# DRAFT EIA REPORT

# FOR THE ELAND PLATINUM MINE

# CONSOLIDATION PROJECT

**FILE REF NO SAMRAD: (NW 30/5/1/2/2/341MR, NW 30/5/1/2/2/280MR, NW30/5/1/2/2/151MR, NW30/5/1/2/2/78MR & NW30/5/1/2/2/363MR) (NW-00273-MR/102)**

**Report No: JEMS-ELAND- DEIAR-01 (Mar 21)**

**Report Prepared by**


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Draft Environmental Impact Assessment Report in support of the applications for an environmental authorisation; a waste management licence; and the amendment/consolidation of the Environmental Management Programmes and Water Use Licences for the proposed Eland Platinum Consolidation Project in terms of the National Environmental Management Act, No 107 of 1998, the National Water Act, No 36 of 1998, the National Environmental Management: Waste Act, No 59 of 2008 and Mineral Petroleum and Resource Development Act (Act 28 of 2002 as amended).

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|---|---|
| **NAME OF APPLICANT:** | **Eland Platinum (Pty) Ltd ("EP"), a subsidiary of Northam Platinum Limited ("Northam").** |
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| **FILE REF NO SAMRAD:** | **NW 30/5/1/2/2/341MR – Zilkaatsnek EMPRs** |
| | **NW 30/5/1/2/2/280MR – Elandsfontein EMPRs** |
| | **NW30/5/1/2/2/151MR** |
| | **NW30/5/1/2/2/78MR** **Maroelabult EMPRs** |
| | **NW30/5/1/2/2/363MR** |

**IMPORTANT NOTICE**

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002) (as amended), the Minister must grant a prospecting or mining right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme Report in terms of the National Environmental Management Act (Act 107 of 1998) (as amended) ("**NEMA**"), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority. In terms of section 17(1)(c) the Competent Authority must check whether the application has taken into account any minimum requirements applicable, or instructions or guidance provided by the Competent Authority to the submission of applications.

**It is therefore an instruction that** the prescribed reports required in respect of applications for an EA for listed activities triggered by an application for a right or permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulations and will lead to the EA being refused.

**It is furthermore an instruction that** the Environmental Assessment Practitioner ("**EAP**") must process and interpret his/her research and analysis and use the findings thereof to complete that information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in order, and under the provided headings as set out below, and ensure that the report is not cluttered with uninterpreted information and that it unambiguously represents the interpretation of the applicant.

**OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

The objective of the environmental impact assessment process is to, through a consultative process—

(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
(c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

(d) determine the—-

(e) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and

(f) degree to which these impacts—

(aa)can be reversed;

(bb) may cause irreplaceable loss of resources, and

(cc) can be avoided, managed or mitigated;

(g) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

(h) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

(i) identify suitable measures to manage, avoid or mitigate identified impacts; and

(j) identify residual risks that need to be managed and monitored.

# EXECUTIVE SUMMARY

## 1. Background

Eland Platinum Proprietary Limited ("**EP**"), a subsidiary of Northam Platinum Limited ("**Northam**"), owns and operates the Eland Platinum Mine ("**EM**") and Concentrator Plant. EM is within the North-West Province ("**NWP**") of the Republic of South Africa ("**RSA**") and falls under the local jurisdiction of the Madibeng Local Municipality ("**MLM**"), situated in the larger district of the Bojanala Platinum District Municipality ("**BPDM**"). The town of Brits is located 10km east of the application site, with the Tshwane Metropolitan 60km to the west. The northern boundary of the area on which the EM surface infrastructure is situated ("**EM Surface Area**") is bounded by the R566 (Brits - Rosslyn) provincial road and N4 Bakwena National Highway (Pretoria-Rustenburg) to the south.

EM is an established (est. 2006) platinum group metals ("**PGMs**") and chrome mining and processing operation and comprises of two mining rights, namely DMR Ref. No: NW 30/5/1/2/2/341MR ("**Zilkaatsnek Mining Right**") and DMR Ref. No: NW 30/5/1/2/2/280MR ("**Elandsfontein Mining Right**").

EP is in the process of acquiring the underground mine bordering EM in the west, known as the Maroelabult Mine ("**MM**"). The MM is also an existing established mining operation (est. 2000's), which is operated under three mining rights NW30/5/1/2/2/151MR, NW30/5/1/2/2/78MR and NW30/5/1/2/2/363MR and was placed under care and maintenance in July 2013.

EP recently concluded a sale agreement to acquire the MM from Barplats ("**Sale Agreement**"), including portions of mining rights NW30/5/1/2/2/151MR and NW30/5/1/2/2/78MR and the entire NW30/5/1/2/2/363MR ("**MR Sale Portion**").

## 2. Application

EP has submitted an application under section 102 of the Mineral and Petroleum Resources Development Act 28 of 2002 ("**MPRDA**") to consolidate the following mining rights into the Elandsfontein Mining Right:

- MR Sale Portion; and
- Zilkaatsnek Mining Right,

("**Section 102 Application**").

One of the conditions precedent to the Sale Agreement is the grant of the Section 102 Application.

The areas held under the Elandsfontein Mining Right, MR Sale Portion and Zilkaatsnek Mining Right are referred to as the "**Consolidated MR Area**".

An environmental authorisation ("**EA**") and waste management license (**"WML**") application under the National Environmental Management Act 107 of 1998 ("**NEMA**") and National Environmental Management: Waste Act 59 of 2008 ("**NEMWA**") was submitted to the Department of Mineral Resources and Energy ("**DMRE**").

The application includes:

- an application for an integrated EA and WML ("**IEA**") for projects proposed by EP to take the EM mining operations forward ("**EP Proposed Projects**"); and existing infrastructure at MM for which EP requires an authorisation to continue the operation of; and

- the consolidation of the existing Environmental Management Programmes ("**EMPRs"**), EAs and WMLs for EM and the portions of the EMPRs ("**Maroelabult EMPRs**") and IEA relevant to the MR Sale Portion ("**Sale Portion Area**") into the Environmental Impact Assessment ("**EIA**") / EMPr for the Elandsfontein Mining Right (approved by the DMRE on 21 December 2006 – Ref No: (NW) 30/5/1/2/3/2/1/280EM) ("**Environmental Licence Consolidation Application**"),

  (collectively the "**Integrated DMRE Environmental Application**").

EP will also be submitting an application to amend and consolidate the water use licences ("**WUL**") held by EP and MM ("**WUL Consolidation Application**").

JEMS Pty Ltd ("**JEMS**") was appointed by EP as the independent EAP for the Integrated DMRE Environmental Application and WUL Consolidation Application.

The EP Proposed Projects include the following activities:

- Mining at MM, including the Boundary Pillar on the UG2 reef horizon between EM and MM;
- Construction and operation of two Run of Mine ("**ROM**") stockpiles at EM;
- Raise-boring and operation two Ventilation Shafts at EM;
- Mining of the Merensky Reef at EM, including associated infrastructure, Overburden Stockpiles and Waste Rock Dumps ("**WRDs**");
- Mining of the UG1 in the existing Tailings Storage Facilities ("**TSF**") Paddocks 2, 3 and 4 in the area which is included in the Elandsfontein Mining Right;
- Backfilling of existing opencast pits at EM with tailings and the construction of a pipeline to convey the wet tailings from the Concentrator Plant to the opencast pits and a return water pipeline between the existing TSF return water sump and opencast pits ("**Pits Pipelines**");
- Water management infrastructure linking EM and MM, including expansion and construction of pump stations and pipelines for the conveying of dirty water and tailings between EM and MM ("**Water Management Pipelines**");
- Construction of an electrical 11kV substation, distribution line and associated infrastructure at MM;
- Construction and operation of a Chrome Floatation Plant ("**CFP**") and associated infrastructure at the Maroelabult shaft within existing operational area; and
- WRD re-processing at MM.

The EP Proposed Projects and Environmental Licence Consolidation Application are collectively referred to as the **"EM Consolidation Project**".

The DMRE North-West Regional Office will be the competent authority ("**CA**") for the Integrated DMRE Environmental Application.

## 3. Scoping Phase

JEMS prepared the Draft and Final Scoping Report in line with the requirements contained in Annexure 2 of the 2014 EIA Regulations, promulgated under the NEMA, and the template provided by the DMRE.

In conjunction with the inception of the public participation process ("**PPP**"), the Draft Scoping Report ("**DSR**") was submitted to interested and affected parties ("**I&APs**") and stakeholder for their review and comments. The DSR was available for review and comments for thirty (30) days from 17 August to 16 September 2020 at the following locations:

- EM Security Office;
- MM entrance;
- Madibeng Local Library in Brits;
- Moumong Store in Mmakau;
- The DeWild Helpmekaar Organisation Offices;
- The Community Hall in Mothotlung; and
- Mmakau Police Station next to the Bakgatla Ba-Mmakau Tribal Council offices.

In addition to the above, the following PPP activities were also performed as part of the initial project announcement phase of the Integrated DMRE Environmental Application:

- Newspaper advertisements were placed in the Beeld, Britspos and Komorant;
- Emails and letters were sent to I&APs and stakeholders;
- Site notices were erected at the following locations:
    - Site Entrance of the EM and MM;
    - Madibeng Local Library;
    - Mmakau Police Station Notice Board;
    - Mothotlung Municipal Services Building;
    - Damonsville Community Library;
    - Oukasie Primary School;
    - Moumong Store in Mmakau;
    - De Wild Helpmekaar Offices; and
    - Easy Build Hardware Shop in the De Wild Community.

As part of the project announcement and Scoping phase, the concerns and issues raised by I&APs and stakeholders can be summed-up to the following major points:

- Impact of mining and projects on groundwater quantity and quality;
- Noise impact associated with mining activities;
- Visual impacts associated with the proposed activities;
- Impact of blasting on buildings;
- Possible job and business opportunities; and
- Socio-economic impact of EM on the surrounding community and businesses.

The Final Scoping Report ("**FSR"**) was approved on 27 January 2021.

## 4. EIA Phase

The 2014 EIA Regulations and EA process requires that an EIA Report be compiled. This Draft EIA Report ("**DEIAR**") and Draft Environmental Management Programme Report ("**DEMPR**") was compiled to comply with the requirements of the said Regulations (as amended) and DMRE Guidelines.

Specialist studies have been finalised for the EIA Phase of the Integrated DMRE Environmental Application. The Specialist studies and the DEIAR / DEMPR will be made available for public comment. The following Specialist studies were conducted for the EM Integrated DMRE Environmental Application:

- Update of the Water Balance;
- Update of the Groundwater Impact Assessment;
- Update of the Stormwater Management Plan;
- Update of the Air Quality Impact Assessment;
- Terrestrial Biodiversity Assessment;
- Freshwater Assessment;
- Update of the Heritage Impact Assessment;
- Update of the Soil and Land Capability Assessment;
- Noise Impact Assessment;
- Visual Impact Assessment;
- Waste Classification Assessment; and
- Update of the Socio-Economic Assessment.

The PPP for the EIA Phase will include the following activities:

- I&APs and stakeholders will be informed of the EM Integrated DMRE Environmental Application via emails, registered mail and hand delivered notices;
- Newspaper advertisements will be placed in the Komorant, Britspos and Rustenburg Herald;
- Site Notices will be placed at the same locations as per the Scoping Phase.
- A public meeting and stakeholder forums will be held based on the interest of the I&APs on the application;
- The DEIAR/ DEMPR will be available for review and comments for thirty (30) days from at the following locations:
    - EM and MM Security Office;
    - Madibeng Local Library in Brits;
    - Oukasie Primary School;
    - Odi Primary School;
    - Botlhabelo High School;
    - Moumong Store in Mmakau;
    - The Community Library (at the Community Hall) Damonsville;
    - The Community Hall in Mothotlung;

- De Wildt Helpmekaar Offices; and
- Mmakau Police Station next to the Bakgatla-Ba-Mmakau Tribal Council offices.

## 5. Environmental Licence Consolidation Application

The Environmental Licence Consolidation Application includes the amendment of various conditions and the integration of the following EMPRs into a consolidated EMPR (Refer to ***Appendix 7: EM Consolidated EMPr***):

- ***Elandsfontein 2006 EMPR*** approved by the DMRE on 21 December 2006 (Ref No: (NW) 30/5/1/2/3/2/1/280EM). The EIA/EMPR was compiled by Metago Environmental Engineers (Pty) Ltd ("**Metago**"), with reference E016-01, and dated September 2006 ("**2006 Elandsfontein EMPR"**).
- ***Elandsfontein 2007 EA*** issued by the then North-West Department of Agriculture, Conservation and the Environment ("**NWDACE**") (now North-West Department of Rural, Environment and Agricultural Development ("**NWREAD"**) on 13 March 2007 (Ref No: EIA 518/2005NW), pursuant to the 2006 Elandsfontein EMPR.
- ***Initial Zilkaatsnek 2010 MPRDA EMPR*** approved by the DMRE (Ref No: (NW) 30/5/1/2/3/2/1/280EM). The EIA/EMPR was compiled by Metago, with reference E016-12, and dated January 2008.
- ***2010 Zilkaatsnek EMPR Amendment*** approved by the DMRE on 19 November 2010 (Ref No: (NW) 30/5/1/2/3/2/1/341EM), compiled by Metago, with reference E016-21 and dated June 2010.
- ***2012 Proposed Concentrator Plant EA*****:** issued by the North West Department of Economic Development, Environment, Conservation and Tourism ("**NWDEDECT**") (now NWREAD) on 8 August 2012 (Ref No: NWP/EIA/441/2007). The EIA / EMPR was compiled by SLR Consulting Africa (Pty) Ltd ("**SLR**") and dated December 2012.
- ***2013 Zilkaatsnek Schietfontein EMPR Amendment*** approved by the DMRE on 13 March 2013 (Ref No: (NW) 30/5/1/2/3/2/1/341EM), compiled by Metago, with reference E016-21 and dated December 2011.
- ***2020 Start Up IEA:*** issued by the DMRE on 10 February 2020 (Ref No: NW 30/5/1/2/3/2/1/280EM). The EIA/EMPR was compiled by CHEMC Environmental (Pty) Ltd ("**CHEMC**") and dated January 2019.
- ***The portion of the Initial 2000 MM EMPR for inter alia 151 MR*** relevant to the MR Sale Portion, approved by the DMRE on 30 January 2001 (Ref No: NW/30/5/1/2/2/151); and compiled by SRK Consulting (Pty) Ltd (dated August 2000, with reference number 269179).
- ***The portion of EMPR for 78 MR*** relevant to the MR Sale Portion, accepted by the DMRE (Ref No: NW/30/5/1/2/2/151 EM), compiled by Metago and dated October 2005, with reference number B012-1.
- ***EMPR for 363 MR***, approved by the DMRE. The EMPR was compiled by Metago and dated September 2008, with reference number B012-24.

- ***A portion of 2018 MM IEA*** issued by the DMRE on 5 October 2018 (Ref No: NW 30/5/1/2/3/2/1/(78, 151, 307, 332 & 363) EM) in respect of the existing salvage yard and two WRDs at MM. The EIA / EMPR was compiled by Envass Environmental Assurance (Pty) Ltd and dated January 2015.

## 6. Conclusion and recommendation

The DEIAR process has been carried out in accordance with NEMA and the 2014 EIA Regulations' provisions, as amended. The EIAR was compiled based on the structure and template from the DMRE.

The EM Consolidation Project has been subjected to a comprehensive Scoping / EIA process and potential environment impacts associated with the EP Proposed Projects have been identified, investigated, assessed and mitigation measures proposed, in accordance with the 2014 EIA Regulations. Potential positive impacts associated with the EM Consolidation Project include the following:

- Reduced environmental liability associated with the utilisation of tailings as backfill material in the opencast pits;
- Continuance of the current land use within an existing mining operation;
- Potential economic benefit associated with the rejuvenation of the existing MM that has been under care and maintenance for almost a decade;
- Socio-economic benefits associated with job creation; capital and operational expenditure on contractors, materials and equipment; and downstream spending;
- Promotion of the waste management hierarchy of controls by re-using tailings as backfill material;
- Promotion of sustainable development by proficiently utilising natural resources (i.e., long term raw water use conservation by means of reduced evaporation on TSF Paddocks); and
- Streamlined and more efficient environmental management and administration and reporting to the DMRE will benefit both the DMRE and EP, with the grant of the Environmental Licence Consolidation Application.

The potential negative impacts identified include the following aspects:

- Socio-economic effects associated with the current local economic and social constraints;
- Loss of floral and faunal habitat and potential species of concern;
- Visual and noise intrusion and nuisance to surrounding land users;
- Contamination of groundwater by means of infiltration and plume migration;
- Groundwater quantity;
- Loss of soil and land with agricultural potential;
- Sedimentation and increase salt loads of surface water, influencing the water quality of downstream users; and
- Land degradation associated with erosion and alien and invasive plant ("**AIP**") establishment.

However, from the Specialist studies commissioned and the impact assessment undertaken for the site, it has been determined that the potential negative impacts associated with the preferred alternative can be mitigated to an acceptable level. In addition, the positive impacts associated with the EM Consolidation Project outweighs the No-Go Alternative.

Based on the outcomes of the impact and risk assessments conducted, coupled with the recommendations made by the relevant Specialists, the EAP can establish that the EM Consolidation Project will contribute positively to the local and regional socio-economic sphere, given that the potential negative environmental impacts will be managed in accordance with the mitigation measures and Specialists' recommendations.

The EAP therefore finds it rational to recommend that the EM Consolidation Project be authorised to proceed, as it is the most preferred option, subsequent to the satisfaction of the regulatory processes and collaboration of the authorities, I&APs and stakeholders.

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# LIST OF ABBREVIATIONS

| Term/Abbreviation | Definition |
|---|---|
| 2013 WML Regulations | The Regulations published under NEMWA in GN 921 of Government Gazette 37083 on 29 November 2013 |
| 2014 EIA Regulations | Environmental Impact Assessment Regulations promulgated in terms of NEMA in GN 982 of Government Gazette 38282 on 4 December 2014 (as amended in 2017). |
| 2006 EIA Regulations | Environmental Impact Assessment Regulations promulgated in terms of NEMA in GN 385 of Government Gazette 28753 of 21 April 2006 |
| AIP | Alien and Invasive Plants |
| AMD | Acid mine drainage |
| BPG1 | DWS Best Practice Guideline G1 for Storm Water Management |
| BIC | Bushveld Igneous Complex |
| BPDM | Bojanala Platinum District Municipality |
| CA | Competent Authority |
| CARA | Conservation of Agricultural Resources Act (Act No. 43. of 1983) |
| CBA | Critical Biodiversity Area |
| CFP | Chrome Flotation Plant |
| CVB | Channelled valley bottom |
| DALRRD | Department of Agriculture, Land Reform and Rural Development |
| DEAFF | Department of Environmental Affairs, Forestry and Fisheries, previously the Department of Environmental Affairs |
| DEIAR | Draft EIA Report |
| DHSWS | Department of Human Settlements, Water and Sanitation |
| DEFF Screening Tool | National Web Based Environmental Screening Tool in terms of Section 24(5)(h) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) |
| DMRE | Department of Mineral Resources and Energy, previously the Department of Mineral Resources and Department of Minerals and Energy |
| DMS | Dense media separator |
| DSR | Draft Scoping Report |
| DWA | Then former Department of Water Affairs, now Department of Human Settlement, Water and Sanitation |
| DWAF | Then former Department of Water Affairs and Forestry, now Department of Human Settlement, Water and Sanitation |
| DWS | Then former Department of Water and Sanitation, now Department of Human Settlement, Water and Sanitation |
| EA | Environmental Authorisation |
| EAP | Environmental Assessment Practitioner |
| EAPASA | Environmental Assessment Practitioners Association of South Africa |
| EC | Ecological Category |
| EI | Ecological Importance |
| EIA | Environmental Impact Assessment |
| EIAR | Environmental Impact Assessment Report |
| EM | Eland Platinum Mine |
| EMP | Environmental Management Programme |
| EMPR | Environmental Management Programme Report |
| EP | Eland Platinum (Pty) Ltd, a subsidiary of Northam |
| EPM | Eland Platinum Mines (Pty) Ltd, a subsidiary of GOSA |
| ES | Ecological Sensitivity |
| ESA | Ecological Support Areas |
| FEIAR | Final EIA Report |
| FSR | Final Scoping Report |
| GDP | Gross Domestic Product |
| GG | Government Gazette |
| GIS | Geographical Investigation System |
| GN | Government Notice |
| GN704 | GN 704, published under the NWA in GG 20118 on June 1999) |
| GN 983 | Environmental Impact Assessment Regulations, promulgated in terms of NEMA in GN 983 of GG 38282 on 4 December 2014 (as amended in 2017). |
| GN 984 | Environmental Impact Assessment Regulations, promulgated in terms of NEMA in GN 984 of GG 38282 on 4 December 2014 (as amended in 2017). |

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|---|---|
| GN 984 | Environmental Impact Assessment Regulations, promulgated in terms of NEMA in GN 985 of GG 38282 on 4 December 2014 (as amended in 2017). |
| NEMBA Ecosystem List | List of Threatened or Protected or Threatened Species, published under NEMBA in GN 1002 in GG 3809 on 9 December 2011. |
| GOSA | Glencore Operations South Africa (Pty) Ltd |
| Ha | Hectares (measure of area, 10 000 square metres) |
| HIA | Heritage Impact Assessment |
| HS | Health and Safety |
| HSEC | Health Safety Environment Community |
| I&APs | Interested and Affected Parties |
| IDP | Integrated Development Plan |
| IEA | Integrated Environmental Authorisation |
| IWULA | Integrated Water use licence application |
| IWMMP | Integrated waste and water management plan |
| IWBSM | Integrated Water Balances Simulation Model |
| Km | Kilometres |
| LOM | Life of Mine |
| $m^2$ | Square Metres |
| MAP | mean annual precipitation |
| MAR | mean annual runoff |
| MLM | Madibeng Local Municipality |
| Mm | Millimetres |
| MM | Maroelabult Mine |
| MPRDA | Mineral and Petroleum Resources Development Act (Act No. 28 of 2002), as amended |
| NEMA | National Environmental Management Act (Act No. 107 of 1998), as amended |
| NEMAQA | National Environmental Management: Air Quality Act (Act No. 39 of 2004), as amended |
| NEM:BA | National Environmental Management: Biodiversity Act (Act No. 10 of 2004), as amended |
| NEMPAA | National Environmental Management: Protected Area Act (Act No. 57 of 2003), as amended |
| NEMWA | National Environmental Management: Waste Act (Act No. 59 of 2008), as amended |
| NEMWA GN 635 and 638 | The National Norms and Standards for the Assessment of Waste for Landfill Disposal and the National Norms and Standards for the Disposal of Waste to Landfill (published under GN 635 and GN 636 respectively in GG 36784 on 23 August 2013) |
| 2013 WML Regulations | Published in GN 921 under the NEMWA in GG 37083 on 29 November 2013, as amended in GNR 633 on 24 July 2015 |
| NBA | National Biodiversity Assessment (2018) |
| NHRA | National Heritage Resources Act (Act No. 25 of 1999) |
| NFEPA | National Freshwater Ecosystems Priority Areas |
| NWA | National Water Act (Act No. 36 of 1998), as amended |
| NWBSP | North West Biodiversity Sector Plan |
| NWDACE | Then North-West Department of Agriculture, Conservation and the Environment (now NWREAD) |
| NWDEDECT | North West Department of Economic Development, Environment, Conservation and Tourism (now NWREAD) |
| NWREAD | North West Department of Rural, Environment and Agricultural Development |
| Northam | Northam Platinum Limited |
| NW BSP | North-West Biodiversity Sector Plan |
| NWP | North-West Province |
| PCD | Pollution control dam |
| PES | Present Ecological Status |
| PGM | Platinum Group Metals |
| POS | Plan of Study |
| PPP | Public Participation Process |
| Pr. Sci. Nat | Professional Natural Scientists |
| ROM | Run-of-mine |
| RSA | Republic of South Africa |
| SACNASP | South African Council of Natural Scientific Professions |
| SAHRA | South African National Heritage Resources Agency |
| SANBI | South African National Biodiversity Institute |
| SANS | South African National Standards |
| SAWS | South African Weather Service |
| SCC | Species of Conservation Concern |
| SEIA | Socio-Economic Impact Assessment |

| | |
|---|---|
| SHE | Safety Health Environment |
| SDF | Spatial Development Framework |
| SLP | Social and Labour Plan |
| SQ | Sub-quaternary catchment |
| STP | Sewage Treatment Plant |
| SWD | Stormwater dam |
| SWMP | Stormwater Management Plan |
| SMS | Short Message Services |
| TSF | Tailings Storage Facility |
| WRD | Waste Rock Dump |
| WTP | Water Treatment Plant |
| WUL | Water Use Licence |
| WML | Waste Management Licence |
| ZoR | Zones of Regulation |
| YRS | Years |

# DRAFT EIA REPORT

## 1. INTRODUCTION:

JEMS Pty Ltd ("**JEMS**") was appointed by Eland Platinum Proprietary Limited ("**EP**") as the independent Environmental Assessment Practitioner ("**EAP**") for the Integrated DMRE Environmental Application.

EP owns and operates the Eland Platinum Mine ("**EM**") and Concentrator Plant at EM. EM is within the North-West Province ("**NWP**") of the Republic of South Africa ("**RSA**") and falls under the local jurisdiction of the Madibeng Local Municipality ("**MLM**"), situated in the larger district of the Bojanala Platinum District Municipality ("**BPDM**"). The town of Brits is located 10km east of EM, with the Tshwane Metropolitan 60km to the west. The northern boundary of the EM Surface Area is bounded by the R566 (Brits - Rosslyn) provincial road and N4 Bakwena National Highway (Pretoria-Rustenburg) to the south.

Established in 2006, EM is a platinum group metals ("**PGMs**") and chrome mining and processing operation and is operated under two mining rights, namely DMRE Reference. No: NW 30/5/1/2/2/341MR ("**Zilkaatsnek Mining Right**") and DMRE Ref. No: NW 30/5/1/2/2/280MR ("**Elandsfontein Mining Right**"), granted in terms of the MPRDA by the DMRE, which include opencast and underground mining sections. EP's core business is to extract ore and process PGMs and chromite concentrate at the EM and Concentrator Plant. The EM Surface Area is approximately 1624 hectares (CHEMC, 2019).

The existing combined mining, processing and auxiliary infrastructure on the Consolidated MR Surface Area comprise of the following:

- Workshops and Stores;
- Overburden and Topsoil Stockpiles;
- Opencast Mining Pits;
- Concentrator Plant;
- On-site Laboratory;
- Mine clinic and training centre;
- Water Management Infrastructure (i.e., dams, channels and pipelines);
- Wastewater Treatment Plant and Water Treatment Plant ("**WTP**");
- Decline Shafts (Maroelabult, Kukama and Nyala) and supporting infrastructure;
- TSF, comprising of four Paddocks;
- Waste Rock Dumps ("**WRDs**");
- Offices and auxiliaries;
- Recreational Area (Game Farm);
- Agricultural fields; and
- Haul and internal Roads.

EP recently concluded the Sale Agreement to acquire the underground Maroelabult Mine ("**MM**"), bordering to the west of EM, from Barplats Mines (Pty) Ltd ("**Barplats**"), a subsidiary of Eastplats (Pty)

Ltd, including portions of mining rights NW30/5/1/2/2/151MR and NW30/5/1/2/2/78MR and the entire NW30/5/1/2/2/363MR ("**MR Sale Portion**"). MM forms part of the Crocodile River Mine.

EP has submitted an application under section 102 of the Mineral and Petroleum Resources Development Act 28 of 2002 (**"MPRDA**") to consolidate the following mining rights into the Elandsfontein Mining Right:

- MR Sale Portion and
- Zilkaatsnek Mining Right,

("**Section 102 Application**").

One of the conditions precedent to the Sale Agreement is the grant of the Section 102 Application.

The MM operation has been in care and maintenance from July 2013. It comprises of an underground operation, accessed via a decline shaft, with the following surface infrastructure (Elemental Sustainability, 2019):

- Administrative offices and parking;
- Main plant area;
- Stockpiles (topsoil, product, etc.);
- Haul roads;
- Two WRDs;
- Laydown areas;
- Water management structures / infrastructure (pollution control dams ("**PCD**"), stormwater dam ("**SWD**"), stormwater diversion berms / trenches, and associated pumps / piping);
- Conveyor belt system;
- Aboveground diesel tanks; and
- Septic tank.

To take the EM and MM operations forward, EP and Northam have identified the EP Proposed Projects. EP has consequently submitted the Integrated DMRE Environmental Application under the NEMA and NEMWA to the DMRE and will be submitting the WUL Consolidation Application to the Department of Human Settlement, Water and Sanitation ("**DHSWS**") for the following activities:

- Consolidation of the existing Environmental Management Programmes ("**EMPRs"**), EAs and WMLs for EM and the portions of the EMPrs ("**Maroelabult EMPrs**") and IEA relevant to the MR Sale Portion ("**Sale Portion Area**") into the Environmental Impact Assessment ("**EIA**") / EMPR for the Elandsfontein Mining Right (approved by the DMRE on 21 December 2006 – Ref No: (NW) 30/5/1/2/3/2/1/280EM) ("**Environmental Licence Consolidation Application**");
- Consolidation of the Water Use Licences ("**WUL**") for the Consolidated MR Surface Area;

*EP Proposed Projects -*

- Mining at MM, including the Boundary Pillar on the UG2 reef horizon between EM and MM;
- Construction and operation of two Run of Mine ("**ROM**") stockpiles at EM;
- Raise-boring and operation of two underground Ventilation Shafts at EM;

- Mining of the Merensky Reef at EM, including associated infrastructure, Overburden Stockpiles and WRDs;
- Mining of the UG1 in the existing TSF Paddocks 2, 3 and 4 at EM;
- Backfilling of existing opencast pits with tailings at EM and the construction of a pipeline to convey the wet tailings to the pits and a return water pipeline between the existing TSF return water sump and the opencast pits ("**Pits Pipelines**");
- Water management infrastructure linking EM and MM, including expansion and construction of pump stations and pipelines for the conveying of water and tailings between EM and MM ("**Water Management Pipelines**");
- Construction of an electrical substation and associated infrastructure at MM;
- Construction and operation of a Chrome Floatation Plant ("**CFP**") and associated infrastructure at the MM shaft within existing operational area; and
- WRD re-processing at MM.

The DEIAR was compiled in line with Annexure 3 of the 2014 EIA Regulations and the template provided by the DMRE.

## 2. CONTACT PERSON AND CORRESPONDENCE ADDRESS:

### 2.1 Details of:

#### 2.1.1 The applicant:

Details of the applicant and the contact details of the responsible person are captured in ***Table 1*** below.

**Table 1: Details of the applicant and contact person.**

| | |
|---|---|
| **Project applicant:** | Eland Platinum Proprietary Limited, a wholly owned subsidiary of Northam Platinum Limited |
| Registration no: | 2016/427918/07 |
| Trading name: | Eland Platinum |
| Responsible person: | Jacques Pretorius (General Manager) |
| Physical address: | Farm Elandsfontein 440 JQ, District of Brits, South Africa |
| Postal address: | PO Box 3436, Brits, 0250, South Africa |
| Telephone no: | 087 158 8000 |
| Fax no: | 086 411 8000 |
| Email: | Jacques.Pretorius@norplats.co.za |
| For the purpose of the application process the following people may be contacted at Eland Platinum: | |
| Mr. S Phalatsi<br>SHEQ Manager<br>Tel No: 087 158 8000<br>Email: Samuel.Phalatsi@norplats.co.za | Mrs. Keneilwe Makwela<br>Environmental Officer<br>Tel: 087 158 8000<br>Email: Keneilwe.Makwela@norplats.co.za |

### 2.1.2 The EAP who prepared the report:

JEMS has been appointed as the independent EAP by EP to undertake the Integrated DMRE Environmental Application in terms of the NEMA, NEMWA and 2014 EIA Regulations and the WUL Consolidation Application in terms of the NWA.

GS Barkhuizen will be the main EAP for the project, with the support of M Potgieter (Junior EAP) and JG Cronje (Project Sponsor).

JEMS is a multi-skilled Environmental and Water Management Consultancy, providing independent and professional services to the industrial, mining, and commercial sectors. It is a proudly South African, level 2 Broad-Based Black Economic Empowerment company.

**Table 2: Details of the EAP**

| | | | |
|---|---|---|---|
| **EAP:** | Gerhardus Stephanus Barkhuizen | | |
| **Company:** | JEMS (Pty) Ltd | | |
| **Address:** | 26 In Full Flight, Mooikloof, 0059 | | |
| **P.O. Box** | 92269 P O Box, Mooikloof, Pretoria, 0059 | | |
| **Tel:** | 082 892 4282 | 083 776 7898 | 082 291 8316 |
| **Fax:** | 086 658 3132 | | |
| **Email:** | stephan@jems.co.za | jannie@jems.co.za | marilize@jems.co.za |

| JEMS Team Details | | | | |
|---|---|---|---|---|
| **Designation** | **Name** | **Qualification** | **Registration** | **Experience** |
| Project Manager/reviewer and Sponsor | JG Cronje | Hons. BSc Geohydrology Post Grad Dipl. Terrain Evaluation | Professional Natural Scientists (Pr.Sci. Nat. 400063/93) with the SACNASP | 30 Years |
| Lead EAP | GS Barkhuizen | BTech Landscape Technology Hons. BSc Environmental Monitoring and Modelling | Certified Natural Scientist in the Environmental Sciences Field (Registration number: 115982), with SACNASP EAP registration pending with EAPASA | 12 Years |
| Junior EAP | M Potgieter | BSc. Hons in Geography B.A Environmental Management | FGASA: Level II Certificate | 12 Years |

### 2.1.3 Expertise of the EAP.

#### *2.1.3.1 Qualifications of the EAP*

The qualifications of the EAP (With evidence attached as **Appendix 1**).

Refer to ***Appendix 1*** for copies of the EAP's qualifications as listed above for this project.

#### *2.1.3.2 Summary of the EAP's past experience.*

(Attach the EAP's curriculum vitae as **Appendix 2**)

Mr Barkhuizen will be the project lead EAP for the Integrated DMRE Environmental Application and WUL Consolidation Application and has 12 years' experience in the environmental field. His experience is in the management of EIAs, EMPRs and integrated water use licence applications ("**IWULA**") processes; coordination and execution of PPP; and management of multi-disciplinary project teams, mainly for mining related projects. He is also involved in conducting environmental audits and site assessments. Mr. Barkhuizen is a Certified Natural Scientist in the Environmental Sciences Field (Registration number: 115982) with the South African Council for Natural Scientific Professions (SACNASP) and his EAP registration is pending with Environmental Assessment Practitioners Association of South Africa (EAPASA).

Mr. Jannie Cronje will be the project sponsor and reviewer of the Environmental Scoping and EIAR. He is a director of JEMS, with 30 years' experience in the environmental and geohydrology consultancy industry. Mr. Cronje is appropriately qualified and registered with the relevant professional bodies. He is registered as a Pr. Sci. Nat (Pr.Sci. Nat. 400063/93) with the SACNASP.

Mrs. Marilize Potgieter will be the environmental junior consultant, aiding in a supplementary role in the Applications. She has over 12 years' experience in the eco-conservation and game management field.

Curriculum Vitae ("**CVs**") of the project team members listed above, with their experience, can be found in ***Appendix 2***.

### 2.2 Description of the property:

The town of Brits is located 10km east of the area on which the EP Proposed Projects will occur ("**Project Area**"), with the Tshwane Metropolitan Municipality 60km to the west. The northern boundary of the EM Surface Area is bounded by the R566 (Brits - Rosslyn) provincial road and N4 Bakwena National Highway (Pretoria-Rustenburg) to the south.

The surrounding communities and their proximity to Project Area include (CHEMC, 2019):

- Brits (10km west);
- Damonsville (1 km north);
- Mothotlung (2 km north);
- Moumong (1.2 km north-east);
- Mmakau (3 km north); and
- De Wildt (3.7 km east).

Land surrounding the Project Area is mainly used for livestock grazing, agriculture, mining (EM is adjacent to MM, Hernic Ferrochrome's Smelter and Mine, and granite mining further north); renewable power (final commissioning in progress of the De Wildt Solar Power Station); and several community residential area and related activities (CHEMC, 2019). The Zilkaatsnek Eco-estate (mixed land-use development), small holdings and other businesses are located directly to the south (across the N4

highway), with several conservancy and protected areas further to south (i.e., Magaliesberg Biosphere Area, Peglerae Conservancy and De Wildt Cheetah Research Area, etc.). (Refer to ***Figure 1*** and ***Figure 2***).

A detailed property description of the Consolidated MR Area is listed in

***Table*** 3, below:

**Table 3: Locality and Property description of the EM and MM Mining Rights**

| Mining Right | Farm Name |
|---|---|
| **Elandsfontein**<br>**NW 30/5/1/2/2/280MR** | Elandsfontein 440JQ<br>➢ Portion 9;<br>➢ Remaining Extent of Portion 91;<br>➢ Remaining Extent of Portion 15;<br>➢ Remainder of Portion 16 (a portion of Portion 15);<br>➢ Portion 37 (a portion of Portion 16);<br>➢ Portion 38 (a portion of Portion 16);<br>➢ Remaining Extent of Portion 52 (a portion of Portion 16);<br>➢ Portion 123 (a portion of Portion 52);<br>➢ Remaining Extent of Portion 82 (a portion of Portion 52);<br>➢ Portion 83 (a portion of Portion 82) (now known as "Damonsville Ext 1 Township");<br>➢ Portion 89 (a portion of Portion 16);<br>➢ Remaining Extent of Portion 17 (a portion of Portion 15);<br>➢ Portion 30 (a portion of Portion 17);<br>➢ Portion 39 (a portion of Portion 17);<br>➢ Remaining Extent of Portion 18 (a portion of Portion 15);<br>➢ Remaining Extent of Portion 32 (a portion of Portion 18);<br>➢ Portion 61 (a portion of Portion 32);<br>➢ Portion 85 (a portion of Portion 18);<br>➢ Remaining Extent of Portion 19 (a portion of Portion 15);<br>➢ Remaining Extent of Portion 40 (a portion of Portion 19);<br>➢ Portion 43 (a portion of Portion 40);<br>➢ Remaining Extent of Portion 58 (a portion of Portion 19);<br>➢ Remaining Extent of Portion 59 (a portion of Portion 58);<br>➢ Portion 87 (a portion of Portion 59);<br>➢ Remaining Extent of Portion 63 (a portion of Portion 58);<br>➢ Portion 88 (a portion of Portion 63);<br>➢ Portion 86 (a portion of Portion 58);<br>➢ Portion 78 (a portion of Portion 19);<br>➢ Portion 45 (a portion of Portion 15);<br>➢ Portion 84 (a portion of Portion 15);<br>➢ Portion 44 (a portion of Portion 15);<br>➢ Portion 46 (a portion of Portion 15); and<br>➢ Portion 47 (a portion of Portion 15). |
| **Zilkaatsnek**<br>**NW 30/5/1/2/2/341MR** | Zilkaatsnek 439 JQ<br>➢ Portion 97 (a portion of Portion 4);<br>➢ Portion 84 (a portion of Portion 58);<br>➢ Remaining Extent of Portion 58;<br>➢ Portion 80 (a portion of Portion 58);<br>➢ Portion 81 (a portion of Portion 58);<br>➢ Portion 82 (a portion of Portion 58); and<br>➢ Portion 87 (a portion of Portion 58).<br><br>Schietfontein 437 JQ<br>➢ Portion 13 (a portion of Portion 2); and<br>➢ Portion 14 (a portion of Portion 2). |

| Mining Right | Farm Name |
|---|---|
| **Maroelabult - a portion of NW30/5/1/2/2/151MR** | Farm De Kroon 444 JQ<br>➢ Remaining Extent of Portion 48;<br>➢ Remaining Extent of Portion 49;<br>➢ Remaining Extent of Portion 141 (a portion of Portion 49);<br>➢ Portion 142 (a portion of Portion 49);<br>➢ portions of Portion 353[1];<br>➢ Remaining Extent of Portion 50;<br>➢ Portion 51;<br>➢ Portion 52;<br>➢ Portion 119;<br>➢ Portion 121;<br>➢ Portion 122;<br>➢ Portion 123;<br>➢ Remainder of Portion 165;<br>➢ Portion 333 of Portion 165;<br>➢ Portion 166 (portion of Portion 47);<br>➢ Portion 167 (portion of Portion 47);<br>➢ Portion 168 (portion of Portion 47);<br>➢ a portion of Portion 296; and<br>➢ a portion of Portion 297. |
| **Maroelabult NW30/5/1/2/2/363MR** | Farm De Kroon 444 JQ<br>➢ Portion 115; and<br>➢ Portion 160. |
| **Maroelabult: A portion of NW30/5/1/2/2/78MR** | Farm De Kroon 444 JQ<br>➢ Remainder of Portion 157 (portion of Portion 47);<br>➢ A portion of Portion 353;<br>➢ Portion 159 (portion of portion 115); and<br>➢ Portion 161 (portion of portion 115). |

**Table 4: Locality and Property description of the EP Proposed Project Area**

| EA Application Property Description incl. 21-digit Surveyor General Code for each farm portion: |
|---|
| The EP Proposed Projects will be located on the following properties:<br>Elandsfontein 440JQ:<br>➢ Remaining Extent of Portion 58 (a portion of Portion 19) - T0JQ00000000044000058<br>➢ Remaining Extent of Portion 59 (a portion of Portion 58) - T0JQ00000000044000059<br>➢ Remaining Extent of Portion 32 (a portion of Portion 18) - T0JQ00000000044000032<br>➢ Portion 61 (a portion of Portion 32) - T0JQ00000000044000061<br>➢ Portion 30 (a portion of Portion 17) - T0JQ00000000044000030<br>➢ Portion 37 (a portion of Portion 16) - T0JQ00000000044000037<br>➢ Portion 39 (a portion of Portion 17) - T0JQ00000000044000039<br>➢ Remaining Extent of Portion 63 (a portion of Portion 58) - T0JQ00000000044000063<br>Zilkaatsnek 439JQ:<br>➢ Remaining Extent of Portion 58 - T0JQ00000000043900058<br>➢ Portion 80 (a portion of Portion 58) - T0JQ00000000043900080<br>➢ Portion 81 (a portion of Portion 58) - T0JQ00000000043900081<br>➢ Portion 82 (a portion of Portion 58) - T0JQ00000000043900082<br>➢ Portion 84 (a portion of Portion 58) - T0JQ00000000043900084<br>➢ Portion 87 (a portion of Portion 58) - T0JQ00000000043900087<br>➢ Portion 97 (a portion of Portion 4) - T0JQ00000000043900097<br>De Kroon 444 JQ<br>➢ Portion 296 - T0JQ00000000044400296 |

[1] Mining Rights 151 MR and 78 MR, and the Sale Portion MR, are held over the whole of Portion 353.

| |
|---|
| ➢ Remaining Extent of Portion 48 - T0JQ00000000044400048<br>➢ Remaining Extent of Portion 50 - T0JQ00000000044400050<br>➢ Portion 121 - T0JQ00000000044400121<br>➢ Portion 122 - T0JQ00000000044400122<br>➢ Portion 123 - T0JQ00000000044400123<br>➢ Remainder of Portion 141 - T0JQ00000000044400141<br>➢ Portion 142 - T0JQ00000000044400142<br>➢ Remainder of Portion 157 - T0JQ00000000044400157<br>➢ Portion 159 - T0JQ00000000044400159<br>➢ Portion 160 - T0JQ00000000044400160<br>➢ Portion 161 - T0JQ00000000044400161<br>➢ Remainder of Portion 165 - T0JQ00000000044400165<br>➢ Portion 166 - T0JQ00000000044400166 |
| **Application area (Ha):** |
| The entire EM Surface Area is approximately 1624Ha in extent, and the area on which infrastructure is situated at MM ("**MM Surface Area**") is approximately 231.6Ha in extent. The EP Proposed Projects will take place on an area of +/- 227Ha within the EM Surface Area and MM Surface Area ("**Consolidated MR Surface Area**"). |

| | |
|---|---|
| **Province:** | North-West Province |
| **District Authority** | Bojanala Platinum District Municipality |
| **Local Authority** | Madibeng Local Municipality |
| **Magisterial district:** | Brits |
| **Municipal Wards** | Ward 21 |

| |
|---|
| **Distance and direction from nearest town:** |
| EP Proposed Project is located near the town of Brits (10km west). Surrounding communities include Damonsville, Mothotlung, Moumong, Mmakau, De Wildt and private landowners and farmers. |
| **Catchment** |
| Crocodile River Catchment and the Quaternary Sub-Catchment A21J |
| **Servitudes** |
| Several servitudes, including Eskom power lines, are located within the Project Area. Servitudes to north and south of the EM Surface Area's boundary include a railway and national road route (N4 – Bakwena) |
| **Major roads and routes** |
| The R566 forms the northern boundary of the EM Surface Area, linking Brits and Rosslyn. The N4 Bakwena national highway is located directly south of EM, linking Pretoria with Rustenburg, Brits and Mafikeng. |

**Table 5: Landowner details of the Proposed EA Project Area.**

| Property Description | Landowner Details |
|---|---|
| **The Farm Zilkaatsnek 439JQ** | |
| **Remaining Extent of Portion 58** | Salene Mining (Pty) Ltd |
| **Portion 80 (a portion of Portion 58)** | |
| **Portion 81 (a portion of Portion 58)** | |
| **Portion 82 (a portion of Portion 58)** | |
| **Portion 87 (a portion of Portion 58)** | |
| **Portion 97 (a portion of Portion 4)** | |
| **Portion 84 (a portion of Portion 58)** | Eland Platinum Proprietary Limited |
| **Portion 197 (a portion of Portion 113).** | |
| **The Farm Elandsfontein 440 JQ** | |
| **Remaining Extent of Portion 58 (a portion of Portion 19)** | Eland Platinum Proprietary Limited |
| **Remaining Extent of Portion 59 (a portion of Portion 58)** | |
| **Remaining Extent of Portion 63 (a portion of Portion 58)** | |
| **Remaining Extent of Portion 32 (a portion of Portion 18)** | |
| **Portion 30 (a portion of Portion 17)** | |

| Property Description | Landowner Details |
|---|---|
| **Portion 39 (a portion of Portion 17)** | |
| **Portion 37 (a portion of Portion 16)** | |
| **Portion 61 (a portion of Portion 32)** | |
| **The Farm De Kroon 444 JQ** | |
| **Remaining Extent of Portion 48** | Barplats Mines Proprietary Limited |
| **Remaining Extent of Portion 50** | |
| **Remaining Extent of Portion 141 (a portion of Portion 49)** | |
| **Portion 142 (a portion of Portion 49)** | |
| **Portion 121** | |
| **Portion 122** | |
| **Portion 123** | |
| **Remaining Extent of Portion 165** | |
| **Portion 166 (a portion of Portion 47)** | |
| **Portion 159 (a portion of Portion 115);** | |
| **Portion 161 (a portion of Portion 115);** | |
| **Remaining Extent of Portion 157 (a portion of Portion 47)** | |
| **Portion 160** | MC Botha |
| **A portion of Portion 296** | Hernic Ferrochrome |

### 2.3 Locality Map

(Show the nearest town, scale not smaller than 1: 250000 attached as Appendix 3)

Refer to ***Figure 1*** and ***Figure 2*** for the Regional and Aerial map.

### 2.4 Legal framework

#### 2.4.1 Eland Mine

EM is an operational mine and is governed by the requirements of the MPRDA and Regulations thereunder. NEMA, NWA, NEMWA and the 2014 EIA Regulations also *inter alia* apply to EM. In this regard, apart from the Elandsfontein and Zilkaatsnek Mining Rights ("**Eland Mining Rights**"), EP also operates with the following environmental approvals, licenses and permits for the area held under the Eland Mining Rights ("**EM Mine Area**"). (This list does not cover occupational health and safety legislation requirements) (CHEMC, 2019):

i) *Elandsfontein Mining Right: 2006 EMPR:* the EIAR/EMPR for this Mining Right (compiled by Metago Environmental Engineers (Pty) Ltd ("**Metago**"), with Ref No: E016-01, and dated September 2006 were approved by the DMRE on 21 December 2006 – Ref No: (NW) 30/5/1/2/3/2/1/280EM) ("**Elandsfontein 2006 EMPR**"). The Elandsfontein 2006 EMPR was for the construction and operation of the following:
   - Opencast Mining Activities and Pits;
   - Underground Mining Activities and Infrastructure;
   - Concentrator Plant;
   - Temporary Topsoil Stockpiles;
   - Ore Stockpiles;

- WRD;
- Access Roads;
- Haul Roads;
- TSF;
- Sewage Treatment Plant ("**STP**");
- WTP;
- Water and Power Supply Reticulation;
- Fuel, Lubricant and Chemical Storage Infrastructure; and
- Offices, Change houses and Workshops

("I**nitial Activities**").

ii) *EA from the then NWDACE (now NWREAD) for the Initial Activities*, for listed activities under the old Environment Conservation Act, 73 of 1989. The EA was granted under the 2006 EIA Regulations on 13 March 2007 (Ref No: EIA 518/2005NW) ("**2007 NWDACE EA**"). The EA was for the construction and operation of the following:

- Concentrator Plant and associated infrastructure;
- WRD;
- Establishment of access control;
- Powerlines;
- TSF;
- STP;
- WTP;
- Fuel, lubricant and chemical storage facilities; and
- Offices, Change houses and Workshops.

iii) *Zilkaatsnek Mining Right 2008 EMPR*: the EIAR and EMPR for this Mining Right (compiled by Metago, with Ref No: E016-12 and dated January 2008) were approved by the DMRE (Ref No: (NW) 30/5/1/2/3/2/1/341EM) ("**Zilkaatsnek 2008 EMPR**"). The EIAR / EMPR was for the construction and operation of the following:

- Opencast Mining operations;
- Internal haul roads;
- Water pipelines (pit dewatering); and
- Temporary topsoil and waste stockpiles.

iv) *Section 102 amendment and update of the Zilkaatsnek 2008 EMPR to include Portions 84 and 97 of the Farm Zilkaatsnek 439 JQ*: (compiled by Metago, with Ref No: E016-21) and dated June 2010) ("**2010 Zilkaatsnek 84/97 EMPR Amendment**"). This EMPR Amendment was approved by the DMRE on 19 November 2010 (Ref No: (NW) 30/5/1/2/3/2/1/341EM) for the following infrastructure:

- Opencast Mining operations;
- Internal haul roads;
- Water pipelines (pit dewatering); and

- Temporary topsoil and waste stockpiles.

v) *EA was issued by the NWDEDECT* (now NWREAD) *for the proposed Concentrator Plant expansion project,* on 8 August 2012 under the 2006 EIA Regulation (Ref No: NWP/EIA/441/2007) ("**2012 Proposed Concentrator Plant EA**"), pursuant to the EIAR and EMPR (compiled by SLR and dated December 2012) ("**2012 Proposed Concentrator Plant EIA / EMP**"). The EA was issued for listed activities to construct and operate the following:

- Construction of an additional concentrator plant;
- Dense media separator ("**DMS**") plant;
- DMS WRD;
- DMS run-off dam;
- New access route;
- Supportive infrastructures, including administration, training and induction building;
- Stores, change house and ablution, clinic, laboratory facilities;
- Explosive magazine upgrade;
- Communication towers; and
- Helipad and greenhouse.

All the above activities have been undertaken, except for the Concentrator Plant expansion, DMS Plant, DMS WRD and DMS run-off dam.

vi) *A WUL issued by the then Department of Water Affairs* ("**DWA**")*,* under section 21 of the NWA, for water uses associated with the EM, including the proposed Concentrator Plant expansion project. The WUL was issued on 23 October 2012 (License No: 03/A21J/ABCGIJ/1547) ("**EP WUL**") and licenses the following water uses as listed in ***Table 6*** below:

vii) *Exemption received from DWA* to register TSF Paddock 1 as a dam with a safety risk on the 26 September 2007.

viii) *Section 102 EMP amendment of the 2008 Zilkaatsnek EMPR* to include Portions 13 and 14 of the Farm Schietfontein 439 JQ, compiled by Metago, with Ref No: E-016-21 and dated December 2011) (DMR Ref No: (NW) 30/5/1/2/3/2/1/341EM) ("**2010 Zilkaatsnek Schietfontein EMP Amendment**"). This EMPR Amendment was approved by the DMR on 13 March 2013 for the following infrastructure:

- Opencast mining operations;
- Underground mining operations;
- Internal haul roads;
- Water pipelines (pit dewatering); and
- Temporary topsoil and waste stockpiles.

ix) *Section 102 EMP amendment application for the 2012 Proposed Concentrator Plant EIAR/EMPR,* submitted to the DMRE on 19 July 2012 for approval for the amendment and update of the Elandsfontein 2006 EMPR (DMRE Ref No: (NW) 30/5/1/2/3/2/1/280EM) ("**2012 Pending Proposed Concentrator Plant EMPR Amendment Application**"). No decision had been issued by the DMRE on the Application and the EMPR approval is still pending.

x) *IEA, issued by the DMRE to EP for the re-start of EM,* on 10 February 2020, in terms of the 2014 EIA Regulations and 2013 WML Activities List (Ref No: NW 30/5/1/2/3/2/1/280EM) (" **2020 Start Up IEA**") for the Elandsfontein Mining Right area, pursuant to an EIAR/EMPR compiled by CHEMC and dated January 2019 ("**2020 Start Up EIAR/EMPR")**. The 2020 Start Up IEA was granted for the following activities:

- Re-mining of the tailings in Paddock 1;
- Construction and upgrading of affected and clean water storage infrastructures;
- Drilling of dewatering borehole;
- Construction of a Grout Plant; and
- Bulk sampling of the Merensky Reef and construction and commissioning of associated activities and infrastructure.

As EM was purchased by EP, all the authorisations, licenses and permits have been transferred from the previous owner (i.e., Eland Platinum Mine (Pty) Ltd ("**EPM**"), a subsidiary of Glencore Operations South Africa (Pty) Ltd ("**GOSA**") (formerly "Xstrata South Africa (Pty)_Ltd")) to EP, pursuant to a NEMA amendment application.

EP also holds the following EAs in respect of pending prospecting rights applications for properties bordering the Zilkaatsnek Mining Rights area:

i) EA from the DMRE in terms of the 2014 EIA Regulations, issued on 1 November 2019 (DMRE Ref No: NW 30/5/1/1/3/2/1/12469EM) ("**Zilkaatsnek Prospecting Right EA**"), pursuant to a basic assessment report ("**BAR"**), compiled by CHEMC and dated 23 January 2019. The EA was granted for prospecting activities on Portions 83, 86 and 197 (a portion of Portion 113) of the Farm Zilkaatsnek 439JQ.

ii) EA from the DMRE in terms of the 2014 EIA Regulations, issued on 12 February 2020 (DMRE Ref No: NW 30/5/1/1/3/2/1/12604EM ("**Schietfontein and Krelingspost Prospecting Right EA**"), pursuant to a BAR, compiled by CHEMC and dated 11 November 2019. The EA was granted for the prospecting activities on the Remaining Extents of Portions 5, 32, 99 and Portions 24 (a portion of Portion 2), 33 (a portion of Portion 32), 34 (a portion of Portion 2), and Portions 100 and 101 (portions of Portion 99) of the Farm Schietfontein 437 JQ and Portions 2, 3 and Portions 70, 71, 72, 73, 74 and 75 (portions of Portion 67), 76, 79 and 80 of the Farm Krelingspost 425 JQ.

**Table 6: Section 21 water uses as licensed in the EP WUL**

| Section 21 Water Use | Details |
|---|---|
| *Section 21 (a): Taking of water from a water resource* | ■ Dewatering using scavenger borehole No. 1 - 120 000 m³/a<br>■ Dewatering using scavenger borehole No. 2 - 300 000 m³/a<br>■ Dewatering using scavenger borehole No. 3 - 8 500 m³/a<br>■ Dewatering using scavenger borehole No. 4 - 15 000 m³/a<br>■ Dewatering using scavenger borehole No. 5 - 425 000 m³/a<br>■ Dewatering using scavenger borehole No. 6 - 285 000 m³/a<br>■ Dewatering using scavenger borehole No. 7 - 120 000 m³/a<br>■ Dewatering using scavenger borehole No. 8 - 120 000 m³/a<br>■ Dewatering using scavenger borehole No. 9 - 120 000 m³/a<br>■ Dewatering using scavenger borehole No. 10 - 1 000 m³/a<br>■ Dewatering using scavenger borehole No. 11 - 1 000 m³/a<br>■ Dewatering using scavenger borehole No. 12- 1 000 m³/a<br>■ Dewatering using scavenger borehole No. 13- 1 000 m³/a<br>■ Dewatering using scavenger borehole No. 14- 1 000 m³/a<br>■ Dewatering using scavenger borehole No. 15- 3 000 m³/a |
| *Section 21 (c): Impeding or diverting the flow of water in a watercourse and Section 21 (i): Altering the bed, banks course or characteristics of a watercourse:* | EP is licensed to divert the Kareespruit Tributary at three points, namely, the eastern and western diversions of the Kareespruit Tributary and a road crossing. |
| *Section 21 (g): Disposing of waste in a manner which may detrimentally impact on a water resource* | ■ Farm Dam (PCD1) - 1 200 000<br>■ SWD at Plant - 4 380<br>■ TSF - 5 000 000<br>■ Return Water Dam - 500 000<br>■ ROM stockpiles - 200 000 tons<br>■ WRD - 100 000 tons<br>■ Western Quarry -400 000<br>■ Eastern Quarry - 230 000<br>■ Lapa Dam (PCD2) 33 750<br>■ Dust suppression at the Concentrator - 142 000<br>■ Drying beds at Sewage Plant - 150 m³ |
| *Section 21 (j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people* | Removal of a maximum volume of 1 663 500 m³ from the opencast and underground mine per annum from the following points:<br>■ Dewatering using scavenger borehole No. 1 - 120 000 m³/a<br>■ Dewatering using scavenger borehole No. 2 - 300 000 m³/a<br>■ Dewatering using scavenger borehole No. 3 - 8 500 m³/a<br>■ Dewatering using scavenger borehole No. 4 - 15 000 m³/a<br>■ Dewatering using scavenger borehole No. 5 - 425 000 m³/a<br>■ Dewatering using scavenger borehole No. 6 - 285 000 m³/a<br>■ Dewatering using scavenger borehole No. 7 - 120 000 m³/a<br>■ Dewatering using scavenger borehole No. 8 - 120 000 m³/a<br>■ Dewatering using scavenger borehole No. 9 - 120 000 m³/a |

| Section 21 Water Use | Details |
|---|---|
| | ■ Dewatering using scavenger borehole No. 10 - 1 000 m³/a<br>■ Dewatering using scavenger borehole No. 11 - 1 000 m³/a<br>■ Dewatering using scavenger borehole No. 12- 1 000 m³/a<br>■ Dewatering using scavenger borehole No. 13- 1 000 m³/a<br>■ Dewatering using scavenger borehole No. 14- 1 000 m³/a<br>■ Dewatering using scavenger borehole No. 15- 3 000 m³/a |

### 2.4.2 Maroelabult

MM is an existing mine, which is currently in the process of being acquired by EP. It is owned and operated by Barplats, a subsidiary of Eastplats (Pty) Ltd and has been in care and maintenance since July 2013. MM is governed by the requirements of the MPRDA and the Regulations thereunder. NEMA, NWA, NEMWA and the 2014 EIA Regulations also *inter alia* apply to MM. In this regard, apart from the three valid mining rights, MM also operates with the following environmental approvals, licenses and permits (This list does not cover occupational health and safety legislation requirements):

i) *EMPR compiled by SRK Consulting and dated August 2000*, with reference number 269179, for the MM for MR 151 and Zandfontein Mine, approved by the DMRE on 30 January 2001 (Ref No: NW/30/5/1/2/2/151) ("**Initial 2000 MM EMPR**"). The Initial 2000 EMPR includes the following at the MM:
   - Three overburden dumps from initial development of the workings;
   - STP;
   - Potable WTP;
   - Water storage dam and pump station;
   - Ventilation Shafts;
   - 11kV sub-station; and
   - Three ore stockpiles, one for underground and two for opencast ore.

ii) *EMPR for 78 MR*, compiled by Metago and dated October 2005, with Ref No B012-01, approved by the DMRE (Ref No: NW/30/5/1/2/2/151 EM) ("**78MR EMPR**"). The 78MR EMPR was submitted as part of the application for 78 MR, to extend the underground mining on the properties held under it.

iii) *EMPR for 363 MR*, compiled by Metago and dated September 2008, with Ref No B012-24, approved by the DMRE ("**363MR EMPR**"). The 363MR EMPR was submitted as part of the application for 363 MR, to extend the underground mining on the properties held under it.

iv) *A WUL from the then Department of Water and Sanitation ("**DWS**")*, under section 21 of the NWA, for water uses associated with the MM. The WUL was issued on 15 June 2017 (License No: 04/A21J/ABCFGIJ/5045) ("**MM WUL**") and licenses the following water uses as listed in ***Table 7*** below.

v) *IEA for the Crocodile River Mine,* issued by the DMRE on 5 October 2018, in terms of the 2014 EIA Regulations and 2013 WML Regulations (Ref No: NW 30/5/1/2/3/2/1/ (78, 151, 307, 332 & 363 EM) ("**MM 2018 IEA**"), pursuant to an EIA and EMP, compiled by Envass Environmental Assurance (Pty) Ltd and dated January 2015. The IEA was granted for the following waste management activities in respect of MM:

- STP;
- Existing salvage yard; and
- Existing 2 WRDs.

