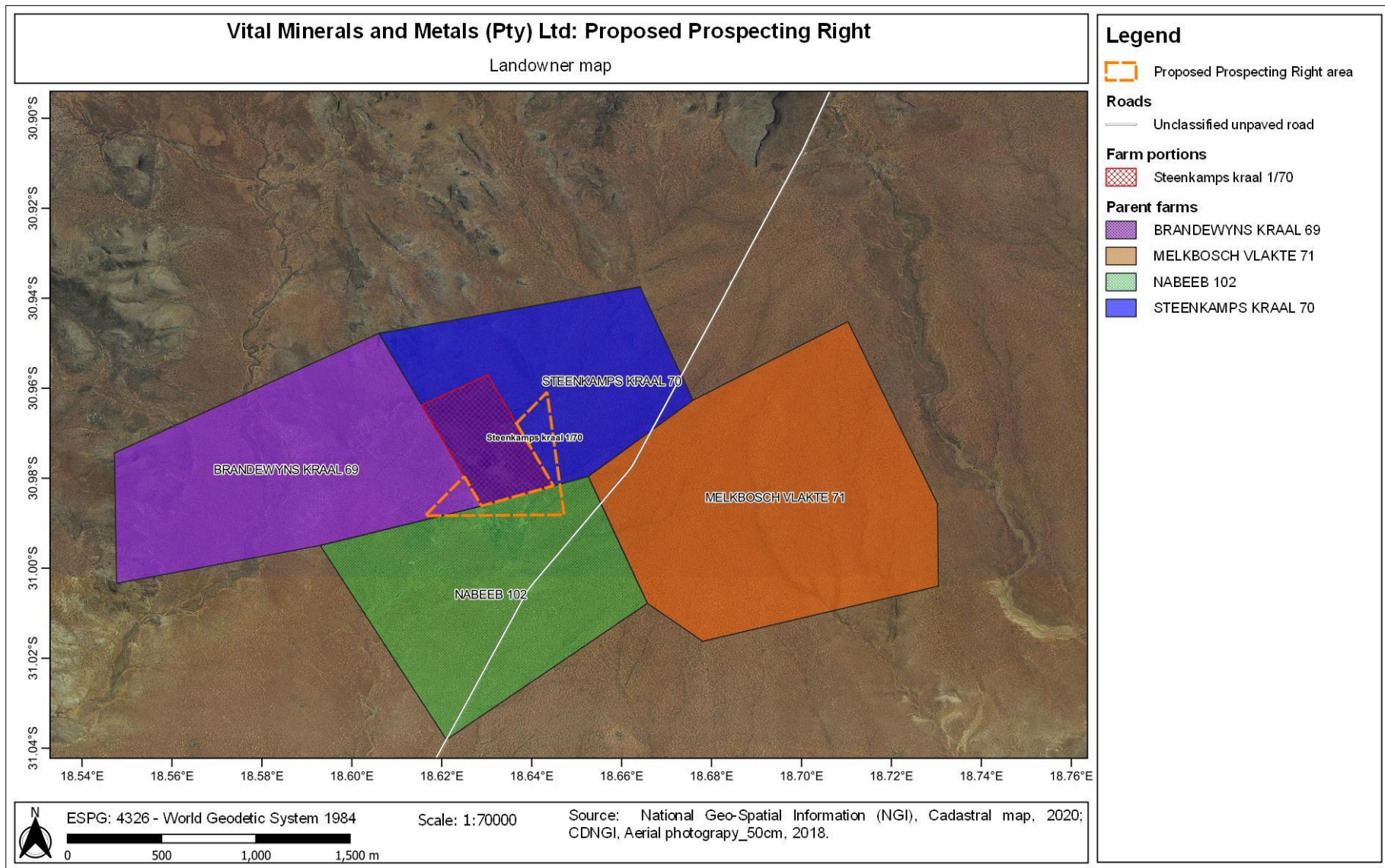


Figure 2: Landowner map

5. Description of the scope of the proposed activity

To prove the resources, Vital Minerals and Metals (Pty) Ltd intend to utilize available historical exploration data such as core data, mineral reserve estimation reports and mineral composition analysis report for the farm Steenkamps Kraal No. 70 which can be obtained from the Council for Geoscience. No intrusive activities will be conducted for the proposed project. Planned non-intrusive activities such as a Drone Aerial Survey (site mapping, contour mapping, 3D terrain models, and digital elevation maps), desktop research and review of historical exploration records as well as detailed geological mapping will be implemented for the proposed project. In addition, from the geological findings, a resource/reserve estimate will be calculated, and finally more realistic data will be obtained using a polygon approach and with several considerations taken which will define the estimate on the basis of three categories: measured, indicated, and inferred. The resource estimate will be further be refined and a mineable reserve will be quantified using geological reserve interpellation.

Table 5: Listed activities

Name of activity	Aerial extent of the Activity	Applicable Listing Notice
<p>Prospecting activities: <u>Review of historical exploration data and report:</u></p> <ul style="list-style-type: none"> Request existing exploration data and reports from the Council for Geoscience; Review of exploration core data, resource estimation report as well as mineral composition analysis report; Review of historical geophysical assessment report; and Conduct extensive desktop research. <p><u>Drone Aerial Survey:</u></p> <ul style="list-style-type: none"> Site mapping; Contour mapping; 3D terrain models; and Review of historical Geophysical Survey Reports. 	245 Ha	<p>Activity 20 in Listing Notice 1 (GNR 983 of in GG 38282):</p> <p><i>“Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required to exercise the prospecting right”.</i></p>

6. Policy and legislative context

Table 6: Policy and legislative context

Applicable legislation and guideline to compile report	Compliance and response to legislation and policy context
The Constitution of the Republic of South Africa (1996)	The Constitution of the Republic of South Africa was considered and applied to throughout the BA&EMPr, as section 24 of the Constitution states that everyone has the right; (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that; (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure

	<p>ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.</p>
<p>The Promotion of Access to Information Act No. 2 of 2000, as amended (PAIA).</p>	<p>Without access to information, a person may be unable to determine whether or not his or her right to just administrative action (or to an environment not harmful to human health or wellbeing or, for that matter, any other Constitutional right) has been infringed. The purpose of the PAIA is to give effect to the Constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights, and to provide for matters connected therewith. In addition to providing access to information, cognisance should be taken that PAIA also makes provision for the refusal of access to information that is deemed to be of a sensitive, confidential or classified nature. This is found under Chapter 4 of part 2 and 3 of PAIA.</p>
<p>MPRDA</p>	<p>The MPRDA was passed to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources, and to provide for matters connected therewith. The preamble to the MPRDA affirms, <i>inter alia</i>, the State's obligation to:</p> <ul style="list-style-type: none"> • Protect the environment for the benefit of present and future generations; • Ensure ecologically sustainable development of mineral and petroleum resources, and; • the general right to an environment provided for in section 24 of The Constitution of the Republic of South Africa, Act 108 of 1996 (then Constitution). <p>The national environmental management principles provided for in section 2 of the NEMA apply to all prospecting and mining operations and any matter relating to such operation. These principles apply throughout the Republic to the actions of all organs of state including, <i>inter alia</i>, the Department of Mineral Resources and Energy (DMRE), that may significantly affect the environment. Any prospecting or mining operation must be conducted in accordance with generally accepted principles of sustainable development by integrating social, economic and environmental factors into the planning and implementation of prospecting and mining projects in order to ensure that exploitation of mineral resources serves present and future generations, promote economic and social development. The BA&EMPr is compiled in terms of the requirements of the NEMA.</p>
<p>NEMA The EIA Regulations. Listing Notice 1.</p>	<p>The overarching principle of the NEMA is sustainable development. It defines sustainability as the integration of social, economic and environmental factors into planning, implementation and decision making so as to ensure the development serves present and future generations. Section 2 provides for National Environmental Management Principles. These principles include:</p> <ul style="list-style-type: none"> • Environmental management must place people and their needs at the forefront of its concern. • Development must be socially, environmentally and economically sustainable. • Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated. • Environmental justice must be pursued. • Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing must be pursued.

	<ul style="list-style-type: none"> • Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle. • The participation of all Interested and Affected Parties (I&APs) in environmental governance must be promoted. • Decisions must take into account the interests, needs and values of all I&APs. • The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment. • Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law. • The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage. • The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment. <p>Section 24 of the NEMA, headed "Environmental Authorisations" sets out the provisions which give effect to the general objectives of Integrated Environmental Management (IEM), and is found in Chapter 5 of the NEMA. In terms of section 24(1), the potential impact on the environment of listed activities must be considered, investigated, assessed and reported on to the competent authority charged by the NEMA with granting of the relevant environmental authorisation.</p> <p>On 4 December 2014, the Department of Forestry, Fisheries and the Environment (DFFE) published the 2014 NEMA Environmental Impact Assessment Regulations and listed activities in Government Gazette No. 38282, which was amended in 2017.</p> <p>The proposed project involves 'listed activities', as identified in terms of the NEMA read with the EIA Regulations of 2014. In terms of section 24(2) and 24D of the NEMA no person may commence an activity listed or specified in terms of the Act unless the competent authority has granted an environmental authorisation for the activity.</p> <p>Listing Notice 1 activities apply to the proposed prospecting activities and will follow a Basic Assessment process under NEMA.</p>
<p>Guideline on Need and Desirability in terms of the Environmental Impact Assessment ("EIA") Regulations, 2010. GN R891 of 2014</p>	<p>The need and desirability is discussed in Section 6 below in terms of the required format contained in the Guideline on Need and Desirability (GN 891 of 2014).</p> <p>It should be noted that the proposed project entails non-intrusive prospecting activities and will not have an impact on the ecological integrity of the area and will not have an impact on the socio-economy of the area.</p>
<p>Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector (2013).</p>	<p>Biodiversity related to the proposed prospecting area are discussed in Section 11.6 of this report and were considered in the Impact Assessment and Mitigation Measures.</p>
<p>The National Water Act No. 36 of 1998, as amended.</p>	<p>The prospecting activities will be conducted through non-intrusive methods and no water uses will be required for undertaking these activities.</p>

