



## **DRAFT SCOPING REPORT**

# **Environmental Impact Assessment for Prospecting Rights with Bulk Sampling for Kaolin and Silica by Xwena Kaolin (Pty) Ltd on Klein Kogel Fontein, Western Cape**



**May 2022**





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## **Environmental Impact Assessment for Prospecting Rights with Bulk Sampling for Kaolin and Silica by Xwena Kaolin (Pty) Ltd on Klein Kogel Fontein, Western Cape**

### **Report prepared for:**

**Xwena Kaolin (Pty) Ltd**

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### **Report Prepared by:**

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## GLOSSARY

Alien species	Species whose presence in a region is attributable to human actions that enabled them to overcome fundamental biogeographical barriers (i.e., human-mediated extra-range dispersal) (synonyms: Introduced, non-indigenous, non-native, exotic).
Anthropogenic	Environmental pollution originating from human activity
Aquifer	Underground layer of water-bearing permeable rock, rock fractures or unconsolidated materials (gravel, sand, or silt) from which groundwater can be extracted using a water well.
Baseline	Information gathered at the beginning of a study which describes the environment prior to development of a project and against which predicted changes (impacts) are measured.
Biodiversity	The variability among living organisms from all terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems.
Biomass	The mass of living biological organisms in a given area or ecosystem.
Biota	Living organisms within a habitat or region
Community	In ecology, a community is a group or association of populations of two or more different species occupying the same geographical area and in a particular time.
Community composition	The number of species in that community and their relative numbers.
Community structure	Taxonomic and quantitative attributes of a community of plants and animals inhabiting a particular habitat, including species richness and relative abundance structurally and functionally.
Cumulative impacts	Direct and indirect impacts that act together with current or future potential impacts of other activities or proposed activities in the area/region that affect the same resources and/or receptors.
Ecological function	The potential of an ecosystem to deliver a service that is itself dependent on ecological processes and structures.
Ecology	The relations of organisms to one another and to their physical surroundings.
Environment	The external circumstances, conditions and objects that affect the existence of an individual, organism or group. These circumstances include biophysical, social, economic, historical and cultural aspects.
Fauna	General term for all the animals found in a particular location.
Faunal community	A naturally occurring group of native animals that interact in a unique habitat.
Flora	General term for all the plant life found in a particular location.
Functional group	A collection of organisms of specific morphological, physiological, and/or behavioural properties.
Impact	A change to the existing environment, either adverse or beneficial, that is directly or indirectly due to the development of the project and its associated activities.
Indigenous	Species within the limits of their native range (Synonyms: native).
Invasive	Alien species that have self-replacing populations over several generations and that have spread from their point of introduction.
Invertebrate	Animals that do not have a backbone. Invertebrates either have an exoskeleton (e.g., crabs) or no skeleton at all (worms).
Mitigation measures	Design or management measures that are intended to minimise or enhance an impact, depending on the desired effect. These measures are ideally incorporated into a design at an early stage.



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Native	Species within the limits of their native range (Synonyms: indigenous).
Operational phase	The stage of the works following the Construction Phase, during which the development will function or be used as anticipated in the Environmental Authorisation.
Physico-chemical	Dependent on the joint action of both physical and chemical processes.
Specialist study	A study into a particular aspect of the environment, undertaken by an expert in that discipline.
Species	A category of biological classification ranking immediately below the genus, grouping related organisms. A species is identified by a two-part name; the name of the genus followed by a Latin or Latinised un-capitalised noun.
Species diversity	The number of different species and relative abundance of each of those species present in an ecosystem.
Species richness	The number of different species represented in an ecological community. It is simply a count of species and does not take into account the abundance of species.

## LIST OF ABBREVIATIONS

Anchor/ AEC	Anchor Environmental Consultants (Pty) Ltd.
BAR	Basic Assessment Report
CA	Competent Authority
DFFE	Department of forestry, fisheries and the Environment (Formerly DEFF and DAFF)
DMRE	Department of Mineral Resources and Energy
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme Report
IBA	Important Bird and Biodiversity Area
IUCN	International Union for Conservation of Nature
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act No. 107 of 1998, as amended
SAHRA	South African Heritage Resource Agency
SANBI	South African National Biodiversity Institute
S&EIA	Scoping & Environmental Impact Assessment



# ABSTRACT

## Project Background

Prospecting is one of the first of many steps of the mining process and can extend over a period of one to five years. It is the search for commodities such as gemstones, minerals, metals, in an area by means of drilling and excavation to determine if mining in that area is economically feasible. Prospecting is also used as an opportunity to collect baseline environmental and biological information, such as the species present in an area, to enable the monitoring of the potential impacts of future mining on the environment. Prospecting does not necessarily guarantee that a mining right will be granted or that an area will be mined.

**Xwena Kaolin (Pty) Ltd** applied for Environmental Authorisation and Prospecting Rights with bulk sampling to prospect for Kaolin and Silica deposits on farms in the Bitterfontein area, Western (Figure 1-1). This was done in terms of the National Environmental Management Act (107 of 1998) and the Mineral and Petroleum Resources Development Act (28 of 2002). The application for prospecting rights was accepted by the DMRE on 12 May 2022 and official correspondence regarding this application received from the DMRE on 20 May 2022. To apply for prospecting rights and environmental authorisation with bulk sampling activities, a Scoping and Environmental Impact Assessment (S&EIA) process has been undertaken for this project.

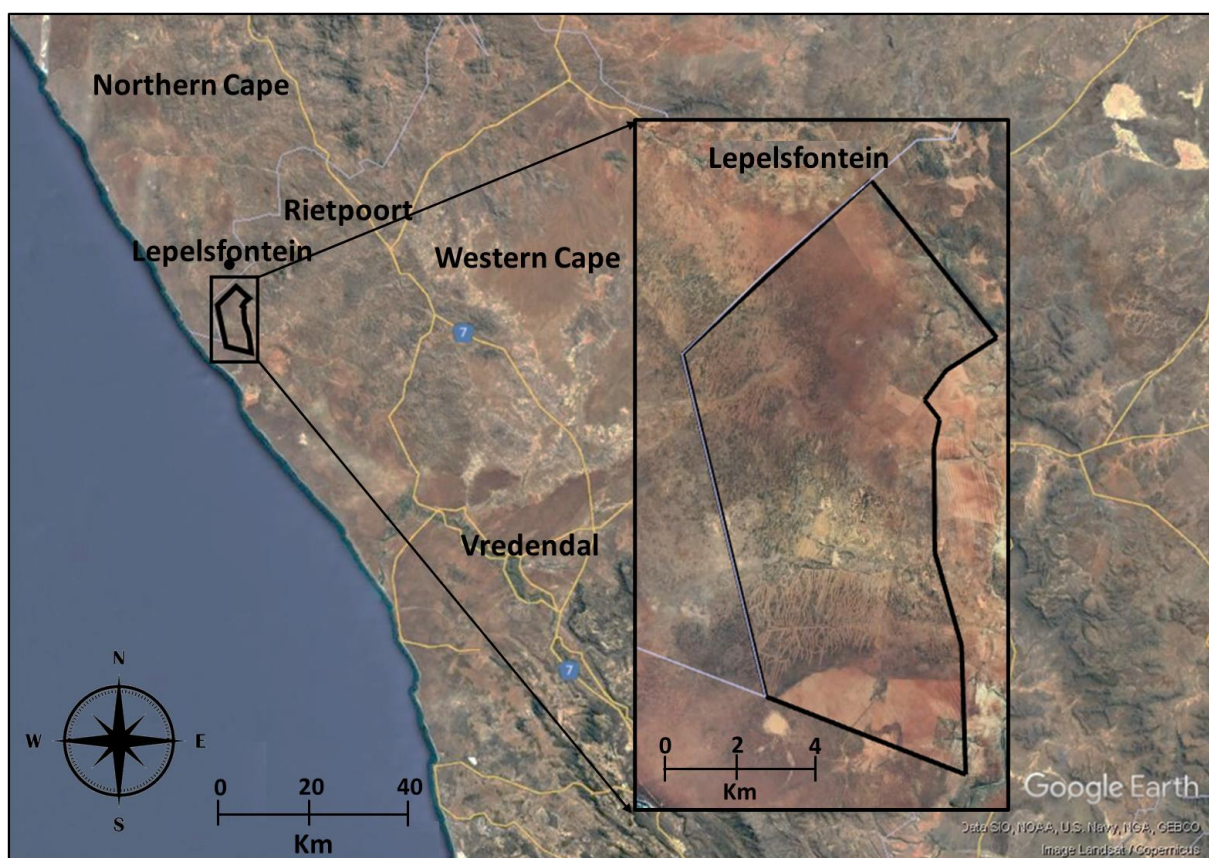


Figure 1-1 The location of the proposed prospecting area in the Western Capet

**Anchor Environmental Consultants** was appointed as Environmental Assessment Practitioner (EAP) to conduct the S&EIA for the proposed activity. The first phase, the Scoping phase, includes the process of determining the content and extent of the potential impacts of an activity and specialist studies that need to form part of the assessment during the EIA phase. This information along with the project description is circulated in the form of a Draft Scoping Report to the public and other Interested and Affected Parties during a 30-day Public Participation Process. The purpose of this Process is to use the community's recommendations to inform the EIA and to address concerns early in the project life cycle.

## **Opportunity to comment**

You are herewith invited to provide your comment on this project to the contact person below via email, post or telephone, during the 30-day Public Participation Process which will extend from Tuesday 31 May 2022 to Thursday 30 June 2022. The Draft Scoping Report will be available from the below website (<https://anchorenvironmental.co.za>), at the Lepelsfontein Primary School, and Rietpoort e-Centre, during this time.

### **Contact Person:**

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**Postal address:** Suite 8, Steenberg House, Steenberg Office Park, Silverwood Close, Tokai, 7945

**Email:** [cher@anchorenvironmental.co.za](mailto:cher@anchorenvironmental.co.za)

**Visit:** <https://anchorenvironmental.co.za>



## mineral resources

Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

### DRAFT SCOPING REPORT

## Environmental Impact Assessment for Prospecting Rights with Bulk Sampling for kaolin and silica by Xwena Kaolin (Pty) Ltd on Klein Kogel Fontein, Western Cape

Portion 1, Klein Kogel Fontein no 148;  
Portion 2, Ptn. Of Ptn 2, Klein Kogel Fontein no.148  
Rem. Portion 3, Klein Kogel Fontein no. 148;  
Portion 5 (Landen), Klein Kogel Fontein no 148;  
Portion 7 (Karoovei), Klein Kogel Fontein no 148 AND  
Portion 8, Klein Kogel Fontein no.148  
Portion 9, Klein Kogel Fontein no.148

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).

## 1 PROSPECTING RIGHT APPLICANT

<b>Name of the Applicant:</b>	Xwena Kaolin Pty Ltd
<b>Responsible Person</b>	Johann Appies
<b>Contact number</b>	087 654 7575
<b>Fax number:</b>	086 520 3958
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<b>Email address:</b>	johann@xwena.com
<b>File reference number SAMRAD:</b>	WC30/5/1/1/2/10417PR

## 2 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 for Environmental Authorisation must (a) be prepared in a format that may be determined by the Competent Authority and (b) in terms of section 17 (1) (c) of the same regulation, the competent Authority must check whether the application has taken into account the 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 uninterpreted information and that it unambiguously represents the interpretation of the applicant.

## 2.1 Objective of a Scoping Process

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

- 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) Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- c) Identify and confirm the proffered activity and technology alternative through and impact and risk assessment and ranking process
- d) Identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- e) Identify the key issues to be address in the assessment phase;
- f) Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- g) Identify, 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 Details of the EAP

<b>Name of The Practitioner</b>	<b>Ms Cheruscha Swart</b>
<b>Contact number:</b>	021 701 3420
<b>Fax number:</b>	021 701 5280
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<b>Postal address:</b>	Suite 8, Steenberg House, Silverwood Close, Steenberg Estate, Tokai, 7945
<b>Email address:</b>	cher@anchorenvironmental.co.za

#### 3.1.1 Expertise of the EAP.

Cheruscha Swart attained a Master of Science degree (MSc), Cum Laude, in Zoology (biodiversity and ecology, marine ecology, marine alien species, impact assessments) and an Honours (BSc Hons) and Bachelor of Science degree (BSc) in Biodiversity and Ecology (biodiversity and ecology, conservation biology, plant and animal sciences and marine ecology), from the University of Stellenbosch.

Her training and experience have made her highly competent within a variety of disciplines, including environmental monitoring, Environmental Management Programmes, environmental legislation, conducting Basic and Environmental Impact Assessments, marine invertebrate taxonomy and biology and undertaking specialist studies in various disciplines, including fauna and flora, terrestrial and marine ecology and invasion biology.

#### 3.1.2 Summary of the EAP's past experience.

(In carrying out the Environmental Impact Assessment Procedure)

Cheruscha has eight years of research and consulting experience in several disciplinary fields, three of which have been spent conducting Basic and Scoping and Environmental Impact Assessments. Within Anchor Environmental Consultants, her primary role is that of Environmental Assessment Practitioner, acting as lead consultant on several environmental specialist studies and collaborating consultant on several other projects. Tasks include applications for prospecting, ranching and other operational rights, environmental licenses and environmental authorisations; specialist impact assessments and baseline studies; environmental monitoring of important conservation and disturbed habitats; and

monitoring environmental compliance of various operations. Projects include, amongst others, land-based and offshore prospecting operations; offshore mining operations; greenhouse agricultural projects; land- and sea-based aquaculture facilities; and monitoring the health of bays and ports along the West Coast. Clients, amongst many others, include Trans Atlantic Diamonds, DeBeers Marine Namibia, Drylands Farms, Transnet National Ports Authority and Saldanha Bay Water Quality Trust. Cheruscha is the author of three peer reviewed scientific publications and numerous scientific reports, with several other projects and publications in preparation. See CV herewith attached as Appendix 1. CVs of co-authors on this report are also included.

## 4 INTRODUCTION

### 4.1 Environmental Impact Assessment Process

Prospecting is one of the first of many steps of the mining process and can extend over a period of one to five years. It is the search for commodities such as gemstones, minerals and/ or metals, in an area by means of drilling and excavation to determine if mining in that area is economically feasible. It is used to analyse the structure of the earth's crust and the rocks of which it is composed, to assist in the engineering of the mining equipment. Prospecting is also used as an opportunity to collect baseline environmental and biological information, such as the species present in an area, to enable the monitoring of the potential impacts of future mining on the environment.

To apply for prospecting rights, an Applicant is also required to apply for Environmental Authorisation (EA), from the competent authority before s/he can commence with prospecting. In the case of prospecting and mining, the competent authority is the Department of Mineral Resources and Energy (DMRE). The main function of the DMRE is to regulate prospecting, mining and matters relating to mineral and petroleum resources under the Mineral and Petroleum Resources Development Act (MPRDA — Act No. 28 of 2002).

The application for EA includes one of two processes, a Basic Assessment (BA) process or a Scoping & Environmental Impact Reporting (S& EIR) process. Basic Assessments are conducted for small scale activities, with short timeframes and which are expected to have easily controlled and less significant impacts. These activities are listed in Listing Notice 1 as published in Government Notice R327 and Listing Notice 3 as published in Government Notice R324 (as per Section 24 of the National Environmental Management Act, 107 of 1998 (NEMA)). Scoping & EIAs (S&EIA) are conducted for larger scale activities, with longer timeframes and which are expected to have more significant impacts. Activities that must be subject to S&EIR are included in Listing Notice 2 as published in Government Notice R325. A Basic Assessment process extends over a period of 197 days whereas a S&EIA process extends over a period of 300 days.

Prospecting can either be done with or without “bulk sampling” activities. Bulk sampling means taking large samples (large-diameter drill cores or trench samples) for testing purposes and could constitute larger scale and more significant impacts. To apply for prospecting rights and environmental authorisation without bulk sampling, a Basic Assessment process must be conducted. To apply for prospecting rights and environmental authorisation with bulk sampling activities, the more intensive S&EIA process must be conducted. The first phase of the S&EIR process, the Scoping phase, includes the process of determining the content and extent of the potential impacts of an activity which should be considered during the EIA phase. A Draft Scoping Report is compiled and circulated to stakeholders and the DMRE for a 30-day commenting period during the Public Participation Process (stakeholder consultation). Thereafter, comments are incorporated into the Final Scoping Report and again circulated to stakeholders and the DMRE for 30 days. The second phase is the EIA phase which includes conducting specialist studies, impact assessments and a second 30-day Public Participation Process. Results from these assessments and the comments received during the second consultation process are then incorporated into an Environmental Impact Report (EIR). It is also used to develop an Environmental Monitoring Programme (EMPr). This document outlines the procedures and methods that need to be implemented to mitigate, manage and monitor potential negative environmental

impacts. The EIR and EMPr are then submitted to the DMRE for consideration in the granting or rejecting of prospecting rights and Environmental Authorisation (EA).

Prospecting does not necessarily guarantee that a mining right will be granted or that an area will be mined. Should results from the prospecting campaign indicate that mining in an area would be economically worthwhile, the client must then apply for a mining right along with Environmental Authorisation for mining in that area by means of an additional S&EIA process.

## 4.2 Project Background

**The Xwena Group of Companies** is a diversified group of companies with 30 years of operational experience. It encompasses several sectors which include Energy, Logistics, Mining, Financial Services, Mineral Resources, Agriculture and Telecommunications. **Xwena Mineral Resources (Pty) Ltd (XMR)** (The Applicant) was incorporated for the purpose of exploring and investing mineral assets in Southern African countries such as Zimbabwe, Zambia and Namibia, Rwanda and Uganda. XMR is focused on minerals exploration, mining and beneficiation of easily accessible resources.

**Xwena Kaolin (Pty) Ltd**, a division of XMR, has applied for Prospecting Rights with bulk sampling activities, to prospect for silica sand (silica), silica sand (general), silcrete (silica), metallurgical silica, kaolin (clay), glass sand, foundry sand (silica), filling sand, crusher sand (silica), concrete sand (silica) and building sand (silica) over the remainder of Portions 3, 2 (portion of portion 2), 8, 1, 5 (Landen), 7 (Karoovei), and 9 (portion of portion 2) of the farm Klein Kogel Fontein 148, within the administrative district of Van Rhynsdorp (Figure 5 1).

The prospecting activities will trigger Listed Activities in Listing notice 1 (“Activity 20: Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the MPRDA”) and Listing Notice 2 (“Activity 19: The removal and disposal of minerals contemplated in terms of section 20 of the MPRDA”, i.e., bulk sampling activities). The Applicant is therefore required to apply for EA and prospecting rights application from the DMRE by means of a S&EIR process.

The Applicant has appointed **Anchor Environmental Consultants (Pty) Ltd** (Anchor) as the independent Environmental Assessment Practitioner (EAP) to assist with applying for prospecting rights, Environmental Authorisation, conducting a S&EIR and compiling the EIR and EMPr.

## 4.3 Assumptions and limitations

- It is assumed that all relevant project description information has been provided by Xwena Kaolin and that all information provided is correct.
- It is assumed that the project description and activities will not change after the completion of this report.

## 5 DESCRIPTION OF THE PROPOSED ACTIVITY

### 5.1 Location and details of the overall Activity.

<b>Farm Name:</b>	Portion 1, Klein Kogel Fontein no 148; Portion 2, Ptn. Of Ptn 2, Klein Kogel Fontein no.148 Rem. Portion 3, Klein Kogel Fontein no. 148; Portion 5 (Landen), Klein Kogel Fontein no 148; Portion 7 (Karoovlei), Klein Kogel Fontein no 148 Portion 8, Klein Kogel Fontein no.148 Portion 9, Klein Kogel Fontein no.148
<b>Application area (Ha)</b>	8,366 Hectares
<b>Magisterial district:</b>	Vanrhynsdorp
<b>Distance and direction from nearest town</b>	The nearest towns are Lepelsfontein and Kotzesrus in the Northern Cape, situated approximately 1.3 km and 10 km northwest of the proposed area. The Western Cape towns closest to the area are that of Rietpoort 13km east and the Olifants River Settlement and Lutzville, approximately 50 km to the southeast.
<b>21 digit Surveyor General Code for each farm portion</b>	Portion 1: C07800000000014800001 Portion 2:C07800000000014800002 Remainder of Portion 3: C07800000000014800003 Portion 5 (Landen): C07800000000014800005 Portion 7 (Karoovlei): C07800000000014800007 Portion 8: C07800000000014800008 Portion 9 (portion of portion 2): C07800000000014800002

### 5.2 Locality map

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

The application area covers 8,366 ha of land in the Western Cape of South Africa. The nearest towns are Lepelsfontein and Kotzesrus in the Northern Cape, situated approximately 1.3 km and 10 km northwest of the proposed area, respectively. Within the Western Cape, the closest towns are Rietpoort approximately 13 km east, and the Olifants River Settlement and Lutzville, approximately 50 km southeast of the area.