**Table 7: Section 21 water uses as licensed in the MM WUL**

| Section 21 Water Use | Details |
|---|---|
| *Section 21 (a): Taking of water from a water resource* | ■ Abstraction of water at the highwall entrance point to the incline, pump out of incline for dewatering - 686 712 m³/a |
| *Section 21(b): Storing of water at the following points* | ■ Circular Steel Water tank at the top of the incline for storage of potable water - 1 221 m³/a<br>■ Circular Steel Water tank just before the underground portal for the storage of potable water - 74 m³/a<br>■ Circular Steel Water tank for the storage of potable water to be used in the event of fire, for fire suppression - 74 m³/a |
| *Section 21 (c): Impeding or diverting the flow of water in a watercourse and Section 21 (i): Altering the bed, banks course or characteristics of a watercourse:* | Bridge over the watercourse to gain access to the MM |
| *Section 21(f) of the NWA: Discharging Waste or Water Containing Waste into a Water Resource, through a pipe, canal, sewer or other conduit* | Discharge of excess water into the unnamed tributary to the Crocodile River - 315 865 m³/a |
| *Section 21 (g): Disposing of waste in a manner which may detrimentally impact on a water resource* | ■ Disposal of waste rock from overburden onto WRD 1 - 1 456 456 m³<br>■ Disposal of waste rock from overburden onto WRD 2 - 783 087 m³<br>■ Disposal of underground water, for dewatering the mine and water used in mining, from underground into Settling Ponds (2 dams and reed beds - one unit) - 7 692 m³.<br>■ Disposal of water from the Settling Ponds, into the bottom dam - 16 720 m³<br>■ Dust suppression with water from the bottom dam on the dirt road to the entrance of the MM -16 608 $m^2$ (area to be suppressed)<br>■ Disposal of waste rock from WRDs 1 and 2 for backfilling of the underground workings and sealing of the shaft |
| *Section 21 (j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people* | ■ Abstraction of water at the highwall entrance point to the incline, pump out of incline for dewatering - 686 712 m³/a |

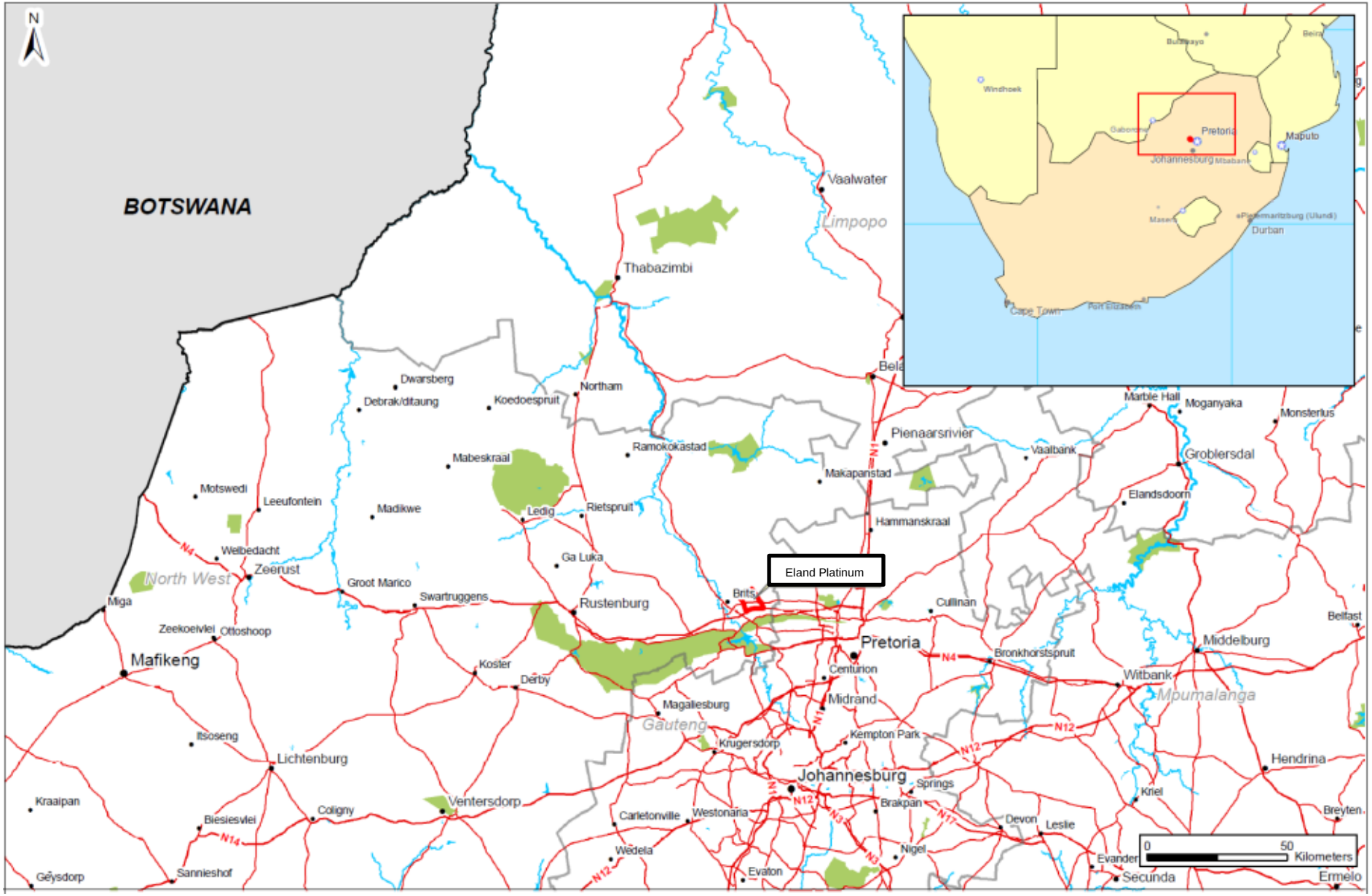


**Figure 1: Regional locality map of Eland Platinum Mine (Highlands Hydrology, 2018)**

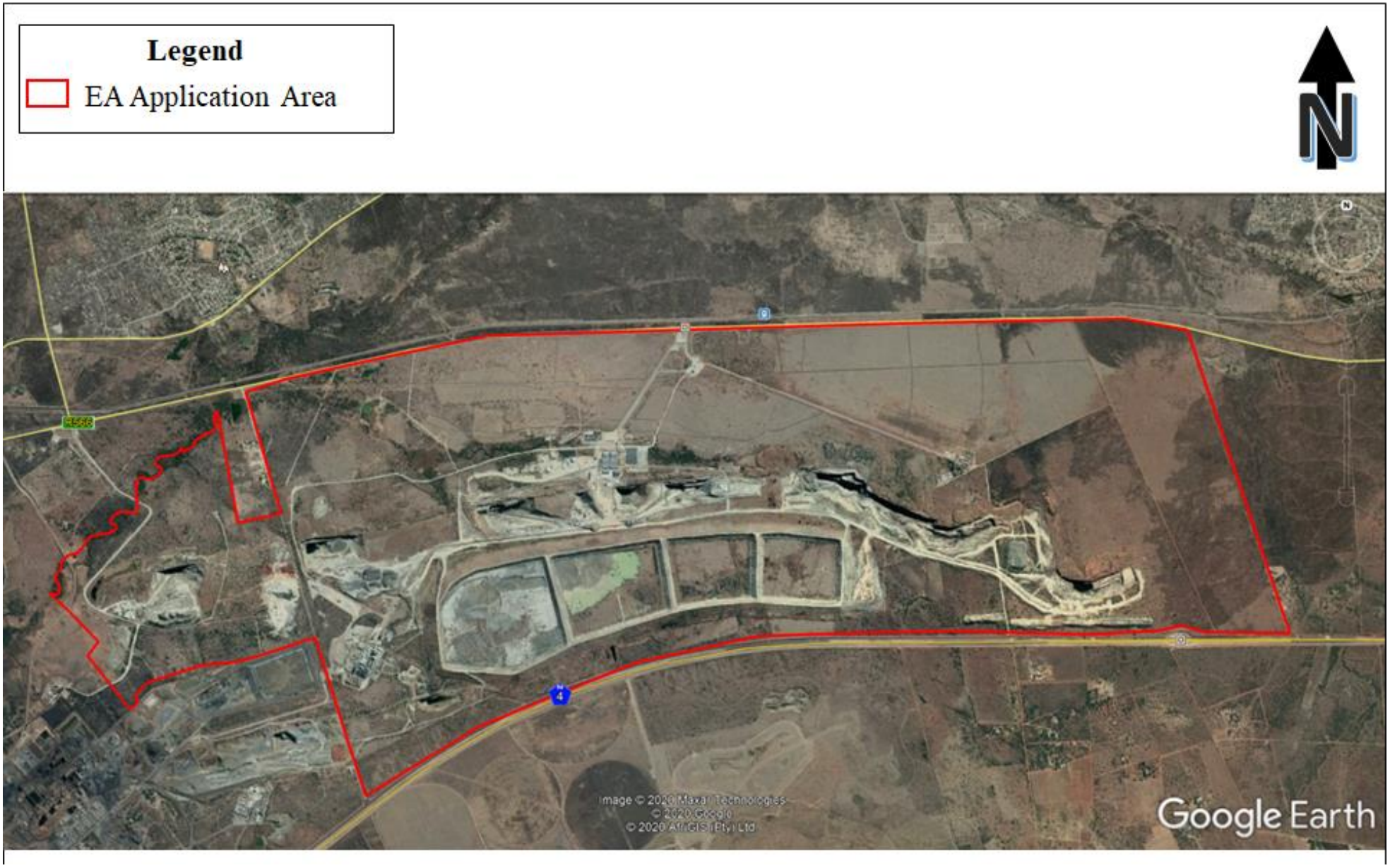


**Figure 2: Aerial locality map of the Consolidated MR Surface Area**

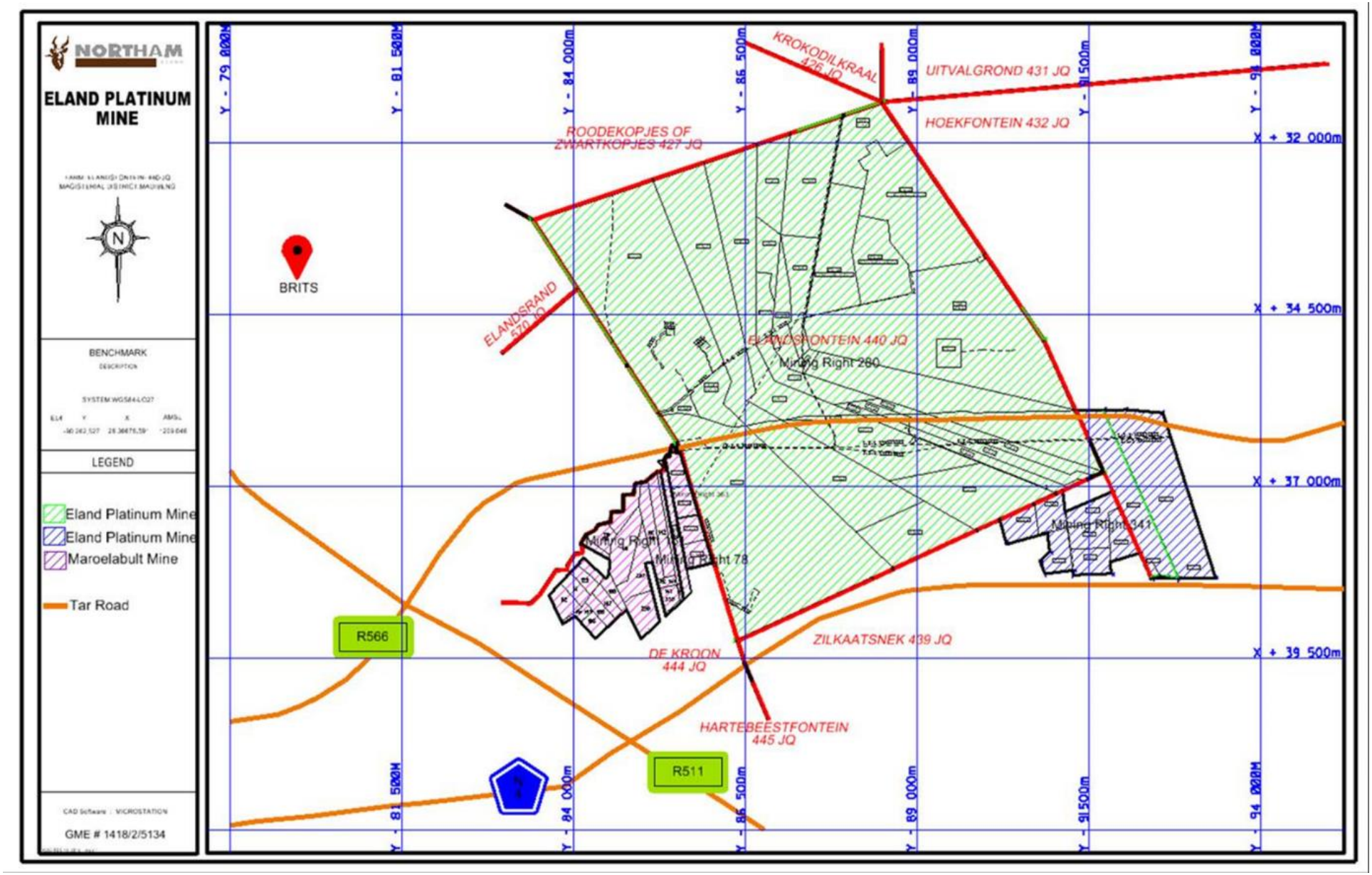


**Figure 3: Property Boundaries of the Consolidated MR Area**

# 3. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY:

## 3.1 Listed and existing activities

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site and attach as **Appendix 4.**

### 3.1.1 Overview of Operation

#### *3.1.1.1 Eland Mine Operations*

***a) Mine Overview***

EM is an established mine, with a Concentrator Plant that produces PGM and chromite concentrate. A description of the operational mining and processing activities is provided below (Refer to ***Figure 4***).

***b) The Mining Processes***

Two different mining methods are undertaken at EM at two sections, namely underground mining at Elandsfontein and opencast mining at Zilkaatsnek. The different mining sections and methods are descried below.

a. **Elandsfontein**

- *Previous Opencast Section*

Opencast mining operations commenced in 2006 prior to the commissioning of the Concentrator Plant, to build up an ore stockpile. The opencast workings were accessed via two boxcuts, located along the length of the UG2 outcrop. Mining took place on both sides of each of the boxcuts (SLR, 2012). Excess waste rock was used for the construction of the TSF Paddocks and roads.

The opencast reserves on the Farm Elandsfontein have been mined out (SLR, 2012). There are currently six void areas within the opencast mining area. These include:

  - a western void – authorised water reservoir;
  - the two portals for the underground decline systems – Kukama and Nyala Shafts;
  - two small void areas adjacent to each of the declines; and
  - an eastern void on the Farm Elandsfontein, located adjacent to the Zilkaatsnek Mining Right area, which will be backfilled as part of the Integrated DMRE Environmental Application.

- *Underground*

The underground mining operation is divided into two mining blocks. These areas are accessed through two decline portals in the high wall of the initial opencast boxcuts (SLR, 2012). These are referred to as the Nyala (eastern portal) and Kukama (western portal) Shafts. Each portal contains two declines, providing access to the underground workings.

b. **Zilkaatsnek**

- *Opencast*

The mining method for the Zilkaatsnek opencast operation comprise of a series of boxcuts, which, once the ore has been removed, the next cut of overburden is removed and the initial void backfilled. Voids will be backfilled as part of the EP Proposed Projects.

c. **Tailings Re-mining**

EP has been authorised to re-mine the tailings in Paddock 1. The tailings are re-mined using hydro-mining. The slurried tailings are piped from Paddock 1 to the Concentrator Plant, where the PGM and chromite minerals are extracted.

d. **Ore from outside sources (unprocessed tailings)**

EP is also currently processing ore from outside sources. The ore is hauled by truck from local sources to EM. It is stored on the existing approved ROM Stockpile and is hydro-mined and pumped to the Concentrator Plant, where it is milled and further processed.

e. **Run-of-mine from neighbouring mines**

EM receives ROM from neighbouring mines, which is transported to the Concentrator Plant, where it is crushed and milled. As part of the Integrated Water and Waste Management Plan a list these external sources will be included.

EP Proposed Project

As part of this application EP is proposing to undertake:

- Opencast extraction of the Merensky Reef, to the north of the existing opencast pits; and
- Upper Group 1 (UG1) extraction inside Paddocks 2, 3 and 4 of the TSF. These activities are further discussed under ***Section 3.2*** below.

***c) The processing processes***

The current mineral processing operations comprise of one Concentrator Plant, with the option of adding an additional concentrator plant in future. The expansion has been authorised, as detailed in the 2012 Proposed Concentrator Plant EA (SLR, 2012).

The existing Concentrator Plant comprises of the following: ROM ore stockpiling, ore storage (silo), crushing and screening, milling and flotation circuits, concentrate handling, a chromite recovery circuit and a TSF. The Concentrator Plant has a capacity to process 250 000 tonnes per month and is designed to produce PGM and chromite concentrate.

- *ROM Processing*

Underground mining will take place at the EM's Kukama and Nyala Shafts. The ROM will be transported to the Concentrator Plant, where it will be crushed and milled. PGM will be extracted from the milled ore by floatation. The tailings from the floatation will then be fed to a Chrome Extraction Plant, where

chrome concentrate will be extracted using gravity separation. The final tailings will then be deposited on the existing TSF Paddocks. The PGM concentrate will be transported off mine to Northam's Zondereinde Smelter for further processing and the chromite concentrate sold to the market.

EP is investigating the sourcing of outside ROM from nearby mines and subsequently will be developing two additional ROM stockpiles, to accommodate the upscale in ROM processing.

- *Tailings Re-mining*

The hydro-mining and reprocessing of the tailings in the existing TSF Paddocks has been authorised by the DMRE. PGM is extracted from the re-mined tailings by floatation. The tailings from the floatation are fed to a Chrome Extraction Plant, where chrome concentrate is extracted by using gravity separation. The final tailings are deposited on the existing TSF Paddocks. The PGM concentrate is transported off mine to the Zondereinde Smelter for smelting and the chromite concentrate is sold to the market.

EP is proposing to backfill the existing opencast pits at EM with re-processed tailings. This activity forms part of this Integrated DMRE Environmental Application and is further discussed under ***Section 3.2***.

- *Ore from outside source*

Ore sourced from outside sources is transported and stockpiled on the existing ROM stockpile area. The stockpiled ore is hydro-mined and pumped to the Concentrator Plant, where it is milled (CHEMC, 2019). PGM is extracted from the milled ore by floatation. The tailings from the floatation are fed to a Chrome Extraction Plant, where chrome concentrate is extracted using gravity separation. The final tailings are deposited on the existing TSF Paddocks. The PGM concentrate is transported off mine to the Zondereinde Smelter for smelting and the chrome concentrate sold to the market.

- *Grout plant/backfill plant*

Limited quantities of the tailings stored in the TSF is processed in a Backfill Plant, to produce cementitious backfill, which is pumped underground for ground support.

#### *3.1.1.2 Maroelabult Operations*

***a) Mine Overview***

Mining at MM commenced in the early 2000s and was a formerly successful opencast mine that was converted to an underground operation, accessed via decline shafts.

***d) The Mining Processes***

MM is equipped with an access decline on the reef out of high wall for primary access. It reached maximum high wall depth at approximately 60m in March 2002. After this, it was transitioned to underground mining following the 1.4m high reef with two decline shafts, using a low-profile mechanised operation to conveyor. The access decline at MM is used for entrance to the underground mine and material transportation, by conveyor system.

### *e) The Concentrator processes*

Platinum ore from MM was originally processed at the existing Zandfontein Concentrator Plant. However, MM was placed in care and maintenance in 2012. EP is currently in the process of acquiring the MM, which is one of the reasons for lodging of this Application.

The MM will be consolidated with the existing neighbouring EM. Once the mining operations re-commence at MM, the ROM from MM will be processed at the EM Concentrator Plant. In addition, the Boundary Pillar on the UG2 reef horizon between MM and EM will be mined, which will allow for future underground infrastructure and resource abstraction synergies.

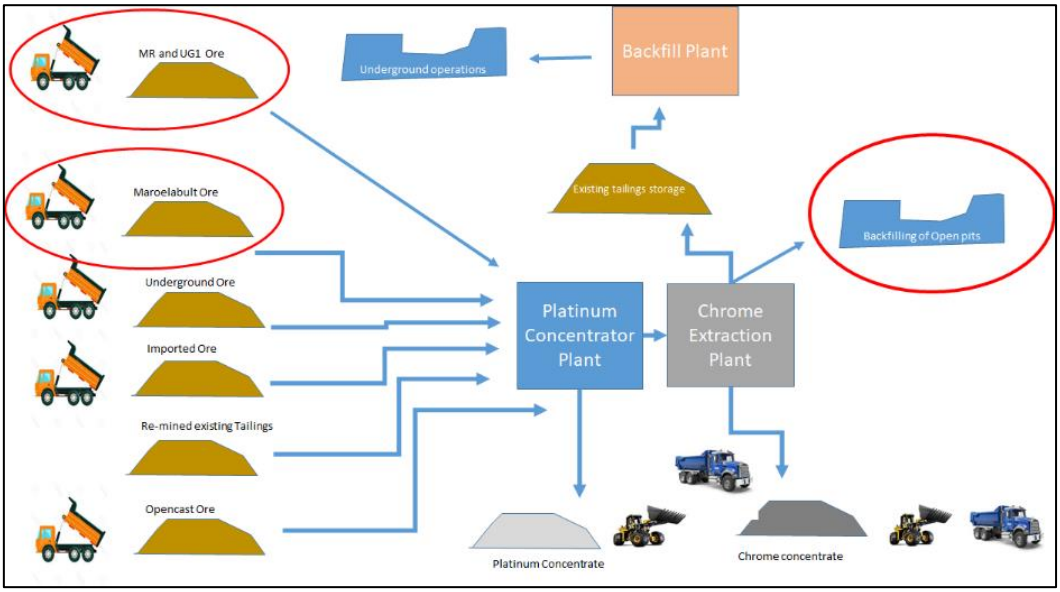


**Figure 4: Eland Platinum Operation Process Flow Diagram (red circles represent proposed additions to process flow).**

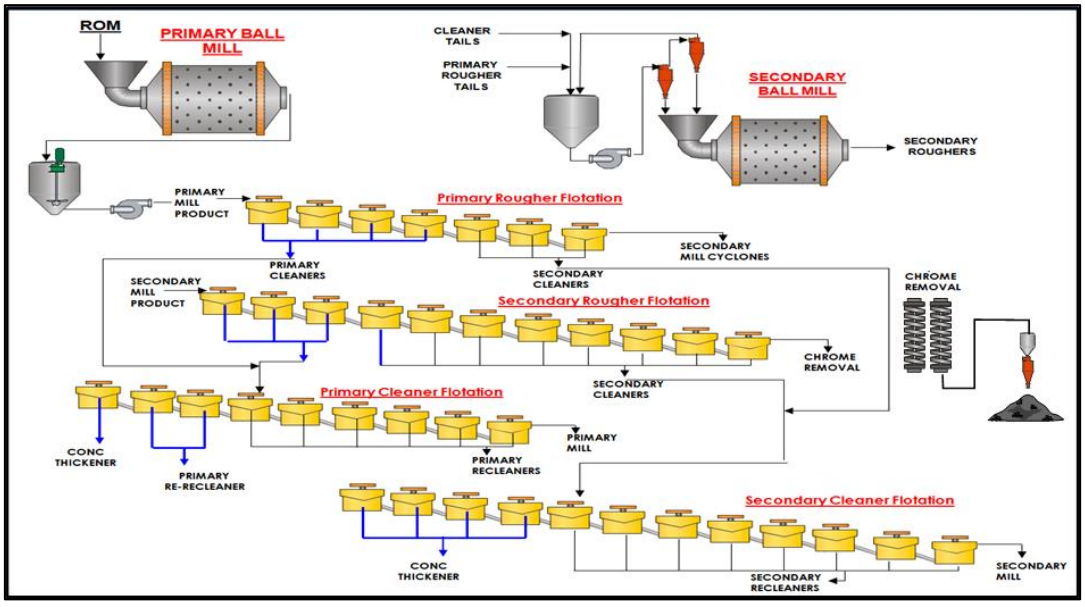


**Figure 5: Concentrator Plant Flow Diagram**

### 3.1.2 Proposed Activities

The purpose of the Integrated DMRE Environmental Application is:

- the Environmental Licence Consolidation (for the consolidation of the existing EMPRs, EAs and WMLs for EM ("**EM Environmental Licences**") and the portions of the Maroelabult EMPRs and IEA relevant to the Sale Portion Area ("**MM Environmental Licences**") into the Elandsfontein 2006 EMPR; and
- apply for an IEA for the EP Proposed Projects ("**EP Proposed Projects IEA Application**").

The project will also include consolidating the EP and MM WULs and an IWULA.

The following listed activities in NEMA and NEWA will be triggered as part of the EP Proposed Projects IEA Application:

**Table 8: List of proposed activities**

| NAME OF ACTIVITY | AERIAL EXTENT | LISTED ACTIVITY | APPLICABLE LISTING NOTICE |
|---|---|---|---|
| 1. Establishment of temporary construction camp | +/- 1000 $m^2$ | N/A | Not listed |
| 2. Backfilling of the existing opencast pits with current tailings produced | +/- 40 Ha | X | GN 984<br>GN 921 Category B<br>Section 21(g) |
| 3. Construction and operation of WRDs, Topsoil, and Overburden Stockpiles for the Merensky Reef mining area | +/- 5 Ha | X | Section 21 (g)<br>GN 984<br>GN 921 Category B |
| 4. Upgrading and expansion of haul roads for the transportation of material and general equipment movement | +/- 2 Ha | X | GN 983<br>GN 985 |
| 5. Expansion of existing pipelines; development of the Water Management Pipelines and Pits Pipelines; and operation of two pipelines present on the Sale Portion, conveying wastewater from the underground workings to the Pre-Settler Dams and Final Dam ("Sale Portion Pipelines"). | +/-1 Ha | X | GN 983<br>GN 985 |
| 6. Vegetation clearance and topsoil stripping for the opencast mining of the Merensky Reef and associated infrastructure at EM, including Overburden Stockpiles and WRDs; two ROM Stockpiles at EM; 11kV substation and electricity distribution line at MM; two new Ventilation Shafts at EM; pipelines and associated infrastructure; and new haul roads at EM. | +/- 90 Ha | X | GN 984<br>GN 985 |
| 7. Mining of the UG1 Reef inside Paddocks 2, 3 and 4. | +/- 61 Ha | X | GN 984<br>GN 921 Category B |
| 8. Construction and operation of a CFP and associated infrastructure at the MM shaft within existing operational area | +/- 2 Ha | X | GN 984 |
| 9. Development and operation of two ROM Stockpiles | +/- 16 Ha | X | GN 984<br>Section 21 (g) |
| 10. Mining of MM, including the Boundary Pillar on the UG2 reef horizon between MM and EM and operating infrastructure at MM directly related to mineral resource extraction, including the conveyor, ventilation shaft and decline shaft | +/- 2.4 Ha | X | GN 984 |
| 11. Construction of new electricity substation and distribution infrastructure | +/- 1 Ha | X | GN 983<br>GN 985 |
| 12. Raise-boring of two Ventilation Shafts at EM | +/- 2 Ha | X | GN 984<br>GN 985 |
| 13. Crushing and re-working of WRD at MM | 10 Ha | X | GN 984<br>GN 921 Category B |
| 14. Construction and expansion of infrastructure in proximity to or across watercourses, including the pump stations and the Water Management Pipelines | +/- 1 Ha | X | GN 983<br>GN 985<br>Sections 21 (c) and (i) |
| 15. Operating an existing hydrocarbon storage tank at MM | 200 $m^2$ | X | GN 983<br>GN 985 |
| 16. Operating the existing conveyor at MM | +/- 1 Ha | X | GN 984 |
| 17. Building rubble and construction waste will be generated during the construction of the EP Proposed Projects. | +/- 500 $m^2$ | N/A | Not listed |
| 18. Decommissioning of the temporary construction camp | +/- 1000 $m^2$ | N/A | Not listed |
| 19. Rehabilitate and replace the topsoil | 101 Ha | N/A | Not listed |
| 20. Continued ground and surface water monitoring | Unknown | N/A | Not listed |
| 21. Dust suppression and monitoring | 10 Ha | N/A | Section 21(g) |
| 22. Maintaining and training of emergency preparedness and response plan | unknown | N/A | Not listed |

## 3.2 Description of the activities to be undertaken

(Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity).

### *a) Consolidation of the Mining rights, IEAs and EMPr(s) into one integrated EMPr*

EM is an established mining and processing operation and is operated under two mining rights, namely Zilkaatsnek and Elandsfontein Mining Rights. EP recently concluded the Sale Agreement to purchase MM, which is owned by Barplats. MM was placed under care and maintenance in July 2013. The MM is situated to the west of EM.

As noted above, EP has submitted the Section 102 Application. As part of the Integrated DMRE Environmental Application, EP has applied to consolidate all the EM Environmental Licences and MM Environmental Licences ("**EM / MM Environmental Licences**") into the Elandsfontein 2006 EMPR, as one integrated EMPr. The EM / MM Environmental Licences to be integrated into the Elandsfontein 2006 EMPR include:

- 2007 NWDACE EA;
- Zilkaatsnek 2008 EMPR;
- 2010 Zilkaatsnek 84/97 EMPR Amendment;
- 2012 Proposed Concentrator Plant EA;
- 2013 Zilkaatsnek Schietfontein EMPR Amendment;
- 2012 Pending Proposed Concentrator Plant EMPR Amendment Application;
- 2019 Re-mining EIAR/EMPR;
- the portion of the Initial 2000 MM EMPR relevant to the Sale Portion Area;
- the portion of the 78MR EMPR relevant to the Sale Portion Area;
- 363MR EMPR; and
- the portion of the MM 2018 IEA relevant to the Sale Portion Area.

This is referred to as the "**Consolidated EMPR**."

The granting of the Environmental Licence Consolidation Application will facilitate a more streamlined and simplified environmental management implementation process and support the mining rights consolidation.

### *b) Consolidation of the Water Use Licences ("WUL") for EM and MM*

EM and MM both have WULs, issued in terms of section 21 of the NWA. Compliance with both WULs' conditions would be unnecessarily onerous and have double cost implications in the long run if they are not consolidated. It also creates an additional administrative burden for the DHSWS. Therefore, the two WULs will be consolidated into one WUL. An integrated approach for all water uses for the Consolidated MR Surface Area will be achieved the WUL Consolidation Application. The WUL Consolidation Application will also include application for the amendment of the existing EP WUL, with the inclusion of the following water uses, listed under section 21 of the NWA, and GNR. 704 exemptions:

- *sections 21 (a) and (j) water uses*: for additional dewatering points at EM for the removal of water from mine workings;
- *sections 21(c) and (i) water uses*: for the construction of mining infrastructure within 500m of the Unchanneled Valley Bottom (UVB) wetland and watercourse identified to the South West of the EM Boundary; and
- *section 21(g) water uses*: for two new ROM Stockpiles, dust suppression with mine affected water, WRDs and backfilling of the opencast pits at EM with current tailings produced.

***c) Mining at Maroelabult, including the Boundary Pillar on the UG2 reef horizon between EM and Maroelabult***

EP intends to conduct underground mining at MM, including the Boundary Pillar on the UG2 reef horizon between the MM and EM. The mining and interconnecting the two operations will have potential long-term ventilation and safety direct benefits for EP and indirect socio-economic benefits for the surrounding communities.

***d) Addressing Gaps identified in the Maroelabult EMPr(s)***

EP is in the process of acquiring the MM, however there are gaps in the Maroelabult EMPRs The Consolidated EMPR will include all infrastructure on the Sale Portion Area and address and update the gaps. The application for an IEA will also include facilities and activities that EP requires authorisation for the operations of under the 2014 EIA Regulations.

***e) Construction and operation of two ROM stockpiles***

EP intends to construct two new ROM stockpile areas at EM in the following locations: (i) to the west of the Concentrator Plant on an existing disturbed laydown area; and (ii) on a backfilled opencast pit to the west of the Kukama Shaft. The ROM stockpiles will be constructed with a Class D landfill liner, as per the specification of G.N.R 636 – NEMS, 2008: National Norms and Standards for Disposal of Waste to landfill (23 August 2013).

***f) Construction and commissioning of associated infrastructure***

To facilitate the abovementioned activities of the EP Proposed Projects and future mining development, EP will require associated infrastructure for the conveyance and transportation of the mine material (i.e., pumping of tailings etc.), water (clean and dirty) and electricity within and between the EM Surface Area and the MM Surface Area.

***g) Raise-boring and operation two Ventilation Shafts***

EP is proposing to sink two Ventilation Shafts at EM. The Shafts will be crucial for the underground development of mine workings and to ensure the health and safety of workers underground (refer to ***Figure 7***: Map illustrating the location of the EP Proposed Projects). One o Ventilation Shafts is required by a neighbouring mine to access the MG1 and MG2 reefs below the EP Concentrator Plant and TSF.

***h) Mining of the Merensky Reef, including associated infrastructure***

EP has identified a feasible amount of minerals in the Merensky Reef outcrop, situated to the north of the existing UG2 opencast section of EM. It is proposing to mine the Merensky Reef, via opencast truck and shovel, and process the material at the Concentrator Plant. This will include vegetation clearance; topsoil stripping; and the construction of haul roads, stormwater berms, infrastructure, Overburden Stockpiles and WRDs. The Merensky Reef will be mined in four sections, and provision will be made for the rehabilitation and restoration of the area post-mining.

***i) Mining of the UG1 in the existing TSF Paddocks 2, 3 and 4***

EP has identified a feasible amount of minerals in the UG1 Reef situated inside the existing approved and licensed TSF Paddocks 2, 3 and 4. It is proposing to mine the UG1 within the EM Surface Area, via opencast truck and shovel, and process the material at the Concentrator Plant. TSF Paddocks 2, 3 and 4 have already been constructed and will remain after the UG1 material has been mined-out and continue to function as authorised.

***j) Backfilling of existing opencast pits with tailings***

EM has several opencast pits that are due for rehabilitation. Currently EP is authorised to dispose of its current tailings being produced in the licensed TSF. However, based on modelling and chemical analyses, it is considered highly feasible to use these tailings as backfilling material in the opencast pits. EP is therefore proposing to use tailings as backfill material for rehabilitation and safe-making purposes ("**Opencast Pits Backfilling Project**"). The backfilling will require construction of the Pits Pipelines (***Refer to Appendix 23: Conceptual Tailings Backfill Designs).***

***k) Construction and operation of a Chrome Floatation Plant and associated infrastructure***

EP is proposing to construct and operate a new CFP and associated infrastructure at MM, on the existing disturbed MM Surface Area. The chrome rich material will be sourced from different sources: EM, MM and third parties.

***l) Waste rock dump re-processing***

On the Consolidated MR Surface Area there are several WRDs and Overburden Stockpiles. EP is proposing to re-process (i.e., crush and screen) the WRD at MM on Portion 161 of De Kroon 444 JQ ("**MM WRD**") for material for secondary uses.

The Integrated DMRE Environmental Application is therefore submitted for the abovementioned activities. The Project Area will consist of a total footprint of **+/- 227 Ha**.

The EP Proposed Projects will be constructed and operated within the Consolidated MR Surface Area.

Refer to the ***Figure 6 - 10*** below for an indication of the location of the EP Proposed Projects.

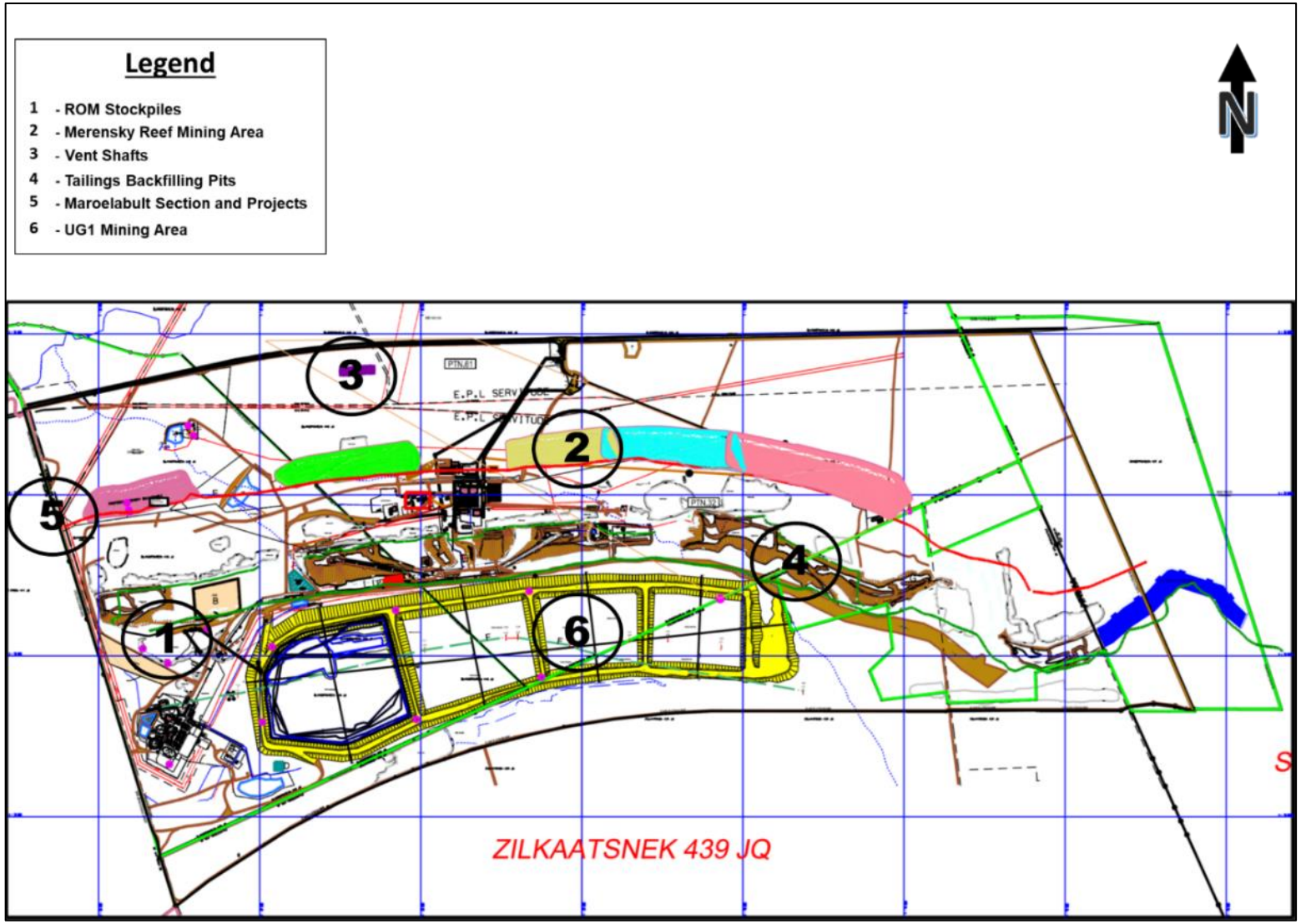


**Figure 6: Surface Plan indicating the location of the EP Proposed Projects at EM**

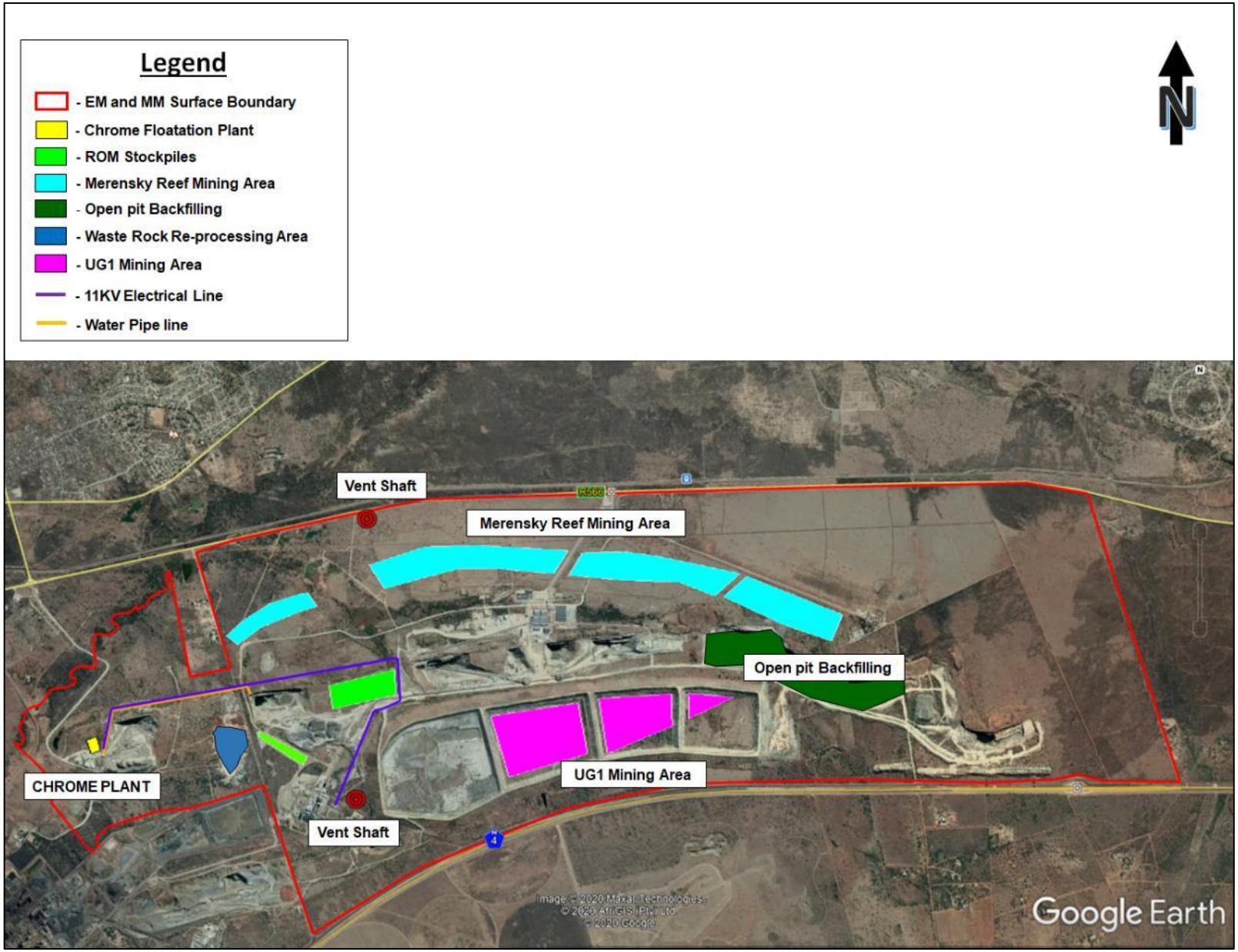


**Figure 7: Map illustrating the location of the EP Proposed Projects**

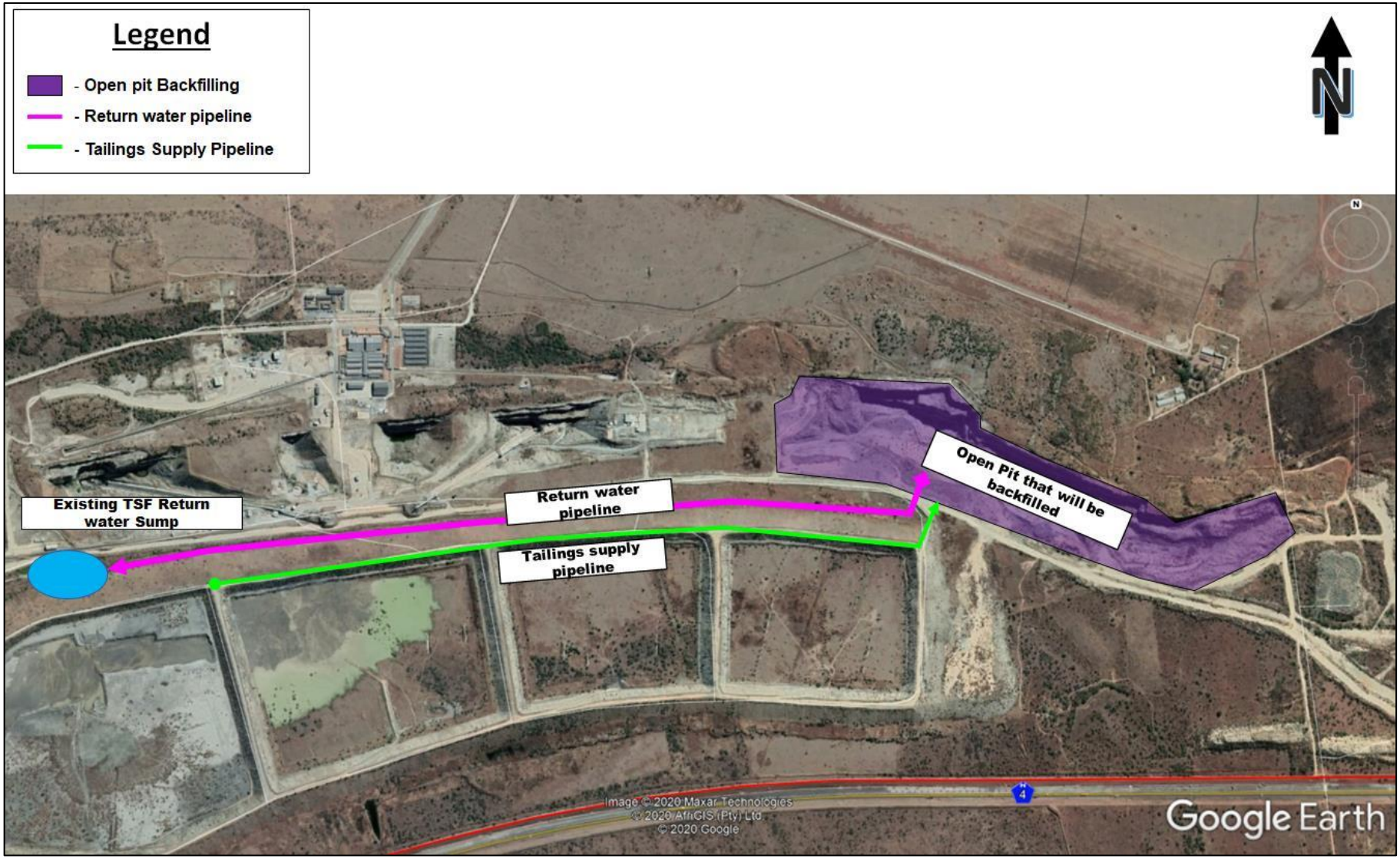


**Figure 8: Aerial Map of the Opencast Pits Backfilling Project, including associated infrastructure.**

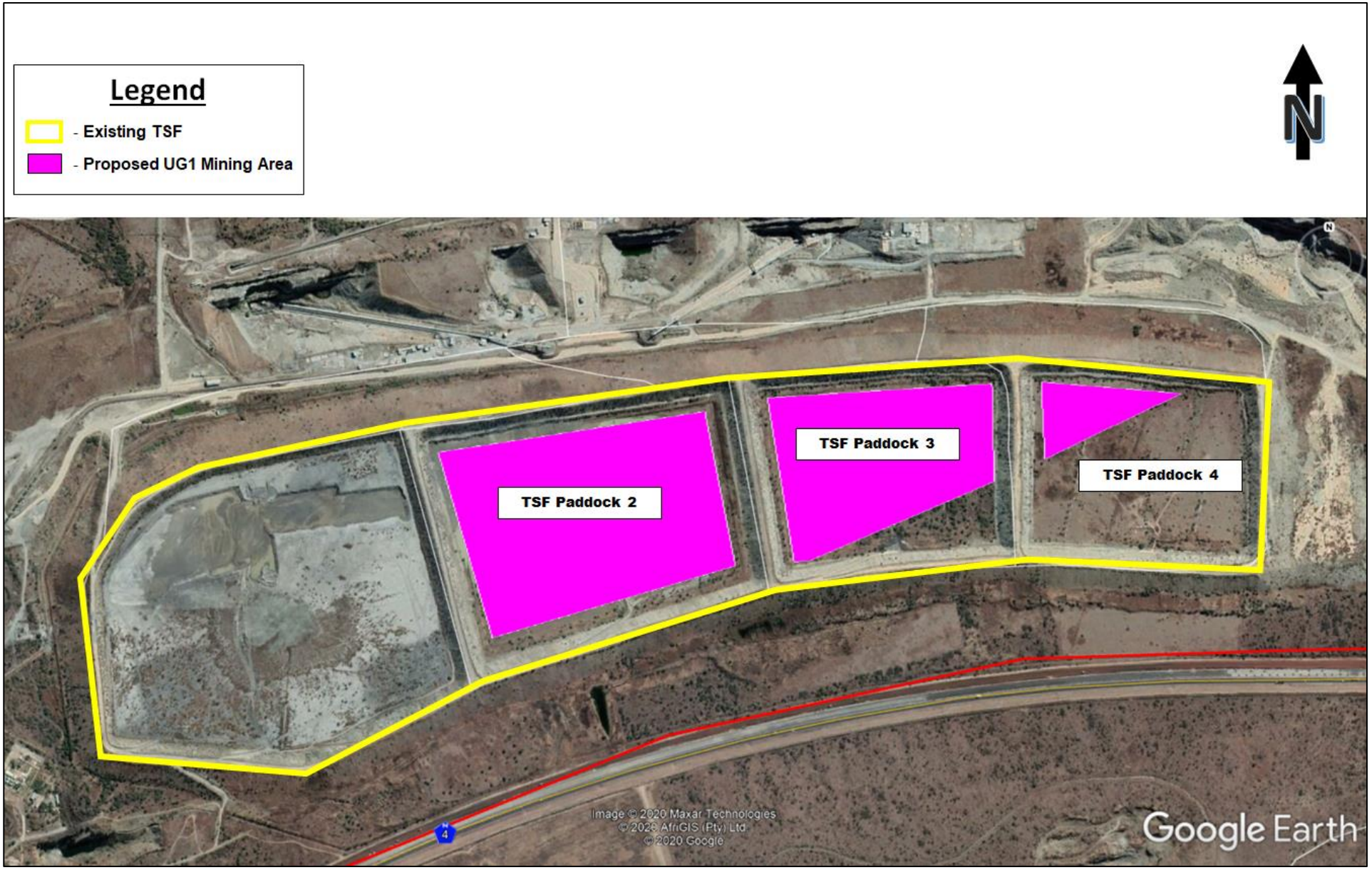


**Figure 9: Aerial Map of the proposed UG1 mining area inside the existing TSF Paddocks.**

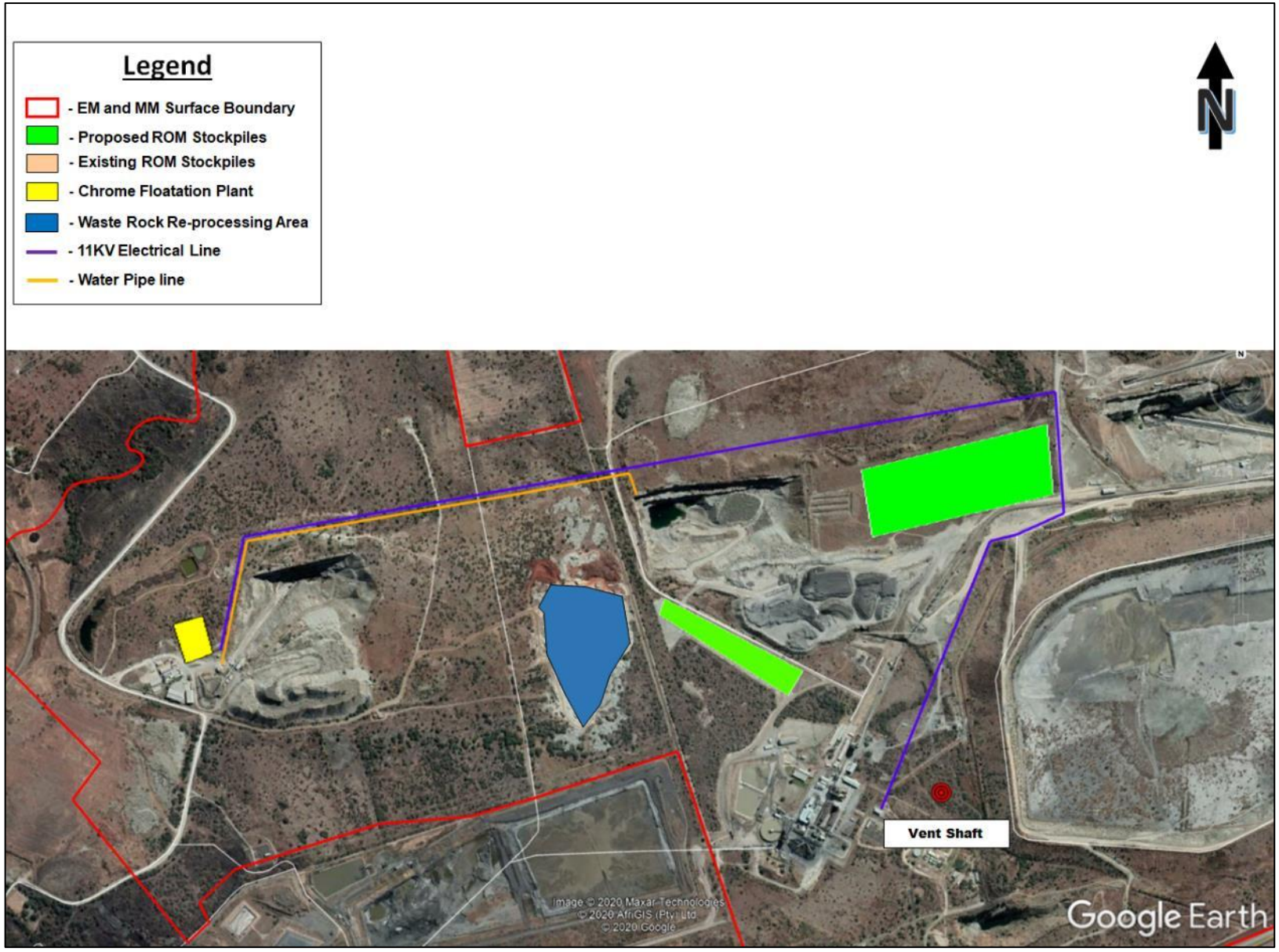


**Figure 10: Aerial Map of proposed location and extent of Vent Shaft, ROM stockpiles, Pipelines and Electrical Supply lines and WRD Re-Processing Area**

# 4. POLICY AND LEGISLATIVE CONTEXT

**Table 9: Policy and legislative context of the Integrated DMRE Environmental Application**

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED |
|---|---|
| **1. <u>Constitution of the Republic of South Africa (Act No. 108 of 1996)</u>**<br>Environmental legislation is shaped by the Bill of Rights of the Constitution of the Republic of South Africa ("**Constitution**"). Section 24 of the Constitution, known as the '**Environmental Right**', guarantees every person the right to an environment that is not harmful to their health or well-being; provides for the protection of the environment against pollution and degradation; and centres sustainable development as the cornerstone of South Africa's environmental law regime. This right is binding on the State and people, both natural and juristic.<br>In fulfilment of its constitutional mandate to take reasonable legislative measures that gives effect to section 24 of the Constitution, the government has promulgated several environmental laws. These laws provide a legal framework that embodies internationally recognised legal principles.<br>The principal act governing activities that affect the environment is NEMA. | The EP Proposed Projects have the potential to cause harm to the environment and pose a potential risk to the health and wellbeing of people. They, however, also have the potential to secure sustainable utilisation of resources through the application of the waste hierarchy; development on existing disturbed areas; and ensuring safe working conditions for employees, visitors and contractors.<br><br>EP has the overall responsibility to ensure that the rights of people in terms of section 24 of the Constitution are protected in terms of the development activity.<br><br>The EIAR and EMPR have been compiled considering the obligation as set out in the Constitution. |
| **2. <u>National Environmental Management Act (NEMA) (Act No. 107 of 1998)</u>**<br>In terms of sections 24(2) and 24D of NEMA, the then Minister of Environmental Affairs promulgated certain activities that may not commence without an EA. Activities promulgated in terms of GN983 and GN9835 require a basic assessment process, while activities promulgated in terms of GN984 require that a full Scoping and EIA process be conducted. GNs 983, 984 and 985 are promulgated under NEMA in GG 38282 of 4 December 2014 (as amended in 2017). The requirements for an EIAR and EMPR are specified in Appendixes 3 and 4 of GN982, promulgated under NEMA in GG 38282 of 4 December 2014 (as amended in 2017) ("**2014 EIA Regulations**").<br>Section 24C(2A) of NEMA indicates that where listed activities are directly related to the extraction and primary processing of a mineral or petroleum resource the Minister of Mineral Resources and Energy is the **CA** or officials at the DMRE to whom he has delegated his authority, being the Regional Managers.<br>Section 28 of NEMA also places a duty of care on all persons to prevent, limit or remediate any pollution or degradation of the environment ("**Duty of Care**"). | The EP Proposed Projects include activities listed in terms of GNs R983, 984 and985, which require an EA from the CA, in terms of 2014 EIA Regulations. This EA must be obtained prior to the commencement of the activities.<br><br>The application for the EA was made to the Regional Manager of the DMRE North West Regional Office.<br><br>The applicant is committed, at all times during construction, operation and decommissioning of the EP Proposed Projects, to comply with the Duty of Care. The Duty of Care applies to all activities taking place at the Consolidated MR Surface Area and is not solely focused on the listed activities being applied for. |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED |
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| **3. <u>EIA Regulations (2014 EIA Regulations)</u>**<br>Chapter 6 of the 2014 EIA Regulations provides for the requirements for PPP, which must be carried out as part of the Integrated DMRE Environmental Application process. In terms of Regulations 21 and 23, the outcome of the PPP must be reported in the FSR and FEIAR submitted to the CA. The PPP: "*must give all potential or registered interested and affected parties, including the competent authority a period of at least 30 days to submit comments on each of the EMPR, scoping report and environmental impact assessment report and, where applicable, the closure plan, as well as the report contemplated in regulation 32, if such reports or plans are submitted at different times*" (Regulation 40(1)).<br>The PPP must also:<br>➢ provide access to all information that reasonably has or may have the potential to influence any decision regarding an application;<br>➢ involve consultation with the CA, every state department that administers a law relating to the environment relevant to the application, all relevant organs of state, and all I&APs; and<br>➢ provide opportunity for I&APs to comment on reports and plans prior to submission of an application and once an application has been submitted to the CA.<br>The process must include:<br>➢ notification of the application to all I&APs, as stipulated in Regulation 41;<br>➢ registration of all I&APs, as required in Regulations 42 and 43; and<br>➢ a record of comments and responses and records of meetings of and with I&APs, as outlined in Regulation 44.<br>Regulation 39 of the 2014 EIA Regulations requires that:<br>"*(1) If the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land.*<br>*(2) Sub regulation (1) does not apply in respect of—*<br>*(b) <u>activities constituting, or activities directly related to</u> prospecting … of a mineral …resource or <u>extraction and primary processing of a mineral</u> ..resource."* | An integrated PPP will be undertaken to make provision for the consultation process during the Integrated DMRE Environmental Application and WUL Consolidation Application.<br><br>Most of the properties where the EP Proposed Project will be undertaken are owned by EP and Barplats. In terms of the Sale Agreement, EP will purchase the properties in the MR Sale Portion that are owned by Barplats, subject to certain conditions precedent first being satisfied.<br><br>Where the properties are owned and/or managed by different parties, the EAP has also notified them as part of PPP initiation process. |
| **4. <u>NEMA Listed Activities (GN983, 984 and 985)</u>** | |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED |
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A scoping and EIA process is being followed in terms of the EIA Regulations for activities listed under GN983, GN984 and GN 985. This report constitutes the scoping report circulated to I&APs and State Organs, in the EIA process being undertaken. The listed activities applicable to the EP Proposed Projects are given in the Table below.