<p>The National Environmental Management: Biodiversity Act No. 10 of 2004, as amended).</p>	<p>Biodiversity related to the proposed prospecting area are discussed in Section 11.6 of this report and was considered in the Impact Assessment and Mitigation Measures. Due to the non-intrusive nature of the prospecting activities, no Biodiversity Permits will be required.</p>
<p>Alien and Invasive Species Regulations (GN R598 dated 2014).</p>	<p>Due to the non-intrusive nature of the prospecting activities, no impact on alien invasive species will occur.</p>
<p>Conservation of Agricultural Resources Act No. 43 of 1983, as amended.</p>	<p>Due to the non-intrusive nature of the prospecting activities, no impact on agricultural resources will occur.</p>
<p>SABS Code of Practice 0103 of 2008: The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication. SABS Code of Practice 0328 of 2008: Environmental Noise Impact Assessments.</p>	<p>Due to the non-intrusive nature of the prospecting activities, the only noise impact that will occur is from the drone survey, this will be a short term and low impact. This was considered in the Impact Assessment and Mitigation Measures.</p>
<p>National Heritage Resources Act No. 25 of 1999, as amended.</p>	<p>Cultural heritage related to the proposed prospecting area is discussed in Section 11.6 of this report and is considered in the Impact Assessment and Mitigation Measures. Due to the non-intrusive nature of the prospecting activities, no Heritage permits will be required.</p>
<p>National Nuclear Regulator Act No. 47 of 1999, as amended (NNR)</p>	<p>The NNR establishes and enforces procedures to protect people who work with radioactive materials. Monazite contains thorium, which is radioactive. Due to the non-intrusive nature of the prospecting activities, no material on site will be handled.</p>
<p>Land Use Planning Ordinance 15 of 1985</p>	<p>The Land Use Planning Ordinance 15 of 1985 (LUPO) is the key piece of land use management legislation in the Western Cape. The main aim of LUPO is to guide and facilitate land use planning in the Western Cape Province, and to regulate land use concerns pertaining thereto. LUPO includes sections on structure plans, zoning schemes and development right applications. Due to the non-intrusive nature of the prospecting activities, no rezoning of the site is required.</p>
<p>Matzikama Spatial Development Framework (SDF)</p>	<p>The Matzikama SDF, which guides planning policy in the area in which the mine is located, recognises the rural character of the Municipality and also provides guidelines in respect of mining, such as:</p> <ul style="list-style-type: none"> • No mining activities are permitted in the core zone in areas designated as such in the bioregional planning framework; • Strict landscaping measures must be implemented to minimise the visual impacts of mining; • Damage to ecosystems must be limited; and • Mining authorisations should include clauses requiring rehabilitation and financial provision for closure. <p>Due to the non-intrusive nature of the prospecting activities, none of the above guidelines will be infringed upon.</p>
<p>The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to proposed project are indicated below:</p>	<p>No infrastructure will be constructed as a result of the proposed prospecting activities. Due to the non-intrusive nature of the prospecting activities, none of the restrictions, exclusions or prohibitions in these strategic documents will be infringed.</p>

- | | |
|---|--|
| <ul style="list-style-type: none"> • Strategic Transmission Corridor-Western corridor • Strategic Transmission Corridor-Expanded Western Corridor • Strategic Gas Pipeline Corridors-Phase 5: Abraham Villiers Bay (Northern Cape) to Saldanha | |
|---|--|

7. Public Participation Process

The public participation process for this project was conducted in terms of:

- The procedures and provisions in terms of the NEMA;
- Chapter 6 of the EIA Regulations;
- GN 807 of 2012; Public Participation Guideline; and
- Other relevant legislation such as the PAIA.

A detailed public participation process is being undertaken, and includes the following:

- Key Stakeholder identification;
- Method of notifications, e.g., advertisements, site notices, Background Information Document (“**BID**”), email notifications;
- Registration of Interested and Affected Parties (“**I&APs**”) and key stakeholders;
- Access and opportunity to comment on the draft BA&EMPr by I&APs; and
- Consultation with the relevant authorities.

The following key stakeholder were identified and notified of the proposed project:

- Landowner/s;
- Lawful occupier/s of the land;
- Landowners or lawful occupiers on adjacent properties;
- Municipal Councilor;
- Municipality;
- Organs of State;
- Communities; and
- Other Competent Authorities affected.

The following notification and consultation methods were used:

- Newspaper advertisement in the Ons Kontrei newspaper placed on 14th October 2021;
- Site notices were placed in and around the site on the 13th October 2021; and
- Background Information Document (“**BID**”) sent to key stakeholders with email notifications and registered post in the week of the 11th to 14th October 2021.

The potential key stakeholders were notified of the proposed project and have been provided with the opportunity to register as I&APs and to comment on the draft BA&EMPr. The draft BA&EMPr is available to the public for review for a period of thirty (30) days from 18 October 2021 to 17 November 2021 on the following link: <https://app.box.com/s/21okmeuja5ux3hb0d33n653108z6pl00>

Once the public review of the draft BA&EMPr has been completed, the report will be finalised inclusive of the comments from I&APs and will be submitted to the DMRE for review. Once DMRE has made a decision, registered stakeholders will be notified of the decision.

8. Specialist Reports

The screening report for Environmental Authorisation as required by the EIA Regulations identified the following specialist studies to be undertaken, based on the sensitivity of the site:

- Agricultural Impact Assessment
- Archeological and Cultural Heritage Impact Assessment
- Paleontological Impact Assessment
- Terrestrial Biodiversity Impact Assessment
- Aquatic Biodiversity Impact Assessment
- Noise Impact Assessment
- Radioactivity Impact Assessment
- Plant Species Assessment
- Animal Species Assessment

These specialist studies are recognized due to the sensitivity of the site. No physical disturbances to the proposed prospecting site will occur as only desktop reviews and drone aerial surveys will be conducted. The drone operator will only access the site from the existing roads and no intrusive prospecting activities will therefore take place. Therefore, no specialist studies have been identified to be undertaken as part of the proposed project

9. Description of alternatives

The Environmental Authorisation application is directly related to the Prospecting Right application submitted to the DMRE. The Environmental Authorisation application and BA&EMPr therefore only focusses

on the activities, properties and commodities indicated in the Prospecting Right acceptance. No alternatives have therefore been identified for the proposed prospecting activities and site location.

10. Need and desirability

In 2017, the Department of Environmental Affairs published an Integrated Environmental Management Guideline, the Guideline on Need and Desirability. The Guideline focuses on how the development (and its separate elements/aspects) will impact on the ecological integrity of the area and promote justifiable economic and social development. The proposed prospecting activities entails planned non-intrusive activities such as a Drone Aerial Survey (site mapping, contour mapping, 3D terrain models, and digital elevation maps), desktop research and review of historical exploration records as well as detailed geological mapping will be implemented for the proposed project. Due to the non-intrusive nature of these activities, the proposed project will have no significant environmental impacts and the ecological integrity of the area will not be changed. The prospecting activities will further not directly contribute to the social and economic development of the area, however, should the prospecting activities prove to be feasible, and a mining right is considered, the mining activities will have an impact on the ecological integrity and socio-economic development of the area. This will then be assessed in further detail as part of such a mining right application.

11. Environmental attributes

11.1 Geology

The proposed project area falls within the Bitterfontein Subgroup of the Okiep Group as well as Quaternary Formation. Bedrock consists of pink to grey medium to coarse grained granite-gneiss of the 1 200 Ma old Namaqua Metamorphic Complex (SRK, 2011). This rock-type forms the Steenkampskraal Inselberg, and it hosts the ~290 m long and up to 4 m wide (average 1 m) monazite-bearing dyke belonging to the Roodewal Suite (ore body) and which has intruded along an east-west striking shear zone (steep structure) dipping (40° to 60°) to the south (SRK, 2011).

In the areas surrounding the inselberg these rocks are overlain by the 550 – 530 Ma old sedimentary rocks of the Vanrhynsdorp Group. The basal unit of the Vanrhynsdorp Group at the site consists of quartzitic sandstone and grit layers of the Arondegas Formation of the Knersvlakte Sub-Group. This layer outcrops on the western side of the Steenkampskraal Inselberg as well as forming the cap of the Bushman Cave Hill south of the mine. The Arondegas Formation is overlain by shale and subordinate sandstone layers of the Gannabos and Besonderheid formations (SRK, 2011).

Surface cover consists of a thin (1 - <5 m) layer of unconsolidated sediments of the Knersvlakte Dorbank soils, sand, calcrete and ferricrete. Logging of the drill chips of the recently drilled boreholes indicated that the previously reported thick (up to 60 m) layer of Recent-age unconsolidated deposits, also called Tertiary Valley Fill deposits, (Setplan, 1997) are in fact intensely weathered shale of the Ganabos and Besonderheid formations. Drilling indicates that weathering extends to ~6 mbgl in the granite-gneiss and to ~14 mbgl in the shale. Weathering is also evident at greater depths along fracture and fault zones.

