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**DRAFT REPORT FOR THE CONSOLIDATION AND AMENDMENT OF THE
VARIOUS EXISTING ENVIRONMENTAL MANAGEMENT PROGRAMME
REPORTS (EMPRS) GRANTED TO THE THARISA MINE, INCORPORATING
NEW ENVIRONMENTAL AND WASTE ACTIVITIES PROPOSED TO BE
CONDUCTED FOR FUTURE PROOFING THE MINING OPERATION AND
INCORPORATION OF ADDITIONAL PROPERTIES INTO THE APPROVED
THARISA MINING RIGHT**

**DMPR REFERENCE NUMBERS: NW 30/5/1/2/2/358 MR
MANYABE CONSULTANCY (PTY) LTD PROJECT CODE: 202436**

tharisa

Prepared for:

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**Contact Person: Ms. Mpho Manyabe
Date: August 2026**

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MANAGING DIRECTOR: MPHO MANYABE
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02	14 August 2026	Mpho Manyabe	Draft Report for review by I&APs

APPROVAL FOR RELEASE

Name	Title	Signed
Ms. Mpho Manyabe	Manyabe Consultancy: Managing Director and Lead EAP	

THARISA MINERALS REPRESENTATIVE CONTACT DETAILS

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DECLARATION BY THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

I **Mpho Manyabe**, declare that -

- I act as the independent Environmental Assessment Practitioner (EAP) in this application for the proposed consolidation and amendment of the various Environmental Management Programmes (EMPs) granted to Tharisa as well as incorporating new environmental and waste activities proposed to be conducted for future proofing the mining operation project at Tharisa Mine.
- 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 relevant Acts, Regulations and any guidelines that have relevance to the proposed activity.
- I will comply with the Act, Regulations and all other applicable legislation, policies and guidelines.
- undertake to disclose to the applicant and the Competent Authority (CA) 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 CA; and the objectivity of any report, plan or document to be prepared by myself for submission to the CA.
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to Interested and Affected Parties (I&APs) and the public at large and that participation by I&APs is facilitated in such a manner that all I&APs, state department and CA 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 CA in respect of the application, provided that comments that are made by I&APs in respect of a final report that will be submitted to the CA 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 public participation process (PPP); and 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.



Signature of the EAP

Date: 14 August 2026

EAP Company: Manyabe Consultancy (Pty) Ltd

EXECUTIVE SUMMARY

PROJECT INTRODUCTION

Tharisa Minerals (Pty) Ltd (Tharisa), a subsidiary of Tharisa Public Limited Company (PLC), operates an opencast mining operation that produces chrome and Platinum Group Metals (PGM) concentrate located on Farms K/Kraal 342 JQ, Rooikoppies 297 JQ and Elandsdrift 467 JQ, south of Marikana in the Northwest Province.

Tharisa holds existing Environmental Authorisations (EAs) and licences under the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA), the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended (NEMA), the National Environmental Management: Waste Act, 2008 (Act. 59 of 2008) (NEMWA) and the National Water Act, 1998 (Act. No 36 of 1998) (NWA) for the mining of the East, West and Far West open pits.

Tharisa Mine has been in operation since November 2009, having an initial Mining Right (MR) (49/2009) effective 19 September 2008, issued on 13 August 2009 by the then Department of Minerals and Energy (DME). Tharisa, subsequently applied for an amendment of the MR with the Reference Number: NW/30/5/1/2/2/358 MR, stamped 28 July 2011. This MR was however only registered in 2016.

Tharisa is in the process of acquiring the required authorisations to undertake underground mining at East and West pits, within the existing approved Mining Right Area (MRA) boundary. The application for the proposed underground mining activities is not applicable for this application for consolidation.

Tharisa is proposing to undertake an Integrated EA and Waste Management Licence (WML) for new activities proposed to be conducted for future proofing the mining operation, incorporating additional properties into the approved Tharisa MR boundary; and the consolidation of the existing EMPs, EAs and WMLs into a single Environmental Impact Assessment (EIA)/ EMP (hereunder referred to as the proposed project). The proposed project requires approval (Integrated EA and WML), and amendment to the existing EMPs, and thus the reason for the application.

Manyabe Consultancy (Pty) Ltd (hereafter referred to as MC) has been appointed by Tharisa as the Independent Environmental Assessment Practitioner (EAP) to undertake the proposed project in terms of the MPRDA, NEMA, NEMWA and NWA. The Competent Authority (CA) for the above-mentioned application is the North West Department of Mineral and Petroleum Resources (DMPR).

A Water Use Licence Application (WULA) process is concurrently being undertaken for the various activities occurring within the mine which are listed as water uses under Section 21 of the NWA. The CA for the WULA is the North West Department of Water and Sanitation (DWS).

EXISTING PROJECT INFRASTRUCTURE

Mining at Tharisa Mine is undertaken using conventional open pit truck and shovel methods. The two (2) mining sections (East and West) are separated by a tributary of the Sterkstroom River and the D1325 (Marikana Road). Waste rock from the open pit areas is stockpiled in various Waste Rock Dumps (WRDs) while tailings from the processing plants are disposed of on Tailings Storage Facilities (TSFs). Some in-pit dumping of waste rock has taken place at East Mine.

The following infrastructure is utilised and located on the Tharisa Mine:

- Opencast Pits:
 - East Pit
 - West Pit
 - Far West Pit
- Run of Mine (RoM):
 - RoM Pad
 - External RoM Chromite Ore Loading Area

- Processing Plants and associated infrastructure:
 - Genesis Processing Plant
 - Includes all associated infrastructure, including crushing (dry) and processing (wet)
 - Voyager Processing Plant
 - Includes all associated infrastructure, including crushing (dry) and processing (wet)
 - Vulcan (Scavenger) Processing Plant
 - Including all associated infrastructure
 - Parking areas
 - AECL-Hydrocarbon storage silos and tanks
 - Material storage areas
- Product Stockpiles:
 - Chromite Ore Loading Facility 1
 - Chromite Ore Loading Facility 2
- WRDs:
 - West WRD
 - Far West WRD
 - Far West Above Ground (OG) WRD
 - East OG WRD
 - Eastern WRD 1 (Choppies WRD)
 - Eastern WRD 2 (Wonderkop WRD)
 - TSF 2 East WRD 1 and 2
 - TSF 3 WRD Extension 1
- TSFs:
 - TSF 1 Phase 1 including support infrastructure
 - TSF 1 Phase 2 including support infrastructure
 - TSF 2 Phase 1 including support infrastructure
 - TSF 2 Phase 2 including support infrastructure
 - TSF 3 including support infrastructure
- Pollution Control Dams (PCDs):
 - Hernic Quarry
 - Process Water PCD
 - Stormwater Dam
 - Rail Loop Buffer Dam
 - Raw Water Dam
 - Community Dam
 - MCC Dam (to be upgraded/ formalised)
 - Zinc Dam 1 and Zinc Dam 2
 - Silt Traps
- Water conveyance and treatment:
 - Process water pipelines (from PCDs to plants)
 - Return water pipelines (from TSFs back to processing plants)
 - Waste Water Treatment Plant (WWTP)
 - Reverse Osmosis (RO) Plants
 - Wash bays at all processing plants
- Stormwater systems:
 - Stormwater channels / canals / berms
 - Clean and dirty water separation infrastructure
 - Stormwater culverts and crossings
- Storage Areas:
 - Hydrocarbon/Chemical Storage Areas;
 - Salvage Yard
 - Explosives Magazine Storage Area
 - Explosive Silos
 - Waste Storage Areas (Hazardous and General)
 - Waste Tyre Storage Area
- Support Infrastructure:
 - Mine offices, visitors' parking, security, change houses, access control facilities, Mine Training Centre, Personal Protective Equipment (PPE) stores, tuck stops, store warehouses and clinic
 - Borrow Pit
 - Haul Roads, overpass bridges and access roads
 - Topsoil Stockpiles
 - Powerlines (275 and 88 kV) and substations (Eskom and Tharisa)
 - Weighbridge
 - Laydown areas and workshop

A network of roads exists within the mine. A 275 kV powerline and associated Eskom servitude cross through the eastern part of the mining area in a north-south direction. Smaller rural power and telephone lines currently service the residential areas within the western and eastern sections of the project area. Infrastructure (pipes and canals) associated with the Buffelspoort Irrigation Board traverses various sections of the project area in a south-north direction.

DESCRIPTION OF THE SCOPE OF THE ACTIVITY

The project will focus on three main parts which will include:

- **Part 1:** The consolidation and amendment of the various EAs, WMLs and EMPs granted to the Tharisa Mine.
- **Part 2:** Incorporation of additional properties into the approved Tharisa MR; and
- **Part 3:** Obtaining relevant EAs, WMLs and EMPs for the operation of proposed activities to be conducted to future proof the mining operation.

A single application for Part 1, 2 and 3 is being made to the regulatory departments to avoid the need for multiple reports and decisions being made by the CAs. Therefore, one application is being made to the DMPR [formerly the Department of Mineral Resources and Energy (DMRE)] and one application to the DWS for decision making.

In summary, prior to the commencement of the proposed project, the following will be required:

- An amended and consolidated EMP issued by the DMPR in terms of Section 102 of the MPRDA, as amended.
- An EA issued by the DMPR in terms of the NEMA for activities in Listing Notice 1 [Government Notice Regulation (GNR.) 983 of 2014, as amended]; Listing Notice 2 (GNR. 984 of 2014, as amended) and Listing Notice 3 (GNR. 985, as amended).
- A WML issued by the DMPR in terms of the NEMWA for activities in Categories B and C (GNR. 921 of 2013); and
- An Integrated Water Use Licence (IWUL) issued by the DWS in terms of Section 21 of the NWA.

A single EIA and EMP will be compiled to:

- Consolidate the various EMPs and approvals (EAs and WMLs) currently applicable to the mine;
- Issue an EA for the operation of proposed activities to be conducted to future proof the mining operation; and
- Incorporate additional properties into the approved Tharisa MR.

Additionally, the IWUL to be issued by the DWS will consolidate all the approved water uses for all activities being undertaken within the mine, and new activities proposed to be conducted for future proofing the mining operation. It will also ensure that the errors that have been found on the 17 September 2024 are also corrected. A single Integrated Water and Waste Management Plan (IWWMP) will therefore be compiled.

PART 1: CONSOLIDATION AND AMENDMENT PROJECT

Over the past 16 years since the mine began operating, significant changes, improvements and new facilities have been constructed to support the operation of the mine. Each change or amendment resulted in the need for environmental approvals which were issued as separate authorisations. The DMPR has requested that these separate approvals be consolidated into one single EMP and EA that is applicable to the Tharisa Mine to improve overall management of the mining operation.

In addition to the consolidation, some changes will need to be made to ensure the accuracy of the EMP and EA to the operation of the mine and ensure all activities currently being undertaken are approved and discussed in the EMP with associated mitigation measures applicable to each activity. Tharisa holds the following approvals to be consolidated into this application:

Existing approvals granted to Tharisa:

Approval	Reference	Licence Type	Approval Date
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	MR	19 September 2008
	North West Department of Agriculture, Conservation and Environment (DACE) Reference Number: NWP/EIA/159/2007	EA	23 October 2009
Amendment of the EA issued on 23 October 2009, to incorporate additional listed activities previously excluded: Transmission and distribution of above ground electricity (120kV or more)	DACE Reference Number: NWP/EIA/159/2007	EA and EMPr Amendment	30 August 2011
EIA and EMPr for changes to the pit, tailings dam and waste rock facilities; a chrome sand drying plant and other operational and surface infrastructure.	Department of Economic Development, Environment, Conservation and Tourism (DEDECT) EA Reference Number: NWP/EIA/50/2011	EA	29 April 2015
	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	EA and EMPr Amendment; and WML	24 June 2015
Amendment of an EA for Increase Storage Capacity of Tailings Facility and WRD and increase the authorised Fuel Storage Capacity in respect of Farm Rooikoppies JQ 297, Elandsdrift JQ 467 And K/Kraal JQ 342, within the Magisterial District of Bojanala, North West Province.	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	EA and EMPr Amendment; and WML	03 August 2021
Tharisa Additional Waste Rock Storage EIA and EMPr. - The expansion of the existing and approved Far West WRD 1 by a footprint of 109 ha. The expanded area will be referred to as the West OG WRD. Portions of the West OG WRD will be located on backfilled areas of the West Pit; and - The establishment of a WRD (referred to as the East OG WRD) on backfilled portions of the East Pit. The proposed East OG WRD will cover an area of approximately 72 ha.	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	EA and EMPr Amendment; and WML	31 May 2023
EA for TSF 3 WRD Extension 1.	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	EA and EMPr Amendment; and WML	05 December 2024
TSF 3 Construction and Operation	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	EA and EMPr Amendment; and WML	07 February 2025
Supporting Infrastructure			
EA for the diversion of an existing 275kV powerline and associated infrastructure.	DEA Reference Number: 14/12/16/3/3/3/408	EA	15 November 2012
Amendment of an EA in respect of the upgrade of the existing WWTP in respect of the Farm Rooikoppies JQ 297, Elandsdrift JQ 467 and K/kraal JQ 342 JQ.	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	Amendment of an EA	14 August 2020
Rectification of an unlawful commencement of a listed activity for the storage of dangerous goods of more than 80m ³ but less than 500m ³ .	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	EA and EMPr	10 August 2021

PART 2: PROPERTIES TO BE INCORPORATED INTO THE MR

Tharisa Mine falls within Ward 31, 32 and 45 of the Rustenburg Local Municipality, and Ward 27 of the Madibeng Local Municipality, within the Bojanala Platinum District Municipality (BDM), North West Province. The mining operation is located on the Farms K/Kraal 342 JQ, Rooikoppies 297 JQ and Elandsdrift 467 JQ, approximately 95 kilometres (km) north-west of Johannesburg and 35 km east of Rustenburg, accessible via the R104 regional road just off the N4 toll road.

Tharisa's EMPr boundary versus the MR boundary is different and includes different properties. This is as a result that certain areas where the mining infrastructure is located will not be mined and therefore have not been

incorporated into the approved MR. This infrastructure is located within the mining area as defined by the MPRDA and is considered infrastructure incidental to the mining operation. To avoid any third-party interlopers and/or opportunists from applying for mining and/or prospecting rights or mining permit over these properties, Tharisa has made the decision to incorporate these properties, where no mining rights, prospecting rights or mining permits have been granted, into the Tharisa MR.

The properties required to be incorporated into the MR are listed below:

- Portion 368 of the farm K/Kraal 342 JQ.
- Portion 29 of the farm Elandsdrift 467 JQ.
- Portion 89 of the farm Elandsdrift 467 JQ.
- Portion 90 of the farm Elandsdrift 467 JQ.
- Portion 91 of the farm Elandsdrift 467 JQ.
- Portion 92 of the farm Elandsdrift 467 JQ.
- Portion of Portion 93 of the farm Elandsdrift 467 JQ.
- Portion of Portion 94 of the farm Elandsdrift 467 JQ.
- Portion 176 of the farm Elandsdrift 467 JQ.
- Portion 177 of the farm Elandsdrift 467 JQ.

PART 3: EAS FOR THE NEW PROPOSED ACTIVITIES

Tharisa is planning to continue operating until 2125 and thus additional infrastructure will need to be developed. The proposed infrastructure triggers activities in terms of the following legislation:

- MPRDA;
- NEMA;
- NEMWA; and
- NWA.

Therefore, the below proposed activities require approval prior to commencement:

i. New Waste Rock Dumps and Associated Infrastructure

New WRDs will be constructed to store the waste generated from the mining operation. Waste will be removed from both the opencast and underground mine (once operational). The waste rock will contain material that is not considered to have material value to the mine and will thus not be processed for PGM and chromite removal. The waste rock will be permanently disposed on surface and will be used for rehabilitation purposes (concurrent and at end of mining). Some waste may remain on surface and will need to be vegetated as part of the final mine closure plan.

Five (5) new WRDs are proposed to be constructed as presented below.

WRD Name	WRD Storage Capacity (Million Cubic Meters)	Deposition Start Date
Safety Butress for West Underground	2.40	2027
TSF 3 Safety Berm	1.95	2027
Far West WRD Expansion	6.27	2027
TSF 1 Phase 1 conversion into WRD	1.7	2027
TSF 1 Phase 1 Safety Butress – Stage 2	1.97	2027

ii. 275kV Realignment and 88kV Upgrade

A 275kV powerline currently exists through the Tharisa mining footprint, which is an Eskom powerline supplying to various areas, including the Northern Cape. To ensure the continuation and functionality of the mine, Tharisa proposes to relocate the 275kV powerline and re-route it around the mining area to avoid interference with the mining operation and Eskom power supply. An alternative line route will be discussed with Eskom and approved. Tharisa is undertaking the environmental process to obtain the approval for its re-location, as part of the proposed project.

Additionally, an 88kV powerline constructed parallel to the D1325 (Marikana Road) must be upgraded to support the mine's power supply requirements as it expands. This will also include upgrades made to the Tharisa substation.

iii. Tailings Storage Facility 3 Slurry Pipeline

The proposed pipeline is for the tailings' deposition between Vulcan Plant and TSF 3. In the original application, two (2) route alternatives were assessed (Route A and Route B). The CA approved Route A and TSF 3 as part of the original application. Tharisa still wishes to keep the approved Route A. It must however be noted that, for this application, Tharisa is proposing Route C as a future option as the TSF expands.

Route C has been opted as the preferred option due to the following reasons:

- It is a direct pipeline as compared to Route A and B.
- It is significantly shorter than Route A and B, resulting in considerably lower construction and maintenance costs, as well as reducing the footprint of the proposed pipeline.
- It will be placed above ground and elevated onto a gantry outside of the floodline of the Sterkstroom River, which will ensure protection from any potential washouts or damage to the infrastructure.
- The pipeline gantry will ensure that there is no impact on the Sterkstroom River, which will thus avoid impacts on stream flows.
- The pipes are expected to be steel pipes, adding to the structural integrity of the crossing.
- The pipeline will run through Tharisa owned properties i.e. Portion 38 and 147 of the Farm K/Kraal 342 JQ

The following specifications are applicable to Routes C:

- 1 535m in length, with 525 000 tons per month total throughput capacity.
- 400mm outside diameter.
- 281mm inside diameter.
- Class 25, SDR 7.4 (25 bar).
- The pipeline will be welded, similar to the existing pipeline feeding the existing TSF 2 Phase 2.

iv. Lifting of the Walls of Tailings Storage Facility 1 Phase 2

The mine currently operates three (3) processing plants, namely Genesis, Voyager and Vulcan. Genesis and Voyager are able to process 100 kt and 300 kt per month, respectively. The waste product produced by both plants is sent to the Vulcan plant for further extraction of chrome, after which, the tailings material is hydraulically pumped to TSF 2 Phase 2 for storage. The TSF 3 has been approved by the DMPR and is currently being constructed. Upon completion of construction activities, the TSF 3 will receive tailings once TSF 2 Phase 2 has reached its Full Supply Level (FSL) by December 2025 (based on current tailing production).

Based on current production of tailings and planned expansions to extend the Life of Mine (LoM) to 2125, Tharisa is compelled to pursue additional storage solutions by lifting the walls of the current TSF 1 Phase 2, TSF 2 Phase 1 and TSF 2 Phase 2. At the time of this application, there are pending EA and WULA applications for the lifting of the walls of TSF 2 Phase 1 and TSF 2 Phase 2, which are not part of this application (separate application). Therefore, the current application only seeks EA for the lifting of the walls for TSF 1 Phase 2. It must be noted that TSF 1 Phase 2 is currently not operational.

By raising the walls of TSF 1 Phase 2, there will be little need for changing the majority of the existing infrastructure, thereby reducing the need for the construction of additional decanting and other associated infrastructure. This will reduce environmental impacts, construction and maintenance costs, providing the Best Practicable Environmental Option (BPEO).

The relevant aspects of the raised TSF 1 Phase 2 stage capacity curves are summarised below:

- Maximum tailings height: = ± 41 m.

- Additional capacity at maximum height: = 1 786 940 tonnes $\approx$ 1,78694 Mm³ (5.14 months).

The TSF1 Phase 2, though not operational, exists, and the EA and WML were approved previously. The existing infrastructure associated with the TSF comprises the following:

- Single, full containment, engineered paddocks, constructed with selected waste rock from the open-pit mining operations.
- 1.5m high starter embankments along the upstream toe of the existing embankments, constructed from selected *in situ* soils in compacted layers.
- Structural key-cuts along the upstream and downstream toe of the TSF embankments, replacing the *in situ* soils with engineered rockfill.
- Penstock gravitation water decanting systems.
- The raised TSF will include the addition of:
 - Embankments constructed using selected waste rock from open-pit mining operations, with a height of 5m. The embankments will have a crest width of 15m with 1V:3H and 1V:2H downstream and upstream slopes, respectively.
 - Geofabric separation layer (750 g/m²) below the raised embankment at the tailings interface.
 - Penstock outfall isolating valves.

The raised TSF will allow for the majority of the existing infrastructure components to remain in place and function as intended, as follows:

- Rockfill Embankment;
- Waste Rock Buttress;
- Toe drains;
- Seepage cut-off drains;
- Decant System;
- Penstock Energy Dissipator;
- Pool wall and Wing Walls;
- Catwalk;
- Geofabric;
- Solution Trench;
- Collection Sump;
- Collection Manhole;
- Drainage design;
 - *Pipe Loading;*
 - *Penstock outfall pipeline bearing capacity;*
 - *Penstock rings;*
 - *Penstock outfall valves;*
 - *Drainage Sizing;*
 - *Outlet Piping; and*
 - *Filter Compatibility.*
- Geofabric Separation Layer; and
- Barrier system.

v. Salvage Yard

Tharisa proposes to relocate the existing salvage yard, which is used for the sorting of industrial waste, to the Old Assembly yard within the mine. The relocation of the salvage yard ensures that the facility is situated inside the mine, and safety and security risks are minimised. Additionally, the Old Assembly yard comprises a weighbridge which will be beneficial for the salvage yard processes. The proposed salvage yard will be

approximately 0.4905 hectares in extent and located within a previously disturbed area. The salvage yard will store more than 80 cubic metres of hazardous waste and 100 cubic metres of general waste.

vi. Conveyor Belt

Waste rock from the East Pit is transported to the Far West OG WRD by haul trucks travelling along the haul road, which crosses the Sterkstroom stream via the existing low-water bridge. While this method was effective, haul truck operations present a range of ongoing operational and environmental challenges, including diesel emissions, fugitive dust, loose rock spillage onto the road, traffic safety concerns, and increasing cost pressures. Tharisa needs to address these cumulative impacts and improve the long-term sustainability of waste rock management, by implementing a conveyor system as the preferred solution, resulting in a safer, cleaner, quieter, and more cost-efficient than continued truck haulage.

Tharisa proposes the construction and operation of a $\pm 1\,600$ mm wide waste rock conveyor belt system that will follow the same alignment of the existing haul road and cross the Sterkstroom stream utilising the existing low-water bridge infrastructure. By leveraging and upgrading existing infrastructure rather than creating new disturbance footprints, the proposal represents a pragmatic and environmentally responsible improvement to current operations. The conveyor will be fully enclosed over the watercourse to eliminate any potential rock spillage, prevent dust emissions at the crossing point, and protect water quality, while addressing key risks that are inherent to the existing truck-based transport method. The crossing structure will comprise a steel frame integrated with the existing bridge, while the conveyor alignment on either side utilises the current haul road network.

The design incorporates safety and operational features, including maintenance walkways, handrails, emergency pull-cord systems, and dedicated access points for routine inspection and maintenance — all of which represent a significant safety improvement over active haul road conditions. The existing culvert system beneath the bridge is retained in full to ensure the continued, uninterrupted flow of the Sterkstroom channel.

In summary, the proposed conveyor system optimises the existing infrastructure to deliver a safer, lower-emission, and more operationally efficient method of waste rock transport, while actively reducing the environmental risks associated with current truck haulage.

SCOPING AND ENVIRONMENTAL IMPACT REPORTING PROCESS

EIA is a planning and decision-making tool that is used to identify the environmental consequences of a proposed project, before the development takes place. The purpose of the EIA is to describe the potential consequences of the proposed consolidation and amendment of the various EMPs granted to Tharisa as well as incorporating new environmental and waste activities proposed to be conducted for future proofing the mining operation project (herein after referred to as “the proposed project”) in environmental, economic and social terms. Public issues and concerns must therefore be identified timeously so that these can be recorded and responded to in the EIA. All comments received in writing will be included in the submission to the CA for consideration.

The NEMA EIA Regulations, 2014, as amended, define two (2) broad processes for an EIA, namely: Basic Assessment (BA) and Scoping and Environmental Impact Reporting (S&EIR). A BA is required for projects with less significant impacts or impacts that can easily be mitigated. The S&EIR is applicable to all projects likely to have significant environmental impacts due to their nature or extent, activities associated with potentially high levels of environmental degradation, or activities for which the impacts cannot be easily predicted and/or mitigated through a simpler process. The proposed project entails the undertaking of the S&EIR in terms of the NEMA EIA Regulations 2014, as amended and the NEMWA.

The S&EIR process consists of two phases, as follows:

The first phase is a Scoping Study (current phase), which identifies potential issues requiring more detailed investigation by undertaking specialist studies. A complete list of specialist studies and the issues that must be

addressed have been detailed in the Plan of Study for EIA in this Draft Scoping Report, which is being made available for public and authority review.

The second phase will be the Impact Assessment Phase during which detailed investigations of the issues identified during the Scoping Study will be undertaken.

This Draft Scoping Report has been compiled in terms of Appendix 2 of the NEMA EIA Regulations of 2014, as amended, as well as the requirements of the Scoping Report template issued by the DMPR. All comments received during the review of the Draft Scoping Report will be incorporated into the Final Scoping Report for submission to the DMPR.

Before Tharisa can commence with the proposed project, an amendment to the EMPr, and an integrated EA and WML application needs to be undertaken in terms of the following national legislation:

- The NEMA, for the listed activities stipulated in the NEMA EIA Regulations of 2014, as amended;
- The MPRDA, for the amendment of the EMPr in accordance with Section 102 of the MPRDA; and
- The NEMWA, for waste management activities stipulated in GNR. 921, promulgated under NEMWA.

The approvals in terms of the NEMA, NEMWA and MPRDA are being applied for to the North West DMPR.

The S&EIR process is being undertaken as per the following legislation:

Integrated EA and WML Application

The proposed project entails the undertaking of the EIA – S&EIR in terms of the EIA Regulations 2014, as amended; promulgated in terms of the NEMA as listed in GNR. 983, 984 and 985, as amended. These activities are identified as actions that may not commence without an EA from the relevant CAs.

As per the NEMWA List of Waste Management Activities, (GNR. 921 of 29 November 2013), the proposed project will trigger Category “B” and “C” activities.

For Category “B” activities, a person who wishes to commence, undertake, or conduct an activity listed under the Category, must conduct a S&EIR process, as stipulated in the EIA regulations 2014, as amended, under section 24(5) of the NEMA as part of a WML application.

For Category “C” activities, a person who wishes to commence, undertake or conduct a waste management activity must comply with relevant requirements or standards determined by the Minister i.e. Norms and Standards for Storage of Waste, 2013.

A WML is being applied for as the project triggers Category “B” activities. For activities which will be triggered as stipulated in Category “C”, Tharisa will comply with the required norms and standards applicable to the relevant activities.

Section 102 amendment application

Section 102 of the MPRDA states that “*a reconnaissance permission, prospecting right, MR, mining permit, retention permit, technical corporation permit, reconnaissance permit, exploration right and production right work programme; mining work programme, EMPr, and Environmental Management Plan (EMP) may not be amended or varied (including by extension of the area covered by it or by the addition of minerals or a share or shares or seams, mineralised bodies, or strata, which are not at the time the subject thereof) without the written consent of the Minister*”.

It must be noted that Activity 21D has been included into Listing Notice 1 on the NEMA EIA Regulations, of 2014, as amended, which requires that a **BA** be undertaken as part of a MR amendment process in terms of section 102 of the MPRDA. Due to the NEMA and NEMWA listed activities, which require a S&EIR process to be followed, Section 102 amendment is also following the S&EIR process. The Section 102 is being applied for to incorporate the proposed and existing mining activities.

PROJECT ALTERNATIVES

In terms of the Appendix 2 of the NEMA EIA Regulations 2014, as amended, all environmental reports must contain a description of any feasible and reasonable alternatives that have been identified, including a description and comparative assessment of the advantages and disadvantages that the proposed activity and alternatives will have on the environment and on the community, that may be affected by the activity.

Every S&EIR process must therefore identify and investigate alternatives, with feasible and reasonable alternatives to be comparatively assessed. If no alternatives exist, proof that an investigation was undertaken and motivation indicating that no reasonable or feasible alternatives other than the proposal/ preferred option and the no-go option exist must be provided.

For the proposed project, the following alternatives have been considered and discussed in more detail below:

- Site/ Route Location Alternatives;
- Type of Activity Alternatives;
- Layout/ Design Alternatives;
- Technology Alternatives; and
- The “No-go” Alternative.

i. Site/ Route Location Alternatives

Site/ route location alternatives refer to different locations/ routes where the new infrastructure could have been constructed and the reasons why the preferred location/ route was selected. The below alternatives were considered, and have been assessed for the various infrastructure to be constructed:

Waste Rock Dumps

a) Far North Waste Rock Dump (Alternative 1)

Originally, the Far North WRD was proposed. This has been disregarded due to its location. The size and geometry of the facility were constrained by several site-specific factors as follows:

- Property boundaries;
- Natural drainage lines traversing available areas;
- Designated stockpile/spoil areas for unstable material; and
- Gravesites/ yards (heritage resources).

The alternative was designed applying a conservative 100m offset from the graveyard, gravesite, and drainage line in the placement of the WRD. Due to these constraints, the facility was split into two facilities i.e. Far North WRD West and Far North WRD East.

Additionally, the WRD on the West partially overlaps on an old rehabilitated Merensky opencast pit. There are also graves located in the middle of the two WRDs. The WRDs will also be constructed within a 100m regulated zone (within 100m from the edge of the watercourse).

b) Far West Waste Rock Dump Expansion (Alternative 2 – Preferred Alternative)

Tharisa has limited space available for the development of WRDs both on and surrounding the Tharisa Mine. The current approach adopted by Tharisa assesses the requirements for waste rock capacity and seeks to extend the available WRDs within the mine's property boundary where possible or to find properties of suitable size adjacent to the current mine boundary for the development of waste rock storage facilities.

Due to reasons mentioned above, with respect to finding properties of suitable size adjacent to the current mine boundary for the development of waste rock storage facilities, Far West WRD Expansion was found to be more feasible.

The Far West WRD Expansion is the most preferred option due to the following reasons:

- The WRD is to be constructed over the west pit after it has been backfilled to natural ground level with waste rock.
- The WRD will tie into the existing Far West OG WRD, and the Far West WRD.
- Its location on previously disturbed area within the mine boundary. The land on which the WRD will be located on is owned by Tharisa. The environmental impact of the proposed WRD is therefore expected to be lower, reducing the potential risk of new or additional ecological disturbance.
- The WRD does not traverse any natural drainage lines nor gravesites/ yards (heritage resources) as compared to the Far North WRD, thus reducing the severity of the impacts on the surrounding pristine natural environment.

The Far West WRD Expansion will have a storage capacity of 6.27 million cubic metres and deposition will commence in 2027.

275kV Realignment

For the realignment of the 275kV powerline, two (2) route alternatives have been proposed i.e. Route Alternative 1 and Route Alternative 2, with Route Alternative 2 being the most preferred option. In this regard, to determine the most preferred route alternative, the following three significant factors were taken into account:

- The location of the existing mine infrastructure;
- Avoidance of interruptions with Eskom services; and
- Environmental sensitivities.

Route Alternative 2 was the best option which considers the existing infrastructure, avoids interruptions with Eskom services, and it will ensure that the mine operates optimally while environmental sensitivities are being avoided.

The following is applicable to the various route alternatives:

- Route Alternative 1: This route is significantly longer than the other routes and therefore will increase construction costs. There are also significant environmental sensitivities to consider. Based hereupon, it was eliminated.
- Route Alternative 2 (preferred alternative): This alignment is the shortest route which reduced construction costs. It also runs through a disturbed area and therefore reducing environmental impacts. It will however require the establishment of a new servitude.

88kV Upgrade

There are no location/ route alternatives considered for the upgrade of the existing 88kV powerline as the powerline will only be upgraded and not rerouted.

Tailings Storage Facility 3 Slurry Pipeline

The proposed pipeline is for the tailings' deposition between Vulcan Plant and TSF 3. In the original application, two (2) route alternatives were assessed (Route A and Route B). The CA approved Route A and TSF 3 as part of the original application. Tharisa still wishes to keep the approved Route A. It must however be noted that, for this application, Tharisa is proposing Route C as a future option as the TSF expands.

Route C has been opted as the preferred option due to the following reasons:

- It is a direct pipeline as compared to Route A and B.
- It is significantly shorter than Route A and B, resulting in considerably lower construction and maintenance costs, as well as reducing the footprint of the proposed pipeline.

- It will be placed above ground and elevated onto a gantry outside of the floodline of the Sterkstroom River, which will ensure protection from any potential washouts or damage to the infrastructure.
- The pipeline gantry will ensure that there is no impact on the Sterkstroom River, which will thus avoid impacts on stream flows.
- The pipes are expected to be steel pipes, adding to the structural integrity of the crossing.
- The pipeline will run through Tharisa owned properties i.e. Portion 38 and 147 of the Farm K/Kraal 342 JQ.

ii. Type of Activity to be Undertaken

Lifting of the Walls of Tailings Storage Facility 1 Phase 2

This alternative has been opted for as the preferred activity as it will negating the need of constructing a new TSF by lifting the walls of the existing TSF to increase storage capacity and utilising existing infrastructure where impacts has already occurred.

The raised facility will include the addition of, *inter alia*, embankments constructed using selected waste rock from open-pit mining operations, with a height of 5m. The embankments will have a crest width of 15m with 1V:3H and 1V:2H downstream and upstream slopes, respectively. The tailings will be deposited behind the embankment, into the basin. This is the method that is currently in place at the mine, and there have not been any reported dams' failures.

Tailings Storage Facility 1 Phase 2 Safety Butress (Stage 2)

The mine intends to backfill the open pits with waste rock material on an advancing front basis once the pits have been developed sufficiently. Excess waste rock material, mainly due to bulking from blasting, has been used for the construction of the TSFs containment walls, mine haul roads and as general backfill for various platforms. WRDs are required for storage of the additional excess material not being absorbed by the construction of other facilities.

Waste Rock Transportation Mode

a) Haul Road (Alternative 1)

Waste rock from the East Pit is transported to the Far West OG WRD by haul trucks travelling along the haul road, which crosses the Sterkstroom stream via the existing low-water bridge. While this method was effective, haul truck operations present a range of ongoing operational and environmental challenges as follows:

- Diesel emissions;
- Fugitive dust;
- Loose rock spillage onto the road;
- Traffic safety concerns; and
- Increasing cost pressures.

Tharisa needs to address these cumulative impacts and improve the long-term sustainability of waste rock management.

b) Conveyor Belt (Alternative 2 – Preferred Alternative)

In order for Tharisa to address cumulative impacts and improve the long-term sustainability of waste rock management, a conveyor system is the preferred solution, which is safer, cleaner, quieter, and more cost-efficient than continued truck haulage.

Tharisa proposes the construction and operation of a $\pm 1\,600$ mm wide waste rock conveyor belt system that will follow the same alignment of the existing haul road and cross the Sterkstroom stream utilising the existing low-water bridge infrastructure. By leveraging and upgrading existing infrastructure rather than creating new

disturbance footprints, the proposal represents a pragmatic and environmentally responsible improvement to current operations. The conveyor will be fully enclosed over the watercourse to eliminate any potential rock spillage, prevent dust emissions at the crossing point, and protect water quality, while addressing key risks that are inherent to the existing truck-based transport method. The crossing structure will comprise a steel frame integrated with the existing bridge, while the conveyor alignment on either side utilises the current haul road network.

The design incorporates safety and operational features, including maintenance walkways, handrails, emergency pull-cord systems, and dedicated access points for routine inspection and maintenance — all of which represent a significant safety improvement over active haul road conditions. The existing culvert system beneath the bridge is retained in full to ensure the continued, uninterrupted flow of the Sterkstroom channel.

In summary, the proposed conveyor system optimises the existing infrastructure to deliver a safer, lower-emission, and more operationally efficient method of waste rock transport, while actively reducing the environmental risks associated with current truck haulage.

iii. **Layout/ Design Alternatives**

Safety Buttress for West Underground

The size and geometry of the safety buttress for West Underground were influenced by spatial constraints associated with both mine and community infrastructure as follows:

- Mine Infrastructure:
 - Enaex Yard;
 - Scat Ball Screening/Recovery Plant;
 - Tyre Yard;
 - Primary Haul Road;
 - Secondary Haul Road;
 - West Pit; and
 - West WRD.
- Community Infrastructure:
 - Piet Retief Primary School; and
 - Community Road.

In the final design, the following buffer zones have been incorporated to maintain safe distances between the safety buttress and sensitive infrastructure:

- A 50m offset has been applied between the safety buttress and the Piet Retief Primary School;
- A 100m offset has been applied between the safety buttress and the Enaex yard; and
- A 25m offset has been applied between the safety buttress and the secondary haul and community roads.

Furthermore, the existing tyre yard and scat ball screening/recovery plant will be removed.

Tailings Storage Facility 3 Safety Berm

The size and geometry of the facility were constrained by several site-specific factors as follows:

- Property boundaries;
- A heritage site; and
- An existing gravesite located in the Northeast of the proposed area.

The TSF 3 safety berm was initially designed to encroach within the 20m buffer from the heritage resources on the eastern side. The safety buttress was redesigned to have a conservative buffer of 100m from the heritage resources.

iv. Technology Alternatives

Lifting of the Walls of Tailings Storage Facility 1 Phase 2

Technological alternatives available for the disposal of tailings include the briquetting of tailing (fines) or the continued use of facilities similar to those in operation. The briquetting of material can be undertaken either by uniaxial pressing or via roll pressing. Various binders are required for the processes, such as lime, molasses, magnesium lignosulfonate, and bentonite. Concerns of storing for periods in excess of five (5) weeks present issues associated with mildew formation, but as the mine is located in an area with a negative water balance, this is unlikely to be of concern. For this method to be effective, Tharisa would require a press to bind the materials as well as the relevant binders in order for this to be effective.

Disposal of tailings in TSFs is the method that is currently in place at the mine. The additional benefit of this process is that there is existing institutional knowledge for this process of disposal. Based on the existing infrastructure and knowledge in place, the disposal to tailings is seen as the preferable method.

The proposed infrastructure has been identified with the goal of optimising existing infrastructure; upscaling production and processing capacities and efficiency; reducing liabilities; safe working and operational practices; and optimising resource utilisation.

v. The “no-go” alternative

The no-go option entails that none of the proposed infrastructure will be developed nor will the consolidation of the existing EMPs, EAs and WMLs take place. Should the proposed project not be undertaken, it would maintain the status quo of the current operations as well as the significant administrative burden of ensuring compliance with multiple EAs, WMLs, and EMPs. There would therefore not be streamlining of environmental management, and the resultant efficiency would not be realised.

For the proposed project, if the application for amendment is not granted, the following negative environmental impacts may occur:

- DMPR has requested that all approvals issued to Tharisa be consolidated into one single EMP and EA that is applicable to the Tharisa Mine to improve overall management of the mining operation. The instruction by the DMPR cannot be disregarded as they are the CA.
- The inaccuracy of the EMPs and EAs to the operation of the mine will remain for all activities currently being undertaken as per the approved EMPs, and the associated mitigation measures applicable to each activity undertaken will not be revised, amended and discussed thoroughly in a single EMP and EA.

For the proposed new activities, the following negative environmental impacts may occur if the amendment is not granted to Tharisa:

- The mine currently has a remaining LoM of 15 years, (i.e. until 2041). Tharisa is planning to continue operating until 2125, and thus additional infrastructure will need to be developed. If this amendment is not granted, there will be a reduction in economic growth [decline in Gross Domestic Product (GDP) and loss of income]. This means that the planned socio-economic initiatives within the surrounding communities would not be able to go ahead, and employees and contractors' workers would be impacted. Not authorising the WRDs would not allow for the optimisation of the current mining operations and could potentially result in the closure of the mine. It could also restrict the mine's ability to realise the economic benefits associated with extracting mineral resources from the East and West Mines.
- The mine is continually generating more waste rock from mining activities than previously anticipated. The balance of waste rock which cannot be backfilled in the pit will require dumping on surface. It follows that no other feasible alternatives exist for waste rock storage.
- Should the authorisation not be granted, current environment impacts may be exacerbated due to a lack of enforceable mitigation measures. Issuing an authorisation will formalise mitigation measures and EA conditions making it enforceable and subject to monitoring and measuring to ensure compliance.

- The current transportation method of waste rock to the Far West WRD needs to be addressed. Haul truck operations present a range of ongoing operational and environmental challenges, including diesel emissions, fugitive dust, loose rock spillage onto the road, traffic safety concerns, and increasing cost pressures. Tharisa needs to address these cumulative impacts and improve the long-term sustainability of waste rock management, by implementing a conveyor system as the preferred solution, resulting in a safer, cleaner, quieter, and more cost-efficient than continued truck haulage.

BASELINE ENVIRONMENT

An overview of the baseline biophysical and socio-economic environment of the proposed project at Tharisa Mine is given below. This information was obtained from the existing data presented in the approved environmental reports and specialist studies reports which were undertaken previously, for similar activities at Tharisa Mine. The data will be updated based on the specialist studies, which are currently being undertaken for the proposed project.

Environmental Aspect	Description
Geology	The Bushveld Igneous Complex (BIC), a massive intrusive body, has undergone erosion and tilting, and now emerges along the apparent boundary of a large basin measuring nearly 350km across. The BIC is comprised of eastern and western lobes, with a northern and far western extension. Additionally, a buried limb, known as the Bethal Limb, exists based on borehole intersections. All five limbs were formed approximately 2,000 million years ago. The eastern and western limbs exhibit striking similarities. This extensive complex originated when vast amounts of molten rock (magma) from the Earth's mantle ascended to the surface through vertical cracks and conduits in the crust. Upon reaching the surface, it differentiated, cooled, and solidified, resulting in a vast layered igneous body with a predominance of Chromite, thus forming the rare rock type known as Chromitite. Chromite deposits in the BIC are found as stratified layers of massive Chromitite. These significant Chromitite layers are located in the lower section of the BIC known as the Critical Zone. The Chromitite layers are categorised into three groups based on their proximity to each other. Lower Group (LG) consists of seven Chromitite layers, the MG has four main Chromitite layers, and the Upper Group (UG) contains two Chromitite layers (some sources also mention a third layer - UG3). The naming convention assigns ascending numbers to the layers within each group, starting from the bottom layer (e.g., LG1, LG2, and so on, up to UG2 at the top). This naming convention reflects the concept that the lowermost layers are considered the oldest. The Merensky Reef, situated at some distance above the UG2 Chromitite layer, is the uppermost layer of economic interest in the Critical Zone. However, the Merensky Reef is mainly composed of Pyroxenite with only a few thin chromite stringers near its base. The individual Chromitite layers can vary in width from a few centimetres to over 2 metres in localised areas, but they generally range around 1 meter in thickness, seldom exceeding 2 metres. As a general trend, the average chrome content and Cr/Fe ratio of the layers decrease as the sequence progresses upward, while the PGMs content increases. The Chromitite layers in the MG exhibit intermediate concentrations of both chrome and Platinum Group Elements (PGE) mineralisation, but there is a general decrease in grain size from the lowermost to the uppermost layers. Traditionally, chrome production primarily focused on exploiting the layers of the LG, while PGE production typically targeted the uppermost Merensky Reef and the underlying UG2 Chromitite layer from the UG. From an economic perspective, the chrome and PGE concentrations in the MG Chromitite layers are considered marginal on an individual basis.
Topography, Vegetation and Land Use	Tharisa Mine is situated on slightly undulating plains and located to the east and west of the perennial Sterkstroom River. Small sections of original vegetation remain intact on the site, although most of the site represents old, cultivated land. The major land uses of the project area as classified by the Environmental Potential Atlas of South Africa (2000) are mining and vacant/unspecified land (AGES, 2023b). Tharisa Mine is situated within the Savanna biome which is the largest biome in Southern Africa. The Savanna Biome is characterised by a grassy ground layer and a distinct upper layer of woody plants (trees and shrubs). Tharisa's operations', former land use in the area, was a mixture of farming, residential, mining, small business, and general community activities. Similar land uses still take place adjacent to the mine infrastructure and activity areas (Metago, 2008; SLR, 2014).

Environmental Aspect	Description
	Mining activities occur to the North and immediate West and East of Tharisa Mine. Amongst the mining activities is open land mostly owned by mining companies and the community of Marikana (GLYA, 2023). Immediately West of the mining area, in the MR footprint, is the Lapologang community. The predominant land cover types in the project area are listed below: • Mine: Extraction pits and quarries; • Mine: Surface infrastructure; • Mine: Tailings and resource dumps; and • Commercial Annual crops rainfed/ dryland. As a result of this, the project area may be described as significantly transformed by mining.
Climate	Tharisa Mine falls within the Highveld Climatic Zone (semi-tropical region) which is characterised by moderately warm temperatures, with mild dry winters and hot summers. The Buffelspoort weather station (Station No. 0511 855 W) is the closest station to Tharisa. Tharisa Mine typically receives the highest rainfall during the rainy season in December and January. From the data, the Mean Annual Precipitation (MAP) of the project area was calculated in other studies to be 665mm (ACS, 2024a) which is lower than the DWS Station A2E005 MAP of 753mm. The area experiences hot temperatures during summer, with a maximum of 36.4°C for October. Winter temperatures are relatively low especially in May to July, with a minimum of -2.4°C in July. Relatively high levels of evaporation occur because of the elevated solar radiation levels experienced. The maximum evaporation rate occurs in December, with a mean rate of more than 7mm per day. Evaporation is greater than rainfall for all months of the year resulting in a marked moisture deficit in the region. The average wind field is mainly from the eastern half of the wind grid with calm conditions 3.17% of the time. The daytime wind field is mainly from the north, ranging between north-west to north-east with 2.47% calm conditions. During the night, the wind field shifts to the south and south-southwest with less frequent winds from the south-westerly to north-westerly sector. The frequency of night-time calm conditions increases to 3.85%. The wind field is varied between most directions with more frequent winds from the north-eastern sector. The wind field shifts to south during autumn, with more frequent southerly winds during winter. During spring, the northerly winds increase with frequent north to north-east winds. Based on the three years of Weather Research and Forecasting (WRF) data, wind speeds exceeding 7 m/s occurred for only 3.3% of the time, with a maximum wind speed of 16.1 m/s. The average wind speed over the three years is 3.2 m/s with calm conditions (wind speeds < 1 m/s) occurring for 7.6% of the time.
Heritage/ Archaeology and Palaeontology	Tharisa Mine is located in the Central Bankeveld of the North West Province of South Africa. The Central Bankeveld is covered by older granites penetrated by younger volcanic magma which formed the series and chains of pyramid-shaped granite hills from the Pilanesberg in the north-west to Onderstepoort near Pretoria in the east. These hills, as part of the Magaliesberg valley, represent a unique ecozone characterised by grassveld, savannah veld and near wooded valleys. The region has abundant surface water supplies. The Pienaar, the Moretele, the Hex and the Apies Rivers all drain their waters into the Crocodile River. Tharisa is also located to the north of the Magaliesberg Mountain range, which is known for its rich and diverse range of heritage resources. Various Stone Age sites are scattered along the Magaliesberg and are also located within caves and rock shelters within the mountain. Rock engraving sites have been located further towards Maanhaarand and Rustenburg in the west. Blockhouses along the Magaliesberg and colonial farm homesteads are still common in Marikana and on the outskirts of Brits (Madibeng). The most abundant heritage, however, are those that date from the Late Iron Age and which are associated with the numerous Tswana chiefdoms who occupied this region during the last four centuries. The most important heritage resources discovered in the area were stone-walled settlements, graveyards, a historical village and homestead, mining heritage remains, isolated and randomly scattered stone tools, historical houses and outdated and discarded agricultural implements. There are several churches within the MRA. These churches include the African Faith Mission (AFM), Uniting Reform Church (URC), New Earth Apostolic Church (NEAC) Ts'eno Apostolic Church (TAC) and many other apostolic churches whose members assemble at various venues including private homes, schools and/or hired venues. Although no paleontological resources are expected within the MRA [According to the South African Heritage Resources Information System (SAHRIS) Paleosensitivity Geographic Information System (GIS), the project area is underlain with sediments of no fossil sensitivity], these resources are protected

Environmental Aspect	Description
Soil and Land Capability	by national legislation and must be reported to the South African Heritage Resources Agency (SAHRA) should they be identified on-site. The dominant soils at Tharisa Mine are neutral to slightly alkaline (pH of 5.2 to 7.3), which is within accepted range for good nutrient mobility. These soils tend to be saline in character. Due to the generally high clay content of the soils, the cation exchange capacity (CEC) of the soils is moderate to high. Majority of the soils within the Tharisa MRA have moderate erodibility. These soils are not that prone to erosion, but compaction and contamination of these soils require assessment and mitigation. The geology of the area includes the mafic intrusive rocks of the Rustenburg layered suite of the BIC, gabbro, norite, pyroxenite, anorthosite, shales and quartzites (Transvaal Supergroup). The land types associated with this geology are Bc, Ea and Ib. According to the land type database (Land Type Survey Staff, 1972 - 2006), the transects relevant to the project are located in the Bc 8, Ea 3 and Ib 3 land types. The Bc 8 land types are commonly characterised with the Hutton, Dundee, and Mispah soil forms with rocky areas as well as other soils also occurring in the terrain according to the Soil Classification Working Group, (2018). The Ea 3 land types are characterised with Arcadia and Oakleaf soil forms and rocky areas with also the occurrence of other associated soils occurring in the landscape. The Ib 3 land types are characterised with Hutton soil forms and rocky areas with also the occurrence of other associated soils occurring in the landscape. The Bc land types are commonly dominated plinthic catena, usually duplex and marginal soils are rare in the upper terrain. These soils have a dystrophic and mesotrophic base status. Red soils are not widespread in the landscape. The Ea land types have vertic, melanic and red structured diagnostic horizons usually undifferentiated. The Ib land types commonly have miscellaneous land classes also associated to rocky areas in the landscape.
Terrestrial Ecology (Flora and Fauna)	No Red Data List plant species or other nationally protected flora were recorded in recent surveys, and suitable habitat for such species is now absent throughout the active mining footprint. The main threats to flora remain ongoing habitat loss, proliferation of alien species, and limited opportunities for natural regeneration due to persistent disturbance and fragmentation. No species of conservation concern (SCC) or Red Data List herpetofauna were recorded in the most recent field surveys, and the lack of intact rocky outcrops or natural drainage lines has further reduced habitat suitability for sensitive species. While historical records indicated the presence of a broader range of mammals, including some SCCs, recent surveys have not confirmed the presence of any Red Data List or National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) protected mammals within the transformed mining footprint. The loss of habitat connectivity and the dominance of alien vegetation have further limited the potential for recolonisation by sensitive species. No Red-Listed or threatened bird species were recorded in recent surveys, and the lack of intact wetland or bushveld habitats has reduced the site's importance for sensitive or specialist avifauna. The remaining avifaunal community is typical of disturbed bushveld and transformed landscapes.
Aquatic Ecology	The project area falls within the Limpopo Water Management Area (WMA), the North Eastern Uplands Ecoregion, and within the A21K quaternary catchment. Desktop information for the Sub-Quaternary Reaches (SQRs) associated with the project area was obtained from the DWS (2014). The project area falls within A21K-1023 SQR associated with the Sterkstroom River. The SQR impacts and activities include large impacts from Alien Invasive Plant species (AIPs) in the riparian zone, mining, runoff/effluent from mining activities. Moderate impacts from abstraction, algal blooms, as well as bed and channel modifications, small farm dams, erosion, irrigation, runoff/effluent from urban areas, urbanisation, and vegetation removal. Small impacts from low water crossings, overgrazing and inundation. The Sterkstroom River drains into the Crocodile River which travels west, eventuating in the Limpopo River. The biomonitoring survey was undertaken twice during the 2025 operational year. The first survey was undertaken in April 2025 (wet season survey) and the second survey was undertaken in September 2025 (dry season survey). Tharisa has diligently maintained a biannual biomonitoring program since its design and inception during August 2013.
Ground water	The site's geological and hydrogeological setting consists mainly of a shallow weathered bedrock aquifer with intergranular porosity and permeability. The site groundwater occurrence is reflected by the aquifer type and highest borehole yield; however, this does not always correlate to surface lithology. According to the 1:500 000 Hydrogeological Map series 2526 Johannesburg (Barnard and Baran., 1999), the site is underlain by fractured (b3) and intergranular and fractured (d3) aquifers. The borehole yield class for the region, based on the median of the data set and excluding dry boreholes, is approximately 0.5 – 2.0 l/s. The surface lithology is characterised by quartzite and dolerite, anorthosites and pyroxenite.

Environmental Aspect	Description
	The west of the site area and the surrounding region large scale groundwater abstraction for irrigation purposes (>10 mil m³/a) was done around 1999. Since then, the water uses have changed significantly to mining and industrial activities (ACS, 2022a+b). The shallow semi-confined aquifer formed because of weathering of the norites, anorthosites, dolerite dykes and pyroxenites (i.e., regolith). Differentially weathered and fractured bedrock under the regolith, thus the aquifer is treated as a single weathered aquifer unit (SLR – Dewatering strategy, 2021). The deeper solid, fractured bedrock aquifer comprises of the fractured and faulted norites, anorthosites and pyroxenites. The intact bedrock matrix itself is assumed to have very low matrix permeability, while its effective bulk permeability is enhanced by faults and mine openings (SLR – Dewatering strategy, 2021). Most of the faults strike North West (NW) to South East (SE), with a prominent dyke structure striking West (W) to East (E). The dyke contacts are inferred to be more permeable and therefore could act as preferential flow zones for potential mass migration towards the East Pit. From geotechnical assessments conducted at Tharisa Mine, clayey and nodular ferricrete soil horizons exist which are important as they could act as a geochemical barrier for mass migration (Inroads Consulting, 2021). Eighteen (18) boreholes make up the monitoring localities for groundwater at the Tharisa mine. Four of the 18 boreholes are community (user) boreholes, and all four boreholes could be sampled during the recent quarterly period (January 2026 to March 2026). The rest of the boreholes are mine boreholes, and the majority were sampled. A sampling and analysis efficiency of 78% was achieved for the quarter. The physical groundwater quality during the quarterly period can be described as neutral and non-saline to saline and very saline. The IWUL guideline was exceeded in terms of the EC values, Ca, Mg, Na, Cl, SO₄ and NO₃-N concentrations at some of the groundwater monitoring localities sampled.
Surface Water	Tharisa is located near Marikana in the Quaternary sub-catchment A21K. The mine falls within the Lower Crocodile Secondary and Crocodile River catchment and within Limpopo WMA which was formerly the Crocodile West Marico WMA3. The Crocodile River is a major tributary of the Limpopo River (Drainage Region A) which discharges into the Indian Ocean (Mozambique). The Pienaars, Apies, Moretele, Jukskei, Hennops, Magalies and Elands rivers are all major tributaries of the Crocodile River which make up the A20 tertiary hydrological catchment with its 39 quaternary catchments. The following watercourses are located within the vicinity of the mine: • Sterkstroom River – Sterkstroom River – a perennial watercourse which flows from the Buffelspoort Dam, south of the N4, in a northerly direction through the centre of the project area. Flows within the Sterkstroom River are dependent on releases from the Buffelspoort Dam. This river originates in the headwaters of the A21K quaternary catchment, within the Magaliesberg Mountain range, and then flows through the Buffelspoort Dam (approximately 5.8 km upstream) and then traverses the mine between East and West mining pits. • On the eastern section of the Mine, are the unnamed tributaries of the Maretlwane – two non-perennial watercourses which originate in the vicinity of the eastern pit, and flow to the north then north-east to a confluence with the Maretlwane; • On the western side of the Mine property are, Unnamed tributaries of the Brakspruit – two non-perennial watercourses which originate in the north-west of the mine, and flow to the north to separate confluences with the Brakspruit; • Eastern unnamed tributaries of the Maretlwane – two non-perennial watercourses which originate to the north of TSF 2, and flow to the north then north-east to a confluence with the Maretlwane tributaries; and • Several non-perennial tributaries which originate just south of the mine and flow north, have been interrupted by the mine and have been authorised for diversion of these headwaters, to the tributaries of the Brakspruit on the west of Sterkstroom River, and to the Elandsdriftspruit on the east of Sterkstroom River through the far eastern part of the mine. The main river upstream of the project area is the Sterkstroom River, which is a source of water for the Buffelspoort Dam. The water quality of the Sterkstroom River (a tributary of the Crocodile River) must be continuously monitored to assess the impacts of the mine on water quality. This river originates in the headwaters of the A21K quaternary catchment, which then flows through the Buffelspoort Dam (approximately 5.8 km upstream) and then traverses the mine and continues towards the Crocodile River. The Sterkstroom River has an ecological category of Class C (DWS, 2014). Class C means the river system is moderately modified, and a loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged.

Environmental Aspect	Description
	Surface water quality monitoring is conducted monthly in accordance with the amended IWUL:2024 requirements as indicated in the water quality monitoring reports submitted to DWS. As detailed in the "Surface Water Quality Report" for May 2026, the general water quality of the surface water monitoring localities could be described as neutral (pH: 6.0 – 8.5) and non-saline (EC: < 70 mS/m) to saline (EC: 70 - 150 mS/m). Low and elevated nutrient concentrations were recorded for May 2026. Some of the monitoring localities recorded concentrations of nitrate (NO₃), exceeding the stipulated limits. EC, Ca, Mg, Na, Cl, SO₄, NO₃, Al and Cr did not comply with the amended IWUL: 2024 Surface Water Guidelines. EC, Ca, Mg, Na, SO₄ and NO₃ did not comply with the South African Water Quality Guidelines (SAWQG) for domestic water use guidelines. In May 2026, pH levels slightly increased across most sampled surface water localities since April 2026. EC levels and NO₃-N concentrations also slightly increased at most sites. No exceedances of the upper EC concentration limit were recorded during May 2026, whilst the lower limit was exceeded at some localities.
Air Quality	Existing sources of emissions in the region and the characterisation of existing ambient pollution concentration is fundamental to the assessment of cumulative air impacts. A change in ambient air quality can result in a range of impacts which in turn may cause a disturbance and/or health impacts to nearby receptors. The main pollutant of concern in the region is particulate matter [total suspended particles (TSP)]; PM₁₀ and PM_{2.5} resulting from vehicle entrainment on the roads (paved and unpaved surfaces), mining and smelter activities, farming activities and windblown dust from exposed surfaces, mine waste dumps and TSFs. Gaseous pollutants such as sulphur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), and carbon dioxide (CO₂) would result from vehicles, mining equipment, and processing emissions. Tharisa Mine has a dustfall monitoring network in place, which included 14 single dust buckets (June 2026) at and around the mine. The average wind field is predominately from the south and north, with calm conditions 7.6% of the time. The daytime wind field is mainly from the north, ranging between north-west to north-east with 5.1% calm conditions. During the night, the wind field shifts to the south and south-southwest with less frequent winds from the south-easterly sector. The frequency of night-time calm conditions increases to 10.3%.
Noise	Tharisa Mine is located in an area where the character of ambient noise is already affected by industrialisation and economic activity, which over time, has resulted in an increase in road traffic noise and noise generated by intensive mining activities by surrounding mines. Road traffic emanates specifically from the N4 and various secondary roads, such as the Marikana Road that runs between the East and West mining areas at Tharisa Mine. The N4 has a wide noise footprint, affecting people living within a zone of approximately 1.2 km either side of the road, while noise generated by surrounding mining activities affects communities, farmers and other third parties in the immediate surrounds. These land use types and associated activities represent perennial sources of noise in the area, such as industrial and traffic noise. Noise emissions from these anthropogenic elements (activities mentioned above) and noise emissions from natural elements such as insects, birds, weather events etc. contribute to the existing soundscape (acoustic baseline environment) of the area. Average sampled day-time noise levels are akin to those typical for urban areas with main roads and/or businesses or central business districts for the sampling locations surrounding the currently active Tharisa operations. Because there is not much difference between measured day- and night-time noise levels, night-time noise levels are more akin to those typical for industrial districts.
Visual Aesthetic	The visual character of an area is determined by considering landscape character, scenic quality, sensitivity of the visual resource, sense of place and visual receptors. Mine-related infrastructure and activities have the potential to alter the visual aspects in a project area and surrounding area. The project area is largely disturbed and is characterised by Tharisa's mining-related infrastructure and activities as well as private farming and community related activities.
Socio-Economic Environment	The project area falls within Ward 31, 32 and 45 of the Rustenburg Local Municipality, and Ward 27 of the Madibeng Local Municipality, within the BDM, North West Province. Concerning economic activities, the BDM comprises four key economic sectors, viz. mining, tourism, agriculture and manufacturing and services. Mining dominates the economy, especially PGMs, which contribute approximately 30-35% of the BDM's GDP. Agriculture contributes approximately 2.6% to the BDM's GDP, with livestock rearing, animal products, maize, sunflower, vegetables and fruits being major activities/products/crops. Manufacturing and services comprise mainly services and trade, manufacturing and construction, which collectively contribute 2.1% to the BDM's GDP. Importantly, despite the dominance of mining, the BDM has a reasonably well-spread economic base. Nevertheless, as reflective

Environmental Aspect	Description
	of the rest of South Africa, unemployment remains stubbornly high at 48.1% in 2021 (a sharp increase from 24.5% in 2012). The Rustenburg Local Municipality exhibits a diverse economy with several sectors contributing to its economic wellbeing. By value, measured as Gross Value Add (GVA), of the total GVA of R 68 billion in 2020, contributing sectors were mining (R 52.1 billion), community services (R 4.4 billion), finance (R 3.5 billion), trade (R 3.2 billion), manufacturing (R 1.4 billion), transport (R 1.4 billion), electricity (R 1.1 billion), construction (R 0.5 billion) and agriculture (R 0.4 billion). Despite the predominant importance of mining and associated downstream sectors such as mineral processing, transport and hospitality, there are other important contributing sectors to the economic well-being of the Rustenburg Local Municipality. Two such sectors are agriculture and tourism, which occupy reasonably large tracts of land, and which offer much-needed employment opportunities. According to the Madibeng Local Municipality Integrated Development Plan (IDP) Review (2026-2027), there are three primary economies i.e. agriculture, tourism and mining. The Agricultural sector, which produces food, is the biggest primary economy. Activities associated with the secondary economy include metal working, smelting, automobile production, textile production, chemical industries, engineering industries, manufacturing, energy utilities, plastic industries, packaging material and construction. Large stock and poultry abattoirs are distributed around the Municipality. Secondary economic activities are normally linked to the primary economic activity. Thus secondary activity in Madibeng Local Municipality is in alignment with agricultural processing without the exclusion of manufacturing and construction, except for the need of a fresh produce market, which is still in plans. These activities are located in Brits, along the N4 Highway as well as a lesser activity scale in Letlhabile. The tertiary sector of the economy is largely associated with service industries. This sector provides services to both the general population and businesses. Activities that are commonly associated with tertiary economy include retail and wholesale sales, transportation, distribution, entertainment, restaurants, clerical services, media, tourism, insurance, banking, healthcare and law. A vast number of shopping complexes and malls exist around Madibeng Local Municipality, and they contribute a lot to local economy through access to supply, and jobs creation.

A) POTENTIAL IMPACTS FOR THE PROPOSED WRDS AND UPGRADES/ CONVERSION OF ASSOCIATED INFRASTRUCTURE, INCLUDING IMPACTS THAT MAY CUMULATE FROM EXISTING INFRASTRUCTURE TO BE AUTHORISED

CONSTRUCTION PHASE
• Destruction and disturbance of biodiversity. • Spreading and establishment of alien invasive species. • Habitat degradation. • Riverine destruction/ fragmentation of riparian habitats. • Road mortalities of fauna/ impact of human activities onsite. • Loss and degradation of aquatic resource habitat (wetland, riparian and instream). • Displacement/loss of aquatic fauna. • Change/deterioration of the ecological status of wetlands/rivers/streams. • Air pollution (dust). • Increase in ambient noise levels. • Change to the visual environment observed by sensitive receptors. No sense of place impact. • Impacts from earthworks. • Loss of land capability. • Loss of soil resources. • Soil compaction. • Soil erosion and sedimentation of watercourses. • Contamination of surface water and sedimentation. • Alteration of drainage patterns. • Contamination of groundwater. • Disturbance of heritage and paleontological resources. • Socio Economic impacts. • Community health impacts.
OPERATIONAL PHASE

- Continued destruction and disturbance of biodiversity.
- Continued spreading of alien invasive species.
- Ongoing habitat destruction/ fragmentation of fauna habitats.
- Ongoing habitat degradation.
- Ongoing road mortalities of fauna/ impact of human activities onsite.
- Continued loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Continued displacement/loss of aquatic fauna.
- Continued deterioration of the ecological status of wetlands/rivers/streams.
- Air pollution (dust).
- Increase in ambient noise levels.
- Change to the visual environment observed by sensitive receptors. No sense of place impact.
- Loss of land capability.
- Loss of soil resources.
- Soil compaction.
- Increased soil erosion and sedimentation of watercourses.
- Contamination to surface water systems.
- Alteration of drainage patterns.
- Contamination to baseflow and groundwater systems.
- Nitrate mass migration.
- Socio Economic impacts.
- Community health impacts.

CLOSURE, REHABILITATION AND POST CLOSURE PHASE

Potential Negative Impacts:

- Spreading and establishment of alien invasive species.
- Habitat degradation.
- Road mortalities of fauna/ impact of human activities onsite.
- Loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Displacement/loss of aquatic fauna
- Change/deterioration of the ecological status of wetlands/rivers/streams.
- Air pollution (dust).
- Increase in ambient noise levels.
- Impacts from earthworks.
- Increased soil erosion and sedimentation of watercourses.
- Soil compaction.
- Contamination to surface water systems.
- Increased runoff.
- Contamination to groundwater and improvement thereof, post closure.
- Socio Economic impacts.

Potential Positive Impacts:

- Improvement of riparian habitat through revegetation/ succession over time.
- Carbon sequestration through re-vegetation.
- Improvement of land capability.
- Improvement of eroded soils and compaction.
- Land reclamation and stability.
- Improvement of the visual quality to nearby residential receptors as well as public roads.
- Improved water quality because of a fully rehabilitated environment.
- Restoration of ecosystems.
- Public safety and health.
- Economic diversification.
- Agriculture.
- Tourism and recreation.
- Renewable energy.
- Community empowerment.
- Sustainable infrastructure.

B) POTENTIAL IMPACTS FOR THE PROPOSED 275 KV REALIGNMENT AND 88KV UPGRADE

CONSTRUCTION PHASE

- Destruction and disturbance of biodiversity.
- Spreading and establishment of alien invasive species.
- Habitat degradation.
- Riverine destruction/ fragmentation of riparian habitats.
- Road mortalities of fauna/ impact of human activities onsite.
- Loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Displacement/loss of aquatic fauna.
- Change/deterioration of the ecological status of wetlands/rivers/streams.
- Air pollution (dust).
- Disturbing Noise.
- Change to the visual environment.
- Impacts from earthworks.
- Contamination and sedimentation of surface water.
- Alteration of drainage patterns.
- Socio Economic impacts, including traffic and safety related impacts.
- Disturbance of Heritage Resources.

OPERATIONAL PHASE

- Bird collision, electrocutions and faulting.
- Visual intrusion, impacting the area's rural sense of place.
- Socio Economic impacts, including traffic and safety related impacts.

CLOSURE, REHABILITATION AND POST CLOSURE PHASE

- Improvement of riparian habitat through revegetation/ succession over time.
- Spreading and establishment of alien invasive species.
- Habitat degradation.
- Road mortalities of fauna/ impact of human activities onsite.
- Loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Displacement/loss of aquatic fauna.
- Change/deterioration of the ecological status of wetlands/rivers/streams.
- Air pollution (dust).
- Increase in ambient noise levels.
- Improvement of the visual quality to nearby residential receptors as well as public roads.
- Impacts from earthworks.
- Contamination to surface water systems.
- Alteration of drainage patterns.
- Socio Economic impacts, including traffic and safety related impacts.

C) POTENTIAL IMPACTS FOR TAILINGS STORAGE FACILITY 3 SLURRY PIPELINE

CONSTRUCTION PHASE

- Destruction and disturbance of biodiversity.
- Spreading and establishment of alien invasive species.
- Habitat degradation.
- Riverine destruction/ fragmentation of riparian habitats.
- Loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Displacement/loss of aquatic fauna.
- Change/deterioration of the ecological status of wetlands/rivers/streams.
- Impacts from earthworks.
- Contamination and sedimentation of surface water.
- Alteration of drainage patterns.

OPERATIONAL PHASE

- Continued destruction and disturbance of biodiversity.
- Continued spreading of alien invasive species.
- Ongoing habitat destruction/ fragmentation of fauna habitats.
- Ongoing habitat degradation.
- Continued loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Continued displacement/loss of aquatic fauna.
- Continued deterioration of the ecological status of wetlands/rivers/streams.
- Loss of soil resources.
- Soil compaction.
- Increased soil erosion and sedimentation of watercourses.
- Contamination to surface water systems.
- Alteration of drainage patterns.

CLOSURE, REHABILITATION AND POST CLOSURE PHASE

- Improvement of riparian habitat through revegetation/ succession over time.
- Spreading and establishment of alien invasive species.
- Habitat degradation.
- Loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Displacement/loss of aquatic fauna.
- Change/deterioration of the ecological status of wetlands/rivers/streams.
- Impacts from earthworks.
- Contamination to surface water systems.
- Alteration of drainage patterns.

D) POTENTIAL IMPACTS FOR THE PROPOSED LIFTING OF THE WALLS OF TAILINGS STORAGE FACILITY 1 PHASE 2**CONSTRUCTION PHASE**

- Change in ambient concentrations.
- Increase in ambient noise level.
- Change in landscape and related visual aspects.
- Contamination to ground- and surface water systems from oil, grease, and diesel spillages from construction vehicles.

OPERATIONAL PHASE

- Establishment of alien plants on disturbed areas.
- Change in ambient concentrations.
- Increase in ambient noise level.
- Change in landscape and related visual aspects.
- Contamination to baseflow and groundwater systems.
- Contamination to ground- and surface water sources.
- Increased surface run-off and erosion from the TSF.
- Downstream sedimentation.
- Failing stormwater infrastructure.

CLOSURE, REHABILITATION AND POST CLOSURE PHASEPotential Negative Impacts:

- Change in ambient concentrations.
- Change in landscape and related visual aspects.

Potential Positive Impacts:

- Final landscaping and shaping impacts.
- Increase in ambient noise level.
- Contamination to ground- and surface water systems.

E) POTENTIAL IMPACTS FOR THE PROPOSED SALVAGE YARD**CONSTRUCTION PHASE**

- Air pollution (dust).
- Increase in ambient noise levels.
- Impacts from earthworks.
- Contamination of groundwater.

OPERATIONAL PHASE

- Increase in ambient noise levels.
- Loss of land capability.
- Contamination to groundwater systems.
- Socio Economic impacts.

CLOSURE, REHABILITATION AND POST CLOSURE PHASE

- Air pollution (dust).
- Increase in ambient noise levels.
- Impacts from earthworks.
- Contamination to groundwater and improvement thereof, post closure.
- Socio Economic impacts.

F) POTENTIAL IMPACTS FOR THE PROPOSED CONVEYOR BELT**CONSTRUCTION PHASE**

- Destruction and disturbance of biodiversity.
- Riverine destruction/ fragmentation of riparian habitats.
- Road mortalities of fauna/ impact of human activities onsite.
- Loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Displacement/loss of aquatic fauna.
- Change/deterioration of the ecological status of wetlands/rivers/streams.
- Air pollution (dust).
- Increase in ambient noise levels.
- Change to the visual environment.
- Impacts from earthworks.
- Contamination of surface water and sedimentation.
- Alteration of drainage patterns.
- Socio Economic impacts, including traffic and safety related impacts.

OPERATIONAL PHASE

- Continued loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Continued displacement/loss of aquatic fauna.
- Continued deterioration of the ecological status of wetlands/rivers/streams.
- Air pollution.
- Increase in ambient noise levels.
- Change to the visual environment.
- Alteration of drainage patterns.
- Socio Economic impacts, including traffic and safety related impacts.

CLOSURE, REHABILITATION AND POST CLOSURE PHASE

- Improvement of riparian habitat through revegetation/ succession over time.
- Spreading and establishment of alien invasive species.
- Habitat degradation.
- Road mortalities of fauna/ impact of human activities onsite.
- Loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Displacement/loss of aquatic fauna.
- Change/deterioration of the ecological status of wetlands/rivers/streams.
- Air pollution (dust).
- Increase in ambient noise levels.
- Improvement of the visual quality to nearby residential receptors as well as public roads.
- Impacts from earthworks.
- Contamination to surface water systems.
- Alteration of drainage patterns.
- Socio Economic impacts, including traffic and safety related impacts.

SPECIALISTS STUDIES

The following specialists' studies will be undertaken, for the various environmental aspects:

- Rehabilitation and Closure Plans.
- Social Impact Assessment (Including Human Rights Assessment).
- Air Quality Impact Assessment.
- Ground water (including Waste Classification, Geochemical Assessment, Water Balance and Ground Water Model).
- Surface Water Management Assessments.
- Noise Impact Assessment.
- Terrestrial Biodiversity (Fauna and Flora).
- Aquatic Ecology Impact Assessment.
- Wetland Impact Assessment including Risk Assessment, Landscape Plan with Design, including and Maintenance Plan.
- Soils, Land Use and Land Capability including Agriculture Loss.
- Hydrogeology Assessment.
- Cultural Heritage Impact Assessment.
- Traffic Impact Assessment.
- Visual Impact Assessment.

- Climate Change and Green House Gas (GHG) Assessment.

The specialists will assess the impacts (including cumulative effects) of the proposed activity/aspect in relation to the construction, operational, closure and decommissioning phases of the proposed project. The reports will detail appropriate and implementable measures to avoid, mitigate and manage the potential impacts that have been identified.

PUBLIC PARTICIPATION PROCESS

The Public Participation Process (PPP) will be undertaken in terms of Chapter 6, regulation 41 of the EIA 2014 Regulations, as amended, for the proposed project triggering listed activities under the NEMA, NEMWA and the MPRDA. MC, on behalf of Tharisa, will take into account all relevant guidelines applicable to the PPP as contemplated in section 24J of the NEMA. Notices will be given to all potential Interested and Affected Parties (I&APs) to participate in the project, as follows:

Announcement of the project and the Draft Scoping Report availability

The objectives of the PPP during the Scoping Phase are to provide sufficient and accessible information to I&APs in an objective manner to enable them to raise comments, issues of concern and suggestions for enhanced benefits. I&APs will also have an opportunity to provide input into the terms of reference (ToRs) for the specialist studies, and to contribute relevant local and traditional knowledge to the S&EIR process.

The project was announced to the public on **Friday, 14 August 2026**, by means of the placement of a newspaper advertisement and site notices. Background Information Documents (BIDs) have been distributed to I&APs to create awareness of the proposed project. The report is being subjected to a PPP of at least 30 days, and the Final Scoping Report will reflect the incorporation of comments received, including any comments from the competent and commenting authorities.

The following processes have been undertaken to announce the project and the availability of the Draft Scoping Report:

- An I&AP database has been compiled and is being maintained and includes all potential I&APs in respect of the application in accordance with Regulation 42.
- Letters are being sent to all I&APs, (written in any of the manners provided for in section 47D of the NEMA, announcing the project and the availability of the Draft Scoping Report, containing project information and a locality map) including:
 - The municipal councillor of the ward in which the site is situated;
 - Any organisation of ratepayers that represents the community in the area;
 - The municipality which has jurisdiction in the area;
 - Any organ of state having jurisdiction in respect of any aspect of the activity; and
 - Any other party as required by the CA, including adjacent communities' members.
- Affected parties of the proposed project, who cannot be reached via mail, fax or e-mail are being visited for delivery of the letters. The letters have attached sheets which allow I&APs to register and/ or/ comment on the project.
- Sixteen (16) site notice boards have been fixed at a place conspicuous to and accessible by the public at the boundary of the site where the activity to which the application relates. Site notices are written in English and Setswana.
- One (1) advertisement (translated in both English and Setswana) has been placed in the Rustenburg Herald Local newspaper.
- The Draft Scoping Report has also been made available on the MC website (<https://manyabeconsultancy.com/stakeholder-engagement/>); and at the Marikana Public Library.
- SMS notifications of the availability of the Draft Scoping Report for public comment have been distributed.
- Four (4) focus group meetings will be held with the adjacent landowners within a 5km radius; community organisations, such as: rate payers associations, Home Owner Associations (HOAs), interest groups, etc.; relevant state departments at local, district, provincial and national levels; ward councillor; Non-Government Organisations (NGOs)/ various environmental protection agencies/ bodies; and, any other

party perceived as playing a role within the community/ project area, to discuss the Draft Scoping Report and the project.

- Telephonic consultation will be undertaken with I&APs to obtain comments about the Draft Scoping Report; and to share information about the Project.

Subsequent to the 30 days' period, all comments and representations received from I&APs will be considered and recorded in the Comments and Responses Report (CRR). All I&APs who would have participated in the PPP will be thanked, and their comments acknowledged. The Draft Scoping Report is available for public comment from **Friday, 14 August 2026 to Monday, 14 September 2026**.

Invitation to focus group meetings, for the review of the Draft Scoping Report

Four (4) focus group meetings are proposed to be hosted as follows:

Venue	Date	Time
Two (2) Public meetings for the general public:		
Mmaditlhokwa Village: Open Space	08 September 2026	10:00 - 12:00
Lapologang Village: Sports Ground	08 September 2026	12:00 - 14:00
Two (2) focus group meetings to be convened online (via MS Teams) for the following groups of stakeholders:		
Service Providers Industry and Government Non-Governmental Organisations	10 September 2026	10:00 - 12:00

The proceedings of the focus group meetings, as well as all comments submitted will be captured in a CRR. The CRR will be attached to the Final Scoping Report when submitted to the DMPP for decision-making. I&APs will also be given an opportunity to verify that all their comments have been captured correctly.

CONCLUSION

This report serves to detail the outcome of the scoping assessment requirements for the proposed project. The consolidation application includes the amendment of various conditions of the EAs, WMLs and the integration of the associated EMPs into a consolidated EA, WML and EMP. For the proposed infrastructure, various alternatives have been identified, with a couple being carried through for investigation in the Impact Assessment Phase of the S&EIR process, due to the need for specialist assessment and input.

Further investigations are required to fully characterise the receiving environment as well as to investigate the potential negative and positive impacts associated with the proposed project. This Draft Scoping Report is being subjected to PPP for review by all identified I&APs. All comments received during the review of the Draft Scoping Report will be incorporated into the Final Scoping Report for submission to the DMPP for approval.

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Appendix 5: Existing Approvals

LIST OF ABBREVIATIONS

AEL	Air Emission Licence
AFM	African Faith Mission
AIDs	Acquired Immunodeficiency Syndrome
AIPs	Alien Invasive Plant species
ARL	Acceptable Risk Level
AMD	Acid Mine Drainage
Aquatico	Aquatico Scientific (Pty) Ltd
ASPT	Average Score Per Taxon
BA	Basic Assessment
BBBEE	Broad Based Black Economic Empowerment
BCM	Bank cubic metres
BDM	Bojanala Platinum District Municipality
BIC	Bushveld Igneous Complex
BID	Background Information Document
BPEO	Best Practicable Environmental Option
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act (Act No. 43 of 1983)
CBA	Critical Biodiversity Area
CCIA	Climate Change Impact Assessment
CCT	Chlorine contact tank
CD: RDM	Chief Directorate: Resource Directed Measures
CEC	Cation Exchange Capacity
COD	Chemical Oxygen Demand
CPI	Consumer Price Index
CR	Critically Endangered
CRR	Comments and Responses Report
CV	Curriculum Vitae
DACE	Department of Agriculture, Conservation and Environment
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DEDECT	Department of Economic Development, Environment, Conservation and Tourism
DFFE	Department of Forestry, Fisheries and the Environment
DME	Department of Minerals and Energy
DMPR	Department of Mineral and Petroleum Resources
DMRE	Department of Mineral Resources and Energy
DO	Dissolved Oxygen
DOL	Direct On-Line
DSR	Dam Safety Regulations
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EA	Environmental Authorisation

EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
EC	Electrical Conductivity
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EN	Endangered
ESAs	Ecological Support Areas
ETS	Ecosystem threat status
EW	Ecological Water Requirements
FAI	Fish-based index
FEPA	Freshwater Ecosystem Priority Area
FoS	Factor of Safety
FSL	Full Supply Level
GA	General Authorisation
GDEnv	Gauteng Department of Environment
GDP	Gross Domestic Product
GHG	Green House Gas
GGP	Gross Geographic Product
GIS	Geographic Information System
GISTM	Global Industry Standard on Tailings Management
GLC	Ground Level Concentration
GN	Government Notice
GNR	Government Notice Regulation
GPS	Global Positioning System
GVA	Gross value Add
ha	Hectares
HDPE	High-Density Polyethylene
HDSA	Historically Disadvantaged South Africans
HIA	Heritage Impact Assessment
HIV	Human Immunodeficiency Virus
HOA	Home Owner Association
IBAs	Important Bird and Biodiversity Areas
IBC	Intermediate Bulk Containers
ICOLD	International Commission on Large Dams
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IFC	International Finance Corporation
IPAP	The Industrial Policy Action Plan
ISSA	Information Security for South Africa
IUA	Integrated Units of Analysis
IUCN	Union for Conservation of Nature
IWWMP	Integrated Water and Waste Management Plan
IWUL	Integrated Water Use Licence
I&APs	Interested and Affected Parties
LC	Least Concern
LCT	Leachable concentrations thresholds
LED	Local Economic Development
LG	Lower Group
LoM	Life of Mine
MAP	Mean Annual Precipitation
MAR	Mean Annual Runoff
MC	Manyabe Consultancy (Pty) Ltd
MEC	Member of the Executive Committee
MG	Middle Group
MHSA	Mine Health Safety Act, 1996 (Act No. 29 of 1996)
MP	Moderately Protected
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MR	Mining Right
MRA	Mining Right Area

MTP	Medium-term plan
NAAQSS	South African National Ambient Air Quality Standards
NBA	National Biodiversity Assessment
NCDs	Non-Communicable Diseases
NDCR	National Dust Control Regulations
NDP	National Development Plan
NEAC	New Earth Apostolic Church
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMAQA	National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)
NEMPAA	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NERSA	National Energy Regulator of South Africa
NFA	National Forestry Act, 1998 (Act No. 84 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas
NGO	Non-Government Organisation
NGP	National Growth Path
NHRA	National Heritage Resources Act, 1999 (Act No. No 25 of 1999)
NOC	Non-overspill crest
NP	Not Protected
NPAES	National Protected Area Expansion Strategy
NSRs	the Noise Sensitive Receptors
NSSD	National Strategy for Sustainable Development
NWA	National Water Act, 1998 (Act No. 36 of 1998)
NWBSP	North West Biodiversity Sector Plan
NWREAD	North West Department of Agriculture, Conservation, Environment and Rural Development
OG	Above Ground
OHS Act	Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
PACs	Potentially Affected Communities
PACAs	Protected Areas and Conservation Areas
PCBs	Polychlorinated biphenyls
PCD	Pollution Control Dam
PES	Present Ecological State
PGE	Platinum Group Elements
PGM	Platinum Group Metals
PHRA	Provincial Heritage Resources Agency (
PLC	Public Limited Company
POPIA	Protection of Personal Information Act, 2013 (Act No. 04 of 2013)
PP	Poorly Protected
PPE	Personal Protective Equipment
PPP	Public Participation Process
REC	Recommended Ecological Category
RO	Reverse Osmosis
RoM	Run of Mine
RQOs	Resource Quality Objectives
RWB	Rand Water Board
SACNASP	South African Council for Natural Scientific Professions
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAIIAE	South African Inventory of Inland Aquatic Ecosystems
SANRAL	South African National Roads Agency Limited
SANS	South African National Standards
SACAD	South Africa Conservation Areas Database
SAPAD	South Africa Protected Areas Database
SAPS	South African Police Services
SASS	South African Scoring System
SAWQG	South African Water Quality Guidelines
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SDP	Site Development Plan
SEP	Stakeholder Engagement Plan
SLP	Social and Labour Plan
SME	Small and Medium Enterprise

SMME	Small, Micro and Medium Enterprises
SPL	Sound pressure level
SPLP	Synthetic Precipitation Leaching Procedure
SPLUMA	Spatial Planning and Land Use Management Act, 2003 (Act No. 16 of 2013)
SQRs	Sub-Quaternary Reaches
SWMP	Stormwater Management Plan
SWSA	Strategic Water Source Areas
S&EIR	Scoping and Environmental Impact Reporting
TAC	Ts'enolo Apostolic Church
TB	Tuberculosis
TBC	The Biodiversity Company
Tharisa	Tharisa Minerals (Pty) Ltd
The Constitution	Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)
ToRs	Terms of Reference
TSF	Tailings Storage Facility
TSP	Total Suspended Particles
TUT	Tshwane University of Technology
UG	Upper Group
UNFCCC	United Nations Framework Convention on Climate Change
UNISA	University of Southern Africa
URC	Uniting Reform Church
US EPA	United States Environmental Protection Agency
VTSD	Villages, Townships, and Small Dorpies
VU	Vulnerable
WMA	Water Management Area
WML	Waste Management Licence
WP	Well Protected
WRC	Water Research Commission
WRCS	Water Resource Classification System
WRD	Waste Rock Dump
WRF	Weather Research and Forecasting
WUL	Water Use Licence
WULA	Water Use Licence Application
WWTP	Waste Water Treatment Plant
Zol	Zone of Influence

ABOUT THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

MC is a 100% black female owned entity which offers sustainable development solutions to both public and private sectors, including parastatals. The company was founded in 2014 by the Managing Director, Mpho Manyabe. MC seeks to maintain its strategic position in the Environmental Management Services sector by providing service of excellence to its clients. This is achieved by providing: a professional and efficient service; the highest possible level of customer care; the highest ethical and moral principles in our actions, words and thoughts; and the highest possible level of integrity.

The objective of MC is to create an environment in which enthusiastic, highly skilled and motivated professionals seek professional opinions for contribution to the environmental, social and economic development in South Africa. MC currently has a turnover of less than R10 million rand and is a Level 1 contributor with 135% Broad Based Black Economic Empowerment (BBBEE) procurement.

Mpho Manyabe: BSc Honours in Environmental Management, University of South Africa (UNISA), 2016; National Diploma Environmental Sciences, Tshwane University of Technology (TUT), 2008

Mpho Manyabe currently holds a BSc Honours Degree in Environmental Management from the University of South Africa (UNISA); and National Diploma in Environmental Sciences, from Tshwane University of Technology (TUT), 2008. She has eighteen (18) years of work experience in the field of Environmental Management from different consulting companies.

She was previously nominated to be in the Gauteng Department of Environment (GDEnv) EIA EAP committee which was launched on 31 March 2015 comprising of EAPs and GDEnv officials to provide quarterly reports to the Executive Authority (Member of the Executive Committee (MEC)) on issues identified as blockages to the improved efficiencies the department seeks to achieve.

She was also a member of the Academic Advisory Committee for the Environmental Science programme in the Department of Environmental, Water and Earth Sciences in the Faculty of Science at the TUT, to serve for a period of three (3) years, where she assisted with preparation and provision of relevant, high quality teaching and learning content for students. She was identified based on her expertise in the field of Environmental Sciences/ Management to make a positive contribution to what TUT was offering students in terms of course content and on how to better run programs to the benefit of students. She is registered with South African Council for Natural Scientific Professions (SACNASP) as a Professional Natural Scientist, and she is also a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA).

She is the Lead EAP on the project.

Please refer to Appendix 4 for the EAP Curriculum Vitae (CV).



Managing Director: Mpho Manyabe

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SECTION 1: PROJECT INTRODUCTION AND BACKGROUND

Tharisa Minerals (Pty) Ltd (Tharisa), a subsidiary of Tharisa Public Limited Company (PLC), operates an opencast mining operation that produces chrome and Platinum Group Metals (PGM) concentrate located on Farms K/Kraal 342 JQ, Rooikoppies 297 JQ and Elandsdrift 467 JQ, south of Marikana in the Northwest Province.

Tharisa holds existing Environmental Authorisations (EAs) and licences under the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA), the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended (NEMA), the National Environmental Management: Waste Act, 2008 (Act. 59 of 2008) (NEMWA) and the National Water Act, 1998 (Act. No 36 of 1998) (NWA) for the mining of the East, West and Far West open pits.

Tharisa Mine has been in operation since November 2009, having an initial Mining Right (MR) (49/2009) effective 19 September 2008, issued on 13 August 2009 by the then the Department of Minerals and Energy (DME). Tharisa subsequently applied for an amendment of the MR with the Reference Number: NW/30/5/1/2/2/358 MR, stamped 28 July 2011. This MR was however only registered in 2016. Please refer to Figure 30 for a map of the existing Mining Right Area (MRA).

Tharisa is in the process of acquiring the required authorisations to undertake underground mining at East and West pits, within the existing approved MR boundary. The application for the proposed underground mining activities is not applicable for this application for consolidation.

Tharisa is proposing to undertake an Integrated EA and Waste Management Licence (WML) for new activities proposed to be conducted for future proofing the mining operation, incorporating additional properties into the approved Tharisa MR boundary; and the consolidation of the existing Environmental Management Programmes (EMPs), EAs and WMLs into a single Environmental Impact Assessment (EIA)/ EMP (hereunder referred to as the proposed project). The proposed project requires approval (Integrated EA and WML), and amendment to the existing EMPs, and thus the reason for the application.

Manyabe Consultancy (Pty) Ltd (hereafter referred to as MC) has been appointed by Tharisa as the Independent Environmental Assessment Practitioner (EAP) to undertake the proposed project in terms of the MPRDA, NEMA, NEMWA and NWA. The competent authority (CA) for the above-mentioned application is the North West Department of Mineral and Petroleum Resources (DMPR).

A Water Use Licence Application (WULA) process is concurrently being undertaken for the various activities occurring within the mine which are listed as water uses under Section 21 of the NWA. The CA for the WULA is the North West Department of Water and Sanitation (DWS).

1-1 DETAILS AND EXPERTISE OF THE APPOINTED EAP

Below are the details of the appointed independent EAP. For the expertise of the EAP, please refer to Appendix 4 for a Curriculum Vitae (CV).

EAP Name	Tel	Email	Qualifications
Mpho Manyabe	011 863 1079	mpho@manyabeconsultancy.com	BSc Honours in Environmental Management, UNISA, 2016. National Diploma Environmental Sciences, TUT, 2008 SACNASP Registered Scientist: Reg No. 117719 EAPASA Registered EAP: Reg No. 2019/700

1-2 THARISA DETAILS

Contact Person	Mr. Tebogo Matsimela
----------------	----------------------

Designation	Group ESG Manager
Email Address:	tmatsimela@tharisa.com
Telephone Number:	+2714 572 0700
Tharisa Mine Physical Address	Portion 84, Farm 342-JQ, Marikana, 0284, South Africa

1-3 PURPOSE OF THE DRAFT SCOPING REPORT

This Draft Scoping Report has been compiled in terms of Appendix 2 of the NEMA EIA Regulations of 2014, as amended, as well as the requirements of the Scoping Report template issued by the DMPP. All comments received during the review of the Draft Scoping Report will be incorporated into the Final Scoping Report for submission to the DMPP, for decision making.

A summary of the requirements of a scoping report including cross-references to sections in this report where these requirements have been addressed is provided in Table 1.

Table 1: Content of the Draft Scoping Report as per Appendix 2, Government Notice Regulation (GNR.) 982, as Amended

Content of the Draft Scoping Report	Section of this Draft Scoping Report Complying to the Regulations
(a) Details of – (i) The EAP who prepared the report and (ii) The expertise of the EAP, including a CV.	Section 1-1 and Appendix 4
(b) The location of the activity, including – (i) The 21-digit Surveyor General code of each cadastral land parcel (ii) Where available, the physical address and farm name (iii) Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	SECTION 2:
(c) A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is – (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken or (ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	Appendix 1
(d) A description of the scope of the proposed activity, including – (i) All listed and specified activities triggered (ii) A description of the activities to be undertaken, including associated structures and infrastructure.	SECTION 2:
(e) A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.	SECTION 3:
(f) A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.	SECTION 4:
(g) A full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including -	SECTION 6:
(i) details of the alternatives considered.	SECTION 6:
(ii) details of the Public Participation Process (PPP) undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs.	SECTION 7: and SECTION 16:
(iii) a summary of the issues raised by Interested and Affected Parties (I&APs), and an indication of the manner in which the issues were incorporated, or the reasons for not including them.	N/A
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	SECTION 8: and SECTION 11:
(v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts – (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated.	SECTION 9:
(vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives.	SECTION 10:
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	SECTION 11:

Content of the Draft Scoping Report	Section of this Draft Scoping Report Complying to the Regulations
(viii) the possible mitigation measures that could be applied and level of residual risk.	SECTION 12:, 15-8 and SECTION 17:
(ix) the outcome of the selection matrix.	SECTION 12:
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for no considering such.	SECTION 13:
(xi) a concluding statement indicating the preferred alternatives, including preferred locations of the activity.	SECTION 14:
(h) a plan of study for undertaking the EIA process to be undertaken, including –	SECTION 15:
(i) A description of the alternatives to be considered and assessed within the preferred site.	SECTION 15:
(ii) A description of the aspects to be assessed as part of the EIA process.	SECTION 15:
(iii) Aspects to be assessed by specialists.	SECTION 15:
(iv) A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists.	SECTION 15:
(v) A description of the proposed method assessing duration significance.	SECTION 15:
(vi) An indication of the stages at which the CA will be consulted.	SECTION 15:
(vii) Particulars of the PPP that will be conducted during the EIA process.	SECTION 16:
(viii) A description of the tasks that will be undertaken as part of the EIA process.	SECTION 16:
(ix) Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	SECTION 17:
(i) An undertaking under oath or affirmation by the EAP in relation to – (i) The correctness of the information provided in the report (ii) The inclusion of comments and inputs from stakeholders, I&APs (iii) Any information provided by the EAP to I&APs and any responses by the EAP to comments or inputs made by interested or affected parties.	SECTION 20:
(j) An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and I&APs on the plan of study for undertaking the EIA.	SECTION 20:
(k) Where applicable, any specific information required by the CA.	SECTION 18:
(l) Any other matter required in terms of section 24(4)(a) and (b) of the Act.	SECTION 19:

SECTION 2: DESCRIPTION OF THE SCOPE OF THE ACTIVITY

The project will focus on three main parts which will include:

- **Part 1:** The consolidation and amendment of the various EAs, WMLs and EMPs granted to the Tharisa Mine.
- **Part 2:** Incorporation of additional properties into the approved Tharisa MR; and
- **Part 3:** Obtaining relevant EAs, WMLs and EMPs for the operation of proposed activities to be conducted to future proof the mining operation.

A single application for Part 1, 2 and 3 is being made to the regulatory departments to avoid the need for multiple reports and decisions being made by the CAs. Therefore, one application is being made to the DMPR [formerly the Department of Mineral Resources and Energy (DMRE)] and one application to the DWS for decision making.

