

SCOPING REPORT FOR COAL MINING RIGHT APPLICATION, INTEGRATED ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL AUTHORISATION PORTIONS 7 AND 20 (EXCLUDING PORTION 26) OF THE FARM LEEUWVONTEIN 48 IS IN THE MAGISTERIAL DISTRICT OF STEVE TSHWETE IN MPUMALANGA PROVINCE.

DMRE REF: MP 30/5/1/2/2/10383 MR.

PREPARED FOR:



Phy50 Toerien Street, Klipfontein, Emalaheni, 1035

Tel: +27 13 692 4378

Cell: +27 79 494 0068

Email: sonwabo@tornowize.co.za

PREPARED BY



Singo Consulting (Pty) Ltd

5 Balalaika Street, Tasbet Park Ext 2, Witbank 1035.

Tel: +27 13 692 0041

Cell: +27 72 832 1117/+27 78 2727 839

Fax: 086-514-4103

Email: simangaliso@singoconsulting.co.za

COMPETENT AUTHORITY:



**mineral resources
& energy**

Department:
Mineral Resources and Energy
REPUBLIC OF SOUTH AFRICA

2023

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DISCLAIMER:

The opinion expressed in this, and associated reports are based on the information provided by Tornowize (Pty) Ltd to Singo Consulting (Pty) Ltd (“Singo Consulting”) and is specific to the scope of work agreed with Tornowize (Pty) Ltd. Singo Consulting acts as an advisor to the Tornowize (Pty) Ltd and exercises all reasonable skill and care in the provision of its professional services in a manner consistent with the level of care and expertise exercised by members of the environmental profession.

Where site inspections, testing or fieldwork have taken place, the report is based on the information made available by Singo Consulting during the visit, visual observations and any subsequent discussions with regulatory authorities. The data and information used in this report were provided to Singo Consulting by the client and also referred to other outside sources (includes historical site investigation information and third-party expert research).

Singo Consulting (Pty) Ltd (“Singo Consulting”) takes reasonable care and diligence when providing services and preparing documents, but it has been assumed that the information provided to Singo Consulting (Pty) Ltd (“Singo Consulting”) is accurate. These views do not generally refer to circumstances and features that may occur after the date of this study, which were not previously known to Singo Consulting (Pty) Ltd or had the opportunity to assess.



**mineral resources
& energy**

Department:
Mineral Resources and Energy
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT:

Submitted for environmental authorizations in terms of the National Environmental Management Act, 1998 and the National Environmental Management Waste Act, 2008 in respect of listed activities that have been triggered by applications in terms of the Mineral and Petroleum Resources Development Act, 2002 (MPRDA) (as amended).

NAME OF APPLICANT:	TORNOWIZE (PTY) LTD (2014/067373/07)
TEL NO.:	+27 13 692 4378/ +27 79 494 0068
E-MAIL.:	sonwabo@tornowize.co.za
FAX NO.:	N/A
PHYSICAL ADDRESS.	50 Toerien street, Klipfontein, EMalahleni, 1035
FILE REFERENCE NUMBER SAMRAD:	MP 30/5/1/2/2/10383 MR.

1. Important notice

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”. Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment (EIA) and an Environmental Management Programme report (EMPr) in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation, or damage to the environment. In terms of section 16(3) (b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the Competent Authority must check whether the application has considered any minimum requirements applicable, or instructions or guidance provided by the Competent Authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused. It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

OBJECTIVES OF THE SCOPING PROCESS

The objective of the scoping process through a consultative process is to:

- a) Identify the relevant policies and legislation relevant to the activity.
- b) Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location.
- c) Identify and confirm the preferred activity and technology alternatives through an impact and risk assessment and ranking process.
- d) Identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment.
- e) Identify the key issues to be addressed in the assessment phase.
- f) Agree on the key issues addressed in the assessment phase; including the methodology to be applied, the expertise required as well as the extend of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration, and probability of the impacts to inform the location of the development footprint within the preferred site.
- g) Identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

Executive summary:

Tornowize (Pty) Ltd (hereafter the applicant) has appointed Singo Consulting (Pty) Ltd (the consultant) to apply for a mining right and undertake environmental authorization associated with the proposed Tornowize Coal Mine. The proposed project area spans 98.6ha of the farm Leeuwfontein 48 IS on portions 7 and 20 (excluding portion 26) in the magisterial district of Steve Tshwete. The proposed project area is owned by Puckree farming (Pty) Ltd.

A Mining right application was lodged with the DMRE on the 05th of October 2022 with reference number: and the acceptance letter was signed on the 9th of February 2023 by the regional manager with the DMRE Ref: MP 30/5/1/2/2/10383 MR, however the letter was written a incorrect farm name and it was received late by the applicant, the EAP requested the Competent Authority to readdress the acceptance letter content and replace portion 9 of the farm Bankfontein 215 IS with Portions 7 and 20 (Excluding Portion 26) of the Farm Leeuwfontein 48. The applicant withdrawn an application for the Prospecting right with DMRE ref: MP 30/5/1/1/2/16234 PR to be accepted for this Proposed Mining Right on the same farm. Project Public participation process and review period proceeded on the 24th of February 2023. The extent of the mining right covers the above-mentioned farm portions and the proposed project relate to the opencast mining.

Thorough consultation will be undertaken with interested and affected parties from the landowner to everyone in the vicinity of the Steve Tshwete area covering a 30km radius. Everyone within this magisterial district will all be consulted whereby an open public meeting will be arranged.

In order for the proposed mine to operate, the applicant is required to submit an application for a mining right with the DMRE. In support of the application to obtain the mining right, the applicant is required to conduct a Scoping and Environmental Impact Assessment (S&EIA) for submission to the DMRE for adjudication. This assessment must include activities triggered under the Environmental Impact Assessment Regulations of 2014 (as amended) promulgated under the National Environmental Management Act, 1998 (Act 107 of 1998) and activities triggered under the National Environmental Management: Waste Act, 2008 (NEM: WA) (Act 59 of 2008).

The proposed project area can be accessed via the R35 provincial road that runs from Middleburg town to Bethal. The proposed project area has been mined in some portions, according to the landowner the area was mined by Ukufisa Holdings (Pty) Ltd, no rehabilitation has too place therefore there is still existing overburden, stockpiles and a pit.

List of abbreviations

BID	Background Information Document
DEA	Department of Environmental Affairs
DMRE	Department of Mineral Resources
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EIAr	Environmental Impact Assessment Report
EMPr	Environmental Management Programme Report
GDARD	Gauteng Department of Agriculture and Rural Development
GIS	Geographic Information System
GN	Government Notice
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
IBA	Important Bird Area
IWULA	Integrated Water Use Licence Application
ASAPA	Association of Southern African Professional Archaeologists
LoM	Life of Mine
MPRDA	Minerals and Petroleum Resources Development Act, 2002
Mtpa	Million tonnes per annum
NEM:WA	National Environmental Management: Waste Amendment Act, 2008
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PPP	Public Participation Process
RoM	Run of Mine
SAHRA	South African Heritage Resources Agency
SANS	South African National Standard
SCC	Species of Conservation Concern
S&EIA	Scoping and Environmental Impact Assessment
WMA	Water Management Area

1 INTRODUCTION AND BACKGROUND

Tornowize (Pty) Ltd (hereafter the applicant) has appointed Singo Consulting (Pty) Ltd (the consultant) to apply for a mining right and undertake environmental authorization associated with the proposed Tornowize Coal Mine. The proposed project area spans 98.6ha of the farm Leeuwfontein 48 IS on portions 7 and 20 (excluding portion 26) in the magisterial district of Steve Tshwete. The proposed project area is owned by Puckree farming. (Pty)

In order for the proposed mine to operate, the applicant is required to submit an application for a mining right with the DMRE. In support of the application to obtain the mining right, the applicant is required to conduct a Scoping and Environmental Impact Assessment (S&EIA) for submission to the DMRE for adjudication. This assessment must include activities triggered under the Environmental Impact Assessment Regulations of 2014 (as amended) promulgated under the National Environmental Management Act, 1998 (Act 107 of 1998) and activities triggered under the National Environmental Management: Waste Act, 2008 (NEM:WA) (Act 59 of 2008).

The proposed open-cast/ surface coal mining operations constitute various listed activities, as contained in the scheduled activities in Government Notice Regulation No 324, 325 and 327 (amended 7 April 2017), now amended as GNR 517 (11 June 2021). As such, a full Scoping and EIA process must be followed. Prior to any listed activity being approved by the DMRE, an environmental process must be undertaken, and a report submitted to the relevant environmental authority for consideration.

The purpose of the S&EIA process is to ensure that potential environmental, economic, and social impacts associated with operation and closure/rehabilitation of a project are identified, assessed, and appropriately managed. This is done in two primary phases: the scoping phase and the impact assessment phase, both of which are discussed in more detail in the following:

1.1 Scoping phase

The scoping phase is conducted as a precursor to the EIA process, during which:

- Project and baseline environmental information is collated. Baseline information for the scoping report is gathered through visual inspections during field visits to the proposed project area and surroundings, desktop studies (including GIS mapping), and review of existing reports, guidelines, and legislation.
- Landowners, adjacent landowners, local authorities, environmental authorities, and other stakeholders who may be affected by/or have an interest in the environmental impacts of the project, are identified.
- Interested and affected parties (I&APs) are informed about the proposed project.

- Environmental authorities are consulted to confirm legal and administrative requirements.
- Environmental issues and impacts are identified and described.
- Development alternatives are identified and evaluated, and non-feasible development alternatives are eliminated.
- The nature and extent of further investigations and specialist input required in the EIA phase is identified.
- The draft and final scoping reports are submitted for review by authorities, relevant organs of state and I&APs.
- Key I&AP issues and concerns are collated into an issues and response section for consideration in the EIA phase.

1.2 Environmental Impact Assessment process

After the initial scoping phase, the following EIA activities are completed:

- Specialist investigations are undertaken in accordance with the terms of reference established in the scoping assessment (plan of study for EIA appended to the scoping report). The scope for specialist work is determined by the nature and scale of the project impacts.
- Evaluation of development alternatives and identification of a proposed option.
- Assessment of existing impacts (no-go development option), environmental impacts that may be associated with the proposed project option, and cumulative impacts using the impact assessment methodology.
- Identification of mitigation measures to address the environmental impacts and development of actions required to achieve the mitigation required.
- Consultation with I&APs.
- Incorporation of public comments received during scoping into the Environmental Impact Assessment (EIA) and Environmental Management Programme report (EMPr), and finalisation of the EIA report.
- Issuing of the final EIA report for review.
- The requirements for the S&EIA process are contained in Chapter 4, Part 3 of the NEMA Reg No 326 (amended on 7 April 2017). The EIA process can take up to 300 days to complete (87 days for the scoping phase, 106 days for the EIA phase, and 107 days for the competent authority review).

2 PROPONENT AND ENVIRONMENTAL ASSESSMENT PRACTITIONER DETAILS

2.1 Details of the proponent

Table 1: Proponent's contact details

Name of Applicant:	Tornowize (Pty) Ltd		
Physical address:	50 Toerin Street, Klipfontein ext 8, Emalaheni		
Postal address:	PO BOX 1035, River Crescent, Die Heuwel		
Postal code:	1040	Cell phone:	+27 79 494 0068
Telephone:	+27 13 692 4378	Fax:	+27 13 692 4378
Email:	sonwabo@tornowize.co.za		

2.2 Details of the Environmental Assessment Practitioner

Singo Consulting has been appointed by the applicant as an independent EAP to undertake an S&EIA in support of the application for a mining right. Singo Consulting (Pty) Ltd has no vested interest in the proposed project and as required by the EIA Regulations, asserts its independence. The contact details of the consultants who compiled this report are as follows:

Table 2: Details of the Candidate EAP that prepared the Report:

Company name:	Singo consulting (Pty) Ltd
Contact person:	Simangaliso Jiyane
Physical address:	Office 870, 5 Balalaika Street, Tasbet Park Ext 2, Witbank, 1040
Telephone:	+27 13 692 0041
Email:	simangaliso@singoconsulting.co.za

Table 3: Details of the EAP Manager who reviewed the Report:

Name of the EAP Manager:	Rudzani Radebe Shonisani
Designation	EAP Manager
Tel No.	+27 13 692 0041
Cell No.	+27 78 548 1244
Fax No.	+27 86 515 4103
Email	rudzani@singoconsulting.co.za

Table 4: Details of the Principal EAP who reviewed the Report:

Name of the Practitioner	Dr NK Singo
Designation	Principal EAP
Tel No.	+27 13 692 0041
Cell No.	+27 78 2727 839
Fax No.	+27 86 515 4103
Email	kenneth@singoconsulting.co.za

2.2.1 Expertise of Environmental Assessment Practitioner

The Curriculum Vitae and EAP qualifications will be made available for final submission to the competent authority due to POPIA Act.

2.3 Property description

Table 5 contains the details of the farm portions included in the application, the municipal district and nearest town to the site.

Table 5: Property descriptions of the proposed Tornowize Coal Mine

	Farm Name	Farm Portions	Area (ha)
Farm name:	Leeuwfontein 48 IS	Portions 7 and 20 (excluding portion 26)	98.600
Magisterial District:	Steve Tshwete		
Distance and direction from nearest town:	Approximately 22.45 km North-East of Kriel and Approximately 6.04 km South of Komati		
21-digit Surveyor General Code for each farm portion:	TOIS00000000004800007 TOIS00000000004800020		

2.4 Locality map

The Tornowize (Pty) Ltd proposed mine is situated in the Middleburg, Mpumalanga province approximately 22.45 km North-East of Kriel and approximately 6.04 km South of Komati, along the R35 provincial road. The Regulation 2.2 map, locality map and adjacent farms map are depicted in respectively and provided Appendix 1.

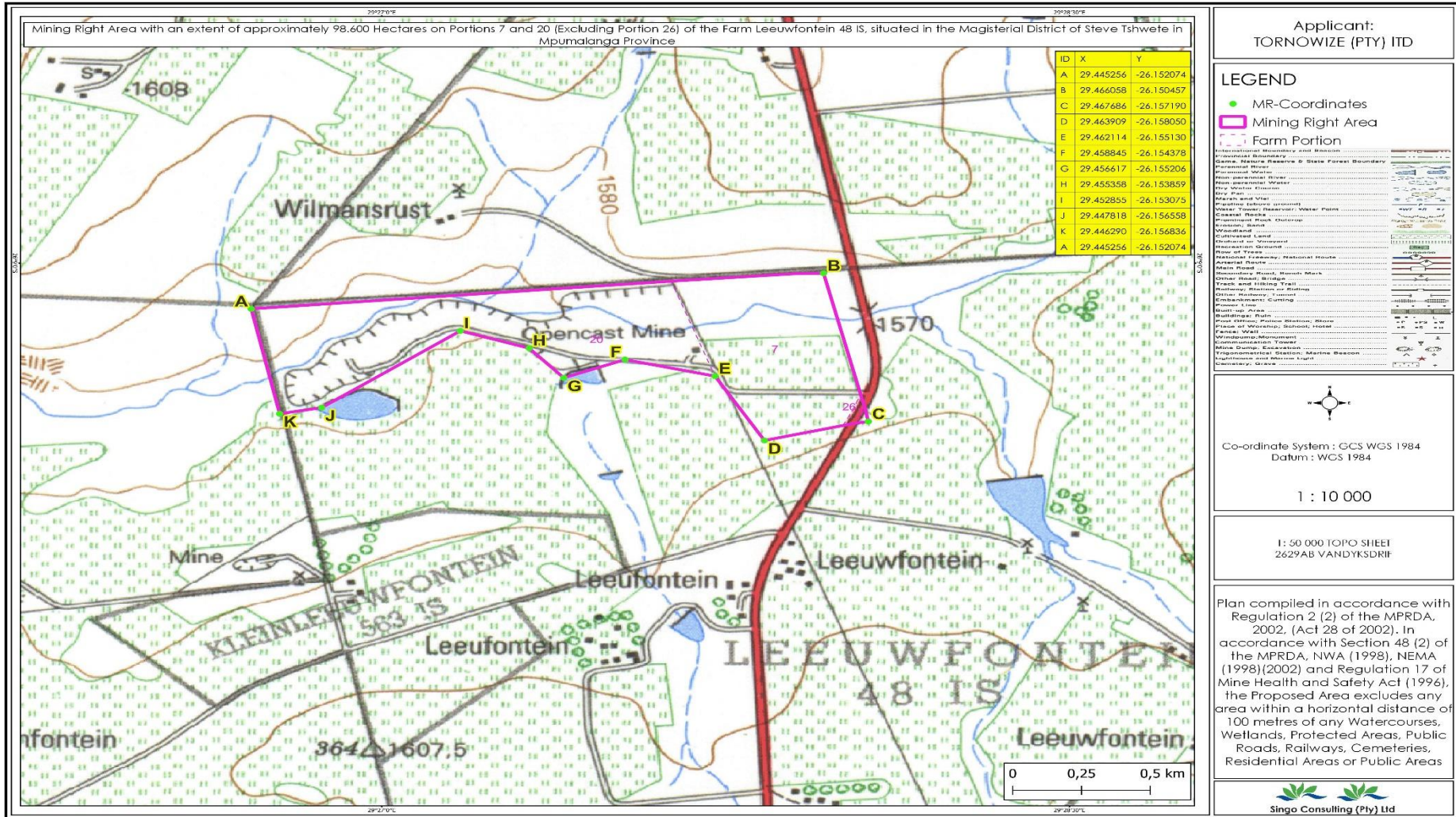


Figure 1: Reg 2.2 Map

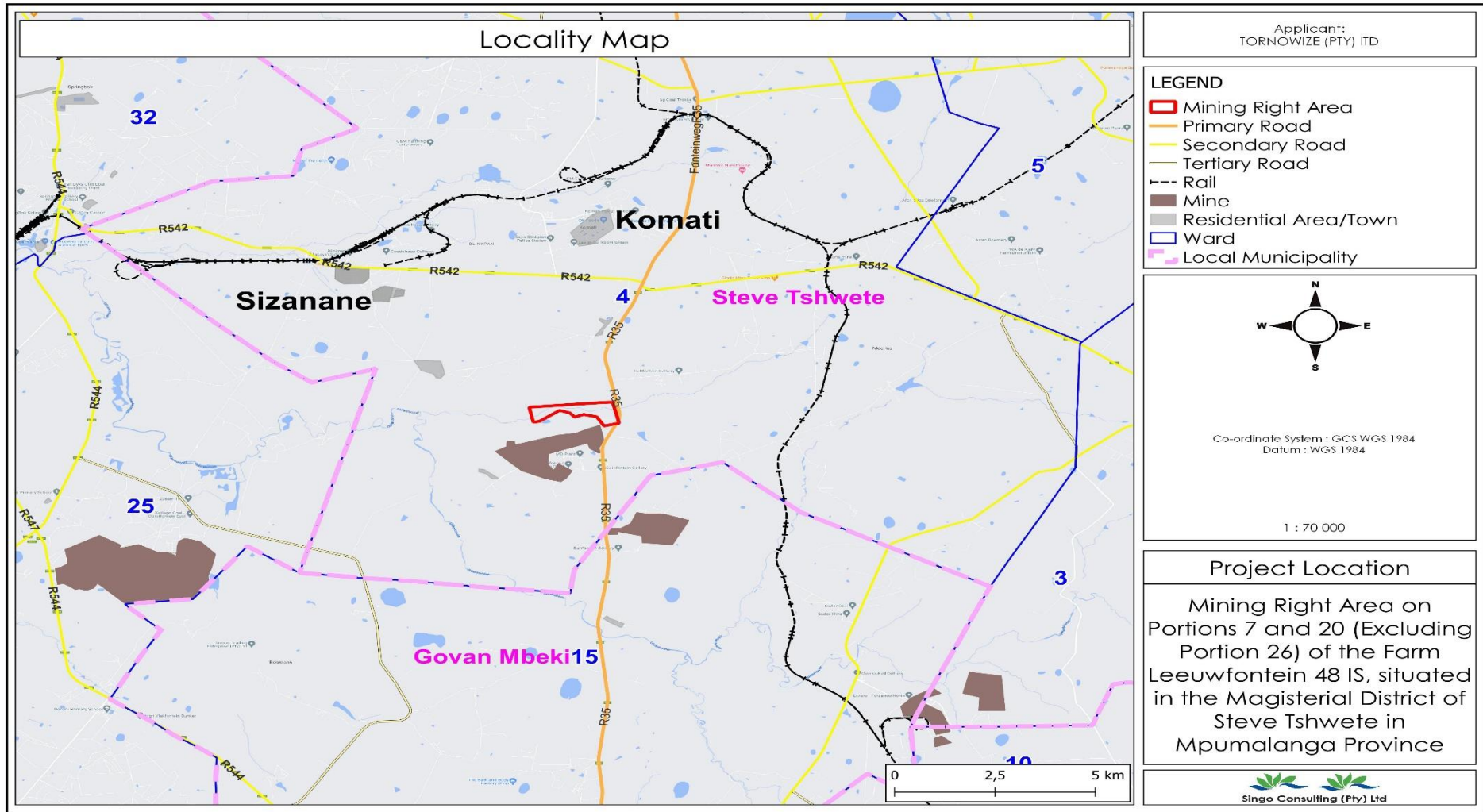


Figure 2: Project area locality (Source: Singo consulting (Pty) Ltd)

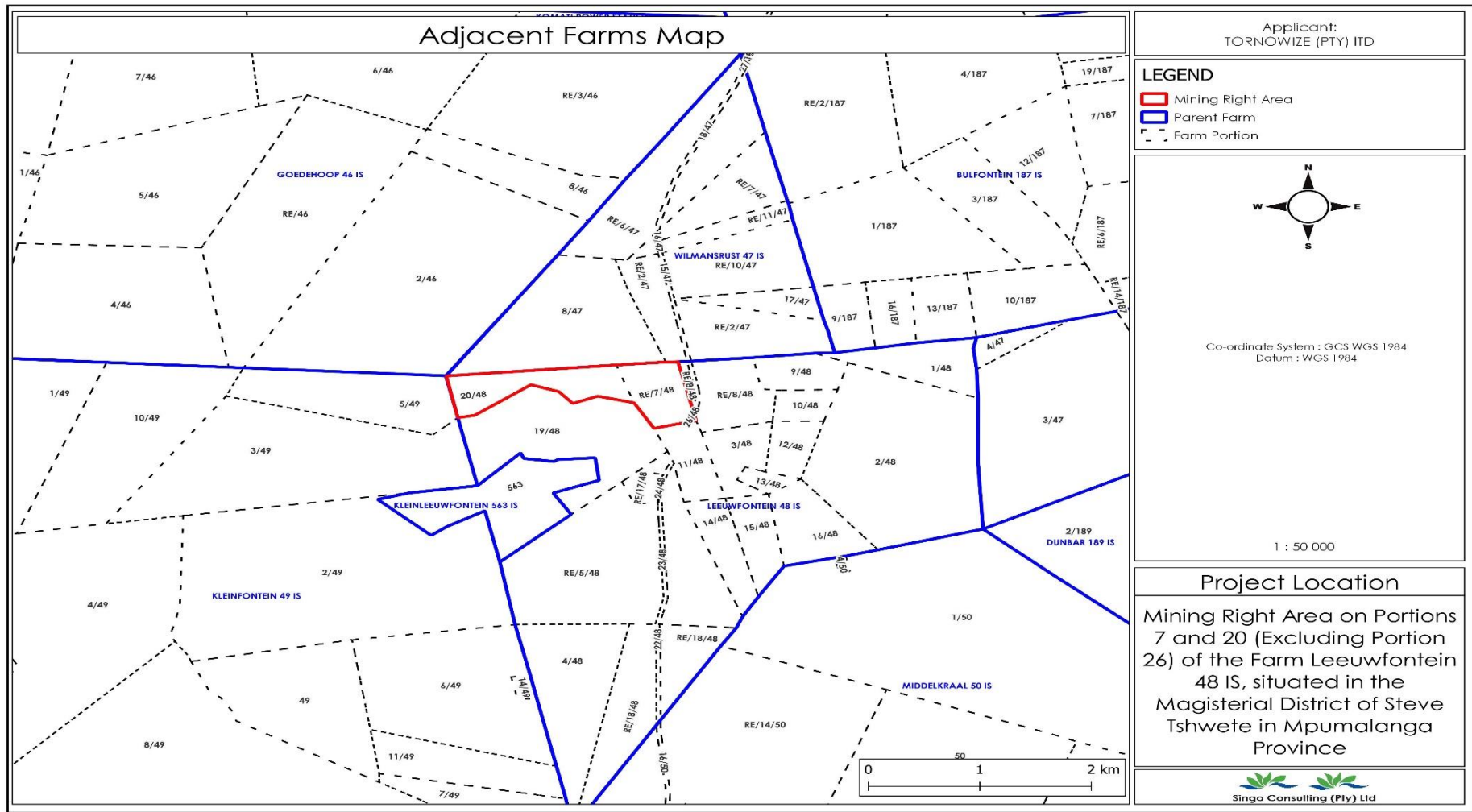


Figure 3: Adjacent Farms Map

2.5 Access road

There is no alternative for the proposed access road to the project area, the area can only be accessed through a tar road that extends towards the R35.



Figure 4: Access Road

2.6 Landowner

The mining right is applicable for portions 7 and 20 (Excluding Portion 26) of the Farm Leeuwfontein 48 IS. The portions of land are owned by Puckree Farming Pty Ltd, see the table below as per windeed results with attached title number.

Table 6: Landowner of the affected properties

Landowner	Property description	Title deed number
Puckree Farming Pty Ltd	Portions 7 and 20	T13984/2021

SEARCH CRITERIA			
Search Date	2022/09/14 11:58	Farm Number	48
Reference	-	Registration Division	IS
Report Print Date	2022/09/14 12:01	Portion Number	7
Farm Name	-	Remaining Extent	NO
Deeds Office	Mpumalanga	Search Source	WinDeed Database

PROPERTY INFORMATION			
Property Type	FARM	Diagram Deed Number	T11413/1943
Farm Name	LEEUVONTEIN	Local Authority	STEVE TSHWETE LOCAL MUNICIPALITY
Farm Number	48	Province	MPUMALANGA
Registration Division	IS	Remaining Extent	NO
Portion Number	7	Extent	40.2570H
Previous Description	-	LPI Code	TOIS00000000004800007

OWNER INFORMATION (1)			
PUCKREE FARMING PTY LTD			Owner 1 of 1
Company Type	COMPANY	Document	T13984/2021
Registration Number	200300862107	Microfilm / Scanned Date	-
Name	PUCKREE FARMING PTY LTD	Purchase Price (R)	2 150 500
Multiple Owners	NO	Purchase Date	2020/02/21
Multiple Properties	NO	Registration Date	2021/12/09
Share (%)	-		

SEARCH CRITERIA			
Search Date	2022/09/15 09:47	Farm Number	48
Reference	-	Registration Division	IS
Report Print Date	2022/09/15 09:49	Portion Number	20
Farm Name	-	Remaining Extent	NO
Deeds Office	Mpumalanga	Search Source	WinDeed Database

PROPERTY INFORMATION			
Property Type	FARM	Diagram Deed Number	T48204/989
Farm Name	LEEUVONTEIN	Local Authority	STEVE TSHWETE LOCAL MUNICIPALITY
Farm Number	48	Province	MPUMALANGA
Registration Division	IS	Remaining Extent	NO
Portion Number	20	Extent	56.8538H
Previous Description	-	LPI Code	TOIS00000000004800020

OWNER INFORMATION (1)			
PUCKREE FARMING PTY LTD			Owner 1 of 1
Company Type	COMPANY	Document	T13984/2021
Registration Number	200300862107	Microfilm / Scanned Date	-
Name	PUCKREE FARMING PTY LTD	Purchase Price (R)	2 150 500
Multiple Owners	NO	Purchase Date	2020/02/21
Multiple Properties	NO	Registration Date	2021/12/09
Share (%)	-		

Figure 5: Windeed results

3 PROJECT DESCRIPTION

This section provides a description of the Project in terms of the activities to be undertaken as well as specific Listed Activities in accordance with legislation.

3.1 Description of the activities to be undertaken

The required infrastructure proposed for the extension includes:

- Dirty Water Trench
- Boxcut (A, B, C &D)
- Haul roads
- Existing Access Road
- Waste dump areas for topsoil, soft overburden, and hard overburden (includes inter burden)

- ROM stockpile
- Overburden stockpile
- Processing Plant Area
- Product Stockpile
- Miner's office
- Contractor's office
- Dirty water Trench.
- Parking Area
- Store, Workshop and Fuel Bay
- Pollution control dam (PCD)
- Waste facility pad

See the attached mine layout plan below in Figure 6

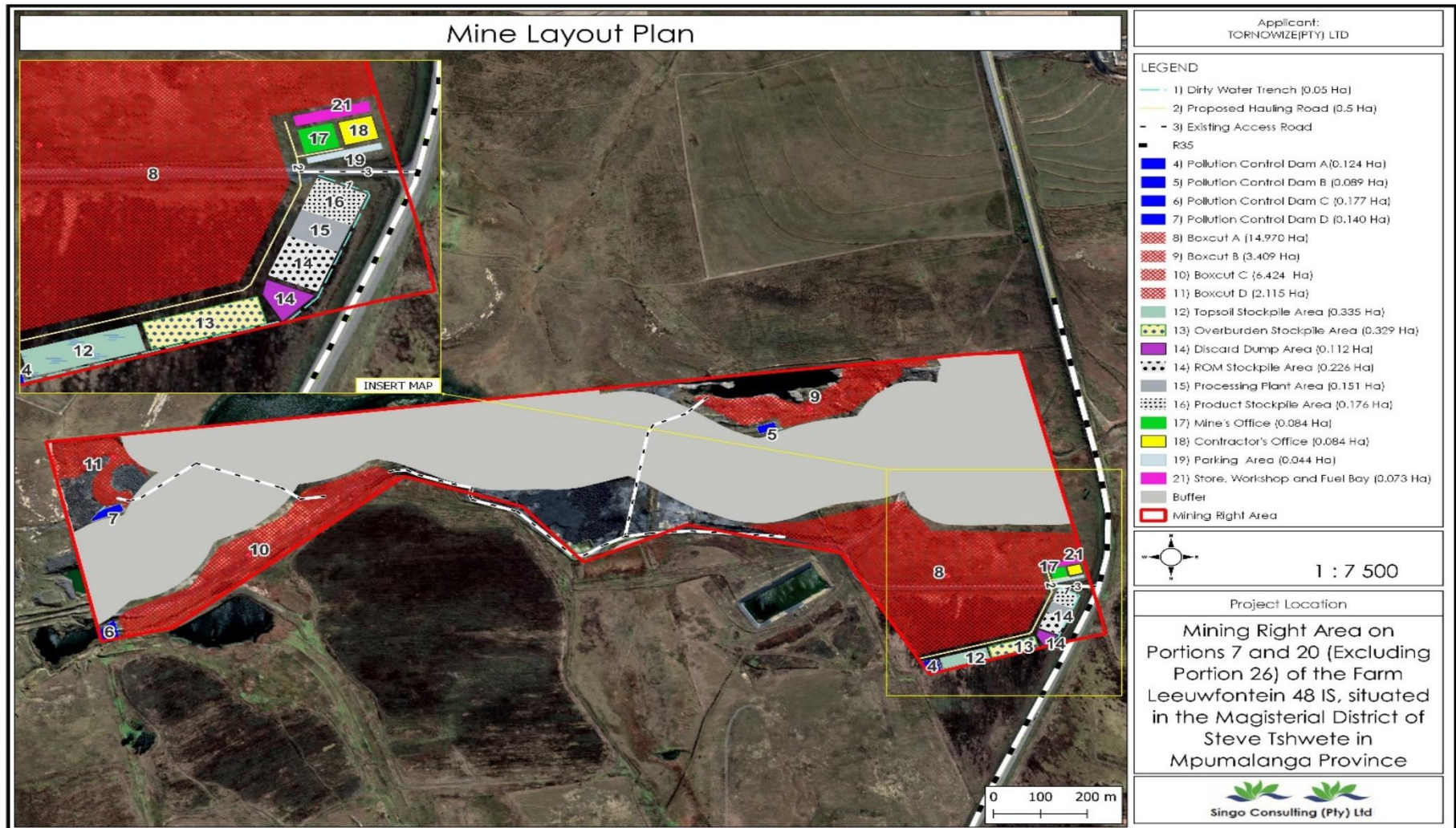


Figure 6: Mine layout plan (Singo consulting (Pty) Ltd,2023)

3.2 SCOPE OF THE PROPOSED OVERALL ACTIVITY

The applicant has applied for a mining right and EA for the development of a mine and supporting infrastructure for the mining area identified. The listed activities require EA in terms of the NEMA EIA Regulations GN R. 326/324/325/327 amended on 7 April 2017, now amended as GNR 517 of June 2021 and the Waste Management Activities listed in terms of the NEM:WA GN R. 921 (2013) and GN R. 633 (amended 2015). The water uses in terms of Section 21 are indicated in the following tables.

