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Final Basic Assessment Report

Mining of Sand on Portion 8 of Farm Kruisfontein No. 193, Humansdorp, Eastern Cape

Version – **Final**

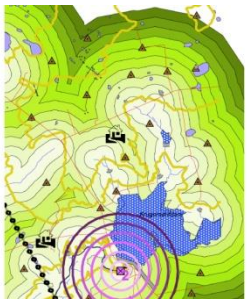
July 2022

Kouga Sand

GCS Project Number: 21-0703

DMRE Ref No: EC30/5/1/3/2/10704MP

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21-0703

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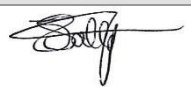
Author	Janice Callaghan		**July 2022**
Document Reviewer	Magnus van Rooyen		**July 2022**
Director Sign Off	Magnus van Rooyen		**July 2022**

Disclaimer

Information contained in this report relating to the project description is based on information supplied by the client and other client-appointed sources. It is assumed that the information provided to GCS is correct.

Environmental and social data, as well as Environmental Impact Assessment, provided in this report is based on information supplied by specialists in their respective fields, as well as existing information pertaining to the area in question (including previous site investigation data and information from the Department of Environmental Affairs' Online Screening Tool). It has been assumed that the information provided to GCS to perform the outcomes of this report is correct.

No responsibility is accepted by GCS for incomplete or inaccurate data supplied by others (the client and external sources). Where gaps have been identified these are listed for consideration by the responsible decision-makers.

GCS's opinions, conclusions and recommendations are based upon information that existed at the time of the start of the production of this document.

NOTE: Notable additions/changes since the Draft Basic Assessment Report (DBAR) (dated June 2022) are indicated by *italic underlined* text in this report.

EXECUTIVE SUMMARY

GCS Water and Environmental Consultants (Pty) Ltd (GCS) was appointed by Kouga Sand (Pty) Ltd (Kouga Sand) to conduct the Environmental Authorisation (EA) process for the proposed mining of sand on Portion 8 of Kruisfontein No. 193, Humansdorp, Eastern Cape. This application for EA is being undertaken on behalf of Kouga Sand (the applicant) and, as such, will be submitted to the Department of Mineral Resources and Energy (DMRE) as the competent authority.

NEED AND DESIRABILITY

There is an increasing demand for building sand in the Kouga Local Municipality, as various activities require this product, such as the upgrading of roads and expansion of towns. Wind farms have already been constructed, with additional phases planned. These projects all require sand for the construction, as well as for roads. The limited number of mines in the area mean that sand has to be trucked in from other nearby areas which increases the price of the product. As a result, this mine would contribute to the development and economic growth of the surrounding areas. It is therefore important for additional sand mines to be constructed to meet the needs of the Municipality.

SITE DESCRIPTION

The proposed site is 4.9ha. The site is currently vacant and highly disturbed with very sparse vegetation. Previously, the site was used for wattle farming. It has since been cleared, with a few trees remaining. It is located within a primarily agricultural-based area, and the site will be accessed via existing farm roads.

LISTED ACTIVITIES

Listed activities in terms of the 2014 NEMA EIA regulations, as amended:

Notice	Activity	Description of related activity	Applicability
1	21	Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including — a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource[,] ; or [including activities for which an exemption has been issued in terms of	Mining of building sand

Notice	Activity	Description of related activity	Applicability
		section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] 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 Listing Notice 2 applies.	
1	22	The decommissioning of any activity requiring – (i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	Provision has been made for closure.
1	27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— i. the undertaking of a linear activity; or ii. maintenance purposes undertaken in accordance with a maintenance management plan.	Clearing of vegetation for mine

SPECIALIST STUDIES

The following specialist studies were identified as required based on the Department of Forestry, Fisheries and Environment Screening Tool:

Theme	Sensitivity	Study Undertaken	Reason
Agriculture	High	No	The area is already disturbed due to current landuse activities
Animal Species	Medium	No	The area is already disturbed due to current landuse activities
Aquatic	Very High	Yes	Required
Heritage	Low	Yes	The area is known for artefacts
Civil Aviation	Low	No	Not required
Defence	Low	No	Not required
Paleontology	High	No	Not required
Plant Species	Medium	No	The area is already disturbed due to current landuse activities
Terrestrial Biodiversity	Very High	Yes	Required

PUBLIC PARTICIPATION PROCESS

The comment period was run **from 31 May 2022 to 1 July 2022**. Two site notices detailing information about the project and the BA Process, as well as invitation to register as I&APs, were placed at two locations on 15 February 2022. A newspaper advertisement for the

registration and participation of I&APs was placed in the Kouga Express Newspaper on 17 February 2022.

ENVIRONMENTAL IMPACT STATEMENT

The following potential impacts associated with the proposed project are rated as **Medium** (**Negative**) significance (**pre-mitigation**):

- *Loss of minimal indigenous vegetation present on site;*
- *Spread of alien invasive plant species;*
- *Contamination as a result of leaking portable toilet facilities; and*
- *Alteration of catchment drainage due to change in baseline topography.*

It must be emphasised that all of these medium negative impacts can be mitigated to a low significance.

The following impacts associated with the proposed project are considered to be of **Positive** significance:

- *Removal of alien invasive vegetation existing on site;*
- Potential employment opportunities for a limited number of local residents; and
- Potential economic benefit for the area from the sale of the product.

In the decommissioning phase, the receiving environment will be rehabilitated as closely as possible to the natural condition of the area.

ENVIRONMENTAL MANAGEMENT PROGRAMME

An Environmental Management Programme (EMPr) related to the construction and operational phases of the proposed mine is included as Appendix E.

CONCLUSIONS

The EAP is confident that all major impacts associated with the proposed sand mine have been adequately described and mitigated. *In the impact assessment, consideration has been given to the relatively short duration of the proposed operation, and the localised nature of the potential impacts.*

In light of the above, and given the generally medium-low impacts associated with the proposed mine, *as well as the strict* implementation of the proposed mitigation measures

including those in the detailed EMPr (Appendix E), the EAP is confident that the project can proceed without significant impact on the receiving environment.

YOUR OPPORTUNITY TO PARTICIPATE

This FBAR has been compiled for submission to the DMRE as the CA. Any further comments on this report must be submitted on or before 12 August 2022, directly to Ms Hloniphile Dlamini, the assessing officer, by means of the following:

Tel: 041 403 6600 *Fax: 086 710 1055* *Email: Hloniphile.dlamini@dmre.gov.za*	*Post: Private Bag X 6076* *Port Elizabeth* *6000*

Please ensure that GCS is copied in any submissions to the DMRE.

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ACRONYMS AND ABBREVIATIONS

BA	Basic Assessment
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
CBA	Critical Biodiversity Area
CR	Critically Endangered
CRR	Comments and Responses Report
CV	Curriculum Vitae
DBAR	Draft Basic Assessment Report
DFFE	Department of Forestry and Fisheries and Environment
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act, 1989 (Act No. 73 of 1989)
ECBCP	Eastern Cape Biodiversity Conservation Plan
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EN	Endangered
ESA	Ecological Support Area
FBAR	Final Basic Assessment Report
FEPA	Freshwater Ecosystem Priority Area
GDP	Gross Domestic Product
GCS	GCS Water and Environmental Consultants (Pty) Ltd
GNR	Government Notice Regulation
GPS	Global Positioning System
ha	Hectares
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
LT	Least Threatened
km	kilometres
Kouga Sand	Kouga Sand (Pty) Ltd
m	Metres
m^3	Cubic metres
mamsl	Metres above mean sea level
mm	Millimetres
MP	Mining Permit
MPRDA	Mineral and Petroleum Resources Development Act, 2002

NCR	Noise Control Regulations
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMA EIA Regulations	National Environmental Management Act, 1998 (Act 107 of 1998) Environmental Impact Assessment Regulations (2014) as amended
NEM:AQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), as amended
NEM: BA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No.59 of 2008), as amended
NFEPA	National Freshwater Ecosystem Priority Area
NGO	Non-Governmental Organisation
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
OHSA	Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
PIA	Palaeontological Impact Assessment
PM	Project Manager
PPP	Public Participation Process
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SAPS	South African Police Services
SEIA	Scoping and Environmental Impact Assessment
SCC	Species of Conservation Concern
SS	Site supervisor
The Constitution	The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)
TOPS	Threatened or Protected Species
VN	Vulnerable
WMA	Water Management Area

1 INTRODUCTION

1.1 Background and Overview

GCS Water and Environmental Consultants (Pty) Ltd (GCS) was appointed by Kouga Sand (Pty) Ltd (Kouga Sand) to conduct the Environmental Authorisation (EA) process for the proposed mining of sand on Portion 8 of Kruisfontein No. 193, Humansdorp, Eastern Cape. This application for EA is being undertaken on behalf of Kouga Sand (the applicant) and, as such, will be submitted to the Department of Mineral Resources and Energy (DMRE) as the competent authority.

Owing to the nature and scale of the project, an Application for EA is required. The Applications for EA and Mining Permit have been undertaken in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the Mineral and Petroleum Resources Development Act, 2002 (MPRDA). This report has been prepared per the 2014 Environmental Impact Assessment (EIA) Regulations, as amended.