| Number and date of relevant notice | Activity No. | Description of each listed activity as per the GN. | Description of the proposed activities in relation to the listed activities being applied for. |
|---|---|---|---|
| GN 983 | 10 | The development and related operation of infrastructure exceeding 1000m in length for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge or slimes –<br>(i) with an internal diameter of 0,36m or more. | This listed activity will be triggered by the construction of the Pit Pipelines, Water Management Pipelines and the operation of the Sale Portion Pipelines by EP. |
| GN 983 | 12 | The development of—<br>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100$m^2$; or<br>(ii) infrastructure or structures with a physical footprint of 100$m^2$ or more, where such development occurs -<br>(a) within a watercourse;<br>(c) if no development setback exists, within 32m of a watercourse, measured from the edge of a watercourse; | EP is proposing to construct additional infrastructure in proximity to watercourses. These activities include the mine infrastructure, pump stations and Water Management Pipelines. |
| GN 983 | 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$m^3$ or more but not exceeding 500$m^3$. | EP will continue to operate an existing hydrocarbon storage tank on the Sale Portion Area. |
| GN 983 | 19 | The infilling or depositing of any material of more than 10$m^3$ into, or the dredging, excavation, removal or moving of *inter alia* soil, sand, pebbles or rock of more than 10$m^3$ from a watercourse. | There is a possibility that some infrastructure will have to cross watercourses. Should this be the case, 10$m^3$ or more of soil will have to be excavated from the watercourse. |
| GN 983 | 24 | The development of a road—<br>(ii) with a reserve wider than 13,5m, or where no reserve exists where the road is wider than 8m. | EP is proposing to undertake opencast mining on undisturbed areas within the EM Mine Area. It is likely that new haul roads will have to be constructed to allow for the movement of mining vehicles. The new roads will likely be wider than 8m. |
| GN 983 | 45 | The expansion of infrastructure for the bulk transportation of water or storm water where the existing infrastructure—<br>(i) has an internal diameter of 0,36m or more; and<br>(ii) where the facility or infrastructure is expanded by more than 1 000m in length; | There are existing water pipelines that will possibly have to be expanded within the Consolidated MR Surface Area. |
| GN 983 | 46 | The expansion and related operation of infrastructure for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge or slimes where the existing infrastructure has:<br>(i) an internal diameter of 0,36$m^2$ or more; or<br>(ii) a peak throughput of 120 litres per second or more; and where the:<br>(a) facility or infrastructure is expanded by more than 1 000m in length; or<br>(b) throughput capacity of the facility or infrastructure will be increased by 10% or more. | Existing pipelines will likely have to be expanded to convey the return water and tailings to the opencast pits for the Opencast Pits Backfilling Project. Pipelines may also be expanded to accommodate the Sale Portion Area. |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | | | REFERENCE WHERE APPLIED |
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| GN 983 | 48 | The expansion of:<br>(i) infrastructure or structures where the physical footprint is expanded by 100m$^2$ or more; or<br>(ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100m$^2$ or more, where such expansion occurs:<br>(a) within a watercourse;<br>(c) if no development setback exists, within 32m of a watercourse, measured from the edge of a watercourse. | There is existing infrastructure that will possibly have to be expanded within the Consolidated MR Surface Area that will be located within 32m of a watercourse. |
| GN 983 | 56 | The widening of a road by more than 6m, or the lengthening of a road by more than 1km—<br>(i) where the existing reserve is wider than 13,5m; or<br>(ii) where no reserve exists, where the existing road is wider than 8m, excluding where widening or lengthening occur inside urban areas. | EP is proposing to undertake opencast mining on undisturbed areas within the EM Mine Area. It is likely that some existing haul roads will have to be widened, to allow for the movement of mining vehicles. |
| GN 984 | 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. | EP is proposing develop the following activities at EM, which will require the EP WUL to be amended to include further water uses under section 21(g) of the NWA:<br>• Two new ROM Stockpiles;<br>• Backfilling with tailings in the existing opencast pits; and<br>• Overburden Stockpiles and WRDs for the Merensky Reef mining area. |
| GN 984 | 7 | The development and related operation of facilities or infrastructure for the bulk transportation of dangerous goods -<br>(iii) in solid form, outside an industrial complex, using funiculars or conveyors with a throughput capacity of more than 50 tons per day. | EP is applying to operate the existing conveyor on the Sale Portion Area. |
| GN 984 | 15 | The clearance of an area of 20 Ha or more of indigenous vegetation. | The following EP Proposed Projects will require indigenous vegetation clearance with a combined footprint of more than 20 Ha:<br>• Two new ROM Stockpiles;<br>• Overburden Stockpiles and WRDs for the Merensky mining area;<br>• Merensky Reef mining areas;<br>• 11kV substation and distribution line;<br>• Construction of two new Ventilation Shafts;<br>• Pipelines, pump stations and associated infrastructure footprint; and<br>• New haul roads. |
| GN 984 | 17 | Any activity, including the operation of that activity, which requires a mining right, as contemplated in terms of section 22 of the MPRDA, including -<br>(a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or<br>(b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing. | EP is proposing to develop the following mining activities:<br>• Two new ROM Stockpiles;<br>• Mining at the Sale Portion Area, including the Boundary Pillar on the UG2 reef horizon between EM and MM, and operating infrastructure on the Sale Portion Area directly related to the extraction of mineral resources, including the conveyor, ventilation shaft and decline shaft, to be used as a secondary escape;<br>• Mining the UG1 inside Paddocks 2, 3 and 4 of the existing TSF;<br>• Overburden Stockpiles and WRDs for the Merensky mining area at EM;<br>• Mining of the Merensky Reef, including construction and operation of associated infrastructure;<br>• Construction of two new Ventilation Shafts; |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | | | REFERENCE WHERE APPLIED |
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| | | | • Construction and operation of a CFP and associated infrastructure on the Sale Portion Area, within an existing disturbed area; and<br>• The MM WRD re-processing. |
| GN 985 | 4 (h) (iv) & (vi) | The development of a road wider than 4 m, with a reserve less than 13,5 metres, where the development takes place:<br>iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the ("**CBAs**"); or<br>vi) Areas within 5km from protected areas identified in terms of National Environmental Management: Protected Areas Act 57 of 2003 ("**NEMPAA**") or from a biosphere reserve. | EP is proposing to undertake opencast mining on undisturbed areas within the EM Surface Area. It is likely that new haul roads, wider than 8 m, will have to be constructed to allow for the movement of mining vehicles.<br><br>The proposed activities are within / near the Marikana Thornveld ecosystem and are situated in a CBA, as per the North-West Biodiversity Sector Plan ("**NW BSP**"). The Consolidated MR Surface Area is within 5km of the Mnandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area. |
| GN 985 | 10 (h)(iv) | 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 30m$^3$ but not exceeding 80m$^3$ within:<br>(iv) a CBA. | EP will continue to operate existing hydrocarbon storage tank on the Sale Portion Area. The tank is situated within a CBA, as per the NW BSP. |
| GN 985 | 12 (h)(iv) & (vi) | The clearance of an area of 300m$^2$ 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) in the NWP on land situated within:<br>iv) a CBA; and<br>vi) areas within 5km from protected areas identified in terms of NEMPAA or from a biosphere reserve. | Vegetation will be cleared for the following activities:<br>• Two new ROM Stockpiles at EM;<br>• Merensky Reef mining area at EM, including Overburden Stockpiles, WRDs and associated infrastructure;<br>• Construction of two new Ventilation Shafts at EM;<br>• Pipelines and associated infrastructure footprint; and<br>• New haul roads.<br><br>It is likely that the impacted vegetation will include indigenous vegetation. The Project Area is within / near the Marikana Thornveld ecosystem and is within a CBA, as per the NW BSP. The Consolidated MR Surface Area is within 5km of the Mnandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area. |
| GN 985 | 14 (h), (iv) and (vi) | The development of infrastructure or structures with a physical footprint of 10m$^2$ or more; where such development occurs –<br>(a) within a watercourse; or<br>(c) if no development setback has been adopted, within 32m of a watercourse, measured from the edge of a watercourse in the NWP within:<br>iv) a CBA; and<br>vi) areas within 5km from protected areas identified in terms of NEMPPA or from a biosphere reserve. | EP is proposing to construct additional infrastructure in proximity to watercourses. These activities include mine infrastructure, pump stations and the Water Management Pipelines.<br><br>The proposed activities are within / near the Marikana Thornveld ecosystem and are within a CBA, as per the NWBSP. The Consolidated MR Surface Area is within 5km of the Mnandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area. |
| GN 985 | 18 (h), (ii) and (v) | The widening of a road by more than 4m, or the lengthening of a road by more than 1km, in the NWP within:<br>ii) a CBA; and<br>v) areas within 5km from protected areas identified in terms of NEMPPA or from a biosphere reserve. | EP is proposing to undertake opencast mining on undisturbed areas within the EM Mine Area. It is likely that existing haul roads will have to be widened to allow for the movement of mining vehicles. The new roads will likely be wider than 8m.<br><br>The Project Area is within / near the Marikana Thornveld ecosystem and is situated in a CBA, as per the NWBSP. The Consolidated MR Surface Area is within 5km of the Mnandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area. |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | | | REFERENCE WHERE APPLIED |
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| GN R. 985 | 23 (h), (iv) and (vi) | The expansion of:<br>i) dams or weirs where the dam or weir is expanded by 10m$^2$ or more; or<br>ii) infrastructure or structures where the physical footprint is expanded by 10m$^2$ or more, where such expansion occurs—<br>(a) within a watercourse;<br>(c) if no development setback has been adopted, within 32m of a watercourse, measured from the edge of a watercourse, in the NWP in:<br>iv) CBAs; and<br>vi) Areas within 5 kilometres from protected areas identified in terms of NEMPPA or from a biosphere reserve. | EP is proposing to construct additional infrastructure in proximity to watercourses. These activities include pump stations and pipelines.<br><br>The Project Area is within / near the Marikana Thornveld ecosystem and is situated in a CBA, as per the NWBSP. The Consolidated MR Surface Area is within 5km of the Mnandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area. |
| **5. <u>National Environmental Management: Air Quality Act (Act No. 39 of 2004</u>)**<br>NEMAQA was promulgated to ensure the protection and regulation of air quality and provide measures that will prevent pollution and sustainability. Under NEMAQA, the Minister of Environmental Affairs, Forestry and Fisheries must identify substances in ambient air which present a threat to health, wellbeing or the environment and establish national standards for ambient air quality, including the permissible quantity or concentration of each substance in ambient air.<br>The following regulations promulgated under NEMAQA were considered for the EP Proposed Projects:<br>➢ *Listed Activities and Associated Minimum Emission Standards,* published in GN 893 of GG 37054 on 22 November 2013, which lists activities that could result in atmospheric emissions requiring an atmospheric emissions licence before being undertaken. Examples of such activities include:<br>▪ the use of combustion installations;<br>▪ storage of petroleum products;<br>▪ slag processes;<br>▪ carbonisation and coal gasification;<br>▪ mineral processing; and<br>▪ disposal of hazardous and general waste by way of incineration.<br>➢ *Waterberg-Bojanala National Priority Area,* published in GN 1207/2015 of GG 39489 on 9 December 2015:<br>The Waterberg-Bojanala National Priority Area was established due to the exceedance of the ambient air quality standards or alternatively that a situation exists within the area which is causing or may cause a significant negative impact on air quality in the area and the area requires specific air quality management action to rectify the situation.<br>➢ *National Dust Control Regulations,* published in GN 827 of GG 36974 on 1 November 2013, which provide that an acceptable dust fallout rate for | | The Consolidated MR Surface Area falls within the Waterberg-Bojanala National Priority Area, as contemplated in section 18(1) of NEMAQA. A dust fallout monitoring network and programme is in place for EM and MM.<br><br>EP is continuously monitoring the dust fallout impacts at both the EM and MM. The Air Quality Impact Assessment ("**AQIA**") was updated, refer to **Section 9.1.17**. Dust control measures have been included in the EMPR. |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED |
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| a non-residential area is considered more than 600 mg/m2/day but less than 1200 mg/m2/day (30-day average), with maximum allowable two exceedances per year, provided these exceedances do not take place in consecutive months. Where the dust fallout rate is exceeded, a dust fallout monitoring programme must be developed, as prescribed in terms of the Regulations, and include:<br>▪ the establishment of a network of dust monitoring points, using method ASTM D1739:1970 (or an equivalent standard), sufficient in number to: establish the contribution to dust fallout in residential and non-residential areas near the premises; monitor identified or likely sensitive receptor locations; and establish the baseline dust fall for the district; and<br>▪ a schedule for submitting to the air quality officer dust fallout monitoring reports annually or at more frequent intervals, if requested by the air quality officer.<br>➢ Greenhouse gases have been declared priority pollutants under the Declaration of Greenhouse Gases as Priority Air Pollutants, published in GN 710 of GG 40996 on 21 July 2017, in terms of NEMAQA, with potential reporting requirements for EM and MM. | |
| **6. <u>National Environmental Management: Biodiversity Act (Act No. 10 of 2004)</u>**<br>In line with the Convention on Biological Diversity, the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) ("**NEM:BA**") aims to legally provide for biodiversity conservation, sustainable use and equitable access and benefit sharing. NEM:BA creates a basic legal framework for the formation of a national biodiversity strategy and action plan and identification of biodiversity hotspots and bioregions, which may then be given legal recognition. It imposes obligations on landowners (state or private) regarding alien invasive species. NEM:BA requires that provision be made by a site developer to remove any aliens which have been introduced to a site or are present on a site.<br>Regulations published under NEM:BA in GN 1002 in GG 3809 on 9 December 2011 ("**NEMBA Ecosystem List**") also provides for listing of threatened or protected ecosystems in one of four categories: critically endangered, endangered, vulnerable or protected. Threatened ecosystems are listed to reduce the rate of ecosystem and species extinction, by preventing further degradation and loss of structure, function and composition of threatened ecosystems. The | The vulnerable Marikana Thornveld Ecosystem is located over sections of the Project Area. As part of the application, indigenous vegetation clearance and removal will likely be undertaken. A biodiversity specialist has been appointed to determine the impact of the EP Proposed Projects on the biodiversity and the findings/recommendations have been included under **Section 9.1.13.** |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED |
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| purpose of listing protected ecosystems is primarily to conserve sites of exceptionally high conservation value. | |
| **7. <u>National Environmental Management: Waste Act (Act No. 59 of 2008)</u>**<br>NEMWA's purpose is to: assist in regulating waste management; ensure the protection of human health; and prevent pollution and environmental degradation, through sound waste management principles and guidelines. It furthermore provides for:<br>➢ national norms and standards for regulating waste management by all spheres of government;<br>➢ licensing and control of waste management activities;<br>➢ remediation of contaminated land;<br>➢ a national waste information system; and<br>➢ provision for compliance and enforcement.<br>The NEMWA defines waste broadly as "*any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be reused, recycled or recovered*". It also regulates processing of mining residue deposits or stockpiles.<br>The NEMWA imposes a general duty upon waste holders to take reasonable measures to avoid waste generation and, where this is impossible, to: minimise the toxicity and quantities of waste generated; reuse, reduce, recycle and recover waste; and ensure that it is treated and disposed of in an environmentally sound way. Failure to do so is a criminal offence, with a maximum fine of R10 million or imprisonment of up to 10 years, or both.<br>It is necessary to hold a WML for defined waste management activities.<br>The DEA promulgated the 2013 WML Regulations, which provides that a WML is required for undertaking certain waste management activities ("**Waste Listed Activities**"). The Waste Listed Activities are separated into three categories, namely Category A, Category B and Category C. Category A and B Waste Listed Activities require a WML, for which either a basic assessment or an EIA process needs to be undertaken that complies with the 2014 EIA Regulations. The procedures for licensing Waste Listed Activities are stipulated in Chapter 5 of NEMW:WA and will have to be considered in the overall EIA process.<br>Category C activities do not require a WML but must comply with *inter alia* the Norms and Standards for Storage of Waste, 2013 (published in GN 926 of | The following activities will be triggered by the EP Proposed Projects:<br>Category B of the 2013 WML Regulations (GN 921) (triggers a scoping and EIA process) –<br>• Activity 4(9) – "*The disposal of inert waste to land in excess of 25000 tons, excluding the disposal of such waste for the purpose of levelling and building which has been authorised by or under other legislation.*" - **EP is proposing to backfill opencast pits with reprocessed tailings from the Concentrator Plant. The volume of tailings will exceed 25 000 tons.**<br>• Activity 4(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).* - **EP is proposing develop the following residue deposits and/or stockpiles: Overburden Stockpiles and WRDs for the Merensky mining area.**<br>• Activity 4(11) - *"The….. reclamation of a residue stockpile or residue deposit resulting from activities which require inter alia a mining right in terms of the MPRDA."* - **EP is proposing to develop Overburden Stockpiles and WRDs for the Merensky mining area; reprocess the MM WRD and remining TSF Paddocks 2,3 and 4..**<br>A scoping and EIA process is required for Category B activities. An integrated IEA application has been submitted by EP for the EP Proposed Projects. A Waste Assessment and Classification of the tailings and ROM material was undertaken, and the findings of the classification is discussed under **Section 9.1.10.** |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED |
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| *Government Gazette* 37088 on 29 November 2013). Such facilities need to be registered with the DEA 90 days before construction commences.<br>Classification of certain waste streams is required in terms of the Waste Classification and Management Regulations, published in GN634 of *Government Gazette* 36784 on 23 August 2013, to ensure that the correct waste management standards and disposal methods are implemented.<br>The National Norms and Standards for the Assessment of Waste for Landfill Disposal and the National Norms and Standards for the Disposal of Waste to Landfill (published under GN 635 and GN 636 respectively in GG 36784 of 23 August 2013) ("**NEMWA GN 635 and 638")** provide the norms and standards for disposal of waste to landfill. This includes liner requirements and design specifications.<br><br>The waste classification as defined in NEMWA GN 635 are summarised as:<br>• Wastes with any element or chemical substance concentration above the LCT3 or TCT2 limits (LC>LCT3 or TC>TCT2) are Type 0 Wastes;<br>• Wastes with any element or chemical substance concentration above the LCT2 but below or equal to the LCT3 limits, or above the TCT1 but below or equal to the TCT2 limits (LCT2<LC<LCT3 or TCT1<TC<TCT2), are Type 1 Wastes;<br>• Wastes with any element or chemical substance concentration above the LCT1 but below or equal to the LCT2 limits, and all concentrations below or equal to the TCT1 limits (LCT1<LC<LCT2 or TC<TCT1), are Type 2 Wastes;<br>• Wastes with any element or chemical substance concentration above the LCT0 but below or equal to the LCT1 limits, and all concentrations below or equal to the TCT1 limits (LCT0<LC<LCT1 or TC<TCT1), are Type 3 Wastes; or<br>• Wastes with all elements and chemical substance concentration levels for metal ions and inorganic anions below or equal to the LCT0 and TCT0 limits (LC≤LCT0 and TC≤TCT0), and with all chemical substance concentration levels also below the relevant concentration limits for organics and pesticides, are Type 4 Wastes (no organics or pesticides are included in the waste rock material and therefore that requirement is not applicable);<br>• If a particular chemical substance in a waste is not listed with corresponding LCT and TCT limits in the norms and standards, and the waste has been classified as hazardous in terms of Regulation 4(2) of GNR 635 based on the | |

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| health or environmental hazard characteristics of the particular element or chemical substance, the waste is considered to be Type 1 Waste (not applicable to this study);<br>• If the TC of an element or chemical substance is above the TCT2 limit, and the concentration cannot be reduced to below TCT2 limit, but the LC for the particular element or chemical substance is below the LCT3 limit, the waste is considered Type 1 Waste;<br>• Wastes listed in item (2)(b) of Annexure 1 of GNR 635 are considered to be Type 1 Waste, unless assessed and determined otherwise in terms of the Norms and Standards;<br>• Waste with all elements or chemical substances leaching concentration levels for metal ions and inorganic anions below or equal to the LCT0 limits are considered to be Type 3 Waste, irrespective of the total concentration of elements or chemical substances in the waste, provided that the:<br>o concentration levels are below the relevant limits for organics and pesticides;<br>o inherent waste and chemical character of the waste is stable and will not change over time; and<br>o waste is disposed of to landfill without any other waste.<br>In 2014 the National Environmental Management: Waste Amendment Act, No. 25 was promulgated to include residue deposits and residue stockpiles from:<br>➢ Mineral excavation;<br>➢ Physical and chemical processing of metalliferous minerals;<br>➢ Physical and chemical processing of non-metalliferous minerals; and<br>➢ Drilling operations.<br>Residue deposits are defined in the MPRDA as "*any residue stockpile remaining at the termination, cancellation or expiry of a prospecting right, mining right, mining permit, exploration right or production right*". Residue stockpiles, in turn, are defined in the MPRDA as "*any debris, discard, tailings, slimes, screening, slurry, waste rock, foundry sand, beneficiation plant waste, ash or any other product derived from or incidental to a mining operation and which is stockpiled, stored or accumulated for potential re-use, or which is disposed of, by the holder of a mining right, mining permit, production right or an old order right*".<br>The Regulations regarding the Planning and Management of Residue Stockpiles and Residue Deposits ("**Residue Regulations**"), published in GN 632 of GG | |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED |
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| 39020 on 24 July 2015, provide for the planning, management and reporting of residue stockpiles and residue deposits, which obligations include:<br>➢ The assessment of impacts and analyses of risks relating to the management of residue stockpiles;<br>➢ Residue deposits, characterisation of residue stockpiles and residue deposits;<br>➢ Classification of residue stockpiles and residue deposits;<br>➢ Investigation and the selection of site for residue stockpiling;<br>➢ Design of the residue stockpiles and residue deposits;<br>➢ Impact management;<br>➢ Duties of the holder of right or permit;<br>➢ Monitoring and reporting systems;<br>➢ Dust management and control; and<br>➢ Decommissioning, closure and post closure management requirements.<br>The Residue Regulations provide the tools for and correspond to the statutory provision relating to managing residue stockpiles and residue deposits in the manner prescribed in section 43A of the NEMWA. | |
| **8. <u>National Heritage Resources Act (Act No. 25 of 1999)</u>**<br>The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (Act No. 25 of 1999) ("**NHRA**"). The national enforcing authority for the NHRA is the South African Heritage Resources Agency ("**SAHRA**"). In terms of the NHRA, historically important features such as graves, archaeology and fossil beds are protected. Similarly, culturally significant symbols, spaces and landscapes are also afforded protection. In terms of section 38 of the NHRA, SAHRA can call for a heritage impact assessment ("**HIA**") for certain categories of development as follows:<br>*Section 38 states:*<br>*"(1) (a): The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;*<br>*(c): Any development or other activity which will change the character of a site -*<br>*i. exceeding 5 000m² in extent;*<br>*ii. involving three or more existing erven or subdivisions thereof;*<br>*iii. involving three or more erven or divisions thereof which have been consolidated within the past 5 years; or*<br>*iv. the costs of which will exceed a sum in terms of regulations by SAHRA or a provincial heritage resource authority."* | The Project Area has already been fundamentally transformed by agricultural, mining and processing activities. There are graves located within the Consolidated MR Surface Area. However, they are not impacted on by EP, and families are accommodated for purposes of visiting the graves.<br><br>HIAs have been conducted for the Consolidated MR Surface Area in the past and has been updated as part of the EIAR. The findings and recommendations have been included under Section **9.1.20**. |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED |
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| Section 38(8) of the NHRA however makes provision for the assessment of heritage impacts as part of an EIA process and, if such an assessment complies with the NHRA, a separate application for consent under the NHRA is not required. | |
| **9. <u>National Water Act (Act No. 36 of 1998</u>** ("**NWA**")<br>The NWA is the primary legislation controlling and managing the use of water resources and pollution thereof. It provides for fundamental reformation of legislation relating to water resource use. The preamble to the NWA recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that water resources quality protection is necessary to ensure sustainability of the nation's water resources in the interests of all water users. The NWA's purpose is stated in section 2, which includes the following:<br>➢ *Promoting the efficient, sustainable and beneficial use of water in the public interest;*<br>➢ *Facilitating social and economic development;*<br>➢ *Protecting aquatic and associated ecosystems and their biological diversity;*<br>➢ *Reducing and preventing pollution and degradation of water resources; and*<br>➢ *Meeting international obligations.*<br>The NWA presents strategies to facilitate sound water resource management; provides for water resource protection; and regulates use of water by means of Catchment Management Agencies, Water User Associations, Advisory Committees and International Water Management. As the NWA is founded on the principle of trusteeship, the government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest. Industry (including mines) can therefore only be entitled to use water if the use is permissible under the NWA.<br>In terms of section 21 of the NWA, certain consumptive and non-consumptive water uses are identified and can only commence once authorised. Where a water use constitutes a Scheduled 1 Use (permissible use without an authorisation requirement); permissible water uses in terms of section 22 of the NWA; or is authorised in terms of a General Authorisation, a WUL is not required.<br>The NWA further requires that:<br>➢ a motivation in terms of section 27 be submitted as part of an IWULA. This will be included in the main application report; | EP and MM both hold WULs, namely the EP WUL and MM WUL (Refer to Section 2.3.1). EP is proposing to consolidate the WULs into one integrated WUL.<br><br>As part of the WUL Consolidation Application, various changes and alterations to the existing EP WULs must be made, including:<br>• Addition and changes to the sections 21(a) and (j) abstraction points for the dewatering and abstraction of groundwater;<br>• Inclusion of sections 21(c) and (i) water uses for watercourse crossings and mining activities possibly undertaken within 500m of wetlands and watercourses;<br>• Possible amendment of the section 21(f) discharge volumes; and<br>• Inclusion and alteration of section 21(g) water uses for the ROM Stockpiles, dust suppression with mine affected water, backfilling of the opencast pits and new mining related infrastructure.<br><br>In addition, a section 21(c) and (i) General Authorisation GN 509 will be required for surface infrastructure situated within 500m of the UVB Wetland and Watercourse situated to the South West of the EM Boundary. |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED |
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| ➢ the necessary water use application forms be compiled and submitted in support of the IWULA;<br>➢ the requirements of GN704 and detail surrounding these activities will be considered in the IWULA; and<br>➢ an integrated waste and water management plan ("**IWMMP**") be submitted in support of the IWULA. | |
| **10. <u>GN 704</u>**<br>GN 704, promulgated under section 26(1) of the NWA, is specifically aimed at the protection of water resources associated with mining related activities. It provides minimum requirements which need to be adhered to for water resource protection on a mine. GN 704 regulates the use of water; management of dirty and clean water infrastructure; and related activities at mines. This includes minimum requirements for infrastructure that hold dirty water. A mine can apply for exemptions from these requirements and could be granted approval, should sufficient management measures be put in place to ensure environmental protection.<br>Regulation 4 of GN 704 places some restrictions in terms of the locality of certain infrastructure which could have an impact on water resources. | The EM stormwater system is designed to comply to the provisions of the GNR 704 provisions. However, several exemptions will need to be applied for, which include using tailings as backfilling material and mining infrastructure within the 1:100-year flood line. |
| **11. <u>Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)</u>**<br>The MPRDA aims at the equitable access and the sustainable development of the RSA's mineral resources. It provides mechanisms that will ensure the protection of the environment throughout the Life of Mine ("**LoM**").<br>Social and environmental sustainability is enhanced through the requirement to submit a Social and Labour Plan ("**SLP**"), which records a mining company's obligations to improve social development. This includes a commitment to training and social investment, with the goal of transferring skills that can be used after mine closure.<br>Section 5A of the MPRDA indicates that: "*No person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without – (a) an environmental authorisation"*.<br>Section 37 of the MPRDA requires all mining and prospecting operations and related activities to be carried out in terms of the environmental management principles set out in section 2 of NEMA.<br>Section 102(1) of the MPRDA states that: | The Sale Agreement is subject to the Minister of Mineral Resources and Energy's consent to the Section 102 Application.<br>As part of the Section 102 Application, EP has submitted an updated SLP and mine works programme. |

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| "*(1) A reconnaissance permission, prospecting right, mining right, mining permit, retention permit, technical corporation permit, reconnaissance permit, exploration right, production right, prospecting work programme, exploration work programme, production work programme, mining work programme, environmental management programme or an environmental authorisation issued in terms of the National Environmental Management Act, 1998, as the case may be, may not be amended or varied (including by extension of the area covered by it or by the additional of minerals or a shares or seams, mineralised bodies or strata, which are not at the time the subject thereof) without the written consent of the Minister."* | |
| **12. <u>Conservation of Agricultural Resources Act, No 43 of 1998</u>** ("**CARA**")<br>In terms of CARA, landowners are legally responsible for the control of weeds and alien vegetation. CARA makes provision for three categories of AIP species:<br>➢ *Category 1a*: must immediately be removed and destroyed;<br>➢ *Category 1b*: need to immediately be removed and contained;<br>➢ *Category 2*: requires a permit to retain the species on site and it must be ensured that they do not spread. All category 2 plants in riparian zones need to be removed; and<br>➢ *Category 3*: require a permit to retain these species. All category 3 plants in the riparian zone need to be removed.<br>CARA is also clear in terms of the conservation of soil and states that degradation of the agricultural potential is illegal. It furthermore requires the protection of land against soil erosion and prevention of water logging and associated salinization. | EP is obligated to manage alien and invasive species occurring on the EM Surface Area and, once the Section 102 Application is granted, the MM Surface Area.<br>It has developed an AIP Removal Procedure that is further discussed under ***Section 9.1.14***. |
| **13. <u>Mine Health and Safety Act (Act No. 29 of 1996)</u> ("MHSA")**<br>The MHSA aims to provide for protection of the health and safety ("**HS**") of all employees and other personnel at RSA mines. Its main objectives are:<br>➢ Protection of the HS of all persons at mines;<br>➢ Requiring employers and employees to identify hazards and eliminate, control and minimise the risks relating to health and safety at mines;<br>➢ Giving effect to the public international law obligations of South Africa that concern HS at all mines;<br>➢ Providing for:<br>• employee participation in matters of HS through HS representatives and the HS committees at mines; | EP already complies with the MHSA and it will be applicable to the MM Surface Area once the Section 102 Application is granted. |

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| • effective monitoring of HS conditions at mines;<br>• enforcement of HS measures at mines;<br>• investigations and inquiries to improve HS at mines; and<br>➢ To promote:<br>• a culture of HS in the mining industry;<br>• training in HS in the mining industry; and<br>• cooperation and consultation on HS between the State, employers, employees and their representatives. | |
| **14. <u>Hazardous Substance Act (Act No. 15 of 1973)</u>** ("**HSA**")<br>The HSA provides for the:<br>➢ Control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances;<br>➢ Control of certain electronic products;<br>➢ Division of such substances or products into groups in relation to the degree of danger;<br>➢ Prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products; and<br>➢ Matters connected therewith. | EP will take cognisance of the requirements of the HSA in relation to hazardous substances that may be used for the EP Proposed Projects. |
| **15. <u>Other Legislation, Policy & Guidelines</u>**<br>Other legislation and associated regulations (where applicable) considered as part of the application process include:<br>➢ The National Development Plan 2030.<br>➢ National Veld and Forest Fire Act, 101 of 1998.<br>➢ Transvaal Nature Conservation Ordinance, 12 of 1983 ("**TNCO**").<br>➢ National Forestry Act, No 84 of 1998 ("**NFA**").<br>➢ DMR Consultation Guidelines.<br>➢ Spatial Planning and Land Use Management Act, No 16 of 2013.<br>➢ Traditional Leadership and Governance Framework Amendment Act, No 41 of 2003 and National House of Traditional Leaders Act, No 22 of 2009.<br>➢ Restitution of Land Rights Act 22 of 1994.<br>➢ Municipal Systems Act, No 32 of 2000.<br>➢ Regulations of Gatherings Act, No. 205 of 1993.<br>➢ Protection of Personal Information Act, No. 4 of 2013. | EP takes note of the requirements of the mentioned provisions and will comply with them where relevant. |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED |
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| ➢ Disaster Management Act: Regulations relating to Covid-19. | |
| **16. <u>Provincial and Municipal Bylaws</u>**<br>The MLM, BPD and NWP have developed local bylaws and various policies relating to waste disposal, water, economic development, air quality etc. The following provincial and Municipal Bylaws are applicable to EM:<br>➢ Spatial Development Framework, 2016: North West Province;<br>➢ Madibeng Local Municipality: Air Quality Management By-Laws, 2013;<br>➢ Madibeng Local Municipality: Waste Management By-Laws, 2008;<br>➢ Madibeng Local Municipality: Storm water management By-laws, 2013; and<br>➢ Madibeng Local Municipality: Water & Sanitation By-Laws, 2015. | EP will ensure that such policies and bylaws are adhered to during the EP Proposed Projects' commencement and operation and its operations in general. |
| **17. <u>Guidelines</u>**<br>In addition to the abovementioned Acts and their associated Regulations, the following guidelines and reports have been taken cognisance of during the application process:<br>➢ BPDM Integrated Development Plan, 2012.<br>➢ BPDM SDF, 2016.<br>➢ MLM IDP, 2017-2018.<br>➢ Madibeng Environmental Management Framework, 2009.<br>➢ SANS 10103 of 2008.<br>➢ SANS 10210 of 2004.<br>➢ NEMA Implementation Guidelines: *Sector Guidelines for Environmental Impact Assessment Regulation* (published in GN 654 of GG 3333 on 29 June 2010).<br>➢ DEA (2011): *A user friendly guide to the National Environmental Management: Waste Act*, 2008. South Africa, Pretoria.<br>➢ Department of Environmental Affairs and Tourism (2004): *Criteria for determining Alternatives in EIA, Integrated Environmental Management*, Information Series 11.<br>➢ *Guideline for Implementation: Public Participation in the EIA Process* (published in GN 807 of GG 35769 on 10 October 2012). | EP will ensure that such policies and standards, as far as possible, are adhered to during the EP Proposed Projects. |
| **18. <u>Eland Platinum Safety Health and Environmental Policy</u> (SHE)**<br>A copy of EP's SHE Policy can be found under ***Appendix 5***. | EP will ensure that its HSEC Policy is adhered to during the EP Proposed Projects' construction and operational phases. |

# 5. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

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

## 5.1 Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site.

EM was previously operated and maintained by EPM, a subsidiary of GOSA, and the operations was placed under care and maintenance in 2015. EP, a subsidiary of Northam, purchased EM in 2017 and is responsible for its operation and maintenance going forward. The operations at EM have gradually recommenced on the EM Surface Area. The MM was also placed under care and maintenance in July 2013 and continues to be in care and maintenance.

EP has undertaken various feasibility studies and financial cost models to identify further strategic and sustainable projects. These projects are based on optimising existing infrastructure, upscaling production and processing capacities and efficiency, reducing liabilities, safe working and operational practices, optimising resource utilisation and environmental considerations. Based on this, EP has identified synergies with the neighbouring MM and thus concluded the Sale Agreement. In conjunction with this, the EP Proposed Projects will be implemented to establish and ensure the LoM of in excess of 20 years of EM going forward.

The Proposed Project's probable need and desirability have been identified as the following:

### *a) Continuance of the current land use*

The EM Surface Area has been impacted from mining activities since it commenced in 2006 (SLR, 2012). The MM is also an existing operation and mining practices commenced in the early 2000s. The EP Proposed Projects will be situated within the Consolidated MR Surface Area, where the necessary mining, processing infrastructure (i.e., the Concentrator Plant, etc.), and services (i.e., roads, electricity, water and sewage) have already been established.

### *b) Economic benefit*

The EP Proposed Projects have economic benefits for the local, provincial and national spheres of the RSA. This is due to increased mineral production and socio-economic benefits, associated with job creation; capital and operational expenditure on contractors, materials and equipment; and downstream spending.

### *c) Job Creation*

It is likely that the EP Proposed Projects will create temporary (construction phase) and permanent (operational phase) job opportunities. Both skilled and unskilled temporary employment opportunities would be created through the EP Proposed Projects. This will have a beneficial impact on the local economy through salaries and local spending.

### *d) Promotion of sustainable development by proficiently utilising natural resources*

EP is proposing to re-use the re-processed tailings as backfill material of opencast pits for rehabilitation purposes. The re-processed tailings would have been disposed to the existing TSF as a long-term tailing management option. In addition, EP will be re-processing (i.e., crushing and screening) the existing waste rock for future purposes. The re-use of the tailings and waste rock promotes the waste management hierarchy, as detailed in the National Waste Management Strategy, 2012.

The waste management hierarchy is a tiered approach, where waste management options are organised in an order of significance, which starts with the avoidance of waste; the subsequent reduction, reuse, recycling, recovery; and the last resort of treatment and disposal (DEA, 2012b).

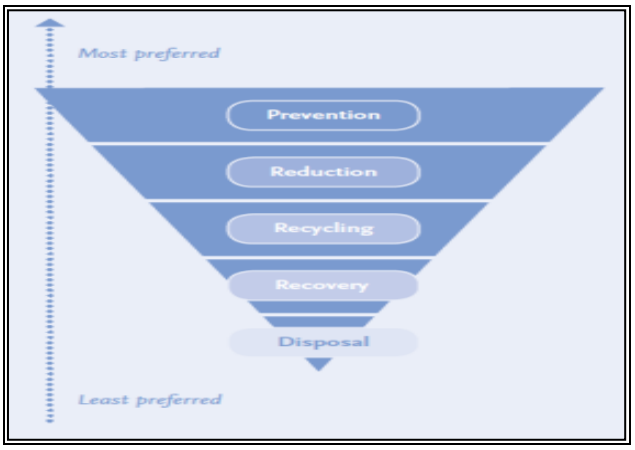


**Figure 11: Waste management hierarchy, (DEA, 2012)**

### *e) Reduce Environmental Liability*

The tailings will be used as backfill material in the opencast pits. The opencast pits are a significant environmental liability that has a potential cumulative financial knock-on effect on the closure liability for EM.

Utilising the tailings for backfill material will likely increase the sequencing of implementing concurrent rehabilitation that has significant environmental and financial benefits. The effect(s) on the groundwater were considered in the groundwater impact assessment.

Other possible advantages of backfilling of pits with tailings include physical stability; reduced risk of leaching of material (i.e., low permeability and sealing capabilities); and optimal utilisation of existing disturbed mining areas.

### *f) Reduced Evaporation and increased water recoveries*

The existing TSF has a footprint of approximately 180 Ha and, due to its size, the TSF has a high evaporation footprint. The wet tailings produced by the Concentrator Plant is currently disposed on the TSF and a significant amount of water is lost through evaporation. Using the tailings as backfill material will allow EP to recover significant water volumes that can be re-used on EM's operation and process circuit.

## 6. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The EP Proposed Projects form an important part of the EP mining and processing operations going forward.

It will be required for the LoM of EM and MM operations. The EA will thus for a minimum be required for an estimated thirty-year period for the LoM of EM and MM.

## 7. DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE

NB!! – This section is not about the impact assessment itself; It is about the determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

As mentioned previously, the EP Proposed Projects will be located within the Consolidated MR Surface Area. The site selection was done primarily on the location of the ore reserves and previous operations with their existing footprints, and more specifically, by taking cognisance of the following factors:

- Location of existing disturbed footprints;
- Existing and future infrastructure and servitudes e.g., future plant upgrades etc.;
- Position in relation to other mine infrastructure;
- Distance from the Concentrator Plant;
- Area and footprint available for proposed activities;
- Environmental and social constraints;
- General topography;
- Geology of the site;
- Surface geotechnical conditions in the footprint zone;
- Geohydrological features and optimal resource locations;
- Watercourse locations;
- Land use;
- Burial and archaeological sites; and
- Proximity to settlements.

## 7.1 Details of all alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:
(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

### 7.1.1 Alternative 1 (proposed, preferred Alternative)

The EP Proposed Projects have 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 **preferred alternative** was based on the following:

- The EP Proposed Projects are located within the established Consolidated MR Surface Area, where the necessary services (i.e., electricity supply, roads and water supply) have already been developed.
- The majority of the Project Area, except for the Merensky Reef mining area and Ventilation Shafts, has previously been disturbed by mining and agricultural activities.
- Mining of MM, including the Boundary Pillar on the UG2 reef horizon between the EM and MM underground workings, will enable additional resource extraction; future underground development; and optimisation of underground infrastructure;
- The Opencast Pits Backfilling Project:
    - promotes the waste management hierarchy;
    - will reduce environmental and rehabilitation liabilities;
    - enhances water saving and reduces water losses through evaporation – provisionally, without a significant, negative cumulative impact on surrounding groundwater qualities; and
- Economic benefits due to resource optimisation.

The preferred alternative will be situated on the following properties, refer to ***Table 10:*** List of the Alternative 1 (preferred alternative) activities and the applicable property description.

**Table 10: List of the Alternative 1 (preferred alternative) activities and the applicable property description.**

| Activities | Property Description | | |
|---|---|---|---|
| Consolidation of the Mining rights and EMPr(s) into one integrated EMPr | <u>Elandsfontein 440JQ</u><br>- Portion 9;<br>- Remaining Extent of Portion 91;<br>- Remaining Extent of Portion 15;<br>- Remaining Extent of Portion 16 (a portion of Portion 15);<br>- Portion 37 (a portion of Portion 16);<br>- Portion 38 (a portion of Portion 16);<br>- Remaining Extent of Portion 52 (a portion of Portion 16);<br>- Portion 123 (a portion of Portion 52);<br>- Remaining Extent of Portion 82 (a portion of Portion 52);<br>- Portion 83 (a portion of Portion 82) (now known as Damonsville Ext 1 Township);<br>- Portion 89 (a portion of Portion 16);<br>- Remaining Extent of Portion 17 (a portion of Portion 15);<br>- Portion 30 (a portion of Portion 17);<br>- Portion 39 (a portion of Portion 17);<br>- Remaining Extent of Portion 18 (a portion of Portion 15);<br>- Remaining Extent of Portion 32 (a portion of Portion 18);<br>- Portion 61 (a portion of Portion 32);<br>- Portion 85 (a portion of Portion 18);<br>- Remaining Extent of Portion 19 (a portion of Portion 15);<br>- Remaining Extent of Portion 40 (a portion of Portion 19);<br>- Portion 43 (a portion of Portion 40);<br>- Remaining Extent of Portion 58 (a portion of Portion 19);<br>- Remaining Extent of Portion 59 (a portion of Portion 58);<br>- Portion 87 (a portion of Portion 59);<br>- Remaining Extent of Portion 63 (a portion of Portion 58);<br>- Portion 88 (a portion of Portion 63); | <u>Zilkaatsnek 439 JQ</u><br>- Remaining Extent of Portion 58;<br>- Portion 80 (a portion of Portion 58);<br>- Portion 81 (a portion of Portion 58);<br>- Portion 82 (a portion of Portion 58);<br>- Portion 84 (a portion of Portion 58);<br>- Portion 87 (a portion of Portion 58); and<br>- Portion 97 (a portion of Portion 4).<br><br><u>Schietfontein 437 JQ</u><br>- Portion 13 (a portion of Portion 2); and<br>- Portion 14 (a portion of Portion 2). | <u>Farm De Kroon 444 JQ</u><br>- Remaining Extent of Portion 48;<br>- Remaining Extent of Portion 50;<br>- Remaining Extent of Portion 49;<br>- Portion 51;<br>- Portion 52;<br>- Portion 119;<br>- Portion 121;<br>- Portion 122;<br>- Portion 123;<br>- Portion 115;<br>- Portion 160;<br>- Remaining Extent of Portion 141 (a portion of Portion 49);<br>- Portion 142 (a portion of Portion 49);<br>- Remaining Extent of Portion 157 (portion of Portion 47);<br>- Portion 159 (portion of Portion 115);<br>- Portion 161 (portion of Portion 115)<br>- Remaining Extent of Portion 165;<br>- Portion 166 (portion of Portion 47);<br>- Portion 167 (portion of Portion 47);<br>- Portion 168 (portion of Portion 47);<br>- Portion 199 (a portion of Portion 48);<br>- a portion of Portion 296;<br>- a portion of Portion 297;<br>- Portion 333 (portion of Portion 165)<br>- Portion 353. |

| Activities | Property Description | | |
|---|---|---|---|
| | - Portion 86 (a portion of Portion 58);<br>- Portion 78 (a portion of Portion 19);<br>- Portion 45 (a portion of Portion 15);<br>- Portion 84 (a portion of Portion 15);<br>- Portion 44 (a portion of Portion 15);<br>- Portion 46 (a portion of Portion 15); and<br>- Portion 47 (a portion of Portion 15). | | |
| Consolidation of the WUL for EM and Maroelabult; | Elandsfontein 440JQ<br>- Portion 30 (a portion of Portion 17);<br>- Remaining Extent of Portion 32 (a portion of Portion 18);<br>- Portion 37 (a portion of Portion 16);<br>- Portion 39 (a portion of Portion 17);<br>- Remaining Extent of Portion 58 (a portion of Portion 19);<br>- Remaining Extent of Portion 59 (a portion of Portion 58);<br>- Portion 61 (a portion of Portion 32); and<br>- Remaining Extent of Portion 63 (a portion of Portion 58). | Zilkaatsnek 439 JQ<br>- Remaining Extent of Portion 58;<br>- Portion 80 (a portion of Portion 58);<br>- Portion 81 (a portion of Portion 58);<br>- Portion 82 (a portion of Portion 58);<br>- Portion 83 (a portion of Portion 58);<br>- Portion 84 (a portion of Portion 58);<br>- Portion 85 (a portion of Portion 58);<br>- Portion 86 (a portion of Portion 58);<br>- Portion 87 (a portion of Portion 58);<br>- Portion 97 (a portion of Portion 4);<br>- Portion 197; and<br>- Portion 200.<br><br>Schietfontein 437 JQ<br>- Portion 13 (a portion of Portion 2); and<br>- Portion 14 (a portion of Portion 2). | Farm De Kroon 444 JQ<br>- Portion 297;<br>- The Remaining Extent of Portion 48;<br>- Portion 161 (portion of Portion 115);<br>- The Remaining Extent of Portion 49;<br>- Portions 119;<br>- Portion 120; and<br>- Portion 123. |
| Mining of the Boundary Pillar on the UG2 reef horizon between EM and Maroelabult; | Farm De Kroon 444 JQ;<br>- -Portion 159 (portion of Portion 115);<br>- -Portion 160; and<br>- -Remaining Extent of Portion 157<br>Elandsfontein 440JQ<br>- Portion 37 | | |
| Construction and operation of two ROM stockpiles; | Portion 37 (a portion of Portion 16) of the Farm Elandsfontein 440JQ | | |
| Raise-boring and operation of two Ventilation Shafts; | Elandsfontein 440JQ<br>- Portion 37 (a portion of Portion 16); and<br>- Portion 61 (a portion of Portion 32) | | |
| Mining of the Merensky Reef, including associated infrastructure | Elandsfontein 440JQ<br>- Remaining Extent of Portion 32 (a portion of Portion 18);<br>- Portion 37 (a portion of Portion 16);<br>- Portion 39 (a portion of Portion 17);<br>- Remaining Extent of Portion 59 (a portion of Portion 58);<br>- Portion 61 (a portion of Portion 32); and | | |

| Activities | Property Description |
|---|---|
| | - Remaining Extent of Portion 63 (a portion of Portion 58). |
| Mining of the UG1 in the existing TSF Paddock 2, 3 and 4; | Elandsfontein 440JQ<br>- Portion 30 (a portion of Portion 17);<br>- Remaining Extent of Portion 32 (a portion of Portion 18); and<br>- Portion 37 (a portion of Portion 16). |
| Backfilling of existing opencast pits with tailings; | Elandsfontein 440JQ<br>- Remaining Extent of Portion 32 (a portion of Portion 18).<br>Zilkaatsnek 439 JQ<br>- Remaining Extent of Portion 58;<br>- Portion 82 (a portion of Portion 58); and<br>- Portion 84 (a portion of Portion 58). |
| Expansion and construction of pipelines for the conveying of water and tailings; | Elandsfontein 440JQ<br>- Portion 30 (a portion of Portion 17);<br>- Remaining Extent of Portion 32 (a portion of Portion 18); and<br>- Portion 37 (a portion of Portion 16).<br>Zilkaatsnek 439 JQ<br>- Remaining Extent of Portion 58; and<br>- Portion 84 (a portion of Portion 58). |
| Construction and operation of the CFP and associated infrastructure; | Remaining Extent of Portion 48 of the Farm De Kroon 444 JQ |
| Construction of an electrical substation and associated infrastructure; including water management pipelines | Portion 37 (a portion of Portion 16) of the Farm Elandsfontein 440JQ<br>Farm De Kroon 444 JQ<br>- Remaining Extent of Portion 48;<br>- Remaining Extent of Portion 49;<br>- Remaining Extent of Portion 50;<br>- Portion 142 (a portion of Portion 49);<br>- Remaining Extent of Portion 157 (a portion of Portion 47);<br>- Portion 159 (a portion of Portion 115); and<br>- Portion 297. |
| MM WRD re-processing | Farm De Kroon 444 JQ<br>- Portion 161 (a portion of Portion 115) |

### 7.1.2 Alternative 2 (alternative)

Alternatives for the EP Proposed Projects included technology, layout and route alternatives. For comparison to the preferred alternatives listed above under Section 7.1.1, refer to below ***Table 11***: *Detail of the Alternative 2 (Alternative) activities that have been considered*.

**Table 11: Detail of the Alternative 2 (Alternative) activities that have been considered.**

| Preferred Activities | Alternative |
|---|---|
| Construction and operation of two ROM stockpiles | Alternative liner specification. No other disturbed areas available, make use of disturbed areas |
| Raise-boring and operation of two Ventilation Shafts | Alternative layout of the infrastructure |
| Mining of the Merensky Reef, including associated infrastructure. | Alternative routes for the haul roads.<br>Alternative location for the topsoil and overburden stockpiles. |
| Backfilling of existing opencast pits with tailings | Alternative technology/methodology of depositing the tailings.<br>Alternative route for the tailings pipeline from the Concentrator Plant to the opencast pits.<br>Alternative route for the return water pipeline. |
| Expansion and construction of pipelines for the conveying of water | Alternative route for the pipelines. |
| Construction and operation of a CFP and associated infrastructure at the MM Shaft | Alternative layout of the CFP and infrastructure. No other disturbed areas available, make use of disturbed areas |
| Construction of an electrical substation and associated infrastructure | Alternative route for the electrical distribution infrastructure and location for the substation. |
| WRD reprocessing | Alternative technology/methodology of re-processing the WRD. |

### 7.1.3 No Go Alternative

The no-go option entails that none of the EP Proposed Projects are undertaken. The risks identified if the No Go Alternative is considered are described below in **Table 12**: *No Go Alternative option and the consequences identified for each activity*:

**Table 12: No Go Alternative option and the consequences identified for each activity.**

| No Go Alternative | Consequence |
|---|---|
| - Consolidation of the EM / MM Environmental Licences into one integrated EMPr.<br>- Consolidation of the MM WUL and EM WUL. | - Significant administrative consequences.<br>- Additional costs for EP.<br>- No streamlining of environmental management and resultant efficiency. |
| Mining of the Merensky Reef, including associated infrastructure | - No vegetation clearance.<br>- Loss of PGM and chromite resource.<br>- Loss of economic value.<br>- Loss of employment opportunity.<br>- No disturbance of the soil profile.<br>- No additional surface and groundwater pollution. |
| Construction of an electrical substation and associated infrastructure; | - Reduced energy supply.<br>- Possible power outages. |
| Mining at MM, including the Boundary Pillar on the UG2 reef horizon between EM and MM | - Loss of PGM and chromite resource.<br>- Loss of economic value.<br>- Loss of employment opportunity. |

| No Go Alternative | Consequence |
|---|---|
| | - Reduced potential water management liability. |
| Mining of the UG1 in the existing TSF Paddocks 2, 3 and 4 | - Loss of PGM and chromite resource.<br>- Loss of economic value.<br>- Loss of employment opportunity.<br>- No disturbance of the TSF barrier profile.<br>- No additional surface and groundwater pollution. |
| Expansion and construction of pipelines for the conveying of mine affected water and tailings | - No risk of pollution of the surface and groundwater.<br>- Loss of employment opportunity.<br>- Loss of synergies in water management. |
| Raise-boring and operation two Ventilation Shafts; | - Limitation to underground development.<br>- Possible risk to the safety of the underground workers. |
| Construction and operation of a CFP and associated infrastructure at the MM Shaft | - Loss of PGM and chromite resource.<br>- Loss of economic value.<br>- Loss of employment opportunity. |
| Construction and operation of two ROM stockpiles | - No optimisation of existing disturbed areas.<br>- No vegetation clearance.<br>- Reduced space for ROM stockpiling.<br>- No disturbance of the soil profile.<br>- No additional surface and groundwater pollution.<br>- Loss of employment opportunities. |
| Construction and commissioning of associated surface and underground infrastructure. | - Loss of employment opportunity.<br>- No land disturbance. |
| The MM WRD re-processing | - Loss of an additional economic benefit.<br>- Loss of backfill material.<br>- Loss of employment opportunity.<br>- No minimisation of rehabilitation liabilities. |
| Backfilling of existing opencast pits with tailings. | - Possible water recovery opportunity lost.<br>- Increased evaporation/water loss on the TSF.<br>- Significant environmental and financial liability.<br>- Long-term liability.<br>- Groundwater contamination. |

# 8. DETAILS OF THE PUBLIC PARTICIPATION PROCESS (PPP) FOLLOWED

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

The Stakeholder Engagement Process that was undertaken during the project announcement and Scoping/EIA phase was undertaken in terms of Regulations 40 and 41 of the 2014 EIA Regulations.

PPP adhered to the requirements of the COVID 19 Regulations as contained in the Disaster Management Act (Act No. 57 of 2002): *Directions regarding measures to address, prevent and combat the spread of COVID-19 relating to national environmental management permits and licences*, published in the relevant GN was adhered to during the PPP.

The following tasks was performed during the PPP to inform stakeholders and I&APs.

## 8.1 Scoping Phase

Evidence of PPP that was conducted during the initiation and Scoping Phase is appended under ***Appendix 6 – I&AP Consultation Report***. The following stakeholder engagement and involvement actions were undertaken:

- The existing Stakeholder Database from EP and MM was utilised as the baseline contact list for the I&APs and stakeholder.
- Notices were placed in three newspapers (two local and one national). The notices were placed in the Beeld (14 August 2020), Kormorant (13 August 2020), and the Britspos (14 August 2020);
- A2 site notices, notifying the public of the process and inviting them to register as I&APs, were placed at the following points:
    - Site Entrance of the EM and MM;
    - Madibeng Local Library;
    - Mmakau Police Station Notice Board;
    - Mothotlung Municipal Services Building;
    - Damonsville Community Library;
    - Odi Primary School;
    - Moumong Store in Mmakau;
    - De Wild Helpmekaar Offices; and
    - Easy Build Hardware Shop in the De Wild Community.
- Public notices / flyers and letters was distributed to the following stakeholders and I&APs:
    - NWREAD;
    - DHSWS;
    - DEAFF;
    - DMRE;
    - MLM;

- BDPM;
- Eskom Holdings SOC Ltd;
- Ward No. 21 Councillor in the MLM;
- Surrounding Ward Councillors (Wards 13, 17, 18, 19, 20, 21 and 35 of the MLM);
- Bakgatla Ba-Mmakau Tribal Council;
- Landowner and neighbouring farms surrounding the Consolidated MR Area;
- Villages, Townships and Small Dorpies (VTSD) Forum;
- Land Claims Commissioner. The required notice will be given under section 11 of the Restitution of Land Rights Act No 22 of 1994 prior to the commencement of the activities to be undertaken on Portions 61 and the Remainder of Portion 32 of the Farm Elandsfontein 440JQ, which properties are subject to land claims;
- Ex-EPM employees and contractors;
- Surrounding Mines; and
- Community Members.

- Correspondence was provided in electronic format.
- One on one meetings were held with farmers, community forums and other stakeholders, where possible.
- The DSR was also provided to key stakeholders and authorities for review and comments. The following stakeholders were provided with a copy of the DSR:
  - NWREAD;
  - MLM;
  - DMRE: North West Region;
  - DHSWS;
  - DEAFF;
  - Department of Rural Development and Land Reform;
  - Department of Agriculture Affairs; and
  - BPDM.
- The DSR was available for review and comments for thirty (30) days from 17 August to 16 September 2020 at the following locations:[2]
  - EM Security Office;
  - MM entrance;
  - Moumong Store in Mmakau
  - The Community Hall in Mothotlung;
  - Madibeng Business Support Centre; and
  - Mmakau Police Station next to the Bakgatla Ba-Mmakau Tribal Council offices.
- The I&APs were informed of the intention of EP to submit the FSR via electronic correspondence.

[2] Note: It was unfortunately not possible to leave the hardcopies of the DSR at the Madibeng and Damonsville community libraries, due to Covid-19 restrictions and closure of the facilities at the time.

All comments received from the I&APs during the Scoping Phase was incorporated into the FSR.

All comments received from the I&APs during the Scoping Phase were also incorporated into the DEIAR (Refer to ***Table 13,*** *below*), together with a response from the EAP and Applicant. As part of the Scoping Phase, the concerns and issues raised by I&APs and stakeholders can be summed-up to the following major points:

- Impact of mining and projects on groundwater quantity and quality;
- Noise impact associated with mining activities;
- Visual impact on neighbouring landowners;
- Impact of blasting on buildings;
- Possible job and business opportunities; and
- Socio-economic impact of the mine on the surrounding community and businesses.

The concerns raised by I&APs were investigated via specialist investigation and impact assessments and will be further investigated via workshops and additional consultation with I&APs in the EIA Phase.

### 8.2 EIA Phase

The Stakeholder Engagement Process will be undertaken during the EIA Phase in terms of Regulations 40 and 41 of 2014 EIA Regulations. The following tasks below were and will be performed during the PPP, to inform stakeholders and interested parties. (Evidence of PPP that was conducted is appended under ***Appendix 6 – I&AP Consultation Report***)

- An advertisement was placed in the 'Rustenburg Herald', Komorant and 'Brits Pos' newspapers;
- Site notices will be erected at the following locations:
    - EM Security Office;
    - Madibeng Local Library in Brits;
    - Oukasie Primary School;
    - Odi Primary School;
    - Botlhabelo High School;
    - Moumong Store in Mmakau;
    - The Community Library (at the Community Hall) Damonsville;
    - The Community Hall in Mothotlung;
    - De Wildt Helpmekaar Offices; and
    - Mmakau Police Station next to the Bakgatla-Ba-Mmakau Tribal Council offices.
- Public notices / flyers and letters will be distributed to the following stakeholders and I&APs:
    - NWREAD;
    - DHSWS;
    - DEAFF;
    - DMRE;
    - MLM;

- BDPM;
- Eskom;
- Ward No. 21 Councillor in the MLM;
- Surrounding Ward Councillors (Wards 13, 17, 18, 19, 20, 21 and 35 of the Madibeng Local Municipality);
- Bakgatla-Ba-Mmakau Tribal Council;
- Landowner and neighbouring farms surrounding the EM Surface Area;
- VTSD Forum;
- Land Claims Commission;
- Ex-EPM employees and contractors;
- Surrounding Mines; and
- Community Members.

- Two public meetings are scheduled to be undertaken at the Brits Community Hall at 53 Van Velden Street in Brits in April 2021.
- Additional landowner and stakeholder engagements are also planned to be undertaken in April 2021.
- The I&APs Register was compiled, making use of the existing Stakeholder Database from EP. The I&APs Register will be continuously updated as necessary (i.e., with new contact details, new I&APs etc.). All comments received from the I&APs during the EIA phase were incorporated into the FEIAR.
- The I&APs were informed of the availability of the DEIAR and DEMPr for review and comments; where/how these reports can be accessed and the commenting timeframes; and how comments can be submitted to JEMS. The DEIAR and DEMPr were made available to the public for a 30-day commenting period from **12 April to 13 May 2021** at the following locations:
  - EM and MM Security Office;
  - Madibeng Local Library in Brits;
  - Oukasie Primary School;
  - Odi Primary School;
  - Botlhabelo High School;
  - Moumong Store in Mmakau;
  - The Community Library (at the Community Hall) Damonsville;
  - The Community Hall in Mothotlung;
  - De Wildt Helpmekaar Offices; and
  - Mmakau Police Station next to the Bakgatla-Ba-Mmakau Tribal Council offices

Proof of the PPP undertaken during the EIA Phase has been appended under ***Appendix 6***.