Table 7: Listed activities according to NEMA requiring environmental authorisation

Government notice	Activity number	Description
Listing Notice 1: GN 517 (11 June 2021)	9	The development of infrastructure exceeding 1,000 m in length for the bulk transportation of water or storm water— (i) with an internal diameter of 0,36 m or more; or (ii) with a peak throughput of 120 l per second or more; excluding where— (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.
	10	The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge or slimes- (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where- (a) such infrastructure is for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.
	12	The development of— a) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 m ² ; or b) infrastructure or structures with a physical footprint of 100 m ² or more; where such development occurs – • within a watercourse; • in front of a development setback; or

		<ul style="list-style-type: none"> if no development setback exists, within 32 m of a watercourse, measured from the edge of a watercourse
	13	The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50,000 m ³ or more.
	14	The development and related operation of facilities or infrastructure for the storage/storage and handling of dangerous good, where such storage occurs in containers with a combined capacity of 80 m ³ or more, but not exceeding 500 m ³ .
	19	<p>The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles, or rock of more than 10 m³ from a watercourse.</p> <p>Mining activities associated with the physical mining activities, construction of wetland and stream crossing or any other related mining activities that trigger this activity.</p>
	25	<p>The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater, or sewage with a daily throughput capacity of more than 2,000 m³ but less than 15,000 m³.</p> <p>Pollution Control Dams.</p>
	28	<p>Residential, mixed, retail, commercial, industrial, or institutional developments where such land was used for agriculture, game farming, equestrian purposes, or afforestation on or after 1 April 1998 and where such development:</p> <ol style="list-style-type: none"> will occur inside an urban area, where the total land to be developed is bigger than 5 ha; or will occur outside an urban area, where the total land to be developed is bigger than 1 ha.
	31	<p>The decommissioning of existing facilities, structures, or infrastructure for –</p> <ol style="list-style-type: none"> any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014 Any expansion and related operation activity or activities listed in this Notice, Listing Notice 2 or Listing Notice 3 of 2014; ...

		<p>d) Any phased activity or activities for development and related operation activity or expansion or related operation activities listed in this Notice or Listing Notice 3 of 2014; or</p> <p>e) Any activity regardless the time the activity was commenced with, where such activity:</p> <ul style="list-style-type: none"> a. Is similarly listed to an activity in i. or ii. above; and b. Is still in operation or development is in progress.
Listing Notice 2: GN.517 (11 June 2021)	4	<p>The development and related operation of facilities or infrastructure, for the storage/storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 m³.</p> <p>Storage of diesel and other hydrocarbons.</p>
	15	<p>The clearance of an area of 20 ha or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-</p> <ul style="list-style-type: none"> (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.
	17	<p>Any activity including the operation of that activity which requires a mining right in terms of section 22 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the mining right.</p>
	19	<p>The removal and disposal of a mineral, which requires a permission stated in terms of section 20 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the permission.</p> <p>Relates to coal crushing, screening, and washing on site.</p>
	24	<p>The extraction or removal of peat or peat soils, including the disturbance of vegetation or soils in anticipation of the extraction or removal of peat or peat soils, but excluding where such extraction or removal is for the rehabilitation of wetlands in accordance with a maintenance management plan.</p>

<p>Listing Notice 3: GN.517 (11 June 2021)</p>	<p>4</p>	<p><i>(The development of a road wider than 4 metres with a reserve less than 13,5 metres.)</i></p> <p>f) Mpumalanga</p> <p>i. Outside urban areas:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding disturbed areas;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority;</p> <p>(dd) Sites or areas identified in terms of an international convention;</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(ff) Core areas in biosphere reserves; or</p> <p>(gg) Areas within 10 km from national parks or world heritage sites or 5 km from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas, where such areas comprise indigenous vegetation; or</p> <p>ii. Inside urban areas:</p> <p>(aa) Areas zoned for use as public open space; or</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.</p>
	<p>10</p>	<p><i>(The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.)</i></p> <p>f. Mpumalanga</p> <p>i. Outside urban areas:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p>

		<p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority;</p> <p>(dd) Sites or areas identified in terms of an international convention;</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(ff) Core areas in biosphere reserves;</p> <p>(gg) Areas within 10 km from national parks or world heritage sites or 5 km from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, where such areas comprise indigenous vegetation; or</p> <p>(hh) Areas within a watercourse or wetland, or within 100 metres of a watercourse or wetland; or</p> <p>ii. Inside urban areas:</p> <p>(aa) Areas zoned for use as public open space; or</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.</p>
	12	<p><i>(The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.)</i></p> <p>f. Mpumalanga</p> <p>i. Within any critically endangered or endangered ecosystem listed in terms of Section 52 of the NEM:BA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>ii. Within critical biodiversity areas identified in bioregional plans; or</p> <p>iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning or proclamation in terms of NEMPAA.</p>
	14	<p><i>(The development of-</i></p> <p><i>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or</i></p>

		<p><i>(ii) infrastructure or structures with a physical footprint of 10 square metres or more;</i></p> <p><i>where such development occurs-</i></p> <p><i>(a) within a watercourse;</i></p> <p><i>(b) in front of a development setback; or</i></p> <p><i>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;</i></p> <p><i>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.)</i></p> <p>f. Mpumalanga</p> <p>i. Outside urban areas:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) World Heritage Sites;</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(ee) Sites or areas identified in terms of an international convention;</p> <p>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(gg) Core areas in biosphere reserves; or</p> <p>(hh) Areas within 10 km from national parks or world heritage sites or 5 km from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve, where such areas comprise indigenous vegetation; or</p> <p>ii. Inside urban areas:</p> <p>(aa) Areas zoned for use as public open space; or</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose.</p>
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Table 8: Waste management listed activities according to NEM:WA requiring environmental authorisation

Government notice	Activity	Description
R.921: Category A	7	Treatment of hazardous waste using any form of treatment at a facility with the capacity to process between 10 and 100 tonnes.
	12	Construction of a facility for a waste management activity listed in Category A of this schedule.
R.921: Category B	1	Storage of hazardous waste in lagoons, excluding storage of effluent, wastewater, or sewage.
	7	Disposal of any quantity of hazardous waste to land (Discard Dump).
	10	Construction of a facility for a waste management activity listed in Category B of this schedule.
R.633: Category B	11	Establishment/reclamation of a residue stockpile or deposit resulting from activities that require a mining, exploration, or production right in terms of the MPRDA.
R.921: Category C	2	Storage of hazardous waste at a facility with the capacity to store more than 80m ³ of hazardous waste at any time, excluding the storage of hazardous waste in lagoons or temporary storage of such waste

Table 9: Water uses according to NWA requiring environmental authorisation

Section 21 water use	Description
21 (a)	Abstraction of water
21 (b)	Storage of water
21 (c)	Impeding or diverting the flow of water in a watercourse
21 (g)	Disposing of waste in a manner which may detrimentally impact a water resource.
21 (i)	Altering the bed, banks, course, or characteristics of a watercourse
21 (j)	Removing, discharging, or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people

4 POLICY AND LEGISLATIVE CONTEXT

This section provides an overview of the governing legislation relating to the proposed project.

4.1 Constitution of the Republic of South Africa

The Constitution of the Republic of South Africa, Act 108 of 1996 (as amended) Section 24 states that:

“Everyone has the right— (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that—

- a) prevent pollution and ecological degradation;
- b) Promote conservation; and
- c) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”

4.2 Mineral and Petroleum Resources Development Act

The Mineral and Petroleum Resources Development Act, 2002 (MPRDA), outlines the procedural requirements an applicant must follow to obtain a mining right before proceeding with a mining project. Applicants are required to obtain Environmental Authorisation (EA) in terms of the National Environmental Management Act 107 of 1998, as amended (NEMA).

The MPRDA is administered by the Department of Mineral Resources (DMRE) and governs the sustainable utilisation of South Africa’s mineral resources. The MPRDA aims to “make provision for equitable access to, and sustainable development of, the nation’s mineral and petroleum resources”.

4.3 National Environmental Management Act

The aim of the NEMA is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA EIA regulations, the applicant is required to appoint an EAP to undertake the EIA, as well as conduct the public participation process (PPP). In South Africa, EIAs became a legal requirement in 1997 with the promulgation of regulations under the Environment Conservation Act (ECA). Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the Minister and any MEC, with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed, and reported on to the competent authority responsible for granting the relevant environmental authorisation.

On 21 April 2006, the Minister of Environmental Affairs and Tourism promulgated regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were amended in June 2010 and December 2014. The December 2014 NEMA regulations apply to this project. Mining activities officially

became governable under the NEMA EIA in December 2014. The objective of the Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the identified activities. The purpose of these procedures is to provide the competent authority with adequate information to refuse authorisation of activities which may impact negatively on the environment to an unacceptable degree. These procedures also aim to ensure that authorised activities are undertaken in a manner that responsibly manages environmental impacts.

In accordance with the provisions of Section 24 (5) and Section 44 of the NEMA, the Minister has published regulations (GN R. 982) pertaining to the required process for conducting EIAs in order to be considered for the issuing of EA. These regulations provide a detailed description of the EIA process to be followed when applying for EA for any listed activity.

The regulations differentiate between a simple Basic Assessment Process (required for activities listed in GN R. 983 and 985) and a more complete EIA process (activities listed in GN R. 984). In the case of this project, activities under GN R. 984 are triggered, requiring a full EIA process. On 7 April 2017, the NEMA 2014 regulations were amended, making activities triggered under GN R. 324, 325 and 327, now amended as GNR 517 OF 11 June 2021 applicable to this application.

A scoping and EIA process is reserved for activities with potentially significant impacts that are complex to assess. Scoping and EIA provides a mechanism for the comprehensive assessment of activities that are likely to have significant environmental impacts.

4.4 National Water Act

The National Water Act, 1998 (NWA) also has a role to play in regulating mining. Mining almost always uses water and/or has an impact on water resources, like streams, wetlands, or rivers. The NWA is administered by the Department of Water and Sanitation (DWS).

The NWA Section 21 defines eleven water uses that require EA:

21 (a): taking water from a water resource

21 (b): storing water

21 (c): impeding or diverting the flow of water in a watercourse

21 (d): engaging in a stream flow reduction activity contemplated in section 36

21 (e): engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1)

21 (f): discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit

21 (g): disposing of waste in a manner which may detrimentally impact on a water resource

21 (h): disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process

21 (i): altering the bed, banks, course, or characteristics of a watercourse

21 (j): removing, discharging, or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people

21 (k): using water for recreational purposes. The proposed mine is in the process of applying for an Integrated Water Use Licence (IWUL) as per the water uses indicated.

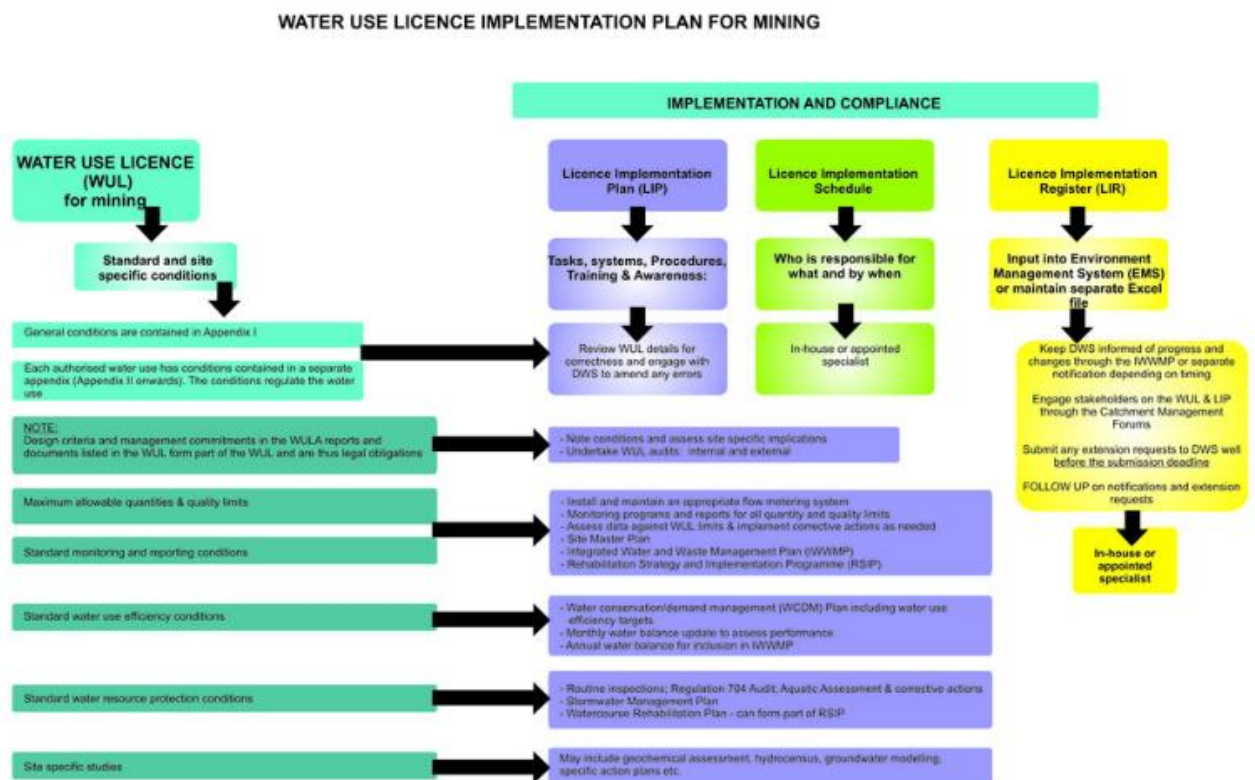


Figure 7: WULA process and Guideline

4.5 National Environmental Management: Waste Act

The National Environmental Management: Waste Act, 2008 (NEM:WA) (Act 59 of 2008) lists mining activities that must be undertaken to manage waste generated by the project and prevent environmental pollution and littering. On 2 June 2014, the NEM:W (amended) came into force. As per the amended Act, waste is longer governed by the MPRDA, but is subject to all the provisions of the NEM:WA). As per Section 16 of the NEM:WA, “a holder of waste must, within the holder’s power, take all reasonable measures to:

- Avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;
- Reduce, re-use, recycle and recover waste;
- Where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
- Manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour, or visual impacts;
- Prevent any employee or any person under his or her supervision from contravening the Act; and
- Prevent the waste from being used for unauthorised purposes.”

These general principles of responsible waste management will be incorporated into this project’s EMPr requirements . The NEM:WA provides for specific waste management measures to be implemented and provides for the licensing and control of waste management activities. Waste management activities apply to Category A, B and C according to GN R 921 (Nov 2013) and the proposed residue stockpiles in terms of Category B, Activity 11 of GNR 921, and, therefore, form part of the application process (NEM: WA – Planning and Management of Residue Stockpiles and Residue Deposits Regulations, 2015 (GN R 632)

This regulates the planning and management of residue stockpiles and deposits from a prospecting, mining, exploration or production operation.

4.5.1 NEM: WA – National Norms and Standards for the Assessment of Waste for Landfill Disposal, 2013 (GN R 635)

These norms and standards prescribe the requirements for the assessment of waste prior to disposal to landfill. The aim of the waste assessment tests is to characterise the material to be deposited or stored in terms of the above-mentioned waste assessment guidelines set by the DEA.

4.5.2 NEM: WA – Waste Classification and Management Regulations, 2013 (GN R 634)

Chapter 9 of the NEM: WA stipulates the requirements for a motivation for and consideration of listed Waste Management Activities that do not require a Waste Management License. The motivation must:

- Demonstrate that the waste management activity can be implemented without unacceptable impacts on, or risk to, the environment or health
- Must provide a description of the waste
- Description of waste minimisation or waste management plans
- Description of potential impacts, etc.
- The transitional provisions under Chapter 6 of this Regulation prescribes timeframes in which all waste must be classified within 18 months from the date of commencement of these regulations (23 August 2013)

Waste streams generated from mine activities will, where applicable, be classified to determine their nature (i.e. general or hazardous), managed and disposed of in accordance with the relevant legislation.

4.6 National Environmental Management: Air Quality Act

The National Environmental Management: Air Quality Act (NEM: AQA) (Act No. 39 of 2004 as amended) is the main legislative tool for the management of air pollution and related activities.

The objectives of the Act are to protect the environment by providing reasonable measures for:

- The protection and enhancement of the quality of air in the republic
- The prevention of air pollution and ecological degradation
- Securing ecologically sustainable development while promoting justifiable economic and social development
- Generally, to give effect to Section 24(b) of the constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and wellbeing of people

The NEM:AQA mandates the Minister of Environmental Affairs to publish a list of activities that result in atmospheric emissions and consequently cause detrimental effects on the environment, human health and social welfare. The Listed Activities and Minimum National Emission Standards were published on 22 November 2013 (Government Gazette No. 37054).

According to NEM:AQA, air quality management control and enforcement is the responsibility of local government, with district and metropolitan municipalities being the licensing authorities. Provincial government is primarily responsible for ambient monitoring and ensuring municipalities fulfil their legal obligations, with national government primarily as policy maker and coordinator. Each sphere of government must appoint an Air Quality Officer responsible for coordinating matters pertaining to air quality management. Under the old Act, air quality management was the sole responsibility of national government, with local authorities only being responsible for smoke and vehicle emission control. The National Pollution Prevention Plan Regulations, which came into effect on 21 July 2017, tie in with The National Greenhouse Gas Emission Reporting Regulations, which took effect on 3 April 2017.

These regulations aim to prescribe the requirements that greenhouse gas (GHG) pollution prevention plans need to comply with (in terms of priority air pollutants), as per NEM:AQA. The regulations specify who needs to comply, and by when, and prescribes the content requirements. Mines do have an obligation to report on the GHG emissions under these regulations.

4.7 The National Heritage Resources Act

The National Heritage Resources Act (NHRA) (Act 25 of 1999) stipulates that cultural heritage resources may not be disturbed without authorisation from the relevant heritage authority. Section 34(1) of the

NHRA states that, “no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority...”.

The NHRA informs the identification, evaluation, and management of heritage resources and, in the case of Cultural Resource Management (CRM), affected by development (as stipulated in Section 38 of NHRA) and those developments administered through the NEMA, MPRDA and NEMWA legislation. In the latter cases, the feedback from the relevant heritage resources authority is required by the state and provincial departments managing these Acts before any authorizations are granted for development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of EIAs required by NEMA and MPRDA. This change requires an evaluation of the section of these Acts relevant to heritage. The NEMA 23(2)(b) states that an integrated environmental management plan should, “...identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage”.

Subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) require the (compulsory) inclusion of the identified cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the environmental regulations. Regulations under NEMA’s regulations on the Specialist Report requirements must be considered when compiling such a report.

The MPRDA and NEMA have similar definitions of “environment”. Both acknowledge cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the NHRA. Section 40 of the same Act requires consultation with any state department administering any law relevant to such an application through Section 39 of the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities (Fourie, 2008b).

In accordance with the legislative requirements and EIA rating criteria, the regulations of the South African Heritage Resources Agency (SAHRA) and Association of Southern African Professional Archaeologists (ASAPA) have been incorporated to ensure that a comprehensive and legally compatible Heritage Impact Assessment (HIA) is compiled.

4.8 National Environmental Management: Biodiversity Act

The overarching aim of the National Environmental Management: Biodiversity Act (No 10 of 2004) (NEM:BA), within the framework of NEMA, is to provide for:

- The management and conservation of biological diversity in South Africa and of the components of such diversity.
- The use of indigenous biological resources in a sustainable manner.
- The fair and equitable sharing, among stakeholders, of benefits arising from bioprospecting involving indigenous biological resources.

- The South African National Biodiversity Institute (SANBI) was established on 1 September 2004 through the signing into force of the NEM:BA, its purpose being (*inter alia*) to report on the status of the country's biodiversity and the conservation status of all listed threatened or protected species and ecosystems.
- Other objectives include the identification, control, and eradication of declared weeds and alien invaders in South Africa. These are categorised according to one of the following categories, and require control or removal:
 - Category 1a Listed Invasive Species: Category 1a Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be combated or eradicated.
 - Category 1b Listed Invasive Species: Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be controlled.
 - Category 2 Listed Invasive Species: Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the Act as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be.
 - Category 3 Listed Invasive Species: Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the Act, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of Act, as specified in the Notice.
 - The provisions of this Act have been considered and, where relevant, incorporated into the proposed mitigation measures and requirements of the EMPr. It is also appropriate to undertake a Fauna and Flora Impact Assessment for developments in an area that is considered ecologically sensitive which require environmental authorisation in terms of NEMA, with such Assessment taking place during the EIA phase.

4.9 The Conservation of Agricultural Resources Act

This Act informs the utilisation of the natural agricultural resources in South Africa to promote soil, water and vegetation conservation, as well as combat weeds and invader plants.

4.10 Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA)

The Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA) is a framework law, which means that the law provides broad principles for a set of provincial laws that will regulate planning for the country. The Act introduces provisions to cater for development principles; norms and standards; inter-governmental support; Spatial Development Frameworks (SDFs) across national, provincial, regional and municipal areas; Land Use Schemes (LUS); and municipal planning tribunals.

SPLUMA also provides clarity on how planning law interacts with other laws and policies. It is a uniform, recognisable and comprehensive system that addresses the past spatial and regulatory imbalances and promotes optimal exploitation of minerals and mineral resources. SPLUMA achieves this by strengthening the position of mining right holders when land needs to be rezoned for mining purposes. SPLUMA’s impact on optimal exploitation is particularly evident where conflict exists between mining right holders and landowners. Economic and policy considerations, as well as practical necessities, often motivate the state to grant mining rights to entities other than landowners. SPLUMA is a new national framework Act that provides clear principles and standards for provincial and local governments to formulate their own new spatial planning and land use policies. The new provincial legislation can regulate, among other things, land development, land use management, spatial planning, and municipal planning.

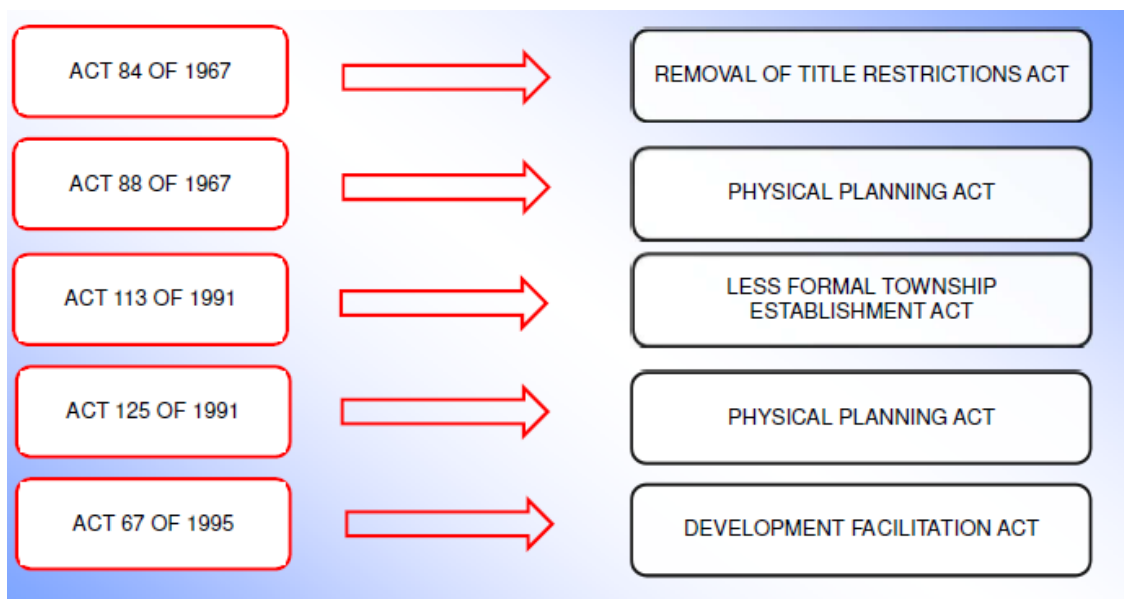


Figure 8: Repealed legislation as a result of SPLUMA.

4.11 Environment Conservation Act, 1989 (Act 73 of 1989) – Noise control regulations

In terms of section 25 of the ECA, the national Noise Control Regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992) were promulgated. The NCRs were revised under GN R. 55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations. The Gauteng Province promulgated provincial regulations: Noise Control Regulations of Gauteng 1999, (Provincial Gazette, Extraordinary no 75 of August 1999).

The noise control regulations must be considered in relation to the potential noise that may be generated during the construction and decommissioning phases of the proposed project. The two key aspects of the noise control regulations relate to disturbing noise and noise nuisance. Section 4 of the regulations

prohibits a person from making, producing or causing a disturbing noise, or allowing it to be made produced or caused by any person, machine, device or apparatus or any combination thereof.

A disturbing noise is defined in the regulations as “a noise level which exceeds the zone sound level or if no zone sound level has been designated, a noise level which exceeds the ambient sound level at the same measuring point by 7 dBA or more”. Section 5 of the noise control regulations prohibits the creation of a noise nuisance. A noise nuisance is defined as “any sound which disturbs or impairs or may disturb or impair the convenience or peace of any person”. Noise nuisance is anticipated from the proposed project particularly to those residents that are situated near the project sites. South African National Standard 10103 also applies to the measurement and consideration of environmental noise and should be considered in conjunction with these regulations. A noise specialist study is proposed for the EIA.

4.12 Noise standards

The following South African Bureau of Standards (SABS) requirements relate to noise from mines, industry, and roads:

- South African National Standard (SANS) 10103:2008. “The measurement and rating of environmental noise with respect to annoyance and to speech communication”.
- SANS 10210:2004. “Calculating and predicting road traffic noise”.
- SANS 10328:2008. “Methods for environmental noise impact assessments”.
- SANS 10357:2004. “The calculation of sound propagation by the Concave method”.
- SANS 10181:2003. “The Measurement of Noise Emitted by Road Vehicles when Stationary”.
- SANS 10205:2003. “The Measurement of Noise Emitted by Motor Vehicles in Motion”.

The relevant standards use the equivalent continuous rating level as a basis to determine what is acceptable. The levels may take single event noise into account, but single event noise by itself does not determine whether noise levels are acceptable for land use purposes. With regards to SANS 10103:2008, the recommendations are likely to inform decisions by authorities, but non-compliance with the standard will not necessarily render an activity unlawful. The noise assessment will take these noise standards and impacts into consideration.

5 MINING METHODOLOGY AN REQUIRMENTS

5.1 Mining methodology.

The location, nature, and number of mineral deposits all influence the mining processes used. Surface mining is most cost-effective when mineral resources are close to the surface (e.g., coal, salts, and other evaporate deposits, or road quarry material) or are part of surface deposits (e.g., alluvial gold and diamonds, and heavy mineral sands). Surface mining of coal is feasible for this project because the resource is located near enough to the surface to be economically mineable. Strip mining and open-pit mining are common surface mining processes, as are dredge, placer, and hydraulic mining in riverbeds, terraces, and beaches. These activities always disrupt the surface, which has an impact on soils, surface water, near-surface ground water, wildlife, vegetation, and all other land-use options.

The project region's relatively low strip ratios and large surface area make it suited for open-cast truck and shovel mining. Applicability of mining methods is determined by technical feasibility, economic viability, safety, equipment, and infrastructure.

The proposed mining method and sequence comprise the following mining activities for waste and coal:

- Initial topsoil and soft overburden removal, which will be stockpiled to ensure it can be placed back in the initial box cut.
- The physical mining of the coal seam, which includes drilling of hard overburden material, charging and blasting.
- Loading coal onto trucks and hauling it to the crushing and screening facility.
- Discard coal will be extracted and replaced in the bottom of the open-cast pit, while the product will be taken to the weighbridge via trucks and then moved off-site.
- The overburden is placed back into the pit as mining progresses, leaving a minimum area open at a single time. Formally known as concurrent rehabilitation.
- The topsoil, which was stripped and stockpiled separately before mining commenced, is then replaced. The findings of the land capability study will determine the optimal composition to ensure pre-mining conditions for utilisation.

5.1.1 Infrastructure requirements

The project has the following infrastructure requirements:

- Access and haul roads (with necessary security), including upgrading the access point to the gravel road.
- Offices with septic/chemical ablution facilities
- Weighbridge, workshop, and stores (with septic/chemical ablution facilities)
- Diesel facilities and a hardstand
- Power and water
- Boxcut
- Stockpiles (topsoil, overburden, subsoil/softs, RoM)
- Surface water management measures (storm water diversion berms and trenches, pollution control dams, discard dump, etc.)
- Processing plant facility

The preliminary mine schedule layout is indicated in **Figure 6**. This layout might be changed once specialist investigations have been completed and alternatives have been assessed and also enclosed/chartered for storm water design from WULA Engineers. The layout design will adhere to EA requirements for the NEMA and WULA processes. This will be discussed in detail during the EIA phase, once the draft Mining Work Programme has been updated.

6 NEED AND DESIRABILITY OF PROPOSED ACTIVITIES

This section examines the need and desirability of the proposed Tornowize Coal Mine project, and the importance of coal as a resource and the desirability of coal mining operations at the proposed study area.

6.1 Project selection area

The site was selected due to the presence of an economically mineable coal without the hustle there are remaining stockpiles of coal on-site. The Tornowize coal mine project offers several economic benefits; mine revenue will facilitate fund allocation to local economic development through the implementation of projects identified on the social and labour plan. Local contractors and businesses will benefit from supplying the mine with goods and services. This proposed project will reduce stress for employment in the surrounding mines namely the Kleinfontein Colliery and Puckree mine. The applicant is fully committed to implementing development plans and projects that will align with the provisions of the broad-based socio-economic empowerment charter of the South African mining industry.

Project development will contribute to the South African economy through exports that will leverage foreign income to the country. The National Government will obtain tax revenue from the project. The

project will provide income for the mining company through profits and will provide wages for employees. Indirect income will also be increased through the mine's procurement of goods and services. More information regarding employment generated by this project will be included in the EIA report.

The unemployment rate of Steve Tshwete decreased slightly from 19.7% in 2011 to 16.4% in 2015 and was the lowest among all the municipal areas of Mpumalanga. Unemployment rate for females 21.8% and that of males 12.9%. Youth unemployment rate according to the 2011 Census figures 27.1% - challenge with especially very high youth unemployment rate of females. The largest employing industries in Steve Tshwete are trade (including industries such as tourism), community/government services and mining these are outlined by the IDP.

Tornowize coal mine will have a positive impact on the socio-economic conditions of the local communities involved once operations commence, it will contribute to the socio-economic development of the region as a whole through social upliftment and the creation of jobs as key agents.

The Tornowize coal mine project will:

- Enable the applicant to commence coal mining and produce coal
- Enable the community to benefit and ensure that resource is mined.
- Enable the applicant to produce a sufficient quality of coal to satisfy its clients' requirements
- Facilitate economic development opportunities created by the project.

More details relating to the need and desirability of the proposed project will be contained in the EIA and EMP reports.

6.2 Coal as an important resource

According to South African Coal Sector Report, Coal is a combustible sedimentary rock formed from vegetation that has been consolidated between other rock strata and altered by the combined effects of pressure and heat over millions of years. Coal is composed primarily of carbon, and contains varying amounts of other components, like hydrogen, oxygen, sulphur, and other impurities. Main parameters used to define coal are calorific value, ash, moisture, and sulphur. According to the energy balance compiled by the DoE, coal constitutes approximately 72% of total primary energy supply in South Africa and is mostly used for power generation. In addition, coal is used to produce virtually all non-recycled iron. Coal is abundant, affordable, easy to transport, store and use, plus free of geopolitical tensions; all these attributes make it very popular. South Africa contributes about 3.5% of the world's coal resources. The country's production is around 3.3% of the world's annual total and exports approximately 6% of global exports. Coal is the major primary energy source for South Africa. More than 90% of the country's

electricity and approximately 30% of the liquid fuel are produced from coal (DoE, 2016). Coal also plays a significant role in supply to the South African chemicals industry and is an essential component of its steelmaking industry. Despite the country's attempts at diversifying energy, coal is expected to play a major role in the foreseeable future, and it is the leading mining commodity revenue generator in South Africa.

Eskom generates approximately 90% of the electricity used in South Africa and approximately 45% of the electricity used in Africa. In global terms, the utility is among the top seven in generating capacity, among the top nine in terms of sales, and has one of the world's biggest dry-cooled power stations. Eskom uses over 90Mt of coal per annum and typically burns low quality coal characterised by high ash content and low calorific values. The coal which can be used varies between power stations. The Return-to-Service power stations require higher grade coal (23 MJ/kg), another group require 21-23 MJ/kg and only certain power stations can burn the lowest grade (Eskom, 2016).

Coal is a good energy source, and it is also the cheapest source of energy. Unlike other forms of energy (nuclear, natural gas, oil, hydroelectric), coal mining provides many jobs by removing coal from the earth, transporting it to the utility, burning it, and properly disposing of coal ash. Eskom has voiced concern over medium and long-term future supply security to its coal-fired electricity generating power stations. If Eskom's needs are not met, it might have severe economic impacts. As such, coal is one of the five minerals selected by the DMRE for local beneficiation as it is considered critical to South Africa's on-going development (DMRE, 2011). See table 8 of Eskom's power stations.

In South Africa, coal is not only used for electricity generation. A diverse range of products can be derived from coal. Coal is also used to produce liquid fuels and non-energy coal products such as chemicals. Recently there is a fight amongst Ukraine and Russia over rulership and the impacts of the war has resulted to more need of coal in other areas as Russian country being a provider of coal in other regions is not trading, thus South Africa's coal was valued yet again, and coal price increased in the market (\$324.00/t). The need for this thermal coal to can be mined, will increases the JSE market of South Africa as more coal will be required in other parts of the continent.

Taking into consideration the need to shift from coal-fired power stations to a greener economy including solar powered stations. Coal remains the best source of energy in South Africa. According to Rob Schmitz (2022), on the journal titled "Amid an energy crisis, Germany turns to the world's dirtiest fossil fuel", available on: <https://www.npr.org/2022/09/27/1124448463/germany-coal-energy-crisis>, developed countries such as Germany have tried to transition to greener and more renewable sources of energy,

which however has ultimately failed, and the same countries are reviving their coal-fired power stations which were meant to shut down such as the Evonik coal plant in Marl, Germany to generate a source of energy once again. In addition, being mindful of the newly signed agreement by the government to shut down 8 power stations by 2035, Eskom being relatively more ambitious; to shut down 9 coal-fired power stations also by 2035. Unfortunately, Camden Coal fired power station falls under those targets, However Amajuba coal fired power station is not included which means it will still need more coal to operate efficiently and if this proposed mine is granted, it will be able to provide exceptional quality coal which will ultimately curb the loadshedding crisis we are faced with in South Africa.