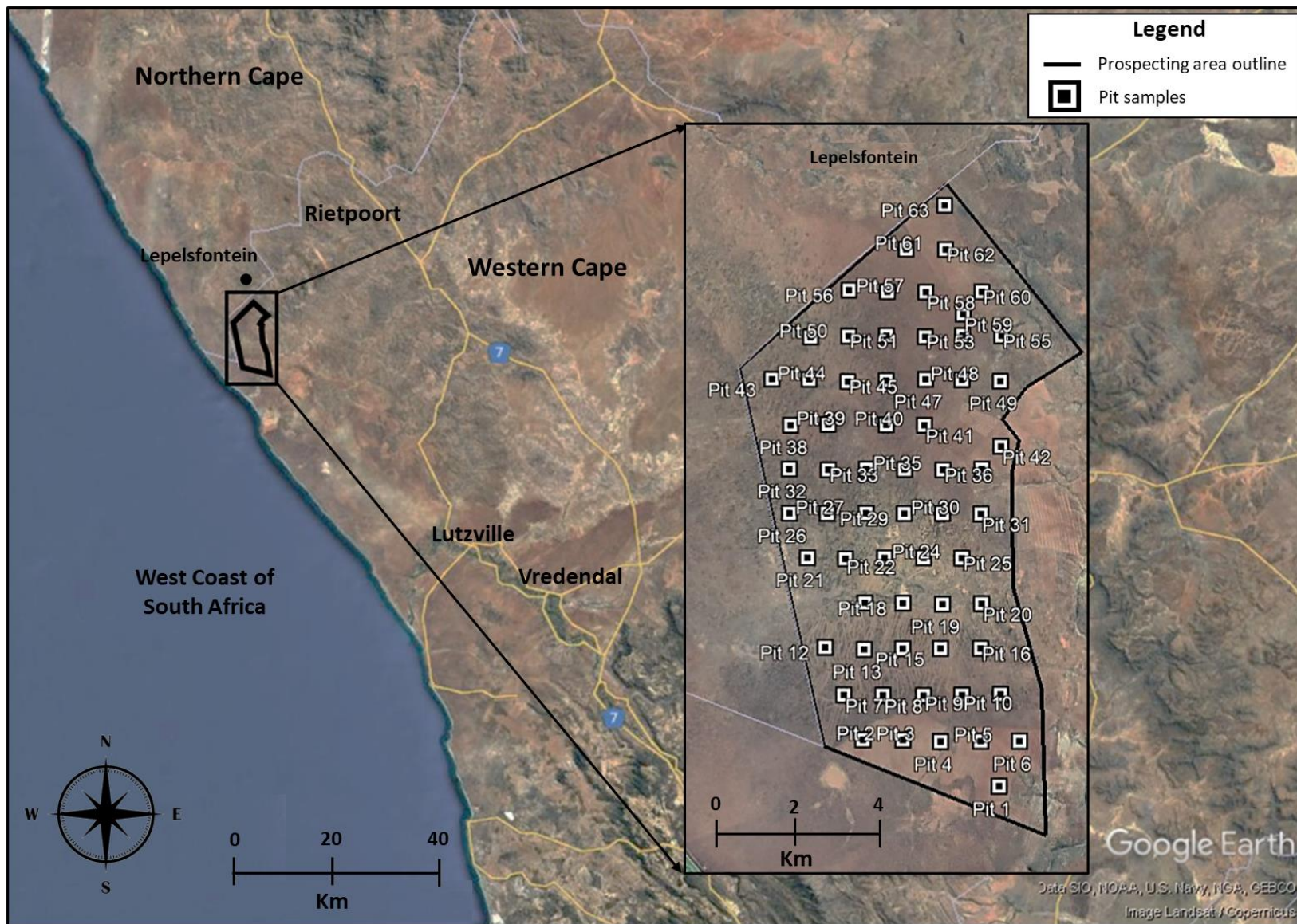
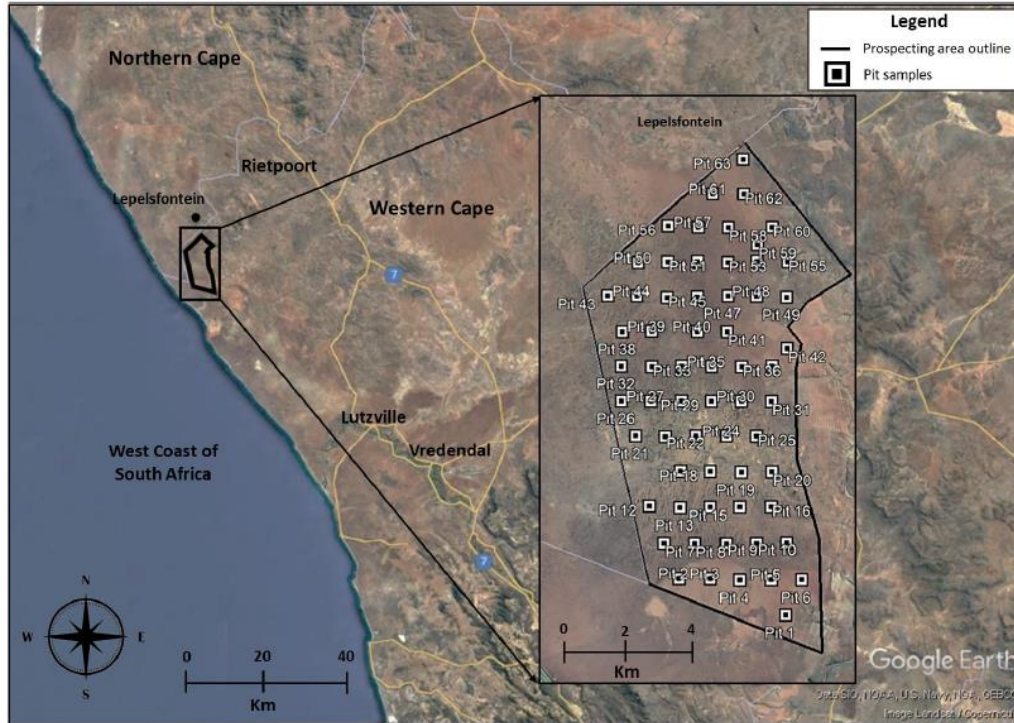


Figure 5-1 Location of the proposed prospecting area in the Western Cape of South Africa. The area is located approximately 1 km south of Lepelsfontein.

**PLAN AS REFERRED TO IN REGULATION 2.2 IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (28 OF 2002).  
IN SUPPORT OF AN APPLICATION FOR A PROSPECTING RIGHT**



**WESTERN CAPE PROVINCE**  
DESCRIPTION OF CONCESSION AREA  
UNDER APPLICATION FOR PROSPECTING  
RIGHTS

**Klein Kogel Fontein no 148:**

- 1) Portion 1,
- 2) Portion 2 (Ptn. Of Ptn 2)
- 3) Rem. Portion 3
- 4) Portion 5 (Landen),
- 5) Portion 7 (Karooovlei)
- 6) Portion 8
- 7) Portion 9 (Ptn. of Ptn. 2)

**REPRESENTS THE AREA OF LAND IN  
EXTENT OF 8 366 HECTARES**

Name of Applicant:  
**Xwena Kaolin Pty Ltd**

*Johann Appies*  
Signature of Applicant

Name (Print): Johann Appies  
Date: 31 March 2022

Plan Approved:

\_\_\_\_\_  
Regional Manager  
WESTERN CAPE PROVINCE  
Department of Minerals and Energy

Date: \_\_\_\_\_

POINT	LATITUDE	LONGITUDE
A	-31.175819°	17.835259°
B	-31.093431°	17.812164°
C	-31.050752°	17.865664°
D	-31.088957°	17.901061°
E	-31.096904°	17.886499°
F	-31.104134°	17.880335°
G	-31.109067°	17.884624°
H	-31.115409°	17.883007°
I	-31.141229°	17.883090°
J	-31.163832°	17.890630°
K	-31.195163°	17.892054°

**Figure 5-2 Site Plan of the proposed prospecting area as referred to in Regulation 2(2) in terms of the Mineral and Petroleum Resources Development Act (28 of 2002).**

### 5.3 Description of the scope of the proposed overall activity.

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

Xwena Kaolin is proposing to prospect for kaolin and silica products on portions of Klein Kogel Fontein farm using both non-invasive (desktop, geological mapping, quality and resource estimation) and invasive sampling activities (pitting and box cutting). Box cutting is considered a bulk sampling activity. Prospecting will be conducted manually using hand tools (for pitting activities) and with an excavator (for box cutting activities). No infrastructure or camp site will be erected on site. Given the proximity of Lepelsfontein to the area (approximately one kilometre away), should infrastructure be required, this will be set up in the town. All equipment / tools required will be stored and transported from the town to site as and when required. The excavator will be parked on a demarcated box cut area when it is not in use. The land in question is agricultural, disturbed land with little to no indigenous vegetation. Prospecting activities would preferably occur on tracks and on land which has already been disturbed by agricultural activities. No clearance of indigenous vegetation is therefore anticipated during prospecting. Water, for dust suppression, will be legally sourced (for example from a municipal area) and transported by means of a water tanker if needed. Only existing roads closest to the sampling sites will be used and vehicles parked next to roads from where laborers will carry hand tools to pit sites. Should there be no road, the excavator will enter and to exit on the same path.

### 5.4 Listed and specified activities

NAME OF ACTIVITY (E.g. For prospecting – drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc. 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...	Aerial extent of the activity Ha or m <sup>2</sup>	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE 1, 2 and 3, i.e., GNR 544, GNR 545 or GNR 546 as amended by GN327, GN325 and GN324 of 2017.
<b>Non Invasive: Desktop Study</b>	8 366 ha		No listed activity triggered
<b>Non Invasive: Geological Mapping</b>	8 366 ha		No listed activity triggered
<b>Invasive: Pitting</b> A total of 63 pits (2 m x 2 m x 2 m) will be dug. Each pit will have a surface area of 4m <sup>2</sup> and a volume of 8 m <sup>3</sup> . The 63 pits will disturb a total area of 252 m <sup>2</sup> and have a total volume of 504 m <sup>3</sup> . Pits will be dug approximately 1 km apart, perpendicular to mineralization to confirm the width of the mineralization. The Geologist will sample the pits vertically at 1-meter intervals with side wall logging. This will give a rough	Approximately 252 m <sup>2</sup> over the area of 8 366 ha	X	<b>1) Listing Notice 1: (GNR 544, as amended by GN327) Activity 20.</b> This activity states that “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 (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral



estimate of the tonnage of surface mineralization visible as well as quality zones.			resource” requires environmental authorisation.
<p><b>Bulk Sampling (Box Cuts)</b></p> <p>Three bulk samples (Box Cuts) will be done. The box cut will be 25 m x 25 m (625 m<sup>2</sup>) in size with a depth of up to 5 m. Each box cut will have a surface area of 625 m<sup>2</sup> and a volume of 3 125 m<sup>3</sup>. The three box cuts will disturb a total area of 1 875 m<sup>2</sup> and will comprise of a total volume of 9 375 m<sup>3</sup>.</p>	<p>A total surface area of approximately 1 875 m<sup>2</sup> is estimated to be disturbed across the entire area of 8 366 ha.</p>	X	<p><b>1) Listing Notice 1 (GNR 544, as amended by GN327 of 2017, Activity 20) — see above.</b></p> <p><b>AND</b></p> <p><b>2) Listing Notice 2 (GNR 545, as amended by GN325 of 2017) Activity 19:</b> <i>“The removal and disposal of minerals contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including—</i></p> <p><i>(a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or (b) 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 this Notice applies.”</i></p> <p>I.e., bulk sampling activities.</p>
<p><b>Stockpiling of sediment from pits and box cuts</b></p> <p>Sediment to be removed during pitting and box cuts will be put aside to be replaced after inspection and logging has been completed. As the sediment can be stored on existing disturbed areas (remainder of the pits/ box cuts), no additional surface area will be disturbed.</p>	n/a		No listed activity triggered
<p><b>Stockpiling of topsoil</b></p> <p>Topsoil (300 mm) is to be removed during pitting and box cuts and will be put aside to be replaced after inspection and logging has been completed. Topsoil per pit is expected to be 1.2 m<sup>3</sup>. Assuming that the height of each stockpile is 1 m, and that only three pits will be open at any given time, the total surface area of the stockpile for pits will be 3.6 m<sup>2</sup></p> <p>Topsoil per box cut is expected to be 187,5 m<sup>3</sup>. Assuming that the height of each stockpile is 1 m and that only one box cut will be open at</p>	3.6 m <sup>2</sup> and 187.5 m <sup>3</sup> , respectively for pits and box cuts.		No listed activity triggered

any given time, the total surface area of the stockpile for box cuts will be 187.5m <sup>3</sup> .			
<p><b>Clearance of indigenous vegetation</b></p> <p>The land in question is agricultural, disturbed land with little or no indigenous vegetation. Prospecting activities would preferably occur on tracks and on land which has already been disturbed by agricultural activities. No clearance of indigenous vegetation is therefore anticipated during prospecting. However, should indigenous vegetation have to be cleared, this will trigger a listed activity as several areas classified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) have been identified within the proposed site. Prospecting activities within these areas should be avoided.</p>	2 127 m <sup>2</sup>	X	<p><b>1) Listing Notice 3 (GNR 546 as amended by GN324 of 2017): Activity 12:</b> <i>“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:</i></p> <p><i>i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</i></p> <p><i>ii) Within critical biodiversity areas identified in bioregional plans;</i></p> <p><i>v) On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.”</i></p>
<p><b>Access routes</b></p> <p>Only existing roads will be used and vehicles parked next to roads from where laborers will carry hand tools to pit sites.</p> <p>During box cutting activities, should there be no road, the excavator will enter and exit on the same path. Average distance from closest farm road to box cut area is about 200 m. Assuming the “road” that will be disturbed is 2 m in width, the total disturbed area will be 1200 m<sup>2</sup> for the three box cuts.</p> <p>Should road rehabilitation be necessary, this will be done and includes raking the loose topsoil and adding fertiliser.</p>	1200 m <sup>2</sup>		No listed activity triggered

<p><b>Site office/ Camp site/ Infrastructure</b> No infrastructure, site office or camp site will be erected on site. Given the proximity of Lepelsfontein to the area (approximately one kilometre), should infrastructure be required, this will be set up in the town.</p>			No listed activity triggered
<p><b>Ablution facility</b> Temporary Ablution facilities will be rented from a contracting company and cleaning and collecting will be contractor's obligation. Total Disturbed area for ablution facility is 2 m x 2 m = 4 m<sup>2</sup></p>	4 m <sup>2</sup> over the area of 8 366 ha		No listed activity triggered
<p><b>Accommodation</b> Accommodation for senior personnel will be rented in the town of Lepelsfontein which is 1 km from the Prospecting area. No accommodation will be required for laborers as they will most probably all come from the Lepelsfontein area.</p>	n/a		No listed activity triggered
<p><b>Equipment storage</b> Digger loader to be parked on demarcated box cut area when not in use and to exit on same path where it entered. Digger loader max dimensions will be 7 x 2.5 m. Given the proximity of Lepelsfontein to the area (approximately one kilometre), all equipment / tools required will be stored and transported from the town to site as and when required.</p>	17.5 m <sup>2</sup> . No additional area will be disturbed as loader will be parked on a box cut.		No listed activity triggered
<p><b>Sample storage</b> No samples will be stored on site. All samples will be sent to Mintek laboratory for analyses.</p>	n/a		No listed activity triggered
<p><b>Water Use</b> Water, for dust suppression, will be legally sourced (for example from a municipal source) and transported by means of a water tanker if needed. No water use licence will be needed for prospecting activities and all water courses, wetlands and or dams/ will be appropriately buffered and avoided as per the National Water Act.</p>	n/a		No listed activity triggered
<p><b>Non Invasive: Quality and Resource Estimate</b></p>			No listed activity triggered
<p><b>Non Invasive: Mining Right or Closure Application</b></p>			No listed activity triggered
			<b>1) Listing Notice 1: (GNR 544, as amended by GN327) Activity 22.</b>

		<p><i>“The decommissioning of any activity requiring –</i></p> <p><i>(ii) a prospecting right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure;</i></p> <p><i>but excluding the decommissioning of an activity relating to the secondary processing of a –</i></p> <p><i>(a) mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource...”</i></p>
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## 5.5 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)

### 5.5.1 Minerals to be prospected for

**Table 5.1** Details relating to the proposed prospecting, including minerals to be prospected and location details.

ITEM	DETAIL
<b>Type of mineral(s)</b>	silica sand (silica) silica sand (general) silcrete (silica) metallurgical silica kaolin (clay) glass sand foundry sand (silica) filling sand crusher sand (silica) concrete sand (silica) building sand (silica)
<b>Locality</b>	The application area covers 8,366 ha of land in the Western Cape of South Africa. The nearest towns are Lepelfontein and Kotzesrus in the Northern Cape, situated approximately 1.3 km and 10 km north west of the proposed area. The Western Cape towns closest to the area is that of Rietpoort 13 km east and the Olifants River Settlement and Lutzville, approximately 50 km southeast.

<b>Extent of the area required for prospecting</b>	The area applied for is 8 366 ha in extent. Approximately 3540 m <sup>2</sup> or 0.354 ha of this area is expected to be disturbed, i.e., 0.004% of the area applied for.
<b>Geological formation</b>	<p>On a Regional scale the Bitterfontein area is covered by a complex of pink gneisses, granulites metamorphic rocks, which were created by a cycle of metamorphism, metasomatism and granitisation of the Malmesbury sediments. Post Nama faulting is evident in the north-eastern and eastern portions of the Bitterfontein area, striking in a general south-easterly direction. Fault planes are often filled by quartz veins that form prominent outcrops. Kaolinisation appears to have been controlled to a large extent by the presence of these fault zones and many large kaolin deposits are located on or near these faults. The geological formation therefore comprises quartzite, fillite and limestone of the Malmesbury formation which is exposed in the south-eastern part of the area.</p> <p>These rocks are essentially composed of feldspar and quartz and were readily amendable to kaolinisation. The majority of the kaolin deposits of the Bitterfontein area were therefore derived from the gneisses. Typical examples occur on Erd Vark Gat, Niewoudts Naauwte, Vleifontein, Stuurman and Elandsfontein. D J Erasmus, August 2009.</p>

### 5.5.2 Description of the proposed activities

The proposed prospecting programme is anticipated to be completed within five (5) years. Sampling will be conducted in five phases and include a combination of non-invasive (activities that do not disturb the land) and invasive activities (activities that will result in disturbances to the land) to detect and analyse mineralisation and deposits, which are known to contain kaolin and silica.

***Planned Non-Invasive Activities will include the following:***

- Desktop study;
- Geological mapping (aerial photography, aeromagnetic surveys);
- Quality and Resource Estimate; and
- Application for Mining Right OR Closure Application (depending on viability of resource).

***Planned Invasive Activities will include the following:***

- Pit sampling (pitting); and
- Box cutting (collecting large samples which constitutes bulk sampling activities);

***The five sampling phases will include:***

- **Phase 1:** Desktop Study
- **Phase 2:** Geological mapping
- **Phase 3:** a) Pit sampling  
b) Box cut sampling
- **Phase 4:** Quality and resource estimation
- **Phase 5:** Application for Mining Right OR Closure Application

### **5.5.2.1 Phase 1: Desktop Study**

A comprehensive literature review will be undertaken to investigate the depositional environments, sediment stratigraphy and geological units of the area. Data will be obtained from a variety of sources including maps, aerial photographs, previous prospecting campaigns and rights holders in neighbouring areas, published papers, data from field surveys, databases, etc. Most of the work will be off site. This review will allow the applicant to identify target sites that are likely to contain kaolin and silica deposits. It will also enable the applicant to identify potential challenges and the best means to address these challenges with a view to minimising environmental impacts and costs. This will allow for a more efficient and effective prospecting sampling programme. Results will be compiled in a Geological Report for further investigation.

### **5.5.2.2 Phase 2: Geological mapping**

Geological mapping (surface mapping) is done by the Geologist and comprises walking and physically surveying the area in addition to using existing aerial photography to create a map of what is observed and the topography (including the dip, strike and extent of any surface outcrop, the soil and vegetation in the area, etc.). This phase will identify the possible extent of surface mineralization, the potential locations where invasive activities could be conducted and to what extent pitting can be done. The information will also be reviewed by the Environmental Control Officer/ Scientific Officer to identify areas that need to be avoided during sampling. No physical or environmentally destructive impacts on the environment are anticipated from this survey method.

### **5.5.2.3 Phase 3: a) Pitting**

Positions of pits will be determined by the surface map which will be produced by the Geologist. The provisional proposed locations and coordinates of each pit are presented in Figure 5-3 and Table 5.2, below. A total of 63 pits (2 m x 2 m x 2 m) will be dug. Each pit will have a surface area of 4 m<sup>2</sup> and a volume of 8 m<sup>3</sup>. The 63 pits will disturb a total area of 252 m<sup>2</sup> and a total volume of 504 m<sup>3</sup>. Pits will be dug in straight lines approximately 1 km apart, perpendicular to mineralization to confirm the width of the mineralization. The Geologist will sample the pits vertically at 1-meter intervals with side wall logging. This will give a rough estimate of the tonnage of surface mineralization visible as well as quality zones. It will also identify target areas for box cutting samples. Pitting will be done by members of the local community and with hand tools including shovels, pickaxes, jack hammers and small generator (5.5 Kw), wherever possible. Should the task be impossible to achieve manually and with hand tools, a digger loader will be used. For safety purposes, pits should be filled immediately after logging and inspection and no more than three pits should be open at any given time. Should pits need to remain open, it should be fenced off to avoid injury and loss to animals and humans.

An estimated 300 mm of topsoil will be removed from each pit and kept aside to be replaced after pit inspection and logging. Approximately 1.2 m<sup>3</sup> of topsoil is expected to be removed per pit. Assuming that the height of each stockpile is 1 m, and that only three pits will be open at any given time, the total surface area of the stockpile for pits will be 3.6 m<sup>2</sup>. Although little to no dust generation is expected, but dust suppressing measures will be in place. This will include spraying the ground and

samples with water to avoid dust generation. Only existing roads will be used and vehicles transporting laborers will be parked as close to the road as possible. From here, the laborers will carry hand tools/ equipment to pit sites.