## 8.3 Summary of issues raised by I&AP's

(Complete the table summarising comments and issues raised, and reaction to those responses)

**Table 13: Table summarising comments and issues raised, and reaction to those responses.**

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
|---|---|---|---|---|---|
| **Affected Parties** | | | | | |
| **Landowners** | | | | | |
| *Eland Platinum Mines (Pty) Ltd* | *X* | | *No comments received* | *Notified via email* | ***Appendix 6*** |
| *Salene Mining (Pty) Ltd* | *X* | | *No comments received* | *Notified via registered mail* | |
| *Republic of South Africa Government* | *X* | | *No comments received* | *Notified via registered mail* | |
| *Hernic Ferrochrome (Pty) Ltd* | *X* | | *No comments received* | *Notified via email* | |
| *Kleinsmit Familie Trust* | *X* | | *No comments received* | *Notified via email* | |
| *M C Botha* | *X* | *25 September 2020* | *Please take note that I am the registered owner of Portion 160 of 115 De Kroon JQ444 Brits and a direct neighbour on the northern boundary of the proposed project.*<br><br>*I would like to hereby register as an affected party and to object to the abovementioned proposed project/subject due to prejudice that I will suffer due to the following:*<br>*1. Negative Visual Impact;*<br>*2. Ecological pollution / contamination*<br>*With reference to the above we await your urgent response.* | *Email sent on 25 September 2020 by JEMS.*<br><br>*Thank you for your correspondence. We hereby acknowledge the receipt thereof and take note of your concerns and inputs.*<br><br>*As part of the EIA Phase the visual and ecological impact of the proposed project will be assessed.*<br><br>*Please don't hesitate to contact us should you have any other comments or queries.*<br><br>*Regards/Groete*<br><br>*Stephan Barkhuizen* | |
| *Barplats Mines (Pty) Ltd* | *X* | *20 August 2020* | *Email received from OMI Solutions on behalf of Barplats.*<br><br>*Kindly register me as an I&AP from Barplats Mines. Also please advise on all the Stakeholder meeting dates and venues.* | *Notified via email*<br><br>*Email sent on 23 August 2020 by JEMS.*<br><br>*Thank you for your correspondence. We hereby acknowledge receipt thereof and inform you that you have been registered as an Interested and Affected Party for the application process. We are still in the process of finalising dates and means of undertaking the Stakeholder engagement meetings due to the Covid 19 Restrictions and Regulations.* | ***Appendix 6*** |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
|---|---|---|---|---|---|
| | | | | *We will however notify you of the dates and venue of the meetings in due course. Do not hesitate to contact us should you have any other questions or queries.* | |
| *Land claim by Daniel Lebelwane* | *X* | | | *Notified via email* | |
| **Lawful occupier/s of the land** | | | | | |
| *EP is the lawful occupier of the land.* | *X* | | | | |
| **Landowners or lawful occupiers on adjacent properties** | | | | | |
| *Transnet Ltd* | *X* | | *No comments received* | *Notified via email and registered mail* | ***Appendix 6*** |
| *Jo-Fana Roses CC* | *X* | | *No comments received* | *Notified via email and registered mail* | |
| *National Housing Board* | *X* | | *No comments received* | *Notification sent to the Suid - Afrikaanse Ontwikkelings Trust* | |
| *Suid - Afrikaanse Ontwikkelings Trust* | *X* | | *No comments received* | *Notified via registered mail* | |
| *Republic of South Africa Government* | *X* | | *No comments received* | *Notified via registered mail* | |
| *Salene Mining (Pty) Ltd* | *X* | | *No comments received* | *Notified via registered mail* | |
| *GOSA* | *X* | | *No comments received* | *Notified via email and registered mail* | |
| *Hernic Ferrochrome (Pty) Ltd* | *X* | | | *See above.* | |
| *Zilkaats Wildlife Estate* | *X* | | *No comments received* | *Notified via email* | |
| *Zolograph Investments (RF) (Pty) Ltd* | *X* | *19 August 2020* | *Email received from Ms. Stephanie Kot*<br>*I trust that you have been keeping well in these unusual times. With reference to the notification below, could I please obtain an electronic copy of the DSR?* | *Email sent on 19 August 2020 by JEMS.*<br>*Please see attached a copy of the Draft Scoping Report for your attention.*<br>*Do not hesitate to contact us should you have any further questions or queries.* | |
| *Bakwena N1 and N4 Toll Concession* | *X* | | *No comments received* | *Notified via email and registered mail* | |
| *Madibeng Local Municipality* | *X* | | | *Please see below* | |
| *South African National Roads Agency SOC Ltd* | *X* | | *No comments received* | *Notified via registered mail* | |
| *SAMANCOR* | *X* | | *No comments received* | *Notified via registered mail* | |
| **Municipal councillor** | | | | | |
| *Ward 21 – Eland Platinum situated in the Ward.*<br>*Mr MW Motlhasedi* | *X* | | *No comments received* | *Notified via email.* | ***Appendix 6*** |
| *Ward 13 – Surrounding Ward*<br>*Cllr Molekoa* | *X* | | | | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
|---|---|---|---|---|---|
| *Ward 17 – Surrounding Ward*<br>*Mr MA Mokgoko* | *X* | | | | |
| *Ward 18 – Surrounding Ward*<br>*Mr Barney A Maubane* | *X* | | | | |
| *Ward 19 – Surrounding Ward*<br>*Mr TS Bogale* | *X* | | | | |
| *Ward 20 – Surrounding Ward*<br>*Mr Chris Seabi* | *X* | | | | |
| *Ward 35 – Surrounding Ward*<br>*Ms Nomsa Maqakamba* | *X* | | | | |
| *Ward 31 – Surrounding Ward in Tshwane Metropolitan Municipality*<br>*Mr Tshepo Kgaje* | *X* | | | | |
| **Municipality** | | | | | |
| *Bojanala District Platinum Municipality;* | *X* | | *No Comments received.* | *Notified via email and a soft copy of the DSR mailed via registered mail.* | ***Appendix 6*** |
| *Madibeng Local Municipality;* | *X* | | *No Comments received.* | *Notified via email and hard copy of the DSR hand delivered to Environmental Section for comments.* | |
| **Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWS etc.** | | | | | |
| *NWREAD* | *X* | *22 September 2020* | *Email received from Eva Mahlangu*<br><br>*Good day*<br><br>*can you please send hard copy as we are facing challenge on printing please*<br><br>*Thank you in Advance* | *Response by JEMS on 6 October 2020*<br><br>*Hi Eva,*<br><br>*Sure no problem.*<br><br>*It will take a couple of days to get out to you but I will make a plan.*<br><br>*Where are you based?*<br><br>*Regards*<br><br>*Stephan Barkhuizen*<br><br>*Good day,*<br><br>*Great, thank you.*<br><br>*I will arrange a courier company to deliver the report.* | ***Appendix 6*** |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
|---|---|---|---|---|---|
| | | *26 November 2020* | *<u>Letter received from Ms. Portia Krisjan (Director: Environmental Quality Management)</u>*<br><br>*RE: COMMENTS ON THE SCOPING REPORT FOR THE PROPOSED ELAND PLATINUM MINE CONSOLIDATION PROJECT*<br><br>*1. The FSR in respect of the above mentioned project was received by this Department on 12 October 2020 has reference:*<br><br>*2. Following the review of the FSR the Department notes the following:*<br>*- The applicant Eland Platinum Mine (Pty ) Ltd proposes to consolidate mining permits, EMPr(s), EA(s), WML(s) and WUL(s) issued for multiple operations (Maroelabult, Zilkaatsnek and Elandsfontein Mining Rights) into one integrated EMPr.*<br><br>*- This is to simplify and streamline environmental management implementation processes for Eland Platinum Mine (Pty) Ltd.*<br><br>*- The applicant is also applying for authorisation of new activities in terms of the 2014 EIA Regulations.*<br><br>*3. The surrounding land uses include mining and mineral processing activities, agricultural fields and a game farm.*<br><br>*4. The North West Biodiversity Sector Plan (2015) identifies CBA Level 1 and 2 and Aquatic Ecological Support Areas Type 2 over the project area.*<br><br>*5. Previous site investigations and specialist studies have been conducted and activities have been authorised on the application area, therefore the Department has no objection towards the proposed Eland Platinum Mine Consolidation Application.*<br><br>*6. The Department recommends cumulative underground water and dust fall out impacts associated with the ongoing and future activities be investigated and mitigation measures be identified for consideration.*<br><br>*Regards.* | *<u>Response by JEMS on 1 December 2020.</u>*<br><br>*Good day Eva,*<br><br>*We hereby acknowledge receipt of the letter and take note of its contents.*<br><br>*Please don't hesitate to contact us should you have any other comments or questions.*<br><br>*Regards/Groete* | ***Refer to the following:***<br>***Section9.1.11;***<br>***Section 9.1.13;***<br>***Section 9.1.14;***<br>***Section 9.1.15;***<br>***Section 9.1.16***<br>***Section 9.1.17***<br>***Section 10***<br><br>***Appendix 7*** |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
|---|---|---|---|---|---|
| *DHSWS* | *X* | *19 August 2020* | *Email received from Chadwick M Lobakeng (Regional Head: North West)*<br><br>*I hereby acknowledge receipt of your correspondence and by copy hereof forward it to Ms Wendy Ralekoa for further processing.* | *Email sent on the 19 August 2020.*<br><br>*Good day Sir,*<br><br>*We take note of your correspondence and thank you in advance.* | ***Appendix 6*** |
| | | | *Letter received from Ms. Cornia Theunissen*<br><br>*This office acknowledges the receipt of your documents regards to the abovementioned on 18 August 2020 Task T194/2020). The officer responsible for this area is: Mr Herbert Kutama and can be contacted at 087 943 3741. Comments would be forwarded in due time.* | *Email sent on the 19 August 2020.*<br><br>*Thank you for the notice, it is hereby acknowledged.* | |
| | | *24 August 2020* | *Email received from Nkwinika Masingita from the DHSWS*<br><br>*Will you please enlist my name as an interested and affected party? Hoping you find this in order.* | *Email sent on 24 August 2020 by JEMS.*<br><br>*Thank you for your correspondence.*<br><br>*We hereby acknowledge receipt thereof and take note of your information. Please note you have been registered as an Interested and Affected Party and future correspondence regarding the project will be made available to you.* | |
| *DMRE* | *X* | *4 September 2020* | *Letter received from the Acknowledgement of an application from the DMRE: North West Region.*<br><br>*The abovementioned matters refer. This letter serves to inform you that your application for the consolidation of Environmental Authorisations and DSR submitted on 17 August 2020 is hereby acknowledged. Kindly be informed that the Scoping Report has not yet been evaluated. Once the evaluation is completed you shall be informed in due course. Kindly also not your application has been assigned to Ms. Matodzi Ramboho who could be reached at the following contact details: Tel: (018) 487 4346/4300.*<br><br>*Your faithfully*<br><br>*Regional Manager* | *Public Notice emailed and hard copy of the DSR hand delivered for comments.* | ***Appendix 6*** |
| *SAHRA* | *X* | | *No comments received.* | *Notified via email and DSR uploaded on SAHRIS Platform for comments.* | ***Appendix 6*** |
| *ESKOM* | *X* | | | *Public Notice Emailed* | |
| **Communities** | | | | | |
| *Damonsville Community*<br>*Mothotlung Community* | *X* | | *No comments received.* | *Site Notices and DSR were available for review in these areas* | ***Appendix 6*** |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
|---|---|---|---|---|---|
| *Moumong Community* | | | | | |
| *Mmakau Community* | | | | | |
| *De Wildt Community* | | | | | |
| **Traditional Leaders / Land Claimants** | | | | | |
| *Bakgatla-Ba-Mmakau Tribal Council* | *X* | | *No comments received.* | *Notified via email* | ***Appendix 6*** |
| *Land Claimants for Portion 61* | | | | | |
| *Bakgatla Ba Moiletswane* | | | | | |
| *Bakgatla Ba Rampakong* | | | | | |
| **Dept. Environmental Affairs Fisheries and Forestry** | | | | | |
| *Director: Environmental Authorisations* | *X* | | *No comments received.* | *Notified via email and a soft copy of the DSR mailed via registered mail.* | |
| **Other Competent Authorities** | | | | | |
| *Department of Public Works Road and Transport* | *X* | | *No comments received.* | *Notified via email* | ***Appendix 6*** |
| *Department of Rural Development* | | | | *Notified via email and a soft copy of the DSR mailed via registered mail.* | |
| *Department of Agriculture* | | | | | |
| *Department of Local Government and Traditional Affairs* | | | | *Notified via email* | |
| *Land Claims Commission* | *X* | *20 August 2020* | *Letter received from the Office of the Regional Land Claims Commissioner: North West.*<br><br>*I acknowledge the receipt of your letter dated the 19th of August 2020 regarding the above-mentioned matter.*<br><br>*Kindly note that a formal response could be expected from our office within the next seven (7) working days.*<br><br>*Should you however require any additional information, you can contact Ms. K Mothupi at the above-mentioned contact details.*<br><br>*Mr. LJ Bogatsu*<br>*Chief Director* | *Email sent on 20 August 2020 by JEMS.*<br><br>*Thank you for your correspondence. We hereby acknowledge receipt of the correspondence and take note of its contents.* | ***Appendix 6*** |
| | | | *Email received from Keabetswe Mothupi from the Land Claims Commission: North West Region*<br><br>*Do like to know if there is a land claim on the below properties?* | *Email sent on 1 September 2020 by JEMS.*<br><br>*My apology for the delayed response.*<br><br>*Based on the information received from Eland Platinum (Pty) Ltd, the Bakgatla-Ba-Mmakau Community have a land claim over Portion 61 (a* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
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| | | | | *portion of Portion 32) and the Remainder of Portion 32 of the Farm Elandsfontein 440 JQ, Brits, North West, which is part of the Project Area and held under Eland Platinum (Pty) Ltd.'s mining right. The land claim in respect of the Remainder of Portion 32 of the Farm Elandsfontein has been referred to the Land Claims Court.*<br><br>*Please do not hesitate to contact us should you have any other questions or comments.* | |
| | | *28 August 2020* | *Letter received from the Office of the Regional Land Claims Commissioner: North West, regarding a land claim enquiry – RE 58, Portion 82 and 84 (Portions of 58), Portion 197 (Portion 113) of the Farm Zilkaatsnek 439JQ.*<br><br>*We refer to your letter dated 19th of August 2020.*<br><br>*We confirm that as at the date of this letter no land claims appear on our database in respect of the properties. This includes the database for land claims lodged by 31 December 1998, and those lodged between 1 July 2014 and 27 July 2016 in terms of the Restitution of Land Rights Amendment Act, 2014.*<br><br>*Whilst the Commission takes reasonable care to ensure the accuracy of the information it provides, there are various factors that are beyond the Commission's control, particularly relating to claims that have been lodged but not yet gazetted such as:*<br>*1. Some claimants referred to properties they claim dispossession of rights in land against using historical property descriptions which may not match the current property description; and*<br>*2. Some claimants provided the geographic descriptions of the land they claim without mentioning the particular property description they claim dispossession of rights in land against.*<br><br>*The commission therefore does not accept any liability whatsoever if through the process of further investigation of claims it is found that there is in fact a land claim in respect of the above property.* | *Email sent on 1 September 2020 by JEMS.*<br><br>*Thank you for your correspondence. We hereby acknowledge receipt thereof and take note of its contents. Do not hesitate to contact us should you have any questions or comments.* | |

| Interested and Affected Parties | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
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| | | *If you are aware of any change in the description of the above property after 19 June 1913 kindly supply us with such description, to enable us to do further search.*<br><br>*Yours faithfully.*<br><br>*Mr. LJ Bogatsu*<br>*Chief Director* | | |
| | *28 August 2020* | *Letter received from the Office of the Regional Land Claims Commissioner: North West, regarding a land claim enquiry – RES of Portions 48,49, 50, RE141 & 142 (portions of Portion 49), 51, 52, 115, 119, 121, 122, 159 and 161 (Portion of Portion 115), 160, RE 165, RE 157 (50), 166, 167, and 168 (Portion 47) (portions of Portions 196 & 297), Portion 353 , 333 (portions of 165) of the Farm De Kroon 444 JQ.*<br><br>*We refer to your letter dated 19th of August 2020.*<br><br>*We confirm that as at the date of this letter no land claims appear on our database in respect of the properties. This includes the database for land claims lodged by 31 December 1998, and those lodged between 1 July 2014 and 27 July 2016 in terms of the Restitution of Land Rights Amendment Act, 2014.*<br><br>*Whilst the Commission takes reasonable care to ensure the accuracy of the information it provides, there are various factors that are beyond the Commission's control, particularly relating to claims that have been lodged but not yet gazetted such as:*<br>*1. Some claimants referred to properties they claim dispossession of rights in land against using historical property descriptions which may not match the current property description; and*<br>*2. Some claimants provided the geographic descriptions of the land they claim without mentioning the actual property description they claim dispossession of rights in land against.*<br><br>*The commission therefore does not accept any liability whatsoever if through the process of further investigation of claims it is found that there is in fact a land claim in respect of the above property.* | *Email sent on 1 September 2020 by JEMS.*<br><br>*Thank you for your correspondence. We hereby acknowledge receipt thereof and take note of its contents. Do not hesitate to contact us should you have any questions or comments.* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
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| | | | *If you are aware of any change in the description of the above property after 19 June 1913 kindly supply us with such description, to enable us to do further search.*<br><br>*Yours faithfully.*<br><br>*Mr. LJ Bogatsu*<br>*Chief Director* | | |
| | | *2 September 2020* | *Letter received from the Office of the Regional Land Claims Commissioner: North West, regarding a land claim enquiry – RE of Portion 32 of the Farm Elandsfontein 440JQ*<br><br>*I acknowledge receipt of your letter dated the 1 September 2020 regarding the above-mentioned matter.*<br><br>*Kindly note that a formal response could be expected from our office within the next seven (7) working days.*<br><br>*Should you however require any additional information, you can contact Ms. K Mothupi at the abovementioned contact details.*<br><br>*Yours faithfully.*<br><br>*Mr. LJ Bogatsu*<br>*Chief Director* | | |
| | | *7 September 2020* | *Letter received from the Office of the Regional Land Claims Commissioner: North West, regarding a land claim enquiry – RE of Portion 58 (Portion19), RE(s) of Portions 59 and 63 (Portion 58), RE of Portion 32 (portion 18); Portions 30 and 39 (Portion 17); Portion 37 (Portion 16) of the Farm Elandsfontein 440JQ*<br><br>*We refer to your letter dated 19th of August 2020.*<br><br>*We confirm that as at the date of this letter **no** land claims appear on our database in respect of the properties. This includes the database for land claims lodged by 31 December 1998, and those lodged between 1 July 2014 and 27 July 2016 in terms of the Restitution of Land Rights Amendment Act, 2014.*<br><br>*Whilst the Commission takes reasonable care to ensure the accuracy of the information it provides, there are various factors that are beyond the Commission's control, particularly* | *Email sent on 7 September 2020 by JEMS.*<br><br>*Thank you for your correspondence. We hereby acknowledge receipt thereof and take note of its contents. Do not hesitate to contact us should you have any questions or comments.* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
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| | | | *relating to claims that have been lodged but not yet gazetted such as:*<br>*1. Some claimants referred to properties they claim dispossession of rights in land against using historical property descriptions which may not match the current property description; and*<br>*2. Some claimants provided the geographic descriptions of the land they claim without mentioning the actual property description they claim dispossession of rights in land against.*<br><br>*The commission therefore does not accept any liability whatsoever if through the process of further investigation of claims it is found that there is in fact a land claim in respect of the above property.*<br><br>*If you are aware of any change in the description of the above property after 19 June 1913 kindly supply us with such description, to enable us to do further search.*<br><br>*Yours faithfully.*<br><br>*Mr. LJ Bogatsu*<br>*Chief Director* | | |
| | | *7 September 2020* | *Letter received from the Office of the Regional Land Claims Commissioner: North West, regarding a land claim enquiry – Portion 61 (Portion 32) of the Farm Elandsfontein 440JQ*<br><br>*We refer to your letter dated 19th of August 2020.*<br><br>*We confirm that there is an existing land claim against the property above, the land claim was lodged under Madibeng Local Municipality within Bojanala District and the claim has been found to be valid and it is settled in phases. This reflets on the database for land claims lodged by 31 December 1998, and those lodged between 1 July 2014 and 27 July 2016 in terms of the Restitution of Land Rights Amendment Act, 2014.*<br><br>*Whilst the Commission takes reasonable care to ensure the accuracy of the information it provides, there are various factors that are beyond the Commission's control, particularly relating to claims that have been lodged but not yet gazetted such as:*<br>*1. Some claimants referred to properties they claim dispossession of rights in land against using historical* | *Email sent on 7 September 2020 by JEMS.*<br><br>*Thank you for your correspondence. We hereby acknowledge receipt thereof and take note of its contents. Do not hesitate to contact us should you have any questions or comments.* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
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| | | | *property descriptions which may not match the current property description; and*<br>*2. Some claimants provided the geographic descriptions of the land they claim without mentioning the actual property description they claim dispossession of rights in land against.*<br><br>*The commission therefore does not accept any liability whatsoever if through the process of further investigation of claims it is found that there is in fact a land claim in respect of the above property.*<br><br>*If you are aware of any change in the description of the above property after 19 June 1913 kindly supply us with such description, to enable us to do further search.*<br><br>*Yours faithfully.*<br><br>*Mr. LJ Bogatsu*<br>*Chief Director* | | |
| | | *16 September 2020* | *Letter received from the Office of the Regional Land Claims Commissioner: North West, regarding a land claim enquiry – RE of Portion 32 of the Farm Elandsfontein 440JQ*<br><br>*We refer to your letter dated 1 September 2020.*<br><br>*We confirm that there is an existing land claim against the property above, the land claim was lodged under Madibeng Local Municipality within Bojanala District and the claim has been found to be valid and it is settled in phases. This reflects on the database for land claims lodged by 31 December 1998, and those lodged between 1 July 2014 and 27 July 2016 in terms of the Restitution of Land Rights Amendment Act, 2014.*<br><br>*Whilst the Commission takes reasonable care to ensure the accuracy of the information it provides, there are various factors that are beyond the Commission's control, particularly relating to claims that have been lodged but not yet gazetted such as:*<br>*1. Some claimants referred to properties they claim dispossession of rights in land against using historical property descriptions which may not match the current property description; and*<br>*2. Some claimants provided the geographic descriptions of the land they claim without mentioning the actual property description they claim dispossession of rights in land against.* | *Email sent on 17 September 2020 by JEMS.*<br><br>*Thank you for your correspondence, we hereby take note and acknowledge receipt thereof. JEMS has directed the letter to the applicant.*<br><br>*Please do not hesitate to contact us should you have any other comments or concerns.* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
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| | | | *The commission therefore does not accept any liability whatsoever if through the process of further investigation of claims it is found that there is in fact a land claim in respect of the above property.*<br><br>*If you are aware of any change in the description of the above property after 19 June 1913 kindly supply us with such description, to enable us to do further search.*<br><br>*Yours faithfully.*<br><br>*Mr. LJ Bogatsu*<br>*Chief Director* | | |
| ***Other Affected Parties*** | | | | | |
| *Agri North West* | *X* | | *No comments received* | *Notified via email* | ***Appendix 6*** |
| *Madibeng Business Support Centre* | *X* | | | *Notified via email and a hard copy of the DSR delivered for comments* | |
| *VTSD Forum* | *X* | | | *Notified via email* | |
| *Bushveld Vametco Alloys – Surrounding Mine* | *X* | *25 August 2020* | *Email received from Rudzani Mudau.*<br><br>*Please register me (Rudzani Mudau – Bushveld Vametco Alloys) as an I&AP.* | *Email sent on 25 August 2020 by JEMS.*<br><br>*Thank you for the correspondence, we hereby acknowledge receipt thereof. Please note that you and the organisation that you represent have been registered as Interested and Affected Parties. Do not hesitate to contact us should you have any other questions or queries.* | |
| ***Interested Parties*** | | | | | |
| *Culverwell Group of Companies* | *X* | | *No comments received* | *Notified via email* | |
| *De Wildt Helpmekaar Organisation* | *X* | *18 August 2020* | *Discussion with Suzette from the De Wildt Helpmekaar Organisation*<br>*Raised the following concern: farmers in the area are concerned about groundwater and the impact of mining on their groundwater. Groundwater is the only source of water and livelihood and farming activities are dependent on it.*<br>*Requested an electronic copy of the DSR.* | *Email sent 19 August 2020 by JEMS.*<br>*Thank you again yesterday for the discussion and information. Please see attached a copy of the Draft Scoping Report as requested.*<br>*Do not hesitate to contact us should you have any questions or concerns.* | ***Refer to the following:***<br>***Section10.9***<br>***Section 9.1.11***<br>***Section 9.1.10***<br>***Section9.1.2***<br><br>***Appendix 7.*** |
| *De Wildt Farmers* | *X* | *20 August 2020* | *Discussion held with Mr and Mrs Louw*<br>*Raised the following concerns:*<br>*Of the opinion that the mine is impacting on their groundwater quantity. Boreholes are drying up. Feel that the mine can* | *Response by JEMS*<br>*All the concerns are noted and will be directed to the mine for response. As part of the EIA Phase, a geohydrologist will investigate the possible impact of* | |

| Interested and Affected Parties | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
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| | | *provide the farmers directly south of the mine with additional water.*<br>*Request a copy of the Water Monitoring Report from Aquatico.*<br>*Believes there is no community involvement from the Mine.*<br>*Will object to the mine going forward.* | *the proposed project on the surrounding groundwater users.*<br>*Any complaints must please be directed to the mine Safety, Health, Environment and Quality (SHEQ) Manger and Specialist for them to investigate.* | |
| | *27 August 2020* | *Email received from Mr. Jakes Louw (owner of Plot 100 Zilkaatsnek, Farm Road No. 23)*<br>*"The right of access to sufficient water in s 27(2) should be understood to mean that the State is not obliged to provide water freely but is under an obligation to create mechanisms that enable people to have access to sufficient water. In the event of resource constraints, which limit the ability of the State to fulfil its obligations, the State is still obliged to provide a plan of action that demonstrates that the full realisation of the right shall be achieved over time. Furthermore, available resources should be utilised effectively, to give maximum results, with priority being given to assuring to everyone, the satisfaction of the most basic requirements as well as the provision of essential services, including access to sufficient water."*<br>*You are violating our constitutional rights.* | *Email sent on 27 August 2020 by JEMS.*<br>*Thank you for your correspondence. JEMS hereby acknowledges receipt thereof and takes note of your concerns.*<br>*JEMS will investigate and assess the concerns raised as part of the Impact Assessment Phase of the Environmental Impact Assessment.*<br>*Do not hesitate to contact us should you have any other comments or queries.* | ***Refer to the following:***<br>***Section10.9***<br>***Section 9.1.11***<br>***Section 9.1.10***<br>***Section9.1.2***<br><br>***Appendix 7.*** |
| | *20 August 2020* | *Discussion held with Mr and Mrs Kemp (Landowner to the south of the mine)*<br>*Raised the following concerns:*<br>*Impact of the mine on the groundwater is a major concern. Farmers are very dependent on the groundwater. One of the farmers needs to buy clean water every third day.*<br>*Noise associated with heavy mining machinery and blasting.*<br>*There is a University research team investigating the existence of a rare rodent and mole specie in the area.*<br>*Requested an electronic copy of the DSR.* | *Response by JEMS*<br>*All the concerns are noted and will be directed to the mine for response. As part of the EIA Phase, a geohydrologist will investigate the possible impact of the proposed project on the surrounding groundwater users. A biodiversity specialist has also been appointed to investigate the impact of the mine on fauna and flora species. The findings of the specialist studies will form part of the EIA phase of the application.*<br>*Any complaints must please be directed to the mine Safety, Health, Environment and Quality (SHEQ) Manger and Specialist for them to investigate.*<br><br>*Email sent 23 August 2020 by JEMS.*<br>*Thank you again for making time to see us on Thursday. Please see attached a copy of the Draft Scoping Report for your attention. Do not hesitate to contact us should you have any other questions or queries.* | ***Refer to the following:***<br>***Section10.9***<br>***Section 9.1.11***<br>***Section 9.1.10***<br>***Section9.1.2***<br><br>***Appendix 7.*** |
| | *19 August 2020* | *Discussion with Stephanie Vermeulen (Owner of Portion 15 of the Farm Zilkaatsnek)*<br>*Concerned about groundwater.* | *Response by JEMS*<br>*All the concerns are noted and will be directed to the mine for response. As part of the EIA Phase, a geohydrologist will investigate the possible impact of* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
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| | | | | *the proposed project on the surrounding groundwater users.*<br>*Any complaints must please be directed to the mine Safety, Health, Environment and Quality (SHEQ) Manger and Specialist for them to investigate.* | |
| | | *19 August 2020* | *<u>Discussion with Wannie Scribante (Farmer and landowner to the south of Eland Mine)</u>*<br>*Groundwater is a major concern for farmers in the area. Not able to meet his current farming requirements. Believes the mine should provide additional water to the farmers.*<br>*Impact of increased traffic on the roads.*<br>*Noise impact and blasting to surrounding farmers.* | *<u>Response by JEMS</u>*<br>*All the concerns are noted and will be directed to the mine for response. As part of the EIA Phase a geohydrologist will investigate the possible impact of the proposed project on the surrounding groundwater users. A noise impact assessment will also be undertaken to determine the potential impact on surrounding landowners. Mitigation measures for blasting impact will be addressed in the EIA phase.*<br>*Any complaints must please be directed to the mine Safety, Health, Environment and Quality (SHEQ) Manger and Specialist for them to investigate.* | ***Refer to the following:***<br>***Section10.9***<br>***Section 9.1.11***<br>***Section 9.1.10***<br>***Section9.1.2***<br><br>***Appendix 7.*** |
| | | *19 August 2020* | *<u>Discussion with Jaco Van Staden (Van Staden Boerdery)</u>*<br>*Groundwater is a problem. Boreholes are drying up and there is not a sustainable water solution for farming in the area.*<br>*Suggest the mine provide the farmers with water.*<br>*Noise impact of mining activities.* | *<u>Response by JEMS</u>*<br>*All the concerns are noted and will be directed to the mine for response. As part of the EIA Phase, a geohydrologist will investigate the possible impact of the proposed project on the surrounding groundwater users. A noise impact assessment will also be undertaken to determine the potential impact on surrounding landowners.*<br>*Any complaints must please be directed to the mine Safety, Health, Environment and Quality (SHEQ) Manger and Specialist for them to investigate.* | ***Refer to the following:***<br>***Section10.9***<br>***Section 9.1.11***<br>***Section 9.1.10***<br>***Section9.1.2***<br><br>***Appendix 7.*** |
| *Conservation Areas and NGOs (Anne Van Dyk Cheetah Centre)* | *X* | | *No comments received.* | *Notified via email and notice delivered per hand.* | |
| *Katemelo Projects* | *X* | *24 August 2020* | *<u>Email received from Katlego Diremelo.</u>*<br>*Good morning,*<br>*As an affected member of the community of Mmakau (Moumong), I would like for you to please send me the DSR to read and make comments if necessary, on the abovementioned subject.* | *<u>Email sent 24 August 2020 from JEMS.</u>*<br>*Good day,*<br>*Thank you for your correspondence, we hereby acknowledge receipt thereof. Please see attached the DSR as per your request.* | ***Refer to the following:***<br>***Section 9.1.2***<br><br>***Appendix 7*** |
| | | *9 September 2020* | *<u>Letter received from Katlego Diremelo.</u>*<br>*To whom this may concern,*<br>*I respond to the abovementioned as it was open to the public to make their views and comment on such.*<br>*It has come to my attention that we as SMMe's we are not given a fair chance by the mine in doing business and supplying them with services. It is with due attention that the mine does not recognise our efforts in the kind of proposals* | *<u>Email sent 9 September 2020 from JEMS.</u>*<br>*Thank you for the correspondence. We hereby acknowledge receipt thereof and its content is noted. We will revert your comments to the Applicant/ Eland Mine and will respond in due course. Do not hesitate to contact us should you have any further questions or queries.*<br>*Response by EAP:* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
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| | | | *we send them. We have always requested that the mine provide us with their SLP, but we always hit a dead end.*<br>*It would be best we get to know on how this will benefit all the locals and the contribution it will make in changing people's lives. I want to know on how the construction face will be faced out in linking local businesses with big businesses because we all know that we as locals get nothing from such.*<br>*Why is the mine not giving us recognition in matters of looking into find small companies around who are in mining because there is quite a few that does that? I as a local feel like there's not transparency as to how beneficial the mine is to us. We are always being side-lined when coming to big projects we are only considered when coming to supply your ball pens and pencils, etc. I mean how does that provide to the local economy?*<br>*It would be best the final draft would outline all the work that will be done and how it will be carried out. How much capacity will be needed for the work from the first phase till the phasing out? It would be best if it were stated on the possibilities of us locals mining or buying some of the ROM, LUMPIES AND THE CONCENTRATED FINAL as well as a percentage as to mining some of the ROM for our own and selling it, provided that we have small scale mining certificates. Even on the issues of logistics and transport because all we see is same companies, we are not given a chance to provide trucks and yellow machinery. A percentage as to how much must be stated also as to how much of machinery should come from close locally affected areas.*<br>*In conclusion we appreciate the notice and fully acknowledge it as it would give and provide to the locals, but we always know that it indirectly doesn't as you'd see the surrounding area like Mmakau and Moumong are not getting any developments from such things.*<br>*Kind Regards*<br>*Katlego Diremelo*<br>*Director* | *As part of the EIA, a specialist has been appointed to assess the socio-economic impacts of the Project, which will include information such as any additional jobs or opportunities for SMMEs and benefits for the local community arising from the Project. EP however does not sell its ROM or concentrate to third parties but sends it to the Northam Zondereinde Smelter for processing. EP hold the mining rights, and it would be unlawful for other parties to mine the reserves. It has submitted a proposed SLP for approval to the DMRE. The SLP also has several projects to uplift the local community.*<br>*Your correspondence has been sent to EP's Procurement Department for further consideration.* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
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| *Exigo Sustainability (Pty) Ltd* | *X* | *18 August 2020* | *Email received from Keitumetse Mthimunye.*<br>*I would like to register as an I&AP on the above-mentioned project. Please provide me with an electronic copy of the DSR in this regard.*<br>*My contact details are indicated below, and my email address is tumi@exigo3.com.* | *Email sent on 18 August 2020 by JEMS.*<br>*Good day Keitumetse,*<br>*Thank you for your message, and we hereby acknowledge receipt thereof. Please note you have been registered as an Interested and Affected Party and future correspondence will be shared with you. As requested, please see attached the DSR.* | ***Appendix 6*** |
| *Owner of Plot 30 Schietfontein* | *X* | *20 August 2020* | *Email received from Mr Hans Van Rensburg*<br>*Thank you very much for the email and notification as an affected party. Can you please email me a copy of the "DSR"?* | *Email sent on 23 August 2020 by JEMS.*<br>*Good day Mr. Van Rensburg,*<br>*Thank you for your correspondence, we hereby acknowledge receipt thereof. Please see attached a copy of the DSR for your attention. Do not hesitate to contact us should you have any other questions or queries.* | ***Appendix 6*** |
| *Bokamoso Landscape Architects and Environmental Consultants* | *X* | *3 September 2020* | *Email sent by Mary Lee Van Zyl (Bokamoso)*<br>*Please register Bokamoso as an Interested and Affected Party for the process/applications mentioned. Kindly provide us with a copy of the Draft Scoping Report and all other information available.* | *Email sent on 3 September 2020 by JEMS.*<br>*Thank you for your correspondence. We hereby acknowledge receipt thereof and take note of your request. Bokamoso is hereby registered as an Interested and Affected Party. Please find attached a copy of the DSR as per your request.* | ***Appendix 6*** |
| | | *18 September 2020* | *Letter received from Lizelle Gregory (Bokamoso):*<br>*The Public Participation (PP) Notice for the Environmental Authorisation and Waste management Licence, Including Consolidation of a Water Use Licence and the Environmental Management Programmes for Eland Platinum and Maroelabult mines, received via email from JEMS (Pty) Ltd on 19 September 2020, refer.*<br>*Bokamoso represent adjacent landowners in this matter, and we were instructed to register as I&AP on their behalf on 3 September 2020. Bokamoso Registered as Interested and Affected party on the same day and requested that JEMS (Pty) Ltd supply Bokamoso with a copy of the Draft Scoping Report that was made available as part of the I&AP Registration Notice.*<br>*Bokamoso received a copy of the Draft Scoping Report on 3 September 2020 but require more time to peruse the fairly complicated document, which proposes to integrate various existing and new application processes.*<br>*The applicable regulations require that an EAP make a Draft Scoping Report available for a period of 30 days and we are of the opinion that the invitation to register as I&AP within a* | *Response by JEMS on 19 September 2020*<br>*Good day Mrs. Gregory,*<br>*Thank you for your comments, we hereby acknowledge receipt thereof.*<br>*Please note that there is a misrepresented date in your comments, under paragraph one of your letter. The public notices were distributed via email on the 19th of August 2020 to I&APs, including the clients you represent (see attachment) and not 19 September 2020 as quoted in Bokamoso letter dated 18 September 2020.*<br>*30 days as per the EIA regulations were provided for the review of the Draft Scoping Report. Your client was provided with ample time and opportunity to review the Draft Scoping Report as indicated in the public notice. You are welcome to submit your comments on the Draft Scoping Report but note the comments will be considered as part of the EIA phase.* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
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| | | | *period of 30 days must be distributed separate from the notification of the availability of the DSR for review for a period of 30 days.*<br>*I&APs who only became aware of the application towards the end of the 30-day registration period will most definitely be prejudiced, because they will not have a fair opportunity (30 days) to supply comments regarding the DSR.*<br>*In this specific case, our client requested that we register as I&AP on their behalf and that we supply the required comments regarding the DSR, but the fee proposal for the Bokamoso inputs first had to be approved by the Directors.*<br>*The 30-day registration period would have been sufficient to formally appoint specialists/ Bokamoso to assist with the required inputs, but the JEMS notification process combined with the report review period made it impossible to compile and submit informed comments and recommendations within the short registration and comment timeframe of 30-days that was afforded, especially if one also considers the fact that the limited comment period overlapped with the stringent Covid-19 lockdown Regulations associated with lockdown Level 2.*<br>*In light of the above, Bokamoso is of the opinion that the DRS comment period can only commence on 20 September and that the due date for the comments will only be 30-days from 20 September 2020.*<br>*Also take note that the President recently announced that we will be entering Lockdown Level 1 from midnight Sunday 20 September 2020 and this will now allow for "an almost normal public participation process (including public meetings/ focus group meetings)" and it is therefore expected that the EAP communicate the remainder of the PP process, including proposed public engagements with the Registered I&APs. The timeframes for PP and the submission of the required documents, in line with the applicable legislation (including the special Covid-19 Directions as published) must also be supplied, to avoid any further confusion.*<br>*Even though we are of the opinion that the comment period only ends 30-days after 20 September 2020 (the I&AP Registration period), we are willing to supply the required comments on Monday 5 October 2020 (30 days after we received the registration notification).*<br>*Bokamoso will need some more detailed information regarding the different processes that will be integrated into one application and we will contact your office within the next 7 days regarding the additional information required.*<br>*Bokamoso will also supply more detailed information* | *The Final Scoping Report will be submitted in due course and a copy of the report will be available on request.* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
|---|---|---|---|---|---|
| | | | *regarding our client and our client's interests in the matter and such information can be used for the updating of the I&AP database to be included as part of the DSR.*<br>*Please do not hesitate to contact Lizelle Gregory or Dashentha Moodley if there are any queries regarding this comment submission notification letter.* | | |
| | | *22 September 2020* | *<u>Email received from Lizelle Gregory (Bokamoso)</u>*<br><br>*Dear Mr Barkhuizen*<br><br>*There was no intended misrepresentation in the notification letter that was submitted to you. There was simply a "date error" in the first "reference" paragraph, which actually only refers to the matter to be discussed in the letter. I apologise for the error in the first paragraph and confirm that the date should have been 19 August 2020. I regard your arrogant , unsympathetic and somewhat subjective approach as inappropriate and unnecessary, since it was only requested that you afford Bokamoso, who rightfully only Registered on 3 September 2020, a reasonable 30-day period from 3 September 2020 until 5 October 2020 to supply the required comments.*<br><br>*If you read the remainder of the Bokamoso letter and the notices distributed by yourself, you would have realised that the first paragraph incorporates a human error. You invited the public to register as I&APs on 19 August 2020 and you afforded them until 19 September 2020 to Register and to peruse the Draft Scoping Report and this parallel "time saving" action is regarded as highly irregular and potential I&APs are most definitely prejudiced by this. It appears that you also ignored the Special Covid-19 Directions for PP.*<br><br>*Bokamoso, our client and all other potential I&APs had the right to register as Interested and Affected Parties at any time during the 30 day registration period, even on the last day, which was 19 September 2020. The DSR which has been made available for comment on 19 August 2020 should have also been made available to all I&APs (also those who were still allowed to register on 19 September 2020) for a 30-day period. In the DSR that was made available, you could not even supply a complete list of the I&APs who requested to be registered in your process, because the report was compiled and completed before the I&APs were invited to register.* | *<u>Response by Sandra Core Legal Consulting on 29 September 2020</u>*<br><br>*Dear Lizelle,*<br><br>*We acknowledge receipt of your various emails, dated 22 September 2020. We forwarded your email to our Client last week and will request that their IT Department resolve the issue.*<br><br>*Northam and I request that you refrain from utilising insults when communicating with the EAP. It is unnecessary.*<br><br>*We are considering any new submissions made in your emails.*<br><br>*Kind Regards*<br><br>*Sandra Gore Legal Consulting* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
|---|---|---|---|---|---|
| | | | *We simply requested that you afford Bokamoso 30-days for comment (as prescribed in the applicable legislation), since the application processes that are integrated are complicated and we needed to conduct thorough investigations in order to raise issues and supply informed comments.*<br><br>*You ignored our questions regarding the special PP measures taken to allow for the Covid-Lockdown restrictions and you also refused to accept the Bokamoso comments to be submitted to you on 5 October 2020 as part of the DSR comments, 30 days after we received the DSR, which was prematurely made available for comment during the 30-day I&AP registration timeframe.*<br><br>*We hereby confirm that it was never our intention to enter into any disputes with you or the applicant. The intention was to provide you with informed comments regarding the application in an amicable manner that will enable you to address our client's issues of concern during the EIA process. You stated that you are not going to consider the comments to be supplied and the issues to be listed by Bokamoso on 5 October 2020 and that you are only willing to consider our comments during the EIA process.*<br><br>*We take not of your reckless and biased approach and confirm that we will be forwarding our comments to the National Department of Environmental Affairs and to the competent authority on 5 October 2020 and we are of the opinion that it would have only been advantageous to the process if you agreed to afford I&APs the required 30-days for comment.*<br><br>*The EIA Regulations makes it possible for I&APs to request that the EAP supply crucial information that could have an impacts on the outcome of an application. It is therefore requested that JEMS supply Bokamoso with a copy of the interested and affected data base, the dates on which the I&APs registered as I&APs and with a copy of the Final SR to be submitted to the competent authority for perusal. It is also required that JEMS supply details of all the PP followed up to date and the timeframes associated with such PP.*<br><br>*As stated in our submissions notification letter, we are now in Covid Lockdown level 1 and we requested more detailed information regarding the remainder of the PP process that will be followed, because the new Lockdown restrictions now allow* | | |

| Interested and Affected Parties | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
|---|---|---|---|---|
| | | *for public gatherings, meetings, site notices and the making available of hard copies of reports at certain points.*<br><br>*Kind regards,*<br><br>*Lizelle Gregory* | | |
| | *29 September 2020* | *<u>Email received from Lizelle Gregory (Bokamoso)</u>*<br><br>*Dear Sandra*<br><br>*Thank you for the feedback.*<br><br>*JEMS is supposed to act as independent consultant and refused to consider our comments regarding the DSR.*<br><br>*At this stage we are under the impression that the EAP is biased and that the I&APs are being prejudiced by the PP process being followed and the timeframes afforded for comment. We explained to JEMS that we only became aware of the project on 3 September 2020 and we undertook to supply the comments regarding the DSR on 5 October 2020. JEMS granted I&APs until 19 August 2020, the last day for registration, to supply comments regarding the DSR and we regard this as unfair and not in accordance with the applicable EIA process. JEMS simply refused to accept our comments and in addition JEMS failed to answer our questions of clarity regarding the integrated application.*<br><br>*As stated it was never the intention to enter into any disputes with the applicant. It was only requested that JEMS grant Bokamoso and our client a fair opportunity to understand the application and to supply comments regarding the DSR in order to ensure that all the issues to be addressed and considered during the EIA process are incorporated.*<br><br>*Kindly confirm the parties represented by yourself and your role as attorney/ legal advisor going forward in this fairly complicated integrated EIA process.*<br><br>*Kind regards,*<br><br>*Lizelle Gregory* | *<u>Letter submitted to Bokomoso by JEMS on 5 October 2020</u>*<br><br>*Dear Mrs Lizelle Gregory,*<br><br>*1. Reference is made to Bokamoso's letter dated 18 September, our response dated 19 September 2020 and subsequent emails dated 22 September 2020.*<br><br>*2. We note that the following is contended and / or requested in the above letter and emails:*<br><br>*a. the EIA Regulations 2014 prescribe that a 30 day period should be given to parties to register as an interested and affected party ("I&AP") and thereafter another 30 day period should be afforded to I&APs to comment on a draft scoping report; and that the notification to register as an I&AP should be separate from the notification to I&APs to comment on the I&AP;*<br>*b. the timeframes for public participation and the submission of the required documents, in line with the applicable legislation (including the special COVID Directions as published) must be supplied to avoid any further confusion; and*<br>*c. information on the public participation process followed to date.*<br><br>*3. Time periods for registration and comments to draft Scoping Report*<br>*a. JEMS Pty Ltd have set out our views in our email of 19 September 2010 that there has been compliance with the public participation requirements under the EIA Regulations, 2014, in particular the applicable timeframes. JEMS have responded to this contention and do not believe any further response is necessary, save to reiterate that we are not aware of any prescribed requirement in the EIA Regulations,* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
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| | | | | *2014 that I&APs must be given a prescribed 30 days to register; and that I&APs were afforded the correct period under the EIA Regulations, 2014 to comment on the draft Scoping Report.*<br>*b. As you are aware, the EIA Regulations, 2014 prescribe a limited time period for submission of a scoping report and it is not at an applicant's discretion to extend this period. The extension period Bokamoso requested is an additional two weeks after the date on which the Final Scoping Report was due to be submitted. If our client agreed to afford Bokamoso an extended period to submit their comments to the Draft Scoping Report and have these comments included in the Final Scoping Report, the competent authority (Department of Mineral Resources and Energy (DMRE)) would be entitled to reject the Final Scoping Report due to it being submitted outside of the prescribed time period, requiring our Client to submit the application anew.*<br>*c. There are limited circumstances in which the competent authority can agree to an extension period for submission of a scoping report under Regulation 3(7) of the EIA Regulations 2014 and it cannot be guaranteed, based on the submissions in Bokamoso's letter of 18 September 2020, that the DMRE would grant an extension period.*<br>*d. As indicated in our correspondence we encourage I&APs to send their comments and views on the EA Application and process. Stating the aforementioned all of Bokamoso's comments to the Draft Scoping Report will be submitted to the competent authority and be before it when it makes the decision whether to approve the Final Scoping Report. Should the competent authority believe that any issues Bokamoso and/or any I&AP may raise demonstrate that the Final Scoping Report is deficient in terms of the EIA Regulations, 2014 it would reject the Final Scoping Report and require the applicant to address the issues. Similarly, should it believe that an I&AP should have been afforded an extended period to comment on the draft Scoping Report, it could require our Client to address the comments Bokamoso or any other I&APs submitted* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
|---|---|---|---|---|---|
| | | | | *in the Final Scoping Report and resubmit the Final Scoping Report to it.*<br>*e. Provided comments will also be responded to by ourselves.*<br>*f. Given the above, we do not believe that any I&AP have and will be prejudiced.*<br><br>*4. Timeframes for the public participation and submission of the required documents*<br><br>*a. The timeframes for the remainder of the public participation will be in accordance with the applicable legislation, being the 2014 EIA Regulations.*<br><br>*b. The notification to I&APs regarding the availability of the Draft Scoping Report for comment contained the commenting period. We are therefore unclear how there could have been any confusion.*<br><br>*c. The Draft and Final Scoping Report, which were both made available to registered I&APs, contain details of the public participation process conducted to date and that proposed for the environmental impact assessment ("EIA") phase.*<br><br>*d. There are no longer any specific COVID directions applicable to public participation under the 2014 EIA Regulations and we are unclear what is being referred to in this regard.*<br><br>*e. We will continue holding focus group meetings and a public meeting will be arranged during the phases to follow. At such meetings, the required social distancing and Covid-19 prevention measures will be adhered to.*<br><br>*f. Should your Client wish to have a meeting with ourselves, please let us know.*<br><br>*5. Information on public participation process followed to date*<br><br>*a. In respect of your request to supply the Final Scoping Report and additional specific information in regard to the public participation process followed to* | |

| Interested and Affected Parties | | Date Comments Received | Issues raised | EAP's Response to the issues raised | Section Referenced |
|---|---|---|---|---|---|
| | | | | *date, the Final Scoping Report was made available to registered I&APs and the specific information requested is contained therein.*<br><br>*6. We look forward to hearing from you regarding a focus group meeting with our Client and ourselves.*<br><br>*Sincere regards*<br><br>*Stephan Barkhuizen* | |
| | | *8 February 2021* | *Email received from Dashentha Moodley (Bokamoso)*<br><br>*Good Day Stefan,*<br><br>*Compliments for 2021.*<br><br>*Kindly advise when the EIA will be available for review and comment for the Eland Mine Consolidation Application.*<br><br>*Kind regards,*<br><br>*Dashentha Moodley* | *Email sent by JEMS on 9 February 2021*<br><br>*Good day Me. Moodley,*<br><br>*Thank you and all the best for 2021.*<br><br>*We have recently received feedback from the DMRE on the Scoping Report and will let you know in due course on the availability of the Draft EIA.*<br><br>*Regards/Groete*<br><br>*Stephan Barkhuizen* | ***Appendix 6*** |
| *Spax Sammy* | *X* | *25 August 2020* | *Email received from Spax Sammy.*<br>*The mine is going to give us the privilege to meet new people and have jobs…I think it will give a lot of disadvantaged people including me a chance to work at the mine "one day". And it will uplift the economy as well….*<br>*Thank you for the opportunity to speak to the mines HR.* | *Email sent by JEMS on 25 August 2020*<br>*We hereby take not of your correspondence and appreciate your feedback.* | |

# 9. THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE CONSOLIDATED MR AREA

This section describes the existing status of the environment that may be affected by the EP Proposed Projects.

The following information has been extrapolated from previous EMPR(s) and recent EIAR and Specialist Studies submitted on behalf of EP and Barplats 2019 (Elemental Sustainability, 2019 and CHEMC, 2019), and recently updated Specialist Studies, commissioned by EP as part of the Integrated DMRE Environmental Application. This section's purpose is to provide a baseline description for the Consolidated MR Area and surrounds and the findings of the specialist. The sources used include and is not limited to the following:

- Recently updated Specialist studies, namely:
  - Update of the Water Balance;
  - Update of the Groundwater Impact Assessment;
  - Update of the Stormwater Management Plan;
  - Update of the Air Quality Impact Assessment;
  - Terrestrial Biodiversity Assessment;
  - Freshwater Assessment;
  - Update of the Heritage Impact Assessment;
  - Noise Impact Assessment;
  - Waste Classification Assessment; and
  - Update of the Socio-Economic Assessment.
- Available information from the EM / MM Environmental Licences, particularly recently submitted EIARs;
- Specialist reports conducted in and around the Project Area for previous applications lodged;
- South African Weather Service ("**SAWS**");
- South African National Biodiversity Institute ("**SANBI**");
- Statistics South Africa;
- MLM IDP;
- Existing information on the environmental parameters of the Consolidated MR Area and surrounds; and
- Stakeholder and I&AP comments received (from previous EA Applications and processes).

## 9.1 Baseline Environment

Type of environment affected by the proposed activity.
(Its current geographical, physical, biological, socio- economic and cultural character).

### 9.1.1 Regional Setting

The EP Proposed Projects will be taking place within the Project Area, which is part of the Consolidated MR Area. It falls within the MLM and is situated to the eastern part of BPDM (NWP). The town of Brits is located 10 km east of the EM and Tshwane Metropolitan (Pretoria) 60 km west.

Neighbouring communities in proximity to the Consolidated MR Area include Damonsville, Mothotlung, Moumong, De Wilt and Mmakau.

The Project Area is surrounded by the N4 Bakwena highway to the south and the R566 Brits-Rosslyn Provincial Road to the north. The Consolidated MR Area is located within Ward 21 of the MLM, and the nearby towns and residential areas are given in ***Table 14*** (line-of-sight distances). The Consolidated MR Area forms part of the platinum mining region, established along the Brits-Rustenburg N4 Bakwena highway, which includes several mining complexes (i.e., Hernic Ferrochrome, Sibanye Platinum, Crocodile River Mines, etc.)

**Table 14: Line of sight distances to nearest towns from the Consolidated MR Area border**

| Town | Distance Km | Direction |
|---|---|---|
| Damonsville | 1 Km | North of the Consolidated MR Area |
| Moumong | 1.2 Km | North-east of the Consolidated MR Area |
| Mothotlung | 2 Km | North of the Consolidated MR Area |
| Tshwara | 2.1 Km | North-east of the Consolidated MR Area |
| Ramolapong | 2.4 Km | North-east of the Consolidated MR Area |
| Mmakau | 3.0 Km | North of the Consolidated MR Area |
| De Wilt | 3.7 Km | East of the Consolidated MR Area |
| Ga-Kwate | 3.7 Km | North-east of the Consolidated MR Area |
| Brits | 10 Km | West of the Consolidated MR Area |
| Pretoria | 60 Km | East of the Consolidated MR Area |

#### *9.1.1.1 Impact of the EP Project on the Regional Setting*

The EP Proposed Projects will be undertaken within the boundaries of existing disturbed and established mines (i.e., EM and MM). Both EM and MM have established infrastructure and a mining footprint that to a large extent forms part of the Regional Setting.

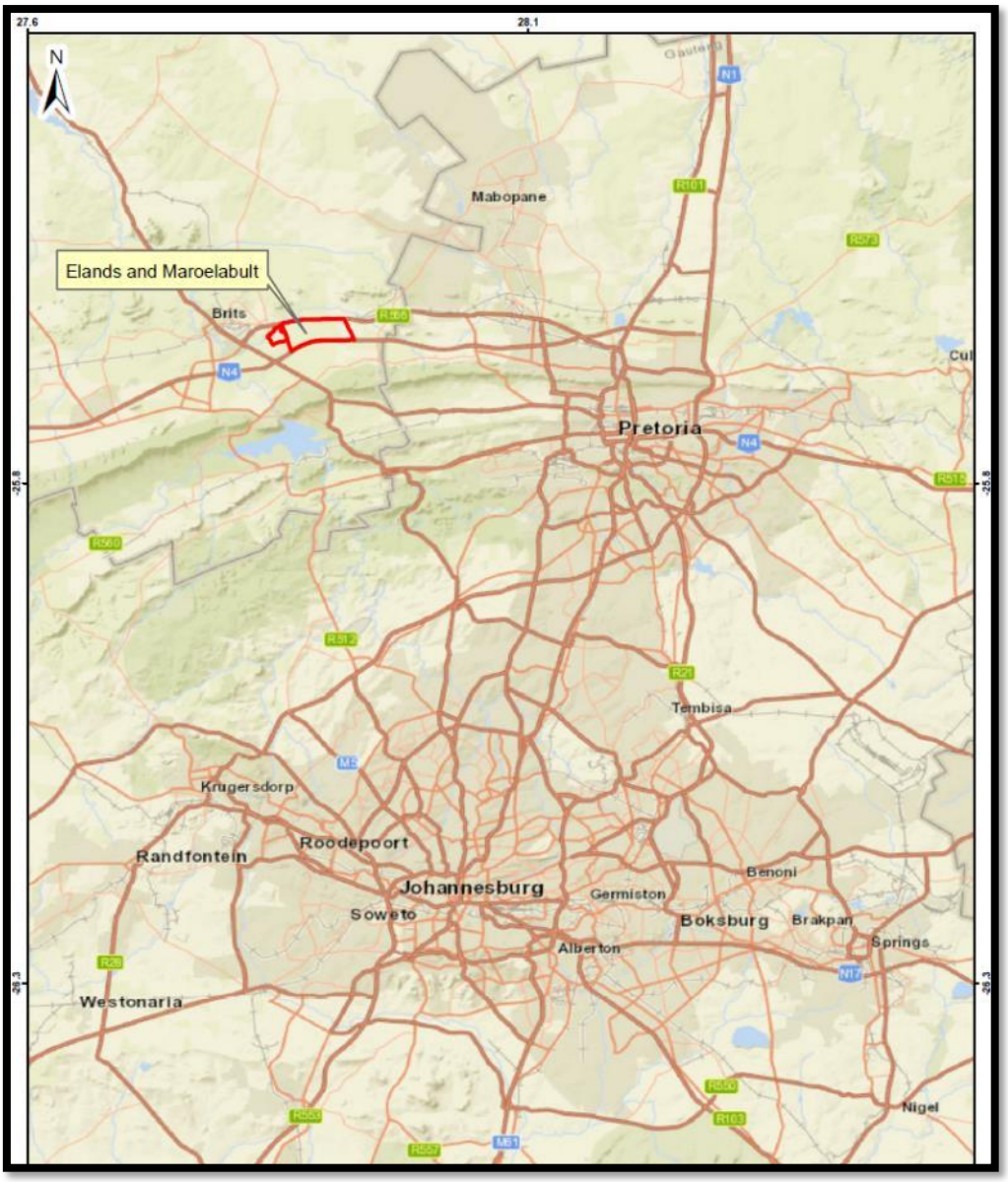


**Figure 12: Regional Setting of the Consolidated MR Surface Area (Highlands Hydrology, 2021).**

### 9.1.2 Socio- Economic Environment

***Refer to Appendix 8 for the Socio-Economic Impact Assessment (SEIA) conducted by Social Enterprise Solutions (SES) in 2020.***

#### *9.1.2.1 North West Province*

The Consolidated MR Area is within the NWP, which is bordered by the Northern Cape, Free State, Gauteng, and Limpopo Provinces, as well as Botswana. Comprising a total land area of 118 797 km², the NWP is the third smallest province in South Africa. It is predominately a rural province, and only 35% of its 4 108 816 inhabitants live in urban areas. (www.nwpg.gov.za).

The economy is dominated by mining, which generates more than half of the province's Gross Domestic Product ("**GDP**"). The Rustenburg and Brits districts produce 94% of South Africa's platinum, which is more than any other single area in the world. The NWP also produces a quarter of South Africa's gold, as well as granite, marble, fluorspar and diamonds. Mining in the NWP therefore provides jobs for a quarter of the province's workforce and contributes approximately 23% towards the South African mining industry (www.nwpg.gov.za).

The eastern and southern parts of NWP are crop-growing regions where maize, sunflowers, tobacco, cotton, and citrus fruits are produced. The northern and western parts of NWP have many sheep farms, cattle and game ranches.

#### *9.1.2.2 Bojanala Platinum District Municipality*

The Consolidated MR Area is within the BPDM of the NWP. The district includes five Local Municipalities: Rustenburg (Marikana, Mooinooi, Phatsima and Tlhabane), Madibeng (Brits and Hartebeespoort), Moses Kotane (Mogwase and Madikwe), Kgetlengrivier (Derby, Koster and Swartruggens) and Moretele.

BPDM has a total population of 1 670 000 inhabitants, comprising 44% of the population of the NWP (BPDM, IDP, 2020/21). Its population comprises 52% males and 48% females, which is typical of districts with labour intensive industries, such as mining, and is projected to grow at an average annual rate of 1.5% from 1.67 million in 2016 to 1.8 million in 2021. (BPDM, IDP, 2020/21).

The 2016 employment statistics for BPDM show that 54% of the population, comprising 894,102 people, are employed and in 2016 the BPDM contributed 52% to the GDP of the NWP, amounting to R137bn (up from R 51.9 billion in 2006). The major sector contributions to the BPDM's GDP are mining 51.2%, financial 10.5%, trade 9.6%, tourism 5.6% and manufacturing 5.5%. BPDM is rich in mineral deposits; half of the RSA's chromite production comes it; and the area is the world's largest platinum producer. The MLM contributes the most to the GDP of the BPDM, with a total of R 46.5 billion or 37.41%. (BPDM, IDP, 2020/21).

#### *9.1.2.3 Madibeng Local Municipality*

The Consolidated MR Area is located within the MLM in the NWP. MLM is one of the five Local Municipalities in the BPDM. The MLM covers a total land area of 3 839 $km^2$. It includes three towns (Brits, Hartbeespoort, and Mooinooi), rural areas, villages, farm portions and an established industrial area in Brits, which is MLM's main economic centre (MLM, IDP, 2017/21).

The MLM has 41 Wards and is governed by a Council, comprising eighty-one council members. Forty-one council members are allocated to Ward Councillors, elected by the Wards they represent, and the remaining forty seats are awarded to political parties in proportion to the number of votes received. (MLM, IDP, 2017/21).

***a) Demographics***

According to WEBHIS data (2020), the total population of the MLM is 574 491 inhabitants, comprising 229 672 households with an average household size of 4 people per household. Men account for 53%

of the population and females 47% (Community Survey, 2016). Children under the age of 14 account for 26% of the population; and 69% of the population are between the ages of 15 and 65 (Community Survey, 2016). This is higher than the BPDM, where 65% of the population are aged between 15 and 65 (BPDM, IDP, 2020/21). The racial composition of the MLM population comprises 92.23% Black Africans; 6.92% White; 0.54% Coloured; and Indian/Asian 0.3%. (MLM, IDP, 2017/21).

Some 55% of the MLM population speak Setswana. This is followed by Xitsonga, which is spoken by 9% of the population, Sepedi 7%, and Afrikaans 6%. Other languages spoken include Sesotho and Isizulu. (Community Survey, 2016).

***b) Education***

The education statistics for the MLM show that 4.3% of the population aged 20 or more have no schooling. While the literacy rate for the area is 89%, 15% of the population aged 20 or more have completed Grade 12; 37.9% have completed some primary schooling; and 33.9% have completed some secondary schooling (Community Survey, 2016). In 2016 2% of the MLM population had completed higher education, and 94% of children between the ages of 5 and 17 years were in school. (Community Survey, 2016).

***c) Basic Services***

The HIV/AIDS prevalence in the MLM is 45.5%, which is significantly higher than the NWP prevalence rate of 26.7% (MLM, IDP, 2017/21). Men and women between the ages of 26 and 35 seem to have higher infection rates than other age groups in the MLM population infection. The MLM has 28 registered NGOs rendering HIV/AIDS related programmes, including voluntary testing, counselling, and treatment services. (MLM, IDP, 2017/21)

According to the MLM IDP (2017/21), 15% of households do not have access to basic water supply. Of the 78% of households that have access to municipal water services (either bulk, full, intermediate, informal intermediate, or basic supply), 22.2% of these households have piped water inside their formal dwellings. Only 49% of households have access to basic sanitation (including flushing toilets, ventilated pit latrines, pit latrines or septic tanks) (MLM, IDP, 2017/21); and of these households 27.2% have a flush toilet.

Water resources in the MLM include the Crocodile River, Hartbeespoort Dam, Rooikoppies Dam and Klipvoor Dam. Three main wastewater treatment plants in the MLM are situated in Brits, Mooinooi, and Hartbeespoort. Due to increasing demand, the bulk water infrastructure's capacity (including WTPs) is insufficient to cater for the demand. As a result, the MLM has established or re-commissioned boreholes to augment the bulk water supply.

From available information, it is estimated that 81% of MLM households in urban areas have access to electricity for lighting. In the rural areas of MLM, it is estimated that only 30% of households make use of electricity for lighting. The use of other forms of lighting except electricity is predominant in informal dwellings. (MLM, IDP, 2017/21)

Only 25.7% of the population have access to weekly refuse removal and waste removal in the MLM is a serious challenge. (MLM, IDP, 2017/21). The Hartbeespoort Regional Landfill Site, which is located

between the towns of Brits and Hartbeespoort, is the only licensed and operational landfill site in the MLM.

### *d) Housing*

In the MLM 59.2% of the population reside in formal dwellings and 54.1% of these formal dwellings are either privately owned or paid off. (MLM, IDP, 2017/21). MLM has more than 34 informal settlements, which have about 48 212 households (excluding backyard dwellers). Almost 30% of the MLM population reside in informal settlements and, according to the MLM IDP (2017/21), the high number of informal settlements is a result of immigration due to mining in the area and farm evictions.

### *e) Economy*

The MLM economy is primarily dependent on mining, agriculture, tourism, and industrial manufacturing. The mining sector in MLM contributes considerably to job creation in the local economy and mainly comprises PGM, chromium and intensive granite and sand mining. (MLM, IDP, 2017/21). In 2016 agriculture accounted for 17.7% of the GDP, manufacturing 13.3%, and tourism 11%. (MLM, IDP, 2017/21). According to the MLM IDP (2017/21), MLM's economy is projected to grow at an average annual rate of 2%.

The MLM has three major tourism attractions, including the Hartbeespoort Dam; Cradle of Humankind, which is a proclaimed World Heritage Site, and Magaliesberg Mountain Range. The MLM area is well known for privately owned game farms, holiday accommodation and camping sites. It also hosts the following four RCI Resorts; Magaliespark, Mount Amanzi, Seasons Spa and Dikhololo. (MLM, IDP, 2017/21)

### *f) Employment*

MLM's employment statistics indicate that 45% of the working population are employed, 20% are unemployed, 4% are discouraged work seekers, and 31% are economically not active (Community Survey, 2016). According to the MLM IDP (2017/21), 23.3% of the population are poverty stricken, with no monthly income; 27.3% of the population earn up to R800 monthly; 43.3% between R800 and R6 500; and 6.3% earn more than R6 500.

Female headed households account for 30.3% of the MLM population. (MLM, IDP, 2017/21). Support provided to indigent households includes free basic services, social grants and job creation through the Expanded Public Works Programme.

### *g) Municipal priorities*

The MLM IDP (2017/21) identifies the following service delivery priorities:

- Water and sanitation;
- Roads and storm water;
- Electricity;
- Social services;
- Land and housing; and
- Local economic development.

In addition, the MLM identifies the following development challenges facing it (SES, 2021):

- Water crisis in the MLM;
- Illegal connection in relation to water and electricity;
- Lack of resources and budget constraints;
- Lack of available land for residential purposes; and
- High level grant dependency.

### h) Local Socio-Economic Baseline Description

The communities in proximity to the Consolidated MR Area (which includes the Project Area) are (SES, 2021):

- Damonsville, is multi-cultural urban suburb, located 7 km east of Brits and 1 km north of EM;
- Mothotlung, is a well-established peri-urban settlement, 12 km east of Brits and 2 km north of EM;
- Mmakau, a semi-rural settlement falling under the Mmakau Tribal Office, is located 16 km east of Brits and 3 km north of EM; and
- Oukasie, is a well-established township, situated adjacent to the town of Brits, and 12 km from EM. Founded in 1931 Oukasie is one of the oldest Black townships in South Africa. In recent years it has become home to several African immigrants and is characterised by 13 sprawling informal settlements.

Communities in the Consolidated MR Area are located within 12 km from EM and form part of the labour sender areas detailed in EM's SLP.

#### *i) Communities in proximity to the Consolidated MR Area*

Population figures for communities in proximity to the Consolidated MR Area ("**Local Communities**") were gathered in key informant interviews with clinic staff at Oukasie and Mmakau Clinics and verified using WEBHIS data, provided by Brits District Hospital (SES, 2020). ***Table 15*** provides an overview of the population figures for these communities. Oukasie is the largest community, as it accounts for 32% of the population of the Local Communities; this is closely followed by Mothotlung, which accounts for 31%

**Table 15: Population figures for communities in proximity to the Consolidated MR Area**

| Community | Population | Estimate Households |
|---|---|---|
| Oukasie | 35 338 | 8 835 |
| Damonsville | 15 403 | 3 851 |
| Mothotlung | 34 289 | 8 572 |
| Mmakau | 24 539 | 6 135 |
| **Total** | **109 569** | **27 392** |

(Source: SES, 2020)

### *j) Project Area Demography*

As in the BPDM and MLM, the Local Communities comprise more males than females, refer to ***Table 16***. This is likely due to more male than female job seekers moving to the area in search of employment opportunities.

**Table 16: Age distribution of communities in the Project Area**

| Age | Oukasie | Mothotlung *(including Damonsville)* | Mmakau | Project Area |
|---|---|---|---|---|
| 0 - 14 years | 28.5% | 25.4% | 26.2% | 26.7% |
| 15 – 64 years | 69.2% | 69.3% | 68.4% | 68.9% |
| Elderly (+65) | 2.3% | 5.3% | 5.4% | 4.3% |

(Source: Community Survey, 2016)

Although Tswana is the dominant ethnic group within the Local Communities, this does vary across the different communities. Refer to ***Table 17***. Tswana (59%) is the dominant ethnic group, followed by Pedi (10%), Tsonga (9%), and Zulu (4%). Few households speak Afrikaans or English within the Local Communities and the dominant languages include Setswana, Xitsonga, and Sepedi.