Structurally, the region has been intensely deformed with at least six deformational episodes having been described (SRK, 2011). The older (1 000 – 1 500 Ma) four periods (F1 – F4) were responsible for intrafolial folds (F1), east-west trending regional recumbent folds (F2), east-west trending major open folds (F3) and east-west trending steep structures and shearing. This was followed by north-south compression (950 – 1 000 Ma) and finally the post Nama / Vanrhynsdorp Group (500 – 550 Ma) open folding and faulting. It is the latter event that has resulted in the northerly and north-westerly striking faults that displace the rocks of the Vanrhynsdorp Group and basement granite-gneiss in the area to form down-faulted graben structures east, west and north of the inselberg. A set of these faults displace the ore body both laterally and vertically on the western and eastern side of the inselberg. The ore body is cut by at least two narrow faults which are striking roughly parallel to the ore body in a north-northwesterly direction. These fault zones dip about 70° to the north and are filled with quartz and the fractured granite-gneiss is replaced by recrystallized quartz, chlorite and talcose material (SRK, 2011).

According to the Council for Geoscience (2014; Report No.: 2014-0012), rare earth elements are only found in the northwestern part of the province between 20 and 40 km south of Kliprand. They are hosted by the mineral monazite, which occurs in subvertical veins containing quartz, apatite, chalcopyrite, magnetite and zircon (Andreoli et al., 1994). The veins trend approximately east-west and are hosted by gneiss of the Namaqualand Metamorphic Complex. Only the deposit at Steenkampskraal, 40 km south-southwest of Kliprand, is presently economically viable (Internet, 2012a). This was formerly mined between 1952 and 1963 when 50 000 tons of monazite concentrate averaging 45 percent rare earth elements and 4 percent thorium oxide were produced (Andreoli et al., 1994). The rare earth elements present are cerium, lanthium, neodymium, yttrium, praseodymium, samarium, gadolinium, dysprosium and erbium and they are used for a variety of applications, e.g., highstrength steel, metallurgical alloys, petroleum catalyst and fluorescent lights (Schürmann and Harmer, 1998).

11.2 Climate

The site falls within the arid west coast climatic region of South Africa which is typified by hot summers, relatively warm winters and low rainfall, falling mostly during the winter months.

The median rainfall is 153 mm/a. Rainfall decreases from about 165 mm/a in the higher lying northern parts of the study area to <140 mm/a in the lower-lying southern parts (SRK, 2011).

Average maximum temperatures reported for Bitterfontein range from 30°C in summer to 20°C in winter, whilst average minimum temperatures range from 15°C in summer to 7°C in winter. The annual average temperature is 18.4°C with a maximum monthly average in February (22.5°C) and minimum monthly average in July (13.8°C).

Monthly data collected at the weather station near Vredendal, which is approximately 80 km south of the site, indicate annual evaporation rates from 1958 to 2010 (52 years) ranging from 1 525 to 1 989 mm/a, with an average of 1 727 mm/a. This is nearly 12 times higher than the MAP of 153 mm/a, hence the aridity of this area.

The prevailing winds are from the south-southwest and west, with an occurrence of winds from the west-northwest, west-southwest, southwest and south (SRK, 2011a). The prevailing wind direction is from the south-southwest for spring, summer and autumn, whilst the prevailing wind directions are from north and north-northeast and northeast during winter. Prevailing winds observed during the day are from the south-southwest, west and south. During the earlier parts of the night the prevailing winds are from the south-

southwest and southwest, whilst during the latter part the prevailing winds are from the northwest and west-northwest.

The average wind speed for the Steenkampskraal area for all hours is 3.18 m/s (11.45 km/h) with maximum speeds generally less than 11.1 m/s (39.96 km/h). The average wind speeds for daytime during the year are 3.29 m/s (11.84 km/h) with calms of 6.01%. During the earlier parts of the night the average wind speed is 3.46 m/s (12.46 km/h), whilst decreasing during the latter parts of the night to 2.93 m/s (10.55 km/h) with calms of 4.46%.

11.3 Topography

The site is located on an undulating plain in the Knersvlakte, at an elevation of approximately 430 m. The low granite hill on the Site immediately to the north of the mine reaches a height of 446 m. Elevations increase to the north of the Site: a spur of mountains about 10-20 km north and northwest of the Site reaches elevations of over 800m, and further north rises to well over 1 000m. There are no pronounced or conservation-worthy topographical features on the Site.

11.4 Soils and Land Capability

Land capability is directly associated with soil form and slope. The site is fairly flat and, in principle, should be able to support grazing, although the impermeable and saline Dorbank soils mean that mainly vegetation adapted to these conditions can survive on the site and that the capacity to support agriculture is limited. It is likely that only the top maximum $\pm 35 - 50$ mm of Dorbank soils are sufficiently leached to yield them suitable as topsoil (SetPlan, 1997).

11.5 Fauna

Along the watercourses (Klein Riet and Nabeep Rivers) there is abundant evidence of faunal activity in the form of spoor, burrows, scats and faunal remains, while incised banks, provide ideal opportunities for hole-nesting birds (Harrison, 2011). The disturbed/artificial habitat of greatest importance for fauna is the underground tunnels of the adjacent mine, which provide ideal roosting habitat for bats.

Fauna occurring or likely to occur on and around the site include:

- Amphibians: there are eight possible species, six of which are of probable occurrence. The rocky hills and any rock pools they may contain are habitats of special significance and sensitivity for amphibians.
- Reptiles: there are 46 possible species, 30 of which are of probable or confirmed occurrence. Species of conservation importance include Namaqualand Speckled Padloper *Homopus signatus*, Namaqualand Tent Tortoise *Psammobates tentorius trimeni*, Fisk's House Snake *Lamprophis fiskii*, Armadillo Girdled Lizard *Cordylus cataphractus*. These four species are potentially threatened (conservation assessment pending), with the two tortoises and the Armadillo Girdled Lizard, in particular, threatened by the pet trade (Harrison, 2011).
- Mammals: there are 54 possible species, 35 of which are of probable or confirmed occurrence. Species of conservation importance include: Dassie Rat *Petromus typicus* (Near Threatened), Littledale's Whistling Rat *Parotomys littledalei* (Near Threatened), Natal Long-Fingered Bat

Miniopterus natalensis (Near Threatened), Lesueur's Wing-gland Bat *Cistugo lesueuri* (Near Threatened), Geoffroy's Horseshoe Bat *Rhinolophus clivosus* (Near Threatened), Cape Horseshoe Bat *Rhinolophus capensis* (Near Threatened), Honey Badger *Mellivora capensis* (Near Threatened). The Natal Long-Fingered Bat, Geoffroy's Horseshoe Bat and Cape Horseshoe Bat (see Figure 4.4) have been confirmed present in the underground mine. It is probable that the bats represent smaller, distinct, regional populations with elevated conservation value. Observation suggests that >1000 bats regularly use the mine. It is reasonable to assume that there are alternative caves for roosting bats in the rocky hills of the region, though these are unlikely to be as extensive or perhaps as suitable as the mine in terms of their microclimatic characteristics (Harrison, 2011).

- Birds: there are 62 species recorded from the vicinity of Steenkampskraal, most of which are of probable or confirmed occurrence. Species of conservation importance include: Secretarybird *Sagittarius serpentarius* (Near Threatened), Martial Eagle *Polemaetus bellicosus* (Vulnerable), Black Harrier *Circus maurus* (Near Threatened), Ludwig's Bustard *Neotis ludwigii* (Vulnerable), Sclater's Lark *Spizocorys sclateri* (Near Threatened) (Harrison, 2011).

11.6 Flora

The study area lies near the southwestern extremity of the Succulent Karoo biome, and is technically outside the Cape Floristic Region, falling outside all identified Critical Biodiversity Areas (CBAs). The study area falls within what is known as the Knersvlakte bioregion (Helme, 2011). The Knersvlakte has been identified by Succulent Karoo Ecosystem Project and numerous other studies as an area of exceptional botanical importance at the national and international level, with extraordinarily high numbers of endemic and localised plant species, making it one of the two richest areas for succulent plants in the world (along with the Richtersveld) (Helme, 2011).

Particularly characteristic of the Knersvlakte are very high numbers of dwarf stem and leaf succulents (such as vygies), and geophytes (bulbs), many of which are very localised, and all are highly sensitive to any form of disturbance. Some 74% of all succulent plant species in the Knersvlakte are thought to be endemic (restricted) to the area (Helme, 2011), and at least 150 species are Red Listed as Species of Conservation Concern. The area is also regarded as a centre of diversity and endemism for the large bulb genera *Oxalis*, *Bulbine* and *Eriospermum* (Helme, 2011).

Various properties within 20km of the study area are now owned by the World Wildlife Fund and are managed (or soon will be) by CapeNature, and all are either already or soon will be regarded and managed as declared nature reserves and are in the process of being proclaimed as Provincial Nature Reserves.

Two main vegetation types (Namaqualand Arid Grassland and Northern Knersvlakte Vygieveld) occur naturally in the study area according to the South Africa Vegetation Map, although in reality there is no evidence of the former within the proposed development area (Helme, 2011). The rocky hills in fact represent a third vegetation type -Namaqualand Klipkoppe Shrubland. Due to the relative lack of intensive crop agriculture in this arid region the three vegetation types are still largely intact (>95% of original extent still intact) and are thus not regarded as Threatened vegetation types on a national basis.

Northern Knersvlakte Vygieveld essentially occupies the vlaktes (plains) within the study area on the deeper soils. Plant cover ranges from 40 to 70%.