In summary, prior to the commencement of the proposed project, the following will be required:

- An amended and consolidated EMP issued by the DMPR in terms of Section 102 of the MPRDA, as amended.
- An EA issued by the DMPR in terms of the NEMA for activities in Listing Notice 1 GNR. 983 of 2014, as amended]; Listing Notice 2 (GNR. 984 of 2014, as amended) and Listing Notice 3 (GNR. 985, as amended).
- A WML issued by the DMPR in terms of the NEMWA for activities in Categories B and C (GNR. 921 of 2013); and
- An Integrated Water Use Licence (IWUL) issued by the DWS in terms of Section 21 of the NWA.

A single EIA and EMP will be compiled to:

- Consolidate the various EMPs and approvals (EAs and WMLs) currently applicable to the mine;
- Issue an EA for the operation of proposed activities to be conducted to future proof the mining operation; and
- Incorporate additional properties into the approved Tharisa MR.

Additionally, the IWUL to be issued by the DWS will consolidate all the approved water uses for all activities being undertaken within the mine, and new activities proposed to be conducted for future proofing the mining operation. It will also ensure that the errors that have been found on the 17 September 2024 are also corrected. A single Integrated Water and Waste Management Plan (IWWMP) will therefore be compiled.

2-1 EXISTING PROJECT INFRASTRUCTURE

Mining at Tharisa Mine is undertaken using conventional open pit truck and shovel methods. The two (2) mining sections (East and West) are separated by a tributary of the Sterkstroom River and the D1325 (Marikana Road). Waste rock from the open pit areas is stockpiled in various Waste Rock Dumps (WRDs) while tailings from the processing plants are disposed of on Tailings Storage Facilities (TSFs). Some in-pit dumping of waste rock has taken place at East Mine.

The following infrastructure is utilised and located on the Tharisa Mine as shown in Figure 1. A more detailed description is provided in the sections below:

- Opencast Pits:
 - East Pit
 - West Pit
 - Far West Pit
- Run of Mine (RoM):
 - RoM Pad

- External RoM Chromite Ore Loading Area
- Processing Plants and associated infrastructure:
 - Genesis Processing Plant
 - Includes all associated infrastructure, including crushing (dry) and processing (wet)
 - Voyager Processing Plant
 - Includes all associated infrastructure, including crushing (dry) and processing (wet)
 - Vulcan (Scavenger) Processing Plant
 - Including all associated infrastructure
 - Parking areas
 - AECI-Hydrocarbon storage silos and tanks
 - Material storage areas
- Product Stockpiles:
 - Chromite Ore Loading Facility 1
 - Chromite Ore Loading Facility 2
- WRDs:
 - West WRD
 - Far West WRD
 - Far West Above Ground (OG) WRD
 - East OG WRD
 - Eastern WRD 1 (Choppies WRD)
 - Eastern WRD 2 (Wonderkop WRD)
 - TSF 2 East WRD 1 and 2
 - TSF 3 WRD Extension 1
- TSFs:
 - TSF 1 Phase 1 including support infrastructure
 - TSF 1 Phase 2 including support infrastructure
 - TSF 2 Phase 1 including support infrastructure
 - TSF 2 Phase 2 including support infrastructure
 - TSF 3 including support infrastructure
- Pollution Control Dams (PCDs):
 - Hernic Quarry
 - Process Water PCD
 - Stormwater Dam
 - Rail Loop Buffer Dam
 - Raw Water Dam
 - Community Dam
 - MCC Dam (to be upgraded/ formalised)
 - Zinc Dam 1 and Zinc Dam 2
 - Silt Traps
- Water conveyance and treatment:
 - Process water pipelines (from PCDs to plants)
 - Return water pipelines (from TSFs back to processing plants)
 - Waste Water Treatment Plant (WWTP)
 - Reverse Osmosis (RO) Plants
 - Wash bays at all processing plants
- Stormwater systems:
 - Stormwater channels / canals / berms
 - Clean and dirty water separation infrastructure
 - Stormwater culverts and crossings
- Storage Areas:
 - Hydrocarbon/Chemical Storage Areas;
 - Salvage Yard
 - Explosives Magazine Storage Area
 - Explosive Silos
 - Waste Storage Areas (Hazardous and General)
 - Waste Tyre Storage Area
- Support Infrastructure:
 - Mine offices, visitors' parking, security, change houses, access control facilities, Mine Training Centre, Personal Protective Equipment (PPE) stores, tuck stops, store warehouses and clinic
 - Borrow Pit
 - Haul Roads, overpass bridges and access roads
 - Topsoil Stockpiles

- | |
|---|
| <ul style="list-style-type: none">○ Powerlines (275 and 88 kV) and substations (Eskom and Tharisa)○ Weighbridge○ Laydown areas and workshop |
|---|

A network of roads exists in and around Tharisa Mine which include:

- | |
|--|
| <ul style="list-style-type: none">• N4;• P2-4 (Old N4);• D2565 – a gravel road in the far western section of the area;• D1526/1566 - the main gravel road servicing the western part of the area;• D1325 – Marikana Road;• D108 – road between Marikana and Rustenburg;• Internal Lonmin tarred road to the north of the area, that runs east – west;• D1270 – a gravel road linking the eastern part of the area with Mooi-nooi; and• Various unnamed, private gravel/dirt roads. |
|--|

The mine is accessed via the D1325 Marikana road. Tharisa operates haul roads around the mine to access the opencast mining areas and transfer of ore around the mine. These haul roads change as the mine expands. A main bridge has been established that crosses the Sterkstroom River and links the East and West opencast mining areas.

A 275 kV powerline and associated Eskom servitude cross through the eastern part of the mining area in a north-south direction. Smaller rural power and telephone lines currently service the residential areas within the western and eastern sections of the project area. Infrastructure (pipes and canals) associated with the Buffelspoort Irrigation Board traverses various sections of the project area in a south-north direction (refer to Figure 1).

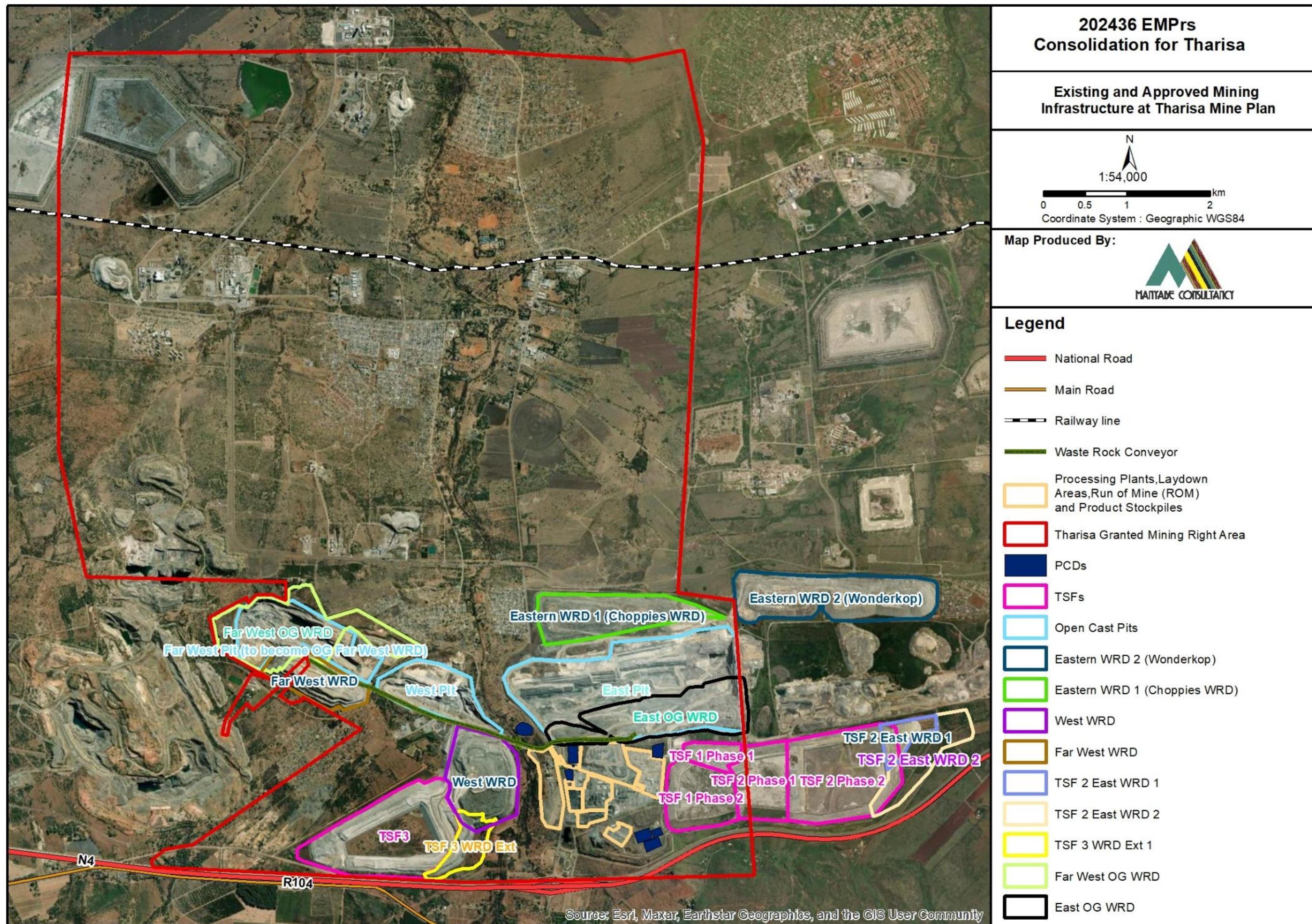


Figure 1: Existing and Approved Mining Infrastructure at Tharisa Mine

2-1.1 Opencast Pits

Tharisa Mine undertakes opencast mining through three active open pits: the Far West Pit, West Pit, and East Pit (Figure 2). Mining is performed using conventional truck-and-shovel methods to the economic limit of the Middle Group (MG) Chromitite Reefs (MG1, MG2, MG3, MG4, MG4A and MG4B).

The East and West mining sections are separated by both:

- a tributary of the Sterkstroom River, and
- the D1325 (Marikana Road).

Mining access to the pit faces is established via boxcuts, ramp systems, and hauls roads that connect to the broader mine haul-road network and overpass crossings. The general mining direction is northwards in all pits.

The steady state pit geometries differ due to orebody dip variations:

- West Pit: ~360 m wide; ~1 km strike length; ~180 m final highwall.
- East Pit: ~580 m wide; ~1 km strike length; ~180 m final highwall.

All topsoil is stripped prior to drilling and blasting and stored in designated topsoil stockpiles located along the low-wall/outcrop sides. Topsoil stockpile positions are updated annually as part of closure cost provisions. Drilling and blasting are undertaken in accordance with the mine's blast design to manage airblast, ground vibration, and fly-rock risks. Waste rock and ore are blasted together.

The removal of overburden and waste rock is conducted using large load-and-haul equipment, with waste material transported to the designated WRDs or used for in-pit backfilling, particularly in the East Pit where in-pit waste placement has historically occurred. Overburden and waste rock are used for concurrent rehabilitation, including the backfilling of mined-out voids. Ore is hauled to the RoM pad and stockpiled according to ore type prior to processing.

Planned monthly extraction volumes, based on the Mine's Medium-Term Plan (MTP), are shown in Table 2, confirming that most mining activity is concentrated in the East Pit. Concurrent rehabilitation is undertaken throughout the mining cycle. Backfilled areas are shaped to final contours, topsoiled, and revegetated once differential settlement has stabilised.

Table 2: Approximate Planned Volumes of Material Mined as per the Mine's MTP

Pit	Far West	West	East	Total
Ore tonnes per month	30,000	17,000	379,000	426,000
Bank cubic metres (BCM) of waste per month	233,000	65,000	1,200,000	1,498,000

Rehabilitation is concurrent with mining. Waste rock/overburden is used to backfill voids where required. Overburden material is used to cater for any settlement. Once the backfill material has settled, topsoil is placed on top of the overburden and vegetation is re-established.

2-1.2 Processing Plants

The Mine produces chromite (FeCr_2O_4) ore concentrate, and PGM ore concentrate from the chromite-rich seams of the Bushveld Complex Middle Critical Zone. The ore containing gangue (i.e., unwanted) material is delivered from the pits to one of the RoM blending pads. The plant capacities are provided in Table 3.

Table 3: Plant Capacities

Plant	Genesis	Voyager	Vulcan
Throughput (tonnes/month)	117 000	350 000	325 000

Tharisa's three independent processing plants are designed to treat five (5) MG Chromitite Layers of the Bushveld Complex, namely MG1, MG2, MG3, MG4, MG4A and MG4B. The plants have a similar process flow that includes crushing and grinding, primary removal of chrome concentrate by spirals, followed by PGM flotation from the chrome tails and a second spiral recovery of chrome from the PGM tails. The tails from these plants are processed further in the fine-chrome recovery plant (Vulcan), before deposition of final tails to the TSFs. The target production figures for the plants are approximately 15 000 tonnes of PGM concentrate per month; and approximately 125 000 tonnes of chrome concentrate per month.

Chrome is dispatched to Richards Bay/ Maputo via the Pendoring Railway siding and/or the N4. PGM is dispatched to smelters in the region.

The layout of the processing plants at the Mine is shown in Figure 3 below.

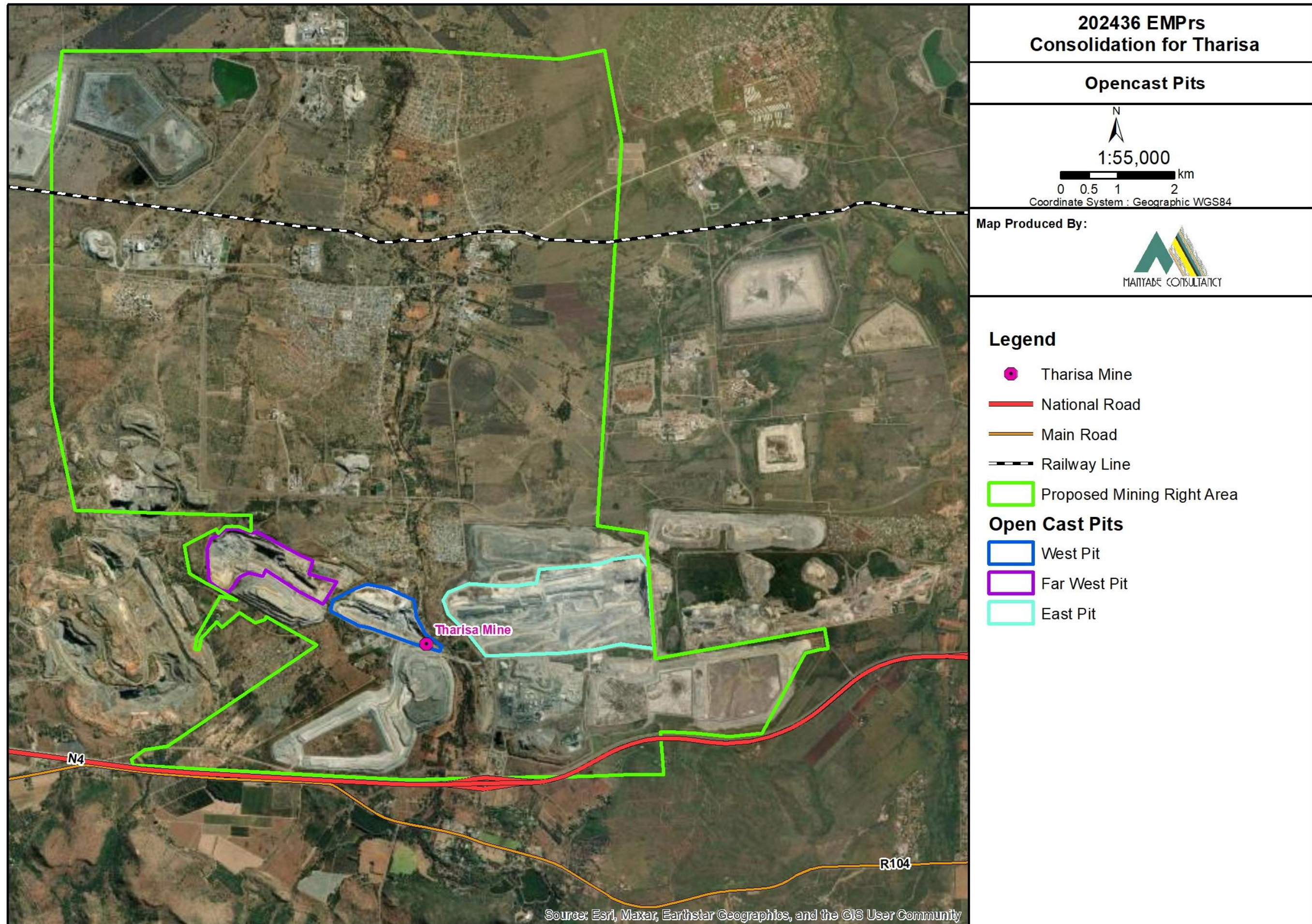


Figure 2: Opencast Pits

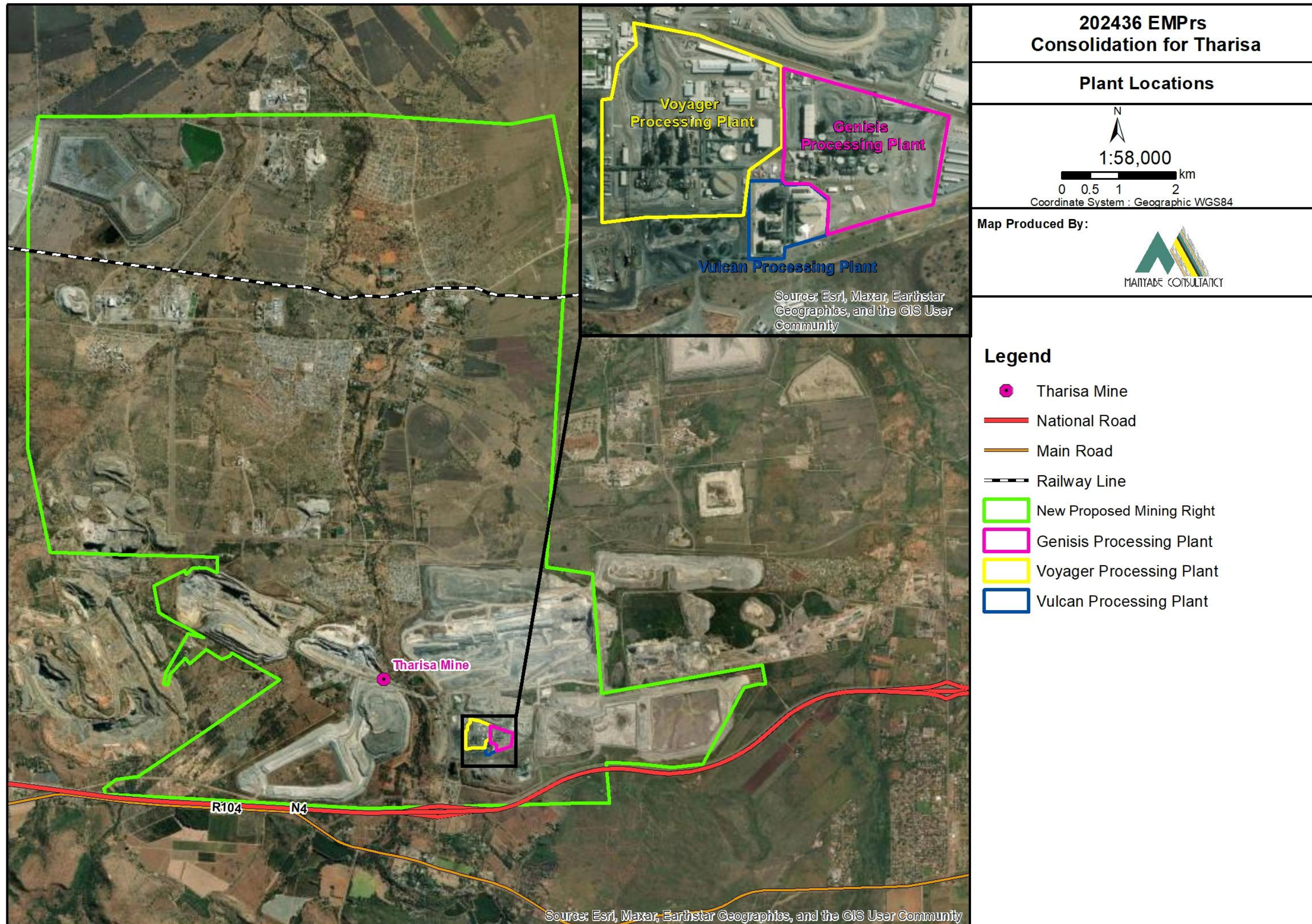


Figure 3: Processing Plants Locality

2-1.2.1 Genesis and Voyager Processing Plant

The Genesis Plant and Voyager Plant receive the RoM ore from the pits. The planned feed grade into the Genesis Plant is 19.8% chromite with 0.78g/t 3 Platinum Group Elements (PGE)+Au, whilst the planned feed grade for the Voyager Plant is 18.0% chromite with 1.35 g/t 3PGE+Au.

RoM material is crushed (Figure 4) from 500mm in top size to 20mm at Voyager and 12mm at Genesis and stored on stockpiles. The crushed material is transported via a conveyor into semi-autogenous mills that contain 70mm steel grinding media whereby the material particles are reduced in size to below 0,8mm. Also at the milling stage, the material is made into a pulp by adding water.

The chromite that is well liberated from gangue material and in pulp/slurry form, is pumped to the spirals circuit (Figure 5). As the slurry flow in each spiral, the material with higher density will form a concentrate stream/band near the centre column of the spiral and can be separated from the gangue in the product box of each spiral. This process in a spiral is repeated multiple times at various spiral stages to produce saleable chromite concentrate (+40% Cr₂O₃).

The tailings of the spiral circuit contain chromite and PGMs that are not well liberated. The spirals circuit tailings are pumped to the secondary milling section, with ball mills containing 30mm steel grinding media, for further breaking down of the particles to sub 75micron (0,075mm). Chemicals are added to the slurry and adsorbed onto the surface of PGM particles and render the particle non-polar. The addition of air into the slurry forms tiny air bubbles to which the non-polar particles attach to and float to the top of each flotation cell. This floatation process is repeated multiple times at various floatation stages to produce saleable PGM concentrate (+100g/tonne). The well liberated chromite that remain in the floatation tailings is pumped to a spiral circuit where through density classification in the spirals, saleable chromite concentrate is produced.



Figure 4: Voyager Crushing Plant



Figure 5: Spirals for Chromite Ore Concentration

The ore concentration processes are illustrated in Figure 6.

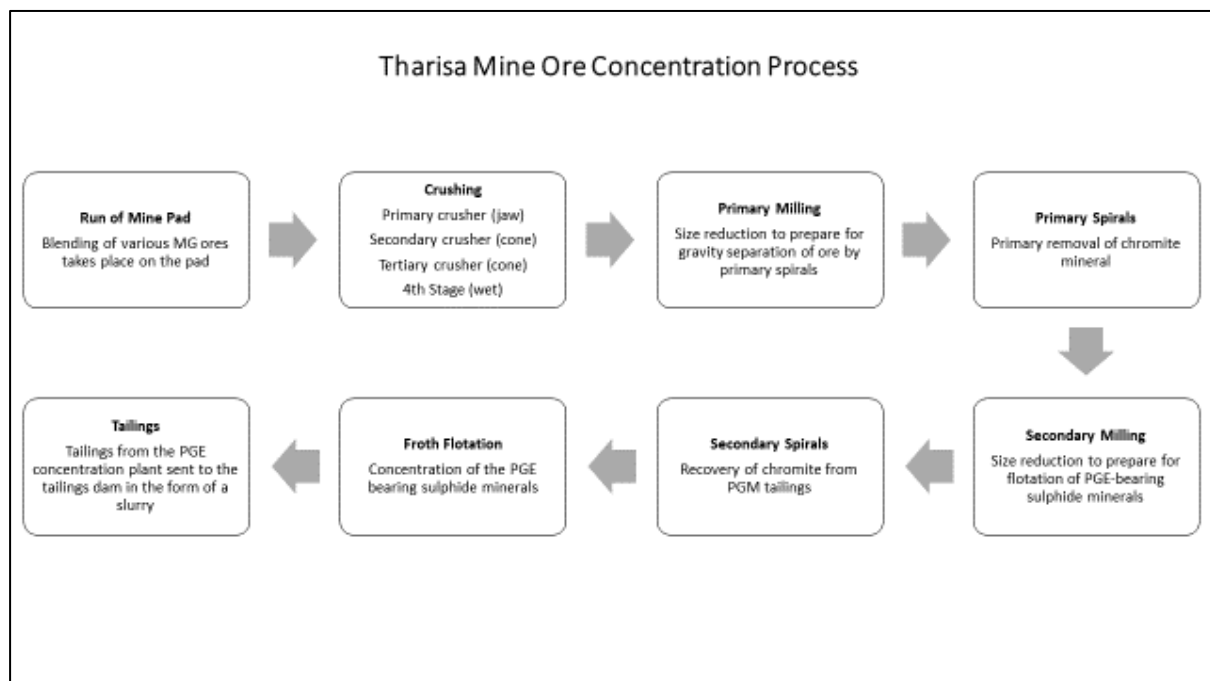


Figure 6: Schematic Illustration of the Ore Concentration Process at the Mine

2-1.2.2 Vulcan (Scavenger) Processing Plant

The tailings of the Genesis and Voyager Plants are combined and pumped to the Vulcan plant where fine chromite particles (-53micron or -0,053mm) are recovered in the spirals circuit. The middlings streams of the spiral circuit are sent to the magnetic separation circuit where material fall onto a thin angled conveyor with permanent magnets underneath. The chromite particles, contain iron and is

ferromagnetic, adhere onto the thin conveyor and get discharged on the product side. The Spiral tailings streams are sent out to the final tailings of the whole Vulcan process. The products of the spirals and magnets circuits are pumped to the shaking tables where with a consistent and directional motion of the table, the chromite with higher density than the gangue, a concentrate forms and discharge at the product side of the table.

The tailings of the Vulcan plant, with all the liberated chromite and PGMs removed, is thickened and pumped to the TSF.

2-1.3 Product Stockpiles

The Mine produces two final products, a chromite concentrate and a PGE-rich sulphide concentrate. Neither product can be considered to be in the final form. The chromite is still in the mineral form (FeCr_2O_4), whilst the PGE-rich sulphide is a concentrate of the PGE-bearing sulphides. These are chalcopyrite (CuFeS_2), pentlandite ($(\text{Fe}, \text{Ni})_9\text{S}_8$), pyrrhotite (Fe_{1-x}S ($x = 0$ to 0.2)) and pyrite (FeS). No metals are recovered from these minerals at the Mine.

Figure 7 and Figure 8 show the concentrated chromite that is sold to the customers. There are three main grades of chromite concentrate which are mainly foundry, chemical and metallurgical grades. The differences in grade are determined by where the product was obtained in the concentration process, rather than specifically altering the product to meet the customers' specifications. The foundry grade is about 45% FeCr_2O_4 with <1% Si, and the chemical grade has the same specifications but is finer. This is obtained after the secondary milling and the secondary spirals. The final product, the metallurgical grade is about 41.5% FeCr_2O_4 with about 4% Si. Figure 9 shows the final PGE-rich sulphide concentrate.



Figure 7: Concentrated Chromite



Figure 8: Concentrated Chromite



Figure 9: PGE-Rich Sulphide Concentrate

Tharisa chromite products are stockpiled for a minimum of 3 days to allow water to drain out. The typical moisture content of the stockpiles before loading is less than 5% by weight. The water that drains from the stockpile is recycled within the process. Tharisa PGM product is filtered by using a hydraulic filter press and stockpiled in an enclosed area with no additional drying processes taking place. The typical moisture content of the stockpiles is 17% by weight.

Tharisa stores about 120 000t of chromite product and 250t of PGM product each month. The maximum storage capacity is 300 000t chromite product and 2000t PGM product. Two Chromite Ore Loading Facilities are utilised to store the product from the processing plant (refer to Figure 10). Chromite product is deposited wet onto the loading facilities and then transported from site via trucks covered with tarpaulin to prevent material being blown away by wind.

Product is transported via 30-tonne trucks with an estimated rate of 320trucks/day for chrome concentrate and 8trucks/day for PGM. Chrome is dispatched to Richards Bay/ Maputo via the Pendoring Railway siding and/or the N4. PGM is dispatched to smelters in the region.

2-1.4 Waste Rock Dumps

During the opencast mining process, waste rock is removed from the pit and stockpiled on various WRDs. This material will be either permanently stored on the WRDs or utilised for rehabilitation as the mine progresses (concurrent rehabilitation) and at closure of the mine. Tharisa has nine approved WRDs located at their mine which are in different stages of use. Some of the WRDs have reached their capacity and are thus no longer utilised while others are still active. A description of all the approved WRDs located at the mine is provided below. Refer to

Figure 11.

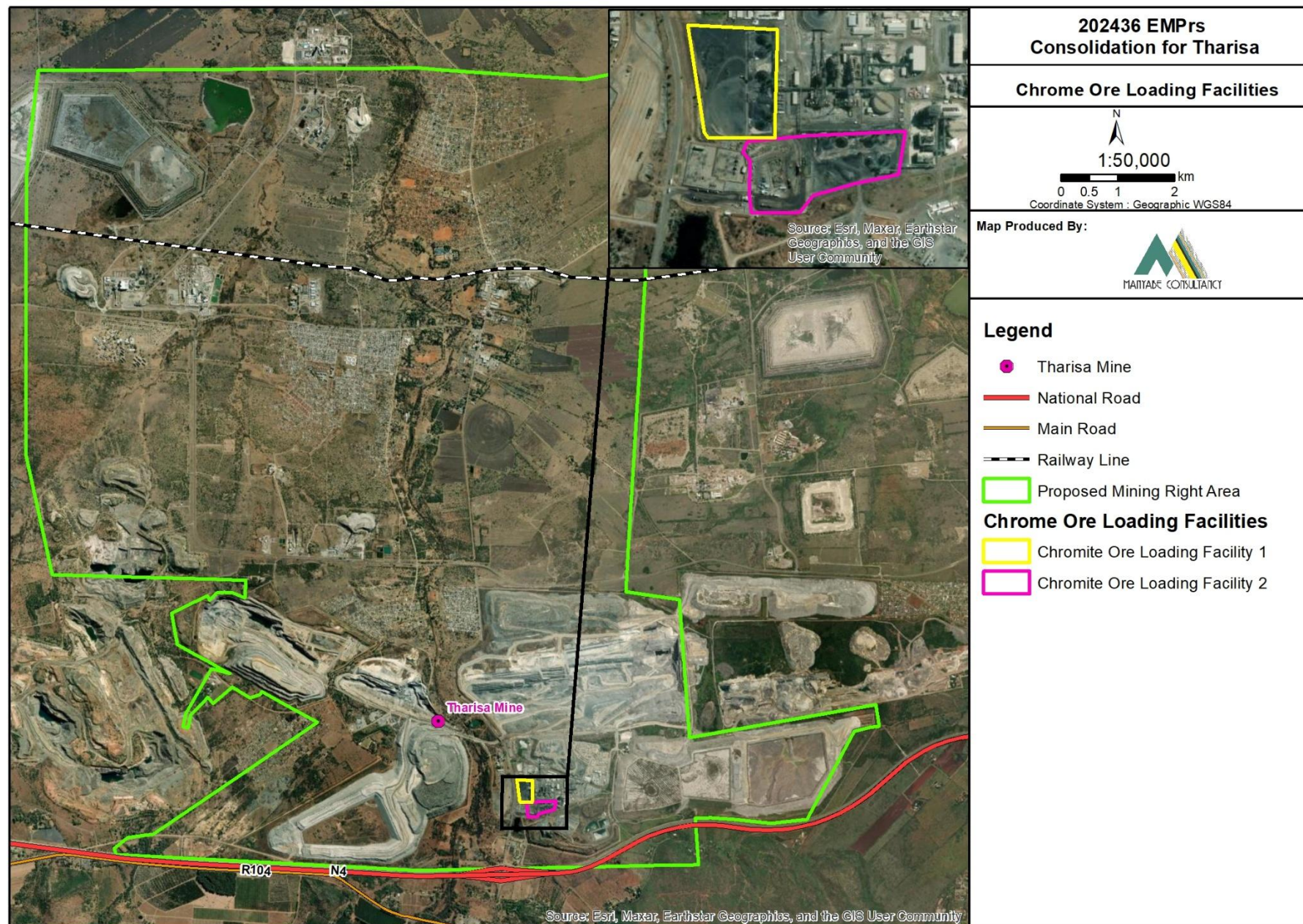


Figure 10: Chrome Ore Loading Facilities

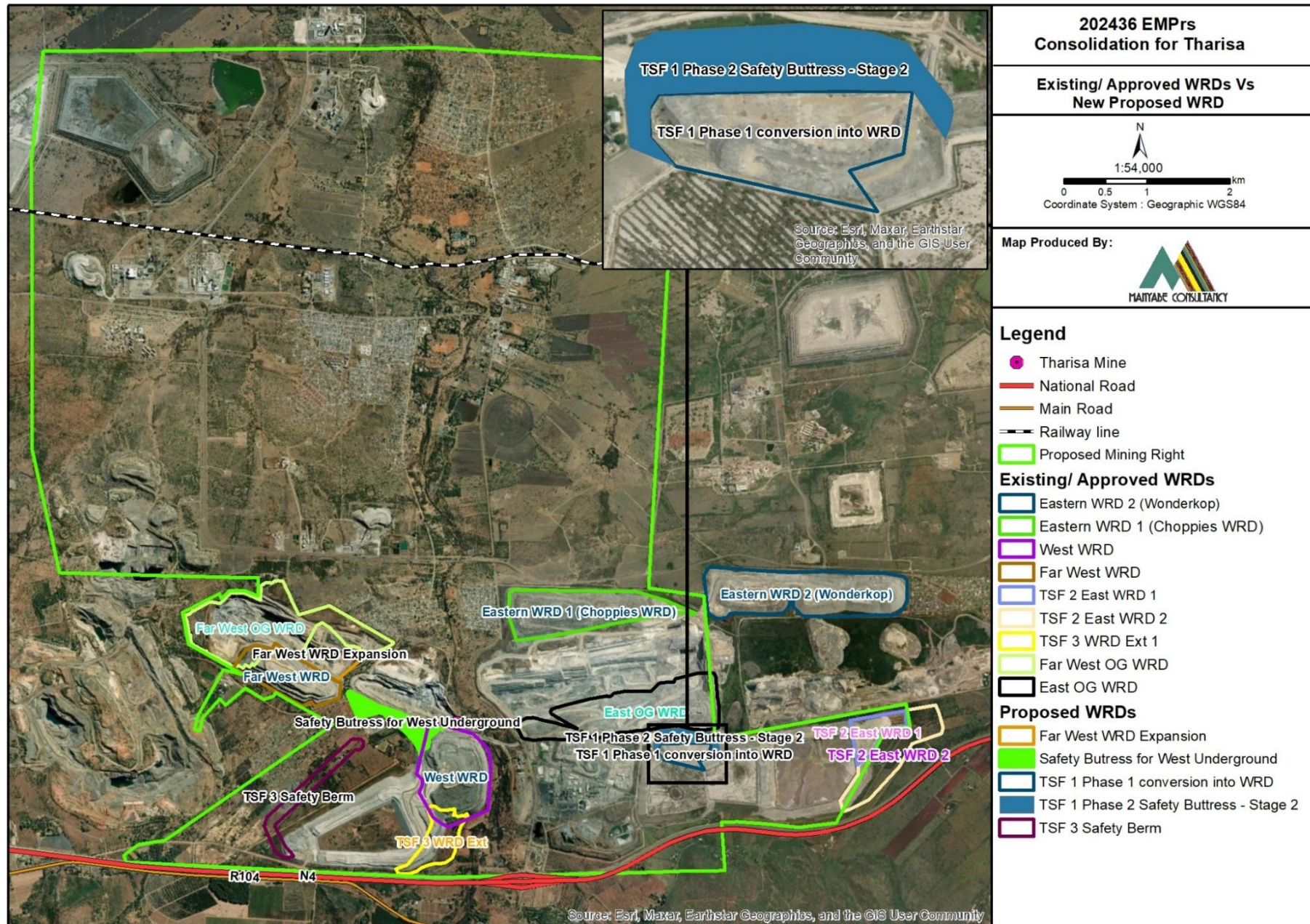


Figure 11: Waste Rock Dumps at Tharisa

2-1.5 Waste Type and Waste Classification for the Waste Rock Dumps

The results from SLR's assessment (2022) indicate that the waste rock at Tharisa is to be classified as a Type 3 waste in terms of the total concentration and a Type 4 waste in terms of the leachable concentrations. Based on this conclusion, a Type 3 waste requires disposal to a facility with a Class C lining.

In accordance with Regulation 3 of GNR 632 of the NEMWA, waste rock stockpiles need to be characterised and classified using a risk-based analysis to determine the appropriate management measures.

In accordance with the assessment undertaken by SLR, it has been motivated that a Class-D liner system is required for storage of the waste rock material, based on the following reasons:

- The leachable concentrations of all the constituents are below the threshold limit which indicates a lack of mobilised leachate and a low risk of seepage;
- The placed waste material will be dry and not contain water;
- SLR concluded from the geotechnical study that the waste rock material is not acid generating; and
- The site is situated on a special aquifer region, characterised by poor to minor groundwater quality (Aquifer Classification of South Africa Map, 2012).

The prescribed lining requirements are depicted in Figure 12.

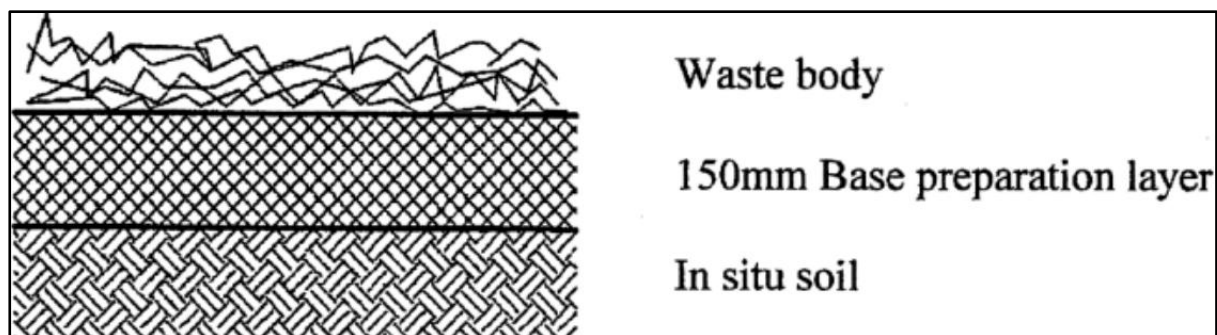


Figure 12: Class D Prescribed Lining Requirement

The primary pollution consideration for the WRDs relates to the contaminated stormwater run-off that contains elevated levels of suspended solids, which will be mitigated by a dirty water containment system.

The WRDs at Tharisa are not expected to generate Acid Mine Drainage (AMD) but surface water runoff and seepage to groundwater should be expected to contain elevated levels of dissolved solids. Aluminium (Al) and Manganese (Mn) are the only contaminants expected to be generated at levels approaching the DWS Acceptable Risk Level (ARL) limits.

2-1.6 Historic Waste Rock Dumps (No Longer Operational)

2-1.6.1 Eastern Waste Rock Dump 2 (Wonderkop Waste Rock Dump)

The Eastern WRD 2 was constructed in 2016 and currently stores 3 904 0659 million m³ of waste rock, and has a height of 60m, with the total storage capacity reached in June 2024. The WRD covers a total footprint area of 86.75ha and is no longer operational. The WRD will remain until the material is either utilised as backfill for rehabilitation or permanently remains on surface and rehabilitated.

2-1.6.2 West Waste Rock Dump

The West WRD commenced construction in 2018 and reached capacity in September 2024. The West WRD has a storage volume of approximately 31 million m³. The WRD covers a total footprint area of 60.86 ha. The WRD will remain until the material is either utilised as backfill for rehabilitation or permanently remain on surface and rehabilitated.

2-1.6.3 Far-West Waste Rock Dump

The Far West WRD commenced construction in 2020, and full capacity was reached in May 2025. The Far West WRD has been developed in 5 successive lifts to provide a maximum waste rock storage capacity of 14,1 million m³. The total final footprint that was disturbed amounted to 45.42 ha. The Far West WRD has been classified as a Low-Risk facility as its Zone of Influence (Zol) does not pose a significant risk to the surrounding environment, private residences and property, nor the mine infrastructure and personnel.

2-1.6.4 Eastern Waste Rock Dump 1 (Choppies Waste Rock Dump)

The Eastern WRD 1 was constructed in 2013 and designed to receive 31,43 million m³ of waste rock with the total storage capacity expected to be reached in October 2024. The WRD covers a total footprint area of 73.83 ha. The WRD is considered to be unlikely to be unstable with high factors of safety above 1.5 and probability of failures of < 1 in 100 000, but certain elements in the Zol dictates that the facility be classified as a High Hazard Facility. The WRD will remain until the material is either utilised as backfill for rehabilitation or permanently remain on surface and rehabilitated.

2-1.7 Active Waste Rock Dumps (Operational)

2-1.7.1 Tailings Storage Facility 2 East Waste Rock Dump 1

TSF 2 East WRD 1 previously known as TSF 2 WRD Expansion 1, is located between the existing TSF 2 Phase 2 to the west; the access road to the east; and the property boundaries north and south of the facility. The TSF 2 East WRD 1 was designed to provide the maximum possible waste rock storage capacity within the available area. Tharisa has commenced with construction and operation of TSF 2 East WRD 1 and is expected to reach full storage capacity in 2027. The TSF 2 East WRD 1 will be developed in 15m bench lifts to provide a maximum waste rock storage capacity of 3.93 million m³ with a final maximum height allowable of 70m and a total disturbance area of 17 ha. A total of 43 319 m³ will be required for the rehabilitation of the WRD.

A seepage and slope stability assessment was undertaken, and the WRD configuration was determined to be acceptable in terms of requirements of NEMWA, with Factor of Safety (FoS) exceeding the minimum required FoS of 1.5 for static conditions and 1.1 for pseudo-static conditions. The TSF 2 East WRD 1 Zol does not extend past the existing, already identified Zol of the TSF 2 complex. The TSF 2 East WRD 1 should be classified as a low-risk facility as its Zol does not pose a significant risk to the surrounding environment, private residences and property, nor the mine infrastructure and personnel.

2-1.8 Approved Waste Rock Dumps (Still to be established)

The below WRDs have been approved, however, they have not yet been constructed.

2-1.8.1 Tailings Storage Facility 2 East Waste Rock Dump 2

The TSF 2 East WRD 2 previously known as TSF 2 WRD Expansion 2, will be developed in 15-meter bench lifts to provide a maximum waste rock storage capacity of 12.9 million m³. This will provide approximately 29.73 months, or 904 days of storage capacity based on a bulk waste rock tipping rate of 453 705 m³ per month.

The TSF 2 East WRD 2 should be classified as a low-risk facility as its Zol does not pose a significant risk to the surrounding environment, private residences, and property, nor the mine infrastructure and personnel.

2-1.8.2 Tailings Storage Facility 3 Waste Rock Dump Extension 1

The TSF 3 WRD Extension 1 will be able to store 4.78 million m³ of waste from the East and West pits. This will provide approximately 7 months, or 210 days of storage capacity based on an average bulk waste rock production rate of 664 725 m³ per month. The final height of the WRD will be 70 m and a total footprint of approximately 22.7 ha. The WRD will have associated toe drainage, access roads and stormwater diversions.

The hazard classification found that the TSF 3 WRD Extension 1 should be classified as a low risk facility as its Zol does not pose a significant risk to the surrounding environment, private residences, and property, nor the mine infrastructure and personnel. The results of both the static and pseudo-static analyses depict that the 30 m key provided sufficient stability to the WRD, resulting in a FoS of 1.536 and 1.106 respectively.

2-1.8.3 Far West Above Ground Waste Rock Dump

The Far West OG WRD is to be constructed over the West Pit after it has been backfilled to natural ground level with waste rock. The Far West OG WRD will tie into the existing Far West WRD. The Far West OG WRD will be developed in 5 successive 15 m lifts to provide a maximum waste rock storage capacity of 35.31 million m³. This will provide approximately 19.6 months, or 597 days of storage capacity based on a bulk waste rock production rate of 1 800 000 m³ per month.

The results of both the static and pseudo-static analyses, with or without a phreatic surface, depict that the removal of the back turf provides sufficient stability to the WRD, resulting in a FoS of 2.267 for static conditions and 1.693 for pseudo-static conditions. The presence of the phreatic surface causes the critical failure plane to migrate to the toe of the facility, as opposed to the central section of the slope. However, given that the FoS far exceeds the target values stipulated in the legislation and best practice guidelines, indicates the design is robust. The Far West OG WRD should be classified as a low-risk facility as its Zol does not pose a significant risk to the surrounding environment, private residences and property, nor the mine infrastructure and personnel.

2-1.8.4 East OG Waste Rock Dump

The East OG WRD is proposed to be positioned over the East Pit. The East OG WRD will be developed in 5 successive lifts, not exceeding 15 m in height, with 15 m wide benches to provide a maximum waste rock storage capacity of 26.26 million m³. This will provide approximately 14.6 months, or 444 days of storage capacity based on a bulk waste rock production rate of 1 800 000 m³ per month.

The East OG WRD should be classified as a low-risk facility as its Zol does not pose a significant risk to the surrounding environment, private residences and property, nor the mine infrastructure and personnel. The results of both the static and pseudo-static analyses, with or without a phreatic surface, depict that the removal of the back turf provides sufficient stability to the WRD, resulting in a FoS of 2.026 for static conditions and 1.54 for pseudo-static conditions. The failure plain remains centred in the vicinity of the toe, indicating a complete slope failure to be unlikely. This is further emphasised by the FoS far exceeding the target values stipulated in legislation and best practice guidelines.

2-1.9 Tailings Storage Facilities

Three (3) TSFs with their associated expansions receive chrome and platinum mine residue tailings from the processing plants. A description of all the approved TSFs located at the mine is provided below. Refer to

Figure 11 and Figure 18.

The TSFs were designed to allow for co-disposal of waste rock and tailings. Waste rock is used to construct the tailings impoundments due to:

- The efficient use of the limited space available for mining infrastructure as the need for additional waste rock disposal sites were negated;
- The construction of a robust structure with high factors of safety due to its proximity to mining operations;
- Ease and ability to rehabilitate the side slopes of the TSF as soon as possible due to the proximity of the N4 Highway;
- The reduction of the overall footprint of the waste storage areas (tailings and waste rock); and
- The reduction of closure costs.

The waste rock is utilised to construct the outer walls of the TSF to ensure containment of the tailings (known as a safety buttress). The material used for constructing the waste rock embankment is sourced from the mine's open pits mining operations. This material is visually assessed to ensure that fine material is placed on the upstream face of the embankment, well-graded material in the centre of the embankment, with the coarse material placed on the downstream face as depicted in Figure 13 below.

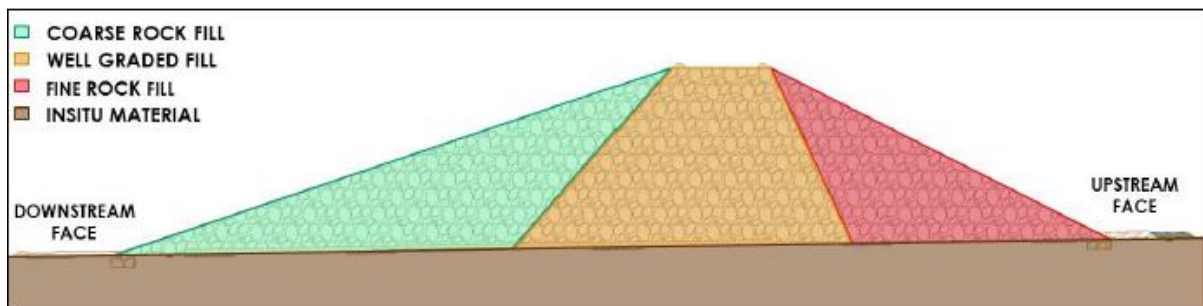


Figure 13: Typical Cross Section through the Rock Fill Embankment Depicting the Placement of Different Grades of Material

The rock fill is constructed in layers not exceeding 2 m in thickness after compaction. The material is dumped on the layer being constructed, 4 m from the edge and dozed into position to allow for mixing of the material, as depicted in Figure 14 below.

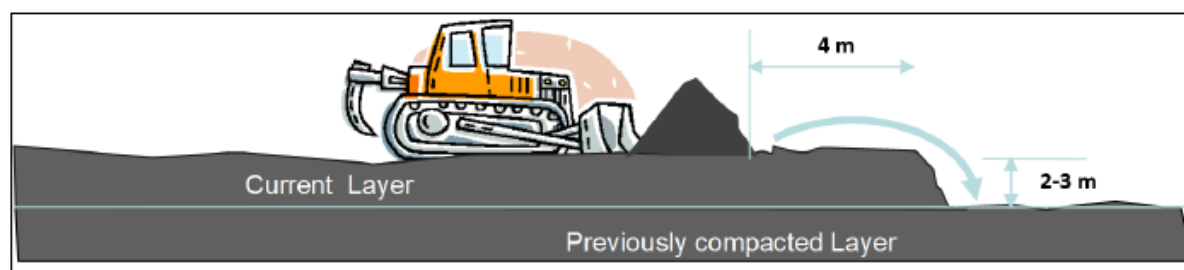


Figure 14: Operating Methodology of Dumping and Dozing of Rock Fill Material

The rock fill is spread so that a uniform layer thickness is obtained. The layer is then given no less than six passes of a twenty tonne (static weight) vibrating roller, as determined utilising test pads to measure the change in settlement per roller pass or equivalent specification as described by the Engineer. A roller pass consists of rolling in a longitudinal direction over the whole width of the formation so that each roll laps half the width of the previous roll. The final layer is compacted and graded so as to ensure that the surface is trafficable in both transverse and longitudinal directions.

Even though care is taken during construction to compact the structure in layers, differential settlement along the final crest will be observed with time which will require reinstatement to design height. Surveys are undertaken on a yearly basis to ensure that the minimum required freeboard is at all times met. The

downstream and upstream side-slopes of the TSFs at Tharisa are designed with a 1V:3H and 1V:2H, respectively.

With a shift in focus towards adhering to the Global Industry Standard of Tailings Management (GISTM), it becomes essential to elevate the FoS in alignment with globally accepted technical guidelines, particularly emphasising compliance with the Tailings Dam Safety technical guidelines of 2022 published by the International Commission on Large Dams (ICOLD bulletin 194). These guidelines address the requirement to assess potential undrained conditions, especially concerning the black clay beneath the TSFs. These clays (black turfs) exhibit very low strength characteristics under undrained conditions which in turn impact the stability of the TSF and the associated factors of safety.

In addition, GISTM mandates the adoption of FoS satisfying the 1:10 000-year seismic event as well as addressing the freeboard and/or spillway requirements to manage the 1:10 000-year storm event.

To address these requirements effectively, Tharisa is required to reinforce the waste rock walls with a buttress which would also necessitate the extension of the embankment keys by removing the clays under the buttress along the perimeter of the TSF complex. The reinforcement is also required due to the mining activities currently taking place at Samancor and associated blasting and vibrations impacting the TSFs.

The size of this buttress directly correlates with its effectiveness, emphasising the need to maximise its dimensions for optimal structural benefit. This also allows for the lifting of the TSF walls with imported waste rock, to provide additional freeboard for the 1:10 000 storm event.

Implementing this waste rock buttress is vital for conforming to industry standards and thus ensuring the safety and stability of the TSF complex.

The tailings production rates from the 100 ktpm (Genesis Plant) and 300 ktpm (Voyager Plant) processing plants are expected to be 110 and 248 tonnes per hour respectively. The tailings slurry is expected to comprise of 49.1% solids and 50.9% water. The tailings are expected to be very low in sulphides and have a very low acid generating potential. Although the groundwater in the TSF area might be affected as the tailings are likely to release certain salts. As with other PGM tailings, the mine's tailing is expected to comprise mainly of plagioclase (anorthite) orthopyroxene (enstatite) and minor amounts of chromite.

The TSFs have been designed to operate with the following infrastructure:

- Upstream toe drains;
- Catchment Paddocks;
- Seepage cut off trenches;
- Intermediate and final intake structures;
- Penstock energy dissipater;
- Pool wall;
- Catwalk;
- Storm water cut off trenches;
- Solution Trench;
- Collection Manhole; and
- Collection sump.

2-1.9.1 Tailings Storage Facility1 Phase 1 and Phase 2 Complex

The design specifications for TSF 1 Phase 1 and Phase 2 have been summarised in Table 4 and Table 5 and discussed in further detail below.

Table 4: Tailings Storage Facility 1 Phase 1 Design Summary

Deposition Rate (Dry)	t/m	350 000
Current Capacity	m ³	1.7 M
Total Capacity	m ³	1.7 M
Footprint	ha	20
FSL	mamsl	1247
Current Height (August 2025)	mamsl	1242
Date of Operation	Date	2009
Date of Full Capacity Reached	Date	2013

Table 5: Tailings Storage Facility 1 Phase 2 Design Summary

Deposition Rate	t/m	350 000
Current Capacity	m ³	10,93 M
Total Capacity (First Lift)	m ³	12.73 M
Footprint	ha	48.3
FSL (First Lift)	mamsl	1247
Current Height (August 2025)	mamsl	1242
Date of Operation	Date	2013
Date of Full Capacity Reached	Date	2028

The design of the TSF 1 Phase 1 was based on an average production rate of 78 400 dry tonnes of tailings per month, and TSF 1 Phase 2 on 260 600 dry tonnes of tailings per month. The tailings and process water from the plant to the TSFs was 345,000 m³/month.

TSF 1 Phase 1 and Phase 2 is situated south of the first open cast operations and has a combined total footprint area of approximately 74.4 ha.

The facility consists of two phases, constructed adjacent to each other in succession, starting with Phase 1 which commenced construction in 2008 and became operational in June 2009 and Phase 2 which commenced construction in 2012.

The general slope of the TSF 1 is gentle in a north and north westerly direction. The penstock outfall pipes for TSF 1 are running in a north-westerly direction and exiting on the north face of Phase 1 and the north-west face of Phase 2.

The penstock outfall pipes discharge directly into separate return water sumps for each phase, whereby the decant water is then pumped directly back to the process plants for re-use.

TSF1 Phase 1 was designed to accept tailings from the 100 ktpm plant platinum concentrator and TSF1 Phase 2 was designed to accept tailings from both plants and to be commissioned in parallel to the commissioning on the 300 ktpm plant in August 2012.

Based on the seepage analyses results, the following observations were made:

- The installation and effective operation of drains along the upstream toe of the waste rock wall result in lowering the elevation of the phreatic surface within the TSF and the containment wall.
- The inclusion of a downstream cut-off drain has little effect on the phreatic surface though the waste rock walls yet ensures that any water seeping through the wall is collected in this drain.
- The removal of the *in situ* clay beneath the waste rock wall has no impact on the resultant phreatic surface through the wall.
- The *in situ* clay layer beneath the tailings acts as a liner restricting the volume of water potentially able to seep into the open cast mining operations.

A toe drain is installed on the upstream toe of the waste rock containment walls. TSF 1 Phase 1 has the drain installed along the north and south walls for a 100m length on each wall along the western sides. Phase 2 has the toe drain installed along the entire internal perimeter of the TSF.

Water collected in the toe drains is released into a return water sump (TSF 1 Dissipator Sump) through a series of toe drain outlets that extend beneath the waste rock wall. The toe drain outlets are placed in a trench that is backfilled with 19mm stone. Should the phreatic surface build up within the waste rock walls, these trenches, having a higher permeability than the wall which creates a preferential flow. The TSF 1 Dissipator Sump transfers the water to the Raw Water Dam for reuse.

The penstock decant system for Phase 1 consists of a buried 450ND class 150D reinforced concrete spigot and socket outfall pipe and a buried 600ND class 150D reinforced spigot and socket outfall pipe for Phase 2. TSF1 Phase1 has a single penstock intake structure with no intermediate intakes. TSF 1 Phase 2 has two single intermediate penstock intake structures and one double final penstock intake structure for the water which releases it into the solution trench.

A typical cross section of TSF 1 Phase 2 is provided in Figure 15.

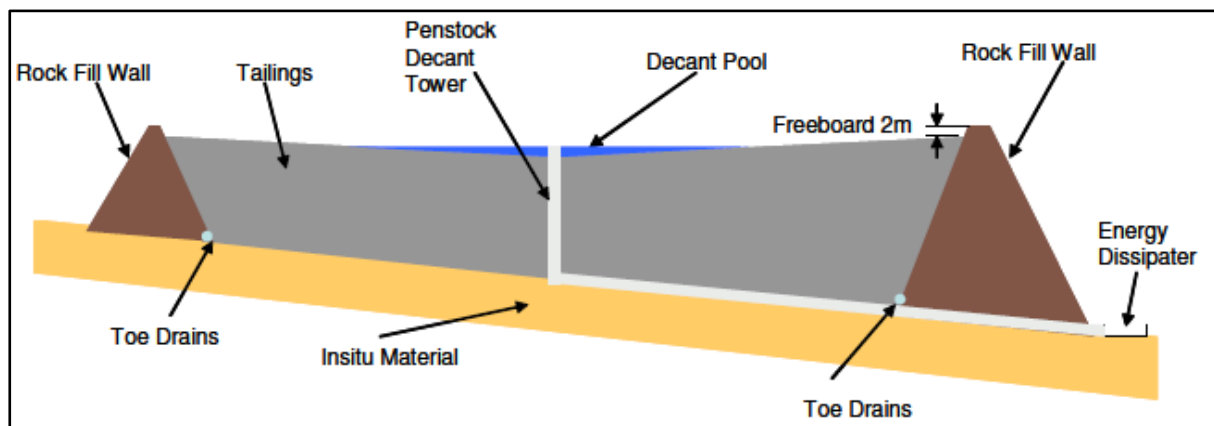


Figure 15: A Typical Cross Section of Tailings Storage Facility 1 Phase 2

Based on the safety classification criteria detailed in the code of practice, the TSF has been classified as a high hazard dam. The high hazard classification is based on the number of residences in the Zol being greater than 10, and the value of 3rd party property being affected exceeding R20 million. Because of the visibility of TSF 1 Phase 2 from the N4 highway to the south of the site, the rehabilitation of the southern wall of the TSF will be prioritised after the buttress construction.

Seepage analyses indicate that locating a drain along the upstream toe of the waste rock wall results in a reduction in the elevation of the phreatic surface within the TSF and the waste rock wall. The slope stability factors of safety and probability of failure for all analyses are within acceptable levels. The only exception to this is when the *in situ* clay beneath the waste rock wall is not removed.

2-1.9.2 Tailings Storage Facility 2 Phase 1 and Phase 2 Complex

The design specifications for TSF 2 Phase 1 and Phase 2 have been summarised in Table 6 and Table 7 and discussed in further detail below.

Table 6: Tailings Storage Facility 2 Phase 1 Design Summary

Deposition Rate (Dry)	t/m	350 000
Current Capacity	m ³	9.66 M
Total Capacity (Final Lift)	m ³	11.03 M
Footprint	ha	51.7
FSL (Final Lift)	mamsl	1247
Current Height (August 2025)	mamsl	1242
Date of Operation	Date	2015
Date of Full Capacity Reached (First Lift)	Date	2027

Table 7: Tailings Storage Facility 2 Phase 2 Design Summary

Deposition Rate	t/m	350 000
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Current Capacity	m ³	15.3 M
Total Capacity (Final Lift)	m ³	26 M
Footprint	ha	118.5
FSL (Final Lift)	mamsl	1270
Current Height (August 2025)	mamsl	1236
Date of Operation	Date	2017
Date of Full Capacity Reached (First Lift)	Date	2033

The design of the TSF2 Phase 1 and Phase 2 was based on an average production rate of 288 000 dry tonnes of tailings per month. The tailings and process water from the plant to the TSF averages 300,000 m³/month.

TSF 2 Phase 1 has a total footprint area of approximately 57 ha while TSF 2 Phase 2 has a total footprint of approximately 118 ha. TSF 2 will abut directly on TSF1's eastern wall thus maximising footprint area by decreasing volume of rock required vs storage capacity.

The general slope of the TSF 2 Phase 1 and Phase 2 is gentle in a north and north easterly direction. At TSF 2 Phase 1 the penstock outfall pipe is aligned in a north-easterly direction and exits on the north face. The penstock outfall pipe discharges into a return water sump, whereby the decant water is then pumped directly back to the process plants for re-use.

The downstream side-slopes of Phase 1 along the north and south faces are 1V:3H. The upstream-side slopes are 1V:1.5H, with a 9m wide bench back at 1218 mamsl and 1227mamsl.

The downstream side-slopes of TSF 2 Phase 2 along the south and east faces are 1V:3H. The northern buttress and upstream-side slopes are 1V:1.5H (overall - 1V:2H), with a 9m wide bench at 1236 mamsl.

Based on the seepage analyses results for TSF 2 Phase 1 and Phase 2, the following observations were made:

- The installation and effective operation of drains along the upstream toe of the waste rock wall result in lowering the elevation of the phreatic surface within the TSF and the containment wall.
- The inclusion of a downstream seepage cut off trench has little effect on the phreatic surface though the waste rock walls yet assists in reducing the volume of water seeping into the basin of the TSF by an order of magnitude when compared with the use of only toe drains.
- The *in situ* clay layer beneath the tailings acts as a liner restricting the volume of water able to seep into the underground water and open cast mining operations.

Based on the slope stability analyses results for TSF 2 Phase 1, the following observations were made:

- The non-operational status of the toe drains along the inside face of the waste rock wall results in no significant reduction in the slope stability factor of safety of the TSF containment wall and is therefore considered to be a non-critical component in terms of slope stability of the TSF containment wall.
- The inclusion of a seepage cut-off key assists in increasing the factor of safety significantly and is considered a critical component in terms of stability of the dam.

From the slope stability analyses results for TSF 2 Phase 2, the following observations were made:

- The non-operational status of the toe drains along the inside face of the waste rock wall results in no significant reduction in the slope stability factor of safety of the TSF containment wall and is therefore considered to be a non-critical component in terms of slope stability of the TSF containment wall.

- The inclusion of a seepage cut-off key assists in increasing the factor of safety significantly (especially in flood conditions) and is considered a critical component in terms of stability of the dam.
- From the TSF 2 Division Wall slope stability analyses it can be concluded that the removal of clay is not required in order to obtain the required factors of safety (> 1.3) reliability index (> 4.35) and the probability of failure (< 1 in 143 000). The removal of the clay sections beneath the toe of this facility is to minimise/reduce possible lateral displacement of clay and ensure that structures in close proximity of the facility are not impacted on.

A toe drain is installed on the upstream toe of the rock containment walls. This drain is installed along the entire internal perimeter of the TSF2 Phase 1 and Phase 2. Water collected in the toe drains is released into a solution trench through a series of toe drain outlets that extend beneath the waste rock wall. All water conveyed in the solution trench is discharged into the silt trap and ultimately into the sump (TSF 2 Dissipator Sump). The water from the TSF 2 Dissipator Sump is transferred to the Process Water Dam for reuse.

The toe drain outlets are placed in a trench that are backfilled with 19mm stone. Should the phreatic surface build up within the rock walls, these trenches, having a higher permeability than the wall, create a preferential flow path for the water, releasing it into the solution trench.

The penstock decant system for Phase 1 consists of a buried 600ND class 150D reinforced spigot and socket outfall pipe, with one single intermediate penstock intake structures and one double final penstock intake tower.

A decant well will be used for the removal of the supernatant water from TSF 2 Phase 2. The decant well consists of a 2.1m (diameter) slotted steel pipe surrounded by coarse rockfill selectively sourced from the mine's waste rock material. A waste rock pool wall/causeway provides access to the decant tower. The decant well will be positioned in the centre of the TSFs (access from the northern wall) and has been positioned in this area to allow the removal of supernatant water from the TSF from the early operational stages of the facility.

The supernatant water from the TSF will infiltrate through the rockfill to the decant well. Rectangular slots fabricated into the wall and positioned around the circumference of the steel decant tower/pipe will allow the water to enter the well. The number and position of the slots have been designed to accommodate a flow of 900m³/hour into the steel tower.

A series of submersible pumps supported by a steel gantry will be located within the well to remove the water seeping in. The water will be pumped to the TSF 2 Phase 1 settling facility, from where it will be returned to the plant.

A typical cross section of TSF 2 Phase 1 is provided in Figure 16 and a typical cross section of TSF 2 Phase 2 is provided in Figure 17.

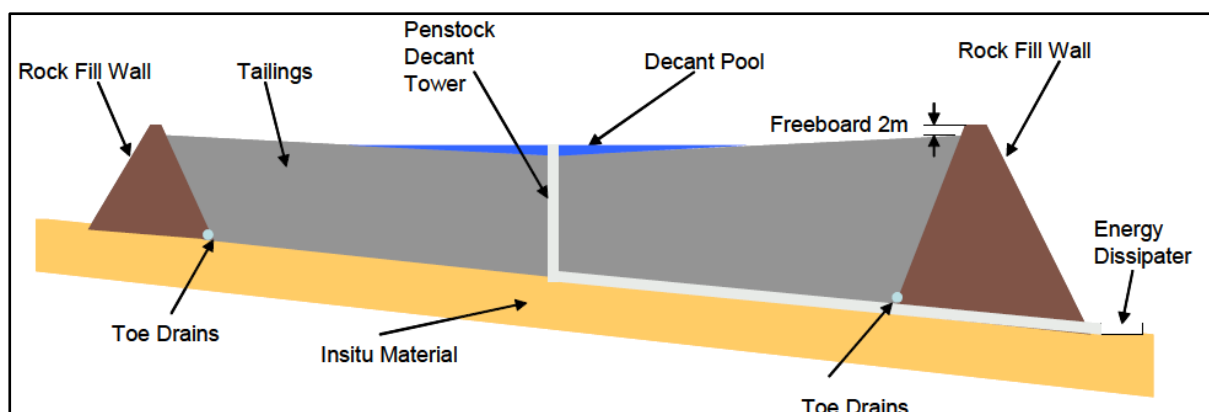
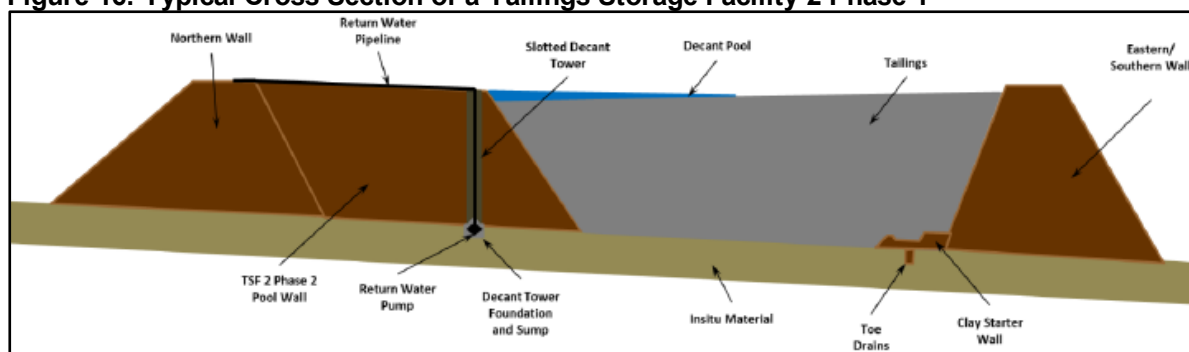


Figure 16: Typical Cross Section of a Tailings Storage Facility 2 Phase 1**Figure 17: Typical Cross Section of a Tailings Storage Facility 2 Phase 2**

Based on the safety classification criteria detailed in the code of practice, the TSF 2 Phase 1 and Phase 2 have been classified as a high hazard dam. The high hazard classification is based on the number of residences in the Zol being greater than 10, and the value of 3rd party property being affected exceeding R20 million.

2-1.9.3 Tailings Storage Facility 3 (In Construction Phase)

The design specifications for TSF 3 have been summarised in Table 8 and discussed in further detail below.

Table 8: Tailings Storage Facility 3 Design Summary

Deposition Rate	t/m	350 000
Deposition Rate	t/annum	4 200 000
Capacity	m ³	18.85 M
Footprint	ha	126
FSL	mamsl	1270
Maximum Height	m	64.29
Tailings Depth	m	54.12

The TSF is designed as a single paddock, full containment facility, with tailings contained behind an engineered embankment. The facility has a maximum height of approximately 64.29 metres at its highest point and a maximum capacity of 18.85 Mm³, providing operational viability for approximately 6.35 years. Total basin coverage is expected after approximately 1.39 years at 1236 mamsl.

The embankment of the facility will be constructed to a final elevation of 1270 mamsl., providing a substantial freeboard that decreases as tailings are deposited within the basin of the TSF. Adequate freeboard is available to accommodate the 1:10 000-year storm event, with a total freeboard of 2.53 m at FSL.

Subsoil drains are designed to control the phreatic surface in the tailings and embankment. The drainage system consists of toe drains placed along the upstream toe of the starter bund, and downstream blanket drains placed within the embankment. Drains have been sized to have sufficient capacity to cater to seepage originating from the pool. Flow rates within the toe-drain pipes have been analysed using Manning's equation for open channel flow, demonstrating sufficient capacity to remove seepage.

A geomembrane liner is employed in the basin area of the TSF. The total strain on the liner is determined to be 2.86%. Leakage rates through the geomembrane are expected to be 0.029 m³/ha/day, meeting the requirements for a Class C liner. The estimated service life of the geomembrane is 424.3 years under a worst-case scenario, significantly exceeding the duration necessary for the facility's pollution period (5 to 10 years).

There is substantial buffer capacity in the freeboard between the estimated 20 000m³ capacity supernatant pool level around the central penstock decants system and the non-overspill crest (NOC)

level of the perimeter embankment as it rises using waste rock from the mining facility. No spillway is required to contain the Regional Maximum Flood. The decanted water exits the penstock arrangement via a stilling basin and sump designed (TSF 3 Dissipator sump) as a reinforced concrete containment structure from where the water is pumped to the Process Water Dam for reuse.

The seepage and slope stability analyses for TSF 3 indicate that the liner toe drain and seepage cutoff key effectively reduce the phreatic surface elevation through the waste rock embankment. Transient seepage analyses show that outflow rates remain below the 0.3 m/year limit for a Class-C liner, consistent with Artesium (2023). Static factors of safety for the upstream slope along Cross-section 1 during start-up exceed ICOLD recommendations, with factors above 1.5 observed when tailings reach halfway, indicating increased support. Pseudo-static factors of safety for the upstream slope also exceed SANCOLD requirements. For the downstream slope along Cross-section 1 at the final tailings elevation, factors of safety under normal operating conditions surpass target static and pseudo-static conditions. Although marginally lower under flooded conditions, they remain within the ICOLD range.

Static factors of safety for the downstream slope along Cross-section 2 meet ICOLD standards. Pseudo-static factors of safety for Cross-section 2 exceed the SANCOLD minimum requirement. Although the capacity of free water in the supernatant pool is less than 50 000m³ thus not require the classification of the TSF as a dam with a safety risk in accordance with the Dam Safety Regulations (DSR) 2012. Cognisance is taken of the NWA Chapter 12 on dam safety and in particular Section 117, and thus the dam safety office is provided with a copy of this report noting that office's request for the registration of tailings dams.

The Zol of TSF 3 was determined per SANS 10286:1998, classifying the facility as a High Hazard facility.

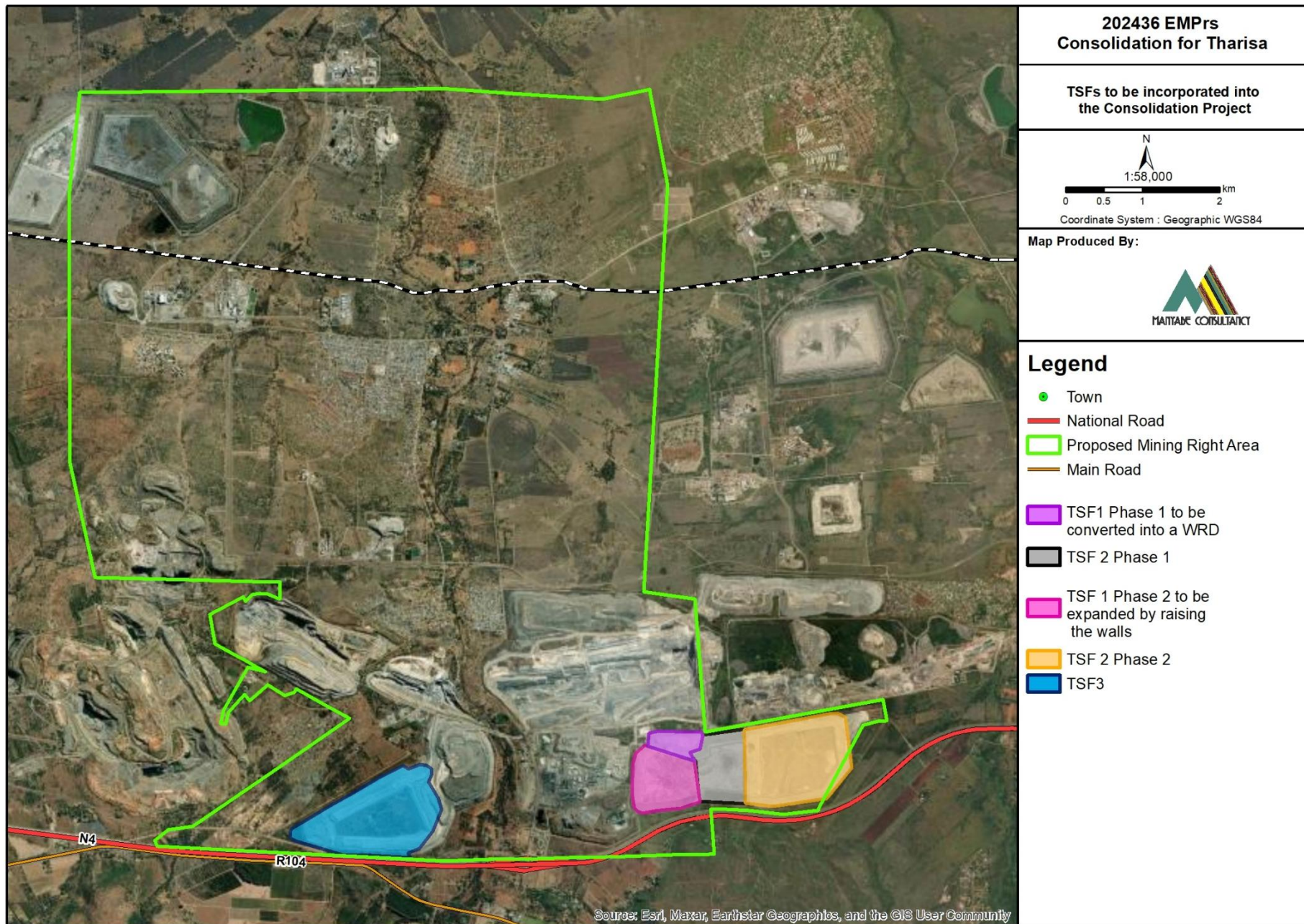


Figure 18: Tailings Storage Facilities to be Consolidated

2-1.10 Pollution Control Dams

The mine requires water to operate. The water usage within the mine operation is prioritised to reuse dirty water before make-up water from clean water such as the municipality or groundwater sources via boreholes. The water reuse hierarchy is applied in the water balance for the mine as follows:

- Mine dewatering is the highest priority to ensure safe operations;
- TSF and RWD water use – prioritised as first water use to retain the safety of the facility and reuse of contact water;
- PCD water use – to create storage capacity to accommodate a follow-on high rainfall event and reuse; and
- Make-up water abstraction from boreholes and Rand Water – lowest priority and can be reduced during surplus water conditions.

A high level summary of the water reticulation within the PCDs at the mine is provided below and shown in Figure 19:

- Clean water is abstracted from boreholes located around the mine. The water abstraction serves two purposes, namely, providing water for the mine and to dewater the opencast pits;
- The abstracted water from the boreholes is taken to TSF 1 Dissipator and Hernic Quarry where it is subsequently distributed to the mine;
- The water from Hernic Quarry is taken to the Process Water Dam which is then transferred directly to the processing plants.
- Should the Process Water Dam overflow, it will overflow to Stormwater Dam which can overflow to Hernic Quarry;
- The water from the processing plants is transferred to TSF 1 and TSF 2 Complexes, and will also be transferred to TSF 3 upon completion of construction activities;
- The water from the TSF 1 and TSF 2 Complexes is then returned to TSF 1 and TSF 2 Complexes Dissipator Sumps and transferred to the Raw Water Dam and Process Water Dam, respectively;
- The water from TSF 3 (once operational) will then be returned to TSF 3 Dissipator Sump and transferred to the Stormwater Dam;
- The Raw Water Dam also receives water from the Samancor boreholes and Brine from the RO Plant 1;
- The Raw Water Dam transfers the water back into the processing plant for reuse;
- The WWTP transfers water to the Stormwater Dam which is then reused and transferred to the Process Water Dam;
- Water from the Buffelspoort Irrigation Scheme feeds into the Community Dam from where it feeds into the RO Plant 1 which feeds into the Potable Reservoir and supplies all potable water users. The Community Dam also receives water from the surrounding boreholes within the mine;
- Zinc Dam 1 receives water from the Braam borehole and Hernic Quarry and transfers water to the Stormwater Dam and the Raw Water Dam;
- Zinc Dam 2 receives water from the Samancor borehole and transfers water to the Raw Water Dam;
- The Railway Loop Buffer Dam (once formalised) will be used to store water from the Stormwater Dam while the current Stormwater Dam is being upgraded; and
- MCC Dam receives rainfall and runoff water, and transfers water to the Stormwater Dam.

A description of the PCDs at the mine used to store and reuse dirty water is provided below and shown in Figure 20.

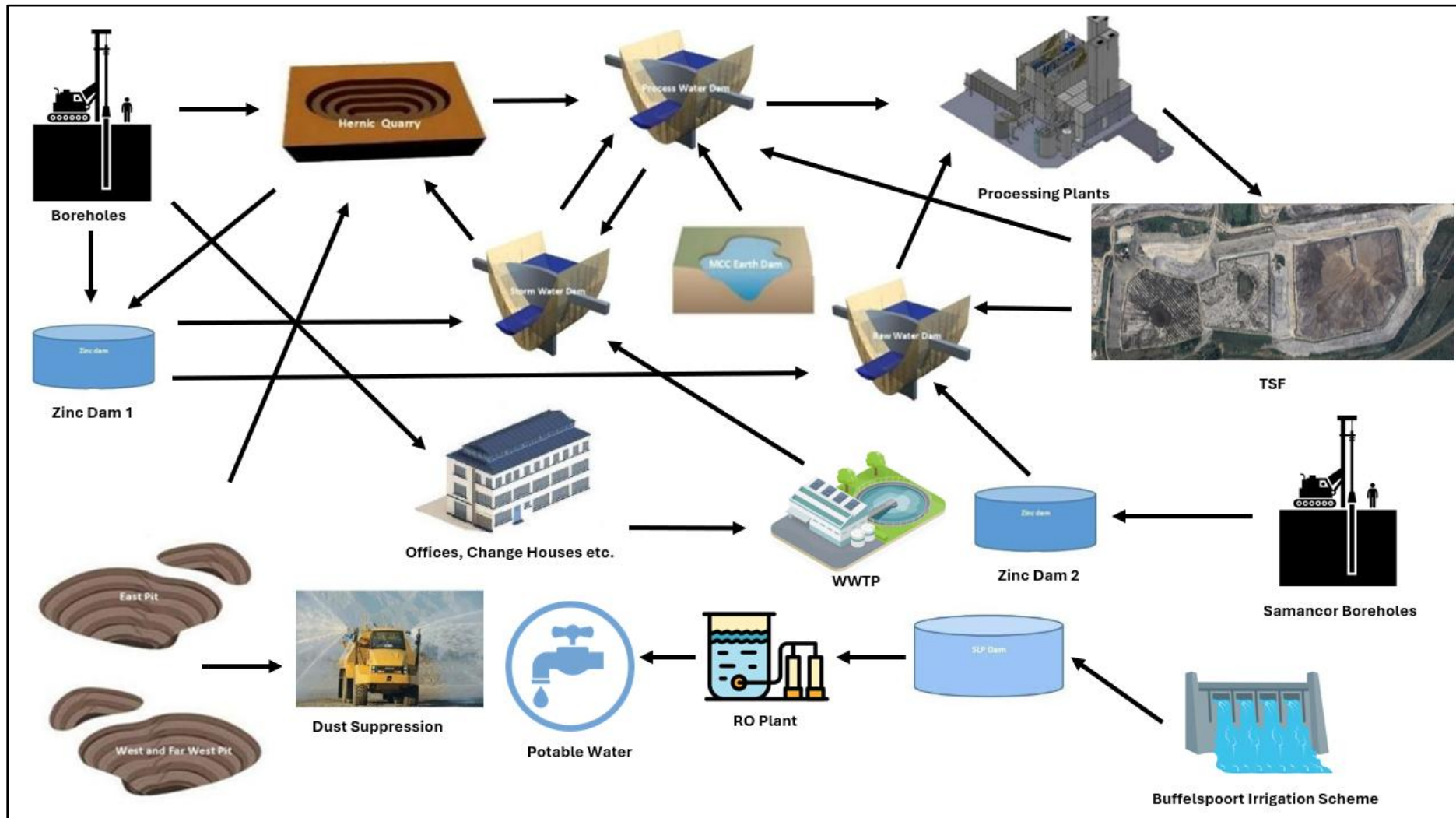


Figure 19: Tharisa Mine Reticulation (2025) - Operational Infrastructure

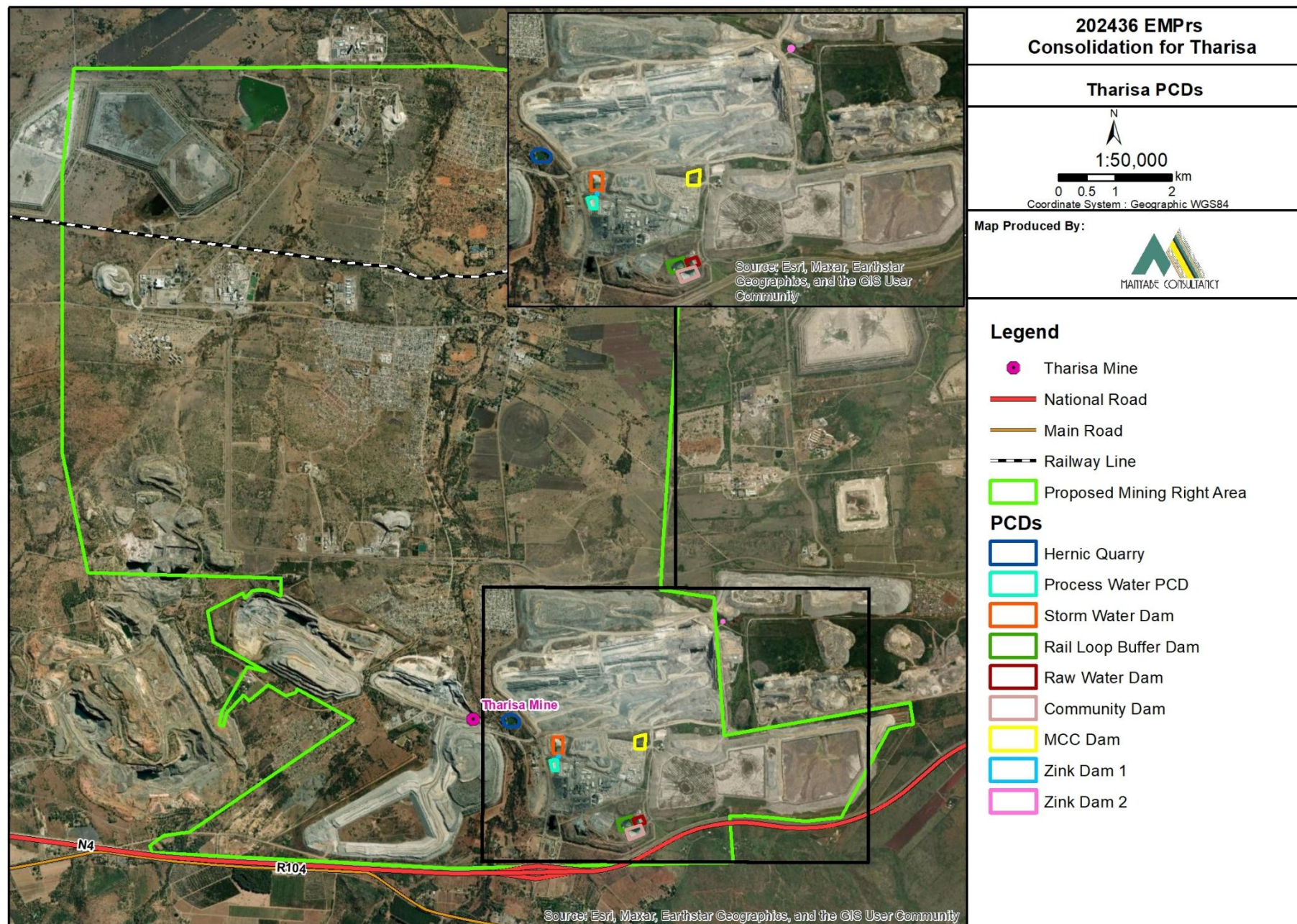


Figure 20: Tharisa PCDs

2-1.10.1 Hernic Quarry

The Hernic Quarry is an existing and abandoned old quarry. The Hernic Quarry has a surveyed capacity of 33 450m³. Tharisa applied for an emergency discharge from the Hernic Quarry into the Sterkstroom River at the rate of 67,980.4m³ per annum which was granted in 2024. Tharisa has subsequently applied to amend the Water Use Licence (WUL) to discharge approximately 230 000m³ per month from the Hernic Quarry into the Sterkstroom River.

The Hernic Quarry receives water from:

- West Pit and associated dewatering boreholes;
- Far West Pit;
- East Pit and associated dewatering boreholes; and
- Overflow from Stormwater Dam.

The Hernic Quarry transfers water to the Process Water Dam and discharges water to the Sterkstroom in the event of an emergency. The Hernic Quarry is shown in Figure 20 and Figure 21.



Figure 21: Hernic Quarry

2-1.10.2 Process Water Dam

The Process Water Dam has a capacity of 10 000m³ and is utilised as a dirty water storage facility. The dam is High-Density Polyethylene (HDPE) lined to ensure the containment of dirty water within the dam.

The Process Water Dam receives water from:

- Hernic Quarry;
- Stormwater Dam;
- TSF 3 (Once operational); and
- TSF 2 Dissipator Sump.

The Process Water Dam transfers water to the processing plants and can overflow to the Stormwater Dam if required. The Process Water Dam is shown in Figure 22.



Figure 22: Process Water Dam

2-1.10.3 Stormwater Dam

The Stormwater Dam has an approved capacity of 30 000m³ and is utilised as a dirty water storage facility. The dam is HDPE lined to ensure the containment of dirty water within the dam. The dam has a silt trap to contain any silt from the process water and then the dam itself. The Stormwater Dam receives water from:

- Waste Water Treatment Plant;
- Process Water Dam (overflow); and
- Zinc Dam 1.

The Stormwater Dam transfers water to the Process Water Dam and can overflow to the Hernic Quarry if required. The Stormwater Dam is shown in Figure 23.



Figure 23: Stormwater Dam

2-1.10.4 Rail Loop Buffer Dam

The Railway Loop Buffer Dam (once formalised) will be used to store water from the Stormwater Dam. Water will be transferred to the Process Water Dam. The Railway Loop Buffer Dam will also be used for additional storage capacity of stormwater run-off captured within the process plants and administrative area. The Rail Loop Buffer Dam.

The Rail Loop Buffer Dam is situated north of the Community Dam, west of the mine's Raw Water Dam and southwest of the TSF 1 and TSF 2 Complexes. The Rail Loop Buffer Dam. Once formalised, will have a capacity of 94 100m³.

A waste type assessment concluded that the tailings and WRDs are classified as a Type 3 Waste requiring a Class C liner. The presence of these waste products in the plant is likely to influence the water quality and be present in the Rail Loop Buffer Dam as solids washed out of the plant by stormwater runoff. As such the Rail Loop Buffer Dam is designed with a Class C liner. The initial design incorporated an HDPE Geomembrane. The design further includes a geotextile and a clay layer to improve impermeability of the barrier system. The barrier system is to be held down by a scats layer on top of the geomembrane to ensure direct contact between the geomembrane and the underlying *in situ*/ imported material.

The Rail Loop Buffer Dam has upstream side slopes of 1V:2.5H and downstream side slopes of 1V:2H, including a 4 m wide crest.

The Rail Loop Buffer Dam has the following components:

- Lining of the facility with a 1.5 mm smooth HDPE geosynthetic system (geomembrane and geotextile);
- The decant system has two manholes for the sump system, one for the leakage detection system, and another for the underdrainage system;
- An underdrain detection system has been included in the design due to potential groundwater presence at the facility;
- A concrete emergency spillway of adequate size; and
- A silt trap.

The Rail Loop Buffer Dam is shown in Figure 20 and Figure 24.

2-1.10.5 Raw Water Dam

The Raw Water Dam has a licenced capacity of 40 000m³ and is utilised as a dirty water storage facility. The dam is concrete lined to ensure the containment of dirty water within the dam.

The Raw Water Dam receives water from:

- TSF 1 Complex Dissipator;
- Samancor boreholes;
- Brine from the RO Plant 1; and
- Zinc Dam 1 and Zinc Dam 2.

The Raw Water Dam transfers water to the processing plants. The Raw Water Dam is shown in Figure 20 and Figure 24.

2-1.10.6 Community Dam

The Community Dam (Figure 20 and Figure 24) has a licenced capacity of 49 000m³ and is utilised as a clean water storage facility. The dam is concrete lined to ensure the containment of water within the dam.

The Community Dam receives water from:

- Buffelspoort Irrigation Scheme; and
- Boreholes located around the mine.

The Community Dam transfers water to the RO Plant 1 and the Raw Water Dam.



Figure 24: Raw Water Dam, Rail Loop Dam and Community Dam

2-1.10.7 MCC Dam

The MCC Dam (Figure 20 and Figure 25) is currently a clay lined dam which is utilised as part of the dirty water reticulation system. The MCC Dam is proposed to be upgraded to increase the capacity of the dam as well as to formalise the dam. The MCC Dam will have a capacity of 49 500 m³ and have the following:

- Homogenous earth embankment walls;
- Liner systems in accordance with the requirements of GN 704;
- Subsurface drainage systems;
- Inlet structures inclusive of energy dissipation measures;
- Access ramps for maintenance and silt removal purposes;
- Silt traps;
- UV protection through a sacrificial HDPE liner;
- Leakage detection sumps;

- Pump sumps for the various pump stations; and
- Emergency spillways.

The MCC dam currently receives dirty water through cut-off channels intercepting water flowing towards the open pit as well as rainwater which is then utilised by the mine. The MCC Dam transfers water to the Stormwater Dam. The intention is however to install a new pipeline to transfer water to the Rail Loop Buffer Dam once formalised.



Figure 25: MCC Dam

2-1.10.8 Zinc Dam 1 and Zinc Dam 2

The Zinc Dam 1 (Figure 20 and Figure 26) is a concreted dam which has a capacity of 4 000m³ and is utilised as a dirty water storage facility.

The Zinc Dam 1 receives water from

- Braam borehole; and
- Hernic Quarry

The Zinc Dam 1 transfers water to the Stormwater Dam and to the Raw Water Dam.

The Zinc Dam 2 (Figure 20 and Figure 27) is a concreted dam which has a licenced capacity of 1 770m³ and is utilised as a dirty water storage facility. The Zinc Dam 2 receives water from the Samancor boreholes which abstract underground water from the old Samancor mine, and transfers the water to the Raw Water Dam.

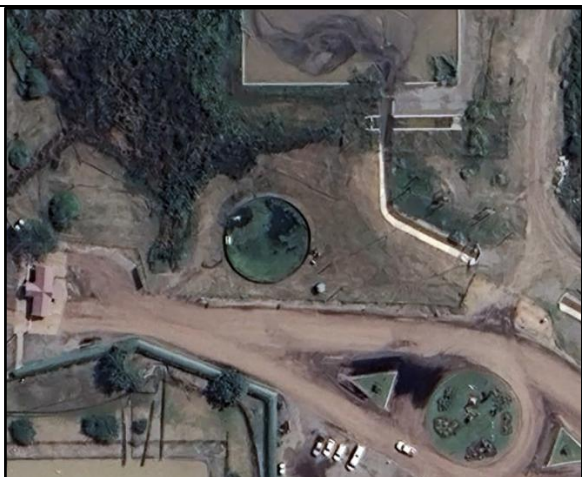


Figure 26: Zinc Dam 1

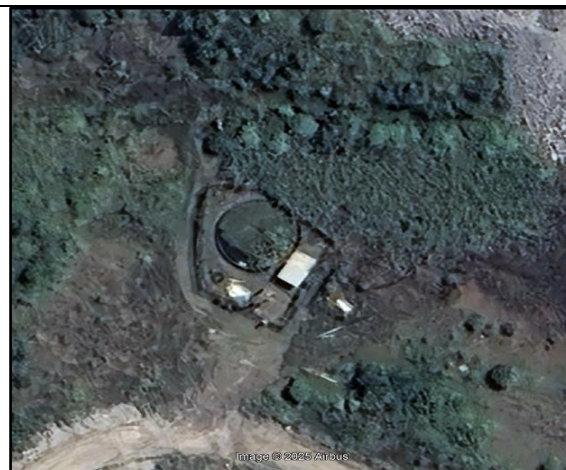


Figure 27: Zinc Dam 2

2-1.11 Storage Areas

The below storage areas are located at the mine and have been discussed:

2-1.11.1 Waste Storage Areas

Tharisa prioritises effective waste management by adhering to a hierarchy of controls that emphasises minimising waste generation as the primary objective. Waste disposal is considered a last resort after exploring all other options. Tharisa's waste management procedures promote responsible waste generation and efficient handling, starting with source separation to facilitate recycling and reuse. A colour-coding system for waste containers aids in proper sorting, ensuring that recyclable materials do not mix with general waste and maintaining safe storage to reduce contamination risks.

The types of waste streams generated by the mine is provided in Table 9.

Table 9: Waste Stream Types Generated at Tharisa

General Waste	Hazardous Waste
General /Domestic Waste: • Wastepaper and cardboard; • Metal; • Plastic containers and wrapping; • Glass; • Used Cartridges • Tin cans; • Food waste; and • Grey water from human consumption. General Industrial Waste: • Cables; • Ferrous and non-ferrous scrap metal; • Rubber and cable material; • Cement and building rubble; • Waste tyres; • Non-compactable waste (wood waste and garden refuse); and • Refurbishable waste (including pumps, valves and pipes).	• Hydrocarbon contaminated waste (including rags, filters, used oil, oil drums and grease); • Fluorescent tubes, batteries and printer cartridges; • Acids; • Aerosols and chemical waste; • Contaminated soil; • Empty explosives packages; • Used drill bits; • Extension rods; • Electronic waste; • Sewage waste (solid and sludge); • Medical waste; • Laboratory waste; • Contaminated Protective Personal Equipment (PPE/ Clothing); • Polychlorinated biphenyls (PCBs); • Pesticide-, herbicide-, insecticide- and fertiliser waste; • Empty Intermediate Bulk Containers (IBC) / Flowbins; • Buckets (20/25L); • Paint and cleaning liquids; and • Chemical containers.

The waste streams are separated into different storage areas before being taken off site for either recycling, further processing or final disposal. The following waste storage areas are located at the mine:

- Hazardous waste storage areas;
- General waste storage areas; and
- Waste tyre storage areas.