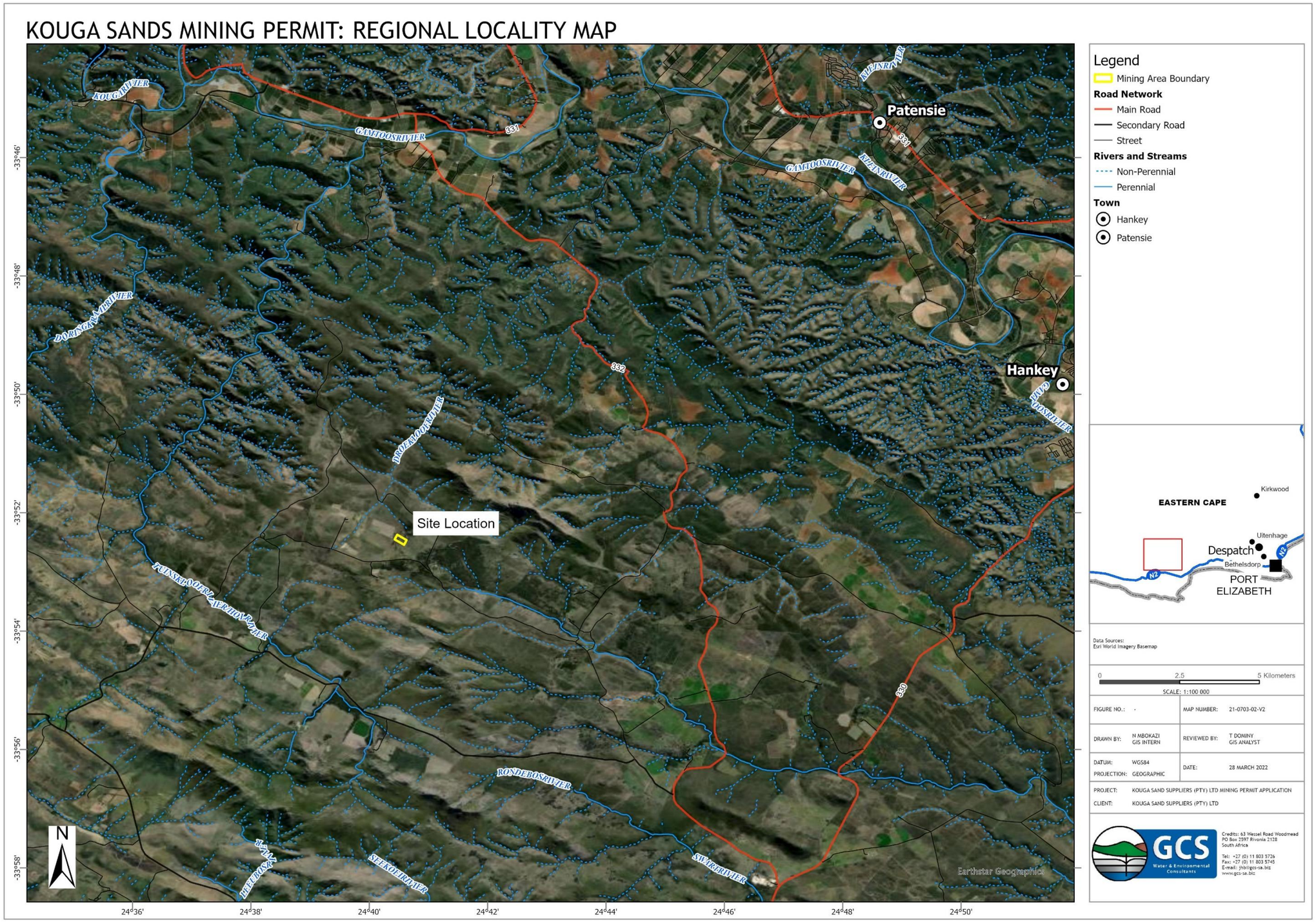

Figure 1-1: Regional Locality Map

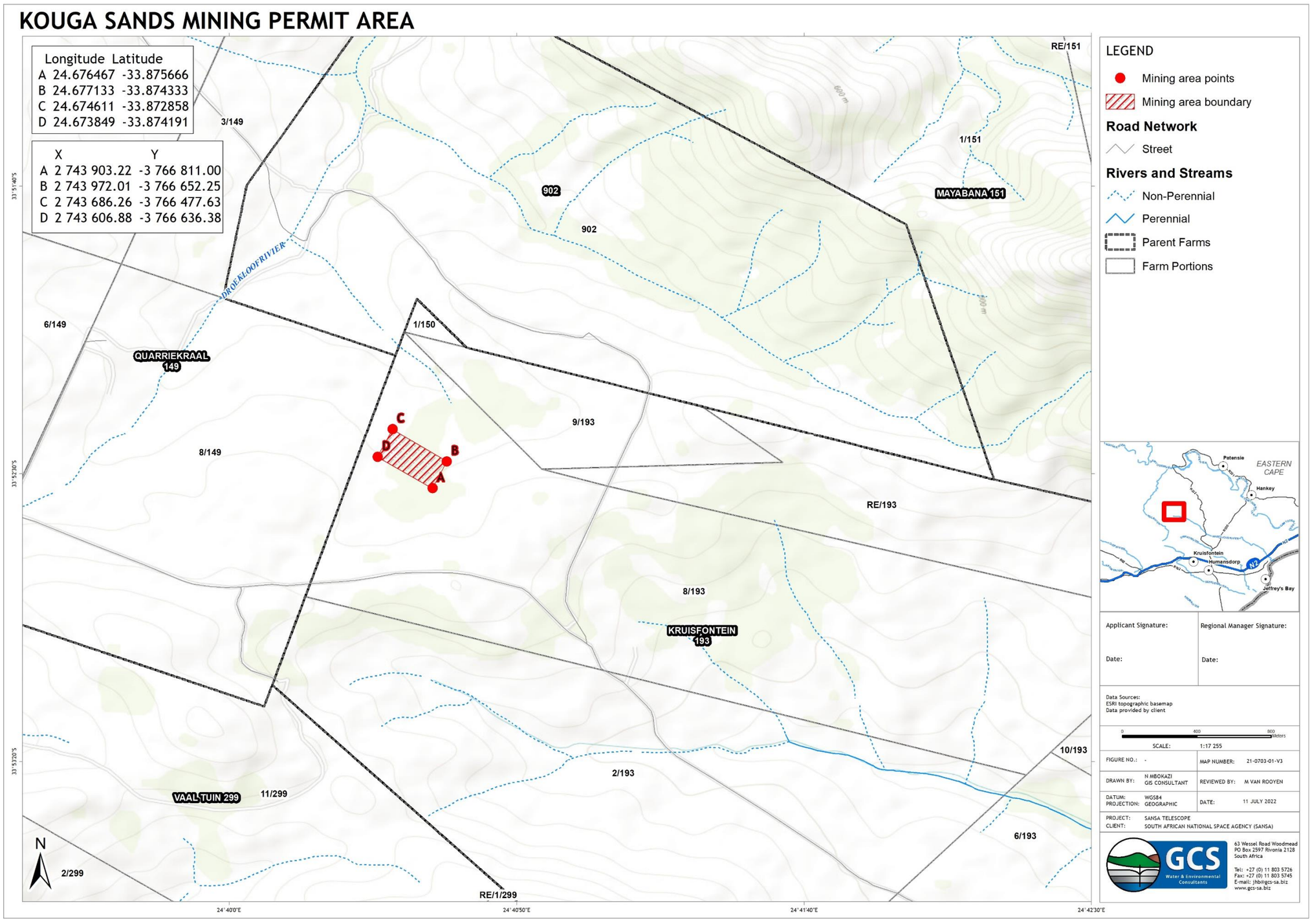

Figure 1-2: Site Locality Map

1.2 Details of Applicant and Environmental Assessment Practitioner (EAP)

The details of the applicant are provided in Table 1-1.

Table 1-1: Contact details for applicant

ITEM	DETAILS		
Project Applicant	Kouga Sand (Pty) Ltd		
Registration Number:	K2021769912		
Trading Name:	Kouga Sand		
Responsible Person:	Lu-Daan van Niekerk		
Contact Persons	Lu-Daan van Niekerk		
Postal Address	Chatten Farm, Humansdorp		
Postal Code:	6330	Cell:	0837949497
E-mail:	info@luvan.co.za		

The contact details of the EAP are provided in Table 1-2 and the EAP's CV is attached as Appendix A.

Table 1-2: Contact details for EAP

ITEM	DETAILS	
Company Name	GCS Water and Environmental Consultants (Pty) Ltd	
Company Representative	Magnus van Rooyen	*Janice Callaghan*
Professional Registration	*Pr.Sci.Nat*	*Cand.Sci.Nat, EAPASA*
Telephone No.	+27 (0)31 764 7430	*+27 (0)31 764 7430*
Facsimile No.	+27 (0)11 803 5745	*+27 (0)11 803 5745*
E-mail Address	magnusvr@gcs-sa.biz	*janicec@gcs-sa.biz*
Postal Address	PO Box 819, Gillitts, 3603	*PO Box 819, Gillitts, 3603*

2 PROJECT DESCRIPTION

2.1 Site description

2.1.1 Existing and Adjacent Land Uses

The current land use *of surrounding farms* is agriculture. *The site is currently cleared and in a disturbed state. According to Figure 2-1, the current land uses on the site are low shrubland, contiguous low forest and thicket, and fallow land and old fields. The area is currently zoned as agriculture according to the Kouga Land Use Scheme, dated December 2020.*

2.1.2 Historical Land Uses

Historically the study site was cleared for agricultural use (circa 1994) and has subsequently being left to be overgrown by alien invasive *Acacia mearnsii* that is systematically cleared from the site by the landowner for the production of firewood.

2.1.3 GPS Coordinates

The Global Positioning System (GPS) coordinates of the proposed mining area are provided in Figure 1-2. The approximate mid-point of the proposed area to be developed is at 33°52'27.99"S 24°40'32.08"E. *The co-ordinates of the corner points as described in Table 2-1.*

Table 2-1: Co-ordinates of the corner points of the proposed mining area

Point	Latitude	Longitude
A	33°52'32.49"S	24°40'35.36"E
B	33°52'27.84"S	24°40'37.86"E
C	33°52'22.24"S	24°40'28.41"E
D	33°52'27.05"S	24°40'25.82"E

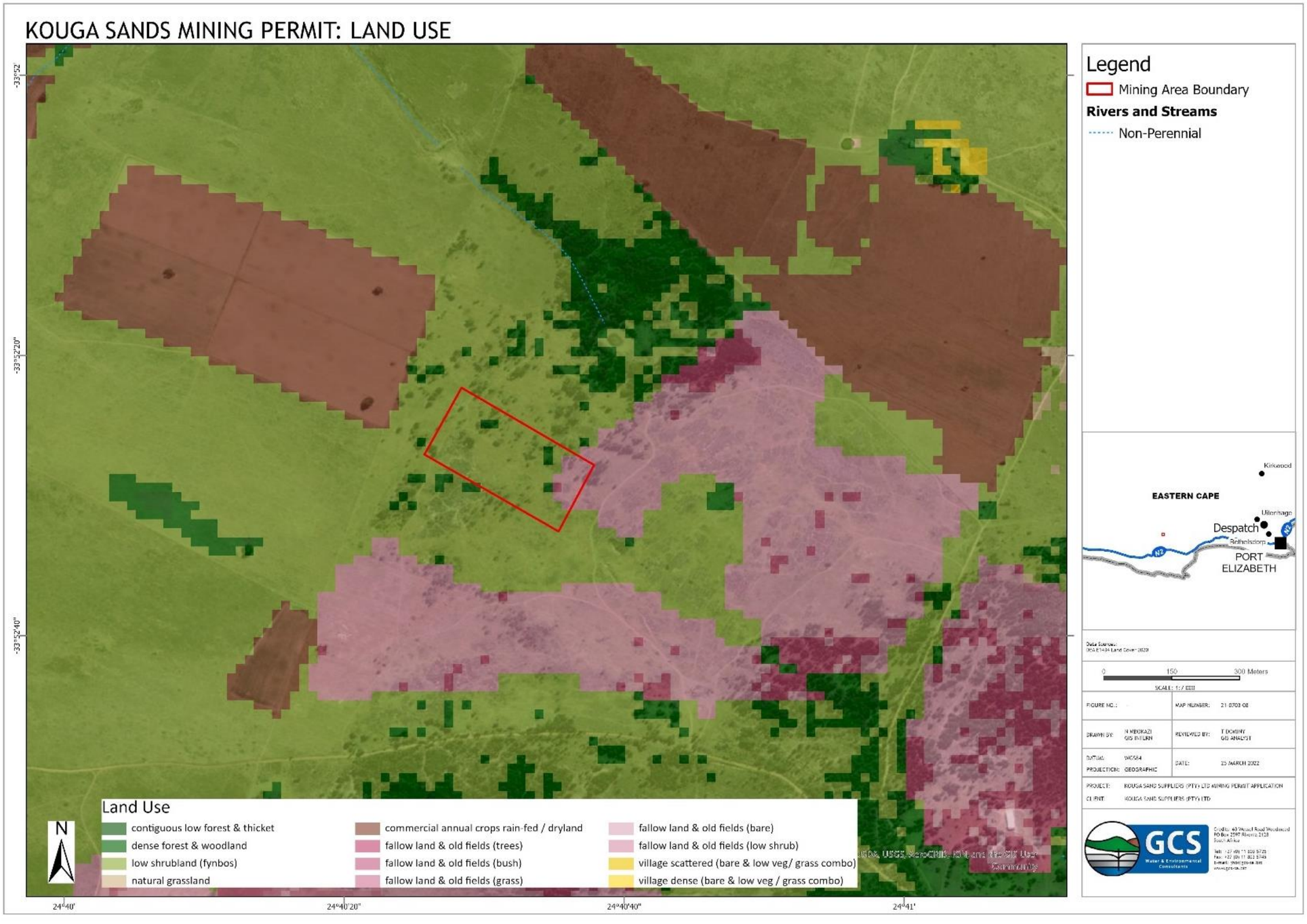

Figure 2-1: Land use of the proposed site

2.2 Land Ownership

The identified property is owned by the Phillips Family Trust. Refer to Table 2-2 for the applicable property details, *and Appendix G for the title deed.*

Table 2-2: Property Owner Details

Farm Details	SG Code	Total Property Size (ha)
Portion 8 of Farm Kruisfontein No 193	C03400000000019300008	534.780

2.3 Description of Proposed Activity

The mining will be conducted as an opencast operation with the sand removed at surface and put through a screen to remove all root material from the sand.

The excavation will be conducted with an excavator which will excavate the sand from the mining area in a concurrent strip-mining process to a depth not exceeding 3m. The sand will be put through a drum-sieve to remove any plant root material that might be in the sand. The sand will then be stockpiled and loaded on tipper trucks for transport from the site to the point of sale. *It is envisaged that four (4) truck loads of material will be removed from site per day.*

An access road to the application area already exists in the form of a farm road.

The following infrastructure will be positioned on site:

- Product stockpile (100m^2);
- Opencast pits (4.5ha); and
- Site office (50m^2).

It is anticipated that there will be three (3) workers present on site. These workers will not be housed on site.

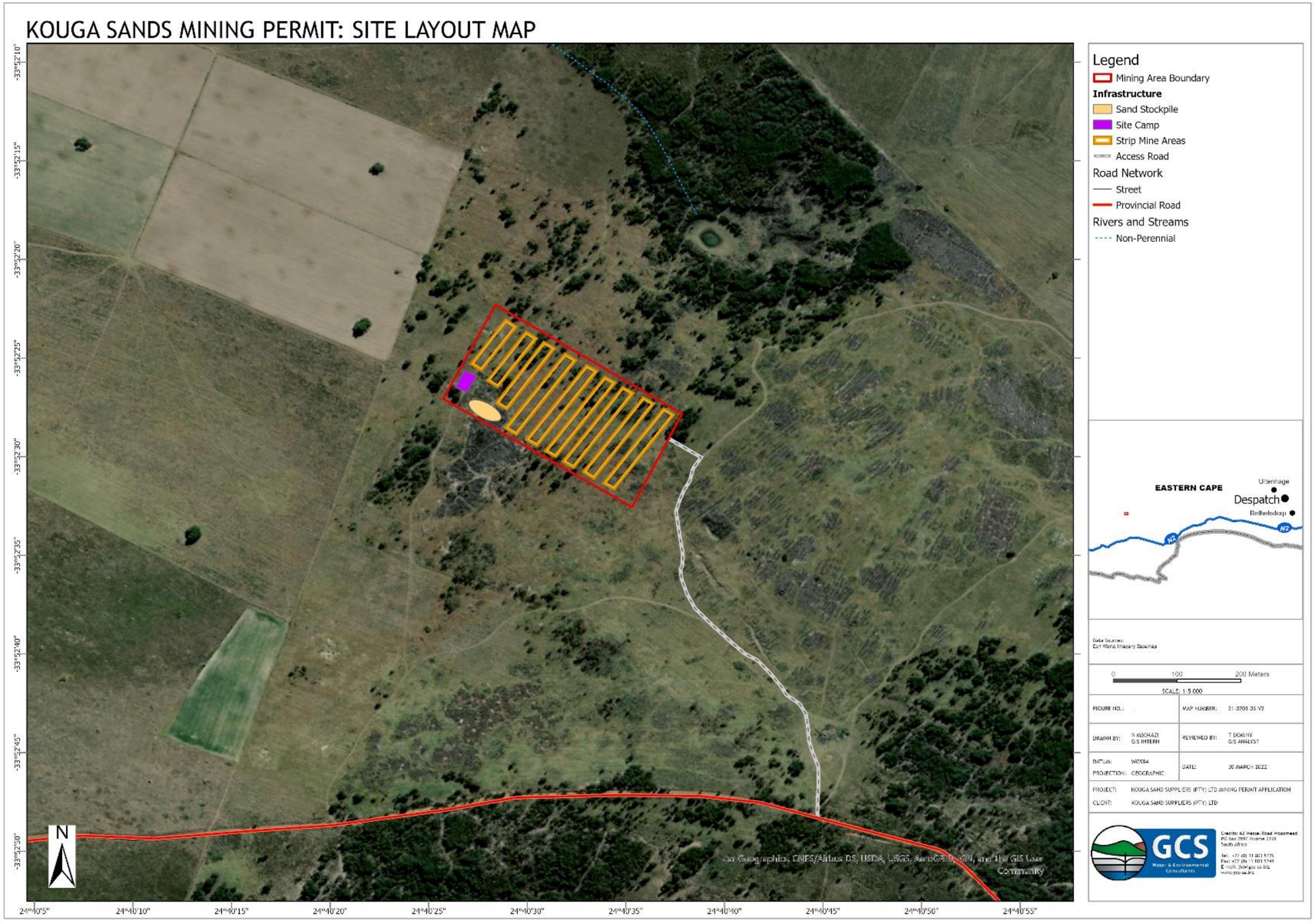

Figure 2-2: Proposed Site Layout

3 LEGAL FRAMEWORK

This chapter details applicable legal provisions and aims to provide a review of relevant national and provincial legislation and regulations, and policy documents, which apply to, or have implications for, the proposed mine.