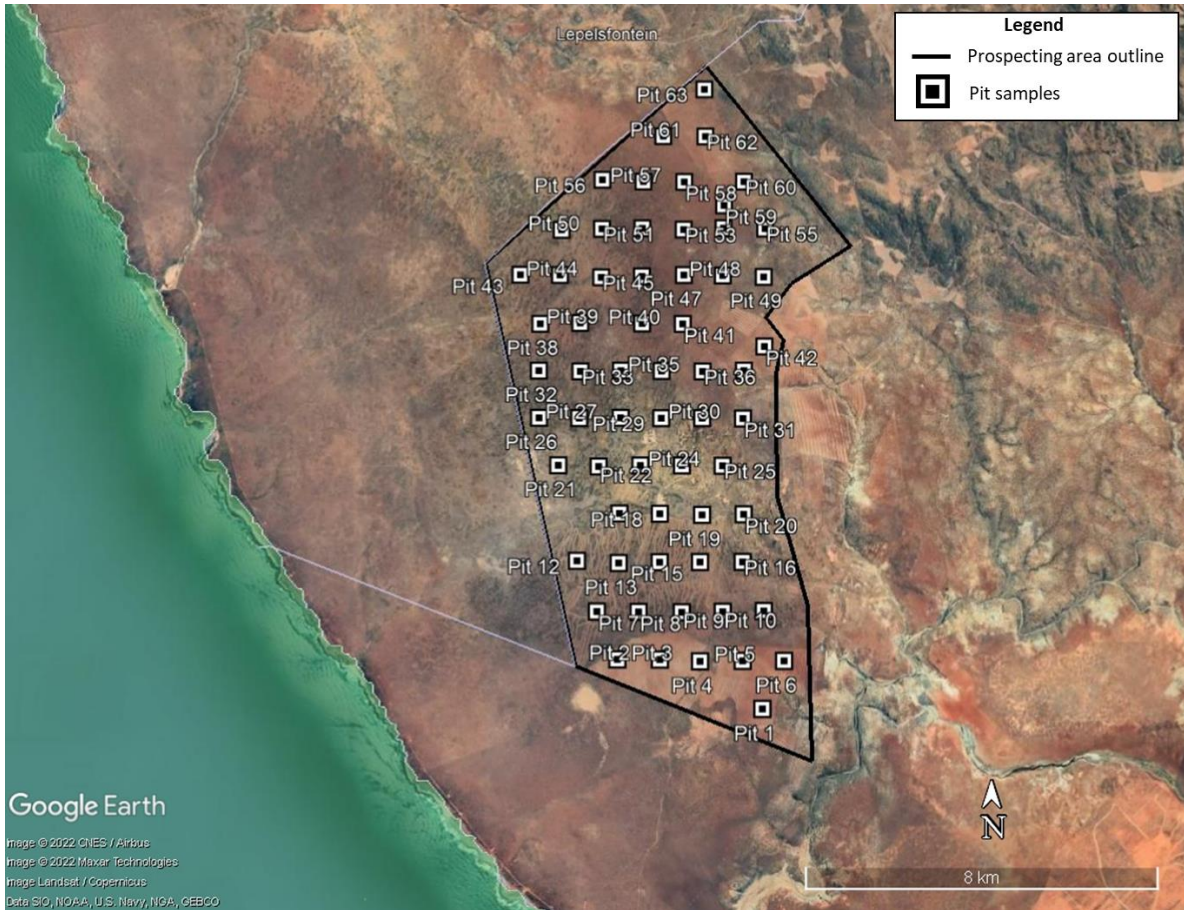


Figure 5-3 Proposed locations of the 63 pits in the prospecting area. See coordinates of each pit in Table 5.2..

Table 5.2 Coordinates of each of the 63 proposed pits.

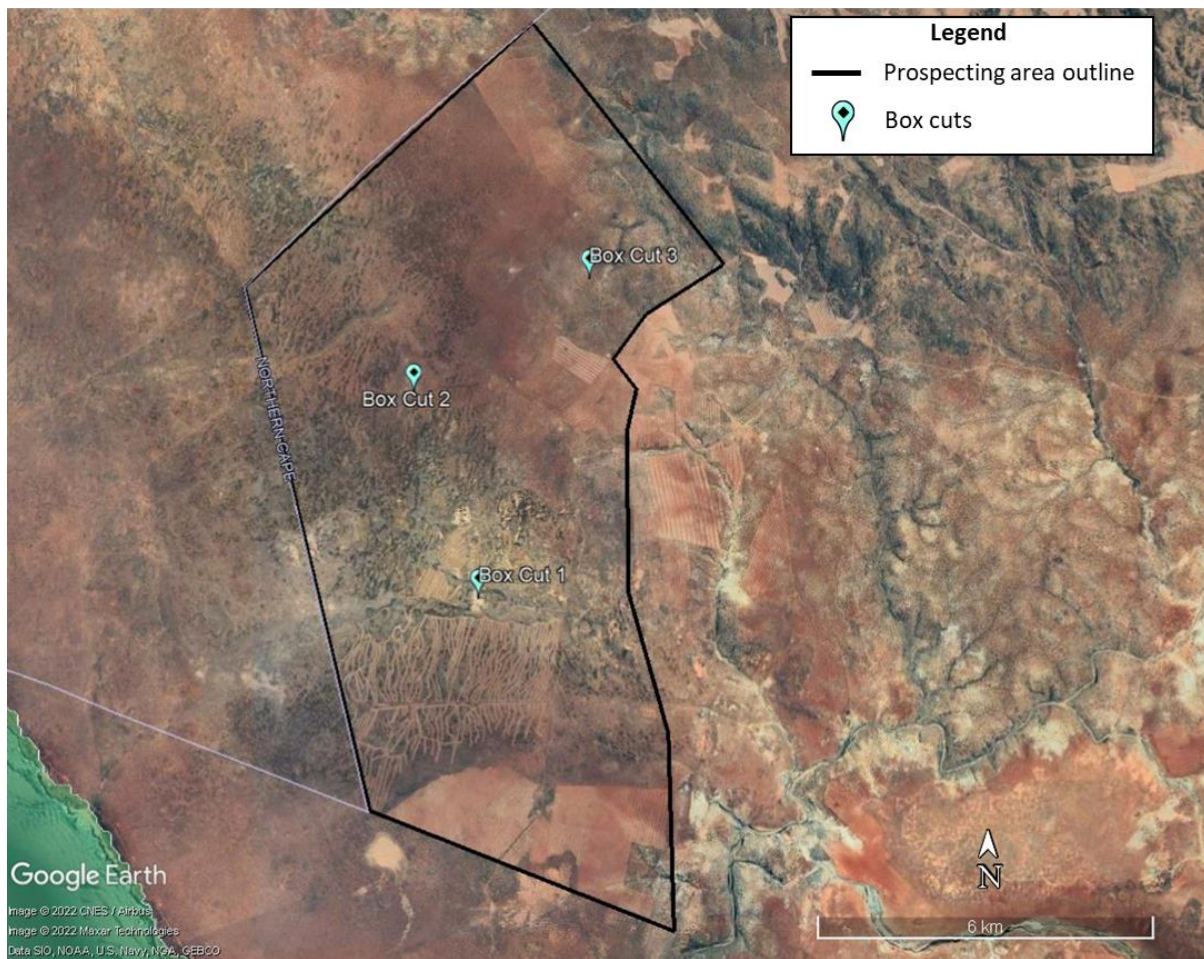
Pit No.	Latitude	Longitude
1	-31.185080°	17.880054°
2	-31.175008°	17.845118°
3	-31.175044°	17.855346°
4	-31.175415°	17.865020°
5	-31.175322°	17.875279°
6	-31.175329°	17.885234°
7	-31.165242°	17.840059°
8	-31.165325°	17.850111°
9	-31.165402°	17.860536°
10	-31.165303°	17.870412°
11	-31.165150°	17.880323°
12	-31.154832°	17.835099°
13	-31.155289°	17.845188°
14	-31.155130°	17.855095°
15	-31.155100°	17.864853°
16	-31.155077°	17.875159°

Pit No.	Latitude	Longitude
17	-31.145073°	17.845251°
18	-31.145140°	17.855037°
19	-31.145373°	17.865280°
20	-31.145260°	17.875355°
21	-31.135070°	17.830262°
22	-31.135324°	17.840074°
23	-31.135123°	17.850205°
24	-31.135122°	17.860310°
25	-31.135194°	17.870192°
26	-31.125175°	17.825425°
27	-31.125237°	17.835223°
28	-31.125188°	17.845296°
29	-31.125269°	17.855191°
30	-31.125266°	17.865157°
31	-31.125349°	17.875086°
32	-31.115291°	17.825205°
33	-31.115452°	17.835353°
34	-31.115306°	17.845253°
35	-31.115390°	17.855178°
36	-31.115487°	17.865183°
37	-31.115314°	17.875265°
38	-31.105432°	17.825390°
39	-31.105264°	17.835168°
40	-31.105382°	17.850312°
41	-31.105479°	17.860247°
42	-31.110245°	17.880257°
43	-31.095049°	17.820340°
44	-31.095109°	17.830045°
45	-31.095616°	17.840169°
46	-31.095417°	17.850156°
47	-31.095136°	17.860443°
48	-31.095235°	17.869985°
49	-31.095548°	17.880022°
50	-31.085512°	17.830284°
51	-31.085306°	17.840223°
52	-31.085199°	17.850161°
53	-31.085474°	17.860299°
54	-31.085174°	17.870100°
55	-31.085280°	17.880335°
56	-31.074820°	17.840185°
57	-31.075208°	17.850291°
58	-31.075293°	17.860362°
59	-31.080320°	17.870205°
60	-31.075243°	17.875079°
61	-31.065455°	17.855092°
62	-31.065538°	17.865502°
63	-31.055369°	17.865176°

#### 5.5.2.4 Phase 3: b) Box cuts

Three bulk samples (box cuts) will be conducted. Box cutting is considered bulk-sampling due to the large size and volume of the samples. The exact locations of box cutting samples will only be established after pitting, although the proposed locations and coordinates of each box cut are presented in Figure 5-4 and Table 5.3, below.





**Figure 5-4** Proposed locations of the three box cuts in within the prospecting area.

Each box cut will be 25 m x 25 m in size and have a depth of up to 5 m. It will therefore have a maximum surface area of 625 m<sup>2</sup> and a volume of 3 125 m<sup>3</sup>. The three box cuts will disturb a total area of 1 875 m<sup>2</sup> and a total volume of 9 375 m<sup>3</sup>. This sampling will be done using a digger loader/ excavator and by an experienced contractor. It will be supervised by a Geologist to ensure the correct sampling procedure, handling of samples for splitting and logging.

An estimated 300 mm of topsoil will be removed from each box cut and kept aside to be replaced after inspection and logging. Approximately 187.5m<sup>3</sup> of topsoil is expected to be removed per sample. Assuming that the height of each stockpile is 1 m and that only one box cut will be open at any given time, the total surface area of the stockpile for box cuts will be 187.5m<sup>2</sup>. This activity is expected to generate dust and as such, dust suppressing measures will be put in place. This includes spraying the ground and samples with water to avoid dust generation. Water will be legally sourced such as from a municipal source and transported by means of a water tanker if needed. Only existing roads closest to the sampling sites will be used. The average distance from the closest farm road to a box cut area is approximately 200 m. Assuming the pathway that will be disturbed is 2 m in width, the total disturbed area is estimated to 1200 m<sup>2</sup> during the box cutting activities. The excavator will be parked on demarcated box cut area when not in use and exit on same path as entered. Should road rehabilitation be necessary, this will be done and includes raking the loose topsoil and adding fertiliser.

For safety purposes, only one box cut will be open at any given time. As it is anticipated that the box cut will remain open for several days, it will be fenced when not being inspected to prevent injury or loss to human and animal life.

#### 5.5.2.5 Phase 4: Quality and Resource Estimate

All samples collected during Phase 3 will be analysed at the accredited laboratory, Mintek. The samples will be tested specifically for its filler and coating properties. The primary tests to which the samples will be subjected include:

- Colour enhancement of the clay by means of chemical treatment (bleaching);
- Elasticity;
- Cracking after firing;
- Particle size distribution;
- Chemical Analysis;
- Physical Separation/ Magnetic Separation to improve quality; and
- Mineralogy tests.

This information together with results obtained during Phase 1 and 2 will be used for resource estimation.

#### 5.5.2.6 Phase 5: Mining Right or Closure Application.

The outcome of this phase will be dependent upon the results of Phase 1–4. Should results indicate an economically viable resource, the Applicant will commence with a Mining Rights Application. Should results indicate otherwise, a closure certificate application will be submitted.

### 5.5.3 Description of bulk sampling activities

This activity requires that an application IN TERMS OF Section 20 of the Act is specifically included in your application for a prospecting Right and cannot be proceeded with if such permission is not specifically granted. (Bulk sampling is a sampling technique ONLY- it cannot be used to conduct mining operations. The following table must be completed for Bulk Sampling)

**Table 5.3 Bulk Sampling Activities.**

ACTIVITY		DETAILS		
Number of pits/trenches planned		3 Pits (Box Cuts)		
Dimensions of pits/trenches, per pit/trench	Number of pits/trenches	Length	Breadth	Depth
	3 Box Cuts	25 m	25 m	5 m
Locality		Box Cut No.	Latitude	Longitude
		1	31.142354°	17.855096°
		2	31.109479°	17.843027°

	3	31.091249°	17.875856°
Volume Overburden (Waste)	187 cubic meters per pit		
Volume Ore	2.937 cubic meters per pit		
Density Overburden	2300 kg per cubic meter		
Density Ore	2200 kg per cubic meter		
Phase(s) when bulk sampling will be required	Phase 3 (Invasive)		
Timeframe(s)	6 months (months 24-30)		

## 5.6 Policy and Legislative Context

**Table 5.4 The most important legislation applicable to prospecting in this area.**

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
<p><b>Constitution of South Africa</b></p> <p>This is the supreme law that provides the legal framework for the existence of the Republic of South Africa.</p>	<p>Throughout the entire prospecting process</p>	<p>The conducting of prospecting activities in the area shall be done in such a manner that avoids significant environmental impacts. In instances where this cannot be avoided, impacts must be minimised or mitigated in order to protect the environmental rights of South Africans.</p>
<p><b>National Environmental Management Act, 1998.</b></p> <p>NEMA sets out a number of governing environmental principles that should be taken into account and applied by all organs of state when making decisions that significantly affect the environment. It provides the minimum requirements for the procedures for investigating, assessing and communicating the potential impacts of activities on the environment and society and for the granting of Environmental Authorisation for any activity. It requires that any activity should not only be environmentally sustainable, but economically and socially as well. The cultural, social, economical, psychological, developmental and physical needs of people should be considered along with the environment.</p>	<p>Throughout the entire prospecting process</p>	<p>An Environmental Impact Assessment Process will be conducted, and the appropriate environmental authorisation obtained before commencing with any activities. Measures will be taken to ensure that the activity preserves and promotes the environmental and socioeconomic integrity of the area. Interested and Affected Parties (I&amp;APs) will be consulted and informed about the proposed activities and their potential impacts (both positive and negative). Comments received from I&amp;APs will be communicated to the authorities for consideration as part of the Basic Assessment Report.</p>
<p><b>Environmental Impact Assessment (EIA) Regulations, 2014 (as amended).</b></p> <p>The EIA regulations, 2014 (as amended) promulgated in term of Chapter 5 of NEMA controls certain listed activities. These activities are published as Listing Notice (LN) 1 in Government Notice (GN) No. R983 (as amended) as LN 2 in GN No.R 984 (as amended) and as LN 3 in GN No. R985 (as amended). These activities are prohibited until Environmental Authorisation (EA) has been granted by the competent authority. Activities triggered under LN 1 and 3 requires that a Basic Assessment be conducted, while activities triggered under LN 2 requires that a Scoping and Environmental Impact Assessment Report be conducted.</p>	<p>Throughout the entire prospecting process</p>	<p>The proposed project triggers Listing Notice (LN) 1, 2 and 3. An Environmental Impact Assessment Process will be undertaken and a Environmental Impact Report and EMPr submitted as part of the application for EA. No activity will commence before EA has been granted by the Competent Authority.</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
See the Department of Environmental Affairs and Development Planning. 2011. EIA guideline and Information document series: Information document on biodiversity offsets		
<p><b>Mineral and Petroleum Resources Development Act, 2002.</b></p> <p>In terms of this Act, a Prospecting Right must be obtained before any prospecting activities may commence</p>	Throughout the entire prospecting process	The applicant must submit a prospecting right application in terms of Section 16 (1) of this Act, along with an application for Environmental Authorisation (EA) to the Regional Manager. The prospecting right application must be accepted within 14 days, provided that no other entity or person holds a Prospecting Right, Mining Right, Mining Permit or Retention Permit for the same land and mineral. Once the application is accepted, an Environmental Impact Assessment Process, including stakeholder consultation and reporting, must be conducted as per Chapter 5 of the National Environmental Management Act, 1998 (NEMA).
<p><b>National Environmental Management: Air quality Act, 2004.</b></p> <p>The purpose of this act is to “reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto”.</p>	Throughout the entire prospecting process	This activity is not expected to have a negative impact on air quality. Regardless, all contractors and employees will be subjected to an environmental awareness campaign to manage potential air pollution.
<p><b>National Environmental Management: Waste Act, 2008.</b></p> <p>This act regulates waste management to ensure the prevention of pollution and ecological degradation to protect the health and the environment.</p>	Throughout the entire prospecting process	The client must ensure that this act is adhered to throughout the entire process.
<p><b>National Heritage Resources Act, 25 of 1999.</b></p> <p>In terms of this act, the responsible heritage resources authority should be informed of the activities.</p>	During coring, drilling and grab sampling	A heritage impact assessment should be conducted to ensure that there are no substantial impacts on heritage sites. No prospecting activities shall take place within 50 m of any identified heritage resources.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
<p><b>Companies Act 71 of 2008</b></p> <p>The aim of this act is to:</p> <ul style="list-style-type: none"> <li>provide for the incorporation, registration, organisation and efficient management of companies, the capitalisation of profit companies, and the registration of offices of foreign companies carrying on business within the Republic;</li> <li>record-keeping and reporting by companies;</li> </ul>	<p>Throughout the entire prospecting process</p>	<p>The client must ensure that this act is adhered to throughout the entire process.</p>
<p><b>Restitution of Land Rights Act 22 of 1994</b></p> <p>The Act provides for the restitution of rights to land to persons or communities dispossessed of their rights after 19 June 1913 as a result of historical racially discriminatory laws and practices</p>	<p>Throughout the entire prospecting process</p>	<p>The client must ensure that this act is adhered to throughout the entire process.</p>
<p><b>National Water Act 36 of 1998</b></p> <p>South Africa’s waters are governed by the Water Services Act of 1997 and the National Water Act (NWA) of 1998. The NWA requires that certain water users obtain a license with the Department of Water Affairs and follow specific requirements.</p> <p>Activities that typically require water use licenses are abstraction of water from dams or boreholes for irrigation, forestry operations, discharging waste water into water courses and altering the physical structures of rivers and streams.</p>	<p>Throughout the entire prospecting process</p>	<p>As per the definitions of the act, a “water resource” includes a watercourse, surface water, estuary, or aquifer. “Aquifer” means a geological formation which has structures or textures that hold water or permit appreciable water movement through them. “Watercourse” means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which, water flows; and any collection of water which the Minister may, by notice in the Gazette declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks. Waste “includes any solid material or material that is suspended, dissolved or transported in water (including sediment) and which is spilled or deposited on land or into a water course in such volume, composition or manner as to cause, or to be reasonably likely to cause, the water resource to be polluted”.</p> <p>No water use licence will be needed for prospecting activities and all water resources will be appropriately buffered and avoided as per the National Water Act.</p>
<p><b>The Occupational Health and Safety Act No. 85 of 1993</b></p> <p>The Act governs health and safety at all workplaces. It is focused on the health and safety of persons at work and places the responsibility on employers “to do everything reasonably practical” to protect the welfare of their employees</p>	<p>Throughout the entire prospecting process</p>	<p>The client has to ensure that they adhere to the conditions set out in this act throughout the entire process. They also have to appoint a Health and Safety Officer to supervise the health and safety performance of the company, as well as to represent the employer and management at Health and Safety Committee meetings.</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
<p>The Act requires that every company with more than 20 employees has to have a health and safety committee, which should be tasked with identifying potential hazards, examining the causes of any workplace incidents, investigating employee complaints and consulting with health and safety inspectors. The Act also directs employers to provide and establish precautionary measures and systems to prevent workplace injuries.</p>		
<p><b>National Environmental Management: Protected Areas Act</b> <i>"To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes"</i></p>	<p>Throughout the entire prospecting process</p>	<p>Results from the Screening Report and specialist impact assessments should be taken into consideration to avoid prospecting in a protected area or area of conservation concern.</p>
<p><b>National Environmental Management: Biodiversity Act 10 of 2004.</b> This act provides legal protection and management of South Africa's biodiversity and ecosystems that are threatened and in need of protection within the context of the National Environmental Management Act and the sustainable use of biological resources.</p>	<p>Throughout the entire prospecting process</p>	<p>Strict compliance with the EMPr should be adhered to and mitigation measures implemented to reduce disturbance of biodiversity and aid in recovery.  Results from the Screening Report and specialist impact assessments should be taken into consideration to avoid prospecting in a critical biodiversity area or areas of conservation concern.</p>
<p><b>Relevant specific environmental management Act (SEMA(s)) and their regulations.</b> This refers to and includes subordinate regulations made in terms of section 1 of NEMA and specifically refers to the Protected Areas, Biodiversity, Air Quality and Waste Acts.</p>	<p>Throughout the entire prospecting process</p>	<p>Applicable SEMA acts should be taken into account during the planning and design phase so that appropriate protocols are developed and maintained during the operational phase such as for waste management and protection of biodiversity areas.</p>
<p><b>CapeNature Western Cape Biodiversity Spatial Plan (WCBSP, 2017)</b> A spatial assessment and biodiversity plan that is delineated on a Geographic Information System map that includes Critical Biodiversity,</p>	<p>Planning and Design Phase</p>	<p>This spatial plan should be taken into account during the plan and design phase to inform areas for prospecting and activities should be adjusted accordingly.</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
Ecological Support Areas to inform sustainable development in the Western Cape.		
<p><b>The Western Cape Provincial Spatial Development Framework (2014) (Department of Environmental Affairs &amp; Development Planning)8</b></p> <p>This includes land development policies, strategies, objectives as well as growth and development strategies for the province, all of which are spatially represented.</p>	Throughout the entire prospecting process	This legislative framework should be taken into account to promote growth and development of local communities and should be considered during the planning and design phase.
<p><b>The Mining and Biodiversity Guideline (2013)</b></p> <p>Outlines six principles that should be applied during any stage of the mining for decision-making. The document uses biodiversity information for decision-making throughout the mining cycle</p>	Throughout the entire prospecting process	This should be employed to provide a practical guideline when making decisions regarding impacts to biodiversity with respect to the prospecting activities.
<p><b>The Western Cape Land Use Planning Guidelines: Rural Areas (2019)</b></p> <p>Aims at Safeguarding priority biodiversity areas and their functionality and ecological infrastructure and ensuring sustainable development in rural locations throughout the Western Cape</p>	Throughout the entire prospecting process	This guideline will inform the planning and design of the prospecting survey and can be used to develop protocols for implementation in the operation phase.
<p><b>Western Cape Guideline on Biodiversity Offsets</b></p> <p>DEA&amp;DP 2015. Western Cape Guideline on Biodiversity Offsets. Prepared by Susie Brownlie and Mark Botha for DEA&amp;DP, Cape Town12</p>	Throughout the entire prospecting process	This guideline should be used during the planning and design phase such that residual impacts of the prospecting activity on biodiversity should be reduced.