Table 10: Eskom’s coal-fired power stations and their installed capacity (South African Coal Sector Report)

Base load stations		Return-to-Service stations	
1. Arnot	2 352 MW	1. Camden	1 510 MW
2. Duvha	3 600 MW	2. Grootvlei	1 200 MW
3. Hendrina	2 000 MW	3. Komati	940 MW
4. Kendal	4 116 MW	Newly built	
5. Kriel	3 000 MW	1. Medupi	4 788 MW
6. Lethabo	3 708 MW	2. Kusile	4 800 MW
7. Majuba	4 110 MW		
8. Matimba	3 990 MW		
9. Matla	3 600 MW		
10. Tutuka	3 654 MW		

Source: Eskom. 2016

6.3 Tornowize proposed open-cast mining operations.

The proposed open-cast mining operations of the Tornowize coal mine project will have positive economic impacts on a local, regional, and national scale. It will result in additional coal, job creation and skills development opportunities. There are two coal mining within 2km radius of the proposed Tornowize coal mine that is Kleinfontein colliery and Bultfontein Colliery, the area that is proposed was mined before in some areas and was not rehabilitated, the proceedings the project will have an advantage on the Middleburg municipality economically and environmentally, after the mining operations rehabilitation will take place and a financial guarantee will be paid to the DMRE before the environmental grant is issued. If the applicant does not proceed with the intended application, another firm may file an application under the MPRDA, Act 28 of 2002. Mining companies will continue to try to extract these coal deposits unless the government deems these regions "NO-GO" for mining and/or the demand for coal falls.

6.4 Period for which EA is required

The estimated period for which EA is required, is 22 years. This includes construction, mining and closure, and rehabilitation. A period for post-closure management risks will be investigated during the EIA phase.

7 PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE

During the S&EIA phase, all reasonable and practicable alternatives must be identified and appraised for consideration and evaluation during the EIA phase. When considering options for a project of this magnitude, there are several restrictions that must be considered. Social, economic, and environmental restrictions are examples of such constraints, which will be considered throughout the examination of the options. It is necessary to emphasize and submit the preferable choice to the authorities. Location, procedure, technology, and activity are generally used to identify alternatives (including the no-go option).

Any option that is regarded feasible (from a technical and environmental standpoint) must fulfil the development proposal's demand while minimizing the related consequences. Such choices must be discussed, as well as the benefits and drawbacks of each. Incremental alternatives are frequently presented as a way of mitigating identified concerns throughout the EIA process. These options are inextricably tied to the selection of mitigation actions and are not clearly defined as separate options.

The development footprint, properties, and activity type possibilities to consider are detailed in the following sub-sections;

7.1 Location alternatives

The research region was chosen based on the mining coal projects around the area and the availability of coal that can be seen on the surface that is stockpiled within the project area, further the proposed study area is ideal for coal mining, based on the positive findings of the CPR conducted on the region's coal resources. See the attached adjacent coal mining map below on

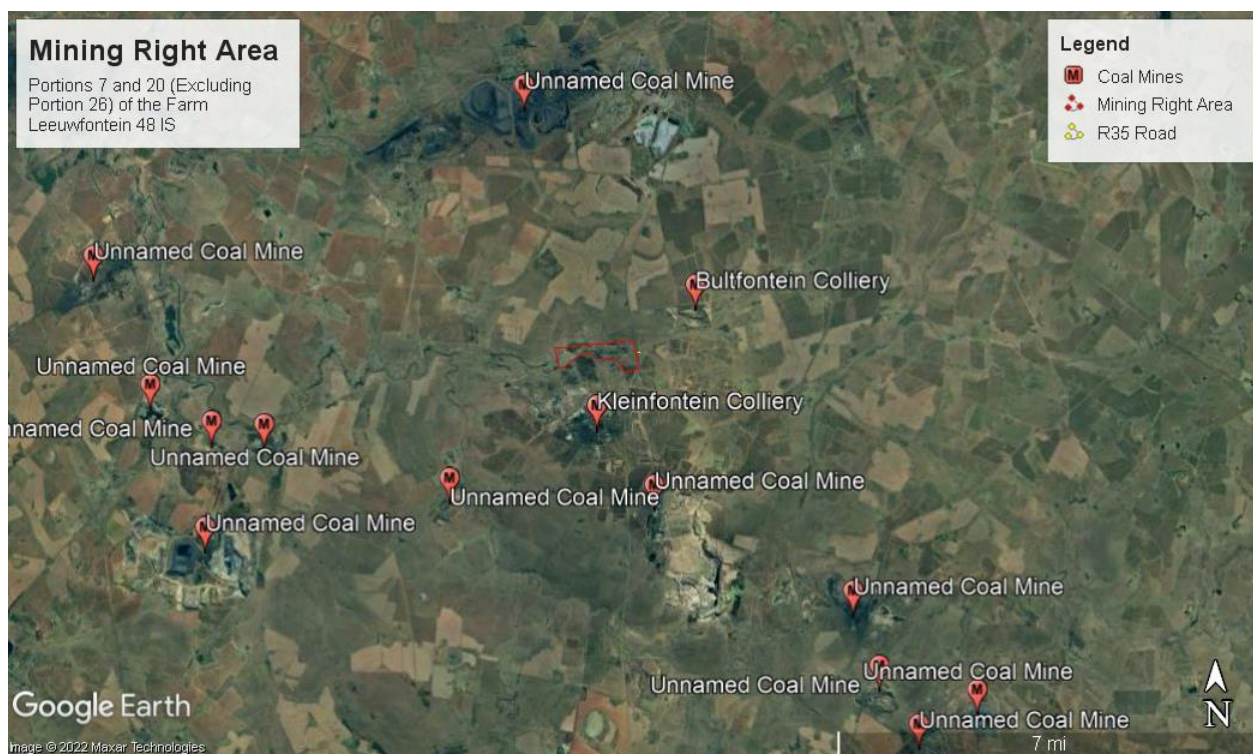


Figure 9: Adjacent coal mines

7.2 Land use alternatives

Due to the past proceeding of coal mining and no rehabilitation within the area no other land-use can be deemed accurate at this moment only mining would be suitable.

7.3 Process alternatives

7.3.1 Mine technology

The alternative for mining and extracting the target mineral resource is open-cast surface mining.

7.3.2 Mine operational

Operations and associated infrastructure, including a full washing facility will be available for the duration of the LoM.

7.3.3 Water supply

Two alternative water-supply options have been identified, namely:

- Water obtained from drilled boreholes. This activity will trigger section (21a) of the NWA, which is included in the IWUL application.
- Water obtained from dirty water containment facilities, e.g., the Pollution Control Dams (PCD) will be used for dust suppression, and this triggers section (21g & 21j) of the NWA, which is included in the IWUL application.
- Any additional triggered sections that can be discussed during meetings and site visits will be added.

7.3.4 Waste disposal

The following waste disposal options have been identified:

- Stockpile for use as non-select product. This option involves temporarily stockpiling on-site and selling it off at a later stage.
- Disposal: This option involves disposal of discard to a surface disposal site or into the pit. The disposal of waste will be further investigated and discussed during the EIA phase.

7.4 No-go alternative

Not mining the coal deposit would be a no-go option, the area has been mined in some portions before and no rehabilitation has taken place, therefore the applicant will pay financial provision and rehabilitate the whole area that would be advantages to the environment. No-go options must be researched and analyzed, according to the NEMA. No-go alternatives suggest that the Tornowize coal project will not be implemented, resulting in the projected severe environmental and socioeconomic consequences. This option will have to be assessed against the EIA findings as well as the project's potential socioeconomic advantages. The assessment's findings will be reported in the EIA report.

The no-go alternative was not deemed to be the preferred alternative as:

- The applicant will not be able to supply in the demand of coal mineral,
- The application, if approved, would allow the applicant to utilize the available coal as well as provide employment opportunities to local employees. Should the no-go alternative be followed, these opportunities will be lost to the applicant, potential employees, and clients.

The no-go alternative's viability cannot be addressed at this time and will be discussed in more detail during the EIA phase once specialist inputs have been received. The brief overview of the no-go alternative is not an in-depth assessment, and the impacts will be assessed and discussed in detail in the EIA report.

8 PUBLIC PARTICIPATION PROCESS

8.1 Objectives of public participation

Public participation aims to:

- Provide I&APs with an opportunity to voice their support, concerns and questions regarding the project, application, or decision.
- Provide an opportunity for I&APs, EAPs and the Competent Authority (CA) to obtain clear, accurate and understandable information about the environmental, social, and economic impacts of the proposed activity or implications of a decision.
- Provide I&APs with the opportunity to suggest ways to reduce or mitigate an activity's negative impacts and enhance the positive impacts.
- Enable the applicant to incorporate the needs, preferences, and values of the I&APs into the application.

8.2 Legislation

The PPP must comply with several important sets of legislation that require public participation as part of an application for authorisation or approval, namely the MPRDA, NEMA, NEM:WA and NWA. Adherence to the requirements of these acts will allow for an integrated PPP, satisfying the requirement for public participation referenced in the Acts. The details of the integrated PPP are provided in the following sections (7.3-7.7) respectively.

8.3 Identification of I&APs

Potential I&APs will be identified based on the definition of I&APs in the EIA regulations. The I&APs database includes authorities and landowner. The PPP and consultation will be conducted in adherence to the relevant legislation.

People and/or organisations will be registered as I&APs for the project if they:

- Are landowners or tenants adjacent to the proposed study area.
- Are the local municipality/ward councillors with jurisdiction in the area or represent the ratepayer's association.
- Are an authority or organ of state with jurisdiction in respect of any aspect of the activity.

- Responded to the Background Information Document (BID), advertisements and site posters.
- Attend a public meeting.

The PPP commenced on the 24th of February 2023. The public participation meeting will be organised with the community and further communication will be announced in due time. The Draft Scoping Report will be available for stakeholders and I&APs to review for a period of 30 days commencing from the 24th of February 2023 to the 27th of March 2023.

- Newspaper advertisement: Published in “Middleburg Observe” on the 24th of February 2023.
- A meeting with the committee and also the ward counsellor.
- A meeting with the landowner (Puckree farming (Pty) Ltd) of all the affected portions of the farm Leeuwfontein 48 IS.
- Public A2 notices will be distributed to all public spaces these include local municipality, farm boundaries and 30km radius around the farm area.
- Project introduction meeting will be held with the community should be there a need for this scoping process.
- Consultation emails will be sent to the identified authorities, adjacent landowners, and stakeholders.
- Draft Scoping Reports will be shared to registered I&APs of the project and comments received, will be incorporated on the report for submission to the DMRE.

A table containing the procedures that will be undertaken to engage with all interested and affected parties physically is demonstrated below:

8.4 Notification of availability of scoping report

All registered I&APs and stakeholders have been notified via newspaper of the availability of the Draft Scoping Report for review for a planned period of thirty days which was due to start from 24th of February 2023 to the 27th of March 2023. The report will be available at Steve Tshwete Local Municipality & Public Library Respectively and obtainable from the EAP candidate Mr SE Jiyane (simangaliso@singoconsulting.co.za) at Singo Consulting (Pty) Ltd. All incoming comments received from stakeholders and I&APs will be included in the Final Scoping Report. Comments are also being anticipated to be received from stakeholders including the Department of Agriculture, SANRAL (South African National Roads Agency Limited), Department of water and sanitation (DWS). Comments have been received from community members who participated in the meeting. The DMRE has forty-three days from report submission to review and make decision for the application.

8.5 Meetings

The following meetings will be held:

- Steve Tshwete Local Municipality meeting (Environmental Team).
- Landowner’s meeting.
- Public participation meeting




The minutes of all meetings, the presentation at the public participation meeting and site notices advertising the project will be included in the Final Scoping Report

Names of I&APs	Organisation/Capacity
	Steve Tshwete Local Municipality
	Mpumulanga Department of Agriculture, Rural Development, Land and Environmental Affairs
	Department of Environmental Affairs
	Department of Agriculture, Forestry and Fisheries
	Department of Water and Sanitation
	Department of Environmental Affairs
	Department of Labour
	Department of Public Works
	Commission on Restitution of Land Rights
	Mpumalanga Tourism
	Biodiversity Planning
	Eskom
	Sanral
	Transnet




8.6 Summary of issues raised by I&APs

I&APs Names of persons consulted. An "X" indicates that those who had to be consulted were consulted.	Date comments received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where issues and/or responses were incorporated
Landowners				
Lawful Occupiers				
Adjacent Occupiers				
Local Municipality				
District Municipality				





TO BE COMPLETED AFTER THE REVIEW OF THE DRAFT SR COMMENT PERIOD

I&APs Names of persons consulted. An "X" indicates that those who had to be consulted were consulted.	Date comments received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where issues and/or responses were incorporated
Government departments				
South African Heritage Resource Agency  an agency of the Department of Arts and Culture				
Department of Water and Sanitation  water & sanitation Department: Water and Sanitation REPUBLIC OF SOUTH AFRICA				
Department of Environmental Affairs  environmental affairs Department: Environmental Affairs REPUBLIC OF SOUTH AFRICA				
Department of Labour				

TO BE COMPLETED AFTER THE REVIEW OF THE DRAFT SR COMMENT PERIOD

I&APs Names of persons consulted. An "X" indicates that those who had to be consulted were consulted.	Date comments received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where issues and/or responses were incorporated
 <p>labour Department: Labour REPUBLIC OF SOUTH AFRICA</p>				
<p>Department of Public Works</p>  <p>public works Department: Public Works REPUBLIC OF SOUTH AFRICA</p>				
<p>Commission on Restitution of Land Rights</p>  <p>COMMISSION ON RESTITUTION OF LAND RIGHTS</p>				
<p>Mpumalanga Tourism</p>				

TO BE COMPLETED AFTER THE REVIEW OF THE DRAFT SR COMMENT PERIOD

<p>I&APs Names of persons consulted. An "X" indicates that those who had to be consulted were consulted.</p>	<p>Date comments received</p>	<p>Issues raised</p>	<p>EAPs response to issues as mandated by the applicant</p>	<p>Section and paragraph reference in this report where issues and/or responses were incorporated</p>
				
 Wayleaves				
				
				

TO BE COMPLETED AFTER THE REVIEW OF THE DRAFT SR COMMENT PERIOD

I&APs Names of persons consulted. An "X" indicates that those who had to be consulted were consulted.		Date comments received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where issues and/or responses were incorporated
COMMUNITY (Leeuwfontein)					
INTERESTED AND AFFECTED PARTY					

9 ENVIRONMENTAL ATTRIBUTES AND DESCRIPTION OF THE BASELINE RECEIVING ENVIRONMENT

9.1 Geology

9.1.1 Regional geology

The Karoo Supergroup in the project area comprises the Eccca Group and the Dwyka Formation. The Eccca sediments consist predominantly of sandstone, siltstone, shale, and coal. Combinations of these rock types are often found in the form of interbedded siltstone, mudstone, and coarse-grained sandstone. The Eccca sediments overlie the Dwyka Formation (loosely referred to as the Dwyka tillite). The latter consists of a proper tillite, sandstone and sometimes thin shale development. The upper portion of the Dwyka sediments may have been reworked, in which case carbonaceous shale and even inclusion of coal may be found.

The Ermelo Coalfield is obtainable at depth 0-100m whereby the Vryheid Formation has the following seams depth: E Seam(0–3 m), D Seam(0.6 m), C Lower Seam(1.5 m, sandstone partings in upper section), C Upper Seam(well developed, 0.7–4 m, sandstone, siltstone or mudstone partings split seam into 2–3 plies, devolatilized/ destroyed by dolerite over large areas), B Lower Seam, B Upper Seam(may coalesce in south, 0–3 m), A (isolated outliers, 1 m), A Seam(0–1.5 m, mainly removed by erosion) Dip gently southwest, minor folding; dykes (2–5 m) common, up to 8 sills (10–250 m) transgress and uplift the seams.

It consists mainly of sandstone, shale and coal beds of the Vryheid Formation of the Eccca Group and is underlain by the Dwyka Formation of the Karoo Supergroup. The Karoo sediments again are underlain at depth by felsitic lavas of the Selons River Formations of the Rooiberg Group and granite from the Lebowa Granite Suite of the Bushveld Complex. The Eccca Group, which is part of the Karoo Supergroup, comprises of sediments deposited in shallow marine and fluvio-deltaic environments with coal accumulated as peat in swamps and marches associated with these environments. The sandstone and coal layers are normally reasonable aquifers, while the shale serves as aquitards. Several layered aquifers perched on the relative impermeable shale are common in such sequences. The Dwyka Formation comprises consolidated products of glaciation (with high amounts of clay) and is normally considered to be an aquiclude. The generally horizontally disposed sediments of the Karoo Supergroup are typically undulating with a gentle regional dip to the south.

The extent of the coal is largely controlled by the pre-Karoo topography. Steep dips can be experienced where the coal butts against pre-Karoo hills. Displacements, resulting from intrusions of dolerite sills, are

common. Abundant dolerite intrusions are present in the Ecca sediments. These intrusions comprise sills, which vary from being concordant to transgressive in structure, and feeder dykes. Although these structures serve as aquitards and tend to compartmentalise the groundwater regime, the contact zones with the pre-existing geological formations also serve as groundwater conduits.

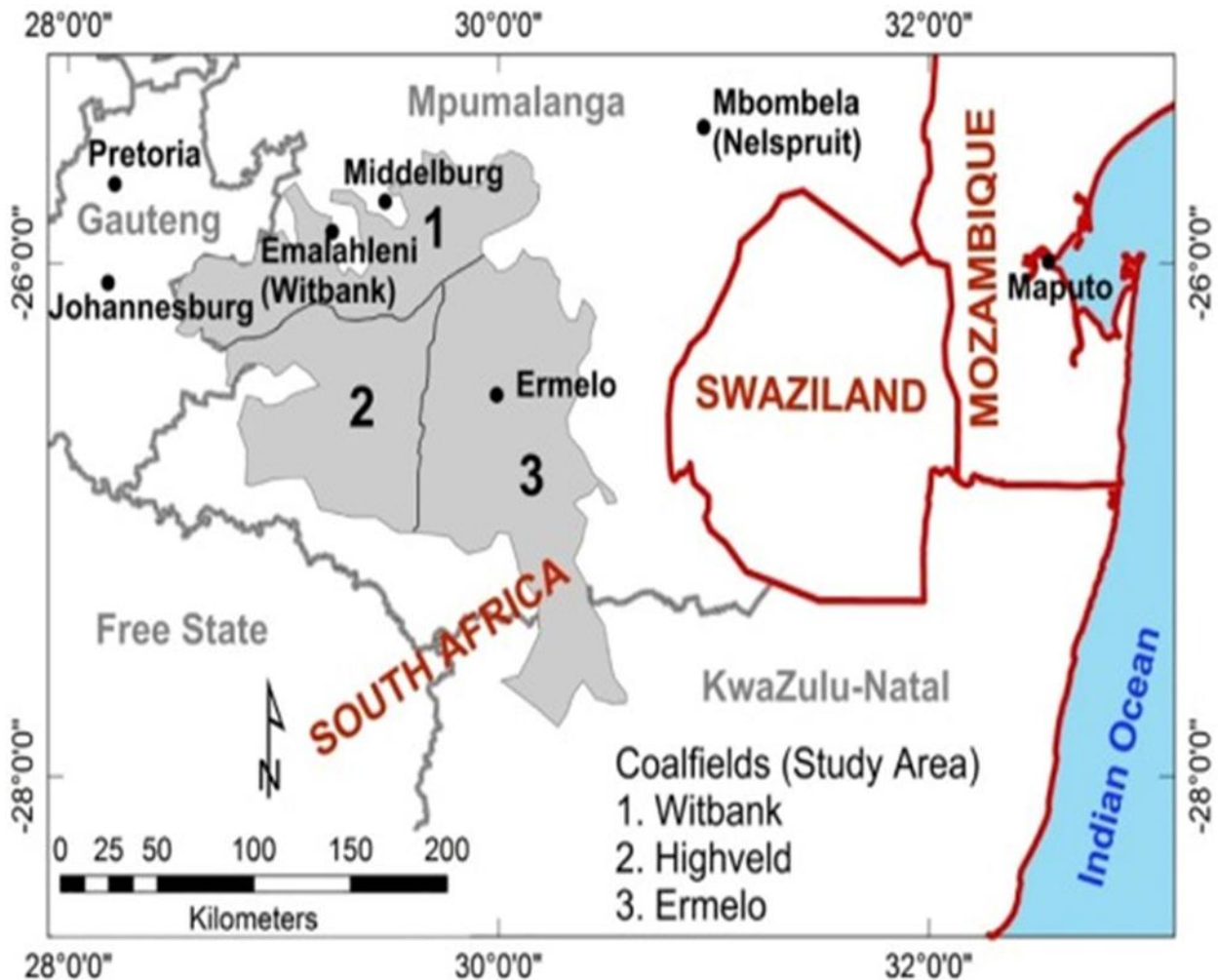


Figure 10: Depiction of the geology where the proposed project is situated (google earth view)

9.1.2 Vryheid formation

The Main Karoo Basin consists of a retro-arc foreland basin filled with a lithological succession ranging in age from the Late Carboniferous to the Middle Jurassic (Johnson et al., 2006). The basin-fill sequence wedges out northwards over the adjacent Kaapvaal Craton. In the Main Karoo Basin of South Africa, the Vryheid Formation is a sandstone and coal-rich stratigraphic unit that interfingers with (i.e., is transitional with and partially time equivalent to) the overlying Volksrust and underlying Pietermaritzburg Formations, both of which are both are predominantly argillaceous (Figure 11). In terms of environment of deposition,

the formation can be divided into lower fluvial-dominated deltaic interval, a middle fluvial interval (the coal-bearing zone) and an upper fluvial-dominated deltaic interval (Johnson et al., 2006). The thickness and frequency of the sandstone units increases from the base of the formation, reaching their maximum in the middle fluvial interval and then decrease again towards the overlying Volksrust Formation. To the south and south-east, the Vryheid Formation grades laterally into undifferentiated, deep-water argillites of the Ecca Group (Figure 11). The Volksrust and Pietermaritzburg Formations can only be recognised when the Vryheid Formation forms part of the vertical sequence. In the north and north-western portions of the basin, the Pietermaritzburg Formation was not deposited and the coal-bearing strata of the Vryheid Formation rest directly upon the basement.

The Vryheid Formation is one of sixteen recognised stratigraphic units that constitute the Permian Ecca Group. During the deposition of the Ecca Group the basin was dominated by a large sea (the salinity levels of this water body remain unresolved). The exception to this model was the deposition of the coal-bearing strata of the Vryheid Formation along the northern margin during an episode of deltaic progradation into the basin. Deposition of the Vryheid Formation was terminated by a basin-wide transgression that drowned the Vryheid deltas and their coal swamps, resulting in the deposition of the deep-water sediments of the Volksrust Formation. The investigation of the project area did not identify any outcrops of bedrock, the entire area being covered by Cenozoic Regolith.

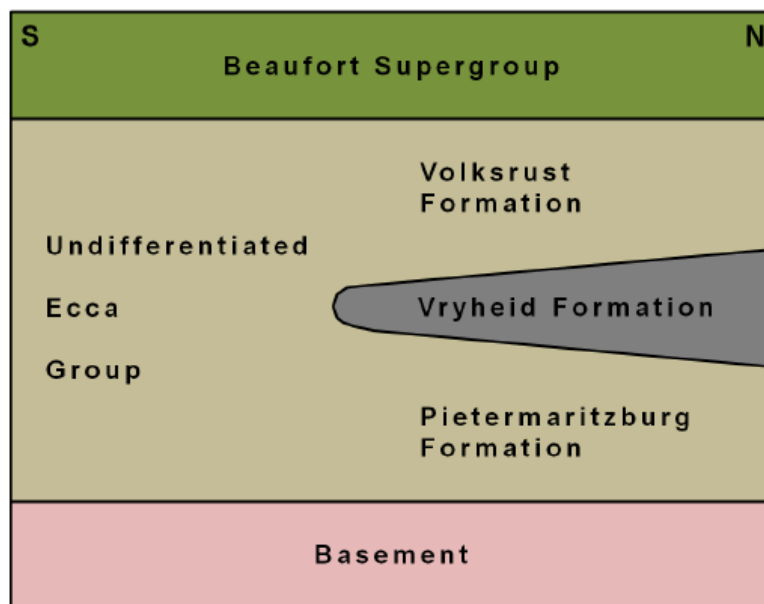


Figure 11: Schematic north-south oriented stratigraphic section of the Ecca Group in the northeast corner of the Karoo Basin.

9.1.3 Local geology and coal seams

The distribution of geological formations in the project area includes rocks from a variety of lithological units, mainly the Karoo dolerite and the Vryheid formation.

9.1.3.1 Karoo dolerite

Karoo dolerite is a well-known feature, which occurred after the deposition of the Karoo Supergroup. Basic dyke formation of the late Karoo magmatic period is found throughout the area. Due to their relatively high resistance to weathering and erosion, the dolerite dykes appear more dominant in areas. The dolerite dykes are generally fine-grained, and dark grey to black in colour with massive structure. These dykes consist of plagioclase (labradorite to bytownite) with augite and other minerals. Intrusions of dolerite dykes are due to weaknesses in the older rock formations and have a north-south orientation.

The Karoo dolerite, which includes a wide range of petrological facies, consists of an interconnected network of dykes and sills and it is nearly impossible to single out any particular intrusive or tectonic event. It would, however, appear that a very large number of fractures were intruded simultaneously by magma and that the dolerite intrusive network acted as a shallow stockwork-like reservoir. Dolerite dykes, like many other magmatic intrusions, develop by rapid hydraulic fracturing via the propagation of a fluid-filled open fissure, resulting in a massive magmatic intrusion with a neat and transgressive contact with the country rock. This fracturing mechanism is in contrast to the slow mode of hydraulic fracturing responsible for breccia-intrusions (i.e., kimberlite). For the intrusion to develop the magma pressure at the tip of the fissure must overcome the tensile strength of the surrounding rock. Dykes can develop vertically upwards or laterally along-strike over very long distances, as long as the magma pressure at the tip of the fissure is maintained. The intrusion of dolerite and basaltic dykes are therefore never accompanied by brecciation, deformation or shearing of the host-rock, at least during their propagation. The average thickness of Karoo dolerite dykes ranges between 2 and 10m. The country rock is often fractured during and after dyke emplacement. These fractures form a set of master joints parallel to its strike over a distance that does not vary greatly with the thickness of the dyke (between 5 and 15m). One of the most prominent features of the present Karoo landscape is the large number of dolerite sills and ring-complexes. These structures often display a sub circular saucer-like shape, the rims of which are commonly exposed as topographic highs and form ring-like outcrops. The Karoo dolerite sills and ring-complexes have the same geographical distribution as the dolerite dykes, and they are by far the most common type of intrusion in the Karoo basin. The dolerite sills and dykes form a complex intrusive network that probably acted as a shallow magma storage system. The lithology of the country-rock strongly controlled the emplacement of the sills.

9.1.3.2 Vryheid formation

The majority of the economically extracted coal in South Africa occurs in rocks of the Vryheid Formation, which ranges in thickness in the MKB from less than 70.0 m to over 500.0 m. It is thickest to the south of the towns of Newcastle and Vryheid, where maximum subsidence took place (Du Toit, 1918; Cadle, 1975; Whateley, 1980a; Stavrakis, 1989; Cadle et al., 1982) and where the basin was the deepest.

This formation has been subdivided into three different lithofacies arrangements. They are dominated by fine-grained mudstone, carbonaceous shale with alternating layers of bituminous coal seams, and coarse-grained, bioturbated immature sandstones respectively. The rock sediments are predominantly arranged in upward-coarsening cycles, although some fining-upward cycles are found in this formation's easternmost deposits. The alternating rock types observed in the Vryheid Formation indicate seasonal variations of storms and fairer weather in a pro-delta setting. The carbonaceous shales were formed below the water surface in anoxic conditions and the coal formed from compacted plant matter deposited at the bottom of peat swamps. These swamps formed on abandoned alluvial plains where stagnant water accumulated.

The thickness of the Vryheid Formation generally thins towards the north, west and south for a maximum of 500 m. However, the marked variations in thickness can be witnessed in the northern and north-western margins of the basin where the formation rests directly on the uneven pre-Karoo topography. The Vryheid formation is characterised by different lithofacies, which are mainly arranged in upward-coarsening cycles, which are essentially of deltaic origin.

According to Johnson et. al (2006), the base of an idealised coarsening-upward deltaic cycle in the eastern part of the formation consists of dark-grey, muddy siltstone resulting from shelf suspension deposition in anoxic water of moderate depth. Prodelta sediments are represented by alternations of bioturbated, immature sandstones, dark siltstones and mudstones of a centimetre to decimetre scale. The Vryheid Formation can be subdivided into a lower fluvial-dominated deltaic interval, a middle fluvial interval and an upper fluvial-dominated deltaic interval in the east (Tavener-Smith et al., 1988a). These subdivisions correspond approximately to the "lower sandstones", "coal zone" and "upper sandstone" of Blignaut and Furter (1940).

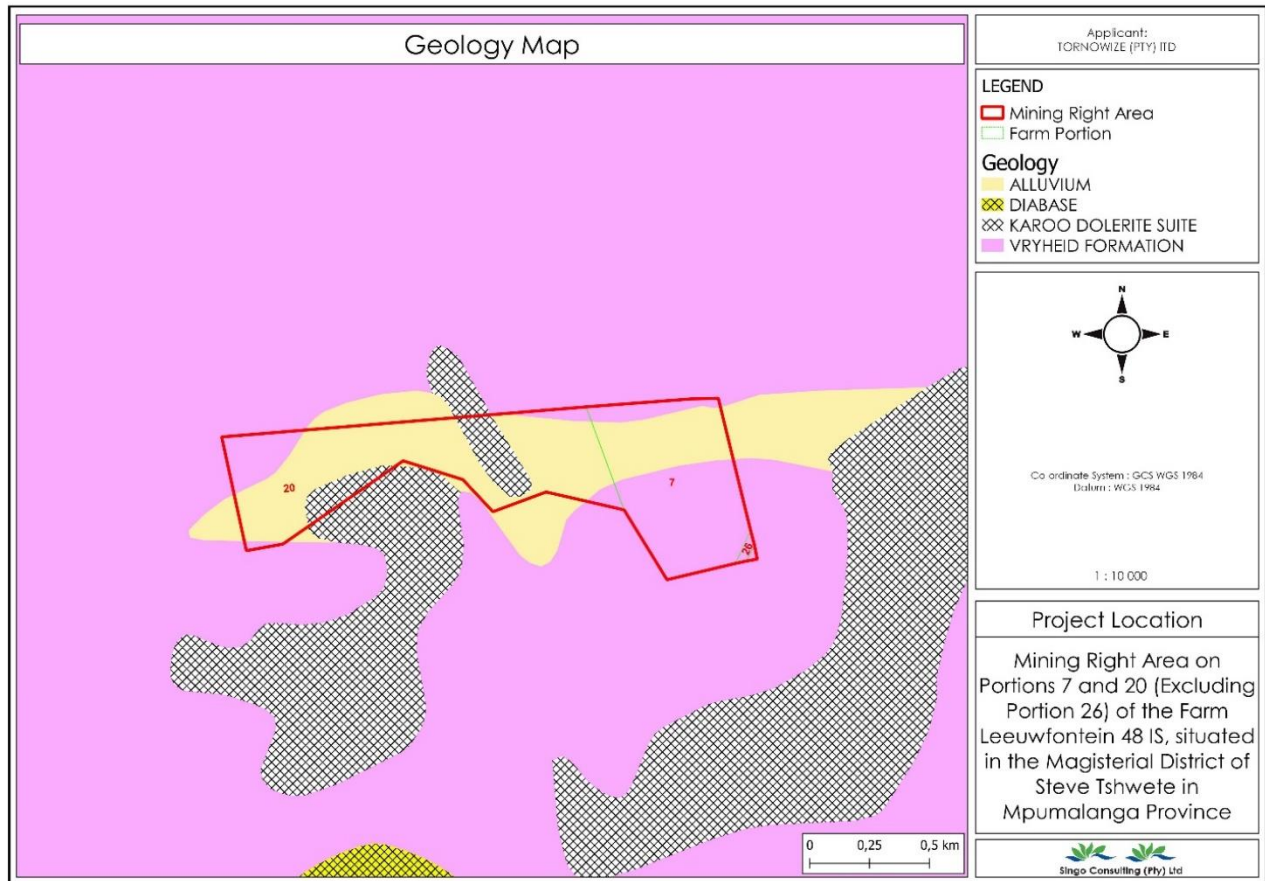


Figure 12: Geology (Singo consulting (Pty) Ltd)

9.1.4 Soil

The soil classes map below on Figure 13 shows that the mining right area is largely covered with the red or yellow structureless soils with a plinthic horizon and Association of Classes 1 to 4: Undifferentiated structureless soils.

Red or yellow structureless soils with a plinthic horizon:

The Soil class has favourable water- holding properties and has im-perfect drainage and the soil is unfavourable in high rainfall area. Crumbly and granular soils have the best structure for favourable physical attributes. The best infiltration, water-holding capacity, aeration, and drainage are all provided by this kind of structure. The supply of nutrients and the activities of soil microorganisms are both good. The properties of Red or yellow structureless soils with a plinthic horizon has experienced a localized build-up of iron and manganese oxides under varying conditions. clear reddish-brown, yellow-brown, or black stains in the water table that cover more than 10% of the horizon; Has grey colors of gleying in the horizon or immediately underneath it; and is not a characteristic soft carbonate horizon.