3.1 The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)

The legal reference source for environmental law in South Africa is found in the Constitution of the Republic of South Africa, 1996 (Act No.108 of 1996)(The Constitution). All environmental aspects should be interpreted within the context of The Constitution. *The Constitution is the supreme act to which all other acts must speak to and sets out the rights for every citizen of South Africa and aims to address past social injustices.* The Constitution has enhanced the status of the environment since environmental rights have been established (Section 24) and other rights created in the Bill of Rights which impact on environmental management. *Section 24 of the Constitution states that:*

"Everyone has the right:

a) To an environment that is not harmful to their health or well-being;

b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:

i. Prevent pollution and ecological degradation;

ii. Promote conservation; and

iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".

The Applicant must ensure that environmental impacts are avoided, mitigated or managed as far as possible throughout the life cycle of the project.

3.2 National Environmental Management Act, 1998 (Act 107 of 1998) Environmental Impact Assessment Regulations (2014) as amended

The National Environmental Management Act, 1998 (Act No. 107 of 1998)(NEMA) is South Africa's overarching framework for environmental legislation *giving effect to the constitutional environmental right and provides the framework for regulatory tools in respect of environmental impacts. Section 24 of NEMA regulates environmental authorisations.*

Of particular importance is the requirement of 'duty of care' with regards to environmental remediation stipulated in Section 28 of NEMA. *Section 28 (1) states that:*

"Every person who causes has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot be reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment."

As such, the Applicant must ensure that environmental impacts are avoided, mitigated or managed as far as possible throughout the life cycle of the project.

Regulations promulgated under NEMA include the Environmental Impact Assessment (EIA) Regulations (2014) published under Government Notice Regulation (GNR) *326*, as amended 4 April 2017, and the associated Listing Notices: Listing Notice 1 *(GNR327)*, 2 *(GNR325)* and 3 *(GNR324)*. Section 24(5) of NEMA stipulates that certain "listed activities" require environmental authorisation by way of either a Basic Assessment (BA) or a full Scoping and Environmental Impact Assessment (SEIA) as defined in the Listing Notices. Activities listed under Listing Notice 1 and 3 require a BA process to be undertaken while those listed under Listing Notice 2 require a full Scoping and SEIA process. Table 3-1 provides an assessment of the applicable listed activities.

3.2.1 Applicable Listed Activities

The proposed project will require EA and Mining Permit (MP) through a BA process, due to the Activities 21, 22(i) and 27 of Listing Notice 1 being triggered (Table 3-1).

Table 3-1: Listed activities in terms of the 2014 NEMA EIA regulations, as amended

Notice	Activity	Description of related activity	Applicability
1	21	Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including — c) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource[,] ; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] d) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.	Mining of sand
1	22	The decommissioning of any activity requiring –	Provision has been made for

Notice	Activity	Description of related activity	Applicability
		(i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	closure.
1	27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— i. the undertaking of a linear activity; or ii. maintenance purposes undertaken in accordance with a maintenance management plan.	Clearing of vegetation for mine

3.2.2 Screening and Initial Site Sensitivity Verification

Based on the Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the NEMA, when applying for EA (GN R320 of 20 March 2020) (the Protocols), the required level of assessment must be based on the findings of the Initial Site Sensitivity Verification and must comply with Appendix 6 of the EIA Regulations promulgated under sections 24(5) and 44 of the NEMA, where a specialist assessment is required.

An Initial Site Sensitivity Verification must be undertaken by an EAP or a registered specialist with expertise in the relevant environmental theme being considered. The Initial Site Sensitivity Verification must be undertaken through the use of:

- A desktop analysis, using satellite imagery; and
- A preliminary on-site inspection to identify if there are any discrepancies with the current use of land and environmental status quo versus the environmental sensitivity as identified on the national web-based environmental screening tool, such as new developments, infrastructure, indigenous/pristine vegetation, etc.

The outcome of the Initial Site Sensitivity Verification must be recorded in the form of a report that-

- Confirms or disputes the current use of the land and environmental sensitivity as identified by the national web-based environmental screening tool;
- Contains motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and
- Is submitted together with the relevant assessment report prepared following the requirements of the EIA Regulations.

The site has several sensitivities and associated reporting requirements, as shown in Table 3-2. The assessment was based on the property description, using the Department of Forestry, Fisheries and Environment (DFFE) online screening tool (24 March 2022) (Appendix G).

Table 3-2: Site Sensitivities (based on the property description) from DFFE online screening tool

THEME	VERY HIGH	HIGH	MEDIUM	LOW
Agriculture		X		
Animal Species			X	
Aquatic Biodiversity	X			
Archaeological and Cultural Heritage				X
Civil Aviation				X
Defence				X
Paleontology		X		
Plant Species			X	
Terrestrial Biodiversity	X			

3.3 Environmental Conservation Act, 1989 (Act No. 73 of 1989), as amended

The Environmental Conservation Act, 1989 (Act No. 73 of 1989)(ECA) has now largely been replaced by the NEMA but certain provisions remain in force. Section 21 of the ECA relates to the control of activities that may have a detrimental effect on the environment, which require written authorization issued by the relevant authority.

The national Noise Control Regulations (NCR) (GN R154 in Government Gazette No. 13717 dated 10 January 1992) (NCR) were promulgated In terms of Section 25 of the ECA, relating to noise, vibration and shock. The NCRs were revised under Government Notice Number R55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations. In accordance with the Act, two procedures exist for assessing and controlling noise, respectively

- *South African National Standard (SANS) 10328:2008 Methods for environmental noise impact assessments;*
- *SANS 10103:2004 'The measurement and rating of environmental noise with respect to annoyance and speech communication'; and*
- *Other SANS.*

The proposed development is likely to temporarily increase ambient noise levels during the construction and operational phases. Noise impacts are closely related to construction and mining activities and trucks transporting the product from site. It must be emphasized that there will be a maximum of four trucks per day removing material from site. The EMPr includes mitigation measures relating to the mitigation of noise impacts.

3.4 National Environmental Management: Waste Act, 2008 (Act No.59 of 2008), as amended

The purpose of the National Environmental Waste Management Act, 2008 (Act No. 59 of 2008) (NEM:WA) is to regulate, inter alia, the duty of care, management, transport and disposal of waste. Section 16(1) of the NEM: WA provides that:

"A holder of waste must, within the holder's power, take all reasonable measures to -

a. avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;
b. reduce, re-use, recycle and recover waste;
c. where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
d. manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through the noise, odour or visual impacts;
e. prevent any employee or any person under his or her supervision from contravening this Act; and
f. prevent the waste from being used for an unauthorised purpose."

The NEM: WA also provides for a licensing regime specific to waste management activities. While no Waste Management Licence is required for this development, the Applicant must ensure that waste is appropriately managed throughout the life cycle of the project, as per the proposed mitigation measures in Section 8, where relevant, and the EMPr.

3.5 National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), as amended

The National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)(NEM:AQA) regulates activities which may have a detrimental effect on ambient air quality including certain processes and dust-generating activities.

The NEM: AQA Dust Control Regulations (1 November 2013). prescribe dust fallout rates for residential and non-residential areas. For activities where the dustfall standard is exceeded, a dustfall monitoring report must be compiled and submitted.

An Air Emissions Licence will not be required, however, a duty of care should be employed during construction to minimise air pollution as far as possible. The Applicant must take all reasonable measures to minimise the generation of dust and ensure compliance with the Dust Control Regulations.

3.6 National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM: BA) provides for the management and conservation of South Africa's biodiversity within the framework of the NEMA. This Act allows for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources and the establishment and functions of the South African National Biodiversity Institute (SANBI).

The 2007 Threatened or Protected Species (TOPS) Regulations (GN R150, as amended) provides protection through a permit system as well as through the identification of restricted activities. If required, the relevant permits will be applied for.

The Act also provides for duty of care with regards to control of alien species, and the national list of ecosystems that are threatened or in need of protection, that was published under GN 1002 of 9 December 2011, providing a listing of threatened or protected ecosystems and species in one of the following four categories: critically endangered (CR), endangered (EN), vulnerable (VN), protected (species only), and least threatened (LT). The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to preserve witness sites of exceptionally high conservation value. **The site is located within Critical Biodiversity Area (CBA) 1, Ecological Support Area (ESA) 1 and 2 and Freshwater Ecosystem Priority Area (FEPA) Subcatchments, based on the DFFE screening tool (24 March 2022).** ***Care must be taken to ensure no protected species or ecosystems are lost, and permits must be applied for if necessary.***

The NEM: BA Alien and Invasive Species Regulations (Government Notice 590 of August 2014) categorises the different types of alien and invasive plant and animal species and how they should be managed:

- *Category 1a Listed Invasive Species – species that must be combatted or eradicated;*
- *Category 1b Listed Invasive Species – species that must be controlled;*
- *Category 2 Listed Invasive Species – species that require a permit and must not be allowed to spread outside of the designated area; and*
- *Category 3 Listed Invasive Species – species which are subject to exemptions in terms of the section requiring a permit, but where such a species occurs in riparian areas, must, for these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to regulation 3.*

The Applicant must also control and eradicate alien and invasive species in line with the NEM: BA Alien and Invasive Species Regulations.

3.7 Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)

The purpose of the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)(CARA) is to ensure that natural agricultural resources of South Africa are conserved through maintaining the production potential of land, combating and preventing erosion, preventing the weakening or destruction of water sources, protecting vegetation, and combating weeds and invader plants.

Most of the provisions are accounted for in more recent legislation such as NEM: BA and NEMA and no applications are required in terms of CARA, however, measures to mitigate potential impacts on agricultural resources, such as soil erosion, alien invasion and protection of vegetation and water resources are included in the EMPr.

3.8 National Water Act, 1998 (Act No. 36 of 1998)

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) is the fundamental law for managing South Africa's water resources. The NWA provides the legal basis upon which to develop tools such as the authorisation of water uses as defined in Chapter 4 of the NWA.

Section 2 of the National Water Act, 1998 (Act No. 36 of 1998((NWA) provides for the protection, use, development, conservation and control of water resources while ensuring:

- *Promoting sustainable use of water;*
- *Protection of aquatic and associated ecosystems and biological diversity; and*
- *Reducing and preventing pollution and degradation of water resources.*

Sections 12 -20 of the NWA include provisions relating to the protection of water resources, including the water reserve and water quality. Section 13 relates to the establishment of water quality objectives, including:

- *The presence and concentration of particular substances in the water*
- *The characteristics and quality of the water resource and the in-stream and riparian habitat*
- *The characteristics and distribution of aquatic biota*
- *The regulation and prohibition of in-stream and land-based activities which may affect the quantity and quality of the water resources*

Section 19 of the NWA provides for pollution prevention and requires that a person who owns, controls occupies or uses the land in question, is responsible for taking reasonable measures to prevent pollution of water resources. A catchment management agency may take action to

prevent or remedy the pollution and recover all reasonable costs from the responsible party. The 'reasonable measures' which have to be taken may include measures to:

- *Cease, modify or control any act or process causing the pollution;*
- *Comply with any prescribed waste standard or management practice;*
- *Contain or prevent the movement of pollutants;*
- *Eliminate any source of pollution;*
- *Remedy the effects of the pollution; and*
- *Remedy the effect of any disturbance to the bed and banks of a watercourse".*

Pollution may be deemed to occur when the following are affected:

- *The quality, pattern, timing, water level and assurance of instream flow;*
- *The water quality, including the physical, chemical and biological*
- *Characteristics of the water;*
- *The character and condition of the in-stream and riparian habitat; and*
- *The characteristics, condition and distribution of the aquatic biota".*

Section 21 of the NWA lists water uses which can only be legitimately undertaken through the water use authorisation issued by the regional Department of Water and Sanitation (DWS). From Google Earth, it is evident that a few dams are located to the north of the site, presumably for the agricultural activities surrounding them. *Specialists have confirmed that* no *natural* watercourses or wetlands are located within the study area. *No water use triggers have been identified, as such, no water use license has been applied for. Measures have been included in the EMPr to ensure that any potential impacts on water resources are appropriately mitigated. The DWS has been provided with all the information associated with the application, with the understanding that they will provide feedback in this regard.*

3.9 National Heritage Resources Act, 1999 (Act No. 25 of 1999)

The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) requires that all heritage resources, that is, all places or objects of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance are protected. In terms of Section 38 (1) of the NHRA, subject to the provisions of subsections (7), (8) and (9), the following activities trigger the need for a HIA:

- Any development or other activity which will change the character of a site;
- The re-zoning of a site exceeding 10 000 m^2 in extent; or
- Any other category of development provided for in regulations by the South African Heritage Resources Agency (SAHRA) or a Provincial Heritage Resources Agency (PHRA).