## 5.7 Need and desirability of the proposed activities.

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

The global population increases by approximately 83 million people every year. This has led to an increased need for goods and services such as food products, houses, transport, healthcare, schools, etc., and has, in turn, driven technological progress and advances, industrialisation, globalisation and consumerism. Unfortunately, the impacts of globalisation, industrialisation and consumerism are complex. Though it is key in economic growth and innovation and in meeting the everyday needs of people, thereby benefiting society as a whole, it also has numerous wide-ranging negative social (mental health and moral) and environmental impacts. One of the roles of Environmental Assessment Practitioners is to assess, mitigate and manage the impacts of globalisation and industrialisation as best possible.

Industrialisation is the shift from a predominantly agricultural economy and society to one dominated by mass-production and technologically advanced goods and services. This has increased our incomes, standards and quality of living and need for recreation and leisure. Globalization is the increased interdependence of the world's economies and cultures, and the trade in technology, goods, services and information to meet the growing needs of the growing population. This has further led to a culture of consumerism, where there is an increasing encouragement and desire for the acquisition and consumption of goods and service. Unfortunately, the growing world and South African population and associated growing needs, requires an increase in products to meet these needs. Examples include transportation, fuel, cell phones, laptops, farming equipment, houses, paper, factories for production of goods, etc. Materials used in the production of these products are mostly sourced from the environment. South Africa possesses some of the world's richest resources, minerals and several other commodities, which has the potential to supply the international markets (Minerals and Mining Policy for South Africa, 1998). According to the Minerals and Mining Policy for South Africa, 1998, the national mining industry is said to be one of the few "world-class industries" in the country with the potential to create broad scale employment opportunities and wealth.

The Bitterfontein area (north-western part of the Western Cape) is covered by a complex of pink gneisses, granulites and metamorphic rocks. Fault planes are evident in the north-eastern and eastern portions of the Bitterfontein area, often filled by quartz veins that form prominent outcrops and many large kaolin deposits are located on or near these faults. Xwena Kaolin is proposing to prospect for kaolin and silica minerals which are considered pivotal in today's modern society and everyday life.

Kaolin, also known as China clay, is a type of nearly white, very fine clay (due to its small particle sizes) that occurs in nature. The name come from the hill in south-eastern China, Kao-ling, where the clay was originally discovered and used mainly to make porcelain or China. Kaolin comprises mainly the mineral kaolinite. This mineral is a hydrous aluminium silicate which has been formed by the decomposition of other minerals. Kaolin deposits are found throughout the world and vary in viscosity, whiteness and characteristics. Interestingly, the best quality and deposits are not found in China, but in other parts of the world. Kaolin, contrary to popular belief, is not only used in the making of Porcelain, China, and crockery, but in a plethora of other products.

There is a need and demand for high quality kaolin in South Africa and worldwide. The paper industry represents the largest market where this mineral is used to improve the gloss, whiteness, brightness and smoothness of paper. It is also used as a filler to reduce production costs and the amount of wood

required. Kaolin is frequently used in modern medicine, specifically to induce and accelerate blood clotting. This mineral is still being used in gauze manufactured for the US military. Kaolin has a variety of other uses in products including rubber, cable insulation, paint, fertilizers, toiletries (toothpaste, and soap), cosmetics (make-up and skin barrier creams) and light bulbs. This mineral is used in organic farming practices to protect crops and in waste-water treatment works to adsorb pollutants.

The prospecting phase for this project will essentially be used to determine the quality of the resource in the proposed area, i.e., the reflectivity (whiteness), viscosity, abrasiveness, plasticity, firing and hiding power. The results of these tests will determine to what extent the product can be used within the paper, ceramics and other industries.

Silica sand, also known as quartz sand, consists of small pieces of quartz and other minerals including clay, salt and silt. Chemically, it comprises silicon dioxide (SiO<sub>2</sub>) or more specifically, the elements silica and oxygen. Silica sand has a number of different uses in everyday life across multiple industries and can be deemed pivotal in today's life. Its uses depend on its chemical, physical and mechanical properties including shape, strength, structure, grain size, stability, colour and distribution. Silica sand is most commonly used in water filtration systems and is the primary component of glass (windows, bottles, jars, etc.). The physical and chemical properties of silica sand give it the ability to increase the durability and structural integrity of products, act as a sealant and improve the quality and appearance. It is therefore the main structural component in materials such as ceramics, crockery, tiles, and cement and also added to paint. Other common uses include landscaping, developing natural and synthetic sports fields, backfill for electrical lines, as a metal casting and as a mineral abrasive for industrial sand blasting.

For years, mining has been the driving force behind South Africa's economy and continues to make a valuable contribution to the country's GDP. The proposed development is aimed at supporting the economy of South Africa by producing a commodity that has a potential to leverage the economy of the country. The primary beneficiaries of this project include, among others, the employees, members of surrounding communities and the country. Secondary beneficiaries include the suppliers of goods and services, and the local businesses through the buying power of employees.

Mineral prospecting also aligns itself with two national policies: The National Development Plan 2030 (NDP) and Operation Phakisa. The main objective of the NDP is to alleviate poverty and inequality amongst South Africans through faster and inclusive growth development. A manner of achieving this is to focus on South Africa's already unprecedented amounts of natural resources and creating opportunities that will advance the NDP strategy. Mining is identified in the NDP as an industry that has large potential for growth and employment opportunities and for it to continue to contribute largely to the South African economy, new mineral resources need to be identified through prospecting.

Operation Phakisa was established to facilitate and boost the growth of the economy to help achieve the objectives of the NDP, and to operate across industries. Mining Phakisa is a programme established under this operation whose objective is to warrant the economic sustainability of the South African mining industry and to promote the growth and contribution thereof at a national level. Both of these frameworks promote the sustainable use of the country's natural resources as well as the conservation, preservation and restoration of the environment.

The applicant estimates that these small pieces of land could, if prospecting rights are granted, prove to bear commodities of high economic value. Only small portions of the farms that are targeted will be temporarily disturbed. The remainder of the farm portions will proceed as normal.

In terms of the above, it is evident that mining-related activities are deemed to be a key component of the current national and provincial economies and future mining projects are a means to assist Governments in meeting broader societal needs. It is important to remember that potential future mining is still years down the line and that the current application process is focused on prospecting which is a key initial step in the mining process and necessary for scientific knowledge, environmental baseline data, resource estimation and planning.

## **5.8 Period for which the environmental authorisation is required**

The overall prospecting programme would run over a five-year period.

## **5.9 Full description of the process followed to reach the proposed preferred 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.

The National Web based Environmental Screening Tool and the SANBI BGIS database was consulted to identify any areas of conservation concern within the larger site that need to be avoided. Comments received from stakeholders during the Public Participation Process will further elucidate areas that need to be avoided. Specialists will make further recommendations on areas that need to be avoided. The preferred alternative pit and box cut locations within the site is thus subject to change pending a site visit by the EAP, Specialists and results from the consultation with stakeholders. No infrastructure will be placed on site.

### **5.9.1 Details of all alternatives considered and motivation for the overall preferred site, activities and technology alternative.**

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

- (a) the property on which, or location where, it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

**a) the property on which, or location where, it is proposed to undertake the activity**

Companies can only apply for prospecting and/ or mining rights within areas where such rights are not in possession of other rights holders. Furthermore, these activities are dependent upon the presence of the desired minerals which are again dependent upon geological formations. As the intention of the proposed prospecting operations is to determine the presence of economically viable kaolin and silica deposits that occur in South Africa, an area known to contain these resources needs to be selected. Kaolin deposits are only present in specific geological formations, which are only present in certain areas within South Africa. On a Regional scale the Bitterfontein area is covered by a complex of pink gneisses, granulites metamorphic rocks (quartzite, fillite and limestone), which were created by a cycle of metamorphism, metasomatism and granitisation of the Malmesbury sediments. These rocks are essentially composed of feldspar and quartz and were readily amendable to kaolinisation. Fault planes are evident in the north-eastern and eastern portions of the Bitterfontein area, and often filled by quartz veins that form prominent outcrops. Kaolinisation appears to have been controlled to a large extent by the presence of these fault zones and many large kaolin deposits are located on or near these faults. The majority of the kaolin deposits of the Bitterfontein area were therefore derived from the gneisses (Erasmus 2009). It is this geological formation which is of interest to the modern kaolin mining industry. No further location alternatives are considered in the Scoping and EIA process.

**b) the type of activity to be undertaken**

Alternatives which exist in terms of the activities include prospecting by means of bulk sampling or prospecting without bulk sampling. Sampling will be conducted using a combination of non-invasive and invasive activities, of which the latter will include pit sampling (pitting), and box cutting (collecting large samples which constitutes bulk sampling activities). These methods have been developed through many years of research and development by the mining industry and are the preferred methods for resource estimation and cannot easily be replaced by any other methods.

**c) the design or layout of the activity**

Areas of conservation concern will be avoided. The preferred alternative pit and box cut locations within the site will still be determined after geophysical sampling, a site visit by the EAP, Specialists and results from the consultation with stakeholders

**d) the technology to be used in the activity**

Although several types of drilling tools and machinery exist for prospecting activities, pits will be dug manually using hand tools and an excavator will be used for box cuts as these methods will be least invasive. Geological mapping comprises walking and physically surveying the area in addition to using existing aerial photography

**e) the operational aspects of the activity**

There is some flexibility in terms of when, where and how the sampling and surveying will be carried out. This will be informed by the specialist studies and consultation with stakeholders. For example, every effort will be made to avoid prospecting during windy seasons and times of strong winds to limit the amount of dust being spread.

**f) the option of not implementing the activity (No-go option)**

According to EIA regulations and guidelines (as amended), a no-go option should also be included. As such, the absence or non-occurrence of prospecting in the concession area is considered to have both positive and negative implications. The advantage of the no-go option will mean that there are no impacts on the bio- and geophysical environment in the proposed prospecting area. The disadvantages of not prospecting include a loss of an economically viable natural resource which can be used in several industries (paper, construction, etc.), loss of direct and indirect employment opportunities, loss of socio-economic benefits and growth development opportunities. Given the high existing levels of unemployment and poverty within South Africa, this is considered significant.

## **6 DETAILS OF THE PUBLIC PARTICIPATION PROCESS TO BE 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.

### **6.1 Public Participation Process**

The public participation process will be an integrated process that engages Interested and Affected Parties (I&APs) for the duration of the project. The following steps are undertaken as part of the public participation process:

#### **6.1.1 Identification of Stakeholders**

Potential I&APs from the Klein Kogel Fontein farm and for the towns of Lepelsfontein, Rietpoort, Kotzesrus and Bitterfontein were identified through the use of existing I&AP databases and by contacting various government departments, community representatives, etc. The following I&APs were considered:

- (i) Host Communities
- (ii) Landowners (Traditional and Title Deed owners)
- (iii) Traditional Authority
- (iv) Land Claimants
- (v) Lawful land occupier
- (vi) The Department of Land Affairs
- (vii) Any other person (including on adjacent and non-adjacent properties) whose socioeconomic conditions may be directly affected by the proposed prospecting or mining operation
- (viii) The Local Municipality and the Municipality adjacent to this area; and
- (ix) The relevant Government Departments, agencies and institutions responsible for the various aspects of the environment and for infrastructure which may be affected by the proposed project.

An extensive database of I&APs was compiled (see Appendix 2). Please note that the names and contact details of the I&APs have been omitted to protect their personal information (as per the Protection of Personal Information Act or POPIA). See Appendix 3 for Anchor Environmental Consultant’s Statement regarding compliance with the POPI Act. The West Coast District Municipality and Matzikama Municipality in the Western Cape have been identified as the ruling authority of the area. Due to this area’s close proximity to the Northern Cape, the Kamiesberg Local Municipality and Namakwa District Municipality was also contacted.

### **6.1.2 Scoping Phase and circulation of Draft Scoping Report**

The application for prospecting rights was accepted by the DMRE on 12 May 2022 and official correspondence regarding this application received from the DMRE on 20 May 2022. To apply for prospecting rights and environmental authorisation with bulk sampling activities, the more intensive S&EIA process was conducted. The first phase, the Scoping phase, includes the process of determining the content and extent of the potential impacts of an activity and specialist studies which need to form part of the assessment during the EIA phase. This information along with the project description was circulated in the form of a Draft Scoping Report to the public and other Interested and Affected Parties during a 30-day Public Participation Process. I&APs were notified of the start of the Public Participation Period and circulation of the Draft Scoping Report by means of:

- Email notices that were sent out on 30 May 2022.
- Notices displayed at various locations in Bitterfontein, Rietpoort and Lepelsfontein.
- Placement of a newspaper advertisement in a regional newspaper (Ons Kontrei).

The Draft scoping report is available on the Anchor website at <https://anchorenvironmental.co.za/>, at the Rietfontein e-centre and Lepelsfontein primary school. I&APs can provide their comment on this document and project during the Public Participation Process which will extend from Tuesday 31 May 2022 to Thursday 30 June 2022. This first process does not include an official public meeting. The community’s recommendations, questions and concerns will be addressed and incorporated into the Final Scoping Report which will then be submitted to the DMRE on 4 July for a 44-day review period. Should the DMRE be satisfied with the scope of the project, the 106-day EIA phase will commence.

### **6.1.3 Circulating Draft Environmental Impact Report (EIR)**

During the second phase, the EIA phase, specialists will be appointed to assess the potential impacts of the project. These results, comments received from the DMRE and any assessments by the EAP will be used to compile a Draft EIR. This report will be circulated to the public and other I&APs during another 30-day Public Participation Process. This process will also include an official public meeting.

All comments received will be used to revise the report (now the Final EIR) and responded to in a Comments and Responses Table to form part of this report. This Final EIR will be submitted to DMRE for consideration and decision-making. Registered I&APs will be informed of the availability of the Final EIR and a copy of the report will be made available on the Anchor website for information purposes.

## **6.2 Summary of issues raised by I&APs**

Copies of the emails received from I&APs and responses sent to the I&APs by the EAP during the Public Participation Period will be included in the Final Scoping Report. All comments and input received will be transcribed into the “comments and responses” table and also included in this report.

## 7 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES

### 7.1 Local Geology

Lepelsfontein is located on a coastal plain at the base of a granitic hill with an elevation of approximately 100 m. On a regional scale, the Bitterfontein area is occupied by a complex of gneisses and metamorphic rocks. The Malmesbury sediments were folded to produce major anticlines and synclines. Post Nama faulting is evident in the north-eastern and eastern portions of the Bitterfontein area, striking in a general south-easterly direction. Fault planes are often filled by quartz veins that form prominent outcrops. Kaolinisation appears to have been controlled to a large extent by the presence of these fault zones and many large kaolin deposits are located on or near these faults (D J Erasmus, August 2009). The comprise quartzite, fillite and limestone of the Malmesbury formation is exposed in the south-eastern part of the area. A first cycle of metamorphism, metasomatism and granitisation of Malmesbury sediments created pink gneisses and granulites, covering the largest portion of the Bitterfontein area. These types of rock are essentially composed of feldspar and quartz and were readily amendable to kaolinisation. The majority of the kaolin deposits of the Bitterfontein area were therefore derived from the gneisses. Typical examples occur on Erd Vark Gat, Niewoudts Naauwte, Vleifontein, Stuurman and Elandsfontein.

### 7.2 Socio-economic and cultural character and land-use

The West Coast has a very rich cultural, heritage and history, with many of the towns being over a century old. The West Coast and local towns are also very popular tourist destinations, being renowned for their beaches, wildlife, hiking trails, whale watching locations, 4x4 routes and variety of holiday accommodations. The level of education is relatively low. Since education improves access to employment opportunities, the low levels of education result in an underdeveloped skilled labour workforce and low household income levels. The area has a high dependency ratio which is commonly observed in developing countries and have been found to show significant relationship with economic growth, poverty, and employment (Vijayakumar 2013).

#### ***West Coast District Municipality (Western Cape)***

The West Coast District Municipality extends over an area of 31 099 km<sup>2</sup> and includes five local municipalities (Matzikama, Cederberg, Bergrivier, Saldanha Bay, and Swartland). It supports a total population of 464 056 inhabitants in 122 074 households (WCDM 2021). The population is 50.3% female and 49.7% male, with three predominant population groups: Coloured (66.58%), Black African (16.36%), and White (15.71%) communities. Most of the populations' first language is Afrikaans (83.67%), followed by IsiXhosa (8.58%), English (3.98%) and other indigenous languages (IsiNdebele, Sesotho, and Setswana). The WCDM population dependency ratio is quite high (45.9%) with 68% in the working age group (15–64), followed by the young (25%, 0–14) and the elderly group (7%, 65+), which puts significant strain on the workforce, social systems and the delivery of basic services. Level of education is relatively low (79.1%) compared to the Western Cape (87.2%) and South Africa as a whole (80.9%). In 2019, the WCDM experienced a loss of 389 jobs, which is expected to have a significant impact on the economy should this trend continue. In 2018, the agriculture, forestry and



fishing sector were the primary source of employment, creating 70 060 jobs and contributing towards 38.1% of the total employment.

### ***Matzikama Local Municipality (Western Cape)***

The proposed mining area falls within the Matzikama municipality which is situated on the north-west coast of the Western Cape and borders the Northern Cape Province (Kamiesberg Municipality in the north, the Hantam Municipality in the east, the Atlantic Ocean on the west and the Cederberg Municipality in the south) (WCDM 2021). The Matzikama municipality consist of 18 towns, with three coastal settlements (Doringbaai, Papendorp and Strandfontein) and several small inland towns which serves as agriculture service centres (MM 2019; WCGPT 2018). The area is defined by an arid environment with a natural irrigation system sustained by the Olifants River. This irrigation system comprises 237 km of canals and is essential to the surrounding towns as it supplies them with water for domestic, industrial and agricultural use (DWS 2019). The river, and in particular the Olifants estuary, is an important fishing ground for many subsistence fisherman. Vredendal is the largest town and supports the majority of economic activities (WCGPT 2018). The agriculture sector (viniculture) followed by the forestry and fishing sector are the largest contributors towards the municipal GDP and employment in 2018 (Mayson et al. 2020; MM 2019). It is estimated that the Matzikama municipality experienced a large decline in its annual GDP growth rate in 2019 due to the COVID-19 pandemic (IDP 2021/22). Should this pandemic continue, it is expected to lead to a further decline in municipal revenue, employment and the local economy (IDP 2021/22).

### ***Namakwa District Municipality (Northern Cape)***

The closest town to the proposed project site is Lepelsfontein. Lepelsfontein falls under the Kamiesberg Local Municipality and Namakwa District Municipality (NDM). The NDM is located in the southwestern portion of the Northern Cape. According to the 2011 Census (Statistics South Africa 2011) this municipality has a population size of 115 842, which is the smallest population in the Northern Cape. The economic growth of this municipality (2.03% per annum) was recorded to be less than 50% of the national growth rate of 5% (as recorded between 1996 to 2007) and relies heavily on the mining sector, which contributes approximately 52% to the GGP (Gross Geographic Product) (CNdV 2012). Mining and agriculture employ the largest number of people, followed by Trade, catering and accommodation. In addition, tourists often go to the area in the spring to see the Namaqua wildflowers.