Red apedal soils:

These soils have a structure that is weaker than moderate blocky or prismatic in the moist state, if structure is borderline, CEC (NH₄OAc, pH7) per kg soil is less than 11cmol (+)/kg soil. These soils are non-calcareous in any part of the horizon which occurs within 1500mm of the soil surface but may contain infrequent, discrete, relict lime nodules in a non-calcareous soil matrix. It does not have alluvial or aeolian stratifications. The B horizons that have uniform colours, falling within the range defined as red and that in the moist state, lack well-formed peds other than porous micro-aggregates, qualify as red apedal. The concept of these macroscopically weakly structured or structureless materials embraces that kind of weathering that takes place in a well-drained oxidizing environment to produce coatings of iron oxides on individual soil particles (hence the diagnostic red colours) and clay minerals dominated by non-swelling 1:1 type.

Yellow apedal soil:

This horizon does not have grey colours in the dry state as defined for the E horizon. Although colour must be substantially uniform, some variability is permitted, for example mottles or concretions which are insufficient to qualify the horizon as a diagnostic plinthic B, faunal reworking may also result in acceptable colour variegations. It is non-calcareous within any part of the horizon which occurs within 1500mm of the surface but may contain infrequent, discrete, relict lime nodules in a non-calcareous soil matrix. Does not have alluvial or aeolian stratifications., directly underlies a diagnostic topsoil horizon or an E horizon. Yellow- brown apedal B horizons occur over approximately the same climatic spread as their red counterparts and so are also very widely distributed throughout the country. They may be found on all types of parent material.

Association of classes 1 to 4: Undifferentiated structureless soils:

Soil depth:

Depth of the soil profile is from the top to the parent material or bedrock. This type of soil can be classified as a restricted soil depth. A restricted soil depth is a nearly continuous layer that has one or more physical, chemical, or thermal properties.

Soil drainage:

Soil drainage is a natural process by which water moves across, through, and out of the soil because of the force of gravity. The soils in the proposed area have an excessive drainage due to the soils having very coarse texture. Their typical water table is less than 150.

Erodibility:

Erodibility is the inherent yielding or non-resistance of soils and rocks to erosion. The freely drained structureless soils have high erodibility. A high erodibility implies that the same amount of work exerted by the erosion processes lead to a larger removal of material.

Natural Fertility:

Soil fertility refers to the ability of soil to sustain agricultural plant growth, i.e., to provide plant habitat and result in sustained and consistent yields of high quality. The soil, as a nature of them, contains some nutrients which is known as ‘inherent fertility’. Among the plant nutrients, nitrogen, phosphorus, and potassium is essential for the normal growth and yield of crop. The proposed area has a low natural fertility soil.

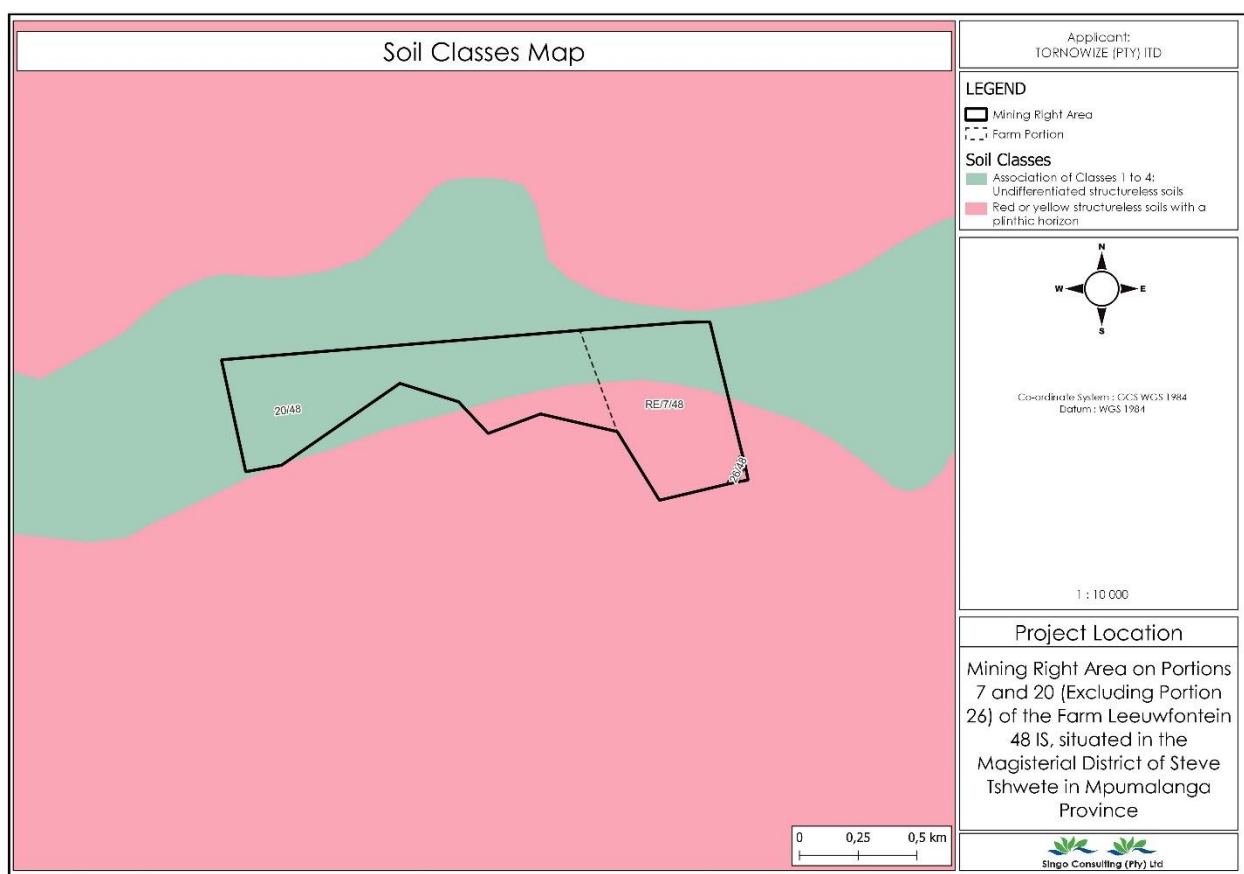


Figure 13: Soil Classes Map (source: Singo consulting (Pty) Ltd)

The topsoil is covered with coal dust from the previous mining activities, the area has remaining stockpiles this was observed during assessment see attached pictures below.



Figure 14: ground covered with coal dust.



Figure 15: Coal stockpiles on the proposed area

10 CLIMATE

10.1 Local climate

Integrating climate with hydrological studies is essential for a better understanding of the impact of present and future climate on hydrological extremes, which may cause frequent flooding, drought, and shortage of water supply. Knowledge of the water regime is crucial for managing protected areas, especially in regions containing lakes, wetlands, marches, or floodplains. Local physiographic characteristics, as well as temporal and geographical fluctuations in the core components of the hydrologic cycle, have a significant impact on the local hydrological conditions. The project area experiences a mean minimum annual temperature of 0.1 to 2 °C and mean annual rainfall ranging from 601 to 800 mm see the attached Figure 16 and Figure 17.

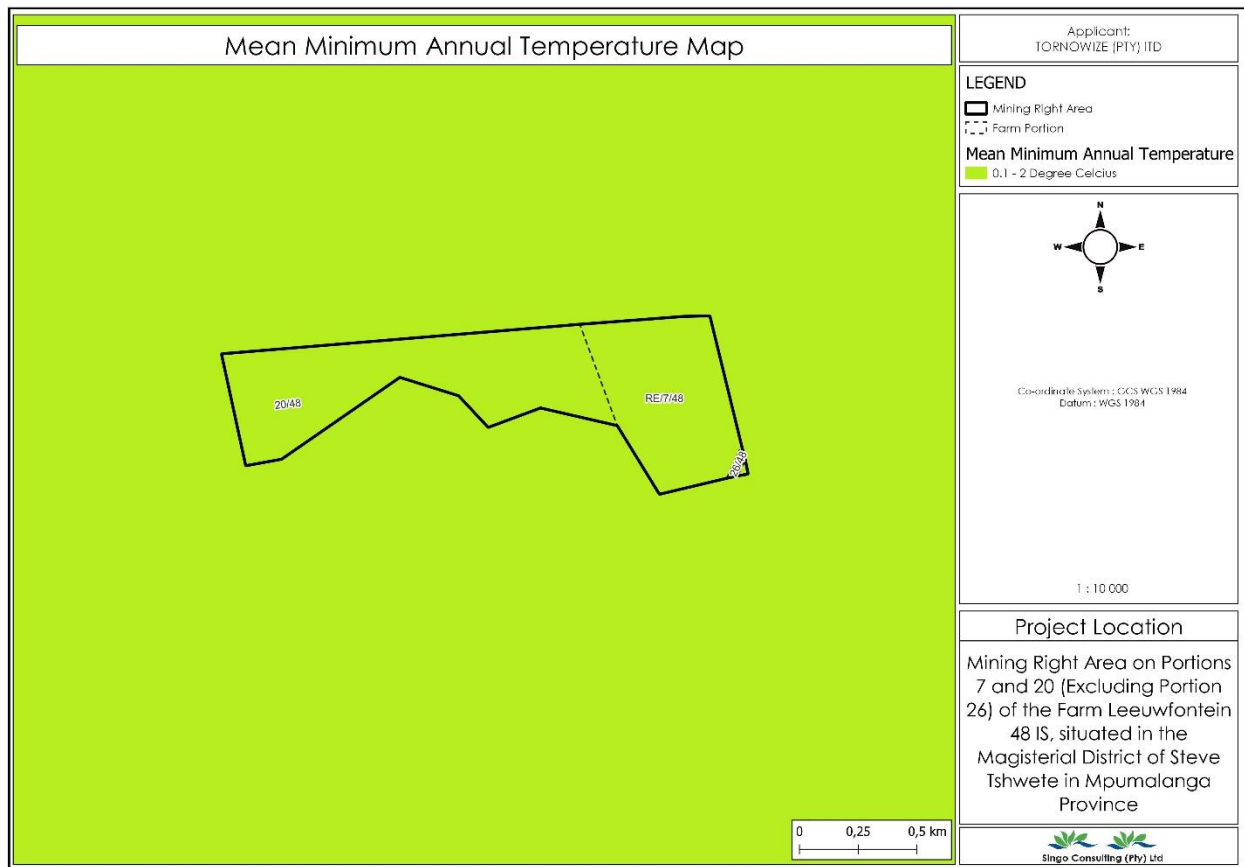


Figure 16: Temperature Map (source: Singo consulting (Pty) Ltd)

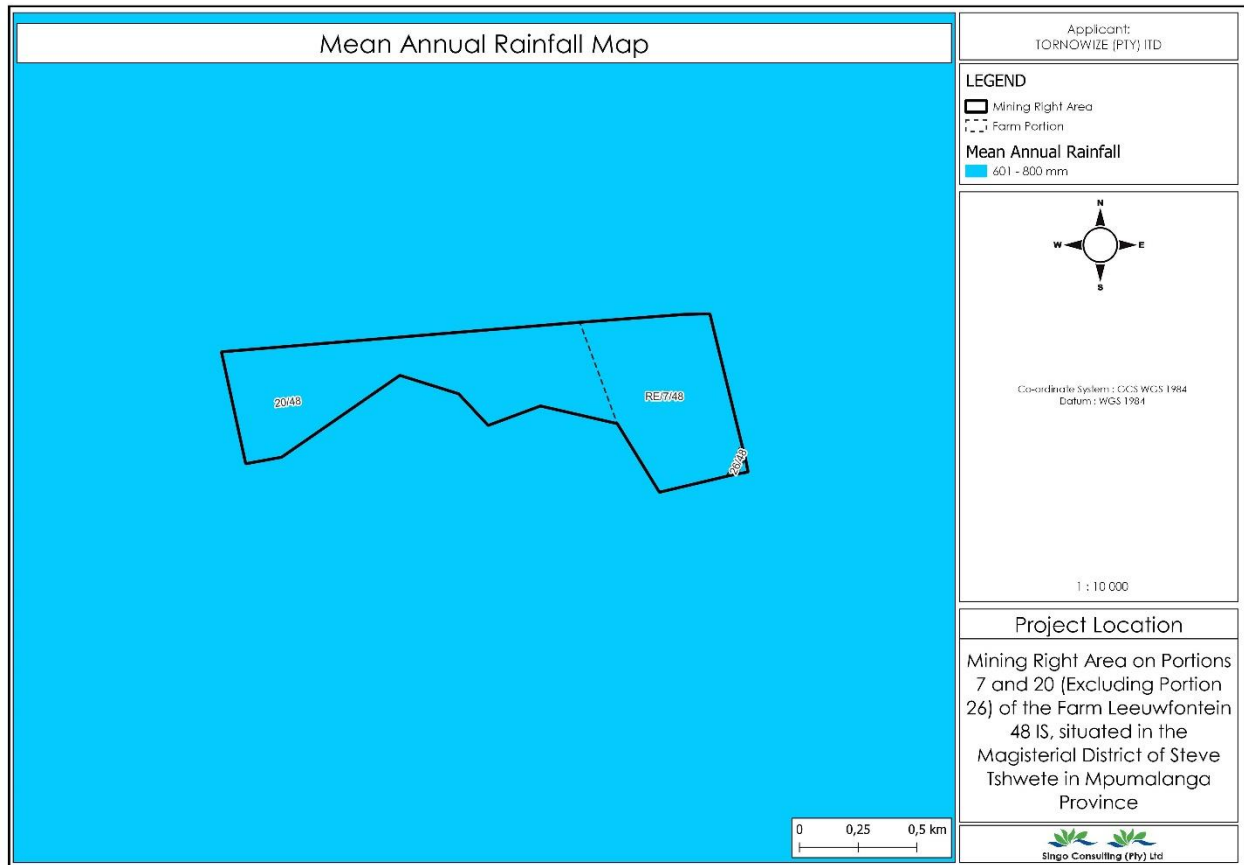


Figure 17: Rainfall Map (source: Singo consulting (Pty) Ltd)

11 DRAINAGE AND TOPOGRAPHY

11.1 Topography

The topology of the area is illustrated below by the below. In this environmental project, topography can be used to deduce the movement of surface water during rainy seasons. In the context of the study, topography will play a crucial role in the surface transport of contaminants and site-specific recommendations thereof. The topography of an area influences groundwater vulnerability, as topography also influences run-off and infiltration. The project area is located on a flat surface with the following hydrological features:

- Perennial river
- Non-perennial river
- Seep wetland
- Channelled river bottom wetland

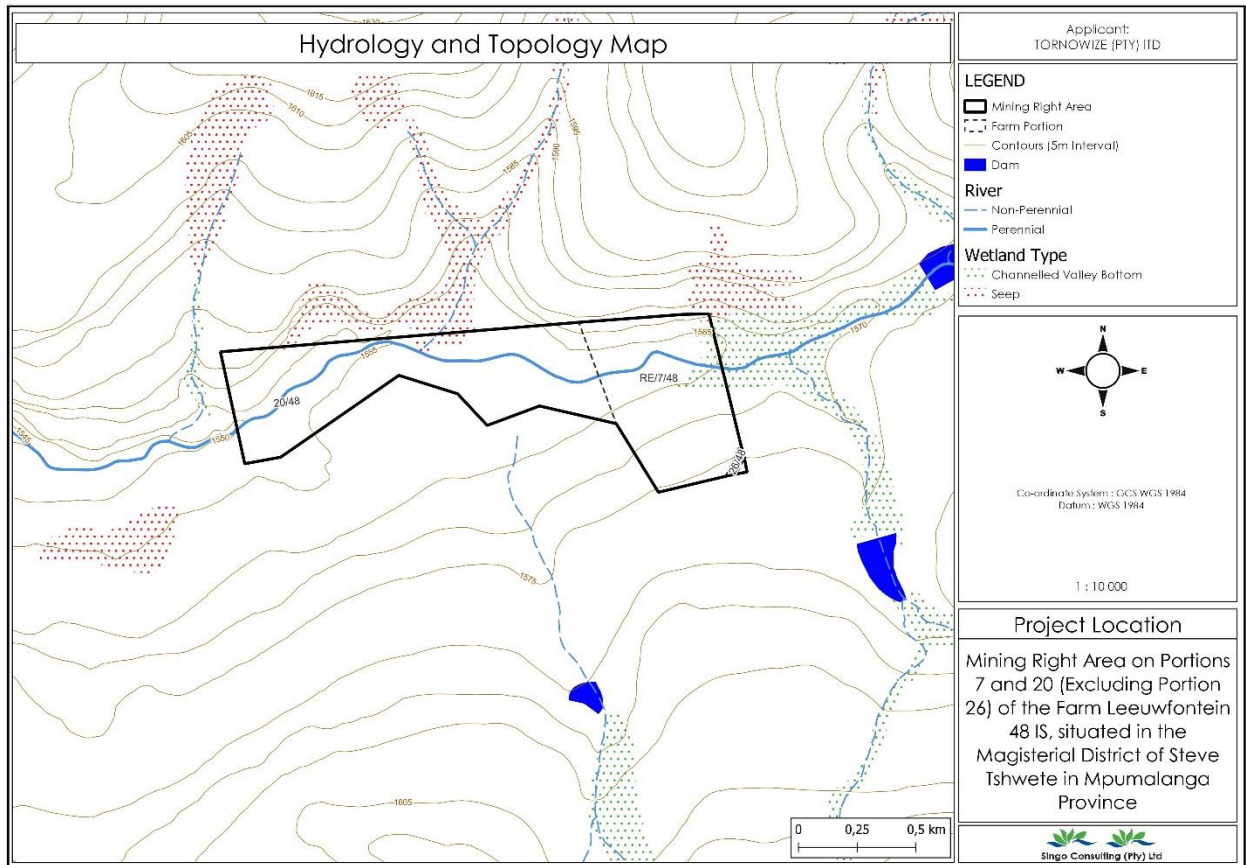


Figure 18: Topography and hydrology within the proposed project area (Source: Singo consulting (Pty) Ltd)

12 CATCHMENT DESCRIPTION

The regional hydrological setting of the project site is indicated by the map below. The Coal mining right is in the Olifants Water Management Area (WMA). The main quaternary catchment is B11B. The WRC 2012 study, presents hydrological parameters for each quaternary catchment including area, mean annual precipitation (MAP) and mean annual runoff (MAR), (Refer to Table 11).

Table 11: Quaternary Catchment Information (WRC. 2012)

Quaternary Catchment	S-Pan Evaporation		Rainfall		
	Evaporation Zone	MAE (mm)	Rainfall Zone	MAP (mm)	MAR (mm)
B11B	4A	1541	B1A	688	23.65

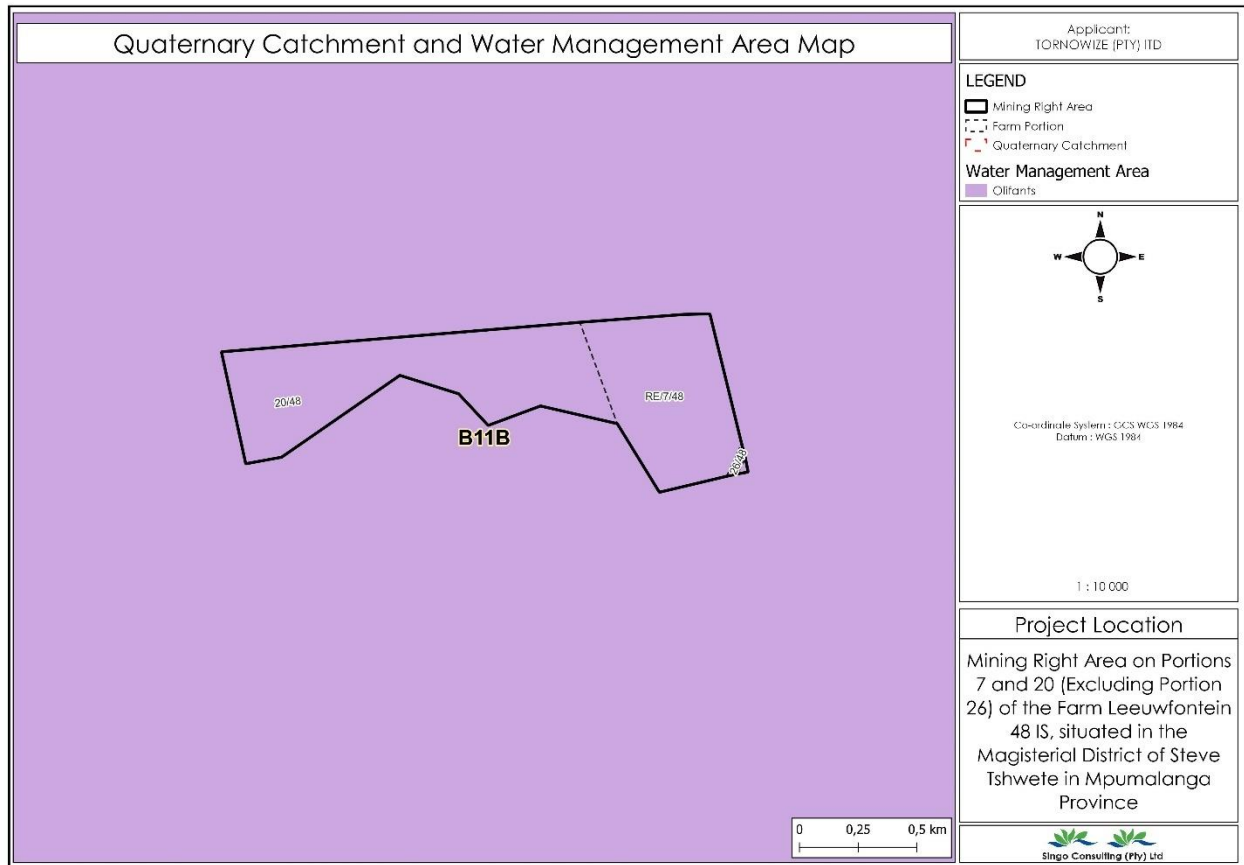


Figure 19: Quaternary Catchment and Water Management Area Map (Source: Singo consulting (Pty) Ltd)

13 AIR QUALITY

The assessment of the ambient air quality is based on available ambient air quality information identified in the literature review and data availed by the DEA and the South African Weather Service (SAWS) websites.

Mpumalanga experiences a wide range of natural and anthropogenic sources of air pollution ranging from veld fires to industrial processes, agriculture, mining activities, power generation, paper and pulp processing, vehicle use and domestic use of fossil fuels. Different pollutants are associated with each of the above activities, ranging from volatile organic compounds and heavy metals to dust and odours.

The project area is located in the Mpumalanga Highveld Priority Area, which has been declared as such by the Minister of Environment and Tourism in terms of Section 18 (1) and 57 (1) of the NEM:AQA. The area is situated near two power stations, namely; Camden and Amajuba situated less than 90km. the two stations result a significant negative impact on air quality in the area and have specific air quality management actions rectifying the situation.

Ambient air quality in Mpumalanga is strongly influenced by regional atmospheric movements, as well as local climatic and meteorological conditions. The most important of these atmospheric movement routes are the direct transport towards the Indian Ocean and the recirculation over the sub-continent (Scholes, 2002). It is these climatic conditions and circulation movements that are responsible for the distribution and dispersion of air pollutants in Mpumalanga and between bordering provinces and countries.

14 NOISE

The proposed area is surrounded by two existing mining operations that makes noise regularly, therefore no new noise will be emitted, the new proposed Tornowize coal mine will just add to the existing noise level.

15 TERRESTRIAL ECOLOGY

15.1.1 Vegetation

The proposed area is made up of moist sandy highveld grass (Figure 20 and Figure 22) this is where the vegetation is dominated by grasses (Poaceae). However, sedge (Cyperaceae) and rush (Juncaceae) can also be found along with variable proportions of legumes, like clover, and other herbs. The moist sandy Highveld grassland is found in the sandy plains west of the Belfast-Carolina-Ermelo area, middleburg and north of Volksrust in Mpumalanga, at an altitude of 1,600 to 1,800 m. Plant theme species from the screening tool report showed that area has medium sensitivity refer to Figure 21, with sensitive species and *Pachycarpus suaveolens*.

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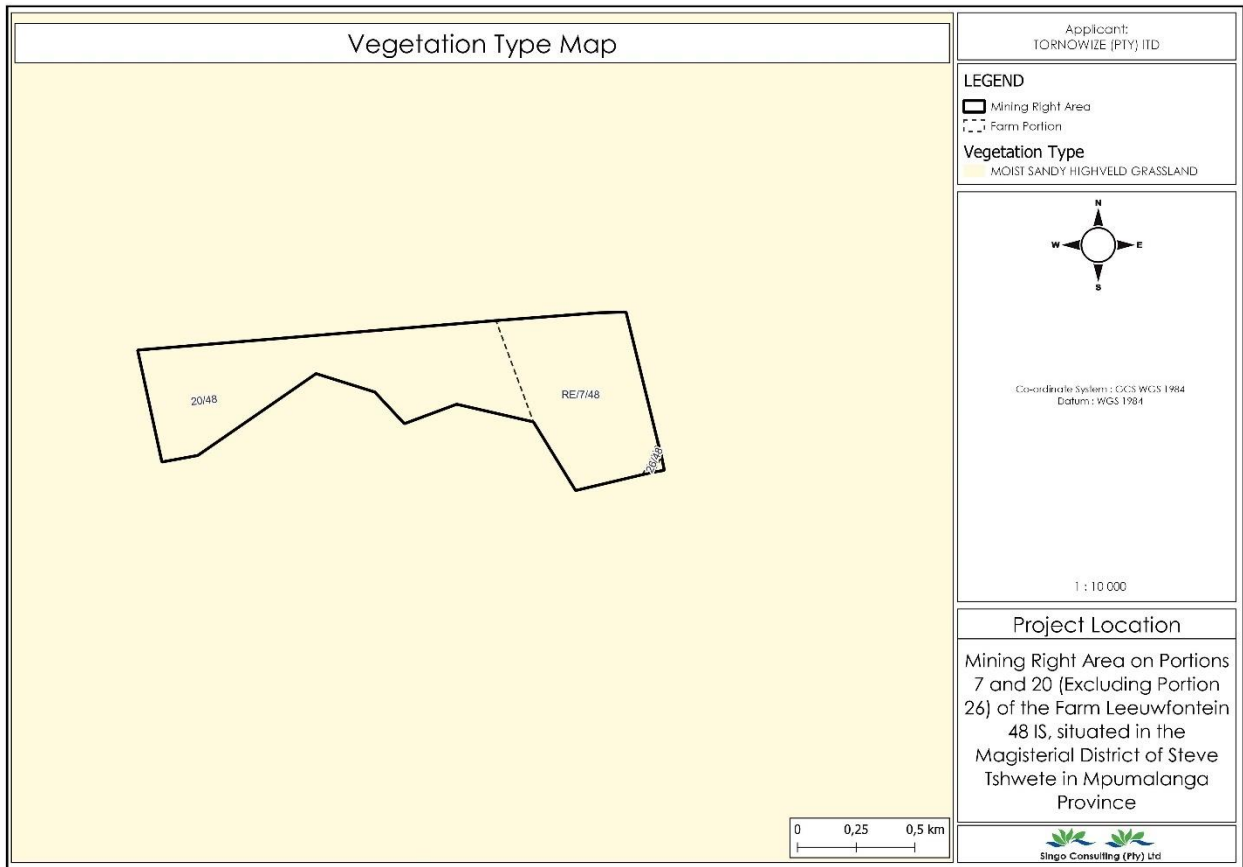
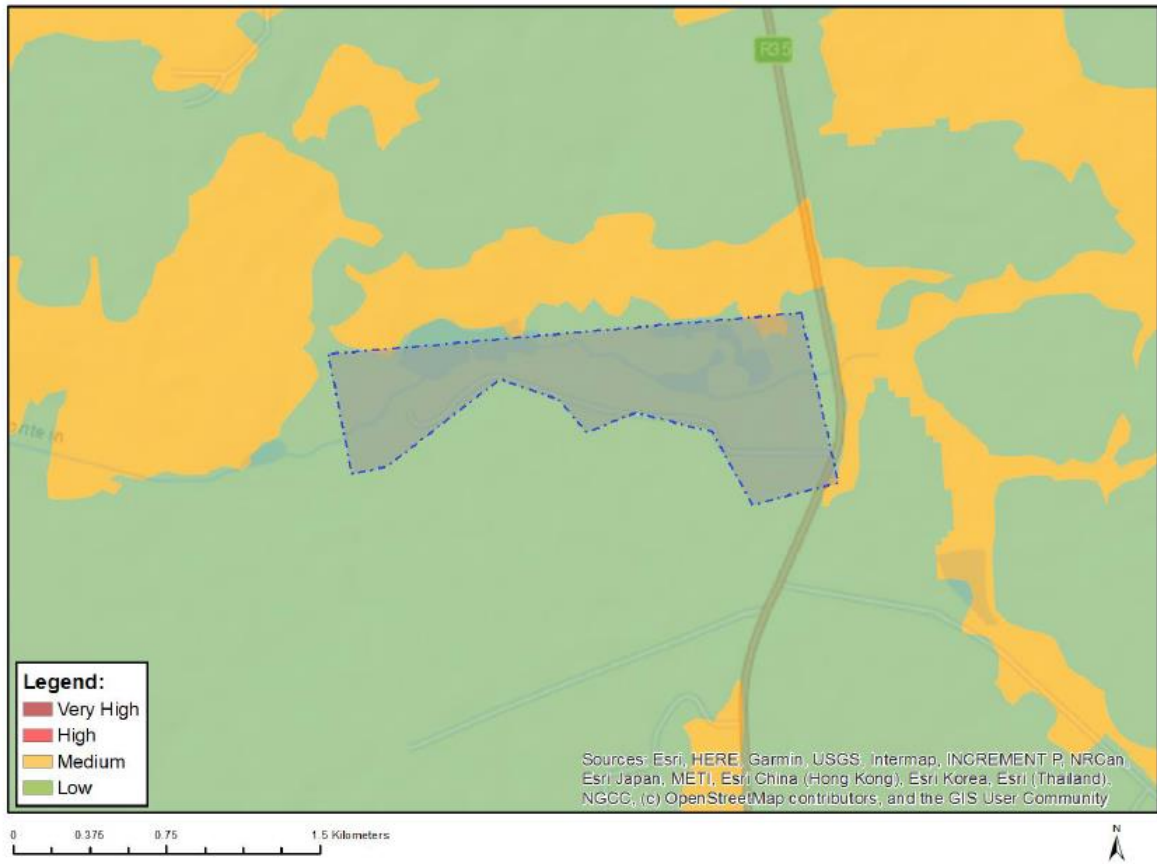


Figure 20: Vegetation type map

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Figure 21: Plant theme sensitivity (adopted from screening tool)



Figure 22: Vegetation type on site

15.2 Terrestrial threatened ecosystem

The South African National Biodiversity Institute (SANBI), in conjunction with the Department of Environmental Affairs (DEA), released a draft report in 2009 entitled “Threatened Ecosystems in South Africa: Descriptions and Maps”, to provide background information on the List of Threatened Ecosystems (SANBI, 2009). The purpose of this report was to present a detailed description of each of South Africa’s ecosystems and to determine their status using a credible and practical set of criteria. The following criteria were used in determining the status of threatened ecosystems:

- Irreversible loss of natural habitat
- Ecosystem degradation and loss of integrity
- Limited extent and imminent threat
- Threatened plant species associations

- Threatened animal species associations
- Priority areas for meeting explicit biodiversity targets as defined in a systematic conservation plan

In terms of section 52 (1) (a), of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA), a new national list of ecosystems that are threatened and in need of protection was gazette on 9 December 2012 (Government Notice 1002 (Driver et. al., 2004). The list classified all threatened or protected ecosystems in South Africa in terms of four categories, namely Critically Endangered (CR), Endangered (EN), Vulnerable (VU), or protected. The purpose of categorising these ecosystems is to prioritise conservation areas to reduce the rates of ecosystem and species extinction, as well as preventing further degradation and loss of structure, function, and composition of these ecosystems. It is estimated that threatened ecosystems make up 9.5% of South Africa, with CR and EN ecosystems accounting for 2.7%, and VU ecosystems 6.8% of the land area. It is therefore vital that Threatened Terrestrial Ecosystems inform proactive and reactive conservation and planning tools, like Biodiversity Sector Plans, municipal Strategic Environmental Assessments (SEAs) and Environmental Management Frameworks (EMFs), EIAs and other environmental applications (Mucina et al., 2006).

The proposed project area is heavily modified, this was confirmed by the candidate EAP during site assessment, this changed is brought by previous mining activities, see Figure 23 below.