The waste storage areas are registered in accordance with the national waste storage regulations and operated in accordance with the following:

- Waste Tyre Regulations, 2017 (GNR. 1064);
- Waste Classification and Management Regulations, 2013 (GNR. 634);
- National Waste Information Regulations, 2012 (GNR. 625);
- National Norms and Standards for the Storage of Waste, 2013 (GNR. 926); and
- National Norms and Standards for the Remediation of Contaminated Land and Soil Quality, 2014 (GNR. 331).

Hazardous Storage Areas

Tharisa stores various hazardous substances located in different areas of the mine. The hazardous substances storage includes:

- Mechanical Oil;
- Waste oil;
- Diesel;
- Flocculant – Senfloc 2660;
- Collector (SNPX);
- Frother (Senfroth 200);
- Depressant (Sendep 30E); and
- Activator (Cuphlex).

It is noted that Tharisa stores more than 500m³ of dangerous goods. Table 10 provides a high level summary of the hazardous substance storage facilities and capacities located at the mine.

Table 10: Hazardous Substance Storage Tanks

Name	Substance Stored	Capacity
Mining Maintenance Bay	Mechanical Oil	5 x 23 000L 4 x 2 000L 1 x 5 000L (JOJO tank)
	Waste Oil	3 x 9 000L 2 x 4 500L
	Diesel	3 x 82 000L
Mining Hard Park	Diesel	6 x 8 200L
Voyager Plant	Diesel	69 000L
Voyager Crusher Workshop	Mechanical Oil	2 x 13 500L
Voyager Engineering Workshop	Mechanical Oil	20 230L
Voyager Main Stores (WH1)	Mechanical Oil	150 000L
Vulcan Plant	Diesel	12 560L
Vulcan Workshop	Mechanical Oil	8 000L
Genesis Plant Laydown Area	Waste Oil	52 000L
Genesis Crusher Workshop	Mechanical Oil	13 500L
Total		811 490L

a) AECI-Hydrocarbon Storage Silos and Tanks

AECI Hydrocarbon Storage Silos and Tanks are located at the Genesis, Voyager and Vulcan Processing Plants for the storage of dangerous goods and use in the plant. Table 11 to Table 13 provide the storage capacities and substances stored.

Table 11: Voyager AECI-Hazardous Storage Silos and Tanks

Code	Description	Material type	Storage Capacity
Flocculant – Senfloc 2660			
80-TNK-01	Flocculant Holding Tank 1	Mild Steel	40 m ³
80-TNK-02	Flocculant Holding Tank 1	Mild Steel	40 m ³
80-TNK-03	Storage Silo	Mild Steel	35 tons = 46.55m ³
Collector (SNPX)			
81-TNK-01	Mixing Tank 3	Stainless Steel	10 m ³
81-TNK-02	Dosing Tank	Stainless Steel	10 m ³
81-TNK-03	Holding Tank 1	Stainless Steel	31 m ³
81-TNK-04	Holding Tank 2	Stainless Steel	31 m ³
Frother (Senfroth 200)			
83-TNK-03	Frother Holding Tank	Stainless Steel	31 m ³
83-TNK-02	Frother Dosing Tank	Mild Steel	4 m ³
Depressant (Sendep 30E)			
82-TNK-01	Depressant Holding Tank1	Mild Steel	25 m ³
82-TNK-03	Depressant Holding Tank2	Mild Steel	25 m ³

Code	Description	Material type	Storage Capacity
82-TNK-02	Depressant Dosing Tank 1	Mild Steel	10 m ³
82-TNK-04	Depressant Dosing Tank 2	Mild Steel	10 m ³
82-TNK-05	Storage Silo	Mild Steel	50 tons = 66.5m ³
Activator (Cuphlex)			
84-TNK-02	Activator Bulk Storage Tank 2	Fiberglass	30 m ³
84-TNK-01	Bulk Storage Tank 1	Fiberglass	30 m ³

Table 12: Genesis AECI-Hazardous Storage Silos and Tanks

Code	Description	Material type	Storage Capacity
Flocculant – Senfloc 2660			
V-Genfloc-lit-01	Flocculant Holding Tank 1	Polyethylene	10 m ³
V-Genfloc-lit-02	Flocculant Holding Tank 2	Polyethylene	10 m ³
Collector (SNPX)			
G -A65- LT- 01	Dosing Tank	Stainless Steel	10 m ³
Depressant (Sendep 30E)			
A-65-LT-02	Depressant Holding Tank	Polyethylene	10 m ³
A-65-LT-03	Depressant Dosing Tank	Polyethylene	15 m ³
Activator (Cuphlex)			
A-65-LT-04	Activator Holding Tank	Polyethylene	10 m ³
A-65-LT-05	Dosing Tank	Polyethylene	5 m ³

Table 13: Vulcan AECI-Hazardous Storage Silos and Tanks

Code	Description	Material type	Storage Capacity
Flocculant – Senfloc 2660			
U-80-LT-001	Flocculant Holding Tank 1	Polyethylene	10 m ³
U-80-LT-001	Flocculant Holding Tank 2	Polyethylene	10 m ³

b) Explosives Magazine Storage Area

An explosive magazine storage area and gassing plant has been constructed on site (refer to Figure 28).

The explosive magazine storage area is utilised as an area where explosives are stored and issued for blasting activities within the opencast mining operation. The explosives are brought onto the site as and when required and only certain amounts of explosives as determined by the license are stored at the mine at one time. The explosive magazine storage area is highly restricted and access controlled.

The gassing plant is utilised to store chemicals used as reagents to activate the explosives utilised for blasting activities. The explosives silos located at the gassing plant are utilised to store explosives used for blasting activities. A total of four silos store emulsion (85 tons each) and ammonium nitrate prill (45 tons each).



Figure 28: Explosive Magazine Storage and Emulsion Plant Area

2-1.12 Support Infrastructure

The following support infrastructure is located at the mine:

- Mine offices, visitors' parking, security, change houses, access control facilities, Mine Training Centre, PPE stores, tuck stops, store warehouses and clinic
- Borrow pits (historically utilised for the establishment of the infrastructure of the mine and will be rehabilitated).
- Haul Roads, overpass bridges and access roads
- Topsoil Stockpiles
- Powerlines (275 and 88 kV) and substations (Eskom and Tharisa)
- Weighbridge

2-1.13 Haul Roads, overpass bridges and access roads

A network of roads exists in and around Tharisa Mine which include:

- N4;
- P2-4 (Old N4);
- D2565 – a gravel road in the far western section of the area;
- D1526/1566 - the main gravel road servicing the western part of the area;
- D1325 – Marikana Road;
- D108 – road between Marikana and Rustenburg;
- Internal Lonmin tarred road to the north of the area, that runs east – west;
- D1270 – a gravel road linking the eastern part of the area with Mooinooi; and
- Various unnamed, private gravel/dirt roads

The mine is accessed via the D1325 Marikana road. Tharisa operates haul roads around the mine to access the opencast mining areas and transfer of ore around the mine. These haul roads change as the mine expands. A main bridge has been established that crosses the Sterkstroom River and links the East and West opencast mining areas.

2-1.14 Topsoil Stockpiles

During construction of infrastructure, the topsoil is first stripped and stockpiled prior to commencement of any earth and civil works. The topsoil is located in clean water areas and is allowed to revegetate or is hydroseeded

to prevent the loss of topsoil during the operation of the mine. The topsoil locations change on an ongoing basis as rehabilitation is concurrently undertaken. The location and quantity of the topsoil stored onsite is recorded during the annual financial provision through surveys. Once the mine reaches its LoM, decommissioning and closure activities will be undertaken where the topsoil will be utilised for rehabilitation. Where an insufficient quantity of topsoil is available, topsoil will be imported into the mine from external sources.

2-1.15 Waste Water Treatment Plant

Wastewater is generated at the mine and treated for reuse in the WWTP. Wastewater is received from the following areas:

- Change houses;
- Offices (mine and projects);
- Clinic; and
- Mine training centre.

The WWTP has been designed to treat 554 m³/d. The WWTP is based on trickling filter principle with nitrate reducing capacity. The plant has been designed to achieve an effluent discharge compliant with the Department of Water Affairs and Forestry (DWAF¹) General Limits of effluent discharge (GN Gazette No. 26187, 2004).

The treatment process is an extended aeration activated sludge system with an attached growth trickle filter system. The purpose of the process is to remove target nutrients by means of bacterial growth. Constituents of the wastewater are utilised by the microorganisms as a food and nutrient source; thereby removing them from the wastewater and facilitating the discharge of an effluent low in nutrients. Sewage wastewater is rich in nutrients and can cause significant damage if discharged untreated into the environment. The Tharisa WWTP is depicted by the process flow diagram in Figure 29.

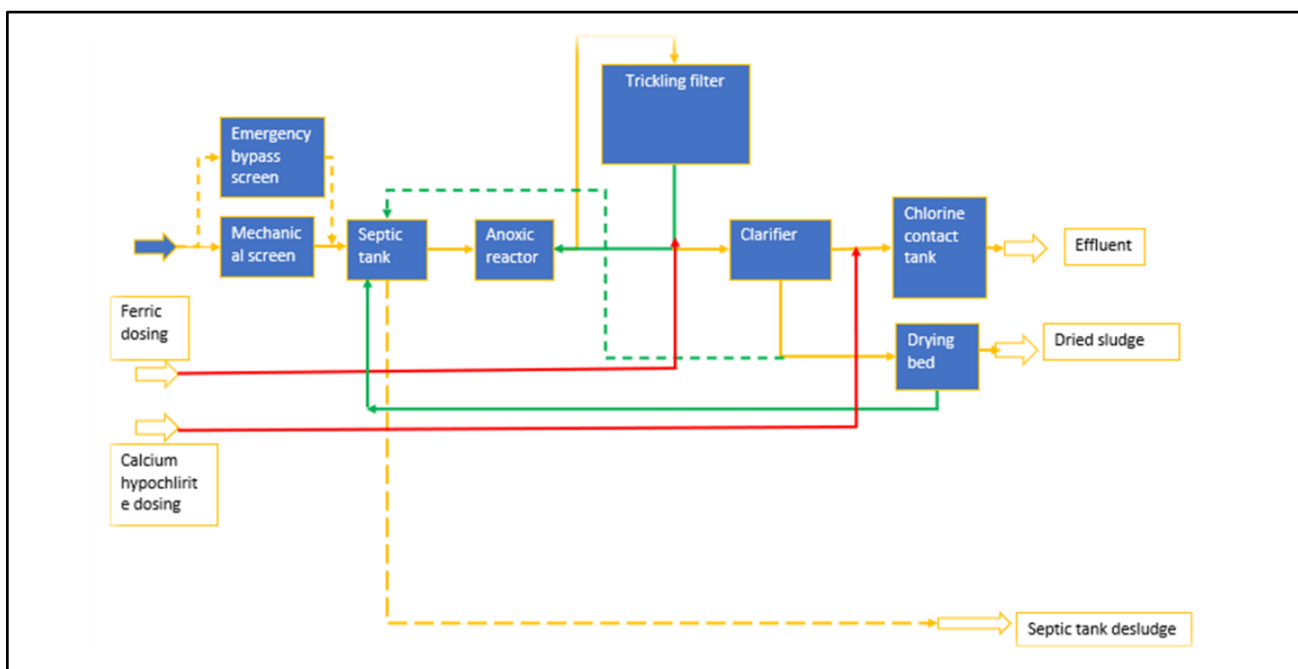


Figure 29: Waste Water Treatment Works Process Flow Diagram

Step 1: Inlet works

The wastewater flows through a mechanical screen. The screen is mechanically raked for the removal of debris. The screened wastewater overflows into a grit separator for the concentration and removal of grit. A manual screen is installed should the mechanical screen be undergoing maintenance or in case of power interruptions

¹ The DWAF is now referred to as the DWS.

to allow sewage to still flow into the septic tank. Untreated domestic sewage gravitates through the mechanical screen (01-TK-001). The retained debris is then removed from the screen by utilising the automatic special rake provided. The wastewater, now free from large debris, overflows to the grit separator for removal of grit and finally flows to the septic tank.

Step 2: Septic tank

The Septic tank (01-TK-006) is underground and receives screened wastewater from the mechanical screen. The Septic tank (anaerobic digester) is a 523 m³ concrete tank designed with 3 zones which allow for sludge settling. The incoming wastewater overflows from zone 1 to zone 2 and zone 3 which receives recycled water from the trickling filter with water leaving the septic tank entering the anoxic fixed bed reactor.

Step 3: Reactor

The reactor (01-TK-007) is open to the atmosphere in order to encourage aerobic digestion. The aerobic digestion process is important for the reduction of sewage sludge and other organic waste contained in sewage. The sludge at the bottom of the anoxic reactor is then removed and reintroduced to zone 1 of the septic tank. The overflow from the reactor is directed into the recycle sump.

Step 4: Recycle Sump

The recycle sump (01-TK-008) collects water from the reactor. It consists of 2 Direct On-Line (DOL) level-controlled pumps (01-PU-001A/B) which are referred to as trickling filter feed pumps. The two feed pumps are controlled START/STOP by level sensor switches. The water is then pumped from the sump to the top of the trickle filter.

Step 5: Trickle filter

The trickle filter (01-TK-009) is arranged as a tower of packing media. Wastewater is introduced evenly across the surface of the packing using distribution nozzles. The water flows down through the packing, and biofilm is propagated on the surface of the packing media. The biofilm is able to break down Chemical Oxygen Demand (COD) and nitrify the wastewater. Water is collected in a basin below the packing media and flow is directed to the clarifier feed pumps. The majority of water collected at the bottom of the trickling filter is continuously recycled to the septic tank zone 3. The water that flows to the clarifier sump, is then pumped into the clarifier by feed pumps (01-PU-002A/B) which are controlled by a level sensor ensuring the pumps do not run dry at low levels.

Step 6: Coagulant Dosing, Clarifier & Sludge Handling

The clarifier (02-TK-001) consists of a slow mixing zone and a high rate settling zone. Coagulant dosing pump 01-PU-003 doses ferric chloride from tank (01-TK-010) to the clarifier feed in order to precipitate residual phosphate and to coagulate the stream. The slow mixing zone is fitted with an electric mixer [02-AG-001] which runs continuously, while the high rate settling zone is fitted with lamella plates allowing for an increased settling area and subsequently effective settling of particulates contained in the water.

The sludge settles to the bottom of the clarifier tank and the treated effluent flows over a V-notched weir into the chlorine contact tank (02-TK-003). The activated settled sludge (RAS) in the clarifier is sent to the sludge drying beds and some of it is returned to the septic tank zone 1. The water collected from the sludge drying bed through an underdrain is recirculated to the septic tank zone 1.

Desludging is carried out automatically from the base of each clarifier. Sludge is directed to the sludge drying beds, where free water percolates through a sand bed and returns to the inlet septic tank. Sludge is retained and solar dried on the sand bed. The dried sludge is periodically removed to skips and then taken off site by a hazardous waste disposal company. Once removed and safely disposed of a safe disposal certificate is generated. The septic tank is also periodically desludged.

Step 7: Disinfection and Discharge of Effluent

Disinfection is the final process before the treated effluent is discharged directly to the stormwater dam. Chlorine dosing pump doses calcium hypochlorite from chlorine dosing tank into the clarified water feed to the chlorine contact tank (CCT), which is also equipped with a mixer. The agitation ensures adequate contact between treated effluent and dosed chlorine. The chlorine dosing pump operates at a fixed flow interlocked with the clarifier feed pumps. The dosed effluent collects in the CCT where complete disinfection is achieved and treated water is gravitated to the Storm Water Dam.

2-1.16 Potable Water

All potable water (except for the West Pit operations) is supplied from Rand Water Board (RWB) through an agreement with Samancor. About a third of the potable water requirements is supplied from the RO Plants. Potable water is stored in two 500 m³ potable reservoirs from where it feeds the plant-, contractors-, administrative- areas and the Mmaditlhokwa communities to the north of the West Pit.

2-1.16.1 Reverse Osmosis Plants

Three (3) RO plants are located at the mine to treat water for potable use, namely:

- RO Plant 1 (Buffelspoort);
- RO Plant 2 (West Pit); and
- RO Plant 3 (Mmaditlhokwa).

2-1.17 Electrical Energy

The efficient use of electricity is essential for the mine's operations and processing plants with electricity powering the latter and diesel fuelling mining machinery. Tharisa aims to reduce its dependency on non-renewable resources by focusing on renewable energy generation.

Tharisa receives its power from the Eskom grid where it is transferred via 275 kV powerlines to the mine. Eskom and Tharisa substations (88 and 11 kV) (Figure 36) have been established at the mine which receive and distribute the power via powerlines to the mining operations.

A 275 kV powerline and associated Eskom servitude cross through the eastern part of the mining area in a north-south direction. Smaller rural power and telephone lines currently service the residential areas within the western and eastern sections of the project area.

2-2 PROPOSED NEW ACTIVITIES AND INFRASTRUCTURE

2-2.1 Part 1: Consolidation and Amendment Project

Over the past 16 years since the mine began operating, significant changes, improvements and new facilities have been constructed to support the operation of the mine. Each change or amendment resulted in the need for environmental approvals which were issued as separate authorisations. The DMPR has requested that these separate approvals be consolidated into one single EMPr and EA that is applicable to the Tharisa Mine to improve overall management of the mining operation.

In addition to the consolidation, some changes will need to be made to ensure the accuracy of the EMPr and EA to the operation of the mine and ensure all activities currently being undertaken are approved and discussed in the EMPr with associated mitigation measures applicable to each activity. Tharisa holds the following approvals to be consolidated into this application (Table 14):

Table 14: Tharisa Approvals

Approval	Reference	Licence Type	Approval Date
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	MR	19 September 2008
	North West Department of Agriculture, Conservation and Environment (DACE) Reference Number: NWP/EIA/159/2007	EA	23 October 2009
Amendment of the EA issued on 23 October 2009, to incorporate additional listed activities previously excluded: Transmission and distribution of above ground electricity (120kV or more)	DACE Reference Number: NWP/EIA/159/2007	EA and EMPr Amendment	30 August 2011
EIA and EMPr for changes to the pit, tailings dam and waste rock facilities; a chrome sand drying plant and other operational and surface infrastructure.	Department of Economic Development, Environment, Conservation and Tourism (DEDECT) EA Reference Number: NWP/EIA/50/2011	EA	29 April 2015
	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	EA and EMPr Amendment; and WML	24 June 2015
Amendment of an EA for Increase Storage Capacity of Tailings Facility and WRD and increase the authorised Fuel Storage Capacity in respect of Farm Rooikoppies JQ 297, Elandsdrift JQ 467 And K/Kraal JQ 342, within the Magisterial District of Bojanala, North West Province.	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	EA and EMPr Amendment; and WML	03 August 2021
Tharisa Additional Waste Rock Storage EIA and EMPr. - The expansion of the existing and approved Far West WRD 1 by a footprint of 109 ha. The expanded area will be referred to as the West OG WRD. Portions of the West OG WRD will be located on backfilled areas of the West Pit; and - The establishment of a WRD (referred to as the East OG WRD) on backfilled portions of the East Pit. The proposed East OG WRD will cover an area of approximately 72 ha.	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	EA and EMPr Amendment; and WML	31 May 2023
EA for TSF 3 WRD Extension 1.	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	EA and EMPr Amendment; and WML	05 December 2024
TSF 3 Construction and Operation	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	EA and EMPr Amendment; and WML	07 February 2025
Supporting Infrastructure			
EA for the diversion of an existing 275kV powerline and associated infrastructure.	DEA Reference Number: 14/12/16/3/3/3/408	EA	15 November 2012
Amendment of an EA in respect of the upgrade of the existing WWTP in respect of the Farm Rooikoppies JQ 297, Elandsdrift JQ 467 and K/kraal JQ 342 JQ.	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	Amendment of an EA	14 August 2020
Rectification of an unlawful commencement of a listed activity for the storage of dangerous goods of more than 80m ³ but less than 500m ³ .	DMRE Reference Number: NW30/5/1/2/3/2/1/358EM	EA and EMPr	10 August 2021

2-2.2 Part 2: Properties to be incorporated into the MR

Tharisa Mine falls within Ward 31, 32 and 45 of the Rustenburg Local Municipality, and Ward 27 of the Madibeng Local Municipality, within the Bojanala Platinum District Municipality (BDM), North West Province. The mining operation is located on the Farms K/Kraal 342 JQ, Rooikoppies 297 JQ and Elandsdrift 467 JQ, approximately 95 kilometres (km) north-west of Johannesburg and 35 km east of Rustenburg, accessible via the R104 regional road just off the N4 toll road. Figure 30, Figure 31 and Figure 32 provide a regional and local map of the project area.

Tharisa's EMPr boundary versus the MR boundary is different and includes different properties. This is as a result that certain areas where the mining infrastructure is located will not be mined and therefore have not been incorporated into the approved MR. This infrastructure is located within the mining area as defined by the MPRDA and is considered infrastructure incidental to the mining operation. To avoid any third-party interlopers and/or opportunists from applying for mining and/or prospecting rights or mining permit over these properties, Tharisa has made the decision to incorporate these properties, where no mining rights, prospecting rights or mining permits have been granted, into the Tharisa MR.

Table 15 provides detailed information regarding the properties applicable to the Tharisa Mine. The properties required to be incorporated into the MR are listed below and shown in Figure 31 and Figure 34.

- Portion 368 of the farm K/Kraal 342 JQ.
- Portion 29 of the farm Elandsdrift 467 JQ.
- Portion 89 of the farm Elandsdrift 467 JQ.
- Portion 90 of the farm Elandsdrift 467 JQ.
- Portion 91 of the farm Elandsdrift 467 JQ.
- Portion 92 of the farm Elandsdrift 467 JQ.
- A Portion of Portion 93 of the farm Elandsdrift 467 JQ.
- A Portion of Portion 94 of the farm Elandsdrift 467 JQ
- Portion 176 of the farm Elandsdrift 467 JQ.
- Portion 177 of the farm Elandsdrift 467 JQ.

Table 15: Property Description

Farm Name (s)	The mining operation is located on the Farms K/Kraal 342 JQ, Rooikoppies 297 JQ and Elandsdrift 467 JQ, approximately 95 kilometres (km) north-west of Johannesburg and 35 km east of Rustenburg, accessible via the R104 regional road just off the N4 toll road.
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Affected Farm (s)	The project is situated within the Rustenburg and Madibeng Local Municipalities which form part of the BDM in the North-West Province (Figure 30, Figure 31 and Figure 32).	
	The following are the approved MR properties which incorporate the entire mine:	
	Farm K/Kraal 342 JQ, Portion 2, 3, 5, 6, 7, 9, 10, 11, 12, 13, 15, 16, 19, 20, 22, 23, 25, 26, 27, 28, 29, 30, 33, 38, 39, 40, 41, 47, 48, 53, 74, 76, 83, 84, 90, 91, 96, 100, 101, 104, 105, 108, 109, 110, 111, 114, 116, 117, 118, 119, 120, 122, 123, 127, 132, 133, 135, 137, 138, 139, 140, 142, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 166, 175, 176, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 196, 205, 206, 207, 208, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 224, 225, 226, 227, 229, 230, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 250, 251, 256, 257, 259, 262, 265, 266, 276, 283, 285, 286, 289, 297, 298, 301, 303, 304, 305, 314, 317, 318, 319, 324, 329, 330, 331, 335, 336, 342, 344, 350, 352, 353, 354, 356, 357, 358, 361, 362 and 365.	
	A Section 102 application (Reference Numbers: NW-00330MR/102 and NW-00358MR/102) was submitted to the DMPR and has been approved for the addition of Portion 260, 261, 306 and 307.	
	Farm Rooikoppies 297 JQ, Portion 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 19, 20, 22, 23, 24, 26, 27, 28, 29, 30, 32, 33, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 49, 50, 52, 53, 54, 55, 56, 57, 58, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 80, 81, 82, 83, 84, 85, 86, 87, 88, 95, 96, 97, 98, 99, 101, 102, 103, 104, 105, 106, 107, 108, 109, 111, 113, 114, 116, 117, 118, 120, 121, 122, 123, 124, 125, 126, 130, 134, 135, 136, 137, 138, 139, 141, 142, 143, 144, 145, 146, 147, 149, 150, 151, 152, 153, 154, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 173, 176, 177, 179, 182, 183, 184, 185, 189, 190, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 212, 213, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 276, 277, 278, 279, 280, 281, 282, 283, 292, 297, 307, 308, 312, 313, 314, 315, 316, 317, 318, 320, 322, 323, 326, 327, 328, 329, 330, 331, 332, 333, 335, 336, 337, 338, 339, 343, 344, 345, 347, 348, 349, 351, 354, 357, 358, 359, 360, 361, 362, 364, 365, 366, 367, 368, 369, 370, 371, 372, 387, 388, 399 and 400.	
Application Area (ha)	Tharisa's EMPr boundary versus the MR boundary is different. Tharisa wishes to amend the mining right boundary by incorporating the following properties which relates specifically to the TSFs and WRD owned and operated by Tharisa.	
	- Farm K/Kraal 342 JQ: Portion 368. - Farm Elandsdrift 467 JQ, Portion 29, 89, 90, 91, 92, Portion of Portion 93, Portion of Portion 94 , 176 and 177.	
	All the properties being applied for are owned by Tharisa. Refer to Figure 33 and Figure 34 below for a map indicating affected properties.	
	Tharisa currently holds an approved MR covering approximately 5 515 ha. It is proposed that additional properties be incorporated into the MRA, increasing its extent to approximately 5 715 ha.	
	In addition, Tharisa has approved mine-associated infrastructure located outside the current MR boundary that is essential to the operation of the mine. Accordingly, for the purposes of this application, the Application Area (EMPr Boundary) comprises the approved MRA together with the associated mine infrastructure incidental to the mining operation, resulting in a total application area of approximately 6 159 ha.	
Farm Owner	Tharisa Minerals (Pty) Ltd	
Province	North West	
District Municipality	Bojanala Platinum District Municipality	
Local Municipality	Rustenburg and Madibeng Local Municipalities	
Distance and direction from nearest town (s)	Tharisa Mine is located approximately 4 km to the south of Marikana Town, in the North West Province	
21 digit Surveyor General Code for each farm portion:	Farm Name and Number	21 Digit Code
	K/Kraal 342 JQ	T0JQ00000000034200002
		T0JQ00000000034200003
		T0JQ00000000034200005
		T0JQ00000000034200006
		T0JQ00000000034200007
		T0JQ00000000034200009
		T0JQ00000000034200010

		T0JQ00000000034200011
		T0JQ00000000034200012
		T0JQ00000000034200013
		T0JQ00000000034200015
		T0JQ00000000034200016
		T0JQ00000000034200019
		T0JQ00000000034200020
		T0JQ00000000034200022
		T0JQ00000000034200023
		T0JQ00000000034200025
		T0JQ00000000034200026
		T0JQ00000000034200027
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	The properties required to be incorporated into the MR are as follows (Figure 34)	
	K/Kraal 342 JQ	T0JQ00000000034200368
	Elandsdrift 467 JQ	T0JQ00000000046700029 T0JQ00000000046700089 T0JQ00000000046700090 T0JQ00000000046700091 T0JQ00000000046700092 T0JQ00000000046700093 T0JQ00000000046700094 T0JQ00000000046700177 T0JQ00000000046700178
Facility Co-ordinates	Latitude: 25°44'4.33"S Longitude: 27°29'27.00"E	

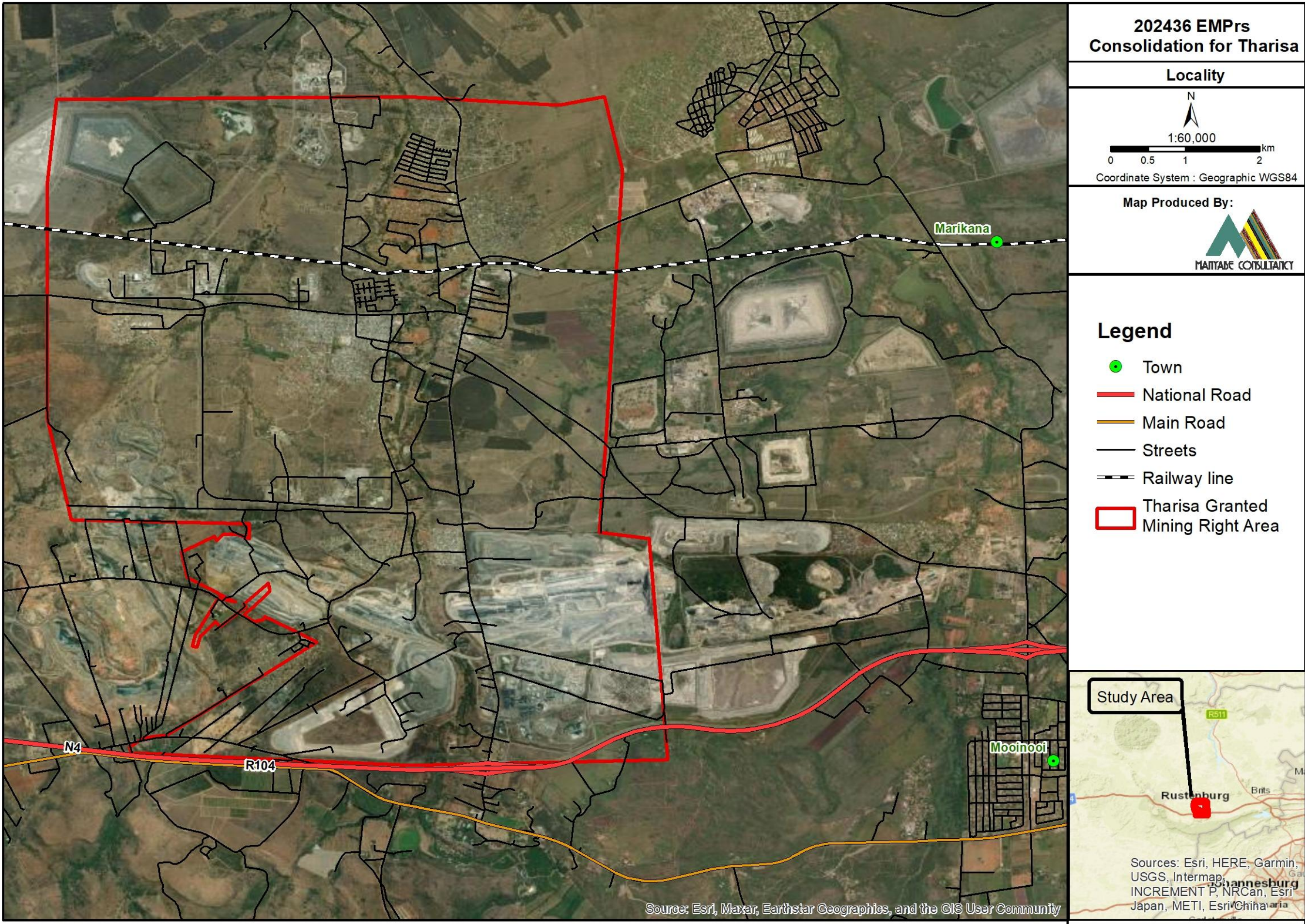


Figure 30: Locality Map (Approved MRA)

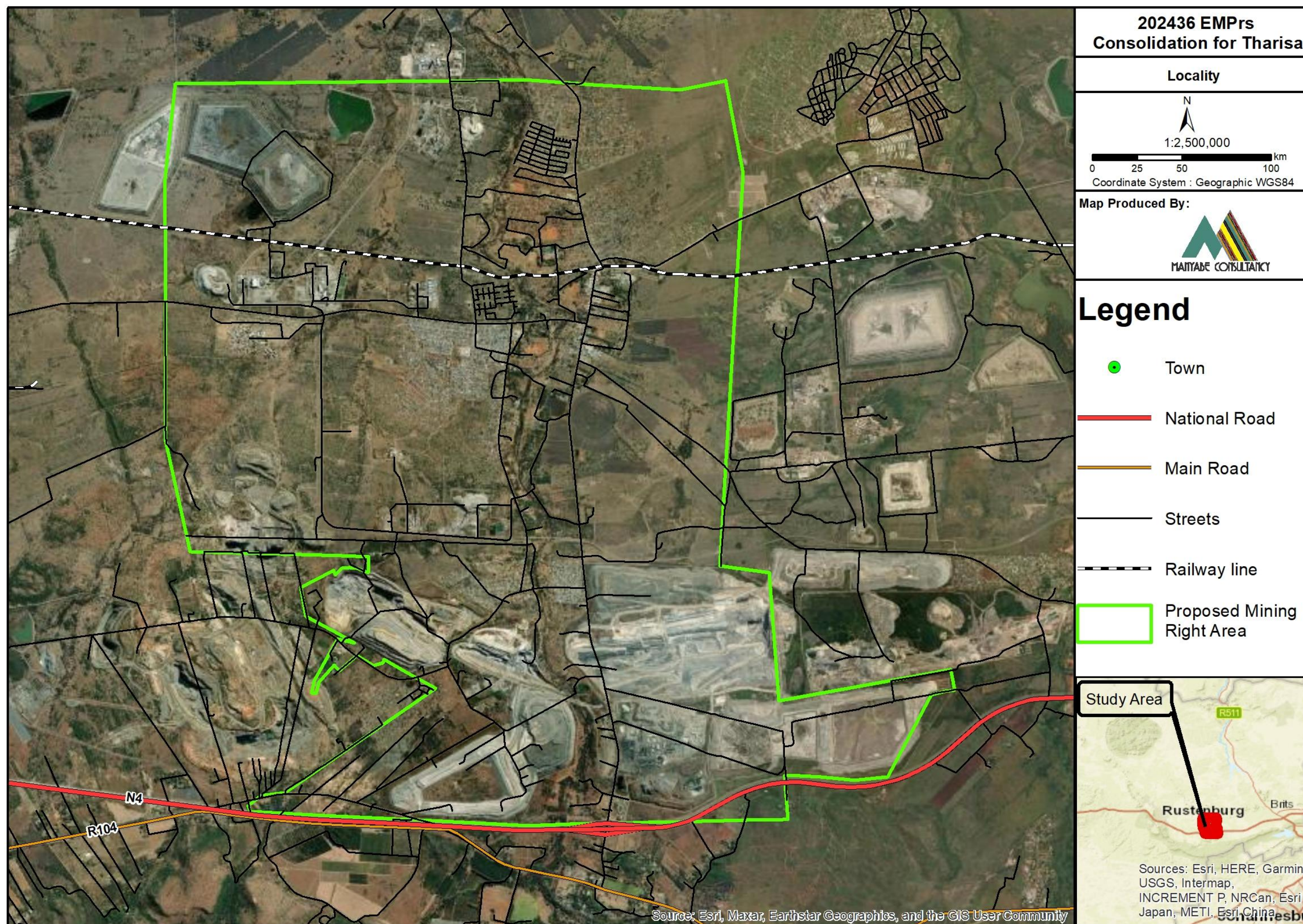


Figure 31: Locality Map (Proposed MRA)

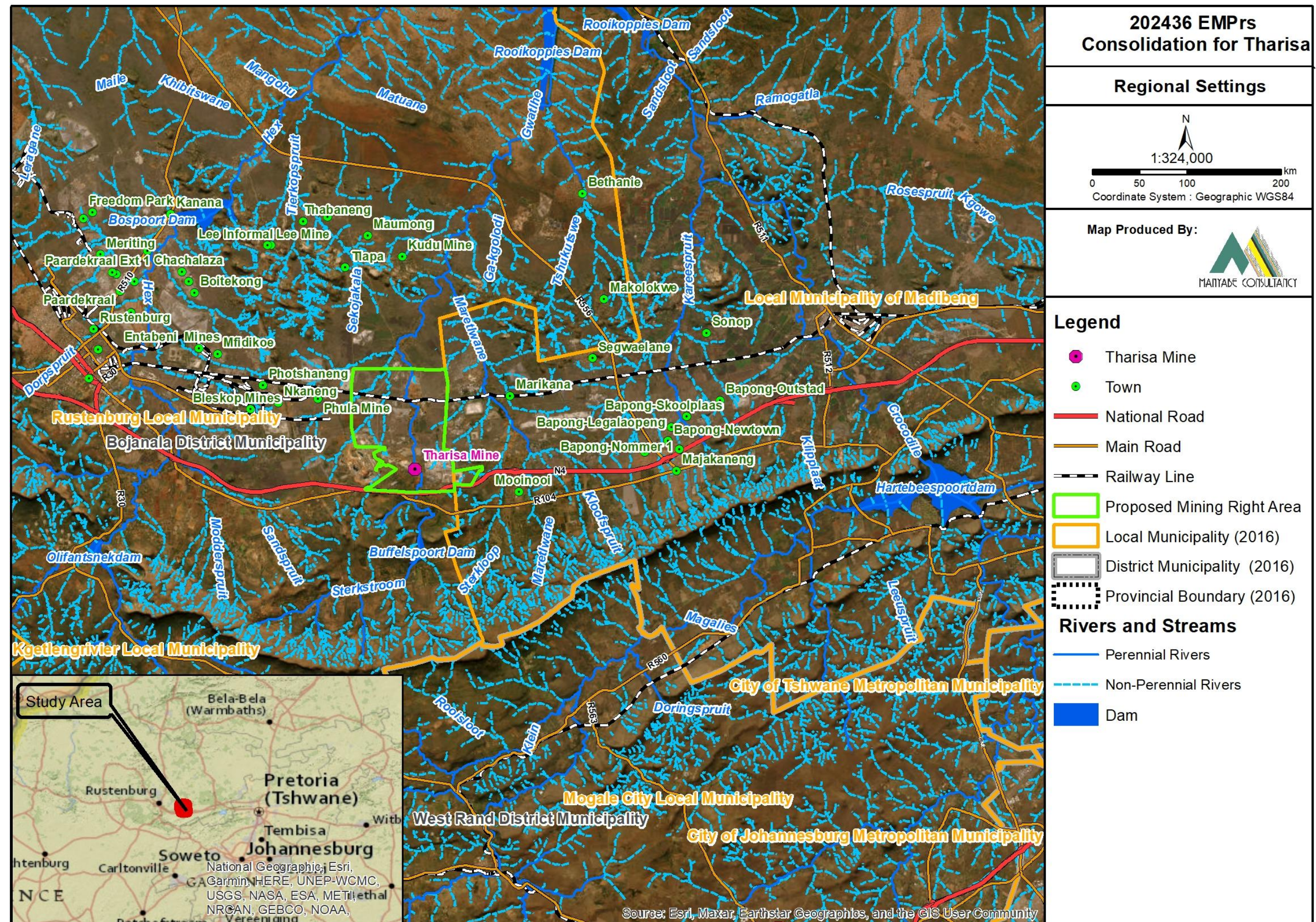


Figure 32: Regional Map

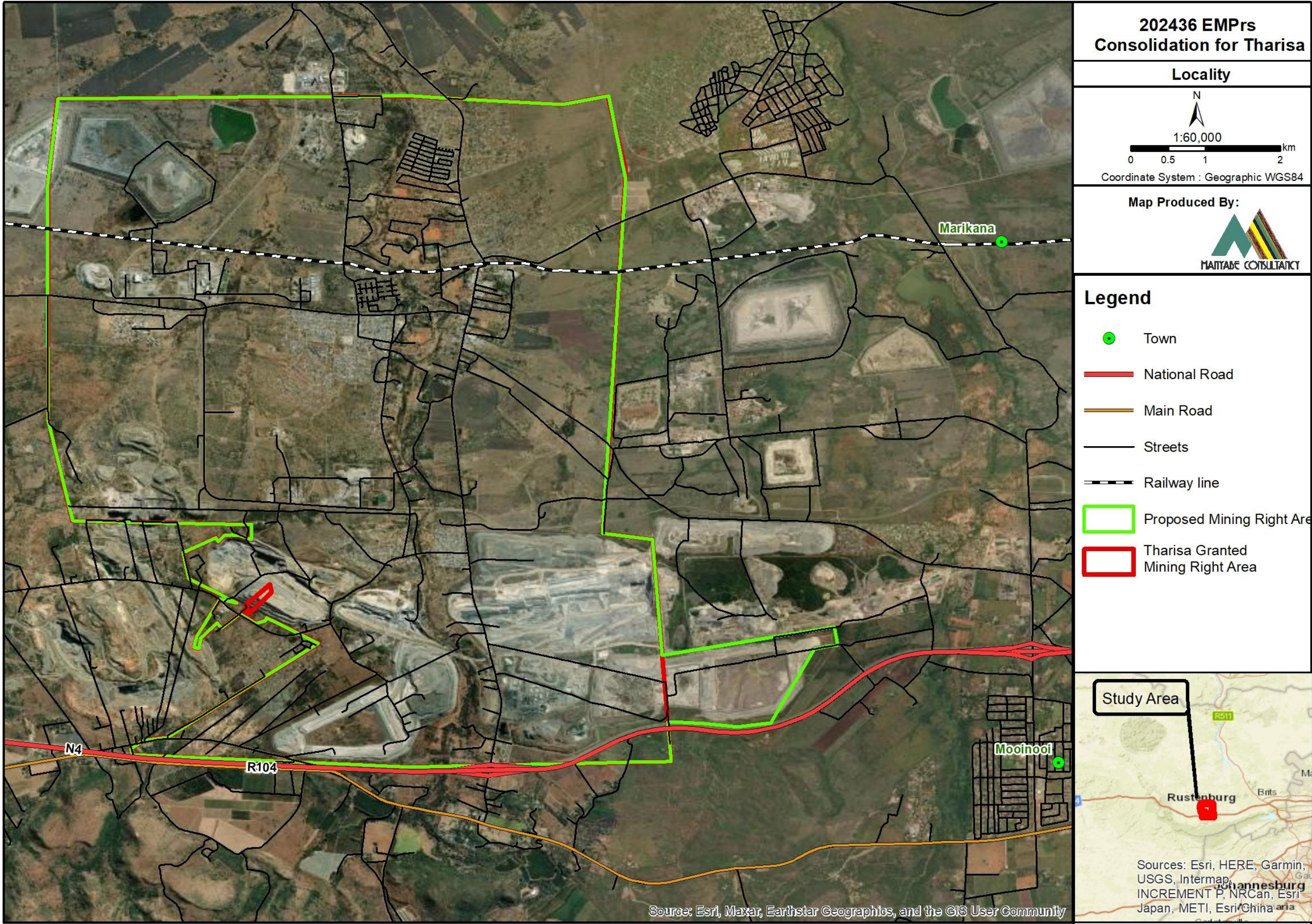


Figure 33: Approved MRA Versus Proposed MRA

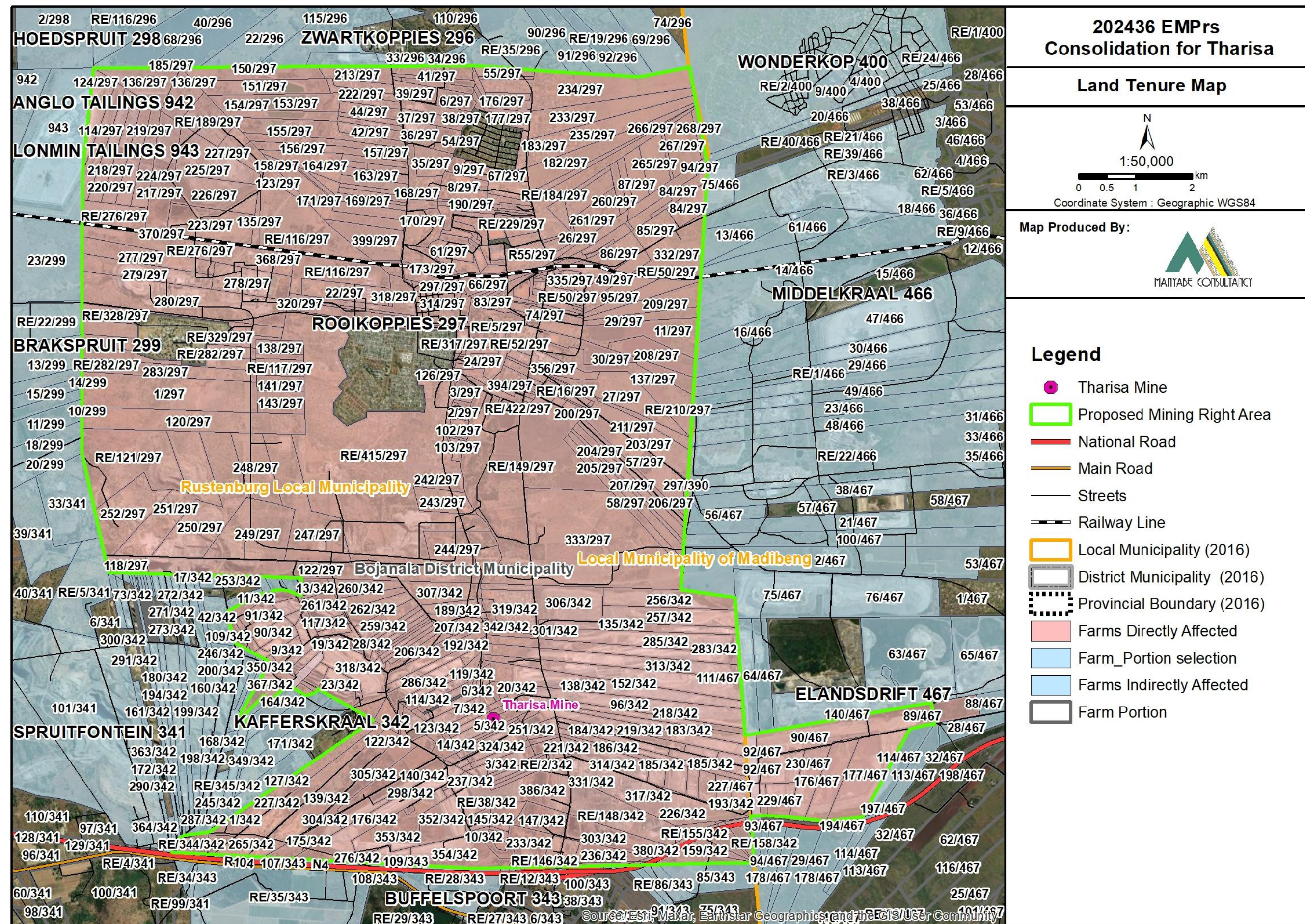


Figure 34: Land Tenure Map

2-2.3 Part 3: EA for the New Proposed Activities

Tharisa is planning to continue operating until 2125 and thus additional infrastructure will need to be developed. The proposed infrastructure triggers activities in terms of the following legislation:

- MPRDA;
- NEMA;
- NEMWA; and
- NWA.

Therefore, the below proposed activities require approval prior to commencement:

2-2.3.1 New Waste Rock Dumps and Associated Infrastructure

New WRDs will be constructed to store the waste generated from the mining operation. Waste will be removed from both the opencast and underground mine (once operational). The waste rock will contain material that is not considered to have material value to the mine and will thus not be processed for PGM and chromite removal. The waste rock will be permanently disposed on surface and will be used for rehabilitation purposes (concurrent and at end of mining). Some waste may remain on surface and will need to be vegetated as part of the final mine closure plan.

Five (5) new WRDs are proposed to be constructed as presented in Table 16. Figure 35 provides the location of the below-mentioned WRDs.

Table 16: New Proposed Waste Rock Dumps

WRD Name	WRD Storage Capacity (Million Cubic Meters)	Deposition Start Date
Safety Butress for West Underground	2.40	2027
TSF 3 Safety Berm	1.95	2027
Far West WRD Expansion	6.27	2027
TSF 1 Phase 1 conversion into WRD	1.7	2027
TSF 1 Phase 1 Safety Butress – Stage 2	1.97	2027

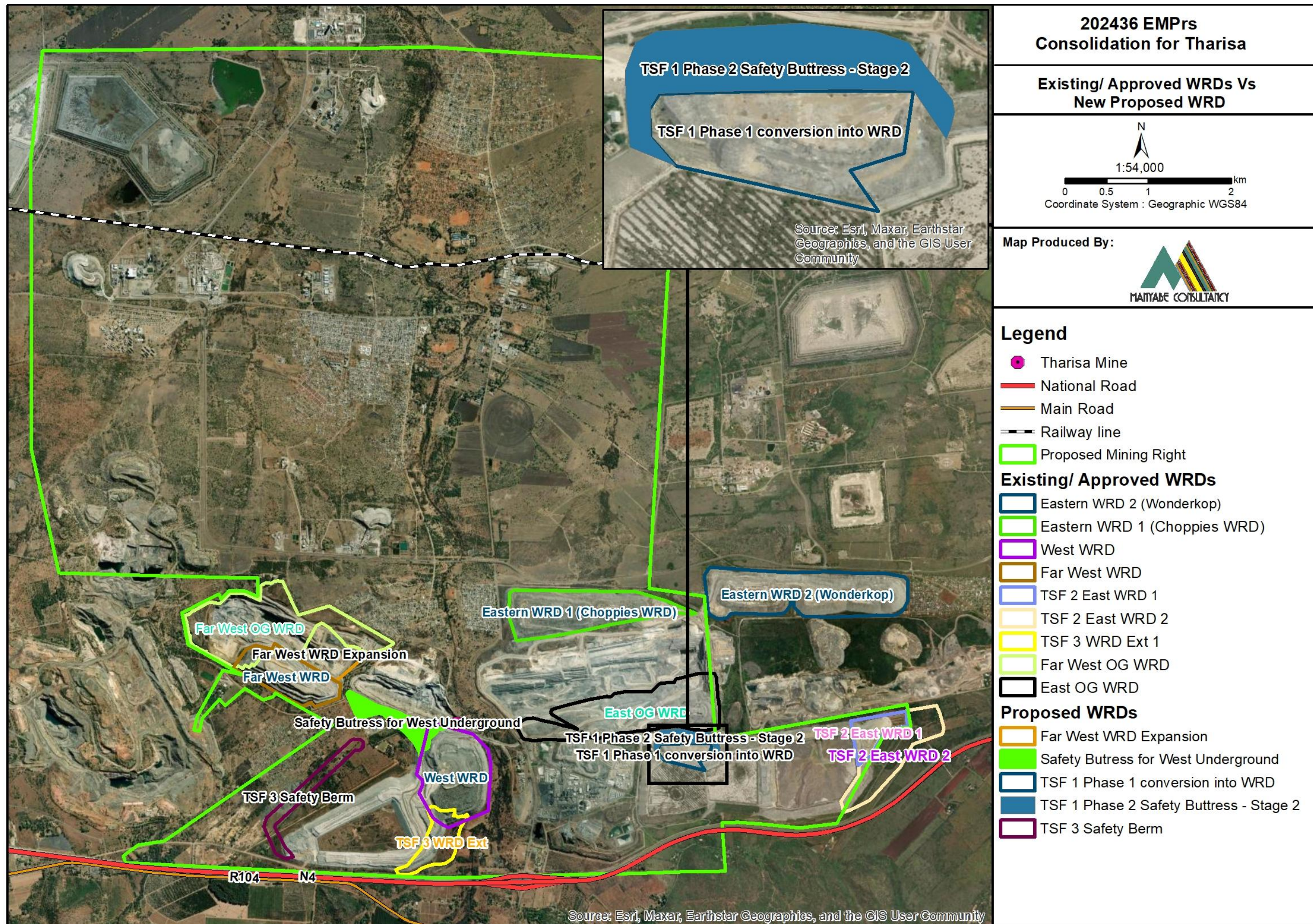


Figure 35: New Proposed and Existing/ Approved Waste Rock Dumps

2-2.3.2 275kV Realignment and 88kV Upgrade

A 275kV powerline currently exists through the Tharisa mining footprint, which is an Eskom powerline supplying to various areas, including the Northern Cape. To ensure the continuation and functionality of the mine, Tharisa proposes to relocate the 275kV powerline and re-route it around the mining area to avoid interference with the mining operation and Eskom power supply. An alternative line route will be discussed with Eskom and approved. Tharisa is undertaking the environmental process to obtain the approval for its re-location, as part of the proposed project.

Additionally, an 88kV powerline constructed parallel to the D1325 (Marikana Road) must be upgraded to support the mine's power supply requirements as it expands. This will also include upgrades made to the Tharisa substation.

The powerlines and associated re-alignments are shown in Figure 36.

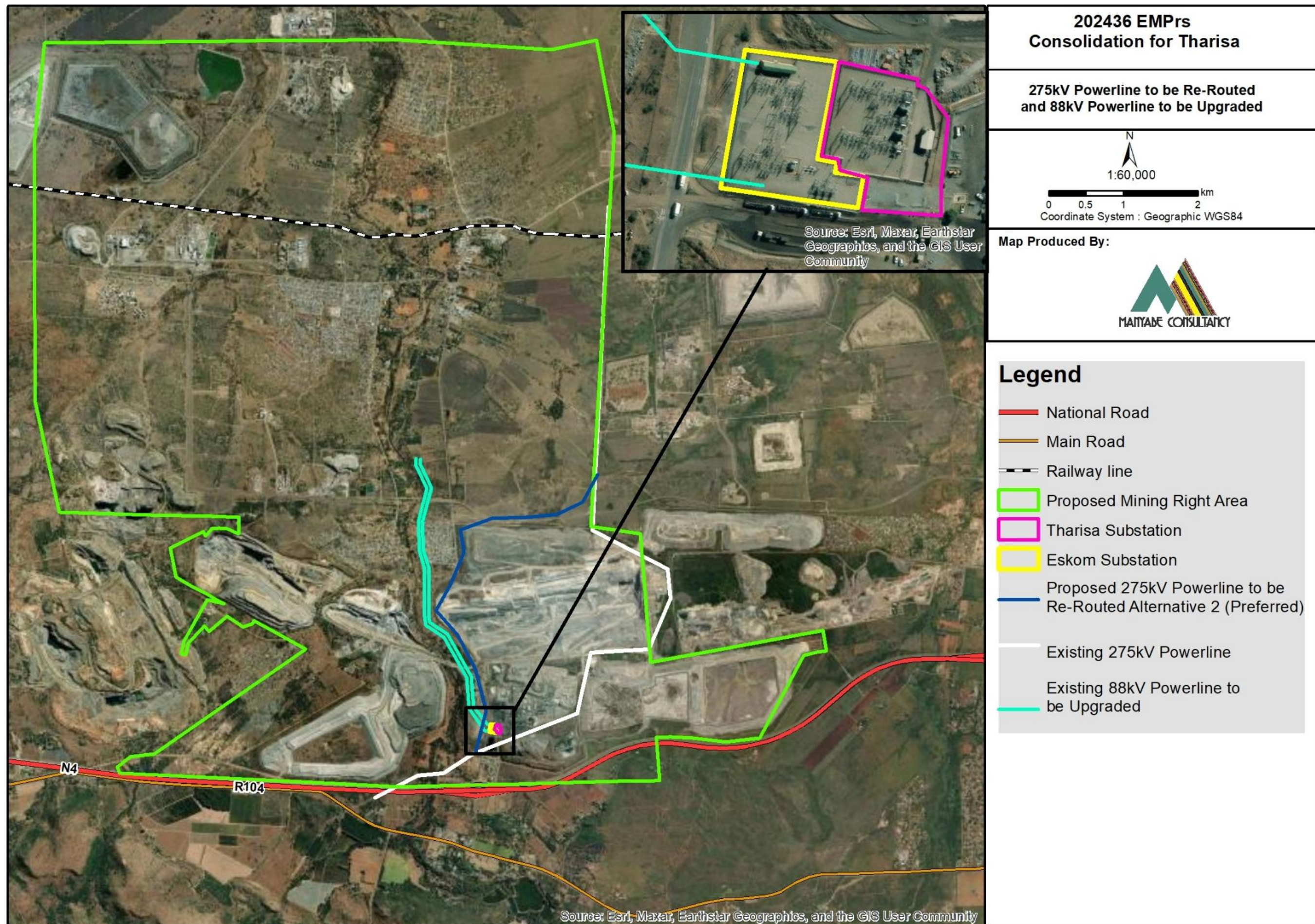


Figure 36: 275kV Powerline Re-routing and 88kV Upgrade

2-2.3.3 Tailings Storage Facility 3 Slurry Pipeline

The proposed pipeline is for the tailings' deposition between Vulcan Plant and TSF 3. In the original application, two (2) route alternatives were assessed (Route A and Route B). The CA approved Route A and TSF 3 as part of the original application. Tharisa still wishes to keep the approved Route A. It must however be noted that, for this application, Tharisa is proposing Route C as a future option as the TSF expands (refer to Figure 38).

Route C has been opted as the preferred option due to the following reasons:

- It is a direct pipeline as compared to Route A and B.
- It is significantly shorter than Route A and B, resulting in considerably lower construction and maintenance costs, as well as reducing the footprint of the proposed pipeline.
- It will be placed above ground and elevated onto a gantry (refer to Figure 37 for a typical pipeline gantry to be constructed) outside of the floodline of the Sterkstroom River, which will ensure protection from any potential washouts or damage to the infrastructure.
- The pipeline gantry will ensure that there is no impact on the Sterkstroom River, which will thus avoid impacts on stream flows.
- The pipes are expected to be steel pipes, adding to the structural integrity of the crossing.
- The pipeline will run through Tharisa owned properties i.e. Portion 38 and 147 of the Farm K/Kraal 342 JQ.

The following specifications are applicable to Routes C:

- 1 535m in length, with 525 000 tons per month total throughput capacity.
- 400mm outside diameter.
- 281mm inside diameter.
- Class 25, SDR 7.4 (25 bar).
- The pipeline will be welded, similar to the existing pipeline feeding the existing TSF 2 Phase 2.



Figure 37: Typical Pipeline Gantry

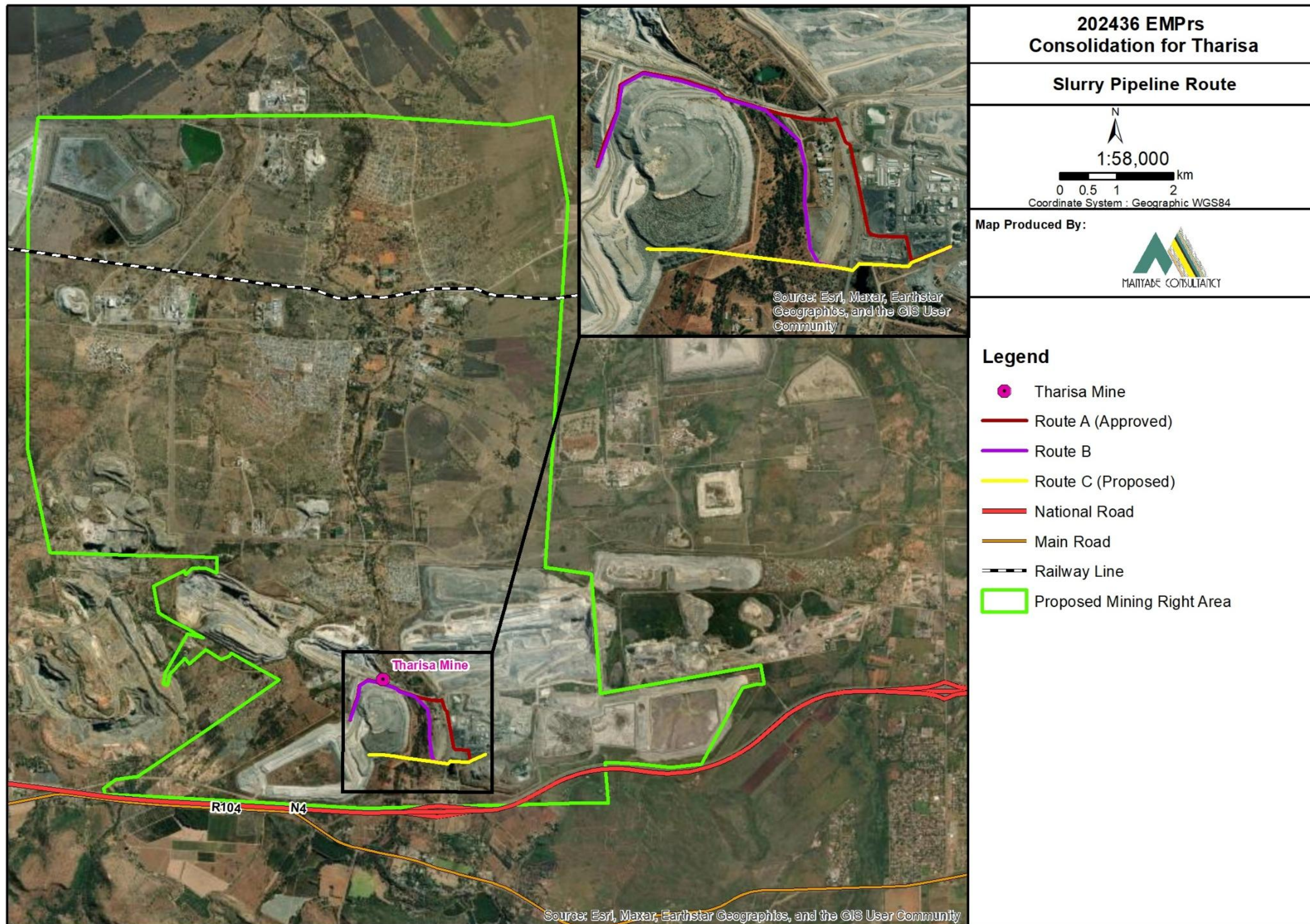


Figure 38: Pipeline Route Alternatives

2-2.3.4 Lifting of the Walls of Tailings Storage Facility 1 Phase 2

The mine currently operates three (3) processing plants, namely Genesis, Voyager and Vulcan. Genesis and Voyager are able to process 100 kt and 300 kt per month, respectively. The waste product produced by both plants is sent to the Vulcan plant for further extraction of chrome, after which, the tailings material is hydraulically pumped to TSF 2 Phase 2 for storage. The TSF 3 has been approved by the DMPR and is currently being constructed. Upon completion of construction activities, the TSF 3 will receive tailings once TSF 2 Phase 2 has reached its FSL by December 2025 (based on current tailing production).

Based on current production of tailings, and planned expansions to extend the Life of Mine (LoM) to 2125, Tharisa is compelled to pursue additional storage solutions by lifting the walls of the current TSF 1 Phase 2, TSF 2 Phase 1 and TSF 2 Phase 2. At the time of this application, there are pending EA and WULA applications for the lifting of the walls of TSF 2 Phase 1 and TSF 2 Phase 2, which are not part of this application (separate application). Therefore, the current application only seeks EA for the lifting of the walls for TSF 1 Phase 2. It must be noted that TSF 1 Phase 2 is currently not operational.

By raising the walls of TSF 1 Phase 2, there will be little need for changing the majority of the existing infrastructure, thereby reducing the need for the construction of additional decanting and other associated infrastructure. This will reduce environmental impacts, construction and maintenance costs, providing the Best Practicable Environmental Option (BPEO).

The relevant aspects of the raised TSF 1 Phase 2 stage capacity curves are summarised below:

- Maximum tailings height: = ± 41 m.
- Additional capacity at maximum height: = 1 786 940 tonnes $\approx 1,78694 \text{ Mm}^3$ (5.14 months).

The TSF1 Phase 2, though not operational, exists, and the EA and WML were approved previously. The existing infrastructure associated with the TSF comprises the following:

- Single, full containment, engineered paddocks, constructed with selected waste rock from the open-pit mining operations.
- 1.5m high starter embankments along the upstream toe of the existing embankments, constructed from selected *in situ* soils in compacted layers.
- Structural key-cuts along the upstream and downstream toe of the TSF embankments, replacing the *in situ* soils with engineered rockfill.
- Penstock gravitation water decanting systems.
- The raised TSF will include the addition of:
 - Embankments constructed using selected waste rock from open-pit mining operations, with a height of 5m. The embankments will have a crest width of 15m with 1V:3H and 1V:2H downstream and upstream slopes, respectively.
 - Geofabric separation layer (750 g/m^2) below the raised embankment at the tailings interface.
 - Penstock outfall isolating valves.

The raised TSF will allow for the majority of the existing infrastructure components to remain in place and function as intended, as follows:

- Rockfill Embankment;
- Waste Rock Buttress;
- Toe drains;
- Seepage cut-off drains;
- Decant System;
- Penstock Energy Dissipator;
- Pool wall and Wing Walls;
- Catwalk;

- Geofabric;
- Solution Trench;
- Collection Sump;
- Collection Manhole;
- Drainage design;
 - *Pipe Loading;*
 - *Penstock outfall pipeline bearing capacity;*
 - *Penstock rings;*
 - *Penstock outfall valves;*
 - *Drainage Sizing;*
 - *Outlet Piping; and*
 - *Filter Compatibility.*
- Geofabric Separation Layer; and
- Barrier system.

2-2.3.5 Salvage Yard

Tharisa proposes to relocate the existing salvage yard, which is used for the sorting of industrial waste, to the Old Assembly yard within the mine (refer to Figure 39). The relocation of the salvage yard ensures that the facility is situated inside the mine, and safety and security risks are minimised. Additionally, the Old Assembly yard comprises a weighbridge which will be beneficial for the salvage yard processes. The proposed salvage yard will be approximately 0.4905 hectares in extent and located within a previously disturbed area (refer to Figure 39). The salvage yard will store more than 80 cubic metres of hazardous waste and 100 cubic metres of general waste.

2-2.3.6 Conveyor Belt

Waste rock from the East Pit is transported to the Far West OG WRD by haul trucks travelling along the haul road, which crosses the Sterkstroom stream via the existing low-water bridge. While this method was effective, haul truck operations present a range of ongoing operational and environmental challenges, including diesel emissions, fugitive dust, loose rock spillage onto the road, traffic safety concerns, and increasing cost pressures. Tharisa needs to address these cumulative impacts and improve the long-term sustainability of waste rock management, by implementing a conveyor system as the preferred solution, resulting in a safer, cleaner, quieter, and more cost-efficient than continued truck haulage.

Tharisa proposes the construction and operation of a $\pm 1\ 600$ mm wide waste rock conveyor belt system that will follow the same alignment of the existing haul road and cross the Sterkstroom stream utilising the existing low-water bridge infrastructure. By leveraging and upgrading existing infrastructure rather than creating new disturbance footprints, the proposal represents a pragmatic and environmentally responsible improvement to current operations. The conveyor will be fully enclosed over the watercourse to eliminate any potential rock spillage, prevent dust emissions at the crossing point, and protect water quality, while addressing key risks that are inherent to the existing truck-based transport method. The crossing structure will comprise a steel frame integrated with the existing bridge, while the conveyor alignment on either side utilises the current haul road network.

The design incorporates safety and operational features, including maintenance walkways, handrails, emergency pull-cord systems, and dedicated access points for routine inspection and maintenance — all of which represent a significant safety improvement over active haul road conditions. The existing culvert system beneath the bridge is retained in full to ensure the continued, uninterrupted flow of the Sterkstroom channel. In summary, the proposed conveyor system optimises the existing infrastructure to deliver a safer, lower-emission, and more operationally efficient method of waste rock transport, while actively reducing the environmental risks associated with current truck haulage.

Refer to Figure 40, which provides a layout of the proposed mining infrastructure at Tharisa Mine.

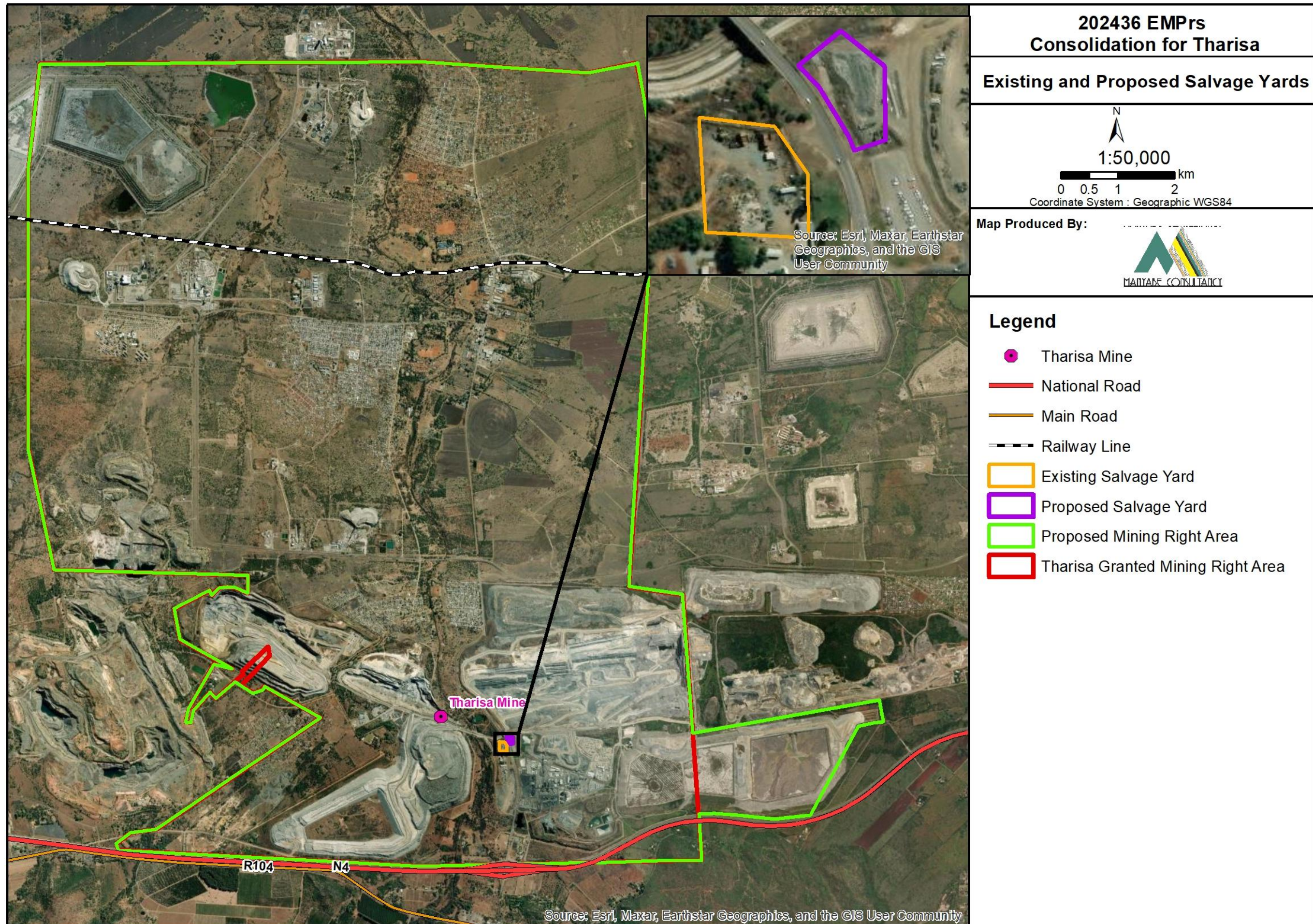


Figure 39: Proposed Salvage Yard

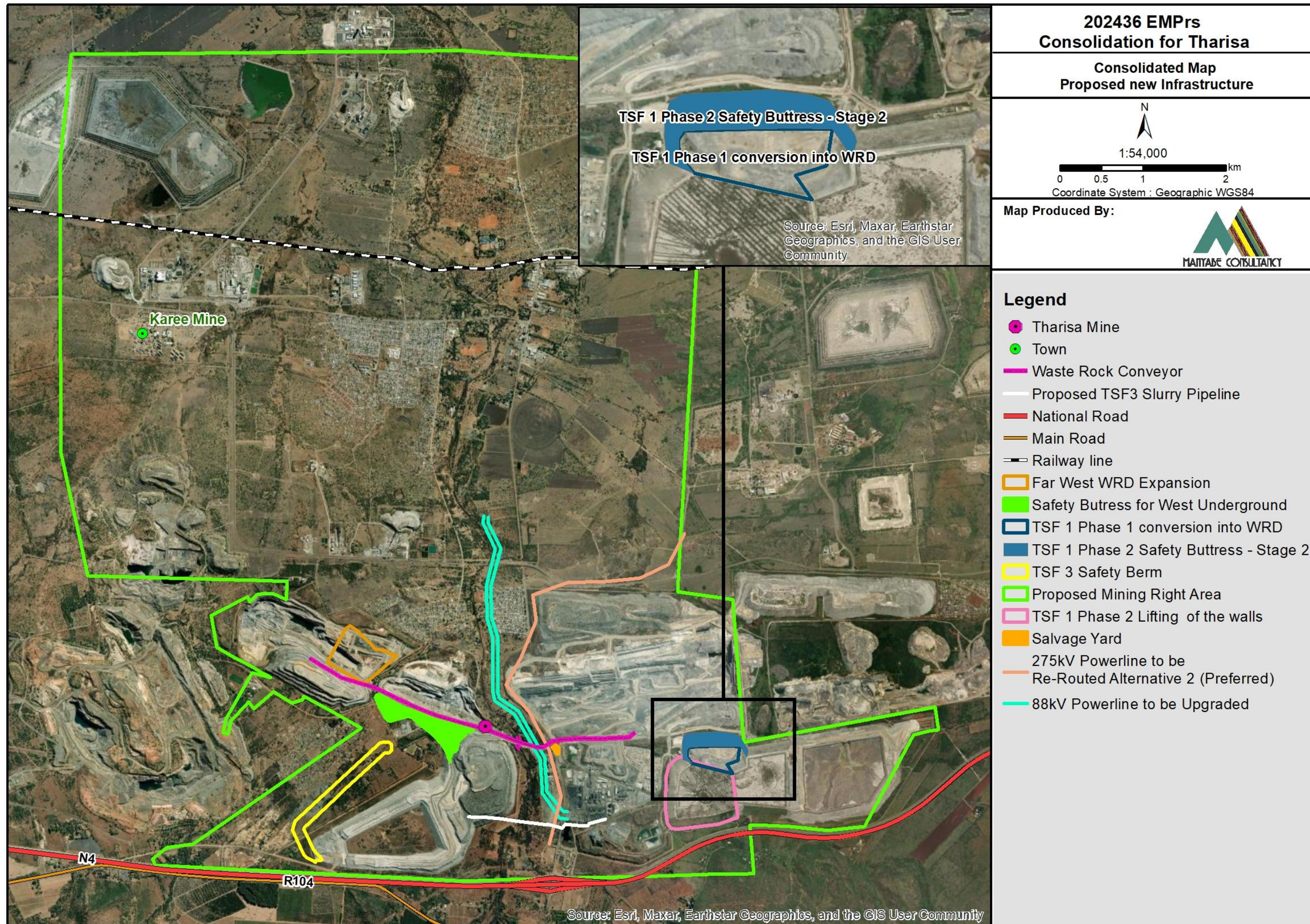


Figure 40: Consolidated Map showing all the Proposed New Infrastructure

2-3 APPROVED LISTED ACTIVITIES

Table 17 provides a list of all historically approved activities at the Tharisa Mine under the approved EAs, EMPs and WMLs that will be consolidated as part of this application as discussed in Table 14.

Table 17: Approved Listed Activities

Environmental Approval	Applicable Infrastructure	Historic Description of Activity Approved	Updated Description of Activity Approved	Listed Activity Applicable at Date of Approval (NEMA)	Corresponding Listed Activity (NEMA) (GNR. 983, GNR. 984 or GNR. 985 as amended)	Corresponding Waste Activity (NEMWA) (GNR. 921 as amended)	Listed Activity Still Applicable to the Operation
EIA and EMP for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	RoM/product stockpiles	Tharisa requested permission to operate several RoM/product stockpiles utilised for the storage of ore. The ore would be stored above ground prior to it being taken to the processing plant or removed from site as a product. The activity permitted the above ground storage of 1000 tons or more but less than 100 000 tons of ore.	Tharisa currently operates one RoM stockpile which receives ore from the mine for processing at the plant and three product stockpiles, namely, Chromite Ore Loading Facility 1, Chromite Ore Loading Facility 2 and External Chromite Ore Loading Facility. These are utilised to store processed chrome ready to be removed from site for sale. The RoM and product stockpiles are approved to continue operating.	2006 EIA Regulations GNR. 386 - Activity 1(b): The construction of facilities or infrastructure, including associated structures or infrastructure, for the above ground storage of 1000 tons or more but less than 100 000 tons of ore.	2014 EIA Regulations (as amended) GNR. 984 - Activity 17: Any activity including the operation of that activity which requires a MR in terms of section 22 of the MPRDA, 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 MR.	N/A	The RoM and product stockpiles are still existing and utilised by the mine.
EIA and EMP for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	- Mining and processing water pipelines - Wastewater pipelines including sewage and wastewater	Pipelines are required to transport sewage and water, including storm water around the operation.	Effective water management is essential for the operation of the Tharisa Mine. Tharisa utilises pipelines for the transportation of clean water from boreholes for use in the mining operation as well as its reticulation around the mine and associated processing plants. Additional pipelines have been constructed to manage stormwater. The pipelines vary in diameter and peak throughput. The largest pipelines have an internal diameter of 0.36 metres and more and a peak throughput of 120 litres per second or more. Therefore, all water and stormwater pipelines constructed within the mining boundary are approved to continue operating. Process water and wastewater is generated by the mine and associated processing plants. This water is reused into the mining processes which is critical to the success of the mine. Additionally, sewage is generated from the change houses and offices which is transported to the WWTP for treatment. Tailings generated from the processing plants is transported to TSFs located at the mine. Pipelines are utilised to transport the sewage, effluent, process water, wastewater, return water and slimes. The largest pipelines have an internal diameter of 0.36 metres and more and a peak throughput of 120 litres per second or more. Therefore, all sewage, effluent, process water, wastewater, return water,	2006 EIA Regulations GNR. 386 - Activity 1(k): The construction of facilities or infrastructure, including associated structures or infrastructure, for the bulk transportation of sewage and water, including storm water, in pipelines with - (i) an internal diameter of 0,36 metres or more; or (ii) a peak throughput of 120 litres per second or more.	2014 EIA Regulations (as amended) GNR. 983 – Activity 9: The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water- (i) with an internal diameter of 0.36 metres or more; or (ii) with a peak throughput of 120 litres per second or more	N/A	The activity is still applicable to the operation.
					2014 EIA Regulations (as amended) GNR. 983 – Activity 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.	N/A	The activity is still applicable to the operation.

Environmental Approval	Applicable Infrastructure	Historic Description of Activity Approved	Updated Description of Activity Approved	Listed Activity Applicable at Date of Approval (NEMA)	Corresponding Listed Activity (NEMA) (GNR. 983, GNR. 984 or GNR. 985 as amended)	Corresponding Waste Activity (NEMWA) (GNR. 921 as amended)	Listed Activity Still Applicable to the Operation
			industrial discharge and slimes pipelines constructed within the mining boundary are approved to continue operating.				
Amendment of an EA in respect of the upgrade of the existing WWTP in respect of the Farm Rooikoppies JQ 297, Elandsdrift JQ 467 and K/kraal JQ 342 JQ. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 14 August 2020			Upgrades to the pipelines associated with the WWTP were required to increase the amount of wastewater being received from the mine as it expanded.	2014 EIA Regulations (as amended) GNR. 983 – Activity 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.			
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	Powerlines located at Tharisa (88kV and 11kV)	Internal powerlines were constructed by Tharisa to transfer power from the Eskom main powerline and substation to the Tharisa substation and then distributed to the mining infrastructure via 88kV and 11kV powerlines.	Tharisa continues to utilise the powerlines and substation for the operation of the mine. Upgrades to the substation and powerlines have been undertaken to ensure continuous power is provided to the mine as it expands. The internal powerlines remain below the 275 kV threshold. Powerlines are required to transfer electricity from the Tharisa substation to the mine. These powerlines constructed within the mining boundary are approved to continue operating.	2006 EIA Regulations GNR. 386 – Activity 1(l): The construction of facilities or infrastructure, including associated structures or Infrastructure, for the transmission and distribution of electricity above ground with a capacity of more than 33 kV and less than 120 kV.	2014 EIA Regulations (as amended) GNR. 983 – Activity 11: The development of facilities or infrastructure for the transmission and distribution of electricity- (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275.kV; or (ii) inside urban areas or industrial complexes with a capacity of 275 kV or more.	N/A	The activity is still applicable to the operation.
Amendment of the EA, 23 October 2009 to incorporate additional listed activities previously excluded: Transmission and distribution of above ground electricity (120kV or more). DACE Reference Number: NWP/EIA/159/2007 - 30 August 2011 EA for the diversion of an existing 275kV powerline and associated infrastructure. DEA Reference Number: 14/12/16/3/3/3/408 - 15 November 2012	Powerlines located at Tharisa (275 kV)	275kV powerlines were constructed to transfer power from the Eskom grid to the Eskom substation and then to the Tharisa substation and mine.	Tharisa continues to utilise the 275 kV powerlines and substations for the operation of the mine and transfer of power from the Eskom power grid. These powerlines constructed to supply Tharisa with power are approved to continue operating.	2006 EIA Regulations GNR. 387 – Activity 1(l) - the transmission and distribution of above ground electricity with a capacity of 120 kV or more	2014 EIA Regulations (as amended) GNR. 984 – Activity 9: The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kV or more, outside an urban area or industrial complex.	N/A	The activity is still applicable to the operation.
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	- East Opencast Pit - Far West Opencast Pit - TSF 1 Phase 1 and Phase 2 - TSF 2 Phase 1 and Phase 2 - Processing Plants and associated infrastructure	A number of perennial and non-perennial streams were historically located on the Tharisa Mine where the proposed infrastructure was located which required authorisation namely: - East Opencast Pit - Far West Opencast Pit - TSF 1 Phase 1 and Phase 2 - TSF 2 Phase 1 and Phase 2 - Processing Plants and associated infrastructure (Genesis and Voyager)	Figure 1 provides the location of the infrastructure located at the Tharisa Mine which has been authorised. The infrastructure that was previously located within a watercourse or within 32m of a watercourse is still being utilised and is operational, including the new infrastructure and various amendments and changes made to the infrastructure.	2006 EIA Regulations GNR. 386 – Activity 1(m): The construction of facilities or Infrastructure, including associated structures or Infrastructure, any purpose in the one in ten-year floodline of a river or stream, or within 32 metres from a bank of a river or stream where the flood line is unknown,	2014 EIA Regulations (as amended) GNR. 983 – Activity 12: The development of- (ii) infrastructure or structures with a physical footprint of 100 square metres or more, where such development occurs- (a) within a watercourse; (b) in front of a development setback; or (c) if no development	N/A	The activity is still applicable to the operation.

Environmental Approval	Applicable Infrastructure	Historic Description of Activity Approved	Updated Description of Activity Approved	Listed Activity Applicable at Date of Approval (NEMA)	Corresponding Listed Activity (NEMA) (GNR. 983, GNR. 984 or GNR. 985 as amended)	Corresponding Waste Activity (NEMWA) (GNR. 921 as amended)	Listed Activity Still Applicable to the Operation
	(Genesis, Voyager and Vulcan)	- West WRD - Far West WRD - Eastern WRD 1 (Choppies WRD) - Roads and Bridges		excluding purposes associated with existing residential use, but Including (i) canals; (ii) channels; (iii) bridges; (iv) dams; and (v) weirs.	setback exists, within 32 metres of a watercourse measured from the edge of a watercourse.		
EIA and EMPr for changes to the pit, tailings dam and waste rock facilities; a chrome sand drying plant and other operational and surface infrastructure. DEDECT EA Reference Number: NWP/EIA/50/2011 - 29 April 2015 DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 24 June 2015	- Borrow Pits - West WRD - Far West WRD - Eastern WRD 1 (Choppies WRD) - Eastern WRD 2 (Wonderkop WRD) - Roads and Bridges	The mining infrastructure previously approved (infrastructure located within a watercourse or within 32m of a watercourse) has been amended to reflect additional proposed changes including expansions to the infrastructure which required an EA. The application also applied for the construction of the Eastern WRD 2 (Wonderkop WRD).		2010 EIA Regulations GNR. 544 - Activity 11: The construction of: (xi) infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.		N/A	
Amendment of an EA for Increase Storage Capacity of Tailings Facility and increase the authorised Fuel Storage Capacity in respect of Farm Rooikoppies JQ 297, Elandsdrift JQ 467 And K/Kraal JQ 342, within the Magisterial District of Bojanala, North West Province. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 03 August 2021		A second amendment application was made to make additional changes to the existing infrastructure and additional infrastructure proposed. Therefore, the infrastructure now approved to be constructed within a watercourse or within 32m of a watercourse is listed below: - East Opencast Pit - Far West Opencast Pit - TSF 1 Phase 1 and Phase 2 - TSF 2 Phase 1 and Phase 2 - Processing Plants and associated infrastructure (Genesis, Voyager and Vulcan) - Borrow Pits - West WRD - Far West WRD - Eastern WRD 1 (Choppies WRD) - Eastern WRD 2 (Wonderkop WRD) - Roads and Bridges		2014 EIA Regulations (as amended) GNR. 983 – Activity 12: The development of- (ii) infrastructure or structures with a physical footprint of 100 square metres or more, where such development occurs- (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse measured from the edge of a watercourse.		N/A	
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	- TSF 1 Phase 1 and Phase 2 - TSF 2 Phase 1 and Phase 2	The construction of the TSFs utilised at the mine was approved namely: - TSF 1 Phase 1 and Phase 2; and - TSF 2 Phase 1 and Phase 2.	Refer to Figure 1 which provides the location of TSF 1 Phase 1 and Phase 2, TSF 2 Phase 1 and Phase 2, which have been authorised.	2006 EIA Regulations GNR. 387 – Activity 6: The construction of a dam where highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, is 5 metres or higher or where the high-water mark of the dam covers an area of 10 hectares or more.	2014 EIA Regulations (as amended)	N/A	The activity is still applicable to the operation.
EIA and EMPr for changes to the pit, tailings dam and waste rock facilities; a chrome sand drying plant and other operational and surface infrastructure. DEDECT EA Reference Number: NWP/EIA/50/2011 - 29 April 2015 DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 24 June 2015	- TSF 1 Phase 1 and Phase 2 - TSF 2 Phase 1 and Phase 2	Amendments to the location of TSF 1 Phase 1 and Phase 2 and TSF 2 Phase 1 and Phase 2 was applied for and approved.		2010 EIA Regulations GNR. 544 – Activity 41: The expansion of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, where the combined capacity will be increased by 50 000 cubic metres or more.	2014 EIA Regulations (as amended)	N/A	The activity is still applicable to the operation.

Environmental Approval	Applicable Infrastructure	Historic Description of Activity Approved	Updated Description of Activity Approved	Listed Activity Applicable at Date of Approval (NEMA)	Corresponding Listed Activity (NEMA) (GNR. 983, GNR. 984 or GNR. 985 as amended)	Corresponding Waste Activity (NEMWA) (GNR. 921 as amended)	Listed Activity Still Applicable to the Operation
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	General Waste Storage Areas	General waste generated from the mine is stored within designated waste storage areas. The waste is separated into different waste streams for recycling purposes. Several general waste storage areas are located around the mine. The general waste is temporarily stored and removed from site for final disposal.	No changes to the activity have been made. General waste is still stored within designated storage areas. The general waste is temporarily stored and removed from site for final disposal.	2006 EIA Regulations GNR. 386 – Activity 1(o): The construction of facilities or infrastructure, including associated structures or infrastructure, for the recycling, re-use, handling, temporary storage or treatment of general waste with a throughput capacity of 20 cubic metres or more daily average measured over a period of 30 days, but less than 50 tons daily average measured over a period of 30 days.	N/A	Category A – Activity 3: The recycling of general waste at a facility that has an operational area in excess of 500 m , excluding recycling that takes place as an integral part of an internal manufacturing process within the same premises.	This activity is not applicable to the current operation
					N/A	Category C – Activity 1 The storage of general waste at a facility that has the capacity to store in excess of 100 m of general waste at any one time, excluding the storage of waste in lagoons or temporary storage of such waste.	The activity is still applicable to the operation.
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	Hazardous Waste Storage Areas	Hazardous waste generated from the mine is stored within designated waste storage areas. Several hazardous waste storage areas are located around the mine. The hazardous waste is temporarily stored and removed from site for final disposal.	No changes to the activity have been made. Hazardous waste is still stored within designated storage areas. The hazardous waste is temporarily stored and removed from site for final disposal.	2006 EIA Regulations GNR. 386 – Activity 1(p): The construction of facilities or infrastructure, including associated structures or infrastructure, for the temporary storage of hazardous waste.	N/A	Category C - Activity 2: The storage of hazardous waste at a facility that has the capacity to store in excess of 80 m of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons or temporary storage of such waste.	The activity is still applicable to the operation.
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	Helicopter Landing Pad	A helicopter landing pad was historically proposed to be constructed at the mine.	A helicopter landing pad was relocated outside the mining footprint and thus was never constructed.	2006 EIA Regulations GNR. 386 - Activity 1(q): The construction of facilities or infrastructure, including associated structures or infrastructure, for the landing, parking and maintenance of aircraft including- (l) helicopter landing pads, excluding helicopter landing facilities and stops used exclusively by emergency services.	Not Applicable The listed activity has been removed from the EIA Regulations. A helicopter landing strip is located at the mine but does not require authorisation.	N/A	This activity is not applicable to the current operation.
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	- WWTP - RO Plants	The mine constructed a WWTP for the treatment of wastewater and sewage generated from the mine. The design capacity was in the order of 300m³/day with a design peak flow of 25m³/h.	The WWTP was prone to flooding as it was located downstream of the plant and closer to the stormwater dam. An EA was granted by the DMPR in August 2020 to increase its capacity. The WWTP capacity was increased to 12,000m³ per day to accommodate the mine expansion plans. The treated effluent is discharged under gravity to the main PCD, from where it is recycled for use in processing.	2006 EIA Regulations GNR. 386 – Activity 1(s): The construction of facilities or infrastructure, including associated structures or infrastructure, for the treatment of effluent, wastewater or sewage with an annual throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres.	2014 EIA Regulations (as amended) GNR. 983 – Activity 25: 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 cubic metres but less than 15 000 cubic metres.	N/A	This activity is not applicable as it is superseded by GNR. 984 - Listing Notice 2, Activity 25 which is applicable.
		Two RO plants have been constructed to treat water abstracted from boreholes to a potable water standard. The water is then utilised by the community.	The RO plants are still in operation and ensure water is of a suitable quality to be provided to the community.	2010 EIA Regulations GNR. 544 – Activity 55A: The construction of facilities for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2000 cubic			

Environmental Approval	Applicable Infrastructure	Historic Description of Activity Approved	Updated Description of Activity Approved	Listed Activity Applicable at Date of Approval (NEMA)	Corresponding Listed Activity (NEMA) (GNR. 983, GNR. 984 or GNR. 985 as amended)	Corresponding Waste Activity (NEMWA) (GNR. 921 as amended)	Listed Activity Still Applicable to the Operation
DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 24 June 2015				metres but less than 15 000 cubic metres.			
Amendment of an EA in respect of the upgrade of the existing WWTP in respect of the Farm Rooikoppies JQ 297, Elandsdrift JQ 467 and K/kraal JQ 342 JQ. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 14 August 2020		The WWTP was upgraded in 2020 to treat additional wastewater and sewage.		2014 EIA Regulations (as amended) GNR. 984- Activity 25: 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 2000 cubic metres but less than 15000 cubic metres.	2014 EIA Regulations (as amended) GNR. 984 – Activity 25: 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 2000 cubic metres but less than 15000 cubic metres.	N/A	The activity is still applicable to the operation.
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	- East Opencast Pit - Far West Opencast Pit - TSF 1 Phase 1 and Phase 2 - TSF 2 Phase 1 and Phase 2 - Processing Plants and associated infrastructure (Genesis, Voyager and Vulcan) - Borrow Pits - West WRD - Far West WRD - Eastern WRD 1 (Choppies WRD) - Eastern WRD 2 (Wonderkop WRD) - Roads and Bridges	A number of perennial and non-perennial streams were historically located on the Tharisa Mine where the proposed infrastructure was located. To construct the infrastructure, material was moved and or removed which required an EA, namely: - East Opencast Pit - Far West Opencast Pit - TSF 1 Phase 1 and Phase 2 - TSF 2 Phase 1 and Phase 2 - Processing Plants and associated infrastructure (Genesis and Voyager) - West WRD - Far West WRD - Eastern WRD 1 (Choppies WRD) - Roads and Bridges	All mining associated infrastructure located within the MR and EMPr footprint that was constructed between 2008 and 2025 located within the watercourse is considered to be approved.	2006 EIA Regulations GNR. 386 – Activity 4: The dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding 5 cubic metres from a river, tidal lagoon, tidal river, lake, in-stream dam, floodplain or wetland.	2014 EIA Regulations (as amended) GNR. 983 – Activity 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.	N/A	The activity is still applicable to the operation.
EIA and EMPr for changes to the pit, tailings dam and waste rock facilities; a chrome sand drying plant and other operational and surface infrastructure. DEDECT EA Reference Number: NWP/EIA/50/2011 - 29 April 2015 DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 24 June 2015		The mining infrastructure previously approved (infrastructure located within a watercourse where material was moved, deposited or removed) has been amended to reflect additional proposed changes including expansions to the infrastructure which required an EA. The application also applied for the construction of the Eastern WRD 2 (Wonderkop WRD).		2010 EIA Regulations GNR. 544 – Activity 18: The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from: (i) a watercourse; (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater.		N/A	The activity is still applicable to the operation.
Amendment of an EA for Increase Storage Capacity of Tailings Facility and WRD and increase the authorised Fuel Storage Capacity in respect of Farm Rooikoppies JQ 297, Elandsdrift JQ 467 And K/Kraal JQ 342, within the Magisterial District of Bojanala, North West Province. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 03 August 2021		A second amendment application was made to make additional changes to the existing infrastructure and additional infrastructure proposed. Therefore, the infrastructure now approved to be constructed within a watercourse where material will be moved, deposited or removed is listed below: - East Opencast Pit - Far West Opencast Pit - TSF 1 Phase 1 and Phase 2 - TSF 2 Phase 1 and Phase 2 - Processing Plants and associated infrastructure (Genesis, Voyager and Vulcan)		2014 EIA Regulations (as amended) GNR. 983- Activity 19: The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from- (i) a watercourse; (ii) the seashore; or		N/A	The activity is still applicable to the operation.