### ***Kamiesberg Local Municipality (Northern Cape)***

The Kamiesberg Local Municipality (KLM) is the smaller of one of six municipalities in the NDM. It is 14 210 km<sup>2</sup> in size with approximately 16 small towns and a total population of 10 187 residents. This is a 5.27% decrease since 2001 (StatsSA 2011) (see Figure 4-8) which is mainly attributed to people leaving the area to seek employment opportunities. Each town supports very few residents, with most being communal farmers of sheep and goats, while others work on the surrounding commercial farms. These towns have cultural and historical significance as many of them formed part of the main route used by the travellers and explorers. A part of the route also formed part of an old well-known game trails of rhinos, elephants and other animals. Approximately 63% of the population is of working age (15 and 64 years), although there is a lower proportion of individuals between ages 15 to 34 years as a result of the younger people leaving the area due to a lack of employment opportunities. The

greatest proportion of residents is between the ages of 35 and 64 years old. Approximately a quarter is between the ages of 0 to 14 years, while the elderly (65+) represents 10% of the population. The number of unemployed and disadvantaged individuals are high as approximately only 2 205 (34%) people of working age are employed, while the remaining are either unemployed (981) being discouraged work-seekers (723) or classified as economically inactive (2535). The population is classified as 85.6% coloured, 8.1% white, 5.3% black African (5.3%), 0.5% Indian/ Asian (0.5%) and 0.5% other people. The key economic sectors contributing to the GGP in the KLM is mining (21.5%), followed by wholesale and retail (including tourism and accommodation; 14.3%) and agriculture (10%) (KM, 2017). As the tourism industry and construction sectors are seasonal, they are prone to economic changes. The main economic activity in the rural areas is agriculture. However, the lack of adequate water supplies severely limits land use opportunities in the area. As a result, the village does not engage in any agricultural activities, although the surrounding communities near Lepelsfontein engage in sheep farming and kaolin and salt mining. Around 70 kilometres south of Lepelsfontein, heavy metals are mined by the Namakwa Sands Mining Company where a few of the community's members are employed.

### 7.3 Soil Type

The proposed mining area comprises several types of soil such as lithosols, xerosdols, yermosols, solonchaks, solonetz and other miscellaneous soils (Wilkus *et al.* 2019; Figure 7-1). Most of the soil found in the proposed prospecting area (light brown shaded area in Figure 7-1) is usually marginally developed, shallow, on hard or weathering rock and with or without intermittent diverse soils (SANBI BGIS). This soil type belongs to the structureless soil class, which drains easily. In addition, lime may be found throughout much of the landscape. The western portion of the area (dark brown shaded area in Figure 7-1) is described as having a red to yellow colour, indicating well-drained sandy soils (structureless soils) with a high base status.

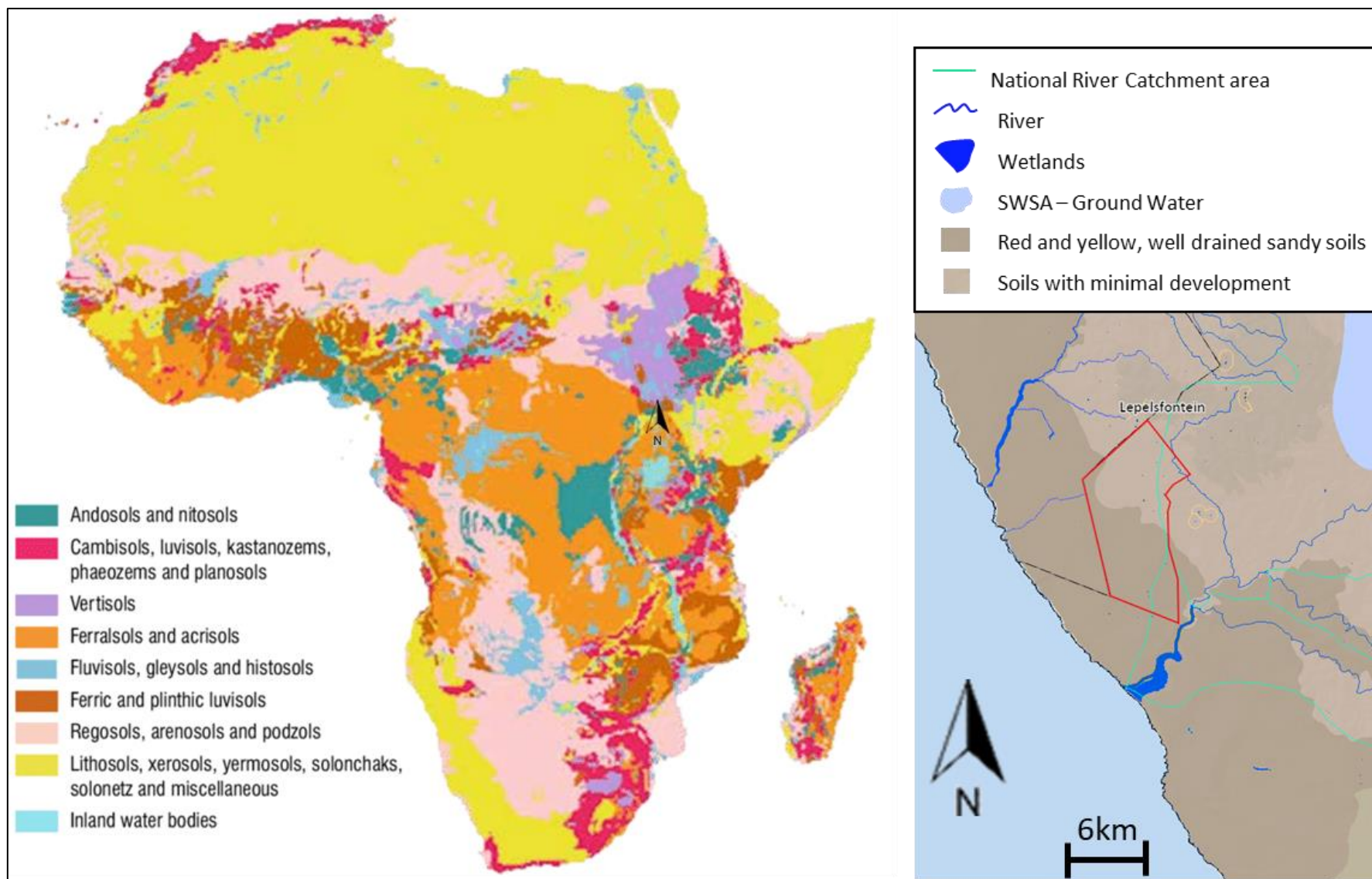


Figure 7-1 General and National soil types in the proposed study area (Wilkis *et al.* 2019, BGIS SANBI).

### 7.4 Climate

The project location is roughly 21 km east of Rietpoort and 4.5 km west of the Atlantic coast, bordering Lepelsfontein in the north. According to the Köppen-Geiger classification, Lepelsfontein has a cold desert climate with an annual precipitation of  $\leq 5$  mm and an annual temperature of  $\leq 18^{\circ}\text{C}$  (Figure 7-2, StepSA, 2021). The availability of water resources, the nature of the natural landscape, and the varieties of vegetation are all dependent upon climate. Summer temperatures are typically high, while winter temperatures are low. The coldest months are July and August (on average), while the hottest months are January to March and December (WaW 2022). The average daily temperatures are  $17.6^{\circ}\text{C}$  and  $30.5^{\circ}\text{C}$  in July and January, respectively. The mean maximum average temperatures are in the summer months, and range between 29 and  $30.5^{\circ}\text{C}$ . The mean average lowest temperatures are in the winter months, and range between  $17.6$  and  $18.8^{\circ}\text{C}$ . The highest average monthly rainfall ranges between 16 and 24 mm in February, May, June, and July, while the annual rainfall is 170 mm. In September, October, and December, the area experiences dry spells with daily rainfall ranging from 5 to 10 mm. Cold fronts, coastal lows, and the South Atlantic anticyclone have a significant impact on local wind circulation (Olivier 2004). During moist summer circumstances, for example, the circulation is largely from the WNW, with contributions from the SSE and less frequently coming from the SSW. The South Atlantic produces southerly winds during the winter, while cold fronts are connected with north westerly and north easterly winds. During dry winter days, winds blow primarily from the west, north, and east due to the movement of cold fronts to the south, the continental high, and coastal lows. Wet episodes are experienced in Lepelsfontein which are predominantly driven by northwest winds throughout the winter (Olivier 2004) while Brand se Baai (approximately 34 km south of the proposed study area) reports average wind velocities of between 3.3 and 8 m/s (Blood 2006).

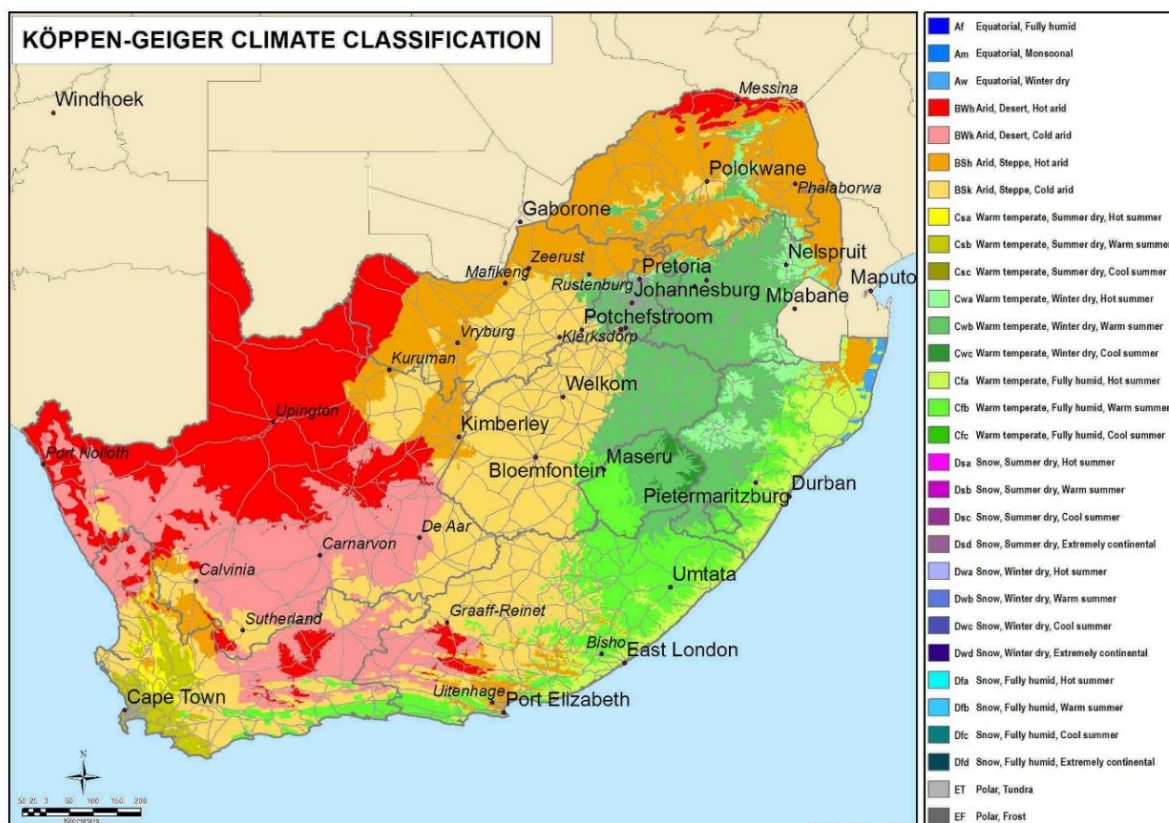


Figure 7-2 Köppen-Geiger climate classification of south Africa (StepSA 2021).

## 7.5 Ecology and Biodiversity

The proposed area is not situated in any protected or designated conservation area (WCD SPF 2020). However, the area is classified as an Other Natural Area (ONA) and Critical Biodiversity Area (CBA) 1 according to the Western Cape Biodiversity Spatial Plan of 2017 (Cape Nature, WCBSP – 2017, Figure 7-3). ONA is defined as “areas that have not been identified as a priority in the current biodiversity spatial plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritised for meeting biodiversity targets, they are still an important part of the natural ecosystem” (WCD SPF 2022). Small areas in the proposed mining ONA are listed as a CBA1 (Figure 7-4) which is defined as; “Areas in a natural condition, required to meet critical biodiversity targets for species, ecosystems or ecological processes and infrastructure. CBA1 refers to regions that should be kept in a natural or near-natural state, with no further habitat loss, and degraded areas should be rehabilitated”.

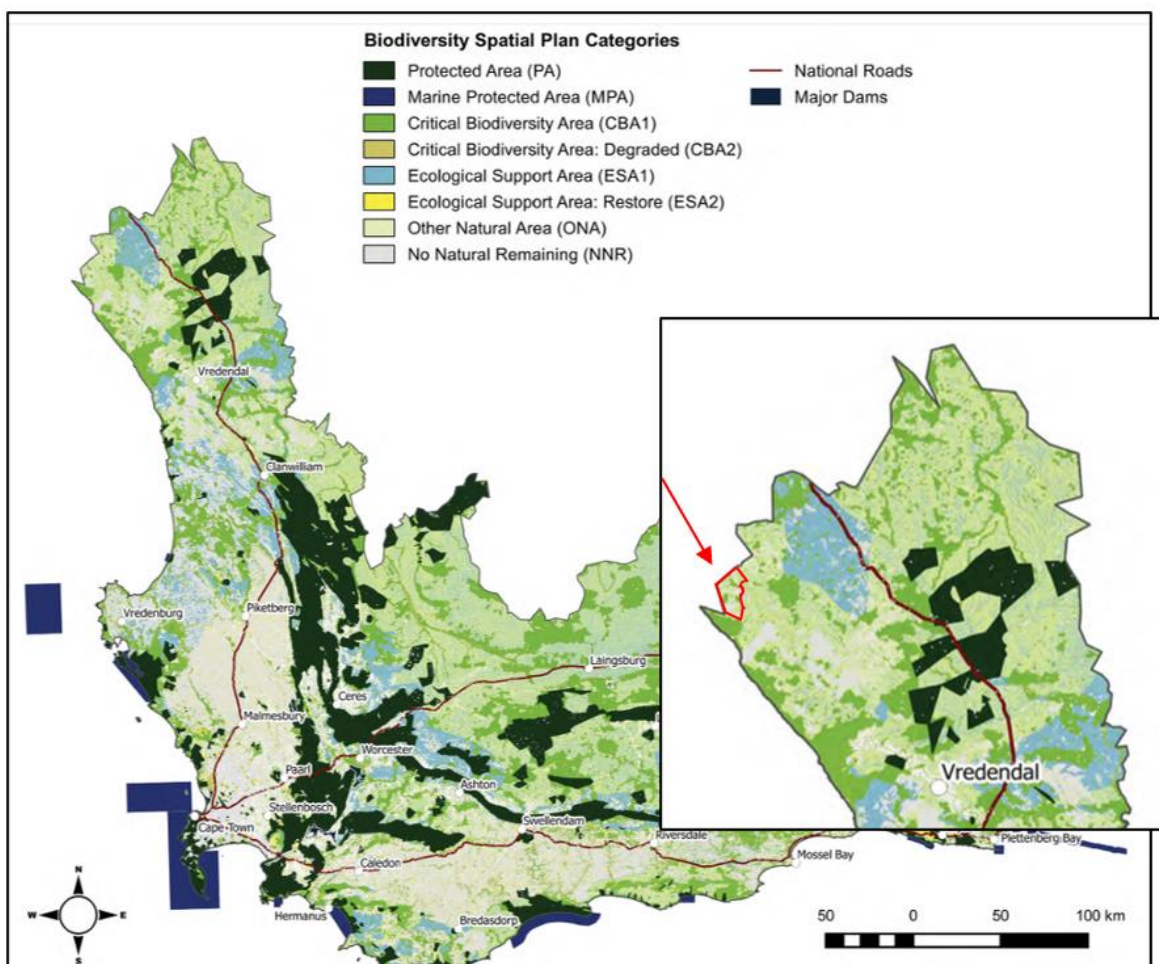


Figure 7-3 Western Cape Biodiversity Spatial Plan (Cape Nature, WCBSP - 2017).

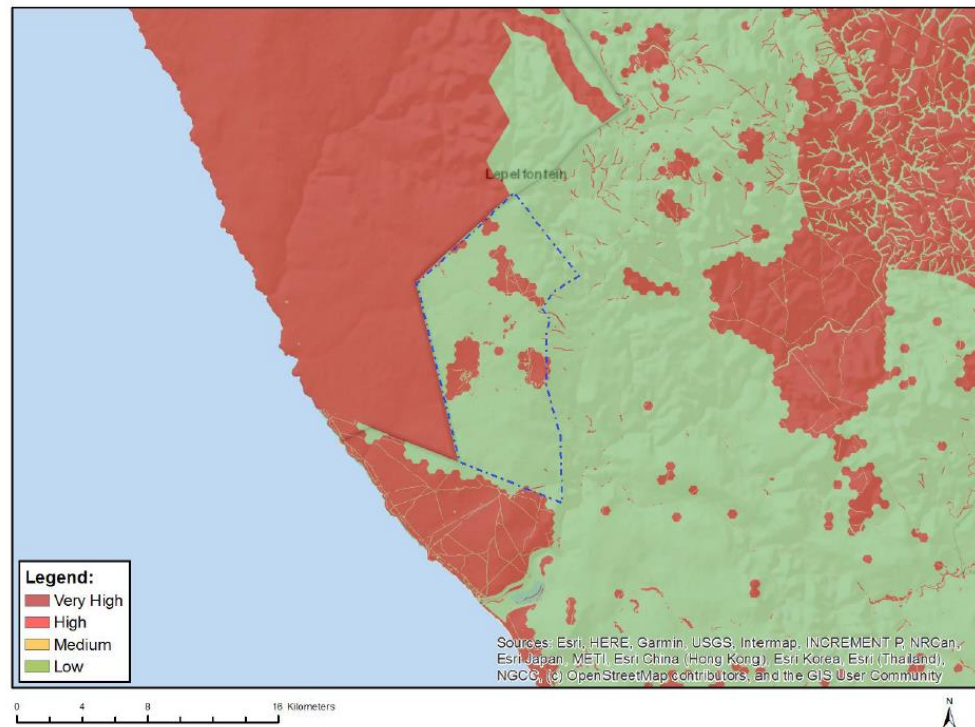


Figure 7-4 Relative Terrestrial Biodiversity Theme Sensitivity in relation to the proposed area. Source: Online screening tool

### 7.5.1 Fauna

The faunal composition was defined based on Mouton (2008) and Savannah Environmental (2007). Please refer to Mouton (2008) for a comprehensive list of faunal species which could potentially occur in the area. The area is characterised by species typical of the succulent karoo red sand, Namakwa sand and disturbed Highveld region. These include Raptors (Black Eagle (*Aquila verreauxii*), Tawny Eagle (*Aquila rapax*), Black-breasted Snake Eagle (*Circaetus pectoralis*), Jackal Buzzard (*Buteo rufofuscus*), Pale Chanting Goshawk (*Melierax canorus*), Rock Kestrel (*Falco tinnunculus*) and Pygmy Falcon (*Polihierax semitorquantus*)), frogs (Namaqua Rain Frog (*Breviceps namaquensis*) and the Namaqua Caco (*Cacosternum namaquense*)), reptiles (the Large-scaled Girdled Lizard and Namaqua plated lizard) and several mammal species (including insectivores, bats, hares, rodents, felids, canids, mustelid, viverrids, dassies, and antelope). The region potentially also supports several species of conservation concern. This includes the critically endangered Riverine Rabbit (*Bunolagus monticularis*), considered one of the world and South Africa's rarest mammals with less than 250 adult individuals recorded in 2008. Lomi's Blind Legless Skink, Armadillo Girdled Lizard and Namaqua Dwarf Adder (classified as Vulnerable), and Grant's Golden mole (also classified as Vulnerable) also occur in this area. The online screening tool also identified several other sensitive species which need to be verified and assessed by the respective specialists. These include, amongst others, the Black harrier (*Circus maurus*), the Secretary bird (*Sagittarius serpentarius*) and the Sandveld Winter Katydid (*Brinckiella mauerbergerorum*).

## 7.5.2 Land cover and vegetation

The land cover types found in the proposed region include cultivated fields, woodland/open bush, grassland, and low shrubland (SANBI BGIS; Figure 7-5).