**Table 17: Local Communities Languages**

| Language | Oukasie | Mothotlung *(including Damonsville)* | Mmakau | Project Area |
|---|---|---|---|---|
| Afrikaans | 2.5% | 0.8% | 0.5% | 1.27% |
| English | 2.1% | 2.4% | 2.4% | 2.30% |
| IsiNdebele | 2.4% | 1.7% | 1.9% | 2.00% |
| IsiXhosa | 1.9% | 1.5% | 1.0% | 1.47% |
| IsiZulu | 4.3% | 3.4% | 3.1% | 3.60% |
| Sepedi | 16.7% | 6.1% | 8.2% | 10.33% |
| Sesotho | 2.6% | 2.5% | 2.1% | 2.40% |
| Setswana | 39.9% | 73.7% | 63.0% | 58.87% |
| Sign Language | 0% | 0.5% | 0% | 0.17% |
| SiSwati | 1.2% | 0.9% | 0.7% | 0.93% |
| Tshivenda | 4.1% | 0.8% | 2.2% | 2.37% |
| Xitsonga | 14.9% | 4.3% | 7.8% | 9.00% |
| Other | 7.2% | 1.3% | 6.9% | 5.13% |

(Source: Community Survey, 2016)

### *k) Basic Services*

The MLM is tasked with providing water, sanitation, transportation facilities, electricity, primary health services, education, housing and security to the Local Communities. During the socio-economic study, several social facilities were identified and are detailed in ***Table 18***.

Overall, the statistics on access to social services detailed in the MLM IDP (2017/21) present a strikingly different reality to what is experienced by households in the Local Communities. Like many municipalities struggling with service delivery in South Africa, the quality and efficient delivery of basic services the Local Communities remains a huge challenge for the MLM. Although most households have access to electricity, water and sanitation, high levels of unemployment lead to non-payment of municipal services.

Service delivery is not only a challenge experienced at a household level. Schools and healthcare facilities in the area regularly experience water shortages and power outages for extended periods that further exacerbate the MLM's ability to provide basic services to the Local Communities.

**Table 18: Social and commercial services in the Project Area**

| Social Service | Oukasie | Damonsville | Mothotlung | Mmakau |
|---|---|---|---|---|
| **Education** | | | | |
| Primary school | 4 | 0 | 3 | 5 |
| Secondary School | 1 | 0 | 2 | 1 |
| Combined school | 0 | 1 | 0 | 0 |
| Crèche/play school | Many | 2 | Many | Many |
| Library | 1 | 1 | 1 | 0 |
| **Refuse removal** | | | | |
| Landfill site | 0 | 0 | 0 | 0 |
| Churches | | | | |
| Church (estimate) | 9 | 6 | 10 | 6 |
| **Social grants** | | | | |
| SASSA pay-out point | 1 | 0 | 1 | 1 |
| ATM | 1 | 0 | 1 | 2 |
| Post office | 0 | 0 | 1 | 1 |
| **Commercial** | | | | |
| Spaza shops | Many | 5 | Many | Many |
| Liquor store | Many | 0 | Many | Many |
| Taverns | Many | 5 | Many | Many |
| Supermarket | Many | 1 | 5 | 5 |
| Petrol station | 1 | 0 | 1 | 1 |
| **Community organisations** | | | | |
| Homebased care | 21 | Unknown | 5 | 3 |
| Farmers Association | 0 | 0 | 0 | 1 |
| **Recreational** | | | | |
| Community Hall | 1 | 1 | 1 | 1 |
| Recreational park | 1 | 1 | 4 | 1 |
| Sports field | 2 | 1 | 1 | 1 |
| **Security** | | | | |
| Police station | 0 | 0 | 1 | 1 |
| Municipal offices | 1 | 0 | 0 | 0 |
| Magistrates court | 0 | 0 | 0 | 0 |
| **Health** | | | | |
| Clinic | 1 | 1 | 1 | 1 |
| Hospital | 0 | 0 | 0 | 0 |
| Cemetery | 1 | 1 | 1 | 1 |

(Source: SES, 2020)

### *I) Education facilities*

The MLM area has 12 primary schools, 4 secondary schools, and 1 combined school located. Education statistics for the area show that at least 20% of the population is illiterate and, of the Local Communities, Oukasie has the most uneducated population (13.6%). 2.9% of Mothotlung' s population have received no schooling (SES, 2020). Refer to ***Table 19***.

**Table 19: Education statistics for the Local Communities in relation to the Consolidated MR Area**

| Education | Oukasie | Mothotlung *(including Damonsville)* | Mmakau | Project Area |
|---|---|---|---|---|
| No schooling | 13.6% | 2.9% | 6.1% | 7.53% |
| Some primary | 13.3% | 9.6% | 15.0% | 12.63% |
| Completed primary | 5.8% | 4.1% | 6.0% | 5.30% |

| | | | | |
|---|---|---|---|---|
| Some secondary | 41.2% | 34.5% | 43.0% | 39.57% |
| Completed Matric | 24.2% | 36.2% | 25.9% | 28.77% |
| Higher education | 2% | 12.7% | 4.0% | 6.23% |

(Source: Community Survey, 2016)

***m) Housing***

The Local Communities have a variety of housing types and structures. Some housing types include large freestanding houses, comprising three or four bedrooms; others include RDP houses and shanties, erected from corrugated iron. Informal settlements are evident, particularly in Oukasie and in the areas between Damonsville and Mothotlung, where a few hundred shanties have been erected.

17.40% of the Local Communities own motorcars, 15.7% satellite television, and 13.70% computers (SES, 2020).

***n) Development Challenges***

Ward Councillors in MLM identified the following key development challenges (SES, 2020):

- High levels of unemployment;
- Immigration and the development of informal settlements;
- Poor support to agriculture development projects;
- Poor service delivery (i.e., roads, water and sanitation);
- Few SMME opportunities;
- Few skills development and training opportunities; and
- High prevalence of HIV and AIDS.

Although the Ward Councillors understand that the Local Government is responsible for service delivery and infrastructure development, they also feel that local businesses, and EP in particular, has a role to play in improving the lives of the Local Communities.

#### *9.1.2.4 Impact of the EP Project on the Socio-Economic Environment*

Socio-economic impacts were identified through two processes; stakeholder engagement and a socio-economic baseline study, which included key informant interviews with project stakeholders, and community leaders (SES, 2020). The SEIA details the socio-economic environment of the Local Communities. It outlines the concerns raised by the Communities' members and presents the identified socio-economic impacts and mitigation measures associated with the EM Consolidation Project. The impacts noted and rated and mitigation measures provided in the SEIA were as follows:

- *Economic Impacts*
  - Job creation and increased employment opportunities;
  - Local procurement opportunities for SMMEs;
  - Improved skills development and training;
  - Tensions over limited employment opportunities and procurement contracts;

- Contribution to Government revenue and the MLM's fiscals;

- *Social Impacts*
  - Community development through SLP commitments;
  - Improved housing security for local employees;
  - Influx of job seekers into the area;
- *Health and Safety Impacts*
  - Reduced groundwater supply and quality
  - Increased social pathologies (i.e., prostitution, teenage pregnancies, domestic violence, crime, alcohol and substance abuse);
  - Increased communicable diseases;
  - Visual, noise and air quality impacts; and
  - Increased traffic and road accidents.

Overall, none of the potential socio-economic impacts identified during the SEIA warrant the EM Consolidation Project not proceeding. There is no reason, based on the assessment of the socio-economic impacts, why the Project should not proceed. This would require EP implementing the mitigation and management measures recommended in the SEIA, alongside the following management plans:

- Cultural Heritage Management Plan;
- Integrated Waste and Water Management Plan;
- Air Quality Management Plan;
- Stakeholder Engagement Plan and Grievance Procedure;
- Human Resources Policies and Procedures;
- SLP;
- Transport Management Plan; and
- Mine Closure Plan.

### 9.1.3 Climate

The Consolidated MR Area falls within the Highveld Climatic Zone, as defined by Schulze (1974). The average climate for the Consolidated MR Area is presented in ***Figure 13***, using the outcome of investigation into rainfall and evaporation for the Area. While evaporation is showing as greatly exceeding rainfall, this is representative of the maximum A-Pan equivalent potential evapotranspiration that could occur, assuming no limitations are placed on evaporative demand. The combination of rainfall, evaporation and temperature results in a hot semi-arid climate, according to the Köppen climate classification. Detailed features of this climatic zone are outlined below (CHEMC, 2019):

- Temperatures in this climatic zone are generally mild, but low minima can be experienced in winter due to clear night skies. Average annual precipitation ranges from 650 mm (west) to 900 mm (east);
- Rain generally occurs in summer from October to March;

- 85% of the mean annual precipitation ("**MAP**") falls during summer thunderstorms. The thunderstorms generally occur every 3 to 4 days in summer and are of short duration and high intensity, accompanied by strong gusty south westerly winds;
- Hail frequency is high, tending to occur 4 to 7 times per season;
- Average of 75 storms occurs per year;
- Summer average daily temperatures range from 17 to 27°C, with maxima of 38°C. In winter average daily temperatures range from 0 to 13°C;
- Frosts may occur from May to September for about 120 days; and
- Light north-easterly and south-westerly winds prevail. However, strong gusty south-westerly winds often accompany thunderstorms.

Various weather stations managed by both the SAWS and the DHSWS are located close to EM. The SAWS stations and DHSWS stations (A2E001) are located approximately 5km and 7.5km from the Consolidated MR Area, respectively. The DHSWS station has a rainfall record length of 91 years (1926 - 2017).

Lynch (2004) was also used as a source of rainfall data for the Consolidated MR Area and is the source of the MAP data. A comparison of DHSWS station A2E001 and Lynch (2004) average monthly rainfall is presented in ***Table 20***. MAP for DHSWS station A2E001 is 686mm. MAP from Lynch (2004) indicates a MAP at the centre of the EM's TSF of 552mm.

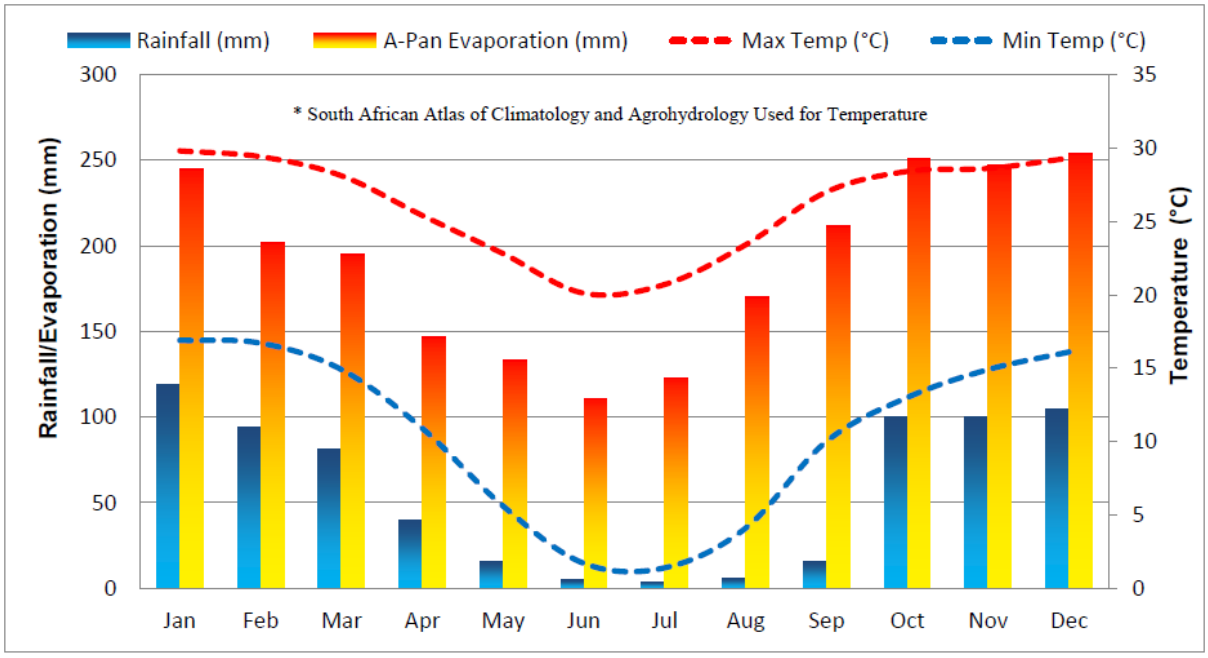


**Figure 13: Average Monthly Climate for Consolidated MR Area (Highlands Hydrology, 2018).**

**Table 20: Average Monthly Rainfall Distribution (Highlands Hydrology, 2018).**

| Rainfall (mm) | | |
|---|---|---|
| **Month** | **A2E001** | **Lynch (2004)** |
| **Jan** | 126 | 119 |
| **Feb** | 94 | 94 |
| **Mar** | 86 | 81 |
| **Apr** | 45 | 40 |
| **May** | 19 | 16 |
| **Jun** | 8 | 5 |
| **Jul** | 5 | 4 |
| **Aug** | 6 | 6 |
| **Sep** | 15 | 16 |
| **Oct** | 60 | 100 |
| **Nov** | 108 | 100 |
| **Dec** | 114 | 105 |
| **Total** | 686 | 637 |

### 9.1.4 Wind Direction and Speed

The wind rose plot for the Consolidated MR Area was generated for the period January 2017 to December 2019, Refer to ***Figure 14***. The predominant wind directions for the period observed is from the east-north-east (~17% of the time) and east (~11% of the time), with smaller south-easterly, east-south-easterly and north-easterly components. Wind speeds for the three-year period were generally moderate to fast with calm condition (defined as wind speeds less than 1 m/s, observed for 10.5% of the time). The morning (AM) and evening (PM) period wind rose plots for the period January 2017 to December 2019 are given in ***Figure 14*** and shows diurnal variation in the wind field data, ***Refer to Figure 15***. During the morning (AM) period, high frequency winds are observed from the east-north-east; as opposed to the evening (PM) period, where there is greater variation in the wind direction.

Seasonal variation in winds at Consolidated MR Area is shown in ***Figure 16*** below. There is slight variation in the wind field over the different seasons. During the warmer summer and spring seasons, prevailing east-north-easterly and north-easterly winds are observed. In autumn, stronger easterly and south-easterly winds occur. During winter, easterly winds continue to be observed, with prevailing winds originating from the south-easterly directions.

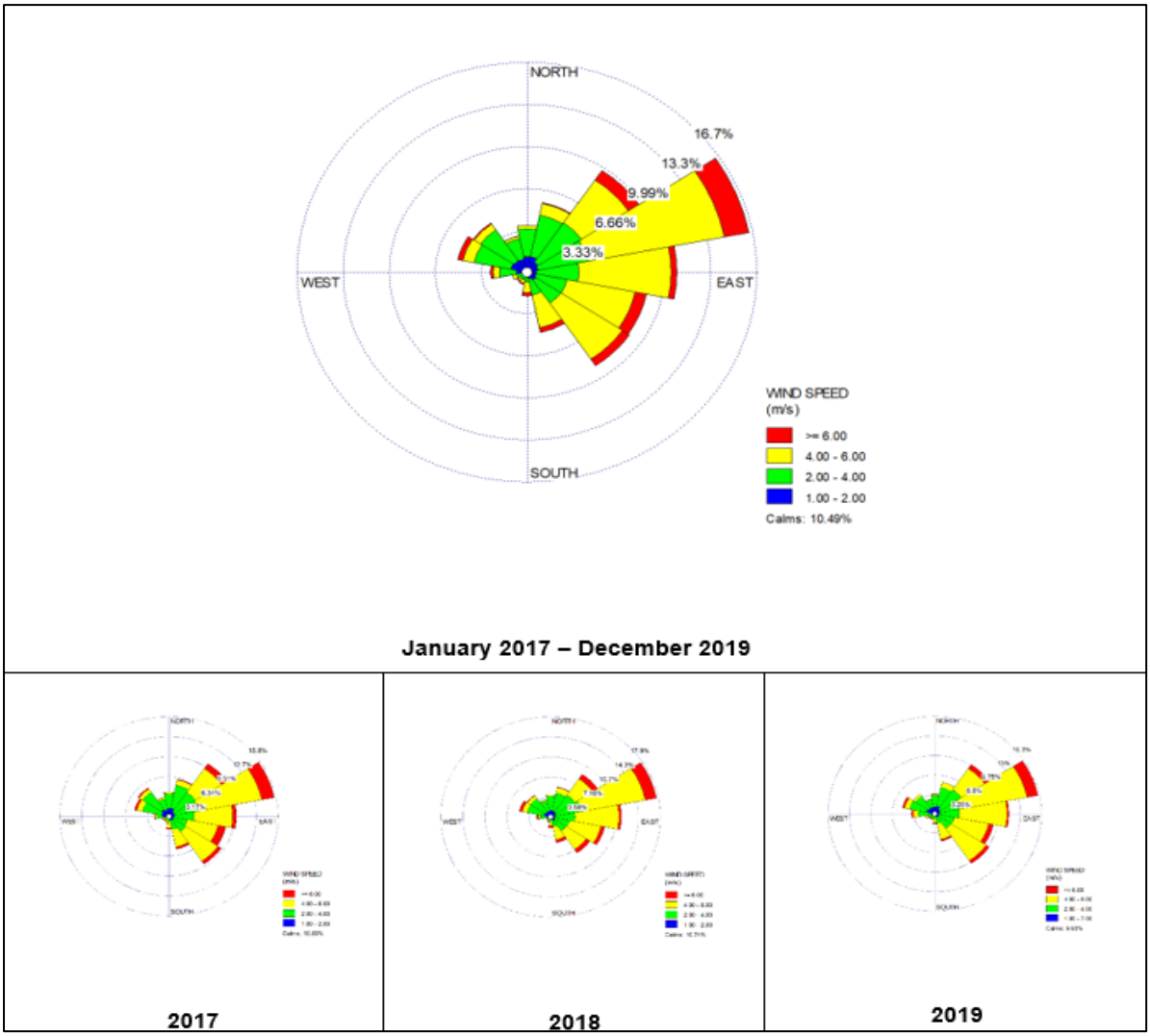


**Figure 14: Period Wind Rose Plots for January 2017 - December 2019 (Rayten, 2021).**

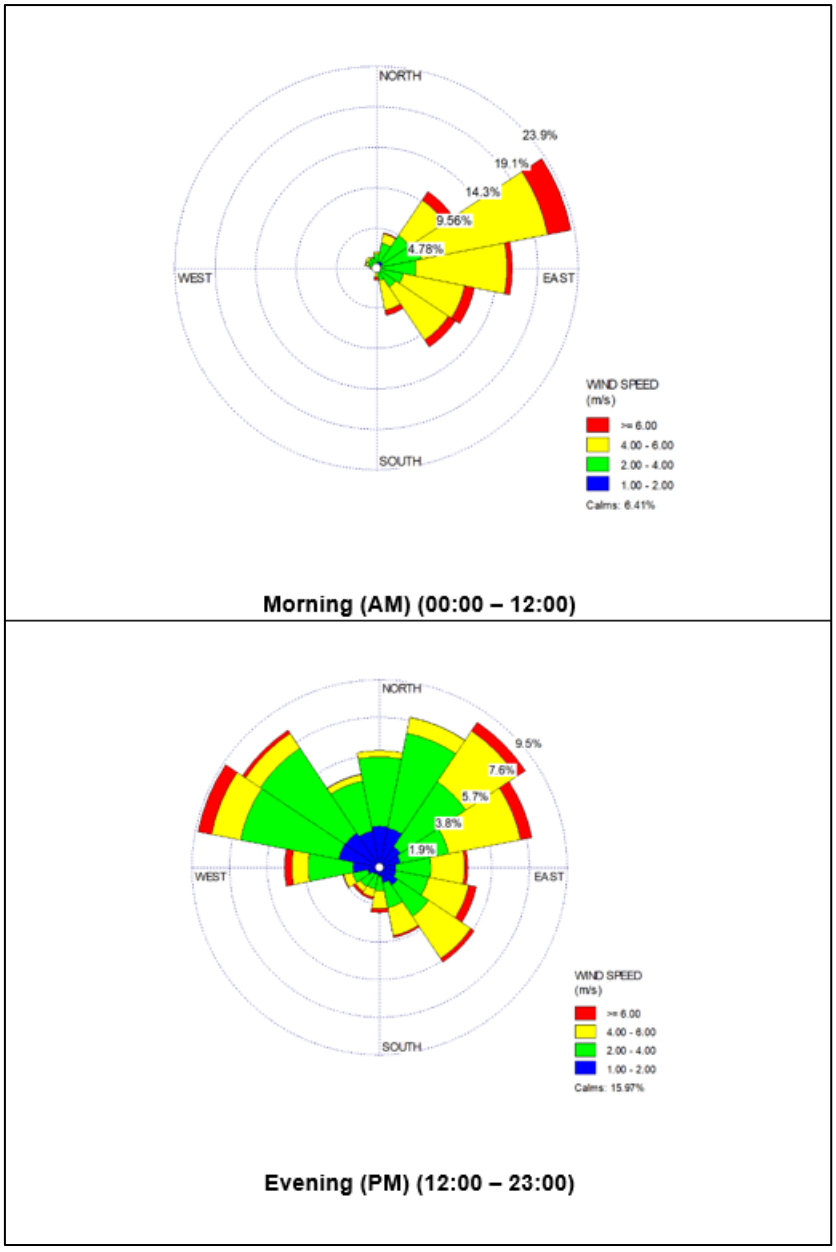


**Figure 15: Morning (AM) (00:00 - 12:00) and Evening (PM) (12:00 - 23:00) Period Wind Rose Plots for January 2017 - December 2019 (Rayten, 2021).**

#### *9.1.4.1 Impact of the EP Proposed Projects in combination with the prevailing wind*

Based on the prevailing wind fields for the period January 2017 to December 2019, emissions from activities associated with the Consolidated MR Area will likely be transported towards the westerly and south-westerly sectors, depending on the season and time of day (Rayten, 2021). Moderate to fast wind speeds observed during all the time periods may result in effective dispersion and dilution of emissions from the **EP Proposed Projects**; however, higher winds speeds can also facilitate fugitive dust emissions from open exposed areas, such as stockpiles and opencast areas (Rayten, 2021).

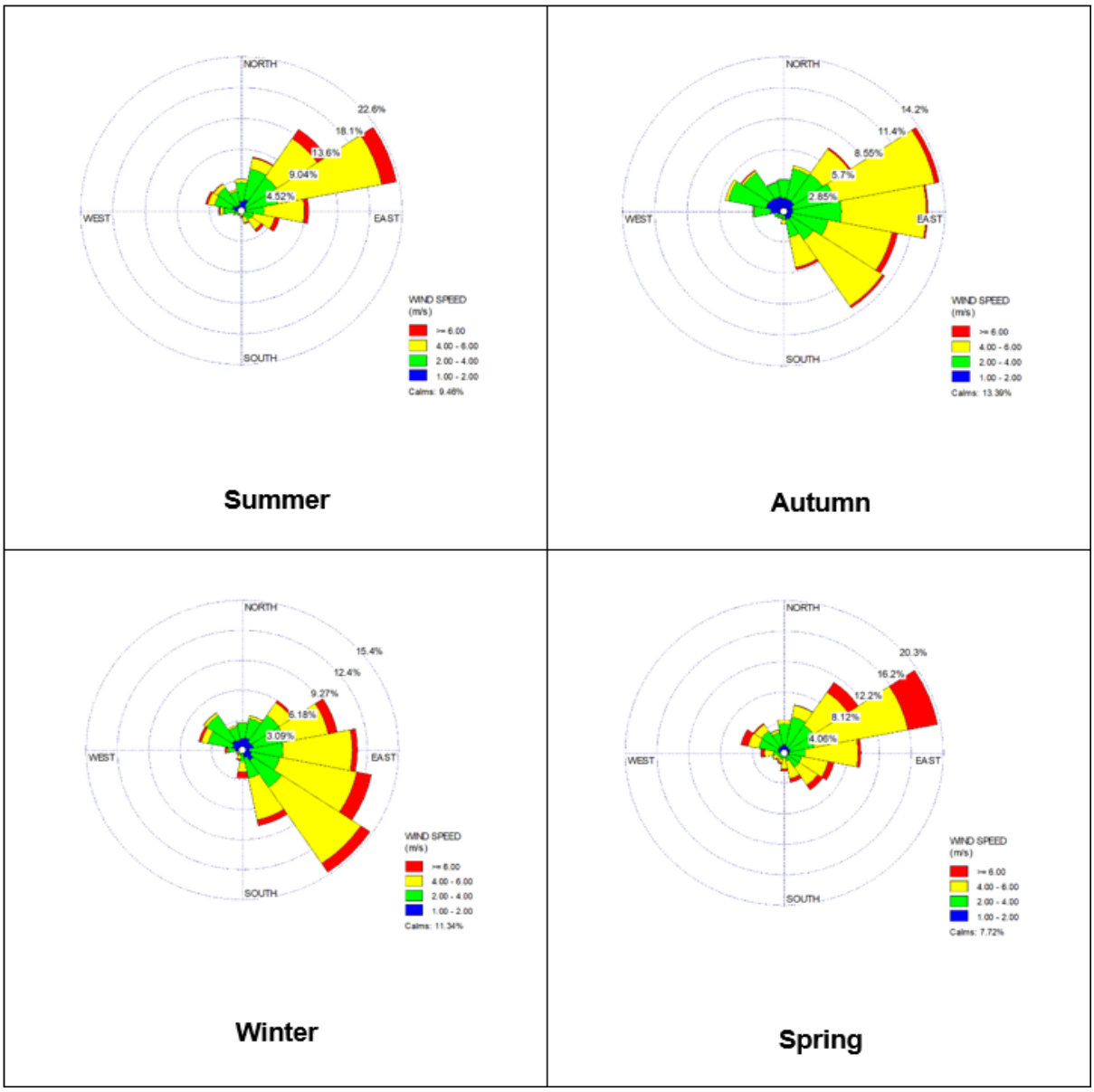


**Figure 16: Seasonal Wind Variation of for Period January 2017 - December 2019 (Rayten, 2021).**

### 9.1.5 Topography

The NWP, the sixth largest province in the RSA, occupies a total area of 116 320 km$^2$ (9,5% of the total area of the RSA). It is geographically situated between 25° and 28° south of the Equator and between 22° and 28° longitude east of Greenwich Meridian. With altitudes ranging from 920 m - 1782 m above sea level, the NWP is professed to have the most uniform terrain of all provinces.

The topography of the Consolidated MR Area is relatively flat, with koppies and hills bordering the site to the north, and the Magaliesberg mountain range to the south. The Area is located approximately 6 km north of Hartbeespoort Dam and 5 km west of the Crocodile River. The average elevation of land in and surrounding the Consolidated MR Area is 1 170 m above mean sea level ("**mamsl**"). Mountain peaks in the nearest section of the Magaliesberg rise to 1 500 – 1 600 mamsl; and the Hartbeespoort Dam lies at an altitude of approximately 1 200 mamsl. The Crocodile River flows from the Hartbeespoort

Dam in a north-westerly direction and passes about 5 km to the west of the Consolidated MR Area, at an altitude of about 1 110 mamsl. The Kareespruit flows north-east to south-west into the Crocodile River and runs directly north of the Area.

#### *9.1.5.1 Impact of the EP Project on the topography*

The overall slope of the Consolidated MR Surface Area is 1:35. The slope increases slightly to the north near the Msilitswane koppie (Trig beacon no. 16), which peaks at 1 317.2 mamsl. The lowest point on the Area is at 1 142 mamsl, where a non-perennial stream leaves the EM Mine Area, along the western boundary (north of the railway line). The topography in parts of the Consolidated MR Surface Area has been altered by existing infrastructure and operation. The altered topography will need to be restored to its pre-mining form, as far as practically possible. Rehabilitated areas must be free draining and re-vegetated to minimise erosion.

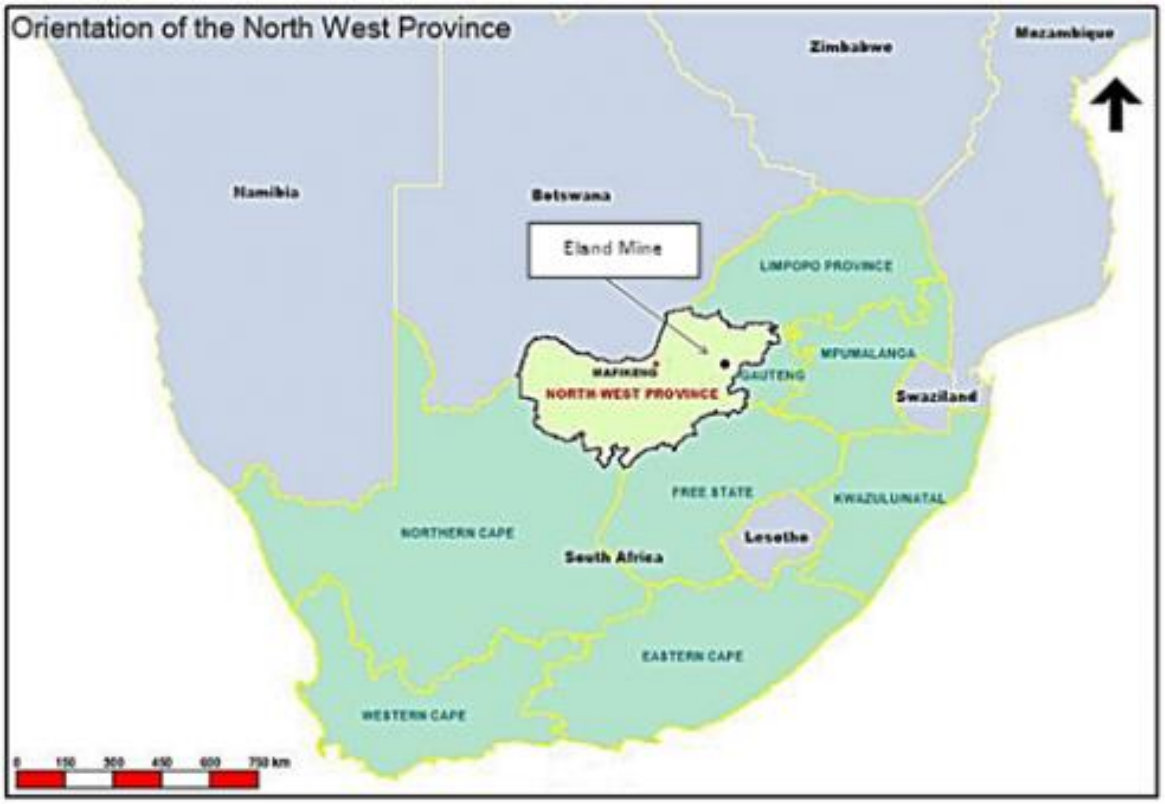


**Figure 17: Orientation of the North-West Province – South Africa.**

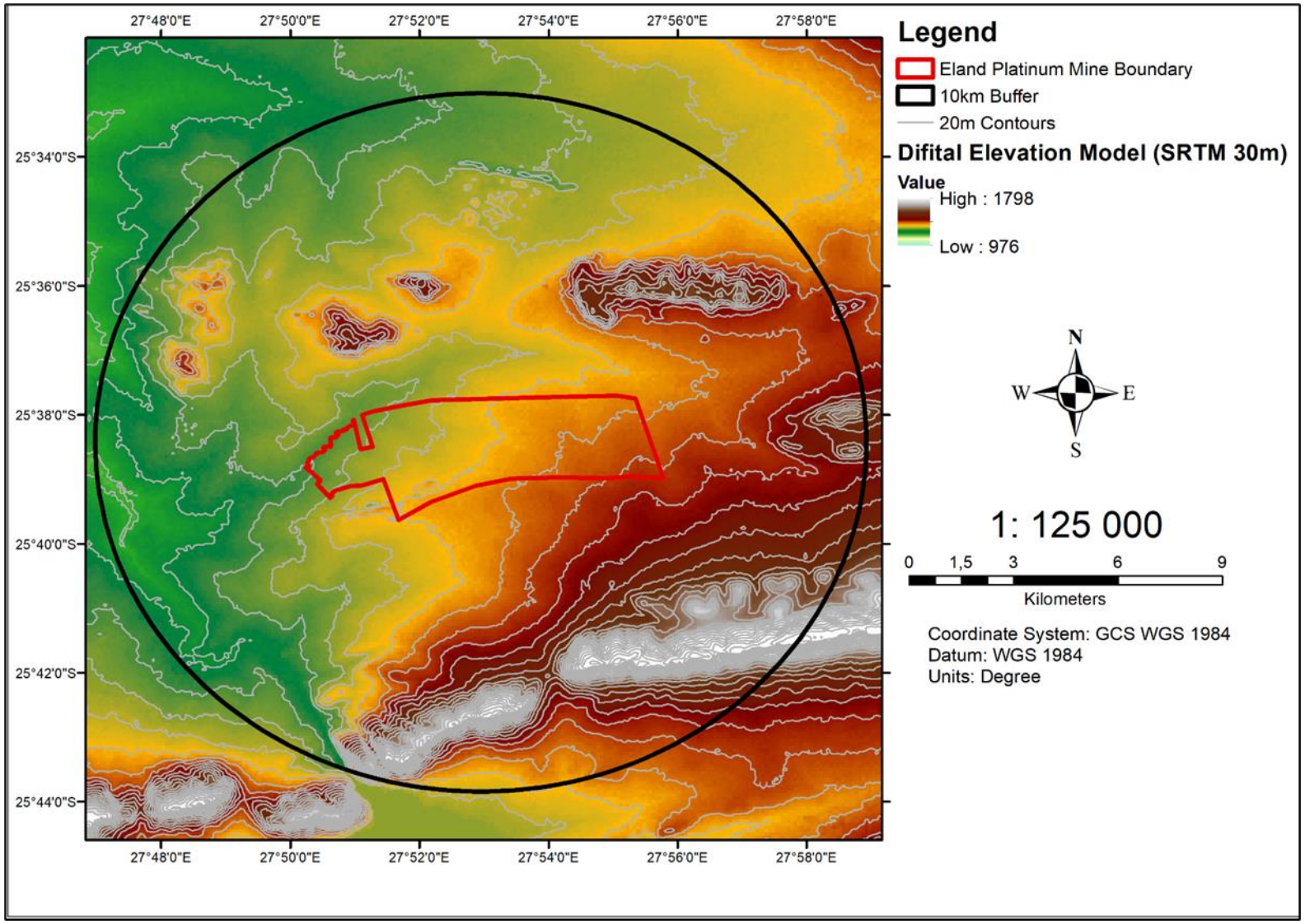


**Figure 18: Local Topography of Consolidated MR Surface Area and Surrounding Area (Rayten, 2021).**

### 9.1.6 Geology

***Refer to Appendix 9 for the Geotechnical Investigation undertaken by RSG Global.***

#### *9.1.6.1 Regional Geology*

Southern Africa is characterised by the presence of large mafic to ultramafic layered complexes, the best known of which are the Great Dyke in the Zimbabwe Craton and Bushveld and Molopo Complexes in the Kaapvaal Craton (SLR, 2012). By far the largest, best-known and economically most important of these is the Bushveld Igneous Complex ("**BIC**"), which was intruded about 2060 million years ago into rocks of the Transvaal Supergroup, largely along an unconformity between the Magaliesberg quartzite of the Pretoria Group and overlying Rooiberg felsites. The total estimated extent of the BIC is some 66 000 $km^2$, of which about 55% is covered by younger formations. The Rustenburg Layered Suite ("**RLS**") comprises the mafic phase of the BIC and is host to several economically extracted minerals, such as chromite, vanadium and platinum group elements (PGMs). The RLS is divided into five zones, known as the Marginal, Lower, Critical, Main and Upper Zones (from the base upwards) (***Figure 19***). Both the Merensky Pyroxenite and UG2 Reef occur within the Upper Critical Zone.

The Critical Zone is divided into the Lower Critical and Upper Critical (***Figure 20***). The transition between the Lower and Upper Critical Zone is defined as the last occurrence of upper most Middle Group ("**MG**") chromitite horizon, usually the MG4. The MG1 and MG2 chromitite layers are extensively mined for chrome.

The Upper Critical Zone is characterised by regular and often fine-scale rhythmic, or cyclic, layering of well-defined layers of cumulus chromite within pyroxenites and olivine-rich rocks.

The first important cycle is the lower of the two Upper Group Chromitite Layers (the UG1 Chromitite Layer). This unit consists of a chromitite layer and underlying footwall chromitite layers that are interlayered with anorthosite. The overlying UG2 chromitite is important because it contains economic concentrations of PGMs and is extensively mined.

The two uppermost cycles of the Critical Zone are the Merensky and Bastard cycles. The former is also of great economic importance, as it contains at its base the PGM-bearing Merensky Reef, a pegmatitic feldspathic pyroxenitic assemblage, with associated thin chromitite layers. The top of the Critical Zone is generally defined as the top of the robust anorthosite (the Giant Mottled Anorthosite) that forms the top of the Bastard cyclic unit.

The economically viable chromite reserves of the BIC, most of which are hosted in the Critical Zone, are estimated at 68% of the world's total, whilst the BIC also contains 56% of all known PGM.

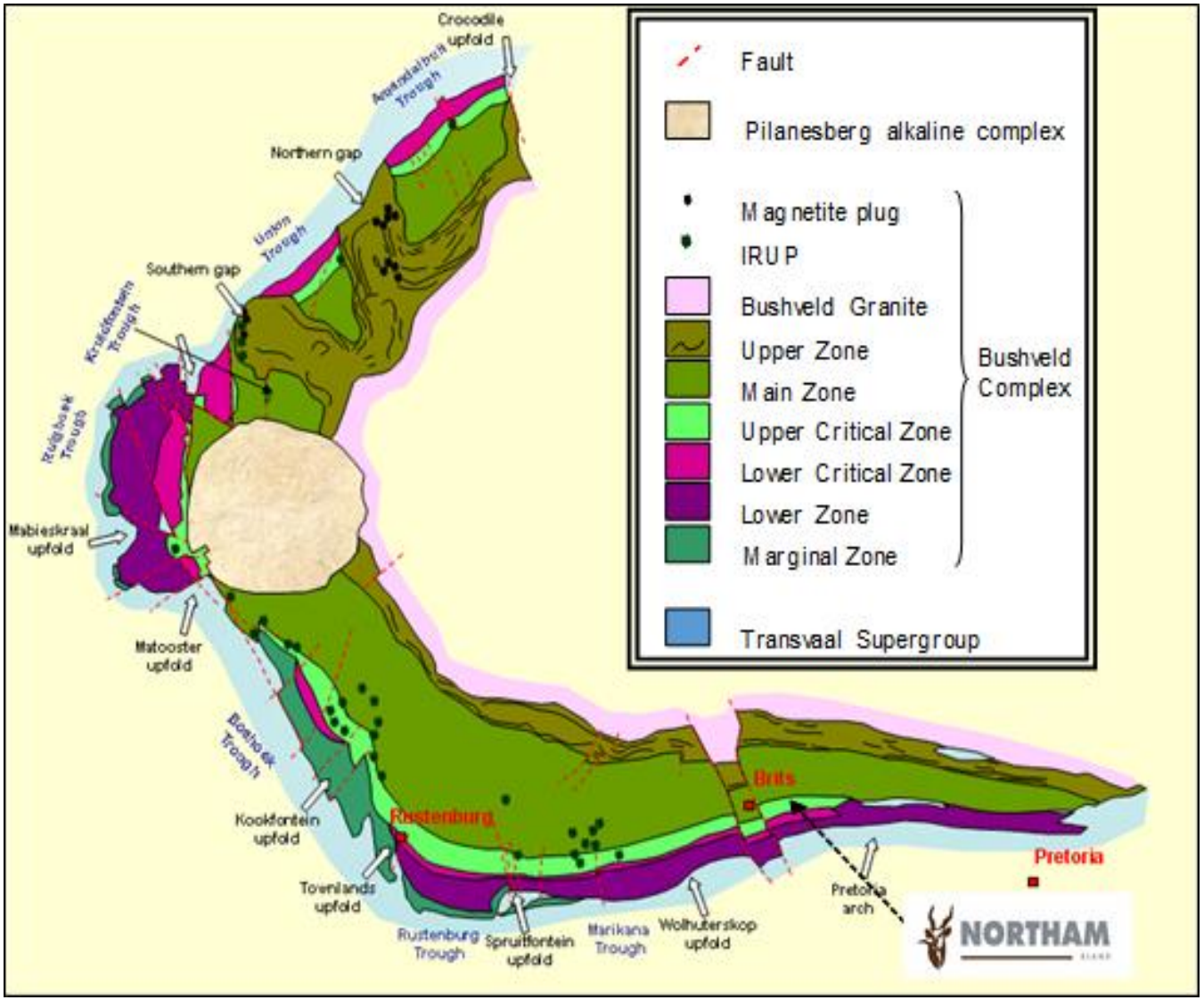


**Figure 19: Generalised layout of western Bushveld Complex**

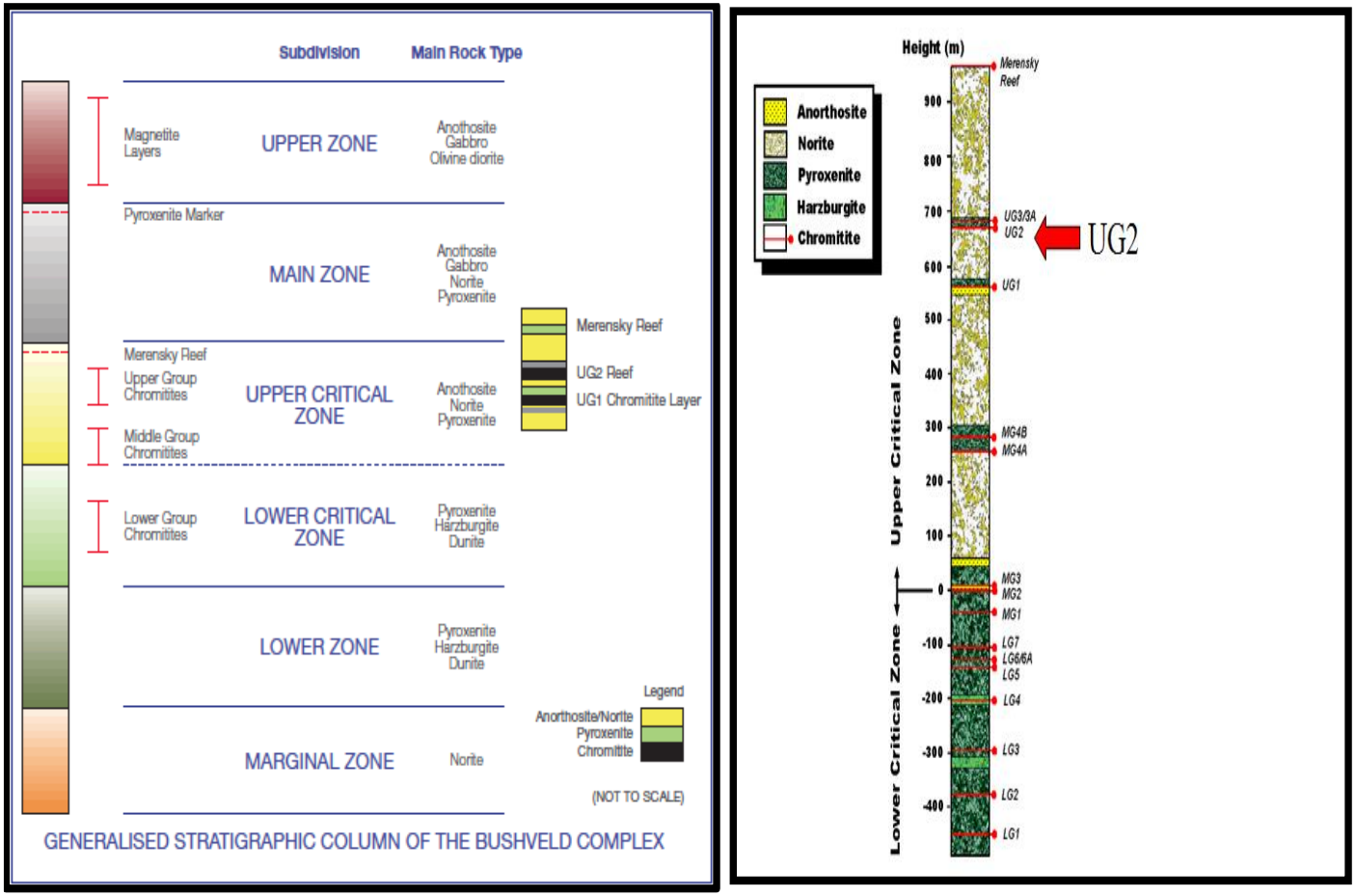


**Figure 20: Generalised stratigraphy on the western Bushveld Complex**

### *9.1.6.2 Local Geology*

A generalized local stratigraphy at the Consolidated MR Area is provided in ***Figure 21*** below. Maroelabult lies close to prominent north-south striking faults and diabase dikes, which are indicated on the geological sheet (Envass, 2016). Both the Merensky pyroxenite and the UG2 Chromitite Layer are present on Consolidated MR Area. Further detail on each of these reefs is provided below.

***a) UG2 Chromitite layer***

The UG2 Chromitite Layer has been located from outcrop to depths of approximately 1 200m below surface. It strikes approximately east-west and dips at 18° to 20° to the north. The UG2 Chromitite Layer is located approximately 220m below the Merensky pyroxenite and a sequence of norites and anorthosites separate the Merensky Reef and the UG2 Chromitite Layer horizons. The UG2 Chromitite Layer comprises a basal chromitite layer (UG2 Main Seam) and immediately overlying it, the leader chromitite layer (UG2 Leader). Feldspathic pyroxenite forms the hanging wall lithology to the UG2 Chromitite Layer and a pegmatoidal feldspathic pyroxenite is within the immediate UG2 Chromitite Layer footwall. The PGE grade distribution has a bimodal characteristic, with peaks on the footwall and hanging wall contacts of the UG2 Main Seam. The UG2 Leader has a uniformly lower grade. The chromitite is comprised mostly of chromite, with lesser amounts of feldspar, pyroxene and altered silicates. The dominant PGE mineral phases are PGE sulphides (cooperite, braggite, malanite and vysotskite ranging from 87% to 99%). The remaining PGE mineral phases are PGE alloys, tellurides, arsenides and sulpharsenides.

***b) Merensky pyroxenite***

The Merensky Reef in the Rustenburg area is typically a coarse to pegmatoidal feldspathic pyroxenite confined between two thin chromitite layers, typically 20cm to 25cm apart. The bulk of the base metal and PGE mineralisation is located between or close to the chromitite layers. Further east, the Merensky Reef widens progressively; and the two chromite layers disappear or become less distinct. East of Karee Mine, the feldspathic pegmatoidal pyroxenite becomes absent or indistinct and the width of the hanging wall feldspathic pyroxenite thickens to more than 10 m. The base metal and PGE mineralisation is spread out significantly across the thickened pyroxenite. The pyroxenite becomes progressively more feldspathic (noritic) as the sequence approaches Pretoria. Although the Merensky pyroxenite is present at Elandsfontein, it is very thick (approximately 15 m thick), with a diffuse distribution of base metal sulphides and low PGE grades.

### *9.1.6.3 Impact of the EP Proposed Projects on the geology*

Where new permanent infrastructure is placed close to mineable ore, there is the possibility that sterilization can occur. The current mine layouts for EM and MM have taken this into account and therefore there is no related sterilization concern. Geological lineaments, such as fault zones, have been identified on the Consolidated MR Area and can act as preferential flow paths for water. If contaminants reach these zones, the transportation / dispersion thereof can potentially be accelerated (SLR, 2012).

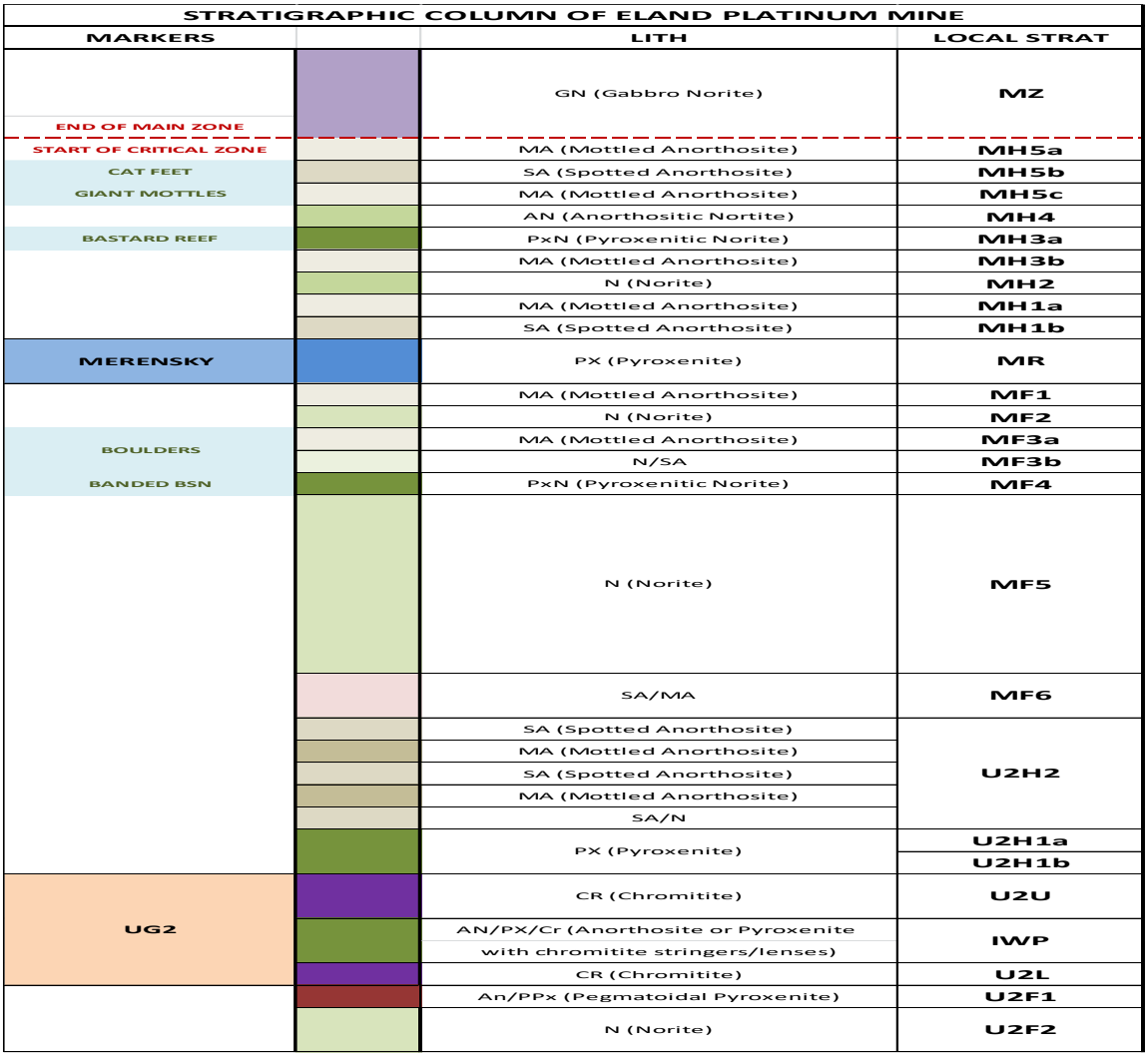


**Figure 21: Local Stratigraphic column at Consolidated MR Area.**

### 9.1.7 Soil and Land Capability

***Refer to Appendix 10 for the Soils and Land Capability 2020 Assessment by Index ("2020 Soil Assessment")***

#### *9.1.7.1 Soil*

A soil survey was done by ESS, 2006 for most of the central portion of the EM Mining Right Area. Parts of the far eastern portion of the Project Area were surveyed by ARC, 2011. The existing data was obtained from a Geographical Investigation System (GIS) and, where gaps and uncertainties were identified, a survey was conducted, to give a complete picture of the Project Area. Soils that have common properties or similar management requirements regarding cultivation practices and/or development potential were grouped together in a less complicated revised soil map. The results are reported on below, refer to ***Figure 22*** and ***Table 21***. The detailed map, before grouping them together, is provided in the addenda. The soils that were grouped together and all the other data of each group can also be found in the metadata of the shape files in the GIS.

The Project Area's south-eastern part has deep reddish soils, with moderately blocky structure. Although it is rocky in places, they are arable with a moderate to high potential, especially when irrigated. The northern parts are dark coloured soils that are high in expansive clays. They tend to form deep cracks when they dry out, then close up again when water is introduced. The wetting cycle effectively seals the soil and retards water infiltration. The western portion consists mostly of shallower soils that have calcium concretions or nodules, with rock outcrops being common. Most of the land, however, is under mining infrastructure or was impacted on by mining activities and hence, has little or no agricultural value.

**Table 21. Soil descriptions (Index, 2020)**

| Map symbol | Description | Dominant soil form | Area (ha) |
|---|---|---|---|
| **Derelict land** | Land that has a very uneven topography because of previous mining activities falls into this category.<br>This land has no agricultural value until restored. | | 87,62 |
| **Mining** | All land with mining infrastructure or mining activities was delineated as '*mining*'.<br>This land has no agricultural value until restored. | | 657,77 |
| **Deep vertic** | Deep dark coloured expansive clay soils, with prominent slickensides. Following cultivation, they show self-mulching properties.<br>The soils are poorly drained, with a low water infiltration rate. They tend to seal when irrigated. While not ideal for cultivation, they are nevertheless used successfully for crop production but tend to be difficult to work and are inaccessible when wet. | Arcadia, Rensburg | 184,09 |
| **Red structured** | They are generally dark red to dark brown/black, with moderate to weak developed blocky structure. The water infiltrating rate is moderate, with a high water holding capabilities.<br>The soil depth ranges from 200 mm to over 1 200 mm. They generally occur on basic parent material. | Valsrivier and Shortlands | 204,18 |
| **Red rocky** | This group has similar properties to the former but has scattered rock outcrops of andesite and other ultramafic rock. | Valsrivier and Shortlands | 60,49 |
| **Shallow rocky** | The soil is shallow, with effective rooting depths of less than 500 mm. The major constraints are rockiness and limiting soil depth. The restrictive layer is hard, partially weathered parent rock. | Mispah, Milkwood and Mayo | 71,89 |
| **Shallow structured** | These are generally grey to dark brown or black soil, with blocky or prismatic structure.<br>Because of the strongly developed structure, these soils have low water infiltration rates and moderate water holding capability, especially where there are expansive clays. The soil depth is generally less than 600mm. | Sterkspruit, Sepane, Valsrivier and Swartland | 462,97 |
| **Vertic/gleyed** | Deep dark coloured expansive clay soil, with prominent slickensides. They occur on and along the banks of streams. The deeper subsoil is gleyed, which is typical of waterlogged conditions. | Rensburg | 7,95 |
| **Vertic/Rock** | Moderately deep dark coloured, expansive clay soils, with prominent slickensides. Following cultivation, they show self-mulching properties. There are many stones and rock outcrops that make this unit not arable, and grazing would be the preferred agricultural use. | Arcadia, Rensburg | 34,89 |
| **Watercourse** | There are various prominent watercourses that drain the area, that have well developed riparian vegetation and wetlands. They are protected by legislation and may not be disturbed without authorisation by the DEFF and DHSWS. | | 45,5 |
| **Waterlogged** | Several waterlogged portions of land were identified that have typical wetland vegetation. They are protected by legislation and may not be disturbed without authorisation by the DEFF and DHSWS. | | 25,73 |
| | | | **1 843,08** |

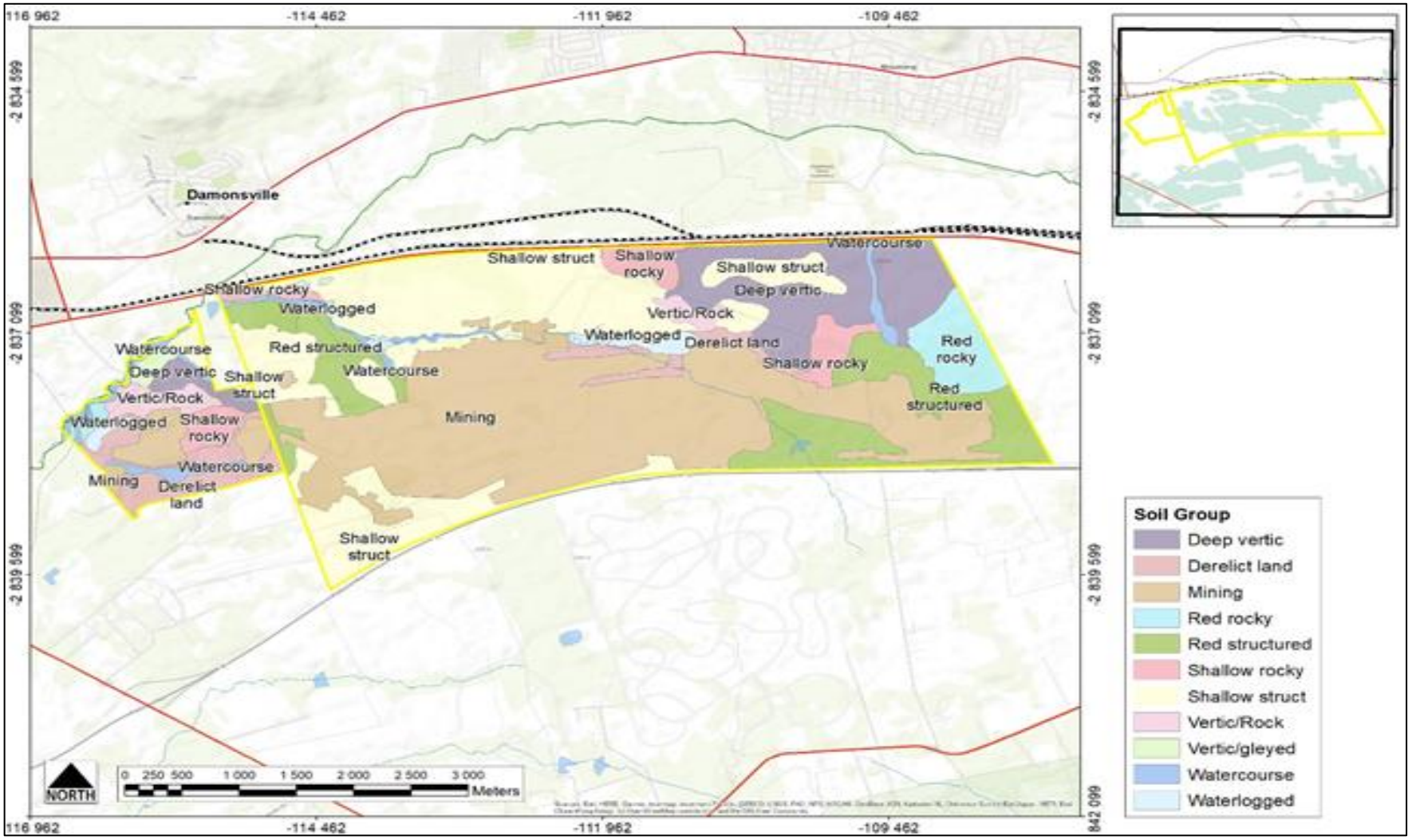


**Figure 22: Generalised soil map (Index, 2020)**

### *9.1.7.2 Land Capability*

EM and MM are both established mining operations. Details of the existing mining, processing and auxiliary infrastructure are captured in the ***Table 22*** below. Refer to ***Figure 25*** and ***Figure 26*** for the infrastructure plan for EM and MM, indicating the existing land-uses and infrastructure.

**Table 22: Details of the current land capability of the EM and MM operations.**

| Operation | Established | Surface area/extent | Existing Infrastructure |
|---|---|---|---|
| Eland Mine | 2006 | +/- 1624 Ha | • Workshops and Stores;<br>• Overburden and Topsoil Stockpiles;<br>• Opencast Mining Pits;<br>• Concentrator Plant;<br>• Water Management Infrastructure (i.e., dams, channels and pipelines);<br>• STP and WTP;<br>• Two Incline Shafts (Kukama and Nyala) and supporting infrastructure;<br>• TSF (four Paddocks);<br>• Offices and auxiliaries, including a mine clinic, laboratory and training centre,<br>• Recreational Area (Game Farm);<br>• Agricultural fields; and<br>• Haul and internal Roads. |
| Maroelabult Mine | 2000 | +/- 20 Ha | • Administrative offices and parking;<br>• Main plant area;<br>• Stockpiles (topsoil, product, etc.);<br>• Haul roads;<br>• Two WRDs;<br>• Laydown areas;<br>• Water management structures / infrastructure PCDs, SWD, stormwater diversion berms / trenches, and associated pumps / piping;<br>• Conveyor belt system;<br>• Aboveground diesel tanks; and<br>• Septic tank. |

Land capability classes are interpretive groupings of land with similar potential and limitations or similar hazards. It is considered by many land use planning practitioners as one of the only methods to describe the potential of land for development. The evaluation involves consideration of:

- Difficulties in land use, owing to physical land characteristics;
- The risks of land damage from erosion and other causes; and
- Climate.

The classic eight-class land capability system (Klingebiel & Montgomery, 1961) was adapted for use with Agriculture Geographic Information System ("**AGIS**") in South Africa. Land capability is classified according to guidelines published by the then Department of Agriculture, Fisheries and Forestry ("**DAFF**)" (now DALRRD) in AGIS. Land Capability is determined by the collective effects of soil, terrain and climate features and shows the most intensive long-term use of land for rain-fed agriculture. At the same time, it indicates the permanent limitations associated with the different land-use classes (***refer to Table 23***).

- *Order A*: Arable land – high potential land with few limitations (Classes i and ii)
- *Order B*: Arable land – moderate to severe limitations (Classes iii and iv)
- *Order C*: Grazing and forestry land (Classes v, vi and vii)

- *Order D*: Land not suitable for agriculture (Class viii)

**Table 23. Land capability classes – intensity of land uses (Index, 2020).**

| LAND CAPABILITY | | | | Grazing and Forestry | | | Crop production | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Order | | Class | Wildlife | Forestry | Veld | Pastures | Limited | Moderate | Intensive | Very |
| Arable | A | i | | | | | | | | |
| | | ii | | | | | | | | |
| | B | iii | | | | | | | | |
| | | iv | | | | | | | | |
| Non arable | C | v | | | | | | | | |
| | | vi | | | | | | | | |
| | | vii | | | | | | | | |
| | D | viii | | | | | | | | |

*Note: the shaded area indicates the suitable land use*

### *9.1.7.3 Soil use and Land capability impact of the Project Area*

The deep structured soils in the Project Area's south-eastern part are considered as high potential; however this area is also the existing Zilkaatsnek Mining Area. However, where the rainfall is low or highly variable, farmers tend to follow water conservation practices and, once sufficient water is available in the soil profile or following good rain, the soils are cultivated and planted. This practice is more successful on the dark coloured Arcadia soils than on the deep reddish structured Shortlands soils. The latter, however, is preferred for irrigation, especially where leaching of salts is required due to the deteriorating water quality from the Hartbeespoort Dam or from boreholes.

According to the criteria in National Policy of the Preservation of High Potential Land (HUAL) , the Project Area has irrigated land, which is classified as high potential. Because the irrigation system is a movable dragline, it is possible to move the system to other areas. The land does not have any significant special use for which it would need to be preserved in terms of the HUAL. The final land capability, after taking note of the soil and climate, is indicated in ***Figure 23***.