Environmental Approval	Applicable Infrastructure	Historic Description of Activity Approved	Updated Description of Activity Approved	Listed Activity Applicable at Date of Approval (NEMA)	Corresponding Listed Activity (NEMA) (GNR. 983, GNR. 984 or GNR. 985 as amended)	Corresponding Waste Activity (NEMWA) (GNR. 921 as amended)	Listed Activity Still Applicable to the Operation
		- Borrow Pits - West WRD - Far West WRD - Eastern WRD 1 (Choppies WRD) - Eastern WRD 2 (Wonderkop WRD) - Roads and Bridges		(iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater.			
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	Dangerous goods storage facilities including tanks, silos and drums at the mining areas, workshops, storage yards and processing plants.	Dangerous goods would be utilised at the mine and thus require to be stored. Stores, tanks and handling areas are utilised for the storage of raw materials, plant reagents, consumables, oil and diesel. The volume of the combined diesel storage tanks was approximately 400 000 litres (approximately 300 000 of this is for the mining section). The storage volume of the other substances is as follows: 130 000 litres of oil - stored in sealed drums and/or storage tanks (approximately 100 000 liters of this is for the mining section) , 2 500 litres of hydraulic fluid - stored in sealed drums and/or storage tanks, - 2 000 kg of lubricants - stored in sealed drums; varying quantities of reagents stored in tanks and sealed drums. The storage method of all these substances is to contain them in sealed containers within impermeable, bunded areas with sufficient capacity to contain spilled materials. All spilled materials must drain to sumps with oil traps that must also be equipped to allow collection and removal of spilled substances as per SANS 10089-1:2003.	Tharisa stores dangerous goods at the mine which are utilised for mining and processing purposes which include diesel, oil, hydrocarbons, chemicals, plant reagents, lubricants, hydraulic fluids, and other related fuels. The mine stores a total of 3 297m³ of dangerous goods which are made up of: - Hydrocarbon and chemical storage tanks and silos at the workshops and opencast pits. - Voyager AECI-Hazardous Storage Silos and Tanks. - Genesis AECI-Hazardous Storage Silos and Tanks. - Vulcan AECI-Hazardous Storage Silos and Tanks. - Hydrocarbon Storage Tanks at the Emulsion Plant.	2006 EIA Regulations	2014 EIA Regulations (as amended)	N/A	This activity is not applicable as it is superseded by GNR. 984 - Listing Notice 2, Activity 4 which is applicable.
				GNR. 386 – Activity 7: The above ground storage of dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers, with a combined capacity of more than 30 cubic metres but less than 1000 cubic metres at any one location or site.	GNR. 983 – Activity 14: The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.		
				2006 EIA Regulations	2014 EIA Regulations (as amended)	N/A	The activity is still applicable to the operation.
				GNR. 387 – Activity 1(c): The construction of facilities or infrastructure, including associated structures or infrastructure, for the above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin in containers with a combined capacity of 1 000 cubic metres or more at any one location or site including the storage of one or more dangerous goods, in a tank farm.	GNR. 984 – Activity 4: 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 more than 500 cubic metres.		
EIA and EMPr for changes to the pit, tailings dam and waste rock facilities; a chrome sand drying plant and other operational and surface infrastructure. DEDECT EA Reference Number: NWP/EIA/50/2011 - 29 April 2015 DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 24 June 2015		Construction of new facilities for the storage of dangerous goods with a capacity of 460m ³ .		2010 EIA Regulations	2014 EIA Regulations (as amended)	N/A	This activity is not applicable as it is superseded by GNR. 984 - Listing Notice 2, Activity 4 which is applicable.
		Storage tanks for storage of dangerous goods which were unlawfully constructed with a storage capacity of 287m ³ .		2014 EIA Regulations (as amended)	2014 EIA Regulations (as amended)		
Rectification of an unlawful commencement of a listed activity for the storage of dangerous goods of more than 80m ³ but less than 500m ³ .				GNR. 983 - Activity 14: The development of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	GNR. 983 – Activity 14: The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	N/A	This activity is not applicable as it is superseded by GNR. 984 - Listing Notice 2, Activity 4 which is applicable.
Amendment of an EA for Increase Storage Capacity of Tailings Facility and WRD and increase the		Tharisa aims to increase the combined storage capacity to 2,000 cubic metres, by adding more		2014 EIA Regulations (as amended)	2014 EIA Regulations (as amended)		

Environmental Approval	Applicable Infrastructure	Historic Description of Activity Approved	Updated Description of Activity Approved	Listed Activity Applicable at Date of Approval (NEMA)	Corresponding Listed Activity (NEMA) (GNR. 983, GNR. 984 or GNR. 985 as amended)	Corresponding Waste Activity (NEMWA) (GNR. 921 as amended)	Listed Activity Still Applicable to the Operation
authorised Fuel Storage Capacity in respect of Farm Rooikoppies JQ 297, Elandsdrift JQ 467 And K/Kraal JQ 342, within the Magisterial District of Bojanala, North West Province. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 03 August 2021		fuel storage tanks within the existing fuels storage facilities.		GNR. 984 – Activity 4: 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 more than 500 cubic metres.	GNR. 984 – Activity 4: 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 more than 500 cubic metres.		
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009		Tharisa aimed to construct a mine and associated support infrastructure on an area which was previously a green fields site. The clearance of vegetation for the infrastructure proposed to be constructed was approximately 750 ha.		2006 EIA Regulations GNR. 386 – Activity 12: The transformation or removal of Indigenous vegetation of 3 hectares or more or of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of section 52 of the National Environmental Management Biodiversity Act, 2004 (NEMBA).	2014 EIA Regulations (as amended) GNR. 983 – Activity 27: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation.	N/A	This activity is not applicable as it is superseded by GNR. 984 - Listing Notice 2, Activity 15 which is applicable.
				2006 EIA Regulations GNR. 387 – Activity 2: Any development activity, including associated structures and infrastructure, where the total area of the development area is, or is intended to be, 20 hectares or more.	2014 EIA Regulations (as amended) GNR. 984 – Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation.	N/A	The activity is still applicable to the operation.
EIA and EMPr for changes to the pit, tailings dam and waste rock facilities; a chrome sand drying plant and other operational and surface infrastructure. DEDECT EA Reference Number: NWP/EIA/50/2011 - 29 April 2015 DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 24 June 2015	Mining infrastructure located within the mining footprint area where vegetation was cleared.	Changes to the existing WRDs, the open pits, the TSFs, addition of the Eastern WRD 2 (Wonderkop WRD) and addition of topsoil stockpiles and other support facilities will result in the alteration of undeveloped and vacant land with a footprint greater than 20ha.	All mining and mining related infrastructure located within the MR and EMPr footprint area as discussed in Section 2-1 and shown in Figure 1 where vegetation was cleared. The clearance of vegetation is considered to be approved.	2010 EIA Regulations GNR. 545 – Activity 15: Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use here the total area to be transformed is 20 hectares or more.	2014 EIA Regulations (as amended) GNR. 984 – Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation.	N/A	The activity is still applicable to the operation.
		Tharisa is located in a Critical Biodiversity Area (CBA) where indigenous vegetation was cleared for mining infrastructure.		2010 EIA Regulations GNR.546 – Activity 14 (a)(i): The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.	2014 EIA Regulations (as amended) GNR. 985 – Activity 12 (h) (iv): 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.	N/A	The activity is still applicable to the operation.
Amendment of an EA for Increase Storage Capacity of Tailings Facility and WRD and increase the authorised Fuel Storage Capacity in respect of Farm Rooikoppies JQ 297, Elandsdrift JQ 467 And K/Kraal JQ 342, within the Magisterial District of Bojanala, North West Province.		Clearance of vegetation due to proposed expansions of the following infrastructure: - TSF 1 (Phase 1 and 2) - TSF 2 (Phase 1 and 2) - West WRD - Far-West WRD - Eastern WRD 1 (Choppies WRD) - Eastern WRD 2 (Wonderkop WRD)		2014 EIA Regulations (as amended) GNR. 984 – Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation.	2014 EIA Regulations (as amended) GNR. 984 – Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation.	N/A	The activity is still applicable to the operation.

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DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 03 August 2021		- TSF 2 East WRD 1 and 2 - Waste storage facilities - Vulcan plant					
EIA and EMP for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	Groundwater abstraction	Abstraction of groundwater from boreholes to supply water to the mine.	Groundwater is abstracted from boreholes to supply the mine with a portion of their water demand. The boreholes where water is abstracted has been authorised under the NWA.	2006 EIA Regulations: GNR. 386 – Activity 13: The abstraction of groundwater at a volume where any General Authorisation (GA) issued in terms of the NWA will be exceeded.	Not Applicable. The listed activity has been removed from the EIA Regulations.	N/A	The activity is still applicable to the operation and approved by the WUL.
EIA and EMP for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	Communication Masts	Communication masts are required to enable communication around the mine as the mine is located within a CBA.	Communication towers/masts have been constructed around the mine.	2006 EIA Regulations GNR. 386 – Activity 14: The construction of masts of any material or type and of any height, including those used by for telecommunication broadcasting and radio transmission, but excluding- (i) masts of 15 metres and lower exclusively used by radio amateurs; or for lightning purposes; (ii) flag poles; and (iii) lightning conductor poles.	2014 EIA Regulations (as amended) GNR. 985 – Activity 3: The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower- (a) is to be placed on a site not previously used for this purpose; and (b) will exceed 15 metres in height.	N/A	The activity is still applicable to the operation.
EIA and EMP for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	Access roads, road diversions and haul roads	Additional roads and access points required for the proposed project are detailed below. <u>Haul roads at open pit operations</u> Internal haul roads will be constructed for the mining operation on the low-wall side of the mining pits close to the outcrop position and will used to transport ore and waste rock to the appropriate stockpiles in the western part of the project area or directly to the concentrator complex in the eastern part of the project area. The haul roads will be constructed of suitably sized and compacted waste rock. A conveyor will run from the central stockpiling and crushing point in the western part of the project area to the concentrator complex.	All historic access roads, road diversions, impacts to existing roads, and haul roads previously constructed is considered to be approved.	2006 EIA Regulations GNR. 386 – Activity 15: The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity, or which are access roads of less than 30 metres long	2014 EIA Regulations (as amended) GNR. 983 – Activity 24: The development of a road- (i) for which an EA was obtained for the route determination in terms of activity 5 in GNR. 387 of 2006 or activity 18 in GNR. 545 of 2010; or (ii) with a reserve wider than 13.5 metres, or where no reserve exists where the road is wider than 8 metres	N/A	This activity is not applicable as it is superseded by GNR. 984 - Listing Notice 2, Activity 27 which is applicable.
		<u>Main access roads to the mine</u> - The main access road to the mine will be the D1325. Stop controls are only required on the side roads. No stops are required on the D1325. <u>Changes to the current public road infrastructure</u> Proposed changes to the current road infrastructure include: - A permanent amendment to the alignment of a section of the D1325; - Formal access to the eastern part of the proposed project site in two places (to the north and south of the proposed open pit) on the D1325; - Formal access to the western part of the project area via the D1526;	Haul roads around the mine will continue to change as the mine progresses. Any road constructed within the mining footprint is considered to be approved. Roads are expected to vary; however, the width of the road may expand larger than 30m to accommodate the mine vehicles.	2006 EIA Regulations GNR. 387 – Activity 5: The route determination of roads and design of associated physical infrastructure, including roads that have not yet been built for which routes have been determined before the publication of this notice and which has not been authorised by a CA in terms of the EIA Regulations, 2008 made under Section 24 (5) of the Act and published in GNR. 385 of 2006, where- (a) It is a national road as defined in section 40 of the South African National Roads Agency Limited (SANRAL) and National Roads Act, 1998 (Act No 7 of 1998); (b) It is a road administered by a provincial authority; (c) the	2014 EIA Regulations (as amended) GNR. 984 – Activity 27: The development of a road- (iii) with a reserve wider than 30 metres; or (iv) catering for more than one lane of traffic in both directions; but excluding a road- (a) for which an EA was obtained for the route determination in terms of activity 5 in GNR. 387 of 2006 or activity 18 in GNR. 545 of 2010, in which case activity 24 in Listing Notice 1 of 2014 applies; (b) which is 1 kilometre or shorter; or (c) where the entire road falls within an urban area.	N/A	The activity is still applicable to the operation.

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		- An additional diversion option around Marikana on the D1325 for trucks transporting product to the Marikana siding; - Potential closure of the local bridge that crosses the N4 and the associated gravel road that runs between the proposed project site and the residential areas to the south of the N4 and the east of Buffelspoort; and - Temporary deviation of the D1526 gravel road that runs through the western part of the project area between the D1325 and the Retief/President van Rensburg School.		road reserve is wider than 30 metres or (d) the road will cater for more than one lane of traffic in both directions.			
EIA and EMP for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	- TSF 1 Phase 1 and Phase 2 - TSF 2 Phase 1 and Phase 2 - West WRD - Far-West WRD - Eastern WRD 1 (Choppies WRD); - Hernic Quarry - Process Water PCD - Stormwater Dam - Raw Water Dam - MCC Dam - Zinc Dams - WWTP - Hydrocarbon storage tanks/silos located at the mine and processing plants	The new proposed infrastructure was constructed that would result in the release of emissions, pollution or effluent, and is considered to be approved.	The listed activity in terms of NEMA removed all waste-related activities, and therefore, the infrastructure approved under this activity is listed below: - Process Water PCD - Stormwater Dam - Raw Water Dam - Community Dam - MCC Dam - Zinc Dams - WWTP - Hydrocarbon storage tanks/silos located at the mine and processing plants Refer to Figure 1 which provides the location of the WWTP, PCDs and Hydrocarbon storage tanks/silos which have been authorised under the various approvals and permitted to continue operating.	2006 EIA Regulations GNR. 387 – Activity 1(e): The construction of facilities or infrastructure, including associated structures or infrastructure, for- any process or activity which requires permit or licence in terms of legislation governing the generation or release of emissions, pollution, effluent or waste and which is not identified in terms of GNR. 386 of 2006.	2014 EIA Regulations (as amended) GNR. 984 – Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding- (i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are included in the list of waste management activities published in terms of section 19 of the NEMWA in which case the NEMWA applies; (iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or (iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.	N/A	The activity is still applicable to the operation.
			It is noted that historically the waste activities (WRDs and TSFs) were approved under GNR. 387 – Activity 1(e). This activity is now incorporated and approved under the NEMWA listed activities. Therefore, the transitional provisions are applicable to the following infrastructure: - TSF 1 Phase 1 and Phase 2 - TSF 2 Phase 1 and Phase 2 - West WRD - Far-West WRD - Eastern WRD 1 (Choppies WRD) Refer to Figure 1 which provides the location of the TSFs and WRDs which have been authorised under the various approvals and permitted to continue operating.	2006 EIA Regulations GNR. 387 – Activity 1(g): The use, recycling, handling, treatment, storage or final disposal of hazardous waste.	2014 EIA Regulations (as amended) GNR. 984 – Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding- (i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are included in the list of waste management activities published in terms of section 19 of the NEMWA in which case the NEMWA applies; (iii) the development of facilities or infrastructure for the treatment of	Category B Activity 7: The disposal of any quantity of hazardous waste to land. Category B Activity 10: The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity). Category B Activity 11: The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a MR, exploration right or production right in terms of the MPRDA.	The activity is still applicable to the operation.

Environmental Approval	Applicable Infrastructure	Historic Description of Activity Approved	Updated Description of Activity Approved	Listed Activity Applicable at Date of Approval (NEMA)	Corresponding Listed Activity (NEMA) (GNR. 983, GNR. 984 or GNR. 985 as amended)	Corresponding Waste Activity (NEMWA) (GNR. 921 as amended)	Listed Activity Still Applicable to the Operation
					effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or (iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.		
EIA and EMPr for changes to the pit, tailings dam and waste rock facilities; a chrome sand drying plant and other operational and surface infrastructure. DEDECT EA Reference Number: NWP/EIA/50/2011 - 29 April 2015 DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 24 June 2015	Eastern WRD 2 (Wonderkop WRD)	Construction and operation of the Eastern WRD 2 (Wonderkop WRD) was applied for and approved.	Refer to Figure 1 which provides the location of the TSFs and WRDs which have been authorised under the various approvals and permitted to continue operating.	2010 EIA Regulations GNR. 545 – Activity 5: The construction of facilities or infrastructure for any process or activity which requires a permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in GNR. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the NEMWA in which case that Act will apply.	2014 EIA Regulations (as amended) GNR. 984 – Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding- (i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are included in the list of waste management activities published in terms of section 19 of the NEMWA in which case the NEMWA applies; (iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or (iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.	Category B Activity 7: The disposal of any quantity of hazardous waste to land. Category B Activity 10: The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity). Category B Activity 11: The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a MR, exploration right or production right in terms of the MPRDA.	The activity is still applicable to the operation.
	- TSF 1 Phase 1 and Phase 2 - TSF 2 Phase 1 and Phase 2 - West WRD - Far-West WRD - Eastern WRD 1 (Choppies WRD)	Changes to the existing WRDs and the TSFs was applied for and approved.	Refer to Figure 1 which provides the location of the TSFs and WRDs which have been authorised under the various approvals and permitted to continue operating.	2010 EIA Regulations GNR. 544 – Activity 28: The expansion of or changes to existing facilities for any process or activity where such expansion or changes to will result in the need for a permit or licence in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the NEMWA in which case that Act will apply.	2014 EIA Regulations (as amended) GNR. 983 – Activity 34: The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution, excluding- (i) where the facility, infrastructure, process or activity is included in the list of waste management activities published in terms of section 19 of the NEMWA in which case the NEMWA applies; (ii) the expansion of existing facilities or infrastructure for the treatment of effluent, wastewater, polluted water or sewage where the capacity will be	Category B Activity 7: The disposal of any quantity of hazardous waste to land. Category B Activity 10: The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity). Category B Activity 11: The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a MR, exploration right or production right in terms of the MPRDA.	The activity is still applicable to the operation.

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					increased by less than 15 000 cubic metres per day; or (iii) the expansion is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will be increased by 50 cubic metres or less per day.		
	Chrome sand drying plant	The project approved the construction of a chrome sand drying plant, which required an Air Emission Licence (AEL)	This activity was never constructed, nor will it be constructed in future therefore this approval is no longer applicable to the operation.	2010 EIA Regulations GNR. 545 - Activity 5: The construction of facilities or infrastructure for any purpose or activity which requires a permit in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in GNR. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the NEMWA in which case that Act will apply.	2014 EIA Regulations (as amended) GNR. 984 – Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding- (i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are included in the list of waste management activities published in terms of section 19 of the NEMWA in which case the NEMWA applies; (iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or (iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.	N/A	Activity is no longer applicable to the operation.
				2010 EIA Regulations GNR. 545 – Activity 26: Commencing of an activity, which requires an AEL in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEMAQA), except where such commencement requires BA in terms of GNR. 544 of 2010.	Not Applicable The listed activity has been removed from the EIA Regulations.	N/A	Activity is no longer applicable to the operation.
Amendment of an EA for Increase Storage Capacity of Tailings Facility and WRD and increase the authorised Fuel Storage Capacity in respect of Farm Rooikoppies JQ 297, Elandsdrift JQ 467 And K/Kraal JQ 342, within the Magisterial District of Bojanala, North West Province. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 03 August 2021	- Rail Loop Buffer Dam - Community Dam	Tharisa was granted permission to construct new PCDs, namely, the Rail Loop Buffer Dam and Community Dam.	No changes to the originally approved PCDs are required.	2014 EIA Regulations (as amended) GNR. 984 – Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding-	2014 EIA Regulations (as amended) GNR. 984 – Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding- (i) activities which are identified and included in Listing Notice 1 of 2014;	N/A	The activity is still applicable to the operation.

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				(i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are included in the list of waste management activities published in terms of section 19 of the NEMWA in which case the NEMWA applies; (iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or (iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.	(ii) activities which are included in the list of waste management activities published in terms of section 19 of the NEMWA in which case the NEMWA applies; (iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or (iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.		
	TSF 2 East WRD 1 and 2	Tharisa was granted permission to construct the TSF 2 East WRD 1 and 2.	No changes to the originally approved TSF are required.	2010 EIA Regulations GNR. 545 - Activity 5: The construction of facilities or infrastructure for any purpose or activity which requires a permit in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in GNR. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the NEMWA in which case that Act will apply.	2014 EIA Regulations (as amended) GNR. 984 – Activity 6: The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding- (i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are included in the list of waste management activities published in terms of section 19 of the NEMWA in which case the NEMWA applies; (iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or (iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.	Category B Activity 7: The disposal of any quantity of hazardous waste to land. Category B Activity 10: The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity). Category B Activity 11 The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a MR, exploration right or production right in terms of the MPRDA.	The activity is still applicable to the operation.
EIA and EMP for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008	Explosive Storage Area	Tharisa stores explosives for use at the mining complex. The explosives are stored according to relevant legislation.		2006 EIA Regulations GNR. 387 – Activity 1(h): The construction of facilities or infrastructure, including associated structures or infrastructure, for the manufacturing, storage or testing of explosives, including ammunition, but excluding	Not Applicable The listed activity has been removed from the EIA Regulations.	N/A	Explosives are still stored onsite; however, the listed activity has been removed from the Regulations.

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North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009				licenced retail outputs and the legal end use of such explosives.			
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	Dangerous Goods Pipeline	Tharisa does not transport dangerous goods via pipeline within the mining complex., and therefore, this activity was never required and is not applicable to the operation.		2006 EIA Regulations GNR. 387 – 1(j): The construction of facilities or infrastructure, Including associated structures or infrastructure, for the bulk transportation of dangerous goods using pipelines, funiculars or conveyors with a throughput capacity of 50 tons or 50 cubic metres or more per day.	2014 EIA Regulations (as amended) GNR. 984 – Activity 7: The development and related operation of facilities or infrastructure for the bulk transportation of dangerous goods- (i) in gas form, outside an industrial complex, using pipelines, exceeding 1 000 metres in length, with a throughput capacity of more than 700 tons per day; (ii) in liquid form, outside an industrial complex, using pipelines, exceeding 1 000 metres in length, with a throughput capacity of more than 50 cubic metres per day; or (iii) in solid form, outside an industrial complex, using funiculars or conveyors with a throughput capacity of more than 50 tons per day.	N/A	Activity not applicable to the operation
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	All mining activities and related infrastructure.	The following infrastructure was approved to be constructed and operated: - East Pit - West Pit - Far West Pit. - Genesis Processing Plant - Voyager Processing Plant - Parking areas - Material storage areas - RoM and Product Stockpiles - West WRD - Far-West WRD - Eastern WRD 1 (Choppies WRD) - TSF 1 Phase 1 and Phase 2 - TSF 2 Phase 1 and Phase 2 - PCDs: - Hernic Quarry - Process Water PCD - Stormwater Dam - Raw Water Dam - MCC Dam - Zinc Dams - Storage Areas: - Hydrocarbon Storage Areas - Salvage Yards - Explosives Magazine Storage Area - Waste Storage Areas - Mine offices, workshops, visitors' parking, security, change houses, access control facilities, and Mine Training Centre, PPE stores, tuck stops, store warehouses and clinic - Haul Roads, overpass bridges and access roads - Topsoil Stockpiles	All mining and mining related infrastructure located within the MR and EMPr footprint area as discussed in Section 2-1 and shown in Figure 1.	2006 EIA Regulations GNR. 387 – 7: Reconnaissance, exploration, production and mining as provided for in the MPRDA in respect of such permits and rights.	2014 EIA Regulations (as amended) GNR. 984 – Activity 17: Any activity including the operation of that activity which requires a MR in terms of section 22 of the MPRDA, 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 MR.	N/A	The activity is still applicable to the operation.

Environmental Approval	Applicable Infrastructure	Historic Description of Activity Approved	Updated Description of Activity Approved	Listed Activity Applicable at Date of Approval (NEMA)	Corresponding Listed Activity (NEMA) (GNR. 983, GNR. 984 or GNR. 985 as amended)	Corresponding Waste Activity (NEMWA) (GNR. 921 as amended)	Listed Activity Still Applicable to the Operation
		- WWTP - Powerlines (275 and 88 kV) and substations (Eskom and Tharisa) - Weighbridge					
EIA and EMPr for a Proposed PGM Mine, Metago Project Number: T014-01, June 2008. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 19 September 2008 North West DACE Reference Number: NWP/EIA/159/2007 - 23 October 2009	Clearance of protected species	Tharisa was historically a farm, however some areas were still considered to be natural. Some protected species were located on the areas where infrastructure was proposed to be constructed. These species were relocated with all required permits. Additionally the mining area falls within a CBA.		2006 EIA Regulations GNR. 387 – 10: Any process or activity identified in terms of Section 53 (1) of the NEMBA.	2014 EIA Regulations (as amended) GNR. 983 – Activity 30: Any process or activity identified in terms of section 53(1) of the NEMBA.	N/A	The activity is still applicable to the operation.
Tharisa Additional Waste Rock Storage EIA and EMPr. - The expansion of the existing and approved Far West WRD 1 by a footprint of 109 ha. The expanded area will be referred to as the West OG WRD. Portions of the West OG WRD will be located on backfilled areas of the West Pit; and - The establishment of a WRD (referred to as the East OG WRD) on backfilled portions of the East Pit. The proposed East OG WRD will cover an area of approximately 72 ha. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 31 May 2023	- Far West OG WRD - East OG WRD	The following activities are approved but have not yet been constructed as the pits are still being mined: - The expansion of the existing and approved Far West WRD 1 by a footprint of 109 ha. The expanded area will be referred to as the West OG WRD. Portions of the West OG WRD will be located on backfilled areas of the West Pit; and - The establishment of a WRD (referred to as the East OG WRD) on backfilled portions of the East Pit. The proposed East OG WRD will cover an area of approximately 72 ha.	No changes to the originally approved application are required.	2014 EIA Regulations (as amended) GNR. 983 – Activity 27L: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan		N/A	The activity is still applicable to the operation.
				2014 EIA Regulations (as amended) GNR. 983 – Activity 21D: Any activity including the operation of that activity which requires an amendment or variation to a right or permit in terms of section 102 of the MPRDA, as well as any other applicable activity contained in this Listing Notice or in Listing Notice 3 of 2014, required for such amendment.		N/A	The activity is still applicable to the operation.
				2014 EIA Regulations (as amended) GNR. 983 – Activity 34: The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent, or pollution, excluding – where the facility, infrastructure, process or activity is included in the list of waste management activities published in terms of section 19 of the NEMWA in which case the NEMWA applies the expansion of existing facilities or infrastructure for the treatment of effluent, wastewater, polluted water or sewage where the capacity will be increased by less than 15 000 cubic metres per day; or the expansion is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will be increased by 50 cubic meters or less per day.	Category B Activity 7: The disposal of any quantity of hazardous waste to land. Category B Activity 10: The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity). Category B Activity 11: The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a MR, exploration right or production right in terms of the MPRDA.		The activity is still applicable to the operation.
				2014 EIA Regulations (as amended) GNR. 985 – Activity 12 (h) (iv): 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.		N/A	The activity is still applicable to the operation.
EA for TSF 3 WRD Extension 1. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 05 December 2024	TSF 3 WRD Extension 1	Tharisa has identified the need for an additional mine residue stockpile for waste rock, which consists of a WRD extension to West WRD 1 at TSF 3. The facility has been approved, however, it has not yet been constructed.	No changes to the originally approved application are required.	GNR. 983 – Activity 34: The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent, or pollution, excluding – where the facility, infrastructure, process or activity is included in the list of waste management activities published in terms of section 19 of the NEMWA in which case the NEMWA applies the	Category B Activity 7: The disposal of any quantity of hazardous waste to land. Category B Activity 10: The construction of a facility for a waste management activity listed in Category B of this		The activity is still applicable to the operation.

Environmental Approval	Applicable Infrastructure	Historic Description of Activity Approved	Updated Description of Activity Approved	Listed Activity Applicable at Date of Approval (NEMA)	Corresponding Listed Activity (NEMA) (GNR. 983, GNR. 984 or GNR. 985 as amended)	Corresponding Waste Activity (NEMWA) (GNR. 921 as amended)	Listed Activity Still Applicable to the Operation																										
		The WRD will be able to store 4.78 Mm ³ of waste from the West and East open pit area. The final height of the WRD will be 70 m with an estimated total footprint of approximately 22.7 ha, and the WRD is currently being designed. The WRD will have associated toe drainage, access roads and stormwater diversions.		expansion of existing facilities or infrastructure for the treatment of effluent, wastewater, polluted water or sewage where the capacity will be increased by less than 15 000 cubic metres per day; or the expansion is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will be increased by 50 cubic meters or less per day.		Schedule (not in isolation to associated waste management activity). Category B Activity 11: The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a MR, exploration right or production right in terms of the MPRDA.																											
				2014 EIA Regulations (as amended) GNR. 984 – Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- i. the undertaking of a linear activity; or ii. maintenance purposes undertaken in accordance with a maintenance management plan.	N/A	The activity is still applicable to the operation.																											
				2014 EIA Regulations (as amended) GNR. 985 – Activity 12 (h) (iv): 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.	N/A	The activity is still applicable to the operation.																											
TSF 3 Construction and Operation. DMRE Reference Number: NW30/5/1/2/3/2/1/358EM - 07 February 2025	• TSF 3	Tharisa is in the process of converting a portion of the approved WRD Extension 1 into a TSF. The following designs are applicable	No changes to the originally approved application are required.	2014 EIA Regulations (as amended) GNR. 983 – Activity 9: The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water— (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 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.	N/A	The activity is still applicable to the operation.																											
		<table><tr><td>Deposition Rate</td><td>t/m</td><td>350 000</td></tr><tr><td>Deposition Rate</td><td>t/annum</td><td>4 200 000</td></tr><tr><td>Capacity</td><td>tonnes</td><td>21 200 690</td></tr><tr><td>Life of Facility</td><td>years</td><td>5.05</td></tr><tr><td>Footprint</td><td>m²</td><td>1,171,928</td></tr><tr><td>Crest Elevation</td><td>mamsl</td><td>1260</td></tr><tr><td>FSL</td><td>mamsl</td><td>1258</td></tr><tr><td>Maximum Height</td><td>m</td><td>54.29</td></tr><tr><td>Tailings Depth</td><td>m</td><td>44.12</td></tr></table>		Deposition Rate	t/m	350 000	Deposition Rate	t/annum	4 200 000	Capacity	tonnes	21 200 690	Life of Facility	years	5.05	Footprint	m ²	1,171,928	Crest Elevation	mamsl	1260	FSL	mamsl	1258	Maximum Height	m	54.29	Tailings Depth	m	44.12	2014 EIA Regulations (as amended) GNR. 983 – Activity 12: The development of dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs (a) within a watercourse.	N/A	The activity is still applicable to the operation.
		Deposition Rate		t/m	350 000																												
		Deposition Rate		t/annum	4 200 000																												
		Capacity		tonnes	21 200 690																												
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FSL	mamsl	1258																															
Maximum Height	m	54.29																															
Tailings Depth	m	44.12																															
The TSF 3 will consist of the following works:	2014 EIA Regulations (as amended) GNR. 983 – Activity 21D: Any activity including the operation of that activity which requires an amendment or variation to a right or permit in terms of section 102 of the MPRDA, as well as any other applicable activity contained in this Listing Notice or in Listing Notice 3 of 2014, required for such amendment.	N/A	The activity is still applicable to the operation.																														
• Rockfill Embankment • Upstream Drains • Downstream Blankets Drains • Catchment Paddocks • Upstream and Downstream Keys • Decant System • Penstock Energy Dissipator • Pool Wall and Wing Walls • Catwalk • Geofabric – Upstream slopes of the facility • Solution Trench • Collection Manhole • Collection Sump	2014 EIA Regulations (as amended) GNR. 983 – Activity 34: The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution, excluding where the facility, infrastructure, process or activity is included in the list of waste management activities published in terms of section 19 of the NEMWA, in which case the NEMWA applies.	Category B Activity 7: The disposal of any quantity of hazardous waste to land. Category B Activity 10: The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity). Category B Activity 11: The establishment or reclamation of a residue stockpile or	The activity is still applicable to the operation. The activity is still applicable to the operation.																														

Environmental Approval	Applicable Infrastructure	Historic Description of Activity Approved	Updated Description of Activity Approved	Listed Activity Applicable at Date of Approval (NEMA)	Corresponding Listed Activity (NEMA) (GNR. 983, GNR. 984 or GNR. 985 as amended)	Corresponding Waste Activity (NEMWA) (GNR. 921 as amended)	Listed Activity Still Applicable to the Operation
						residue deposit resulting from activities which require a MR, exploration right or production right in terms of the MPRDA.	
				2014 EIA Regulations (as amended) GNR. 984 – Activity 16: The development of a dam where the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, is 5 metres or higher or where the highwater mark of the dam covers an area of 10 hectares or more.		N/A	The activity is still applicable to the operation.
				2014 EIA Regulations (as amended) GNR. 984 – Activity 19: The removal and disposal of minerals contemplated in terms of section 20 of the MPRDA, including (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.	2014 EIA Regulations (as amended) GNR. 984 – Activity 19: The removal and disposal of minerals contemplated in terms of section 20 of the MPRDA, including associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the MPRDA.	N/A	The activity is not applicable to the operation.

2-4 NEW LISTED ACTIVITIES TO BE AUTHORISED

As noted above, the proposed new infrastructure at Tharisa Mine requires authorisation for listed activities in terms of the EIA Regulations of 2014 (as amended) and the listed activities in terms of the NEMWA. Table 18 below provides a list of applicable activities for the proposed new infrastructure at Tharisa Mine.

Table 18: New Listed Activities to be Authorised

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc. E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity ha or m²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR. 983, GNR. 984 or GNR. 985)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
A) NEW WASTE ROCK DUMPS AND ASSOCIATED INFRASTRUCTURE				
The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	More than 20 hectares of indigenous vegetation might be cleared. This is still to be confirmed as the Biodiversity Impact Assessment is currently underway	X	Listing Notice 2 (GNR. 984), as amended by Listing Notice 2 (GNR. 325): Activity 15	N/A
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. (h) North West (iv) CBAs as identified in systematic biodiversity plans adopted by the CA; (v) Sensitive areas as identified in an environmental management framework (EMF) as contemplated in Chapter 5 of the Act and as adopted by the CA; or (vi) Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland.	More than 300m² of indigenous vegetation might be cleared. This is still to be confirmed as the Biodiversity Impact Assessment is currently underway	X	Listing Notice 3 (GNR. 985), as amended by Listing Notice 3 (GNR. 324): Activity 12	N/A
The disposal of any quantity of hazardous waste to land.		X	N/A	Category B Activity 7 of GNR. 921 of 2013

Mark Occupying Report for the EIA TS Consolidation				
NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc. E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity ha or m ²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR. 983, GNR. 984 or GNR. 985)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
The construction of a facility for a waste management activity listed in category B of this schedule (not in isolation to associated waste management activity).	- The Safety Butress for West Underground will have a storage capacity of 2.4 million cubic metres and deposition will commence in 2027. - The TSF 3 Safety Berm will have a storage capacity of 1.95 million cubic metres and deposition will commence in 2027. - The Far West WRD Expansion will have a storage capacity of 6.27 million cubic metres and deposition will commence in 2027. - TSF 1 Phase 1 conversion into WRD will have a storage capacity of 1.7 million cubic metres and deposition will commence in 2027. - TSF 1 Phase 1 Safety Butress – Stage 2 will have a storage capacity of 1.97 million cubic metres and deposition will commence in 2027. - The raised TSF 1 Phase 2 stage capacity curves will have the maximum tailings height: = ± 41 m; additional capacity at maximum height: = 1 786 940 tonnes ≈ 1,78694 Mm³ (5.14 months). - The final combined storage capacity for the TSF 1 Complex will be 9.9 Mm³.	X	N/A	Category B Activity 10 of GNR. 921 of 2013.
The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a MR, exploration right or production right in terms of the MPRDA.		X	N/A	Category B Activity 11 of GNR. 921 of 2013
B) 275 KV REALIGNMENT AND 88KV UPGRADE				
The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is-(a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometres or shorter in length; (c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development.	The 275kV preferred alternative 2 realignment will measure approximately 4.88km in length. Alternative 1 will measure approximately 8.68km in length.	X	Listing Notice 2 (GNR. 984), as amended by Listing Notice 2 (GNR. 325): Activity 9	N/A
C) TSF 3 SLURRY PIPELINE				
The development and related operation of infrastructure exceeding 1,000 meters in length for the bulk transportation of sewage, effluent, process water, waste water, 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, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or (b) where such development occurs within an urban area.	The following dimensions are applicable to the TSF 3 slurry pipeline: 1 535m in length, with 525 000 tons per month total throughput capacity. 400mm outside diameter. 281mm inside diameter. - Class 25, SDR 7.4 (25 bar). - The pipeline will be welded, similar to the existing pipeline feeding the existing TSF 2 Phase 2.	X	Listing Notice 1 (GNR.983), as amended by Listing Notice 1 (GNR. 327): Activity 10	N/A
D) LIFTING OF THE WALLS OF TSF 1 PHASE 2				
Any activity including the operation of that activity which requires an amendment or variation to a right or permit in terms of section 102 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity contained in this Listing Notice or in Listing Notice 3 of 2014, required for such amendment.	217.9 hectares.	X	Listing Notice 1 (GNR.983), as amended by Listing Notice 1 (GNR. 327): Activity 21D	N/A
The expansion of a dam where (i) the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, was originally 5 metres or higher and where the height of the wall is increased by 2,5 metres or more; or (ii) where the high-water mark of the dam will be increased with 10 hectares or more.	The raised TSF 1 Phase 2 stage capacity curves are summarised below: - Maximum tailings height: = ± 41 m. - Additional capacity at maximum height: = 1 786 940 tonnes ≈ 1,78694 Mm³ (5.14 months). The existing infrastructure associated with the TSF comprises the following: - Single, full containment, engineered paddocks, constructed with selected waste rock from the open-pit mining operations. 1.5m high starter embankments along the upstream toe of the existing embankments, constructed from selected <i>in situ</i> soils in compacted layers. - Structural key-cuts along the upstream and downstream toe of the TSF embankments, replacing the <i>in situ</i> soils with engineered rockfill. - Penstock gravitation water decanting systems. - The raised TSF will include the addition of: - Embankments constructed using selected waste rock from open-pit mining operations, with a height of 5m. The embankments will have a crest width of 15m with 1V:3H and 1V:2H downstream and upstream slopes, respectively. - Geofabric separation layer (750 g/m²) below the raised embankment at the tailings interface. - Penstock outfall isolating valves.	X	Listing Notice 1 (GNR.983), as amended by Listing Notice 1 (GNR. 327): Activity 66	N/A
E) SALVAGE YARD				
The storage of general waste at a facility that has the capacity to store in excess of 100 cubic metres of general waste at any one time, excluding the storage of waste in lagoons or temporary storage of such waste.	The proposed salvage yard will be approximately 0.4905 hectares in extent. The salvage yard will store more than 80 cubic metres of hazardous waste and 100 cubic metres of general waste.	X	N/A	Category C Activity 1 of GNR 242 of 2017.
The storage of hazardous waste at a facility that has the capacity to store in excess of 80 cubic metres of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons or temporary storage of such waste.		X	N/A	Category C Activity 2 of GNR 242 of 2017.
The storage of waste tyres in a storage area exceeding 500 square metres.	The waste tyre storage facility must be registered as the storage facility area will be in excess of 500m ² .	X	N/A	Category C Activity 3 of GNR 242 of 2017.
The sorting, shredding, grinding, crushing, screening or baling of general waste at a waste facility that has an operational area that is 1000m ² and more.		X	N/A	Category C Activity 6 of GNR. 921 of 2013
F) CONVEYOR BELT				
The development of dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs (a) within a watercourse.	The proposed construction of a ±1 600 mm wide waste rock conveyor belt system will follow the same alignment of the existing haul road and cross the Sterkstroom River utilising the existing low-water bridge infrastructure.	X	Listing Notice 1 (GNR.983), as amended by Listing Notice 1 (GNR. 327): Activity 12	N/A

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc. E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity ha or m²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR. 983, GNR. 984 or GNR. 985)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.	The proposed construction of a ±1 600 mm wide waste rock conveyor belt system will follow the same alignment of the existing haul road and cross the Sterkstroom River utilising the existing low-water bridge infrastructure. At the Sterkstroom River, there is potential for the infilling and depositing of material of more than 10 cubic metres into, and the dredging, excavation, removal or moving of soil or rock of more than 10 cubic metres from a watercourse.	X	Listing Notice 1 (GNR.983), as amended by Listing Notice 1 (GNR. 327): Activity 19	N/A
The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs (a) within a watercourse; h. North West iv. CBAs as identified in systematic biodiversity plans adopted by the competent authority.	The proposed construction of a ±1 600 mm wide waste rock conveyor belt system will follow the same alignment of the existing haul road and cross the Sterkstroom River utilising the existing low-water bridge infrastructure.	X	Listing Notice 3 (GNR. 985), as amended by Listing Notice 3 (GNR. 324): Activity 14	N/A
G) OBTAINING AN AMENDED CONSOLIDATED EA, WML AND EMPr FOR THE OPERATION OF EXISTING AND PROPOSED ACTIVITIES WITHIN THE PROPOSED THARISA MINE BOUNDARY				
Any activity including the operation of that activity which requires an amendment or variation to a right or permit in terms of section 102 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity contained in this Listing Notice or in Listing Notice 3 of 2014, required for such amendment.	Tharisa currently holds an approved MR covering approximately 5 515 ha. It is proposed that additional properties be incorporated into the MR area, increasing its extent to approximately 5 715 ha. In addition, Tharisa has approved mine-associated infrastructure located outside the current MR boundary that is essential to the operation of the mine. Accordingly, for the purposes of this application, the Application Area (EMPr Boundary) comprises the approved MRA together with the associated mine infrastructure incidental to the mining operation, resulting in a total application area of approximately 6 159 ha.	X	Listing Notice 1 (GNR. 983), as amended by Listing Notice 1 (GNR. 327): Activity 21D	N/A

SECTION 3: POLICY AND LEGAL CONTEXT

The purpose of this section is to list legislation, principles and policies that may relate to the management of anticipated impacts resulting from the proposed project. The reason for this is to ensure that the DMPR have access to the rich picture in terms of legislation. Legislation principles and policies as listed hereunder are relatively detailed.

3-1 LEGISLATION, POLICIES AND GUIDELINES APPLICABLE TO THE PROPOSED PROJECT

Table 19 below lists the applicable legislation, policies and guidelines identified as relevant to the proposed project. In addition, a description of how the proposed activity complies with and responds to the legislation and policy context is given. This list is not exhaustive but rather presents the most applicable legislation relevant to the proposed project.

Table 19: Policy and Legislative Context of the Proposed Project

Applicable legislation and guidelines	Reference where applied	How does this development comply with and respond to the legislation and policy context	Authority
The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) (The Constitution).	Throughout the Scoping Report.	Section 24 of the Constitution states that "... everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that (c) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development." This protection encompasses preventing pollution and promoting conservation and environmentally sustainable development.	Government of the Republic of South Africa.
MPRDA.	Throughout the Scoping Report.	Tharisa has been in operation since November 2009 having an initial MR 49/2009 effective 19 September 2008, issued on 13 August 2009 by the then the DME (now referred to as the DMPR). Tharisa subsequently applied for an amendment of the MR with the Reference Number: NW/30/5/1/2/2/358 MR, stamped 28 July 2011. This MR was however only registered in 2016. The original EMPr was compiled by Metago in 2008 in terms of NEMA and the MPRDA. The following approvals have been granted under the MPRDA: - A MR (Reference No.: NW30/5/1/2/3/2/1/358) issued by the DMPR on 19 September 2008 and amended in July 2011; - An approved EMPr (Reference No.: NW 30/5/1/2/3/2/1/358EM) issued by the DMPR on 19 September 2008; - An addendum to the EIA and EMPr (Ref No.: NW/30/5/1/2/3/2/1/358EM) issued by the DMPR on 24 June 2015; - An addendum to the EIA and EMPr (Ref No.: NW/30/5/1/2/3/2/1/358EM) issued by the DMPR on 03 August 2021; - An addendum to the EIA and EMPr (Ref No.: NW/30/5/1/2/3/2/1/358EM) issued by the DMPR on 31 May 2023; - An addendum to the EIA and EMPr (Ref No.: NW/30/5/1/2/3/2/1/358EM) issued by the DMPR on 05 December 2024; and - An addendum to the EIA and EMPr (Ref No.: NW/30/5/1/2/3/2/1/358EM) issued by the DMPR on 07 February 2025. The proposed EMPs consolidation is being undertaken under the MPRDA.	North West DMPR.
NEMA and the EIA Regulations 2014, as amended.	- Throughout the Scoping Report. - Section 2 of this report details the proposed project description and the listed activities triggered; detail the listed activities to be authorised according to NEMA.	Section 24 of the NEMA i.e. control of activities which may have a detrimental effect on the environment and Section 28 of the NEMA i.e. duty of care and remediation of environmental damage have been taken in consideration of. Tharisa has EAs authorised under NEMA. The following EAs have been granted under the NEMA: - An EA (Ref No.: NWP/EIA/159/2007) issued by the North West DEDECT on 23 October 2009, amended on 30 August 2011; - An EA (Ref No.: DEA 14/12/16/3/3/3/408) issued by the Department of Forestry, Fisheries and the Environment (DFFE) on 15 November 2012; - An EA (Ref No.: NWP/EIA/50/2011) issued by the North West DEDECT on 29 April 2015; - An EA (Ref No.: NW30/5/1/2/3/2/1/358EM) issued by the DMPR on 14 August 2020; - An EA (Ref No.: NW30/5/1/2/3/2/1/358EM) issued by the DMPR on 03 August 2021; - A Section 24G EA (Ref No.: NW/30/5/1/2/3/2/1/358EM) issued by the DMPR on 10 August 2021; - An EA (Ref No.: NWP-EIA-60-2022 EA) issued by the North West DEDECT on 25 April 2023; - An EA (Ref No.: NW/30/5/1/2/3/2/1/358EM) issued by the DMPR on 31 May 2023; - An EA (Ref No.: NW/30/5/1/2/3/2/1/358EM) issued by the DMPR on 05 December 2024; and - An EA (Ref No.: NW30/5/1/2/3/2/1/358EM) issued by the DMPR on 07 February 2025. The proposed project triggers activities listed in GNR. 983, 984 and 985, as amended, which require an EA from the DMPR. Activities listed in GNR. 325 as amended require that a Scoping and Environmental Impact Reporting (S&EIR) be undertaken. <u>Triggered activities listed under GNR.327 (Listing Notice 1) are as follows:</u> Activities 10, 12, 19, 21D and 66. <u>Triggered activities listed under GNR.325 (Listing Notice 2) are as follows:</u> Activities 9 and 15. <u>Triggered activities listed under GNR.324 (Listing Notice 3) is as follows:</u> Activities 12 and 14. An Integrated EA – WML application is being undertaken under the NEMA and the NEMWA.	
DFFE Integrated Environmental Management (IEM) Guideline Series, Guideline 5: Assessment of the EIA Regulations, 2012 (Government Gazette 805). IEM Guideline Series 11, published by the DFFE in 2004. Review in EIA IEM, Information Series 13, Department of Environmental Affairs and Tourism (DEAT), Pretoria.	Throughout the Scoping Report.	Potential environmental impacts will be generated primarily in the construction phase of the project with associated operational phase impacts. These have been assessed as part of the proposed project. A S&EIR is required for the proposed project as activities are triggered under GNR. 983, 984 and 985, as amended.	North West DMPR.
DFFE 2017, Public Participation guideline in terms of NEMA EIA Regulations.	Throughout the Scoping Report.	PPP is a requirement of the S&EIR and is being conducted for the proposed project.	North West DMPR.
NWA.	Throughout WULA – pertaining to water related aspects. As mentioned above, the proposed project requires that an IWUL be applied for. A WULA is	A WUL (Licence No. 03/A21K/ABCGIJ/1468) was issued by the DWS to Tharisa on 16 July 2012 for the following Section 21 water uses: (a), (b), (c), (i), (g), (j). An amended IWUL to the issued WUL was issued by the DWS on 12 November 2020, for the same water uses, as originally applied for. Subsequently, a consolidated WUL was issued by the DWS to Tharisa on 17 September 2024, which supersedes the licence issued to Tharisa on 12 November 2020, for the following water uses: Section 21 (a), (b) (c), (i), (f), (g) and (j).	DWS.

Applicable legislation and guidelines	Reference where applied	How does this development comply with and respond to the legislation and policy context	Authority
	currently being undertaken in parallel with the EA – WML Application, and Section 102 EMPs amendment for the proposed project.	On 12 November 2024, a WUL for Section 21(g) water use was issued for TSF 3 WRD Extension 1. The following new water uses will now be applied for, for the new infrastructure: - Section 21 (a) - Taking water from a water resource. - Section 21 (c) - Impeding or diverting the flow of water in a watercourse and 21 (i) - Altering the bed, banks, course or characteristics of a watercourse. - Section 21 (f) - Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit. - Section 21 (g) - Disposing of waste in a manner which may detrimentally impact on a water resource. - Section 21 (j) - Removing, discharging or disposing of water found underground if it is necessary of the efficient continuation of an activity or for the safety of the people. In addition to the above water uses, an exemption from Government Notice (GN) 704 from the requirements of regulations 4, 6 and 7, will also be applied for. The IWUL to be issued will incorporate all water uses as per the issued 17 September 2024 WUL and will also incorporate the T SF 3 WRD Extension 1 WUL. Additionally, the IWUL will consolidate all the approved water uses for all activities being undertaken within the mine, and new activities proposed to be conducted for future proofing the mining operation. It will also ensure that the errors that have been found on the 17 September 2024 are also corrected. A single IWWMP will therefore be compiled.	
NEMWA.	- Throughout the Scoping Report. - SECTION 2: of this report details the proposed project description and the listed activities triggered.	The proposed project triggers activities listed in under GNR.921 [Category B (4) and Category C(5)] and requires a WML from the DMPR. According to GNR. 921 of the NEMWA, activities listed in GNR.921 (Category B) require that a S&EIR be undertaken. Triggered activities listed under GNR.921 [Category B (4)] are as follows: - Activities 7, 10 and 11. The project will also trigger activities; listed under Category “C” of GNR.921. Under this category, a WML is not required, but the proponent will comply with the relevant Norms and Standards. It must however be noted that an Integrated EA - WML application is being submitted for the approval by the DMPR. The EA – WML application is being undertaken under the NEMA and the NEMWA. Triggered activities listed under GNR.921 [Category C (5)] is as follows: - Activities 1, 2, 3 and 6.	North West DMPR, through the Integrated application process.
National Forestry Act, 1998 (Act No. 84 of 1998) (NFA).	SECTION 8: Baseline Description.	The NFA protects against the cutting, disturbance, damage, destruction, or removal of protected trees. A Biodiversity Impact Assessment is currently being conducted as part of the S&EIR, which will identify protected trees, which may be affected by the proposed activities. Should there be any protected trees within the mine, Tharisa would have to apply for the required permit for the removal and/or relocation of the trees for the proposed activities.	Department of Agriculture, Forestry and Fisheries (DAFF).
NEMBA.	SECTION 8: Baseline Description.	The NEMBA provides for the management and conservation of South Africa's biodiversity within the framework of NEMA, as well as the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources. The Act provides for listing of threatened or protected ecosystems, in one of four categories: critically endangered, endangered, vulnerable or protected. During the S&EIR process, biodiversity hotspots and bioregions will be investigated in the Terrestrial Biodiversity Impact Assessment to determine the impacts that the proposed activities may have on the receiving environment. The management and control of alien invasive species on the impacted areas during all the phases of the project will be governed by the NEMBA. The NEMBA ensures that provision is made by the proponents to remove any alien species, which have been introduced to the site or are present on the site. The site overlaps with: - Endangered (EN) and Least Concern (LC) Ecosystems; - Moderately Protected and Poorly Protected Ecosystems; - Ecological Support Areas (ESA) 1 and 2 as well as CBA 1 and 2; - National Protected Area Expansion Strategy (NPAES) Priority Focus Areas; - Critically Endangered (CR) wetlands and rivers; - Class B: Largely Natural National Freshwater Priority Area (NFEPA) river; - Important Magaliesberg Bird and Biodiversity Areas (IBAs); and - Marikana/Kroondal Groundwater Strategic Water Source Areas (SWSAs).	DFFE.
Mine Health Safety Act, 1996 (Act No. 29 of 1996) (MHSA).	SECTION 8: Baseline Description.	The MHSA aims to provide for protection of the health and safety of all employees and other personnel at the mines of South Africa. Tharisa will need to ensure that employees, contractors, sub-contractors and visiting personnel, adhere to this Act and subsequent amendment regulations on site.	North West DMPR.
Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA).	SECTION 8: Baseline Description.	The Act makes provision for the control measures for erosion; and control measures for alien and invasive plant species. The provisions of this Act will be taken into consideration in the Soil and Agricultural Impact Assessment to be undertaken in support of application for the new proposed activities.	DAFF.
National Heritage Resources Act, 1999 (Act No. No 25 of 1999) (NHRA).	SECTION 8: Baseline Description.	A Heritage Impact Assessment (HIA) and Palaeontological Impact Assessment are currently being undertaken for the mine to identify whether there are any areas of historical importance or of palaeontological importance. In terms of Section 38(1) of the Act, an HIA is required for: - The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length; - The construction of a bridge or similar structure exceeding 50m in length; - Any development or other activity which will change the character of a site (i) exceeding 5000 square metres in extent; or (ii) involving three or more existing erven or subdivision thereof; or (iii) involving three or more erven or division thereof which have been consolidated within the past five years; - The rezoning of a site exceeding 10,000 square metres in extent; or	North West Heritage Resource Authority.

Applicable legislation and guidelines	Reference where applied	How does this development comply with and respond to the legislation and policy context	Authority
		Any other category of development provided for in regulations by South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority.	
Climate Change Act, 2024 (Act No. 22 of 2024).	SECTION 8: Baseline Description.	The Act places a legal obligation on high-emitting sectors, including mining, to reduce Green House Gas (GHG) emissions by requiring a GHG Mitigation Plan to be submitted to the CA. The provisions of this Act will be taken into consideration in the A Climate Change and GHG Assessment to be undertaken in support of application for the new proposed activities.	North West DMPR.
National Greenhouse Gas Emissions Reporting Regulations (GNR. 275 of 2017).	SECTION 8: Baseline Description.	The Regulations require that an Emissions Inventory detailing Scope 1 and 2 emissions must be submitted to the CA by high-emitting sectors including mining. The provisions of these Regulations will be taken into consideration in the A Climate Change and GHG Assessment to be undertaken in support of application for the new proposed activities.	North West DMPR.
National Environmental Management Protected Areas Act, 2003 (Act No. 57 of 2003) (NEMPAA)	SECTION 8: Baseline Description.	The NEMPAA restricts mining in Special Nature Reserves, National Parks, World Heritage Sites or Marine Protected Areas. Tharisa's existing and proposed operations occur within the Magaliesberg Biosphere Reserve, with the project area situated approximately 8.5 km from the Magaliesberg Protected Natural Environment. The mine overlaps with the NPAES Priority Focus Areas. During the S&EIR process, protected areas will be investigated in the Terrestrial Biodiversity Impact Assessment to determine the impacts that the proposed activities may have on the receiving environment.	DFFE.
Noise Control Regulations (GNR. 154 of 1992) in terms of the Environmental Conservation Act, 1989 (Act 73 of 1989).	SECTION 8: Baseline Description.	These Regulations require that a Noise Impact Assessment must be conducted for new developments including mining-related projects. The provisions of these Regulations will be taken into consideration in the Noise Impact Assessment to be undertaken in support of application for the new proposed activities.	North West DMPR.
Protection of Personal Information Act, 2013 (Act No. 04 of 2013) (POPIA).	SECTION 7: Details of the PPP Followed	During the PPP, information about the application will be made available to I&APs. I&APs will be given a reasonable opportunity to comment, which will involve collecting and processing personal data that must be protected under POPIA's conditions for lawful data processing. In terms of the POPIA, MC is therefore seeking consent from I&APs, to collect and use their personal information for purposes of conducting the project's PPP in terms of the EIA Regulations, 2014, as amended. The Draft Scoping Report is being subjected to public review. The report will be finalised for submission to the DMPR, which will reflect all comments that would have been received from all I&APs. In the context of the overall project and the PPP, all I&APs' personal information: (i) full name (s) and surname (s); (ii) email address (es); and (iii) comments, concerns or objections submitted during the PPP, which are/ will be circulated by MC to Tharisa and the relevant CAs.	North West DMPR.
Electricity Regulation Act, 2006 (Act No. 4 of 2006).	- Throughout the Scoping Report. - SECTION 2: of this report details the proposed project description and the listed activities triggered.	The Electricity Regulation Act, 2006 (Act No. 4 of 2006) establishes a national regulatory framework for the electricity supply industry, with the National Energy Regulator of South Africa (NERSA) as the custodian and enforcer of this framework. The Act governs the licensing and regulation of electricity generation, transmission, distribution, and trading, and aims to ensure an efficient, sustainable, and orderly electricity supply industry while safeguarding the interests of customers and end-users. For the rerouting of the 275kv powerline and capacity increase of the 88kv powerline, a license (or amendment of an existing license) from the NERSA must be obtained.	DMPR and North West DEDECT.
Spatial Planning and Land Use Management Act, 2003 (Act No. 16 of 2013) (SPLUMA).	Section 3-4.	The SPLUMA establishes a unified, equitable, and effective system for spatial planning and land use management, placing the municipality at the centre of decision-making. Its primary goal is to promote social and economic inclusion, address historical spatial imbalances, and create a coherent and consistent framework for development planning and land use management across all spheres of government. Tharisa must ensure compliance with zoning requirements and land use schemes of the Rustenburg Local Municipality, Madibeng Local Municipality and BDM, as well as alignment with Municipal Spatial Development Frameworks (SDFs).	Rustenburg Local Municipality, Madibeng Local Municipality and BDM
Hazardous Substances Act, 1973 (Act No. 15 of 1973).	- Throughout the Scoping Report. - SECTION 2: of this report details the proposed project description and the listed activities triggered. - SECTION 15-8 – Potential Impacts.	The Hazardous Substances Act, 1973 (Act No. 15 of 1973) controls substances posing health and environmental risks due to their toxic, corrosive, flammable, or other hazardous properties, and also regulates certain electronic products. The Act categorizes these substances and electronic products; and provides for the prohibition and control of their importation, manufacture, sale, use, disposal, and dumping. It establishes requirements for safe handling, use, and storage, including licensing, employee training, and appropriate PPE to minimise exposure. This Act requires Tharisa to classify and categorise its hazardous substances and provide strict regulations for storage, handling, disposal and emergency response as it relates to hazardous substances.	North West DMPR.
North West Biodiversity Management Act, 2016 (Act No. 4 of 2016).	SECTION 8: Baseline Description.	The North West Biodiversity Management Act, 2016 (Act No. 04 of 2016) provides for the management, protection, and conservation of the province's biological diversity and its resources. Its purpose includes the sustainable use of biological resources, the control of alien and invasive species, the regulation of captive breeding operations and wildlife traders, and the protection of threatened ecosystems within the province. The Act aims to consolidate existing biodiversity legislation and operates within the framework of the NEMA. It serves to consolidate and implement specific provincial biodiversity management requirements in line with national environmental goals. A Terrestrial Biodiversity Impact Assessment will be undertaken to determine the impacts that the proposed activities may have on the receiving environment. The study will be conducted as part of this application to ensure compliance with the requirements of this Act including compliance to the North West Biodiversity Sector Plan (NW BSP), permitting for protected species and control of alien and invasive species.	North West DEDECT.

3-2 NATIONAL POLICY AND PLANNING FRAMEWORK

3-2.1 National Development Plan 2030

The National Development Plan (NDP) 2030 promotes an economy that will create more jobs, improving infrastructure, transition to low carbon economy, an inclusive and integrated rural economy, reversing the spatial effects of apartheid, improving the quality of education, training and innovation, quality health for all, social, protection, building safer communities and reforming the public sector.

The NDP 2030 provides the context for all growth in South Africa. The NDP provides a broad strategic framework, setting out an overarching approach to confronting poverty and inequality through the promotion of development, based on the six focused and interlinked priorities. One of the key priorities is “faster and more inclusive economic growth”. To transform the economy and create sustainable expansion for job creation, an average economic growth exceeding 5% per annum is required.

It is also acknowledged that environmental challenges are in conflict with some of these development initiatives. As such, it is emphasised that there is also a need to:

- Protect the natural environment.
- Enhance the resilience of people and the economy to climate change.
- Reduce carbon emissions in line with international commitments.
- Make significant strides toward becoming a zero-waste economy.
- Reduce greenhouse gas emissions and improve energy efficiency.

Government has set development goals aimed at reducing poverty, unemployment, and inequality. The mining sector is a big contributor to the economy of South Africa as well as the region. The proposed project to be implemented has many positive benefits and spinoffs during the construction, operational and closure phases. The benefits and positive impacts have a countrywide reach. The impacts of the positive benefits of the proposed project have long-term benefits starting from the lowest unit, which is the individual, graduating to households and/or family unit, to the local level up to the country level.

3-3 PROVINCIAL PLANS

3-3.1 North West Spatial Development Framework

The North West SDF needs to be conducive for sustainable development and provides for the execution of specific objectives. Those applicable to the proposed project area listed:

- iii. Giving spatial effect to objectives set by National Government Policies on Sustainability to support the optimal integration of the aspects of social, economic, institutional, political, physical and engineering services. The objectives include:
 - a. The NDP 2030 which promotes an economy that will create more jobs, improving Infrastructure, transition to low carbon economy, an inclusive and integrated rural economy, reversing the spatial effects of apartheid ,improving the quality of education, training and innovation, quality health for all, social, protection, building safer communities and reforming the public sector.
 - b. The National Strategy for Sustainable Development (NSSD) promoting the integration between social demands, natural resource protection, sustainable use and economic development.
- iv. Restructuring and eliminating the disparate spatial development patterns provided by apartheid planning.
- v. Creating an enabling environment for sustainable employment and economic growth and infrastructure development, promoting the objectives of the National Growth Path (NGP), The Industrial Policy Action Plan (IPAP) and The National Infrastructure Plan.
- x. The optimal utilisation of natural resources by the objectives of:

- a) Protecting biodiversity from the development of mines, forestry, urban and rural development, agriculture set by the NWBSP.
- b) Enhancing the quantity and protecting the quality of water resources.
- c) Utilising the mineral resources in a responsible way attending to the effect of it on the environment.
- d) Protecting high and unique potential agriculture land and the reduction of available land due to the development of mines, urban and rural areas and forestry.

Five strategic objectives have been identified to provide a foundation for spatial development strategies in the North West. These objectives are outlined below:

- **Strategic Objective 1:** Focus development on regional spatial development initiatives, development corridors, development zones and nodes.
- **Strategic Objective 2:** Protect biodiversity, water and agricultural resources.
- **Strategic Objective 3:** Promote Infrastructure Investment.
- **Strategic Objective 4:** Support economic development and job creation guiding the spatial development pattern of North West.
- **Strategic Objective 5:** Balance urbanisation and the development of rural areas within North West.

To achieve high growth scenarios and strategic objectives above, seven (7) development mechanisms were identified. These include land use planning and management, settlement planning, economic development, infrastructure investment, human resources development, facilitative governance and industrialisation. These mechanisms will ensure that the province enjoys high growth by shifting from social needs-based policy to infrastructure and economic growth-based policies.

The project will extend the LoM to circa 2125, thereby providing for future economic growth and job opportunities, thereby contributing to the objectives of North West SDF. Furthermore, the project aims to comply with the Environmental Legislative Framework ensuring that the identified impacts of the project are either avoided or mitigated to an acceptable level, further aligning it with the objectives of the North West SDF.

3-4 MUNICIPAL PLANS

3-4.1 Bojanala Platinum District Municipality Integrated Development Plan (2022 – 2027)

BDM is one of the four district municipalities in the North West Province. BDM is situated on the eastern part of the North West province, and it shares provincial boundaries with Limpopo, Mpumalanga and Gauteng Provinces and a national boundary with Botswana in the northern side. Its geographic size covers 18 333km², with a population of 1 657 148 (2016, Statistics SA) and this makes it the most populous of the four districts of the North West Province.

The main economic drivers of the district municipality are agriculture, tourism, manufacturing, mining and the service industry. BDM is located along the Merensky Reef, which account for the district municipality being the leader in the production of PGMs. As a result, mining is the biggest employer in the district. The tourism industry also plays a major role in the economy of the district due to the number of world class public and private game parks. Sun City in Moses Kotane is also one of the region's tourist attractions.

The N4 freeway also plays a role in linking the district with major economic centres in Gauteng Province. Furthermore, The N4 freeway that traverses the boundaries of three local municipalities in BDM is unique as it spans the central section of the only coast-to-coast corridor in Africa. The east-west corridor runs from Maputo in the east to Walvis Bay, Namibia in the west and connects the capital cities of four countries of the Southern African Development Community (SADC), namely Maputo in Mozambique, Pretoria in South Africa, Gaborone in Botswana and Windhoek in Namibia.

A number of challenges affecting the local economic development key performance area in the district were identified as follows:

- Lack/poor tourism infrastructure development.
- Driving difficulties and poor visibility at major tourism activities within the district.
- No proactive measures to initiate activities that could attract or promote tourism.
- Poor Integrated tourism information management system.
- Widening gap between commercial and emerging farmers.
- Not transferring assets to the local municipality/traditional authority for purpose of maintenance and operation.
- Lack of support for farmers to do game farming.
- Poor tenure development support.
- Poor coordinate, monitoring and implementation of Social and Labour Plan (SLPs).
- No mineral beneficiation for enterprises.
- Lack of coordination job creation stats by private sector e.g. Mines, Retails, manufacturing, etc.

One of the key objectives of the BDM Integrated Development Plan (IDP) is to promote sustainable economic growth and reduce unemployment. By future proofing the mine's operation and extending the LoM to circa 2125, the project aligns with the BDM IDP ensuring future economic growth and job opportunities. Furthermore, the project illustrates a proactive approach to environmental management which is a core tenet of the BDM IDP i.e., to "ensure sustainable use of natural resources and protecting the environment for future generations. Additionally, the project also ensures that the objective to "guide future growth and ensure harmonious land use and spatial integration.

3-4.2 Rustenburg Local Municipality Integrated Development Plan (2022 – 2027)

The Rustenburg Local Municipality is a category B municipal council consisting of 45 wards. It occupies the central part of the BDM and houses the main offices of the district municipality. The major settlements of Rustenburg Local Municipality are the Rustenburg town, Phokeng, Tlhabane, Hartebeesfontein and Marikana.

The N4 freeway passes through the town of Rustenburg and also links the municipality with the main centres of Johannesburg and Tshwane metros. Rustenburg is home to large mining operations by companies such as Anglo Platinum, Impala Platinum, Glencore and Lonmin. Approximately 97% of the total platinum production occurs in Rustenburg, with the mining sector providing more than 50% of all formal employment.

The Rustenburg Local Municipality's IDP identifies strategic focus areas it has identified as the cornerstones of a successful and thriving council within the developed Master Plan 2040, and which form the foundation of its Five-year IDP. The approved master plan has 5 goals which reads as follows:

- City of vibrant and diversified economy;
- City of identity;
- City of smart liveable homes;
- City of excellence in Education and sport; and
- City of sustainable resources management.

The IDP identifies agriculture, mining, manufacturing, utilities, trade, transport, finance, community and personal services, general government services and tourism as sectors that contributes to local economic development. Of relevance to the project is opportunities identified in terms of recycling and rehabilitations of mines which could contribute to the local economic development.

The Rustenburg area has a large concentration of mining activities, with the mining sector creating the biggest job opportunities.

The Rustenburg IDP's main objective is to promote sustainable economic growth, reduce unemployment, and address past developmental imbalances. By "future proofing" the mine and extending its life until 2125, the project ensures long-term job security for its employees and continued economic contribution to the municipality. This provides stability to the local economy and supports the broader goals of the BDM, of which Rustenburg is a part.

3-4.3 Madibeng Local Municipality Integrated Development Plan (2022 – 2027)

Madibeng is classified as a category B Municipality, functioning through the Executive Mayoral System. The Municipality was recently demarcated into 41 wards, and the Municipal Council comprises of 82 Councillors, (of which 10 are members of the Mayoral Committee), with a full-time Speaker, Chief Whip and Executive Mayor.

Madibeng consists of several urban and rural areas, 9 000 farm portions, as well as a proper established and serviced industrial area. According to the Municipal Villages, Townships, and Small Dorpies (VTSD) plan there are 43 villages, 6 Townships and 7 small dorpies.

The N4 (Platinum highway) is the only national freeway found in Madibeng Local Municipality. It stretches on the south of Brits and the north of Magaliesberg mountain range. On the west it links to Rustenburg until the Trans-Kalahari Corridor, while it links up to City of Tshwane Metropolitan Municipality. On the Southern side N4, the R104 runs parallel until it merges into R560. The latter road stretches from the south of Magaliesberg and ends south of the N4 where it merges into the R511. From the R51, the R513 runs similarly to the R104 but in the easterly direction. The R566 (Pendoring Street) in the south-east of Brits links Madibeng to the Ga- Rankuwa in City of Tshwane Metropolitan Municipality. In the westerly side, the R566 branches off on from the N4 at Modderspuit and spreads in a north westerly direction. In the northern side of Madibeng Local Municipality, the R511 (Hendrick Verwoerd) is the only regional route that stretches along the Crocodile River and all the way to Elandsberg. The north-eastern side of the Madibeng Local Municipality is dominated with secondary gravel roads.

The following Traditional Authorities are situated within the jurisdiction of Madibeng.

- Mmakau Tribal Office
- Baapo ba Mogale Tribal Office, Bapong
- Bakwena ba Mogopa, Jericho
- Bakwena Ba Mogopa Tribal Office, Hebron
- Batang Tribal Office Maboloka

One of the advantages of Madibeng is its central location in the North West province, with Pretoria, Johannesburg, Rustenburg and Krugersdorp as bordering neighbours. As the neighbouring towns are easily accessible through road networks, residents are not confined to employment in the Madibeng jurisdiction alone but can easily commute to workplaces in the cities and other towns. Furthermore the Lanseria Airport is situated a mere 40 kilometres from Brits.

Today Madibeng is characterised by a various economy, including vibrant agriculture, mining, and manufacturing as well as tourism sectors. Nonetheless, these sectors at present contribute a huge percentage to the total Gross Geographic Product (GGP), they are capable and have potential to encourage and accommodate economic growth and development. Madibeng is the world's third largest chrome producer and includes the richest PGM Reserve (situated on the Merensky Reef). Manufacturing is the dominant sector, with motor industry related activities predominant. Madibeng Local Municipality, in particular Brits Town is a more formal urban area which has vibrant economic nodes.

There are local economic objectives identified within Madibeng Local Municipality as follows:

- Reinforcing the current Brits economic cluster for maximising the existing competitive advantages;
- Defining the economic development role of Madibeng Local Municipality;
- Investigating and implementing incentives for the retention and support businesses currently existing in Madibeng Local Municipality;
- Identification and creation of investment opportunities;
- Ensuring that resources in mining, tourism, agro-industries and manufacturing are utilised economically as well as in an environmentally sustainable manner;
- Establishment of politically and technocratic leadership that will connect the potential of the region's main economic sectors and natural resource base;
- Determining economic priorities and establish simplified, user-friendly processes to encourage economic development;
- Creation, promotion and sustaining a single economic forum which is all- inclusive;
- Marketing Madibeng Local Municipality as an attractive investment destination;
- Reforming bureaucracy and reducing regulations that affect businesses;
- Finding ways and means to invest in rural economic infrastructure and to redress development imbalances;
- Improving physical access to Madibeng by road and rail; and
- Development of various fast track programmes that stimulate short-term economic opportunities.

In order to attain the above objectives, the Madibeng Local Municipality SDF's objective is to identify and demarcate areas that have high potential level for economic development as well as ensuring that the required movement networks are proposed to support these Economic Activity Areas. Economic Activity Areas within the municipality are divided into three categories:

- Mining;
- Economic Corridors; and
- Tourism Areas.

The Madibeng economic activity is dependent on industrial, farming, tourism and mining activities. The two key economic activities in Madibeng Local Municipality are agriculture (17.7%) and manufacturing (13.3%).

The project aligns with the Madibeng Local Municipality IDP through several key strategic objectives, particularly those related to economic growth, infrastructure, and environmental management. Madibeng's IDP recognizes mining, along with agriculture and tourism, as a primary economic driver in the region.

3-5 OTHER ENVIRONMENTAL PLANNING AND MANAGEMENT GUIDELINES

A number of planning and management guidelines have been developed that need to be considered as part of the S&EIR process, including:

- DWS, 2010. Operational Guideline: IWWMP. Resource Protection and Waste;
- DWAF, 2007. Best Practice Guideline A2: Water Management for Mine Residue Deposits;
- DWAF, 2007. Best Practice Guideline A4: PCD;
- DWAF, 2008. Best Practice Guideline A6: Water Management for Underground Mines;
- DWAF, 2006. Best Practice Guideline G1 Storm Water Management;
- DWAF, 2006. Best Practice Guideline G2: Water and Salt Balances;
- DWAF, 2006. Best Practice Guideline G3. Water Monitoring Systems;
- DWAF, 2008. Best Practice Guideline G4: Impact Prediction;
- DWAF, 2008. Best Practice Guideline H1: Integrated Mine Water Management;
- DWAF, 2006. Best Practice Guideline H3: Water Reuse and Reclamation;
- DEAT. 2002. IEM, Information series 2: Scoping. DEAT. 2002;

- DEAT. 2002. IEM, Information series 3: Stakeholder Engagement. DEAT. 2002;
- DEAT. 2002. IEM, Information series 4: Specialist Studies. DEAT. 2002;
- DEAT. 2002. IEM, Information series 12: EMPs. DEAT. 2002;
- DFFE. 2012. Companion to the EIA Regulations 2010, IEM Guideline Series 7, DEA; and
- DFFE. 2017. Guideline on Need and Desirability, DEA, Pretoria, South Africa.

SECTION 4: NEED AND DESIRABILITY OF THE ACTIVITY

Platinum Group Metals

PGMs describe the six (6) metal elements of platinum, palladium, rhodium, ruthenium, iridium, and osmium. However, osmium is typically not economically recoverable. These metals typically occur together with concentrations of nickel, copper, chrome, and gold. The major PGM deposits are found in the South African Bushveld Complex, the Great Dyke of Zimbabwe, and the palladium rich Russian deposits.

PGMs are vital industrial metals valued for their durability, resistance to corrosion and catalytic properties. The automotive industry is the world's largest consumer of PGMs, which are used in catalytic converters for vehicle exhaust systems. Other drivers of demand are jewellery, industrial uses, and investment.

The South African Bushveld Complex hosts the largest PGM deposits globally and is the major primary producer accordingly. Whilst South Africa accounts for global primary supply of some 70% of platinum, 36% of palladium and 82% of rhodium excluding secondary supplies. The supply statistics are according to Johnson Matthey, as seen in their PGM Market Report published in May 2023.

According to the Platinum Standard based on information from SFA Oxford Limited, primary platinum supply decreased by 11% from 2021 to 2022 to 5 500 koz. Therefore the project will assist in providing supply to the market.

The South African PGM mining industry is well established, especially on the eastern and western limb of the Bushveld Complex. The Merensky mines are being depleted, and the South African environment is dominated with Upper Group (UG2) mining. Expansion projects in the South African context include the ramping up of Sibanye-Stillwater's K4 shaft (ZAR3.9 billion development) and the Impala's Two Rivers Merensky expansion (ZAR10 billion), the expansion of Mogalakwena as well as Sedibelo's Triple Crown project.

There are two major projects that are in development on the northern limb of the Bushveld Complex, namely Ivanplats' Platreef project and PGMs Waterberg project, at steady state production they are estimated to bring approximately 1 000 kozpa of PGMs into the market.

Chrome

Chromium is the 14th most abundant metal in the lithosphere (the earth's crust and the uppermost mantle). Chromite or chrome ore is the commercial name for iron chromium oxide (FeCr_2O_4), a mineral containing chromium. Iron chrome oxide contains around 68% of chromium and 32% of iron oxide (FeO).

Major deposits have been identified in many locations worldwide; however, the main deposits in terms of estimated volumes are located on the African continent, primarily between South Africa and Zimbabwe.

According to the International Chromium Development Association, global chromite resources are estimated at over 12 000 Mt while chrome mineral reserves are estimated at around 470 Mt.

Global chrome ore and concentrates production in 2022 was 33.0 Mt. As it possesses the largest resources and reserves of chrome ore, South Africa is also the largest producer globally. South Africa's chrome ore and concentrate production reached 20.8 Mt in 2022, including 14.8 Mt of conventional chrome ore, and around 6.0 Mt of UG2 chrome concentrate.

Conventional chrome ore is extracted from Lower Group (LG) and MG Chromitite Layers while UG2 Chromitite Layers is a source of chromite and PGMs. The UG2 Chromitite Layers is mined by PGM producers to extract PGMs and the by-product of that extraction process is chrome ore concentrate. As a by-product

and therefore accounted for at a lower cost, UG2 chrome concentrate is seen as a cost effective alternative to conventional chrome typically used by ferrochrome producers. UG2 is mainly exported to China where local ferrochrome producers use it in their furnaces as a blend to reduce raw materials costs.

The top chrome ore producers in South Africa are: Assmang Proprietary Limited, Glencore plc, Merafe Resources Limited, Samancor Chrome Limited and Tharisa.

South Africa exports approximately 90% of its production to China as chrome ore lump and concentrates. Chinese customs data does not distinguish conventional chrome ore from UG2 concentrate. In 2022, South Africa exported over 13.4 Mt of chrome ore.

Chrome ore demand is driven by ferrochrome demand as approximately 96% of the chrome ore is used for metallurgical purposes. Two percent of the demand comes from the chemical industry and the rest from refractory and foundry industries. Stainless steel is the largest consumer of ferrochrome and as such a change in the dynamics of the stainless steel industry impacts on the ferrochrome industry.

4-1 BENEFITS OF THE PROPOSED PROJECT

The benefits of the proposed project are listed below:

- The proposed infrastructure has been identified with the goal of optimising existing infrastructure; upscaling production and processing capacities and efficiency; reducing liabilities; safe working and operational practices; and optimising resource utilisation.
- The proposed waste management infrastructure will promote the waste management hierarchy; reduce environmental and rehabilitation liabilities; and will enhance water saving and reduce water losses through evaporation – provisionally, without a significant, negative cumulative impact on surrounding groundwater qualities.
- All of the proposed infrastructure will be located within the established MRA, where the necessary services (i.e., electricity supply, roads and water supply) have already been developed, and it is foreseen that this will reduce the severity of the impacts on the surrounding natural environment.
- The majority of the project area has already been disturbed by previous mining activities (excluding the Safety Butress for West Underground; a portion of the TSF 3 Safety Berm; some sections of the 275 kV realignment route; and the TSF 3 slurry pipeline route). The environmental impact of the proposed activities is therefore expected to be lower, reducing the potential risk of new or additional ecological disturbance.
- The current transportation method of waste rock to the Far West WRD needs to be addressed. Haul truck operations present a range of ongoing operational and environmental challenges, including diesel emissions, fugitive dust, loose rock spillage onto the road, traffic safety concerns, and increasing cost pressures. Tharisa needs to address these cumulative impacts and improve the long-term sustainability of waste rock management, by implementing a conveyor system as the preferred solution, resulting in a safer, cleaner, quieter, and more cost-efficient than continued truck haulage.
- Consolidation of the EAs, WMLs, WUL and development of a consolidated EMPr would result in positive significant administrative consequences and operational efficiency which would result in less costs for Tharisa. There would be streamlining of environmental management.
- The mine is continually generating more waste rock from mining activities, than previously anticipated. Originally the mine designs allowed for backfill into the open pits. The pits have however reached capacity and the balance of waste rock which cannot be backfilled into the pits will require dumping on surface as no other feasible alternatives exist for waste storage.
- To ensure the continuation and functionality of the mine, the re-routing of the 275kV powerline is required to avoid interferences with the mining operation and Eskom power supply. The upgraded 88kV powerline will increase energy supply as the mine expands, which would avoid possible power outages.

4-2 QUESTIONS TO BE ENGAGED WITH, WHEN CONSIDERING NEED AND DESIRABILITY

The Guideline on the assessment of Need and Desirability [Department of Environmental Affairs (DEA), 2017] includes a number of questions, the answers to which should be considered in the S&EIR process. Table 20 presents the needs and desirability analysis undertaken for the proposed project.

Table 20: Need and Desirability

Theme	No.	Question	Response
Securing ecological sustainable development and use of natural resource	1	How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	The entire area covered by the application will be completely transformed by the proposed activities (new activities). The vegetation and topsoil will be stripped. The vegetation and topsoil to be stripped, is however within the approved MRA. The existing operations and infrastructure will not impact on the ecological integrity as they occur within the already disturbed MRA footprint.
	1.1	How were the following ecological integrity considerations taken into account?	
	1.1.1	Threatened Ecosystems	The project area does not fall within any original or remaining extents of a threatened ecosystem. The project area overlaps with a CR river – the Sterkstroom River. According to the spatial dataset the project area overlaps with an EN and LC ecosystems.
	1.1.2	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.	The proposed activities (TSF 3 slurry pipeline and conveyor belt) will be developed within the riparian zone/ 1:100m floodline and will potentially impact on the drainage lines. Detailed designs are currently being compiled, which will determine the extent of which the footings will be constructed. Wetlands have been identified within the MRA. A WULA is being submitted to the DWS to obtain the required permission for all proposed infrastructure.
	1.1.3	CBAs and ESAs	The MRA intersects Aquatic ESA1, ESA2, CBA1, and CBA2 areas. The project area includes a CR river (the Sterkstroom) defined by the North-West Province 2009 biodiversity assessment, and a High Biodiversity area in terms of the recently published Mining Biodiversity Guidelines. It is important to note that these national guidelines and assessments were published after the mine was approved in 2008. The area has been transformed by agricultural and mining activities (both on the project sites and in the surrounding areas), yet aquatic and terrestrial habitat, although limited, does still exist within the project area which is suitable for fauna and flora species, including some Red Data and protected species.
	1.1.4	Conservation targets	
	1.1.5	Ecological drivers of the ecosystem	
	1.1.6	Environmental Management Framework	
	1.1.7	SDF	The North West SDF has been referenced for the compilation of this Scoping Report and will also be considered in the Impact Assessment Phase.
	1.1.8	Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.)	No RAMSAR sites are present in the vicinity of the project area. A Climate Change Impact Assessment (CCIA) is currently underway, which will consider the potential impacts of climate change on the ecosystems and ecological services in the area.
	1.2	How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	MC's impact assessment methodology will be utilised to identify, determine and assess the potential impacts during the Impact Assessment Phase. Several alternatives were considered in terms of the site/ route location; type of activity; layout/ design, technology; and the "No-go" alternatives. The proposed activities (TSF 3 slurry pipeline and conveyor belt) will be developed within the riparian zone/ 1:100m floodline and will potentially impact on the drainage lines. Detailed designs are currently

Theme	No.	Question	Response										
	1.3	How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	being compiled, which will determine the extent of which the footings will be constructed. Wetlands have been identified within the MRA. A WULA is being submitted to the DWS to obtain the required permission for all proposed infrastructure. The area has been transformed by agricultural and mining activities (both on the project sites and in the surrounding areas), yet aquatic and terrestrial habitat, although limited, does still exist within the project area which is suitable for fauna and flora species, including some Red Data and protected species.										
	1.4	What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	An overview of waste streams has been summarised in the table below. <table><tr><th>Aspect</th><th>Description</th></tr><tr><td colspan="2">Tharisa Water and Waste Management Systems</td></tr><tr><td>Identified waste streams</td><td>Mine waste, waste rock, concentrator tailings, general domestic waste, general industrial waste, medical waste, laboratory chemical waste; scrap metal, process and hazardous chemical containers.</td></tr><tr><td>Waste disposal (domestic, industrial and hazardous waste)</td><td> The WRDs and TSFs will be the only waste disposal facilities at the mine. Considering the mining activities, these types of waste are unavoidable. Design and location alternatives ensure the safe storage of these types of waste. Domestic waste from the site is collected, compressed and then transported to a municipal waste disposal facility at Rustenburg or Mooi-nooi. Hazardous waste is collected and transported back to suppliers for recycling or by a waste disposal company to the Holfontein waste site in Springs, Gauteng. Domestic and industrial waste is removed from site on a monthly basis as a minimum. An area at the visitors' parking area is to be converted into a salvage yard. The proposed salvage yard operation is being applied for, for approval by the DMPR. </td></tr><tr><td>WWTW</td><td> Wastewater is generated at the mine and treated for reuse in the WWTP. Wastewater is received from the following areas: • Change houses; • Offices (mine and projects); • Clinic; and • Mine training centre. The WWTP has been designed to treat 554 m³/d. The WWTP is based on trickling filter principle with nitrate reducing capacity. The plant has </td></tr></table>	Aspect	Description	Tharisa Water and Waste Management Systems		Identified waste streams	Mine waste, waste rock, concentrator tailings, general domestic waste, general industrial waste, medical waste, laboratory chemical waste; scrap metal, process and hazardous chemical containers.	Waste disposal (domestic, industrial and hazardous waste)	The WRDs and TSFs will be the only waste disposal facilities at the mine. Considering the mining activities, these types of waste are unavoidable. Design and location alternatives ensure the safe storage of these types of waste. Domestic waste from the site is collected, compressed and then transported to a municipal waste disposal facility at Rustenburg or Mooi-nooi. Hazardous waste is collected and transported back to suppliers for recycling or by a waste disposal company to the Holfontein waste site in Springs, Gauteng. Domestic and industrial waste is removed from site on a monthly basis as a minimum. An area at the visitors' parking area is to be converted into a salvage yard. The proposed salvage yard operation is being applied for, for approval by the DMPR.	WWTW	Wastewater is generated at the mine and treated for reuse in the WWTP. Wastewater is received from the following areas: • Change houses; • Offices (mine and projects); • Clinic; and • Mine training centre. The WWTP has been designed to treat 554 m³/d. The WWTP is based on trickling filter principle with nitrate reducing capacity. The plant has
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Theme	No.	Question	Response
			been designed to achieve an effluent discharge compliant with the DWAF General Limits of effluent discharge (GN Gazette No. 26187, 2004). The treatment process is an extended aeration activated sludge system with an attached growth trickle filter system. Authorisation to upgrade the current WWTW was granted by DMPR on 14 August 2020, and it is now operational.
			Mine residue characterisation The 2008 geochemical assessment classified the waste streams (waste rock and tailings) according to the Minimum Requirements for Waste Disposal by Landfill (2nd Edition, 1998; DWAF). Based on the assessment, waste rock and tailings material were given a hazard rating of HR2 (in terms of the minimum requirements). In turn, this determined the landfill class that would accept that waste and the minimum design requirements to which it needed to be constructed. According to the minimum requirements, materials classified as HR2 were to be disposed of to a landfill constructed with a H:H liner system. Changes in mine water legislation resulted in all residue deposits and stockpiles from mining activities being regarded as waste and fell under the ambit of the NEMWA. A waste type assessment was undertaken for five existing waste facilities at Tharisa in terms of Regulation 8 of GNR. 634 of 2013 in January 2016. The TSFs and the three WRDs, namely, East WRD, West WRD and Far West WRD, were classified as a Type 3 waste, which requires disposal in a Class C landfill. A Geochemistry study and Waste Assessment was again undertaken in 2023. Three (3) waste rock composite and 2 tailings samples from the mine were subjected to comprehensive geochemical investigation and waste assessment to predict the leachate quality from the waste storage facilities on site and if they pose any risk to surface or groundwater resources. The laboratory results [Leachable concentrations thresholds (LCT) and Synthetic Precipitation Leaching Procedure (SPLP)] are based on first flush static tests that often give conservative (elevated) concentrations whereas the modelled source terms are calibrated to long term water quality monitoring data that is subject to field scale conditions and are regarded as more accurate indicators of site leachate quality. According to NEMWA GNR. 635 and 636 guidelines, all the waste rock samples were classified as Type 4 and are required to be incorporated into a storage facility with a Class

Theme	No.	Question	Response
			D barrier; and tailings samples were classified as equivalent to Type 3 waste and are required to be incorporated into a storage facility with a Class C barrier. WRDs/Stockpiles Waste rock from the open pit mining operations has been used in the construction of the TSFs containment walls, mine haul roads and as general backfill for various platforms. These uses would continue where required. Waste rock will also be used in the backfilling of the open pits on an advancing front basis once the pits have been developed sufficiently. Excess waste rock is stored in WRDs which have been approved (refer to Table 17). The WRDs have been classified in terms of the requirements of the South African National Standards (SANS) Code of Practice for Mine Residue Deposits and are rated as a medium hazard and high hazard. The environmental classification is such that there could be potentially significant impacts associated with the facilities, but with mitigation measures put in place, the impacts can be mitigated to an acceptable level. The following WRDs form part of the consolidation project: <u>Existing approved WRDs</u> • West WRD; • Far West WRD; • Far West OG WRD; • East OG WRD; • Eastern WRD 1 (Choppies WRD); • Eastern WRD 2 (Wonderkop WRD); • TSF 2 East WRD 1 and 2; and • TSF 3 WRD Extension 1. <u>New Proposed WRDs</u> • Safety Butress for West Underground; • TSF 3 Safety Berm; • Far West WRD Expansion; • TSF 1 Phase 1 conversion into WRD; and • TSF 1 Phase 1 Safety Butress – Stage 2.
	1.5	How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to	The extent to which cultural heritage sites will /may be disturbed will be investigated in the Impact Assessment Phase.

Theme	No.	Question	Response
		firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	
	1.6	How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The mining activities deplete a non-renewable natural resource within the MRA. Once the mineral is removed, it will be gone from the area forever. However, the associated proposed infrastructure does not directly deplete the natural resources. Impacts of the project have been identified and mitigation measures aimed at avoiding, reducing and/or managing the negative impacts as well as enhancing the positive impacts. Additional management measures will be recommended in the EMP.
	1.7	How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?	The mining activities deplete a non-renewable natural resource within the MRA. Once the mineral is removed, it will be gone from the area forever. However, the associated proposed infrastructure does not directly deplete the natural resources. Impacts of the project have been identified and mitigation measures aimed at avoiding, reducing and/or managing the negative impacts as well as enhancing the positive impacts. Additional management measures will be recommended in the EMP.
	1.7.1	Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)	PGMs are vital industrial metals valued for their durability, resistance to corrosion and catalytic properties. The automotive industry is the world's largest consumer of PGMs, which are used in catalytic converters for vehicle exhaust systems. Other drivers of demand are jewellery, industrial uses, and investment. According to the Platinum Standard based on information from SFA Oxford Limited, primary platinum supply decreased by 11% from 2021 to 2022 to 5 500 koz.
	1.7.2	Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)	The top chrome ore producers in South Africa are: Assmang Proprietary Limited, Glencore plc, Merafe Resources Limited, Samancor Chrome Limited and Tharisa. South Africa exports approximately 90% of its production to China as chrome ore lump and concentrates. Chrome ore demand is driven by ferrochrome demand as approximately 96% of the chrome ore is used for metallurgical purposes. The ore that is currently being extracted is taken to the existing processing plant for further processing before being sold to a third party. Preliminary impacts of the proposed project have been identified and mitigation measures aimed at avoiding, reducing and / or managing the negative impacts as well as enhancing the positive impacts have been recommended.

Theme	No.	Question	Response
	1.7.3	Do the proposed location, type and scale of development promote a reduced dependency on resources?	The EIA will provide mitigation measures to reduce the overall impact of the mine in terms of scarce resource usage: The option of the project not proceeding would mean that the environmental and social status would remain the same as current. This implies that both negative and positive impacts would not take place. As such, negative impacts on biodiversity, water resources, air quality land use etc. would not transpire, but also that the positive impacts such as economic development, employment creation, skills development and poverty alleviation would not occur. If the project was not to proceed, the expected revenue, economic activity, skills development, job opportunities, and the continued upliftment of the surrounding communities as a whole would not be realised.
	1.8	How were a risk-averse and cautious approach applied in terms of ecological impacts?	Sufficient information was gathered prior to the onset of this process to indicate that the potential mining of the mineral is feasible.
	1.8.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Each specialist will investigate the impacts and present the gaps and /or limitations in knowledge in their respective reports. Gaps in knowledge are collated and expressly provided in the EIA and EMP Report, which will be submitted to the DMPR for consideration.
	1.8.2	What is the level of risk associated with the limits of current knowledge?	
	1.8.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	
	1.9	How will the ecological impacts, resulting from this development impact on people's environmental right in terms following:	This will be investigated and quantified by each specialist and presented in the Impact Assessment Phase.
	1.9.1	Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	
	1.9.2	Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	
	1.10	Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	
	1.11	Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	
	1.12	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different	Refer to SECTION 6: for details of the alternatives considered. This aspect will be further investigated during the Impact Assessment Phase.

Theme	No.	Question	Response
		impacts being proposed), resulted in the selection of the “best practicable environmental option” in terms of ecological considerations?	
	1.13	Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Cumulative impacts will be investigated and presented during the Impact Assessment Phase.
Promoting justifiable economic and social development	2.1	What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?	
	2.1.1	The IDP and its sector plans’ vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,	The social baseline took the BDM, 5 years District IDP, 2022 – 2027, the Rustenburg and Madibeng Local Municipalities IDP (2022 – 2027) into consideration. The IDP presents issues and requests raised by residents within the municipality.
	2.1.2	Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),	The labour is from the existing open-cast labour force as well as from external labour forces (local, provincial, and national expertise, if required).
	2.1.3	Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and	
	2.1.4	Municipal Economic Development Strategy [“local economic development (LED) Strategy”].	
	2.2	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	Tharisa is committed to the socio-economic upliftment of the host communities in which the mine operates. During FY2021/2022, 18 new small and medium enterprises (SMEs) were developed on the mine’s enterprise initiatives. Seven (7) SMEs provided services by fixing 69 houses and two churches in Lapologang and Mmaditlhokwa communities. These SMEs were able to register their companies and ensure compliance through the assistance of the enterprise development programme at Tharisa. Some SMEs are able to conduct business with other organisations following on from this project initiative. Tharisa strives to minimise potential negative social impacts while promoting opportunities for the local communities in its areas of operation. Tharisa will continue its commitment to community initiatives through its SLP to address job creation, poverty alleviation, basic infrastructure, education and development needs.
	2.2.1	Will the development complement the local socio-economic initiatives (such as LED initiatives), or skills development programs?	The mine will offer transferable skills to employees throughout the LoM, to ensure that they have skills other than those required by the mine, to lessen the negative impact and foster continued livelihood.
	2.3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	
	2.4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	The mining operations result in the creation of job opportunities. The labour is from the existing open-cast labour force as well as from external labour forces (local, provincial, and national expertise, if required).
	2.5	In terms of location, describe how the placement of the proposed development will	
	2.5.1	result in the creation of residential and employment opportunities in close proximity to or integrated with each other,	Chrome is dispatched to Richards Bay/ Maputo via the Pendoring Railway siding and/or the N4. PGM is dispatched to smelters in the region.
	2.5.2	reduce the need for transport of people and goods	
	2.5.3	result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),	

Theme	No.	Question	Response
	2.5.4	compliment other uses in the area,	Mining activities occur to the North and immediate West and East of Tharisa Mine. Amongst the mining activities is open land mostly owned by mining companies and the community of Marikana (GLYA, 2023). Immediately West of the mining area, in the MR footprint, is the Lapologang community. The predominant land cover types in the area are listed below: • Mine: Extraction pits and quarries; • Mine: Surface infrastructure; • Mine: Tailings and resource dumps; and • Commercial Annual crops rainfed/ dryland. The current mining activities compliment other uses in the area.
	2.5.5	be in line with the planning for the area,	The Closure and Rehabilitation Report will consider the end-land use in line with the LED Strategy.
	2.5.6	for urban related development, make use of underutilised land available with the urban edge,	Not applicable. The mine and the proposed activities fall outside of an urban area.
	2.5.7	optimise the use of existing resources and infrastructure,	The following infrastructure (existing and proposed) as part of the opencast mine will be utilised to support the mining operation: • Haul roads. • RoM stockpiles. • Concentrator complex (all associated infrastructure). • Topsoil stockpiles. • WRDs and TSFs.
	2.5.8	opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	An existing 88kV powerline will be upgraded to support the mine's power supply requirements as it expands. This will also include upgrades made to the Tharisa substation. An existing 275kV powerline will be rerouted to ensure the continuation and functionality of the mine. This will also avoid interference with the mining operation and Eskom power supply.
	2.5.9	discourage "urban sprawl" and contribute to compaction/densification,	The project area and surrounds are fairly rural and cannot therefore influence urban sprawl.
	2.5.10	contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	The community projects associated with the SLP prioritises Historically Disadvantaged South Africans (HDSAs) as beneficiaries.
	2.5.11	encourage environmentally sustainable land development practices and processes,	Not applicable. This can only be considered during the investigation for the end land use, post closure.
	2.5.12	take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	The operation of the mine is dependent on the location of the identified resource.
	2.5.13	the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),	The mine operations contribute to the local, regional and national Gross Domestic Product (GDP), and also to the local communities through job security, as well as other influences and community upliftment programmes.