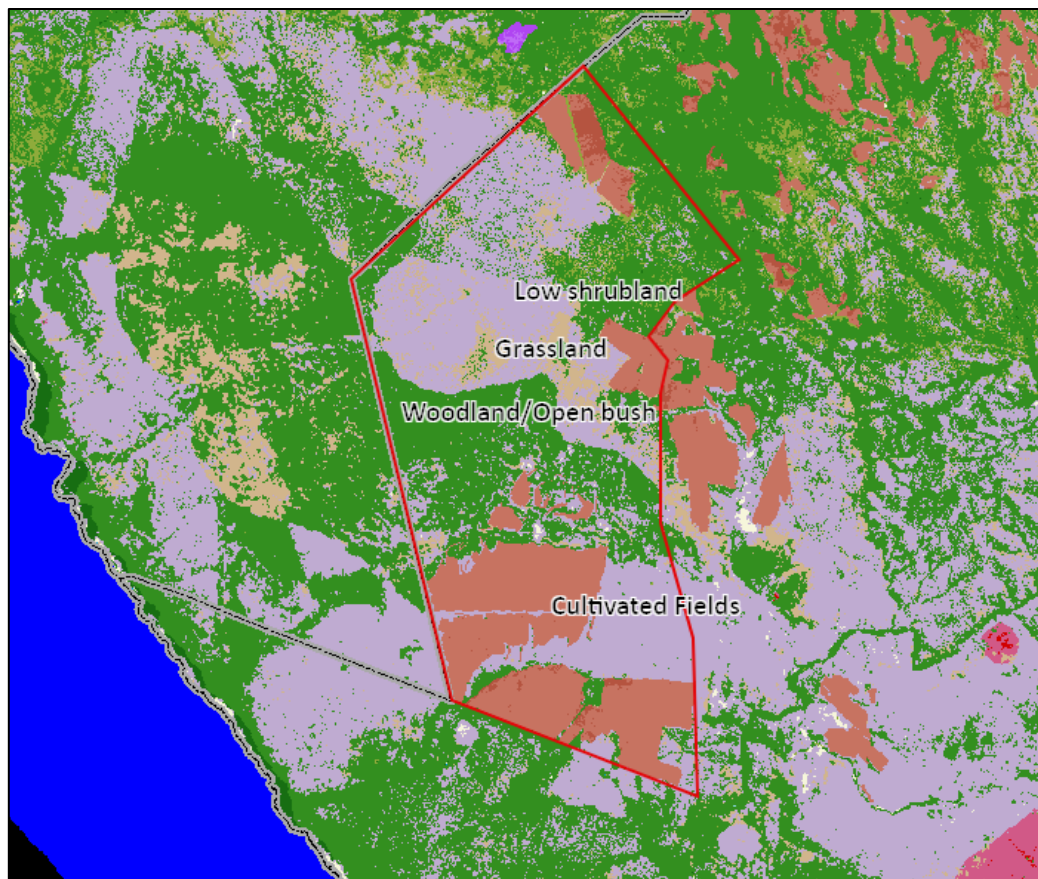


Figure 7-5 National Land Cover Types (Source: SANBI BGIS).

The Matzikama Municipality supports six different vegetation types which all form part of the Knervlakte expansion bioregion (MM 2022; Figure 7-6, Figure 7-7). The proposed study area is characterised by two vegetation bioregions, i.e., the coastal corridor (i.e., Namaqua land Sand fynbos) and the Hardeveld corridor (Namaqualand Strandveld, Savannah Environmental 2007, MM 2013). The coastal corridor is typically made up of sandy beaches and rocky headlands that are covered in susceptible Namaqualand Sandveld. The coastal corridor has been described as the Strandveld Succulent Karoo by De Villiers (2007). Succulent shrubs, like *Zygophyllum morgsana*, *Euphorbia mauritanica*, and *E. burmannii* are prevalent in the Succulent Karoo, as are scattered low shrubs and trees like *Salvia lanceolata* and *Nylantia spinosa*. Where the Strandveld overlaps with the Sand Plain Fynbos, geophytes such as Restionaceae species become notably more prevalent. Only 0.4% of this plant type has conservation status (Low and Rebelo 1998).

The species composition and richness of the Hardeveld Namaqualand vegetation is greatly influenced by the soil salinity. It is therefore broadly categorised according to less saline locations (sandy plains and rocky hills landscape), saline locations (quartz fields, heuweltjies (termitaria) centers), and a combination of these (Luther-Mosebach *et al.* 2012). The marginally saline soils are dominated by

*Hermannio trifurcae-Zygophylletea morgsanae* and the salty soils are represented by *Didelto carnosae-Cephalophylletea inaequalis*.

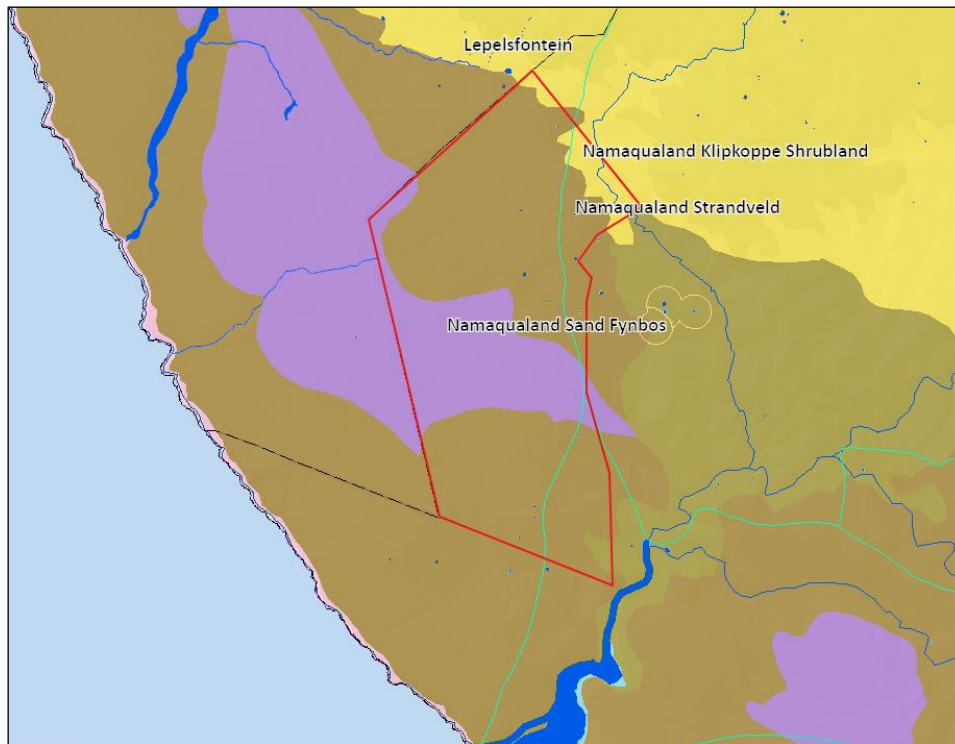


Figure 7-6 Vegetation types of the proposed study area (SANBI BGIS).

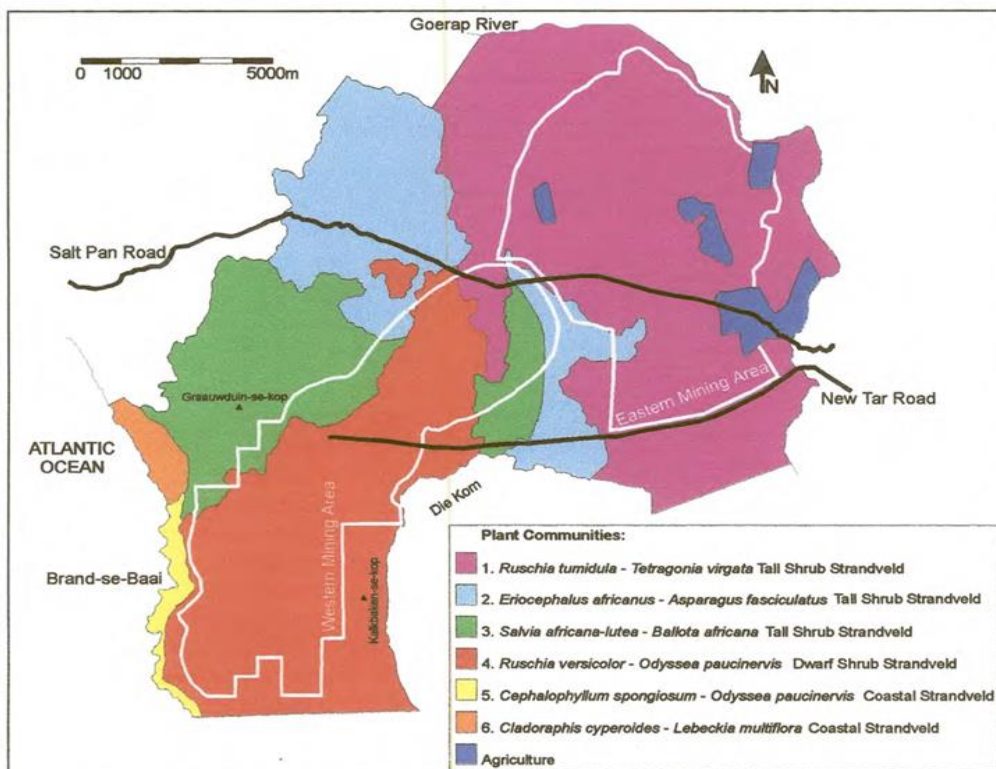


Figure 7-7 Dominant vegetation type in the coastal corridor (De Villiers 2007).



Other dominant vegetation that can be expected are succulents (*Cephalophyllum spongiosum*, *Drosantheum calycinum*, *Helichrysum incamatum*, *Hypertelis salsoloides* and *Drosantheum species*), conspicuous dwarf shrubs (*Galenia sarcophylla*, *Arctotis scullyi*, *Vanzijlia annulata*, *Phamaceum aurantium* and *Cladoraphis cyperoides*), and herbaceous conspicuous stratum (*Didelta camosa*, *Odysea paucinervis*, and *Mesembryanthemum crystallinum*). Several species of conservation concern that were further identified by the Online Screening tool include species in the family Aizoaceae (*Jacobsenia hallii*, *Lampranthus procumbens* and *Tetragonia pillansii*), Fabacea (*Aspalathus cuspidate*, *A. obtusata* and *Argyrolobium velutinum*), Scrophulariaceae (*Otholobium incanum* and *Manulea cinerea*), Iridaceae (*Ferraria ornata*), Asteracea (*Leucoptera nodosa*, *Leucoptera oppositifolia* and *Oncosiphon schlechteri*), Rutaceae (*Agathosma elata*), Proteaceae (*Leucospermum praemorsum* and *Leucospermum rodolentum*), Molluginaceae (*Adenogramma teretifolia*), Polygalaceae (*Muraltia obovate*) and Hemerocallidaceae (*Caesia sabulosa*).

## 7.6 Air Quality

The Matzikama Municipality is considered to have relatively good air quality (MM 2019). Air quality in the Matzikama Municipality is regulated by the conditions as stipulated the Service Level Agreement with the West Coast District Municipality. These conditions regulate air pollution according to the activities listed in the National Environmental Management: Air Quality Act of 2004 (Act 39 of 2004). Sand prospecting could potentially generate dust leading to air pollution, degradation of air quality, settling of dust in nearby communities and health risks. With the implementation of a dust control measures, these impacts could easily be mitigated and controlled.

## 7.7 Freshwater ecosystem

Inland rivers, wetlands, subsurface waterways, and estuaries are all examples of freshwater ecosystems. The National Biodiversity Assessment 2011 classified over half of the South Africa's rivers and wetland ecosystem types as threatened (Nel *et al.* 2011). The proposed study area supports a national river catchment area and a river system (Figure 7-8 and Figure 8-3). Although these perennial rivers throughout Lepelfontein are used by community members, groundwater is the primary source of water (Olivier 2004). The main water bearing strata in the proposed prospecting area is of fractured aquifer media (Musekiwa and Majola 2011). Groundwater is impacted by the type of aquifer in the area. For example, the more fractured and permeable the rock, the more vulnerable the groundwater. The groundwater vulnerability map is a useful tool to determine the susceptibility of groundwater contamination for different geographical areas (Vrba and Zaporozec, 1994). This is important for groundwater management (Musekiwa and Majola 2011). According to this map (Figure 7-8), the proposed area has a very high vulnerability status (45 – 60).

The proposed study area is situated west of a Strategic Water Source Area (SWSA). SWSAs are “areas of land that either: (a) supply a disproportionate quantity of mean annual surface water runoff in relation to their size and are considered nationally important; (b) have high groundwater recharge and where the groundwater forms a nationally important resource; or (c) areas that meet both criteria (a) and (b) (DWS 2020).”

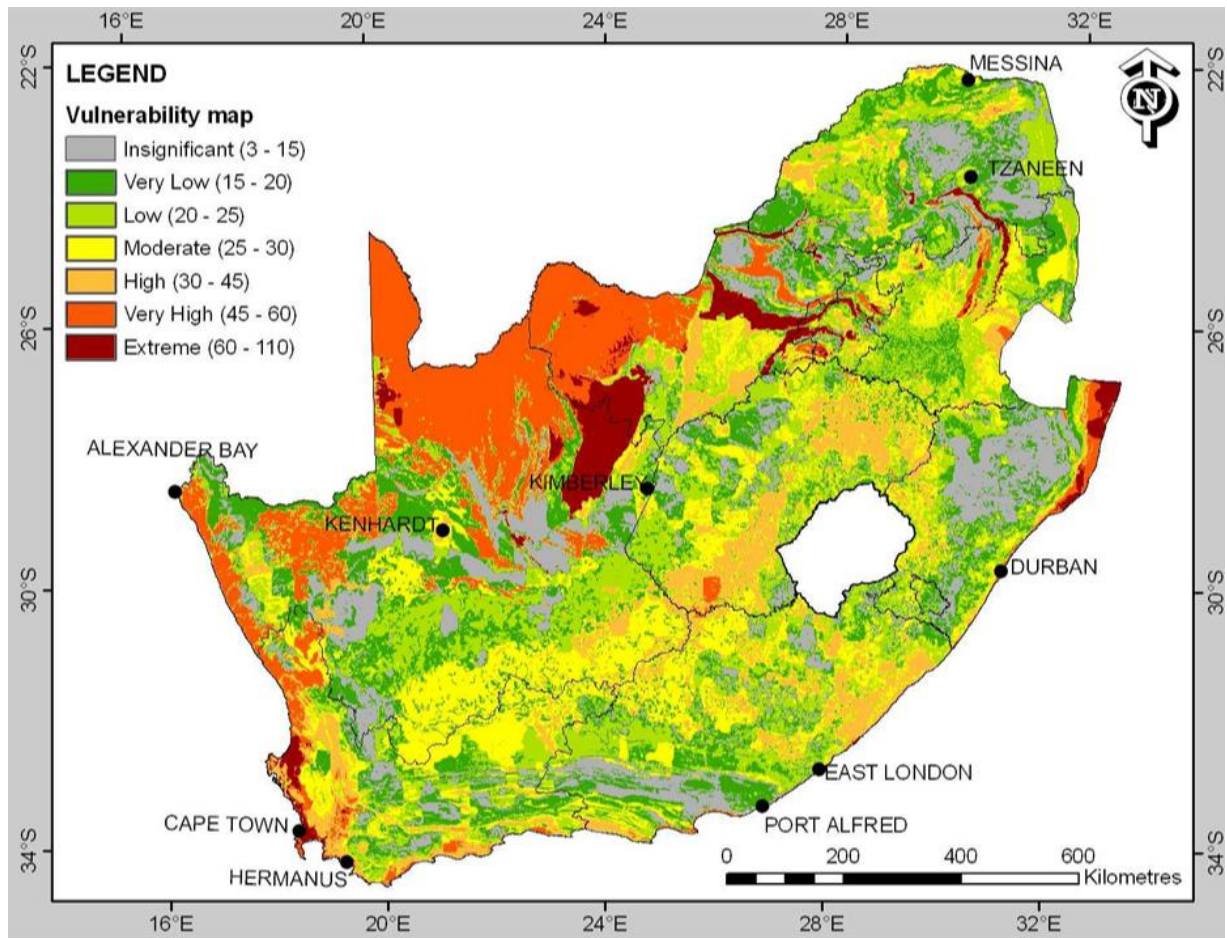


Figure 7-8 Groundwater vulnerability (Musekiwa and Majola 2011).

## 8 IMPACT ASSESSMENT

### 8.1 Impacts and risks identified

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

The National Environmental Screening Tool was used in accordance with NEMA and the EIA Regulations to assess the environmental sensitivity of the concession area (Appendix 4). The tool generates a report summarising the most important Environmental Themes that needs to be considered for assessment (e.g. terrestrial biodiversity, ecology, agricultural, etc.) and their Environmental Sensitivity (very high, high, medium or low) relating to the developmental footprint. It also identifies sensitive plant and animal species which need to be considered by the specialists. The following themes and associated environmental sensitivities (in parenthesis) were identified within the study area (refer to Figure 8-1 – Figure 8-7, below):

1. Agricultural (High)
2. Animal Species (High)
3. Aquatic Biodiversity (Very High)
4. Archaeological and Cultural Heritage (Low)
5. Civil Aviation (Low)
6. Defence (Low)
7. Palaeontology (Very High)
8. Plant Species (Medium)
9. Terrestrial Biodiversity (Very High)

Also refer to Section 7.5 for the sensitive plant and animal species that were identified by this tool.

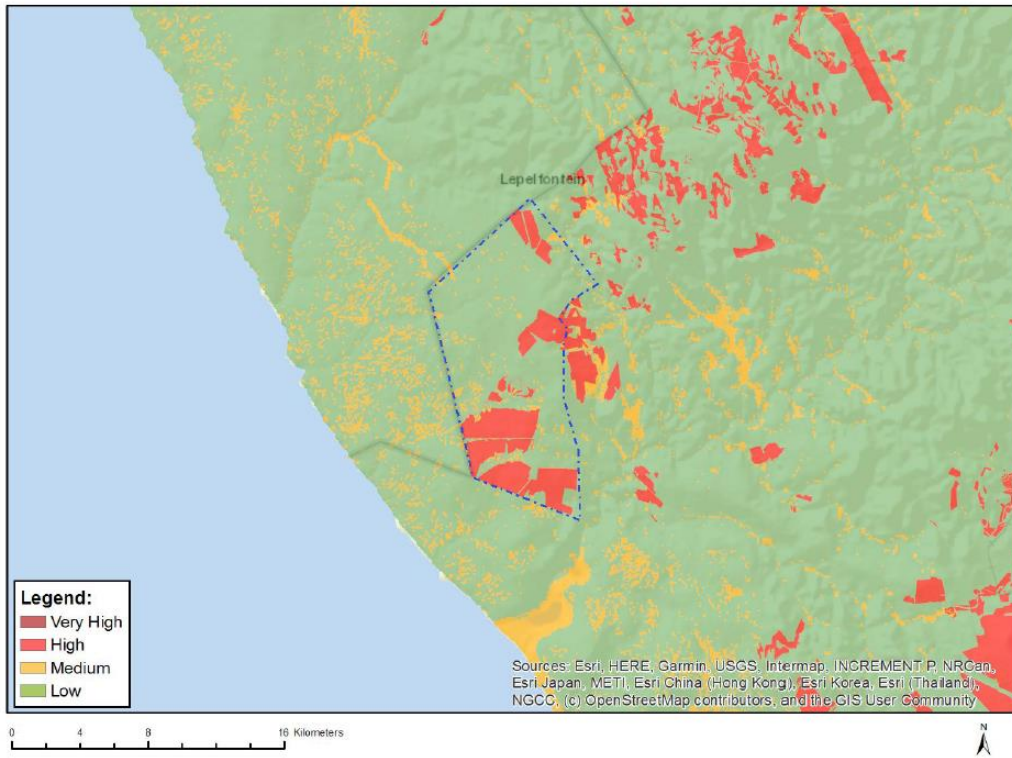


Figure 8-1 Relative Agricultural Theme Sensitivity in relation to the proposed area. Source: Online screening tool

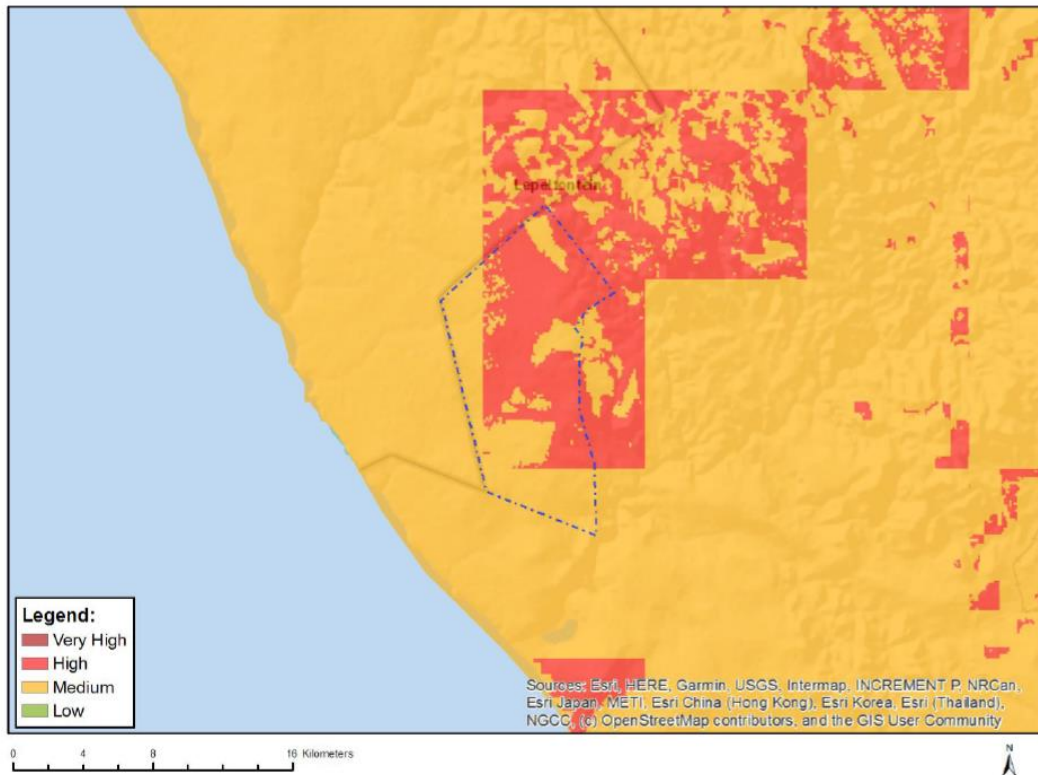


Figure 8-2 Relative Animal Species Theme Sensitivity in relation to the proposed area. Source: Online screening tool