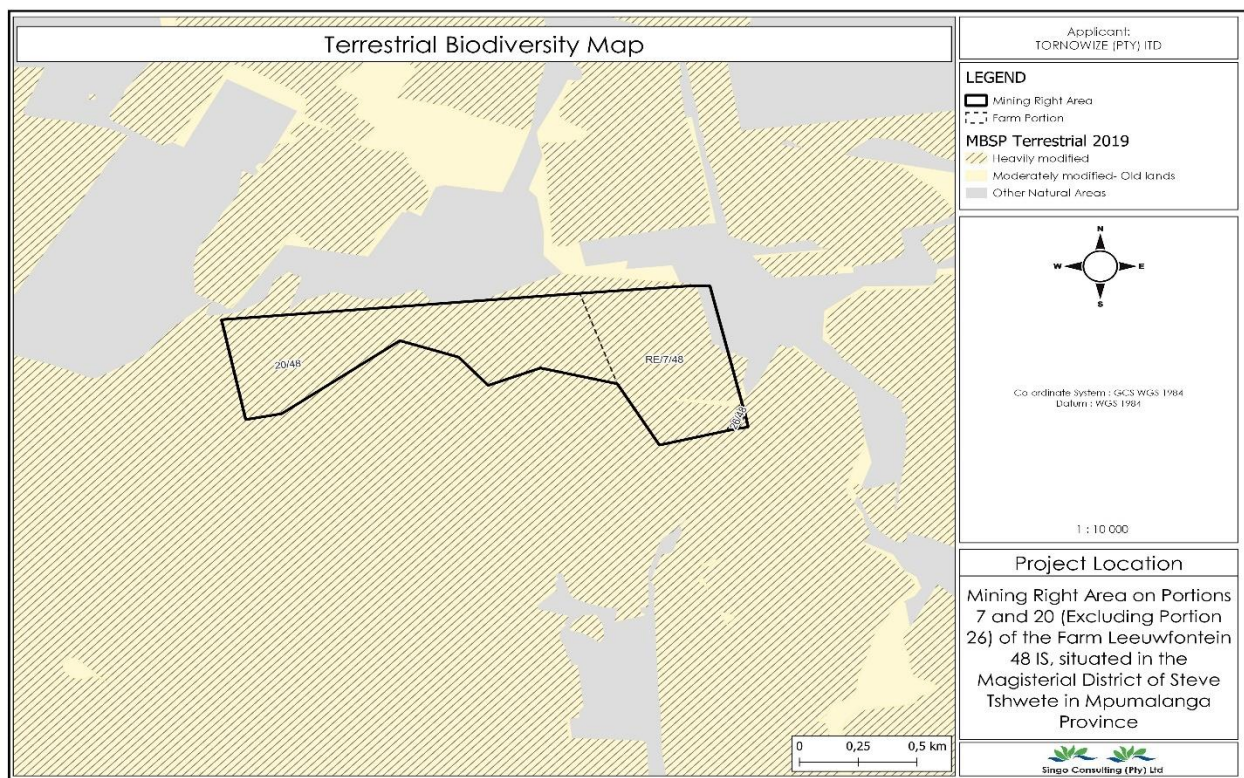


Figure 23: Terrestrial Biodiversity Map (Source: Singo consulting (Pty) Ltd)

15.3 Methodology and Site Assessment

The information provided in this terrestrial biodiversity report is based mainly on the observations that were made during the field survey and a review of the available reports that contain known and predicted ecology and wetland information on the study area.

15.3.1 5.1 Desktop study

A desktop survey was conducted using maps and reviewing other reports and photography to assemble background information on the different features of and vegetation present in the proposed project area. The site was assessed on the 23rd of January 2023 to record the features present.

15.3.2 Fauna survey

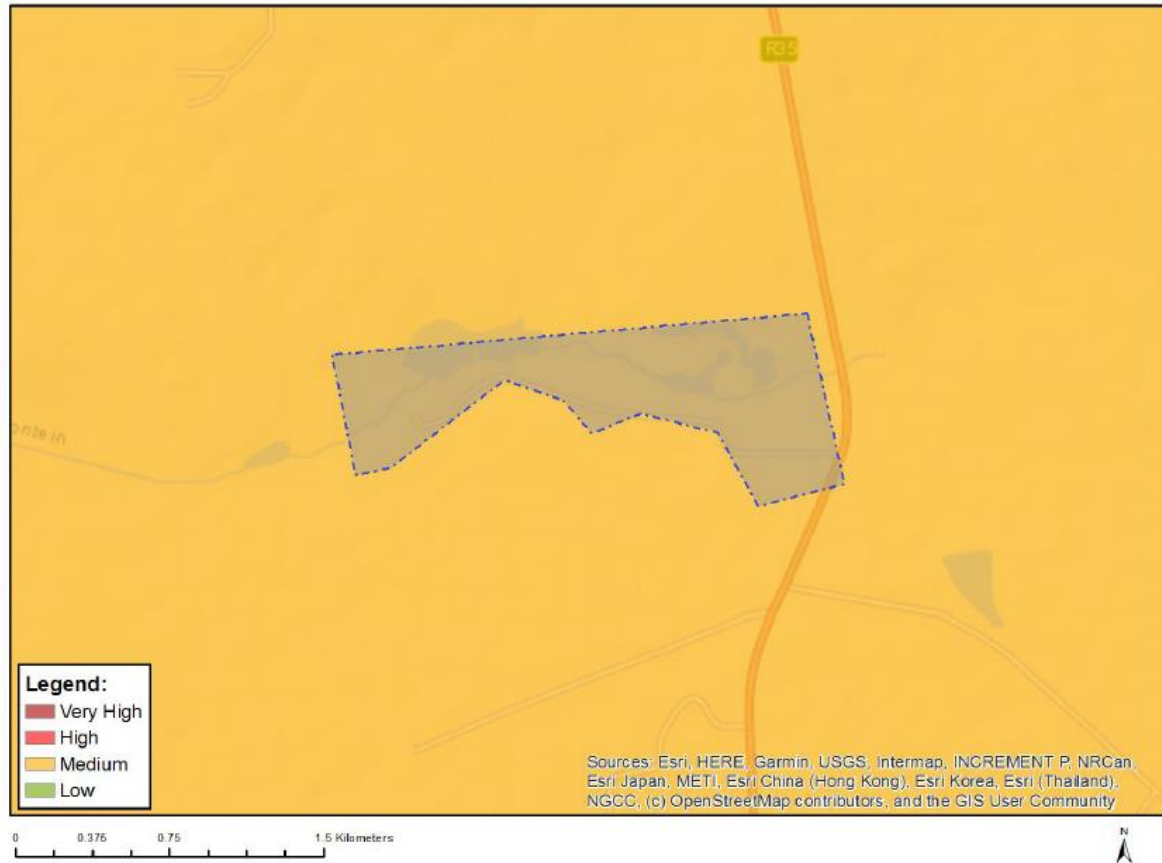
According to the screening report the proposed mining area has medium animal sensitivity. The identified animal species include Aves-Hydroprogne caspia, Crocidura maquassiensis, Dasymys robertsii, Ourebia ourebi ourebi and Hydriectis maculicollis. The Makwassie musk shrew (Figure 25 Mammalia-Crocidura maquassiensis) is a species of mammal in the family Soricidae. This is a rare species endemic to South Africa, Swaziland, and Zimbabwe, existing in moist grassland habitats in the Savannah and Grassland biomes. The oribi (Ourebia ourebi ourebi) is a small antelope found in eastern, southern and western Africa. The sole member of its genus, it was described by the German zoologist Eberhard August Wilhelm von Zimmermann in 1783. Eight subspecies are identified, see Figure 26 for typical example.

The secretarybird or secretary bird (Sagittarius serpentarius) is a large, mostly terrestrial bird of prey. Endemic to Africa, it is usually found in the open grasslands and savanna of the sub-Saharan region. John Frederick Miller described the species in 1779 refer to Figure 27.

The main threats to shrews are the loss or degradation of moist, productive areas such as wetlands and rank grasslands within suitable habitat. The two main drivers behind this are abstraction of surface water and draining of wetlands through industrial and residential expansion, and overgrazing of moist grasslands, which leads to the loss of ground cover and decreases small mammal diversity and abundance (Bowland & Perrin 1989, 1993). Suppression of natural ecosystem processes, such as fire, can also lead to habitat degradation through bush encroachment or loss of plant diversity through alien invasive infestation, and is suspected to be increasing with human settlement expansion. There are also clear overlaps and

synergistic effects between these threats. We infer a continuing population decline based on loss of natural habitat.

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Sensitivity	Feature(s)
Medium	Aves-Hydroprogne caspia
Medium	Mammalia-Crocidura maquassiensis
Medium	Mammalia-Dasymys robertsii
Medium	Mammalia-Hydrictis maculicollis
Medium	Mammalia-Ourebia ourebi ourebi

Figure 24: Relative animal species theme sensitivity (adopted from screening report).



Figure 25: Typical example of Mammalia-Crocidura maquassiensis



Figure 26: Typical example of Ourebia ourebi ourebi



Figure 27: Typical example of *Sagittarius serpentarius*

15.3.3 Mammals

Mammals are nocturnal, secretive, or seasonal. Their specific habitats, walking trails, faeces, spoor, fur, bones, and carcasses were assessed to document mammal species associated with the proposed site. During site assessment cattles were spotted close to the vicinity of the proposed area, see the picture below.



Figure 28: Cattles on-site

15.4 Wetland Delineation

The proposed mining Right area is composed of a Channelled Valley Bottom and Seep Wetland.; which are all located inside and within the 2 km radius of the mining Right.

15.5 Buffer Zones

Buffer zones (or “setback areas”) have been used in land-use planning to protect natural resources and limit the impact of one land-use on another. They are typically designed to act as a barrier between human activities and sensitive water resources, thereby protecting them from negative impacts. The proposed area has a 100m buffer zone from the mining Right area to the wetlands, see the attached waterbody pictures on site, what looks like on top right of Figure 30 is a dam on the pictures is actually a pit created by a previous mine. The primary roles of buffer zones include:

- Maintaining basic aquatic processes, services, and values.
- Reducing impacts on water resources from upstream activities and adjoining land uses.
- Meeting life requirements for aquatic and semi-aquatic species.
- Providing habitat for terrestrial species.
- Providing a range of ancillary societal benefits.

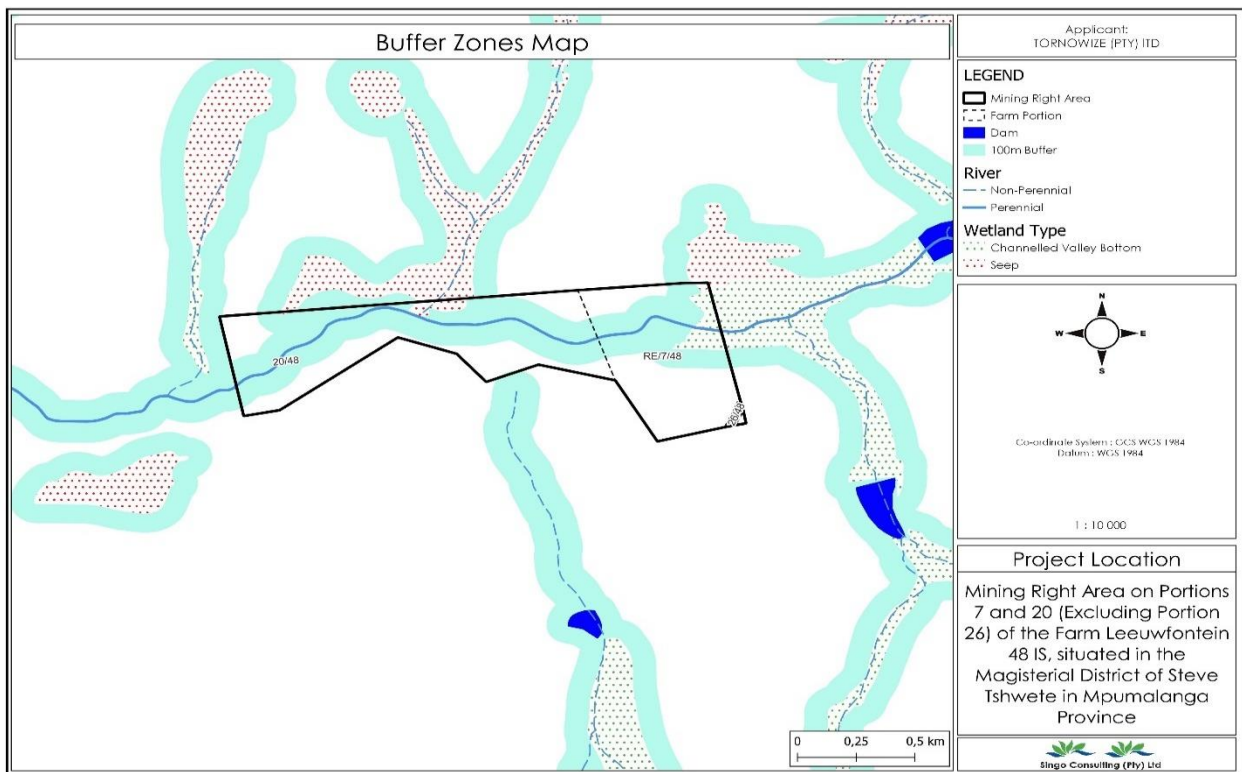


Figure 29: Buffer zone (Source: Singo consulting (Pty) Ltd)

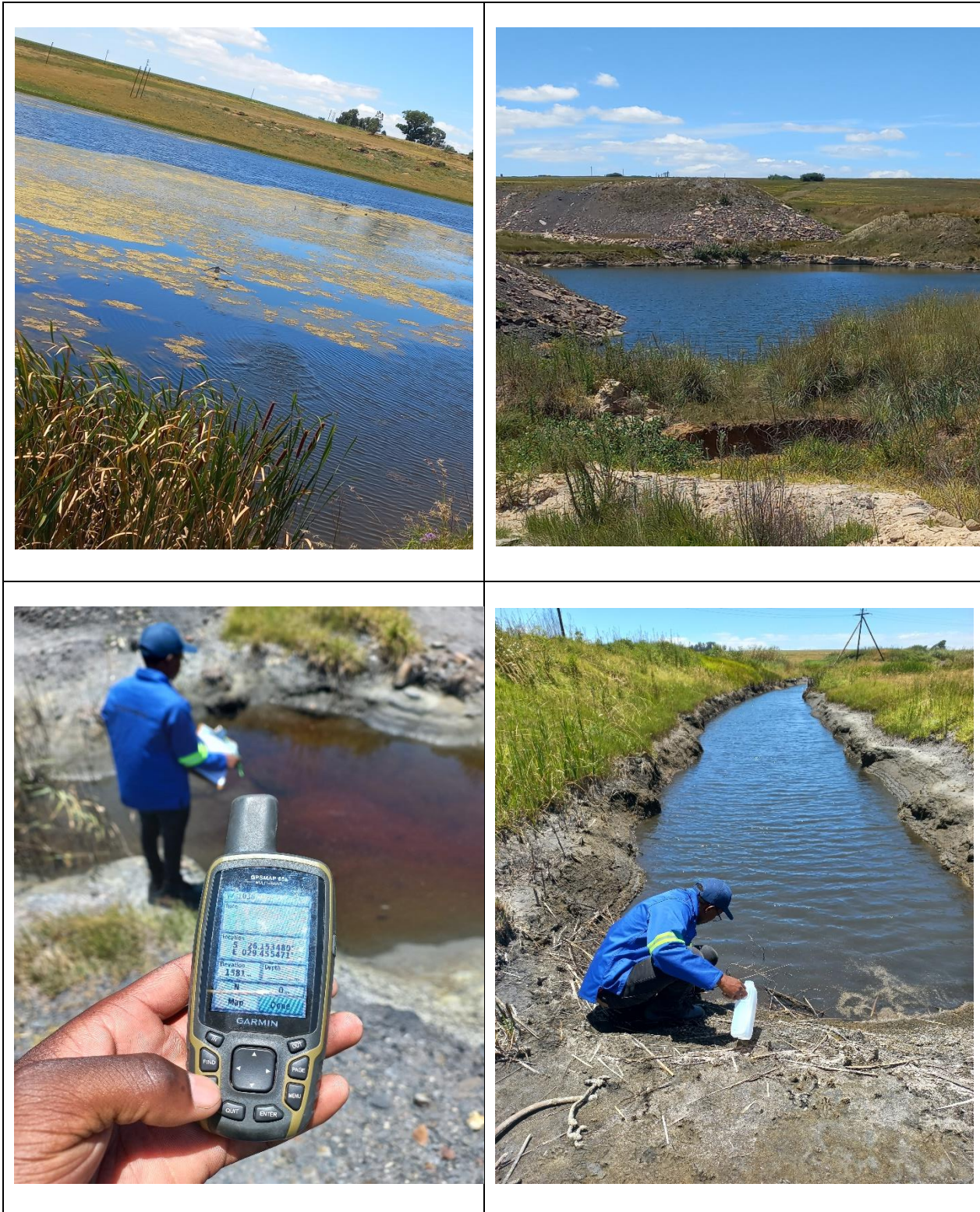


Figure 30: Water within the vicinity of the area

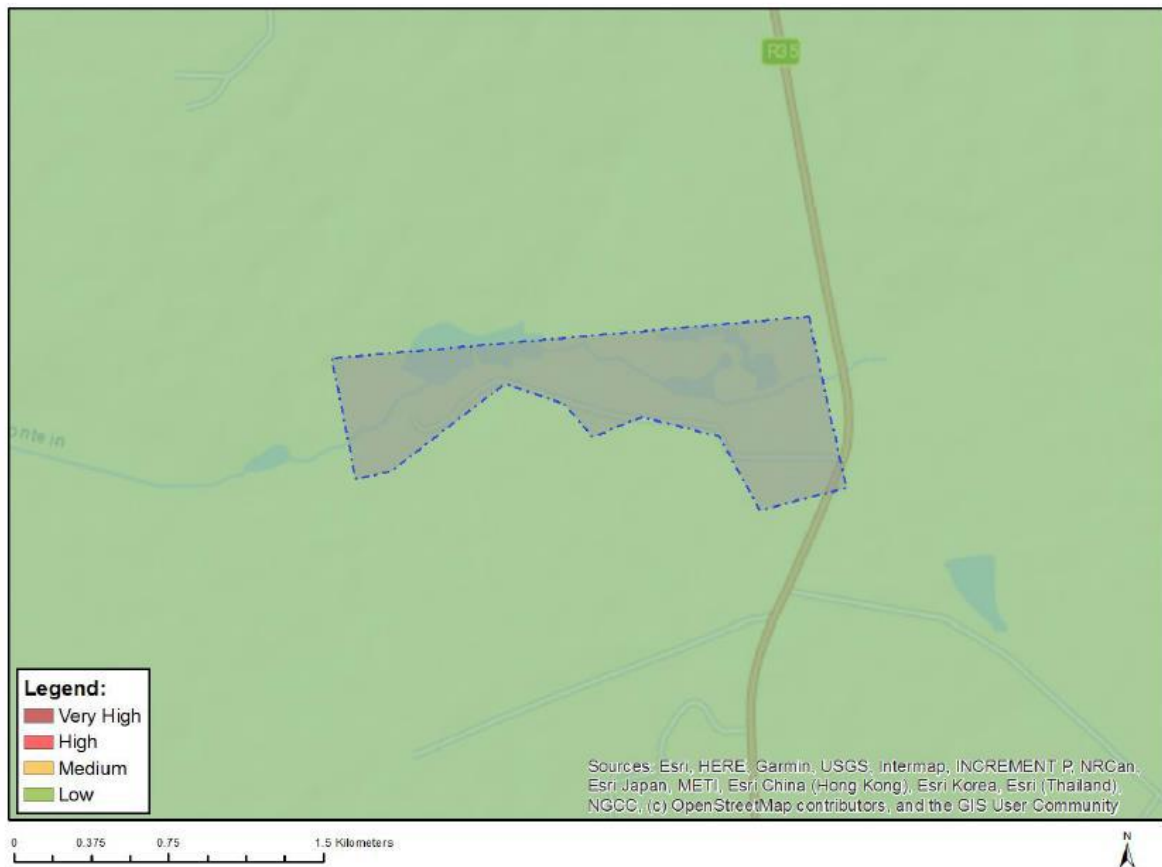
16 HERITAGE STUDY

16.1 Historical background

Singo consulting (Pty) Ltd will appoint a specialist (Integrated Specialist Services (Pty) Ltd) who will conduct a heritage impact assessment should be a need. Relevant published and unpublished sources will be consulted to generate desktop information. This includes online databases such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) website, Google Earth, Google Scholar, and South African Heritage Resources Information System (SAHRIS). Previous HIA in the project area will also be consulted. Published works on the archaeology, history and palaeontology will also be consulted. Thus, the proposed mining right application site will be considered in relation to the broader landscape, which is a key requirement of the International Council on Monuments and Sites (ICOMOS) Guidelines.

As part of the desktop study, published literature and cartographic data, as well as archival data on heritage legislation, the history and archaeology of the area will be studied. The desktop study will be followed by field surveys. See the attached Archaeological and Cultural Heritage Theme Sensitivity adopted from the screening report which shows that the area has low sensitivity for archaeological and cultural heritage

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

Figure 31: Archaeological and Cultural Heritage Theme Sensitivity

17 SOCIAL ASPECTS

The socio-economic analysis is specifically aimed at spatial related matters, i.e. employment, income and economic profile. This analysis is based on a municipal level to give a broader overview of the Municipality.

- **Poverty and Inequality**

In the last ten years the municipality has made huge investments in infrastructure and housing development as a result of that, poverty and inequality has been decreasing steadily. However, the current rate of unemployment and poverty are key factors contributing to high inequality levels.

Table 12:Poverty in Steve Tshwete 2001, 2011 and 2016

INDICATORS	2001	2011	2015
Poverty rate	31.6%	25.9%	21%
Number of people in poverty	48 865	59 929	53 567
Poverty gap (R million)	R54	R110	R575

Source: Statistics South Africa Census 2001, 2011, 2016

According to the 2016 Community Survey of StatSA, the poverty headcount of Steve Tshwete increased from 4.3% in 2011 to 5.1% in 2016 which then made the municipality to be 4th lowest in the province however the poverty intensity decreased slightly from 42.0% to 41.7% in the same period. In 2015, Steve Tshwete’s share of population below the lower-bound poverty line was the 2nd lowest (favourable) among the municipal areas.

- **Social Grants**

The table below shows the number of beneficiaries of social grants as per April 2018. Youth is generally not targeted by South Africa's social welfare system. Child Grants followed by the old age grants were the highest payouts for the department while R303 837 was paid out to Disability Temporary Period.

Table 13: Social grant beneficiaries

NUMBER OF ACTIVE GRANTS PER LOCAL MUNICIPALITY PER GRANT TYPE		
Grant Type	Total	Amount Paid
Care Dependency Grant	481	R817 700
Child Support Grant	38 295	R15 700 950
Disability Grant	2 676	R4 549 200
Foster Care Grant	1 327	R1 273 920
Grant-In-Aid	231	R94 710
Old Age Grant	11 009	R18 768 460
Total	54 019	R41 204 940

Department of Social Security Agency, 2019

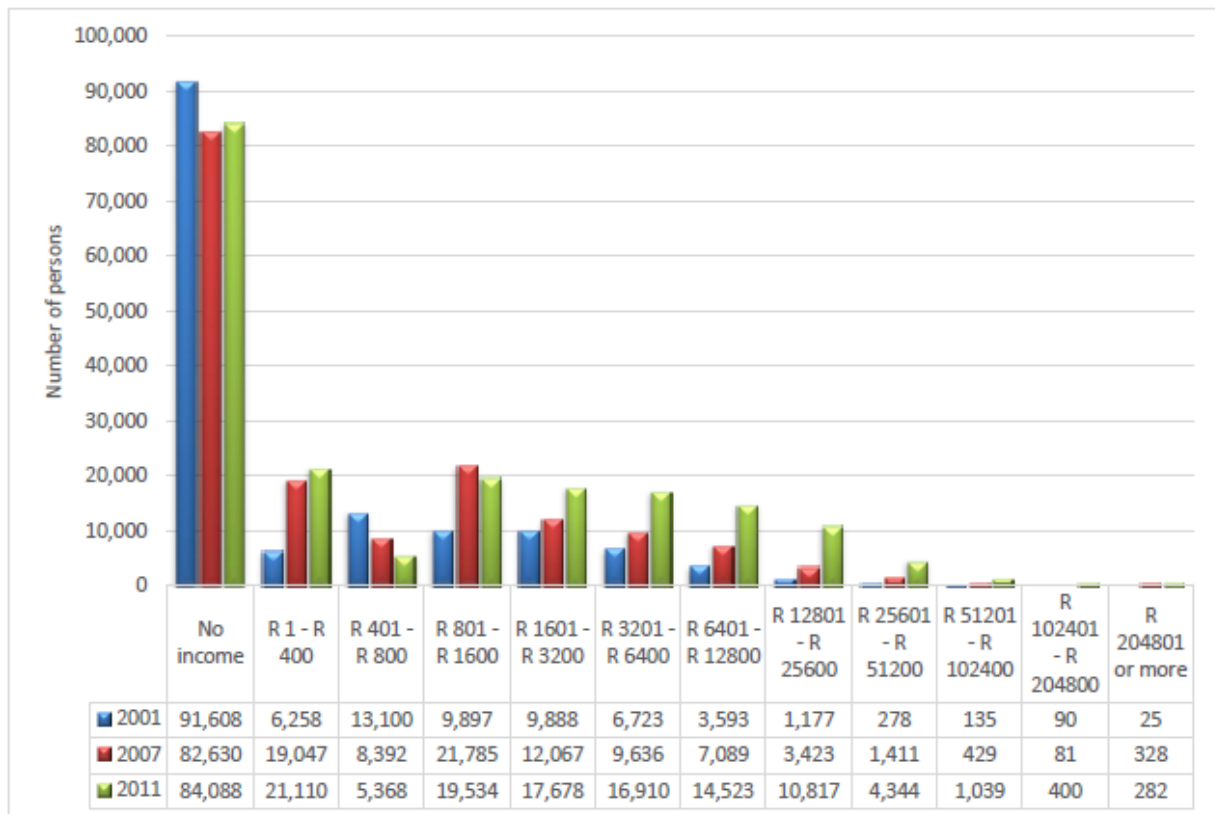
- **Employment**

Steve Tshwete economy is one of the biggest economic areas and it is therefore expected that a significant number of employment opportunities are being provided in the area. Mining, trade and manufacturing are the major leading employment drivers in Steve Tshwete LM.

The unemployment rate of Steve Tshwete decreased slightly from 19.7% in 2011 to 16.4% in 2015 and was the lowest among all the municipal areas of Mpumalanga. In 2018, the municipality has recorded a slight increase yet again from 2015 figures to just 17,9% . Unemployment rate for females has increased from 21.8% in 2015 to 23.1% in 2018 and that of males from 12.9% in 2015 to 14.5% in 2018. Though there is a high growth rate of unemployment, Steve Tshwete still has the lowest percentage in the province. Youth unemployment rate according to the 2011 Census figures 27.1% - challenge with especially very high youth unemployment rate of females. The largest employing industries in Steve Tshwete are trade (including industries such as tourism), community/government services and mining. High labour intensity in industries such as agriculture, trade and construction.

- **Individual Income**

According to the census, the number of people without an income has decreased from 91608 to 84088 between 2001 and 2011. The majority (63690) of Steve Tshwete individual earn within the R1-R 3200 followed by about 47 633 individuals who earn from R3200-R102 400 in 2011, there has been an increase this could be attributed to the number of mines, and manufacturing industries located in STLM. The share of population in Steve Tshwete below the so-called lower-bound poverty line (of Stats SA) deteriorated from 23.4% in 2015 to 26.9% in 2018. In 2018, Steve Tshwete's share of population below the lower-bound poverty line was however, the lowest (favourable) among the municipal areas. The number of people below the lower bound poverty line was high at more than 70 000 people in 2018. Thi the very same year, Steve Tshwete's share of population below the lower-bound poverty line was however, the lowest (favourable) among the municipal areas. Individual income distribution in Steve Tshwete is detailed in the Figure 32 below:



Source: Statistics South Africa Census 2001 and 2011

Figure 32: Individual income distribution in Steve Tshwete 2001 and 2011

- Household income

According to Census 2011, the average annual household income increased from R 55 369 per annum in 2001 to R134 026 per annum in 2011 refer to Figure 32. This represents an absolute increase in nominal terms over the 10-year period, which was the highest among the eighteen local municipalities in the province. This is closely related to its higher education levels and employment rates.

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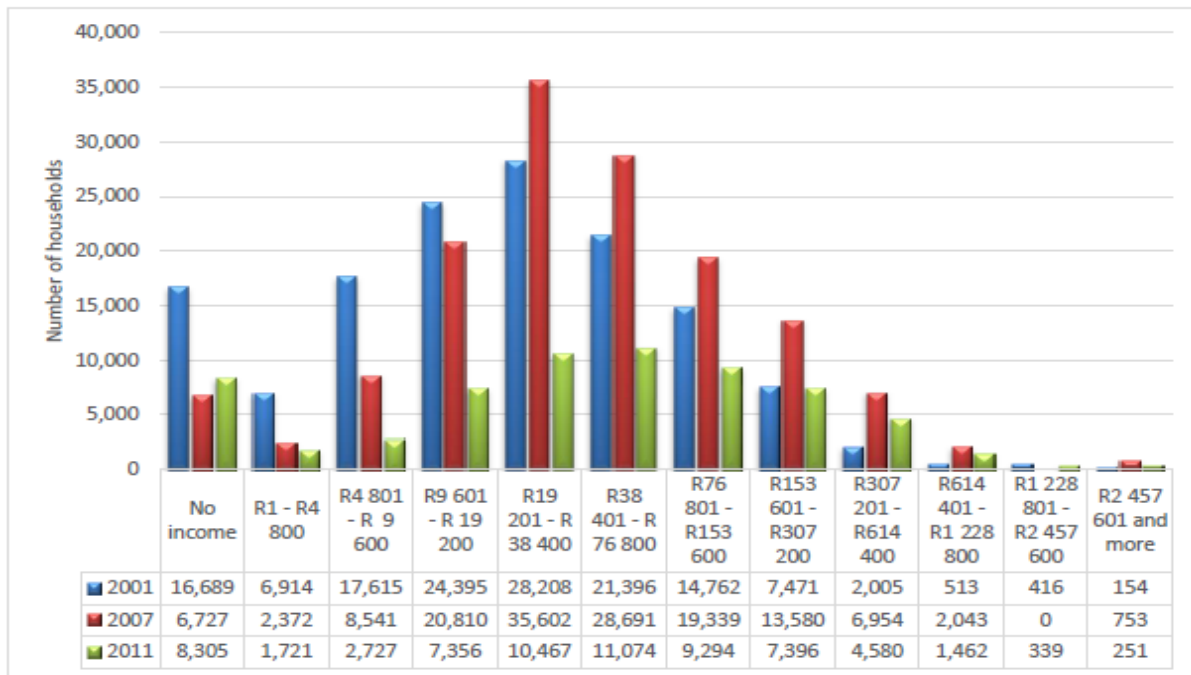
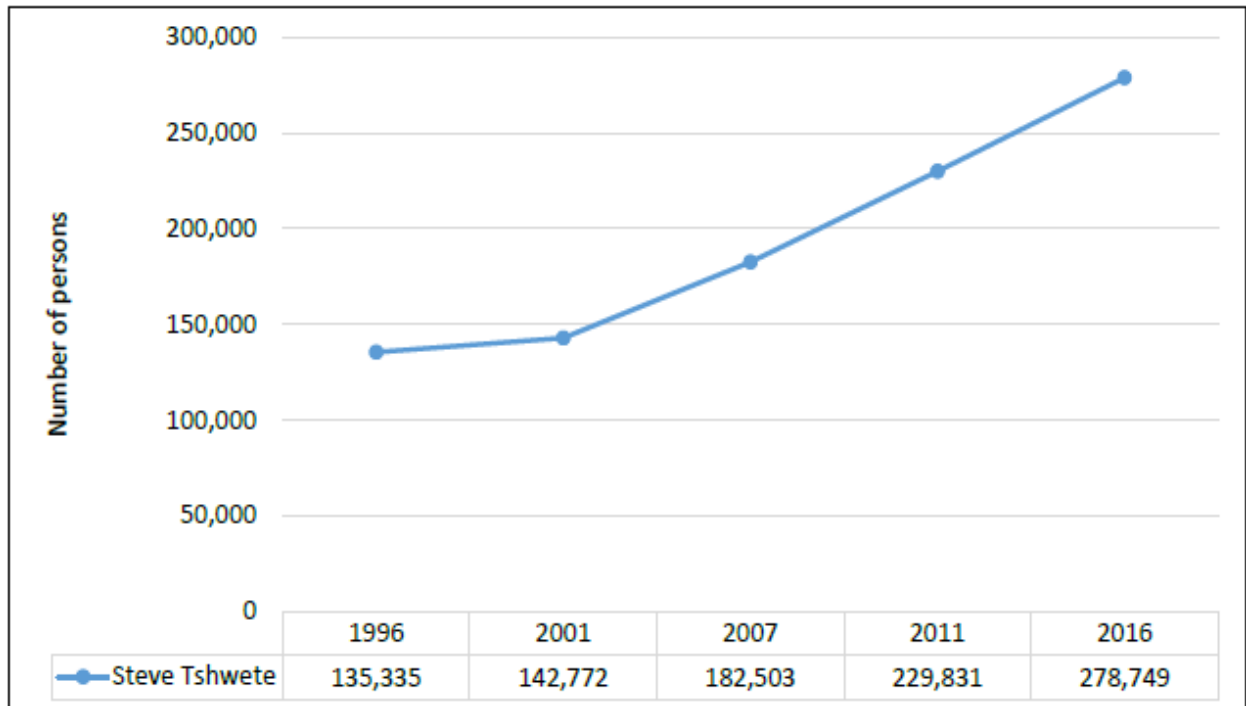


Figure 33: Individual income distribution in Steve Tshwete 2001 and 2011

- Population demographics

It is imperative to note that population growth statistics was taken into consideration throughout the IDP planning processes of the municipality. Specific reference is made to the latest 2016 Community Survey in comparison to the Census 1996, 2001, 2007 Community Survey and 2011 Census in order to see the trend.