Theme	No.	Question	Response
	2.5.14	impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	The impact to cultural heritage will be investigated during the Impact Assessment Phase.
	2.5.15	in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	The proposed project will ensure job security, as well as programmes proposed in the mine's SLP.
	2.6	How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	Social impacts will be investigated during the Impact Assessment Phase.
	2.6.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Gaps in knowledge, uncertainties and assumptions will be determined during the Impact Assessment Phase and presented in the EIA and EMP Report.
	2.6.2	What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	
	2.6.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	
	2.7	How will the socio-economic impacts, resulting from this development impact on people's environmental right in terms following:	A Social Impact Assessment will be conducted during the Impact Assessment Phase which will consider the extent and significance of the proposed impacts presented in this section.
	2.7.1	Negative impacts: e.g. health [e.g. Human Immunodeficiency Virus (HIV)-acquired immunodeficiency syndrome (AIDs)], safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	
	2.7.2	Positive impacts. What measures were taken to enhance positive impacts?	
	2.8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	
	2.9	What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	
	2.10	What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	

Theme	No.	Question	Response
	2.11	What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	
	2.12	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	
	2.13	What measures were taken to:	
	2.13.1	ensure the participation of all I&APs,	An I&AP database has been developed to identify and verify the directly and indirectly affected landowners or land occupiers as well as the potentially affected surrounding communities. This database will be updated throughout the S&EIR process to ensure adequate consultation.
	2.13.2	provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,	MC will maintain and update the I&AP database to ensure communication with all registered I&APs. Site notices will be erected in various locations around the site and in the nearest communities to announce the project. SMS notifications will be utilised to keep I&APs informed about the project.
	2.13.3	ensure participation by vulnerable and disadvantaged persons,	Refer to SECTION 7: of this Scoping Report, describing the PPP to be implemented for the proposed project. Four Focus Group Meetings are planned to be convened in the Scoping Phase of the Project. Efforts will be made at the meetings to ensure that all participants can participate in a language they are able to understand.
	2.13.4	promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	The consultation process seeks to inform affected communities of the positive and negative impacts associated with the proposed project and provide opportunity for any stakeholder to raise concerns which will be responded to both on record in the reports and through direct written response (where possible).
	2.13.5	ensure openness and transparency, and access to information in terms of the process,	MC is bound by legislation and regulations to share information pertaining to the project, to be transparent and impartial.
	2.13.6	ensure that the interests, needs and values of all I&APs were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge, and	All stakeholders' needs will be accommodated as far as is reasonably possible.
	2.13.7	ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein was be promoted?	The EAP cannot force participation from specific demographics. Cultural norms will be respected and adhered to; however, no demographic can be excluded from public consultation and therefore all registered stakeholders and meeting attendees will be considered intrinsic to the public consultation process and outcomes.
	2.14	Considering the interests, needs and values of all the I&APs, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	
	2.15	What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and	The applicant must produce a Health and Safety policy and best practice on site, compliant with the MHSA.

Theme	No.	Question	Response
		what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected	Workers must be educated on a regular basis about the environmental and safety risks that may occur within their work environment. Also, adequate measures need to be taken to ensure that the appropriate PPE is issued to workers based on the areas that they work and the requirements of their job.
	2.16	Describe how the development will impact on job creation in terms of, amongst other aspects:	
	2.16.1	the number of temporary versus permanent jobs that will be created,	The labour is from the existing open-cast labour force as well as from external labour forces (local, provincial, and national expertise, if required).
	2.16.2	whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),	
	2.16.3	the distance from where labourers will have to travel,	
	2.16.4	the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and	
	2.16.5	the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).	Though there are host communities living in the areas close to the mine operations, the agricultural jobs will not be affected as the project is for the proposed consolidation and amendment of the various EMPs granted to Tharisa as well as incorporating new environmental and waste activities proposed to be conducted for future proofing the mining operation, which are within the approved MRA.
	2.17	What measures were taken to ensure:	
	2.17.1	that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and	MC has identified the relevant government organisations which must be consulted throughout the S&EIR process. Furthermore, this application is in terms of the One Environmental System and MC shall endeavour to align the various procedures to reduce stakeholder fatigue.
	2.17.2	that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	Not Applicable.
	2.18	What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	As part of the S&EIR process, Financial Liability for the Applicant will be calculated to determine the cost of decommissioning and rehabilitating the mine site to an end-land use which is sustainable and in the best interest of both the surrounding communities and the environment.
	2.19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	
	2.20	What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental	

Theme	No.	Question	Response
		damage or adverse health effects will be paid for by those responsible for harming the environment?	
	2.21	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	This aspect will be further investigated during the Impact Assessment Phase.
	2.22	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	Cumulative impacts will be assessed during the Impact Assessment Phase and presented in the EIA and EMPr Report.

SECTION 5: PERIOD FOR WHICH EA IS REQUIRED

It is envisaged that the consolidated EA would have been granted in July 2027 for the proposed project. The EA is required to be in line with the approved MR i.e., until the projected end of LoM circa 2125. The East Pit is planned to be completed by 2037 and the West/Far West pits by 2040, after which each will transition to underground operations.

SECTION 6: DESCRIPTION OF THE ALTERNATIVES CONSIDERED

In terms of Appendix 2 of the NEMA EIA Regulations 2014, as amended, all environmental reports must contain a description of any feasible and reasonable alternatives that have been identified, including a description and comparative assessment of the advantages and disadvantages that the proposed activity and alternatives will have on the environment and on the community, that may be affected by the activity.

Every S&EIR process must therefore identify and investigate alternatives, with feasible and reasonable alternatives to be comparatively assessed. If no alternatives exist, proof that an investigation was undertaken and motivation indicating that no reasonable or feasible alternatives other than the proposal/ preferred option and the no-go option exist must be provided.

The EIA Regulations 2014, as amended, define alternatives as the different means of meeting the general purpose and requirements of the activity, which may include alternatives to:

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

Alternatives were only considered for the new proposed activities as the existing activities have already been constructed and approved in previous EMPs. The new activities to be approved, where alternatives have been considered as described in Section 2-2.3 have been listed below:

- WRDs:
 - Safety Butress for West Underground
 - TSF 3 Safety Berm
 - Far West WRD Expansion
 - TSF 1 Phase 1 conversion into WRD
 - TSF 1 Phase 1 Safety Buttress – Stage 2
- 275kV Realignment and 88kV Upgrade
- TSF 3 Slurry Pipeline
- Lifting of the Walls of TSF 1 Phase 2
- Salvage Yard
- Conveyor Belt

For the proposed project, the following alternatives have been considered and discussed in more detail below:

- Site/ Route Location Alternatives;
- Type of Activity Alternatives;
- Layout/ Design Alternatives;
- Technology Alternatives; and
- The “No-go” Alternative.

6-1 THE PROPERTY ON WHICH OR LOCATION WHERE IT IS PROPOSED TO UNDERTAKE THE ACTIVITY

Site/ route location alternatives refer to different locations/ routes where the new infrastructure could have been constructed and the reasons why the preferred location/ route was selected. The below alternatives were considered, and have been assessed for the various infrastructure to be constructed:

6-1.1 Waste Rock Dumps

6-1.1.1 Far North Waste Rock Dump (Alternative 1)

Originally, the Far North WRD was proposed. This has been disregarded due to its location. The size and geometry of the facility were constrained by several site-specific factors as follows:

- Property boundaries;
- Natural drainage lines traversing available areas;
- Designated stockpile/spoil areas for unstable material; and
- Gravesites/ yards (heritage resources).

The alternative was designed applying a conservative 100m offset from the graveyard, gravesite, and drainage line in the placement of the WRD. Due to these constraints, the facility was split into two facilities i.e. Far North WRD West and Far North WRD East.

Additionally, the WRD on the West partially overlaps on an old rehabilitated Merensky opencast pit. There are also graves located in the middle of the two WRDs. The WRDs will also be constructed within a 100m regulated zone (within 100m from the edge of the watercourse). Refer to Figure 41.

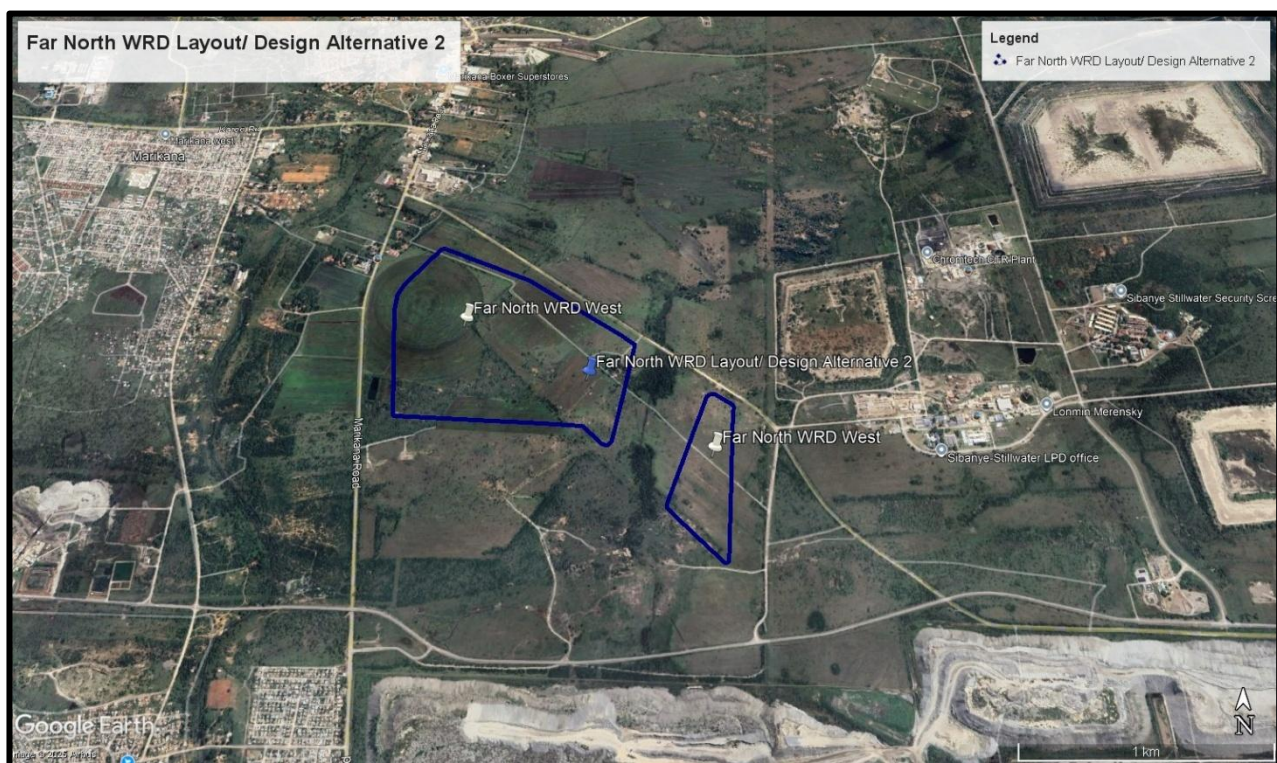


Figure 41: Far North Waste Rock Dump Layout/ Design Alternative

6-1.1.2 Far West Waste Rock Dump Expansion (Alternative 2 – Preferred Alternative)

Tharisa has limited space available for the development of WRDs both on and surrounding the Tharisa Mine. The current approach adopted by Tharisa assesses the requirements for waste rock capacity and seeks to extend the available WRDs within the mine's property boundary where possible or to find properties of suitable size adjacent to the current mine boundary for the development of waste rock storage facilities.

Due to reasons mentioned above, with respect to finding properties of suitable size adjacent to the current mine boundary for the development of waste rock storage facilities, Far West WRD Expansion (refer to Figure 35 and Figure 42) was found to be more feasible.



Figure 42: Far West Waste Rock Dump Expansion (Alternative 2 – Preferred Alternative)

The Far West WRD Expansion is the most preferred option due to the following reasons:

- The WRD is to be constructed over the west pit after it has been backfilled to natural ground level with waste rock.
- The WRD will tie into the existing Far West OG WRD, and the Far West WRD.
- Its location on previously disturbed area within the mine boundary. The land on which the WRD will be located on is owned by Tharisa. The environmental impact of the proposed WRD is therefore expected to be lower, reducing the potential risk of new or additional ecological disturbance.
- The WRD does not traverse any natural drainage lines nor gravesites/yards (heritage resources) as compared to the Far North WRD, thus reducing the severity of the impacts on the surrounding pristine natural environment.

The Far West WRD Expansion will have a storage capacity of 6.27 million cubic metres and deposition will commence in 2027. Refer to Figure 35 and Figure 41.

6-1.2 275kV Realignment

For the realignment of the 275kV powerline, two (2) route alternatives have been proposed i.e. Route Alternative 1 and Route Alternative 2 (refer to Figure 43), with Route Alternative 2 being the most preferred option. In this regard, to determine the most preferred route alternative, the following three significant factors were taken into account:

- The location of the existing mine infrastructure;
- Avoidance of interruptions with Eskom services; and
- Environmental sensitivities.

Route Alternative 2 was the best option which considers the existing infrastructure, avoids interruptions with Eskom services, and it will ensure that the mine operates optimally while environmental sensitivities are being avoided.

The following is applicable to the various route alternatives:

- Route Alternative 1: This route is significantly longer than the other routes and therefore will increase construction costs. There are also significant environmental sensitivities to consider. Based hereupon, it was eliminated.
- Route Alternative 2 (preferred alternative): This alignment is the shortest route which reduced construction costs. It also runs through a disturbed area and therefore reducing environmental impacts. It will however require the establishment of a new servitude.

6-1.3 88kV Upgrade

There are no location/ route alternatives considered for the upgrade of the existing 88kV powerline as the powerline will only be upgraded and not rerouted.

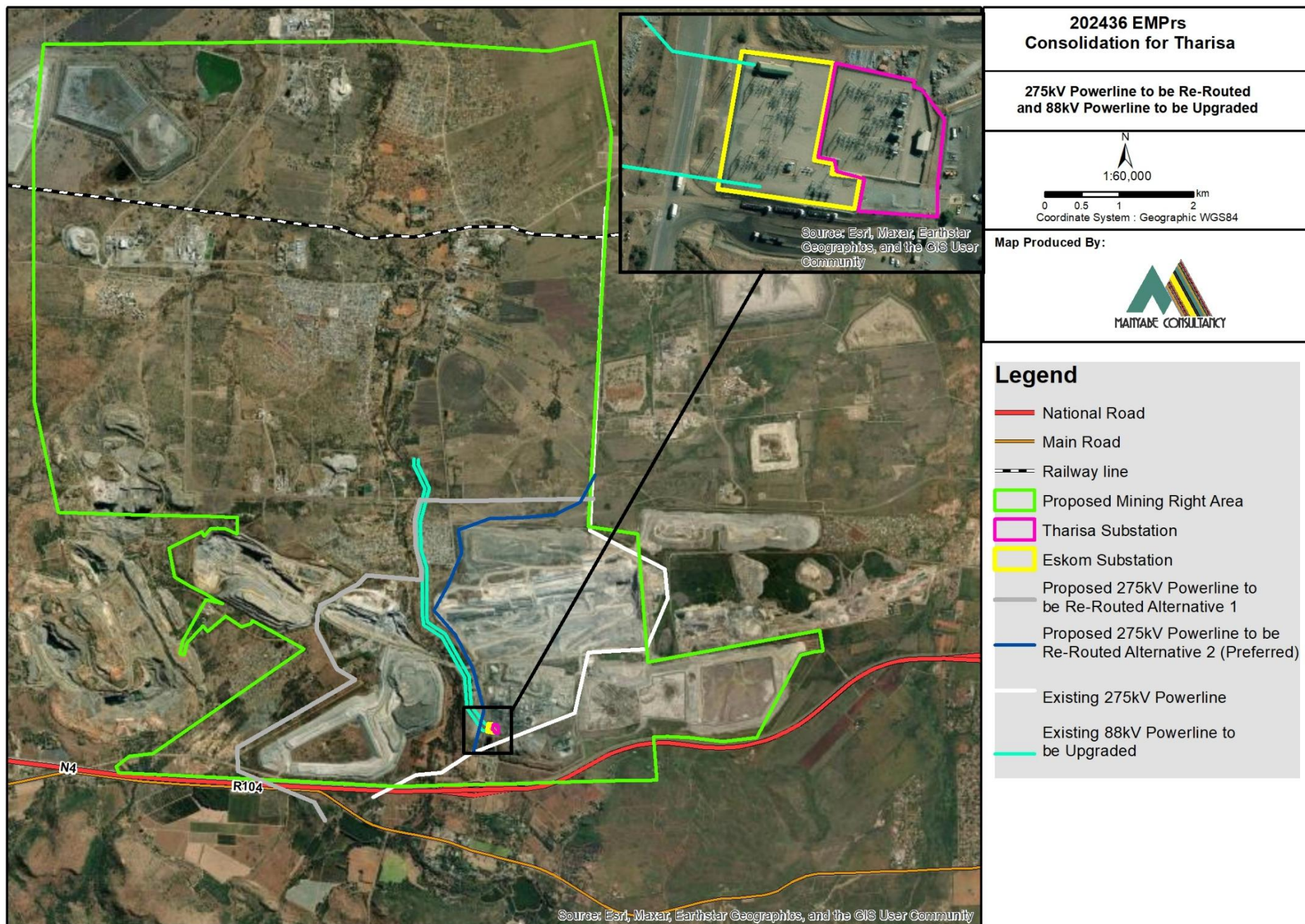


Figure 43: 275kV Realignment and 88kV Upgrade Alternatives

6-1.4 Tailings Storage Facility 3 Slurry Pipeline

The proposed pipeline is for the tailings' deposition between Vulcan Plant and TSF 3. In the original application, two (2) route alternatives were assessed (Route A and Route B). The CA approved Route A and TSF 3 as part of the original application. Tharisa still wishes to keep the approved Route A. It must however be noted that, for this application, Tharisa is proposing Route C as a future option as the TSF expands (refer to Figure 38).

Route C has been opted as the preferred option due to the following reasons:

- It is a direct pipeline as compared to Route A and B.
- It is significantly shorter than Route A and B, resulting in considerably lower construction and maintenance costs, as well as reducing the footprint of the proposed pipeline.
- It will be placed above ground and elevated onto a gantry outside of the floodline of the Sterkstroom River, which will ensure protection from any potential washouts or damage to the infrastructure.
- The pipeline gantry will ensure that there is no impact on the Sterkstroom River, which will thus avoid impacts on stream flows.
- The pipes are expected to be steel pipes, adding to the structural integrity of the crossing.
- The pipeline will run through Tharisa owned properties i.e. Portion 38 and 147 of the Farm K/Kraal 342 JQ.

6-2 THE TYPE OF ACTIVITY TO BE UNDERTAKEN

Activity alternatives were considered for the new proposed infrastructure where alternative means of managing the need for the new infrastructure was considered and the preferred activity selected.

6-2.1 Lifting of the Walls of Tailings Storage Facility 1 Phase 2

This alternative has been opted for as the preferred activity as it will negating the need of constructing a new TSF by lifting the walls of the existing TSF to increase storage capacity and utilising existing infrastructure where impacts has already occurred.

The raised facility will include the addition of, *inter alia*, embankments constructed using selected waste rock from open-pit mining operations, with a height of 5m. The embankments will have a crest width of 15m with 1V:3H and 1V:2H downstream and upstream slopes, respectively. The tailings will be deposited behind the embankment, into the basin. This is the method that is currently in place at the mine, and there have not been any reported dams' failures.

6-2.2 Tailings Storage Facility 1 Phase 1 Safety Buttress Phase 1 and 2

The mine intends to backfill the open pits with waste rock material on an advancing front basis once the pits have been developed sufficiently. Excess waste rock material, mainly due to bulking from blasting, has been used for the construction of the TSFs containment walls, mine haul roads and as general backfill for various platforms. WRDs are required for storage of the additional excess material not being absorbed by the construction of other facilities.

6-2.3 Waste Rock Transportation Mode

6-2.3.1 Haul Road (Alternative 1)

Waste rock from the East Pit is transported to the Far West OG WRD by haul trucks travelling along the haul road, which crosses the Sterkstroom stream via the existing low-water bridge. While this method was effective, haul truck operations present a range of ongoing operational and environmental challenges as follows:

- Diesel emissions;

- Fugitive dust;
- Loose rock spillage onto the road;
- Traffic safety concerns; and
- Increasing cost pressures.

Tharisa needs to address these cumulative impacts and improve the long-term sustainability of waste rock management.

6-2.3.2 Conveyor Belt (Alternative 2 – Preferred Alternative)

In order for Tharisa to address cumulative impacts and improve the long-term sustainability of waste rock management, a conveyor system is the preferred solution, which is safer, cleaner, quieter, and more cost-efficient than continued truck haulage.

Tharisa proposes the construction and operation of a $\pm 1\ 600$ mm wide waste rock conveyor belt system that will follow the same alignment of the existing haul road and cross the Sterkstroom stream utilising the existing low-water bridge infrastructure. By leveraging and upgrading existing infrastructure rather than creating new disturbance footprints, the proposal represents a pragmatic and environmentally responsible improvement to current operations. The conveyor will be fully enclosed over the watercourse to eliminate any potential rock spillage, prevent dust emissions at the crossing point, and protect water quality, while addressing key risks that are inherent to the existing truck-based transport method. The crossing structure will comprise a steel frame integrated with the existing bridge, while the conveyor alignment on either side utilises the current haul road network.

The design incorporates safety and operational features, including maintenance walkways, handrails, emergency pull-cord systems, and dedicated access points for routine inspection and maintenance — all of which represent a significant safety improvement over active haul road conditions. The existing culvert system beneath the bridge is retained in full to ensure the continued, uninterrupted flow of the Sterkstroom channel.

In summary, the proposed conveyor system optimises the existing infrastructure to deliver a safer, lower-emission, and more operationally efficient method of waste rock transport, while actively reducing the environmental risks associated with current truck haulage.

6-3 LAYOUT/ DESIGN ALTERNATIVES

6-3.1 Safety Buttress for West Underground

The size and geometry of the safety buttress for West Underground were influenced by spatial constraints associated with both mine and community infrastructure as follows (Figure 44):

- Mine Infrastructure:
 - Enaex Yard;
 - Scat Ball Screening/Recovery Plant;
 - Tyre Yard;
 - Primary Haul Road;
 - Secondary Haul Road;
 - West Pit; and
 - West WRD.
- Community Infrastructure:
 - Piet Retief Primary School; and
 - Community Road.



Figure 44: Layout of the Facility and how the Footprint of the Facility was Determined by these Constraints.

In the final design, the following buffer zones have been incorporated to maintain safe distances between the safety buttress and sensitive infrastructure:

- A 50m offset has been applied between the safety buttress and the Piet Retief Primary School;
- A 100m offset has been applied between the safety buttress and the Enaex yard; and
- A 25m offset has been applied between the safety buttress and the secondary haul and community roads.

Furthermore, the existing tyre yard and scat ball screening/recovery plant will be removed.

6-3.2 Tailings Storage Facility 3 Safety Berm

The size and geometry of the facility were constrained by several site-specific factors as follows:

- Property boundaries;
- A heritage site; and
- An existing gravesite located in the Northeast of the proposed area.

The TSF 3 safety berm was initially designed to encroach within the 20m buffer from the heritage resources on the eastern side (Figure 46). The safety buttress was redesigned to have a conservative buffer of 100m from the heritage resources (Figure 45).



Figure 45: Tailings Storage Facility 3 Safety Berm Alternative 1 (Preferred Alternative)



Figure 46: Tailings Storage Facility 3 Safety Berm Alternative 2

6-4 TECHNOLOGY TO BE USED IN THE ACTIVITY

6-4.1 Lifting of the Walls of Tailings Storage Facility 1 Phase 2

Technological alternatives available for the disposal of tailings include the briquetting of tailing (fines) or the continued use of facilities similar to those in operation. The briquetting of material can be undertaken either by uniaxial pressing or via roll pressing. Various binders are required for the processes, such as lime, molasses, magnesium lignosulfonate, and bentonite. Concerns of storing for periods in excess of five (5) weeks present issues associated with mildew formation, but as the mine is located in an area with a negative

water balance, this is unlikely to be of concern. For this method to be effective, Tharisa would require a press to bind the materials as well as the relevant binders in order for this to be effective.

Disposal of tailings in TSFs is the method that is currently in place at the mine. The additional benefit of this process is that there is existing institutional knowledge for this process of disposal. Based on the existing infrastructure and knowledge in place, the disposal to tailings is seen as the preferable method.

The proposed infrastructure has been identified with the goal of optimising existing infrastructure; upscaling production and processing capacities and efficiency; reducing liabilities; safe working and operational practices; and optimising resource utilisation.

6-5 THE OPTION OF NOT IMPLEMENTING THE ACTIVITY

The no-go option entails that none of the proposed infrastructure will be developed nor will the consolidation of the existing EMPs, EAs and WMLs take place. Should the proposed project not be undertaken, it would maintain the status quo of the current operations as well as the significant administrative burden of ensuring compliance with multiple EAs, WMLs, and EMPs. There would therefore not be streamlining of environmental management, and the resultant efficiency would not be realised.

For the proposed project, if the application for amendment is not granted, the following negative environmental impacts may occur:

- DMPR has requested that all approvals issued to Tharisa be consolidated into one single EMP and EA that is applicable to the Tharisa Mine to improve overall management of the mining operation. The instruction by the DMPR cannot be disregarded as they are the CA.
- The inaccuracy of the EMPs and EAs to the operation of the mine will remain for all activities currently being undertaken as per the approved EMPs, and the associated mitigation measures applicable to each activity undertaken will not be revised, amended and discussed thoroughly in a single EMP and EA.

For the proposed new activities, the following negative environmental impacts may occur if the amendment is not granted to Tharisa:

- The mine currently has a remaining LoM of 15 years, (i.e. until 2041). Tharisa is planning to continue operating until 2125, and thus additional infrastructure will need to be developed. If this amendment is not granted, there will be a reduction in economic growth [decline in GDP and loss of income]. This means that the planned socio-economic initiatives within the surrounding communities would not be able to go ahead, and employees and contractors' workers would be impacted. Not authorising the WRDs would not allow for the optimisation of the current mining operations and could potentially result in the closure of the mine. It could also restrict the mine's ability to realise the economic benefits associated with extracting mineral resources from the East and West Mines.
- The mine is continually generating more waste rock from mining activities than previously anticipated. The balance of waste rock which cannot be backfilled in the pit will require dumping on surface. It follows that no other feasible alternatives exist for waste rock storage.
- Should the authorisation not be granted, current environment impacts may be exacerbated due to a lack of enforceable mitigation measures. Issuing an authorisation will formalise mitigation measures and EA conditions making it enforceable and subject to monitoring and measuring to ensure compliance.
- The current transportation method of waste rock to the Far West WRD needs to be addressed. Haul truck operations present a range of ongoing operational and environmental challenges, including diesel emissions, fugitive dust, loose rock spillage onto the road, traffic safety concerns, and increasing cost pressures. Tharisa needs to address these cumulative impacts and improve the long-term sustainability of waste rock management, by implementing a conveyor system as the preferred solution, resulting in a safer, cleaner, quieter, and more cost-efficient than continued truck haulage.

SECTION 7: DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

The PPP will be undertaken in terms of Chapter 6, regulation 41 of the EIA 2014 Regulations, as amended, for the proposed project triggering listed activities under the NEMA, NEMWA and the MPRDA. MC, on behalf of Tharisa, will take into account all relevant guidelines applicable to the PPP as contemplated in section 24J of the NEMA. Notices will be given to all potential I&APs to participate in the project, as follows:

7-1 LEGAL REQUIREMENTS OF THE PPP AS REQUIRED BY SECTION 41 OF THE NEMA

41 (1) This regulation only applies in instances where adherence to the provisions of this regulation is specifically required.

(2) The person conducting a PPP must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential I&APs of an application or the proposed application which is subjected to public participation by:

- (a) fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of (i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and (ii) any alternative site;
- (b) giving written notice, in any of the manners provided for in section 47D of the Act, to (i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (iii) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area; (iv) the municipality which has jurisdiction in the area; (v) any organ of state having jurisdiction in respect of any aspect of the activity; and (vi) any other party as required by the CA;
- (c) placing an advertisement in (i) one local newspaper; or (ii) any official that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official referred to in paragraph (c)(ii); and
- (e) using reasonable alternative methods, as agreed to by the CA, in those instances where a person is desirous of but unable to participate in the process due to (i) illiteracy; (ii) disability; or (iii) any other disadvantage.

(3) A notice, notice board or advertisement referred to in subregulation (2) must (a) give details of the application or proposed application which is subjected to public participation; and (b) state (i) whether a BA or S&EIR procedures are being applied to the application; (ii) the nature and location of the activity to which the application relates; (iii) where further information on the application or proposed application can be obtained; and (iv) the manner in which and the person to whom representations in respect of the application or proposed application may be made.

(4) A notice board referred to in subregulation (2) must (a) be of a size of at least 60cm by 42cm; and (b) display the required information in lettering and in a format as may be determined by the CA.

7-2 ANNOUNCEMENT OF THE PROJECT AND THE DRAFT SCOPING REPORT AVAILABILITY

The objectives of the PPP during the Scoping Phase are to provide sufficient and accessible information to I&APs in an objective manner to enable them to raise comments, issues of concern and suggestions for enhanced benefits. I&APs will also have an opportunity to provide input into the terms of reference (ToRs) for the specialist studies, and to contribute relevant local and traditional knowledge to the S&EIR process.

The project was announced to the public on **Friday, 14 August 2026**, by means of the placement of a newspaper advertisement and site notices. Background Information Documents (BIDs) have been distributed to I&APs to create awareness of the proposed project. The report is being subjected to a PPP of at least 30 days, and the Final Scoping Report will reflect the incorporation of comments received, including any comments from the competent and commenting authorities.

The following processes have been undertaken to announce the project and the availability of the Draft Scoping Report:

- An I&AP database has been compiled and is being maintained and includes all potential I&APs in respect of the application in accordance with Regulation 42.
- Letters are being sent to all I&APs, (written in any of the manners provided for in section 47D of the NEMA, announcing the project and the availability of the Draft Scoping Report, containing project information and a locality map) including:
 - The municipal councillor of the ward in which the site is situated;
 - Any organisation of ratepayers that represents the community in the area;
 - The municipality which has jurisdiction in the area;
 - Any organ of state having jurisdiction in respect of any aspect of the activity; and
 - Any other party as required by the CA, including adjacent communities' members.
- Affected parties of the proposed project, who cannot be reached via mail, fax or e-mail are being visited for delivery of the letters. The letters have attached sheets which allow I&APs to register and/or comment on the project.
- Sixteen (16) site notice boards have been fixed at a place conspicuous to and accessible by the public at the boundary of the site where the activity to which the application relates. Site notices are written in English and Setswana.
- One (1) advertisement (translated in both English and Setswana) has been placed in the Rustenburg Herald Local newspaper.
- The Draft Scoping Report has also been made available on the MC website (<https://manyabeconsultancy.com/stakeholder-engagement/>); and at the Marikana Public Library.
- SMS notifications of the availability of the Draft Scoping Report for public comment have been distributed.
- Four (4) focus group meetings will be held with the adjacent landowners within a 5km radius; community organisations, such as: rate payers associations, Home Owner Associations (HOAs), interest groups, etc.; relevant state departments at local, district, provincial and national levels; ward councillor; Non-Government Organisations (NGOs)/ various environmental protection agencies/ bodies; and, any other party perceived as playing a role within the community/ project area, to discuss the Draft Scoping Report and the project.
- Telephonic consultation will be undertaken with I&APs to obtain comments about the Draft Scoping Report; and to share information about the Project.

Subsequent to the 30 days' period, all comments and representations received from I&APs will be considered and recorded in the Comments and Responses Report (CRR). All I&APs who would have participated in the PPP will be thanked, and their comments acknowledged. The Draft Scoping Report is available for public comment from **Friday, 14 August 2026** to **Monday, 14 September 2026**.

Invitation to focus group meetings, for the review of the Draft Scoping Report

Four (4) focus group meetings are proposed to be hosted as follows:

Venue	Date	Time
Two (2) Public meetings for the general public:		
Mmaditlhokwa Village: Open Space	08 September 2026	10:00 - 12:00
Lapologang Village: Sports Ground	08 September 2026	12:00 - 14:00
Two (2) focus group meetings to be convened online (via MS Teams) for the following groups of stakeholders:		
Service Providers Industry and Government Non-Governmental Organisations	10 September 2026	10:00 - 12:00

The proceedings of the focus group meetings, as well as all comments submitted will be captured in a CRR. The CRR will be attached to the Final Scoping Report when submitted to the DMPr for decision-making. I&APs will also be given an opportunity to verify that all their comments have been captured correctly.

7-3 ANNOUNCEMENT OF THE SUBMISSION OF THE FINAL SCOPING REPORT TO THE COMPETENT AUTHORITY

- The Draft Scoping Report will be updated based on the comments and inputs received during the review and commenting period of the Draft Scoping Report.
- The Final Scoping Report will be submitted to the DMPr for decision-making. All registered I&APs will be notified of the Final Scoping Report submission, and that it is available on the MC website for review and commenting.
- Any additional comments received will be incorporated into the Draft EIA and EMPr Report. All additional comments will also be captured in the “live, continuously updated” CRR for the project.

7-4 ANNOUNCEMENT OF DRAFT EIA AND EMPR REPORT AVAILABILITY

The objectives of PPP during the Impact Assessment Phase are to verify that I&APs issues have been considered in the Impact Assessment, and to comment on the findings of the S&EIR, including the potential negative and positive impacts and the proposed management measures.

MC will compile and announce the availability of Draft EIA and EMPr Report. The report will be subjected to PPP of at least 30 days and will reflect the incorporation of comments received, including any comments of the competent and commenting authorities.

The following processes will be undertaken to announce the Draft EIA and EMPr Report:

- Letters will be sent to all I&APs, (written in any of the manners provided for in section 47D of the NEMA, announcing the availability of the Draft EIA and EMPr Report, including:
 - The municipal councillor of the ward in which the site is situated;
 - Any organisation of ratepayers that represent the community in the area;
 - The municipality which has jurisdiction in the area;
 - Any organ of state having jurisdiction in respect of any aspect of the activity; and
 - Any other party as required by the CA, including adjacent communities' members.
- SMS notifications of the availability of the Draft EIA and EMPr Report for public comment will be distributed.
- Six (6) focus group meetings [two (2) online (via MS Teams) and four (4) face to face] focus group meetings will be held with the adjacent landowners within a 5km radius; community organisations, such as: rate payers associations, HOAs, interest groups, etc.; relevant state departments at local, district, provincial and national levels; ward councillor; NGOs/ various environmental protection agencies/ bodies; and any other party perceived as playing a role within the community/ project area, to discuss the Draft EIA and EMPr Report.
- Telephonic consultation will be undertaken with I&APs to obtain comments about the Draft EIA and EMPr Report.
- The Draft EIA and EMPr Report will be made available on the MC website (<https://manyabeconsultancy.com/stakeholder-engagement/>); and at the Marikana Public Library; and

- Subsequent to the 30 days' period, all comments and representations received from I&APs will be considered and recorded in the CRR. All I&APs who would have participated in the PPP will be thanked, and their comments acknowledged.

7-5 ANNOUNCEMENT OF THE SUBMISSION OF THE FINAL EIA AND EMPR TO THE COMPETENT AUTHORITY

- The Final EIA and EMPr Report will consider and address all comments raised by I&APs, as per the CRR.
- The Final EIA and EMPr Report will be submitted to the DMPR for review and consideration towards a decision.
- All registered I&APs will be notified of the submission and the availability of the Final EIA and EMPr Report on MC website for review and commenting, should they choose to do so.
- Any additional comments will be directed to DMPR and copied to MC.

7-6 ANNOUNCEMENT OF THE DECISION

MC will ensure that all registered I&APs are provided with access to the decision and the reasons for such decision. I&APs will be drawn to the fact that appeals may be lodged against the decision in terms of the National Appeals Regulations of 2025 (GNR. 5985), if such appeals are available in the circumstances of the decision. The decision will be advertised through the following methods:

- Personalised letters to individuals and organisations on the stakeholder database; and
- Placement of a newspaper advert in the same local newspaper where the project and the availability of the Draft Scoping Report was announced, translated in both English and Setswana.

SECTION 8: SPECIFIC BASELINE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITE

An overview of the baseline biophysical and socio-economic environment of the proposed project is given below. This information was obtained from the existing data presented in the approved environmental reports and specialist studies which were undertaken previously, for similar activities at Tharisa Mine. The data will be updated based on the specialist studies which are currently being undertaken for the proposed project. Sensitive environmental and socio-economic features associated with the current mining operations will be confirmed during the undertaking of the specialist studies which are currently being undertaken as part of this S&EIR process.

8-1 GEOLOGY

The Bushveld Igneous Complex (BIC), a massive intrusive body, has undergone erosion and tilting, and now emerges along the apparent boundary of a large basin measuring nearly 350km across. The BIC is comprised of eastern and western lobes, with a northern and far western extension. Additionally, a buried limb, known as the Bethal Limb, exists based on borehole intersections. All five limbs were formed approximately 2,000 million years ago. The eastern and western limbs exhibit striking similarities. This extensive complex originated when vast amounts of molten rock (magma) from the Earth's mantle ascended to the surface through vertical cracks and conduits in the crust. Upon reaching the surface, it differentiated, cooled, and solidified, resulting in a vast layered igneous body with a predominance of Chromite, thus forming the rare rock type known as Chromitite.

Chromite deposits in the BIC are found as stratified layers of massive Chromitite. These significant Chromitite layers are located in the lower section of the BIC known as the Critical Zone. The Chromitite layers are categorised into three groups based on their proximity to each other (Figure 47).

LG consists of seven Chromitite layers, the MG has four main Chromitite layers, and the UG contains two Chromitite layers (some sources also mention a third layer - UG3). The naming convention assigns ascending numbers to the layers within each group, starting from the bottom layer (e.g., LG1, LG2, and so on, up to UG2 at the top). This naming convention reflects the concept that the lowermost layers are considered the oldest.

The Merensky Reef, situated at some distance above the UG2 Chromitite layer, is the uppermost layer of economic interest in the Critical Zone. However, the Merensky Reef is mainly composed of Pyroxenite with only a few thin chromite stringers near its base.

The individual Chromitite layers can vary in width from a few centimetres to over 2 metres in localised areas, but they generally range around 1 meter in thickness, seldom exceeding 2 metres. As a general trend, the average chrome content and Cr/Fe ratio of the layers decrease as the sequence progresses upward, while the PGMs content increases. The Chromitite layers in the MG exhibit intermediate concentrations of both chrome and PGE mineralisation, but there is a general decrease in grain size from the lowermost to the uppermost layers.

Traditionally, chrome production primarily focused on exploiting the layers of the LG, while PGE production typically targeted the uppermost Merensky Reef and the underlying UG2 Chromitite layer from the UG. From an economic perspective, the chrome and PGE concentrations in the MG Chromitite layers are considered marginal on an individual basis.

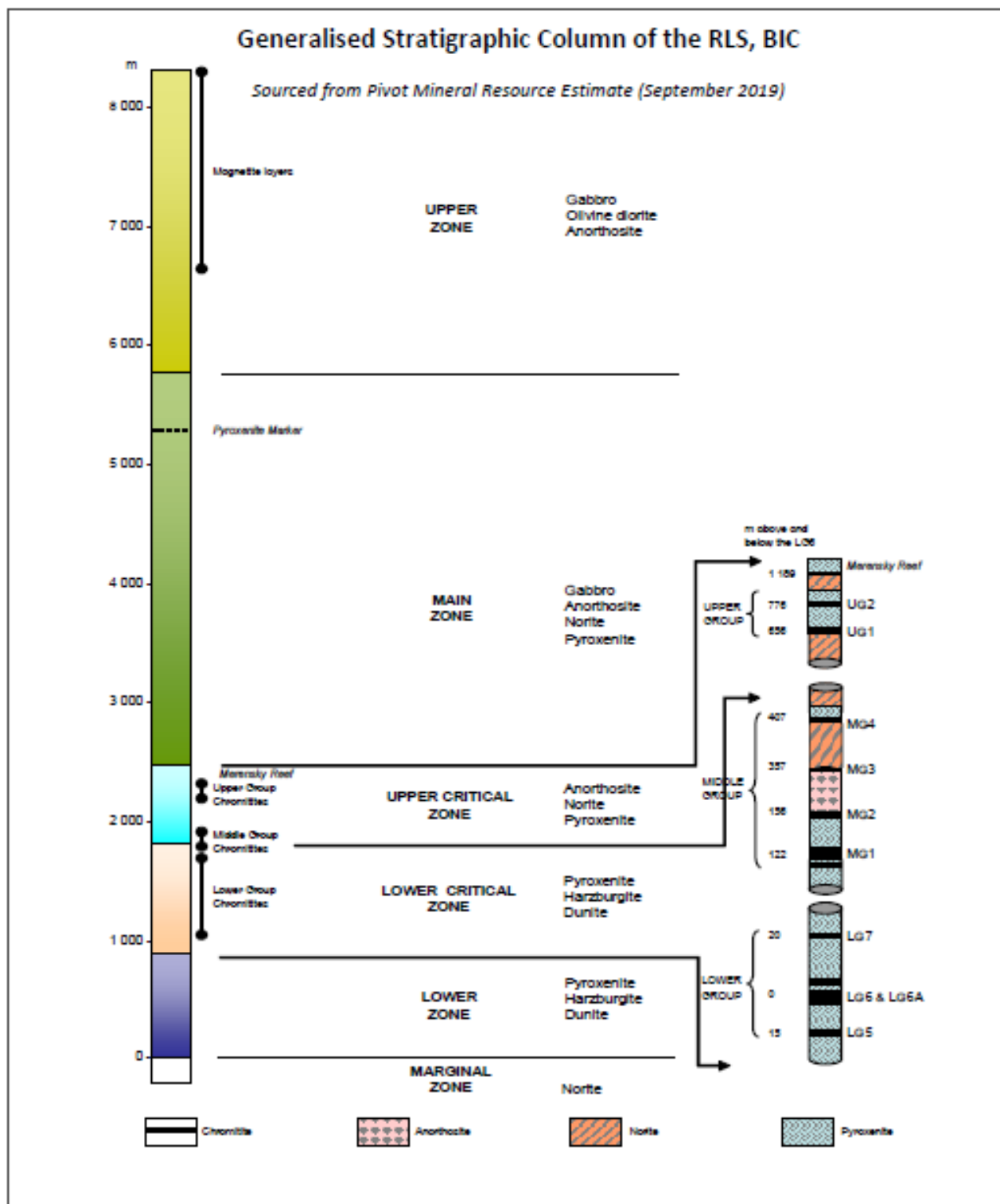


Figure 47: Stratigraphy of the Regional Geology

8-1.1 Local Geology

The open cast operations of Tharisa are located on Farm K/Kraal 342JQ where Chromitite layers of the MG and UG1 (for which Tharisa holds the MRs) is outcropping on the property. The MR for these layers extends northward underground onto Rooikoppies 297JQ. Both properties are situated in the Marikana Section of the southwestern limb of the Bushveld Complex. The Marikana Section is separated from the Brits Section by Wolhuterskop in the east, and from the Rustenburg Section by the Spruitfontein “upfold” in the west. Tharisa Mine property is positioned on the western side of the Marikana Section, with its westernmost area falling within the Rustenburg Section.

The MG package has four main groups of Chromitite layers hosted in anorthosite, norite and feldspathic pyroxenite. These Chromitite layers are important as they contain significant concentrations of chromite and

PGMs. Of the four main chromite layers (seams), the MG1 has the highest chrome content. It is common for the MG1 to be divided into more than one band. Shearing in the MG1 is also common but the location varies. The MG2s have three subdivisions, with the MG2A, MG2B and MG2C identifiable from the base upwards. MG2A and MG2B usually occur as one layer but are distinguishable by their definite analytical signature. Of the three subdivisions, MG2C contains the highest content of PGMs followed slightly by MG2A. MG2B has a much lower content in comparison. The MG2s are hosted in a felspathic pyroxenite but directly underlay the anorthositic marker. The anorthositic marker is a prominent anorthosite and often a norite separating the MG2s and the overlying MG3. Chrome stringers are sometimes present within the marker and can be high in PGM content. The MG3 appears as a banded layer of chrome stringers and bands within norite and anorthosite. The MG4s are subdivided into the MG4(0) at the base, MG4 and MG4A at the top (refer to Figure 48).

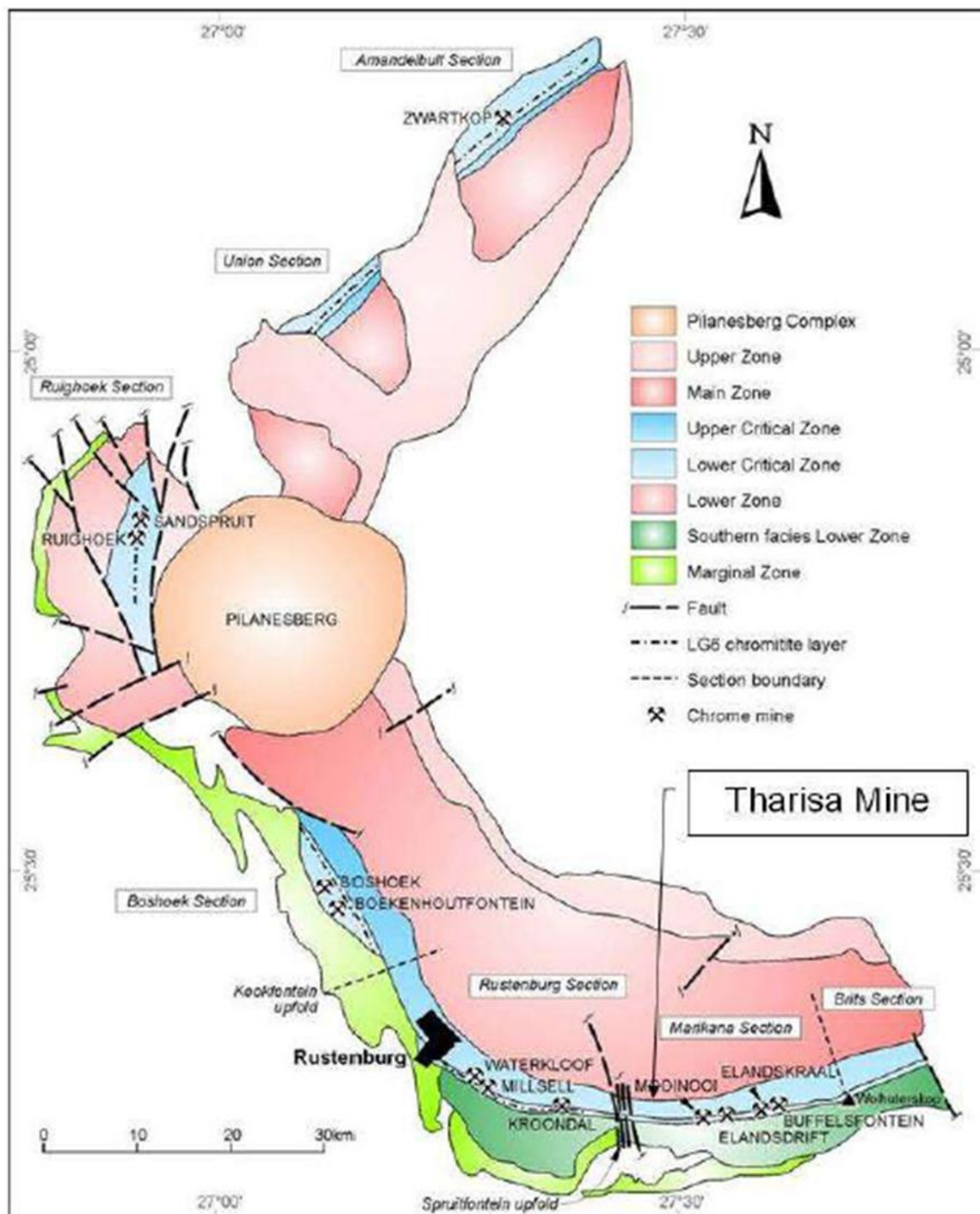


Figure 48: Map of the Western BIC showing the Location of the Tharisa Mine

8-2 TOPOGRAPHY, VEGETATION AND LANDUSE

8-2.1 Topography

Tharisa Mine is situated on slightly undulating plains and located to the east and west of the perennial Sterkstroom River (Figure 49). Small sections of original vegetation remain intact on the site, although most of the site represents old, cultivated land. The major land uses of the project area as classified by the Environmental Potential Atlas of South Africa (2000) are mining and vacant/unspecified land (AGES, 2023b). Approximately 15 km to the south of the project area lies the Magaliesberg Mountain range. Peaks in this part of the Magaliesberg rise to approximately 1 700 mamsl. The area is approximately 1 200 mamsl. However, the natural topography surrounding the project area is modified by the mining activities of Tharisa Mine and other miners through open pits, WRDs and tailings facilities (Eclectic; 2025).

8-2.2 Regional Vegetation

Tharisa Mine is situated within the Savanna biome which is the largest biome in Southern Africa. The Savanna Biome is characterised by a grassy ground layer and a distinct upper layer of woody plants (trees and shrubs).

The most recent classification of the area by Mucina and Rutherford (2006) shows that the mine is classified as Marikana Thornveld. The Marikana Thornveld vegetation type is considered Endangered. While the national conservation target for this vegetation type is 19%, less than 1% is statutorily conserved. This vegetation type has been transformed (48%), mainly by cultivation and urban or built-up areas. Most agricultural development of this area is in the western regions towards Rustenburg, while in the east industrial development is a greater threat. Alien invasive plants are localised in high densities, especially along drainage lines, in this vegetation type.

The Marikana Thornveld vegetation type is characterised by open Vachellia karroo woodland, valleys and slightly undulating plains and some lowland hills. Shrubs are denser along drainage lines, on termitaria and rocky outcrops or in other habitats protected from fire.

8-2.3 Land Use

Tharisa's operations, land use in the area was a mixture of farming, residential, mining, small business, and general community activities. Similar land uses still take place adjacent to the mine infrastructure and activity areas (Metago, 2008; SLR, 2014).

Mining activities occur to the North and immediate West and East of Tharisa Mine. Amongst the mining activities is open land mostly owned by mining companies and the community of Marikana (GLYA, 2023). Immediately West of the mining area, in the MR footprint, is the Lapologang community.

The predominant land cover types in the area are listed below:

- Mine: Extraction Pits and Quarries;
- Mine: Surface Infrastructure;
- Mine: Tailings and Resource Dumps; and
- Commercial Annual Crops rainfed/dryland.

As a result of this, the area may be described as significantly transformed by mining.

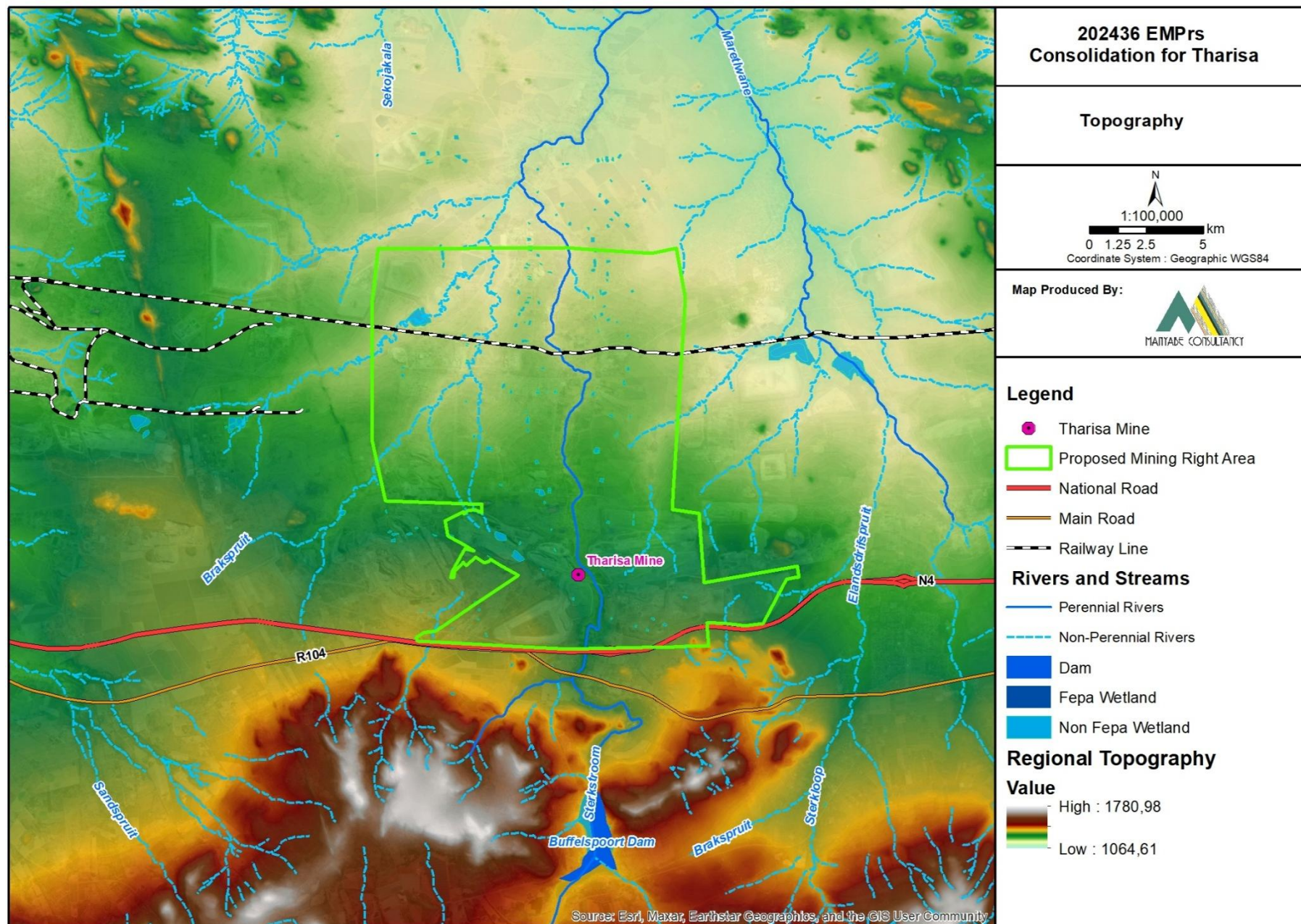


Figure 49: Topographical Map

8-3 CLIMATE

Climate data was assessed from various data sources, a DWS Station for Buffelspoort Dam (A2E005) for the period 31 March 1942 – 01 March 2024 and Water Research Commission (WRC) - WR2012 project data for station 0511855A for the periods 1925-1936 and 1966-2009 (WR2012), (WRC,2024). Tharisa Mine has a weather station on site, used for monitoring. From the data, the Mean Annual Precipitation (MAP) of the project area was calculated in other studies to be 665mm (ACS, 2024a), which is lower than the DWS Station A2E005 MAP of 753mm.

8-3.1 Regional Climate

Tharisa Mine falls within the Highveld Climatic Zone (semi-tropical region), which is characterised by moderately warm temperatures, mild dry winters and hot summers.

8-3.2 Ambient Temperature

The area experiences hot temperatures during summer, with a maximum of 36.4°C for October. Winter temperatures are relatively low especially in May to July, with a minimum of -2.4°C in July. The monthly temperature pattern is provided in Figure 50.

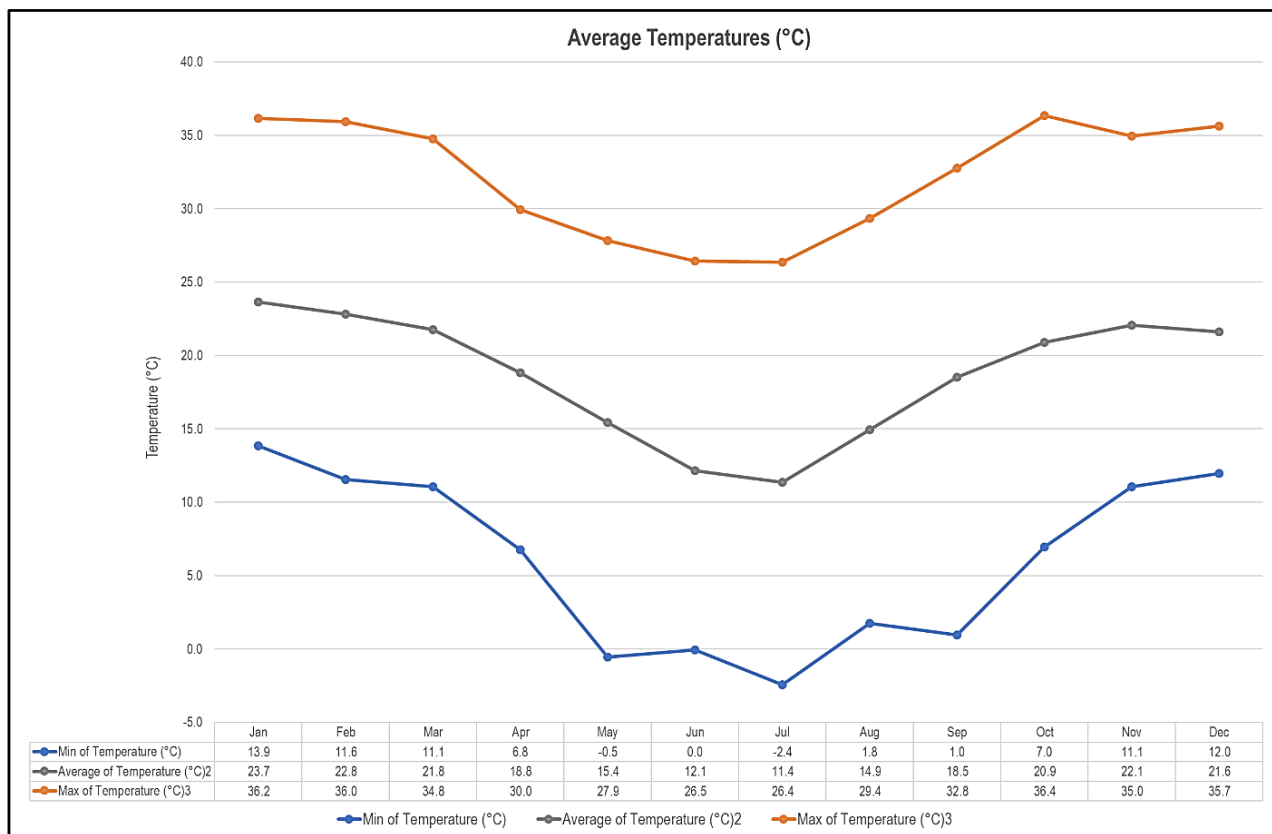


Figure 50: Minimum, Average and Maximum Temperatures Over the Project Area [Weather Research and Forecasting (WRF) Data; 2019 to 2021]

8-3.3 Rainfall and Evaporation

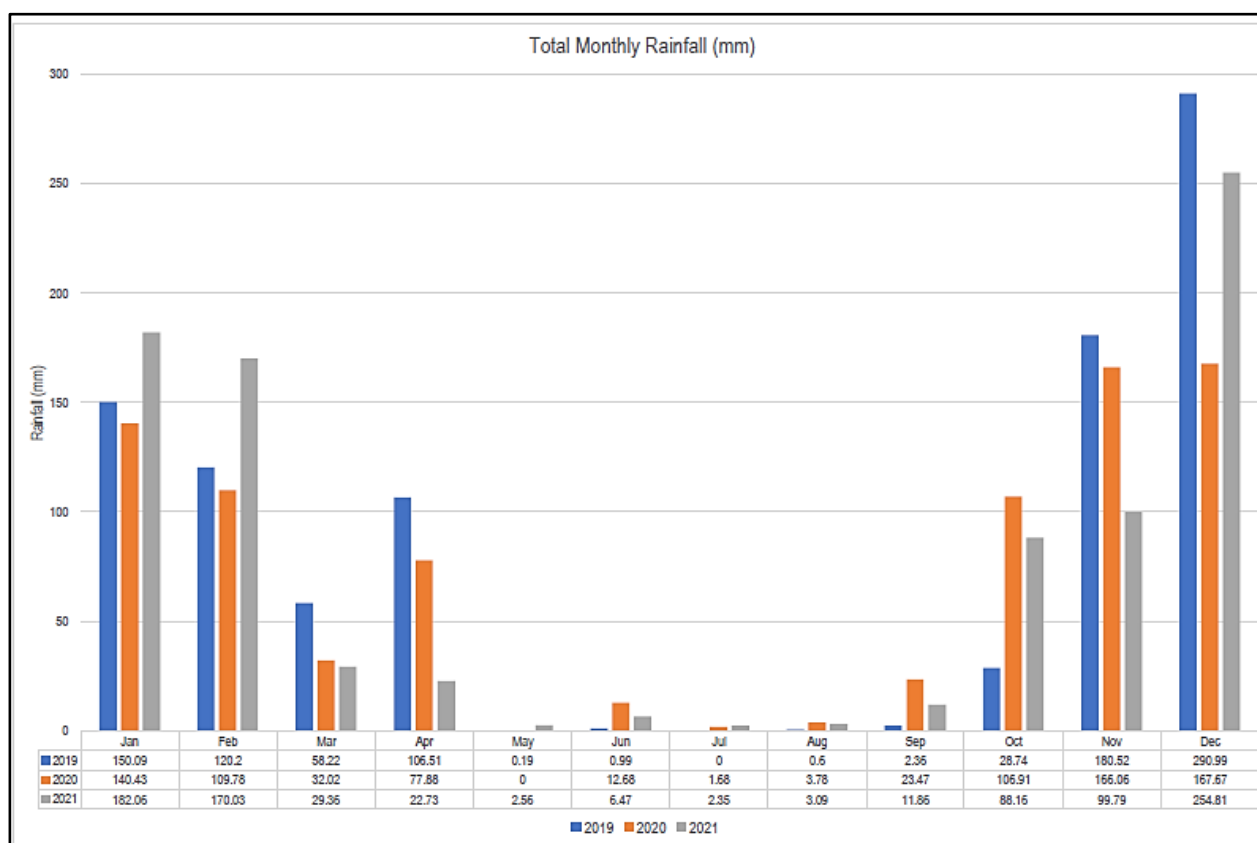
Tharisa Mine typically receives the highest rainfall during the rainy season in December and January. From the data, the MAP of the project area was calculated in other studies to be 665mm (ACS, 2024a) which is lower than the DWS Station A2E005 MAP of 753mm. The average rainfall is presented in Table 21 below.

Table 21: Average Monthly Rainfall and Evaporation

Month	A2E005 Average Rainfall (mm)	0511855A Average Rainfall (mm)	A2E005 Average S pan Evaporation (mm)
Jan	138.6	136.6	193.8
Feb	108.1	92.8	164.3
March	98.1	90.5	156.5
Apr	56.1	41.5	122.3
May	19	14.1	104.9
Jun	9	4.5	85.7
July	4.8	3.5	95.4
August	5.9	6.1	126
Sept	18.6	17.9	166.5
Oct	63.4	54.4	193.6
Nov	102.2	86.0	189.9
Dec	129.2	105.6	199.6
Total	753.0	653.6	1798.5

Precipitation is important to air pollution studies since it represents an effective removal mechanism for atmospheric pollutants and inhibits dust generation potentials. Monthly rainfall for the project site (based on WRF data for 2019 – 2021) is given in Figure 51. Months wherein the most rain occurred stretched from October to April (Airshed Planning Professionals, 2025).

Relatively high levels of evaporation occur because of the elevated solar radiation levels experienced. The maximum evaporation rate occurs in December, with a mean rate of more than 7mm per day. Evaporation is greater than rainfall for all months of the year resulting in a marked moisture deficit in the region.

**Figure 51: Monthly Precipitation over the Project Area (WRF Data; 2019 to 2021)**

8-3.4 Surface Wind Field

The wind field determines both the distance of downward transport and the rate of dilution of pollutants. The generation of mechanical turbulence is a function of the wind speed, in combination with the surface roughness. The wind field for the project area is described with the use of wind roses. Wind roses comprise

16 spokes, which represent the directions from which winds blew during a specific period. The colours used in the wind roses below, reflect the different categories of wind speeds; the yellow area, for example, representing winds in between 4 and 5 m/s. The dotted circles provide information regarding the frequency of occurrence of wind speed and direction categories. Calm conditions are periods when the wind speed was below 1 m/s. These low values can be due to “meteorological” calm conditions when there is no air movement; or, when there may be wind, but it is below the anemometer starting threshold.

The period wind field and diurnal variability in the wind field are shown in Figure 52. The average wind field is mainly from the eastern half of the wind grid with calm conditions 3.17% of the time. The daytime wind field is mainly from the north, ranging between north-west to north-east with 2.47% calm conditions. During the night, the wind field shifts to the south and south-southwest with less frequent winds from the south-westerly to north-westerly sector. The frequency of night-time calm conditions increases to 3.85%.

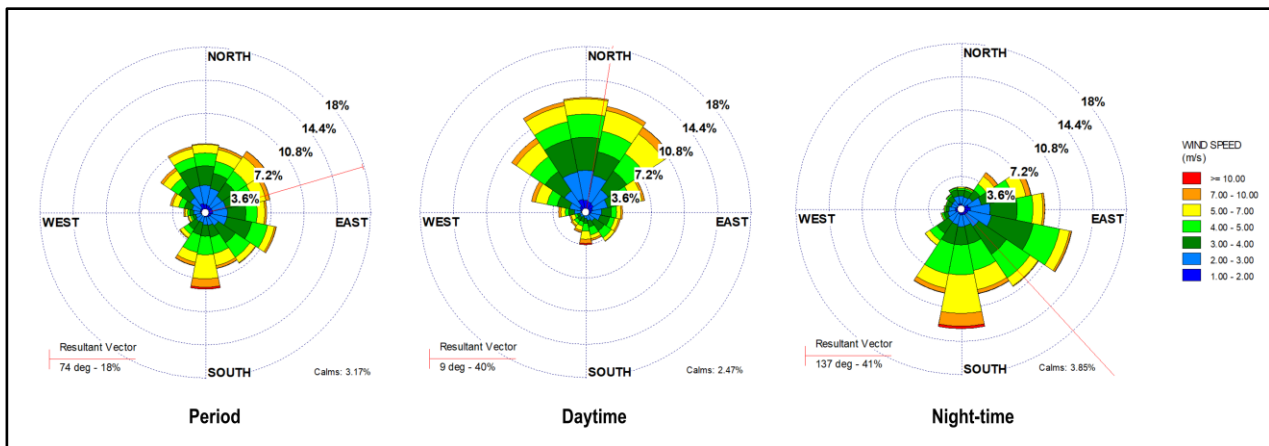


Figure 52: Period, Day- and Night-Time Wind Roses (WRF data; 2019 to 2021)

A distinct seasonal variation in the wind field is visible from Figure 53. During summer, the wind field is varied between most directions with more frequent winds from the north-eastern sector. The wind field shifts to south during autumn, with more frequent southerly winds during winter. During spring, the northerly winds increase with frequent north to north-east winds.

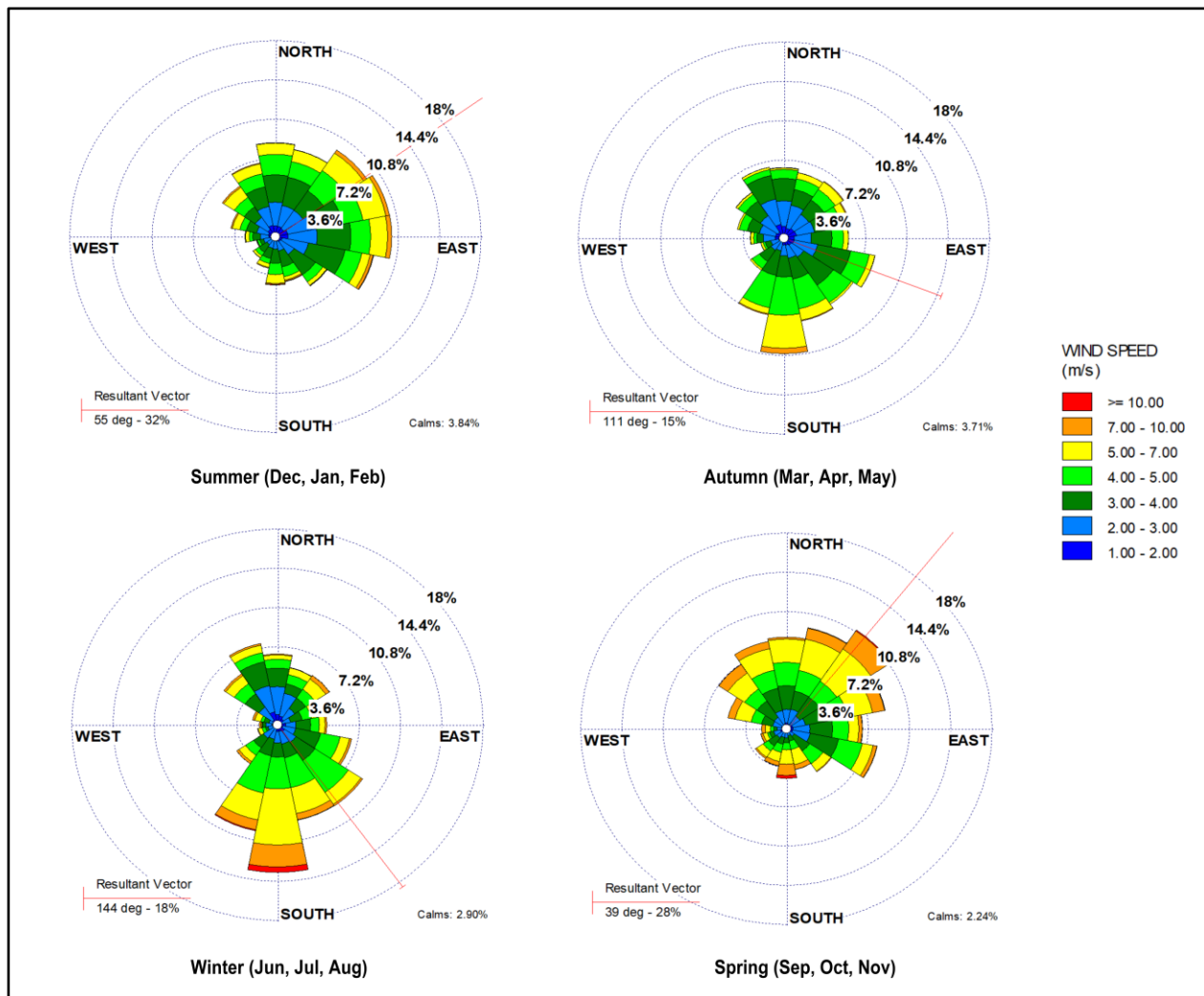


Figure 53: Seasonal Wind Roses (WRF data; 2019 to 2021)

According to the Beaufort wind force scale (<https://www.metoffice.gov.uk/guide/weather/marine/beaufort-scale>), wind speeds between 6-8 m/s equates to a moderate breeze, with wind speeds between 14-17 m/s near gale force winds. Based on the three years of WRF data, wind speeds exceeding 7 m/s occurred for only 3.3% of the time, with a maximum wind speed of 16.1 m/s. The average wind speed over the three years is 3.2 m/s with calm conditions (wind speeds < 1 m/s) occurring for 7.6% of the time (Figure 54). According to the United States Environmental Protection Agency (US EPA), the likelihood exists for wind erosion to occur from open and exposed surfaces with loose fine material when the wind speed exceeds at least 5.4 m/s (US EPA, 2006). Wind speeds exceeding 5.4 m/s occurred for 8% over the three years (2019 -2021).

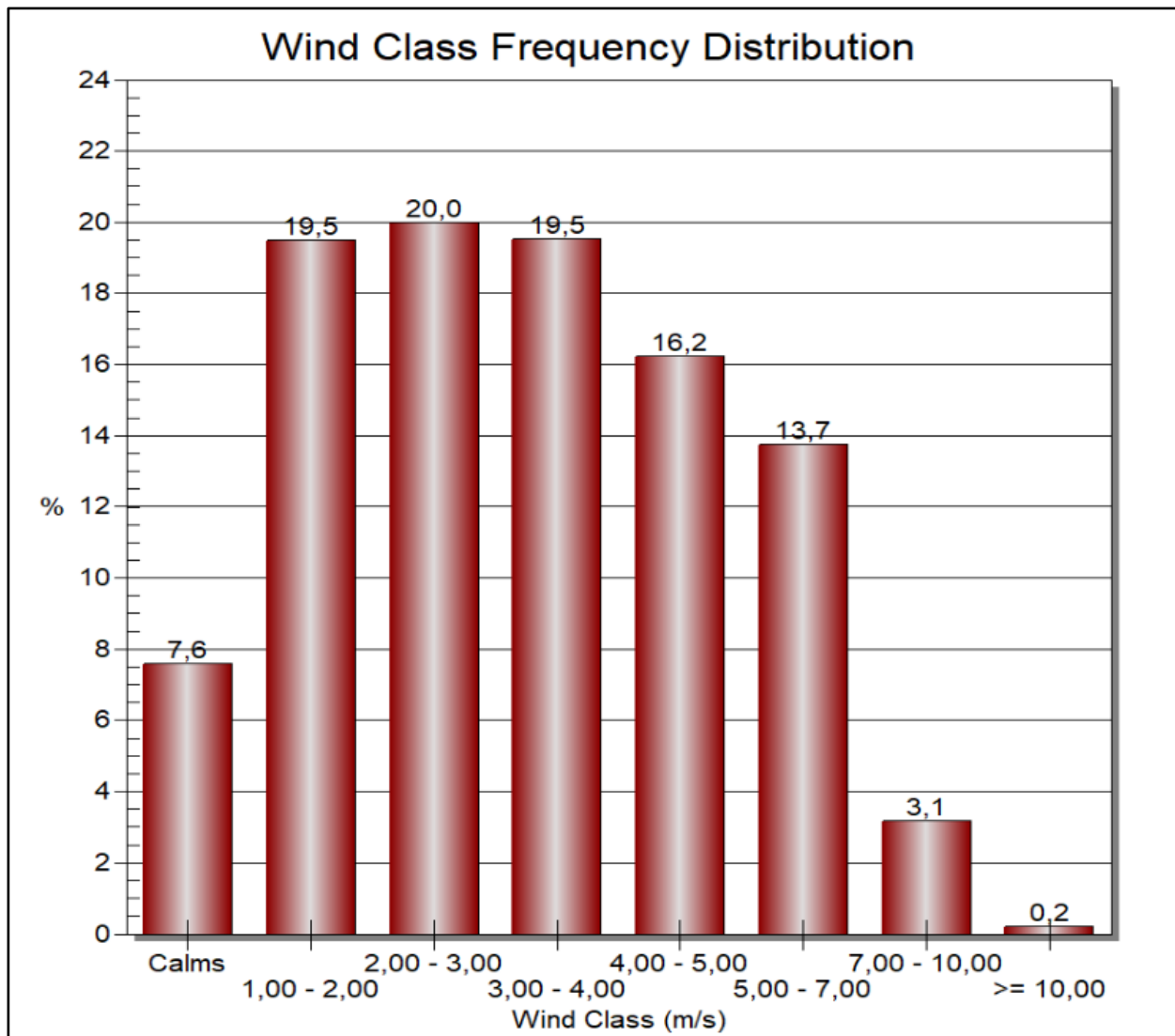


Figure 54: Wind Speed Categories (WRF data; 2019 to 2021)

8-3.5 Extreme Weather Conditions

Rainfall conditions are highly variable, and droughts and floods do occur.

8-3.6 Atmospheric Stability and Mixing Depth

The atmospheric boundary layer constitutes the first few hundred metres of the atmosphere. This layer is directly affected by the earth's surface, either through the retardation of flow due to the frictional drag of the earth's surface, or as result of the heat and moisture exchanges that take place at the surface. During the daytime, the atmospheric boundary layer is characterised by thermal turbulence due to the heating of the earth's surface and the extension of the mixing layer to the lowest elevated inversion. The radiative flux divergence during the night usually results in the establishment of ground-based inversions and the erosion of the mixing layer. The night times are characterised by weak vertical mixing and the predominance of a stable layer. These conditions are normally associated with low wind speeds, hence less dilution potential.

The mixed layer ranges in depth from a few metres (i.e. stable or neutral layers) during night times, to the base of the lowest-level elevated inversion during unstable, daytime conditions. Elevated inversions may occur for a variety of reasons and on some occasions as many as five may occur in the first 1000 m above the surface.

Atmospheric stability is frequently categorised into one of six stability classes – these are briefly described in Table 22. The most commonly occurring stability class calculated the site is Class C and F, representing

Unstable and Very Stable conditions respectively. For elevated releases (e.g. from the plant stack), the highest Ground Level Concentration (GLC) would occur during unstable, daytime conditions. For low level releases, such as vehicle and materials handling activities, the highest GLCs would occur during weak wind speeds and stable (night-time) atmospheric conditions. Windblown dust is likely to occur under high winds (neutral conditions).

Table 22: Atmospheric Stability Classes

Designation	Stability Class	Atmospheric Condition
A	Very unstable	calm wind, clear skies, hot daytime conditions
B	Moderately unstable	clear skies, daytime conditions
C	Unstable	moderate wind, slightly overcast daytime conditions
D	Neutral	high winds or cloudy days and nights
E	Stable	moderate wind, slightly overcast night-time conditions

8-4 HERITAGE/ ARCHAEOLOGY AND PALAEOLOGY

Heritage (and cultural) resources include all human-made phenomena and intangible products that are the result of the human mind. Natural, technological or industrial features may also be part of heritage resources as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa.

Paleontological resources are fossils; the remains or traces of prehistoric life preserved in the geological (rock stratigraphic) record. They range from the well-known and well publicised (such as dinosaur and mammoth bones) to the more obscure but nevertheless scientifically important fossils (such as palaeobotanical remains, trace fossils, and microfossils). Paleontological resources include the casts or impressions of ancient animals and plants, their trace remains (for example, burrows and trackways), microfossils (for example, fossil pollen, ostracodes, and diatoms), and unmineralised remains (for example, bones of Ice Age mammals).

The most important heritage resources discovered in the area were stone-walled settlements, graveyards, a historical village and homestead, mining heritage remains, isolated and randomly scattered stone tools, historical houses and outdated and discarded agricultural implements.

There are several churches within the MRA. These churches include the African Faith Mission (AFM), Uniting Reform Church (URC), New Earth Apostolic Church (NEAC) Ts'enolo Apostolic Church (TAC) and many other apostolic churches whose members assemble at various venues including private homes, schools and/or hired venues.

Although no paleontological resources are expected within the MRA [According to the South African Heritage Resources Information System (SAHRIS) Paleosensitivity Geographic Information System (GIS), the project area is underlain with sediments of no fossil sensitivity], these resources are protected by national legislation and must be reported to the SAHRA should they be identified on-site.

8-4.1 Cultural Heritage Background

Tharisa Mine is located in the Central Bankeveld of the North West Province of South Africa. The Central Bankeveld is covered by older granites penetrated by younger volcanic magma which formed the series and chains of pyramid-shaped granite hills from the Pilanesberg in the north-west to Onderstepoort near Pretoria in the east. These hills, as part of the Magaliesberg valley, represent a unique ecozone characterised by grassveld, savannah veld and near wooded valleys. The region has abundant surface water supplies. The Pienaar, the Moretele, the Hex and the Apies Rivers all drain their waters into the Crocodile River.

Tharisa is also located to the north of the Magaliesberg Mountain range, which is known for its rich and diverse range of heritage resources. Various Stone Age sites are scattered along the Magaliesberg and are

also located within caves and rock shelters within the mountain. Rock engraving sites have been located further towards Maanhaarrand and Rustenburg in the west.

Blockhouses along the Magaliesberg and colonial farm homesteads are still common in Marikana and on the outskirts of Brits (Madibeng). The most abundant heritage, however, are those that date from the Late Iron Age and which are associated with the numerous Tswana chiefdoms who occupied this region during the last four centuries.

8-4.2 Heritage and Palaeontological Resources at Tharisa Mine

Heritage resources identified at Tharisa Mine include stone walled settlements, graveyards, a historical village and homestead, mining heritage remains, isolated and randomly scattered stone tools, historical houses and outdated and discarded agricultural implements.

Figure 55 below provides the location of all heritage resources within the project area.

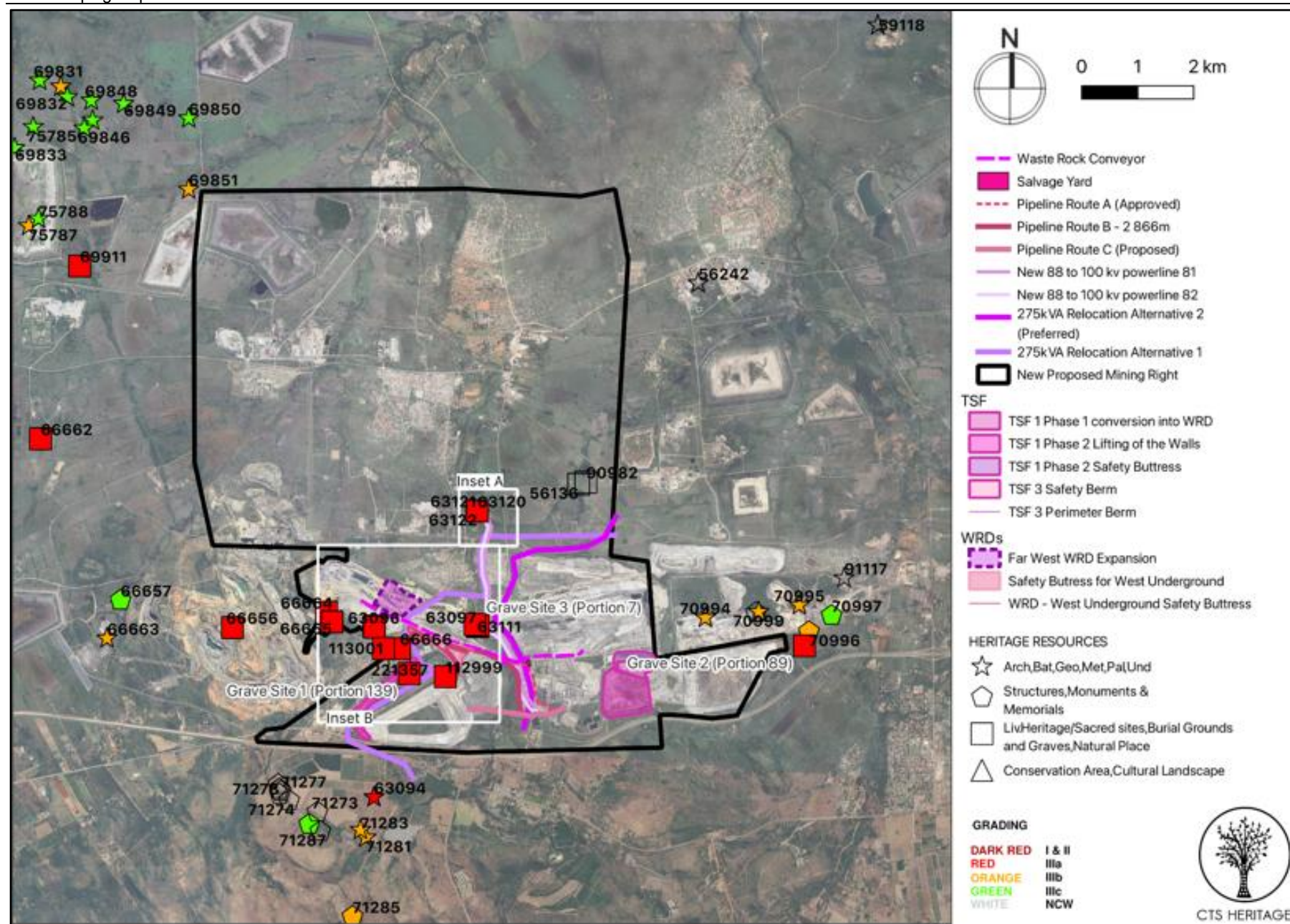


Figure 55: All Heritage Resources within Proximity to the Project Area

8-5 SOIL AND LAND CAPABILITY

Soils are structured with a high clay content. Land capable for use as grazing dominates the project area. The geology of the area includes the mafic intrusive rocks of the Rustenburg layered suite of the BIC, gabbro, norite, pyroxenite, anorthosite, shales and quartzites (Transvaal Supergroup). The land types associated with this geology are Bc, Ea and Ib.

According to the land type database (Land Type Survey Staff, 1972 - 2006) the transects relevant to the project are located in the Bc 8, Ea 3 and Ib 3 land types. The Bc 8 land types are commonly characterised with the Hutton, Dundee, and Mispah soil forms with rocky areas as well as other soils also occurring in the terrain according to the Soil Classification Working Group, (2018). The Ea 3 land types are characterised with Arcadia and Oakleaf soil forms and rocky areas with also the occurrence of other associated soils occurring in the landscape. The Ib 3 land types are characterised with Hutton soil forms and rocky areas with also the occurrence of other associated soils occurring in the landscape. The Bc land types are commonly dominated plinthic catena, usually duplex and marginal soils are rare in the upper terrain. These soils have a dystrophic and mesotrophic base status. Red soils are not widespread in the landscape. The Ea land types have vertic, melanic and red structured diagnostic horizons usually undifferentiated. The Ib land types commonly have miscellaneous land classes also associated to rocky areas in the landscape.

8-5.1 Soil Chemical Characteristics

The dominant soils at Tharisa Mine are neutral to slightly alkaline (pH of 5.2 to 7.3), which is within accepted range for good nutrient mobility. These soils tend to be saline in character. Due to the generally high clay content of the soils, the cation exchange capacity (CEC) of the soils is moderate to high. Majority of the soils within the Tharisa MRA have moderate erodibility. These soils are not that prone to erosion, but compaction and contamination of these soils require assessment and mitigation.

8-5.2 Dry Land Agricultural and Irrigation Potential

Due to the general low levels of Potassium (K), Zinc (Zn) and Phosphorus (P) in the soils, the dryland production potential, especially of the shallower Valsrivier, Swartland, Sterkspruit, and Mayo soil forms is low. In order to increase the productivity to a viable and sustainable cropping potential, additional fertilisers will be required. Majority of the pre-mining footprint had a grazing land capability. In terms of soil structure and drainage capability, the irrigation potential of the soils can be described as moderate. With adequate drainage and good water management, the soils can be economically cultivated. Existing infrastructure and mining related activities at Tharisa Mine have influenced the natural capability of the land.

8-6 TERRESTRIAL ECOLOGY (FLORA AND FAUNA)

8-6.1 Ecologically Important Landscape Features

No Red Data List plant species or other nationally protected flora were recorded in recent surveys, and suitable habitat for such species is now absent throughout the active mining footprint. The main threats to flora remain ongoing habitat loss, proliferation of alien species, and limited opportunities for natural regeneration due to persistent disturbance and fragmentation.

No species of conservation concern (SCC) or Red Data List herpetofauna were recorded in the most recent field surveys, and the lack of intact rocky outcrops or natural drainage lines has further reduced habitat suitability for sensitive species.

While historical records indicated the presence of a broader range of mammals, including some SCCs, recent surveys have not confirmed the presence of any Red Data List or NEMBA-protected mammals within the transformed mining footprint. The loss of habitat connectivity and the dominance of alien vegetation have further limited the potential for recolonization by sensitive species.

No Red-Listed or threatened bird species were recorded in recent surveys, and the lack of intact wetland or bushveld habitats has reduced the site's importance for sensitive or specialist avifauna. The remaining avifaunal community is typical of disturbed bushveld and transformed landscapes.

The GIS analysis pertaining to the relevance of the proposed activities to ecologically important landscape features is summarised in Table 23.

Table 23: Summary of Relevance of the Proposed Project to Ecologically Important Landscape Features

Desktop Information Considered	Relevant/Irrelevant
Ecosystem Threat Status	Relevant – Overlaps with EN and LC Ecosystems.
Ecosystem Protection Level	Relevant – Overlaps with 'Moderately Protected' and 'Poorly Protected' Ecosystems.
Provincial Conservation Plan	Relevant – Overlaps with terrestrial ESA1, CBA2, ESA2. The MRA intersects Aquatic ESA1, ESA2, CBA1, and CBA2 areas.
South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD)	Relevant – project area occurs within the Magaliesberg Biosphere Reserve, with the project area situated approximately 8.5 km from the Magaliesberg Protected Natural Environment.
NPAES	Relevant – Overlaps with NPAES Priority Focus Areas.
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Relevant – Overlaps with CR wetlands and CR rivers.
NFEPA	Relevant – Overlaps with Class B: Largely NFEPA River.
IBAs	Relevant – Overlaps with the 'Magaliesberg' IBA.
SWSA	Relevant – Overlaps with the Marikana/Kroondal Ground water SWSA.

8-6.2 Red List of Ecosystems

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as CR, EN, Vulnerable (VU) or LC, based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset, the mine overlaps with an EN and LC ecosystem.

8-6.2.1 Ecosystem Protection Level

This is an indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems. The mine overlaps with a PP and MP ecosystems.

8-6.2.2 Provincial Conservation Plan

The North West Department of Agriculture, Conservation, Environment and Rural Development (NWREAD), as custodian of the environment in the North West, is the primary implementing agent of the NWBSP. The spatial component of the NWBSP is based on systematic biodiversity planning undertaken by NWREAD. The purpose of a NWBSP is to inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management, undertaken by a range of sectors whose policies and decisions impact on biodiversity. This is done by providing a map of biodiversity priority areas, referred to as CBAs and ESAs, with accompanying land use planning and decision-making guidelines (NWREAD, 2015).

The mine overlaps with terrestrial ESA1, CBA2, ESA2. The MRA intersects Aquatic ESA1, ESA2, CBA1, and CBA2 areas.

8-6.2.3 Protected and Conservation Areas

The DFFE maintains a spatial database on Protected Areas and Conservation Areas (PACAs). PACA Database scheme is used for classifying protected areas (SAPAD) and conservation areas (SACAD) into types and sub-types in South Africa.

According to the protected area spatial datasets, the mine occurs within the Magaliesberg Biosphere Reserve (SACAD, 2023). Furthermore, the mine is situated approximately 8.5km from the Magaliesberg Protected Natural Environment (SAPAD, 2023).

8-6.2.4 National Protected Areas Expansion Strategy

NPAES (2016) areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with a strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases, only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2016).

The mine overlaps with Priority Focus Areas according to the NPAES database.

8-6.2.5 Hydrological Setting

The SAIIE was released with the National Biodiversity Assessment (NBA) 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer et al., 2019; Skowno et al., 2019).

The mine overlaps with a CR river – the Sterkstroom River.

8-6.2.6 National Freshwater Ecosystem Priority Area Status

To better conserve aquatic ecosystems, South Africa has categorised its river systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver et al., 2011). The FEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the NEMBA's biodiversity goals (Nel et al., 2011).

The mine overlaps with a Class C: Moderately modified NFEPA River and wetlands.

8-6.3 Important Bird and Biodiversity Areas

IBAs are the sites of international significance for the conservation of the world's birds and other conservation significant species as identified by BirdLife International. These sites are also all Key Biodiversity Areas; sites that contribute significantly to the global persistence of biodiversity (Birdlife, 2017).

According to Birdlife International (2017), the selection of IBAs is achieved through the application of quantitative ornithological criteria, grounded in up-to-date knowledge of the sizes and trends of bird populations. The criteria ensure that the sites selected as IBAs have true significance for the international conservation of bird populations and provide a common currency that all IBAs adhere to, thus creating consistency among, and enabling comparability between, sites at national, continental, and global levels.

The 'Magaliesberg' IBA is situated within the project area. This IBA was previously known as the Magaliesberg and Witwatersberg IBA, and consists mainly of the Magaliesberg range, which extends in an arc from just northwest of Rustenburg in the west to the N1 in the east near Pretoria. To the south, the Witwatersberg range runs parallel to the Magaliesberg, extending from the town of Magaliesberg in the west to Hartbeespoort Dam in the east.

8-7 AQUATIC ECOLOGY

The project area falls within the Limpopo Water Management Area (WMA), the North Eastern Uplands Ecoregion, and within the A21K quaternary catchment. Desktop information for the Sub-Quaternary Reaches (SQRs) associated with the project area was obtained from the DWS (2014). The project area falls within A21K-1023 SQR associated with the Sterkstroom River. The Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) for the SQRs are summarised in Table 24.

The SQR impacts and activities include large impacts from Alien Invasive Plant species (AIPs) in the riparian zone, mining, runoff/effluent from mining activities. Moderate impacts from abstraction, algal blooms, as well as bed and channel modifications, small farm dams, erosion, irrigation, runoff/effluent from urban areas, urbanisation, and vegetation removal. Small impacts from low water crossings, overgrazing and inundation. The Sterkstroom River drains into the Crocodile River which travels west, eventuating in the Limpopo River.

Anthropogenic activities within the local area and broader catchment that have contributed to the deteriorated state of the system include mining, farming, urbanisation, the spread of alien and invasive vegetation, rubbish dumping, water abstraction, and instream impoundments such as culverts and roads that modify natural flow and channel conditions. Collectively, these pressures have resulted in habitat loss, the encroachment of alien vegetation into riparian zones, flow alteration, declining water quality, and a reduction in overall instream and riparian integrity.

The sampled sites showed a moderate diversity of instream habitats (biotopes), which are capable of supporting a moderate diversity of aquatic macroinvertebrates. Habitat types included a moderate diversity of stones in flowing conditions (stones in current) and marginal vegetation across various flow classes (both in and out of current). Aquatic vegetation was limited in diversity, and finer substrates such as gravel and mud were moderately diverse. Overall, the sampled reach contains habitat features suitable for a moderately diverse macroinvertebrate assemblage, although the absence or limited presence of certain habitat types may constrain the potential for higher macroinvertebrate diversity.

Table 24: PES of Systems and the SQR Associated with the Project (DWS, 2014)

Present Ecological State		Ecological Importance		Ecological Sensitivity	
D (Largely Modified)		High		High	
Variable	Status	Variable	Status	Variable	Status
Modifications to Instream Habitat Continuity	Moderate	Fish species per sub quaternary catchment	11	Fish Physico-Chemical sensitivity description	High
Modifications to Riparian/ Wetland Zone Continuity	Moderate	Invertebrate taxa per sub quaternary catchment	41	Fish No-flow sensitivity description	High
Potential Instream habitat modifications	Large	Habitat Diversity Class	Low	Invertebrate Physico-Chemical sensitivity	Very High
Modifications to Riparian/ Wetland Zones	Large	Instream Migration Link Class	High	Invertebrate velocity sensitivity	Very High
Potential Flow Modifications	Large	Riparian-Wetland Zone Migration Link	High	Stream size sensitivity to modified flow/water level changes description	High
Potential Physico-chemical Modifications	Large	Instream Habitat Integrity Class	Moderate	Riparian-Wetland Vegetation intolerance to water level changes description	High

8-7.1 Biomonitoring and Toxicity testing

8-7.1.1 Biomonitoring

Biomonitoring was undertaken by Clean Stream Biological Services (Pty) Ltd (Clean Stream). The biomonitoring survey was undertaken twice during the 2025 operational year. The first survey was

undertaken in April 2025 (wet season survey) and the second survey was undertaken in September 2025 (dry season survey). Locations of the sampling sites are presented in Table 25 and Figure 56. Tharisa has diligently maintained a biannual biomonitoring program since its design and inception during August 2013.