Areas that have been heavily disturbed support a much lower indigenous plant diversity than the largely natural areas (seldom more than 15% of the original diversity), vegetation cover is much reduced, and alien invasive species are much more common. Species in the disturbed areas are typically either highly resilient or are widespread pioneers' species capable of colonising disturbed habitats. This includes indigenous species and invasive species. Annuals and bulbs seem to be absent from most disturbed areas. In the old slimes dam area large areas remain totally uncolonised by any vegetation, which suggests that the radioactive silt in this area may be at least partly toxic to plants.

No quartz patches, which are the preferred or only habitat of a large number of the rare and localised Knersvlakte plant species, occur within the study area (Helme, 2011).

Two plant Species of Conservation Concern (previously known as Red Data or Red Listed species) were found within the study area.

Oxalis lichenoides is Red Listed as Rare but should probably be downgraded to Least Concern as numerous new localities have been recorded in the Knersvlakte in the last two years (Helme, 2011). It is however, a Knersvlakte endemic, and this record is the first record for the northern Knersvlakte (north of the Sout River). The species is fairly common in some of the undisturbed parts of the site (in the Vygieveld).

Ferraria ovata is also Red Listed as Rare, and is known from only three localities, and a total global population of less than 200 plants. One of the known populations is only 4km to the north of the study area. Only two adult plants of this bulb were seen in the study area, both about 200-250m northeast of the shaft entrance, where they were rooted in granite rock crevices. This species is almost certainly under-recorded (probably because it flowers early in the winter) but would appear to be a genuinely rare species whose occurrence on site is significant.

About 75% of the vegetation in the study area is essentially undisturbed and only lightly to moderately grazed and is thus of Medium to High sensitivity. Only the previously disturbed areas (totalling about 25.5 ha) with minimal or reduced natural vegetation are considered to be of Low sensitivity (Helme, 2011).

The rocky area (about 2.8 ha) supporting the Rare bulb species *Ferraria ovata* is deemed to be of High sensitivity, given that this species is known to be very rare regionally, and this is the only part of the site in which it was recorded.

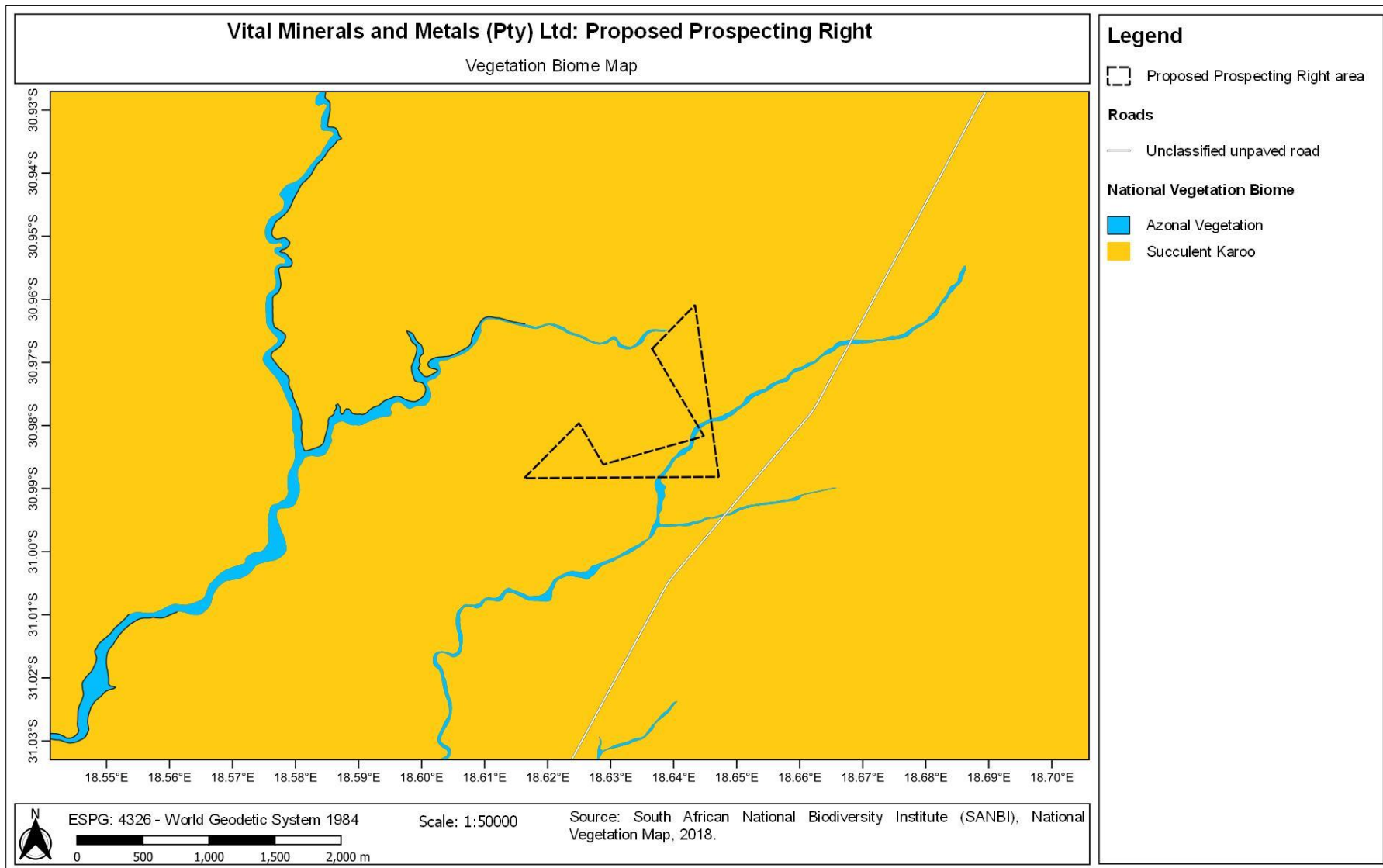


Figure 3: Vegetation Biome map

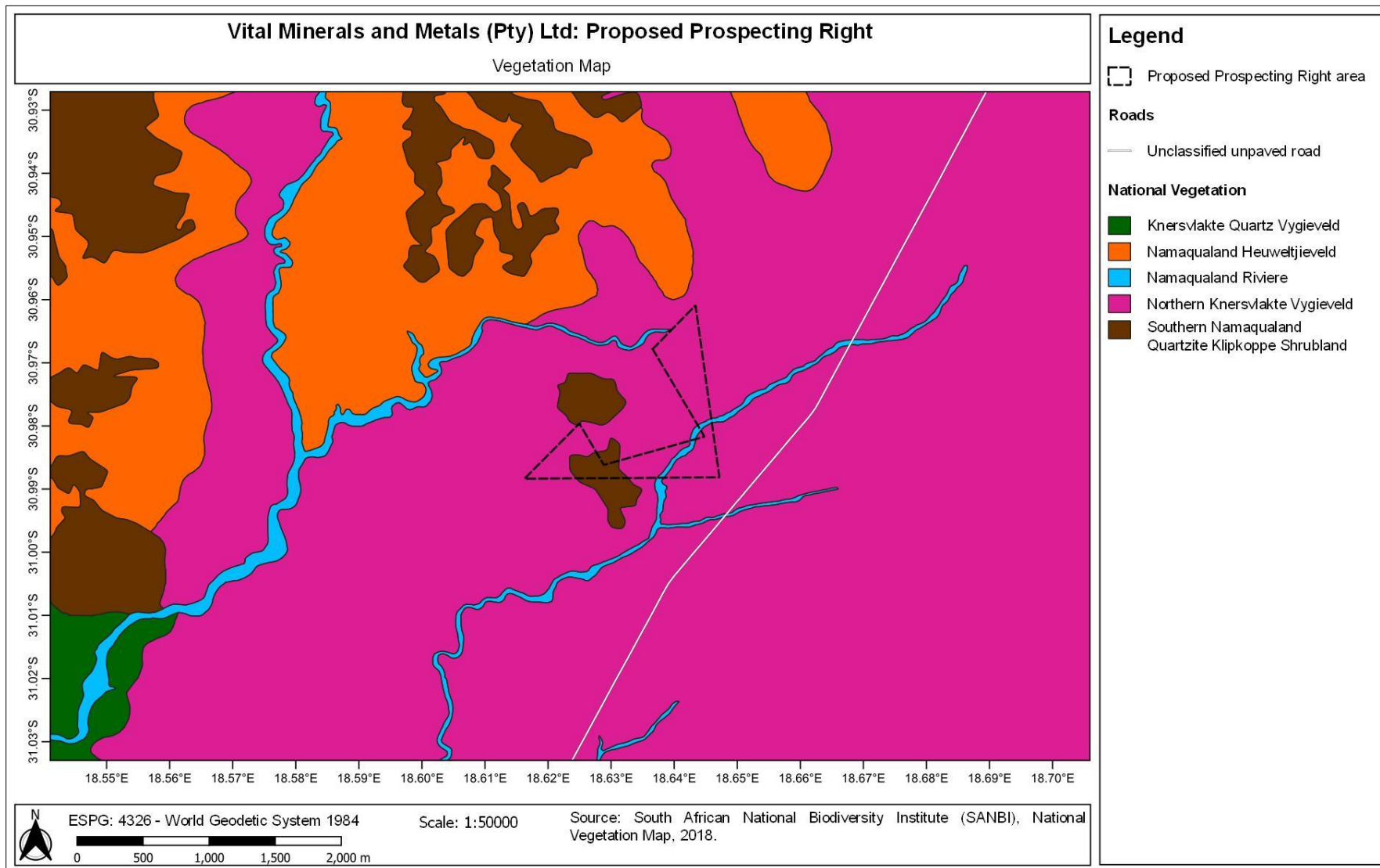


Figure 4: Vegetation map

11.7 Surface water

The region is arid and perennial or permanent surface water resources are scarce. Watercourses generally drain the mountains to the north of the Site, conveying runoff in a southerly direction across the Knersvlakte and on towards the Atlantic Ocean in the west. The ephemeral Sout River is one of the principal watercourses draining the Knersvlakte.