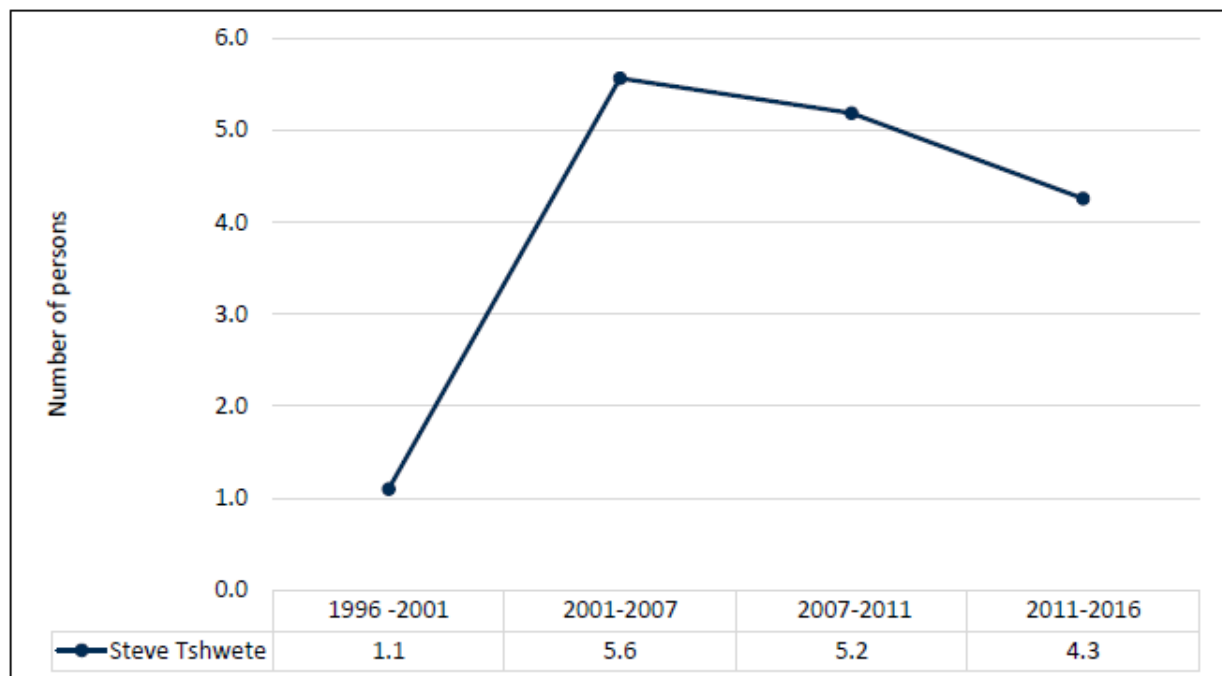
- Population size



Source: Stats SA Community Profile (1996, 2001, 2007, 2011 & 2016)

Figure 34: Population size for 1996, 2001, 2007, 2011 and 2016

i. Population growth rate (%)



Source: Stats SA Community Profile (1996, 2001, 2007, 2011 & 2016)

Figure 35: Population growth rate for 1996- 2016

The population size and population growth indicate that Steve Tshwete is increasingly under pressure due to population growth. In 2016, the total population in Steve Tshwete was 278 749. Population grew by 4.4 %. Over the nine years period from 2007 to 2016, STLM's population increased by 9.7%. In 2016, the municipality ranked the 7th largest population in the province and 19.3% of total population of Nkangala as per the 2016 community survey. This could be attributed to the number of industries that were opened within the 10 years (2001-2011) that attracted workers into Middelburg. It is estimated that the population number for 2030 will be at more or less 509 000 people given the historic population growth per annum which will put pressure on the infrastructure and basic service delivery and eventually also sustainable job creation in the long run.

Concluding Remarks:

Socio-economic information detailed in this section of the report provides an understanding of the need for economic development which is to further create employment opportunities. The people most affected by the proposed project is the community residing near/around the project area. Although there are other mining projects in close proximity to the application area, most of the people residing within the 20 km radius; in this context being the Komati community and farm dwellers remain unemployed and underprivileged. Not implementing the activities will result in a loss of potential economic development and opportunities that comes with the development.

18 DESCRIPTION OF CURRENT LAND USES

The land within which the proposed site it was used for mining activities, covered wetlands, natural vegetation and waterbodies. See the attached Figure 36 and Figure 37.

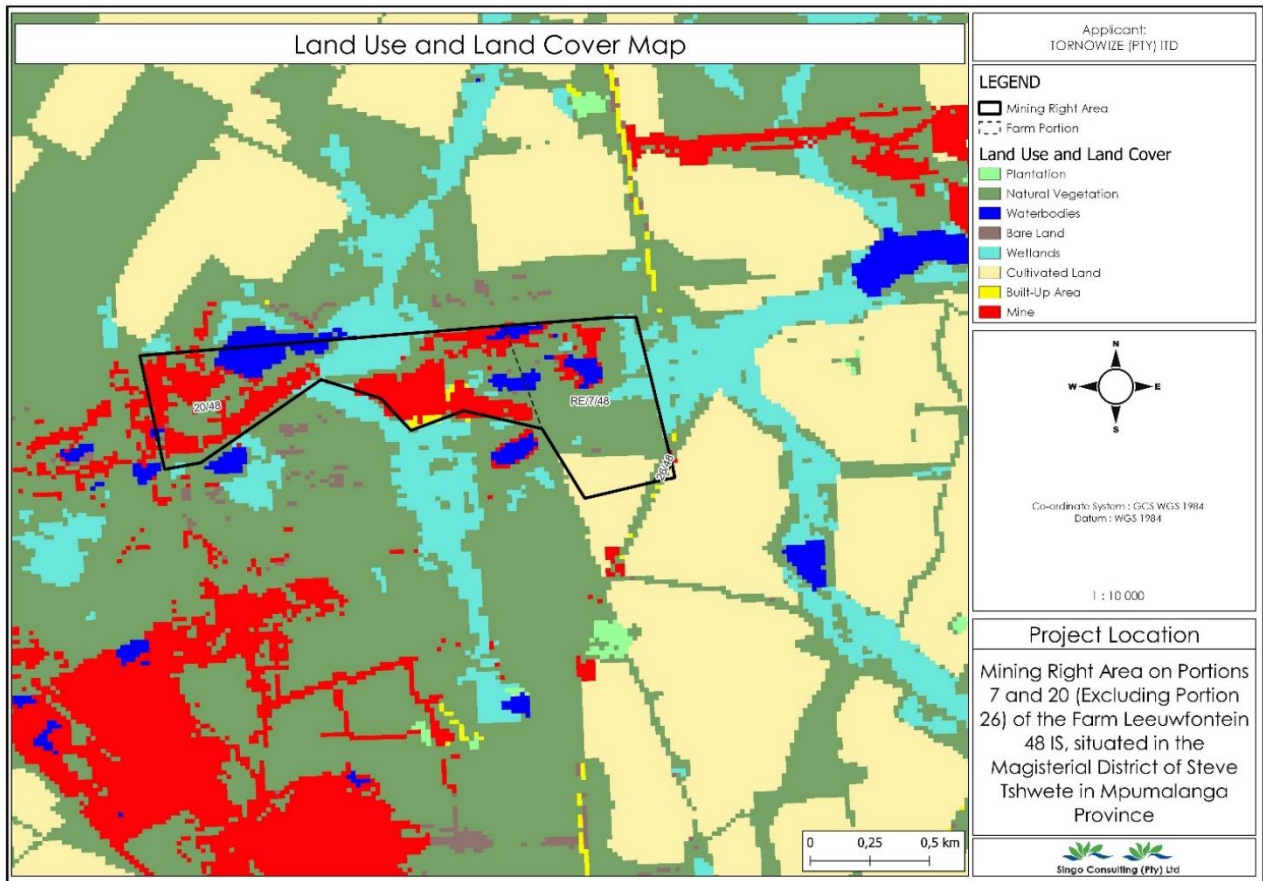


Figure 36: Land Use and Land Cover Map

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Figure 37: Land use

19 IMPACT ASSESSMENT

19.1 Methodology

Direct, indirect and cumulative impacts of the issues that will be identified during the specialist investigations will be assessed in terms of standard rating scales to determine their significance. The rating system used for assessing impacts (or when specific impacts cannot be identified, the broader term issue should apply) is based on five criteria, namely:

1. Status of impacts– Determines whether the potential impact is positive (positive gain to the environment), negative (negative impact on the environment), or neutral (no perceived cost or benefit to the environment).
2. Spatial scale of impacts– Determines the extent of the impact. Potential impact is expressed numerically on a scale of 1 (site-specific) to 5 (global).

3. Temporal scale of impacts – Determines the extent of the impact in terms of timescale and longevity. Potential impact is expressed numerically on a scale of 1 (project duration) to 5 (permanent).
4. Probability of impacts– Quantifies the impact in terms of the likelihood of the impact occurring on a percentage scale of <5% (improbable) to >95% (definite).
5. Severity of impacts– Quantifies the impact in terms of the magnitude of the effect on the environment (receptor) and is derived by consideration of points 1, 2 and 3 above. For this particular study, a conservative approach is adopted for severity (e.g. where spatial impact was considered to be 2 and temporal impact was considered to be 3, a value of 3 would be adopted as a conservative estimate for severity of impact).

Table 14: Status of impacts

Rating	Description	Quantitative rating
Positive	A benefit to the receiving environment (positive impact)	+
Neutral	No determined cost or benefit to the receiving environment	N
Negative	At cost to the receiving environment (negative impact)	-

Table 15: Spatial scale of impacts

Rating	Description	Quantitative rating
Very low (VL)	Site-specific: Impacts confined within the project site boundary.	1
Low(L)	Proximal: Impacts extend to within 1 km of the project site boundary.	2
Medium(M)	Local: Impacts extend beyond to within 5 km of the project site boundary.	3
High(H)	Regional: Impacts extend beyond the site boundary and have a widespread effect, i.e. > 5 km from the project site boundary.	4
Very high (VH)	Global: Impacts extend beyond site boundary and have a national/global effect.	5

Table 16: Temporal scale of impacts

Rating	Description	Quantitative rating
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Very low (VL)	Project duration: Impacts expected only for the duration of the project or not longer than one year.	1
Low(L)	Short term: Impacts expected on a duration timescale of 1-2 years.	2
Medium(M)	Medium term: Impacts expected on a duration timescale of 2-5 years.	3
High(H)	Long term: Impacts expected on a duration timescale of 5-15 years.	4
Very high (VH)	Permanent: Impacts expected on a duration timescale exceeding 15 years.	5

Table 17: Probability of impacts

Rating	Description	Quantitative rating
Highly improbable	Likelihood of the impact arising is estimated to be negligible <5%	1
Improbable	Likelihood of the impact arising is estimated to be negligible 5-35%	2
Possible	Likelihood of the impact arising is estimated to be negligible 35-65%	3
Probable	Likelihood of the impact arising is estimated to be negligible 65-95%	4
Highly probable	Likelihood of the impact arising is estimated to be negligible >95%	5

Table 18: Severity of impacts

Rating	Description	Quantitative rating
Very low (VL)	Negligible: Zero or very low impact	1
Low (L)	Site-specific and short-term impacts	2
Medium (M)	Local scale and/or short-term impacts	3
High (H)	Regional and/or long-term impacts	4
Very high (VH)	Global scale and/or permanent environmental change	5

These five criteria combine to describe the overall significance rating. Calculated significance of impact determines the overall impact on (or risk to) a specified receptor and is calculated as the product of the probability (P) of the impact occurring and the severity (S) of the impact if it were to occur (Impact = P×S).

This is a widely accepted methodology for calculating risk and results in an overall impact rating of Low (L), Low/Medium (LM), Medium (M), Medium/High (MH) or High (H). The significance of a particular impact is depicted in Table 21 and assigned a particular colour code in relation to its severity.

Table 19: Overall significance rating

Rating	Description	Quantitative rating
Low	PxS=1-3 (Low impact significance)	L
Low/medium	PxS=4-5 (Low/medium impact significance)	LM
Medium	PxS=6-9 (Medium impact significance)	M
Medium/high	PxS=10-12 (Medium/high impact significance)	MH
High	PxS=13-25 (High impact significance)	H

Table 20: Overall significance rating - Severity

Probability (P)	Severity (S)				
	1	2	3	4	5
1	L	L	L	LM	LM
2	L	LM	M	M	MH
3	L	M	M	MH	H
4	LM	M	MH	H	H
5	LM	MH	H	H	H

The impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings described in the following.

- *Insignificant*: The potential impact is negligible and will not have an influence on the decision regarding the proposed development.
- *Low*: The potential impact is very small and should not have any meaningful influence on the decision regarding the proposed development.
- *Low/medium*: The potential impact may not have any meaningful influence on the decision regarding the proposed activity/development.

- *Medium:* The potential impact should influence the decision regarding the proposed activity/development.
- *Medium/high:* The potential impact will affect the decision regarding the proposed activity/development.
- *High:* The proposed activity should only be approved under special circumstances.

Practicable mitigation and optimisation measures are recommended, and impacts are rated in the prescribed way, both without and with the assumed effective implementation of the recommended mitigation (and/or optimisation) measures. Mitigation and optimisation measures are either:

- *Essential:* Measures that must be implemented and are non-negotiable.
- *Best practice:* Recommended to comply with best practice, with adoption dependent on the proponent's risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the proponent if not implemented.

The model outcome is then assessed in terms of impact certainty and consideration of available information. Where a particular variable rationally requires weighting or an additional variable requires consideration, the model outcome is adjusted accordingly.

20 IDENTIFICATION OF IMPACTS

Potential impacts resulting from the proposed Tornowize Coal Mine are identified during the scoping phase using input from the following sectors:

- Views of I&APs parties
- Existing information based on literature reviews and desktop studies (EAP, Stakeholders, and specialist inputs)
- Site visit with the project team
- Legislation
- Guidelines

The following potential impacts were identified:

- Contamination of ground and surface water (including AMD)
- Disturbance of geology and soils
- Land uses and capability

- Socio-economic
- Flora and fauna
- Traffic
- Watercourses (wetlands)
- Dust and air quality
- Blast and vibration
- Heritage and cultural resource
- Paleontological

Proposed specialist studies to assess the environmental impacts during the EIA phase:

- Geohydrological investigation, impact assessment and modelling
- Wetland delineation and impact assessment (PES and EIS)
- Aquatic ecology and surface water assessment and Floodline determination
- Terrestrial ecology including flora and fauna
- Civil engineering pollution control dam designs and storm-water management plan
- Blasting and vibration assessment
- Soils and land capability assessment
- Agricultural input assessment
- Traffic impact assessment
- Rehabilitation management plan
- Heritage impact assessment
- Hydropedological study
- Mine Work Programme
- Rehabilitation Plan
- Social and Labour Plan
- Paleontological desktop assessment

20.1 Positive and negative impacts of the proposed activities/development and alternatives

Currently, a comprehensive impact assessment has not been conducted for certain studies except for Heritage impact assessment, Ecology and Wetlands. The anticipated impacts can, however, be discussed to provide an indication of whether it will be positive or negative (Table 21).

Table 21: Anticipated impacts

Impact	Status of impacts prior to mitigation	Proposed mitigation/improvement measures/ Recommendations
Surface and groundwater		
Ground and surface water contamination	Negative	<ul style="list-style-type: none"> ❖ Conduct water monitoring and implement remedial actions as required and effective rehabilitation to as close to pre-processing conditions as practically possible. ❖ It is recommended that the monitoring network be extended to all the boundaries; north, south, east and west of the proposed coal mine. The construction must be overseen by a qualified Hydrogeologist to monitor pollution in the upper weathered aquifer as well as the lower fractured aquifer. ❖ A monitoring network should be dynamic. This means that the network should be extended over time to accommodate the migration of contaminants through the aquifer as well as the expansion of infrastructure and/or addition of possible pollution sources. An audit on the monitoring network should be conducted annually ❖ Prevention of pollution of surface water resources and impacts on other surface water users by training of workers to prevent pollution, equipment and vehicle maintenance, fast and effective clean-up of spills, effective waste management, manage clean and dirty water in accordance ❖ The disturbance of streams and surface drainage patterns and reduction in flow to downstream must be mitigated through careful design of ephemeral stream diversion that minimizes impacts on the downstream environment, limit activities and infrastructure within wetland and watercourses and their floodlines and implementation of storm water management plan to divert clean water ❖ Clean water trenches should be constructed surrounding the coal mine to prevent clean water from entering the coal mine area, regarded as a dirty water catchment ❖ Dirty water trenches must be constructed as well to direct water from the mine to the pollution control dam, thereby preventing any contaminant water from leaving the mine area.
Wetland/River/ Hydrology/Geomorphology	Negative	<ul style="list-style-type: none"> • Natural pans and channelled valley bottom wetlands, including the Klein Olifants River, are the most important wetlands in the study area. These wetlands have been identified as potential no - go areas and it is recommended that all mining activities avoid these highly sensitive wetlands. Where any wetlands are to be destroyed, the best possible security factor (to a factor of 2) should be used if mining is above 100 m. This must be determined in the later stages of the design of the project. • Mining across wetlands/rivers should be restricted to low flow period (dry winter season) if possible. Ensure that mining activities are carefully monitored to limit

		<p>unnecessary impacts to wetlands/riparian areas (particularly in-stream habitat).</p> <ul style="list-style-type: none"> • Do not lower the original stream bed / profile of the wetland/river as this may result in scouring in an upstream direction and further alteration of bed conditions. • Ensure that coarse immovable material including boulders and other rock in river channels is not removed to ensure continued stability and functioning of the river systems. River sediments should not be permanently removed from the system in any case. • Limit activities occurring within the in-stream area of channels. • Under no circumstance should consideration be given to the excavation of an artificial channel or the damming of wetlands or rivers in such a manner as to totally restrict the flow. • Excavated material/sediments/spoil from the mining zone (including any foreign materials) should not be placed or stockpiled within wetlands or river channels, including the riparian zone of streams/ivers. • Any abstraction of water from rivers/wetlands for construction purposes must be approved by the Department of Water and Sanitation (DWS) by means of WUL.
Potential reduction of catchment yield of the aquifers through dewatering	Negative	<ul style="list-style-type: none"> • Regularly monitor groundwater levels as per the recommendations of the geohydrological report.
Excavated materials that are stockpiled in incorrect areas can interfere with the natural drainage, cause sedimentation and water pollution	Negative	<ul style="list-style-type: none"> • The areas excavated must have vegetated berms to separate dirty and clean water systems and serve as an erosion control measure. • The stockpiles must be vegetated to prevent erosion and subsequent siltation of clean and dirty water streams, as well as surface water resources. • Upslope diversion and down-slope silt containment structures should be constructed. • Surface water resources must be monitored pre-mining and during construction, as per the monitoring programme.
Terrestrial ecology		
The clearance for the construction of the proposed structures and infrastructure will result in habitat loss	Negative	<ul style="list-style-type: none"> • Keep the footprint of the disturbed area to the minimum and designated areas only. • Unnecessary vegetation clearing should be avoided. • Ensure rehabilitation plans are initiated during and after construction in areas not affected by mining operations. • Vegetation clearing on slopes must be minimised and, where necessary, appropriate stormwater management must be put in place to limit erosion of exposed soil.

		<ul style="list-style-type: none"> • No harvesting of indigenous tree species for firewood should be permitted. • An environmental induction for all staff members must be mandatory to discuss the potential of fire e.g. only smoking in designated areas and no open cooking fires. • All licences must be obtained prior to mining; • All ablution facilities must be placed far away from the water bodies including their buffer zone (50 meters from watercourses); • When placing structures as well as the mining area high sensitive areas as according to Appendix C of this report must be avoided; • An alien and invasive management plan as well as emergency preparedness plan during spillages must be adhered to at all times; and • Rehabilitation of cleared/mined areas occurs to avoid or to limit erosion
Accidental introduction of alien species and invaders	Negative	<ul style="list-style-type: none"> • Eradication and/or control of alien invasive plants and weeds as per the alien and invasive species monitoring programme. • Disturbance of natural areas should be avoided as far as possible and the spread of alien flora into natural areas must be controlled. • Continuous monitoring of the growth and spread of alien and invasive flora coupled with an adaptive management approach to identify suitable control mechanisms (e.g. mechanical, chemical or biological control). Mechanical control is usually preferred. • Cleaning of vehicles and equipment before entering natural areas to remove large deposits of foreign soils and plant material sourced from elsewhere.
Faunal mortalities	Negative	<ul style="list-style-type: none"> • Environmental induction for all staff members must be mandatory to discuss issues related to the killing and/or disturbance of faunal species should be avoided. • Several staff members must complete a snake handling course to safely remove snakes from designated areas. • Road mortalities should be monitored by vehicle operators (for personal incidents only) and the ECO (all roadkill on a periodic monitoring basis as well as specific incidents) with trends being monitored and subject to review as part of the monthly reporting. Monitoring should occur via a logbook system where staff notes the date, time and location of the sighting/incident. This will allow determination of the locations where the greatest likelihood exists of causing road mortality and allow mitigation against it (e.g., fauna underpasses, and seasonal speed reductions). Mitigation must be adapted to the on-site situation which may vary over time.

		<ul style="list-style-type: none"> • All staff operating motor vehicles must undergo an environmental induction training course that includes instruction on the need to comply with speed limits, to respect all forms of wildlife (especially reptiles and amphibians) and, wherever possible, prevent accidental road kills of fauna. Drivers not complying with speed limits should be subject to penalties. • The proposed prospecting activities will result in the deaths of numerous fauna species. It is suggested that construction and mining operations occur from a predetermined area and move along a gradient to allow fauna species to relocate. • The ECO must monitor live animal observations to detect trends in animal populations and implement proactive adaptable mitigation of vehicle movements. • Should holes or burrows be located on-site, contact a zoological specialist to investigate and possibly remove any species located in them. • Where possible, barriers around excavation sites must be erected to prevent fauna from falling into excavations. • The area surrounding the bulk sampling operation must be demarcated and fenced-off to restrict animals from moving into the area, and to reduce fauna mortalities.
Vegetation and Fauna Management		<ul style="list-style-type: none"> • Keep the clearing of natural vegetation in wetland areas to a minimum and attempt to ensure that clearing occurs in parallel with the mining progress where practically possible. • Limit mining equipment operating in wetland/riparian areas to that needed to clear • Temporary noise pollution due to mining works should be minimized in sensitive areas by ensuring the proper maintenance of equipment and vehicles and tuning of engines and mufflers as well as employing low noise equipment where possible. • No wild animal may under any circumstance be hunted, snared, captured, injured, killed, harmed in any way or removed from the site. This includes animals perceived to be vermin. • Any fauna that are found within the mining corridor should be moved to the closest point of natural or semi-natural vegetation outside the mining corridor. A specialist may need to be used for dangerous/venomous species such as snakes.
Geology and soils		
Land use change which will affect the soil and land use capability both during construction phase and post-mining operations.	Negative	<ul style="list-style-type: none"> • Should the No-Go alternative not be considered, mining activities must be located on low-medium agricultural potential land to minimise impacts. • Compensate landowners. • Rehabilitate areas disturbed by mining to return land to arable land where feasible. If not, other land uses (decommissioning phase) deemed socially,

Loss of agricultural soils and land expected.		economically or environmentally applicable must be considered.
Site clearance and levelling during the construction phase will cause some additional exposed areas and could trigger erosion and siltation, especially during rainy periods	Negative	<ul style="list-style-type: none"> • Prevent soil loss through erosion. • Develop appropriate storm water management system to control surface run off over exposed areas. • Preserve soil fertility for later use. • Ensure all vehicles stay within the designated areas (for example, away from watercourses). • Plan to construct the majority of development during the dry winter months. • Have in place temporary erosion and sedimentation trapping control measures during the construction phase
Storage of topsoil	Negative	<ul style="list-style-type: none"> • Remove and stockpile topsoil from roads, building platforms, stockpile and dam areas prior to construction. • Preserve topsoil and store in an appropriate manner to maintain viability and seed bank for future rehabilitation. • Store away from watercourses to prevent sedimentation and erosion. • Protect from alien plant establishment.
Soils and Sediment Management	Negative	<ul style="list-style-type: none"> • Where possible, mining activities in river and wetlands should proceed during the dry winter months (low or zero flow periods) in order to limit the potential for erosion linked to high runoff rates. • All soil stockpiles should be placed in an up-slope direction from the trench so that that any surface wash is directed into the trench and not further downslope. • Any erosion points created during mining activity construction should be filled and stabilized immediately. Stockpiles must be protected from erosion, stored on flat areas where possible, and be surrounded by appropriate berms. • No stockpiling of soils or materials should take place within a watercourse, including wetlands and the riparian zone of streams/rivers. • Periodic visual inspections of on-site water quality, identifying the source of any rapid increases in turbidity of surface waters and remedying this where necessary such be performed by a qualified Environmental Officer. Water must be pumped out into a well- vegetated area some distance from any watercourse to facilitate sediment trapping and reduce the chance of sediment entering wetlands/streams. • Excavated and imported material should be stored away from streamlines / areas of concentrated flow to limit the risk of sediment wash to downstream areas. • Any topsoil removed from wetlands must be stockpiled separately from subsoil material and

		<p>replaced once mining is complete to facilitate re-colonization of the site.</p> <ul style="list-style-type: none"> • Stripped topsoil from wetlands must not be buried or in any other way be rendered unsuitable for further use by mixing with spoil or subjected to compaction by machinery. • Exposed soils should be rehabilitated as soon as practically possible to limit the risk of erosion. The channel embankments must be rehabilitated to ensure both longitudinal and cross-sectional stability against summer floods.
Pollution		
Waste Management/Pollution Control	Negative	<ul style="list-style-type: none"> • Storage of potentially hazardous materials (e.g. fuel, oil, etc.) should be outside of the 100-year flood line, or within a horizontal distance of 50m from a watercourse or wetland. This applies to storage of these materials and does not apply to normal operation or use of equipment in these areas. • Operation and storage of machinery and mining-related equipment must be done outside of wetlands and rivers wherever possible, unless authorised by a WUL. • Spillages of fuels, oils and other potentially harmful chemicals should be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil from the site must be removed and rehabilitated timeously and appropriately. • Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any watercourse (including river and wetlands). • Provide adequate waste disposal facilities (bins) and encourage workers not to litter or dispose of solid waste in the natural environment but to use available facilities for waste disposal. • Ensure that any rubbish is regularly cleared from the site, especially from wetlands/streams. • Routinely check machinery/plant for oil or fuel leaks each day before mining activities begin. No stockpiling should take place within a watercourse, including wetlands and the riparian area of the river. • Sanitation – portable toilets (1 toilet per 30 users is the norm) to be provided where mining is occurring. Workers need to be encouraged to use these facilities and not the natural environment. Toilets should be located outside of the 1:100 yr. flood line of a watercourse or 50m or from any natural water bodies including streams and wetlands. Waste from chemical toilets should be disposed of regularly and in a responsible manner by a registered waste contractor.
Social		

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Recruitment strategies for the mine	Positive	N/A
Advantage to previously disadvantage individuals	Positive	N/A
Community development programmes	Positive	N/A
Upgrades and expansion of services will benefit local area	Positive	N/A
Increased income generation for local community	Positive	N/A
Increased job opportunities for local mining communities	Positive	N/A
Economic injection to the area and Mpumalanga	Positive	N/A
Noise		
Noise emanating from heavy machinery and transport vehicles	Negative	<ul style="list-style-type: none"> Noise barriers in the form of berms should be constructed as close to the noise sources as possible. Mining-related machines and vehicles must be serviced regularly to ensure noise suppression mechanisms are effective, e.g. installing exhaust mufflers where possible. Noisy machinery must be used predominately during daylight hours. Grievance mechanism to record complaints should be kept on site and investigated. Regular monitoring of noise to take place.
Noise from blasting	Negative	<ul style="list-style-type: none"> Blasting operations are generally intermittent and should be limited to the day when ambient noise levels are highest.
Infrastructure (e.g. contractor's yard, weighbridge, workshop and stores)	Negative	<ul style="list-style-type: none"> To reduce the visual impact of permanent structures, colours for roofing, walls, etc. should have a matt finish to reduce reflection. Infrastructure must be located away from sensitive and elevated areas.
Location of stockpiles, pollution control dams and discard dumps	Negative	<ul style="list-style-type: none"> Place as far away as possible from roads and settlements. Topsoil stockpiles must be vegetated as soon as possible, to reduce erosion and decrease visual disturbance. Keep stockpiles as low as possible to reduce visual impact. Plant fast-growing indigenous trees around the dams to enhance visual.

Lighting pollution	Negative	<ul style="list-style-type: none"> • Avoid up-lighting of structures but rather direct the light downwards and focused on the object to be illuminated. • Use non-UV lights where possible, as light emitted at one wavelength has a low level of attraction to insects. This will reduce the likelihood of attracting insects and their predators specifically in the site camps. • “ Noise level discussions have commenced between the Applicant and neighbouring mine which have already conducted the studies and continuously monitor the noise level on the area at about 3km radius”.
Heritage and cultural		
Heritage resources disturbed/destroyed	Negative	<p>From an archaeological and heritage point of view, the proposed Mining Right application site may be approved subject to mitigation measures implemented on the identified burial site.</p> <ul style="list-style-type: none"> ▪ The identified burial site must be preserved in situ and properly mapped before any mining activity commences. ▪ The planners for the proposed mine must provide for a 100m buffer zone for the recorded burial site. ▪ No heritage mitigation work is allowed without the consent of descendant families. ▪ The mining right application site may be approved to proceed as planned under observation that project work does not extend beyond the surveyed site. ▪ Should chance archaeological materials or human burial remains be exposed during subsurface mining work on any section of the proposed development laydown sites, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in mining scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the NHRA regulations. ▪ Subject to the recommendations herein made and the implementation of the mitigation measures and adoption
Paleontological sites disturbed/destroyed	Negative	
Cultural places disturbed/destroyed	Negative	

		<p>of the project EMPr, there are no other significant cultural heritage resources barriers to the</p> <p>proposed mining development. The Heritage authority may approve the Mining Right application site to proceed as planned with special commendations to implement the recommendations here in made.</p> <ul style="list-style-type: none">▪ If during development, operational or closure phases of this project, any person employed by the applicant, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the site manager.▪ The site Manager must then make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area before informing an archaeological practitioner.▪ It is the responsibility of the applicant to protect the site(s) from publicity (i.e., media) until a mutual agreement is reached.▪ Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by MPHRA.▪ The applicant is reminded that unavailability of archaeological materials (e.g., pottery, stone tools, remnants of stonewalling, graves, etc.) and fossils does not mean they do not occur, archaeological material might be hidden underground, and as such the client is reminded to take precautions during mining.▪ Overall, impacts to heritage resources are not considered to be significant for the project receiving environment. It is thus concluded that the project may be cleared to proceed as planned subject to the
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		<p>Heritage Authority ensuring that detailed heritage monitoring procedures are included in the project EMPr for the mining phase, include chance archaeological finds mitigation procedure in the project EMPr (See Appendix 1 on heritage report).</p> <ul style="list-style-type: none"> ▪ The findings of this report, with approval of the MPHRA, may be classified as accessible to any interested and affected parties within the limits of the laws.
Traffic		
Increased traffic volumes on the existing road networks	Negative	<ul style="list-style-type: none"> • Implement speed limits and safety controls on-site. • Construct access roads within safety limits from other crossings. • Possible road upgrades where required. • Create safe environment for pedestrians, animals and motorists. • Create fauna underpasses where necessary (e.g. bridge crossings).
Blasting and vibration		
Blasting and vibration	Negative	<ul style="list-style-type: none"> • Pre-blast survey of all structures in the mining area. • Ground vibration survey in the form of signature trace study to be done for determination of ground vibration constants that can be used for accurate ground vibration prediction. • Investigate the possibility of alternative methods to blasting.
Safety		
Blasting	Negative	<ul style="list-style-type: none"> • Clearly demarcated areas and erect signs to indicate blasting zones.
Roads and vehicles	Negative	<ul style="list-style-type: none"> • Speed limits must be in place on site and before access roads on a provincial or national road. • Ensure drivers are trained in road safety.
Surrounding neighbours	Negative	<ul style="list-style-type: none"> • Personnel are not permitted on other properties without permission. • Avoid conflict with surrounding landowners. • Safety specialist will be appointed, and assessments will be conducted. Recommendations will be implemented.
Air quality		
Dust pollution		<ul style="list-style-type: none"> • The removal of vegetation will be minimised during stripping to reduce the effects of dust pollution as a result of exposed soil. • Water or dust control agents must be used in working areas, and roads will be sprayed for dust suppression on a regular basis in designated susceptible areas during heavy usage.

	Negative	<ul style="list-style-type: none"> • Dust monitoring must be undertaken in accordance to the monitoring programme. It is recommended that topsoil stockpiles be vegetated to sustain biological components and prevent dust emissions. • Reduction of dust fallout levels and particulate matter. • All coal haul trucks must be covered by a tarpaulin. • The overland conveyor belt should be covered and coal on the conveyor should be sprayed to reduce emissions. • " Air quality discussions have commenced between the Applicant and neighbouring mines which have already conducted the studies and continuously monitor the Air on the area at about 3km radius" ..
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20.2 Mitigation measures

The impacts that are generated by development can be minimised if measures are implemented to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts to minimise impacts and achieve sustainable development. This will be assessed and discussed in more detail during the EIA phase., however some recommendations as part of mitigations are listed in Table 28.

20.3 Motivating the preferred site

As a result of the scoping phase impact assessment and the sensitivity mapping exercise, a preferred layout enclosing stormwater design from WULA engineers alternative will be identified and assessed in the EIA phase.