As such, a Heritage Survey was prepared and is included as Appendix B-1, *and the recommendations, where relevant, are included in Section 8 of this report and the EMPr.*

3.10 Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)

The Occupational Health and Safety Act (Act 85 of 1993) (OHSA) Makes provision to protect the health and safety of employees at work or others affected by activities undertaken by businesses or industries.

The Applicant must adhere to the stipulations within the Act throughout the lifecycle of the activity.

3.11 Hazardous Substances Act, 1973 (Act No 15 of 1973)

The Hazardous Substances Act, 1973 (Act 15 of 1973) aims to control the production, import, use, handling and disposal of hazardous substances. Under the Act, hazardous substances are defined as substances that are toxic, corrosive, irritant, strongly sensitising, flammable and pressure generating under certain circumstances and may injure, cause ill-health or even death in humans.

Where hazardous substances from any of the 4 groups below are to be used, (see below) care must be taken to ensure that or sourced from a licensed sourced, transported, handled and disposed of in compliance with the provisions of the Act.

- *Group I: industrial chemicals (IA) and pesticides (IB);*
- *Group II: 9 classes of wastes excluding Class 1: explosives and class 7: radioactive substances;*
- *Group III: electronic products and group; and*
- *Group IV: radioactive substances.*

The list of group IA hazardous substances is provided in the Act.

Hazardous substances may be stored, handled or transported as part of the proposed project and include diesel and other liquid fuel, oil and hydraulic fluid, cement, etc.

4 PROJECT MOTIVATION AND NEED & DESIRABILITY

There is an increasing demand for building sand in the Kouga Local Municipality, as various activities require this product, such as the upgrading of roads and expansion of towns. Wind farms have already been constructed, with additional phases planned. These projects all require sand for the construction, as well as for roads. The limited number of mines in the area mean that sand has to be trucked in from other nearby areas which increases the price of the

product. As a result, this mine would contribute to the development and economic growth of the surrounding areas. It is therefore important for additional sand mines to be constructed to meet the needs fo the Municipality.

5 DEVELOPMENT ALTERNATIVES

Development alternatives are defined in relation to a proposed activity as different means of meeting the general purposes and requirements of the activity, which may include alternatives to –

- The property on which, or location where it is proposed to undertake the activity;
- The type of activity to be undertaken;
- The design or layout of the activity;
- The technology to be used in the activity;
- The operational aspects of the activity; and
- The option of not implementing the activity.

5.1 Potential Alternatives

No property or location alternatives have been assessed.

No alternate development types, layouts or technologies have been considered, as the activity is the basic mining of sand. This involves the stripping and storage of topsoil, mining of sand, and transporting it to the supplier. The only possible alternate activity would be alternate land uses.

5.2 No Go Alternative

Should the proposed mine development not go-ahead, the shortage of sand for projects and developments in the area will not be alleviated.

6 ENVIRONMENTAL ATTRIBUTES

This section outlines the biophysical and cultural heritage attributes of the study area, and indicates any environmental sensitivities that must be considered in planning and design, and in the impact assessment process.

6.1 Climate

The area receives an average ranging between 400mm and 650mm per annum, dependent on the location within the Kouga Municipality (IDP, 2021). As indicated in Figure 6-1, the area receives predominantly winter rainfall, with most of the rainfall occurring during April and November, i.e. Autumn and Spring (Meteoblue, 2022).

The climate of the area is noted to be subtropical. Frost and snow are uncommon in this area. *The warmest mean daily maximum temperature is recorded as 26˚C in February, while the coolest mean daily minimum temperature is 7˚C in July (Meteoblue, 2022)(Figure 6-1).*

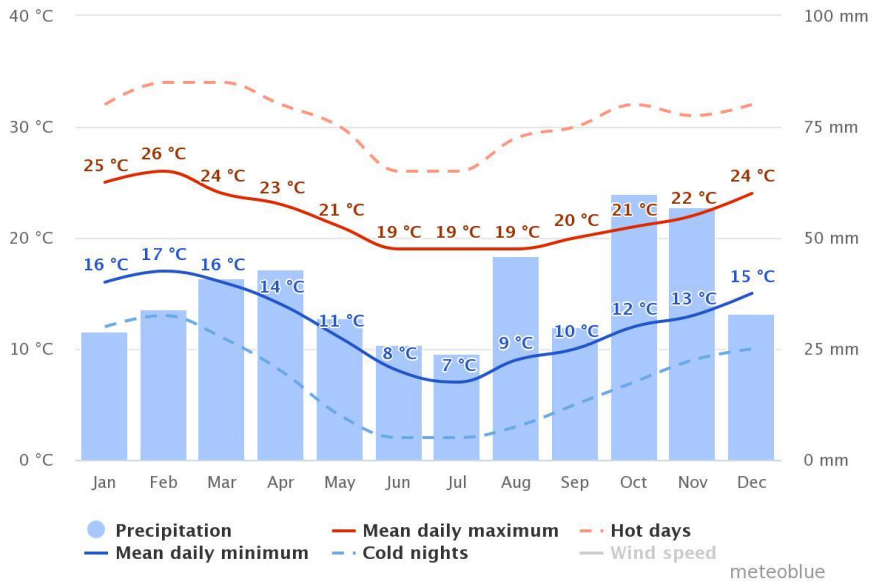

Figure 6-1: Rainfall and temperature averages for Humansdorp, Eastern Cape (Meteoblue, 2022)

The area is noted to be windy, with the predominant wind direction being a south-southwesterly direction (Figure 6-2). It is noted that the most days with the highest average windspeed (between 28km/hr and 37km/hr) occurs in October, with a general trend of increased days recorded between August and November (Figure 6-3).

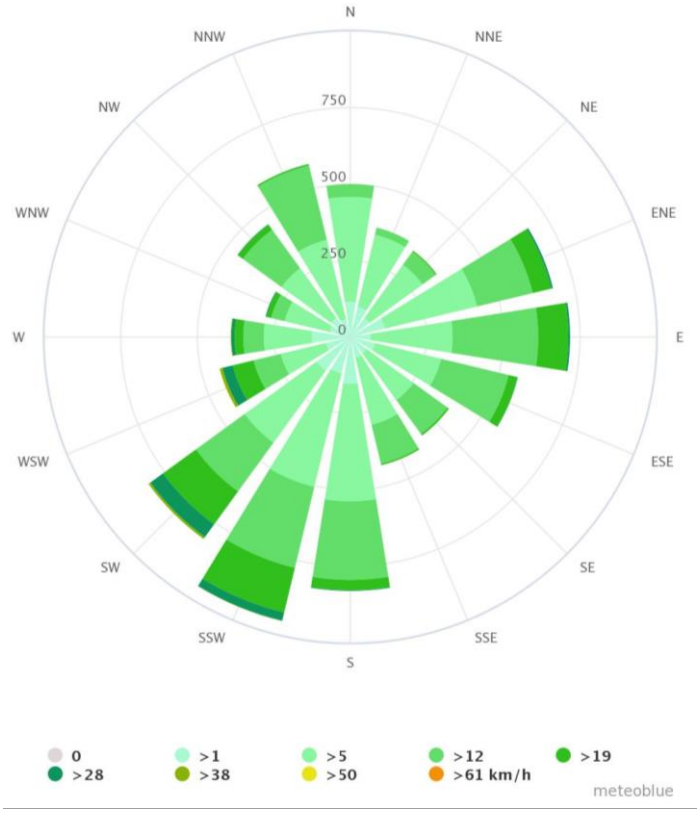

Figure 6-2: Predominant wind directions recorded in Humansdorp (Meteoblue, 2022)

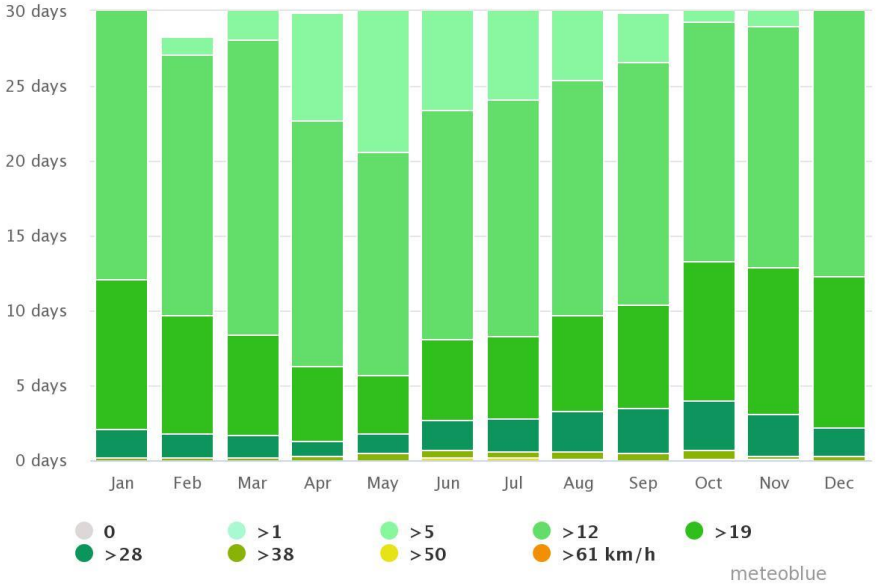

Figure 6-3: Average wind speeds recorded per month in Humansdorp (Meteoblue, 2022)

6.2 Topography and Geology

The proposed site can be considered to be flat to having undulating plains at the foot of the Kouga Mountains, which is expected in this part of the Eastern Cape. The site is approximately

90-100m above mean sea level (amsl). Refer to Figure 6-4. The study site is located on a gentle north-easterly facing slope. The natural topography of the study site has been altered by the establishment of drainage contours when the area was used for agricultural activities.

The site is situated in the Baviaanskloof Formation, Table Mountain Group of the Cape Supergroup (Geological Survey Sheet 3324 Port Elizabeth) (Figure 6-5). This consists of quartzitic sandstone. It is likely that the erosion or weathering of the shale results in the formation of the deposit.

The soils on the study site are imperfectly drained sandy soils, often shallow and often with a hard plinthic horizon at depths varying between 3m to 6m. The soils on the site are yellow to greyish sandy soils with a very thin organic layer at surface.

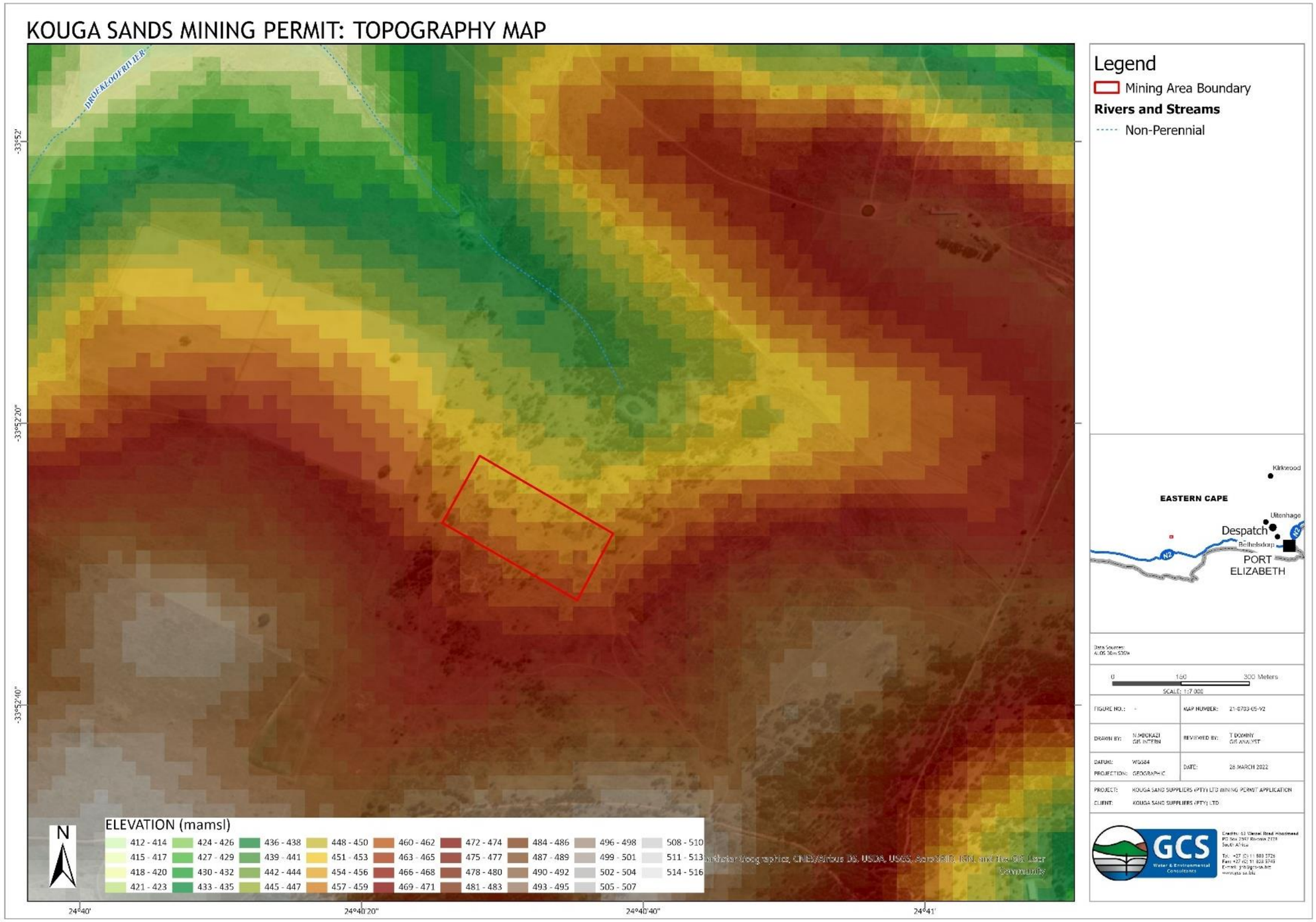

Figure 6-4: Topography of the proposed site

Figure 6-5: Geology of the proposed site

6.3 Terrestrial Biodiversity

6.3.1 Flora

The proposed site is located in the Kouga Grassy Sandstone Fynbos vegetation (FFs 28) (Mucina & Rutherford, 2006) (Figure 6-6), which is classified as Least Threatened. *In terms of the the DFFE Online Screening Tool that assesses the area in terms of the natural distribution of certain Species of Conservation Concern (SCC) and those listed on the IUCN Red List of Threatened Species, or South Africa's National Red List website, the species listed in Table 6-1 were identified as potentially being present on site.*

Table 6-1: Sensitive plant species identified as potentially present within the study site

Scientific name	Sensitivity	Present on site (Y/N)
Argyrolobium crassifolium	Medium	N
Argyrolobium trifoliatum	Medium	N
Indigofera hispida	Medium	N
Paranomus reflexus	Medium	N
Erica gladulosa subsp. *breviflora*	Medium	N
Gymnosporia elliptica	Medium	N
Amphiglossa callunoides	Medium	N
Relhania decussata	Medium	N
Sensitive species 315*	Medium	N
Aristea nana	Medium	N
Bobarta macrocarpa	Medium	N
Sensitive species 654*	Medium	N

** These species are indicated as specific numbers due to their collectable nature*

Due to the high level of disturbance on the site, none of the sensitive plant listed in Table 6-1 were identified by the specialist during the site visit.