Natural runoff from the Steenkampskraal catchments is drained by two non-perennial rivers. The Klein-Riet River is located in the northern section of the site and runs in an east to north-west direction. Runoff from the outcrops on the northern slope induces high monazite concentrations in the Klein-Riet River. The Nabeep River runs through the south-east of the study area and runs in a north-east to south-west direction.

These two non-perennial rivers meet 22 km south-west of the study area to form the non-perennial Geelbeks River for a distance of 25 km before entering the semi-perennial Sout River. After a further 15 km the Sout River joins the Vars River and becomes truly perennial as the Hol River which, 15 km further downstream, enters the Olifants River near Lutzville.

The study area falls within the Olifants/Doring Water Management Area which forms part of Drainage Region E. The project area is situated in quaternary catchment (4th level) E33D. The E33D catchment covers an area of 1 559 km² of which the Steenkampskraal catchment comprises approximately 93 km².

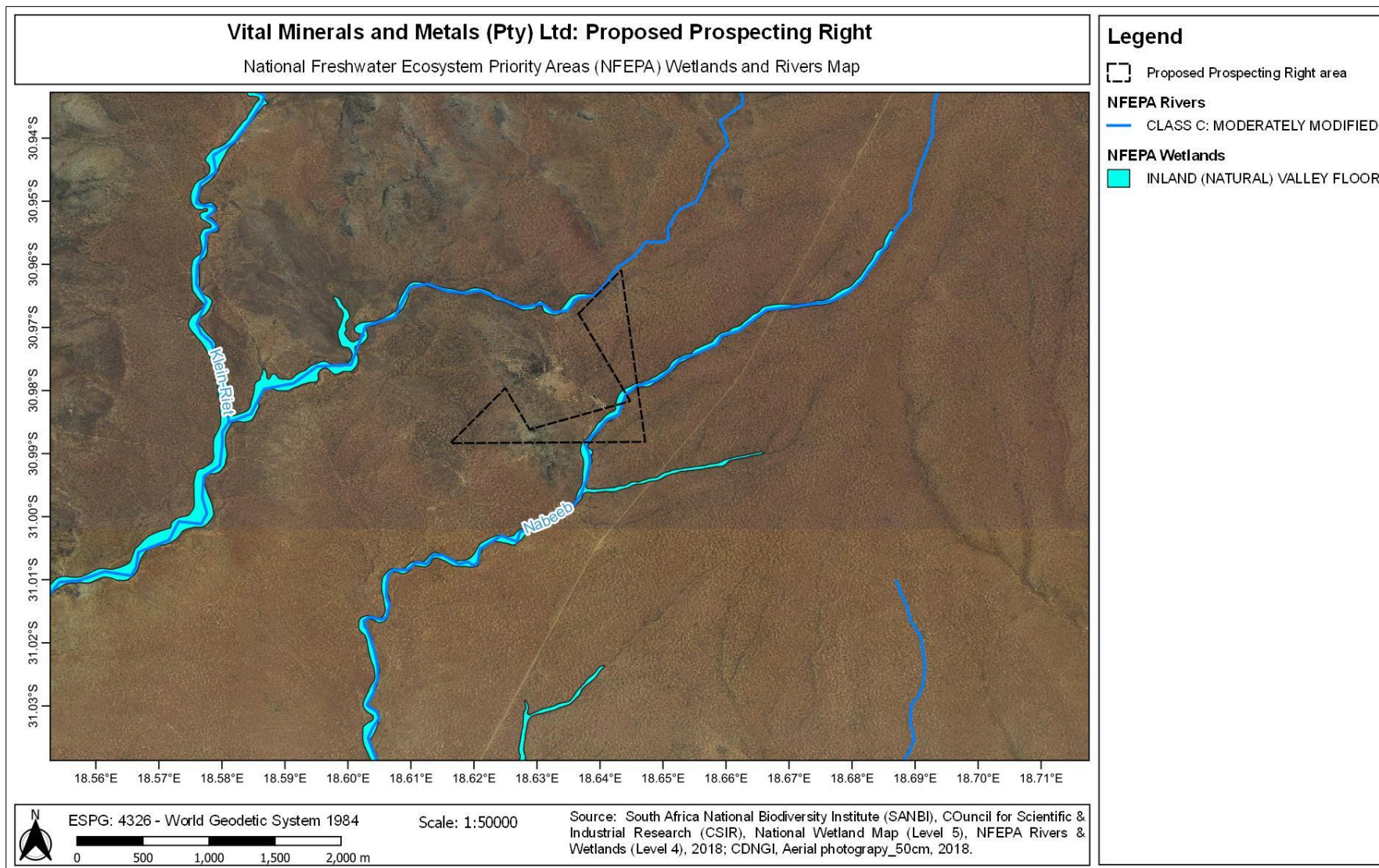


Figure 5: National Freshwater Ecosystem Priority Areas: Wetlands and Rivers map

11.8 Groundwater

The aquifers of the area consist of semi-confined fractured-rock aquifers associated with deformational features such as faults, folds and joint systems. From a groundwater supply perspective, the most important and highest yielding (most transmissive) of these structures are the post-Vanrhynsdorp north-south striking fault systems and the deformed and folded quartzitic sandstone layer of the Arondegas Formation (Arondegas Aquifer). The fractured-rock east-west striking shear zone hosting the ore body and the sub-parallel faults and joint systems occurring in the granite-gneiss of the Steenkampskraal Inselberg (Granite-gneiss Aquifer) have lower transmissivities and are thus lower yielding.

In terms of groundwater potential, the average effective recharge for the area is very low with ~0.16 mm per annum for the E33D quaternary catchment and 0.01 mm per annum for Steenkampskraal Portion 70/1. This equates to a total average recharge of approximately 252 700 m³ per annum for the quaternary catchment and 1 741 m³ per annum for Portion 70/1 of Steenkampskraal. However, when the exploitability, accessibility and seasonal variation are taken into account these values decrease to between 155 000 (dry seasons) and 188 000 m³ per annum (wet seasons) for the quaternary catchment to between 1 000 and 1 300 m³ per annum for Steenkampskraal Portion 70/1. In comparison to these figures the anticipated water demand of the mine is 43 800 m³ per annum, or 28% of the average dry season annual exploitation potential of the quaternary catchment (SRK, 2011).

The volume of groundwater stored in the aquifers of the quaternary catchment was calculated as approximately 51.3 million m³ and for Steenkampskraal Portion 70/1 as approximately 36 800 m³ (SRK, 2011).

Depth to the water table ranges from >100 m beneath the inselberg to 71 m near the western boundary. In the eastern part the depth to water table is approximately 48 m (SRK, 2011).

Groundwater flow at the site mimics the topography and is roughly in a south-westerly direction from the higher lying areas to the lower lying areas. The hydraulic gradient is estimated at ~0.003 while projected groundwater flow velocity is ~0.02 m/d (SRK, 2011).

The groundwater in the area is saline with Electrical Conductivity ranging from 530 mS/m to 988 mS/m which, if compared to the Drinking Water Standards (SANS 241:2006), is unfit for human consumption unless treated. The groundwater is neutral to slightly alkaline with pH ranging from 6.9 to 7.8. With the exception of aluminium (Al), the metals in the water of all the boreholes are very low and mostly below the detection limits. This is to be expected with a neutral to alkaline pH. The groundwater has a high carbonate content which will have a neutralizing effect (SRK, 2011).

Radionuclide analyses of groundwater samples in terms of the DWAF's Water Quality Guidelines for Domestic Use indicate no significant human health effects except at one location on the western boundary of the site.

11.9 Cultural and Historical Environment

Knervlakte is extremely sparsely populated. Historically, the area was (and continues to be) used as seasonal grazing lands. Stock farmers expanded into the Namaqualand by the mid 18th century. The scarcity of natural resources (particularly water and vegetation for grazing) is reflected in the vast size of the farms. It is only after the development of the windmill, that permanent settlement became viable.

Nonetheless the area remains remote and is not located close to any historic settlements (Clift, 2011). The mine and its associated infrastructure are not older than 60 years and as such are not protected.

Early and Middle Stone Age (ESA and MSA) stone tool scatters are commonly found along river courses and terraces and in deflated areas of the Knersvlakte. The MSA is associated with the emergence of modern humans (behaviorally as well as anatomically) and spans the period 300 000 to 20 000 years ago. Later Stone Age (LSA) sites are less visible, and recorded sites are largely restricted to coastal shell middens and relatively rare rock shelters in the interior (Clift, 2011).

Historically, the Namaqualand has also been associated with the Khoekhoe people (the Nama), though there is a debate around the advent and distribution of herding as a means of subsistence and the cultural expression of herders (Khoekhoe) vs hunters (San or Bushmen). Sites with Cape pottery date to the last 2000 years and are generally thought to be associated with herding (Clift, 2011).

The archaeological record in the Namaqualand/Knersvlakte extends into the historic period, evidenced by the presence of glass beads, leather fragments and a button found in conjunction with traditionally LSA artefacts (Clift, 2011).

11.10 Socio Economic

The West Coast District Municipality (**WCDM**) is located in the western portion of the Western Cape and forms the entire western coastline of the province north of the City of Cape Town metropolitan area. The WCDM occupies an area of ~ 31 100 km² and has a population of ~ 450 610. The district is divided into five local management areas, namely the Matzikama, Cederberg, Berg River, Saldanha and Swartland local municipalities.