Table 25: Biomonitoring Testing Points

Sample point	Description	South	East
		Latitude	Longitude
TM-SW01	Sterkstroom Upstream of mining area	25.7566	27.4834
TM-SW03	Sterkstroom Downstream of some Tharisa potential impacts	25.7370	27.4871
TM-SW02	Sterkstroom Downstream of all Tharisa potential impacts	25.7257	27.4830
TM-SW16	Elandsdriftspruit Upstream of Tharisa potential impacts	25.73722	27.5466
TM-SW17	Elandsdriftspruit Downstream of Tharisa potential impacts	25.7307	27.5471



Figure 56: Biomonitoring and Toxicity Testing Points

The following is the summary of the findings from the April 2025 survey:**a) *In situ* water quality measurements (April 2025)****Sterkstroom:**

- As of November 2023, temporal trends in the salinity [as reflected by electrical conductivity (EC)] of the Sterkstroom sites are included. Linear trends were fitted to data collected between September 2017 and April 2025 to better examine changes in the salinity of the Sterkstroom over time.
- Salinity increased from site TM-SW01 (6.6 mS/m) to TM-SW02 (23.8 mS/m) in April 2025, and, although still not considered particularly high, is suggestive of water quality impacts along this reach. Temporal data show a decreasing (improving) trend in EC for site TM-SW01, while a slightly increasing (deteriorating) trend is displayed for site TM-SW02. Additionally, temporal data also show that salinity (EC) almost always increases towards site TM-SW02. These findings are suggestive of activities along this reach (from mining and/or other activities) impacting on the salinity of the Sterkstroom and indicate that a pathway for water pollution has been established. Tharisa environmental staff should take measures to ensure that Tharisa mining activities are not contributing to the scenario and implement remedial action if needed.
- The dissolved oxygen (DO) level measured above the lower guideline level (>5mg/l) at site TM-SW01 and TM-SW02 in April 2025 and was not limiting to aquatic biota. The pH measured above the target range for fish health (6.5-9.0) at site TM-SW01 (9.5) and may have limited aquatic biota. The pH decreased to within the target range at site TM-SW02.

Elandsdriftspruit:

- Sites TM-SW16 and TM-SW17, respectively located in the Elandsdriftspruit upstream and downstream of potential impacts from the Tharisa mining area, are included in the biomonitoring surveys as of April 2023 to assess potential impacts from Tharisa on this stream.
- The following recent sampling limitations are noted: Site TM-SW16 was sampled in April 2025, however, dry conditions precluded sampling of site TM-SW16 in October 2024. Site TM-SW17 is severely impacted by deep excavation (suspected illegal mining) and dumping and was unsuitable for sampling in April 2025 (only toxicity testing sample taken) and October 2024, thus precluding assessment of potential impacts from Tharisa. Although unrelated to Tharisa, the suspected illegal mining as well as dumping of animal carcasses should be reported to the relevant authorities. Also refer to the recommendations section below.
- In April 2025, the salinity measured 98.4 mS/m at site TM-SW16, reflecting a further increase since April 2024 (49.7 mS/m). However, given the site's upstream location, this deterioration is unrelated to Tharisa. The DO level measured above the median guideline and the pH fell within the target range at site TM-SW16 in April 2025 as in April 2024.
- Brief reference is again made to the April 2023 survey when both sites could last be sampled: Based on the April 2023 survey (report TM-A-23): In April 2023, the salinity remained fairly stable from site TM-SW16 (17.6 mS/m) to site TM-SW17 (18.5 mS/m), the pH values (although somewhat high) measured within the target range for fish health at both sites, and the DO level measured above the minimum guideline level. These findings suggest no deterioration in the water quality of the Elandsdriftspruit after flowing past the Tharisa mining area.

b) South African Scoring System (SASS)5 protocol (macroinvertebrates):

It must be noted that heavy rainfall resulted in high surface flow and water levels at the time of the April 2025 survey, impacting sampling efforts to some extent. The findings should also be interpreted while keeping in mind that high flows potentially impacted findings (the SASS5 protocol was not designed for implementation in flooded conditions).

Sterkstroom:

- Based on the April 2025 SASS5 findings, macroinvertebrate-based biotic integrity deteriorated from site TM-SW01 to site TM-SW02, however the deterioration appeared to be largely habitat related (as evident when assessing the most comparable biotope and supported by toxicity testing). That being said, although salinity was not considered high at site TM-SW02, cognisance must be taken of the regularly recorded increase in salinity towards this site which may suggest that mining activities (and/or other activities along this reach) are contributing to pollution of the Sterkstroom. In April 2024, as during the present survey, biotic integrity decreased towards site TM-SW02, but while habitat appeared to be the primary driver during the present survey, water quality seemed to be underlying the deterioration noted in April 2024.
- Several previous surveys have also shown a downstream deterioration in macroinvertebrate-based biotic integrity. Surface flow often ceases at the downstream site, while higher water levels and better surface flow is usually observed for the upstream site. This observed flow effect probably played a role in the low scores achieved at the downstream site during some surveys. Nonetheless, possible impacts of Tharisa on this reach of the Sterkstroom cannot be disregarded and measures should continuously be taken to rule out or identify and mitigate any mining related impacts. The limitations of applying SASS in seasonal streams must also be considered when interpreting these findings. Reference should be made to the water quality monitoring programme to identify and mitigate potential water quality variables of concern originating from Tharisa. Toxicity testing should also be maintained at all possible source waters at Tharisa (Pollution Control Facilities, effluents etc.).
- The temporal database remains limited at this stage and trends will become increasingly accurate with continued monitoring. Early indications tend to suggest generally lower biotic conditions at the downstream site, which is likely related to the low to zero-flow scenario often observed at this site. Biotic conditions at the upstream site (TM-SW01) followed an overall slight but steady improving trend for most of the study period to date, however lower Average Score Per Taxon (ASPT) values were obtained during the recent surveys, and further monitoring is required to verify if this is the start of a changing trend. Conditions at the downstream site reflected a decreasing (deteriorating) trend from 2013 to 2019, however, an increasing (improving) trend noted since 2020 appears to indicate recent temporal improvement in biotic integrity, however close monitoring remains warranted.

Elandsdriftspruit:

Sampling has been limited in the Elandsdriftspruit to date and only site TM-SW16 (upstream site) could be sampled in April 2025. Spatial comparisons were last possible in April 2023, and brief reference is therefore also made to that survey.

- Biotic integrity (total SASS5 score and ASPT) had improved at site TM-SW16 when comparing the April 2025 and April 2024 surveys. The high water level and surface flow seen in April 2025 may have contributed to the improvement (increased habitat availability and possibly quality). However, the improvement is in contrast to the marked increase in salinity at this site, as measured *in situ* as well as the increased toxicity hazard seen in March 2025 (Class II) compared to March 2024 (Class I). However, as site TM-SW16 is the upstream site, changes in the biotic integrity and water quality of this site are unrelated to Tharisa.
- Brief reference is again made to the April 2023 survey: The total SASS5 score reflected stability, while the ASPT pointed to slight improvement in biotic integrity from site TM-SW16 (67 & 4.8) to site TM-SW17 (70 & 5.8), based on the April 2023 survey. Water quality improvement may be underlying the slight improvement in ASPT; however toxicity testing placed both sites in a Class I (no hazard) and *in situ* water quality measurements did not reveal notable differences. The SASS5 findings, therefore, did not reflect impacts on the macroinvertebrate-based biotic integrity of this reach of the Elandsdriftspruit related to Tharisa or other users.
- Water toxicity testing and SASS5 sampling are likely to continue to be limited by dry conditions (non-perennial stream) which are further exacerbated by excavation in the Elandsdriftspruit, and addition of sediment toxicity testing is strongly recommended for all stream sites.

- The Elandsdriftspruit sites, TM-SW16 and TM-SW17, have only been included in the biomonitoring programme since March 2023, and inclusion of temporal trend analysis is not yet possible for these sites.
- c) Fish-based index (FAIL) (fish):
- Fish sampling is only performed in the Sterkstroom and is not considered suitable for application in the Elandsdriftspruit.
 - Fish sampling is conducted once per annum. The findings represented here are an excerpt from the April 2024 survey (TM-A-24). Fish-based biotic integrity (April 2023/April 2024 surveys) showed downstream improvement in the Sterkstroom, in contrast to the spatial deterioration noted for macroinvertebrates. The previous fish assessment (based on the April 2022/April 2023) survey also showed downstream improvement. However, the low fish diversity generally present in this reach renders the FAIL of lowered confidence. The presence of exotic predator species (recorded during previous surveys) and low-flow conditions are considered to be limiting factors.
 - Temporal trends in FAIL scores are included as of April 2024. It must be noted that trends are still of limited confidence and continued population of the temporal data base is required. Additionally, the flow limitations in this reach lowers confidence in FAIL findings, as does the generally low diversity of indigenous fish species recorded during surveys.
 - Early indications are that the FAIL score generally improved from the upstream site (TM-SW01) to the downstream site (TM-SW02) in the Sterkstroom. A slight improving trend in FAIL score is displayed for site TM-SW02 while a stable to marginally declining trend is displayed for site TM-SW01. These early findings suggest that activities between these sites (Tharisa and/or others) have not impacted on the fish assemblages of the Sterkstroom. The FAIL trends are in contrast to the trends of the SASS5 protocol, which generally reflects downstream deterioration.

The following is the summary of the findings from the September 2025 survey:

- d) *In situ* water quality measurements (September 2025)

Sterkstroom:

- As of November 2023, temporal trends in the salinity [as reflected by EC] of the Sterkstroom sites are included. Linear trends were fitted to data collected between September 2017 and September 2025 to better examine changes in the salinity of the Sterkstroom over time.
- The September 2025 survey saw an increase in salinity from site TM-SW01 (8.0 mS/m) to site TM-SW02 (15.0 mS/m) and, although still not considered particularly high, is suggestive of water quality impacts along this reach. Temporal data show a decreasing (improving) trend in EC for site TM-SW01, and following the latest survey a decreasing trend is also reflected for site TM-SW02. Additionally, temporal data also show that salinity (EC) almost always increases towards site TM-SW02. These findings are suggestive of activities along this reach (from mining and/or other activities) impacting on the salinity of the Sterkstroom and indicate that a pathway for water pollution has been established. Tharisa environmental staff should take measures to ensure that Tharisa mining activities are not contributing to the scenario and implement remedial action if needed.
- The DO level measured above the lower guideline level (>5mg/l) at site TM-SW01 and TM-SW02 in September 2025 and was not limiting to aquatic biota. The pH measured within the target range for fish health (6.5-9.0) at both Sterkstroom sites and was not limiting to aquatic biota.

Elandsdriftspruit:

- Sites TM-SW16 and TM-SW17, respectively located in the Elandsdriftspruit upstream and downstream of potential impacts from the Tharisa mining area, are included in the biomonitoring surveys as of April 2023 to assess potential impacts from Tharisa on this stream.

- The following sampling limitations are noted: Site TM-SW17 remains severely impacted by deep excavation (suspected illegal mining) as well as dumping of rubbish and animal carcasses and was unsuitable for sampling in April 2025, October 2024, and April 2024. Although the impacts at site TM-SW17 were still present in September 2025, conditions had improved to such an extent that sampling could be conducted. Although unrelated to Tharisa, the suspected illegal mining as well as dumping of rubbish and animal carcasses should be reported to the relevant authorities. Also refer to the recommendations section below.
 - Salinity at site TM-SW16 was notably higher in September 2025 (53.0 mS/m) than in April 2025 (9.8 mS/m), but given the site's upstream location, this deterioration is unrelated to Tharisa. The salinity remained stable from site TM-SW16 (53.0 mS/m) to site TM-SW17 (52.0 mS/m), despite lower flow (and therefore less dilution) at the latter site. The September 2025 findings suggest that activities between these sites did not result in additional salts entering the Elandsdriftspruit.
 - The DO level measured above the lower guideline level (>5mg/l) at both Elandsdriftspruit sites in September 2025. The pH measured within the target range for fish health (6.5-9.0) at both sites and was not limiting to aquatic biota.
- e) SASS5 protocol (macroinvertebrates):

Sterkstroom:

- The September 2025 SASS5 findings saw macroinvertebrate-based biotic integrity improving from site TM-SW01 to TM-SW02, with slightly better habitat at the latter site potentially contributing to this improvement although the decrease in water toxicity hazard (Class II to I) show that water quality improvement may also have played a role. The present survey's findings contrast with the deterioration recorded between sites TM-SW01 and TM-SW02 based on the April 2025 SASS5 findings.
- Although the present survey's findings are encouraging, it is again noted that several previous surveys have shown a downstream deterioration in macroinvertebrate-based biotic integrity. Surface flow often ceases at the downstream site, while higher water levels and better surface flow is usually observed for the upstream site. This observed flow effect probably played a role in the low scores achieved at the downstream site during some surveys. Nonetheless, possible impacts of Tharisa on this reach of the Sterkstroom cannot be disregarded and measures should continuously be taken to rule out or identify and mitigate any mining related impacts. The limitations of applying SASS in seasonal streams must also be considered when interpreting these findings. Reference should be made to the water quality monitoring programme to identify and mitigate potential water quality variables of concern originating from Tharisa. Toxicity testing should also be maintained at all possible source waters at Tharisa (Pollution Control Facilities, effluents etc.).
- The temporal database remains fairly limited at this stage and trends will become increasingly accurate with continued monitoring. Early indications tend to suggest generally lower biotic conditions at the downstream site, which is likely related to the low to zero-flow scenario often observed at this site. Biotic conditions at the upstream site (TM-SW01) followed an overall slight but steady improving trend for most of the study period to date, however lower ASPT values were obtained during some recent surveys, and further monitoring is required to verify if this is the start of a changing trend. Conditions at the downstream site reflected a decreasing (deteriorating) trend from 2013 to 2019, however, an increasing (improving) trend noted since 2020 appears to indicate recent temporal improvement in biotic integrity, however close monitoring remains warranted. Indeed, the ASPT score of site TM-SW02 surpassed that of site TM-SW01 during the two latest surveys, but further monitoring is needed to verify this trend.

Elandsdriftspruit:

- Although both Elandsdriftspruit sites could be sampled in September 2025, cognisance should be taken of the sampling limitations of recent surveys.
- In September 2025, biotic integrity (total SASS5 score and ASPT) decreased from site TM-SW16 to site TM-SW17, with poorer habitat at the downstream likely contributing to the decrease. *In situ* water

quality measurement did not reflect major differences between the Elandsdriftspruit sites, and water toxicity testing reflected a decrease in hazard (Class II to I) towards site TM-SW17, further suggesting habitat differences and not water quality differences resulting in the lower biotic integrity at this site. Indeed, the habitat related impacts from dumping, excavation, and mining (suspected illegal mining unrelated to Tharisa) at site TM-SW17 further underscores the SASS5 findings.

- Prior to the current survey, spatial comparison in the Elandsdriftspruit was last possible during the April 2023 survey. In contrast to the September 2025 survey, the April 2023 survey pointed to a slight improvement in biotic conditions between sites TM-SW16 and TM-SW17.
- It is reiterated that the limitations of applying SASS5 in seasonal streams must also be considered when interpreting these findings. Water toxicity testing and SASS5 sampling are likely to continue to be limited by dry conditions (non-perennial stream) which are further exacerbated by excavation in the Elandsdriftspruit, and addition of sediment toxicity testing is strongly recommended for all stream sites.
- The Elandsdriftspruit sites, TM-SW16 and TM-SW17, have only been included in the biomonitoring programme since March 2023, and inclusion of temporal trend analysis is not yet possible for these sites.

FAIL (fish):

- Fish sampling is only performed in the Sterkstroom and is not considered suitable for application in the Elandsdriftspruit.
- Fish sampling is only conducted once per annum, usually during the first (wet season) survey. However, due to the high flows in April 2025, it was decided to postpone fish sampling to a later survey to ensure meaningful and comparative assessment. Fish sampling was considered for the second 2025 survey, but as this is the dry season survey, results may again not be as comparable to previous surveys and for this reason, fish sampling was rescheduled for the first survey of 2026. The findings represented here are an excerpt from the April 2024 survey (TM-A-24). Fish-based biotic integrity (April 2023/April 2024 surveys) showed downstream improvement in the Sterkstroom, in contrast to the spatial deterioration noted for macroinvertebrates. The previous fish assessment (based on the April 2022/April 2023) survey also showed downstream improvement. However, the low fish diversity generally present in this reach renders the FAIL of lowered confidence. The presence of exotic predator species (recorded during previous surveys) and low-flow conditions are considered to be limiting factors.
- Temporal trends in FAIL scores are included as of April 2024. It must be noted that trends are still of limited confidence and continued population of the temporal data base is required. Additionally, the flow limitations in this reach lowers confidence in FAIL findings, as does the generally low diversity of indigenous fish species recorded during surveys.
- Early indications are that the FAIL score generally improved from the upstream site (TM-SW01) to the downstream site (TM-SW02) in the Sterkstroom. A slight improving trend in FAIL score is displayed for site TM-SW02 while a stable to marginally declining trend is displayed for site TM-SW01. These early findings suggest that activities between these sites (Tharisa and/or others) have not impacted on the fish assemblages of the Sterkstroom. The FAIL trends contrast with the trends of the SASS5 protocol, which generally reflects downstream deterioration.

8-7.1.2 Toxicity testing

Toxicity testing was undertaken by BioTox Lab on behalf of Aquatico Scientific (Pty) Ltd (Aquatico). Samples were analysed as received from Aquatico. The toxicity testing survey was undertaken twice during the 2025 operational year. The first survey was undertaken in March 2025, and the second survey was undertaken in September 2025. Locations of the toxicity sampling sites are presented in Table 26 and Figure 56. This section is updated with information obtained from the March and September 2025 surveys.

Table 26: Toxicity Testing Points

Sample point	Description	Coordinates	
		Latitude	Longitude
TM SW07	WWTW	S25.73660	E27.48786
TM SW08	MCC Dam	S25.73878	E27.49435
TM SW10	TSF Dissipator	S25.73950	E27.50306
TM SW11	Raw Water	S25.73963	E27.50480
TM SW12	Storm Water Dam	S25.74643	E27.50217
TM SW13	Process Water Dam	S25.73836	E27.49333
TM SW14	SLP Dam	S25.74096	E27.49308
TM SW15	WWTW	S25.74722	E27.50250

The following is the summary of the findings from the March 2025 survey:

f) Toxicity testing:

Sterkstroom:

- The March 2025 water samples from site TM-SW01 (upstream site), TM-SW03 (middle site), and TM-SW02 (downstream site) reflected a slight sub-lethal environmental toxicity hazard (Class II). As the slight hazard was already present at the upstream site, and no further increase in hazard was detected, it appears that activities upstream of Tharisa resulted in a slight hazard in the Sterkstroom. Site TM-SW02 was tested on a definitive level, and as the slight toxicity effect could not be diluted out, no safe dilution factor could be established.

Elandsdriftspruit:

- A slight sub-lethal environmental toxicity hazard (Class II) was assigned to the March 2025 water samples from both site TM-SW16 and site TM-SW17, reflecting no further increase in toxicity hazard (at the time of sampling) of the Elandsdriftspruit after inclusion of potential Tharisa impacts.

Temporal trends (stream sites):

- Long-term trend assessment of the stream sites is included (2017 to 2025); however, it must be noted that further population of the temporal database is required to improve the accuracy of trends.
- Temporal data show that all three Sterkstroom sites fluctuated between no toxicity hazard (Class I) and a slight toxicity hazard (Class II) for the majority of surveys conducted to date. However, Class II and Class III hazards have been detected at all three sites on a few occasions. Temporal trends have generally been fairly similar at sites TM-SW01 and TM-SW03, with a spatial increase in toxicity hazard noted towards site TM-SW03 during three surveys. A stable to marginally increasing trend is displayed for site TM-SW01 and TM-SW03 over recent surveys. The toxicity hazard has generally remained similar or decreased towards the most downstream site (TM-SW02), and the trend now appears to be stabilising. Close monitoring remains essential. It is again noted that the database is still sparse at this time and continued population of the dataset will be essential to improve the accuracy of trends.
- The Elandsdriftspruit sites, TM-SW16 and TM-SW17, have only been included in the biomonitoring programme since March 2023, and inclusion of temporal trend analysis is not yet possible for these sites.

Source water toxicity testing sites:

- A slight sub-lethal environmental toxicity hazard (Class II) was detected for the March 2025 sample from site TM-SW08, and as no safe dilution factor could be established, water from this source should not be allowed to reach the natural environment. Toxicity hazards (Class II to Class IV) for the water sampled from the WWTP have been observed during several previous surveys and it is of utmost importance to monitor this source frequently for focused mitigation.

- No lethal/sub-lethal environmental toxicity hazard (Class I) was detected for the March 2025 samples from sites TM-SW13 (Storm Water Dam), TM-SW11 (TFS Dissipator), and TM-SW14 (Process Water Dam). The March 2025 survey showed a slight sub-lethal environmental toxicity hazard (Class II) for the sample from site TM-SW12 (Raw Water) and site TM-SW07 (Hernic Quarry).
- The pollution control facilities represented by samples TM-SW10 (MCC Dam) and sample TM-SW15 (SLP Dam) are tested on a definitive level. A slight sub-lethal environmental toxicity hazard (Class II) was recorded for the March 2025 sample from site TM-SW15, and as no safe dilution factor could be established for the sample from this site. Water from this source should not be allowed to reach the natural environment. MCC Dam (TM-SW10) was not included for toxicity testing in March 2025 but reflected a slight toxicity hazard (Class II) in October 2024 (with no safe dilution factor calculable).

Temporal trends (source water toxicity testing sites):

- Five samples (TM-SW-07, TM-SW08, TM-SW10, TM-SW11, and TM-SW14) have reflected a higher than Class II toxicity hazard, during a few occasions since March 2017. The trend at most of the facilities have generally fluctuated between no toxicity hazard (Class I) and a slight hazard (Class II). A very slight increasing trend in toxicity hazard is displayed for sites TM-SW10 and TM-SW12. Site TM-SW07 also shows an overall slight increasing trend and although it appears to be stabilising towards the latter part of the period, the Class III hazard detected for this site in October 2024 might be the start of an increasing trend and warrants close monitoring. Sites TM-13 and TM-SW14 are reflecting a trend of decreasing toxicity hazard over recent surveys, while the trend at TM-SW11 appears to be stabilising (slight increasing trend previously visible).
- Site TM-SW08 (WWTP) has generally displayed the highest toxicity hazard of all the samples. The high toxicity hazard (Class IV) recorded for site TM-SW08 in October 2024 resulted in a trend of increasing toxicity hazard and, despite the reduced Class II hazard recorded in March 2025, the increasing trend is still displayed for this site.
- The increasing toxicity trend noted for site TM-SW10 (MCC Dam) and the regular toxicity hazard and increasing trend recorded at site TM-SW08 is an early indication that extreme care should be taken not to release (controlled or uncontrolled) these pollution sources to the receiving environment. Definitive toxicity testing should be considered for pollution control facilities that regularly pose toxicity risks so that safe dilution factors can be established. Sites TM-SW08, TM-SW10, and TM-SW15 is currently tested on a definitive level.

The following is the summary of the findings from the September 2025 survey:

g) Toxicity testing:

Sterkstroom:

- The September 2025 water sample from site TM-SW01 (upstream site) tested as posing a slight sub-lethal environmental toxicity hazard (Class II). No lethal/sub-lethal environmental toxicity hazard (Class I) was detected for the samples from sites TM-SW03 (middle site) and TM-SW02 (downstream site), suggesting that, at the time of sampling, activities along this reach did not lead to a further increase in toxicity hazard of the Sterkstroom (in fact a decrease in toxicity hazard was recorded).

Elandsdriftspruit:

- A slight lethal environmental toxicity hazard (Class II) was assigned to the September 2025 water samples from site TM-SW16, while no lethal/sub-lethal environmental toxicity hazard (Class I) was detected for the sample from site TM-SW17. This shows that, at the time of sampling, there was no further increase in toxicity hazard (in fact a decrease in hazard was recorded) of the Elandsdriftspruit after inclusion of potential Tharisa impacts.

Temporal trends (stream sites):

- Long-term trend assessment of the stream sites is included (2017 to 2025); however, it must be noted that further population of the temporal database is required to improve the accuracy of trends.
- Temporal data show that all three Sterkstroom sites fluctuated between no toxicity hazard (Class I) and a slight toxicity hazard (Class II) for the majority of surveys conducted to date. However, Class II and Class III hazards have been detected at all three sites on a few occasions. Temporal trends have generally been fairly similar at sites TM-SW01 and TM-SW03, with a spatial increase in toxicity hazard noted towards site TM-SW03 during three surveys). Following inclusion of the latest (September 2025) results, a slight increasing trend is displayed for site TM-SW01 while a stable to marginally decreasing trend is displayed for site TM-SW03. The toxicity hazard has generally remained similar or decreased towards the most downstream site (TM-SW02), and a decreasing trend is now reflected for this site. Close monitoring remains essential. It is again noted the database is still somewhat sparse at this time and continued population of the dataset will be essential to improve the accuracy of trends.
- The Elandsdriftspruit sites, TM-SW16 and TM-SW17, have only been included in the biomonitoring programme since March 2023, and inclusion of temporal trend analysis is not yet feasible for these sites.

Source water toxicity testing sites:

- A slight sub-lethal environmental toxicity hazard (Class II) was detected for the September 2025 sample from site TM-SW08 (WWTP), and as no safe dilution factor could be established. Water from this source should not be allowed to reach the natural environment. Toxicity hazards (Class II to Class IV) for the water sampled from the WWTP have been observed during several previous surveys and it is of utmost importance to monitor this source frequently for focused mitigation.
- No lethal/sub-lethal environmental toxicity hazard (Class I) was detected for the September 2025 samples from sites TM-SW12 (Raw Water Dam), TM-SW13 (Storm Water Dam), and TM-SW14 (Process Water Dam). A slight lethal/sub-lethal environmental toxicity hazard (Class II) was assigned to the samples from sites TM-SW11 (TFS Dissipator) and TM-SW07 (Hernic Quarry).
- The pollution control facilities represented by samples TM-SW10 (MCC Dam) and sample TM-SW15 (SLP Dam) are tested on a definitive level. A slight lethal/sub-lethal environmental toxicity hazard (Class II) was assigned to the September 2025 sample from site TM-SW15, and as no safe dilution factor could be established for the sample from this site. Water from this source should not be allowed to reach the natural environment. MCC Dam (TM-SW10) was not included for toxicity testing in September 2025 nor in March 2025 but reflected a slight toxicity hazard (Class II) in October 2024 (with no safe dilution factor calculable).

Temporal trends (source water toxicity testing sites):

- Five samples (TM-SW-07, TM-SW08, TM-SW10, TM-SW11, and TM-SW14) have reflected a higher than Class II toxicity hazard, during a few occasions since March 2017. The trend at most of the facilities have generally fluctuated between no toxicity hazard (Class I) and a slight hazard (Class II). Following inclusion of recent data, a slight increasing trend in toxicity hazard is displayed for sites TM-SW07, TM-SW08, and TM-SW10, and the scenario warrants close monitoring. Sites TM-13 and TM-SW14 are reflecting a trend of decreasing toxicity hazard over recent surveys, while the trends at TM-SW11 and TM-SW12 appear to be stabilising (slight increasing trend previously visible). A stable trend is reflected at site TM-SW15 (Class II hazard recorded during all six surveys conducted for this site to date).
- Site TM-SW08 (WWTP) has generally displayed the highest toxicity hazard of all the samples. The high toxicity hazard (Class IV) recorded for site TM-SW08 in October 2024 resulted in a trend of increasing toxicity hazard and, despite the reduced Class II hazard recorded in September 2025 and March 2025, the increasing trend is still displayed for this site.
- The increasing toxicity trend noted for site TM-SW10 (MCC Dam) and the regular toxicity hazard and increasing trend recorded at site TM-SW08 is an early indication that extreme care should be taken

not to release (controlled or uncontrolled) these pollutions sources to the receiving environment. Definitive toxicity testing should be considered for pollution control facilities that regularly pose toxicity risks so that safe dilution factors can be established. Sites TM-SW08, TM-SW10, and TM-SW15 is currently tested on a definitive level.

8-7.2 Recommendations from the Biomonitoring and Toxicity Report (March 2025)

- Reference should be made to the water quality monitoring programme to identify potential water quality hazards that may originate from Tharisa.
- Biomonitoring protocols, as applied in this study, should be continued in future to verify and identify any biotic responses that may arise from activities at the mine. This would serve as an early warning system when potential biotic problems arise and allow for further investigation to identify and mitigate problematic water quality variables. Such a biomonitoring programme should be performed at least twice per annum, once during the dry season and once during the wet season.
- It is recommended that the bio-toxicity analyses be maintained as a key component of the biomonitoring programme (as adopted during the 2016/2017 monitoring period).
- It is recommended to perform water toxicity testing twice per annum and to also upgrade the level of testing from screening to definitive testing, with sources that are frequently of toxicity Class II or higher. Definitive testing will allow for more accurate classification and assist in the determination of safe dilution factors, in order to negate the hazard, prior to release if it becomes an option.
- Given the often regular dry conditions at the Sterkstroom and especially the Elandsdriftspruit sites, it is strongly recommended to include sediment toxicity testing in addition to the other biomonitoring tools. Sediment toxicity testing will allow monitoring of sites even when devoid of water and will help to timeously detect potential impacts and so inform appropriate management decisions.
- It should be considered to move site TM-SW17 slightly further downstream to ensure all potential impacts from the Tharisa mining area on the Elandsdriftspruit are taken into consideration.

8-7.3 Recommendations from the Biomonitoring and Toxicity Report (September 2025)

- Reference should be made to the water quality monitoring programme to identify potential water quality hazards that may originate from Tharisa.
- Biomonitoring protocols, as applied in this study, should be continued in future to verify and identify any biotic responses that may arise from activities at the mine. This would serve as an early warning system when potential biotic problems arise and allow for further investigation to identify and mitigate problematic water quality variables. Such a biomonitoring programme should be performed at least twice per annum, once during the dry season and once during the wet season.
- It is recommended that the bio-toxicity analyses be maintained as a key component of the biomonitoring programme (as adopted during the 2016/2017 monitoring period).
- It is recommended to perform water toxicity testing twice per annum and to also upgrade the level of testing from screening to definitive testing, with sources that are frequently of toxicity Class II or higher. Definitive testing will allow for more accurate classification and assist in the determination of safe dilution factors, in order to negate the hazard, prior to release if it becomes an option.
- Given the often regular dry conditions at the Sterkstroom and especially the Elandsdriftspruit sites, it is strongly recommended to include sediment toxicity testing in addition to the other biomonitoring tools. Sediment toxicity testing will allow monitoring of sites even when devoid of water and will help to timeously detect potential impacts and so inform appropriate management decisions.
- It should be considered to move site TM-SW17 slightly further downstream to ensure all potential impacts from the Tharisa mining area on the Elandsdriftspruit are taken into consideration.

8-8 GROUND WATER

8-8.1 Geology and hydrogeology

Ground water is defined as water which is located beneath the ground surface in soil/rock pore spaces and in the fractures of lithological formations and is a valuable resource. In arid areas, groundwater is frequently the sole source of water and thus essential to agriculture and other developments. Ground water quality and quantity are key indicators of the resource value and status and can have significant effect on the suitability and availability for use. Mine-related activities have the potential to influence the quality and availability of groundwater through seepage of contaminants that may reach underlying aquifers.

The site's geological and hydrogeological setting consists mainly of a shallow weathered bedrock aquifer with intergranular porosity and permeability. The site groundwater occurrence is reflected by the aquifer type and highest borehole yield; however, this does not always correlate to surface lithology.

According to the 1:500 000 Hydrogeological Map series 2526 Johannesburg (Barnard and Baran., 1999), the site is underlain by fractured (b3) and intergranular and fractured (d3) aquifers. The borehole yield class for the region, based on the median of the data set and excluding dry boreholes, is approximately 0.5 – 2.0 l/s. The surface lithology is characterised by quartzite and dolerite, anorthosites and pyroxenite. The west of the site area and the surrounding region large scale groundwater abstraction for irrigation purposes (>10 mil m³/a) was done around 1999. Since then, the water uses have changed significantly to mining and industrial activities (ACS, 2022a+b).

The shallow semi-confined aquifer formed because of weathering of the norites, anorthosites, dolerite dykes and pyroxenites (i.e., regolith). Differentially weathered and fractured bedrock underly the regolith, thus the aquifer is treated as a single weathered aquifer unit (SLR – Dewatering strategy, 2021).

The deeper solid, fractured bedrock aquifer comprises of the fractured and faulted norites, anorthosites and pyroxenites. The intact bedrock matrix itself is assumed to have very low matrix permeability, while its effective bulk permeability is enhanced by faults and mine openings (SLR – Dewatering strategy, 2021).

Most of the faults strike North West (NW) to South East (SE), with a prominent dyke structure striking West (W) to East (E). The dyke contacts are inferred to be more permeable and therefore could act as preferential flow zones for potential mass migration towards the East Pit.

From geotechnical assessments conducted at Tharisa Mine, clayey and nodular ferricrete soil horizons exist which are important as they could act as a geochemical barrier for mass migration (Inroads Consulting, 2021).

8-8.2 Aquifer Classification

The aquifer classification and vulnerability were assessed using the aquifer system management classification discussed in Parsons and Conrad's (1995) Explanatory Note for the Aquifer Classification Map of South Africa. The aquifer vulnerability and classification maps are presented in Figure 57 and Figure 58, respectively.

The aquifer system management classification was developed based on the work by Parsons (1995) and Vegter (1995). The aquifer classification map was developed utilising the geohydrological units developed by Vegter (1995) and system management classes developed by Parsons (1995). Table 27 below presents the different aquifer classes as described by Parsons and Conrad.

Table 27: Modified Aquifer System Management Classification (Parsons and Conrad, 1995)

Aquifer type	Description
Sole source aquifer	An aquifer used to supply 50% or more of urban domestic water for a given area and for which there are no reasonably available alternative sources of water.

Major aquifer region	A high-yielding aquifer system of good quality water.
Minor aquifer region	A moderately-yielding aquifer system of variable water quality.
Poor groundwater region	A low to negligible yielding aquifer system of moderate to poor water quality.
Special aquifer region	An aquifer system designated as such by the Minister of Water Affairs and Forestry, after due process.

Table 28 below indicates groundwater usage in South Africa and was developed to inform the sole source aquifers and special aquifers across the country.

Table 28: The Aquifer Management System in Relation to the Borehole Prospect Map of Vegter (1995) and Parsons and Conrad (1995).

Accessibility	Exploitability					
	<10%	10% - 20 %	20% - 30 %	30% - 40 %	40% - 50 %	>50%
>60%	poor	minor	minor	major	major	major
40% - 60%	poor	poor	minor	minor	major	major
<40%	poor	poor	poor	minor	minor	major

Q and TQc

major

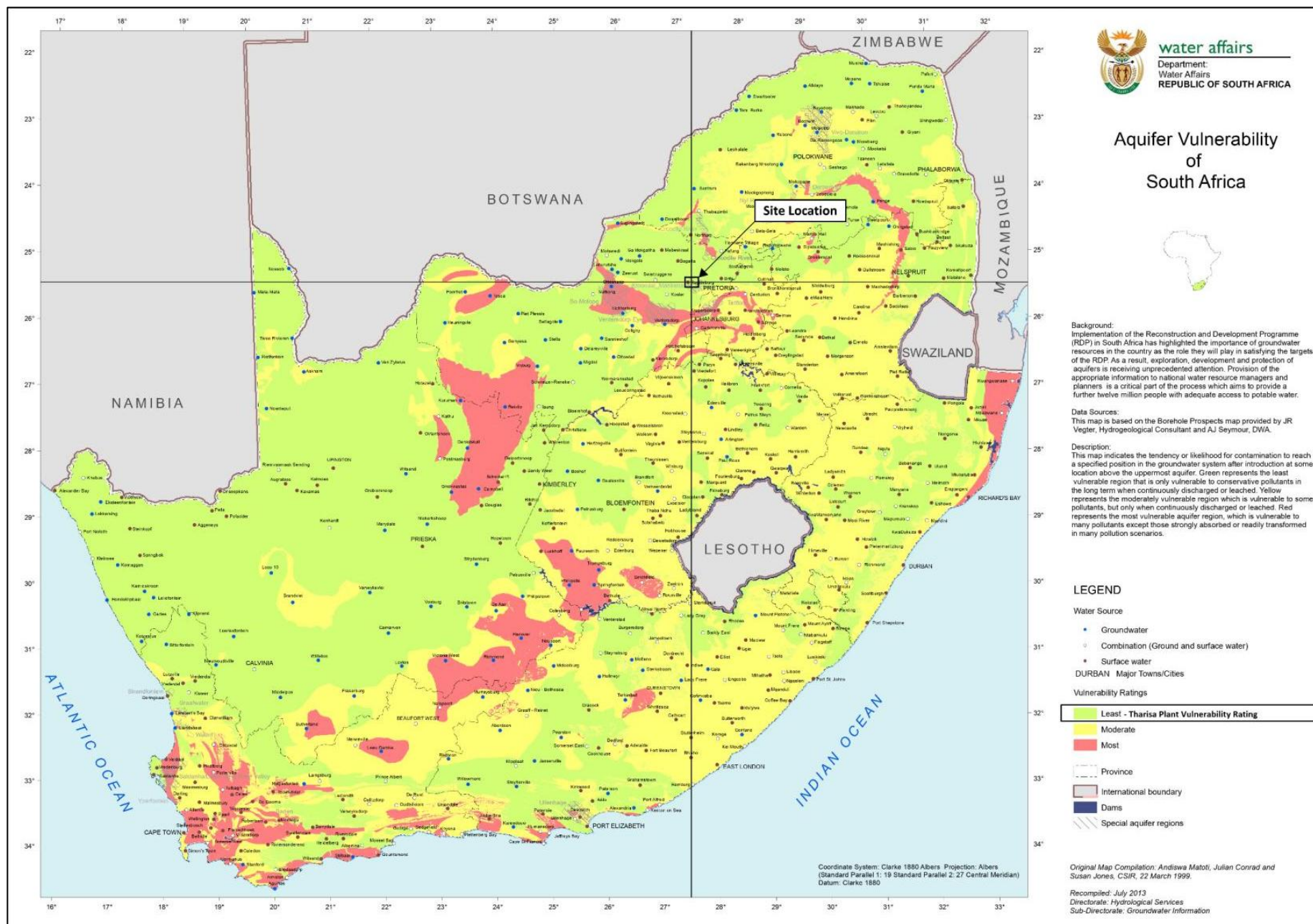


Figure 57: Aquifer Vulnerability Map of South Africa

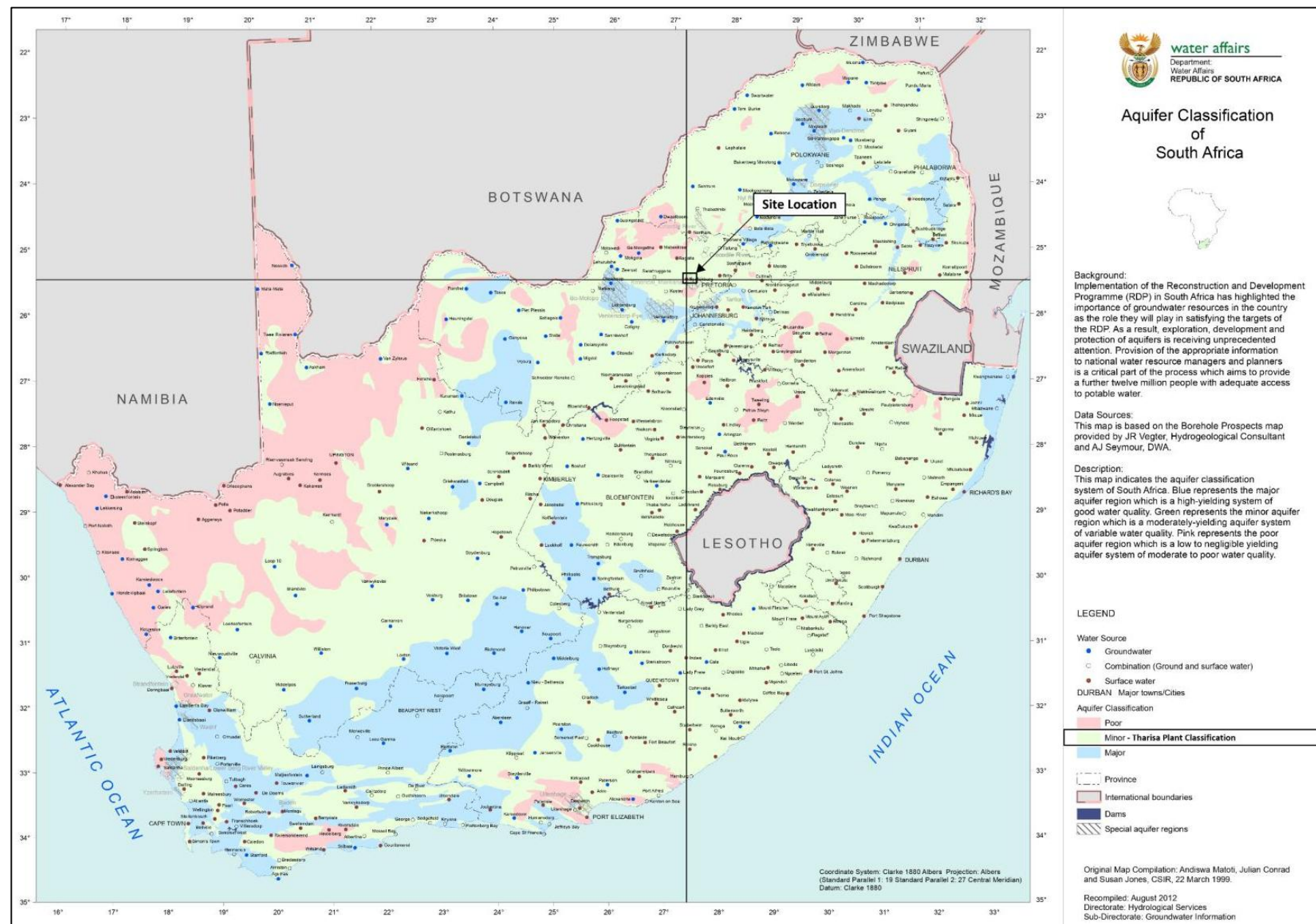


Figure 58: Aquifer Classification Map of South Africa

The Aquifer vulnerability is based on the map originally compiled by Reynders and Lynch (1993), (Parsons and Conrad, 1995). The classification uses the DRASTIC method of classification that considers the seven factors that affect aquifer characterisation:

- Depth to groundwater;
- Recharge;
- Aquifer Media;
- Soil media;
- Topography;
- Impact on vadose zone; and
- Hydraulic Conductivity.

Based on the locality and aquifer characteristics of the mine, it is inferred that the site is situated on a minor aquifer region, characterised by poor to minor groundwater quality (Aquifer Classification of South Africa Map, 2012). The main water source in the region is surface water. Considering the Aquifer Vulnerability of South Africa Map (2013) the aquifer region is rated as least vulnerable (Figure 57 and Figure 58).

Aquifer mass susceptibility can be determined by the product of the classification and vulnerability of an aquifer. The matrix below (Table 29) shows the different classes in aquifer susceptibility. Based on the description given in the table, the localised aquifer at Tharisa Mine has low susceptibility to mass transport.

The findings align with aquifer testing results (ACS, 2022a and 2022b) that concluded the aquifer is a minor aquifer system with moderate to low permeability of 1-1e-03 m/d and a borehole yield of 0.1 – 1 l/s.

Table 29: Aquifer Contamination Susceptibility Classes (Parsons and Conrad, 1995)

Vulnerability Class	Vulnerability Class		
Aquifer System Management Class	low (1)	medium (2)	high (3)
poor groundwater region (1)	low susceptibility (1)	low susceptibility (2)	medium susceptibility (3)
minor aquifer region (2)	low susceptibility (2)	medium susceptibility (4)	high susceptibility (6)
major aquifer region (3)	medium susceptibility (3)	high susceptibility (6)	high susceptibility (9)

8-8.3 Current Tharisa Mine Water Monitoring Network

Ground water quality monitoring is conducted quarterly in accordance with the amended IWUL 2024 requirements as indicated in the water quality monitoring reports submitted to DWS. Sampling is conducted by Sedibelo, and Aquatico is responsible for the analysis and reporting on the water quality. Ground water levels are also undertaken and included in the report.

Groundwater monitoring was conducted at 18 monitoring boreholes during the quarterly period (January 2026 to March 2026), and their positions are presented in Table 30 and Figure 59. A comprehensive report discussing groundwater quality is compiled quarterly by Aquatico. The data is compared to the applicable water quality limits presented in

Table 31.

Table 31 includes the quality limits and monitoring frequency as included in Table 13 of IWUL 2024.

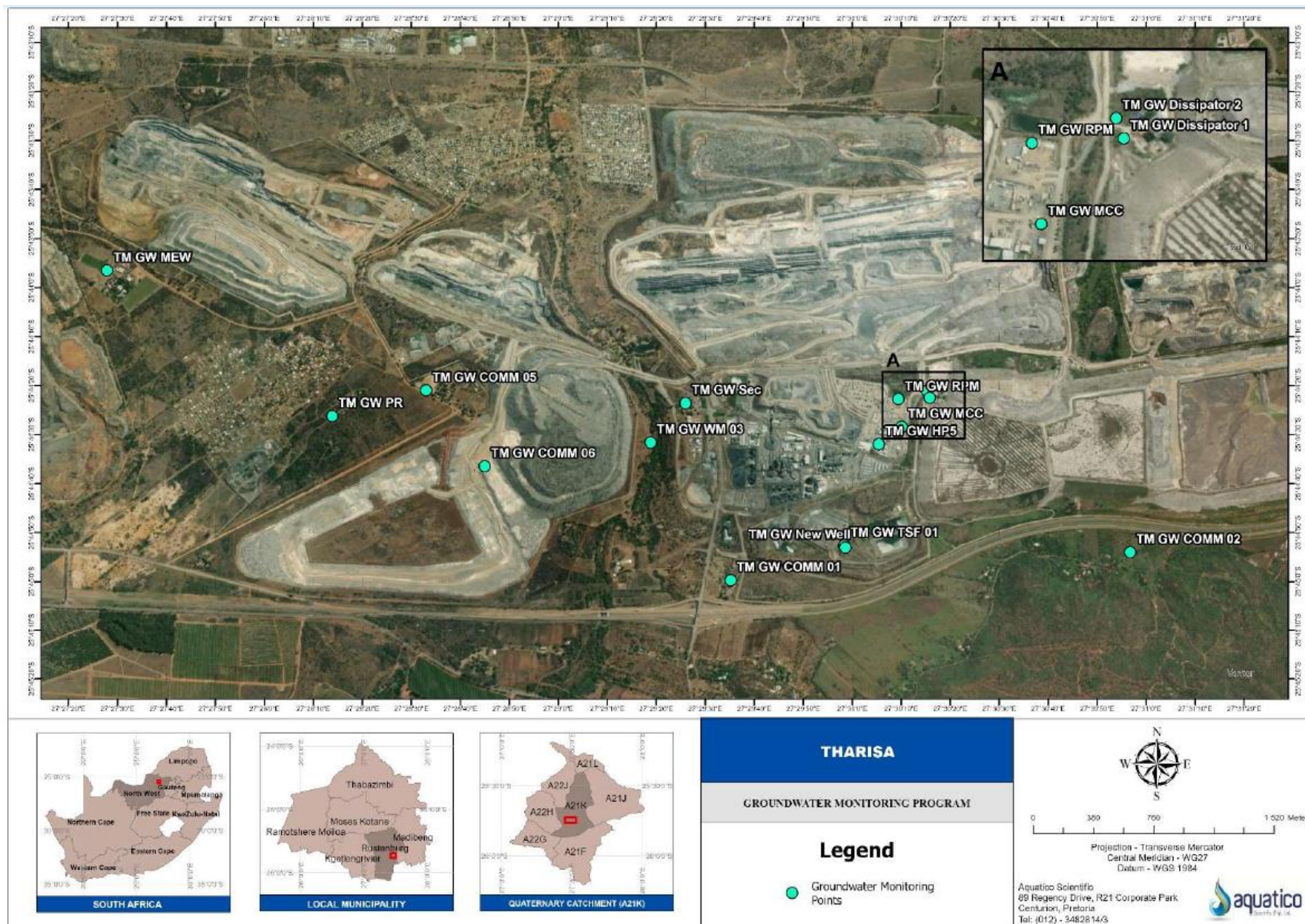


Figure 59: Aerial View of the Groundwater Monitoring Localities at Tharisa Mine

Table 30: Ground Water Monitoring Points

Sample point	Description	Coordinates	
		Latitude	Longitude
TM GW COMM 01	South of Plant-Mrs. Potgieter	25°44'59.74"S	27°29'35.02"E
TM GW COMM 02	South of TSF Complex adjacent to N4 - Clenn Ross	25°44'55.88"S	27°30'56.25"E
TM GW COMM 05	In line with west mine activities - Relief School	25°44'20.12"S	27°28'33.33"E
TM GW COMM 06	In line with west mine activities - Harbours	25°44'34.84"S	27°28'44.52"E
TM GW Dissipator 1	Dissipator Borehole	25°44'22.44"S	25°30'15.80"E
TM GW Dissipator 2	In line with east mine activities - Near the Dissipator	25°44'20.99"S	27°30'15.21"E
TM GW FWM	Hardpark 5	25°44'31.78"S	27°30'04.85"E
TM GW HP5	Ground water monitoring Hardpark	25°44'34.78"S	27°30'08.78"E
TM GW MCC	Marikana Engineering Workshop	S0	E0
TM GW MEW		25°44'53.05"S	27°29'58.60"E
TM GW New Well	Borehole at Mr. Pretorius Residence	S25.74807	E27.49961
TM GW PR	Borehole at Mr Pretorius Residence	S0	E0
TM GW RPM	Near RPM Workshop	25°44'22.41"S	27°30'11.05"E
TM GW SBH	Samancor Borehole	25°43'35.65"S	27°30'42.93"E
TM GW Sec	Ground water feeding tap at Security	25°44'23.58"S	27°29'25.97"E
TM GW TSF 01	West of TSF Complex	25°44'48.29"S	27°29'57.51"E
TM GW WM 03	In line with west mine activities - Braam Janse Van Rensburg	25°44'31.53"S	27°29'18.91"E
TM GW EM01	North of TSF	25°44'11.62"S	27°30'53.17"E
TM GW EM02	North of east mine pit and east mine WRD	25°43'26.88"S	27°30'20.69"E
TM GW FW01	North of far West pit and far-west WRD	25°43'25.87"S	27°27'47.13"E

Table 31: Ground Water Monitoring Variables and Limits

Parameter (mg/l unless otherwise stated)	Ground water base line limits	Frequency
	Ground water quality reserve	
EC (mS/m)	70	Quarterly
Sodium	20	Quarterly
Magnesium	50	Quarterly
Chloride	30	Quarterly
Calcium	32	Quarterly
Sulphates	70	Quarterly
Nitrates	6	Quarterly
Fluorides	0.5	Quarterly
Cr	0.05	Quarterly
pH (pH units)	6.0-9.0	Quarterly

Four of the 18 boreholes are community (user) boreholes, and all four boreholes could be sampled during the recent quarterly period. The rest of the boreholes are mine boreholes, and the majority were sampled, except for locality TM GW Dissipator 1, TM GW Dissipator 2, TM GW FWM, TM GW HP5. A sampling and analysis efficiency of 78% was achieved for this quarter.

The physical groundwater quality during the quarterly period can be described as neutral and non-saline to saline and very saline. The IWUL guideline was exceeded in terms of the EC values, Ca, Mg, Na, Cl, SO₄ and NO₃-N concentrations at some of the groundwater monitoring localities sampled (refer to Table 32).

a) Community boreholes:

The physical parameters for water quality could be described as neutral (pH: 6.0 – 8.0) and non-saline (EC: <70 mS/m) to saline (EC: 70 -150 mS/m; TM GW COMM 01 and TM GW COMM 05).

Variables exceeding the IWUL:2024 guideline were evident at the following localities (refer to Table 32):

- TM GW COMM 01: EC, Mg, Na and SO₄.
- TM GW COMM 05: EC, Ca, Mg and NO₃.
- TM GW COMM 06: NO₃

Time series trend graphs are presented in Figure 60 and Figure 61, which illustrate the measured variable concentrations (Ca, Mg, Na, Cl, SO₄, and NO₃-N) and values (EC) over a long-term period. The following observation(s) can be made when comparing the March 2026 quarter's data to the data from previous quarters:

Most groundwater localities displayed stable EC readings over time. However, a significant decrease in EC was observed at locality TM GW COMM 02 between September 2025 and March 2026. TM GW COMM 01 and TM GW COMM 05 also showed a slight increase in EC since December 2025.

- A significant decrease in calcium concentration was observed at locality TM GW COMM 02 since September 2025. A slight upward trend was noted across most locations since March 2021, with calcium concentrations mostly exceeding the limits specified in the IWUL. Ca exceeded the IWUL guidelines only at TM GW COMM 05 in March 2026.
- A slight upward trend in magnesium (Mg) concentrations has been observed at all sites since June 2024. Mostly stable Mg levels were noted; however, they exceeded the limits specified in the IWUL during the majority of the recorded period. Locality TM GW COMM 02 showed a sudden decrease in Mg concentration since September 2025.
- Sodium (Na) and chloride (Cl) concentrations remained stable across all monitored periods, with some fluctuations noted at TM GW COMM 06. A sudden increase in sodium occurred at TM GW COMM 01 since June 2025, still exceeding the IWUL:2024 guideline in March 2026. The Sodium (Na) concentration recorded at TM GW COMM 01 however, showed a decrease from December 2025 to March 2026.
- Nitrate (NO₃) levels were generally stable at TM GW COMM 05, TM GW COMM 01, and TM GW COMM 02. In contrast, TM GW COMM 06 showed fluctuating NO₃ concentrations throughout most of the monitoring period. A steady decrease in the NO₃ concentration at TM GW COMM 06 was recorded between March 2025 and March 2026.
- Sulphate (SO₄) levels at all localities remained generally stable between March 2025 and March 2026, with the concentrations recorded at TM GW COMM 01 mostly exceeding the IWUL limit during this period.

Although the Ca and Mg concentrations exceeded the IWUL: 2024 guidelines for Tharisa groundwater at some localities, the water quality at these localities is still within suitable drinking water conditions. Raised NO₃ was recorded at TM GW COMM 06 and TM GW COMM 06; thus, care should be taken when water is being consumed, and treatment is recommended.

The water quality of the measured variables can be categorised as follows: TM GW COMM 02 is classified as 'Ideal,' TM GW COMM 01 and TM GW COMM 05 is classified as Good, and TM GW COMM 06 is classified as Marginal.

Nitrate results from the oxidation of nitrite or ammonia. NO₃ in domestic water is primarily a health concern, as it can readily be converted to nitrite due to bacterial reduction in the gastrointestinal tract. Generally, NO₃ is associated with the breakdown of organic matter and eutrophic conditions in aquatic environments but is also readily found in soils. If nitrates are between 10 - 20 mg/l, no health effects should occur in healthy adults; however, concentrations higher than 20 mg/l may cause the occurrence of mucous membrane irritation in adults and possible chronic to acute health risks to babies. When compared to the TWQGR for livestock watering, the concentrations of all the variables measured were well within the acceptable limits (refer to Table 33).

Table 32: Community Boreholes Water Quality Results for March 2026 (IWUL)

VARIABLE	UNITS	ASSESSMENT 1	ASSESSMENT 2	MONITORING LOCALITIES			
				TM GW COMM 01	TM GW COMM 02	TM GW COMM 05	TM GW COMM 06
pH @ 25°C	pH	6.0/9.0	4.5/10.0	8.33	6.91	7.32	7.14
Electrical conductivity (EC) @ 25°C	mS/m	70	150	71.8	24.6	72.1	35.1
Calcium (Ca)	mg/l	32	150	31.6	21.9	55	26.8
Magnesium (Mg)	mg/l	50	100	74.8	17.2	66.1	25.3
Sodium (Na)	mg/l	20	200	24.3	5.44	11.6	5.8
Chloride (Cl)	mg/l	30	200	19.7	3.9	24.5	11
Sulphate (SO ₄)	mg/l	70	400	88.2	12	59.1	15.4
Fluoride (F)	mg/l	0.5	1	<0.263	<0.263	0.357	<0.263
Nitrate (NO ₃) as N	mg/l	6	10	4.67	0.27	6.12	12.4
Chromium (Cr)	mg/l	0.05	-	0.021	<0.010	<0.010	<0.010
Classification according to the Quality of Domestic Water Supplies				Class 1 - Good	Class 0 - Ideal	Class 1 - Good	Class 2 - Marginal

*Value exceeds the assessment set 1

Table 33: Community Boreholes Water Quality Results for March 2026 (TWQGR)

VARIABLE	UNITS	ASSESSMENT 1	ASSESSMENT 2	MONITORING LOCALITIES			
				TM GW COMM 01	TM GW COMM 02	TM GW COMM 05	TM GW COMM 06
pH @ 25°C	pH	-	6.5/8.4	8.33	6.91	7.32	7.14
Electrical conductivity (EC) @ 25°C	mS/m	-	40	71.8	24.6	72.1	35.1
Calcium (Ca)	mg/l	1000	-	31.6	21.9	55	26.8
Magnesium (Mg)	mg/l	500	-	74.8	17.2	66.1	25.3
Sodium (Na)	mg/l	200	70	24.3	5.44	11.6	5.8
Chloride (Cl)	mg/l	1500	100	19.7	3.9	24.5	11
Sulphate (SO ₄)	mg/l	1000	-	88.2	12	59.1	15.4
Fluoride (F)	mg/l	2	2	<0.263	<0.263	0.357	<0.263
Nitrate (NO ₃) as N	mg/l	22.6	-	4.67	0.27	6.12	12.4
Chromium (Cr)	mg/l	-	-	0.021	<0.010	<0.010	<0.010



Figure 60: EC, Ca, Mg, and Na trends for Community groundwater localities



Figure 61: Cl, SO₄ and NO₃-N Trends for Community Groundwater Localities.

b) Mine boreholes:

The following is the summary of the findings for the quarterly period from January 2026 to March 2026:

The physical parameters for the water quality could be described as neutral (pH: 6.0 – 8.0), nonsaline (EC: <70) (, TM GW MEW, TM GW New Well, TM GW PR, TM GW RPM and TM GW TSF 01) to saline (EC: 70 – 150) (TM GW MCC and TM GW WM01) and very saline (EC: 150 – 370) (TM GW SBH, TM GW Sec, and TM GW WM03).

The EC, Ca, Na, Cl, Mg, F, SO₄, and NO₃ concentrations exceeded the IWUL: 2024 guideline at some of the groundwater monitoring localities sampled (Table 34). Time series trend graphs of these variables are presented in Figure 62 and Figure 63.

- The majority of the groundwater localities remained stable in terms of the aforementioned parameters when compared to the previous quarter. Some fluctuations are however evident.

According to the colour-coded classification system of the WRC (1998), “Quality of Domestic Water Supplies”, the water quality based on the measured variables can be classified as

- ‘Ideal’ at TM GW New Well, TM GW PR, TM GW RPM, and TM GW TSF 01;
- ‘Good’ at TM GW MCC, TM GW MEW, TM GW WM01;
- ‘Poor’ at TM GW Sec;
- ‘Unacceptable’ at TM GW SBH and TM GW WM03 due to extremely high NO₃ concentrations.

Nitrate results from the oxidation of nitrite or ammonia. NO₃ in domestic water is primarily a health concern, as it can readily be converted to nitrite due to bacterial reduction in the gastrointestinal tract. Generally, NO₃ is associated with the breakdown of organic matter and eutrophic conditions in aquatic environments but is also readily found in soils.

Water with an Mg concentration between 100 – 200 mg/l as measured at TM GW Sec and TM GW WM03 is aesthetically unacceptable because of its bitter taste and increased scaling problems. If sulphate is present, most new users might experience diarrhea (DWAF, 1996).

When compared to the TWQGR for livestock watering (Table 35), the concentrations of all of the variables measured were within acceptable limits, except for the recorded NO₃ concentrations measured at TM GW SBH and TM GW WM03. Generally, crop yield, quality and foliar damage are associated with high EC, Na and Cl. Clogging of irrigation equipment can also be encountered.

Table 34: Mine Monitoring Boreholes Water Quality Results for March 2026 (IWUL)

VARIABLE	UNITS	ASSESSMENT 1	ASSESSMENT 2	MONITORING LOCALITIES													
				TM GW Dissipator 1	TM GW Dissipator 2	TM GW FWM	TM GW HP5	TM GW MCC	TM GW MEW	TM GW New Well	TM GW PR	TM GW RPM	TM GW SBH	TM GW Sec	TM GW TSF 01	TM GW WM 03	TM GW WM01
pH @ 25°C	pH	6.0/9.0	4.5/10.0	BOREHOLE NOT SAMPLED - Blocked/ Damaged	BOREHOLE NOT SAMPLED - Blocked/ Damaged	Demolished	BOREHOLE NOT SAMPLED - Blocked/ Damaged	7.57	7.59	8.46	8.02	7.51	8.16	8.21	7.49	7.94	7.94
Electrical conductivity (EC) @ 25°C	mS/m	70	150					70.8	57.1	42.7	29.6	26.6	185	163	36	208	70
Calcium (Ca)	mg/l	32	150					57.1	46.9	33.8	24.2	23.9	144	61.8	26.6	123	57
Magnesium (Mg)	mg/l	50	100					72.5	47.5	36	24.7	8.9	87.1	223	27.5	177	63.5
Sodium (Na)	mg/l	20	200					20.7	7.66	11.1	2.7	16.8	115	24.2	8.41	33.9	11.2
Chloride (Cl)	mg/l	30	200					8.84	16.3	14.4	1.82	13.8	68.4	111	11.5	69.1	27
Sulphate (SO ₄)	mg/l	70	400					46	12.4	22.1	9.54	19.5	266	95.4	19.5	247	56.5
Fluoride (F)	mg/l	0.5	1					<0.263	<0.263	<0.263	<0.263	<0.263	0.414	1.66	<0.263	0.665	<0.263
Nitrate (NO ₃) as N	mg/l	6	10					1.02	6.36	0.803	<0.194	0.989	162	0.705	3.48	175	<0.194
Chromium (Cr)	mg/l	0.05	-					<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.011	<0.010	<0.010	<0.010
Classification according to the Quality of Domestic Water Supplies								Class 1 - Good	Class 1 - Good	Class 0 - Ideal	Class 0 - Ideal	Class 0 - Ideal	Class 4 - Unacceptable	Class 3 - Poor	Class 0 - Ideal	Class 4 - Unacceptable	Class 1 - Good

*Value exceeds the assessment set 1

Table 35: Mine Monitoring Boreholes Water Quality Results for March 2026 (TWQGR)

VARIABLE	UNITS	ASSESSMENT 1	ASSESSMENT 2	MONITORING LOCALITIES													
				TM GW Dissipator 1	TM GW Dissipator 2	TM GW FWM	TM GW HP5	TM GW MCC	TM GW MEW	TM GW New Well	TM GW PR	TM GW RPM	TM GW SBH	TM GW Sec	TM GW TSF 01	TM GW WM 03	TM GW WM01
pH @ 25°C	pH	6.0/9.0	4.5/10.0	BOREHOLE NOT SAMPLED - Blocked/ Damaged	BOREHOLE NOT SAMPLED - Blocked/ Damaged	Demolished	BOREHOLE NOT SAMPLED - Blocked/ Damaged	7.57	7.59	8.46	8.02	7.51	8.16	8.21	7.49	7.94	7.94
Electrical conductivity (EC) @ 25°C	mS/m	70	150					70.8	57.1	42.7	29.6	26.6	185	163	36	208	70
Calcium (Ca)	mg/l	32	150					57.1	46.9	33.8	24.2	23.9	144	61.8	26.6	123	57
Magnesium (Mg)	mg/l	50	100					72.5	47.5	36	24.7	8.9	87.1	223	27.5	177	63.5
Sodium (Na)	mg/l	20	200					20.7	7.66	11.1	2.7	16.8	115	24.2	8.41	33.9	11.2
Chloride (Cl)	mg/l	30	200					8.84	16.3	14.4	1.82	13.8	68.4	111	11.5	69.1	27
Sulphate (SO ₄)	mg/l	70	400					46	12.4	22.1	9.54	19.5	266	95.4	19.5	247	56.5
Fluoride (F)	mg/l	0.5	1					<0.263	<0.263	<0.263	<0.263	<0.263	0.414	1.66	<0.263	0.665	<0.263
Nitrate (NO ₃) as N	mg/l	6	10					1.02	6.36	0.803	<0.194	0.989	162	0.705	3.48	175	<0.194
Chromium (Cr)	mg/l	0.05	-					<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.011	<0.010	<0.010	<0.010

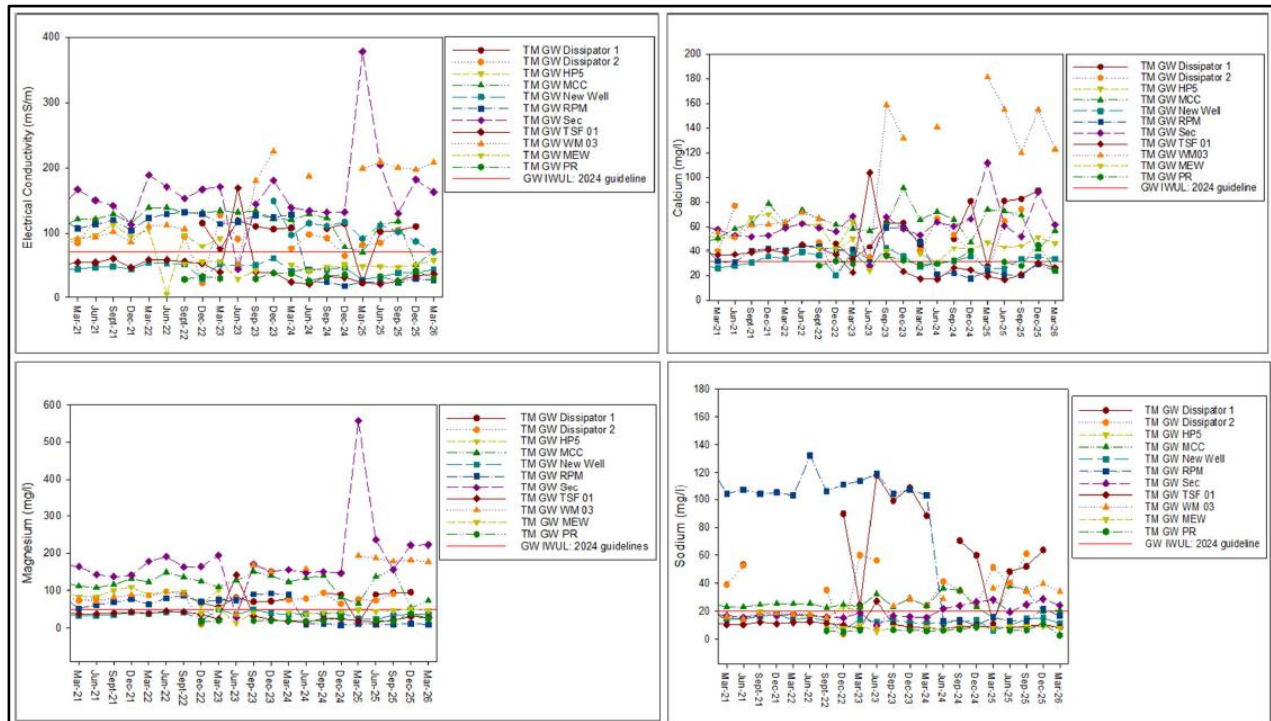
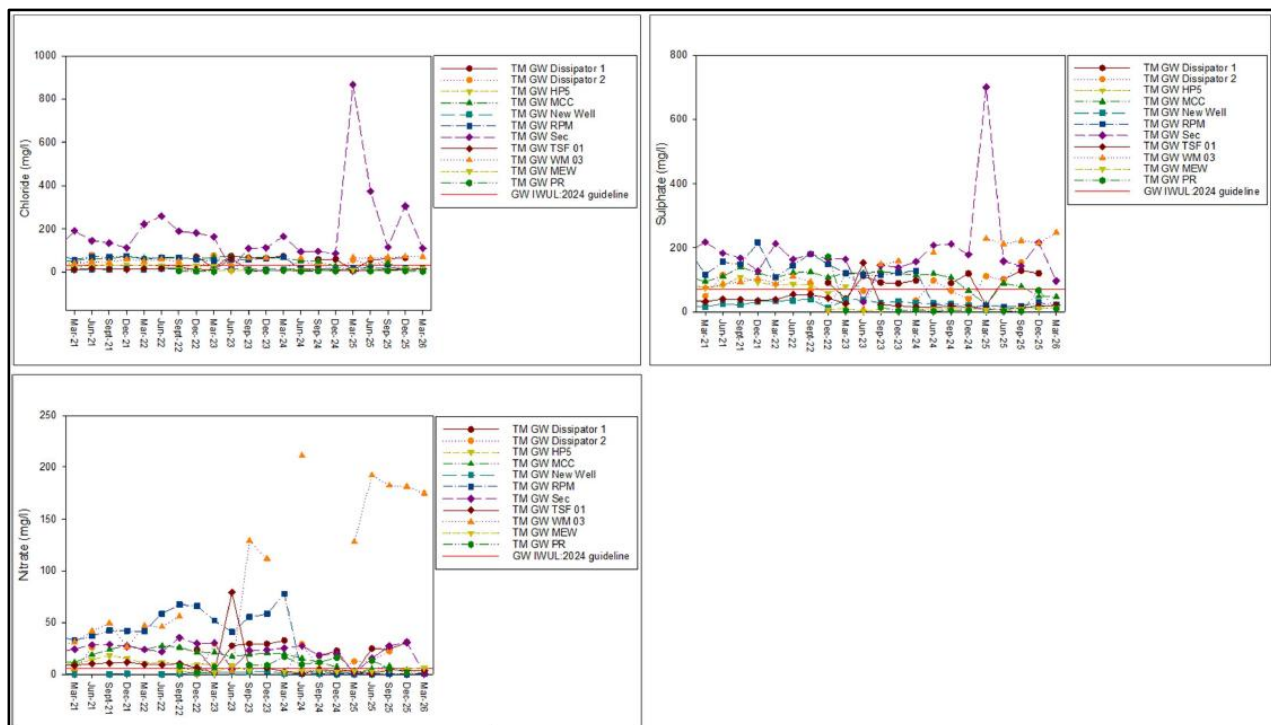


Figure 62: EC, Ca, Mg, and Na Trends for Groundwater Localities

Figure 63: Cl, SO₄ and NO₃-N Trends for Groundwater Localities

8-8.4 Ground water levels

Ground water levels are measured on a monthly basis as reported by Aquatico. For the quarterly period January 2026 to March 2026, Figure 64 presents the bar graph of groundwater levels showing the variance in water levels of the groundwater localities during the quarterly period. Water levels were measured at the majority of localities.

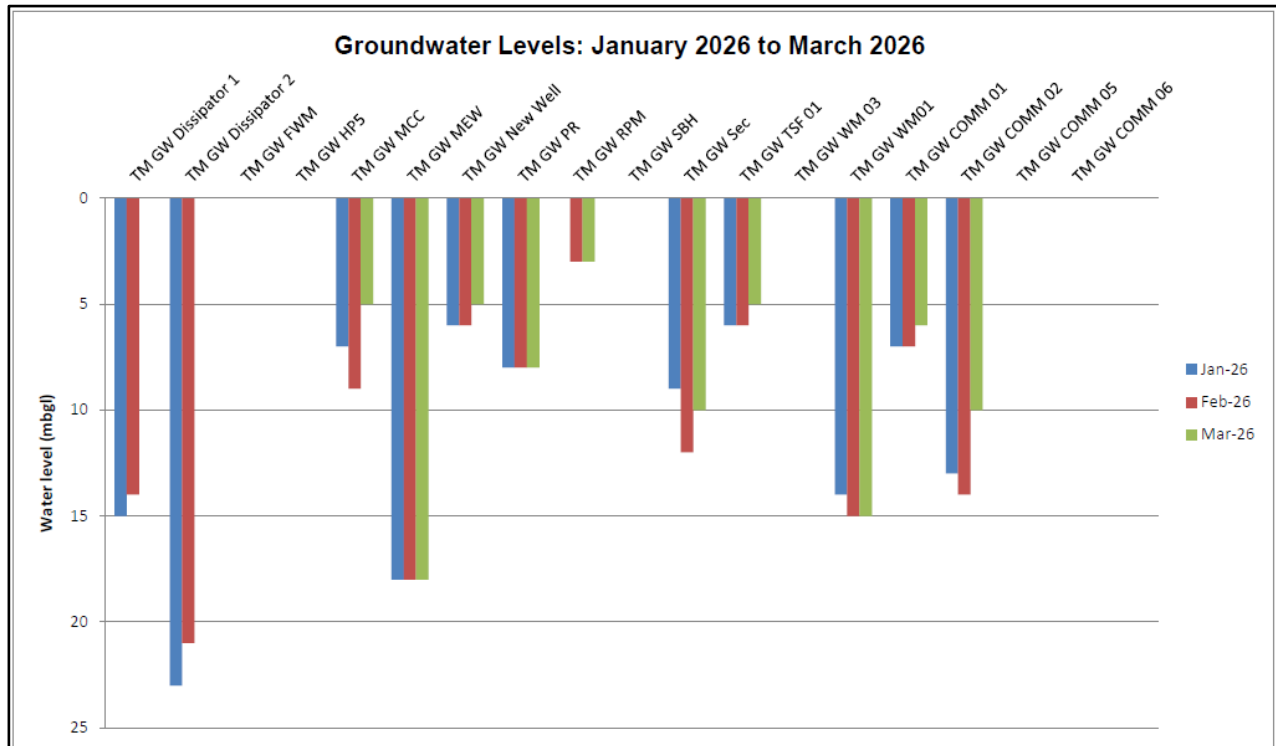


Figure 64: Water Levels for Period January 2026 to March 2026 (Aquatico, 2026)

For the monitoring period the highest/shallowest water level was recorded at TM GW RPM, which implies that the water level was closer to the ground surface, while the lowest/deepest groundwater levels were measured at TM GW Dissipator 2 and TM GW MEW (further away from the ground surface).

8-8.5 Potential Pollution Source Identification

The biggest impactors on water quality in the area are the large-scale water and land users. Surface water resources downstream of the project infrastructure and activities could be polluted if there are discharges of contaminated substances into these resources. Pollution of water resources can have negative health impacts on both people and animals, and it can negatively impact on the watercourse related biodiversity. In the unmanaged scenario, potential pollution sources include:

- Sedimentation from erosion;
- Spillage of chemicals, solvents, paint, fuel, oil, cement;
- Sewage; and
- Contaminated discharges from the dirty water systems including: the pits, plant, TSFs, return water dam, rock dumps, dirty water and waste pipelines, WWTPs, machinery maintenance workshops and wash bays.

8-9 SURFACE HYDROLOGY

The following watercourses are located within the vicinity of the mine:

- Sterkstroom River — a perennial watercourse which flows from the Buffelspoort Dam, south of the N4, in a northerly direction through the centre of the project area. Flows within the Sterkstroom River are dependent on releases from the Buffelspoort Dam. This river originates in the headwaters of the A21K quaternary catchment, within the Magaliesberg Mountain range, and then flows through the Buffelspoort Dam (approximately 5.8 km upstream) and then traverses the mine between East and West mining pits.

- On the eastern section of the Mine, are the unnamed tributaries of the Maretlwane – two non-perennial watercourses which originate in the vicinity of the eastern pit, and flow to the north then north-east to a confluence with the Maretlwane.
- On the western side of the Mine property are, Unnamed tributaries of the Brakspruit – two non-perennial watercourses which originate in the north-west of the mine, and flow to the north to separate confluences with the Brakspruit.
- Eastern unnamed tributaries of the Maretlwane – two non-perennial watercourses which originate to the north of TSF 2, and flow to the north then north-east to a confluence with the Maretlwane tributaries; and
- Several non-perennial tributaries which originate just south of the mine and flow north, have been interrupted by the mine and have been authorised for diversion of these headwaters, to the tributaries of the Brakspruit on the west of Sterkstroom River, and to the Elandsdrifspuit on the east of Sterkstroom River through the far eastern part of the mine.

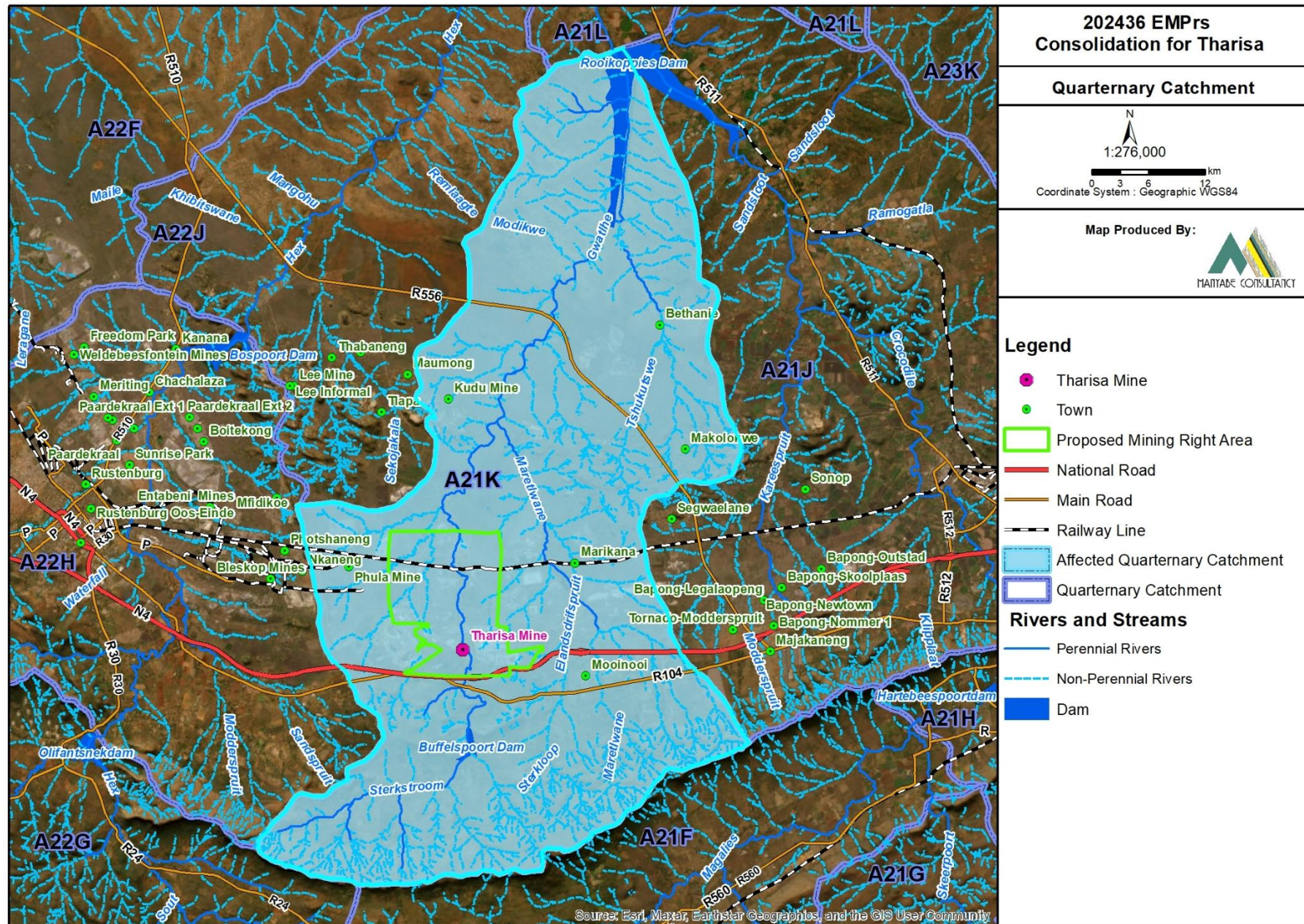


Figure 65: Water Management Area Map of Tharisa

8-9.1 Surface water quality

Surface water quality monitoring is conducted monthly in accordance with the amended IWUL:2024 requirements as indicated in the water quality monitoring reports submitted to DWS. Aquatico has been appointed to undertake monthly surface water motoring within the project area.

The existing water quality monitoring locations are provided in Table 36 and Figure 66. A comprehensive report discussing surface quality is compiled biannually. The data is compared to the applicable water quality limits presented in

Table 37, which includes the quality limits and monitoring frequency as included in Table 6 of IWUL 2024.

Table 36: Surface Water Quality Monitoring Points

Sample point	Description	Coordinates	
		Latitude	Longitude
Sterkstroom Localities			
TM SW01	Upstream on the Sterkstroom	S25.75711	E27.48329
TM SW02	Downstream on the Sterkstroom	S25.72562	E27.48292
TM SW03	Middle Stream	S25.73562	E27.48600
Elandsdrift Monitoring Localities			
TM SW16	Elandsdrift Upstream	S25.73722	E27.54661
TM SW17	Elandsdrift Downstream	S25.73069	E27.54706
Process Water Monitoring Localities			
TM SW07	Hernic Quarry	S25.73660	E27.48786
TM SW08	WWTW	S25.73878	E27.49435
TM SW10	MCC Dam	S25.73950	E27.50306
TM SW11	TSF Dissipator	S25.73963	E27.50480
TM SW12	Raw Water	S25.74643	E27.50217
TM SW13	Storm Water Dam	S25.73836	E27.49333
TM SW14	Process Water Dam	S25.74096	E27.49308
TM SW15	SLP Dam	S25.74722	E27.50250
East WRD Monitoring Localities			
TM SW EWRD 01	TM SW East WRD 01	S0	E0
TM SW EWRD 02	TM SW East WRD 02	S0	E0
Overflow Localities			
TM SW Upstream Discharge	Upstream of the discharge - TM SW Before Overflow	S0	E0
TM SW Discharge	At the discharge - Quarry discharge outlet point – TM SW07 Overflow to TM SW03	S0	E0
TM SW Downstream Discharge	Downstream of the discharge - TM SW After Overflow	S0	E0

Table 37: Water Quality Limits (IWUL:2024)

Constituents	Water quality limits	Units	Monitoring frequency
pH	6.5-8.5	pH units	Monthly
Electrical conductivity	70-150	mS/m	Monthly
Dissolved oxygen	5	mg/l	Monthly
Na	70	mg/l	Monthly
Ca	20	mg/l	Monthly
Mg	15	mg/l	Monthly
Cl	57	mg/l	Monthly
SO ₄	70	mg/l	Monthly
F	0.75	mg/l	Monthly
NO ₃	15	mg/l	Monthly
Al	5	ug/l	Monthly

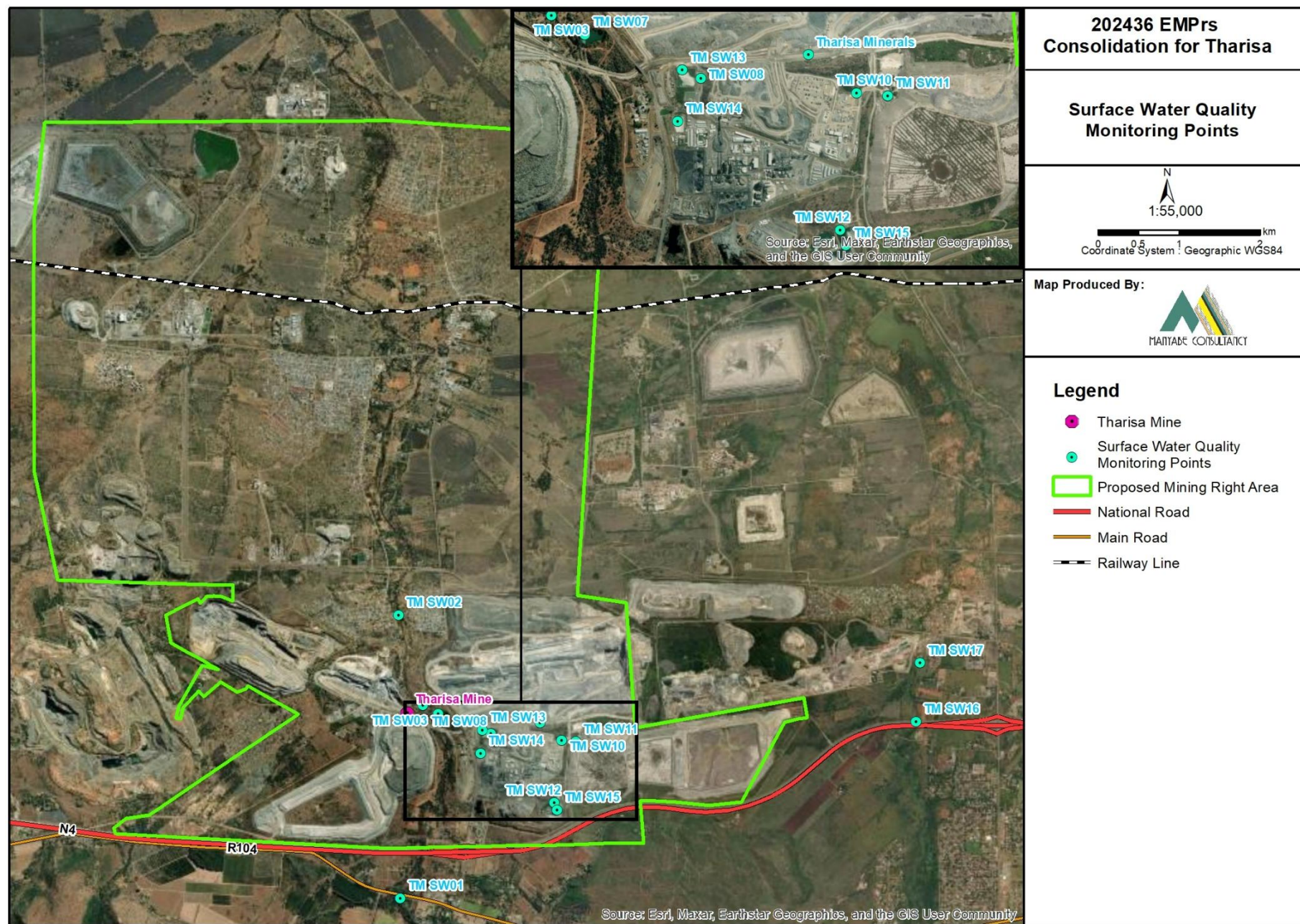


Figure 66: Surface Water Monitoring Points

Information below is extracted from the “Surface Water Quality Report” for May 2026. The report was compiled by Aquatico.

The general water quality of the surface water monitoring localities could be described as neutral (pH: 6.0 – 8.5) and non-saline (EC: < 70 mS/m) (TM SW01, TM SW02, TM SW03, TM SW08, TM SW15, TM SW16, TM SW17) to saline (EC: 70 - 150 mS/m) (TM SW07, TM SW11, TM SW12, TM SW13, TM SW14, TM SW EWRD 01, TM SW EWRD 02). Low nutrient concentrations were recorded for TM SW01, TM SW02, TM SW03, TM SW15, TM SW16 and TM SW17, while the remaining surface water monitoring localities recorded elevated nutrients for May 2026. It must be noted that some of the monitoring localities recorded concentrations of nitrate (NO_3), exceeding the stipulated limits (TM SW07, TM SW08, TM SW11, TM SW12, TM SW13, TM SW14, TM SW EWRD 01, and TM SW EWRD 02).

The variables that did not comply with the amended IWUL: 2024 Surface Water Guidelines are listed below:

- EC – TM SW01, TM SW02, TM SW03, TM SW08, TM SW15, TM SW16, TM SW17.
- Ca – TM SW07, TM SW08, TM SW11, TM SW12, TM SW13, TM SW14, TM SW EWRD 01, and TM SW EWRD 02.
- Mg – TM SW07, TM SW11, TM SW12, TM SW13, TM SW14, TM SW EWRD 01, and TM SW EWRD 02.
- Na – TM SW07, TM SW11, TM SW12, TM SW13, TM SW14.
- Cl – TM SW08, TM SW11, TM SW13, and TM SW14.
- SO_4 – TM SW07, TM SW11, TM SW12, TM SW13, TM SW14, TM SW EWRD 01, and TM SW EWRD 02.
- NO_3 – TM SW07, TM SW08, TM SW11, TM SW12, TM SW13, TM SW14, TM SW EWRD 01, and TM SW EWRD 02.
- Al – TM SW01, TM SW02, TM SW03, TM SW07, TM SW08, TM SW11, TM SW12, TM SW13, TM SW14, TM SW15, TM SW17, TM SW EWRD 01, and TM SW EWRD 02.
- Cr – TM SW11.

The following parameters did not comply with the South African Water Quality Guidelines (SAWQG) for domestic water use guidelines:

- EC – TM SW07, TM SW11, TM SW12, TM SW13, TM SW14, TM SW EWRD 01, and TM SW EWRD 02.
- Ca – TM SW07, TM SW11, TM SW12, TM SW13, TM SW14, TM SW EWRD 01, and TM SW EWRD 02.
- Mg – TM SW07, TM SW11, TM SW12, TM SW13, TM SW14, TM SW EWRD 01, and TM SW EWRD 02.
- Na – TM SW11, TM SW13, and TM SW14.
- SO_4 – TM SW11 and TM SW14.
- NO_3 – TM SW02, TM SW03, TM SW07, TM SW08, TM SW11, TM SW12, TM SW13, TM SW14, TM SW EWRD 01, and TM SW EWRD 02.

A comparison of the water quality results for March 2026 and May 2026 for the Sterkstroom localities, TM SW01, TM SW02, and TM SW03, is presented in Table 39, Table 40 and Table 41.

In May 2026, pH levels slightly increased across most sampled surface water localities since April 2026. EC levels and Nitrate ($\text{NO}_3\text{-N}$) concentrations also slightly increased at most sites.

No exceedances of the upper EC concentration limit were recorded during May 2026, whilst the lower limit was exceeded at localities TM SW01, TM SW02, TM SW03, TM SW08, TM SW15, TM SW16 and TM SW17. Time series graphs for pH, EC, and $\text{NO}_3\text{-N}$ from October 2024 to May 2026 are presented in Figure 67.

Table 38: Surface Discharge Water Quality Data for May 2026

VARIABLE	UNITS	ASSESSMENT 1	MONITORING LOCALITIES		
			TM SW Upstream Discharge	TM SW Discharge	TM SW Downstream Discharge
pH @ 25°C	pH	5.5/9.5	7.52	7.75	7.73
Electrical conductivity (EC) @ 25°C	mS/m	75	19.2	108	25.1
Dissolved oxygen (DO)	mg/l	75	5.12	50.3	8.38
Total oxidised nitrogen as N	mg/l	-	<0.263	<0.263	<0.263
Sulphate (SO ₄)	mg/l	65	16.8	121	25
Ammonium (NH ₄) as N	mg/l	-	0.233	1.43	0.359
Nitrate (NO ₃) as N	mg/l	6	0.233	1.43	0.359
Free and Saline Ammonia as N	mg/l	-	9.25	62.5	11.6
Chloride (Cl)	mg/l	55	9.25	62.5	11.6
Fluoride (F)	mg/l	1	13.4	62.3	14.7
Calcium (Ca)	mg/l	32	9.66	45.6	10.6
Magnesium (Mg)	mg/l	30	9.44	102	12.9
Sodium (Na)	mg/l	90	<0.003	0.004	0.015
Aluminium (Al)	mg/l	0.15	<0.002	<0.002	<0.002
Cadmium (Cd)	mg/l	0.05	<0.010	<0.010	<0.010
Chromium (Cr)	mg/l	0.05	<0.006	<0.006	<0.006
Arsenic (As)	mg/l	0.5	7.15	6.71	7.44
Faecal coliform	CFU/100ml	0	29	19	50
Atrazine	µg/l	2	10	<10.0	<10.0

*Value exceeds the assessment set 1

Table 39: Spatial Assessment Table Showing the Comparison Between April 2026 and May 2026 Water Quality Results

VARIABLE	UNITS	ASSESSMENT VALUE	TM SW01		Calculated Change
			Date 1	Date 2	
			10-Apr-26	10-May-26	
pH @ 25°C	pH	8.35	7.38	7.45	0.07
Electrical conductivity (EC) @ 25°C	mS/m	16.5	4.78	6.46	1.68
Calcium (Ca)	mg/l	10	3.2	3.6	0.407
Magnesium (Mg)	mg/l	6.33	2.85	3.12	0.264
Sodium (Na)	mg/l	6	1.79	2.35	0.553
Chloride (Cl)	mg/l	7.33	2.05	2.36	0.315
Potassium (K)	mg/l	1.53	1.01	1.39	0.379
Sulphate (SO ₄)	mg/l	9.33	2.65	9.82	7.17
Nitrate (NO ₃) as N	mg/l	0.33	0.097	0.321	0.224
Fluoride (F)	mg/l	0.2	0.132	0.132	0
Aluminium (Al)	mg/l	0.04	0.002	0.017	0.016
Cadmium (Cd)	mg/l	0.01	0.001	1.001	0
Chromium (Cr)	mg/l	-	0.005	0.005	0
Zinc (Zn)	mg/l	0.03	0.003	0.003	0
Arsenic (As)	mg/l	-	0.003	0.003	0
Dissolved oxygen (DO)	mg/l	-	6.76	7.72	0.96
Atrazine	µg/l	-	5	5	0

Table 40: Spatial Assessment Table Showing the Comparison Between April 2026 and May 2026 Water Quality Results

VARIABLE	UNITS	ASSESSMENT VALUE	TM SW02		Calculated Change
			Date 1	Date 2	
			10-Apr-26	10-May-26	
pH @ 25°C	pH	8.35	7.36	7.6	0.24
Electrical conductivity (EC) @ 25°C	mS/m	16.5	21.5	26.6	5.13
Calcium (Ca)	mg/l	10	13	16.3	3.32
Magnesium (Mg)	mg/l	6.33	9.58	12.5	2.96
Sodium (Na)	mg/l	6	12.2	14.9	2.67
Chloride (Cl)	mg/l	7.33	7.48	8.98	1.5

VARIABLE	UNITS	ASSESSMENT VALUE	TM SW02		Calculated Change
			Date 1	Date 2	
			10-Apr-26	10-May-26	
Potassium (K)	mg/l	1.53	2.17	2.59	0.413
Sulphate (SO ₄)	mg/l	9.33	22	27.6	5.66
Nitrate (NO ₃) as N	mg/l	0.33	12.6	13.2	0.608
Fluoride (F)	mg/l	0.2	0.385	0.132	-254
Aluminium (Al)	mg/l	0.04	0.007	0.01	0.003
Cadmium (Cd)	mg/l	0.01	0.001	1.001	0
Chromium (Cr)	mg/l	-	0.005	0.005	0
Zinc (Zn)	mg/l	0.03	0.003	0.003	0
Arsenic (As)	mg/l	-	0.003	0.003	0
Dissolved oxygen (DO)	mg/l	-	6.71	7.65	0.94
Atrazine	µg/l	-	5	5	0

Table 41: Spatial Assessment Table Showing the Comparison Between April 2026 and May 2026 Water Quality Results

VARIABLE	UNITS	ASSESSMENT VALUE	TM SW03		Calculated Change
			Date 1	Date 2	
			10-Apr-26	10-May-26	
pH @ 25°C	pH	8.35	7.38	7.53	0.15
Electrical conductivity (EC) @ 25°C	mS/m	16.5	21.9	2.61	4.12
Calcium (Ca)	mg/l	10	13.3	15.9	2.64
Magnesium (Mg)	mg/l	6.33	9.89	12.2	2.31
Sodium (Na)	mg/l	6	12.8	14.5	1.69
Chloride (Cl)	mg/l	7.33	7.86	8.66	0.798
Potassium (K)	mg/l	1.53	2.25	2.55	0.294
Sulphate (SO ₄)	mg/l	9.33	22.8	26.2	3.44
Nitrate (NO ₃) as N	mg/l	0.33	12.4	13	0.635
Fluoride (F)	mg/l	0.2	0.132	0.132	0
Aluminium (Al)	mg/l	0.04	0.004	0.01	0.006
Cadmium (Cd)	mg/l	0.01	0.001	1.001	0
Chromium (Cr)	mg/l	-	0.005	0.005	0
Zinc (Zn)	mg/l	0.03	0.003	0.003	0
Arsenic (As)	mg/l	-	0.003	0.003	0
Dissolved oxygen (DO)	mg/l	-	6.68	7.52	0.84
Atrazine	µg/l	-	5	5	0

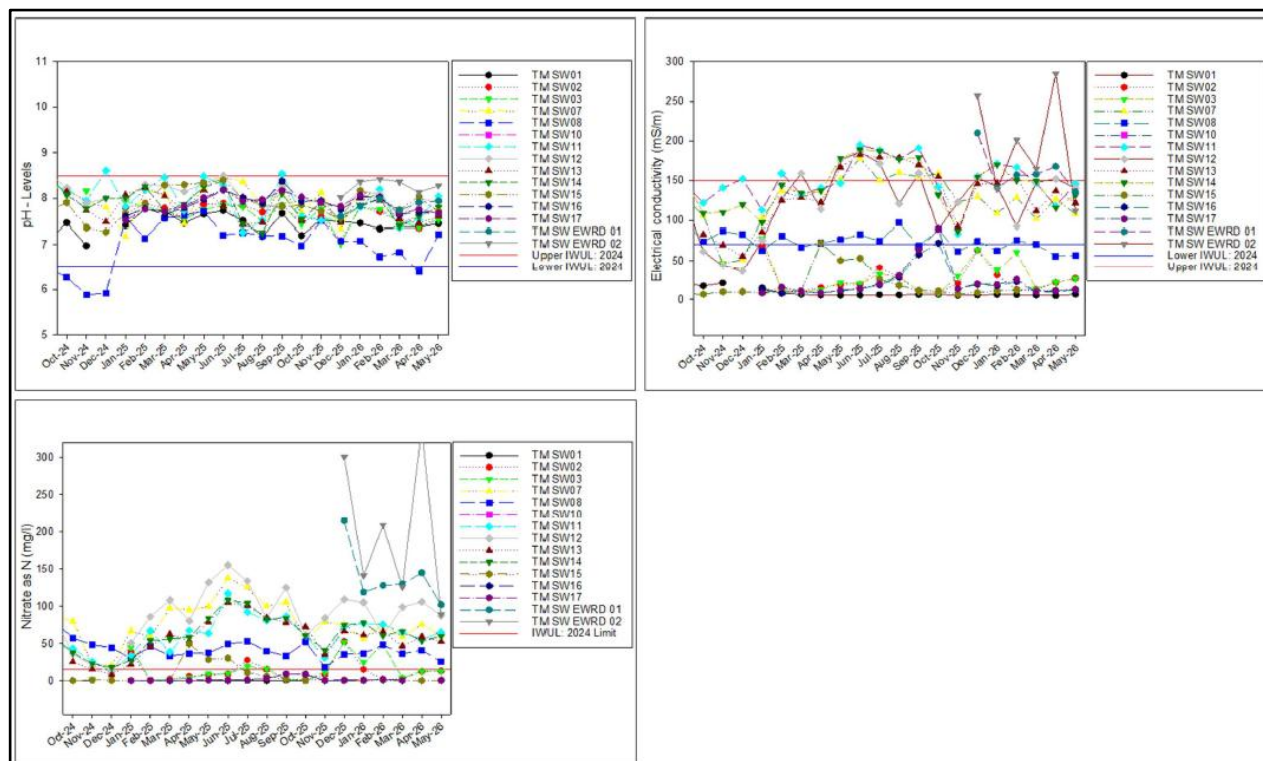


Figure 67: pH, EC and NO₃-N Trends for Surface Water Localities.