6.3.2 Fauna

In terms of the the DFFE Online Screening Tool that assesses the area in terms of the natural distribution of certain SCC and those listed on the IUCN Red List of Threatened Species, or South Africa's National Red List website, the species listed in Table 6-2 were identified as potentially being present on site.

Table 6-2: Sensitive animal species identified as potentially present within the study site

Class	Scientific name	Sensitivity	Present on site (Y/N)
Invertebrate	*Aneuryphymus montanus*	Medium	N
Aves	*Tyto capensis*	Medium	N
Aves	*Notis denhami*	Medium	N
Aves	*Circus maurus*	Medium	N

Aves	*Sarothrura affinis*	Medium	N
Mammalia	*Chlorotalpa duthieae*	Medium	N
Not specified	*Sensitive species 7*	Medium	N

** These species are indicated as specific numbers due to their collectable nature*

It was confirmed by the specialist that, in most cases, although the study site falls within the natural habitat for these species to occur, the disturbed nature of the habitat renders it unsuitable for any of these species. Although the habitat on site is suitable for Notis denhami, no signs of these species were observed during the site visit, however the area surrounding the study site is considered to be of suitable habitat.

6.4 Hydrology and Aquatic Features

The site falls within the Droeëkloof River catchment that is a tributary of the Gamtoos River approximately 18km to the northeast of the site, which is part of the Mzimvubu-Tsitsikamma Water Management Area (WMA). The upper reaches of the Droeëkloofrivier start approximately 200m to the north of the proposed permitarea.

The upper reaches of a small seasonal, unnamed tributary of the Dieprivier starts approximately 620m to the southeast of the permit area and drains into the Kabeljousrivier. None of the features indicated above initiate within the boundaries of the permit area or within 100m of the boundaries of the site.

The interrogation of the National Freshwater Ecosystem Priority Areas (NFEPA) (2014) database managed by the South African Biodiversity Institute (SANBI) has not identified any aquatic features (wetlands or watercourses) within the boundaries of the permit area. There are two agricultural dams located to the north of the site, 220m and 480m respectively (refer to Figure 6-7).

The aquatic layer of the Eastern Cape Biodiversity Conservation Plan (2019) (ECBCP), which is currently not gazetted, classifies the site to be located in a Freshwater CBA1 as a result of its location in an ESA1 which forms part of the Gamtoos River catchment. The sector plan confirms the absence of any aquatic features within the study site.

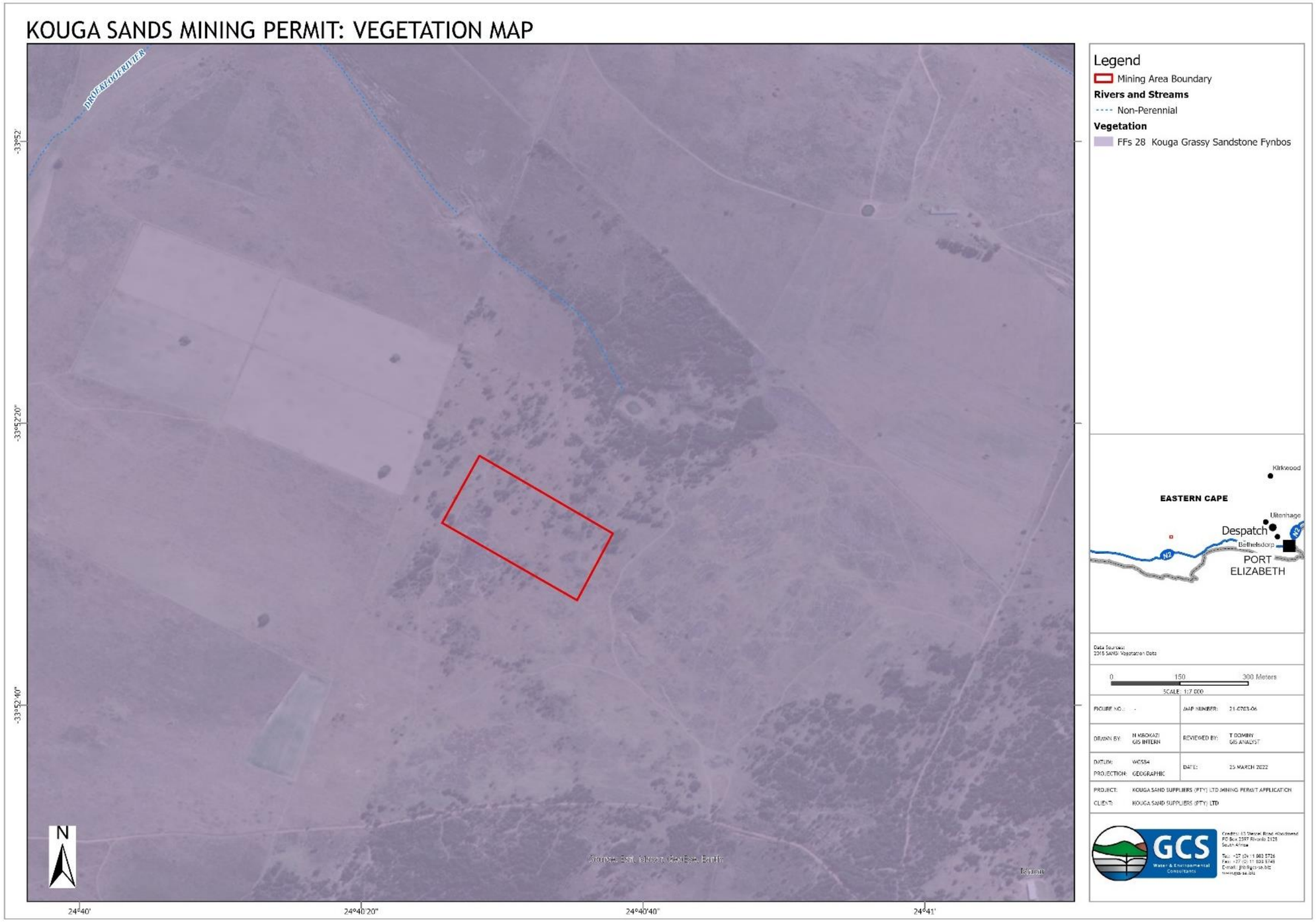

Figure 6-6: Vegetation of the proposed site

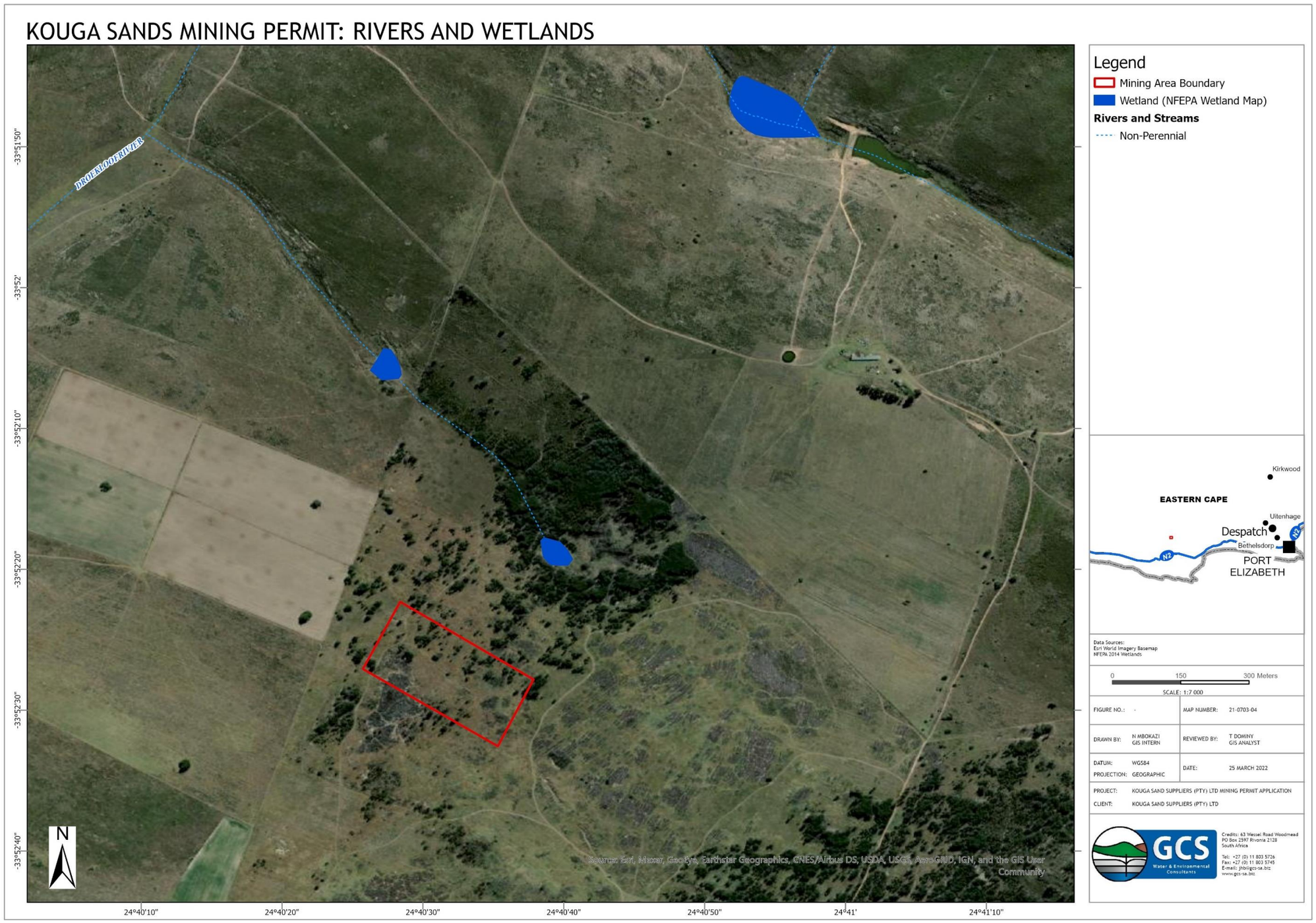

Figure 6-7: Rivers and wetlands around the proposed site

6.5 Socio-Economic Context

The site is located in the Kouga Local Municipality, within the Sarah Baartman District Municipality. Humansdorp is one of the primary nodes in the municipality, and one of two primary urban settlements with main retail and commercial activities.

According to the 2016 Community Survey, the estimated population size of Kouga Local Municipality is 112 941 (Kouga Local Municipality, 2020). Although it is the smallest region in the District, it has the largest population, representing approximately 24% of the District's population. It also has the fastest annual growth rate in the District of 3.22% per annum, as opposed to 1.1% for the District. The largest race group in Kouga is Coloured, followed by Black African and then White. The most commonly spoken first language is Afrikaans, followed by Xhosa.

As of 2016, Kouga contributed 31% of the Gross Domestic Product (GDP) of the Sarah Baartman District Municipality (Kouga Local Municipality, 2021). It was also estimated than 14.42% of households were living on R30 000 or less per annum. Based on 2016 data, 91.4% of the Municipality's water supply is provided by both regional and local water schemes. Drinking water quality is tested weekly, and is constantly above the norms, except for in Ward 3 and 8, which is a constant issue. 98.6% of households have access to piped water, while 86.9% of households have access to electricity. It is also reported that 83.4% of households have flush toilets.

6.6 Cultural Heritage Resources

Based on a desktop assessment (Umlando, 2022), no archeological features are noted on site. There is a circular feature outside the project boundary on the southwest corner. During the field survey that was undertaken, no artefacts or heritage features were noted within the study area, or directly adjacent.

A desktop Palaeontological Impact Assessment (PIA) was undertaken as project site is in an area of high sensitivity. It was determined that trace fossils may be found but are not significant. No significant palaeontological finds have been made in this underlying rock formation. As such, exemption from a PIA has been applied for.

7 PUBLIC PARTICIPATION PROCESS

The Public Participation Process (PPP) is a legislated requirement environmental authorisation procedure. Refer to Appendix H for related documentation.

7.1 Objectives of Public Participation

The procedures followed during the undertaking of the PPP for the proposed Application for EA must adhere to the NEMA principle whereby the participation of all Interested and Affected Parties (I&APs) in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and involvement by vulnerable and disadvantaged individuals must be ensured (NEMA, Section 2(1)(f)).