The population of the Western Cape is estimated at ~ 6.6 million people (2018). The West Coast District contributed 5.1% of the Western Cape Gross Domestic Product (**GDP**), which is relatively small compared to the rest of the province. However, when excluding the Cape Metropole (which accounts for 72 per cent of the provincial GDP), the West Coast District is the third largest district economy (of five) in the Western Cape. A sectoral analysis of the West Coast District economy showed that two main sectors contributed to more than 40% of the district's economy, namely: agriculture (20.2%) and manufacturing (20.3%). Agriculture is the prominent contributing economic sector in the three smaller local municipalities. Manufacturing was the highest economic contributing sector in the two strongest local economies, being the Saldanha Bay and Swartland Municipalities, and subsequently also in the district overall. Mining is the smallest sector in the district economy, which is surprising when considering the prominent extend of mining activities observed in the district. Agriculture is the major employment generating sector, contributing to almost 40% of employment in the West Coast District, which emphasizes the key role and importance of the agricultural sector (including fisheries and forestry).

The Matzikama municipal area experienced significant growth over the last 15 to 20 years in terms of its population and land area. In more recent years and months the municipal area experienced unprecedented change; its land area almost doubled between the years 2000 to 2011; the land area increased from about 7000 km² to 12 900 km² following the inclusion of the previously District Management Areas. The population increased in the last 15 to 20 years from 40000 to more than 72000. Despite being a sparsely populated area (approximately, 0.22km² per person) the unprecedented change in the land area attributed to pressures on engineering services (such as water resources, waste management sites, roads and environmental management) and other negative impacts on society as a whole and the natural environment

(with referenced to the unprecedented drought experienced). These affects are evident in the ever increasing numbers of unemployment, poverty and housing backlog. The municipality appears to have experienced an unusual demographic trend with its population declining from 50 000 (2001) to 46 000 (2007), increasing to 71 500 (2016 community survey).

The majority (42.6 per cent or 11 132) of the workforce in Matzikama Municipality operate within the low-skill sector, which has contracted by 0.7 per cent per annum on average since 2005. Most of the job losses experienced during the recession emanated from this sector. The semi-skilled sector employed 24.8 per cent of the municipality's workforce, and stagnated (contracting by only 0.03 per cent per annum on average since 2005). The informal sector (which employs 5794 workers or 22.2 per cent of the municipality's workforce) experienced robust growth of 6.1 per cent per annum over the past decade and absorbed most of the job losses from the low and semi-skilled sectors. The skilled sector employed only 2720 workers and grew at a moderate rate of 1,01 per cent per annum since 2005.

12. Site sensitivity and land use map

A site sensitivity and land use map have been compiled and included below. From the sensitivity map it is evident that the proposed site is located within a Natural Area and approximately 2 km away from a Protected Area. The site falls within a terrestrial and aquatic Critical Biodiversity Area and an aquatic Ecological Support Area. The proposed prospecting activities will, however, have no impact on these sensitive landscapes. From the land use classification maps it is evident the proposed site is located within the Karoo and Fynbos Shrubland, with some patches of natural grassland.