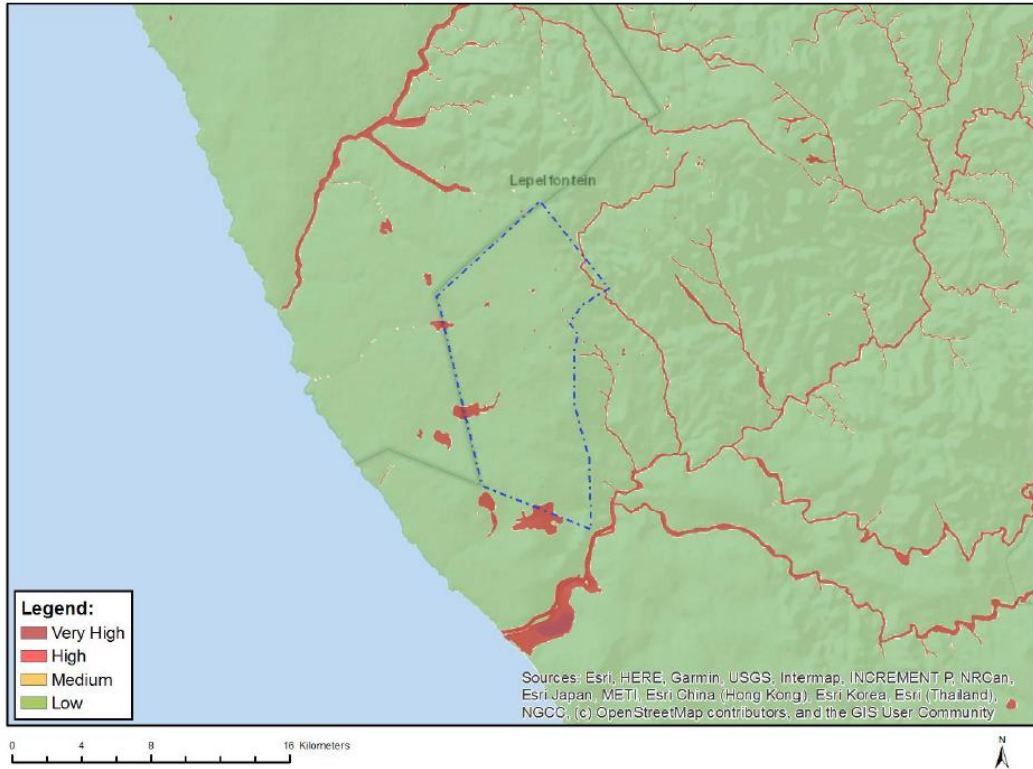


Figure 8-3 Relative Aquatic Biodiversity Theme Sensitivity in relation to the proposed area. Source: Online screening tool

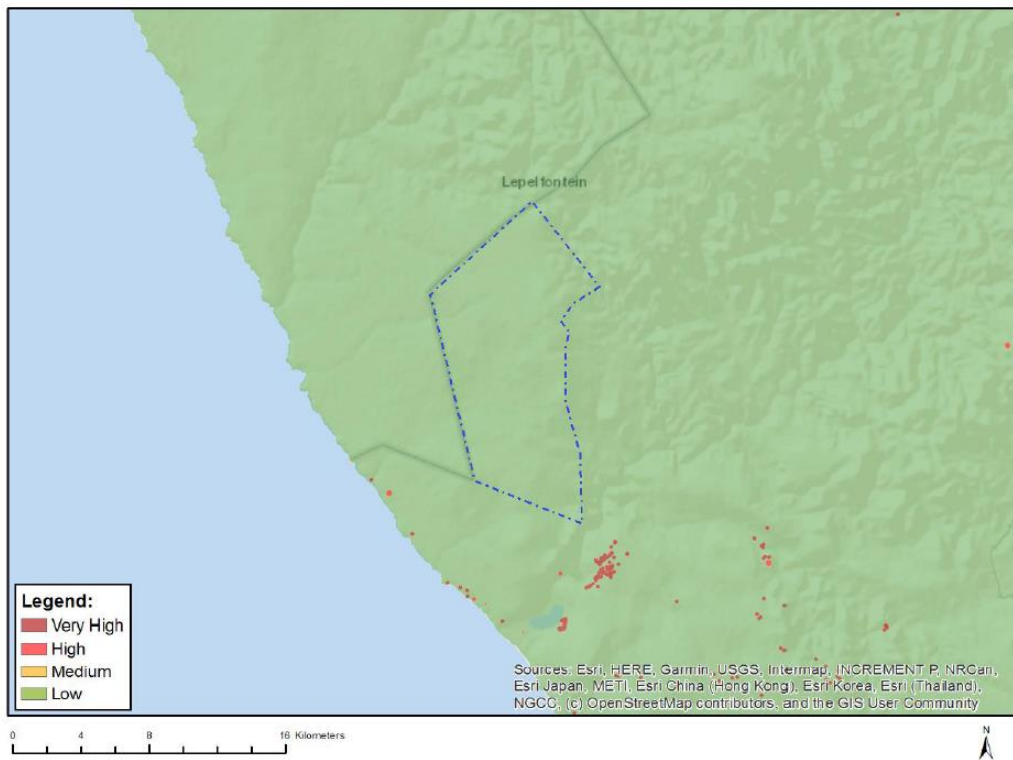


Figure 8-4 Relative Archaeological and Cultural Heritage Theme Sensitivity in relation to the proposed area. Source: Online screening tool

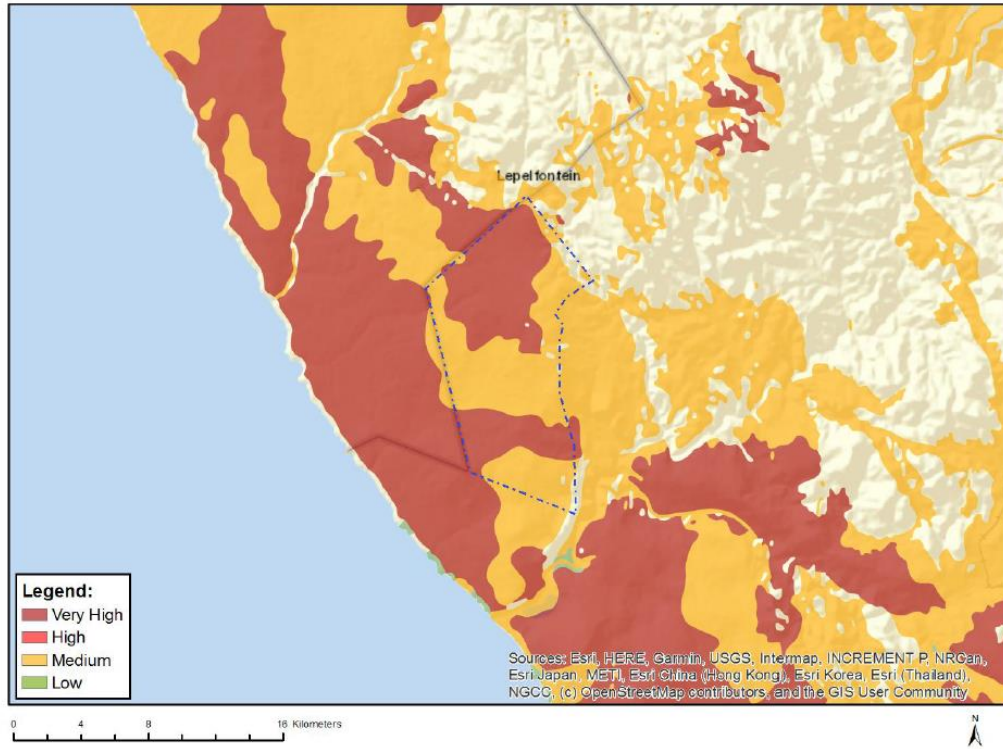


Figure 8-5 Relative Palaeontology Theme Sensitivity in relation to the proposed area. Source: Online screening tool

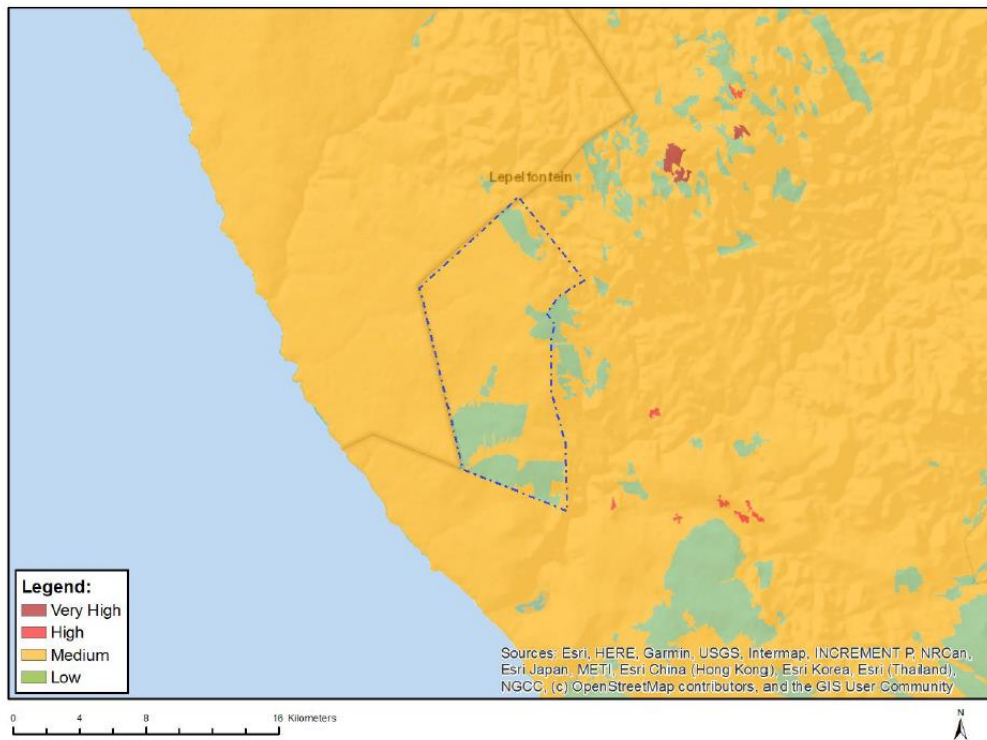
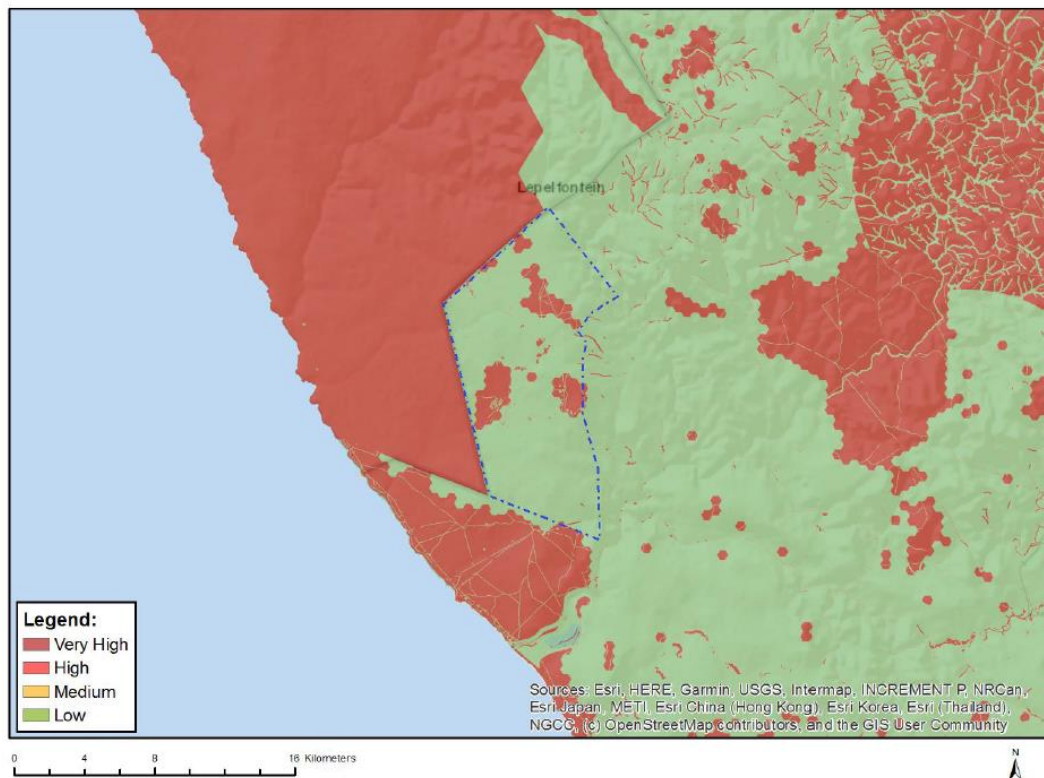


Figure 8-6 Relative Plant Species Theme Sensitivity in relation to the proposed area. Source: Online screening tool



**Figure 8-7 Relative Terrestrial Biodiversity Theme Sensitivity in relation to the proposed area. Source: Online screening tool**

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the study:

- 1) Agricultural Impact Assessment;
- 2) Archaeological and Cultural Heritage Impact Assessment;
- 3) Palaeontology Impact Assessment;
- 4) Terrestrial Biodiversity Impact Assessment;
- 5) Aquatic Biodiversity Impact Assessment;
- 6) Noise Impact Assessment;
- 7) Radioactivity Impact Assessment;
- 8) Plant Species Assessment;
- 9) Animal Species Assessment;
- 10) Birds and Bat Impact Assessment; and
- 11) Invertebrate Impact Assessment.

Visual and Landscape impacts, although important, were not identified by the screening tool, possibly because no visual impacts are anticipated. For this reason, these impacts will be reviewed by the EAP in the form of a Compliance Statement, rather than being subjected to a comprehensive specialist impact assessment. Neither a Hydrology nor a Socio-economic Impact Assessment were identified by the screening tool. As such, specialist studies for these themes will not be commissioned.

Preliminary identification of potential impacts associated with prospecting in this area are presented in Table 8.1, below. During the EIA phase, the potential impacts will be assessed in terms of their nature, extent, duration, intensity, probability of occurrence, potential for mitigation, cumulative effects and overall significance. Section 8.4 provides a description of the impact assessment methodology which will be used.



**Table 8.1 Potential impacts on the surrounding environment and associated mitigation measures**

<b>POTENTIAL IMPACT</b> (e.g. dust, noise, disturbance, surface water contamination, air)	<b>CONSEQUENCE</b>
Dust generation during the pitting, box cuts and vegetation clearing leading to air pollution and degraded air quality	<ul style="list-style-type: none"> <li>• Negative influence on visual landscape</li> <li>• Dust inhalation can lead to silicosis, that poses a danger to miners, and nearby communities and animals</li> </ul>
Ground and surface water contamination due to dust, oil spillages, littering, sewage and chemical ablution facilities	<ul style="list-style-type: none"> <li>• Health implications for animals and humans</li> <li>• Social implications</li> <li>• Economic implications</li> </ul>
Soil pollution due to oil leakages from vehicles, littering, sewage and chemical ablution facilities	<ul style="list-style-type: none"> <li>• The loss, damage and fragmentation of floral and faunal habitats, loss of biodiversity and sensitive species, displacement of species and potential loss of ecosystem functioning</li> <li>• Health and safety risk to humans</li> </ul>
Disturbance and destruction of habitat due to trampling, excavation and vegetation clearance	<ul style="list-style-type: none"> <li>• The loss, damage and fragmentation of floral and faunal habitats, loss of biodiversity and sensitive species, displacement of species and potential loss of ecosystem functioning</li> </ul>
Disturbance and destruction of habitat can create an open niche for the establishment and spread of alien and invasive plant species	<ul style="list-style-type: none"> <li>• The loss, damage and fragmentation of floral and faunal habitats, loss of biodiversity and sensitive species, displacement of species and potential loss of ecosystem functioning</li> <li>• Degradation of sense of place</li> <li>• Negative social and economic implications</li> <li>• Reduction in water quality and quantity</li> </ul>
Visual impact of the site, waste, littering, excavations, stockpiles and dust	<ul style="list-style-type: none"> <li>• Social implications</li> </ul>
Damage to roads	<ul style="list-style-type: none"> <li>• Disadvantage to farmers and communities using the roads</li> </ul>

<b>POTENTIAL IMPACT</b> (e.g. dust, noise, disturbance, surface water contamination, air)	<b>CONSEQUENCE</b>
Injury or death of humans and animals due to falling into open pits	<ul style="list-style-type: none"> <li>• Injury or death</li> </ul>
Noise pollution and vibrations due to noise from vehicles, excavator, shovelling and digging	<ul style="list-style-type: none"> <li>• Disturbance of humans and animals in the surrounding environment</li> <li>• Displacement of animals from the environment</li> <li>• The disruption of current ambient noise levels and sense of place</li> </ul>
Social and Safety risks	<ul style="list-style-type: none"> <li>• Influx of workers to the area increases health risks and loitering (resulting in lack of security and safety);</li> </ul>
Positive social and economic impacts	<ul style="list-style-type: none"> <li>• Provide employment opportunities to the local communities</li> </ul>
Injury or health problems due to employees not adhering to implemented safety rules	<ul style="list-style-type: none"> <li>• General Occupational Health and Safety of the employees</li> <li>• Safety risk to other people in the surrounding area</li> </ul>
Loss of palaeontological and cultural heritage resources and places	<ul style="list-style-type: none"> <li>• Permanent loss of Heritage resources</li> </ul>
Discovery of palaeontological and cultural heritage resources	<ul style="list-style-type: none"> <li>• Contribution to science</li> </ul>
Changes to surface topography due to topsoil removal and excavations	<ul style="list-style-type: none"> <li>• The loss, damage and fragmentation of floral and faunal habitats, loss of biodiversity and sensitive species, displacement of species and potential loss of ecosystem functioning</li> </ul>
Loss of land capability through topsoil removal, disturbances and loss of soil fertility	<ul style="list-style-type: none"> <li>• Loss of agricultural potential of the land</li> </ul>
Soil erosion due to the clearance of vegetation and excavations	<ul style="list-style-type: none"> <li>• The loss, damage and fragmentation of floral and faunal habitats, loss of biodiversity, potential loss of ecosystem function</li> <li>• Safety to animals and humans</li> </ul>

## 8.2 Cumulative Impacts

Mining is a well-established along South Africa's west coast between St Helena Bay and the Orange River mouth (Figure 8-8). There are prospecting and mining permits allocated for most of the nearshore, land based and surf zone coastal concessions between the Olifants and Orange River mouths (Figure 8-8). Between the Olifants estuary mouth and Brand se Baai, mineral sands are extracted by Tormin, and Tronox mines in intertidal and land based coastal concessions. There are also offshore oil and gas production and prospecting licenses with additional exploration applications currently underway (Figure 8-8). The prospecting and exploration methods for oil and gas exploration (seismic surveys and core/drill sampling) are similar to those used for offshore diamond and other mineral exploration (although normally of greater intensity as the oil and gas reserves are typically deeper and located in pockets of sedimentary rock below the sea floor). There has been a recent increase in applications for prospecting and exploration rights and increased prospecting in the short term and mining in the long-term is anticipated.

This means that cumulative impacts of prospecting and mining must be considered at a broader spatial scale in a strategic manner for each potential impact identified. Obtaining detailed information on the scale, extent, methodology (and hence intensity) of various current and pending applications is, however, very difficult. This requires a revised strategic level Environmental Impact Assessment to assess cumulative impacts with a medium to high level of confidence.

It is, however, logical and reasonable, to anticipate that many of the potential impacts assessed would continue together with other projects that are ongoing or scheduled to come on-line. The result is that the spatial Extent would change from "local" to "regional", whilst the duration would change from "short-term" (<2 years) to at least "medium term" (2–15 years) or even "long-term" (>15 years, mostly reversible in the case of prospecting, but not always for mining). The intensity of impacts is anticipated to remain as they will be assessed for operations of this nature, but may be higher for other projects in different areas with different objectives.

Effective implementation of international best practice mitigation measures by all active operations would reduce the "probability" of the impact. The assessments will also have a "low confidence" due to the lack of information on other activities in the region.

It is recommended that a strategic level Environmental Impact Assessment (EIA) process be undertaken to assess and manage potential cumulative impacts in a holistic manner and to identify and implement regional level mitigation measures. The decision-making authority (DMRE) must take cognisance of this recommendation to do a strategic level EIA in order for Specialists and Environmental Assessment Practitioners to accurately assess cumulative impacts.