The primary objectives of the PPP are to:

- Identify key stakeholders (i.e. Non-Governmental Organisations [NGOs], municipalities, government departments, traditional authorities) and I&APs (i.e. surrounding businesses, residents, landowners, interested members of the public);
- Inform I&APs about the proposed Application for EA;
- Establish lines of communication between I&APs and the project team to deal with potentially contentious issues;
- Provide ample opportunity to all parties to exchange information and express their views and raise issues and concerns; and
- Obtain contributions of I&APs and ensure that all issues, concerns and questions raised are fully documented and assessed as part of the BA process.

7.2 Public Participation Process

The public participation process included the following activities (refer to Appendix H):

- An electronic I&AP database was developed, which was maintained and updated throughout the project;
- An English advertisement for the registration and participation of I&APs was placed in the Kouga Express newspaper on 17 February 2022;
- Two English notice boards detailing information about the project and the BA Process, as well as invitation to register as I&APs, were placed at three strategic points around the development site on 15 February 2022. All notice boards were designed to the specification of Section 54 (3) of the NEMA EIA Regulations; and
- Email notifications were circulated to all registered I&APs on the database (as applicable) inviting comments until 1 July 2022.

7.3 Public Review of Draft BAR

The Draft Basic Assessment Report (DBAR) was made available for public comment for 30 days, from **31 May 2022 to 1 July 2022** (30 days). The report was also made available electronically via the GCS Website (www.gcs-sa.biz) or on a CD upon request.

7.4 Comments and Responses

All comments received during the application process have been captured in a Comments and Responses Report (CRR). This CRR was updated on a continuous basis and is to be presented to the authorities and other I&APs together with the consultation and final reports as a full record of issues raised, including responses on how the issues were considered during the application process. Refer to Appendix H for this report.

8 IMPACT ASSESSMENT

This section outlines the anticipated environmental impacts associated with each phase of the proposed prospecting activities. Furthermore, this section has been completed with consideration of comments made by I&APs.This section outlines the anticipated environmental impacts associated with each phase of the proposed sand mine. These impacts are rated in terms of significance.

8.1 Methodology

The assessment of potential impacts was addressed in a standard manner to ensure that a wide range of impacts were comparable. The ranking criteria and rating scales were applied to all potential impacts identified by the EMPr. The following methodology was used to rank these impacts. Clearly defined rating and rankings scales (**Table 8-1 -**Table 8-4) were used to assess the impacts associated with the proposed activities. The impacts identified by each specialist study and through public participation were combined into a single impact rating table for ease of assessment.

Table 8-1: Severity or magnitude of impact.

Not applicable/none/negligible	0
Minor	2
Low	4
Moderate	6
High	8
Very high/extreme	10

Table 8-2: Spatial Scale – extent of area being impacting upon.

Not applicable/none/negligible	0
Site only	1
Local (within 5km)	2
Regional/neighbouring areas (5 km to 50 km)	3
National	4
International	5

Table 8-3: Duration of activity

Not applicable/none/negligible	0
Immediate	1
Short term (reversible, 0-5 years)	2
Medium term (difficult to reverse with effort, 5-15 years)	3
Life of the activity (long term – very difficult to reverse with extensive effort)	4
Beyond life of the activity (permanent – not reversible)	5

Table 8-4: Probability

Not applicable/none/negligible	0
Improbable / almost never / Annually or less	1
Low probability / Very seldom / 6 monthly	2
Medium probability / Infrequent / Temporary / Monthly	3
Highly probable / Often / semi-permanent / Weekly	4
Definite / Always / permanent / Daily	5

Each identified impact was assessed in terms of severity, spatial scale and duration (temporal scale). Significance was then determined as follows:

Significance = (Magnitude + Duration + Scale) x Probability

Impacts were rated as either of high, moderate or low significance on the basis provided in **Table 8-5**.

Table 8-5: Impact significance ratings (maximum of 100).

Significance	Environmental Significance Points	Colour Code
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	<30	L
Neutral	0	N
Low (negative)	>-30	L
Medium (negative)	-30 to -60	M
High (negative)	<-60	H

8.2 No-Go Impacts

To contextualise the potential impacts of the project's activities and associated infrastructure, the existing impacts (or status quo) associated with current terrestrial biodiversity conditions need to be described in terms of the vegetation patterns, structure and composition. This status quo should be used as the comparison against which the other project impacts are assessed. The main issues identified with the existing impacts are:

- The presence of alien invasive vegetation will persist on the study area and will proliferate from the site.

Since these existing impacts will continue even if the project is not implemented, they are considered to be "no-go" impacts.

8.3 Construction Phase

8.3.1 Surface Water

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impacts	Significance	
	Before Mitigation	Before Mitigation
Increase in surface runoff and velocity, leading to erosion	28	10
Mitigation Measures	• Restrict vegetation clearing to specific footprints. • Undertake continual monitoring to identify erosion as early as possible to remedy. • Implement the necessary stormwater control measures to ensure no uncontrolled discharge of stormwater takes place.	

8.3.2 Fauna

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impacts	Significance	
	Before Mitigation	After Mitigation
Disturbance or mortality incidents of terrestrian fauna.	28	10
Mitigation Measures	• Restrict all movement of vehicles and heavy machinery to permissible, designated areas. No off-road driving beyond designated areas may be allowed. • Strict speed limits must be set and adhered to. • Driving between dusk and dawn should be permissible to emergency situations only.	

8.3.3 Flora

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impacts	Significance:	
	Before Mitigation	After Mitigation
Loss of minimal indigenous vegetation present on site	44	18
Loss of alien invasive vegetation	44	44
Spreading of alien invasive plant species	33	18
Contamination of the area by domestic waste	21	8
Mitigation Measures	• A seedbed of alien plants will be present within the cleared soils. This seedbed and the plants that originate from it must be managed as follows: ○ The Mining Permit footprint must be clearly surveyed and demarcated before any construction or operations are set to commence, to ensure that the area to be cleared is limited to only the areas that are necessary for the mining activities. ○ The cleared areas must be regularly monitored for the establishment of alien plant species. These must be cleared when they appear. ○ If alien invasive plant species become a problem on the mining area aite, a formal Alien Invasive Management Plan must be set up and implemented. This plan must make provision for the identification and eradication of these species. • Even though the impacts of contamination of the area by domestic waste are considered to be low pre-mitigation, the following mitigation measures must be included to further reduce the significance of the impact: ○ A designated eating area must be established within the mining area. ○ Covered domestic waste bind must be present at the eating area to receive all the domestic waste generated by the labour. ○ The capacity of these domestic bins must be monitored on a daily basis to ensure they are emptied timeously. ○ The domestic waste from these waste bins must be removed off site and disposed of at a municipal landfill site ona weekly basis or more regularly if the bins fill up quicker. • Restrict all movement of vehicles and heavy machinery to permissible areas. No off-road driving beyond designated areas may be allowed.	

8.3.4 Rivers and Wetlands

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Increase in runoff and erosion.	10	5

Impact	Significance:	
	Before Mitigation	Before Mitigation
Mitigation Measures	• A seedbed of alien plants will be present within the cleared soils. This seedbed and the plants that originate from it must be managed as follows: ○ The Mining Permit footprint must be clearly surveyed and demarcated before any construction or operations are set to commence, to ensure that the area to be cleared is limited to only the areas that are necessary for the mining activities. ○ The cleared areas must be regularly monitored for the establishment of alien plant species. These must be cleared when they appear. ○ If alien invasive plant species become a problem on the mining area aite, a formal Alien Invasive Management Plan must be set up and implemented. This plan must make provision for the identification and eradication of these species. • Undertake continual monitoring to identify erosion as early as possible to remedy. • Implement the necessary stormwater control measures to ensure no uncontrolled discharge of stormwater takes place.	

8.3.5 Geology and Topography

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Change in baseline topography	28	20
Mitigation Measures	• Restrict disturbance to designated footprint. • Strict adhereance to the EMPr. • Ensure proper access control to the development area ○ Fencing. ○ Security. ○ Barriers. • Ensure warning signs are erected on the perimeter of these areas. • Structural safety to be ensured according to engineering standards.	

8.3.6 Soil

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Contamination of the area by petrochemical spillages	18	6
Contamination of the area as a result of leaking portable toilet facilities	32	8

Impact	Significance:	
	Before Mitigation	Before Mitigation
Mitigation Measures	• Even though the impacts of contamination of the area by petrochemical spillages are considered to be low pre-mitigation, the following mitigation measures must be included to further reduce the significance of the impact: o All plant and equipment that make use of petrochemical substances must be checked for leakages on a daily basis. o All plant and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed. o If any petrochemical substances are stored on the property, this storage must be done on an impermeable surface in a bunded area that makes provision for 110% of volume of the substances that are stored. o All refuelling of plant and equipment must be conducted over a driptray. o If any plant or equipment is to be parked on site, these must be parked within the demarcated construction footprint that has been cleared. o If any spillages from plant or equipment occur, the spill must be immediately contained, the contaminated soils must be collected and bagged in impermeable bags and stored on site to be removed and disposed of by a registered service provider. • Regarding portable chemical toilets, the following must be implemented: o Only portable chemical toilets with a sealed reservoir will be allowed on site. o The capacity of the reservoirs in the portable chemical toilets must be monitored on a daily basis to ensure that they can be serviced timeously. o All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a municipal waste water treatment facility.	

8.3.7 Land Use

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Change in land use from disturbed area to mining	12	5
Mitigation Measures	• Restrict disturbance to designated footprint. • Restrict vehicle movement to designated access roads. • Strict adherence to the EMPr. • All areas disturbed by activities must be subject to rehabilitation.	

8.3.8 Traffic

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Minimal, intermittent increase in number of trucks on the road	12	6
Mitigation Measures	• The road is designed according to the specifications of a provincial road. The applicant will assist where feasibly possible to repair and maintain the road.	

8.3.9 Cultural and Heritage Resources

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Disturbance of palaeontological material	7	5
Mitigation Measures	• Adhere to footprint areas. • A Chance find procedure should be implemented for the duration of the project with inputs from stakeholders and the local community, should there be a heritage resource identified. • For any chance finds of heritage resources, such as graves, all work must cease in the affected area and the Contractor must immediately inform the Project Manager (PM). A heritage specialist must be called to site for inspection. The relevant heritage resource agency (SAHRA) must also be informed about the finding. • Should any recent remains be found on site that could potentially be human remains, the South African Police Service (SAPS) as well as SAHRA must be informed. No SAPS official may remove remains until the correct permit/s have been obtained.	

8.3.10 Socio-Economic

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Potential employment opportunities for a limited number of local residents	16	16
Mitigation Measures	• Positive impact, so no mitigation measures required.	

8.3.11 Noise

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance	
	Before Mitigation	Before Mitigation
Minimal increase in ambient noise levels	20	8
Mitigation Measures	• The Contractor must keep noise level within acceptable limits. • Comply with ECA (GN R154 of 10 January 1992) and all local noise bylaws. • Restrict the use of sound amplification equipment for communication and emergency only. • Any complaints received by the Contractor regarding noise must be recorded and communicated to the SS and PM. • Develop a Code of Conduct for the site establishment phase in terms of the behaviour of construction staff.	

8.3.12 Visual

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance	
	Before Mitigation	Before Mitigation
Visual intrusion	27	14
Mitigation Measures	• Limit the site footprint to the designated works area. • Limit the site establishment duration. • Reinstating and rehabilitating disturbed areas as soon as possible. • Limiting site establishment activities to working hours. • Ensure that the site is in a visually acceptable state at all times. • Ensure a complaints register is in place to record and address complaints. • Undertake rehabilitation efforts as soon as feasibly possible	

8.3.13 Air

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance	
	Before Mitigation	Before Mitigation
Generation of dust	20	7
Air pollution from equipment	20	7
Mitigation Measures	• Implement dust suppression measures. • Ensure a complaints register is in place to record and address complaints. • Fuel-saving through optimal vehicle and equipment use scheduling. • Servicing and maintenance of vehicles, and machinery. • Use of fuel-saving technology. • Use of low carbon and sulphur fuels. • Restricting vehicle speeds on access routes and other unsurfaced areas of the work site.	

Impact	Significance	
	Before Mitigation	Before Mitigation
	• Restrict vehicle access to defined areas to avoid unnecessary off-road vehicle movements outside of the active work sites.	

8.4 Operational Phase

8.4.1 Surface Water

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impacts	Significance	
	Before Mitigation	Before Mitigation
Increase in surface runoff and velocity, leading to erosion	28	10
Mitigation Measures	• Restrict operational activities to specific footprints. • Undertake continual monitoring to identify erosion as early as possible to remedy. • Implement the necessary stormwater control measures to ensure no uncontrolled discharge of stormwater takes place.	

8.4.2 Fauna

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impacts	Significance	
	Before Mitigation	After Mitigation
Disturbance or mortality incidents of terrestrian fauna.	28	10
Mitigation Measures	• Restrict all movement of vehicles and heavy machinery to permissible, designated areas. No off-road driving beyond designated areas may be allowed. • Strict speed limits must be set and adhered to. • Driving between dusk and dawn should be permissible to emergency situations only.	