21 PLAN OF STUDY

The scoping phase identified potential environmental impacts and discussed alternatives considered. The following section outlines the proposed plan of study which will be conducted for the various environmental aspects during the EIA phase. It is important to note that the plan of study will be guided by comment obtained from I&APs and other stakeholders during the PPP of Scoping Phase.

21.1 Impact assessment phase objectives

The impact assessment phase will have the following objectives:

- Identify and assess the environmental (biophysical and social) impacts of the construction, operation, decommissioning and post closure impacts of the proposed development. The cumulative impacts of the proposed development will also be identified and evaluated.
- Determine and assess alternative activities and locations in parallel with the proposed activity.
- Identify and evaluate potential management and mitigation measures that will reduce the negative impacts of the proposed development and enhance the positive impacts.
- Compile monitoring, management, mitigation, and training needs in the EMPr.
- Provide the decision-making authorities with sufficient and accurate information to make a sound decision on the proposed development.

21.2 Impact assessment phase tasks

The impact assessment phase has four key elements, namely:

- **Specialist studies:** Specialist studies identified in the scoping phase and any additional studies that may be required by the authorities, will be conducted during the initial phase of the EIA. The relevant specialists will be appointed to conduct the various assessments. They will gather baseline information relevant to the study and assess impacts associated with the development. Specialists also make recommendations to mitigate negative impacts and optimise benefits. The resulting information is synthesised into the draft EIA report that will be made available to I&APs for review.
- **EIAr:** The main purpose of this report is to gather environmental information and evaluate the overall impacts associated with the project, consider mitigation measures and alternative options, and make recommendations in choosing the best development alternative. The EIAr identifies mitigation measure/management recommendations to minimise negative impacts and enhance benefits.

The draft EIAr and associated reports will be made available for public and authority review and comment for a period of thirty days as it was for scoping phase. The availability of the draft EIAr will be communicated to all registered I&APs and will be easily accessible. After comments have been received, the final EIAr will be compiled and submitted to the competent authority (DMRE) for review. This report will assist the DMRE in making an informed decision.

- **EMPr:** The EMPr provides guidelines to the proponent and the technical team on how to best implement the mitigation measure/management recommendations outlined in the EIAr during the

construction, operational and decommissioning/rehabilitation phase. The EMP is a legally binding document, and once approved cannot be amended without permission from the DMRE.

- **PPP:** The PPP initiated during the scoping phase, is continued. This includes continuous engagement with I&APs and stakeholders, which includes meetings, receiving comments, issues and concerns raised by I&APs and the authorities during the review period, and also provides relevant responses to these comments.

21.3 Alternatives to be considered, including no-go option

According to the MPRDA and NEMA regulations, feasible alternatives need to be considered and assessed during the scoping and impact assessment phase of the project. During the scoping phase, based on professional judgement of the EAP, the engineering designs, specialist inputs, and I&AP comments, must be considered. The alternatives identified must achieve the triple bottom-line of sustainability, i.e., they must meet the social, economic, and ecological needs of the public. The alternatives must aim to address the key significant impacts of the proposed project by maximising benefits and avoiding or minimising the negative impacts. The primary objective must be to avoid all negative impacts, rather than minimise them. The “feasibility” and “reasonability” of and the need for alternatives must be determined by considering:

- The general purpose and requirements of the activity
- Need and desirability
- Opportunity costs
- The need to avoid negative impact altogether
- The need to minimise unavoidable negative impacts
- The need to maximise benefits
- The need for equitable distributional consequence

A comparative assessment (of all alternatives identified) will be conducted in accordance with the aforementioned criteria, as part of the impact assessment.

21.4 Aspects to be assessed as part of the EIA

The following specialist studies will be assessed during the EIA phase:

- Soil, Land Capability and Land Use
- Surface Water
- Geohydrology

- Cultural and Heritage Resources
 - Paleontological Impacts
 - Social Impacts
 - Waste Classification
 - Closure (rehabilitation)
 - Terrestrial ecology
 - Traffic Impacts
 - Blasting and Vibration
- In addition, the following will continue during the EIA phase:
- Public participation and consultation
 - Environmental Management Programme
 - Site layout designs and Mining Works Programme

21.5 Proposed method of assessing environmental aspects and alternatives

Refer to section 20 for more details.

21.6 Stages at which the competent authority will be consulted

Competent authorities stated being consulted during the initial notification period, scoping phase and during the EIA phase. A scoping phase meeting was not held with the DMRE and DWS, however, draft Scoping reports will be submitted to their offices. The purpose of the authority meeting is to explain the project in detail to authorities and clarify the process anticipated. Stakeholders include the district and local municipalities, ward councillors, and others. Thus, a meeting will be held with Mkhondo Local municipality. Comments will be expected after reviewing the draft scoping report.

The consultation process to be followed as part of the review and decision-making stages include:

- Scoping review and decision-making stage
- Environmental impact assessment review and decision-making stage
- The environmental authorisation decision making and appeal process stage

21.7 Public participation process for the impact assessment

Competent authorities, stakeholders and I&APs will be consulted during the initial notification period, scoping phase, and EIA phase.

21.7.1 Steps to be taken to notify interested and affected parties

A detailed description of the PPP conducted for the scoping phase.

I&APs will be notified of the proposed application via newspaper advertisement, emails, site and public notices. The PPP will be undertaken in accordance with the NEMA process and the 2014 Regulations (as amended). A minimum of thirty days is provided to the public to register as I&APs and provide initial comments. Thirty days is provided to comment on the draft scoping report. The information submitted by I&APs will be utilised in the final Scoping and will be utilised more in detail during the Impact Assessment and compilation of the EIAr. Should the final scoping report be accepted by the competent authority, an EIA will be undertaken. During the EIA phase I&APs, stakeholders and the competent authorities will be notified of the process to be undertaken (as described in Section 8 and outlined in the NEMA regulations (2014, as amended). They will also be provided an opportunity to comment on the draft EIAr (which will include specialist studies) and attend public meetings as they have also attended for this scoping phase.

21.7.2 Details of the engagement process

The process of identifying and contacting landowners, stakeholders and I&APs will commence when I&APs are notified via site and public notices, newspaper adverts, emails, and distribution of the Draft Scoping Report. Landowner was identified through Title Deed search for the property was done. Proof of notifications and documentation pertaining to the PPP during scoping phase have been recorded and will be recorded also during environmental impact assessment phase and will only be shared with the competent authority to the POPIA.

During the EIA phase, I&APs will be afforded the following opportunities in order to participate in the project:

- I&AP'S will be notified of the following phase and acceptance of the Scoping Report.
- I&APs will be asked to provide their comments on the project, notified when the draft EIAr is available for review and notified of a public meeting that will take place.
- The EIAr and EMPr will be available for comment for a period of thirty days at the same public places in the project area that the scoping report will be made available. Report copies will be sent to stakeholders who request it.

All comments and issues raised during the public comment period will be incorporated into the final EIAr and EMPr to be submitted to the competent authorities for review and the final decision-making stage.

I&APs will be notified of the decision of the competent authority within fourteen days of receiving written letters and will specify any further process to be undertaken, like the appeal process.

❖ **Grievance Mechanism**

In accordance with international good practice the mine shall establish a specific mechanism for dealing with grievances. A grievance is a complaint or concern raised by an individual or organisation that judges that they have been adversely affected by the project during any stage of its development. Grievances may take the form of specific complaints for actual damages or injury, general concerns about project activities, incidents and impacts, or perceived impacts. The IFC standards require Grievance Mechanisms to provide a structured way of receiving and resolving grievances. Complaints should be addressed promptly using an understandable and transparent process that is culturally appropriate and readily acceptable to all segments of affected communities and is at no cost and without retribution. The mechanism should be appropriate to the scale of impacts and risks presented by a project and beneficial for both the company and stakeholders. The mechanism must not impede access to other judicial or administrative remedies.

The proposed grievance mechanism shall be based on the following principles:

- Transparency and fairness.
- Accessibility and cultural appropriateness.
- Openness and communication regularity.
- Written records.
- Dialogue and site visits.
- Timely resolution

Based on the principles described above, the grievance mechanism process involves four stages:

- Receiving and recording the grievance.
- Acknowledgement and registration.
- Site inspection and investigation.
- Response.

❖ **Internal Grievance Procedure**

The mine shall develop a detailed internal grievance mechanism designed to receive and facilitate resolution of workplace concerns and grievances raised by employees (and their organizations, where

they exist). Employees must be informed of the grievance mechanism at the time of recruitment, and it must be made easily accessible to them. The mechanism should involve an appropriate level of management and address concerns promptly, using an understandable and transparent process that provides timely feedback to those concerned, without any retribution. The mechanism should also allow for anonymous complaints to be raised and addressed. The mechanism should not impede access to other judicial or administrative remedies that might be available under the law or through existing arbitration procedures, or substitute for grievance mechanisms provided through collective agreements.

Document Control

A formal document control system should be established during the development of the ESMS. The document control system must provide for the following requirements:

- Documents are approved for adequacy prior to use.
- Review and update documents as necessary and re-approve documents.
- Ensure that changes and the current version status of documents are identified.
- Ensure that relevant versions of applicable documents are available at points of use.
- Ensure that documents remain legible and readily identifiable.
- Ensure that documents of external origin necessary for the ESMS are identified and their distribution controlled.
- Prevent unintended use of obsolete documents and apply suitable identification to them if they are retained for any purpose.

21.7.3 Information which was provided during Scoping and will be provided to interested and affected parties during EIA phase.

The following information was and/or will be made available to I&APs:

- BID: The aim of the BID is to inform all I&APs of the proposed project and process followed during the scoping and which will be followed during EIA phase, which were/or are; the undertaking of the PPP and EIA for the compilation of the EIA, Environmental Management Programme and Waste Management Licence for the proposed mining activities.
- The site plan, scale and extent of activities to be authorised.

- The draft scoping report, which includes:
 - The plan of study:
 - List of activities to be authorized according to NEMA, NEM:WA and NWA
 - Indication and discussion of the impacts of activities to be authorised
 - The proposed specialist studies that will be undertaken as part of the project
 - The proposed mining methods to be used
 - Discussion of alternatives, including location, process and methodology and no-go
 - Details of the MPRDA, NEMA, NEM:WA and NWA Regulations (including a list of other applicable regulations) that must be adhered to
 - Draft EIR and EMPr (including results from the specialist assessments) will be made available for public review and comment for a period of thirty days.
 - Information will be made available as requested by the I&APs throughout the process.

21.8 Tasks that will be undertaken during the EIA

The following tasks will be undertaken as part of the EIA phase of the project:

- Finalisation of the legislative context in which the activities will take place and documentation of the proposed activity and how it complies with this legislation.
- Finalisation of the activities triggered under NEMA and NEM:WA based on the specialist assessments and final design layout and specifications.
- Identification of the location of the development footprint in the preferred site based on impact and risk assessment process. This includes cumulative impacts and ranking of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment.
- Identification of the most ideal location for the activities in the preferred site based on the lowest level of environmental sensitivity identified during the assessment, especially with the proposed sitting of the mining infrastructure.
- Determination of the nature, significance, consequence, extent, duration and probability of the impacts occurring to identify preferred alternatives and the degree to which these impacts can be reversed, may cause irreplaceable loss of resources, can be avoided, managed or mitigated.
- Identification of suitable measures to avoid, manage or mitigate identified impacts
- Detailed specialist studies
- Continued PPP

- Compilation of the draft EIAr and EMPr and, once the consultation, review and commenting period has finished, the finalisation of the EIAr and EMPr, which will be submitted to the CA (Competent Authority) for review and final decision making.

❖ **SUMMARY OF NEXT STEPS IN THE EIA PROCESS.**

The next step will be to finalise the specialist studies that will inform the impact assessment. During the impact assessment phase, the issues raised by stakeholders and the potential impacts of the proposed project on the environmental and socio-economic status of the area will be examined in detail. Stakeholder issues will therefore assist to drive the EIA process. When complete, the findings of the specialist studies will be integrated into a single report, the Draft EIA Report and EMPr. The report will then be made available for stakeholder comment, after which it will be finalised and submitted to the decision-making Authorities for a final decision. It must also be noted that the approval of scoping report also comes with conditions or guidelines on how an EA[P can approach EIA process.

21.9 Measures to avoid, reverse, mitigate, or manage identified impacts and determine the extent of the residual risks

Please refer to Table 21: Anticipated impacts.

21.10 Financial Provision

Financial provision will be determined during the full EIA process.

22 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

Compliance with the provision of Section 24(4)(a) and (b) read with Section 24 (3) (a) and (7) of the NEMA, the EIA report must include the following.

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

This depends on the results of the Social and Labour Plan. Full details will be made available during the EIA phase after the specialist studies and consultation with the community, stakeholders and other I&APs have been concluded. The proposed Tornowize Coal Mine will provide employment opportunities, skills development, social development programmes, community upliftment and economic injection to the local area. Furthermore, impacts including traffic, service delivery, land use changes and security and safety will be assessed and discussed during the EIA phase.

22.2 Impact on any national estate referred to in Section 3(2) of the National Heritage Resources Act

A specialist will be appointed by Singo Consulting (Pty) Ltd. The appointed specialist will conduct the first assessment during the scoping phase and the second phase of assessment during the EIA phase whereby full result of different phases will be made available.

22.3 Other matters required in terms of Section 24(4) (A) and (B) of the Act

Section 24(4)(b)(i) of the NEMA (as amended), stipulates that an investigation must be undertaken to determine the potential consequences or impacts of the alternatives on the environment and assess the significance of these consequences or impacts, including the option of not implementing the activity. Alternatives have been discussed in Section 7 of this report and will be addressed in detail during the EIA phase once all specialist assessments and comments from I&APs, stakeholders and the competent authorities have been received.

23 ASSUMPTIONS, LIMITATIONS AND UNCERTAINTIES

Certain assumptions, limitations, and uncertainties are associated with the scoping phase. This report is based on information that is currently available. The following limitations and assumptions are applicable:

- The client's information about the project served as the basis for this report.
- Only studies on heritage, ecology, soil, and water resources have been completed so far as specialist studies for the scoping phase. Based on desk research and the literature that is currently accessible for the location, descriptions of the natural, economic, and social surroundings are provided. The results of the expert studies will be used to inform the EIA phase's more in-depth information. For this report's inclusion, just a small amount of expert input from the scoping phase was gathered.
- Several sources were used to compile the description of the baseline environment and, when applicable, the updated data. Based on the findings of the expert studies, the completion of the Mining Works Program, and design layout, more specific information will be provided throughout the EIA phase.
- A thorough impact analysis was partially completed as of this writing, but the level of confidence is thought to be too low. Once the I&APs have provided detailed expert input and comments, which will be presented and discussed in more detail during the EIA phase, a full, detailed impact assessment will be completed.

24 UNDERTAKING

The EAP herewith confirms:

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

-END-

25 EAP DECLARATION

I,

declare that:

General declaration:

- I act as the independent EAP in this application.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant.
- I declare that there are no circumstances that may compromise my objectivity in performing such work.
- I have expertise in conducting Environmental Impact Assessments (“EIAs”), including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity.
- I will comply with the Act, Regulations and all other applicable legislation.
- I will take into account, as far as possible, the matters listed in Regulation 8 of the Regulations when preparing the application and any report relating thereto.
- I have no, and will not engage in, conflicting interests in the undertaking of the activity.
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority.
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to I&APs and the public and that participation by I&APs is facilitated in such a manner that all I&APs will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application.

- I will ensure that the comments of all I&APs are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments made by I&APs in respect of a final report may be attached to the report without further amendment to the report.
- I will keep a register of all I&APs that participated in a PPP.
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not.
- All the particulars furnished by me in this form are true and correct.
- I will perform all other obligations as expected from an EAP in terms of the Regulations.
- I realise that a false declaration is an offence in terms of Regulation 71 of the Regulations and is punishable in terms of section 24F of the Act.

Disclosure of vested interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity other than remuneration for work performed in terms of the Regulations.
- I do not have any vested interest in the proposed activity other than remuneration for work performed in terms of the NEMA regulations.

Signature of the EAP

Company

Date

Appendix 1: DMRE Letters



mineral resources & energy

Department
Minerals Resources and Energy
REPUBLIC OF SOUTH AFRICA

Private Bag X7279, Witbank, 1035, Tel: 013 653 0500, Fax 086 605 6894
Saveways Crescent Centre, First Floor, Mandela Drive, Witbank, 1035

Directorate: Mineral Regulation: Mpumalanga Region

Email: Lerato.Santho@dmre.gov.za

Subdirectorate: Mineral Laws **Enquiries:** L C Mariri **File Ref:** MP 30/5/1/2/2/10383MR

REGISTERED MAIL

The Directors
Tornowize (Pty)Ltd
P O Box 1035
River Crescent
Die Heuwel
Gauteng
1047

Fax/ Email: sonwabo@tornowize.co.za

Dear Sir/Madam

APPLICATION FOR MINING RIGHT IN TERMS OF SECTION 22 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002) [HEREIN AFTER REFERRED TO AS THE ACT] AS AMENDED BY SECTION 18 OF THE MINERALS AND PETROLEUM RESOURCES DEVELOPMENT AMENDMENT ACT, 2008 (ACT 49 OF 2008) [HEREINAFTER REFERRED TO AS THE AMENDMENT ACT]: PORTION 9 OF THE FARM BANKFONTEIN 215 IS, SITUATED IN THE MAGISTERIAL DISTRICT OF MIDDELBURG.

1. I refer to the abovementioned matter and confirm that your application for a mining right in terms of section 22(2) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) as amended by section 18 of the Amendment Act 2008 (Act 49 of 2008) has been accepted .
2. In terms of Section 18(4) (a) and(b) as amended, you are required to submit:

TORNOWIZE (PTY)LTD: MINING RIGHT ACCEPTANCE: 10383MR

- 2.1 The required environmental reports and documents as stipulated at your acknowledgement of receipt of an environmental authorisation in this regard.
- 2.2 In light of the minimum requirements as stipulated on Regulation 16(1) and 16(2) of the EIA Regulations, your application for an Environmental Authorisation was incomplete as it was not accompanied by this acceptance letter as per Sub Regulation 16(1)(ix) and considering that it is now completed by this acceptance letter, you are hereby required to submit the documents as stipulated on Regulation 19(1) to 19(8) of the EIA Regulations (only in cases where Basic Assessment Report is applicable) or Regulations 21 (Scoping Report) and Regulation 23 (EIR and EMP) (In case of Scoping Report). All timeframes are effective from the date of this letter
3. To notify and in writing consult with the landowner (s) or lawful occupier(s) and all interested and affected parties (I and AP) and upload the results of such consultation within 180 days from the date of this letter.
4. Should the land be owned by the communities of a Trust on Behalf of the community, a proper and thorough consultation process must be engaged upon and a legitimate Tribal Resolution or consent must be obtained from the Traditional Authority/ Council or Trust and be submitted with the results consultation.
5. In other for your application to comply with the ownership element in your prospecting right in furthering the objects of Section 2(d) read together with Mining Charter, your shareholding must achieved the target which is the minimum of 30% BEE shareholding in terms of the 2018 Charter and must be distributed in the following manner:
 - (i) A minimum of 5% non-transferable carried interest to qualifying employees from the effective date of a mining right.
 - (ii) A minimum of 5% non-transferable carried interest or minimum 5% equity equivalent benefit as defined herein to host communities from the effective date.
 - (iii) A minimum of 20% effective ownership in the form of shares to a BEE which Entrepreneur, 5% of which must preferably.

TORNOWIZE (PTY)LTD: MINING RIGHT ACCEPTANCE: 10383MR

You are therefore urged to consider aligning your shareholding with the 2018 Charter.

6. You are advised to apply for water use licence from the Department of Water and Sanitation.

Do not hesitate to contact us, should you need clarity

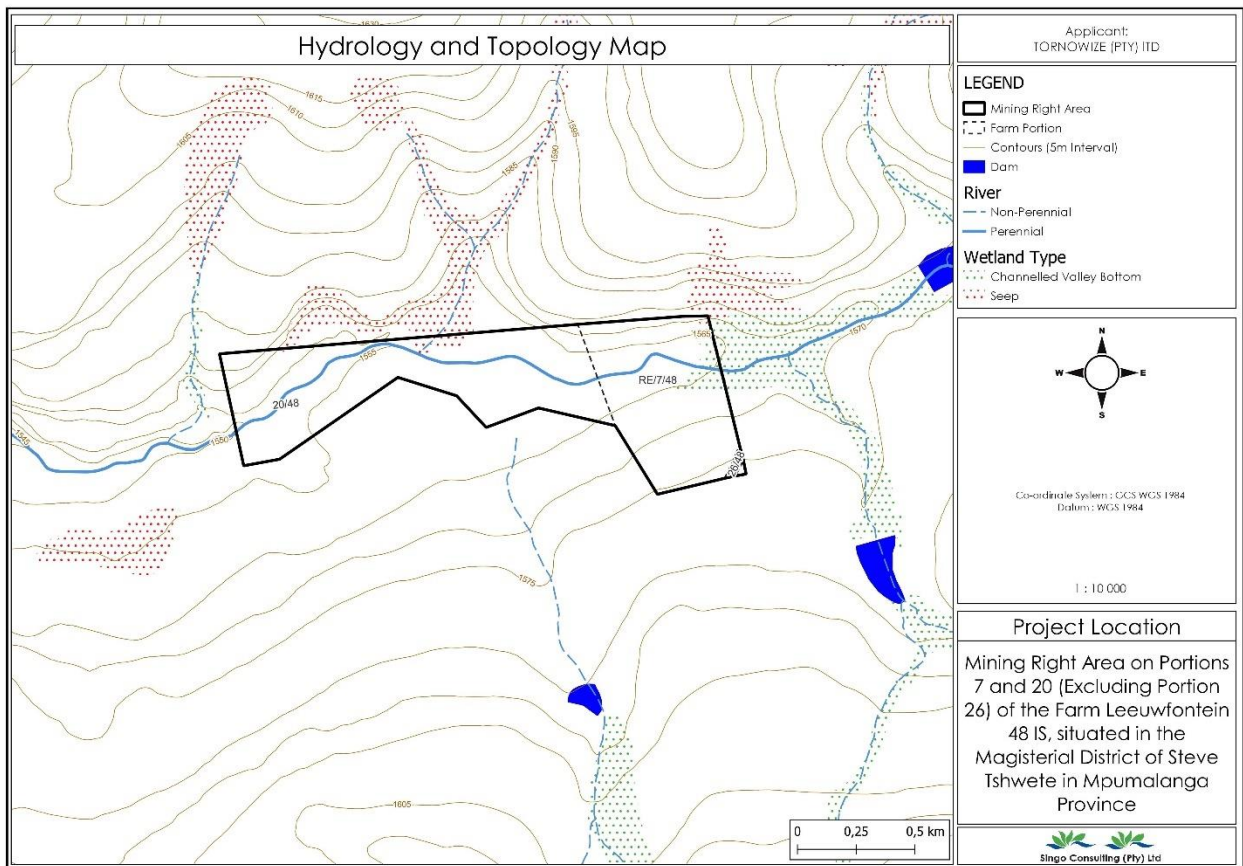
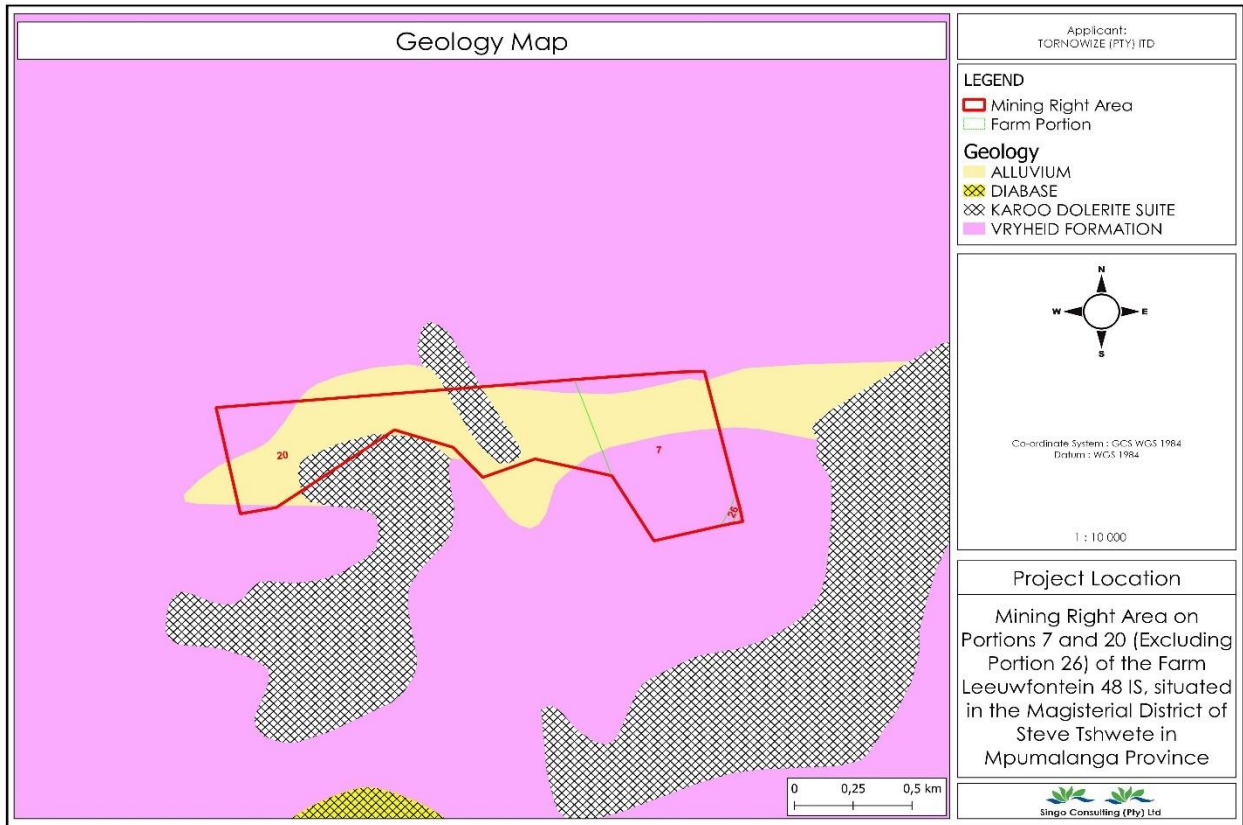
Yours faithfully



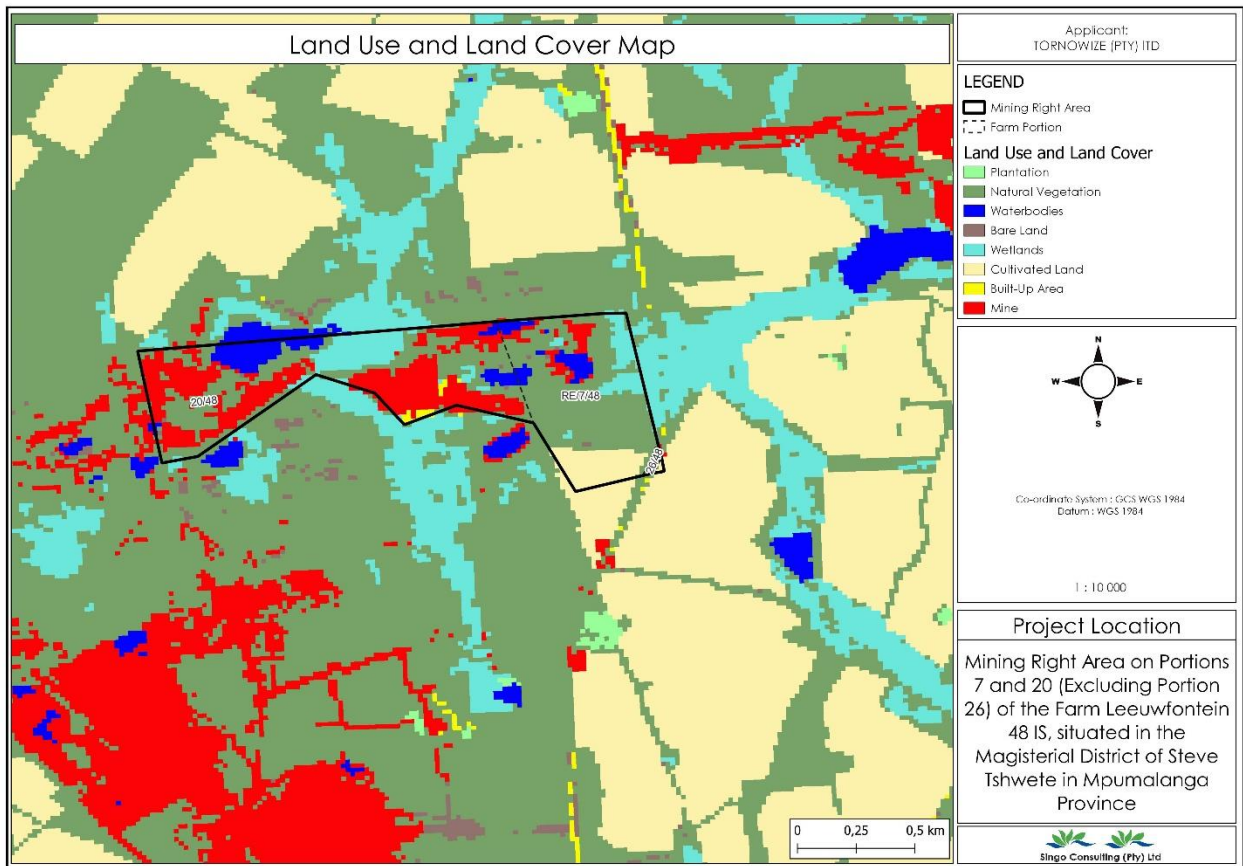
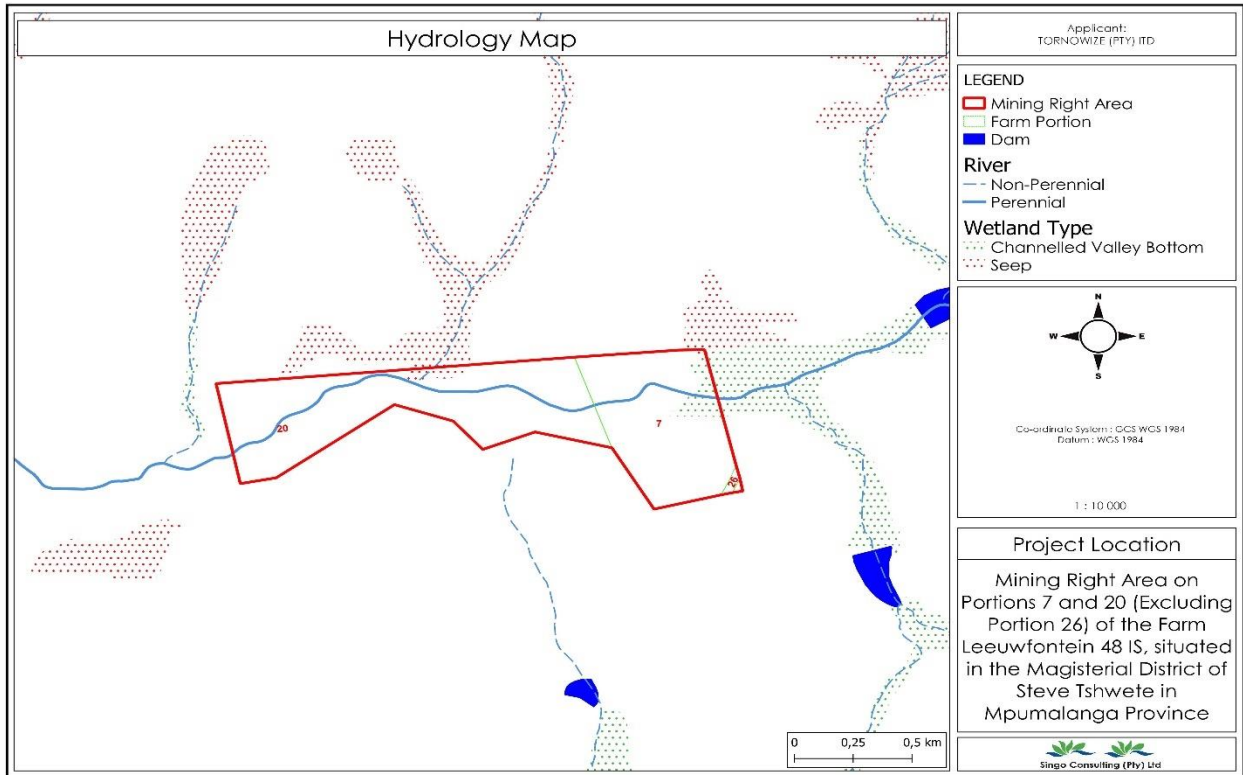
**REGIONAL MANAGER
MPUMALANGA REGION**