The general water quality of the surface water discharge monitoring locality, TM SW Discharge (Table 39), could be described as neutral (pH: 6.0 – 8.5) and saline (EC: 70 – 150 mS/m). Nutrient and inorganic salt concentrations at the discharge point was elevated for the May 2026 monitoring period. Sample TM SW Discharge exceeded the IWUL:2024 Waste Water Quality for Discharge Guidelines in terms of EC, sulphate (SO₄), free and saline ammonia as N, Fluoride, calcium, magnesium, and faecal coliform. Further, the general water quality upstream and downstream of the discharge point were relatively similar, being neutral and non-saline in nature. Most analysed variables increased only slightly from upstream to downstream. Both localities exceeded the IWUL:2024 Waste Water Quality for Discharge Guidelines in terms of free and saline ammonia as N and Faecal coliform counts. The IWUL was further exceeded upstream in terms of Atrazine during the May 2026 monitoring period.

8-9.2 Mean annual runoff

According to WR2012, the quaternary catchment A21K has a catchment area of 865 km² and an estimated mean annual runoff (MAR) of 23.73 Mm³/year. Figure 68 shows the seasonal distribution of the runoff in quaternary catchment A21K.

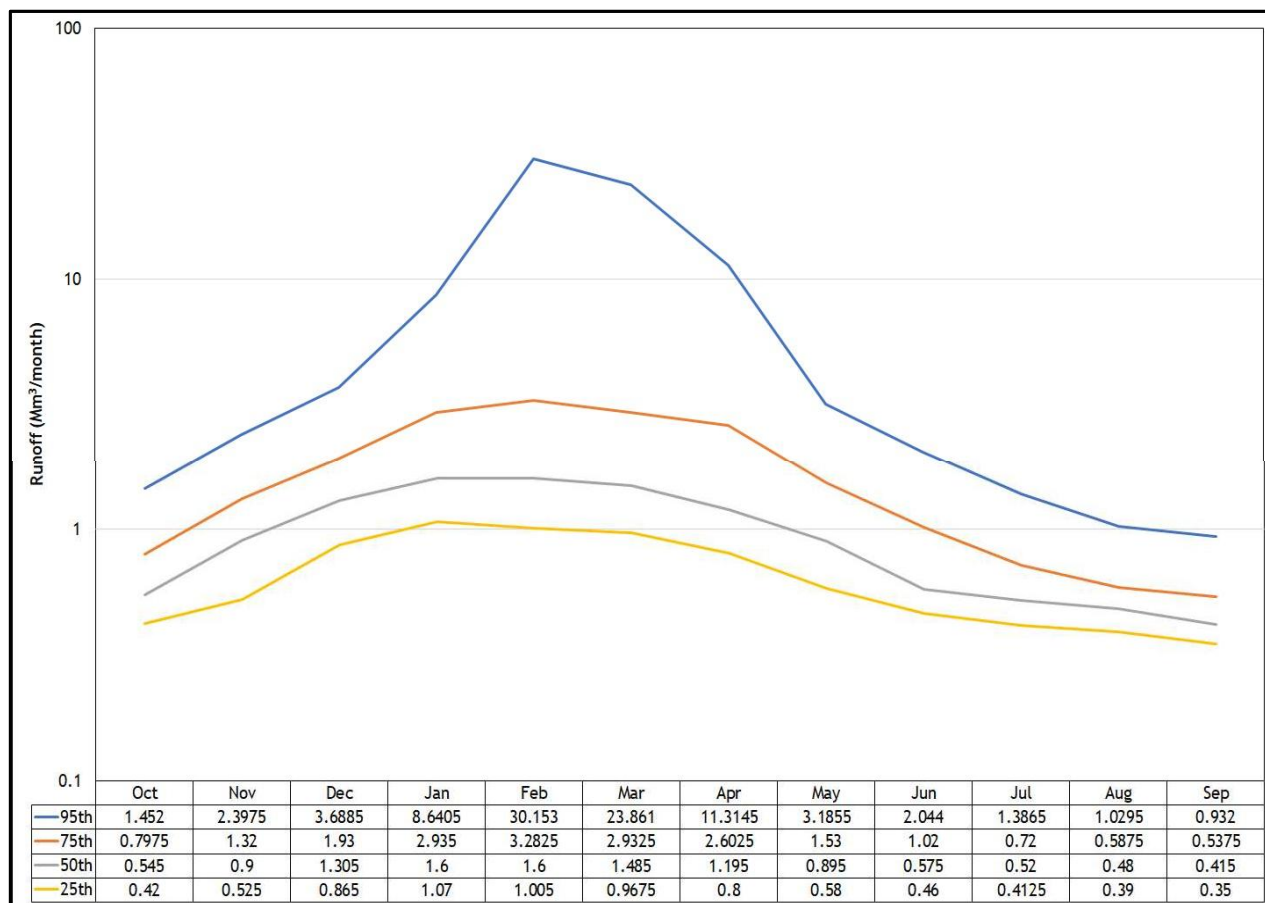


Figure 68: Seasonal Distribution of the Mean Monthly Runoff for Quaternary A21K

8-9.3 Resource Class and River Health Receiving water quality objectives and reserve

The Chief Directorate: Resource Directed Measures (CD: RDM) of DWS has identified the need to undertake the classification of significant water resources (rivers, wetlands, groundwater and lakes) in accordance with the Water Resource Classification System (WRCS) (DWA, 2012).

The management classes and the ecological categories are defined below (DWA, 2013):

- Class I (Minimally used): Water resource is one which is minimally used, and the overall ecological condition of that water resource is minimally altered from its predevelopment condition (the ecological category is a Class A/B);
- Class II (Moderately used): Water resource is one which is moderately used, and the overall ecological condition of that water resource is moderately altered from its predevelopment condition (the ecological category is a Class C); and
- Class III (Heavily used): Water resource is one which is heavily used, and the overall ecological condition of that water resource is significantly altered from its predevelopment condition (the ecological category is Class D).

In terms of Government Gazette No 42775 of 22 February 2019, the DWS has published the classes of water resources and resource quality objectives (RQOs) – flow and quality - for the Mokolo, Matlabas, Crocodile (West) and Marico catchments for the delineated Integrated Units of Analysis (IUA). The RQOs and resource classes for the quaternary catchment where Tharisa is located are presented in Table 42. The classification and RQOs include the ecological water requirements (EWR), PES, EIS, recommended ecological category (REC) and quality limits for certain parameters (nitrate, sulphate and phosphate).

Table 42: Proposed Management Classes for the Sterkstroom River (A21K)

Catchment/water resource	RQO		
	Natural MAR x 10 ⁶ m ³	EWR as % N MAR	Monthly maintenance flow range over dry and wet season
A21K: Crocodile River	14.0	28.21	184.5x106m ³
Classification	EIS	PES	REC
A21K: Crocodile River	Moderate to High	C	C
Quality	PO₄ mg/l as P	NO₃ mg/l as N	SO₄ mg/l as S
A21K: Crocodile River	≤ 0.010mg/l	≤0.5mg/l	≤70mg/l

8-9.4 Floodlines

The floodlines for the 1:50-year and 1:100-year recurrence intervals were determined. There is no proposed infrastructure located within the floodlines in compliance with Regulation 4 of GN 704, which stipulates that no residue deposit or associated activity may be located or placed within the 1:100-year flood line or within a horizontal distance of 100 metres from any watercourse, whichever is greatest.

8-10 AIR QUALITY

Existing sources of emissions in the region and the characterisation of existing ambient pollution concentration is fundamental to the assessment of cumulative air impacts. A change in ambient air quality can result in a range of impacts which in turn may cause a disturbance and/or health impacts to nearby receptors.

Mining and processing activities, farming and residential land-uses occur in the region. These land-uses contribute to baseline pollutant concentrations via vehicle tailpipe emissions, household fuel combustion, biomass burning and various fugitive dust sources. Long-range transport of particulates, emitted from remote tall stacks and from large-scale biomass burning in countries to the north of South Africa, has been found to contribute to background fine particulate concentrations within the South African boundary (Andreae, et al., 1996; Garstang, Tyson, Swap, and Edwards, 1996; Piketh, Annegarn, and Kneen, 1996).

8-10.1 Air Quality Monitoring Data

Tharisa Mine has a dustfall monitoring network in place and does passive sampling of NO₂ and SO₂ (Table 43 and Figure 69). There are fourteen (14) dust fall localities in the monitoring programme.

Data analysed for NO₂ and SO₂ is limited to the most recent period for which data was available (July 2026). Both NO₂ and SO₂ are screened against South African National Ambient Air Quality Standards (NAAQS) while dustfall is screened against the National Dust Control Regulations (NDCR). It should be noted that the ambient measurements account for all emission contributions in the region, not just the mine.

Table 43: Tharisa Mine Ambient Monitoring Network Locations

Dustfall Bucket ID	Description	Latitude (°)	Longitude (°)	Classification
TM DF01	Toll Gate	-25.752060	27.495610	Non-Residential
TM DF02	Ind N4 1	-25.748048	27.525503	Non-Residential
TM DF03	School	-25.738390	27.476500	Residential
TM DF04	Glenross	-25.748670	27.515530	Residential
TM DF05	Lapologang 2	-25.737530	27.470500	Residential
TM DF06	Mmaditlhokwa 2	-25.723860	27.488140	Residential
TM DF07	Bokamoso	-25.727180	27.533450	Residential
TM DF08	Mmaditlhokwa far-west	-25.725083	27.471239	Residential
TM DF09	Marikana Engineering Workshop	-25.734361	27.458167	Non-Residential
TM DF10	N4 Agricultural Nursery	-25.753443	27.477389	Non-Residential
TM DF11	Mooinooi Resident 01	-25.749337	27.550045	Residential
TM DF12	Mooinooi Resident 02	-25.740028	27.538750	Non-Residential

TM DF13	R104 Diesel Bay	-25.750139	27.453778	Non-Residential
TM DF14	Ind Lonmin 3	-25.716394	27.506561	Non-Residential

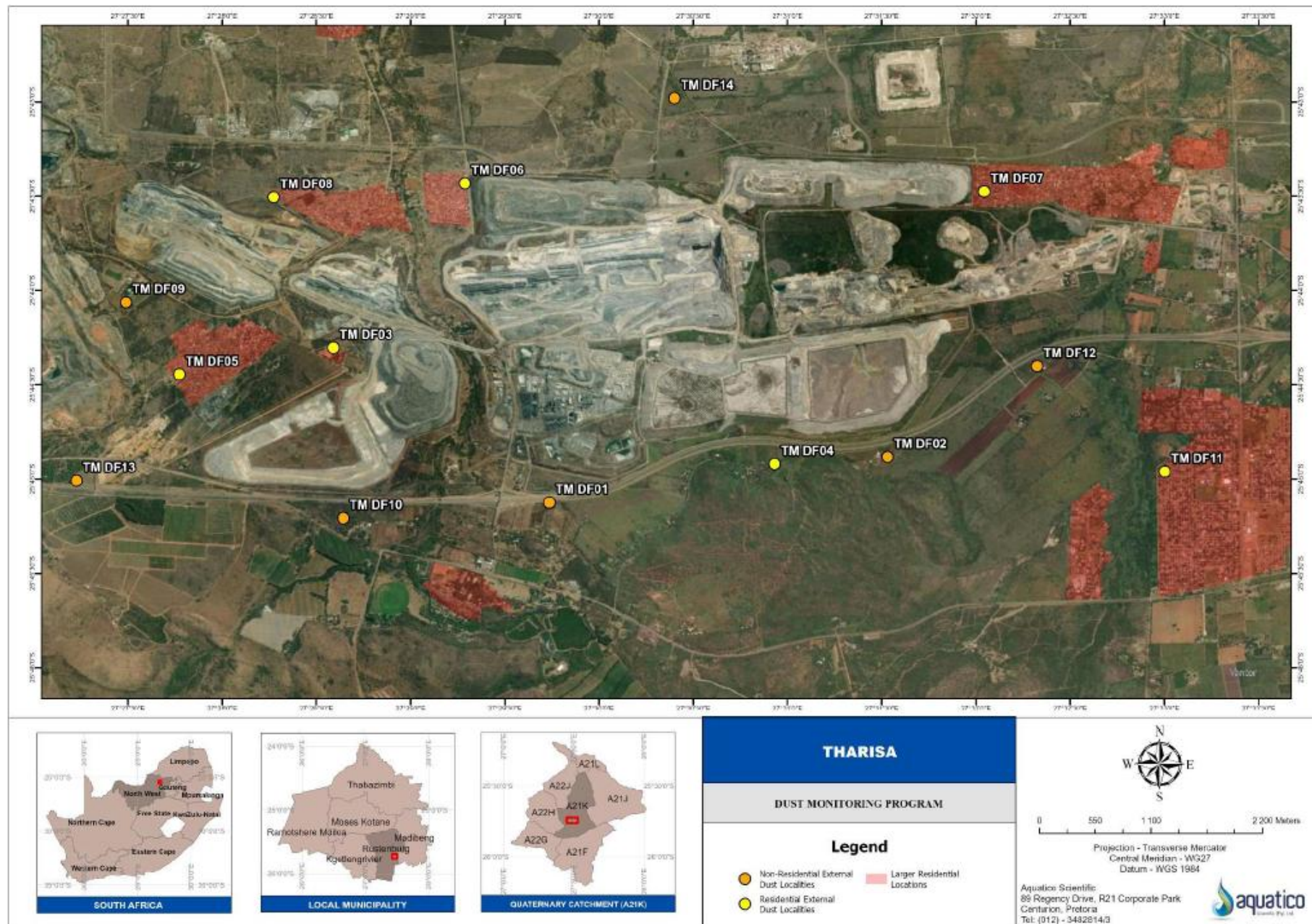


Figure 69: Tharisa Mine Ambient Monitoring Network Locations

8-10.1.1 Dustfall monitoring network

The latest results were taken from the available dustfall monitoring report (June 2026) which included 14 single dust buckets at and around Tharisa Mine (Table 43 and Figure 69). Aquatico currently performs the dustfall sampling.

From the results of the monitoring period 08 May 2026 to 09 June 2026 (Figure 70), it was found that dustfall did not exceed the NDCR for residential areas (below 600 mg/m²/day). The NDCR allow for a permitted frequency of exceeding the dustfall rate of two exceedances within a calendar year (not sequential months). None of the sites exceeded the NDCR and all sites are therefore compliant with the NDCR.

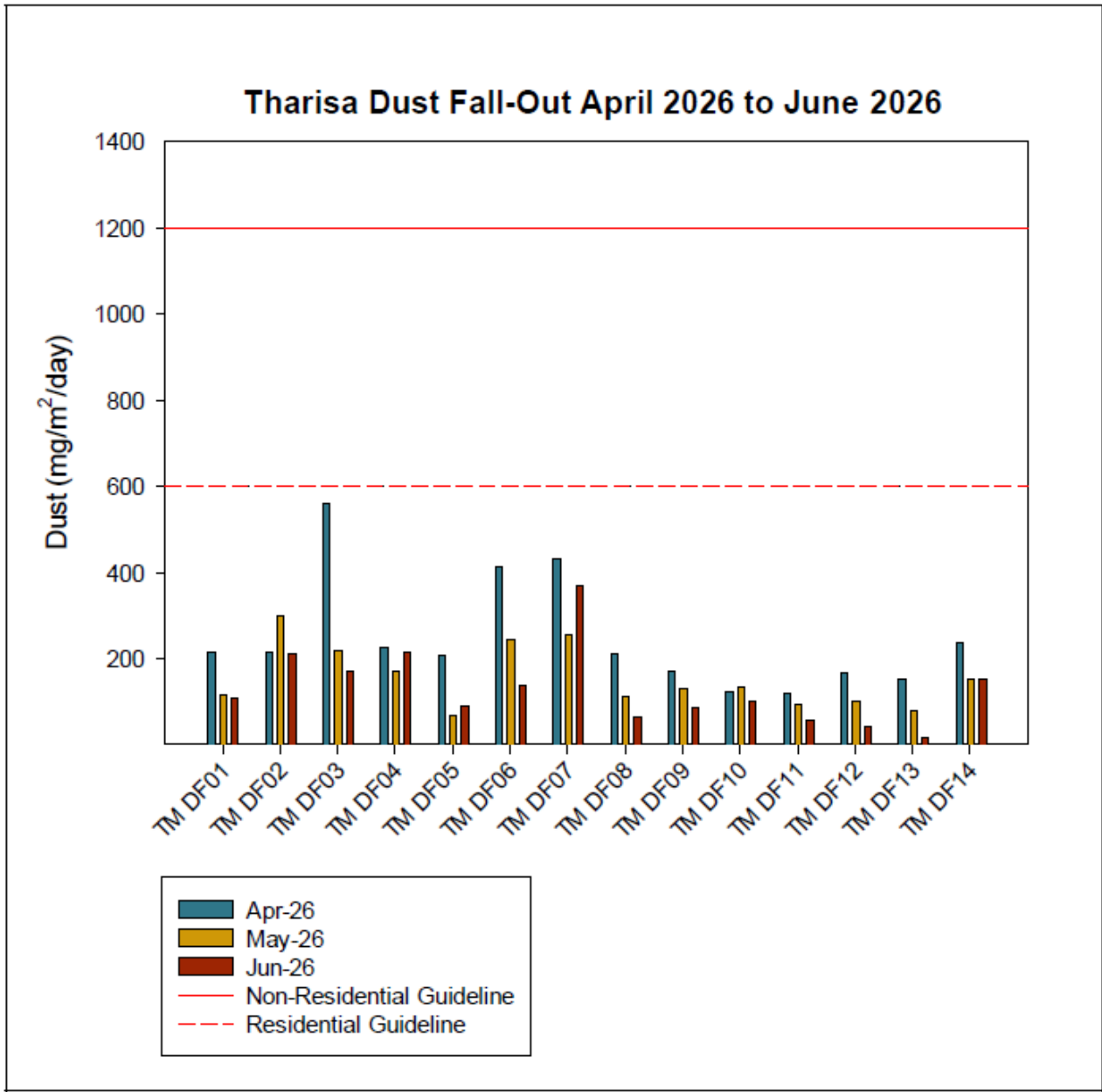


Figure 70: The recorded dust falls for the past quarterly period at Tharisa

All of the sampled non-residential monitoring localities recorded dust fell below the specific non-residential guideline limit of 1200 mg/m²/day (Table 44 and Figure 70). Most of the sampled locations recorded a decrease in dust fall when compared with the previous month's (May 2026) results, whilst some sampled locations showed an increase (TM DF04, TM DF05, and TM DF07) in dust fall. However, overall dust fall measured was low and compliant during June 2026.

Table 44: Executive Summary of the Non-Residential Dust Fall Results

Tharisa Dust Fall Monitoring						
Locality	Locality Category	Results (g/m ² /day)	Results (mg/m ² /day)	Permissible non-residential (mg/m ² /day)	Guideline description	Months Guideline Exceeded (January 2026-current)
TM DF01	Non-Residential	1.11	110	1200 mg/m ² /day	Results should remain below the permissible non-residential of 1200 mg/m ² /day	
TM DF02		0.212	212			
TM DF09		0.087	87			
TM DF10		0.101	101			
TM DF12		0.042	42			
TM DF13		0.018	18			
TM DF14		0.155	155			
	Requires investigation and remediation if two sequential months in this band, or more than three occurrences in a year.					
	Below permissible commercial and light industrial standard. No action or remediation required. Continue with monthly monitoring.					

All residential monitoring localities recorded dust fall below the specified residential guideline of 600 mg/m²/day (Table 45 and Figure 70).

Table 45: Executive Summary of the Residential Dust Fall Results

Tharisa Dust Fall Monitoring						
Locality	Locality Category	Results (g/m ² /day)	Results (mg/m ² /day)	Permissible non-residential (mg/m ² /day)	Guideline description	Months Guideline Exceeded (January 2026-current)
TM DF03	Residential	0.173	173	600 mg/m ² /day	Results should remain below the permissible residential of 6200 mg/m ² /day	
TM DF04		0.217	217			
TM DF05		0.091	91			
TM DF06		0.137	137			
TM DF07		0.369	369			
TM DF08		0.064	64			Feb-26
TM DF11		0.057	57			
	Requires investigation and remediation if two sequential months in this band, or more than three occurrences in a year.					
	Below permissible commercial and light industrial standard. No action or remediation required. Continue with monthly monitoring.					

Increases at some localities might be due to:

- Wind and Atmospheric Conditions: Wind can carry dust over distances, impacting nearby areas. Certain weather conditions, such as low atmospheric stability, can exacerbate the dispersion of dust.
- Lack of Ground Cover: Areas with minimal vegetation or soil cover are more prone to dust fall as there is less natural protection against wind erosion.
- Unpaved Roads: Areas with unpaved roads or construction sites can experience increased dust fall due to vehicle movement.

8-10.1.2 Ambient NO₂ and SO₂ Concentrations

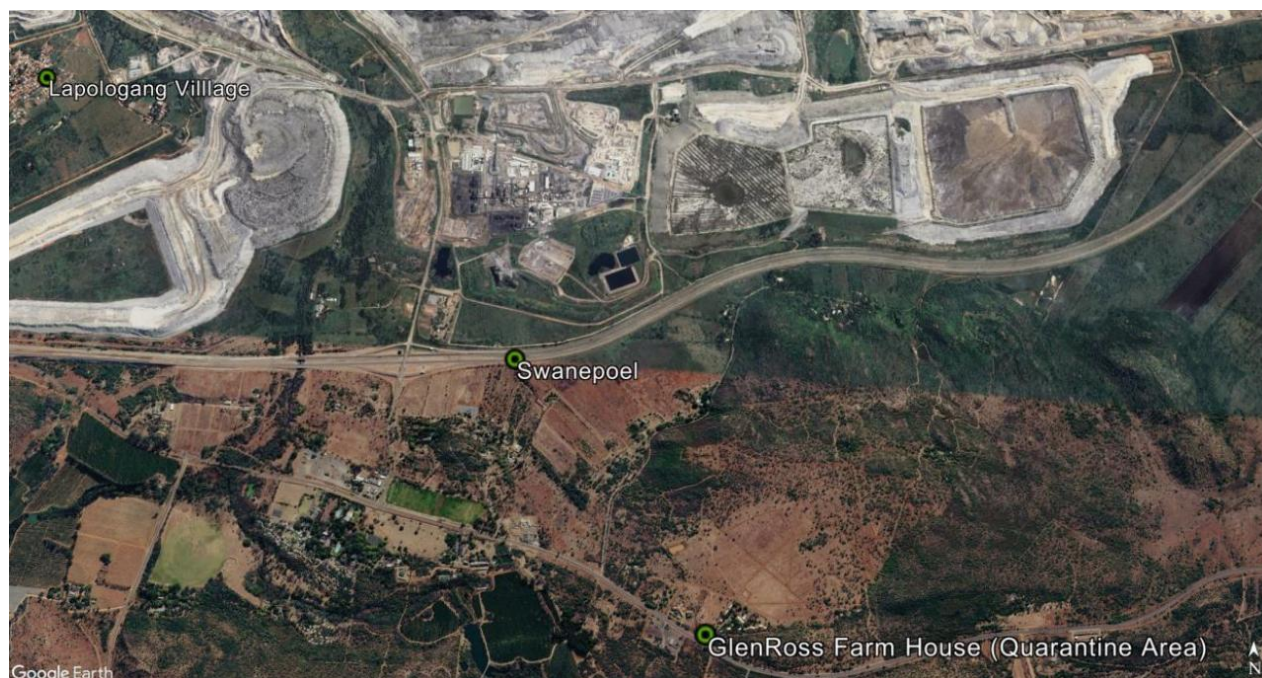
The current monitoring network comprises of three radiello® passive monitors for NO₂ and SO₂. Refer to Figure 71 for the passive sampling locations at Tharisa Mine. The results of the NO₂ and SO₂ monitoring are represented in Table 46 and Figure 71 (for the period 15 June 2026 to 14 July 2026).

While you may not validly compare the NO₂ and SO₂ results obtained to the annual standard unless you continuously sampled for a year and obtained an average, the radiello® passives technique provides an indication of possible high incidences of NO₂ and SO₂ levels at Tharisa Mine. Results obtained for NO₂ and SO₂ for the year in review were well below the NAAQS.

Table 46: Passives SO₂ and NO₂ Results for 15 June 2026 to 14 July 2026

Site Name	NO ₂ (ppb)	SO ₂ (ppb)
Annual average NAAQS 24 (December 2009)	21	19
Lapologang village	11.60	1.29
GlenRoss Farm House (Quarantine Area)	9.03	1.19
Swanepoel	7.35	0.88

The annual average guideline for SO₂ according to NAAQS of 24 December 2009 is 19 ppb. Results obtained for the month in review were below this value. The annual average guideline for NO₂ according to NAAQS of 24 December 2009 is 21 ppb. Results obtained for the month in review were below this value. A sample recovery of 100 % was achieved.

**Figure 71: Passive Sampling Locations at Tharisa**

8-11 NOISE

The noise generating activities associated with the proposed project could cause an increase in ambient noise levels in and around the mining area.

8-11.1 Current Ambient Noise

Tharisa Mine is located in an area where the character of ambient noise is already affected by industrialisation and economic activity, which over time, has resulted in an increase in road traffic noise and noise generated by intensive mining activities by surrounding mines. Road traffic emanates specifically from the N4 and various secondary roads, such as the Marikana Road that runs between the East and West mining areas at Tharisa Mine. The N4 has a wide noise footprint, affecting people living within a zone of approximately 1.2 km either side of the road, while noise generated by surrounding mining activities affects communities, farmers and other third parties in the immediate surrounds.

These land use types and associated activities represent perennial sources of noise in the area, such as:

- Industrial noise – noise generated from the usage of heavy equipment and machinery; excavators, trucks etc.; and
- Traffic noise – noise generated from the usage of light (motorcycles and cars) and heavy vehicles (buses and trucks).

Noise emissions from these anthropogenic elements (activities mentioned above) and noise emissions from natural elements such as insects, birds, weather events etc. contribute to the existing soundscape (acoustic baseline environment) of the area. The results of the noise monitoring survey undertaken in June 2026 are presented in Table 48. The sampling points are indicated in Table 47 and Figure 72.

The ambient noise levels recorded on-site, and the rating limits according to the SANS 10103:2008 guidelines, are presented side by side for comparison. The sound pressure level. (SPL) is given in the a-weighted scale, which is used to filter the sound levels according to the human ear's varying response to different frequencies.

Table 47: Selected Monitoring Sites

Sampling Location	Description	Co-ordinates	Distance from the noise sources
Receptor Number 1	Receptor Number 1 - Tharisa agriculture farm	-25.750045°S 27.493548°E	Mining area: ±1692m Mining Dump: ± 868m N4 Highway: ± 267m Plant: ± 850m
Receptor Number 2	Receptor Number 2 - Pretorius Residence (Relocated)	-25.73932°S 27.472342°E	Mining area: ± 1041m Mining Dump: ± 562m N4 Highway: ±1392m Plant: ± 2250m
Receptor Number 3	Receptor Number 3 - Van Der Hoven Residence (Relocated)	-25.734063°S 27.463353°E	Mining area: ± 507m Mining Dump: ± 99m N4 Highway: ±2470m Plant: ± 3292m
Receptor Number 4	Receptor Number 4 - Kgoitsi House (Residence)	25°43'42.76"S 27°28'44.67"E	Mining area: ± 572m Mining Dump: ±1100m N4 Highway: ±3033m Plant: ± 2295m
Receptor Number 5	Receptor Number 5 - Mmaditlhokwa Church	-25.728034°S 27.487698°E	Mining area: ± 878m Mining Dump: ±241m N4 Highway: ±2647m Plant: ±1852m
Receptor Number 6	Makwase Residence portion 233	-25°44'55.78"S 27°29'14.57"E	Mining area: ±1169m Mining Dump: ±610m N4 Highway: ±387m Plant: ±936m
Receptor Number 7	Old van Rensburg Nursery Portion 239 (few meters to N4 road)	-25.750936°S 27.468727°E	Mining area: ±1965m Mining Dump: ±100m N4 Highway: ±100m Plant: ±2194m
Receptor Number 8	Portion 139 adjacent to the Chrome Plant (relocated)	-25.74304°S 27.468318°E	Mining area: ±1649m Mining Dump: ±386m N4 Highway: ±1098m Plant: ±2807m

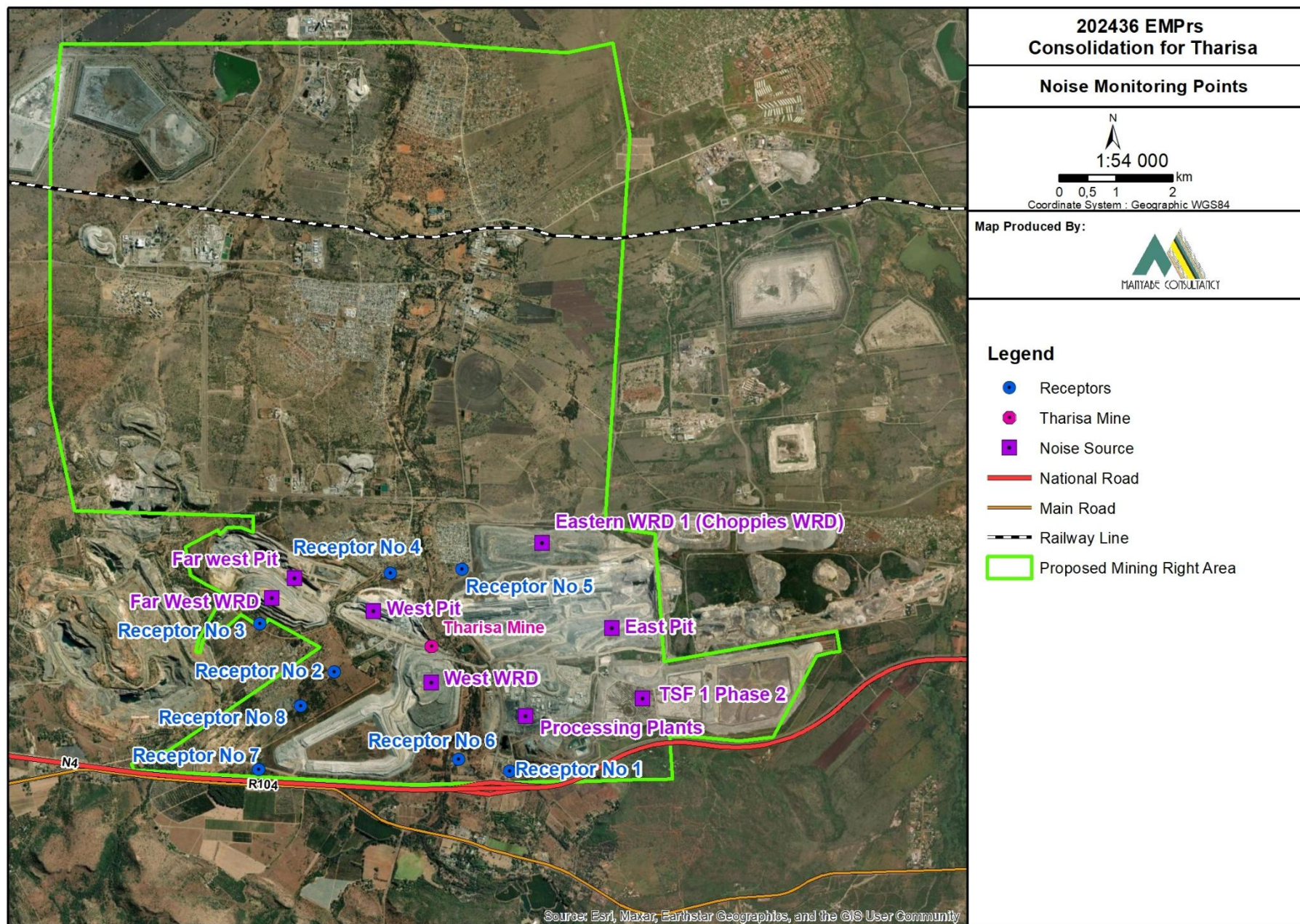


Figure 72: Selected Monitoring Site (Receptors) and Noise Sources

Table 48: Baseline Noise Measurements

Sample ID	Type of district	Period (time)	SANS 10103:2008 Rating Limit dBA	Ambient Noise Levels (dBA) - Field Measurement	Min (dBA)	Max (dBA)	Start Date	End Date
Receptor Number 1	Residential	06:00 to 22:00	60.9	60	48.7	71.4	03/06/2026	04/06/2026
		22:00 to 06:00	59.4	50	48.6	66.9		
		06:00 to 06:00	60.5	60	48.6	71.4		
Receptor Number 2	Residential	06:00 to 22:00	55.8	60	45.7	65.5	03/06/2026	04/06/2026
		22:00 to 06:00	55.4	50	47.9	64		
		06:00 to 06:00	55.6	60	45.7	65.5		
Receptor Number 3	Residential	06:00 to 22:00	59.4	60	46.1	71.4	03/06/2026	04/06/2026
		22:00 to 06:00	57.1	50	50.4	64.7		
		06:00 to 06:00	58.8	60	46.1	71.4		
Receptor Number 4	Residential	06:00 to 22:00	57.8	60	50.3	66.3	03/06/2026	04/06/2026
		22:00 to 06:00	59.1	50	56.5	64		
		06:00 to 06:00	58.2	60	50.3	66.3		
Receptor Number 5	Residential	06:00 to 22:00	55.3	60	40.8	82.4	03/06/2026	04/06/2026
		22:00 to 06:00	41.9	50	40.8	51.9		
		06:00 to 06:00	53.7	60	40.8	82.4		
Receptor Number 6	Residential	06:00 to 22:00	54.1	60	37	82	03/06/2026	04/06/2026
		22:00 to 06:00	39	50	36.8	50.4		
		06:00 to 06:00	52.5	60	36.8	82		
Receptor Number 7	Residential	06:00 to 22:00	56.5	60	39	85.2	03/06/2026	04/06/2026
		22:00 to 06:00	41.8	50	39	57.3		
		06:00 to 06:00	54.9	60	39	85.2		
Receptor Number 8	Residential	06:00 to 22:00	55.2	60	51	82	03/06/2026	04/06/2026
		22:00 to 06:00	51.3	50	51	56.2		
		06:00 to 06:00	54.3	60	51	82		

(a) Exceedances of the background levels as summarised in Table 48 are highlighted in red.

8-12 SOCIO-ECONOMIC ENVIRONMENT

The mining sector is a big contributor to the economy of South Africa as well as the region. The Rustenburg area has a large concentration of mining activities, with the mining sector creating the biggest job opportunities. The proposed projects to be implemented have many positive benefits and spinoffs both during the construction and operational phases. The benefits and positive impacts have a countrywide reach. The impacts of the positive benefits of the projects have long-term implications starting from the lowest unit, which is the individual, graduating to households and/or family unit, to the local level up to the country level.

The project area falls within Ward 31, 32 and 45 of the Rustenburg Local Municipality, and Ward 27 of the Madibeng Local Municipality, within the BDM, North West Province.

The North West Province is situated in the northern part of South Africa and borders the Gauteng, Free State, Northern Cape, and Limpopo provinces. It also shares an international border with Botswana. The province covers an area of approximately 104,882 km². Mahikeng is the provincial capital and forms a single urban area with the neighbouring town of Mmabatho. Other major cities include Potchefstroom and Klerksdorp, while the principal towns include Rustenburg, Brits, and Lichtenburg. The province is divided into four district municipalities, namely Bojanala Platinum, Dr Kenneth Kaunda, Dr Ruth Segomotsi Mompati, and Ngaka Modiri Molema.

The BDM covers an area of approximately 18,333 km² and shares a border with Gauteng Province. Rustenburg serves as the district seat, while other prominent towns include Brits, Derby, Hartbeespoort, Koster, Madikwe, Marikana, Mooi-nooi, Phatsima, Swartruggens, and Tlhabane. The district comprises five local municipalities, namely Kgetlengrivier, Madibeng, Moses Kotane, Moretele, and Rustenburg.

The Rustenburg Local Municipality covers an area of approximately 3,423 km². The municipality encompasses the city of Rustenburg and surrounding towns and settlements, including Phokeng, Tlhabane, Kroondal, Boshoeck, Marikana, and Mooi-nooi. Mining, particularly platinum mining, is the dominant economic activity and serves as the primary driver of the local economy. The municipality also has a growing tourism sector, supported by attractions such as the Kgaswane Mountain Reserve, the Magaliesberg Biosphere Reserve, and the Royal Bafokeng Sports Complex.

The Madibeng Local Municipality covers an area of 3 720 km². The main towns in the area are Brits, Hartbeespoort, and Mooi-nooi. Mining is the predominant economic activity, and the Hartbeespoort Dam is a well-known tourist attraction.

The socio-economic information for the area was sourced from www.wazimap.co.za.

WARDS 31, 32, AND 45 OF THE RUSTENBURG LOCAL MUNICIPALITY

According to Statistics South Africa (Stats SA, Census 2022), the Rustenburg Local Municipality has a total population of 562,315 people. As shown in Table 49 below, the population is almost evenly distributed by sex, with males accounting for approximately 52% of the population and females accounting for approximately 48%.

Table 49: Population by Sex

Population by sex	Value	Percentage
Female	806,949	48%
Male	860,550	52%

Source: Stats SA, 2022

Table 50 below, as recorded during the 2022 South African Census, indicates that the majority (93.9%) of the Rustenburg Local Municipality population group is Black African. This number is followed by 4.9% white persons.

Table 50: Population Group

Population by Group	Value	Percentage
Black African	528,255	93.9%
Coloured	4,420	0.8%
Indian or Asian	618	0.1%
White	27,297	4.9%
Other	1,317	0.2%
Unspecified	407	0.1%

Source: Stats SA, 2022

Table 51 below indicates that the majority of Rustenburg Local Municipality population is aged between 30 and 39 (20.9%). The 60-69 age group is relatively small, constituting only 4.6% of the population.

Table 51: Population by Age Band

Population by Age Group	Value	Percentage
0-9	95,148	16.9%
10-19	82,406	14.7%
20-29	98,920	17.6%
30-39	117,643	20.9%
40-49	81,038	14.4%
50-59	48,421	8.6%
60-69	25,735	4.6%

Source: Stats SA, 2022

Table 52 shows that the majority of persons within Rustenburg Local Municipality speaks Setswana (65.4%) as their home language, followed by 9.3% of persons who speak IsiXhosa as their home language.

Table 52: Population by Language Most Spoken at Home

Language	Value	Percentage
Afrikaans	24,587	4.5%
Chichewa/Chewa/Nyanja/Chinyanja	2,411	0.4%
English	7,958	1.5%
Isindebele	1,216	0.2%
IsiXhosa	50,558	9.3%
IsiZulu	9,972	1.8%
Khoi, Nama and San languages	39	0.0%
Portuguese	3,102	0.6%
Sepedi	9,044	1.7%
Sesotho	26,549	4.9%
Setswana	355,450	65.4%
Shona	13,811	2.5%
Sign language	163	0.0%
Siswati	2,510	0.5%
Tshivenda	2,555	0.5%
Xitsonga	23,910	4.4%
Other	2,790	0.5%
Unspecified	6,630	1.2%

Source: Stats SA, 2022

Table 53 below, as recorded during the 2022 South African Census, indicates that the majority (31.7%) of Rustenburg Local Municipality population holds highest education level of Grade 12/ Standard 10/ Form 5/ Matric/ NCV Level 4/ Occupational Certificate NQF Level 4.

Table 53: Population by Highest Education Level

Level of education	Value	Percentage
Grade R/0	10,114	2.0%
Grade 1/ Sub A/ Class 1	8,982	1.8%
Grade 2/ Sub B/ Class 2	10,135	2.0%

Level of education	Value	Percentage
Grade 3/ Standard 1/ ABET/ AET 1	10,861	2.2%
Grade 4/ Standard 2	13,506	2.7%
Grade 5/ Standard 3/ ABET/ AET	15,551	3.1%
Grade 6/ Standard 4	18,329	3.7%
Grade 7/ Standard 5/ ABET/ AET	24,423	4.9%
Grade 8/ Standard 6/ Form 1	27,473	5.5%
Grade 9/ Standard 7/ Form 2/ ABET/ AET 4/ Occupational Certificate NQF Level 2	32,448	6.5%
Grade 10/ Standard 8/ Form 3/ NCV Level 2/ Occupational Certificate NQF Level 2	41,311	8.3%
Grade 11/ Standard 9/ Form 4/ NCV Level 3/ Occupational Certificate NQF Level 3	50,344	10.1%
Grade 12/ Standard 10/ Form 5/ Matric/ NCV Level 4/ Occupational Certificate NQF Level 4	158,345	31.7%
NTC I/N1	470	0.1%
NTC II/N2	999	0.2%
NTC III/N3	1,493	0.3%
N4/NTC 4/ Occupational Certificate NQF Level 5	1,788	0.4%
N5/NTC 5/ Occupational Certificate NQF Level 5	866	0.2%
N6/NTC 6/ Occupational Certificate NQF Level 5	2,216	0.4%
Certificate with less than Grade 12/ Standard 10	661	0.1%
Diploma with less than Grade 12/ Standard 10	1,246	0.2%
Higher/ National/ Advanced Certificate with Grade 12/ Std10/ Occupational Certificate NQF Level 5	2,174	0.4%
Diploma with Grade 12/ Standard 10/ Occupational Certificate NQF Level 6	9,112	1.8%
Higher Diploma/ Occupational Certificate NQF Level 7	2,931	0.6%
Bachelors Degree/ Occupational Certificate NQF Level 8	6,736	1.3%
Honours Degree/ Postgraduate Diploma/ Occupational Certificate NQF Level 8	2,523	0.5%
Masters/ Professional Masters at NQF Level 9	775	0.2%
PHD (Doctoral Degrees)/ Professional Doctoral Degree at NQF Level 10	254	0.1%
Other	3,284	0.7%
Do not know	16,978	3.4%
No schooling	20,066	4.0%
Unspecified	3,868	0.8%

Source: Stats SA, 2022

Table 54 below indicates, as recorded during the 2022 South African Census, there is a total of 74.9% main dwelling type in the Rustenburg Local Municipality that are classified as formal dwelling/house or brick/concrete block structure on a separate stand or yard or on farm.

Table 54: Population by Main Dwelling Type

Population by main dwelling type	Value	Percentage
Formal dwelling/house or brick/concrete block structure on a separate stand or yard or on farm	381,343	74.9%
Traditional dwelling/hut/structure made of traditional materials	2,903	0.6%
Flat or apartment in a block of flats/flat or apartment in a block of flats in a complex	7,325	1.4%
Cluster house in complex	2,829	0.6%
Town house (semi-detached house in complex)	2,760	0.5%
Semi-detached house	3,597	0.7%
Formal dwelling/house/flat/room in backyard/servants' quarters/granny flat/cottage	35,122	6.9%
Informal dwelling/shack in back yard	31,001	6.1%
Informal dwelling/shack not in backyard, e.g. in an informal/squatter settlement or on farm	39,772	7.8%
Caravan/tent	52	0.0%
Other	2,265	0.4%

Source: Stats SA, 2022

In terms of the source of water in the Rustenburg Local Municipality, Table 55 below shows that a relatively large percentage (87.6%) are getting water from a regional/local water scheme (operated by municipality/other service provider) as recorded during the 2022 South African Census.

Table 55: Population by Water Source

Source of water	Value	Percentage
Borehole	27,633	5.4%
Dam/pool/stagnant water	908	0.2%
Flowing water/river/stream	1,345	0.3%
Rain-water tank	634	0.1%
Regional/local water scheme (operated by municipality/other service provider)	445,827	87.6%
Spring	417	0.1%
Water tanker	9,144	1.8%
Water vendor	4,875	1.0%
Other	18,189	3.6%

Source: Stats SA, 2022

In terms of access to toilet facilities in the Rustenburg Local Municipality as recorded during the 2022 South African Census, 60.2% of the population have access to a flush toilet connected to a public sewerage system, as shown in Table 56 below.

Table 56: Population by Type of Toilet Facilities

Toilet facilities	Value	Percentage
Bucket toilet (collected by municipality)	154	0.0%
Bucket toilet (emptied by household)	3,274	0.6%
Chemical toilet	4,999	1.0%
Ecological toilet (e.g. urine diversion, enviroloo, etc)	660	0.1%
Flush toilet connected to a public sewerage system	306,159	60.2%
Flush toilet connected to a septic tank or conservancy tank	28,950	5.7%
Pit latrine/toilet with ventilation pipe (VIP)	50,453	9.9%
Pit latrine/toilet without ventilation pipe	106,039	20.8%
Other	1,009	0.2%
None	7,275	1.4%

Source: Stats SA, 2022

From the source of energy (fuel) for cooking within Rustenburg Local Municipality, Table 57 below shows that a large percentage (90.3%) of the population has access to electricity from the mains.

Table 57: Population by Energy (Fuel) for Cooking

Energy (Fuel) for Cooking	Value	Percentage
Animal dung	38	0.0%
Coal	93	0.0%
Electricity from mains	459,734	90.3%
Other source of electricity (e.g. generator etc.)	4,566	0.9%
Gas	16,076	3.2%
Paraffin	20,902	4.1%
Solar	183	0.0%
Wood	5,685	1.1%
Other	648	0.1%
None	1,047	0.2%

Source: Stats SA, 2022

Another variable to consider when looking at service delivery indicators is access to energy (fuel) for lighting. Within Rustenburg Local Municipality, Table 58 below shows that a large percentage (93.6%) of the population has access to electricity from the mains.

Table 58: Population by Energy (Fuel) for Lighting

Energy (Fuel) for Lighting	Value	Percentage
Candles	17,581	3.5%
Electricity from mains	476,357	93.6%
Other source of electricity (e.g. generator etc.)	4,432	0.9%

Energy (Fuel) for Lighting	Value	Percentage
Gas	1,521	0.3%
Paraffin	6,457	1.3%
Solar	1,050	0.2%
None	664	0.1%
Other	910	0.2%

Source: Stats SA, 2022

Table 59 below indicates access to refuse disposal, as recorded during the 2022 South African Census, within Rustenburg Local Municipality, 70.8% of the population are getting refuse removal by local authority/private company/community members at least once a week.

Table 59: Population by Refuse (Rubbish) Service

Refuse (rubbish) service	Value	Percentage
Removed by local authority/private company/community members at least once a week	360,145	70.8%
Removed by local authority/private company/community members less often	10,667	2.1%
Communal refuse dump	10,277	2.0%
Communal container/central collection point	17,514	3.4%
Own refuse dump	91,480	18.0%
Dump or leave rubbish anywhere (no rubbish disposal)	13,350	2.6%
Other	5,536	1.1%

Source: Stats SA, 2022

WARD 27 OF THE MADIBENG LOCAL MUNICIPALITY

According to the latest population census (Stats SA), 2022, the total population for the Madibeng Local Municipality is 522,566. As can be seen from Table 60 below, as recorded during the 2022 South African Census, the majority of the population is male, who constitute 51.6% of the population.

Table 60: Population by Sex

Population by sex	Value	Percentage
Female	806,949	48.4%
Male	860,550	51.6%

Source: Stats SA, 2022

Table 61 below, as recorded during the 2022 South African Census, indicates that the majority (91.3%) of the Madibeng Local Municipality population group is Black African. This number is followed by 7.3% white persons.

Table 61: Population by Group

Population by Group	Value	Percentage
Black African	1,522,587	91.3%
Coloured	13,513	0.8%
Indian or Asian	5,122	0.3%
White	121,871	7.3%
Other	2,421	0.1%
Unspecified	1,984	0.1%

Source: Stats SA, 2022

Table 62 below indicates that the majority of Madibeng Local Municipality population is aged between 30 and 39 (18.3%). The 60-69 age group is relatively small, constituting only 5.7% of the population.

Table 62: Population by Age Band

Population by Age Group	Value	Percentage
0-9	93,141	17.8%
10-19	83,695	16.0%
20-29	90,425	17.3%
30-39	95,506	18.3%
40-49	68,447	13.1%

Population by Age Group	Value	Percentage
50-59	43,949	8.4%
60-69	29,964	5.7%

Source: Stats SA, 2022

Table 63 shows that the majority of persons within Madibeng Local Municipality speaks Setswana (54.2%) as their home language, followed by 8.5% of persons who speak Xitsonga as their home language.

Table 63: Population by Language Most Spoken at Home

Language	Value	Percentage
Afrikaans	21,724	4.3%
Chichewa/Chewa/Nyanja/Chinyanja	3,251	0.6%
English	8,549	1.7%
Isindebele	7,512	1.5%
IsiXhosa	19,078	3.7%
IsiZulu	22,251	4.4%
Khoi,Nama and San languages	32	0.0%
Portuguese	1,744	0.3%
Sepedi	35,900	7.0%
Sesotho	30,935	6.1%
Setswana	276,243	54.2%
Shona	21,654	4.3%
Sign language	156	0.0%
Siswati	3,160	0.6%
Tshivenda	6,891	1.4%
Xitsonga	43,531	8.5%
Other	2,519	0.5%
Unspecified	4,130	0.8%

Source: Stats SA, 2022

Table 64 below, as recorded during the 2022 South African Census, indicates that the majority (26.5%) of Madibeng Local Municipality population holds highest education level of Grade 12/ Standard 10/ Form 5/ Matric/ NCV Level 4/ Occupational Certificate NQF Level 4.

Table 64: Population by Highest Education Level

Level of education	Value	Percentage
Grade R/0	10,299	2.2%
Grade 1/ Sub A/ Class 1	9,461	2.0%
Grade 2/ Sub B/ Class 2	10,842	2.3%
Grade 3/ Standard 1/ ABET/ AET 1	11,952	2.6%
Grade 4/ Standard 2	13,676	2.9%
Grade 5/ Standard 3/ ABET/ AET	15,732	3.4%
Grade 6/ Standard 4	18,883	4.0%
Grade 7/ Standard 5/ ABET/ AET	24,294	5.2%
Grade 8/ Standard 6/ Form 1	27,908	6.0%
Grade 9/ Standard 7/ Form 2/ ABET/ AET 4/ Occupational Certificate NQF Level 2	30,488	6.5%
Grade 10/ Standard 8/ Form 3/ NCV Level 2/ Occupational Certificate NQF Level 2	40,654	8.7%
Grade 11/ Standard 9/ Form 4/ NCV Level 3/ Occupational Certificate NQF Level 3	48,595	10.4%
Grade 12/ Standard 10/ Form 5/ Matric/ NCV Level 4/ Occupational Certificate NQF Level 4	123,772	26.5%
NTC I/N1	296	0.1%
NTC II/N2	434	0.1%
NTC III/N3	804	0.2%
N4/NTC 4/ Occupational Certificate NQF Level 5	1,272	0.3%
N5/NTC 5/ Occupational Certificate NQF Level 5	583	0.1%
N6/NTC 6/ Occupational Certificate NQF Level 5	1,499	0.3%
Certificate with less than Grade 12/ Standard 10	453	0.1%
Diploma with less than Grade 12/ Standard 10	1,125	0.2%

Level of education	Value	Percentage
Higher/ National/ Advanced Certificate with Grade 12/ Std10/ Occupational Certificate NQF Level 5	1,936	0.4%
Diploma with Grade 12/ Standard 10/ Occupational Certificate NQF Level 6	6,672	1.4%
Higher Diploma/ Occupational Certificate NQF Level 7	2,470	0.5%
Bachelors Degree/ Occupational Certificate NQF Level 8	5,211	1.1%
Honours Degree/ Postgraduate Diploma/ Occupational Certificate NQF Level 8	1,877	0.4%
Masters/ Professional Masters at NQF Level 9	952	0.2%
PHD (Doctoral Degrees)/ Professional Doctoral Degree at NQF Level 10	472	0.1%
Other	2,938	0.6%
Do not know	21,540	4.6%
No schooling	26,139	5.6%
Unspecified	3,692	0.8%

Source: Stats SA, 2022

Table 65 below indicates, as recorded during the 2022 South African Census, there is a total of 67.7% main dwelling type in the Madibeng Local Municipality that are classified as formal dwelling/house or brick/concrete block structure on a separate stand or yard or on farm.

Table 65: Population by Main Dwelling Type

Population by main dwelling type	Value	Percentage
Formal dwelling/house or brick/concrete block structure on a separate stand or yard or on farm	327,556	67.7%
Traditional dwelling/hut/structure made of traditional materials	4,193	0.9%
Flat or apartment in a block of flats/flat or apartment in a block of flats in a complex	3,594	0.7%
Cluster house in complex	816	0.2%
Town house (semi-detached house in complex)	1,295	0.3%
Semi-detached house	3,629	0.7%
Formal dwelling/house/flat/room in backyard/servants' quarters/granny flat/cottage	20,561	4.2%
Informal dwelling/shack in back yard	45,112	9.3%
Informal dwelling/shack not in backyard, e.g. in an informal/squatter settlement or on farm	74,171	15.3%
Caravan/tent	96	0.0%
Other	2,929	0.6%

Source: Stats SA, 2022

In terms of the source of water in the Madibeng Local Municipality, Table 66 below shows that a relatively large percentage (56.4%) are getting water from a regional/local water scheme (operated by municipality/other service provider) as recorded during the 2022 South African Census.

Table 66: Population by Water Source

Source of water	Value	Percentage
Borehole	85,410	17.6%
Dam/pool/stagnant water	1,743	0.4%
Flowing water/river/stream	977	0.2%
Rain-water tank	6,580	1.4%
Regional/local water scheme (operated by municipality/other service provider)	273,124	56.4%
Spring	1,210	0.3%
Water tanker	33,840	7.0%
Water vendor	55,808	11.5%
Other	25,261	5.2%

Source: Stats SA, 2022

In terms of access to toilet facilities in the Madibeng Local Municipality, as recorded during the 2022 South African Census, 30.7% of the population have access to a flush toilet connected to a public sewerage system, as shown in Table 67 below.

Table 67: Population by Type of Toilet Facilities

Toilet facilities	Value	Percentage
Bucket toilet (collected by municipality)	564	0.1%
Bucket toilet (emptied by household)	2,392	0.5%
Chemical toilet	6,492	1.3%
Ecological toilet (e.g. urine diversion, enviroloo, etc)	2,130	0.4%
Flush toilet connected to a public sewerage system	148,499	30.7%
Flush toilet connected to a septic tank or conservancy tank	40,348	8.3%
Pit latrine/toilet with ventilation pipe (VIP)	47,207	9.8%
Pit latrine/toilet without ventilation pipe	225,828	46.7%
Other	3,428	0.7%
None	7,060	1.5%

Source: Stats SA, 2022

From the source of energy (fuel) for cooking within Madibeng Local Municipality, Table 68 below shows that a large percentage (87.0%) of the population has access to electricity from the mains.

Table 68: Population by Energy (Fuel) for Cooking

Energy (Fuel) for Cooking	Value	Percentage
Animal dung	11	0.0%
Coal	228	0.0%
Electricity from mains	420,981	87.0%
Other sources of electricity (e.g., generator etc.)	2,579	0.5%
Gas	19,756	4.1%
Paraffin	24,962	5.2%
Solar	481	0.1%
Wood	12,976	2.7%
Other	808	0.2%
None	1,169	0.2%

Source: Stats SA, 2022

Another variable to consider when looking at service delivery indicators is access to energy (fuel) for lighting. Within Madibeng Local Municipality, Table 69 below shows that a large percentage (91.4%) of the population has access to electricity from the mains.

Table 69: Population by Energy (Fuel) for Lighting

Energy (Fuel) for Lighting	Value	Percentage
Candles	26,784	5.5%
Electricity from mains	442,515	91.4%
Other source of electricity (e.g. generator etc.)	2,585	0.5%
Gas	1,060	0.2%
Paraffin	4,047	0.8%
Solar	3,828	0.8%
None	1,384	0.3%
Other	1,750	0.4%

Source: Stats SA, 2022

Table 70 below indicates access to refuse disposal, as recorded during the 2022 South African Census, within Madibeng Local Municipality. 34.3% of the population are getting refuse removal by local authority/private company/community members at least once a week.

Table 70: Population by Refuse (Rubbish) Service

Refuse (rubbish) service	Value	Percentage
Removed by local authority/private company/community members at least once a week	165,785	34.3%
Removed by local authority/private company/community members less often	8,098	1.7%
Communal refuse dump	12,434	2.6%
Communal container/central collection point	14,261	2.9%
Own refuse dump	240,078	49.6%
Dump or leave rubbish anywhere (no rubbish disposal)	36,943	7.6%
Other	6,355	1.3%

8-12.1 Traffic

Traffic from mining projects has the potential to affect the capacity of existing road networks, as well as result in public road safety issues.

8-12.1.1 Road Networks

A network of roads exists in and around Tharisa Mine. These include (Figure 73):

- N4;
- P2-4 (Old N4);
- D2565 – a gravel road in the far western section of the area;
- D1526/1566 - the main gravel road servicing the western part of the area;
- D1325 – Marikana Road;
- D108 – road between Marikana and Rustenburg;
- Internal Lonmin tarred road to the north of the area, that runs east – west;
- D1270 – a gravel road linking the eastern part of the area with Mooi-nooi; and
- Various unnamed, private gravel/dirt roads.



Figure 73: The Road Network Surrounding the Project Area

Mine-related traffic is largely limited to internal mine roads. The mine does however make use of external roads for the transport of staff and PGMs for sale to third parties.

8-12.2 Baseline health status: North West Province

The North West public health system has been in a state of crisis for many years. Of major concern is the persistent and widespread stockouts crisis across the province that causes people to be sent home from the clinic empty handed, or with shorter supplies of essential medicines than they need. We hear too many reports of people waiting long days at clinics only to be told there are no medicines when they finally get their turn at the pharmacy. The health crisis is worsened by severe understaffing and

shortages of healthcare workers that mean patients must wait in long queues for many hours to access the services they need.

The burden of disease in the North West Province of South Africa encompasses various health challenges affecting its population. While specific data might change over time due to evolving health trends, several key health issues commonly contribute to the burden of disease in this province:

- HIV/AIDs: Like many regions in South Africa, the North West Province has a significant HIV prevalence rate, leading to associated health complications.
- Tuberculosis (TB): TB remains a major health concern in the province, contributing substantially to the burden of disease.
- Non-Communicable Diseases (NCDs): Conditions such as cardiovascular diseases, diabetes, hypertension, and certain cancers are prevalent and contribute significantly to the province's health burden.
- Maternal and Child Health: Challenges related to maternal health, infant mortality rates, and child health indicators persist in certain areas of the province.
- Mental Health: Mental health disorders, including depression and anxiety, are prevalent health issues requiring attention and support services.
- Respiratory Diseases: Environmental factors and indoor air pollution may contribute to respiratory ailments amongst certain populations.
- Injuries and Accidents: Incidents related to road accidents, workplace injuries, and other trauma-related incidents contribute to the province's burden of disease.

8-13 VISUAL AESTHETIC

The visual character of an area is determined by considering landscape character, scenic quality, sensitivity of the visual resource, sense of place and visual receptors. Mine-related infrastructure and activities have the potential to alter the visual aspects in a project area and surrounding area.

In general, the landscape character surrounding the mine consists of flat plains with a gentle slope towards the north, the Magaliesberg Mountain range to the south and gabbro-norite hills in the north. The area surrounding the mine is largely characterised by mining activities including the Marikana Platinum Mine to the west, Western platinum Mine to the north and Samancor Western Chrome Mine to the east. Within the Tharisa MRA, the area is relatively flat and the East and West mining sections are separated by the perennial Sterkstroom River and the Marikana Road. The natural environment within and around the MRA has been extensively disturbed by past and current mining and private farming activities. As such, mining activities and residue facilities have become an integral part of the landscape topographical features and character.

The project area is largely disturbed and is characterised by Tharisa's mining-related infrastructure and activities as well as private farming and community related activities.

8-14 CLIMATE CHANGE CONTEXT RECEIVING ENVIRONMENT

Climate change is a global phenomenon caused by an increase in GHG emissions in the global atmosphere. It is characterised by shifts in long-term weather patterns and environmental conditions and affects ecosystems, societies, and economies worldwide.

Climate change transcends geographical boundaries as it manifests globally. GHG emissions disperse into and circulate within the atmosphere, thereby contributing to climate change beyond the boundaries of the emission source. As a result of this, emissions from a particular site or project and their resulting impact cannot be directly linked back to the emission source.

Figure 74 below illustrates how implementing a project that emits GHGs directly impacts the global carbon emissions inventory. As the project emits GHG emissions over time, it contributes to the annual global emissions, which in turn affects the global energy balance, leading to the GHG effect and ultimately contributing to global climate change. The principle that GHG emissions have no local impact and can therefore not be managed on a local level is fundamental to the formation of the global climate change bodies and related policies, such as the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol, and the Paris Agreement.

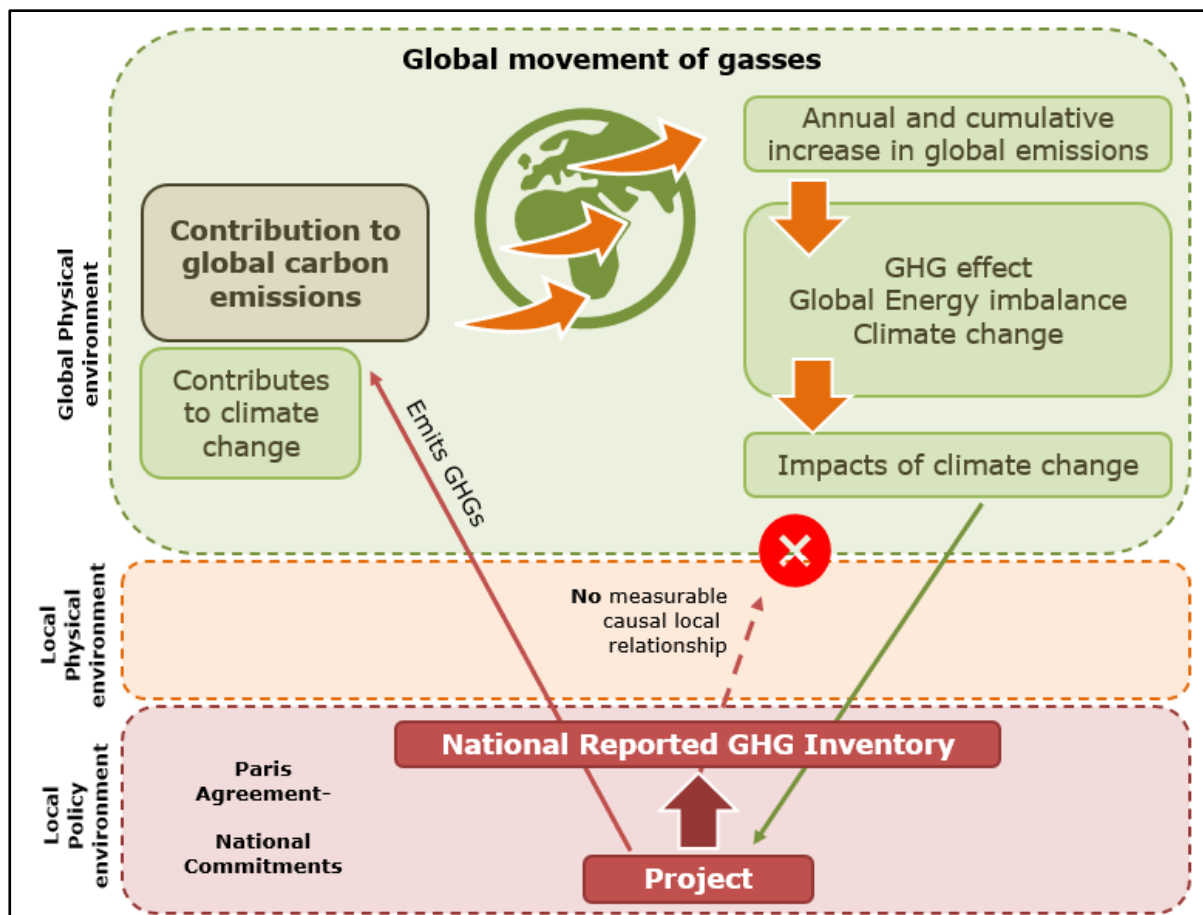


Figure 74: Relationship between a Project's GHG Emissions and the Policy Environment

Often, climate change is confused with air pollution. Although these concepts have related environmental issues, they have distinct characteristics and impacts. The main distinction lies in the timeframe of their occurrences: the effects of air pollution can be immediate or brief, as seen in respiratory issues during smog events, while climate change unfolds gradually over extended periods, such as the temperature rise observed over a decade or longer. Distinguishing between climate change and air pollution can be a challenging task.

Climate change indicators, such as sea level rise and the frequency of tropical storms, are used to evaluate the impact of climate change on various regions worldwide. While the impacts of sea level rise are primarily felt in coastal areas, climate change also affects non-coastal regions. However, if a GHG-emitting project is situated in a coastal zone, its emissions cannot directly correlate to the sea level rise in that specific area of the coastal zone.

Nevertheless, climate change needs to be considered from two perspectives, the physical environment, and the policy environment.

8-14.1 Global physical environment

It is important to reiterate that a global increase in GHG emissions can be directly linked to climate

change. There exist sufficient reputable data sources indicating the historical increase in annual global emissions, as illustrated in Figure 75, along with the rise in global cumulative emissions since the industrial revolution.

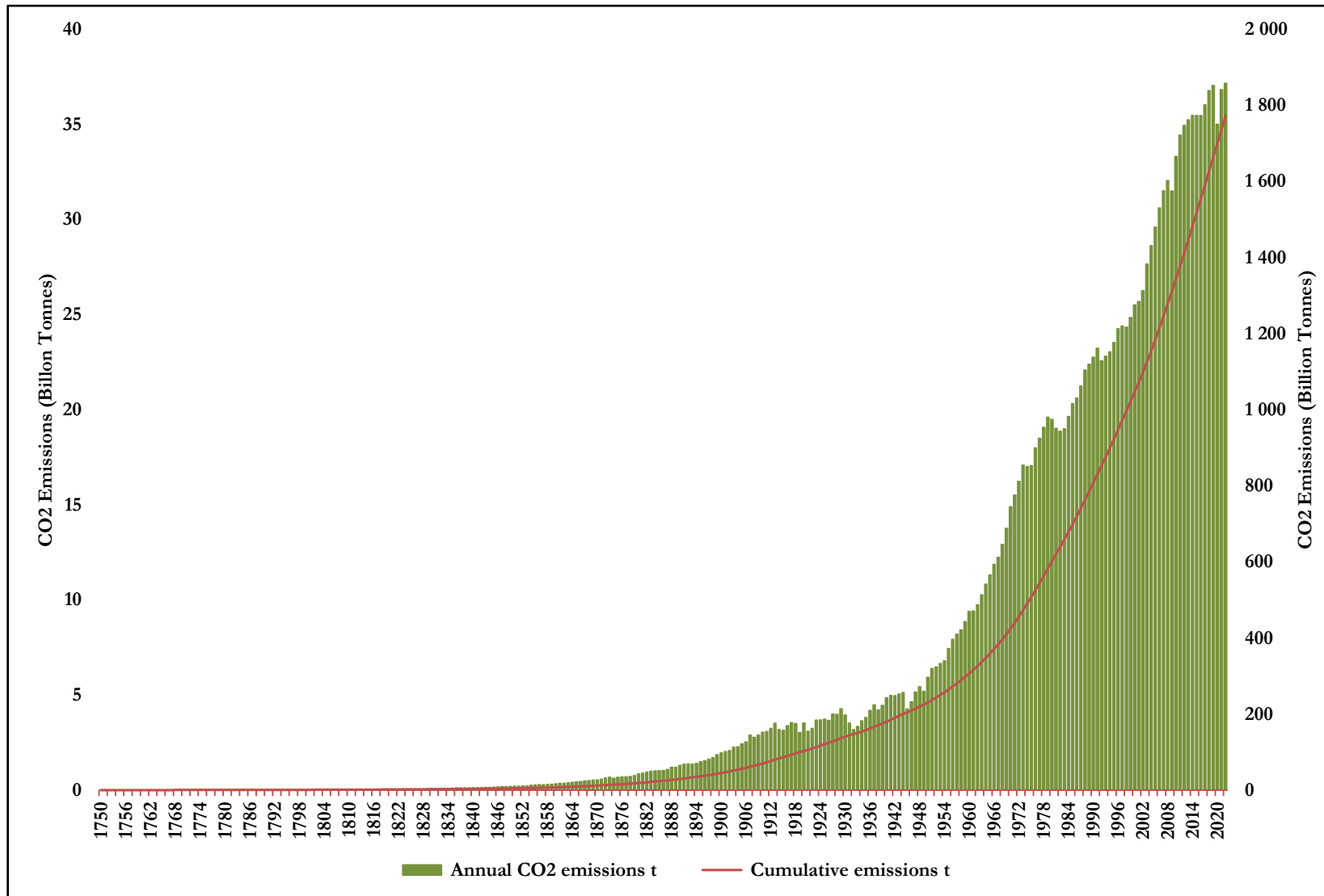


Figure 75: Global Annual CO₂ Emissions for the Period between 1750 and 2022 the Primary Axis, and the Cumulative CO₂ Emissions for the Period between 1750 and 2022 on the Secondary Axis ²

² Global Carbon Budget (2023)- obtained from Our World in Data, as available here [Annual CO₂ emissions \(ourworldindata.org\)](https://ourworldindata.org)

As indicated in Figure 75 above, the annual CO₂ emissions have increased consistently year-on-year since 1760, with the year 2022 recording the highest global emissions at 37 billion tCO₂.³ However, the cumulative emissions are a critical factor to consider. Since GHGs can persist in the atmosphere for years to centuries, cumulative emissions reflect the historical and ongoing contribution of human activities to the greenhouse effect and climate change. As illustrated, cumulative emissions rose from approximately 108 million tCO₂ in 1760 to 1 772 billion tCO₂ in 2022.

Climate change indicators are measurable parameters or phenomena that scientists use to track and assess changes in the Earth's climate system over time. These indicators provide evidence of climate change and its impacts on various aspects of the environment. Examples include:

- Temperature Anomalies: Monitoring changes in average global temperatures and temperature anomalies helps identify trends in warming or cooling patterns over time.
- Sea Level Rise: Measuring sea level changes and coastal inundation events provides insights into the melting of ice sheets, thermal expansion of seawater, and impacts on coastal regions.
- Greenhouse Gas Concentrations: Monitoring concentrations of GHGs (e.g., carbon dioxide, methane, nitrous oxide) in the atmosphere helps assess the role of human activities in driving climate change.
- Extreme Weather Events: Analysing trends in extreme weather events, such as heatwaves, droughts, heavy rainfall, hurricanes, and wildfires helps assess the influence of climate change on the frequency and intensity of these events.

The impact of increased global GHG emissions can be demonstrated using global average temperature anomalies. Data on global temperature anomalies for both the Northern and Southern Hemispheres has been collected since 1844, indicating a positive change in temperature per year in the Southern Hemisphere starting from 1983, as shown in Figure 76. In 2024, the Southern Hemisphere experienced its highest recorded average temperature anomaly of 0.77°C.

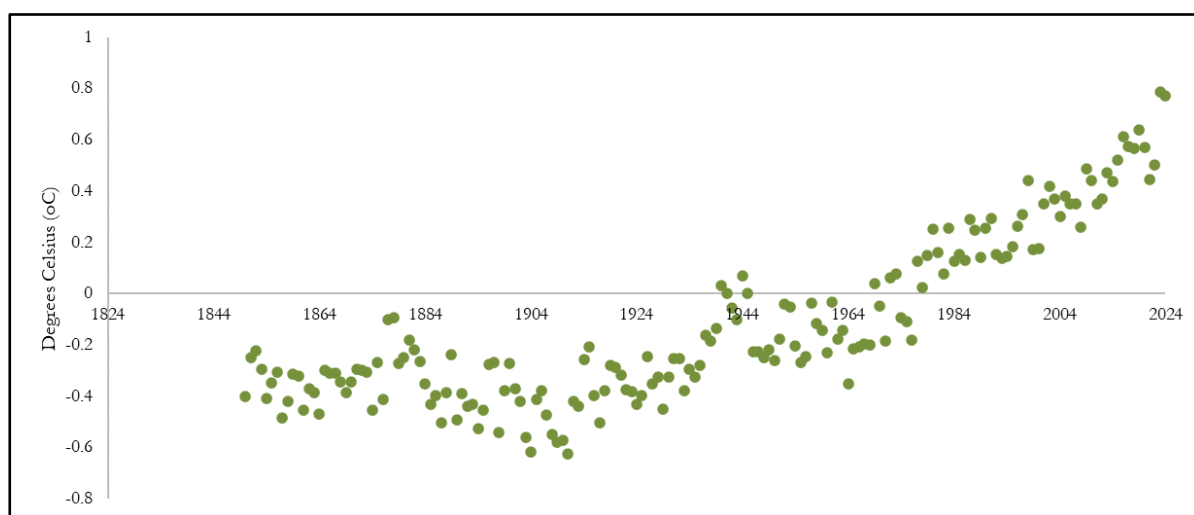


Figure 76: Annual Average Temperature Anomalies in the Southern Hemisphere for the Period between 1850 and 2024⁴

Similarly, the Northern Hemisphere (see Figure 77) has also observed an annual positive (increase) change in temperature since 1986, with the highest recorded average temperature anomaly for 2024 being 1.5°C. Comparatively, these trends highlight the noticeable impact of increased GHG emissions

³ The data used in this analysis does not include 2023 or 2024 as these years are not yet available in the data source at: Annual CO₂ emissions (ourworldindata.org).

⁴ Met Office Hadley Centre (2023) – processed by Our World in Data. "Mean" [dataset]. Met Office Hadley Centre, "HadCRUT5 HadCRUT.5.0.2.0" [original data].

on global temperatures in both hemispheres.

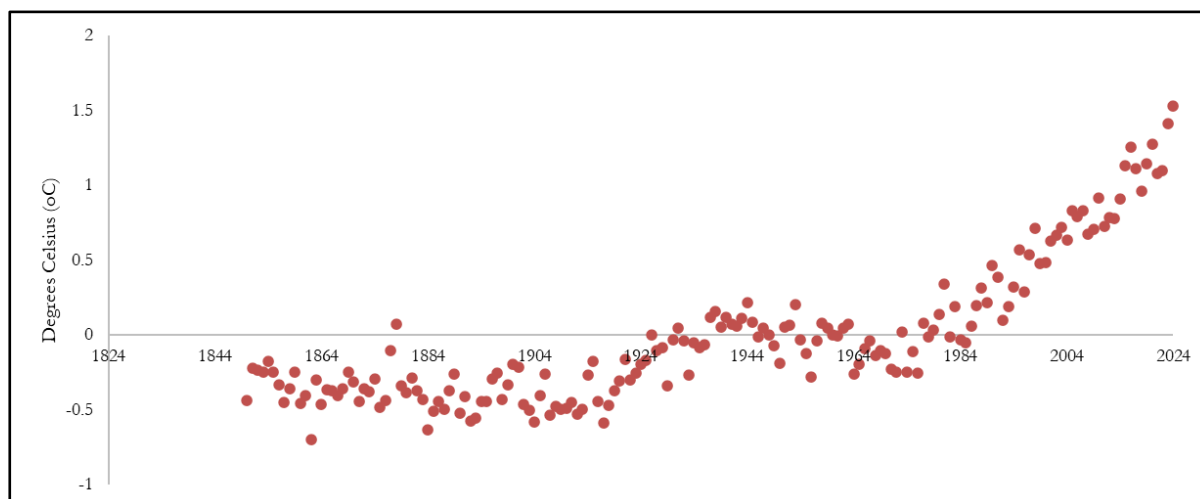


Figure 77: Annual Average Temperature Anomalies in the Northern Hemisphere for the Period between 1850 and 2024.⁵

8-14.2 South African emissions

Since 1884, South Africa has followed the global trend of increasing annual CO₂ emissions (see Figure 78). For example, in 1884, the annual emissions were calculated at 21 000 tCO₂ compared to the 447 million tCO₂ in 2020. Similarly, South Africa's cumulative emissions increased from 24 million tCO₂ in 1898 to 21 billion tCO₂ in 2020.

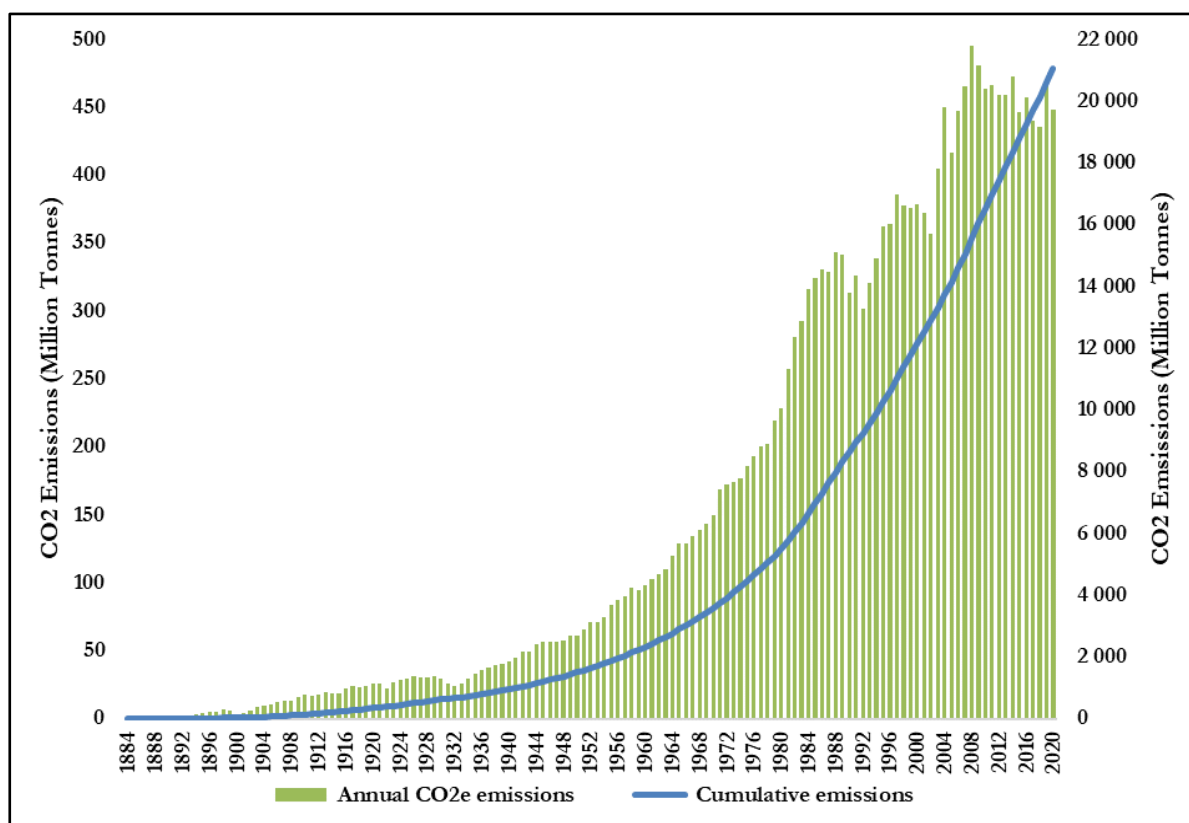


Figure 78: South African Annual CO₂ Emissions for the period between 1884 and 2020 the Primary Axis, and the Cumulative CO₂ Emissions for the Period between 1884 and 2020 on the Secondary Axis.⁶

⁵ Met Office Hadley Centre (2023) – processed by Our World in Data. "Mean" [dataset]. Met Office Hadley Centre, "HadCRUT5 HadCRUT.5.0.2.0" [original data].

⁶ Global Carbon Budget (2023) obtained from Our World in Data, as available here [Annual CO₂ emissions \(ourworldindata.org\)](https://ourworldindata.org). The date in this data set was limited to 2020, for both cumulative and annual emissions as the data from Global Carbon Budget deviates slightly from South Africa's National GHG Inventory for both 2000-2015 and 2000-2020.

Until 2022, South Africa's contribution to the global carbon emissions amounted to 21 billion tCO₂. To contextualise this, it represents a 1.2% share of global cumulative emissions (1 772 billion tCO₂) up to 2022. This is illustrated in Figure 79 below.

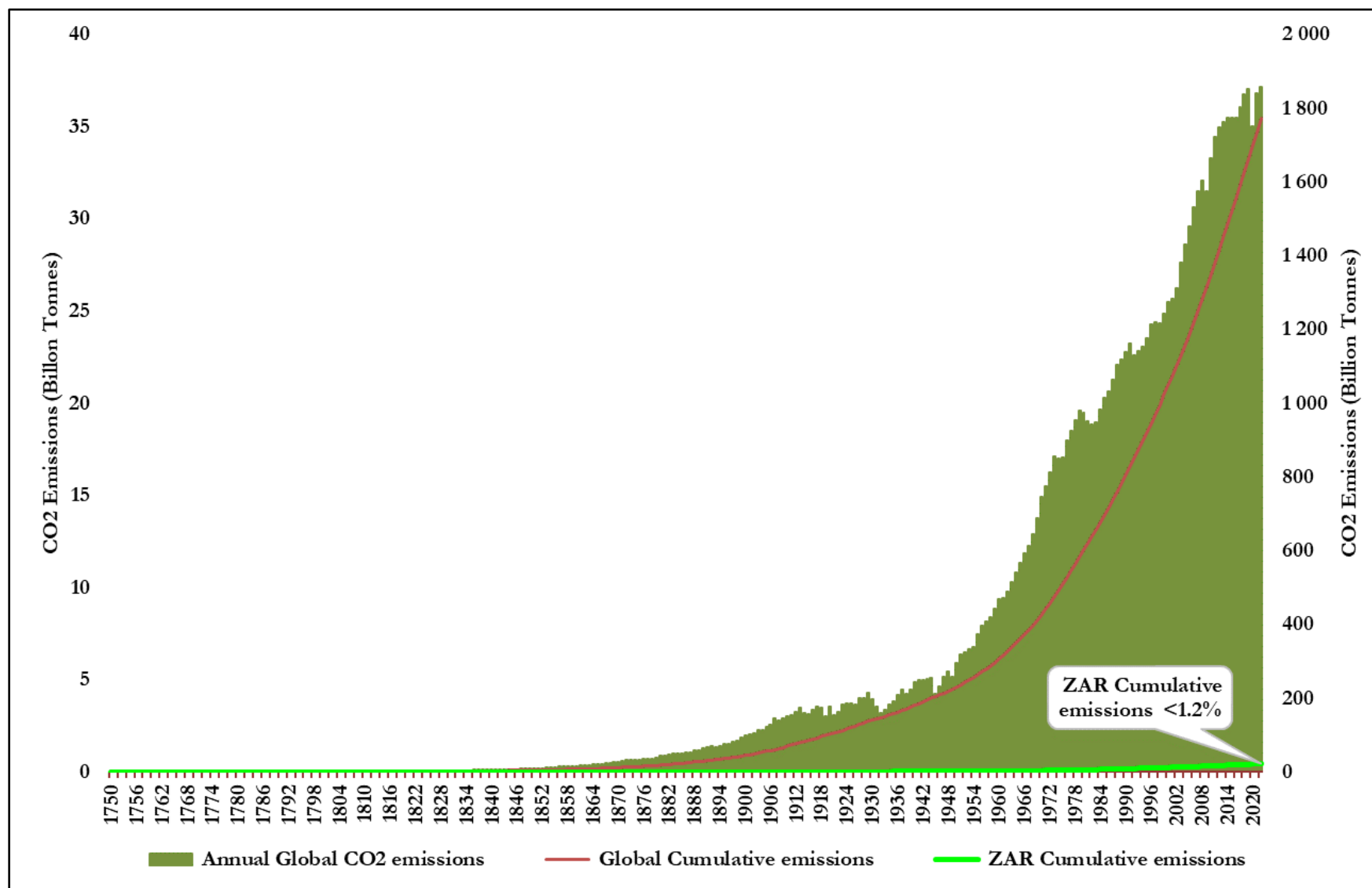


Figure 79: Global Annual CO₂ Emissions and Global Cumulative CO₂ Emissions for the Period between 1750 and 2022 Compared to the South African Cumulative CO₂ Emissions Between 1884 and 2022.⁷

⁷ Global Carbon Budget (2023) – as per available data obtained from Our World in Data, at: Annual CO₂ emissions (ourworldindata.org).

SECTION 9: POTENTIAL IMPACTS IDENTIFIED

9-1 HISTORICAL IMPACTS AND MANAGEMENT MEASURES

Impacts which were identified as part of the existing mining activities and infrastructure are presented in previous approved EMPs. The management measures identified within these EMPs will be detailed in the EMP (consolidated) to be complied with in terms of NEMA.

9-2 POTENTIAL IMPACTS AS A RESULT OF THE PROPOSED PROJECT

A number of potential impacts have been identified which will be considered further in the process as required. Typical impacts that will be investigated as part of this EIA include:

9-2.1 Potential Impacts for the Proposed Waste Rock Dumps and Upgrades/ Conversion of Associated Infrastructure, including Impacts that may Cumulate from Existing Infrastructure

CONSTRUCTION PHASE
• Destruction and disturbance of biodiversity. • Spreading and establishment of alien invasive species. • Habitat degradation. • Riverine destruction/ fragmentation of riparian habitats. • Road mortalities of fauna/ impact of human activities onsite. • Loss and degradation of aquatic resource habitat (wetland, riparian and instream). • Displacement/loss of aquatic fauna. • Change/deterioration of the ecological status of wetlands/rivers/streams. • Air pollution (dust). • Increase in ambient noise levels. • Change to the visual environment observed by sensitive receptors. No sense of place impact. • Impacts from earthworks. • Loss of land capability. • Loss of soil resources. • Soil compaction. • Soil erosion and sedimentation of watercourses. • Contamination of surface water and sedimentation. • Alteration of drainage patterns. • Contamination of groundwater. • Disturbance of heritage and paleontological resources. • Socio Economic impacts. • Community health impacts.
OPERATIONAL PHASE
• Continued destruction and disturbance of biodiversity. • Continued spreading of alien invasive species. • Ongoing habitat destruction/ fragmentation of fauna habitats. • Ongoing habitat degradation. • Ongoing road mortalities of fauna/ impact of human activities onsite. • Continued loss and degradation of aquatic resource habitat (wetland, riparian and instream). • Continued displacement/loss of aquatic fauna. • Continued deterioration of the ecological status of wetlands/rivers/streams. • Air pollution (dust). • Increase in ambient noise levels. • Change to the visual environment observed by sensitive receptors. No sense of place impact. • Loss of land capability. • Loss of soil resources. • Soil compaction. • Increased soil erosion and sedimentation of watercourses. • Contamination to surface water systems. • Alteration of drainage patterns. • Contamination to baseflow and groundwater systems.

- Nitrate mass migration.
- Socio Economic impacts.
- Community health impacts.

CLOSURE, REHABILITATION AND POST CLOSURE PHASE

Potential Negative Impacts:

- Spreading and establishment of alien invasive species.
- Habitat degradation.
- Road mortalities of fauna/ impact of human activities onsite.
- Loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Displacement/loss of aquatic fauna
- Change/deterioration of the ecological status of wetlands/rivers/streams.
- Air pollution (dust).
- Increase in ambient noise levels.
- Impacts from earthworks.
- Increased soil erosion and sedimentation of watercourses.
- Soil compaction.
- Contamination to surface water systems.
- Increased runoff.
- Contamination to groundwater and improvement thereof, post closure.
- Socio Economic impacts.

Potential Positive Impacts:

- Improvement of riparian habitat through revegetation/ succession over time.
- Carbon sequestration through re-vegetation.
- Improvement of land capability.
- Improvement of eroded soils and compaction.
- Land reclamation and stability.
- Improvement of the visual quality to nearby residential receptors as well as public roads.
- Improved water quality because of a fully rehabilitated environment.
- Restoration of ecosystems.
- Public safety and health.
- Economic diversification.
- Agriculture.
- Tourism and recreation.
- Renewable energy.
- Community empowerment.
- Sustainable infrastructure.

9-2.2 Potential Impacts for the Proposed 275kV Realignment and 88kV Upgrade

CONSTRUCTION PHASE

- Destruction and disturbance of biodiversity.
- Spreading and establishment of alien invasive species.
- Habitat degradation.
- Riverine destruction/ fragmentation of riparian habitats.
- Road mortalities of fauna/ impact of human activities onsite.
- Loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Displacement/loss of aquatic fauna.
- Change/deterioration of the ecological status of wetlands/rivers/streams.
- Air pollution (dust).
- Disturbing Noise.
- Change to the visual environment.
- Impacts from earthworks.
- Contamination and sedimentation of surface water.
- Alteration of drainage patterns.
- Socio Economic impacts, including traffic and safety related impacts.
- Disturbance of Heritage Resources.

OPERATIONAL PHASE

- Bird collision, electrocutions and faulting.
- Visual intrusion, impacting the area's rural sense of place.

Socio Economic impacts, including traffic and safety related impacts.
CLOSURE, REHABILITATION AND POST CLOSURE PHASE
- Improvement of riparian habitat through revegetation/ succession over time. - Spreading and establishment of alien invasive species. - Habitat degradation. - Road mortalities of fauna/ impact of human activities onsite. - Loss and degradation of aquatic resource habitat (wetland, riparian and instream). - Displacement/loss of aquatic fauna. - Change/deterioration of the ecological status of wetlands/rivers/streams. - Air pollution (dust). - Increase in ambient noise levels. - Improvement of the visual quality to nearby residential receptors as well as public roads. - Impacts from earthworks. - Contamination to surface water systems. - Alteration of drainage patterns. - Socio Economic impacts, including traffic and safety related impacts.

9-2.3 Potential Impacts for Tailings Storage Facility3 Slurry Pipeline

CONSTRUCTION PHASE
- Destruction and disturbance of biodiversity. - Spreading and establishment of alien invasive species. - Habitat degradation. - Riverine destruction/ fragmentation of riparian habitats. - Loss and degradation of aquatic resource habitat (wetland, riparian and instream). - Displacement/loss of aquatic fauna. - Change/deterioration of the ecological status of wetlands/rivers/streams. - Impacts from earthworks. - Contamination and sedimentation of surface water. - Alteration of drainage patterns.
OPERATIONAL PHASE
- Continued destruction and disturbance of biodiversity. - Continued spreading of alien invasive species. - Ongoing habitat destruction/ fragmentation of fauna habitats. - Ongoing habitat degradation. - Continued loss and degradation of aquatic resource habitat (wetland, riparian and instream). - Continued displacement/loss of aquatic fauna. - Continued deterioration of the ecological status of wetlands/rivers/streams. - Loss of soil resources. - Soil compaction. - Increased soil erosion and sedimentation of watercourses. - Contamination to surface water systems. - Alteration of drainage patterns.
CLOSURE, REHABILITATION AND POST CLOSURE PHASE
- Improvement of riparian habitat through revegetation/ succession over time. - Spreading and establishment of alien invasive species. - Habitat degradation. - Loss and degradation of aquatic resource habitat (wetland, riparian and instream). - Displacement/loss of aquatic fauna. - Change/deterioration of the ecological status of wetlands/rivers/streams. - Impacts from earthworks. - Contamination to surface water systems. - Alteration of drainage patterns.

9-2.4 Potential Impacts for the Proposed Lifting of the walls of Tailings Storage Facility 1 Phase 2

CONSTRUCTION PHASE
- Change in ambient concentrations. - Increase in ambient noise level. - Change in landscape and related visual aspects. - Contamination to ground- and surface water systems from oil, grease, and diesel spillages from construction vehicles.

OPERATIONAL PHASE
- Establishment of alien plants on disturbed areas. - Change in ambient concentrations. - Increase in ambient noise level. - Change in landscape and related visual aspects. - Contamination to baseflow and groundwater systems. - Contamination to ground- and surface water sources. - Increased surface run-off and erosion from the TSF. - Downstream sedimentation. - Failing stormwater infrastructure.
CLOSURE, REHABILITATION AND POST CLOSURE PHASE
<u>Potential Negative Impacts:</u> - Change in ambient concentrations. - Change in landscape and related visual aspects. <u>Potential Positive Impacts:</u> - Final landscaping and shaping impacts. - Increase in ambient noise level. - Contamination to ground- and surface water systems.

9-2.5 Potential Impacts for the Proposed Salvage Yard

CONSTRUCTION PHASE
- Air pollution (dust). - Increase in ambient noise levels. - Impacts from earthworks. - Contamination of groundwater.
OPERATIONAL PHASE
- Increase in ambient noise levels. - Loss of land capability. - Contamination to groundwater systems. - Socio Economic impacts.
CLOSURE, REHABILITATION AND POST CLOSURE PHASE
- Air pollution (dust). - Increase in ambient noise levels. - Impacts from earthworks. - Contamination to groundwater and improvement thereof, post closure. - Socio Economic impacts.