**Table 24: Land capability of soil groups (Index, 2020).**

| Soil Group | Area (ha) | Land Capability | Flood | Erosion | Depth | Texture | Drainage | Mechan |
|---|---|---|---|---|---|---|---|---|
| Red structured | 204,2 | ii | 0 | 0 | 2 | 2 | 2 | 0 |
| Deep vertic | 184,1 | iv | 0 | 0 | 2 | 2 | 4 | 0 |
| Vertic/Rock | 34,9 | v | 0 | 0 | 0 | 2 | 4 | 0 |
| Red rocky | 60,5 | v | 0 | 0 | 3 | 2 | 2 | 3 |
| Shallow rocky | 71,9 | v | 0 | 0 | 3 | 3 | 3 | 0 |
| Shallow structured | 463,0 | v | 0 | 0 | 3 | 3 | 3 | 0 |
| Vertic/gleyed | 7,9 | vi | 2 | 0 | 3 | 2 | 5 | 1 |
| Derelict land | 87,6 | vi | 0 | 0 | 5 | 0 | 0 | 4 |
| Mining | 657,8 | vii | 0 | 0 | 5 | 2 | 0 | 4 |
| Watercourse | 45,5 | vii | 2 | 0 | 5 | 0 | 5 | 0 |
| Waterlogged | 25,7 | vii | 2 | 0 | 5 | 0 | 5 | 0 |
| **TOTAL** | **1 843,1** | | | | | | | |

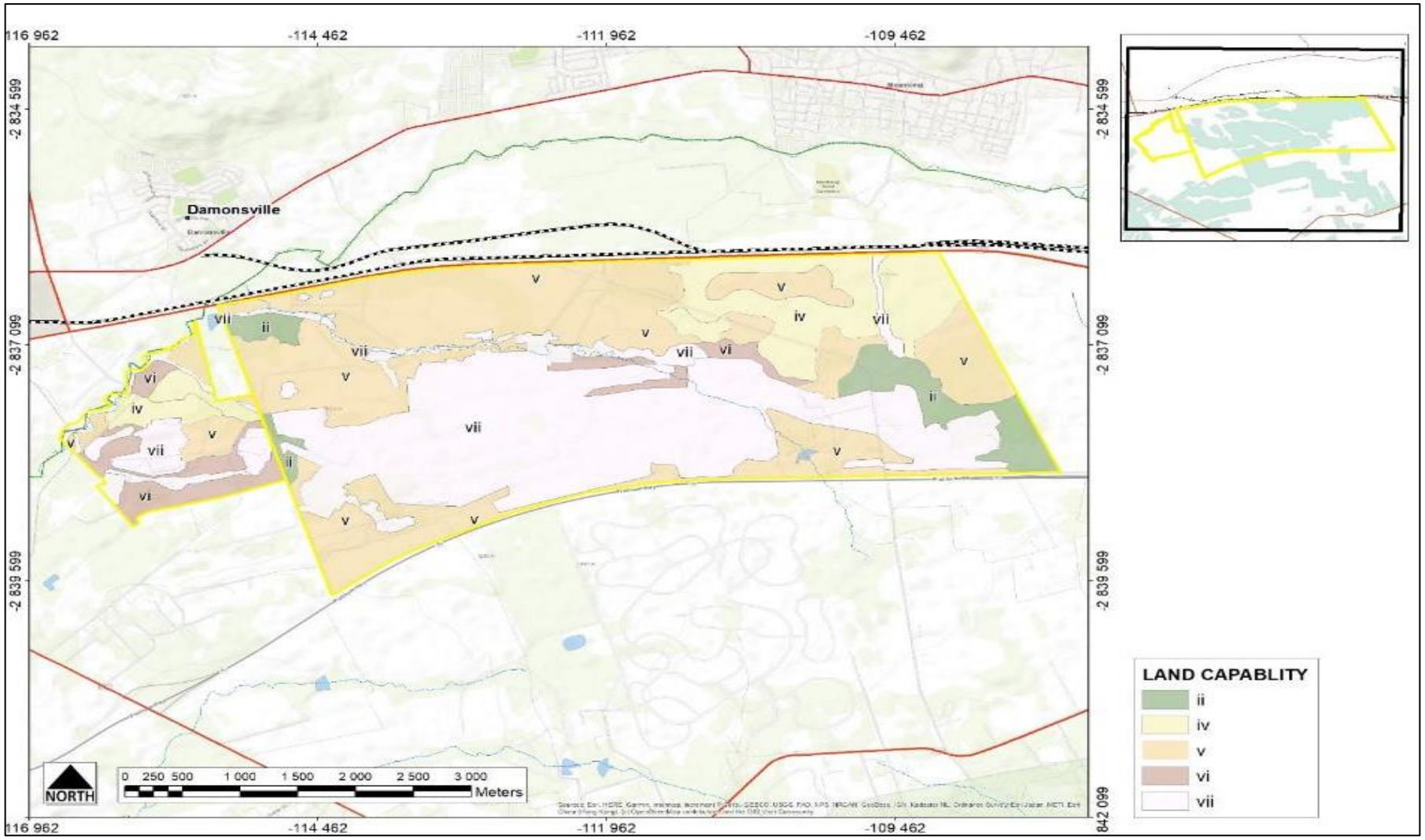


**Figure 23. Land Capability (Index, 2020).**

### *a) AGIS evaluation*

According to AGIS, the official web site of the DALRRD (http://www.arcgis.com), the Project Area is classified as 'marginal potential arable land'. Because of the rock outcrops and shallow soils, coupled with the climatic constraints, this is considered optimistic – dryland crop production on the Project Area is not feasible, unless it forms part of a mixed enterprise farm.

### *b) Sensitivity Analysis*

The 2014 EIA Regulations require a sensitivity analyses in an EA application. The sensitivity of a site is determined by the DEFF Screening Tool. The DEFF Screening Tool, although not perfect in terms of describing the impact that the land use change will have on farming, it is, nevertheless, useful in evaluating what the impact will be of a proposed activity (Index, 2020). ***Figure 24*** provides the DEFF Screening Tool's result, overlain on the proposed development footprint of the EP Proposed Projects.

According to the Screening Tool, the Project Area has mostly a low-moderate and moderate sensitivity. Small portions fall on level land and, regardless of rock outcrops, are classified as very high or moderate-high sensitivity (Index, 2020). The detailed 2021 Soil Assessment found that, except for the deep Shortlands soils that occur in the Project Area's south-eastern part, the land has a moderate to very low sensitivity.

The EP Proposed Projects are located on low/moderate sensitivity land. The tailings backfill area will be located on an area that is indicated as very high sensitivity according to the DEFF Screening tool. However, this area is not deemed sensitive because it is already disturbed by mining activities. The four opencast areas (indicated as "OC" on the map) are on medium sensitive land. All the other activities, i.e., Stockpiles and Ventilation Shafts are either insignificant in size or will be located on land that is not suitable for farming purposes.

The actual loss of high potential land, grazing land, agricultural production or farming infrastructure due to the EP Proposed Projects is small and is not considered as significant (2020 Soil Assessment).

## 9.1.8 Land Use

Prior to mining activities, the land was used mainly for growing sunflower crops. Currently the land is used for mining and mineral processing related processes, with some areas of open veldt, agricultural lands, recreational area (game farm) and mining infrastructure (CHEMC, 2019). The land use where the EP Proposed Projects will take place comprises of agricultural crop lands, recreational area (game farm), open veldt, mining, mineral processing and the EM Surface Area.

The EP Proposed Projects will be located within the existing Consolidated MR Surface Area that has been fenced with access control. (Refer to ***Figure 25*** and ***Figure 26*** for the EM and MM Surface Infrastructure Plan).

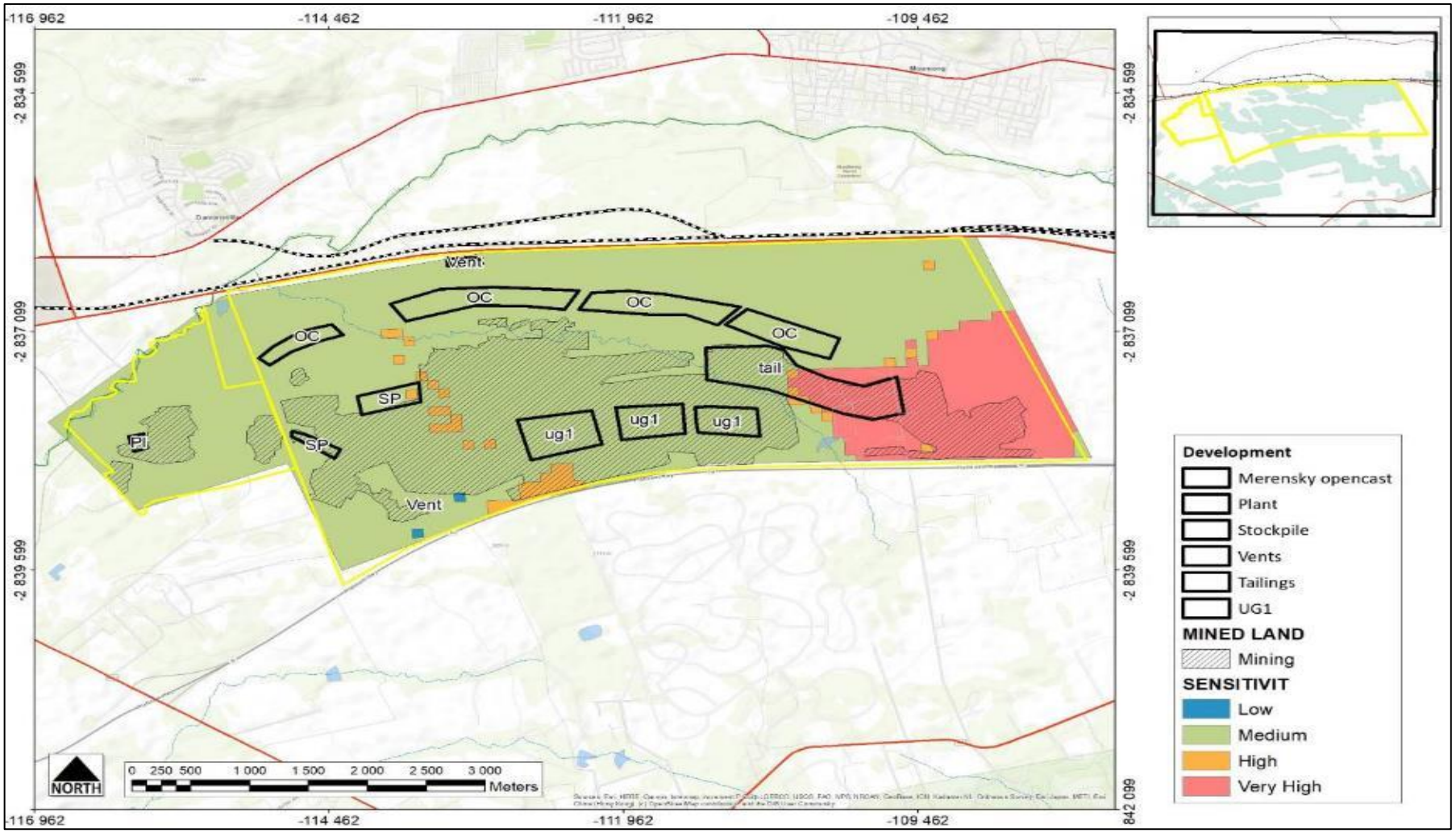


**Figure 24. Agricultural sensitivity (Screening Tool), (Index, 2020).**

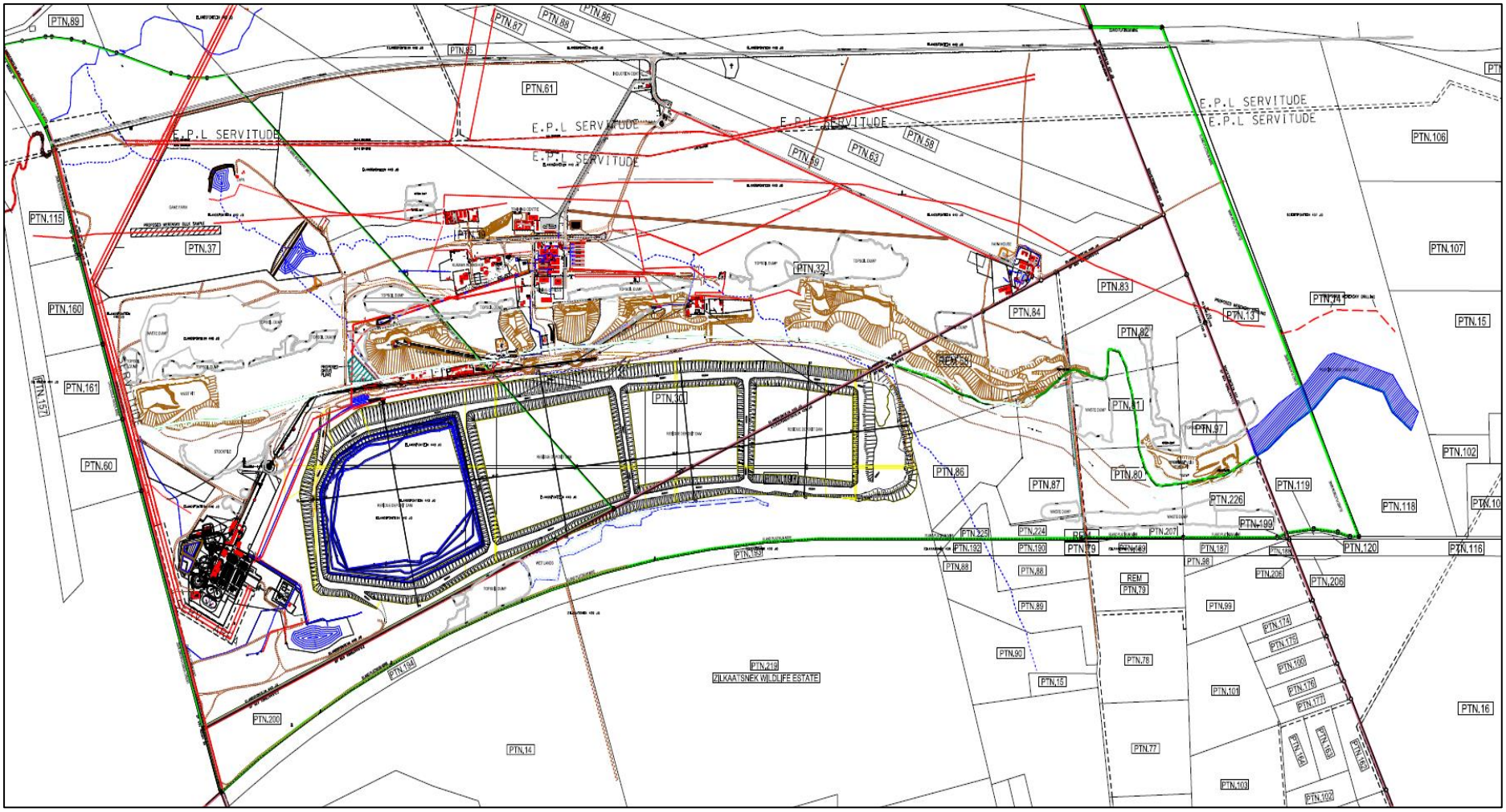


**Figure 25: Surface Infrastructure Plan for EM**

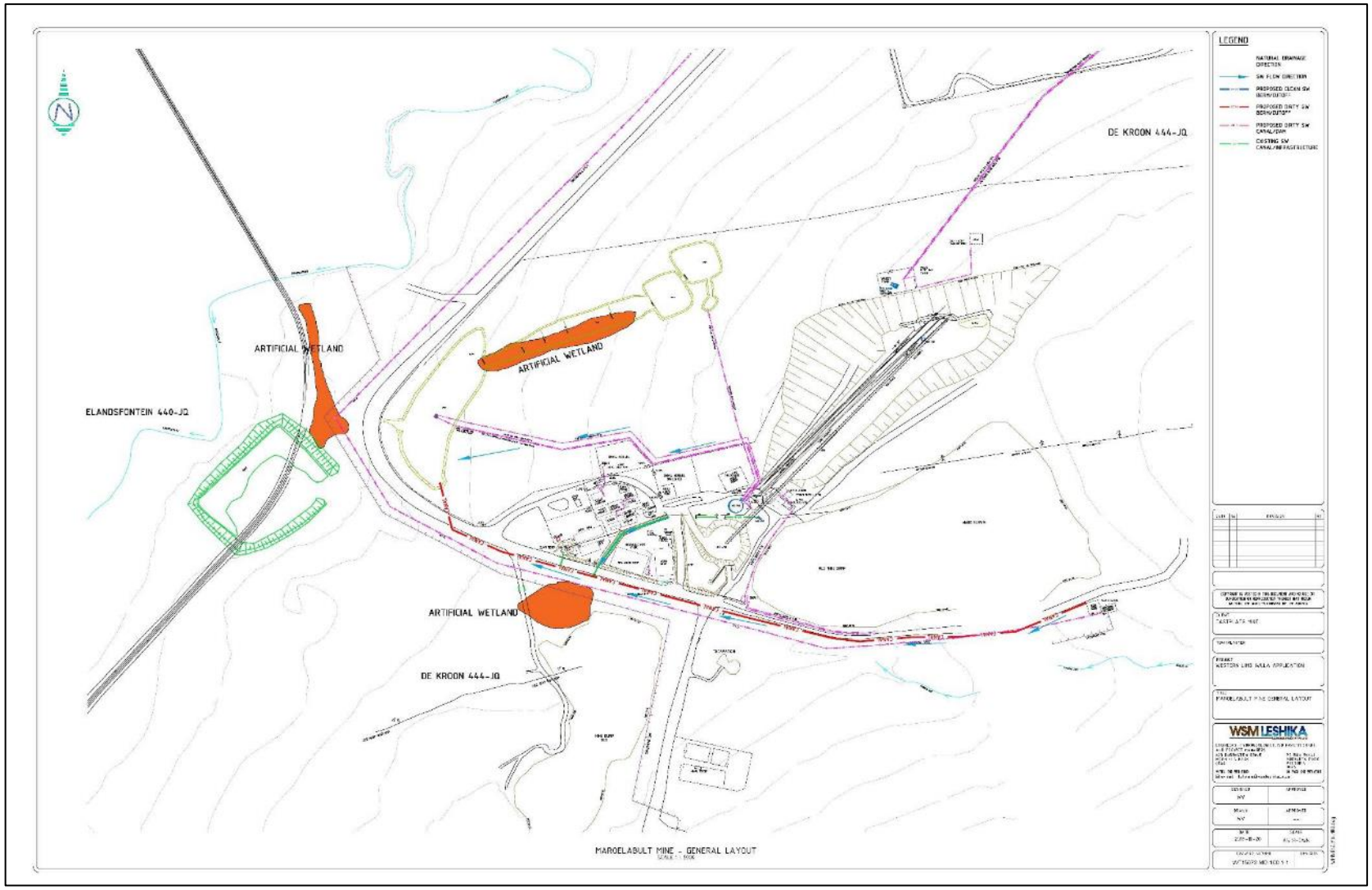


**Figure 26: General Infrastructure Plan for MM (Elemental Sustainability, 2019).**

### 9.1.9 Surface Water

***Refer to Appendix 11 for Conceptual Stormwater Management Plan conducted by Highland Hydrology, 2020*.**

#### *9.1.9.1 Hydrology*

The Consolidated MR Area falls within Quaternary Catchment A21J of the Crocodile River West Catchment, which is in the Crocodile West Marico Water Management Area (***Refer to Figure 27***) (Highland Hydrology, 2020).

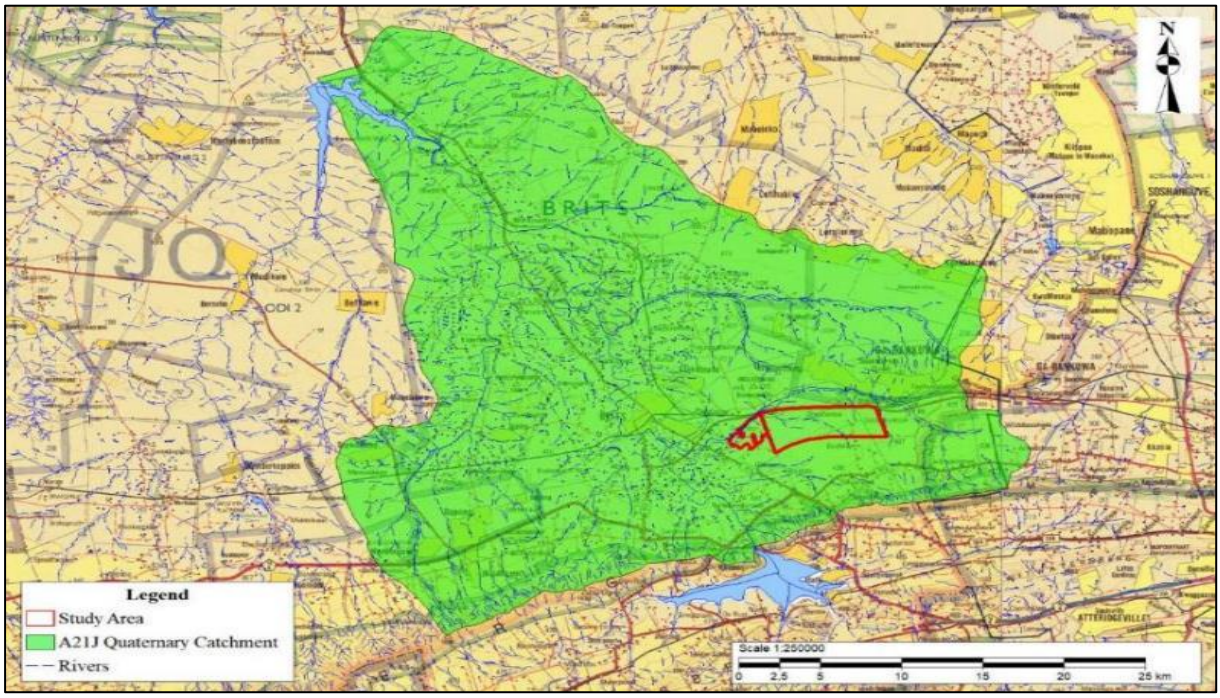


**Figure 27: Eland Platinum Mine location in relation to its catchment and receiving water bodies.**

No perennial watercourses are located on the Consolidated MR Surface Area, however non-perennial watercourses (non-perennial tributaries of the Kareespruit) are located and traverse the areas. The Kareespruit flows north-east to south-west of the Consolidated MR Surface Area. The Kareespruit feeds into the Crocodile River about 5km to the west of the Area (***Refer to Figure 28***). The non-perennial tributaries mentioned above were diverted around the mining areas and licensed accordingly (EP and MM WULs). Most of the drainage on the Consolidated MR Surface Area is primarily by sheet flow, in preferential stormwater paths, and mine-related stormwater control measures (Highland Hydrology, 2020). The general direction of flow across the Consolidated MR Area and its surrounding area occurs in a westerly direction (CHEMC, 2019).

The Consolidated MR Area lies within an agricultural district, which is served by canals from the Hartbeespoort Irrigation Scheme. There are no canals on the EM Surface Area; the closest canal to the Consolidated MR Area is the west canal, which flows in a south to north direction approximately 5 km to the west. The Kareespruit tributary, prior to the construction of the TSF, was situated from south-east

to north-west. EP however received authorisation under section 21 (c) and (i) of the NWA to divert the watercourse (EP WUL).

#### *9.1.9.2 Water Quality*

Surface water quality in the Region generally exhibits high levels of nitrate (Water Hunters, 2018), elevated above the recommended DWAF domestic use guidelines (DWAF Water Quality Guidelines, 1996). Water in the Crocodile River (the nearest perennial water source to the Consolidated MR Area) does not meet applicable irrigation standards for total dissolved solids and manganese concentrations (Water Hunters, 2018).

Surface water sampling is conducted for both EM and MM on set points in the non-perennial streams and watercourses surrounding the Consolidated MR Area. Sampling is undertaken monthly, as required in the EP and MM WUL(s). The sampling locations are shown on ***Figure 29.***

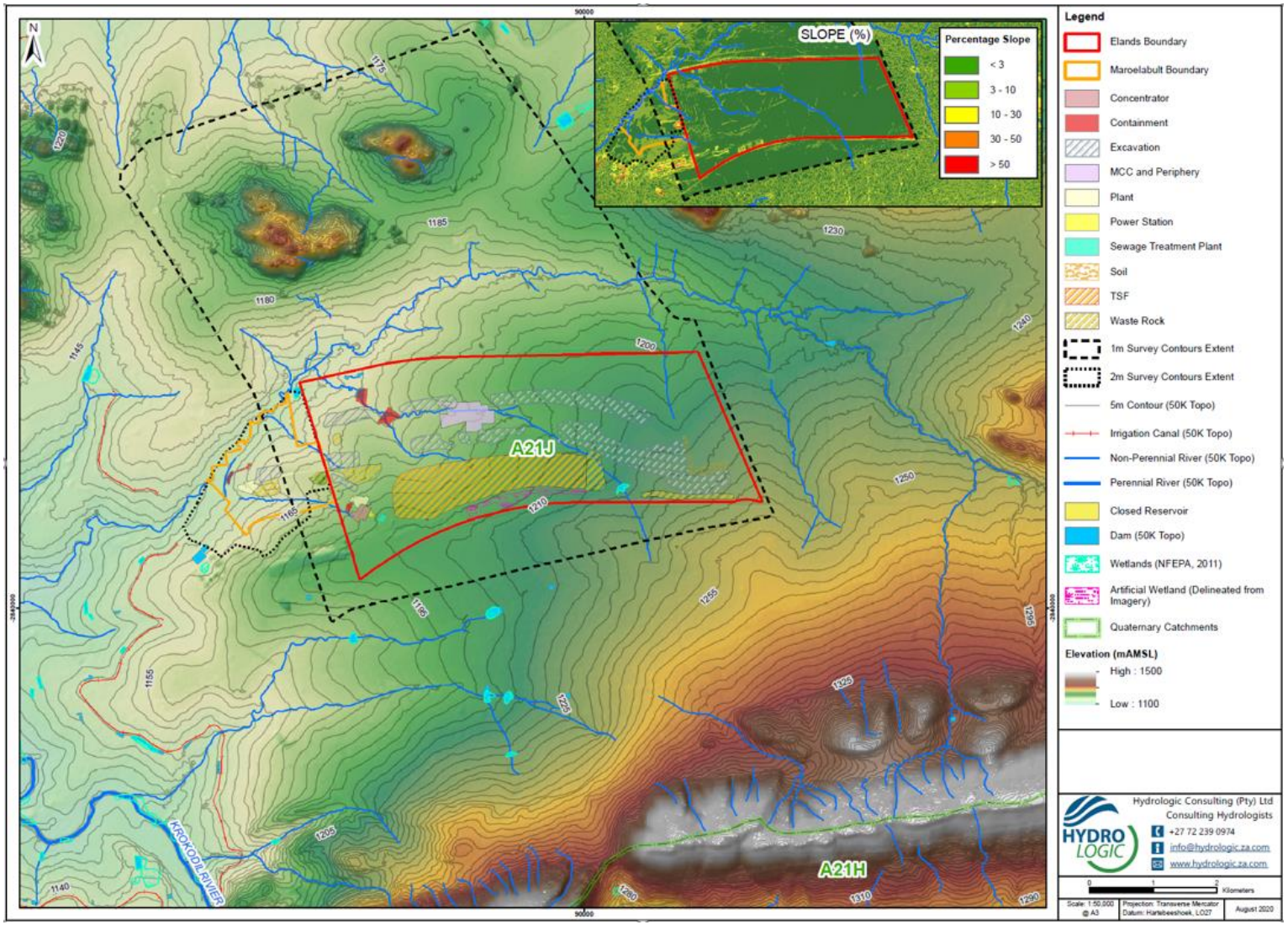


**Figure 28: Hydrology and Terrain Map, (Highlands, 2020).**

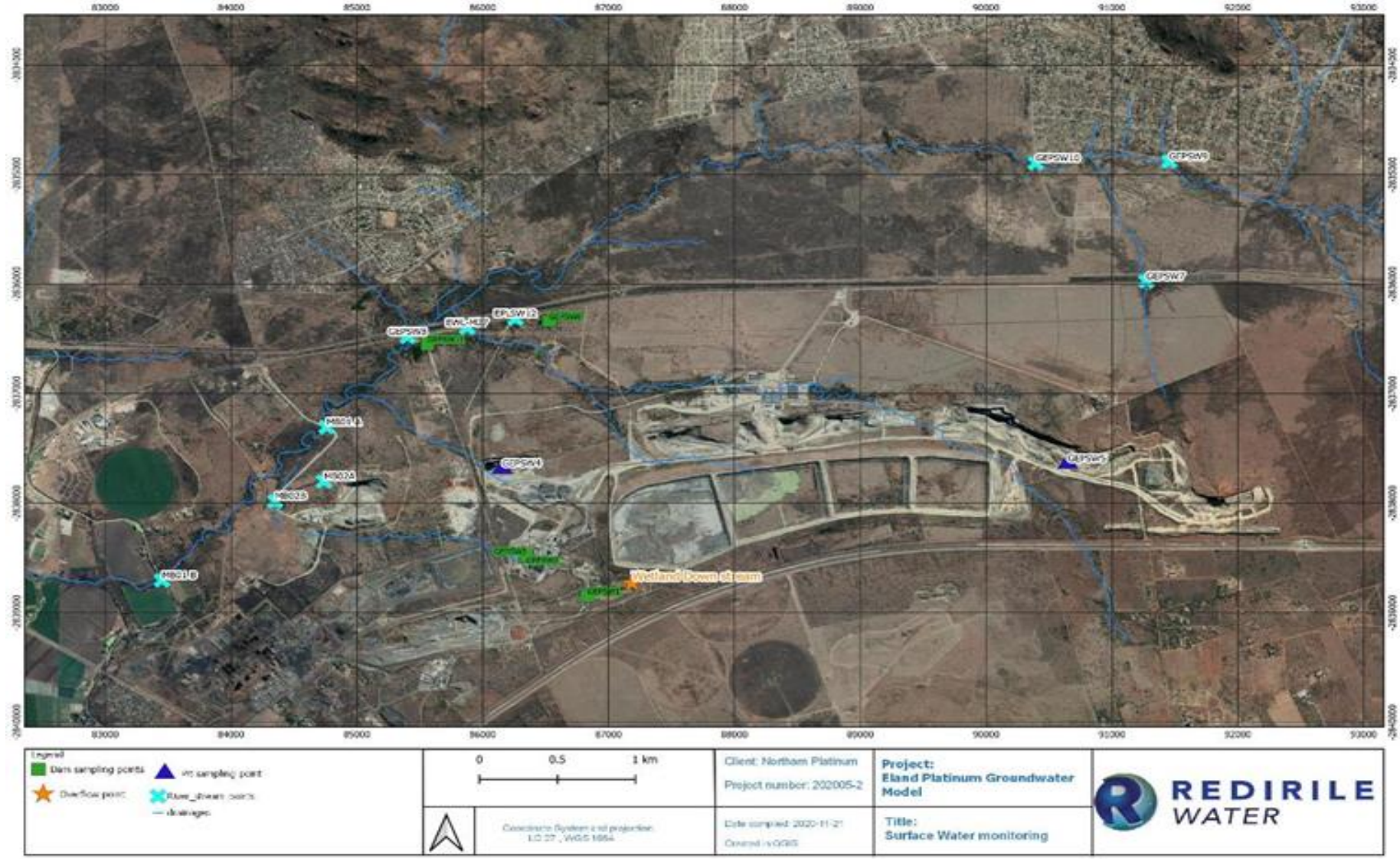


**Figure 29: Aerial map of EM surface and process water monitoring localities (Redirile, 2021).**

#### *9.1.9.3 Stormwater*

***Refer to Appendix 11 Stormwater Management Plan conducted by Highland Hydrology.***

Current opencast mining operations have altered the natural environmental state, thereby affecting the generation of stormwater and likely affected downstream rivers. Mining is expected to continue, and it is therefore important to identify the effect EM and MM has on stormwater production and manage this water accordingly. Stormwater volumes generated over areas disturbed by mining operations are generally expected to increase because of the reduction in natural vegetation, while the stormwater quality generated is expected to decrease due to the nature of mining operations. The purpose of this section is therefore to provide information and details of the planned Stormwater Management Plan (SWMP) by which clean and dirty water generating areas were firstly identified and then managed appropriately.

The consolidated conceptual SWMP will form a necessary part of the IWULA. The SWMP was aimed at ensuring compliance with GN 704, published under the NWA in GG 20118 on June 1999) ("**GN704**"); and the principles presented in the DWS Best Practice Guideline G1 for Storm Water Management ("**BPG1**"). Overall, the SWMP aims to minimise the final dirty area to limit containment of unnecessary clean areas. This benefits the EM and MM mining operations in reducing the size of the dirty water diversions and any PCDs required to store dirty water generated on site; as reduces the impact on the receiving water environment due to natural runoff reduction. Where possible, existing stormwater management infrastructure has been incorporated within the SWMP, to limit unnecessary construction.

***a) Existing Stormwater Management***

Due to the EM and MMs' historic operation, stormwater management infrastructure and measures have already been implemented on both sites.

***Eland Mine***

The existing stormwater management measures on EM include (but are not limited to) the channels and PCD at the Concentrator Plant; two informal earth lined containment facilities which were originally farm dams (Farm and Lapa dams); a stormwater channel bisecting the contractors area; and local management of stormwater at the decline shaft entrances. The opencast/decline areas are self-contained and consequently have an inherent ability to contain stormwater, thereby preventing the direct escape of dirty water into the surface water environment. This was reinforced by using berms (where necessary), to definitively partition these areas. The opencast/decline areas and their internal sump storage also have the potential to accommodate water originating from other upslope dirty areas, such as peripheral WRDs. A backfill area to the west has undergone some rehabilitation, however it is still classified as 'dirty' due to it having previously been an opencast area.

The opencast/decline areas are self-contained and consequently have an inherent ability to contain stormwater, thereby preventing the direct escape of dirty water into the surface water environment. The opencast/decline areas and their internal sump storage also have the potential to accommodate water originating from other upslope dirty areas, such as peripheral WRDs.

Clean areas are also defined according to anticipated quality of runoff. Of most relevance are the TSF complex side walls, which are grassed. Runoff from these areas is expected to be clean, while underdrains capturing any TSF complex seepage are expected to be present, thereby preventing mixing of dirty groundwater water with clean surface water at the toe of the TSF complex. An artificial wetland (TSF seepage area) is present to the south of the TSF complex and is known to be affected by mine water which is discharged into the area. The result of this is that dirty water does enter the area, however, some remediation of this dirty water is expected (due to the polishing influence of the vegetation and soil). Discharges from the area have consequently been assumed to be clean (partially remediated). The discharges are nonetheless routed to an existing quarry, where it is contained. The quarry is not expected to receive any direct inflows of dirty water, with only the artificial wetland being a potential source of mine affected water, due to its dirty water only being partially remediated. The quarry's water quality is, however, likely not 'clean' owing to past quarry workings and the potential for 'dirty' groundwater interaction from the current underground mining at the site. Discharge of partially remediated (dirty) water into the quarry is therefore likely warranted due to the assumed 'dirty' water of the quarry and proposed addition of partially remediated water (i.e., quarry water quality is likely to not be exacerbated with artificial wetland water additions). Water quality testing from the artificial wetland and within the quarry can be used to further inform water management, as discussed above.

Of additional relevance is the clean area south of the N4 which approximates 8km$^2$. A significant portion of this clean water area has the potential to flow into the EM Surface Area through underpass/es below the N4.

***Maroelabult Mine***

MM is an existing operation. to the west of the EM Surface Area. MM was operated on the strategy of maximising the utilisation of "dirty water" in the mining area (Envass, 2016). The settling ponds and stormwater dams are aimed to hold all the potentially contaminated water on site. This includes surface run-off inside the so-called "dirty area"; and groundwater seepage from underground mine workings. A single stormwater channel between the stores and the carports exist, which drains southwards (Envass, 2016). Two concrete pipe culverts accommodate stormwater flow beneath the access road and drains southwards, towards a rivulet, which contributes to the Kareespruit runoff to the west.

#### *9.1.9.4 Planned Stormwater Management Measures*

Stormwater management infrastructure has been conceptually designed in this report as per the requirements of GN 704 and BPG1, using the 1:50 year recurrence intervals (RI) event. No account has been taken of climate change and any potential future increases in rainfall depth or intensity; these will need to be considered depending on the expected life of the structure. ***Figure 30*** illustrates the overall SWMP, including both EM (and the Merensky Reef expansion) and MM. ***Figure 31*** illustrates the EM SWMP (including the Merensky expansion), while ***Figure 32*** illustrates the EM Surface Areas western portion (Concentrator Plant) for greater clarity. Lastly, ***Figure 33*** illustrates the SWMP for MM.

Refer to the attached SWMP for the details on the dimensions of the clean and dirty water management measures.

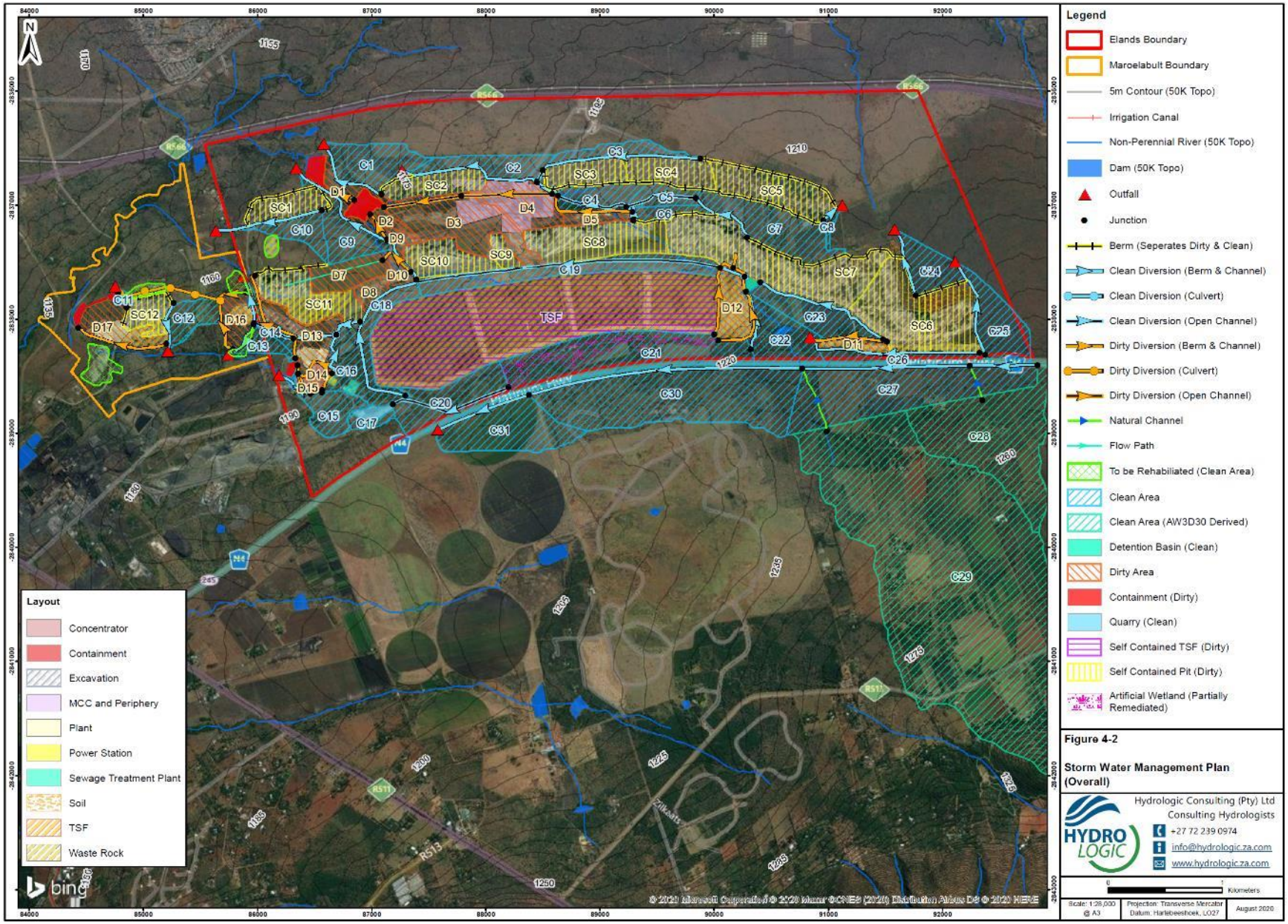


**Figure 30: Overall SWMP for Consolidated MR Surface Area (Highlands, 2021).**

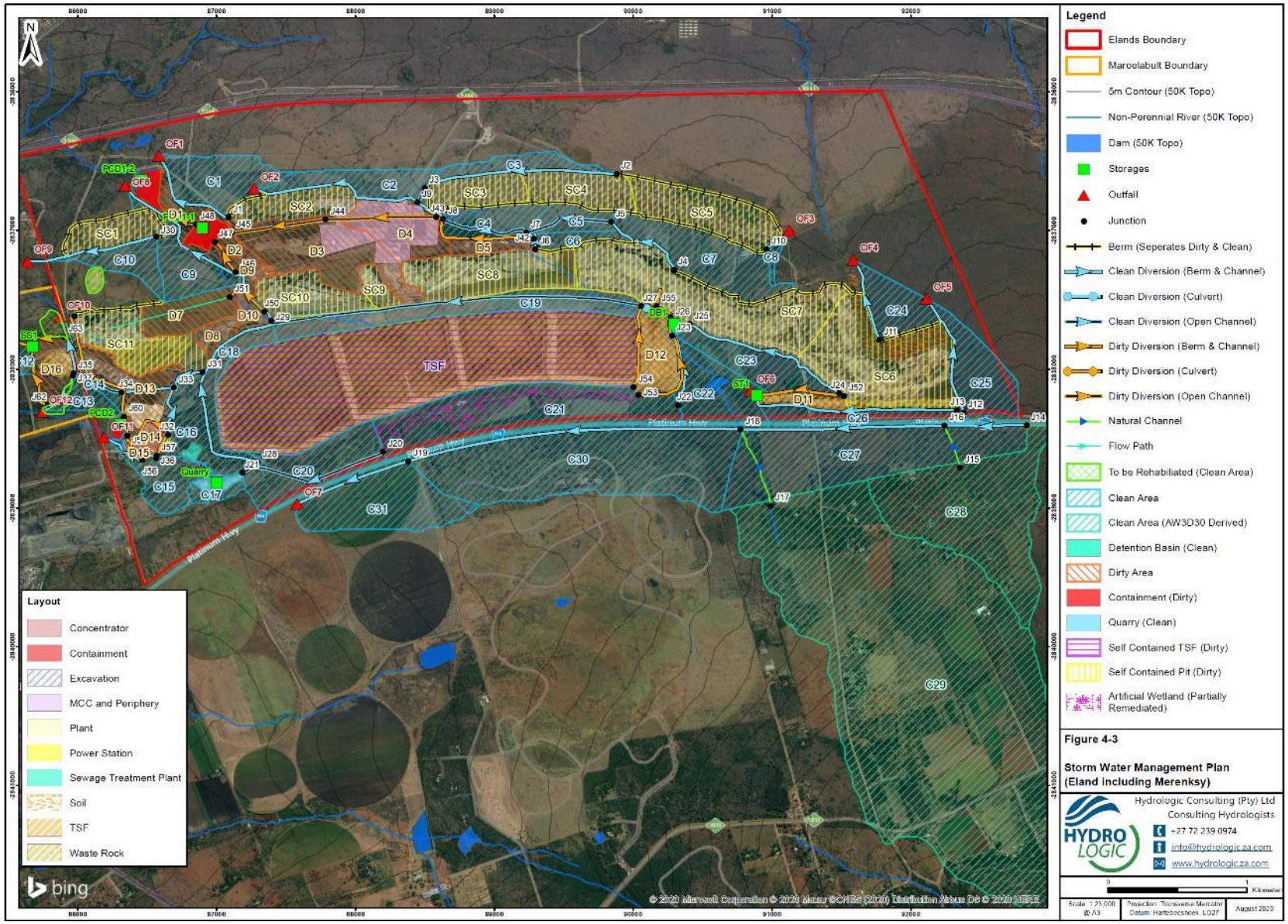


**Figure 31: SWMP for EM, including EP Proposed Projects (Highlands, 2021).**

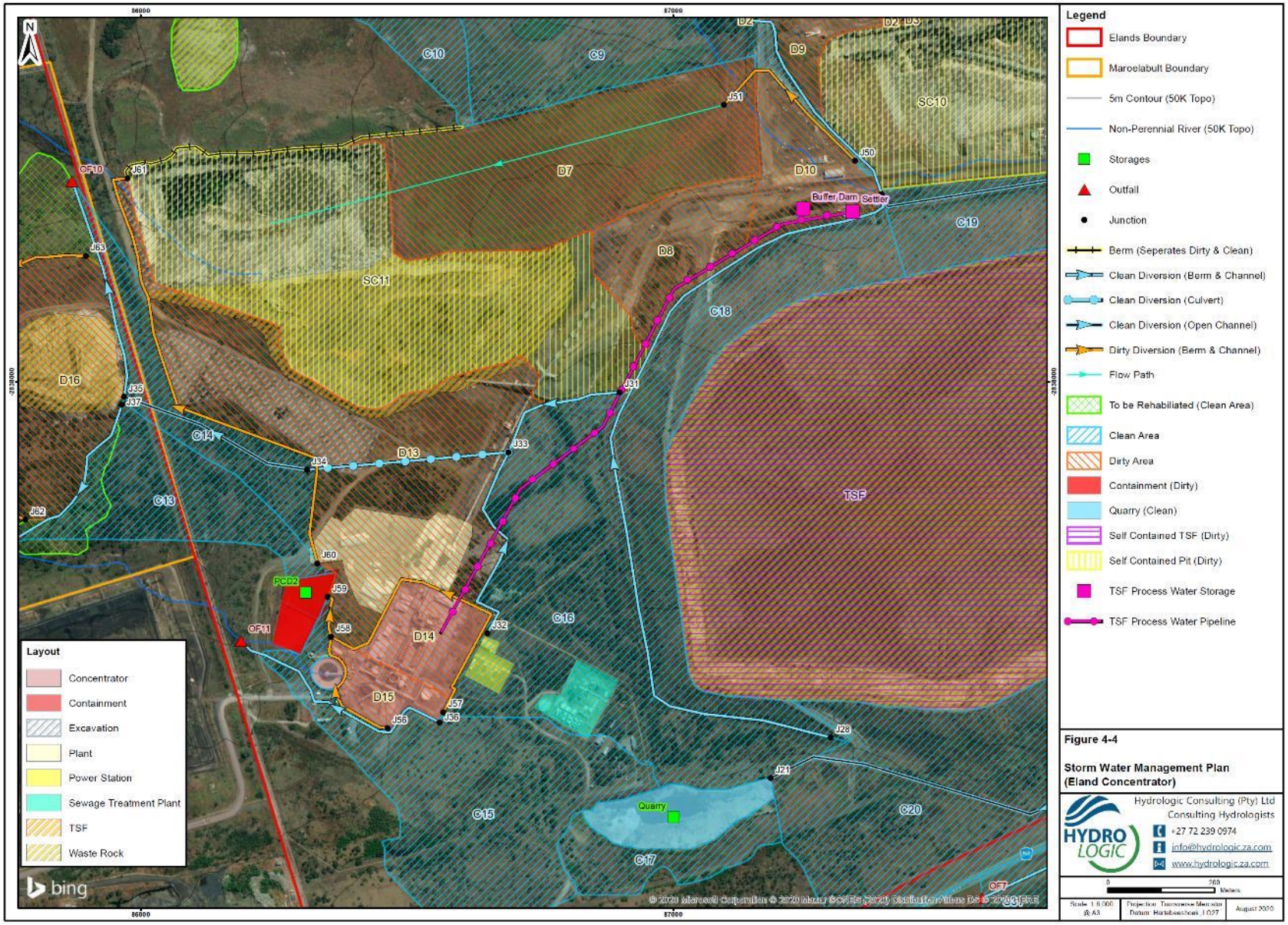


**Figure 32: SWMP for the EM Concentrator Plant area (Highlands, 2021).**

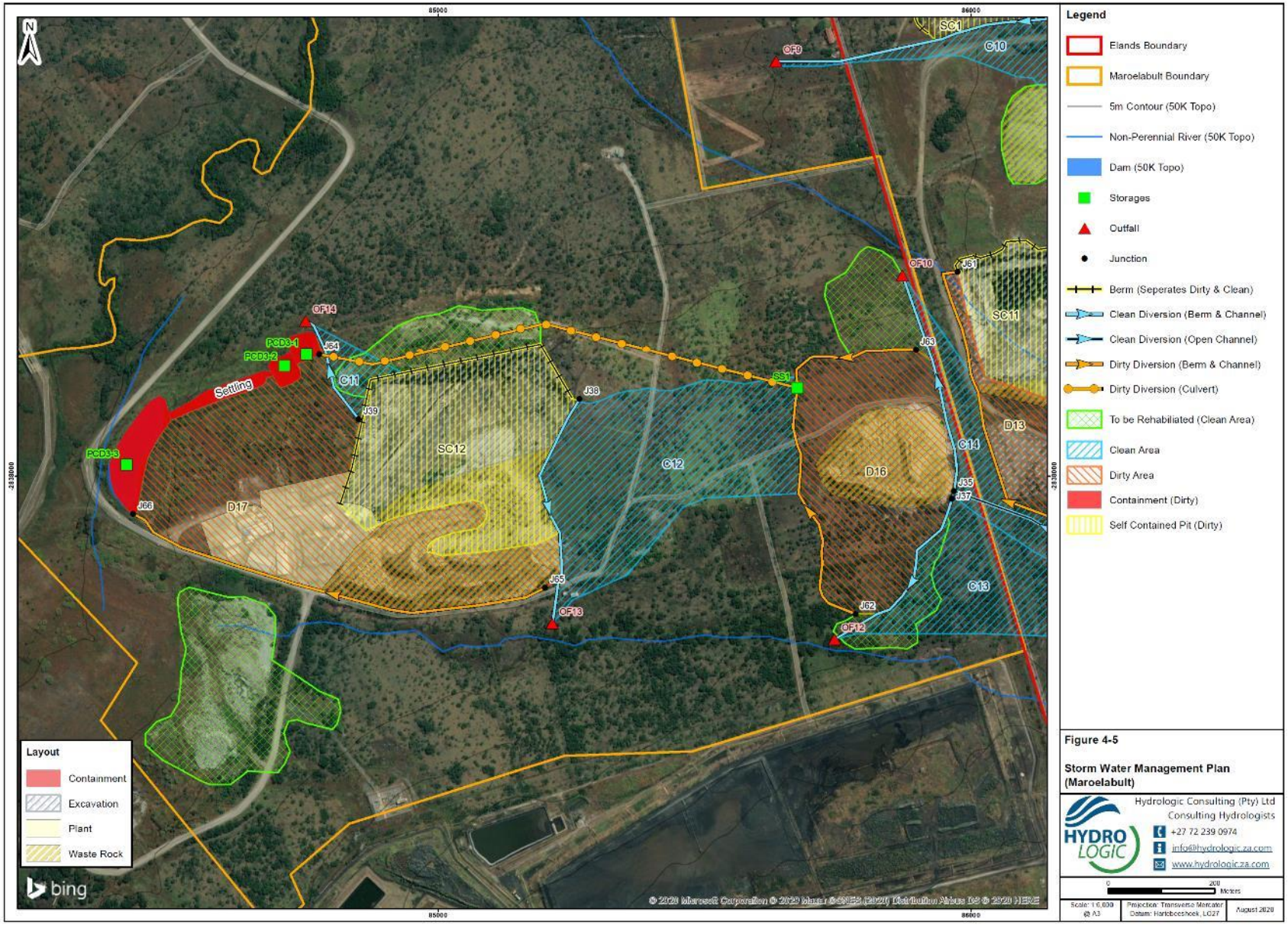


**Figure 33: SWMP for Maroelabult Mine (Highlands, 2021)**

### 9.1.10 Water Balance

***Refer to Appendix 12 for the Integrated Water Balance Simulation Model conducted by Redirile.***

Redirile Water was appointed to develop a unique Integrated Water Balances Simulation Model (IWBSM), using Arena Simulation Software from Rockwell. The simulation period for this Model is 31 years.

Water requirements for EM are calculated from the production ramp-up schedule and ratio of water required for different production types. The Concentrator Plant, Kukama Decline (DC1), Mine Offices, and Nyala Decline (DC2) are the largest consumptive users of potable water and drive the flow system (Redirile, 2021). The flow volumes between components are determined by the water use rates, water levels in dams, and the flow logic applied. Each flow has a flow number; a description of where the flow starts; and where it flows to. Rainfall is generated by the simulation, according to the historic averages, and has a major impact on flows between components. A few scenarios were tested to evaluate the impact of various new developments at the EP. The objectives of the updated IWBSM were to:

- Update the existing IWBSM with new components and flows to include:
    - Development of MM as a standalone entity that feeds into EM.
    - Development of the planned five new Merensky opencast pits.
    - Development of the TSF Mining (UG1).
    - Make provision for inclusion of the MM Decline.
    - Update production figures to include MM, Merensky Reef mining and UG1 mining of the TSF.)
    - New and altered storage facilities as indicated by the latest SWMP. This includes all the storage facilities at MM, planned Merensky opencast pits and the UG 1 development. Those are Settling Dams, Reed Bed, PCD Stormwater Sump, Steel Potable water tanks, Fire Suppression Tank and all the opencast pit pools.
    - New flows around all new components, as well as moisture in ROM at all mining operations and sewage flows.
    - Updated rainfall data from the latest SWMP, which includes 1:50 year storm events.
    - Updated catchment areas for all storage components, as indicated in the latest SWMP.

The IWBSM Flow diagram is provided below, refer to ***Figure 34 and Figure 35.***

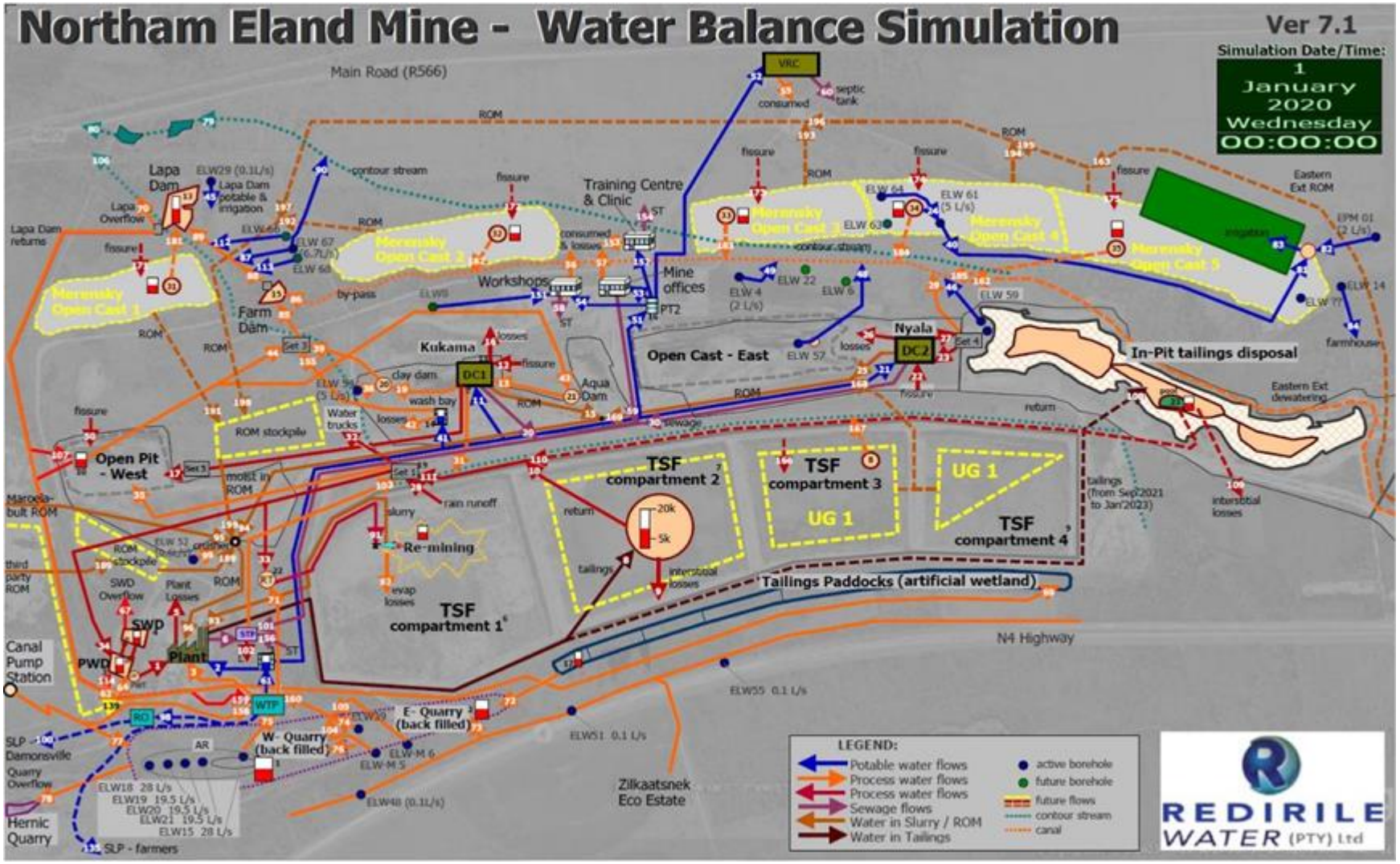


**Figure 34: Flow Diagram for Northam Eland Mine (Base Case including all planned developments) (Redirile, 2021).**

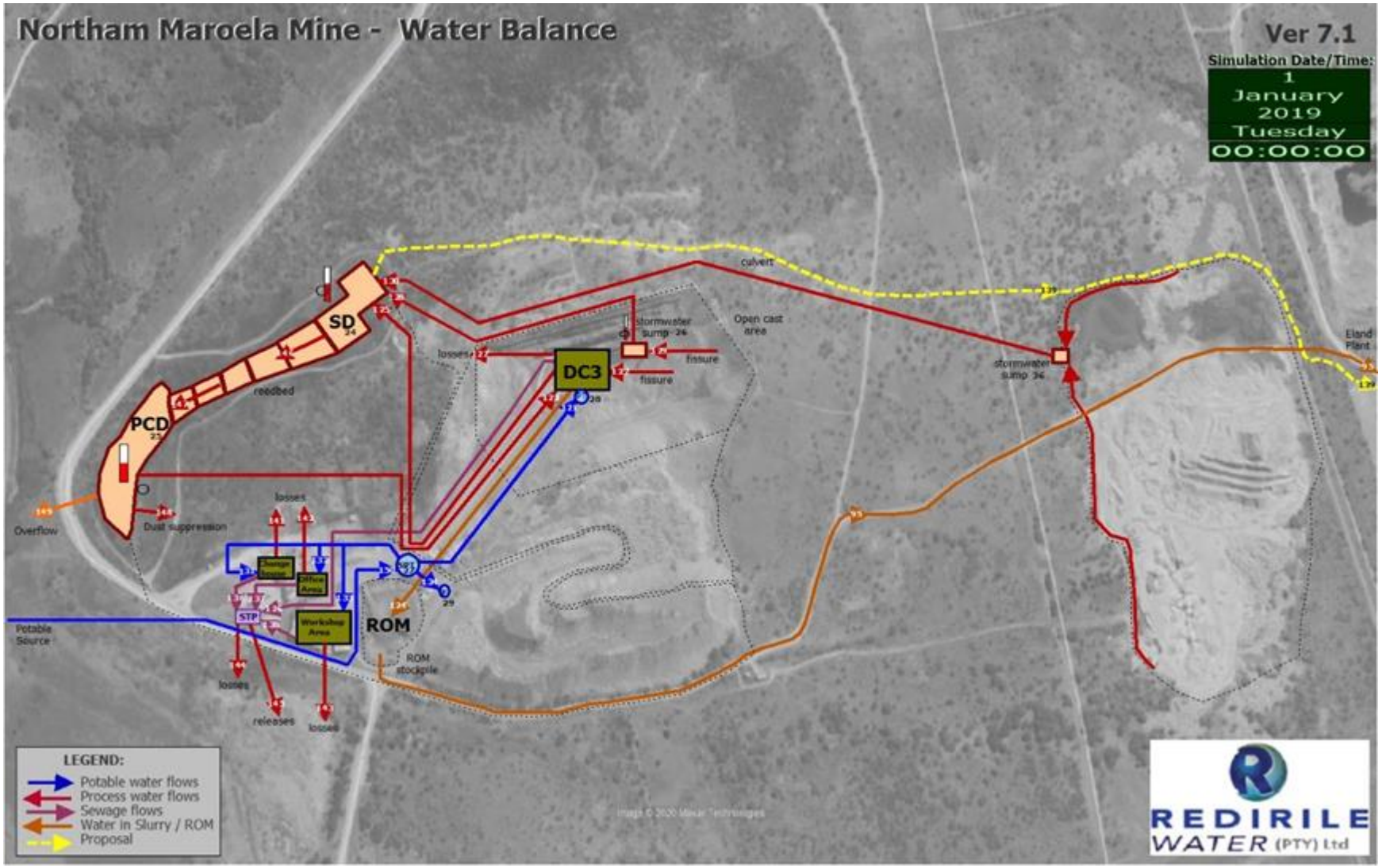


**Figure 35: Flow Diagram (FD) for Maroelabult Mine (Base Case) (Redirile, 2021).**

The IWBSM results support the following conclusions:

- EP will be able to safely implement the water supply project, included in its SLP, to local communities; and also to supply water to the farmers to the south.
- By diverting the water that is lost to the environment at present from the MM PCD to the TSF artificial wetlands and, depending on the scenario tested, a huge saving of water purchased from the Hartebeespoort Canal could be achieved.
- The current big losses to overflows at the Lapa Dam can almost be eliminated if the artificial wetlands are correctly fed, to ensure that the anthropogenic aquifers are properly managed, which will then have adequate reserves to feed the WTP demand.
- Overflows at the PCD are mostly limited to occur only during the simulated 1-in-50-year flood rainfall events.
- The water reserves available at EM are adequate to support all the planned new mining operations.

### 9.1.11 Geohydrology

The groundwater baseline in the area was obtained from:

- Hydrocensus undertaken for EM by Metago in 2006;
- Groundwater study undertaken for EM by AGES in 2006;
- Groundwater study undertaken for MM by Delta in 2012;
- Groundwater Report undertaken for Crocodile River Mine by WSM Leshika in 2015;
- Monitoring boreholes that were installed on site and quality analysis of the monitoring points;
- Information obtained from current mining operations;
- A numerical groundwater flow model undertaken by Redirile in 2021 (***Refer to Appendix 16***).