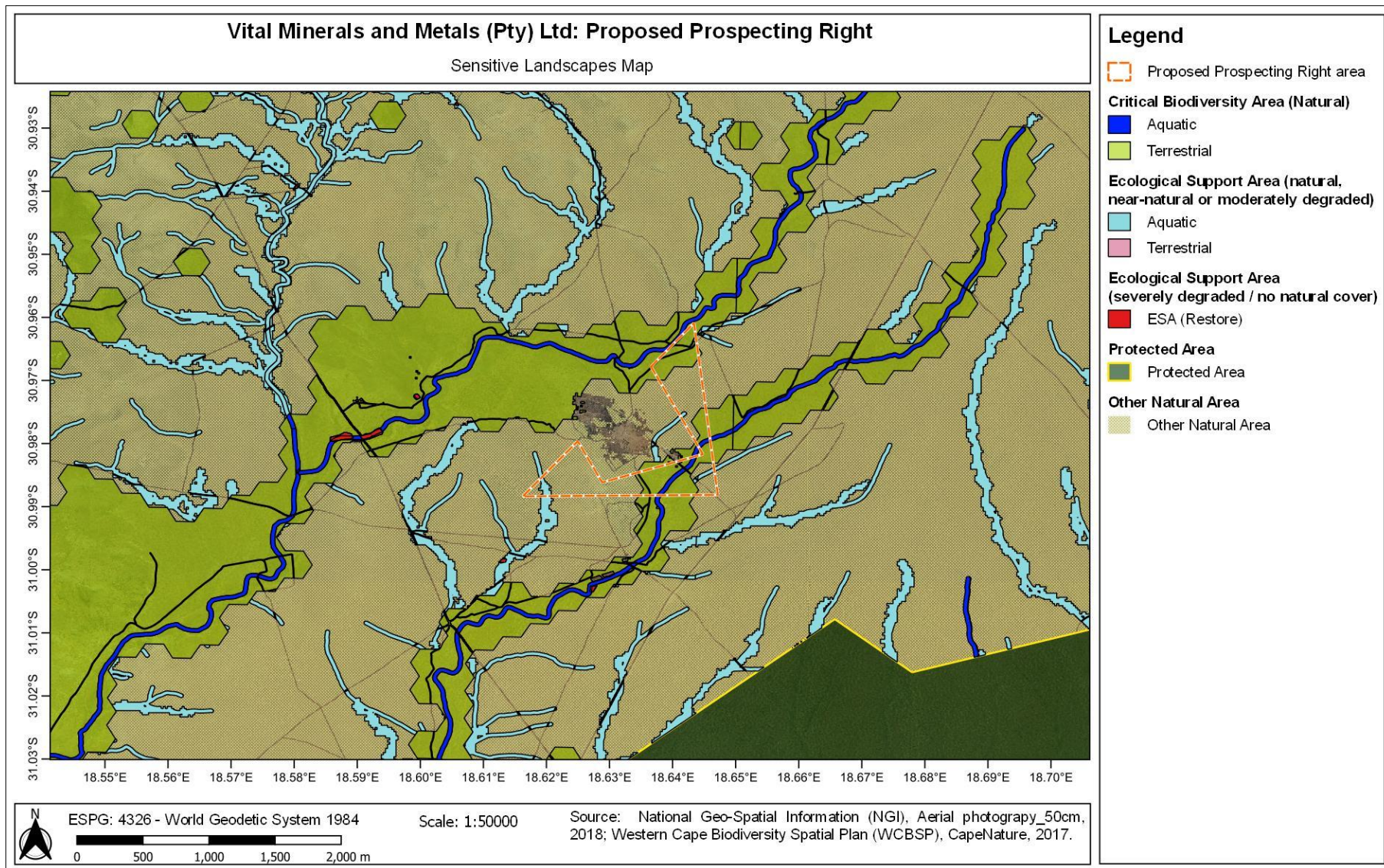


Figure 6: Sensitivity map

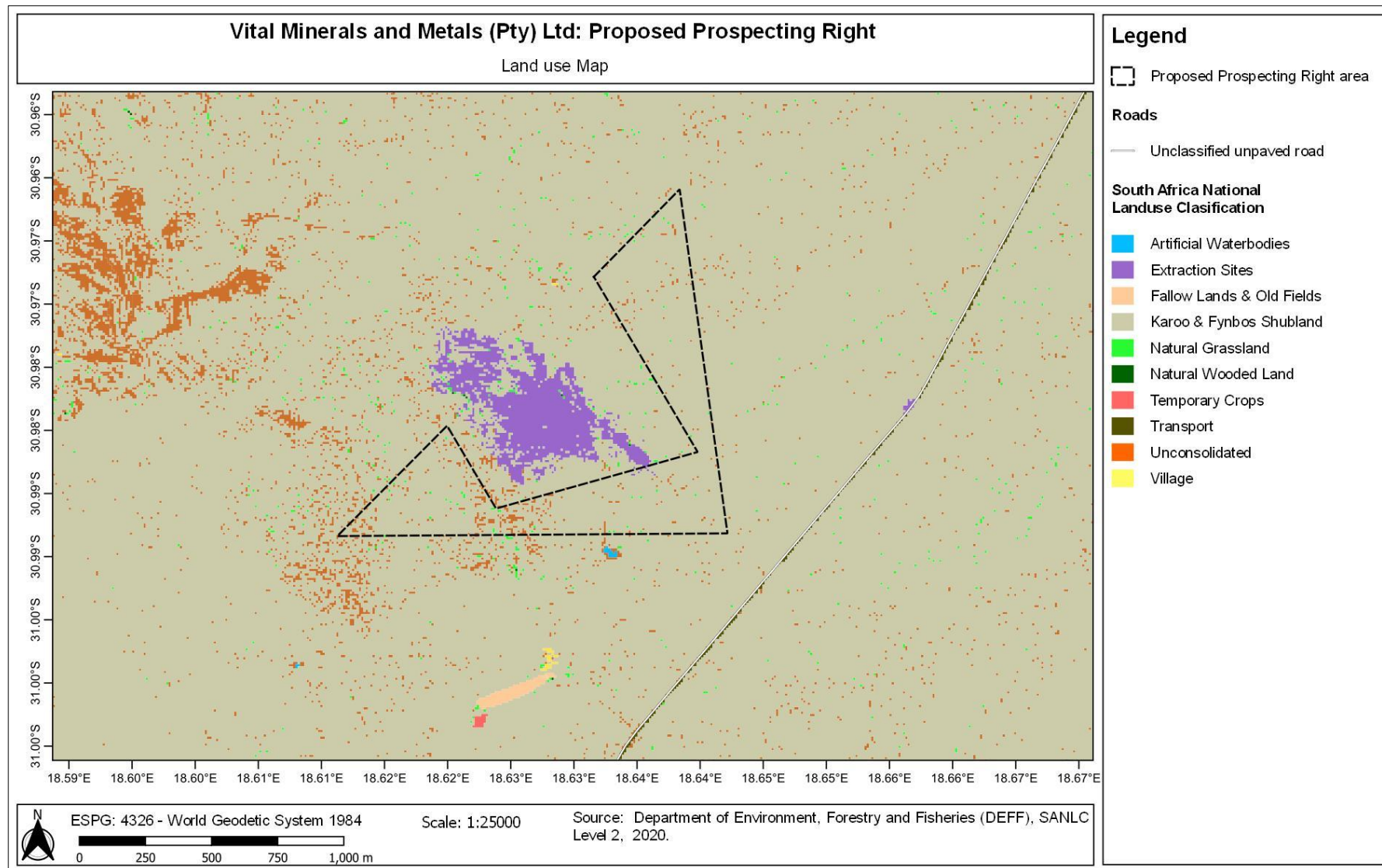


Figure 7: Land use map

13. Impact assessment methodology

The activities arising from each phase of the proposed project are included in the impact assessment table in Section 14. The activities identified require environmental management actions for mitigation measures. The assessment of impacts has been conducted to the criteria listed below¹.

Table 7: Ranking of evaluation criteria

Consequence	Nature / Intensity/ Severity of Impact (Nat)		
	Low	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are not affected	1
	Medium	Impacts affect the environment in such a way that natural cultural and/or social functions and processes are altered	3
	High	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will temporarily or permanently cease	5
	Spatial extent of Impact (Ext)		
	On-site	Impact occurs on-site	1
	Local	Impact occurs within 5km radius of the site	2
	Regional	Impact occurs within 100km radius of the site	3
	National	Impact occurs within South Africa	4
	International	Impact occurs internationally	5
	Duration of Impact (Dur)		
	Short-term	Through dilution and dispersion, the impact reduces to insignificant within 1 week	1
	Medium-term	Through dilution and dispersion, the impact reduces to insignificant within the life of the proposed activities	2
	Long-term	The impact will cease after the operational life of the mine either because of natural processes or by human intervention	3
Permanent	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient	4	
Likelihood	Probability of potential occurrence of Impact (Prob)		
	Improbable	The possibility of the impact materializing is very low either because of design or historic experience	1
	Probable	There is a distinct possibility that the impact will occur	2
	Highly probable	It is most likely that the impact will occur	3
	Definite	The impact will occur regardless of any prevention measures	4
	Frequency of potential occurrence of Impact (Freq)		
	Annually or less	Impact occurs at least once in a year or less frequently	1
	6 months	Impact occurs at least once in 6 months	2
	Monthly	Impact occurs at least once a month	3
	Weekly	Impact occurs at least once a week	4
Daily	Impact occurs daily	5	

¹ Adopted from the draft National Guideline on Minimum Information Requirements for preparing Environmental Impact Assessments for Mining Activities that require Environmental Authorisation (GN 89 of 09 February 2018).

The significance of impacts is determined based on the evaluation of an activity's impact in terms of consequence and likelihood. Using the sum of the evaluated ranking, the overall significance can be classified.

Table 8: Significance classification

		Consequence											
		3	4	5	6	7	8	9	10	11	12	13	14
Likelihood	2	5	6	7	8	9	10	11	12	13	14	15	16
	3	6	7	8	9	10	11	12	13	14	15	16	17
	4	7	8	9	10	11	12	13	14	15	16	17	18
	5	8	9	10	11	12	13	14	15	16	17	18	19
	6	9	10	11	12	13	14	15	16	17	18	19	20
	7	10	11	12	13	14	15	16	17	18	19	20	21
	8	11	12	13	14	15	16	17	18	19	20	21	22
	9	12	13	14	15	16	17	18	19	20	21	22	23

Table 9: Overall significance (OS)

Low	Where it will not have a significant influence on the environment management measures can be proposed to ensure that significance does not increase	5 - 11
Medium	Where it could have a significant influence on the environment unless it is mitigated or managed	12 - 17
High	Where it would have a significant influence on the environment regardless of any possible mitigation and hence must be either avoided or managed	18 - 23

14. Impact Assessment and Mitigation Measures

The proposed prospecting activities of the proposed project have been assessed using the methodology stated above and the mitigation measures for each impact assessed have also been provided. The prospecting activities will include the following:

Review of historical exploration data and report:

- Request existing exploration data and reports from the Council for Geoscience.
- Review of exploration core data, resource estimation report as well as mineral composition analysis report.
- Review of historical geophysical assessment report.
- Conduct extensive desktop research.

Drone Aerial Survey:

- Site mapping
- Contour mapping
- 3D terrain models
- Review of historical Geophysical Survey Reports

Table 10: Impact Assessment and Mitigation Measures

Activity	Phase	Size and scale	Environmental component and Impact	Significance Pre-Mitigation						Mitigation Measure and standards	Significance Post Mitigation						Timeframe for implementation	Responsible person
				Consequence			Likelihood				Consequence			Likelihood				
				Nat	Ext	Dur	Prob	Freq	OS		Nat	Ext	Dur	Prob	Freq	OS		
Review of historical exploration data and report	Planning and design	245 ha	No impact as a result of the review of historical data and reports.													12 months	Geologist	
Drone Aerial Survey	Operational Phase	245 ha	<u>Landowners and fauna:</u> Disturbance to fauna and landowners and surrounding landowners by noise of low flying drone.	1	1	1	2	2	7	Site activities will be conducted during daytime hours 07h00 – 17h00 during weekdays to avoid night-time and weekend noise disturbances. Notify affected landowners of how and where they can lodge a noise complaint prior to commencement of the airborne activities. Maintain and Implement Complaint register.	1	1	1	1	2	6	12 months	Geologist / Drone operators
Drone Aerial Survey	Operational Phase	245 ha	<u>Air Quality, flora and fauna:</u> Speeding on roads may create dust and fauna species may be killed by collisions. Destruction to flora by driving outside of existing designated roads.	1	1	1	2	2	7	Abide by traffic rules, no speeding allowed. To stay on existing designated roads (and not to drive on areas that are not fit and designed for this purpose). To be aware of the fauna species and to be on the lookout and avoid collisions	1	1	1	1	2	6	12 months	Geologist / Drone operators
Drone Aerial Survey	Operational Phase	245 ha	<u>Cultural Heritage:</u> Interference with cultural significance of the area.	1	1	1	2	2	7	To respect all cultures and believes. To remain within working areas and not to enter or interfere with any cultural heritage. Report any sightings as identified during operation activities (e.g., fossils) to the Heritage Western Cape and South African Heritage Resource Association.	1	1	1	1	1	5	12 months	Geologist / Drone operators
Drone Aerial Survey	Operational Phase	245 ha	<u>Fauna:</u> Removal or destruction of fauna.	1	1	1	2	2	7	No contractor or personnel allowed to catch or kill any species, and how any sightings should be reported if further actions are required (e.g., to catch and release).	1	1	1	1	1	5	12 months	Geologist / Drone operators
Drone Aerial Survey	Operational Phase	245 ha	<u>Flora:</u> Removal or destruction of fauna species	1	1	1	2	2	7	No contractor or personnel allowed to remove, harvest or destroy any flora species.	1	1	1	1	1	5	12 months	Geologist / Drone operators
Drone Aerial Survey	Operational Phase	245 ha	<u>Visual:</u> Littering on site	1	1	1	2	2	7	No littering allowed.	1	1	1	1	1	5	12 months	Geologist / Drone operators

15. Monitoring and reporting

An environmental audit should be conducted every six months during the operational phase and submitted to the DMRE every six months. The mitigation measures in the BA&EMPr should be implemented and monitored by the contractor (geologist/drone operator) on a continuous basis and any deviations reported to the DMRE.

16. Environmental awareness plan

The following Environmental Awareness Training will be implemented by Vital Minerals and Metals (Pty) Ltd in order to inform employees and contractors of the environmental risk that may result from their work, or the risk of their interaction with the sensitive environment. The training will be conducted as part of the induction process for all new employees (including contractors) that will perform work in terms of the proposed activities. Proof of all training provided must be kept. The Environmental Awareness Training will, as a minimum cover the following topics:

Air Quality

- Activities that may result or mitigate impact on air quality, speeding on roads.
- Negative impacts on the receiving environment if mitigation measures are not implemented.

Cultural Heritage

- The cultural significance of the area.
- To respect all cultures and beliefs.
- To remain within working areas and not to enter or interfere with any cultural heritage.
- How to report any sightings as identified during operation activities (e.g., fossils).

Fauna

- Overview of the fauna found on site and the uniqueness thereof.
- Mitigation measures that all contractors and employees need to abide by.
- No contractor or personnel allowed to catch or kill any species, and how any sightings should be reported.

Flora

- Overview of the flora diversity on site, and the rare and endangered nature thereof.
- No contractor or personnel allowed to remove, harvest or destroy any flora species unless clearly instructed based on the construction and operational plans.

Waste management

- To not litter.

Traffic

- Abide by traffic rules, no speeding allowed.
- To stay on designated roads (and not to drive on areas that are not fit and designed for this purpose).
- To be aware of the fauna species and to be on the lookout and avoid collisions.