9-2.6 Potential Impacts for the Proposed Conveyor Belt

CONSTRUCTION PHASE
- Destruction and disturbance of biodiversity. - Riverine destruction/ fragmentation of riparian habitats. - Road mortalities of fauna/ impact of human activities onsite. - Loss and degradation of aquatic resource habitat (wetland, riparian and instream). - Displacement/loss of aquatic fauna. - Change/deterioration of the ecological status of wetlands/rivers/streams. - Air pollution (dust). - Increase in ambient noise levels. - Change to the visual environment. - Impacts from earthworks. - Contamination of surface water and sedimentation. - Alteration of drainage patterns. - Socio Economic impacts, including traffic and safety related impacts.
OPERATIONAL PHASE

- Continued loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Continued displacement/loss of aquatic fauna.
- Continued deterioration of the ecological status of wetlands/rivers/streams.
- Air pollution.
- Increase in ambient noise levels.
- Change to the visual environment.
- Alteration of drainage patterns.
- Socio Economic impacts, including traffic and safety related impacts.

CLOSURE, REHABILITATION AND POST CLOSURE PHASE

- Improvement of riparian habitat through revegetation/ succession over time.
- Spreading and establishment of alien invasive species.
- Habitat degradation.
- Road mortalities of fauna/ impact of human activities onsite.
- Loss and degradation of aquatic resource habitat (wetland, riparian and instream).
- Displacement/loss of aquatic fauna.
- Change/deterioration of the ecological status of wetlands/rivers/streams.
- Air pollution (dust).
- Increase in ambient noise levels.
- Improvement of the visual quality to nearby residential receptors as well as public roads.
- Impacts from earthworks.
- Contamination to surface water systems.
- Alteration of drainage patterns.
- Socio Economic impacts, including traffic and safety related impacts.

9-3 POTENTIAL FOR ACID MINE DRAINAGE (GROUND WATER CONTAMINATION)

Geochemical characterisation of the waste streams (tailings and waste rock) was carried out as part of the original EIA and EMPr for Tharisa Mine (Metago, 2008). Samples of the following were analysed: waste rock from exploratory drill cores and tailings from pilot metallurgical test work.

The results showed that the waste stream material is non-acid generating and has a medium neutralising potential. Similarly, the project components (particularly the waste rock and tailings) are not expected to generate acid. Therefore, the design of pollution abatement measures needs to consider the leachability of the waste under natural pH conditions to mildly acidic conditions.

SECTION 10: METHODOLOGY TO BE USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL AND SOCIAL IMPACTS

The following methodology complies with Regulation 31(2)(l) of the NEMA, which is utilised in the rating of significance of potential environmental and social impacts of the proposed project as part of the Impact Assessment Phase.

10-1 EXTENT

Rating	Description
Footprint/ site (1)	Extends only as far as the activity, such as footprint occurring within the total development area.
Local Area (2)	Affect the site.
Regional (3)	Affect the regions.
National (4)	Affects other provinces throughout the country.
International (5)	Affects other countries outside South Africa.

10-2 INTENSITY

Rating	Description
Very low (1)	Natural processes not affected
Low (2)	Natural processes slightly affected
Medium (3)	natural processes continue but in a modified manner A few times a month
Medium-high (4)	Natural processes are modified significantly
High (5)	Natural processes disturbed significantly so that they cease to occur (temporarily / permanently)

10-3 DURATION

Rating	Description
Short-term- few days (1)	The impact will eventually not be felt due to the implementation of mitigation measures 0-5 years.
Short-term- few months (2)	The impact will eventually not be felt due to the implementation of mitigation measures 0-5 years.
Medium-term (3)	5 to 15 years from construction.
Long-term (4)	The impact will last for the entire operational phase but will end at the end of operational phase due to natural processes or human interventions.
Permanent (5)	Mitigation either by human or natural interventions/ processes will not occur in such a way or in such a time span that the impact can be considered transient.

10-4 PROBABILITY

Rating	Description
Improbable (1)	The probability of an impact occurring is none, either due to the design, historic circumstances, design or experience.
Possible/ probable (2)	The probability is very low.
Likely (3)	The probability is low.
Highly probable/ possible (4)	It is most likely that the impact will occur.
Definite (5)	The impact will occur regardless of any prevention measures.

10-5 DETERMINATION OF SIGNIFICANCE WITHOUT MITIGATION

Significance provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact without mitigation is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as positive. Significance will be rated on the following scale:

SIGNIFICANCE = E+ I+ D + P

The minimum result should give a minimum value of 5, maximum of 25. This will determine whether the impact is negative or positive.

Rating	Description
No significance= <1	The impact is not substantial and does not require any mitigation action
Low = 1– 5	Low consequence, probably, minimal mitigation may be required.
Medium = 6 to 10	Medium consequence, probably, mitigation is advised / preferred. The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
Medium–high = 11 to 15	Medium to high consequence, probably to very probable, mitigation is necessary. The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
High = 16 to 20	High consequence, probably / definite, mitigation is essential. The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

10-5.1 Mitigation

The impacts that are generated by the project activity can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the project activity considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

10-6 DETERMINATION OF SIGNIFICANCE WITH MITIGATION

Determination of significance with mitigation refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation will be rated on the following scale:

Rating	Description
No significance:	The impact will be mitigated to the point where it is regarded as insubstantial.
Low	Low consequence, probably, the impact will be mitigated to the point where it is of limited importance.
Medium	Medium consequence, probably, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw;
Medium–high	Medium to high consequence, probably to very probable, mitigation is necessary. The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
High	High consequence, probably / definite, mitigation is essential. The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.
Extreme	Very high consequence, definite, fatal flaw.

SECTION 11: POSITIVE AND NEGATIVE IMPACTS OF THE PROPOSED ACTIVITY AND ALTERNATIVES

Refer to Section 9-2 for the potential positive and negative impacts which have been identified for the proposed project. A detailed assessment of the potential positive and negative environmental and social impacts associated with the proposed project will be developed and included in the EIA and EMP Report.

SECTION 12: POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK

Mitigation measures are implemented to ensure that the identified impacts from the proposed project activities are reduced as far as possible.

The specialist studies will assess potential environmental and social impacts that may occur as a result of proposed activities related to the proposed project. Appropriate mitigation and management measures to avoid and/or minimise the identified impacts associated with the project will be developed and included in the EIA and EMP Report. Refer to 9-2 for the potential positive and negative impacts which have been identified for the proposed project.

Specialists will be informed to be cognisant of the following mitigation measure objectives:

- To find more environmentally sound ways of undertaking specific activities;
- To enhance any environmental and social benefits of a proposed activity;
- To avoid, minimise or remedy negative environmental impacts; and
- To ensure that any residual negative environmental impacts are environmentally acceptable.

The identification of appropriate mitigation measures will be conducted in a hierarchal manner:

- Preventative measures will be identified to avoid, where possible, negative impacts that may arise as a result of the proposed activity;
- Measures will be identified to minimise and/or reduce the negative impacts to “as low as practicable” levels; and
- Measures will be identified to compensate or remedy residual negative impacts that are unavoidable and cannot be minimised or reduced any further.

Table 72 below provides high level mitigation measures for potential impacts identified for the proposed project. Additional measures will be provided for in the EMP to be developed during the Impact Assessment Phase.

SECTION 13: MOTIVATION WHERE NO ALTERNATIVES WERE CONSIDERED

This section is not applicable. Refer to SECTION 6: for the alternatives which have been considered, which will further be assessed in the Impact Assessment Phase.

SECTION 14: STATEMENT MOTIVATION THE PREFERRED SITE

The preferred sites are motivated for the proposed activities as the new infrastructure is designed to be located within the existing MRA and to optimise the use of current resources and infrastructure. The proposed site layout and activities represent the BPEO as they minimise potential negative impacts, streamline management and are aligned with both project goals and regulatory requirements.

The proposed sites are the only feasible locations for the new infrastructure for the following reasons:

- Optimal use of Existing Infrastructure and Disturbed Areas: Most of the project area has already been disturbed by previous mining activities. By placing new infrastructure within this existing footprint, the project avoids disturbing new, undisturbed areas and reduces the risk of new ecological impacts. This approach aligns with the principle of optimising resource use and operational practices.
- Avoidance of Environmental and Social Sensitivities: The layout of the new infrastructure has been specifically designed to avoid sensitive environmental and social features. For instance, the TSF 3 safety berm was redesigned to have a 100-meter buffer from heritage resources. This demonstrates a conscious effort to protect sensitive areas.
- Technological and Operational Feasibility: Alternatives like backfilling open pits with waste rock are not currently feasible as the pits are still operational. Building new surface WRDs is the only viable option for waste storage at this time. The chosen technology for tailings disposal is a continuation of the current method, which the mine has existing knowledge and infrastructure for, making it the preferable and more reliable method.
- Compliance with Legal and Administrative Requirements: The decision to consolidate all EAs, WMLs, and EMPs into a single document was a directive from the DMPR. This consolidation will streamline environmental management and improve operational efficiency. The project also requires a WULA for specific activities, which is being undertaken concurrently.

The "no-go" alternative would not be a viable option, as it would prevent the project from obtaining the necessary consolidation and amendment approvals, leading to significant administrative burdens and potential mine closure. This would result in the loss of economic benefits and employment opportunities that the mine provides to the local communities and the wider regional and national economy.

SECTION 15: PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

15-1 DESCRIPTION OF ALTERNATIVES TO BE CONSIDERED INCLUDING THE OPTION OF NOT GOING AHEAD WITH THE ACTIVITY

Refer to SECTION 6: for consideration of alternatives.

15-2 DESCRIPTION OF ASPECTS TO BE ASSESSED AS PART OF THE EIA PROCESS

Different impacts can occur during the different phases of a project, from pre-construction to final rehabilitation and closure phase. For this reason, project specific activities that will be undertaken during each project phase will need to be assessed in light of the methodology detailed in SECTION 10: of this report.

The following aspects will be assessed as part of the EIA process:

- Rehabilitation and Closure Impacts.
- Social Impacts (Including Human Rights).
- Air Quality Impacts.
- Ground water Impacts.
- Surface Water Impacts.
- Noise Impacts.
- Terrestrial Biodiversity (Fauna and Flora) Impacts.
- Aquatic Ecology Impacts.

- Wetland Impacts.
- Soils, Land Use and Land Capability Impacts, including Agriculture Loss.
- Hydropedological Impacts.
- Cultural Heritage Impacts.
- Traffic Impacts.
- Visual Impacts.
- Climate Change and GHG Impacts.

15-3 DESCRIPTION OF ASPECTS TO BE ASSESSED BY SPECIALISTS

The following specialists' studies will be undertaken, for the various environmental aspects:

- Rehabilitation and Closure Plans.
- Social Impact Assessment (Including Human Rights Assessment).
- Air Quality Impact Assessment.
- Ground water (including Waste Classification, Geochemical Assessment, Water Balance and Ground Water Model).
- Surface Water Management Assessments.
- Noise Impact Assessment.
- Terrestrial Biodiversity (Fauna and Flora).
- Aquatic Ecology Impact Assessment.
- Wetland Impact Assessment including Risk Assessment, Landscape Plan with Design, including and Maintenance Plan.
- Soils, Land Use and Land Capability including Agriculture Loss.
- Hydropedology Assessment.
- Cultural Heritage Impact Assessment.
- Traffic Impact Assessment.
- Visual Impact Assessment.
- Climate Change and GHG Assessment.

The specialists will assess the impacts (including cumulative effects) of the proposed activities/aspects in relation to the construction, operational, closure and decommissioning phases. The reports will detail appropriate and implementable measures to avoid, mitigate and manage the potential impacts that have been identified.

15-4 TERMS OF REFERENCE FOR SPECIALIST STUDIES

Table 71 outlines the studies proposed during the EIA Phase of the project and the proposed scope of work to be undertaken as part of the S&EIR process:

Table 71: Terms of Reference for Specialist Studies

Study	Terms of Reference
Rehabilitation and Closure Plans	The financial provisions will be determined using the DMPR Master Rates, as per the requirements of the DMRE Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine (January 2005). The cost estimate will be aligned with the requirements of Regulation 54 of the Mineral and Petroleum Resources Development Regulations (GNR. 527 of 2004) which requires that an applicant or holder of a permit or right must determine and make financial provision to guarantee the availability of sufficient funds for the rehabilitation and remediation of adverse environmental impacts to the satisfaction of the Minister responsible for Mineral Resources. The unit (Master) rates for each closure component will be taken from the DMPR guideline (and inflated by the Consumer Price Index (CPI) to account for escalation since January 2005) and a Multiplication Factor applied depending on the Risk Ranking and the Environmental Sensitivity.

Study	Terms of Reference
	The approach followed for the closure costs estimate determination will be as follows: • Review the available background information. • Measure the individual infrastructure and operational areas that inform the closure costs determination, using Google Earth and the available conceptual mine layout and planning drawings. • Develop and populate a site-specific closure costing workbook based on the above. • Revise and update the master unit rates table according to the latest third-party rates. • Identify site-specific aspects requiring unique mitigation approaches not catered for by the “standard” unit rate sheet and devise appropriate measures and associated unit rate costs for these. • Determine the costs associated with monitoring, maintenance and aftercare that would be required to verify that key rehabilitation success criteria have been achieved. • Provide narratives for each closure cost item, describing key assumptions/qualifications and other considerations which have been considered in the cost item. • Compile summary sheets providing aggregated costs at facility and operational complex-wide levels.
Social and Human Rights Impact Assessment	The Social Impact Assessment, including Human Rights Study, will include the following: <u>Desktop study</u> • An in-depth desktop study will be conducted making use of existing material including but not limited to existing literature, social/socio-economic statistical data, maps, and aerial imagery. It is acknowledged that this has been done recently and, therefore, the desktop study will focus on new areas or new subjects relevant to potential social impacts potentially arising from the current assignment (importantly, the desktop study and resultant description of the environment will not attempt to provide a definitive treatise on the baseline demographic, socio-economic and livelihood environments of the environment in which Tharisa Mine is located). <u>Identification of and engagement with key stakeholders (specifically communities, community representatives, local businesses (including commercial agriculture), Tharisa Mine representatives, organised labour, local government, etc.)</u> • This will be done in close collaboration with the client’s public participation team. <u>Site visit</u> • It is anticipated that a site visit will be conducted during which formal and informal interviews will be conducted with key stakeholders and representatives of key organisations. Where necessary, these engagements will be followed up telephonically and/or via email. <u>Impact identification and assessment</u> • Identified impacts and sensitivities will be assessed using ACER’s qualitative assessment conventions, presented in MCs reporting format. <u>Human rights assessment</u> • This will cover aspects such as land management (nomadic people (past and present), conflicts concerning land ownership/land-use entitlements/rights, resettlement (economic and physical) and current resource use in support of livelihoods); cultural impacts (presence of important cultural, architectural, archaeological, paleontological, artistic, historical or environmental sites); security (public and private security forces (previous and present conduct and actions, including the use of force); operational matters (effects of mining on peoples’ livelihoods, pollution, health, etc.); and complicity (government conduct and actions vis-a-vis human rights). <u>Reporting</u> • A standalone report, including human rights, will be produced on the understanding that the EAP will feed findings and recommendations into the EIA and EMP Report.
Air Quality Impact Assessment	The study will include the following: • Project information review and consolidation • Consolidate emissions inventory for all relevant projects, and update where needed. • Atmospheric dispersion simulations, extractions and assessment of impacts. • Proposing mitigation measures for the anticipated impacts.

Study	Terms of Reference
Ground Water Impact Assessment, including waste classification, geochemical assessment, water balance and groundwater model	• Compile a consolidated report reflecting all proposed projects. The study will include the following: • Data Review and inclusion/consolidation of all hydrogeological data from previous studies. • Historical geochemical waste assessment review. • Ground water flow and mass transport numerical modelling (Impact Assessment). • Update of the site wide static mine water and salt mass balance to calculate potential water surplus/shortage based on additional facilities and new layouts. • Cumulative effects analysis for the consolidation of EAs and EMPs.
Surface Water Impact Assessment	The study will include the following: • Site Assessments: A site visit for site familiarisation and status quo observations site wide. • Information Review and Baseline Hydrology: Gathering, reviewing, and consolidating data in available surface and other reports; and previous approvals, for climatic data and interpretation of baseline hydrology and water quality results. • Conceptual Stormwater Management Plan (SWMP): Review previous SWMPs from Tharisa in GIS/ CAD and Design Reports and compile existing catchment characteristics and peak flows. Delineate catchments, calculate 1:50 year peaks, and propose SWMP for the proposed infrastructure. Consolidate the delineated clean and dirty catchments, and SWMP with existing drains, storages, and management recommendations. The SWMPs should align with the DWS best practice guidelines BPG1 and GN704 but exclude engineering designs. • Floodlines: Topographical and project location information review, catchment delineation and update the parameters. Modelling of 1:50 and 100-year peak flows using appropriate methods for all associated sub-catchments. Floodlines need to be modelled to include the whole MRA. Undertake Steady state 1-D hydraulic modelling in HEC-RAS and determination of the 50 and 100 year floodlines and GIS maps. A single scenario is assumed, and no river diversions have been included in the scope. • Impact Assessment: Identification and rating assessments of impacts for the proposed infrastructure and increased MR footprint. Include recommendations and mitigation measures. • Reporting: Report consolidation of the above findings, which will include surface water management measures for impact management and monitoring plans.
Noise Impact Assessment	The Noise Impact Assessment will include the following: • Processing and analysis of available baseline noise data (monthly noise surveys are conducted by Thlago Environmental Health & Safety Solutions). • Noise emissions from all proposed activities will be estimated. The propagation of noise will be simulated using CadnaA software for industrial applications. Data representative of conditions in the study will be obtained from the air quality study which will be applied in the calculations. • Consolidate the noise source inventory to reflect all the approved and EAs and EMPs, including EIA processes that are currently in progress. • Noise impacts will be calculated both in terms of total ambient noise levels as a result of the proposed activities, as well as the effective change in ambient noise levels. Impacts will be calculated and assessed according to guidelines provided by the International Finance Corporation (IFC). • The findings of the above components informed recommendations of noise management measures, including mitigation and monitoring (if necessary). • The compilation of a comprehensive Noise Impact Assessment Report.
Terrestrial Ecology Assessment	The <u>faunal surveys</u> will include the following: • Compilation of an expected species list. • Compilation of an identified species list. • Identify any Red Data or listed species present or potentially occurring in the area. • A proximity assessment to any protected or ecologically important areas. • A habitat assessment and delineation. The field survey for fauna will be undertaken concurrently with vegetation surveys. All animals observed in the area will be noted. Ecological indicators, such as calls, tracks and dung will be noted and regarded as indicative of the presence of that particular animal. A detailed fauna list will be compiled and discussed in relation to the floristic survey findings. The probability of occurrence for species not observed during field surveys will be considered if

Study	Terms of Reference
	applicable regarding available habitats. Protected and endemic species will be the focus of discussion. Faunal composition of disturbed sites will be compared to the composition of undisturbed areas. The current status of the faunal environment will be determined and an evaluation of the extent of site-related effects in terms of certain ecological indicators, as well as identification of specific important ecological attributes such as rare and endangered species, protected species, sensitive species and endemic species will be made. The faunal environment and habitat will be characterised in relation to biota and the extent of site related effects. Presence of red data and protected species will be indicated on a map. The <u>plants and vegetation surveys</u> will include the following: • A survey for Red and Orange Data plant species. • Vegetation units will be identified, classified and delineated. • Habitat types will be classified and delineated. • The survey will be conducted in consultation with local authorities who have information to be considered. • The survey area will include the project area. Protected, endemic, exotic, alien invasive and culturally significant species will also be discussed as separate issues and related back to relevant legal requirements. Furthermore, the identification of red data and protected species as listed according to the International Union for Conservation of Nature (IUCN) List, NEMBA and other Provincial and National legislation will be completed. Depending on the vegetation and terrain, the timed meander sampling could be used during vegetation assessments, however, should dominant vegetation types require other methods be used, then these shall be motivated. The <u>habitat features surveys</u> will include the following: • The identification of these features and delineation thereof. • The location of any unique or protected habitat features. All sensitive areas, as described by the provincial and national legislation, will be identified. The locality and extent, as well as species composition of sensitive areas such as the wetlands or pans, streams, rivers and rocky outcrops will be conducted to identify and map all such sensitive areas present. Sensitive areas will be identified and delineated. An impact assessment culminating in recommendations and mitigation measures will be conducted.
Aquatic Ecology Impact Assessment	The areas will be traversed on foot to identify local freshwater resources. The following will be achieved to supplement the approach: • A desktop assessment of all available datasets. • GIS processing to preliminary identify water accumulation areas. • The delineation of water resources in accordance with the DWAF (2005) guidelines, whereby the outer edges will be identified. • A functional and integrity assessment of the water resources. The "Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries" (Macfarlane, et al., 2014) will be used to determine the appropriate buffer zone for the proposed activity. The risk assessment will be completed in accordance with the requirements of the DWS GA in terms of Section 39 of the NWA for water uses as defined in Section 21(c) or Section 21(i) (GN 4167 of 2023).
Wetland Impact Assessment	This will include: • A desktop assessment of all available datasets. • The wetland areas will be delineated in accordance with the DWAF (2005) guidelines, whereby the outer edges of the wetland areas were identified. • Completion of the ecological functional assessment. • An assessment of the impacts of the project; • Recommendations and mitigation measures based on the outcome of the impact assessment.

Study	Terms of Reference
	The “Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries” (Macfarlane, et al., 2014) will be used to determine the appropriate buffer zone for the proposed activity. The risk assessment will be completed in accordance with the requirements of the DWS GA in terms of Section 39 of the NWA for water uses as defined in Section 21(c) or Section 21(i).
Soils, Land Use and Land Capability including Agriculture Loss Assessment	The agricultural theme sensitivity is classified as medium and low sensitivity. Based on this, it is proposed that a compliance statement be submitted. Land capability and agricultural potential are determined by a combination of soil, terrain and climate features. Land capability is defined by the most intensive long term sustainable use of land under rain-fed conditions. At the same time an indication is given about the permanent limitations associated with the different land use classes. Land capability is divided into eight classes, and these may be divided into three capability groups. The land classes and groups are arranged in order of decreasing capability and ranges of use. The risk of use increases from class I to class VIII (Smith, 2006). The land potential classes are determined by combining the land capability results and the climate capability of a region. Land use will be identified using aerial imagery and then ground-truthed while out in the field. The land use categories are split into: • Cultivated. • Grazing. • Natural. • Mines. • Urban Built-Up. • Waterbodies.
Hydropedology Impact Assessment	The approach of this assessment is based on the protocols compiled by van Tol et al., (2021) and issued by the DWS. According to these protocols, four main steps are required depending on the level of the hydropedology assessment: • Identification of dominant hillslopes. • Conceptualise hillslope hydrological responses. For impact assessments associated with activities that pose significant threats on the interflow volumes of a landscape or activities that are expected to drastically change the dynamics of a landscape (i.e. open cast mining), all four steps are required. For those activities that only include minor impacts (i.e. installation of a pipeline), only the first two steps are required. Considering that the first two steps will be required, the following is included in the assessment: • Identification of representative hillslopes from satellite imagery, terrain analysis and legacy soil data. • Hydropedological survey of representative hillslopes on the site according to the methodology of van Tol et al., 2017. • Conceptualisation of hydrological behaviour of representative hillslopes based on interpretations of soil morphological properties and their spatial distribution (dominant drivers and responses).
Cultural Heritage Impact Assessment	<u>Heritage Management:</u> • The study will define the heritage component of the EIA process to be undertaken for the proposed project. The HIA report will attempt to evaluate both the accumulated heritage knowledge of the area and information derived from direct physical observations. <u>Inventory:</u> • Inventory studies will involve the in-field survey and recording of archaeological resources within a proposed development area. The nature and scope of this type of study is defined primarily by the results of the overview study. In the case of site-specific developments, direct implementation of an inventory study may preclude the need for an overview. • There are several different methodological approaches to conducting inventory studies. Therefore, the proponent, in collaboration with the archaeological consultant, must develop an inventory plan for review and approval by the SAHRA prior to implementation. <u>Evaluating Heritage Impacts:</u>

Study	Terms of Reference
	• A combination of document research as well as the determination of the geographic suitability of areas and the evaluation of aerial photographs will determine which areas could and should be accessed. • After plotting the site on a Global Positioning System (GPS), the areas will be accessed using suitable combinations of vehicle access and access by foot. • Sites will be documented by digital photography and geo-located with GPS readings using the WGS 84 datum. An aerial drone will be used to evaluate the site from different heights and to improve coverage of the area. • Further techniques (where possible) will include interviews with local inhabitants, visiting local museums and information centres and discussions with local experts. All this information will be combined with information from an extensive literature study as well as the result of archival studies based on the SAHRA provincial databases. • The HIA will rely on the analysis of written documents, maps, aerial photographs and other archival sources combined with the results of site investigations and interviews with effected people. Site investigations are not exhaustive and often focus on areas such as river confluence areas, elevated sites or occupational ruins.
Traffic Impact Assessment	Traffic Impact Assessment will involve the following tasks: • Traffic counts (weekdays peak hours). • Inspect only external key intersections. • Obtain relevant site information and surrounding mine infrastructure. • Liaise with road authorities (where applicable). • Trip generation, distribution and assignment. • Key intersections – SIDRA analyses. • Prepare all required traffic volume figures. • Evaluate the accesses and address/propose improvements/safety measures where required. • Evaluate traffic impact and baseline. • Address impact and safety measures. • Prepare TIA Report. • Prepare/ complete Risk Assessment/ Matrix. • Submit the Traffic Impact Assessment Report.
Visual Impact Assessment	The Category of Development and Level of Assessment will be determined as outlined by Oberholzer (2005) prior to conducting a field assessment. The following input will also be provided (Oberholzer, 2005): • Identification of issues raised in Scoping Phase. • Field assessment. • Description of the receiving environment and the proposed project. • Establishment of Receptor Site areas, view corridors, viewpoints and receptors. • Indication of potential visual impacts using established criteria. • Inclusion of potential lighting impacts at night. • Description of alternatives, mitigation measures and monitoring programmes. • 3D modelling and simulations, with and without mitigation. <u>Identification of Issues Raised:</u> • Any issues relating to visual impacts from the proposed project raised during the PPP will be addressed in the Visual Impact Assessment report. <u>Field Assessment:</u> • A site visit, including a drive-around and on-foot survey of the project area and surroundings will be conducted. Surrounding villages, towns, as well as prominent roads and important landmarks within the area will be visited or driven and points recorded (making use of GPS) from where the proposed project might be visible, in order to identify aesthetically sensitive viewpoints and receptors in relation to the proposed project. • High resolution photographs will be taken from areas from where the proposed project will have the highest visual impact. These photographs will serve as the basis from which to develop a conceptual visual model and will be interpreted to provide accurate indication of the visual impact that the proposed project will have on the aesthetic integrity of the surrounding areas.

Study	Terms of Reference
	<u>Description of the Receiving Environment:</u> - As part of the description of the receiving environment, a desktop study will be completed through making use of 1:50 000 topographic and relief maps as well as high-definition aerial imagery and obtaining data from relevant datasets. These will be used to identify landforms and landscape patterns, while computer programmes will be utilised in conceptually modelling the topography of the area in order to determine the level of visual exposure and intrusion of the proposed project. - The existing visual and aesthetic characteristics of the proposed development and its surroundings will be described in terms of existing surface infrastructure and land cover, land use, landscape character, landscape integrity and Visual Absorption Capacity (through analysis of visual variety, vegetation and topographical diversity). The sense of place of the region surrounding the project site will be determined and factors impacting upon the sense of place will be described. Landscape integrity will also be defined in terms of the level of intactness of the natural and cultural landscape and lack or presence of visual intrusions and incompatible structures. <u>Establishment of Viewsheds, Key Observation Points and Sensitive Receptors:</u> - Receptor sites and potential sensitive receptors will be established through determining areas from where the proposed project might be visible to surrounding tourism areas, schools, residential areas, motorists, etc. and where such areas overlap with viewsheds as generated through digital elevation modelling. - The potential density/ number of observers within a receptor site and their perception of the development (which in turn is determined by cultural background, state of mind, reason for the sighting and how often the project is viewed in a set period) will also be considered. - Special attention will be given to determining visual impacts from surrounding natural (and protected) areas. This will be done through analysis of the topography, digital terrain modelling and determining the observer proximity to the proposed project. - In addition, overall visual sensitivity of the region and potential horizon effects will be determined by a combined number of factors, such as prominent topographic or other scenic features, including high points and ridges. - Visual exposure and line of sight analysis utilising digital terrain modelling and elevation profiles will be conducted to support the results of view shed and sensitive receptor identification. Viewpoints and view corridors will be identified through selection based on prominent viewing positions in the area which will be used as a basis for determining visual exposure, visibility and visual impacts of the proposed activities. <u>Visual Impact Assessment:</u> - The overall objective of the VIA is to assess the significance of potential visual impacts as a result of the proposed project and to determine whether the project is in conflict or compatible with its surroundings. - Potential visual impacts will be identified using standard criteria such as geographic view shed and viewing distance, as well as qualitative criteria such as importance to surrounding land users and compatibility with the existing landscape. - Any issues relating to visual impacts from the development raised during the Scoping Phase of the project will be addressed in the VIA report. Impacts may include visibility impacts, visual exposure impacts, visual intrusion impacts and alteration to landscape morphology. <u>Night Lighting Impacts:</u> - The potential night light impacts on the region will be assessed taking into account regional topography, current levels of similar development in the area, the density of neighbouring settlements and the distance of the proposed project from sensitive receptors. - The size of the proposed project expected lighting source intensity, potential light spillage, building luminance and duration of night time operations (including lighting from mobile equipment) will also be considered. <u>Alternatives Description, Mitigation Measures and Monitoring:</u> - Project alternatives, which may affect potential visual impacts (if applicable), will be described. Suitable mitigation measures will be developed to minimise the impact of the proposed project as far as possible. <u>3D Modelling and Simulations:</u>

Study	Terms of Reference
	Digital 3D topographic models will be developed to support the visual analyses, if required, in line with the guidelines prepared by Oberholzer (2005). Areas will be recorded to show the characteristic landscape of the local area with three dimensional (3D) simulations of the proposed development indicated for illustrative purposes, as viewed from the Key Observation Points.
Climate Change Assessment	The Climate Change and GHG Assessment will be undertaken according to the following methodology: <u>Construction Phase:</u> - Calculate the carbon footprint of the project for the construction phase. - Screening of applicable project GHG emissions related to the proposed project. - Where information is not available in this regard, the specialist will develop a set of assumptions to inform the upstream and downstream GHG emissions. <u>Operational Phase:</u> - Calculate the carbon footprint of the proposed project during its operational phase. - The resilience of the project to climate change, taking into account how climate change will impact on the operation of the project. - How these impacts may be avoided, mitigated, or remedied.

15-5 PROPOSED METHOD OF ASSESSING THE ENVIRONMENTAL ASPECTS INCLUDING THE PROPOSED METHOD OF ASSESSING ALTERNATIVES

The EIA will be undertaken according to a standardised methodology, which is detailed in SECTION 10: of this report, which complies with Regulation 31(2)(l) of the NEMA.

15-6 THE PROPOSED METHOD OF ASSESSING DURATION SIGNIFICANCE

Refer to SECTION 10: for the significance assessment, which includes duration.

15-7 STAGE AT WHICH THE COMPETENT AUTHORITY WILL BE CONSULTED

A pre-application meeting was convened with the DMPR on Tuesday, 10 June 2025.

The meeting objectives were as follows:

- Introduce Tharisa (the proponent) & MC (the appointed EAP).
- Provide project background of the proposed applications.
- Confirm specialist studies to be undertaken.
- Confirm department's requirements on submission of the EA- WML Application, EMPr and Section 102 amendment.

The DMPR will be consulted throughout the project application phases as follows:

- The Draft Scoping Report will be finalised, and the Final Scoping Report will be submitted to the DMPR for approval with comments and feedback received from I&APs and authorities.
- The Specialists studies will be undertaken, and potential impacts as identified in the Draft Scoping Report will be assessed during the Impact Assessment Phase.
- A Draft EIA and EMPr Report will also be compiled which will include management measures to avoid, mitigate and manage the potential impacts identified in the Impact Assessment. The report will also be subjected to PPP for another 30 days.
- Subsequently, the report will be finalised, incorporating comments from I&APs for submission to the DMPR.

- The DMPR will then decide on the submission. The decision will then be communicated to all stakeholders.

15-8 MITIGATION, MANAGEMENT AND MONITORING OF IDENTIFIED IMPACTS

The summary of potential impacts has been indicated in SECTION 9:. These impacts require further investigation during the Impact Assessment Phase. SECTION 15-3 provides an indication of the independent specialist studies, field surveys and assessments that are required to form part of the Impact Assessment Phase. The specialist studies will consider the development footprint of proposed new activities, existing surface infrastructure, and the MRA as a whole. With this information, the proposed project will be able to fully assess and investigate the feasible and reasonable possible mitigation measures that could be applied and the level of risk is depicted Table 72 below.

Table 72: High Level Mitigation Measures for Potential Impacts Identified for the Proposed New Activities

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
CONSTRUCTION PHASE							
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV UPGRADE • TSF 3 SLURRY PIPELINE • CONVEYOR BELT	• Clearing of vegetation, and establishment of contractor laydown area (s), and project service facilities. • Excavation and stockpiling of topsoil. • Site preparation (levelling, compaction, drainage, layout, etc.) and establishment of civil structures for the proposed infrastructure. • Commissioning of the proposed infrastructure.	• Destruction and disturbance of biodiversity. • Spreading and establishment of alien invasive species. • Habitat degradation. • Riverine destruction/ fragmentation of riparian habitats. • Road mortalities of fauna/ impact of human activities onsite.	Terrestrial Biodiversity (Fauna and Flora)	Construction	High (Negative)	• Avoid clearing vegetation in areas for the proposed infrastructure as far as possible. • It should be made an offence for any staff to bring any alien plant species into or take any indigenous species out of any portion of the project area outside of rehabilitation purposes. This is to prevent the spread of exotic or invasive species or the illegal collection of plants. • Demarcate work areas during the construction phase to avoid affecting outside areas. Use physical barriers e.g., safety tape, not painted lines, and use signage. • Do not clear areas of indigenous vegetation outside of the direct project footprint. • Minimise vegetation clearing to the minimum required. • An Environmental Control Officer (ECO) to provide supervision and oversight of vegetation clearing activities. • All activities must make use of existing roads and tracks as far as practically and feasibly possible. No new roads or servitudes should be constructed where existing infrastructure can be used. • Compile and implement a fire management plan to minimise the risk of veld fires around the project area. • A Maintenance/Rehabilitation Plan must be adhered to from the onset of the project. • Access roads should have run-off control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. • Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas. • Rehabilitate areas as soon as they are no longer impacted by construction. • The rehabilitated areas must be revegetated with indigenous vegetation native to the vegetation type. • Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. Surplus rehabilitation material can be applied to other areas in need of stabilisation and vegetation cover. • All erosion observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. • Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated laydown areas. • A hydrocarbon spill management plan must be put in place to ensure that, should there be any chemical spill out or over that, it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. • Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. • No servicing of equipment on site unless necessary. • All contaminated soil/ yard stone shall be treated <i>in situ</i> or removed and be placed in containers. • Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment. • To mitigate the spread of AIPs during construction, implement a comprehensive AIP Management Plan, including regular monitoring, prompt removal of identified species, and rehabilitation with indigenous species. • All AIP species must be removed/controlled using the appropriate techniques. • All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the project area.	Medium (Negative)
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV UPGRADE • TSF 3 SLURRY PIPELINE • CONVEYOR BELT		• Loss and degradation of aquatic resource habitat (wetland, riparian and instream). • Displacement/loss of aquatic fauna. • Change/deterioration of the ecological status of wetlands/rivers/streams.	Aquatic Biodiversity	Construction	Medium (Negative)	• Keep footprint to a minimum and encourage indigenous vegetation growth within the disturbed area. • No heavy machinery shall be permitted within unauthorised water resource areas for any purpose, without the prior approval of the ECO (except emergency procedures). • The route for vehicles (including heavy machinery) must be planned to avoid sensitive habitats, wetland/riparian vegetation, buffer areas and other water bodies as far as feasibly possible. • Sensitive areas must be demarcated to guide operators, labourers and contractors. • To minimise the impact on both surface water flow and interflow, portions of the road must	Low (Negative)

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
						include a coarse rock layer that has been specifically incorporated to increase the porosity and permeability of the sub-layers of the road. • The footprint area of the road should be kept to a minimum. • The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. • Temporary storm water channels should be filled with aggregate and dissipate flows on a downhill slope. • Signs of erosion must be addressed immediately to prevent further erosion of the riverbank (sandbags can be installed where feasible). Keep footprint to a minimum and encourage indigenous vegetation growth within the disturbed area. • Signs of 'No Littering' should be displayed close to the riverbank visibly enough for users to see them • No vehicles should park or be serviced on the riverbank to avoid oil spills etc. • An AIP management plan needs to be compiled and implemented prior to construction to control and prevent the spread of invasive aliens. • The aquatic and riparian areas outside of the specific project site area must be avoided where possible. • Aspects of the site development plan (SDP) such as laydown area and site camp (where applicable) should be located to outside of the riparian buffer zone, which would significantly reduce potential impacts to the riparian zone. • The construction vehicles and machinery must make use of existing access routes as much as possible, before adjacent areas are considered for access. • Avoid multiple access route through the riparian area. • Install sandbags around soil stockpiles to prevent soils washing into the system. • Make sure that the soil is backfilled and compacted to appropriate geotechnical specifications for the project area. • Sufficient waste bins should be provided. All waste generated on-site during construction must be adequately managed. • Separation and recycling of different waste materials should be supported. • Where feasible, material must be prefabricated outside the delineated buffers and then transported to site to avoid the risks of contamination associated with mixing, pouring and the storage of chemicals and compounds on site. • Have action plans on site, and training for contactors and employees in the event of spills, leaks and other impacts to the water resources. • All stockpiles and hazardous waste storage areas must be bunded by either a cut-off trench directed to the PCDs or via a berm. • Relandscape to gentler gradients and re-vegetate all cleared areas, which includes the areas adjacent to the proposed infrastructure, as soon as possible to limit erosion potential. • Stockpiling should take place away from the watercourse and buffer area. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • Dust suppression should be made a priority. • Prevent uncontrolled access of vehicles through the river system that can cause a significant adverse impact on the hydrology and alluvial soil structure of these areas. • Heavy vehicles must be parked outside of the riparian buffer zone except where needed for the construction process. • All chemicals and toxicants during construction must be stored in bunded areas. • All machinery and equipment should be inspected regularly for faults and possible leaks. These should be serviced off-site. • A spill response kit must always be available. • All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported. • The banks must be reshaped to the natural/adjacent slope. • Temporary and permanent erosion control methods may include silt fences, flotation silt curtains, interceptor ditches, seeding and sodding, erosion mats, and mulching.	

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
- NEW WRDS AND ASSOCIATED INFRASTRUCTURE 275 kV REALIGNMENT AND 88kV UPGRADE - LIFTING OF THE WALLS OF TSF 1 PHASE 2 - SALVAGE YARD - CONVEYOR BELT	- Transport and general construction activities. - Clearing of groundcover. - Levelling of area. - Wind erosion from open areas. - Materials handling. - Topsoil removal, material loading and hauling, stockpiling. - Grading, bulldozing, as well as metal and concrete works for the establishment of infrastructure.	Air pollution (dust).	Air quality	Construction	Medium (Negative)	- Limit the speed of haul trucks. - Limit unnecessary travelling on unpaved haul roads. - Apply water sprays on regularly travelled, unpaved sections. - When haul trucks need to use public roads, the vehicles need to be cleaned of all mud and the material transported must be covered to minimise windblown dust. - Dust-reducing mitigation. - Use of environmentally friendly dust suppressant products. - Long-term dust monitoring programme. - Rehabilitation Plan.	Medium (Negative)
- NEW WRDS AND ASSOCIATED INFRASTRUCTURE 275 kV REALIGNMENT AND 88kV UPGRADE - LIFTING OF THE WALLS OF TSF 1 PHASE 2 - SALVAGE YARD - CONVEYOR BELT	- Removal and transportation of topsoil from the footprint area. - Earthmoving equipment at the footprint area. - Hauling of material to and from the specific area. - Building activities during construction. - Land clearing and site preparation in the footprint of proposed activities infrastructure area.	Increase in ambient noise level.	Noise	Construction	Medium (Negative)	- Construction staff needs to be trained on noise control plan during health and safety briefings. 'Low noise' equipment, or methods of work is to be selected. - Avoid clustering of mobile plant near receptors and enforce rest periods for unavoidable maximum noise events. - Investigate use of alternatives to audible reversing alarms (such as broadband noise emitting models) or configure to maximise forward movements of mobile plant. - Regular inspection and maintenance of all equipment is to be established. - Avoid unnecessary equipment idling. - Where possible, limit activities to daytime working hours (6am – 6pm). - Establish community engagement and ensure all affected persons have been consulted with prior to the commencement of and during activities. - Provision of measures to reduce the noise reaching noise sensitive receptors, for example: - Installation of temporary barriers. - Restriction of some activities to less sensitive times, for example: restricting blasting activity to the mid-day (10:00 –14:00) only.	Medium (Negative)
- NEW WRDS AND ASSOCIATED INFRASTRUCTURE 275 kV REALIGNMENT AND 88kV UPGRADE - LIFTING OF THE WALLS OF TSF 1 PHASE 2 - CONVEYOR BELT	- Clearing of vegetation, and establishment of contractor laydown area (s), and project service facilities. - Excavation and stockpiling of topsoil. - Site preparation (levelling, compaction, drainage, layout, etc.) and establishment of civil structures for the proposed infrastructure. - Commissioning of the proposed infrastructure.	Change to the visual environment observed by sensitive receptors. No sense of place impact.	Visual	Construction	Medium (Negative)	- Construction camp must be established in appropriate locations prior to the commencement of construction activities. The camp must be maintained in an orderly and tidy condition. - No littering at the site. - Sufficient containers must be made available to handle the amount of litter, wastes, rubbish, debris and builders' wastes generated on site. These containers must be emptied frequently to avoid rodents, insects or any other organisms accumulating on the site and becoming a health hazard to adjacent properties. - Waste must be separated into recyclable and non-recyclable waste, and shall be separated as follows: - General waste (domestic waste; paper; plastic; cardboard; tins; and glass). - Hazardous Waste (hydrocarbon waste; chemical waste; and light bulbs i.e. containing mercury). - Recyclable waste shall preferably be deposited in separate bins. Tharisa is advised that "Collect-a-Car" collect tins, including paint and chemical tins, and "Consol" collect glass for recycling. - Any illegal dumping of waste will not be tolerated. This action will result in a fine and if required further legal action will be taken. This aspect must be closely monitored and reported on. - Proof of legal dumping must be produced on request. - Bins must be clearly marked for ease of management. All refuse bins must have a lid secured so that animals cannot gain access. - Subcontractors must contain a clause to the effect that the disposal of all construction-generated refuse/ waste to an officially approved waste disposal site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMP. - Proof of this undertaking must be issued to the ECO. All solid and chemical wastes that are generated must be removed and disposed of at a licenced waste disposal site. The contractor is to provide proof of such to the ECO. - Chemical containers and packaging brought onto the site must be removed for disposal at a suitable site. - The soil must be exposed for the minimum time possible once cleared of vegetation to avoid prolonged exposure to wind and water erosion and to minimise dust generation.	Low (Negative)

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV UPGRADE • TSF 3 SLURRY PIPELINE • SALVAGE YARD • CONVEYOR BELT	• Clearing of vegetation, and establishment of contractor laydown area (s), and project service facilities. • Excavation and stockpiling of topsoil. • Site preparation (levelling, compaction, drainage, layout, etc.) and establishment of civil structures for the proposed infrastructure. • Commissioning of the proposed infrastructure.	• Impacts from earthworks. • Loss of land capability. • Loss of soil resources. • Soil compaction. • Soil erosion and sedimentation of watercourses.	Soil, Land Capability and Hydropedological Impacts	Construction	Medium (Negative)	• Minimise soil compaction and keep the soil covered with residue and vegetative cover. • Install pre-treatment stormwater practices which remove large sediment and other solids upstream of infiltration practice. • Adhere to recommended footprint buffers of the proposed project area and also prevent any discharge of untreated wastewater into the catchment as responsive saturated soils (mostly associated with the valley bottoms or along water channels) have a high tendency to promote contaminant migrations towards water resources. • The project footprint must be kept as small as possible. • Traffic should be restricted to existing haul roads where possible, and demarcated areas. • Topsoil stripping and stockpiling should not be conducted during wet periods. • All removed soil and material must not be stockpiled within watercourses. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • Excavated and imported material should be stockpiled/stored away from areas of concentrated flow to limit the risk of sediment wash to downstream areas. • Revegetate topsoil stockpiles. • Install sandbags around soil stockpiles to prevent soils washing into the watercourses. • Ensure that topsoil is appropriately stored and re-applied. • Ensure that the soil is backfilled and compacted to appropriate geotechnical specifications for the project area. • Signs of erosion must be addressed immediately to prevent further erosion of the constructed infrastructure. • Temporary and permanent erosion control methods may include silt fences, flotation silt curtains, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats, and mulching. • Dewater, where necessary, any excavations (either on or off the construction right of way) in a manner that does not cause erosion and does not result in heavily silt-laden water flowing downslope. Any runoff from dewatering must be controlled in containment facilities or stable channels/ slopes until it reaches stable areas in the natural environment. • Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil. • Landscape and re-vegetate all cleared areas as soon as possible to limit erosion potential. • Drip trays must be used during refuelling, and underneath machinery and parked construction vehicles. • Construction materials liable to spillage are to be stored in appropriate containment structures, adequately lined and bunded and appropriate management measures must be implemented in handling these materials. • 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). • Contaminated soils must be removed for disposal at a registered waste disposal facility. • Routinely check machinery/plant for oil or fuel leaks each day before construction activities begin and implement remedial action as necessary. • 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. Such waste must be regularly cleared from the site. • Cement batching boards should be used. Cement products/wash not to be disposed of into the natural environment. • Runoff from roads must be managed to avoid erosion and pollution problems. Where excessive loose sediment is created, attenuation swales and/ or soils screens should be installed. • Oil residue shall be treated with oil absorbent such as Drizit or similar and this material removed to an approved waste disposal site. • Concrete and tar, if used, shall be mixed only in areas which have been specially demarcated for this purpose. • Concrete is to be mixed on mixing trays only, not on exposed soil. • All concrete and tar that is spilled outside these areas shall be promptly removed by the Contractor and taken to an approved waste disposal facility. • Stormwater shall not be allowed to flow through the batching area. Cement sediment shall be removed from time to time and disposed of in a manner as instructed by the Consulting Engineer.	Low (Negative)

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
						• Portable septic toilets are to be provided and maintained for construction crews. Maintenance must include their removal without sewage spillage. • Conservation of topsoil should be prioritised onsite and done as follows: - The topsoil needs to be stockpiled separately from the waste rock to preserve soil organisms and propagules. - Topsoil should only be harvested, handled and spread during the autumn and winter (March to August). Handling wet topsoil dramatically reduces soil beneficial properties and further damages soil structure due to increased compaction. - Topsoil stockpiles should not exceed a height of 2 m where possible. - The topsoil outer layer should also be protected from wind erosion using wind nets and soil binders. If topsoil needs to be stockpiled for longer than 12 months, seeding will improve long term stability and help to keep the soil in an active state. - Double handling of topsoil must be avoided as far as possible. Double handling will severely damage the underground structures such as roots and bulbs that contribute significantly to effective rehabilitation. - Stockpile in an area that is protected from stormwater run-off and wind. - Maintain topsoil stockpiles in a weed free condition. - Topsoil should not be compacted in any way, nor should any object be placed or stockpiled upon it.	
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV UPGRADE • TSF 3 SLURRY PIPELINE • LIFTING OF THE WALLS OF TSF 1 PHASE 2 • CONVEYOR BELT	• Accelerated erosion of areas adjacent to the riverbanks will lead to increased suspended sediment loads in nearby streams and rivers. • Levelling and filling surface soils for site preparations during the construction of the proposed infrastructure may expose soil surface to erosion factors. When a large area of land is exposed, loose materials are susceptible to erosion. During rainfall events, runoff from the exposed site will transport the soil material into perennial streams in the project area. • Poor management of waste generated during construction may result in deterioration of water quality. • The construction phase of the proposed infrastructure consists of extensive civil work. It is assumed that extensive machinery and possibly oiled equipment will be used on-site. This equipment may leak if stationed in one place for longer periods. • It is expected that there will be extensive vehicle traffic movement on site, which may result in loosened contaminated soils. During heavy storms, this rainfall may reach streams, contaminating water resources.	• Contamination of surface water and sedimentation. • Alteration of drainage patterns.	Surface Water	Construction	Medium (Negative)	• Progressive compaction and dust suppression during levelling and resurfacing in the construction area must be undertaken. • Drip trays should be placed under all stationary equipment. • Oil recovered from any vehicle or machinery on-site should be collected, stored and disposed of by accredited vendors for recycling. • Minimise the disturbance footprint as much as possible by restricting construction activities within demarcated areas to reduce erosion sources. • Progressive rehabilitation of disturbed land should be carried out to minimise the amount of time that bare soils are exposed to the erosive effects of rain and subsequent runoff. • Construction should be undertaken with care to avoid soil disturbance during very wet weather. • Time construction during the dry season where possible. • Additional to erosion control measures focusing on source control erosion, more erosion control measures such as erosion control blankets, hydroseeding and hydro-mulch, and silt and sediment fences must be incorporated where required depending on erosion indicators.	Low (Negative)

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
- NEW WRDS AND ASSOCIATED INFRASTRUCTURE - LIFTING OF THE WALLS OF TSF 1 PHASE 2 - SALVAGE YARD	- Clearing of vegetation, and establishment of contractor laydown area (s), and project service facilities. - Excavation and stockpiling of topsoil. - Site preparation (levelling, compaction, drainage, layout, etc.) and establishment of civil structures for the proposed infrastructure. - Commissioning of the proposed infrastructure.	Contamination of groundwater.	Ground water Systems	Construction	Low (Negative)	- Vehicles must be checked for oil leaks and all maintenance must take place at a designated site with spillage sumps. - Spill-sorb or a similar product to be kept on site and used to clean up hydrocarbon spills in the event that they should occur. - All employees must be trained in cleaning up of a spillage. - Polluted soil and used spill materials must be disposed of at a licenced facility. - Implement best practise principals for storing hazardous substances [Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHSA)] and Information Security for South Africa (ISSA, 2012) and keep spill kits near working areas. - All hazardous substances must be stored within a bunded area. - Construction should be undertaken with care to avoid soil disturbance during very wet weather. - Time construction during the dry season where possible. - Erosion control measures such as erosion control blankets, hydroseeding and hydromulch, and silt and sediment fences must be incorporated where required depending on erosion indicators. - Drip trays should be placed under all stationary equipment. - Oil recovered from any vehicle or machinery on-site should be collected, stored and disposed of by accredited vendors for recycling. - Minimise the disturbance footprint as much as possible by restricting construction activities within demarcated areas to reduce erosion sources. - Progressive rehabilitation of disturbed land should be carried out to minimise the amount of time that bare soils are exposed to the erosive effects of rain and subsequent runoff.	Negligible
- NEW WRDS AND ASSOCIATED INFRASTRUCTURE 275 kV REALIGNMENT AND 88kV UPGRADE - TSF 3 SLURRY PIPELINE - SALVAGE YARD - CONVEYOR BELT		Disturbance of heritage and paleontological resources.	Heritage impacts	Construction	Medium (Negative)	The following mitigation measures may be applied to the burial grounds and graves located within 100m of the proposed areas for the proposed infrastructure: - Chance Find Protocol must be implemented as per Tharisa's Chance Find Procedure. - The graveyards can be demarcated with brick walls or with fences. Conserving graves ensures that the mine remains responsible for their future unaffected existence, maintenance and that controlled access must exist for any relatives or friends who wish to visit the deceased. - Graveyards can be exhumed and relocated. The exhumation of human remains, and the relocation of graveyards are regulated by various laws, regulations and administrative procedures. This task is undertaken by forensic archaeologists or by reputed undertakers who are acquainted with all the administrative procedures and relevant legislation that have to be adhered to whenever human remains are exhumed and relocated. This process also includes social consultation with a 60 day statutory notice period for graves older than sixty years. Permission for the exhumation and relocation of human remains must be obtained from the descendants of the deceased (if known), the National Department of Health, the Provincial Department of Health, the Premier of the Province and the local police. The following mitigation measures may be applied to the buildings and structures located within 100m of the proposed areas for the proposed infrastructure: - All historical buildings that may be affected by the proposed project must be investigated prior to these buildings being affected (impacted) by the development activities. This investigation must be done by a historical architect accredited with the SAHRA. - The architect must apply for a permit from the Northwest Provincial Heritage Resources Agency (PHRA) which will authorise the necessary effect (impact) on any historical buildings/ structures which then may be demolished, altered, renovated or removed. - The latter actions must be preceded by documenting the historical structures by means of a plan and profile drawings, photographs and descriptions of these buildings.	Low (Negative)

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
- NEW WRDS AND ASSOCIATED INFRASTRUCTURE 275 kV REALIGNMENT AND 88kV UPGRADE - TSF 3 SLURRY PIPELINE - CONVEYOR BELT	Proposed infrastructure.	Socio Economic impacts	Socio- Economic Environment	Construction	High (Negative)	- Amongst transport contractors, enforce the mandatory use of the N4 Platinum Highway as opposed to provincial, district and local roads, thereby attempting to keep heavy vehicles away from neighbours and their activities (some of which are tourism-orientated). Enlist the aid of the traffic authorities and make offences penalisable to transport contractors. - Adhere to the mitigation measures stipulated by the transport/traffic specialist. - Practice 'good housekeeping' during the construction of the proposed project infrastructure. ECOs must pay particular attention to housekeeping matters when conducting site inspections. Non-compliances must not be tolerated. - Provide waste receptables for each class of waste generated. Waste should be sorted and stored separately in these receptables until disposed at facilities licenced to receive particular wastes. Disposal contractors must obtain disposal certificates for submission to Tharisa for its records. - Share with communities and neighbouring landowners, commercial enterprises, etc, Tharisa's waste manifests for the disposal of different waste streams. This is to prove that Tharisa is using its WRDs and TSFs for the purposes they are intended and is not disposing of other wastes in these facilities. - Maintain the integrity of safe distances from waste facilities. - Engage a communications specialist to design a Stakeholder Engagement Plan (SEP) in consultation with local communities. - Engage a specialist facilitator to act as 'honest broker' in the open and transparent roll-out of the SEP. - Within the SEP, ensure that communication messages that Tharisa wishes to convey, are conveyed, and ensure that messages that local communities wish to convey, are conveyed. - Where messages may be unpopular, e.g. employment requirements, convey these messages openly and honestly, with, if possible, alternatives that may prove attractive. - Consider the establishment of a community advisory panel to facilitate dialogue and problem-solving mitigation within the relevant communities. - Engage with local business owners to hear and understand concerns and to provide feedback. - Provide open and honest feedback to communities. - Proper waste management, habitat restoration, and water management practices can help minimise stagnant water and reduce breeding grounds for disease vectors during construction. - Educating Potentially Affected Communities (PACs) about preventive measures, personal protection, and proper sanitation practices is crucial in reducing the risk of vector-related diseases. - Implementing dust control measures, such as proper ventilation, dust suppression systems, and the use of PPE e.g. masks. - Regular monitoring of air quality and dust levels to assess potential health risks. - Providing adequate training and education to workers on the risks associated with occupational hazards and the use of PPE. - Ensuring proper occupational health and safety regulations compliance, and compliance with standards to minimise exposure to respiratory hazards. - Develop and regularly practice emergency response plans for various scenarios. - By addressing these risks proactively, Tharisa can protect the health and safety of their workforce and maintain a safer working environment. - Proper waste management practices, such as covering waste, controlling leachate, and minimising open dumping, can reduce the attractiveness of waste disposal facilities to vectors and decrease the risk of disease spread. - Training and educating mining workers and local communities about zoonotic diseases, proper hygiene practices, and the risks associated with contact disease carrying vermin (e.g. Rodents) can help prevent disease transmission. - Regular monitoring and avoidance of stagnant water bodies around mining site as these may lead to establishment of vector breeding sites.	Low (Negative)
OPERATIONAL PHASE							
- NEW WRDS AND ASSOCIATED INFRASTRUCTURE 275 kV REALIGNMENT AND 88kV UPGRADE - TSF 3 SLURRY PIPELINE - LIFTING OF THE WALLS OF TSF 1 PHASE 2	Operational activities impacting on biodiversity.	- Continued destruction and disturbance of biodiversity. - Establishment of alien plants on disturbed areas. - Continued spreading of alien invasive species. - Ongoing habitat destruction /	Terrestrial Biodiversity (Fauna and Flora)	Operational	Medium (Negative)	- It should be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants. Bringing/ taking of plant species into/out of the project area should only be allowed for rehabilitation purposes. - Effectively restrict unauthorised access to the development site by utilising perimeter security, establishing access control points, installing surveillance and monitoring systems. Furthermore, it is imperative to develop access control systems such as identification measures	Low (Negative)

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
• CONVEYOR BELT		fragmentation of fauna habitats. • Ongoing habitat degradation. • Ongoing road mortalities of fauna / impact of human activities onsite. • Bird collision, electrocutions and faulting.				and electronic access. Consider community engagement strategies and local collaboration. • A Maintenance/Rehabilitation Plan must be written for the development area – it must be ensured that it is adhered to. • Access roads should have run-off control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. • All erosion observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. • There should be follow-up rehabilitation and re-vegetation of any remaining denuded areas with local indigenous perennial grass, shrubs and trees. • Implementation of an alien vegetation management plan: - Regular monitoring for AIP encroachment during the operational phase to ensure that no alien invasion problems have developed as result of the disturbance. This should be every 3 months during the first two years of the operational phase and every six months for the life of the project. - All AIP species must be removed/controlled using the appropriate techniques as indicated in the AIP management plan. • Compile and implement a Solid Waste Management Plan. Waste management must be a priority, and all waste must be collected, stored and disposed of adequately. It is recommended that all waste be removed from site on a weekly basis as a minimum. • A pest control plan must be implemented. it is imperative that poisons not be used. • Any outside lighting should be designed and limited to minimise impacts on fauna. Lighting fixtures should be fitted with baffles, hoods or louvres and directed downward. Outside lighting should be directed away from highly sensitive areas such as the wetlands. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (yellow) lights should be used wherever possible. • Where feasible, motion detection lighting must be used to minimise the unnecessary illumination of areas. • No vehicle traffic nor the use of vehicle lights should be permitted during the night. • Noise must be kept to a minimum from dusk to dawn to minimise all possible disturbances to amphibian species and nocturnal mammals. • All personnel and contractors must undergo Environmental Awareness Training and must include awareness about not harming or collecting species. • Any fauna threatened by the maintenance and operational activities should be removed to a safe location by an appropriate individual. • All vehicles accessing the site should adhere to a max 40 km/h to avoid collisions. Appropriate signs must be erected.	
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • TSF 3 SLURRY PIPELINE • CONVEYOR BELT	• River crossings. • Infrastructure close to the riverbanks.	• Continued loss and degradation of aquatic resource habitat (wetland, riparian and instream). • Continued displacement/loss of aquatic fauna • Continued deterioration of the ecological status of wetlands/rivers/streams.	Aquatic Biodiversity	Operational	Medium (Negative)	• All chemicals and toxicants during operational phase must be stored in bunded areas. All machinery and equipment should be inspected regularly for faults and possible leaks. These should be serviced off-site. A spill response kit must always be available. • The stormwater infrastructure network should include cut-off drains around the perimeter of the activities and proposed infrastructure areas to intercept sloperunoff and divert drainage around the activities to aid in clean and dirty water separation. • The stormwater infrastructure should be monitored monthly for potential faults/failures. Monitor and maintain the surface water baseflow within the river. • All removed soil and material must not be stockpiled within the system. Stockpiling should take place outside of the water resources. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. Install sandbags around stockpiles to prevent washing into the system. • Signs of erosion must be addressed immediately to prevent further erosion of the riverbank (sandbags can be installed where feasible). Keep footprint to a minimum and encourage indigenous vegetation growth within the disturbed area. • Signs of 'No Littering' should be displayed close to the riverbank visibly enough for users to see them • All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping". A plan must be in place to control accidental spills and discharge of untreated effluent into the river.	Medium (Negative)
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV	Proposed mine infrastructure operations (vehicle activity on unpaved roads; materials	• Air pollution (dust).	Air quality	Operational	High (Negative)	• Regular water sprays and chemical suppression on unpaved roads to ensure at least 90% control efficiency. • Monthly physical inspection of road surface, daily visual observation of entrained dust	Medium – High (Negative)

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
UPGRADE • LIFTING OF THE WALLS OF TSF 1 PHASE 2 • CONVEYOR BELT	handling; crushing and wind erosion).					emissions from unpaved road surfaces. • Drop height into haul trucks to be kept at a minimum for ore and waste rock. • Keep material handled by dozers and wheeled loaders moist to achieve a control efficiency of 50%, especially during dry periods. • Rock cladding with larger pieces of waste rock is recommended to reduce wind erosion emissions from the overburden storage piles. • Institute progressive rehabilitation immediately after the construction of the proposed infrastructure for the proposed project.	
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • SALVAGE YARD • CONVEYOR BELT	• Transport of waste with haul trucks from the mining areas to WRDs.	• Increase in ambient noise levels.	Noise	Operational	Medium – High (Negative)	• Ensure machinery are well-oiled/greased. • Where possible, without compromising safety, replace reversing hooters with alternate means of alerting people to the presence and activity of heavy vehicles and machinery serving the mine and mineral processing complex. These could include warning flags on long staffs attached to all vehicles, hooters that sound less intrusive, e.g. cockerel crowing, etc. • Encourage and/or assist the Rustenburg Local Municipality to install traffic calming measures on roads serving Tharisa Mine. • Enlist the support of traffic law enforcement authorities to enforce speed limits on all roads, to reduce noise from heavy vehicles serving Tharisa Mine. • Make it mandatory for heavy vehicles serving Tharisa Mine to be fitted with vehicle tracking devices. Tracking records are to be scrutinised for speed, with offenders penalised for excessive speed, which, amongst others, can lead to the excessive use of noisy air brakes. • There is little that can be done to minimise vibrations caused by surface mining machinery; nevertheless, ensure all mine machinery is in good working order through regular servicing. In this regard, vibrations will likely persist to the end of surface mining (circa 2035/2036) and probably beyond during mine rehabilitation (during which vibrations are likely to be less intense). • Formulate and implement a Noise Management Plan that aims to keep noise at levels within gazetted limits for mining and industrial activities, taking note of noise level limits for neighbouring commercial and residential areas. • Train operational staff on noise control plan during health and safety briefings; • A noise complaints register must be kept. • If complaints are received, noise sampling should be undertaken at the Noise Sensitive Receptors (NSRs) and source of noise should be investigated and attenuation measures put in place. • Include noise enclosures for noisy equipment such as motors and pumps. • All diesel-powered equipment and vehicles should be kept at a high level of maintenance. This should particularly include the regular inspection and, if necessary, replacement of intake and exhaust silencers. • Any change in the noise emission characteristics of equipment should serve as trigger for withdrawing it for maintenance. • In managing noise specifically related to vehicle traffic for operational phase, efforts should be directed at: - Minimising individual vehicle engine, transmission, and body noise/vibration. This is achieved through the implementation of an equipment maintenance program. - Maintain road surfaces regularly to repair potholes etc. - Avoid unnecessary equipment idling at all times. - Minimise the need for trucks/equipment to reverse. This will reduce the frequency at which disturbing but necessary reverse warnings will occur. Alternatives to the traditional reverse 'beeper' alarm such as a 'self-adjusting' or 'smart' alarm could be considered. These alarms include a mechanism to detect the local noise level and automatically adjust the output of the alarm so that it is 5 to 10 dB above the noise level near the moving equipment. The promotional material for some smart alarms does state that the ability to adjust the level of the alarm is of advantage to those sites 'with low ambient noise level'. Also, when reversing, vehicles should travel in a direction away from NSR's if possible.	Medium (Negative)
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV UPGRADE • LIFTING OF THE WALLS OF TSF 1 PHASE 2 • CONVEYOR BELT	• Proposed infrastructure.	• Change to the visual environment observed by sensitive receptors. No sense of place impact.	Visual	Operational	Low (Negative)	• Prior to commencing with operations, develop a post-closure rehabilitation plan to acceptable topographic and ecological conditions. • No littering at the site. • Sufficient containers must be made available to handle the amount of waste generated on site. These containers must be emptied frequently to avoid rodents, insects or any other organisms accumulating on the site and becoming a health hazard to adjacent properties. • Waste must be separated into recyclable and non-recyclable waste, and shall be separated as follows:	Low (Negative)

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
						- General waste (domestic waste; paper; plastic; cardboard; tins; and glass). - Hazardous Waste (hydrocarbon waste; chemical waste; and light bulbs i.e. containing mercury). - Recyclable waste shall preferably be deposited in separate bins. Tharisa is advised that "Collect-a-Can" collect tins, including paint and chemical tins, and "Consol" collect glass for recycling. • Any illegal dumping of waste will not be tolerated. This action will result in a fine and if required further legal action will be taken. This aspect must be closely monitored and reported on. • Proof of legal dumping must be produced on request. • Bins must be clearly marked for ease of management. All refuse bins must have a lid secured so that animals cannot gain access.	
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • TSF 3 SLURRY PIPELINE • LIFTING OF THE WALLS OF TSF 1 PHASE 2 • SALVAGE YARD	• Alteration of flow paths.	• Loss of land capability. • Loss of soil resources. • Soil compaction. • Increased soil erosion and sedimentation of watercourses. • Downstream sedimentation. • Failing stormwater infrastructure.	Soil, Land Capability and Hydropedological Impacts	Operational	High (Negative)	• Signs of erosion must be addressed immediately to prevent further erosion of the constructed infrastructure. • Temporary and permanent erosion control methods may include silt fences, flotation silt curtains, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats, and mulching. • Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil. • Storage of potentially hazardous materials (e.g. fuel, oil, bitumen and other hydrocarbons, cement, paint, etc.) should be placed 32m from the wetlands and outside floodlines. The same limitation applies to storage, servicing and refuelling of mechanical plant and equipment, areas set aside for construction camps, lay down areas, batching plants and any stores in general. These activities can occur closer only if the ECO finds, in advance, no reasonable alternative and the contractors have taken appropriate steps (including secondary containment structures) to prevent spills and provide for prompt clean-up in the event of a spill. • 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). • Contaminated soils must be removed for disposal at a registered waste disposal facility. • Routinely check machinery/plant for oil or fuel leaks each day before operational activities begin and implement remedial action as necessary. • 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. Such waste must be regularly cleared from the site. • Runoff from roads must be managed to avoid erosion and pollution problems. Where excessive loose sediment is created, attenuation swales and/ or soils screens should be installed. • Oil residue shall be treated with oil absorbent such as Drizit or similar and this material removed to an approved waste disposal site.	Low (Negative)
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • TSF 3 SLURRY PIPELINE • LIFTING OF THE WALLS OF TSF 1 PHASE 2 • CONVEYOR BELT	• Leaks from stored chemicals and fluid in tanks. • Contaminated water from diesel tanks during heavy rainfall.	• Contamination to surface water systems. • Alteration of drainage patterns. • Increased surface run-off and erosion from the TSF.	Surface Water (water quality impacts)	Operational	High (Negative)	• All hazardous chemicals storage tanks must be handled inside bunding. The bunding capacity should be equivalent to the tank capacities plus a safety margin. • Pollution prevention by instilling the right behaviours through education and training of workers (both permanent and temporary). • A Spill clean-up plan to enable containment and remediation of pollution incidents. • Good housekeeping practices should be implemented and maintained by timeously cleaning up accidental spillages and ensuring all dislodged material, such as debris, is kept within the confined storage footprints. In addition, spill cleaning kits and material safety data sheets for chemical and hazardous substances should be accessible and available where these are used for immediate clean-up of accidental spillages of pollutants. • All mitigation measures must be complemented with monitoring of water quality.	Medium (Negative)
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • LIFTING OF THE WALLS OF TSF 1 PHASE 2 • SALVAGE YARD	• Ground water quality deterioration.	• Contamination to baseflow and groundwater systems. • Nitrate mass migration.	Ground water Systems	Operational	Medium (Negative)	• Ensure proper environmental management principles are followed, and no additional water supply boreholes are added within the plume area. • Divert the stormwater runoff towards existing dirty water structures on site by means of a breakwater wall and drain (stormwater diversion trench), to divert and collect stormwater runoff from the WRDs and TSFs and divert towards mining water dams.	Negligible
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV UPGRADE • SALVAGE YARD • CONVEYOR BELT	• Proposed infrastructure.	• Socio Economic impacts	Socio- Economic Environment	Operational	High (Negative)	• Traffic into and out of the mine (east and west) is unavoidable. If the need is indicated, engage the Rustenburg Local Municipality and BDM for road and intersection improvements to facilitate better traffic flows. • Practice 'good housekeeping' during the operation of the proposed project infrastructure. ECOs must pay particular attention to housekeeping matters when conducting site inspections. Non-compliances must not be tolerated. • Provide waste receptacles for each class of waste generated. Waste should be sorted and	Medium (Negative)

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
						stored separately in these receptacles until disposed at facilities licenced to receive particular wastes. Disposal contractors must obtain disposal certificates for submission to Tharisa for its records. • Share with communities and neighbouring landowners, commercial enterprises, etc, Tharisa's waste manifests for the disposal of different waste streams. This is to prove that Tharisa is using its WRDs and TSFs for the purposes they are intended and is not disposing of other wastes in these facilities. • Maintain the integrity of safe distances from waste facilities. • There should be the instant dismissal and prosecution of any staff caught in criminal activities of any kind. • Inform South African Police Services (SAPS) of the potential for increased criminal activity in the area. • Engage the North West Departments of Social Services and Social Development concerning matters such as prostitution and drug abuse, and, where possible, assist with measures to combat this type of deviant social behaviour. • Engage the Department of Education North West about extra curricula interventions from which learners would benefit in terms of turning away from deviant social behaviour, dropping out of school, etc. These interventions could form part of Tharisa's SLP. • Engage a communications specialist to design a SEP in consultation with local communities. • Engage a specialist facilitator to act as 'honest broker' in the open and transparent roll-out of the SEP. • Within the SEP, ensure that communication messages that Tharisa wishes to convey, are conveyed, and ensure that messages that local communities wish to convey, are conveyed. • Where messages may be unpopular, e.g. employment requirements, convey these messages openly and honestly, with, if possible, alternatives that may prove attractive. • Consider the establishment of a community advisory panel to facilitate dialogue and problem-solving mitigation within the relevant communities. • Engage with local business owners to hear and understand concerns and to provide feedback. • Establish what services could potentially be provided by local contractors and Small, Micro and Medium Enterprises (SMMEs). • Develop a database of local contractors and SMMEs that provide the required services. • Ensure that sub-contractors are sourced locally where the requisite skills and experience exist. • Engage with local businesses forums and the Rustenburg Local Municipality regarding the required services and availability of potential service providers within the local area. • Control of vector breeding sites through efficient removal of organic/domestic wastes, draining of stagnant water (e.g. in ditches or hollows), and sealing off of building roofs and basements. • Coordination with the relevant government departments (i.e. health and social development) in establishing vector awareness programmes is also essential. • Education on household and food hygiene and waste management for the control of vectors and vermin, keeping household surfaces clean, sealing off food storage. Supply of educational materials for use in local clinics, with cognisance of low education levels of local community. • Implementing dust control measures, such as proper ventilation, dust suppression systems, and the use of PPE like masks. • Providing adequate training and education to workers on the risks associated with respiratory hazards and the use of PPE. • Ensuring proper occupational health and safety regulations and compliance with standards to minimise exposure to respiratory hazards. • Develop and regularly practice emergency response plans for various scenarios. • By addressing these risks proactively, Tharisa can protect the health and safety of their workforce and maintain a safer working environment. • prioritising safety protocols, continuous training, and adherence to regulations, mining operations can reduce the occurrence of accidents and injuries, promoting a safer workplace for miners. • If traffic is to increase, Tharisa should engage the Local Municipality and I&APs to assist with programmes targeted at improving traffic management and road safety in the project area. • Develop a clear policy for the management of emergencies or accidents in the community as a direct result of the projects activities. • Preventing road traffic accidents associated with mining involves implementing various safety measures. • Driver Training and Awareness: Providing comprehensive training to drivers on safe driving	

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
						practices, fatigue management, and adherence to traffic rules and regulations. • Vehicle Maintenance: Regular maintenance and inspection of vehicles, ensuring that they are in proper working condition to minimise the risk of mechanical failures contributing to accidents. • Infrastructure Improvements: Investing in road maintenance, upgrading roads, installing safety signs, adding lighting where necessary, and implementing traffic management measures around mining sites. • Use of Technology: Employing technology like GPS tracking, driver monitoring systems, and vehicle safety features to enhance road safety and monitor driver behaviour. • Regulatory Compliance: Adhere to transportation regulations, safety standards, and protocols set by authorities to promote safe transportation practices. • By prioritising road safety measures, proper training, vehicle maintenance, and infrastructure improvements, Tharisa can minimise the risks associated with road traffic accidents in mining operations.	
CLOSURE, REHABILITATION AND POST CLOSURE PHASE							
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV UPGRADE • TSF 3 SLURRY PIPELINE • CONVEYOR BELT	• Infrastructure removal/ demolition. • Topsoil recovered from stockpiles for rehabilitation and revegetation of surroundings. • Vehicle entrainment on unpaved road surfaces during rehabilitation – once that is done, vehicle activity associated with the operations should cease.	• Improvement of riparian habitat through revegetation/ succession over time. • Carbon sequestration through re-vegetation. • Spreading and establishment of alien invasive species. • Habitat degradation. • Road mortalities of fauna/ impact of human activities onsite.	Terrestrial Biodiversity (Fauna and Flora)	Closure, rehabilitation and post closure	Medium (Negative)	• Ongoing implementation of an alien vegetation management plan as well as the monitoring of the plants.	Low (Negative)
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV UPGRADE • TSF 3 SLURRY PIPELINE • CONVEYOR BELT	• The removal of infrastructure and rehabilitation activities.	• Loss and degradation of aquatic resource habitat (wetland, riparian and instream). • Displacement/loss of aquatic fauna • Change/deterioration of the ecological status of wetlands/rivers/streams.	Aquatic Biodiversity	Closure, rehabilitation and post closure	Medium (Negative)	• The footprint area of the access road to the infrastructure to be decommissioned should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. • All chemicals and toxicants during decommissioning must be stored in bunded areas. All machinery and equipment should be inspected regularly for faults and possible leaks; these should be serviced off-site. A spill response kit must always be available. All waste generated on-site during decommissioning must be adequately managed. Separation and recycling of different waste materials should be supported. • All chemicals and toxicants during rehabilitation must be stored in bunded areas. All machinery and equipment should be inspected regularly for faults and possible leaks; these should be serviced off-site. A spill response kit must always be available. • Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil and prevent erosion. Conduct routine alien invasive removal across whole property right (have an AIPs maintenance plan in place). • Document the soil profile on removal and ensure the soil is backfilled in the same horizon order in which it was removed (this is more related to the proposed infrastructure). Keep footprint to a minimum and encourage indigenous vegetation growth within the disturbed area. Install sandbags around soil stockpiles to prevent soils washing into the system. Dust suppression should be made a priority.	Low (Negative)
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV UPGRADE • LIFTING OF THE WALLS OF TSF 1 PHASE 2 • SALVAGE YARD • CONVEYOR BELT	• All activities associated with closure and rehabilitation of the project.	• Air pollution (dust).	Air quality	Closure, rehabilitation and post closure	Medium (Negative)	• Demolition of infrastructure to have water sprays where vehicle activity is high. • Reshape all disturbed areas to their natural contours. • Cover disturbed areas with previously collected topsoil and replant native species.	Medium (Negative)
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV UPGRADE • LIFTING OF THE WALLS OF TSF 1 PHASE 2 • SALVAGE YARD • CONVEYOR BELT	• All activities associated with closure and rehabilitation of the project.	• Increase in ambient noise level.	Noise	Closure, rehabilitation and post closure	Medium (Negative)	• Closure staff need to be trained on noise control plan during health and safety briefings. • 'Low noise' equipment, or methods of work is to be selected. • Avoid clustering of mobile plant near receptors and enforce rest periods for unavoidable maximum noise events. • Investigate use of alternatives to audible reversing alarms (such as broadband noise emitting models) or configure to maximise forward movements of mobile plant. • Regular inspection and maintenance of all equipment is to be established. • Avoid unnecessary equipment idling.	Medium (Negative)

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
						- Where possible, limit activities to daytime working hours (6am – 6pm). - Establish community engagement and ensure all affected persons have been consulted with prior to the commencement of and during activities.	
- NEW WRDS AND ASSOCIATED INFRASTRUCTURE 275 kV REALIGNMENT AND 88kV UPGRADE - LIFTING OF THE WALLS OF TSF 1 PHASE 2 - CONVEYOR BELT	All activities associated with closure and rehabilitation of the project.	- Improvement of the visual quality to nearby residential receptors as well as public roads. - Final landscaping and shaping impacts.	Visual	Closure, rehabilitation and post closure	Medium (Positive)	- Re-establishing vegetation on rehabilitated areas, as required, to be aesthetically pleasing, aligned to surrounding natural vegetation cover. - Develop a post mining landform design based on geomorphological principles and informed by hydrological calculations and erosion modelling. Manage accurate implementation and calibrate the model based on actual volumes and bulking factors determined during operations. - Shaping and levelling rehabilitated areas to create landforms that emulate the surroundings and to facilitate drainage. - Establish realistic and achievable site relinquishment criteria with respect to visual amenity. - Undertake continued engagement during the closure planning process, particularly with respect to inputs into post closure use and visual amenity. - The presence of two permanent voids after closure will have a pronounced impact on the visual character of the site and visual mitigation must be implemented where feasible to soften these changes. - Concurrent rehabilitation must be done where feasible to ensure that the visual impact is progressively mitigated throughout operations and not deferred to closure. - Ongoing monitoring and aftercare of rehabilitated areas will be required to ensure that long-term vegetation reestablishment is successful and that the visual character of the site does not deteriorate over time. - Undertake rehabilitation activities as per the approved rehabilitation plan for the site. The project area is largely disturbed and is characterised by Tharisa's mining-related infrastructure and activities as well as private farming and community related activities.	Low (Negative)
- NEW WRDS AND ASSOCIATED INFRASTRUCTURE 275 kV REALIGNMENT AND 88kV UPGRADE - TSF 3 SLURRY PIPELINE - SALVAGE YARD - CONVEYOR BELT	All activities associated with closure and rehabilitation of the project.	- Impacts from earthworks. - Increased soil erosion and sedimentation of watercourses. - Soil compaction. - Improvement of land capability. - Improvement of eroded soils and compaction.	Soil, Land Capability and Hydropedological Impacts	Closure, rehabilitation and post closure	Medium (Positive)	- Minimise soil compaction and keep the soil covered with residue and vegetative cover. - Install pre-treatment stormwater practices which remove large sediment and other solids upstream of infiltration practice. - Adhere to recommended footprint buffers of the project area and also prevent any discharge of untreated wastewater into the catchment as responsive saturated soils (mostly associated with the valley bottoms or along water channels) have a high tendency to promote contaminant migrations towards water resources. - The project footprint must be kept as small as possible. - Traffic should be restricted to existing haul roads where possible, and demarcated areas. - Topsoil stripping and stockpiling should not be conducted during wet periods. - All removed soil and material must not be stockpiled within watercourses. - All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. - Excavated and imported material should be stockpiled/stored away from areas of concentrated flow to limit the risk of sediment wash to downstream areas. - Revegetate topsoil stockpiles. - Install sandbags around soil stockpiles to prevent soils washing into the watercourses. - Document the soil profile on removal and ensure that the soil is backfilled in the same horizon order in which it was removed. - Ensure that topsoil is appropriately stored and re-applied. - Ensure that the soil is backfilled and compacted to appropriate geotechnical specifications for the project area. - Signs of erosion must be addressed immediately to prevent further erosion of the rehabilitated infrastructure. - Temporary and permanent erosion control methods may include silt fences, flotation silt curtains, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats, and mulching. - Dewater, where necessary, any excavations (either on or off the rehabilitation area right of way) in a manner that does not cause erosion and does not result in heavily silt-laden water flowing downslope. Any runoff from dewatering must be controlled in containment facilities or stable channels/ slopes until it reaches stable areas in the natural environment. - Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil. - Landscape and re-vegetate all cleared areas as soon as possible to limit erosion potential. - Drip trays must be used during refuelling, and underneath machinery and parked rehabilitation vehicles.	Low (Negative)

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
						• Materials liable to spillage are to be stored in appropriate containment structures, adequately lined and bunded and appropriate management measures must be implemented in handling these materials. • 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). • Contaminated soils must be removed for disposal at a registered waste disposal facility. • Routinely check machinery/plant for oil or fuel leaks each day before rehabilitation activities begin and implement remedial action as necessary. • 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. Such waste must be regularly cleared from the site. • Cement batching boards should be used. Cement products/wash not to be disposed of into the natural environment. • Runoff from roads must be managed to avoid erosion and pollution problems. Where excessive loose sediment is created, attenuation swales and/ or soils screens should be installed. • Oil residue shall be treated with oil absorbent such as Drizit or similar and this material removed to an approved waste disposal site. • Concrete and tar, if used, shall be mixed only in areas which have been specially demarcated for this purpose. • Concrete is to be mixed on mixing trays only, not on exposed soil. • All concrete and tar that is spilled outside these areas shall be promptly removed by the Contractor and taken to an approved waste disposal facility. • Stormwater shall not be allowed to flow through the batching area. Cement sediment shall be removed from time to time and disposed of in a manner as instructed by the Consulting Engineer. • Portable septic toilets are to be provided and maintained for rehabilitation crews. Maintenance must include their removal without sewage spillage. • Conservation of topsoil should be prioritised onsite and done as follows: - The topsoil needs to be stockpiled separately from the waste rock to preserve soil organisms and propagules. - Topsoil should only be harvested, handled and spread during the autumn and winter (March to August). Handling wet topsoil dramatically reduces soil beneficial properties and further damages soil structure due to increased compaction. - Topsoil stockpiles should not exceed a height of 2 m where possible. - The topsoil outer layer should also be protected from wind erosion using wind nets and soil binders. If topsoil needs to be stockpiled for longer than 12 months, seeding will improve long term stability and help to keep the soil in an active state. - Double handling of topsoil must be avoided as far as possible. Double handling will severely damage the underground structures such as roots and bulbs that contribute significantly to effective rehabilitation. - Stockpile in an area that is protected from stormwater run-off and wind. - Maintain topsoil stockpiles in a weed free condition. - Topsoil should not be compacted in any way, nor should any object be placed or stockpiled upon it.	
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV UPGRADE • TSF 3 SLURRY PIPELINE • LIFTING OF THE WALLS OF TSF 1 PHASE 2 • SALVAGE YARD • CONVEYOR BELT	• Water quality impacts as a result of closure and decommissioning of all proposed infrastructure.	• Contamination to surface water systems. • Increased runoff. • Improved water quality because of a fully rehabilitated environment. • Restoration of ecosystems. • Alteration of drainage patterns.	Surface (water impacts) Water quality	Closure, rehabilitation and post closure	Medium (Negative)	• Scheduling of demolition to minimise the footprint at risk of erosion at any given time or schedule works according to the season. • Only accredited companies should be used for infrastructure removal, as they are equipped to handle or rectify any spills. • It is recommended that a post-rehabilitation audit and monitoring be undertaken during the mine's end-of-life to ascertain whether the remediation has been successful. If not, further measures should be recommended and implemented. • A post-rehabilitation audit should be undertaken at the end of life to ascertain whether the remediation has been successfully recommended, and if not, further measures should be recommended and implemented. • The rehabilitation plan must ensure that it allows for runoff to flow without erosion. Furthermore, rehabilitation should be carried out by accredited service providers. • Water quality monitoring during rehabilitation, should proceed post closure, until the water quality has stabilised, as per defined post closure liability monitoring programme which will be drafted during operation of the proposed activities. • Water quantity monitoring during rehabilitation, should proceed post closure, until the water	Medium (Negative)

Proposed New Infrastructure to be impacted	Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Measures/ Type	Significance if mitigated
						flows have stabilised, as per defined post closure liability monitoring programme which will be drafted during operation of the proposed activities. GIS based erosion inspections can be incorporated for any visual gullies and evidence of erosion. If erosion is identified, such areas should be rehabilitated again is identified.	
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV UPGRADE • LIFTING OF THE WALLS OF TSF 1 PHASE 2 • SALVAGE YARD	• Ground water quality deterioration and improvement as a result of closure and decommissioning of all proposed infrastructure.	• Contamination to groundwater and improvement thereof, post closure.	Ground water Systems	Closure, rehabilitation and post closure	Low (Negative)	• Rehabilitation of facility (cladding and vegetation) to limit rainfall recharge. • Seepage water quality should be useful for use as a water resource for agricultural and/or domestic supply in the post-closure phase.	Negligible
• NEW WRDS AND ASSOCIATED INFRASTRUCTURE • 275 kV REALIGNMENT AND 88kV UPGRADE • SALVAGE YARD • CONVEYOR BELT	• Impacts related to socio economic processes affected by decommissioning and closure.	• Socio Economic impacts.	Socio- Economic Environment	Closure, rehabilitation and post closure	High (Negative)	For decommissioning and closure, especially for the loss of employment and negative effects to the loss of employment and negative effects to the local economy, the following are submitted for consideration by Tharisa: • Skills development and training of employees to enhance their value in the labour market and thereby their chances of finding employment after mine closure. • Formulation of a retrenchment plan in consultation with employees (commencing at least five years before closure). • Assisting redundant employees to find alternative employment as far as practically possible). • Focusing on sustainable community projects, especially those designed as alternative livelihood activities, that are aimed at remaining viable without continued support from Tharisa. • Leaving intact infrastructure that can be used by local communities, provided the infrastructure is classified as safe by the authorities. The first four suggestions above are already elements within Tharisa Mine's SLP. The SLP should be reviewed annually, with major reviews occurring every 10 years to ensure the relevance of interventions to prevailing environmental (social) conditions and realities faced by Tharisa's resident and neighbouring communities. • Establish what services could potentially be provided by local contractors and SMMEs. • Develop a database of local contractors and SMMEs that provide the required services. • Ensure that sub-contractors are sourced locally where the requisite skills and experience exist. • Engage with local businesses forums and the Rustenburg Local Municipality regarding the required services and availability of potential service providers within the local area.	High (positive)

SECTION 16: PARTICULARS OF THE PPP WITH REGARDS TO THE IMPACT ASSESSMENT PROCESS THAT WILL BE CONDUCTED

Refer to SECTION 7: for the PPP to be undertaken throughout the application phases.

16-1 STAKEHOLDER ENGAGEMENT DURING IMPACT ASSESSMENT PHASE

The objectives of public participation during the Impact Assessment Phase are to verify that I&APs issues have been considered in the Impact Assessment, and to comment on the findings of the S&EIR, including the potential negative and positive impacts and the proposed management measures.

MC will compile and announce the availability of Draft EIA and EMPr Report. The report will be subjected to PPP of at least 30 days and will reflect the incorporation of comments received, including any comments of the competent and commenting authorities.

The following processes will be undertaken to announce the Draft EIA and EMPr Report:

- Letters will be sent to all I&APs, (written in any of the manners provided for in section 47D of the NEMA, announcing the availability of the Draft EIA and EMPr Report, including:
 - The municipal councillor of the ward in which the site is situated;
 - Any organisation of ratepayers that represent the community in the area;
 - The municipality which has jurisdiction in the area;
 - Any organ of state having jurisdiction in respect of any aspect of the activity; and
 - Any other party as required by the CA, including adjacent communities' members.
- SMS notifications of the availability of the Draft EIA and EMPr Report for public comment will be distributed.
- Six (6) focus group meetings [two (2) online (via MS Teams) and four (4) face to face] focus group meetings will be held with the adjacent landowners within a 5km radius; community organisations, such as: rate payers associations, HOAs, interest groups, etc.; relevant state departments at local, district, provincial and national levels; ward councillor; NGOs/ various environmental protection agencies/ bodies; and any other party perceived as playing a role within the community/ project area, to discuss the Draft EIA and EMPr Report.
- Telephonic consultation will be undertaken with I&APs to obtain comments about the Draft EIA and EMPr Report.
- The Draft EIA and EMPr Report will be made available on the MC website (<https://manyabeconsultancy.com/stakeholder-engagement/>); and at the Marikana Public Library; and
- Subsequent to the 30 days' period, all comments and representations received from I&APs will be considered and recorded in the CRR. All I&APs who would have participated in the PPP will be thanked, and their comments acknowledged.

16-2 ANNOUNCEMENT OF THE SUBMISSION OF THE FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT TO THE COMPETENT AUTHORITY

- The Final EIA and EMPr Report will consider and address all comments raised by I&APs, as per the CRR.
- The Final EIA and EMPr Report will be submitted to the DMPR for review and consideration towards a decision.
- All registered I&APs will be notified of the submission and the availability of the Final EIA and EMPr Report on MC website for review and commenting, should they choose to do so.
- Any additional comments will be directed to DMPR and copied to MC.

16-3 NOTIFICATION OF AUTHORITY DECISION

MC will ensure that all registered I&APs are provided with access to the decision and the reasons for such decision. I&APs will be drawn to the fact that appeals may be lodged against the decision in terms of the National Appeals Regulations of 2025 (GNR. 5985), if such appeals are available in the circumstances of the decision. The decision will be advertised through the following methods:

- Personalised letters to individuals and organisations on the stakeholder database; and
- Placement of a newspaper advert in the same local newspaper where the project and the availability of the Draft Scoping Report was announced, translated in both English and Setswana.

16-4 DESCRIPTION OF THE TASKS THAT WILL BE UNDERTAKEN DURING THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The following activities will take place as part of the planned S&EIR process going forward:

- The Draft Scoping Report will be finalised, and the Final Scoping Report will be submitted to the DMPR for approval with comments and feedback received from I&APs and authorities.
- The specialists' studies will be undertaken, and potential impacts as identified in the Draft Scoping Report will be assessed during the Impact Assessment Phase.
- A Draft EIA and EMPr Report will also be compiled which will include management measures to avoid, mitigate and manage the potential impacts identified in the Impact Assessment. The report will also be subjected to PPP for another 30 days.
- Subsequently, the report will be finalised, incorporating comments from I&APs for submission to the DMPR.
- The DMPR will then decide on the submission. The decision will then be communicated to all stakeholders.

SECTION 17: MEASURES TO AVOID, REVERSE, MITIGATE OR MANAGE IDENTIFIED IMPACTS AND TO DETERMINE THE EXTENT OF THE RESIDUAL RISKS THAT NEED TO BE MANAGED AND MONITORED

The EMPr will incorporate measures aimed at mitigating and managing impacts of the proposed new activities and current operation activities through the consolidation and amendment of the various EMPs granted to Tharisa. Mitigation measures as prescribed in the approved EMPs will be incorporated into the EMPr, which will assist in the development of a more effective environmental management tool for Tharisa's current and proposed operations.

The updated EMPr will allow for a greater level of alignment between the different EMPs in terms of management measures and monitoring reporting requirements. Detailed mitigation and management measures for the identified negative impacts will be developed and included in the EMPr.

Table 72 above provides high level mitigation measures for potential impacts identified for the proposed project.

SECTION 18: OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

18-1 IMPACTS ON THE SOCIO-ECONOMIC CONDITIONS OF ANY DIRECTLY AFFECTED PERSON

Table 72 provides high level mitigation measures for potential impacts identified for the proposed project. Detailed mitigation and management measures of potential negative social economic impacts associated with the proposed project will be developed and included in the EMPr. Extensive specialist work will be conducted which will include incorporation of understanding of the socio-economic environment within the area. This aspect will be further investigated by the appointed Social and Human Rights Impact Assessment specialist during the Impact Assessment Phase.

18-2 IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NHRA

The study will define the heritage component of the EIA process to be undertaken for the proposed project. The HIA report will attempt to evaluate both the accumulated heritage knowledge of the area and information derived from direct physical observations.

SECTION 19: OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT

Not Applicable.

SECTION 20: UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I **Mpho Manyabe**, the EAP responsible for compiling this report, undertake that the information provided in this report is correct, and that the level agreement with I&APs and stakeholders will be correctly recorded and reported in the Final Scoping Report.

It must be noted that this Draft Scoping Report is being subjected to PPP for commenting by the general public and state departments in parallel with the submission of the application forms to DMPR. Comments and objections received from stakeholders will be recorded accordingly.

SECTION 21: STATEMENT OF MC'S INDEPENDENCE

I **Mpho Manyabe**, declare that -

- I act as the independent EAP in this application for the proposed consolidation and amendment of the various EMPs granted to Tharisa as well as incorporating new environmental and waste activities proposed to be conducted for future proofing the mining operation project at Tharisa Mine.
- 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 EIAs, including knowledge of the relevant Acts, Regulations and any guidelines that have relevance to the proposed activity.
- I will comply with the Act, Regulations and all other applicable legislation, policies and guidelines.
- undertake to disclose to the applicant and the CA 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 CA; and the objectivity of any report, plan or document to be prepared by myself for submission to the CA.
- 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 at large and that participation by I&APs is facilitated in such a manner that all I&APs, state department and CA 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 CA in respect of the application, provided that comments that are made by I&APs in respect of a final report that will be submitted to the CA 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; and 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.



Signature of the EAP

Date: 14 August 2026

EAP Company: Manyabe Consultancy (Pty) Ltd

SECTION 22: CONCLUSION

This Draft Scoping Report has been compiled in accordance with Appendix 2 of the NEMA EIA Regulations of 2014, as amended, and provides a description of the proposed project. This report serves to detail the outcome of the scoping assessment requirements for the proposed consolidation and amendment of the various EMPs granted to Tharisa as well as incorporating new environmental and waste activities proposed to be conducted for future proofing the mining operation project.

The consolidation application includes the amendment of various conditions of the EAs, WMLs and the integration of the following EMPs into a consolidated EA, WML and EMP. For the proposed infrastructure, various alternatives have been identified, with a couple being carried through for investigation in the Impact Assessment Phase of the S&EIR process, due to the need for specialist assessment and input. Further investigations are required to fully characterise the receiving environment as well as to investigate the potential negative and positive impacts associated with the proposed project.

This Draft Scoping Report is being subjected to PPP for review by all identified I&APs. All comments received during the review of the Draft Scoping Report will be incorporated into the Final Scoping Report for submission to the DMPR for approval.

The following activities will take place as part of the planned S&EIR process going forward:

- The Draft Scoping Report will be finalised, and the Final Scoping Report will be submitted to the DMPR for approval with comments and feedback received from I&APs and authorities.
- The Specialists studies will be undertaken, and potential impacts as identified in the Draft Scoping Report will be assessed during the Impact Assessment Phase.
- A Draft EIA and EMP Report will also be compiled which will include management measures to avoid, mitigate and manage the potential impacts identified in the Impact Assessment. The report will also be subjected to PPP for another 30 days.
- Subsequently, the report will be finalised, incorporating comments from I&APs for submission to the DMPR.
- The DMPR will then decide on the submission. The decision will then be communicated to all stakeholders.

SECTION 23: REFERENCES

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APPENDICES

APPENDIX 1: LOCALITY MAP, MASTER PLAN; LAYOUT PLAN AND OTHER SITE MAPS

APPENDIX 2: AUTHORITY CORRESPONDENCE

APPENDIX 3: PUBLIC PARTICIPATION PROCESS

APPENDIX 4: EAP DETAILS (CV, QUALIFICATIONS AND REGISTRATION BODIES CERTIFICATES)

APPENDIX 5: EXISTING APPROVALS