#### *9.1.11.1 Geological Features*

The regional geology comprises the RLS, ranging from basic pyroxenites and anorthosites in the lower parts to norite, gabbro and magnetite gabbros in the upper parts, refer to ***Figure 36***. There are five distinct zones within the RLS i.e., Marginal, Lower, Critical, Main, and Upper Zone. The mine is located within the western limb of the BIC, extending from Thabazimbi in the north towards Pretoria, 200km south. The BIC is comprised of western, eastern and northern limbs – all associated with platinum and chrome mining operations. The seams for the Consolidated MR Area have an east-west strike and are characterized by various faults (north-east / south-west trending) and dykes (north-west/south-east trending). The dykes are known to be semi-impermeable and act as no-flow boundaries. Preferential flows paths are associated with the dyke contact zones and faults; and in these zones higher yielding boreholes are located. The dykes form various compartments They are part of the mitigation measures, especially the dykes located north of the open pits. These dykes restrict cross compartment flows and mitigate long term mass transport downstream. A black turf of almost 2 m in thickness covers most of the Consolidated MR Area. The black turf is formed due to in-situ weathering of the gabbro/norite rocks.

Prominent faulting is present across the entirety of the site as MER and UG2 faults and dykes as well as in the wider area. These faults could act as preferential flow paths for groundwater (Redirile, 2021), refer to ***Figure 37***. This is specifically relevant to the fault that runs north-east along the drainage in the Consolidated MR Area's western part. The potential for seepages from mining underground at MM need to be checked for leakages associated with this fault.

#### *9.1.11.2 Hydrogeology of the Study Area*

##### *a) Aquifers and Groundwater Occurrence*

Two aquifer types are present in the study area and vary regarding characteristics and are commonly interconnected through fractures and faults, in particular a:

- weathered zone aquifer.
- deeper fractured rock aquifer formed through secondary fracture / fault zones.

A shallow, unconfined, water table aquifer is generally found in the regolith / saprolite down to the saprock zone. These zones are treated as a single aquifer unit and referred to as the weathered overburden. This zone varies in thickness from 10 – 50 m. The weathered overburden is considered to have low to moderate transmissivity but high storativity.

##### *b) Water Strike Depths*

Based on drilling at the mine, records of water strikes were available from 10 boreholes drilled (ELW1-ELW10). The water strikes depths range from 16 – 185 mbgl.

##### *c) Monitoring Network*

The existing monitoring network is considered extensive, with groundwater and surface monitoring sites available, refer to ***Table 25***. Groundwater quality, levels and abstraction volumes are monitored quarterly, with information available from 2016 to present. A total of 30 monitoring boreholes exists, refer to ***Figure 39***. Groundwater quality is conducted at 27 boreholes on a quarterly basis. Water quality of streams, rivers, dams and process water around the site is monitored monthly, refer to ***Figure 29***.

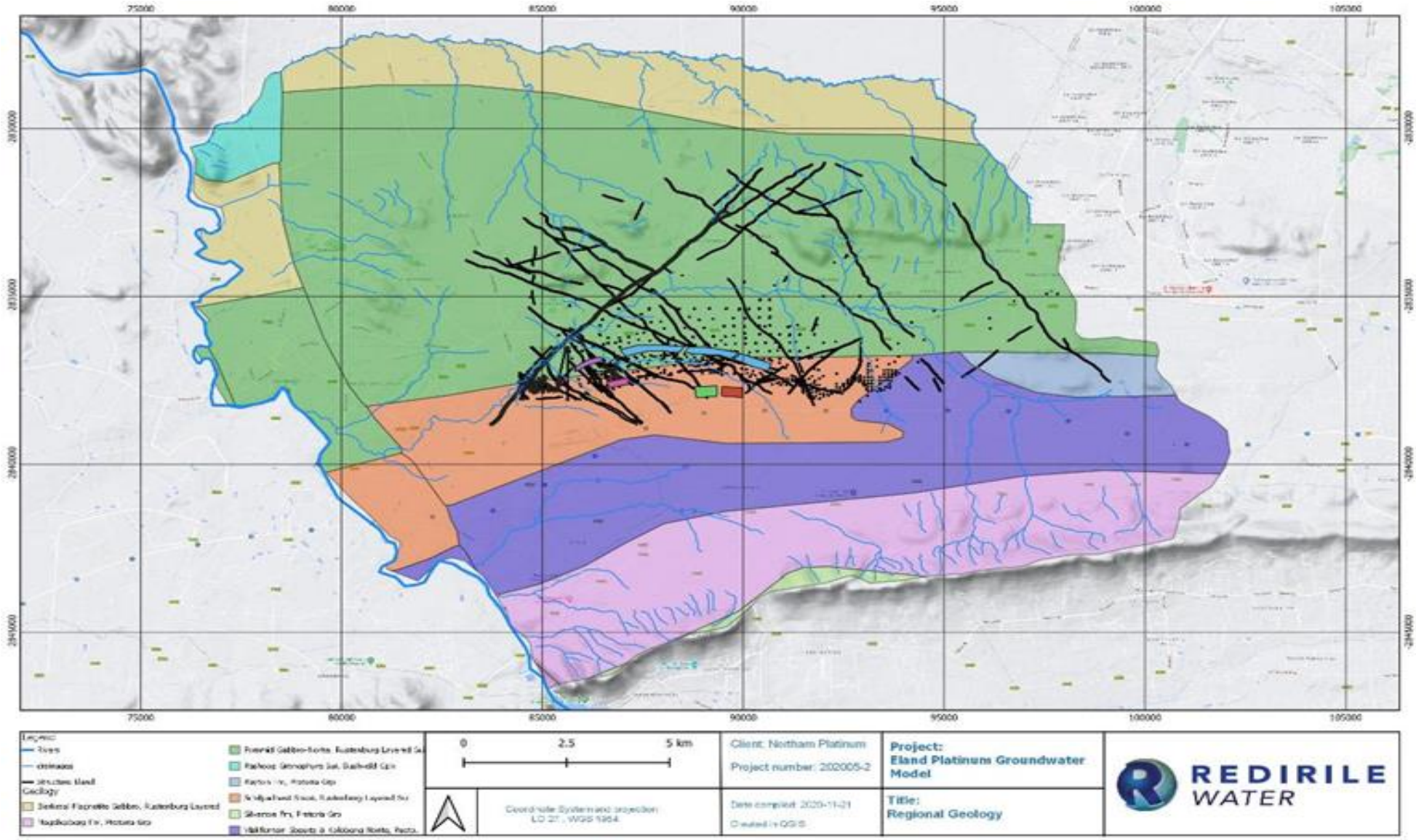


**Figure 36: Geology and the surrounding boreholes (Redirile, 2021).**

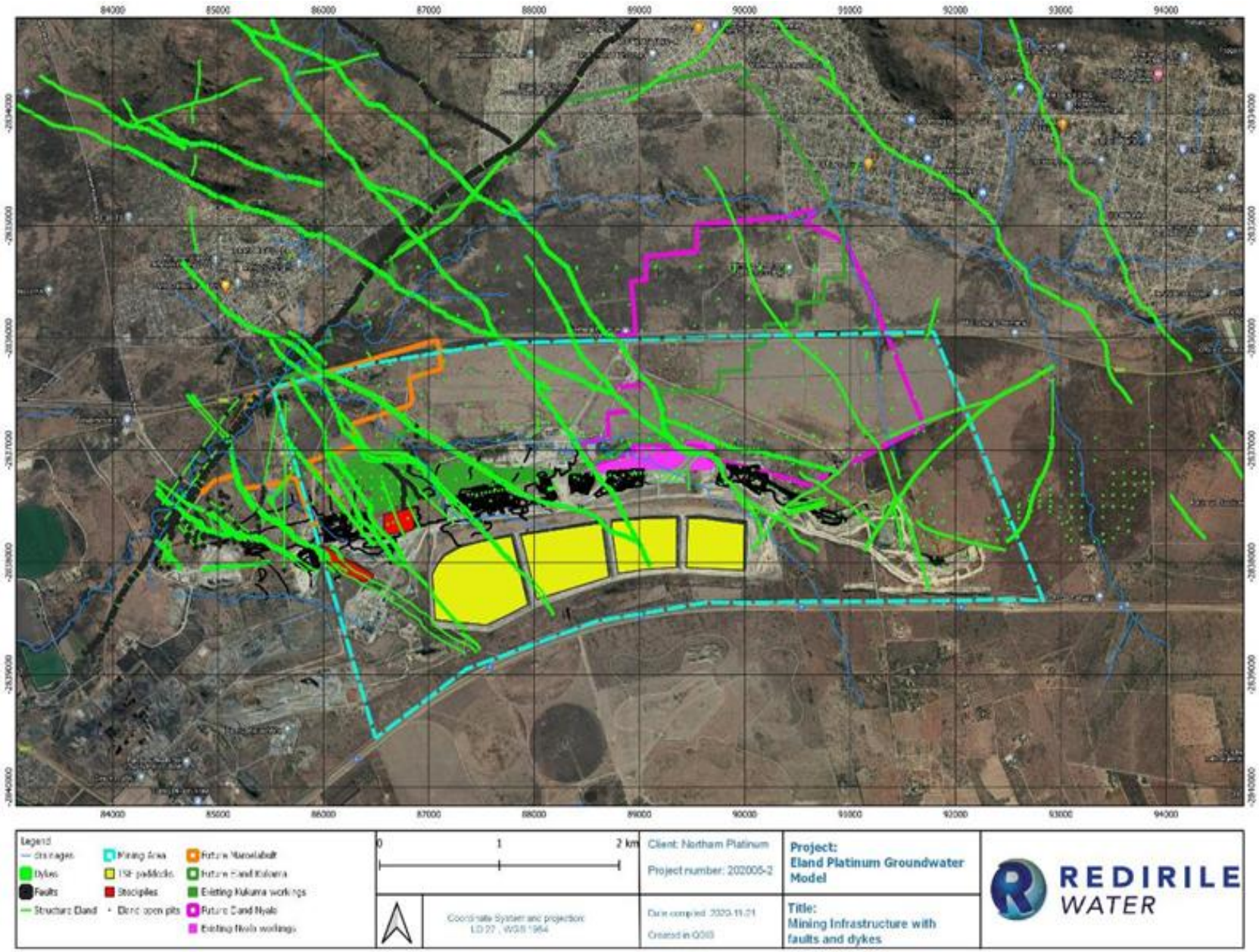


**Figure 37: Mining infrastructure with geological structures (Redirile, 2021).**

**Table 25: Monitoring boreholes and location monitored (Redirile, 2021).**

| Site | X (LO27,WGS84) | Y (LO27,WGS84) | Z (mamsl) | Water level (mbgl) | Water level Elevation (mamsl) |
|---|---|---|---|---|---|
| ELW-61 | 88179.50 | -2836888.19 | 1184.44 | No level | No level |
| ELW-M01 | 86982.45 | -2837758.24 | 1182.00 | 13.70 | 1168.30 |
| EWL-GC01 | 91364.01 | -2836947.80 | 1211.92 | 18.40 | 1193.52 |
| EWL-GC02 | 92291.27 | -2837160.73 | 1224.54 | 24.49 | 1200.05 |
| EWL-GC03 | 92717.39 | -2838272.99 | 1245.00 | DRY | DRY |
| EWL-M03 | 86250.15 | -2838249.83 | 1181.51 | 5.50 | 1176.01 |
| EWL-M04 | 86641.88 | -2838700.33 | 1194.00 | 8.65 | 1185.35 |
| EWL-M05 | 87286.82 | -2838832.40 | 1200.00 | 21.00 | 1179.00 |
| EWL-M06 | 87479.11 | -2838774.06 | 1200.00 | 19.08 | 1180.92 |
| EWL-M08 | 90749.45 | -2837005.97 | 1215.00 | No data | No data |
| EWL-M10 | 87164.89 | -2837073.61 | 1172.02 | No data | No data |
| EWL-M15 | 86830.54 | -2838843.49 | 1197.92 | 35.41 | 1162.51 |
| GEPGW1 | 89484.31 | -2836806.16 | 1200.68 | 36.55 | 1164.13 |
| GEPGW10 | 86540.85 | -2838114.34 | 1183.33 | 7.90 | 1175.43 |
| GEPGW11 | 86871.16 | -2839234.08 | 1198.45 | No Access | No Access |
| GEPGW12 | 87034.45 | -2839172.00 | 1199.70 | 19.90 | 1179.80 |
| GEPGW13 | 87423.03 | -2838948.19 | 1200.00 | 16.07 | 1183.93 |
| GEPGW14 | 88149.81 | -2838639.00 | 1202.66 | 6.78 | 1195.88 |
| GEPGW15 | 88889.14 | -2838440.40 | 1206.32 | 5.91 | 1200.41 |
| GEPGW16 | 85620.02 | -2836886.86 | 1154.03 | No Access | No Access |
| GEPGW17 | 85680.20 | -2836961.81 | 1155.40 | No level | No level |
| GEPGW18 | 91849.54 | -2838703.73 | 1242.00 | No level | No level |
| GEPGW2 | 89702.91 | -2837186.33 | 1202.74 | Blocked | Blocked |
| GEPGW3 | 86871.81 | -2836769.45 | 1168.31 | 16.47 | 1151.84 |
| GEPGW4 | 87165.63 | -2837068.63 | 1171.89 | 7.80 | 1164.09 |
| GEPGW5 | 87349.71 | -2837667.25 | 1180.00 | No level | No level |
| GEPGW6 | 89462.15 | -2842243.23 | 1234.47 | No Access | No Access |
| GEPGW7 | 89460.25 | -2842242.22 | 1234.47 | No Access | No Access |
| GEPGW8 | 95525.02 | -2837547.65 | 1240.15 | No level | No level |
| GEPGW9 | 89704.42 | -2837184.90 | 1202.74 | 62.15 | 1140.59 |
| Ela1-430 | 9075.92 | -2838310.4 | 1225 | No level | No Level |
| Ela2-310 | 91620.9 | -2838310.4 | 1236 | No level | No Level |
| Jak1-70 | 92261.89 | -2838807.68 | 1255 | No level | No Level[3] |

[3] EWL-GC02 and EWL-GC03 were re-developed and added to the monitoring network. Boreholes EL1-430, Ela2-310 and Jak1-70 are newly drilled monitoring boreholes in the eastern part of the project area.

### *d) Hydrocensus*

A hydrocensus was carried out around the Consolidated MR Area in July 2020. Its aim was to identify groundwater boreholes other than the monitoring boreholes and inform the current groundwater conditions around the Consolidated MR Area (Redirile, 2021). From the 70 sites visited, a total of 27 groundwater levels were recorded, refer to ***Figure 38***. 16 boreholes were found equipped with submersible pumps and reported yields varying between 0.5 and 5 L/s. Samples were collected at selected boreholes; sampled locations are provided in ***Figure 38***.

### *e) Flow direction*

The general flow direction is north-west, towards the major drainages and driven by topography. In some areas, for example around borehole GEPGW9 and hydrocensus boreholes PD, Elands 3, Elands 5 and boreholes JL, localized drawdown is observed, refer to ***Figure 40.*** Based on the available information, the mining activities i.e., opencast and underground mining, have little to no regional impact on groundwater levels in the shallow aquifer. Abstraction boreholes influence neighbouring boreholes for a limited period i.e., while abstraction occurs, however, this impact is mitigated once pumping ceases and water levels indicate a quick recovery.

### *f) Water Quality*

A Piper plot is a tri-linear plot where the hydro-chemical composition of water samples is evaluated determining the ratios of predominant cations and anions. The plot is divided into water facies depicting the dominant ratios. The calcium-magnesium-bicarbonate (left quarter) of the Piper diagram is normally characterized by recently recharged water. The sodium-bicarbonate (bottom quarter) is typical of flow within the aquifer, with the sodium replacing the calcium and magnesium in solution. The sodium-chloride dominant (right quarter) is associated with stagnant or slow-moving groundwater with little or no recharge. The sulphate dominant (top quarter) is typical of water impacted by the oxidation of pyrite, or other sulphate bearing sources.

The Piper diagram in ***Figure 41*** indicates that the local groundwater regime exhibits unaffected groundwater qualities. The diagram indicates that most of the boreholes plot within the calcium-magnesium-bicarbonate waters, indicating recently recharged water.

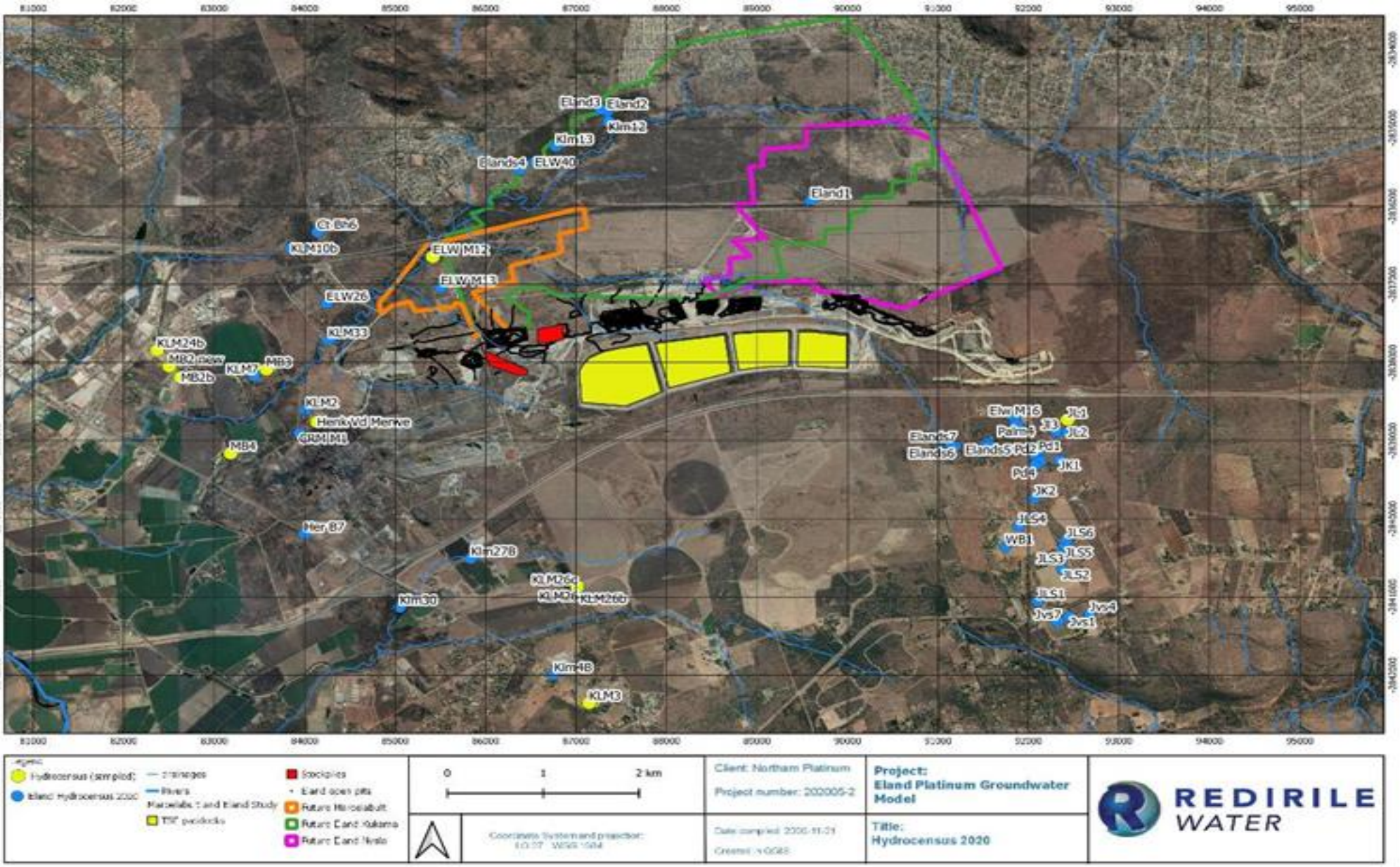


**Figure 38: Hydrocensus data July 2020 (Redirile, 2021).**


**Figure 39: Location of monitoring boreholes (Redirile, 2021).**


**Figure 40: Groundwater flow contours (mamsl) and directions for May 2020 (Redirile, 2021).**

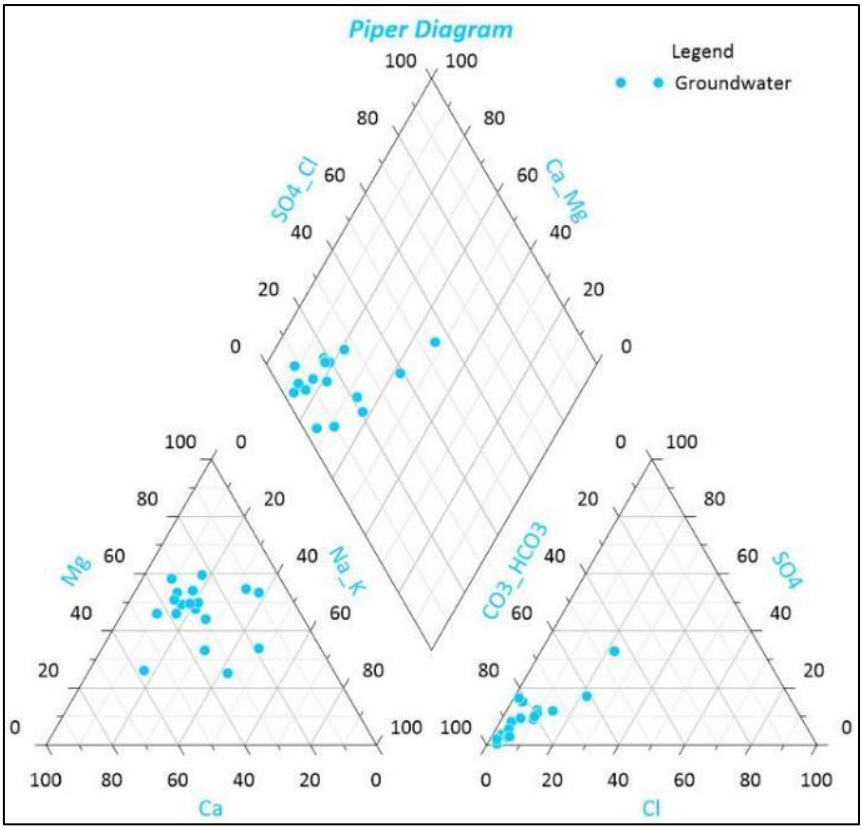


**Figure 41: Piper Diagram for groundwater water based on May 2020 results (Redirile, 2021).**

#### *9.1.11.3 Groundwater Model*

A numerical model was developed for the EM Consolidated Surface Area and surroundings, refer to the Figures below. The numerical groundwater flow model assists in determining the impact on the groundwater regime in terms of quantity (groundwater ingress and groundwater levels) due to opencast and underground mining, together with the impact on the groundwater quality due to surface infrastructure based (proposed RoM stockpiles, TSFs and underground and opencast mining). Different scenarios were modelled for the period year 2021 to 2050, refer to ***Figure 42*** for the model's outcome. The simulated inflows for each mining area were developed and is shown in the ***Figures below***. The simulated heads were developed for the shallow aquifer and for the deep aquifer simulated results. The total simulated inflows for the entire complex are between 100-120 l/s. Most of the dewatering is present at MM due to the fault zone in the western part of the mining area. In 2044 Kukama dewatering ramps up in the model due to the deep mining.

The shallow aquifer experience minimal impact from the simulated mining and localised dewatering is observed (Redirile, 2021). The dewatering impacts remain localised around the EM Surface boundary about 800 m, extending a maximum distance of 5 km along the fault to the south west of Maroelabult at about 5 m in the fractured layer. Drawdown is evident from the simulations at the fault at MM as underground mining advances.

Nitrate ($NO_3$-N) concentrations were used in this investigation as an indicator of contamination, to simplify the groundwater flow modelling exercise. Nitrates show high background concentrations. The simulated mass migration from the TSF Paddocks is contained on site by opencast mining and abstraction boreholes. Mining and abstraction in the area, together with the dykes, will control the movement of pollution from EM Consolidated Surface Area (Redirile, 2021).

The potential mass migration is limited to 300 m from the proposed backfill areas i.e. remains on the EM. The source is potentially managed such that the migration is limited, and the potential impact on any sensitive receptors is mitigated. The 180 day (6 months) and 2.5 year simulations are indicated in ***Figure 52 and Figure 53***.

EM and MM have an extensive groundwater monitoring network. Any reduced groundwater quality is actively identified through the groundwater monitoring programme.

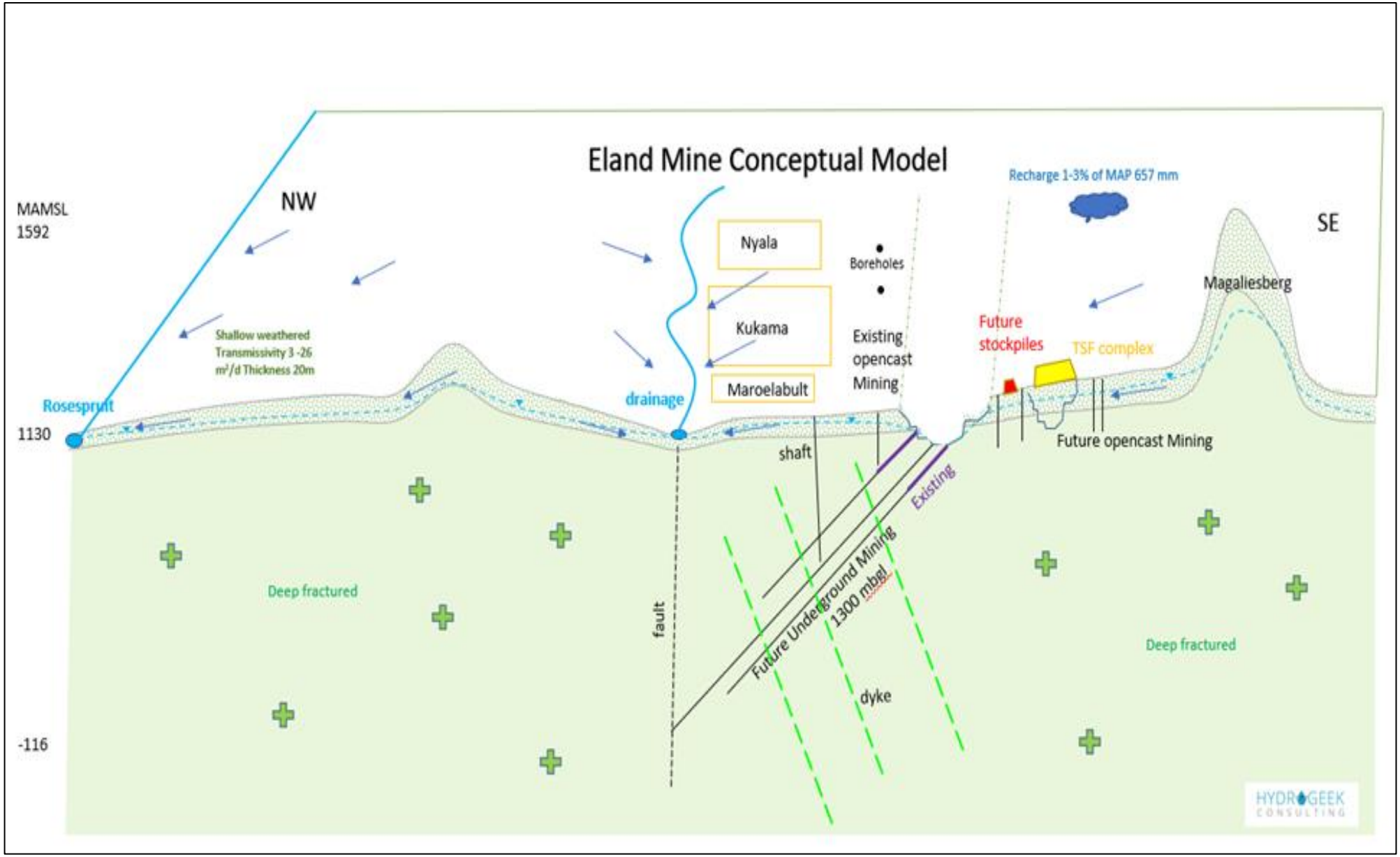


**Figure 42: Detail conceptual model of aquifer regime associated with current and planned activities at Eland Platinum Mine (Redirile, 2021).**

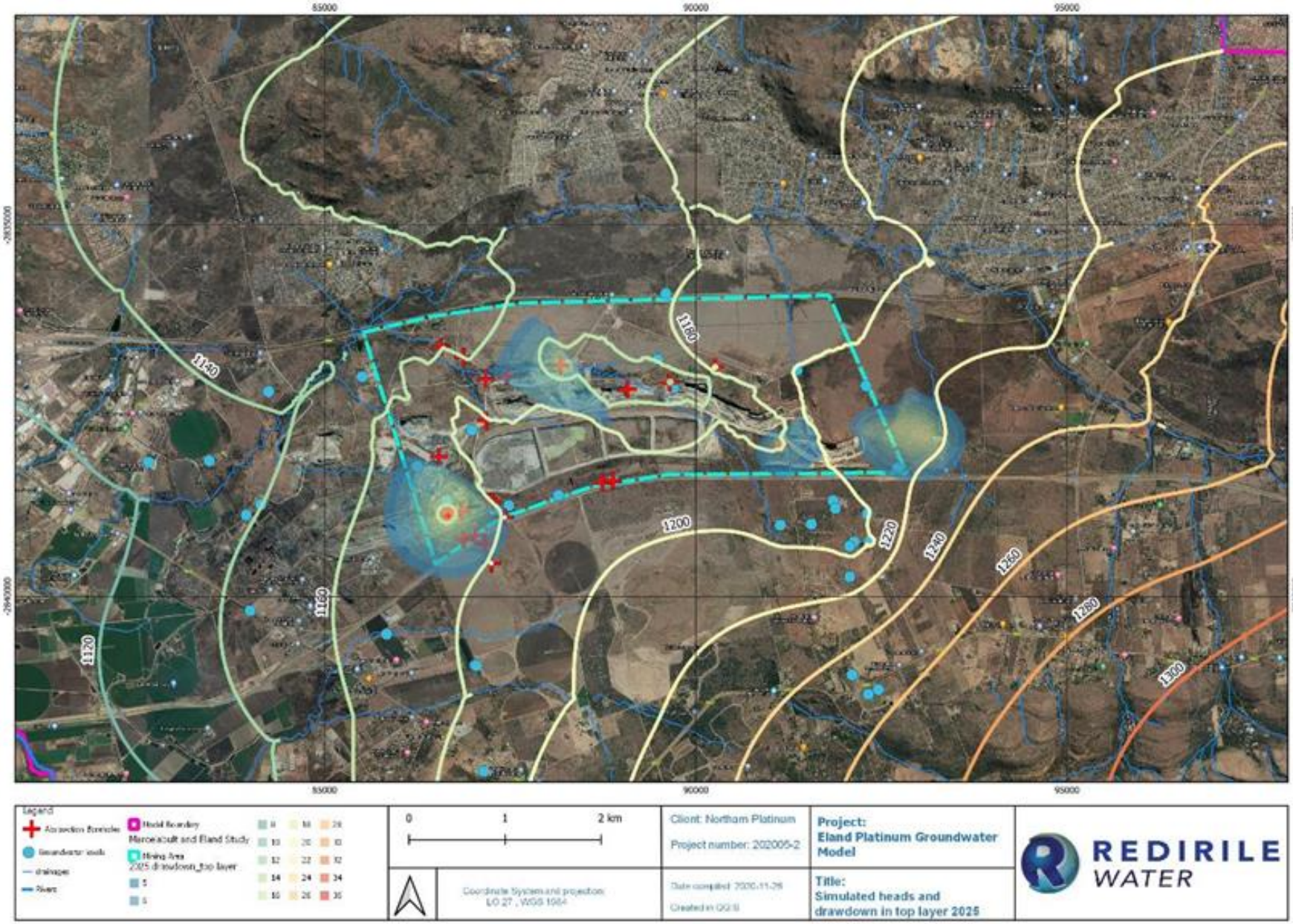


**Figure 43: Simulated heads for year 2025 – shallow aquifer (Redirile, 2021).**

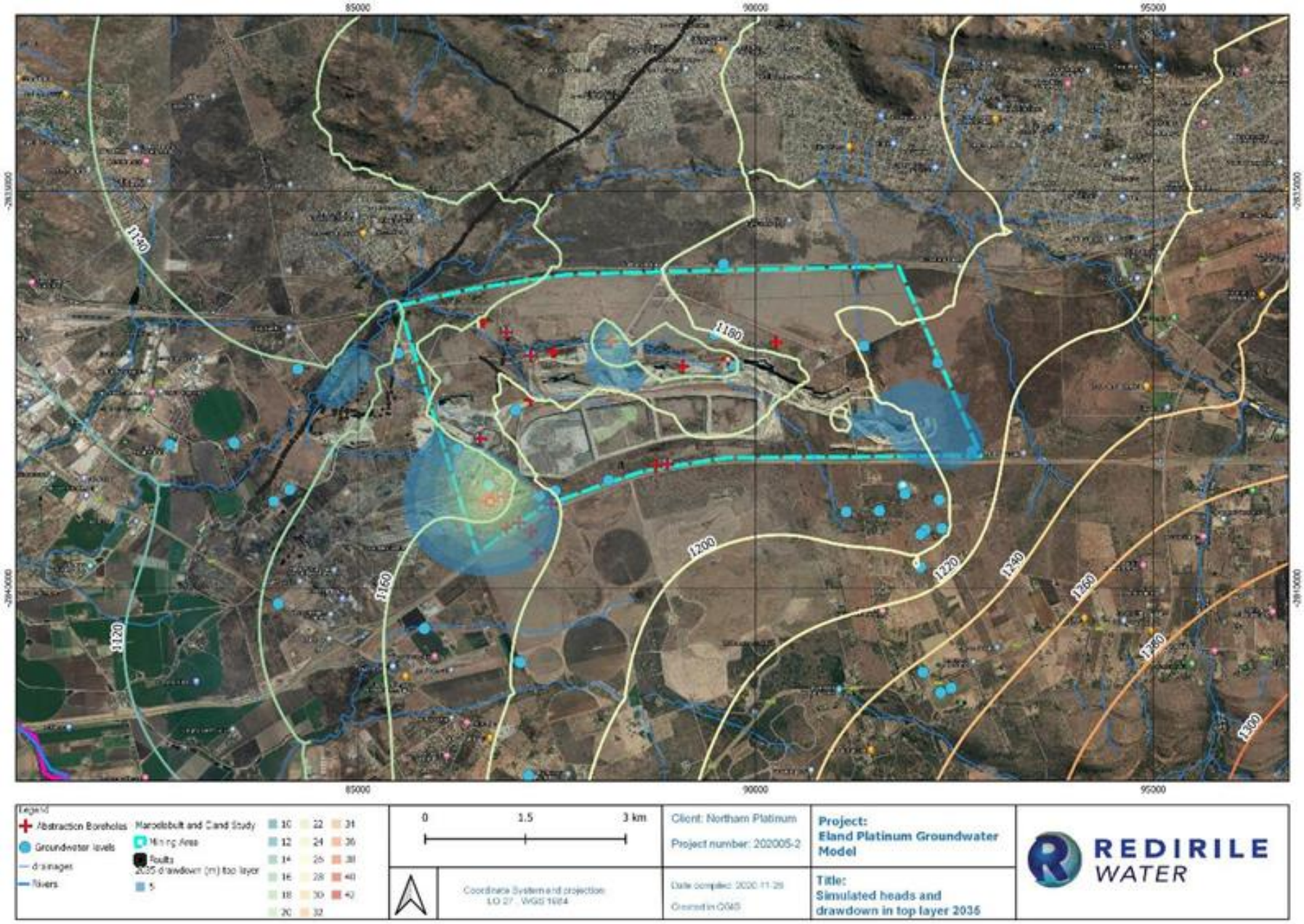


**Figure 44: Simulated heads for year 2035 – shallow aquifer (Redirile, 2021).**

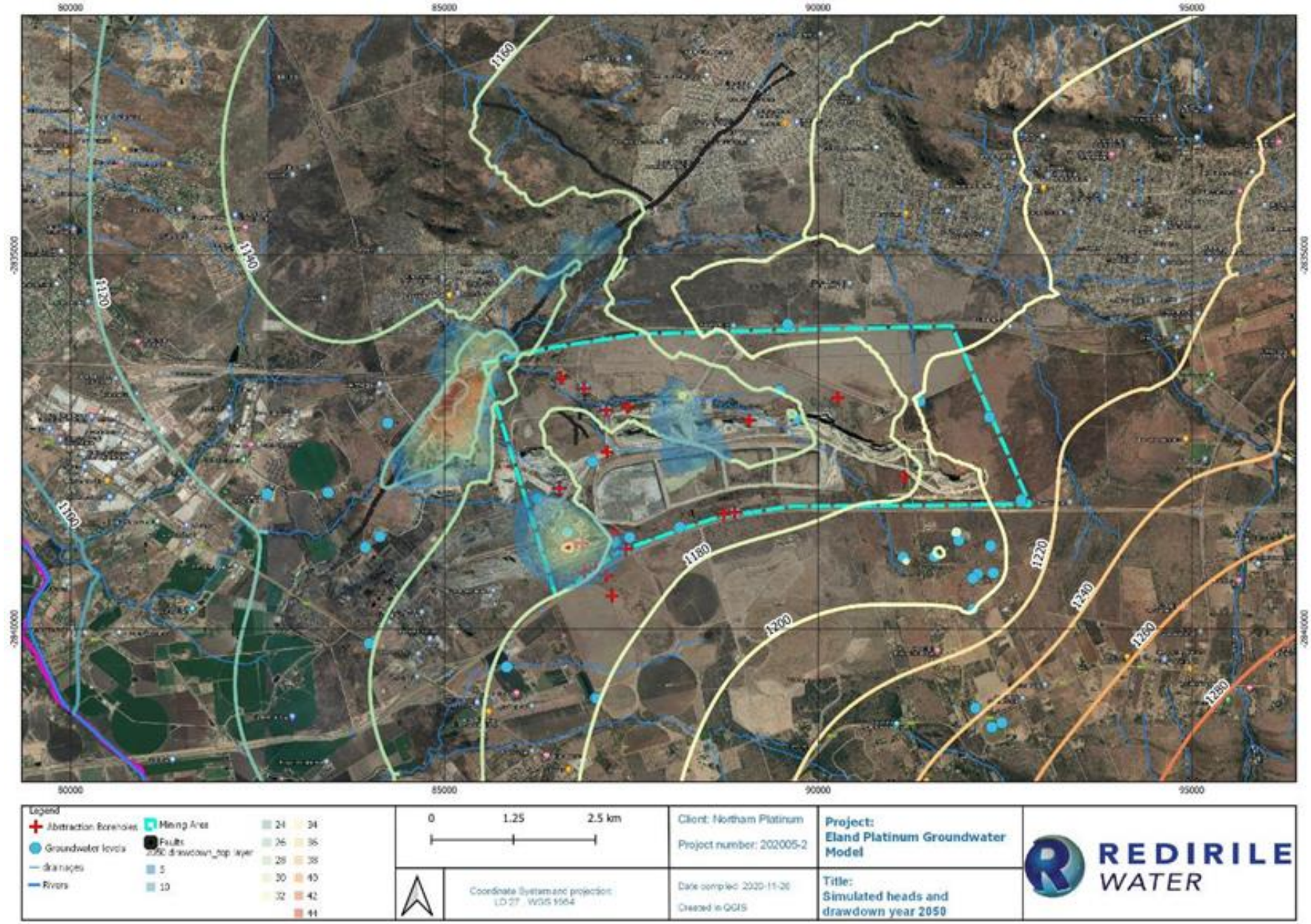


**Figure 45: Simulated heads for year 2050 – shallow aquifer (Redirile, 2021).**

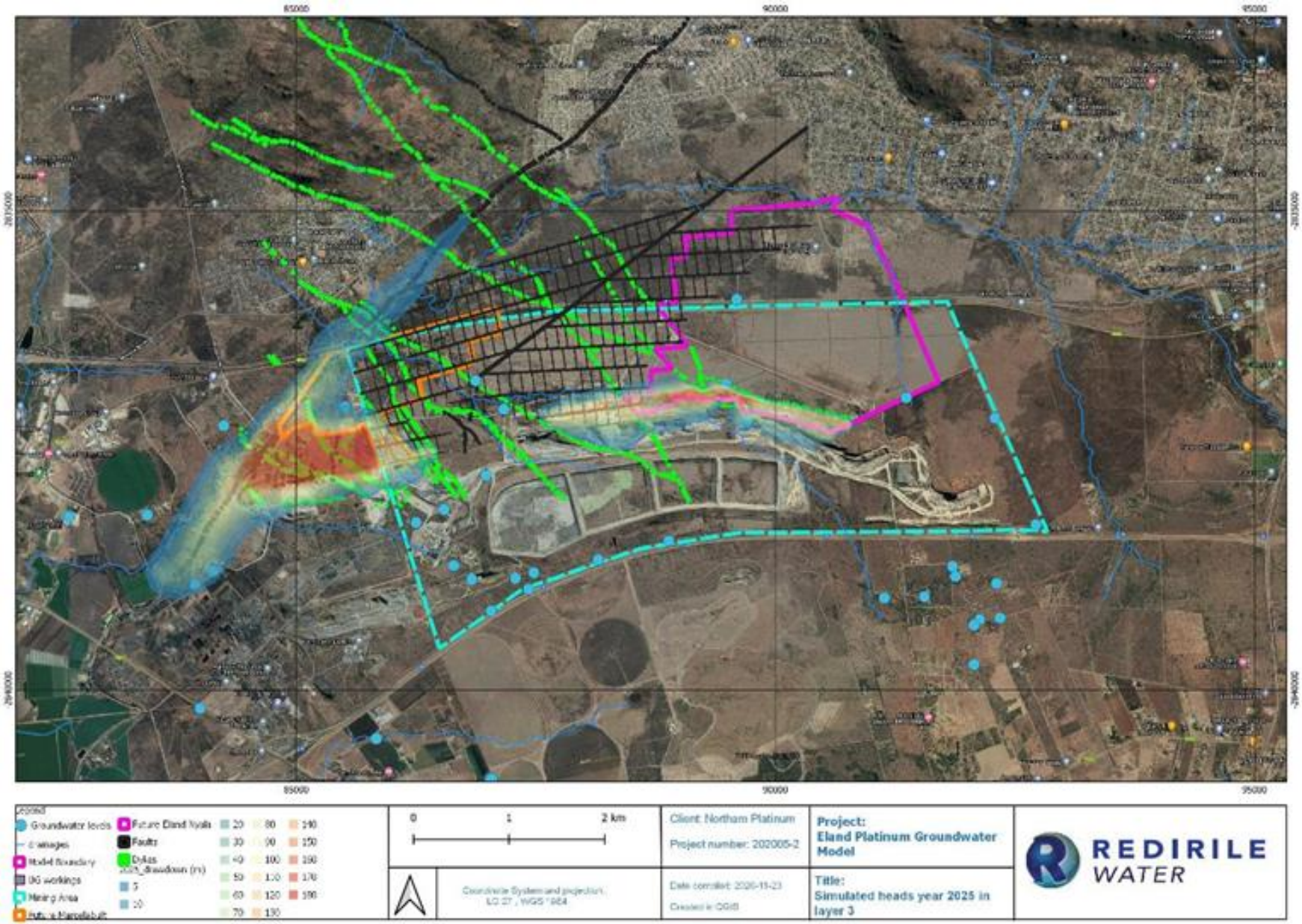


**Figure 46: Simulated heads for year 2025 – deep aquifer (Redirile, 2021).**

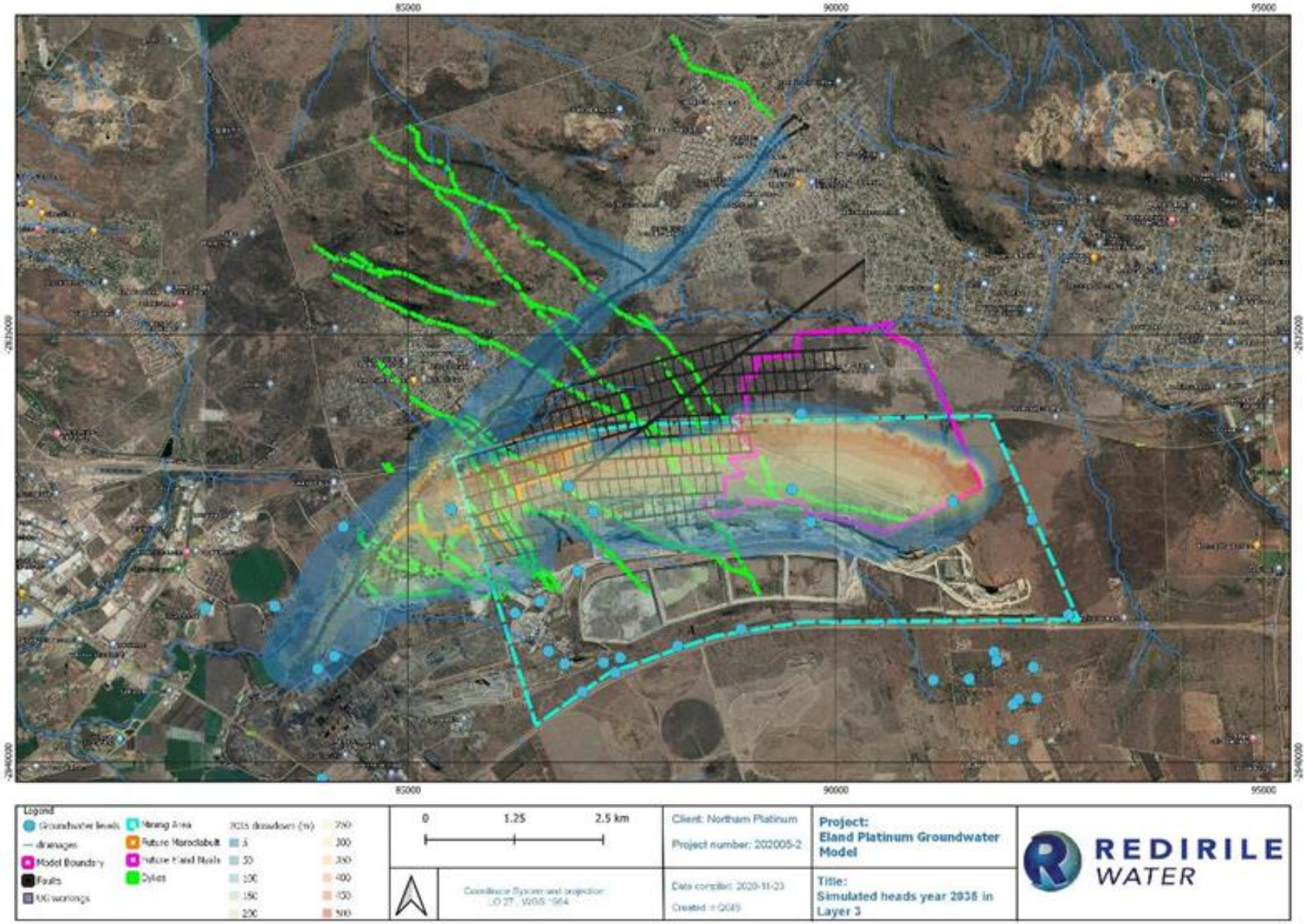


**Figure 47: Simulated heads for year 2035 – deep aquifer (Redirile, 2021).**

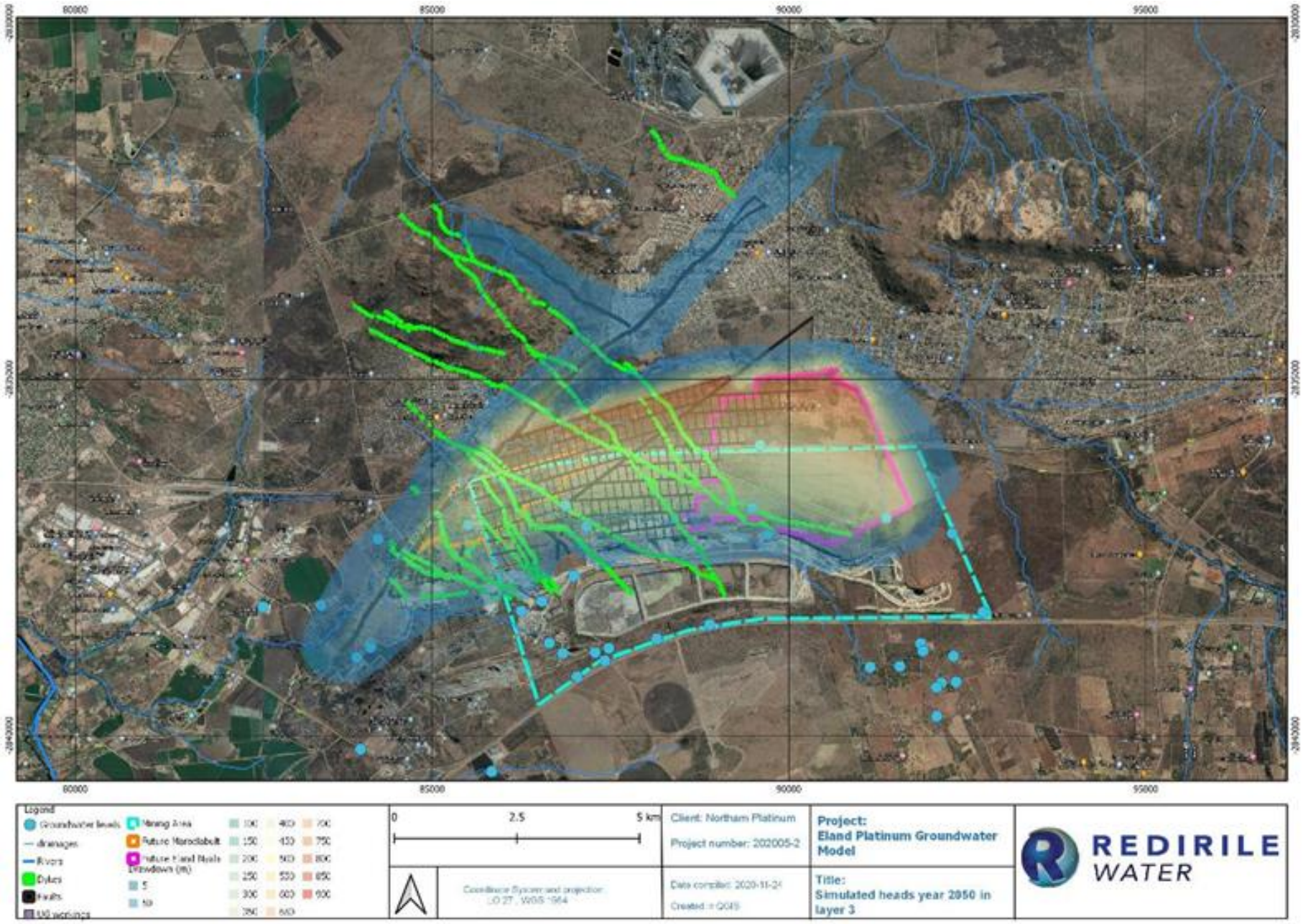


**Figure 48: Simulated heads for year 2050 – deep aquifer (Redirile, 2021).**

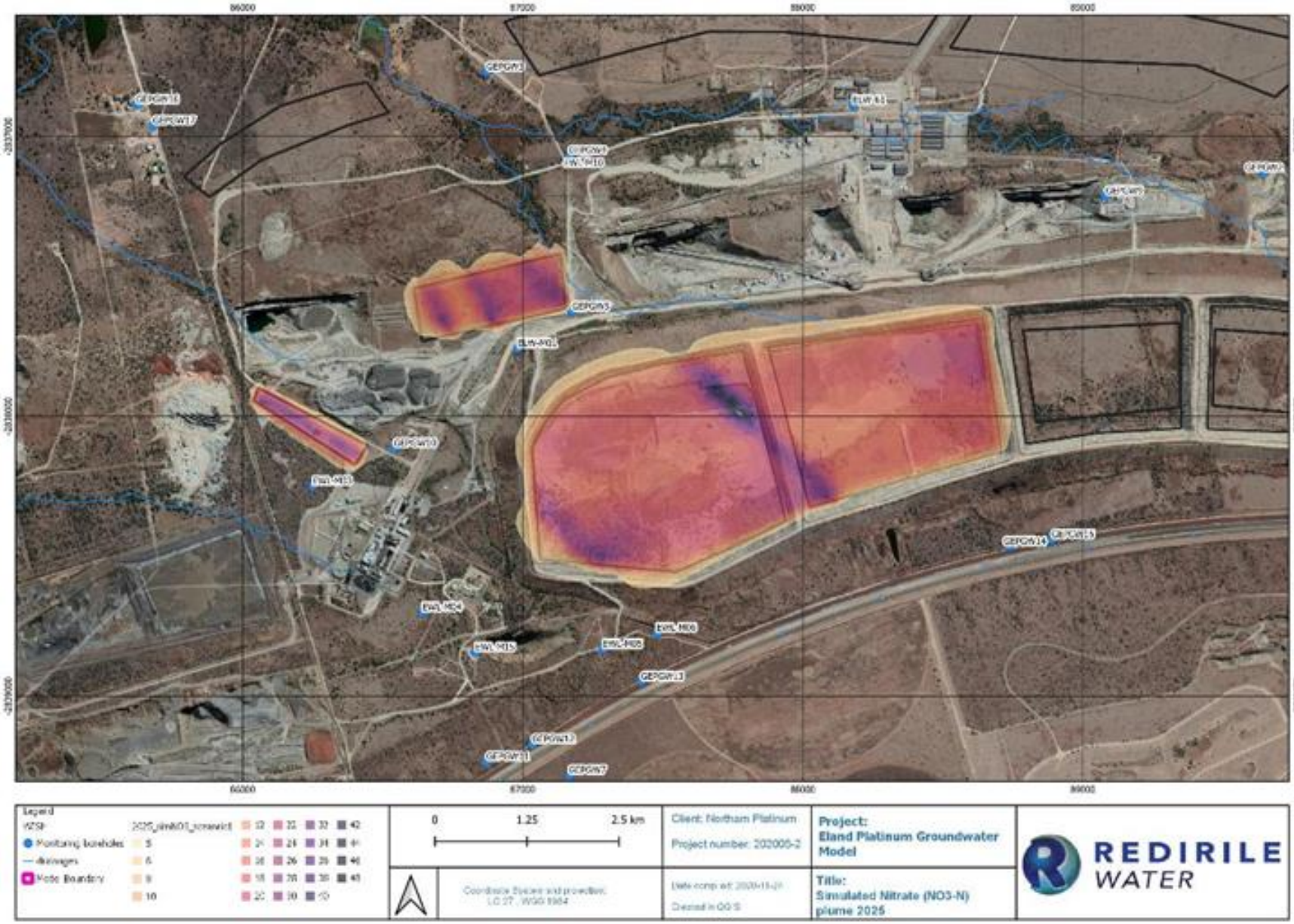


**Figure 49: Simulated Nitrate (NO3-N) mass migration 2025 (Redirile, 2021).**

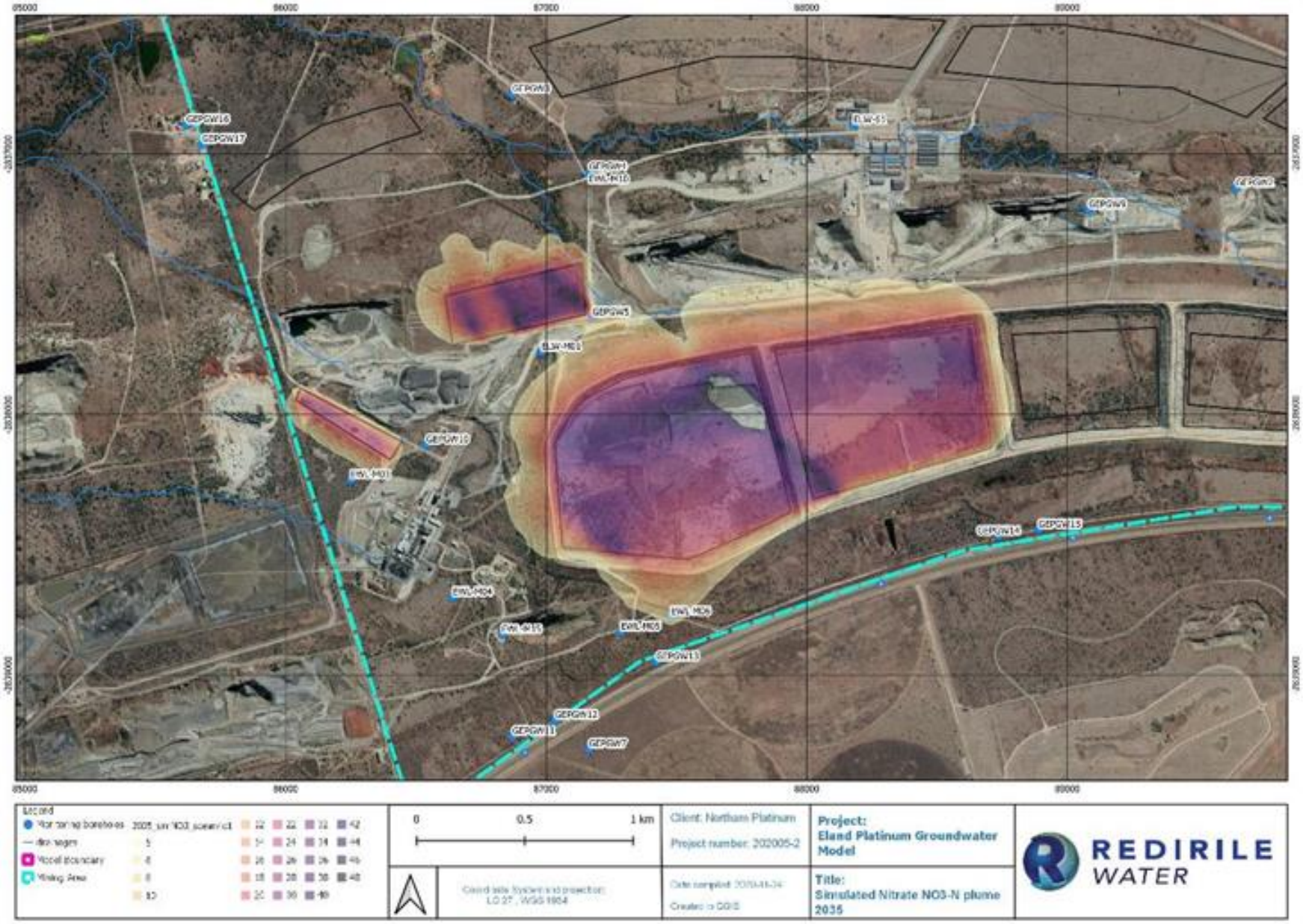


**Figure 50: Simulated Nitrate ($NO_3$-N) mass migration 2035 (Redirile, 2021).**

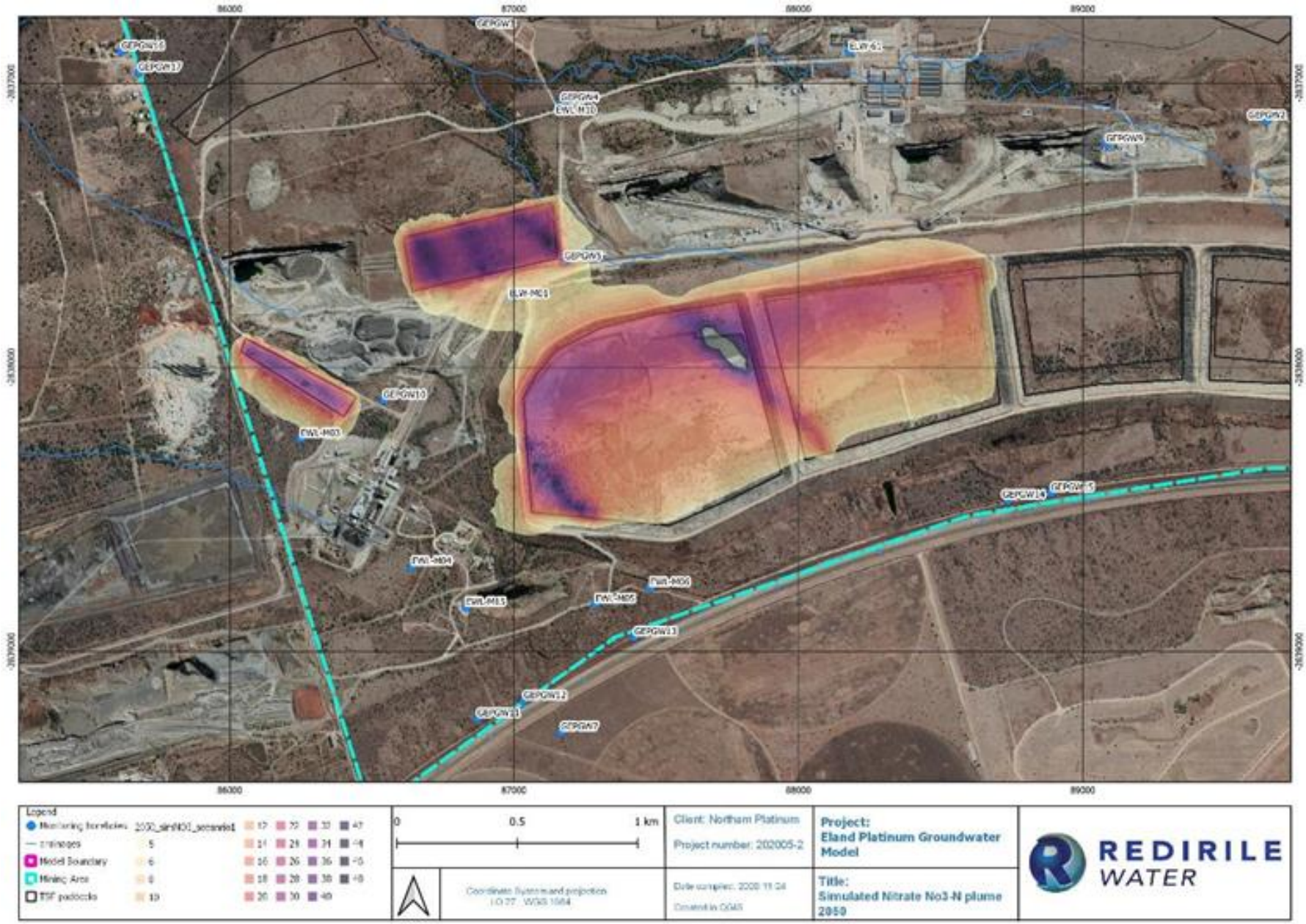


**Figure 51: Simulated Nitrate ($NO_3$-N) mass migration 2050 (Redirile, 2021).**

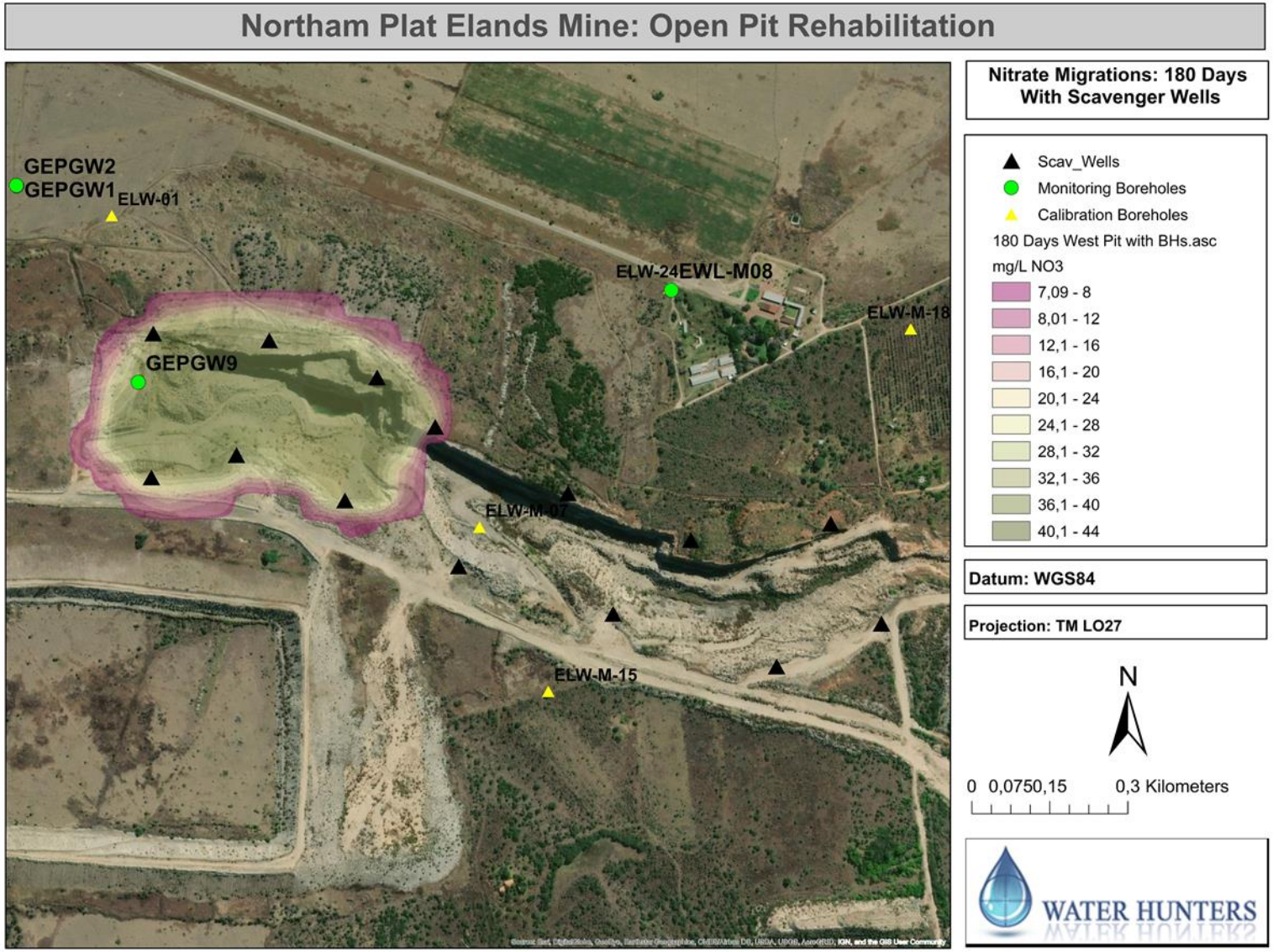


**Figure 52: Potential mass migration (180 days) with increased recharge to the area and scavenger wells implemented. The zone of impact is isolated to less than 300m from the backfilled areas.**

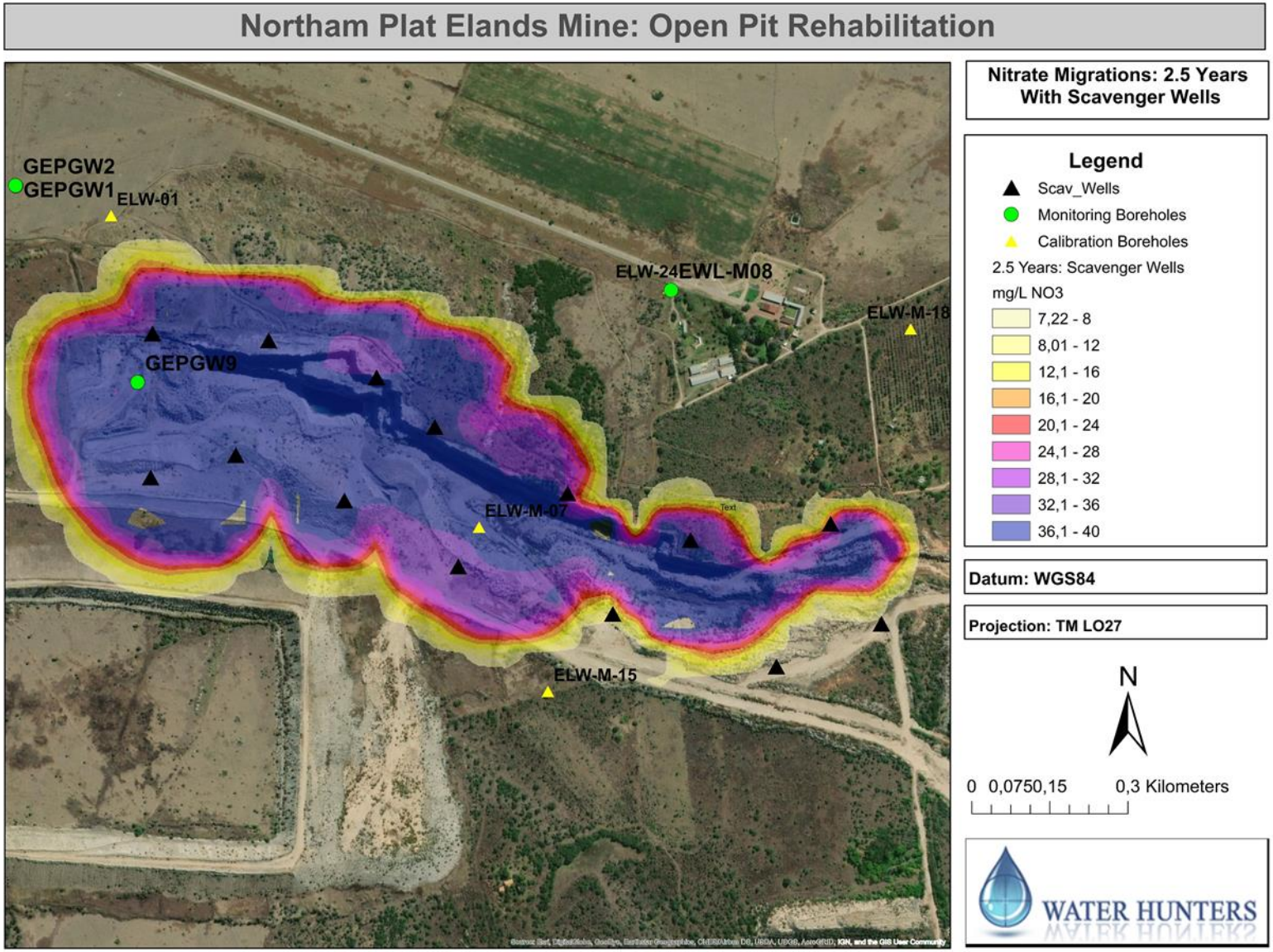


**Figure 53: Potential mass migration (2.5 years) with increased recharge to the area and scavenger wells implemented. The zone of impact is isolated to less than 300m from the backfilled areas.**

### 9.1.12 Waste Classification

***Refer to Appendix 14: Waste Classification and Geochemical Analysis undertaken by Redirile.***

Geochemical characterisation and waste classification was carried out for the EM as a specialist study for an EIA Application in 2019 (CHEMC, 2019). The tailings in Paddock 1 were classified as Type 3 Waste following the GN 635 classification system. However, the TSF Paddocks were designed accordingly and approved as a Section 21(g) Water Use as per the Eland Platinum WUL.