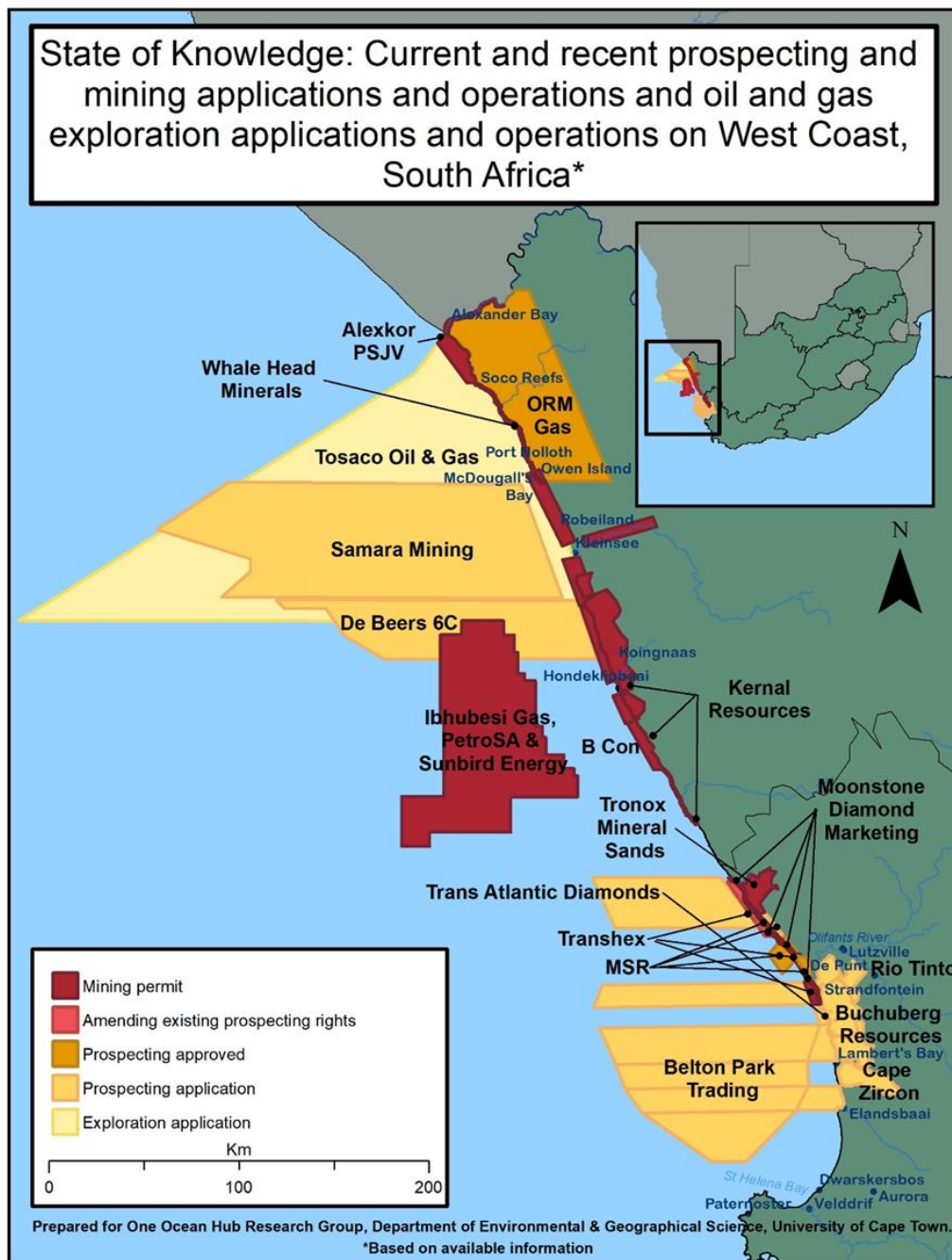


Figure 8-8. Extent of prospecting and mining applications and operations along South Africa’s West Coast (Source: Compiled by R. Button for the One Ocean Hub Research Group, Department of Environmental & Geographical Science, University of Cape Town).

### 8.3 The “No-go” alternative

The no-go alternative assumes that the proposed project will not go ahead i.e. no prospecting or bulk sampling for Kaolin and Silica deposits on farms in the Bitterfontein area will be undertaken. This alternative would result in no environmental impacts on the site or surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the report. The following implications will occur if the “no go” alternative is implemented:

- No benefits will be derived from the implementation of an additional land-use;
- No new job opportunities or investment will be realised as a result of the prospecting activities being undertaken or resulting from the uncovering of mineable mineral deposits in the region where job creation is identified as a key priority;
- Local communities will continue their dependence on agriculture production and government subsidies. The local municipality’s vulnerability to economic downturns will increase because of limited access to capital;
- There will be lost opportunity for skills transfer and education/training of local communities; and
- The positive socio-economic impacts likely to result from the project such as increased local spending and the creation of local employment opportunities will not be realised;

Converse to the above, the following benefits could occur if the “no-go” alternative is implemented:

- There will be no prospecting or bulk sampling for Kaolin and Silica deposits on farms in the Bitterfontein area;
- Only the agricultural land use will remain;
- No vegetation will be removed or disturbed during these activities;
- No change to the current landscape will occur;
- No heritage artefacts will be impacted on; and
- No additional water use during prospecting.

While the “no-go” alternative will not result in any negative environmental impacts; it will also not result in any positive community development or socio-economic benefits. It will also not assist government in addressing unemployment and low economic growth in the region. Hence the “no-go” alternative is not currently the preferred alternative.

## 8.4 Methodology to be used in determining, assessing and ranking impacts

Provide a full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity). (Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)

The method that will be used to assess the impacts of the proposed prospecting activity is guided by the requirements of the NEMA, 1998 (Act No. 107 of 1998) and EIA Regulations, 2014 (as amended). The broad approach to the assessment criteria is to ensure that it is comprehensive in its approach to determine the overall significance as accurately as possible. A number of criteria thus need to be taken into consideration for this purpose.

The significance of all potential impacts that would result from the proposed project is determined in order to assist decision-makers. The **significance** of an impact is defined as a combination of the **consequence** of the impact occurring and the **probability** that the impact will occur. The significance of each identified impact was thus rated according to the methodology set out below.

**Step 1** – Determine the **consequence** rating for the impact by determining the score for each of the three criteria (A-C) listed below and then **adding** them. The rationale for assigning a specific rating, and comments on the degree to which the impact may cause irreplaceable loss of resources and be irreversible, must be included in the narrative accompanying the impact rating:

Rating	Definition of Rating	Score
<b>A. Extent – the area over which the impact will be experienced</b>		
Local	Confined to project or study area or part thereof (e.g. limits of the concession area)	1
Regional	The region (e.g. the whole of Namaqualand coast)	2
(Inter) national	Significantly beyond Saldanha Bay and adjacent land areas	3
<b>B. Intensity – the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources</b>		
Low	Site-specific and wider natural and/or social functions and processes are negligibly altered	1
Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way	2
High	Site-specific and wider natural and/or social functions or processes are severely altered	3
<b>C. Duration – the time frame for which the impact will be experienced and its reversibility</b>		
Short-term	Up to 2 years	1
Medium-term	2 to 15 years	2
Long-term	More than 15 years (state whether impact is irreversible)	3

The combined score of these three criteria corresponds to a **Consequence Rating**, as follows:

Combined Score (A+B+C)	3 – 4	5	6	7	8 – 9
Consequence Rating	Very low	Low	Medium	High	Very high

#### Example 1:

Extent	Intensity	Duration	Consequence
Regional 2	Medium 2	Long-term 3	High 7

**Step 2** – Assess the **probability** of the impact occurring according to the following definitions:

Probability– the likelihood of the impact occurring	
Improbable	< 40% chance of occurring
Possible	40% - 70% chance of occurring
Probable	> 70% - 90% chance of occurring
Definite	> 90% chance of occurring

#### Example 2:

Extent	Intensity	Duration	Consequence	Probability
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Regional 2	Medium 2	Long-term 3	High 7	Probable
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**Step 3** – Determine the overall **significance** of the impact as a combination of the **consequence** and **probability** ratings, as set out below:

		Probability			
		Improbable	Possible	Probable	Definite
Consequence	Very Low	INSIGNIFICANT	INSIGNIFICANT	VERY LOW	VERY LOW
	Low	VERY LOW	VERY LOW	LOW	LOW
	Medium	LOW	LOW	MEDIUM	MEDIUM
	High	MEDIUM	MEDIUM	HIGH	HIGH
	Very High	HIGH	HIGH	VERY HIGH	VERY HIGH

**Example 3:**

Extent	Intensity	Duration	Consequence	Probability	Significance
Regional 2	Medium 2	Long-term 3	High 7	Probable	HIGH

**Step 4** – Note the **status** of the impact (i.e. will the effect of the impact be negative or positive?)

**Example 4:**

Extent	Intensity	Duration	Consequence	Probability	Significance	Status
Regional 2	Medium 2	Long-term 3	High 7	Probable	HIGH	– ve

**Step 5** – State the level of **confidence** in the assessment of the impact (high, medium or low).

Impacts are also considered in terms of their status (positive or negative impact) and the confidence in the ascribed impact significance rating. The prescribed system for considering impacts status and confidence (in assessment) is laid out in the table below. Depending on the data available, a higher level of confidence may be attached to the assessment of some impacts than others. For example, if the assessment is based on extrapolated data, this may reduce the confidence level to low, noting that further ground-truthing is required to improve this.

Confidence rating	
Status of impact	+ ve (beneficial) or – ve (cost)
Confidence of assessment	Low, Medium or High

**Example 5:**

Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Regional 2	Medium 2	Long-term 3	High 7	Probable	HIGH	– ve	High

The significance rating of impacts is considered by decision-makers, as shown below. Note, this method does not apply to minor impacts which can be logically grouped into a single assessment.

- **INSIGNIFICANT:** the potential impact is negligible and **will not** have an influence on the decision regarding the proposed activity.
- **VERY LOW:** the potential impact is very small and **should not** have any meaningful influence on the decision regarding the proposed activity.
- **LOW:** the potential impact **may not** have any meaningful influence on the decision regarding the proposed activity.
- **MEDIUM:** the potential impact **should** influence the decision regarding the proposed activity.
- **HIGH:** the potential impact **will** affect a decision regarding the proposed activity.
- **VERY HIGH:** The proposed activity should only be approved under special circumstances.

**Step 6** – Identify and describe practical **mitigation** and **optimisation** measures that can be implemented effectively to reduce or enhance the significance of the impact. Mitigation and optimisation measures must be described as either:

- **Essential:** must be implemented and are non-negotiable; and
- **Best Practice:** must be shown to have been considered and sound reasons provided by the proponent if not implemented.

Essential mitigation and optimisation measures must be inserted into the completed impact assessment table. The impact should be re-assessed with mitigation, by following Steps 1-5 again to demonstrate how the extent, intensity, duration and/or probability change after implementation of the proposed mitigation measures.

#### Example 6: A completed impact assessment table

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional 2	Medium 2	Long-term 3	<b>High</b> 7	Probable	<b>HIGH</b>	– ve	High
Essential mitigation measures: xxxxx xxxxx								
With mitigation	Local 1	Low 1	Long-term 3	<b>Low</b> 5	Improbable	<b>VERY LOW</b>	– ve	High

**Step 7** – Prepare a summary table of all impact significance ratings as follows:

Impact	Consequence	Probability	Significance	Status	Confidence
Impact 1: XXXX	Medium	Improbable	LOW	–ve	High
With Mitigation	Low	Improbable	VERY LOW		High



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Impact 2: XXXX	Very Low	Definite	VERY LOW	-ve	Medium
With Mitigation:	<i>Not applicable</i>				

Indicate whether the proposed development alternatives are environmentally suitable or unsuitable in terms of the respective impacts assessed by the relevant specialist and the environmentally preferred alternative.

## **8.5 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)

Refer to Section 5.9 and Section 8 above for a comprehensive discussion relating to the site layout and the positive and negative impacts of prospecting in this area.

## **8.6 The possible mitigation measures that could be applied and the level of risk.**

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

The nature, intensity and extent of any potential impacts that are identified, including those issues identified by I&APs during the consultation process, will be carefully assessed and incorporated into the Final Scoping Report and specifically into the EMPr. This information will then used to inform management actions (an impact management plan) that will form part of the EMPr. The objectives of the impact management plan are to anticipate and avoid risks and impacts. Each prospecting activity needs to be considered, together with its potential impacts on the environment, socio-economic, heritage and other resources. Through the development of the EMPr, measures will be developed to avoid environmental, social and other risks and impacts, and to provide mitigation where possible. These mitigation measures will all be included in an impact management plan to be retained by the Environmental Control Officer (or such designated authority) who can oversee and report on the impact monitoring and mitigation measures.

The objectives of this impact management framework or the EMPr will be to:

- Provide sufficient information to strategically plan the prospecting activities so as to mitigate social, economic, heritage, environmental and other impacts.
- Provide a management plan that is effective and practical for implementation.
- Anticipate the risks and impacts of the prospecting activities through environmental monitoring and inspections.
- Create an adaptive framework for management of impacts such that unplanned events or incidents can be effectively controlled or minimised.
- The impact management plan and associated mitigation measures will be developed in adherence to international, national and regional legal standards such as those implemented by designated authorities which include the DMRE, NEMA, and EIA regulations and guidelines.
- Through the development of the EMPr, measures will be developed to avoid environmental, social and other risks and impacts, and to provide mitigation where possible. This will then be included in the EMPr to be retained by the Environmental Control Officer (or such designated authority) who can oversee and report on the impact monitoring and mitigation measures.

To ensure the implementation of the impact management plan, the outcomes will be measured through compliance monitoring, evaluations, routine inspections and independent audits which will also be defined in the EMPr.

### **8.6.1 Environmental awareness and general mitigation measures:**

- Contractor personnel and staff should undergo environmental awareness training which would include being briefed about the sensitivities pertaining to the environmental and sensitive species, archaeological, heritage, and palaeontological resources, the consequences of any damage/removal of such resources;
- A dedicated Scientific or Environmental Site Officer should be employed to ensure compliance with mitigation measures during prospecting; and
- Maintain active communications with IAPs.

### **8.6.2 Air Quality**

- Employ dust suppression and control methods such as dampening soil before and during excavations without compromising the sensitive water balance of the area;
- Feasible methods include wet suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads;
- The length of time where open areas are exposed should be restricted. Prospecting should not be delayed after vegetation has been cleared and topsoil removed; and
- For all prospecting activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.

### **8.6.3 Water use**

- No water may be used from a water source without an water use licence; and
- All water resources must be appropriately buffered and avoided as per the National Water Act.

### **8.6.4 Water and soil pollution**

- Contractor personnel and staff should undergo waste management and spill management training;
- A Pollution Emergency Plan must be prepared and should be in place at all times during operations;
- Implementation of a waste management programme, such as providing bins for litter and removal and proper disposal before the end of the day;

- Ensure all vehicles and equipment are in a good working order and regularly serviced, i.e., no damaged or leaking vehicles should be allowed on site;
- Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution;
- Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site;
- Measures to prevent seepage of pollutants into the groundwater and soil, for example through the use of drip trays when excavator not in use;
- Frequent monitoring of surface water resources (Standing water);
- Prevention of overspill of soil and excavated material into the surrounding drainage channels streams;
- Waste management to prevent littering and pollution; and
- Under no circumstances may ablutions or eating occur outside the provided facilities.

### 8.6.5 Biodiversity

- Sensitive and no-go areas such as those with protected and priority species, as determined by the EAP and specialists, should be demarcated. No person may enter, and no activities may occur within these areas;
- Search and rescue of sensitive plant species or species of conservation concern before the start of the operations;
- Return these species once the operations have ceased;
- Employing a monitoring programme to monitor biodiversity in the area after the operations have ceased;
- Eradicate, and control the spread, of alien invasive species;
- A management plan should be implemented to ensure proper establishment of ex situ individuals;
- Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert;
- Prospecting activities must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type; and
- Minimise the generation of excessive noise and vibration.

### 8.6.6 Soil erosion

- Preserve soil resources and topsoil and rehabilitate area and surface topography once excavations are completed;
- Rehabilitation of the area by means of returning topsoil and plants;
- Waste management to prevent littering and pollution;
- Effective planning of the location of operations to minimise visual impact;

- The prospecting operation must co-ordinate different activities in order to optimise the utilisation of the excavated trenches and thereby prevent repeated and unnecessary excavations;
- Construction that required the clearing of large areas of vegetation and excavation should ideally occur during the dry season only;
- Construction during the rainy season should be closely monitored and controlled;
- The run-off from the exposed ground should be controlled with the careful placement of flow retarding barriers;
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees), protected by berms to prevent erosion and on the higher laying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate; and
- Stockpiles susceptible to wind erosion are to be covered during windy periods.

### **8.6.7 Traffic and roads**

- Utilise existing access roads, where applicable; and
- Implement measures that ensure adherence to traffic rule.

### **8.6.8 Noise and Vibration**

- Minimise the generation of excessive noise and vibration.

### **8.6.9 Land Capability and Land Use**

- Employ effective rehabilitation strategies to restore land capability and land use potential of the farm.

### **8.6.10 Visual Impacts**

- Dust suppression procedures should be implemented especially on windy days during earth works; and
- Implement waste management plan.

### 8.6.11 Heritage Resources

- It is recommended that a Xwena Kaolin representative must undergo a short induction on archaeological site and artefact recognition, as well as the procedure to follow should archaeological material be encountered during sampling.
- The contractor must be notified that archaeological sites could be exposed during sampling activities, as well as the procedure to follow should archaeological material be encountered during sampling.
- Any core sample sections which contain alluvial material, particularly where organic remains are present, are retained and are subject to paleo-environmental assessment.
- If any cultural, heritage or palaeontological resources are discovered,
  - Cease work in the directly affected area to avoid damage until the South African Heritage Resources Agency (SAHRA) has been notified and the contractor has complied with any additional mitigation as specified by SAHRA; and
  - Where possible, take photographs of them, noting the date, time, location and types of artefacts found. Under no circumstances may any artefacts be removed, destroyed or interfered with on the site, unless under permit from SAHRA.

### 8.6.12 Socio-Economic and Safety

- The project must ensure that false expectations are not created regarding job creation;
- Contractors and employees should not be permitted to wander outside of the project area; and
- A health and safety officer should be appointed.

### 8.6.13 Cumulative impacts on the environment and community

Mitigation measures as recommended for each individual impact will be implemented. Furthermore, a strategic level Environmental Impact Assessment (EIA) process should be conducted to assess and manage potential cumulative impacts in a holistic manner and to identify and implement further mitigation measures.

## **8.7 Motivation where no alternative sites were considered.**

See Section 5.9.1 above

## **8.8 Statement motivating the alternative development location within the overall site.**

See Section 5.9.1 above

## **9 PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

In accordance with the requirements of Section 2(i) of Appendix 2 of the EIA Regulations 2014, a detailed Plan of Study for the EIA must be presented in the Scoping Report. The Plan of Study for EIA sets out the proposed approach to the environmental impact assessment of the application.

### **9.1 Description of alternatives to be considered including the option of not going ahead with the activity.**

See Section 5.9.1 above

### **9.2 Description of aspects to be assessed as part of the environmental impact assessment process**

A detailed description of the aspects to be assessed as part of the EIA process is presented in Section 6 and Section 8 above.

### **9.3 Description of aspects to be assessed by specialists**

A detailed description of the aspects to be assessed by specialists is presented in Section 8 above.

### **9.4 Proposed method of assessing the environmental aspects including the proposed method of assessing.**

Where applicable, each impact will also be assessed according to the project phases, i.e., planning, construction, operation and decommissioning. See the impact assessment methodology which will be implemented in Section 8.4, above. In addition to this, the following regulations, guidelines and reports will be considered:

- Appendix 6 of the EIA regulations;
- The Screening report;
- Species environmental assessment guidelines;
- Ecosystem Environmental Assessment Guideline: Draft;
- Government Notice 320: Site sensitivity verification requirements where a specialist assessment is required but no specific assessment protocol has been prescribed;
- Government Notice 320: protocol for the specialist assessment and minimum report content requirements for environmental impacts on agricultural, terrestrial biodiversity, aquatic biodiversity and noise; and



- Government Notice 1150 : Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species and terrestrial plant species.

## 9.5 The stages at which the competent authority will be consulted

Consultation with the DMRE and commenting authorities will continue throughout the duration of S&EIA. After the closure of the commenting period on 30 June 2022, the Scoping Report will be updated to incorporate the comments received. The updated and Final Scoping Report will then be submitted to DMRE for review and recommendations for a period of 44-days. Should the DMRE be satisfied with the scope of the project, the DMRE will inform the EAP and the 106-day EIA phase will commence. Specialists will be appointed to assess the potential impacts of the project. These results, comments received from the DMRE, and any assessments by the EAP, will be used to compile a Draft Environmental Impact report (EIR). This report will be circulated to the public and other I&APs during another 30-day Public Participation Process. All comments received will be used to revise the report (now the Final EIR) and this Final EIR will be submitted to DMRE for consideration and decision-making

## **10 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY**

### **10.1 Compliance with the provisions of (sections 24(4)(a) & (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act, the EIA report must include the):**

#### **10.1.1 Impact on the socio-economic conditions of any directly affected person.**

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

A description of the baseline socio-economic environment is provided in Section 7.2 above. Potential socio-economic impacts likely to be affected by the proposed project in the study area will be assessed by the EAP as part of the EIA phase.

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

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

A detailed assessment of the cultural and palaeontological heritage resources likely to be affected by the proposed project will be undertaken by specialists as part of the EIA phase.

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

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

Not applicable.

## 11 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.

✓
n/a
n/a
✓

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**Signature of the environmental assessment practitioner:**

Anchor Environmental Consultants Pty Ltd

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**Name of company:**

27 May 2022

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**Date:**

**-END-**

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Xwena  
kaolin



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