8.4.3 Flora

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impacts	Significance:	
	Before Mitigation	After Mitigation
Loss of minimal indigenous vegetation present on site	44	18
Loss of alien invasive vegetation	44	44

Impacts	Significance:	
	Before Mitigation	After Mitigation
Spreading of alien invasive plant species	33	18
Contamination of the area by domestic waste	21	8
Mitigation Measures	• Provision must be made for concurrent rehabilitation of the mining operations which will ensure that the permit area is mined in designated sections. • The mined out sections will be rehabilitated and planted with an indigenous grass seed mix in the first growing season after it has been mined out. This will limit the operational area to the current operational area. • A seedbed of alien plants will be present within the cleared soils. This seedbed and the plants that originate from it must be managed as follows: o The Mining Permit footprint must be clearly surveyed and demarcated before any construction or operations are set to commence, to ensure that the area to be cleared is limited to only the areas that are necessary for the mining activities. o The cleared areas must be regularly monitored for the establishment of alien plant species. These must be cleared when they appear. o If alien invasive plant species become a problem on the mining area aite, a formal Alien Invasive Management Plan must be set up and implemented. This plan must make provision for the identification and eradication of these species. • Even though the impacts of contamination of the area by domestic waste are considered to be low pre-mitigation, the following mitigation measures must be included to further reduce the significance of the impact: o A designated eating area must be established within the mining area. o Covered domestic waste bind must be present at the eating area to receive all the domestic waste generated by the labour. o The capacity of these domestic bins must be monitored on a daily basis to ensure they are emptied timeously. o The domestic waste from these waste bins must be removed off site and disposed of at a municipal landfill site ona weekly basis or more regularly if the bins fill up quicker. • Restrict all movement of vehicles and heavy machinery to permissible areas. No off-road driving beyond designated areas may be allowed.	

8.4.4 Rivers and Wetlands

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Increase in runoff and erosion.	10	5

Impact	Significance:	
	Before Mitigation	Before Mitigation

Mitigation Measures	• A seedbed of alien plants will be present within the cleared soils. This seedbed and the plants that originate from it must be managed as follows:
	  ○ The Mining Permit footprint must be clearly surveyed and demarcated before any construction or operations are set to commence, to ensure that the area to be cleared is limited to only the areas that are necessary for the mining activities.
	  ○ The cleared areas must be regularly monitored for the establishment of alien plant species. These must be cleared when they appear.
	  ○ If alien invasive plant species become a problem on the mining area aite, a formal Alien Invasive Management Plan must be set up and implemented. This plan must make provision for the identification and eradication of these species.
	• Undertake continual monitoring to identify erosion as early as possible to remedy.
	• Implement the necessary stormwater control measures to ensure no uncontrolled discharge of stormwater takes place.	

8.4.5 Geology and Topography

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Alteration of catchment drainage due to change in baseline topography	35	10

Mitigation Measures	• Restrict disturbance to designated footprint.
	• Strict adhereance to the EMPr.
	• Ensure proper access control to the development area
	  ○ Fencing.
	  ○ Security.
	  ○ Barriers.
	• Ensure warning signs are erected on the perimeter of these areas.
	• Structural safety to be ensured according to engineering standards.
	• Provision must be made during concurrent rehabilitation that the topography is free draining in the natural drainage direction of the surrounding area.	

8.4.6 Soil

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Contamination of the area by petrochemical spillages	18	6

Impact	Significance:	
	Before Mitigation	Before Mitigation
Contamination of the area as a result of leaking portable toilet facilities	32	8
Mitigation Measures	• Even though the impacts of contamination of the area by petrochemical spillages are considered to be low pre-mitigation, the following mitigation measures must be included to further reduce the significance of the impact: ○ All plant and equipment that make use of petrochemical substances must be checked for leakages on a daily basis. ○ All plant and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed. ○ If any petrochemical substances are stored on the property, this storage must be done on an impermeable surface in a bunded area that makes provision for 110% of volume of the substances that are stored. ○ All refuelling of plant and equipment must be conducted over a driptray. ○ If any plant or equipment is to be parked on site, these must be parked within the demarcated construction footprint that has been cleared. ○ If any spillages from plant or equipment occur, the spill must be immediately contained, the contaminated soils must be collected and bagged in impermeable bags and stored on site to be removed and disposed of by a registered service provider. • Regarding portable chemical toilets, the following must be implemented: ○ Only portable chemical toilets with a sealed reservoir will be allowed on site. ○ The capacity of the reservoirs in the portable chemical toilets must be monitored on a daily basis to ensure that they can be serviced timeously. ○ All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a municipal waste water treatment facility.	

8.4.7 Land Use

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Change in land use from disturbed area to mining	12	5
Mitigation Measures	• Restrict disturbance to designated footprint. • Restrict vehicle movement to designated access roads. • Strict adherence to the EMPr. • All areas disturbed by activities must be subject to rehabilitation.	

8.4.8 Traffic

The table below indicates the potential impacts based on activities and the proposed mitigation

measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Minimal, intermittent increase in number of trucks on the road	12	6
Mitigation Measures	• The road is designed according to the specifications of a provincial road. The applicant will assist where feasibly possible to repair and maintain the road.	

8.4.9 Cultural and Heritage Resources

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Disturbance of palaeontological material	7	5
Mitigation Measures	• Adhere to footprint areas. • A Chance find procedure should be implemented for the duration of the project with inputs from stakeholders and the local community, should there be a heritage resource identified. • For any chance finds of heritage resources, such as graves, all work must cease in the affected area and the Contractor must immediately inform the PM. A heritage specialist must be called to site for inspection. SAHRA must also be informed about the finding. • Should any recent remains be found on site that could potentially be human remains, the SAPS as well as SAHRA must be informed. No SAPS official may remove remains until the correct permit/s have been obtained.	

8.4.10 Socio-Economic

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Potential employment opportunities for a limited number of local residents	16	16
Potential economic benefit for the area from the sale of the product	16	16
Mitigation Measures	• Positive impact, so no mitigation measures required.	

8.4.11 Noise

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance	
	Before Mitigation	Before Mitigation
Minimal increase in ambient noise levels	20	8
Mitigation Measures	• The Contractor must keep noise level within acceptable limits. • Comply with the Noise Control Regulations in terms of Section 25 of ECA (GN R154 of 10 January 1992) and all local noise bylaws. • Restrict the use of sound amplification equipment for communication and emergency only. • Any complaints received by the Contractor regarding noise must be recorded and communicated to the SS and PM. • Develop a Code of Conduct for the site establishment phase in terms of the behaviour of construction staff.	

8.4.12 Visual

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance	
	Before Mitigation	Before Mitigation
Visual intrusion	27	14
Mitigation Measures	• Limit the site footprint to the designated works area. • Reinstating and rehabilitating disturbed areas as soon as possible. • Limiting operational activities to working hours. • Ensure that the site is in a visually acceptable state at all times. • Ensure a complaints register is in place to record and address complaints. • Undertake rehabilitation efforts as soon as feasibly possible	

8.4.13 Air

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance	
	Before Mitigation	Before Mitigation
Generation of dust	20	7
Air pollution from equipment	20	7

Impact	Significance	
	Before Mitigation	Before Mitigation
Mitigation Measures	• Implement dust suppression measures. • Ensure a complaints register is in place to record and address complaints. • Fuel-saving through optimal vehicle and equipment use scheduling. • Servicing and maintenance of vehicles, and machinery. • Use of fuel-saving technology. • Use of low carbon and sulphur fuels. • Restricting vehicle speeds on access routes and other unsurfaced areas of the work site. • Restrict vehicle access to defined areas to avoid unnecessary off-road vehicle movements outside of the active work sites.	

8.5 Decommissioning Phase

8.5.1 Surface Water

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impacts	Significance	
	Before Mitigation	Before Mitigation
Compaction of soil during rehabilitation activities leading to increased runoff velocity and erosion	28	10
Mitigation Measures	• Restrict operational activities to specific footprints. • Undertake continual monitoring to identify erosion as early as possible to remedy. • Implement the necessary stormwater control measures to ensure no uncontrolled discharge of stormwater takes place. • Rehabilitation activities must ensure the area reflects the natural drainage direction of the surrounding areas.	

8.5.2 Fauna

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impacts	Significance	
	Before Mitigation	After Mitigation
Restoration of habitats will encourage fauna to return to the area.	28	28
Mitigation Measures	• None required – positive impact.	

8.5.3 Flora

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impacts	Significance	
	Before Mitigation	After Mitigation
Spreading of alien invasive vegetation	44	9
Mitigation Measures	• A seedbed of alien plants will be present within the cleared soils. This seedbed and the plants that originate from it must be managed as follows: ○ The Mining Permit footprint must be clearly surveyed and demarcated before any construction or operations are set to commence, to ensure that the area to be cleared is limited to only the areas that are necessary for the mining activities. ○ The cleared areas must be regularly monitored for the establishment of alien plant species. These must be cleared when they appear. ○ If alien invasive plant species become a problem on the mining area aite, a formal Alien Invasive Management Plan must be set up and implemented. This plan must make provision for the identification and eradication of these species.	

8.5.4 Rivers and Wetlands

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Increase in runoff and erosion.	10	5
Mitigation Measures	• A seedbed of alien plants will be present within the cleared soils. This seedbed and the plants that originate from it must be managed as follows: ○ The Mining Permit footprint must be clearly surveyed and demarcated before any construction or operations are set to commence, to ensure that the area to be cleared is limited to only the areas that are necessary for the mining activities. ○ The cleared areas must be regularly monitored for the establishment of alien plant species. These must be cleared when they appear. ○ If alien invasive plant species become a problem on the mining area aite, a formal Alien Invasive Management Plan must be set up and implemented. This plan must make provision for the identification and eradication of these species. • Undertake continual monitoring to identify erosion as early as possible to remedy. • Implement the necessary stormwater control measures to ensure no uncontrolled discharge of stormwater takes place.	

8.5.5 Geology and Topography

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Alteration of catchment drainage due to change in baseline topography	35	10
Mitigation Measures	• Strict adhereance to the EMPr. • Provision must be made during concurrent rehabilitation that the topography is free draining in the natural drainage direction of the surrounding area.	

8.5.6 Soil

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Contamination of the area by petrochemical spillages	18	6
Contamination of the area as a result of leaking portable toilet facilities	32	8
Mitigation Measures	• Even though the impacts of contamination of the area by petrochemical spillages are considered to be low pre-mitigation, the following mitigation measures must be included to further reduce the significance of the impact: ○ All plant and equipment that make use of petrochemical substances must be checked for leakages on a daily basis. ○ All plant and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed. ○ If any petrochemical substances are stored on the property, this storage must be done on an impermeable surface in a bunded area that makes provision for 110% of volume of the substances that are stored. ○ All refuelling of plant and equipment must be conducted over a driptray. ○ If any plant or equipment is to be parked on site, these must be parked within the demarcated construction footprint that has been cleared. ○ If any spillages from plant or equipment occur, the spill must be immediately contained, the contaminated soils must be collected and bagged in impermeable bags and stored on site to be removed and disposed of by a registered service provider. • Regarding portable chemical toilets, the following must be implemented: ○ Only portable chemical toilets with a sealed reservoir will be allowed on site. ○ The capacity of the reservoirs in the portable chemical toilets must be monitored on a daily basis to ensure that they can be serviced timeously. ○ All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a municipal waste water treatment facility.	

8.5.7 Land Use

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Restoration of disturbed areas as closely as possible to natural land use	12	12
Mitigation Measures	• None required – positive impact.	

8.5.8 Traffic

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Minimal, intermittent increase in number of trucks on the road	12	6
Mitigation Measures	• The road is designed according to the specifications of a provincial road. The applicant will assist where feasibly possible to repair and maintain the road.	

8.5.9 Cultural and Heritage

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Disturbance of palaeontological material	7	5
Mitigation Measures	• Adhere to footprint areas. • A Chance find procedure should be implemented for the duration of the project with inputs from stakeholders and the local community, should there be a heritage resource identified. • For any chance finds of heritage resources, such as graves, all work must cease in the affected area and the Contractor must immediately inform PM. A heritage specialist must be called to site for inspection. The relevant heritage resource agency (SAHRA) must also be informed about the finding. • Should any recent remains be found on site that could potentially be human remains, the SAPS as well as SAHRA must be informed. No SAPS official may remove remains until the correct permit/s have been obtained.	

8.5.10 Socio-Economic

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance:	
	Before Mitigation	Before Mitigation
Potential employment opportunities for a limited number of local residents	16	16
Mitigation Measures	• Positive impact, so no mitigation measures required.	

It is important to note that, although employment opportunities will be available during the decommissioning phase, these opportunities will cease with the closure of the operation.

8.5.11 Noise

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance	
	Before Mitigation	Before Mitigation
Minimal increase in ambient noise levels	20	8
Mitigation Measures	• The Contractor must keep noise level within acceptable limits. • Comply with the Noise Control Regulations in terms of Section 25 of ECA (GN R154 of 10 January 1992) and all local noise bylaws. • Restrict the use of sound amplification equipment for communication and emergency only. • Any complaints received by the Contractor regarding noise must be recorded and communicated to the SS and PM. • Develop a Code of Conduct for the site establishment phase in terms of the behaviour of construction staff.	

8.5.12 Visual

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance	
	Before Mitigation	Before Mitigation
Visual intrusion	27	14
Mitigation Measures	• Limit the site footprint to the designated works area. • Reinstating and rehabilitating disturbed areas as soon as possible. • Limiting rehabilitation activities to working hours. • Ensure that the site is in a visually acceptable state at all times. • Ensure a complaints register is in place to record and address complaints.	

Impact	Significance	
	Before Mitigation	Before Mitigation
	• Undertake rehabilitation efforts as soon as feasibly possible	

8.5.13 Air Quality

The table below indicates the potential impacts based on activities and the proposed mitigation measures.

Impact	Significance	
	Before Mitigation	Before Mitigation
Air pollution from equipment undertaking rehabilitation activities	20	6
Mitigation Measures	• Implement dust suppression measures. • Ensure a complaints register is in place to record and address complaints. • Fuel-saving through optimal vehicle and equipment use scheduling. • Servicing and maintenance of vehicles, and machinery. • Use of fuel-saving technology. • Use of low carbon and sulphur fuels. • Restricting vehicle speeds on access routes and other unsurfaced areas of the work site. • Restrict vehicle access to defined areas to avoid unnecessary off-road vehicle movements outside of the active work sites.	