DATE: ...09/02/2023

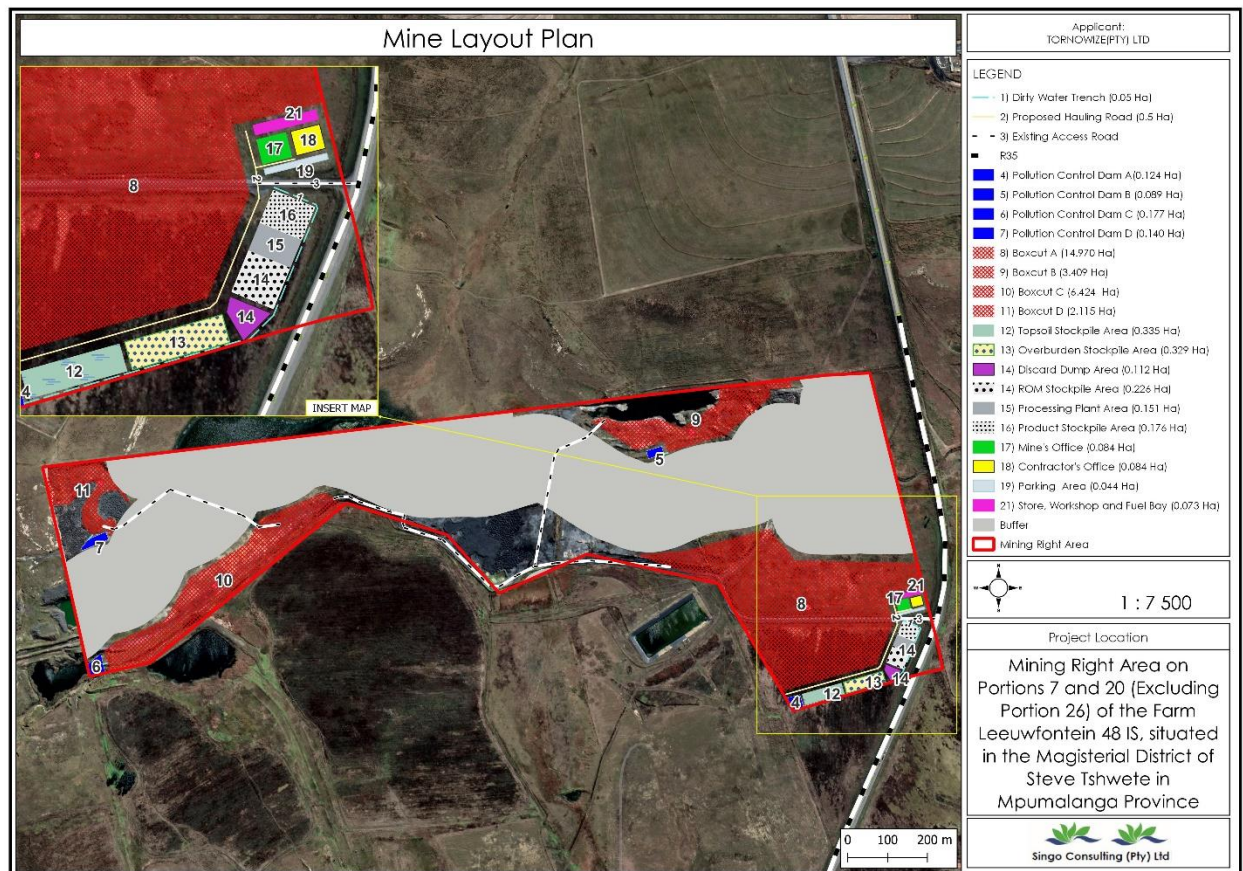
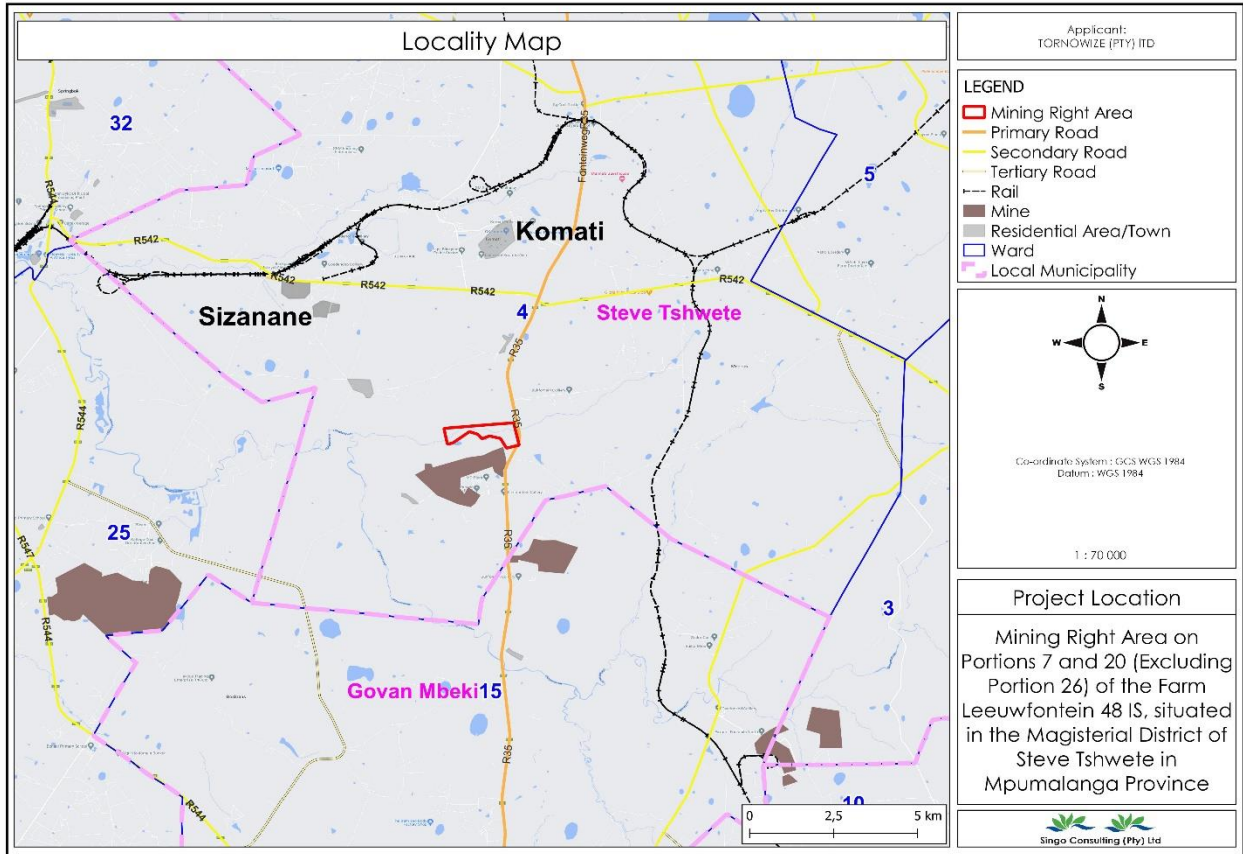
Appendix 2: Project Maps



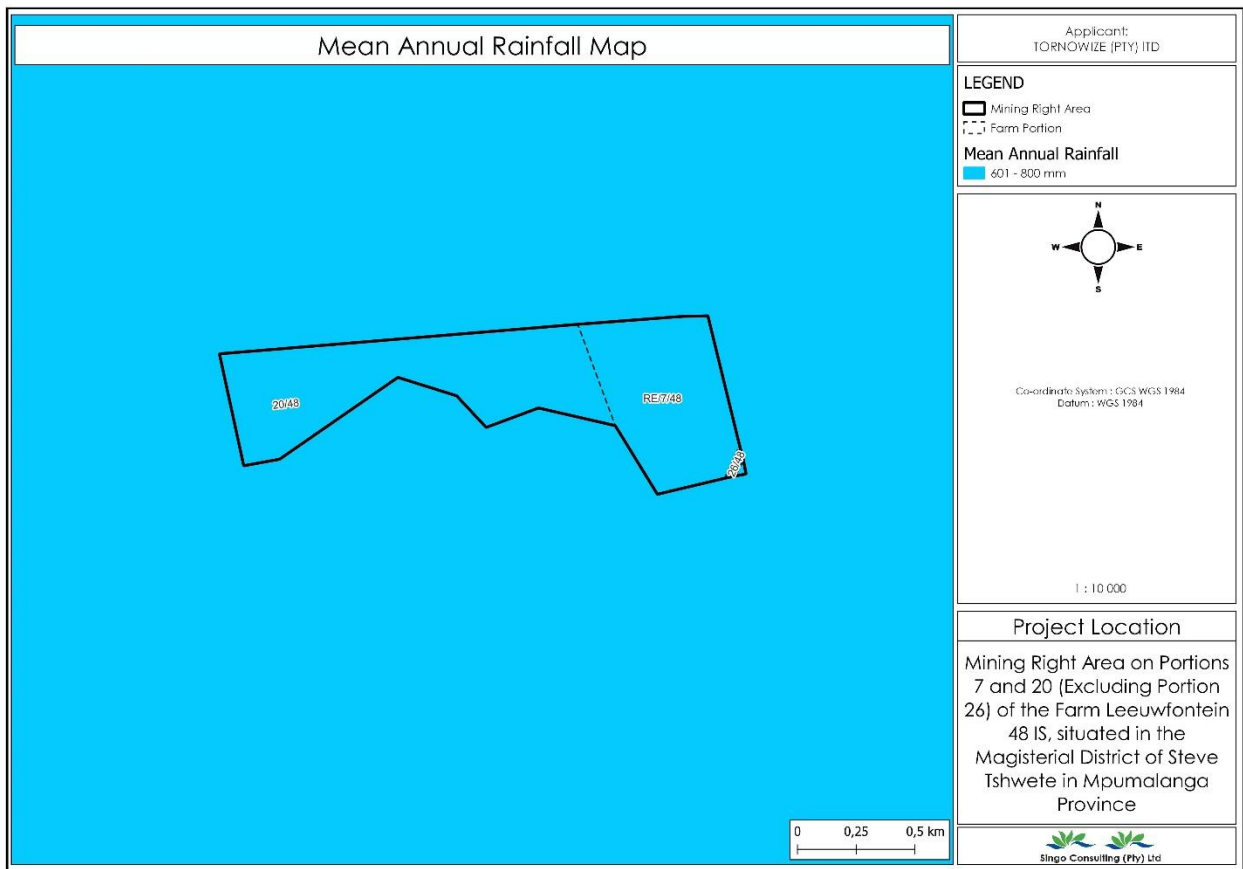
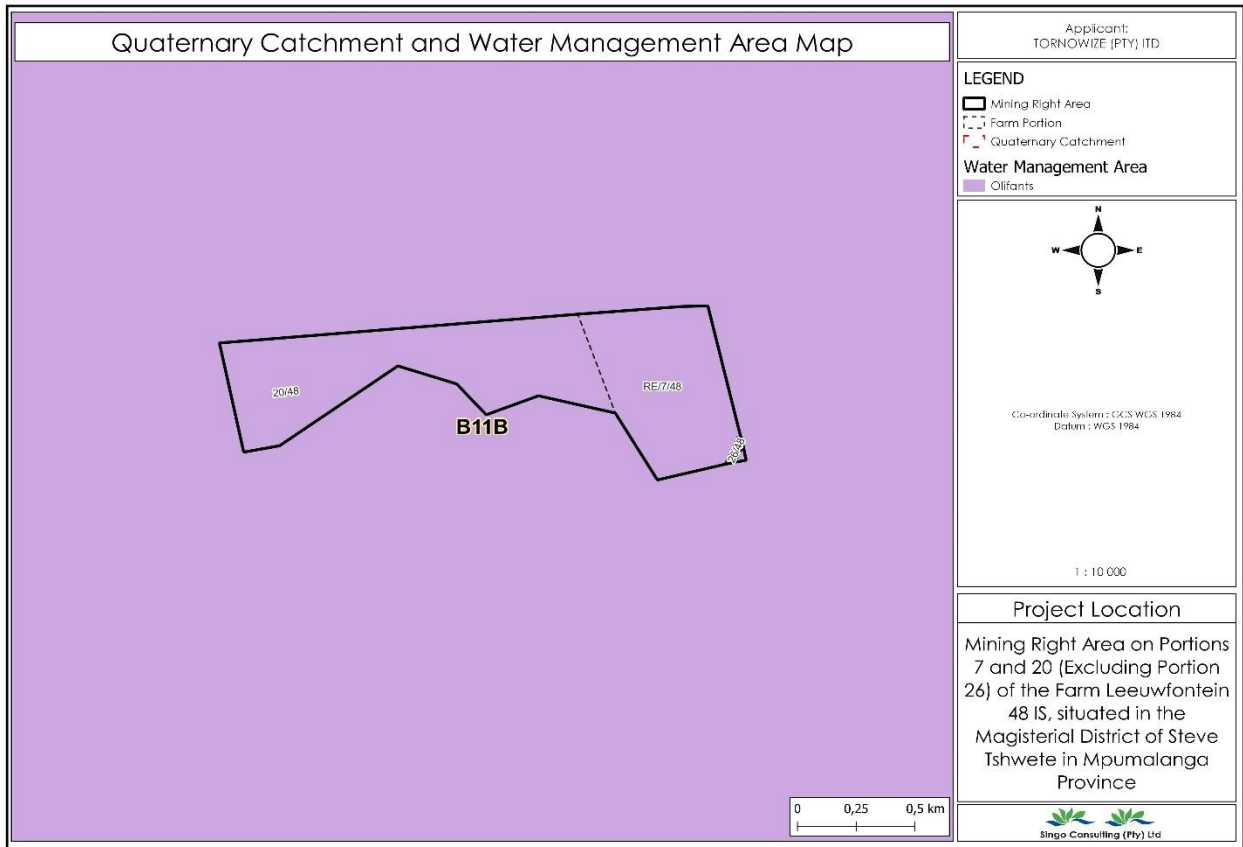
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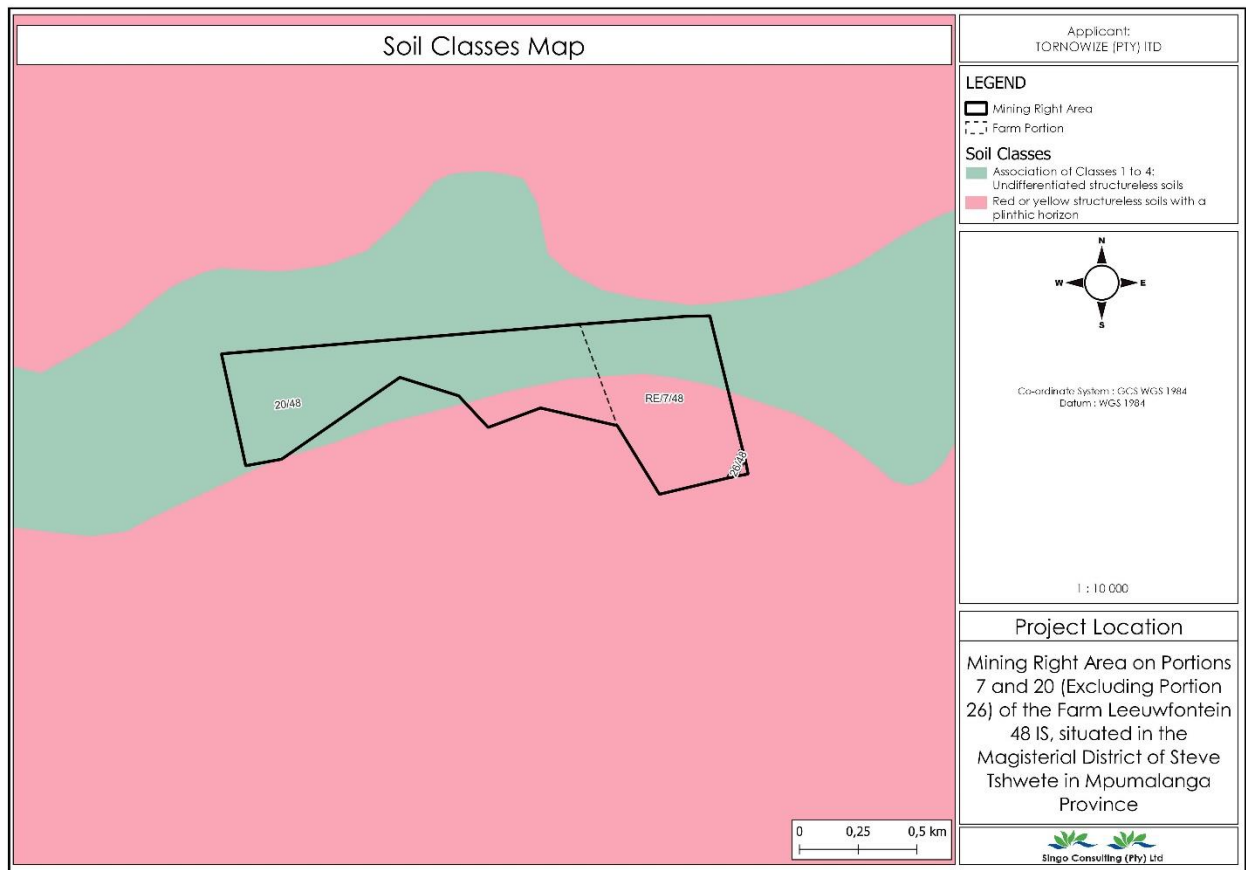
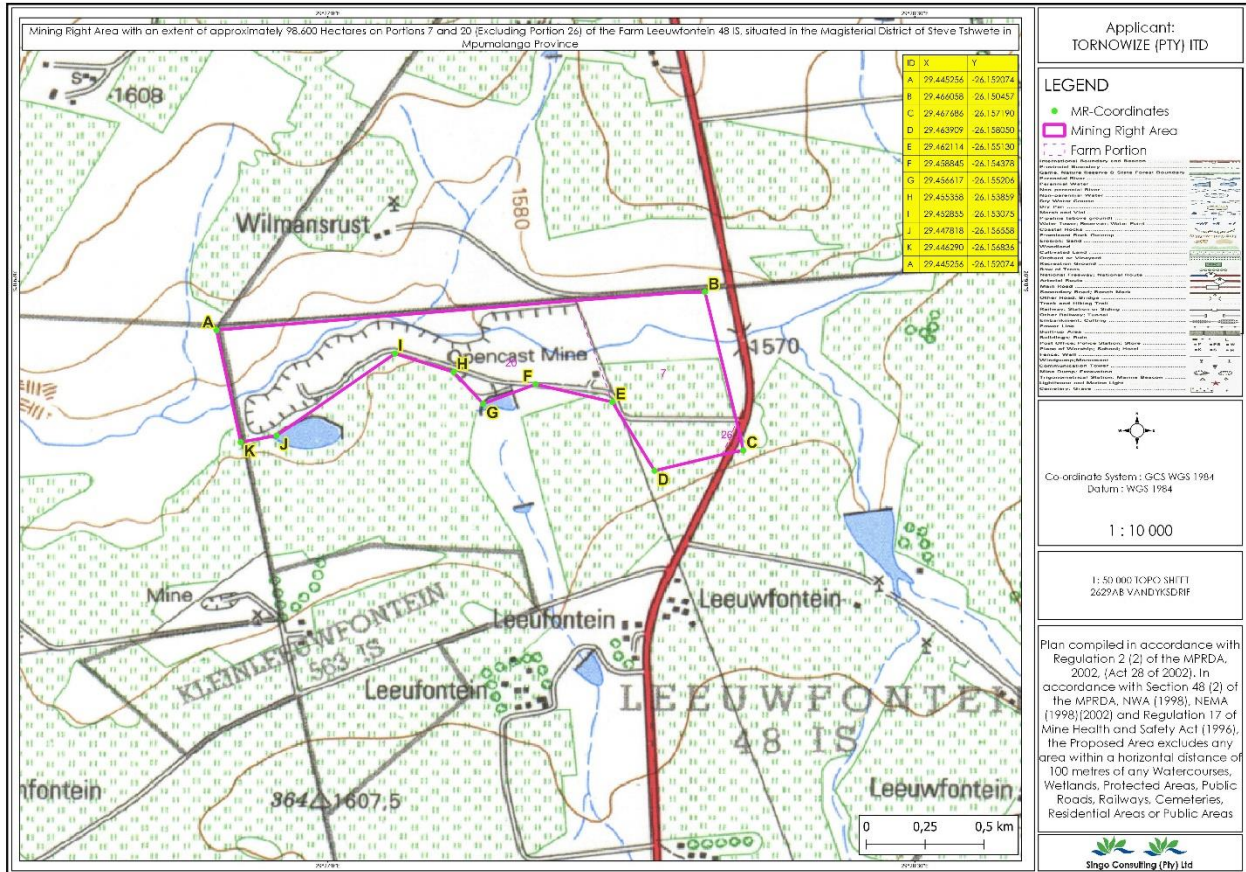
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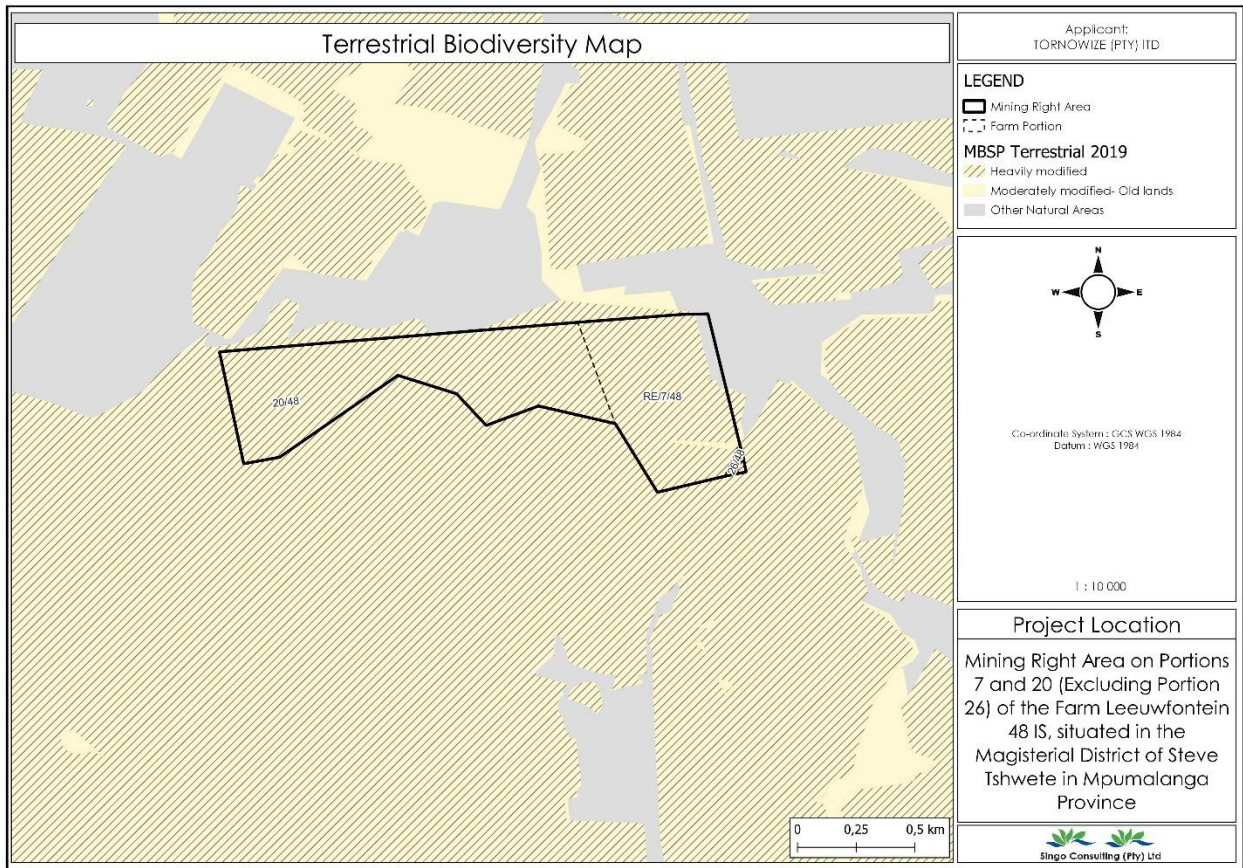
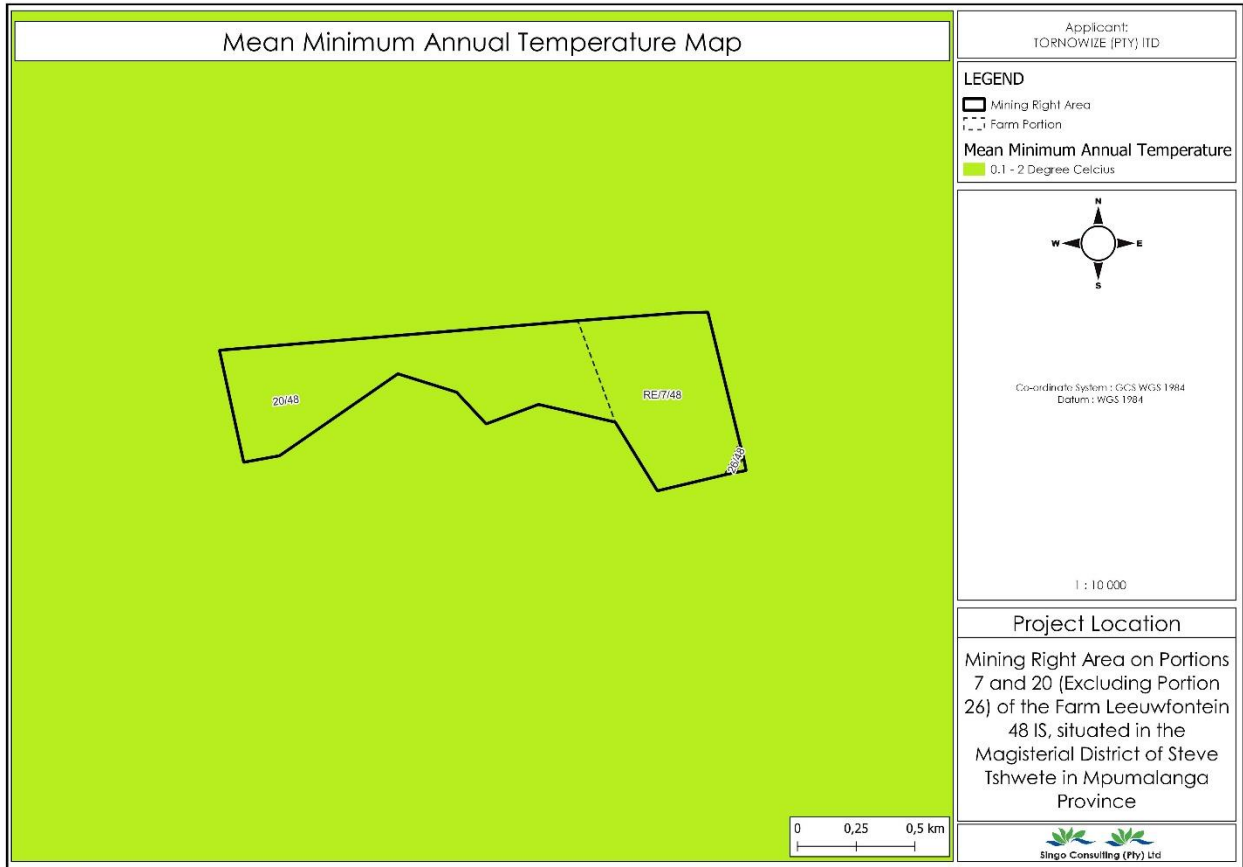


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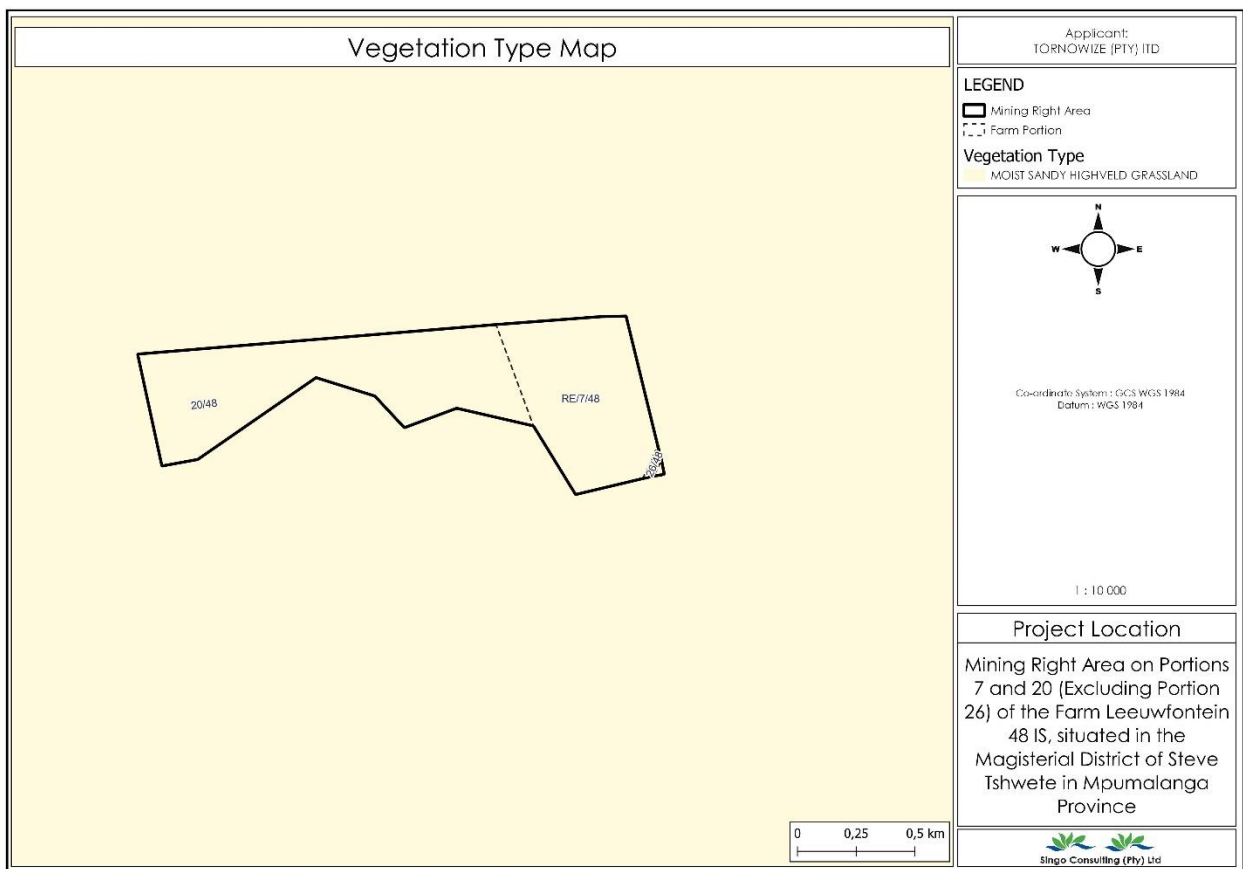
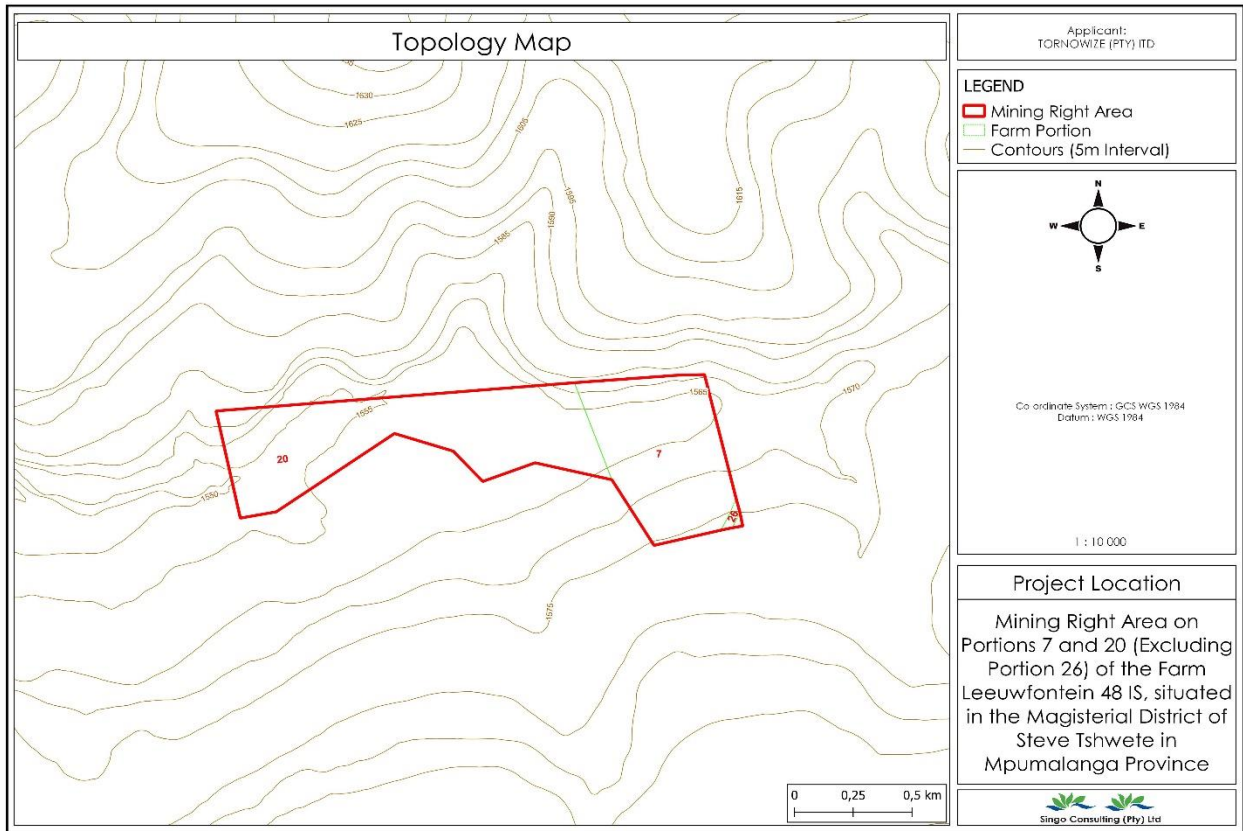


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Appendix 3: Specialist Studies

TO BE COMPLETED AFTER THE REVIEW OF THE DRAFT SR COMMENT PERIOD