Emergency Preparedness and Response

- How to report any emergency or incident or compliant from landowner.
- Incident and emergency reporting requirements.

General rules and conduct

- Respect for the sensitive environment.
- Do not litter.
- Respect for each other and for different cultures.
- Safety and health requirements.

17. Financial provision and closure

No rehabilitation cost has been identified to be undertaken as part of the proposed project. No physical disturbances to the proposed prospecting site will occur as only desktop reviews and drone aerial surveys will be conducted.

18. Assumptions, uncertainties, and gaps in knowledge

No assumptions, uncertainties or knowledge gaps have been identified.

19. Environmental impact statement

This BA&EMPr serves to identify the potential impacts associated with the activities of the associated project. In accordance with the relevant environmental legislation, reasonable measures to mitigate the potential impacts arising from the proposed activities have been assessed and the significance of each of these impacts under both the pre- and post-mitigation scenarios identified and detailed.

The methodology utilised to undertake the impact assessment has incorporated, amongst other skills, professional experience, relevant literature and local knowledge of the site and surrounding area.

It is the EAP's opinion that based on the process that has been followed and the findings of the impact assessment, in conjunction with the proposed mitigation measures, that no unmanageable adverse impacts are expected to occur.

20. Conditions for Environmental Authorisation

Should the DMRE grant authorisation for this project, it should be subject to the following conditions:

- The proposed project should remain in full compliance with the requirements of the EMPr and with all regulatory requirements.
- The EMPr should be implemented by qualified environmental personnel who have the competence and credibility to interpret the requirements of the EMPr. Such persons must be issued with a written mandate by management to provide guidance and instructions to employees and contractors; and
- Stakeholder engagement must be maintained during all phases of the proposed project.

21. Reasoned opinion for authorisation

In accordance with the 2014 EIA Regulations, as amended, the EAP must provide an opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation must be stated.

An impact assessment has been undertaken, which will incorporate extensive consultation with and participation of interested and affected parties. Applying the hierarchical approach to impact management, where impacts were found to be potentially significant, various mitigation measures to manage and monitor the impacts of the project the proposed project were not deemed feasible.

In terms of collectively considering ecological, social and economic impacts it is important to remember that while there might be some trade-offs between the considerations, in South Africa all development must in terms of Section 24 of the Constitution be ecologically sustainable, while economic and social development must be justifiable. There are, therefore, specific "trade-off" rules that apply. Environmental integrity may never be compromised, and the social and economic development must take a certain form and meet certain specific objectives in order for it to be considered justifiable.

Given that the prospecting activities to be undertaken will be non-intrusive, the EAP is of opinion that the impacts associated with the proposed project have a low environmental impact significance if the recommended mitigation measures are effectively implemented.

In terms of collectively considering ecological, social and economic impacts, the proposed activities should be allowed provided that the management objectives and management measures as presented in this BA&EMPr are implemented to effectively manage, prevent, control and / or stop environmental impacts from occurring. The EAP is of opinion that this project should therefore be authorised.

22. Period for environmental authorisation

The proposed non-intrusive prospecting activities will be undertaken within 24 months. Therefore, the period for which environmental authorisation is required is at least 2 years (from the date of approval provided by the DMRE).

23. Specific information required by the competent authority

The acknowledgment of the application for Environmental Authorisation by the DMRE, dated 13 September 2021 and attached hereto as Annexure 4 stipulated conditions that need to be adhere to during the Basic Assessment Process. The table below provides for these conditions and the EAP's response.

Table 11: Conditions in the acknowledgment letter from DMRE and EAPs response

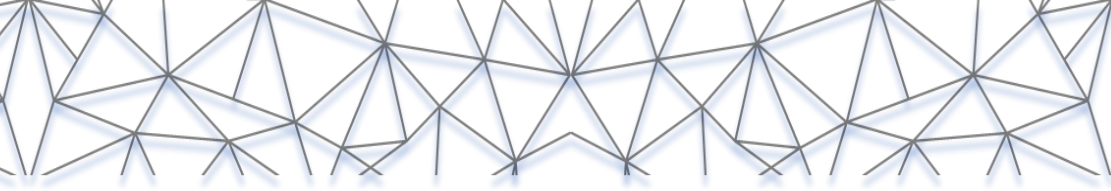
Condition from DMRE	EAPs response
<p>1. In accordance to Regulation 19(1) "Where basic assessment must be applied to an application, the applicant must, within 90 days of receipt of the application by the competent authority, submit to the competent authority – (a) a basic assessment report, inclusive of specialist reports, an EMP, and where applicable a closure plan, which have been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority". The basic assessment report must be in accordance with Appendix 1 of the 2014 EIA Regulations as amended. It is the responsibility of the EAP and the applicant to ensure that all listed activities triggered by the proposal are identified.</p>	<p>This BA&EMPr has been compiled in terms of Appendix 1 and Appendix 4 of the EIA Regulations, respectively.</p> <p>The application for the Prospecting Right was accepted on the 23 of August 2021, giving effect to the commencement of the timeframes.</p> <p>The BA&EMPr will be available for public review from rom 18 October 2021 to 17 November 2021, whereafter the final BA&EMPr inclusive of public comment will be submitted to the DMRE on 19 November 2021. These timeframes are within the 90-day period.</p>
<p>2. Public participation must be conducted in accordance with Chapter 6 of the NEMA: 2014 EIA Regulations as amended. Comments received from all interested and affected parties (including state organs) must be presented in a tabular format that includes the EAP's response to all the issues raised.</p>	<p>Public Participation will be conducted in terms of Chapter 6 of the EIA Regulations. Once the public review of the draft BA&EMPr has been completed, the report will be finalised inclusive of the comments from I&APs and will be submitted to the DMRE for review. Once DMRE has made a decision, registered stakeholders will be notified of the decision.</p>
<p>3. In terms of Regulation 7(2) as amended "the competent authority or EAP must consult with every organ of state that administers a law relating to a matter affecting the environment relevant to that application for an environmental authorisation when such competent authority considers the application and unless agreement to the contrary has been reached the EAP will be responsible for such consultation". The EAP is therefore requested to consult draft basic assessment report with every organ of state that administers a law relating to a matter affecting the environment as stipulated in regulation 7(2) of 2014 EIA Regulations as amended and to notify the Department of such consultation with the organ of sate.</p>	<p>As part of the Public Participation process to be undertaken, organ of state that administers a law relating to a matter affecting the environment will be consulted and given an opportunity to comment on the BA&EMPr.</p>

<p>4. You are further reminded to comply with Regulation 13(1) of NEMA: EIA Regulations. In the event where the EAP or specialist does not comply with sub regulation 1(a) the proponent or applicant must, prior to conducting public participation as contemplated in Chapter 6 of these Regulations, appoint another EAP or specialist to externally review the work of an EAP or specialist as contemplated in sub regulation (2), must comply with sub regulation (1)(a).</p>	<p>The EAP appointed meets the requirements contemplated in Regulation 13 of the EIA Regulations.</p>
<p>5. Please note that acknowledgement of your application does not grant you permission to commence with mining activities. Commencement of a listed activity without an environmental authorisation constitutes an offence in terms of Section 49A(1)(a) of NEMA, 1998 (Act 107 of 1998) as amended and upon conviction for such an offence, a person is liable to a fine not exceeding R10 million or to imprisonment for a period not exceeding ten years, or to both such fine and such imprisonment.</p>	<p>The applicant takes note of this condition</p>
<p>NB: Regulation 45 of the 2014 EIA Regulations as amended stipulates that “an application in terms of these Regulations lapses and a competent authority will deem the application as having lapsed, if the applicant fails to meet any of the time-frames prescribed in terms of these Regulations, unless extension has been granted in terms of regulation 3(7)”.</p>	<p>The timeframes in accordance with the EIA Regulations for a Basic Assessment process will be met.</p>
<p>Please note that the timeframes will be triggered by an acceptance letter issued in terms of the Minerals and Petroleum Resources Development Act (MPRDA), for an application for a permit. Should your application be accepted, your environmental assessment must focus on properties and commodities indicated in the acceptance letter. However, should the application for a permit be rejected, administration of your EA application will be discontinued.</p>	<p>Noted. The application for the Prospecting Right was accepted on the 23 of August 2021 giving effect to the commencement of the timeframes.</p> <p>The BA&EMPr will be available for public review from 18 October 2021 to 17 November 2021, whereafter the final BA&EMPr inclusive of public comment will be submitted to the DMRE on 19 November 2021. These timeframes are within the 90-day period.</p>

24. Any other matters required in terms of section 24(4)(a) and (b) of the NEMA

The applications for Environmental Authorisation and the Prospecting Right were submitted simultaneously to the DMRE on the SAMRAD online system. All other organs of state were notified of the proposed project.

An impact assessment for the proposed project has been undertaken and will incorporate extensive consultation with and participation of interested and affected parties. Applying the hierarchical approach to impact management was firstly considered to avoid negative impacts, but where avoidance was not possible, to better mitigate and manage negative impacts. No significant impacts were identified as part of the risk assessment and there will be no significant impacts posing threat on the environment. Furthermore,



the environmental impact statement summarises the key findings of the environmental impact assessment of the project the proposed project.

25. Undertaking

The EAP herewith confirms:

- the correctness of the information provided in the reports;
- the inclusion of comments and inputs from stakeholders and I&APs;
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed.

Draft for public comment will be signed on final report

Signature of EAP

Date

References

Refence list

Clift (2011). Review of heritage resources in the vicinity of Steenkampskraal Mine, Farm 70/1 Vanrhynsdorp. July 2011, Cape Town.

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