8.6 Cumulative Impacts

Section 2 of the NEMA requires the consideration of cumulative impacts as part of the environmental assessment process. EIAs have traditionally, however, failed to come to terms with such impacts, largely as a result of the following considerations:

- Cumulative effects may be local, regional or global in scale and dealing with such impacts requires co-ordinated institutional arrangements; and
- EIA's are typically carried out on specific developments, whereas cumulative impacts result from broader biophysical, social and economic considerations, which typically cannot be addressed at the project level.

Cumulative impacts associated with this type of development could lead to initial, incremental or augmentation of existing types of environmental degradation, including impacts on the soil and land use within the available habitat. Pollution of these elements might not always be immediately evident, but incremental increases might rise to levels where biological attributes could be affected adversely on a local or regional scale. In most cases, these effects are not bound and are dispersed or diluted over an area that is much larger than the actual footprint of the causal factor. These impacts are usually most prevalent in areas where continuous and long-term impacts have been experienced. **However in this instance, this is not envisaged**.

The following cumulative impacts have been identified and assessed.

8.6.1 Loss of Indigenous Vegetation

Impact Description	Impact Rating
The mining operations will be conducted as an open cast surface mining operation which will result in the removal of the vegetation from the active mining areas. As a result of this clearance, it is likely that some indigenous vegetation will be cleared from the site. However, with the level of alien invasive plant infestation (*Acacia mearnsii*) the indigenous vegetation will be limited to pioneering grass species that has established on the site as a result of the existing land use. Furthermore, the rehabilitation of the site will make provision for the reestablishment of the same pioneering grasses that would have been removed during the mining activities. This cumulative impact can therefore be successfully managed and mitigated.	Low

8.6.2 Loss of Alien Invasive Plant Species

Impact Description	Impact Rating
The mining operations will be conducted as an open cast surface mining operation which will result in the removal of vegetation from the active mining areas. As a result of this clearance, large numbers of alien invasive plant species (*Acacia mearnsii*) will be removed from the site. In addition to the physical removal of these plants, the associated seedbed of this species will be removed with the removed sand, which will limit the amount of revegetation of the species that might occur. As such, the mining activities is considered to have a medium positive impact on the loss of alien invasive plant species from the area.	Medium

8.6.3 Spread of Alien Invasive Plant Species

Impact Description	Impact Rating
Due to the existing presence of alien invasive species on the old agricultural areas within the mining site, the risk of these species spreading from the site is present. However, since these species will be removed during the mining activities, the impact is considered to be limited. Furthermore, the management of alien invasive plant species must be included in the EMPR for the operations. The measures included in this plan must have as a goal to reduce the spread of the alien invasive species and to eradicate them from area within the property in which they occur. Similarly, the rehabilitation of the site during the decommissioning phase must make provision for the planting of indigenous pioneering grasses on the site. As such implementation of these plans will result in the improvement of the vegetative biodiversity on the property and result in an improvement of the current biodiversity baseline on the site. This cumulative impact can therefore be successfully managed and mitigated.	Low

8.6.4 Disruption of an Open Space Corridor

Impact Description	Impact Rating
The site that is designated as the mining permit area is currently vacant land. The operations on the site will therefore change this "vacant land" status for the duration of the operations. As Mining Permits issued in terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) makes provision for the mining of an area for no longer than 4 years, this disruption will only be present for that duration. The rehabilitation of the site will make provision for the shaping of the mining area to blend in with the surrounding topography and associated drainage as well as for the planting of pioneering grasses that are endemic to the area. This cumulative impact can therefore be successfully managed and mitigated.	Low

8.6.5 Alteration of the catchment drainage regime of the area

Impact Description	Impact Rating
Due to the nature of the open cast mining, the excavation associated with the mining activity will result in an impact to the localized catchment stormwater runoff. However, as the site will be rehabilitated to be free draining in the natural drainage direction, all stormwater runoff from the site will end up in the appropriate catchment. In addition, the relatively small size of the site as well as the position high up in the particular catchment will further limit the impact of the mining activities on the surrounding hydrology. This cumulative impact can therefore be successfully managed and mitigated.	Low

9 ASSUMPTIONS, UNCERTAINTIES, AND GAPS IN KNOWLEDGE

Information in this report has been obtained from various sources. The following gaps, uncertainties or assumptions have been identified:

- The impact descriptions and assessment are based on the author's understanding of the proposed development based on the information provided.
- It is assumed that the existing farm road will be used, and no new access roads constructed.

The following assumptions were made in the Terrestrial Biodiversity Assessment Report:

- *The assessment of the potential impacts of the proposed development is based on the terrestrial biodiversity features on the development site is based on the project description provide in the sections above. If the project description is amended, the impact identification and assessment contained in this report may also change.*
- *The findings of the Terrestrial Biodiversity report are limited to a single day long site visit conducted on 4 January 2022 which is considered to be mid-summer. The seasonal timing of the site assessment is not considered to influence / compromise the findings of the assessment.*

- *The following desktop information was used to augment the finding of the Terrestrial Biodiversity Assessment:*
    - *Electronic biodiversity databases managed by SANBI;*
    - *Available provincial electronic biodiversity databases; and*
    - *Wetland and Riparian Habitat Delineation Document (DWS report);*

The following assumptions were made in the Aquatic Assessment Report:

- *The assessment of the potential impacts of the proposed operations, is based on the aquatic features on the site and the operational activities provided. If the development layout and operations is amended, the impact identification and assessment contained in this report may also change.*
- *The findings of the Aquatic Assessment Report are limited to a single day long site visit conducted on 4 January 2022 which is considered to mid-summer. The seasonal timing of the site assessment is not considered to influence / compromise the findings of the assessment.*
- *The identification and possible delineation of the wetland and riparian areas within the development site was conducted in terms of the procedures as specified by the DWS.*
- *The determination of the Present Ecological State and the Ecological Importance and Sensitivity of the wetland and watercourses that may have been identified would have been conducted by using the WET-Assess Models.*
- *The classification of any identified aquatic features would have been conducted in accordance with the classification system of inland aquatic ecosystem as prescribed by Ollis et al., 2013*
- *The following desktop information was used to augment the finding of the assessment:*
    - *Electronic biodiversity databases managed by SANBI;*
    - *Available provincial electronic biodiversity databases;*
    - *Wetland and Riparian Habitat Delineation Document (DWS report); and*
    - *Classification system for wetlands and other aquatic ecosystems in South Africa (Inland Systems) (Ollis et al., 2013 – SANBI Biodiversity Series 22).*

10 SPECIALIST RECOMMENDATIONS

The following recommendations are proposed by the Terrestrial Biodiversity Compliance Statement:

- *It is recommended that an Environmental Control Officer (ECO), who meets the requirements of the NEMA: EIA Regulations (2014) as amended, be appointed to conduct biannual audits of the operations for the duration of the project. An audit*

report must be completed for each audit and be submitted to the DMRE.

- *Furthermore, a specialist ecologist should conduct a site visit at the commencement of the rehabilitation phase of the project to ensure that the contractor is adequately informed of the rehabilitation requirements associated with the works.*

11 ENVIRONMENTAL IMPACT STATEMENT

11.1 Negative Impacts

The following potential impacts associated with the proposed project are rated as **Medium** (**Negative**) significance (**pre-mitigation**):

- *Loss of minimal indigenous vegetation present on site;*
- *Spread of alien invasive plant species;*
- *Contamination as a result of leaking portable toilet facilities; and*
- *Alteration of catchment drainage due to change in baseline topography.*

It must be emphasised that all of these medium negative impacts can be mitigated to a low significance.

11.2 Positive Impacts

The following impacts associated with the proposed project are considered to be of **Positive** significance:

- *Removal of alien invasive vegetation existing on site;*
- Potential employment opportunities for a limited number of local residents; and
- Potential economic benefit for the area from the sale of the product.

In the decommissioning phase, the receiving environment will be rehabilitated as closely as possible to the natural condition of the area.

11.3 Site Sensitivity

The sensitivity of the receiving environment is depicted in Figure 11-1. A 100m buffer from all watercourses has been observed. As previously mentioned, the aquatic layer of the ECBCP, which is currently not gazetted, classifies the site to be located in a Freshwater CBA1 as a result of its location in an ESA1 which forms part of the Gamtoos River catchment. The sector

plan, as well as the site visit by a specialist, confirms the absence of any aquatic features within the study site.

The correct implementation of the mitigation measures outlined in section 8 of this report, as well as the EMPr, will ensure that all potential impacts are managed, mitigated or avoided as far as practicably possible.

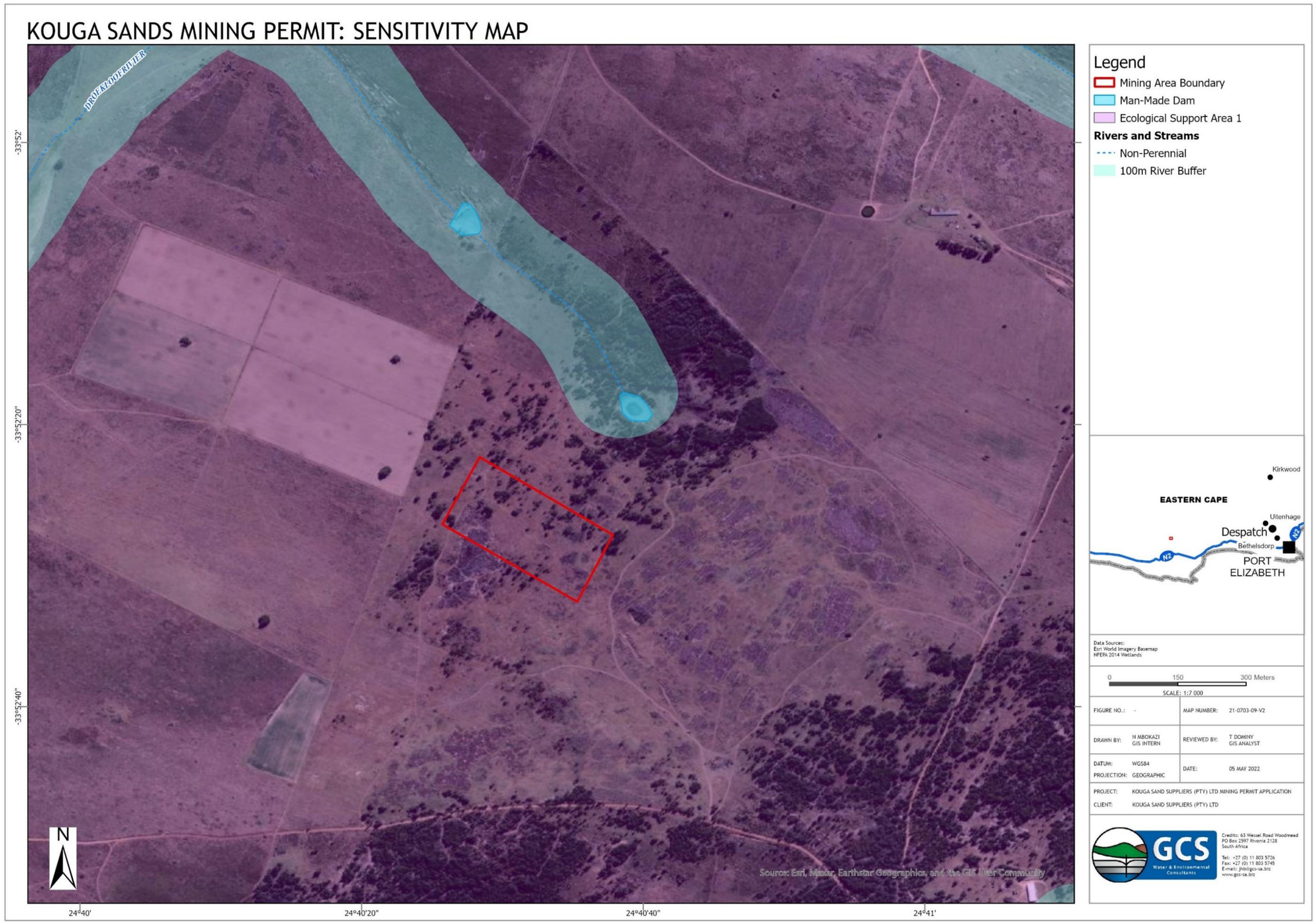

Figure 11-1: Sensitive Features on and around the site

12 MOTIVATION OF THE EAP

The EAP is confident that all major impacts associated with the proposed sand mine have been adequately described and mitigated. *In the impact assessment, consideration has been given to the relatively short duration of the proposed operation, and the localised nature of the potential impacts.*

In light of the above, and given the generally medium-low impacts associated with the proposed mine, *as well as the strict* implementation of the proposed mitigation measures including those in the detailed EMPr (Appendix E), the EAP is confident that the project can proceed without significant impact on the receiving environment.

13 REFERENCES

GCS. 2022. *Kouga Sand Aquatic Compliance Statement Associated with the Kouga Sand Mining Permit Application on a Portion of the Farm Kruisfontein No. 193 Near Humansdorp, Eastern Cape Province*. GCS Project Number 21-0703.

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Meteoblue. 2022. *Simulated Historical Climate and Weather Data for Humansdorp*. Accessed: https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/humansdorp_south-africa_995094

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APPENDICES

APPENDIX A: QUALIFICATIONS AND DECLARATION OF EAP

APPENDIX B: SPECIALIST STUDIES

APPENDIX C: DFFE ONLINE SCREENING REPORT

APPENDIX D: PUBLIC PARTICIPATION

APPENDIX E: ENVIRONMENTAL MANAGEMENT PROGRAMME

APPENDIX F: DETAILED IMPACT ASSESSMENT

APPENDIX G: PROPERTY TITLE DEED