A detailed geochemical assessment i.e., sample analyses and long-term geochemical modelling was conducted as part of the EM Consolidation Project, to characterise the material to be used. The study aims to evaluate the medium to long-term geochemical behaviour of tailings material to be used as pit backfill as part of the rehabilitation strategy, in terms of potential risks. The proposed rehabilitation by means of in-pit tailings disposal incorporates different waste streams:

- UG2 Tailings from the Eland TSF,
- MG Tailings from Jubilee,
- LG Tailings from Clover.

And the ROM Material from the:

- MER Tailings from Merensky Reef ore
- UG2(2) Tailings from UG2 ore

The proposed dispositioning will occur over a project lifecycle of 5 years. Numeric geochemical modelling was used as a tool to quantify geochemical risks by taking time dependent mineral kinetic rates into account. Essentially, this allows the backfill material to be placed in the internationally accepted source-pathway-receptor assessment methodology, which is also preferred and recommended by the then DEA (2010). Thus, the risks quantification through kinetic geochemical models will help to contextualise existing laboratory data and simulated model results, in terms of legal compliance, and determine if leached substances meet all statutory requirements. Furthermore, kinetic geochemical models aid to evaluate if the water quality that leach from the tailings backfill area meets given guidelines for the immediate downstream users; and to identify potential future liabilities. Mining activities takes place near local and informal residential areas with the most common water uses pertaining to domestic use and livestock watering. The hydrogeochemical baseline assessment of groundwater and surface water in the area will be evaluated against the SANS 241: 2015 drinking water standards to serve as a guideline for identification of non-compliance. The simulated long-term water quality will be evaluated against the 2019 hydrocensus baseline as determined in the hydrogeochemical baseline assessment. The SANS 241: 2015 standards will also serve as a comparative guideline.

The project had the following main objectives:

- Conduct a waste classification in terms of NEMWA GN635;
- Development of representative conceptual models built on the foundation of existing laboratory data, highlighting the main physical-chemical processes influencing the pit backfill;

- Development of numeric geochemical models, to evaluate and quantify medium to long-term geochemical risks associated with the pit backfill and the ROM Material for the Stockpile areas;
- Assessment of potential long-term (100 years) leachability of specific contaminants, as highlighted in the distilled water leach tests and water quality monitoring data.

#### *9.1.12.1 Waste Classification*

***a) Leachate concentration***

The comparison between the leachate results and the regulatory guideline values is shown in ***Table 26***. It is evident that all element and chemical substance concentration levels for the leachable metal(loid)s and inorganic anions are below the LCT0 limits.

***b) Total concentration***

The comparison between the total analysis results and the regulatory guideline values is presented in ***Table 27***. Only the lowest regulatory value (TCT0) of cobalt, chromium (total), copper, nickel, vanadium and zinc for all tailings waste samples is exceeded for the solid material. The TCT0 values for barium, manganese, and lead are exceeded for two of the tailings samples. The TCT0 value for antimony is exceeded for one of the tailings samples. Regulatory TCT1 limits are not exceeded by any of the waste constituents.

***c) Waste classification results***

According to NEMWA GN635, the results of the comparison of the leach concentration and total concentration need to be used collectively, to generate a final classification of the material. The material assessed falls in the following criteria, which is wastes with all element and chemical substance leachable concentration levels for metal ions and inorganic anions below or equal to the LCT0 limits are considered Type 3 waste, irrespective of the total concentration of elements or chemical substances in the material. According to these criteria, the tailings classify as Type 3. However, the leach test methodology, as legislated in NEMWA GN635, does not take geochemical processes, like mineral solubility and rate of dissolution and immobilisation of chemical elements into consideration. As shown in the environmental geochemical specialist study outlined below, the recommendation is made that the waste be classified as Type 4, as the likelihood of hazardous substances leaching from the mine waste and tailings material is negligible.

***d) Hydrogeochemical Baseline Assessment***

To aid in the assessment of risk to groundwater, the hydrocensus data was used to calculate an upstream baseline using the 95th percentile. Furthermore, existing process water and groundwater quality monitoring data were evaluated in terms of current baseline. The description of the site-specific process water and groundwater quality is therefore based on the boreholes and surface sites sampled during the monthly and quarterly monitoring conducted by Aquatico Scientific (Pty) Ltd

### *9.1.12.2 Geochemical Analysis*

Modelling of geochemical processes is used as a tool to quantify the medium to long-term geochemical risks associated with the mining waste material. The quantification of potential geochemical risks is based on a conceptual understanding of the physical environment and dynamic processes, which is built on the foundations of the available data and sound scientific principles. The conceptual model is used to build a numeric geochemical model that considers the geochemical processes over time. A geochemical model was developed to determine the influence the pit backfill leachate quality over the medium to long-term.

A simplified conceptual model was developed and used as a basis to identify the most important geochemical processes that may influence the pit backfill. The conceptual model, as graphically illustrated in ***Figure 54,*** will be used as a guide during the conceptualisation of model scenarios and the geochemical interaction simulations. The number correspond to the most important geochemical zones, which includes:

1 - Rainfall and evapotranspiration;
2 - Geochemical reactions within the pit backfill; and
3 - Leaching of source term products to sensitive receptors

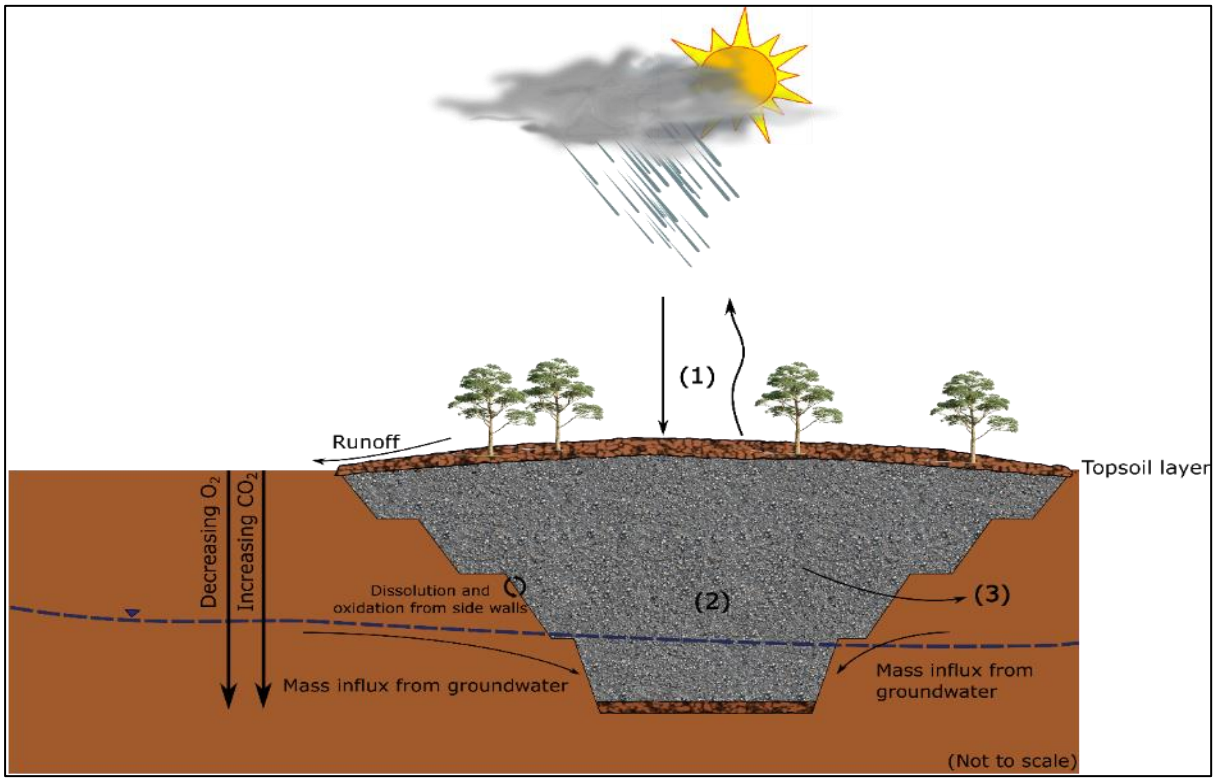


**Figure 54: Simplified conceptual model of the pit backfill as a geochemical system showing the most important water flow paths. (Redirile, 2020).**

### *a) Rainfall and evapotranspiration*

Although rainfall and evapotranspiration processes are not important from a geochemical point of view, it serves as the driver of water availability within the pit backfill. Water is important for geochemical reactions to take place and serves an important transport mechanism of dissolved components. Water availability within the pit backfill is expected to fluctuate with the wet and dry seasons. A topsoil crest will facilitate increased runoff to minimise water ingress to the backfilled pit.

### *b) Geochemical reactions within the pit backfill*

Water was considered as the contaminant flow paths as it will be responsible for the transport medium of dissolved potential contaminants in the pit backfill. Mineralogical, acid-base accounting (ABA) and sulphur speciation data was obtained from laboratory reports compiled by Waterlab (Pty) Ltd. The proposed pit backfill material, which will include tailings material from different source streams (UG2 Tailings from EM TSF, MG Tailings from Jubilee, LG Tailings from Clover), and Run of Mine stockpile material (Mer and UG2 ore), were analysed for mineralogical composition, major element concentrations, acid generation potentials and sulphur species.

Sulphur speciation of the tailings material suggest that acid producing sulphide minerals such as pyrite only occur in trace amounts, i.e., very low concentrations. Sulphide minerals are therefore not a significant component of the tailings material and pyrite was included as a rare (<1 wt%) mineral in the models. The main minerals of the BIC (mafic minerals with chromite) tend to weather to kaolinite and smectite type clay minerals, which is also confirmed by the mineralogical analyses of the tailings material. The most important secondary phases included talc, smectite-type clays, kaolinite, chlorite and amorphous material.

None of the mineral phases are redox sensitive, implying that exposure to oxygen is not expected to be a driving force in the dissolution of any of the mineral phases. Dissolution and secondary mineral precipitation due to contact with water is thus expected to be the dominant geochemical processes. In addition, adsorption to secondary mineral phases is also expected to be important.

The primary minerals to consider in the weathering models, which are bound to have an influence on both groundwater and surface water (process water) hydrochemistry, include anorthite, enstatite, chromite, muscovite, diopside and actinolite. These minerals weathering and dissolution have the greatest influence on the tailings pore water and groundwater and process water chemical signatures, which will dictate the hydrogeochemical parameters and simulations of the pit backfill scenarios.

Previous assessments of acid mine drainage ("**AMD"**), by use of static acid-base accounting tests, found that the tailings material does not have a potential to produce acid, having net-neutralisation potentials (NNP) that correspond to the United States Environmental Protection Agency (U.S. EPA) criteria. According to the U.S. EPA method, a NNP of less than 20, a neutralisation potential ratio of less than 1 and a negative neutralisation potential all indicate that a sample could be potentially acid producing. A positive neutralisation potential suggests that the gangue minerals may be able to neutralise any acid formed. However, as indicated by the positive NNP values and the study area alkaline groundwater and process water conditions, the gangue minerals also present in the samples

are of such a nature and concentrations that they will buffer any acid that is produced. Furthermore, the total sulphur percentages of less than 0.25% indicate that the tailings materials are non-acid forming. The mine waste therefore poses minimal risk for the development of AMD conditions. due to the waste material and host geology being dominated by mafic mineral rocks and being deficit of significant sulphide mineral content.

The mineralogical analyses indicated the absence of carbonate minerals; but the average pH of the groundwater is ~8.2, which indicates that the activity and oxidation of metals is unlikely. This suggest that the tailings and gangue material's buffer capacity far outstrip the acidity produced by the oxidation of trace amounts of sulphides.

The fluid influx rainwater and outflow from evaporation and seepage to underlying sediments introduce dilution and concentration of dissolved constituents in the pit backfill material, especially in the upper oxidation zone. In the dry season, water is removed from the backfill material through evaporation. This decreases the water to rock ratio and causes increase in dissolved ion load. In the rainy season, however, more water falls on the pit backfill and can infiltrate into the systems. The greater water volume in the pit backfill, the greater the water to rock ratio which causes dilution of dissolved constituents. However, as mentioned previously, the proposed topsoil crest will facilitate rainfall runoff and minimise water infiltration to the pit backfill.

***c) Leaching of source term products to sensitive receptors***

The shallow weathered and deeper fractured aquifers are for the purposes of this study considered from a hydrogeochemical perspective to aid in the quantification of geochemical risks to the environment. From this perspective the aquifer systems should be considered sensitive receptors and as an important transport pathway for potential contaminants.

The reactions in the groundwater systems are expected to mirror those already described in the previous section, as the in-situ geology include the tailings mineralogy and therefore also chemical composition however, less concentrated. From a hydrogeochemical perspective the most important processes in the aquifers are expected to be mixing, dilution, ion exchange and precipitation. Adsorption is an important process, as the hydroxide and clay content in the pit backfill mineralogy are high which could act as mineral substrates for dissolved constituents.

From this perspective only nitrogen is viewed as a potential risk. This is due to the redox conditions and the presence of microbes in the groundwater, which have the potential to reduce nitrate to ammonia, but not further to nitrogen gas. If nitrate is then changed to ammonia, the total nitrogen concentration remains relatively constant over time.

**Table 26: Result of the comparison between the leach concentration threshold (LCT) values of Regulation 635 and the mine waste material. (Redirile, 2020).**

| Inorganic Waste constituents | Abbreviation | R635 Leach Concentration Threshold Values | | | | Eland Mine Leachate Concentrations | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | LCT0 | LCT1 | LCT2 | LCT3 | Tailing Dam 2 Open End Feed 1 | SC/MG | CLOVERL G6 | MER | UG2(2) |
| | | *mg/L* | *mg/L* | *mg/L* | *mg/L* | *mg/L* | | | | |
| **Metal Ions** | | | | | | | | | | |
| Arsenic | As | 0.01 | 0.5 | 1 | 4 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Barium | Ba | 0.7 | 35 | 70 | 280 | 0.013 | <0.001 | <0.001 | 0.024 | 0.018 |
| Cadmium | Cd | 0.003 | 0.15 | 0.3 | 1.2 | <0.001 | <0.001 | <0.001 | 0.002 | <0.001 |
| Cobalt | Co | 0.5 | 25 | 50 | 200 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Chromium (Total) | Cr | 0.1 | 5 | 10 | 40 | 0.030 | 0.016 | 0.002 | <0.001 | <0.001 |
| Hexavalent Chromium | Cr(VI) | 0.05 | 2.5 | 5 | 20 | 0.010 | <0.010 | <0.010 | 0.012 | 0.054 |
| Copper | Cu | 2 | 100 | 200 | 800 | 0.001 | <0.001 | <0.001 | <0.010 | <0.010 |
| Mercury | Hg | 0.006 | 0.3 | 0.6 | 2.4 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Manganese | Mn | 0.5 | 25 | 50 | 200 | <0.025 | <0.025 | <0.025 | <0.001 | <0.001 |
| Molybdenum | Mo | 0.07 | 3.5 | 7 | 28 | 0.001 | <0.001 | <0.001 | <0.025 | <0.025 |
| Nickel | Ni | 0.07 | 3.5 | 7 | 28 | 0.002 | <0.001 | <0.001 | <0.001 | <0.001 |
| Lead | Pb | 0.01 | 0.5 | 1 | 4 | <0.001 | <0.001 | <0.001 | 0.004 | 0.001 |
| Antimony | Sb | 0.02 | 1 | 2 | 8 | <0.001 | <0.001 | 0.002 | <0.001 | <0.001 |
| Selenium | Se | 0.01 | 0.5 | 1 | 4 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Vanadium | V | 0.2 | 10 | 20 | 80 | 0.003 | 0.010 | 0.002 | <0.001 | <0.001 |
| Zinc | Zn | 5 | 250 | 500 | 2 000 | <0.001 | <0.001 | <0.001 | 0.004 | 0.001 |
| **Inorganic Anions** | | | | | | | | | | |
| Total Dissolved Solids | TDS | 1 000 | 12 500 | 25 000 | 100 000 | 34 | 74 | 74 | 30 | <10 |
| Chloride | Cl | 300 | 15 000 | 30 000 | 120 000 | <2 | <2 | 2 | <2 | <2 |
| Sulphate | $SO_4$ | 250 | 12 500 | 25 000 | 100 000 | <2 | 2 | 22 | <2 | <2 |
| Nitrate as Nitrogen | $NO_3$-N | 11 | 550 | 1 100 | 4 400 | <0.1 | <0.1 | 3.8 | 0.3 | <0.1 |
| Fluoride | F | 1.5 | 75 | 150 | 600 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |

**Table 27: Results of the comparison between the total concentration threshold (TCT) values of Regulation 635 and the mine waste material. (Redirile, 2020).**

| Waste constituents | Abbreviation | R635 Total Concentration Threshold Values | | | Eland Platinum Waste Total Analysis | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TCT0 | TCT1 | TCT2 | Tailing dam 2 Open End Feed | SC/MG | CLOVERL G6 | MER | UG2(2) |
| | | *mg/kg* | *mg/kg* | *mg/kg* | *mg/kg* | | | | |
| **Metal Ions** | | | | | | | | | |
| Arsenic | As | 5.8 | 500 | 2 000 | <0.43 | <0.43 | <0.43 | <0.43 | <0.43 |
| Baron | B | 150 | 15 000 | 60 000 | * | * | * | n.a. | n.a. |
| Barium | Ba | 62.5 | 6 250 | 25 000 | 53.8 | 116 | 75.4 | 105 | 27 |
| Cadmium | Cd | 7.5 | 260 | 1 040 | <3.04 | <3.04 | <3.04 | <3.04 | 3.39 |
| Cobalt | Co | 50 | 5 000 | 20 000 | 140 | 123 | 117 | <0.56 | 219 |
| Chromium (Total) | Cr | 46 000 | 800 000 | n.a. | 106 404.8 | 102 367.6 | 119 816.6 | 1 779 | 170 503 |
| Chromium (VI) | CR(VI) | 6.5 | 500 | 2 000 | * | * | * | n.a. | n.a. |
| Copper | Cu | 16 | 19 500 | 78 000 | 55.2 | 66.3 | 65.2 | 49.8 | 47.5 |
| Mercury | Hg | 0.93 | 160 | 640 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| Manganese | Mn | 1 000 | 25 000 | 100 000 | 697.06 | 1 936.29 | 2 401 | 1 472 | 1 549 |
| Molybdenum | Mo | 40 | 1 000 | 4 000 | 1.12 | 1.75 | 2.08 | 1.11 | 1.17 |
| Nickel | Ni | 91 | 10 600 | 42 400 | 812 | 582 | 821 | 766 | 687 |
| Lead | Pb | 20 | 1 900 | 7 600 | 46.3 | 19.1 | 48.7 | 48 | 61 |
| Antimony | Sb | 10 | 75 | 300 | 11.4 | 8.66 | 3.51 | 10.3 | <1.48 |
| Selenium | Se | 10 | 50 | 200 | 5.34 | 3.62 | 4.73 | 0.4 | 8.94 |
| Vanadium | V | 150 | 2 680 | 10 720 | 618 | 564 | 578 | 168 | 1 325 |
| Zinc | Zn | 240 | 160 000 | 640 000 | 622 | 510 | 562 | 163 | 825 |

* Not tested.

#### *9.1.12.3 Quantification of the Medium to Long-term Behaviour*

A numeric geochemical modelling was used as a tool to quantify the medium to long-term behaviour and thus also the risks to the local environment, including soil, groundwater and surface water. The models used different conceptual scenarios for the proposed pit backfill. The following scenarios were assessed:

- Scenario 1: Assessment of source term chemistry in pit backfill reactions and resultant fluid chemistries after 100 years under a fixed oxygen fugacity as a conservative approach.
- Scenario 2: Assessment of source term chemistry in pit backfill reactions and resultant fluid chemistries after 100 years under a sliding oxygen fugacity.
- Scenario 3: Adsorption model assessing final 100-year source term chemistry with the purpose to determine the importance of adsorption as a potential geochemical process to immobilise post-operational leachate contaminants in the site lithologies.

***a) Model Results***

The results following the modelled scenarios for the planned in-pit tailings disposal (pit backfill) are shown in the ***Table 28*** below. Also shown in the Table is the regulatory guidelines (SANS 241:2015) as well as the 2019 hydrocensus and process water baselines for comparison. The values presented should be viewed as a quantitative guide to risk assessment rather than an absolute prediction of pore water concentrations. The climate alone can cause fluctuations in water chemistry within the pit backfill implying that one single predicted value cannot be provided for the mine waste drainage water quality. The models thus provide an indication of the probability that a potential contaminant, nitrogen, could be expected to occur in the mine waste drainage, which could impact on sensitive receptors:

- Scenario 1 - The tailings pore waters are almost near neutral with a model pH value of ~6.95. Dominant components of bicarbonate, sulphate, chloride and calcium are evident. The model pore water solutions display elevated nitrate concentrations.
- Scenario 2 - The long-term tailings pore water under less oxidising conditions also indicate near-neutral pH of ~6.99. The dominant components include bicarbonate, sulphate, chloride and calcium. The model pore water solutions have elevated concentrations of specifically nitrate concentrations above given baseline values.
- Scenario 3 - The modelled water display near neutral pH of ~6.98, with dominant bicarbonate, sulphate, chloride and calcium signatures. Nitrate remain at elevated concentrations.

The long-term model waste material pore water simulations indicate that although near neutral pH prevails, the pore fluids are likely to contain elevated chromium concentrations. Chromium has the potential to be sorbed out of solution to secondary mineral phases as shown by the adsorption model (Scenario 3) that indicate high sorbed fractions especially within the first year of simulations. However, as finite amounts of sorbing sites are available, chromium may remain mobile within the system. Thus, although chromium adsorption was high, it still occurs at concentrations above the regulatory guidelines.

**Table 28: Model results for the tailings material to be used as backfill material in relation to the 2019 hydrocensus and process water baselines (model concentrations that exceed the 2019 hydrocensus values as well as the SANS guidelines are highlighted).**

| Parameter | Abbreviation | Unit | SANS guidelines | 2019 Aquatico Hydrocensus | Process Water Baseline | Scenario 1 | Scenario 2 | Scenario 3 |
|---|---|---|---|---|---|---|---|---|
| | | | Value | Value | Value | Value | Value | Value |
| pH | pH | *pH units* | 5 - 9.7 | 8.05 | 8.97 | 6.95 | 6.99 | 6.98 |
| Total Dissolved Solids | TDS | $mg.\ell^{-1}$ | 1 200 | 324.30 | 689 | 958 | 922 | 912 |
| Calcium | Ca | $mg.\ell^{-1}$ | -[b] | 54.86 | 44.73 | 160 | 135 | 135 |
| Magnesium | Mg | $mg.\ell^{-1}$ | -[b] | 35.42 | 75.18 | 11 | 10 | 10 |
| Sodium | Na | $mg.\ell^{-1}$ | 200 | 13.79 | 9933 | 98 | 98 | 98.23 |
| Potassium | K | $mg.\ell^{-1}$ | -[b] | 3.55 | 9.64 | 7 | 7 | 7 |
| Bicarbonate | $HCO_3$ | $mg.\ell^{-1}$ | -[b] | - | 264 | 245 | 258 | 258 |
| Chloride | Cl | $mg.\ell^{-1}$ | 300 | 17.32 | 92.80 | 175 | 175 | 175 |
| Sulphate | $SO_4$ | $mg.\ell^{-1}$ | 250 | 5.40 | 141.75 | 193 | 171 | 171 |
| Fluoride | F | $mg.\ell^{-1}$ | 1.5 | b.d | 0.56 | 0.13 | 0.13 | 0.13 |
| Nitrate | $NO_3$ | $mg.\ell^{-1}$ | 11 | 14.11 | 24.53 | 76 | 76 | 76 |
| Ammonia | $NH_4$ | $mg.\ell^{-1}$ | 1.5 | 0.06 | 0.20 | 0.11 | 0.11 | 0.14 |
| Aluminium | Al | $mg.\ell^{-1}$ | 0.3 | b.d | 0.03 | 0.001 | 0.001 | <0.001 |
| Iron | Fe | $mg.\ell^{-1}$ | 0.3 | b.d | b.d | <0.01 | <0.01 | <0.01 |
| Manganese | Mn | $mg.\ell^{-1}$ | 0.1 | 0.01 | b.d | <0.001 | <0.001 | <0.001 |
| Total Chromium | Cr (Total) | $mg.\ell^{-1}$ | 0.05 | b.d | b.d | <0.01 | <0.01 | <0.01 |
| Hexavalent Chromium | Cr(VI) | $mg.\ell^{-1}$ | -[b] | - | - | <0.01 | <0.01 | <0.01 |
| Copper | Cu | $mg.\ell^{-1}$ | 2 | b.d | - | <0.001 | <0.001 | <0.001 |
| Nickel | Ni | $mg.\ell^{-1}$ | 0.07 | b.d | - | <0.001 | <0.001 | <0.001 |
| Silica | $SiO_2$ | $mg.\ell^{-1}$ | -[b] | b.d | - | 6 | 6 | 6 |

***b) Environmental geochemical risks***

The aquifer systems are not only a potential transport medium for potential contaminants but should also be viewed as a sensitive receptor from a groundwater use perspective. The geochemical assessment, modelling results and interpretation identified metals, specifically chromium and iron, as well as nitrates as potential contaminants. However, due to adsorptive processes provided by clay and hydroxide minerals chromium may be reduced in concentration or completely immobilized. This is further suggested by the site groundwater and process water; therefore, chromium leaching does not pose significant risks. It is further recommended that hexavalent chromium does not pose long-term geochemical risks. Iron is less influenced by adsorption and may remain mobile under more reducing conditions.

The static geochemical assessments supplemented by the geochemical modelling indicated that the risk of acid mine drainage conditions is highly unlikely due to deficient sulphide minerals and enough neutralisation capacity available within the pit backfill material to buffer the pH of the system.

### *9.1.12.4 Outcome of the Waste Classification and Geochemical Analysis in terms of the EP Proposed Projects.*

- Impacts on the shallow aquifer are only expected in isolated instances where geological structures such as dykes and major faults link the open pits with the immediate environment. Localized mass migration may therefore occur if sub-vertical structures occur that are transmissive and allow preferential flow along the weathered contact zones. This could be intercepted by the proposed mitigation scavenger wells. The potential negative consequences in terms of the tailings backfilling and ROM stockpiling can be mitigated successfully.
- The soluble elements could enter into the groundwater system.
- Impact on groundwater quantity (water levels) and quality during backfilling and stockpiling occurs when the backfill material and ROM material comes in contact with the in-situ material and a pathway is created (additional recharge added for depositioning).
- The risk for the development of AMD conditions for all tailings material and pit backfill is insignificant, as the laboratory data indicated that acid producing sulphide mineral content is minimal in the waste material and site lithology.
- Initial geochemical findings indicate that in-pit tailings disposal and ROM Stockpiles have associated risks in terms of the likelihood of leachate containing contaminants (nitrate) exceeding regulatory guideline values and localised baselines and thus pose risks in the long-term.
- The likelihood of hazardous substances leaching from the mine waste and tailings material is negligible and can thus be considered as a Type 4 waste, low risk.
- It is suggested by the distilled water leach tests and geochemical models that the risk of leaching of metal(loid)s and inorganic anions is insignificant. The contamination of groundwater

by leachate contaminants from the pit backfill material in the post operational phase is therefore unlikely due to prevailing physiochemical conditions and adsorptive processes.

- The leachate does not contain significant sulphate concentrations, as the XRD, as well as the ABA and sulphur speciation analyses, indicated that sulphide mineral content is minimal and is thus not a significant contributor to the tailings backfill geochemical system.
- Elevated nitrate concentrations within the TSF process water and downstream groundwater compared to the 2019 hydrocensus baseline may suggest that nitrates are possibly assimilated and leached within the TSF.
- In-pit tailings disposal can have utility as a reclamation option, since the backfill material will be deposited above the regional groundwater table and the backfill material will be capped and revegetated post deposition, which will minimize water ingress.
- The numerical groundwater flow and mass transport model indicated the potential source and migration associated with the rehabilitation of the open pits by means of backfilling with tailings material and the RoM stockpiles. The mass migration is limited to the site and contained within a proximity of 300m during the rehabilitation process.
- This assessment shows that environmental geochemical risks are likely due to the persistence of nitrogen species in the groundwater and mitigation and remediation measures need to be designed into the facility infrastructure. Additional investigations with regards to long term nitrate concentrations and potential decrease of total nitrogen concentrations over time need to be considered if the risk of elevated nitrate concentrations in the groundwater is deemed unacceptable. The acceptability of elevated nitrogen in the groundwater will depend on the post-closure land use options being considered.
- The backfilling of the opencast pits on the other hand will need to be authorised as a Section 21(g) Water Use.

### 9.1.13 Ecology

***Refer to Appendix 15 for the Terrestrial Biodiversity Assessment conducted by STS Environmental.***

The Consolidated MR Surface Area is located within the Savanna Biome and is depicted in ***Figure 55*** below (Rutherford & Westfall, 1994 and Mucina & Rutherford, 2006). The Savanna Biome is regarded as the spatially largest biome in South Africa, comprising some 32.5% of the country (Rutherford & Westfall, 1994). According to Mucina & Rutherford (2006), the Area falls in the Marikana thornveld and the Moot Plain Bushveld biome.

***Table 29*** below contains data accessed as part of the desktop assessment. It is important to note that, although all data sources used provide useful and often verifiable high-quality data, the various databases do not always provide an entirely accurate indication of the Consolidated MR Surface Area and the actual biodiversity characteristics.

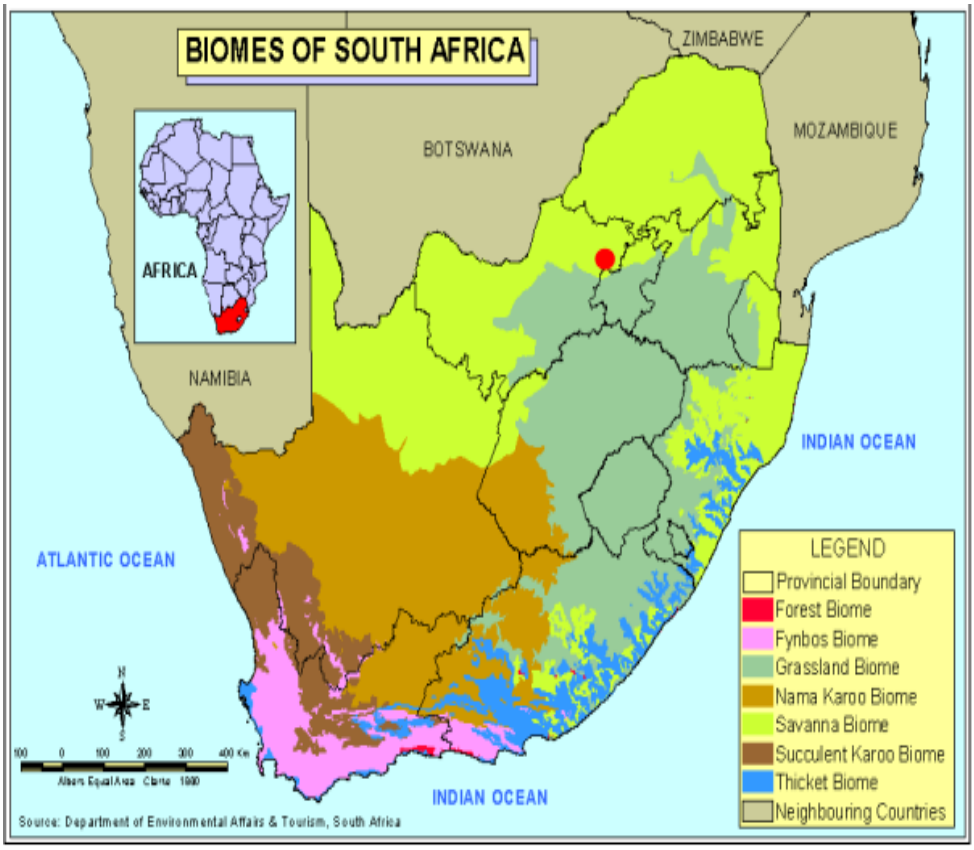


**Figure 55: Biomes associated with the Consolidated MR Surface Area.**

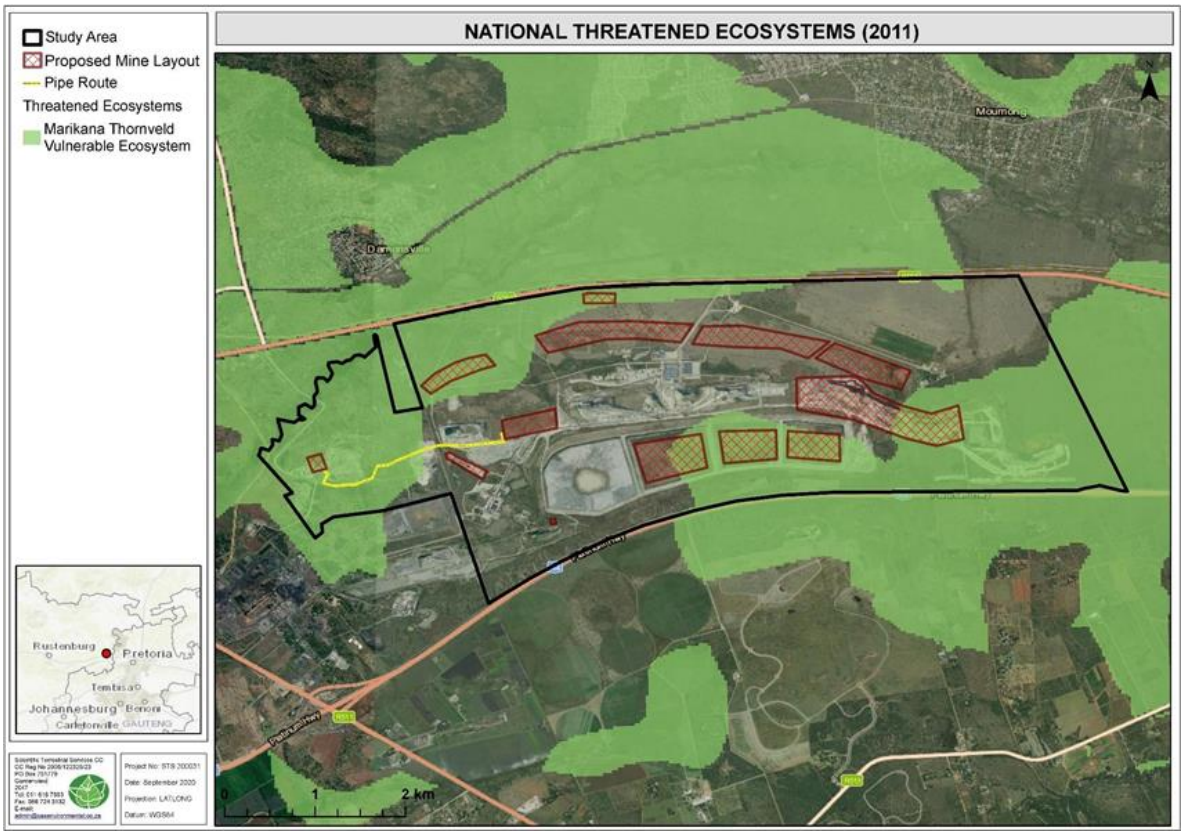


**Figure 56: Remaining vulnerable Marikana Thornveld ecosystem in relation to the Consolidated MR Surface Area and proposed mine layout (National Threatened Ecosystems, 2011).**

**Table 29: Summary of the conservation characteristics for the Consolidated MR Surface Area (SAS Environmental, 2020).**

<table>
<tr><th colspan="2">DETAILS OF THE EM & MM SURFACE AREA IN TERMS OF MUCINA & RUTHERFORD (2012)</th><th colspan="7">DESCRIPTION OF THE VEGETATION TYPE(S) RELEVANT TO THE EM SURFACE AREA (MUCINA & RUTHERFORD 2012)</th></tr>
<tr><td>Biome</td><td>The Consolidated MR Surface Area is situated within the Savanna Biome.</td><td>Vegetation Type</td><td colspan="6">Marikana Thornveld</td></tr>
<tr><td rowspan="3">Bioregion</td><td rowspan="3">The Consolidated MR Surface Area is located within the Central Bushveld Bioregion</td><td rowspan="3">Climate</td><td colspan="6">Summer rainfall with very dry winters</td></tr>
<tr><td>MAP* (mm)</td><td>MAT* (°C)</td><td>MFD* (Days)</td><td>MAPE* (mm)</td><td colspan="2">MASMS* (%)</td></tr>
<tr><td>682</td><td>19.4</td><td>21</td><td>2284</td><td colspan="2">76</td></tr>
<tr><td>Vegetation Type</td><td>The Consolidated MR Surface Area is situated within the Marikana Thornveld</td><td>Altitude (m)</td><td colspan="6">1050 - 1450</td></tr>
<tr><td colspan="2">CONSERVATION DETAILS PERTAINING TO THE EM SURFACE AREA (VARIOUS DATABASES)</td><td>Conservation</td><td colspan="6">Endangered. Approximately 3% conserved. Conservation target is 24%.</td></tr>
<tr><td rowspan="4">National Biodiversity Assessment (2018)</td><td rowspan="4">The Consolidated MR Surface Area falls within an endangered vegetation type (Marikana Thornveld) that is currently poorly protected (PP). According to the NBA dataset, portions of the two western Merensky Opencast pits, the Eland Vent Shaft 2, the northern ROM Stockpile and the two western UG1s are within the remaining extent of the endangered Marikana Thornveld vegetation type.<br><br>Ecosystem types are categorised as “not protected”, “poorly protected”, “moderately protected” and “well protected”, based on the proportion of each ecosystem type that occurs within a protected area recognised in the NEMPAA and compared with the biodiversity target for that ecosystem type.<br><br>The ecosystem protection level status is assigned using the following criteria:<br>i. If an ecosystem type has more than 100% of its biodiversity target protected in a formal protected area either A or B, it is classified as Well Protected;<br>ii. -When less than 100% of the biodiversity target is met in formal A or B protected areas, it is classified it as Moderately Protected;<br>iii. - If less than 50% of the biodiversity target is met, it is classified it as Poorly Protected; and<br>iv. - If less than 5% it is Hardly Protected.</td><td>Distribution</td><td colspan="6">North-West and Gauteng Provinces</td></tr>
<tr><td>Vegetation & landscape features (Dominant Floral Taxa)</td><td colspan="6">Open Vachellia karroo woodland, occurring in valleys and slightly undulating plains, and some lowland hills. Shrubs are denser along drainage lines, on termitaria and rocky outcrops or in another habitat protected from fire.</td></tr>
<tr><td>Geology & Soils</td><td colspan="6">Most of the area underlain by mafic intrusive rocks of the Rustenburg Layered Suite of the BIC. Rocks include gabbro, norite, pyroxenite and anorthosite. The shales and quartzites of the Pretoria Group (Transvaal Supergroup) also contribute. Mainly vertic melanic clays with some dystrophic or mesotrophic plinthic catena’s and some freely drained, deep soils.</td></tr>
<tr><td colspan="2">NATIONAL WEB BASED ENVIRONMENTAL SCREENING TOOL (2020)</td></tr>
<tr><td rowspan="2">National Threatened Ecosystems (2011)</td><td rowspan="2">The north-western and south-eastern portions of the Consolidated MR Surface Area fall within the remaining extent of the vulnerable Marikana Thornveld Ecosystem. The proposed CFP, MM to EM Pipeline route, western Merensky Opencast, most of the UG1 and the eastern half of the TSF intersect this ecosystem. It should be noted that much of the vulnerable Marikana Thornveld Ecosystem is</td><td>Terrestrial Sensitivity</td><td colspan="6">The Terrestrial Sensitivity for the Consolidated MR Surface Area is considered to have a Very High sensitivity. The triggered sensitivity features include a Critical Biodiversity Area (CBA) 2; Ecological Support Area (ESA) 1, and an ESA 2 (as per the 2015 North West Terrestrial CBA Map). The study area is also in a Focus Areas for land-based protected areas expansion (likely provincial) and the remaining extent of a Vulnerable ecosystem (vulnerable Marikana Thornveld, as per the National Threatened Ecosystems 2011 dataset).</td></tr>
<tr><td>Plant Species</td><td colspan="6">For the Plant Species theme, most of the Consolidated MR Surface Area is considered to have a Low sensitivity, with only a small section in the far east of the Area considered to have a Medium Sensitivity due to the potential presence of the vulnerable (VU) species, Dicliptera magaliesbergensis.</td></tr>
<tr><td></td><td></td><td>Animal Species</td><td colspan="6">For the Animal Species theme, most of the Consolidated MR Surface Area is considered to have a Low sensitivity with only a small section in the far east of the study area considered to be of Medium Sensitivity due to the potential presence of sensitive species 13.</td></tr>
</table>

| | | | |
|---|---|---|---|
| | completely transformed due to mining activities. Refer to the floral assessment, for a discussion on the sensitivity of the ecosystem based on ground- truthed results.<br>The NEMBA provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function, and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to preserve witness sites of exceptionally high conservation value. | | |
| **SAPAD (2019, Q4); SACAD (2019, Q4); NPAES (2009)** | According to SACAD6 (2019, Q4), the Consolidated MR Surface Area falls within the Magaliesberg Biosphere Reserve.<br>The SAPAD7 (2019, Q4) and NPAES (2009) database indicate that the Magaliesberg Protected Natural Environment is situated ± 3.4 km south of the Area. SAPAD (2018, Q1) additionally shows the Hartbeespoort Dam Nature Reserve located ± 3.9 km south-west of the Consolidated MR Surface Area and the M'Nandi Private Nature Reserve ± 3 km east of the Area.<br>No other protected areas are located within 10 km of the Consolidated MR Surface Area. | **STRATEGIC WATER SOURCE AREAS FOR SURFACE WATER (2017)** | |
| | | **Name and Criteria** | The Consolidated MR Surface Area is not within 10 km of a Strategic Water Source Area. |
| | | **NORTH WEST BIODIVERSITY SECTOR PLAN (NWBSP, 2015)** | |
| | | **Critical Biodiversity Area (CBA)** | Large portions of the Consolidated MR Surface Area, particularly areas along the edges, are situated within a terrestrial CBA 2. This includes the proposed Eland Vent Shaft 2, small sections of the two western Merensky opencast pits and a small portion of the TSF.<br>CBAs are terrestrial or aquatic areas of the landscape that need to be maintained in a natural or near natural state, to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services.<br>The CBA 2 within the Consolidated MR Surface Area is important habitat within the Focus Wildlife Areas category, as it is an important bird area ("**Magaliesberg IBA**") in a natural state. It further forms part of the 5 km Protected Areas buffer for the Hartbeespoort Dam Nature Reserve and M'Nandi Private Nature Reserve. |
| **IBA (2015)** | The Consolidated MR Surface Area is located the Magaliesberg IBA. The most important trigger species in the IBA is the globally threatened Cape Vulture. The number of breeding pairs in the Skeerpoort colony seems to be stable at 200–250. Secretary bird is the other globally threatened species in the IBA. Regionally threatened species are Lanner Falcon (Falco biarmicu), Half-collared Kingfisher, African Grass Owl, African Finfoot and Verreauxs' Eagle. Biome-restricted species include White-bellied Sunbird (Cinnyris talatala), Kurrichane Thrush (Turdus libonyanus), White-throated Robin-chat (Cossypha humeralis), Kalahari Scrub Robin (Erythropygia paena) and Barred Wren-Warbler. | **Ecological Support Area (ESA)** | The remaining central and southern portions of the Consolidated MR Surface Area and all remaining proposed infrastructure are identified within an ESA 1 and ESA 2.<br>ESAs are terrestrial and aquatic areas that are not essential for meeting biodiversity representation targets (thresholds), but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The ESA 1 within the Consolidated MR Surface Area is identified as an important bird area (corresponds with the Magaliesberg Important Bird and Biodiversity Area). The ESA 2 areas form part of the 5 km Protected Areas buffer that is not natural, with the north-eastern patches considered biodiversity corridors consisting of cultivated areas. |
| **MINING AND BIODIVERSITY GUIDELINES (2013)** | | | |
| **Highest Biodiversity Importance** | The south-eastern portion of the Consolidated MR Surface Area is situated within an area considered of highest biodiversity importance. More specifically, the TSF's eastern portion falls within this highest biodiversity importance area; however, this area has already been transformed by mining activities and is no longer characterised by important biodiversity features. | | |

| | |
|---|---|
| **High Biodiversity Importance** | Most of the southern and north-western portions of the eastern portion falls within an area considered of high biodiversity importance. Proposed infrastructure that falls within this area include the MM to EM water pipeline route, CFP, all three TSF paddocks, the TSF's western section, the two western Merensky opencast pits and both ROM Stockpiles. However, much of the proposed infrastructure is within completely transformed areas and the floral assessment must be consulted for the sensitivity of the high biodiversity importance area.<br>Mining implications: Mining options may be limited in these areas and red flags for mining projects are possible. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations. |
| **Moderate Biodiversity Importance** | Several small sections within the Consolidated MR Surface Area's northern portion are situated within an area considered of moderate biodiversity importance – only the western Merensky opencast area intersects this moderately important area.<br>Mining implications: Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations. |

**NBA = National Biodiversity Assessment; SAPAD = South African Protected Areas Database; SACAD = South African Conservation Areas Database; NPAES = National Protected Areas Expansion Strategy; IBA = Important Bird Area; MAP = Mean annual precipitation; MAT = Mean annual temperature; MAPE = Mean annual potential evaporation; MFD = Mean Frost Days; MASMS = Mean annual soil moisture stress (% of days when evaporative demand was more than double the soil moisture supply).**

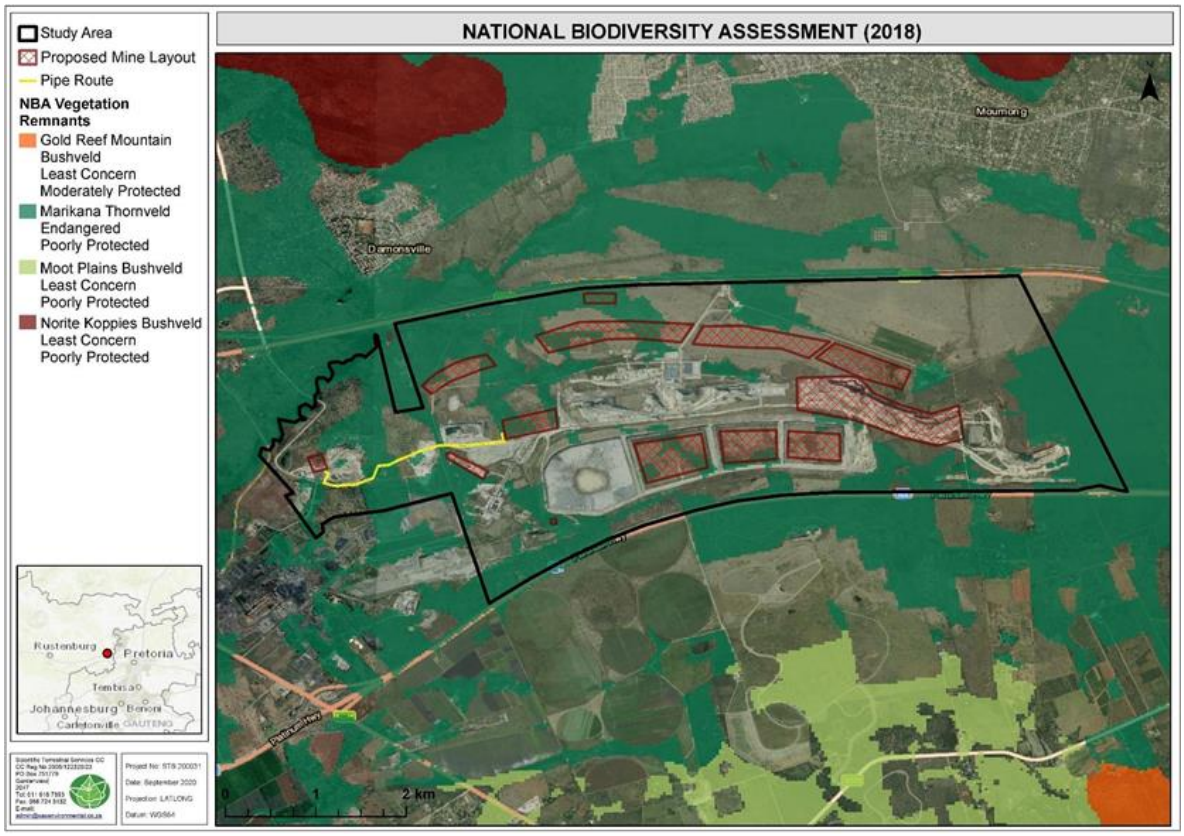


**Figure 57: Remaining endangered and poorly protected Marikana Thornveld, according to the National Biodiversity Assessment (NBA, 2018).**

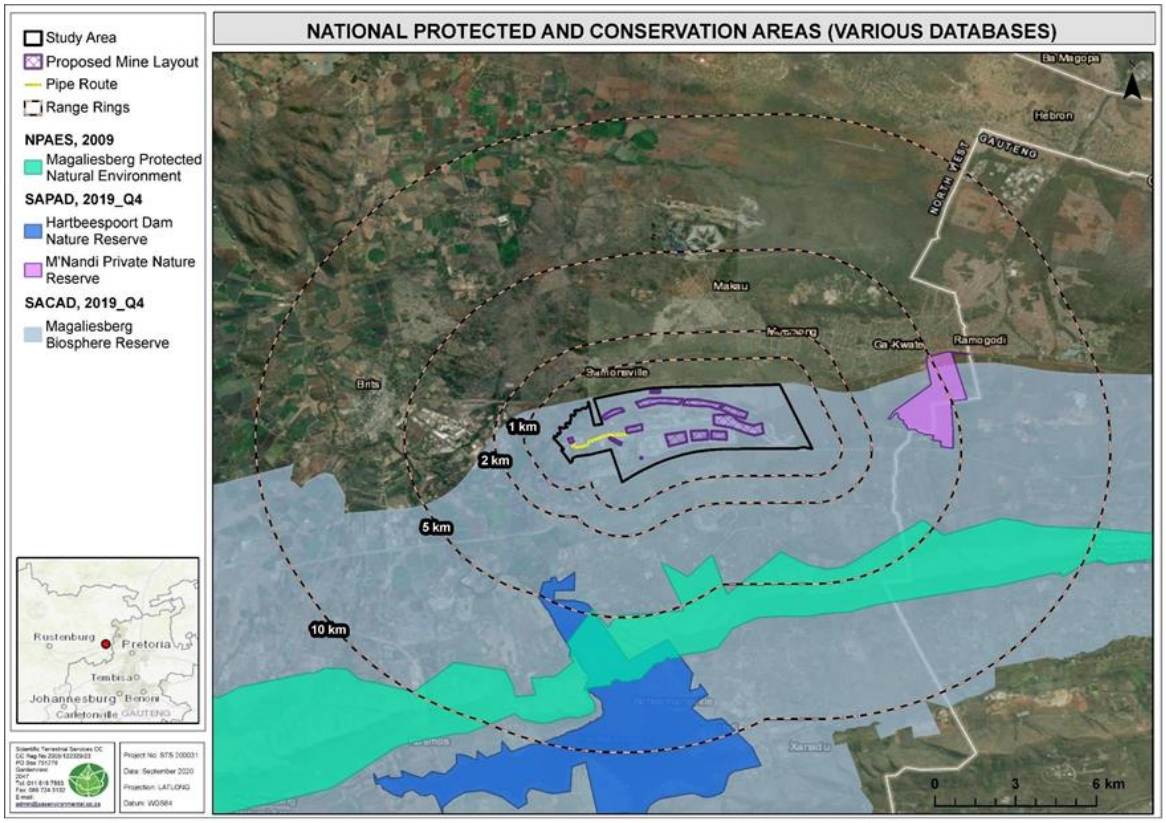


**Figure 58: Nationally protected and conservation areas associated with the Consolidated MR Surface Area (various databases).**

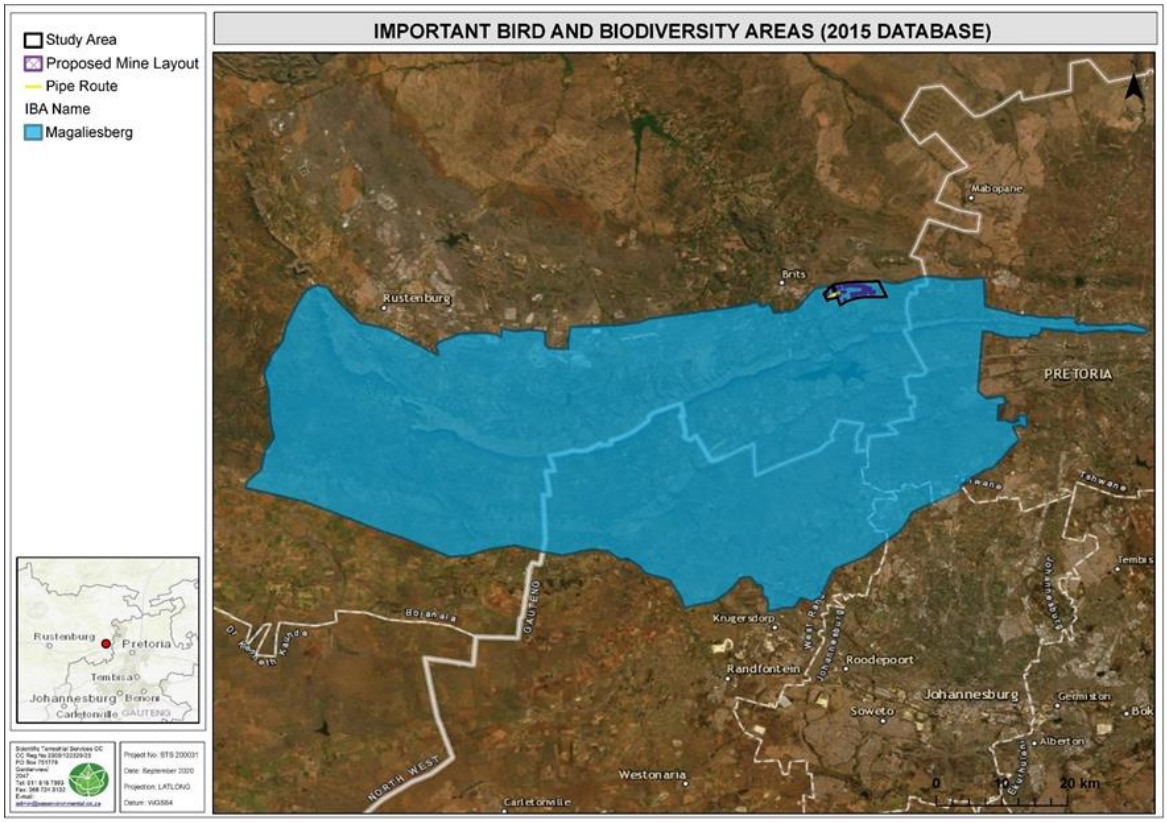


**Figure 59: The Consolidated MR Surface Area in relation to the entire Magaliesberg Important Bird and Biodiversity Area (IBA, 2015).**

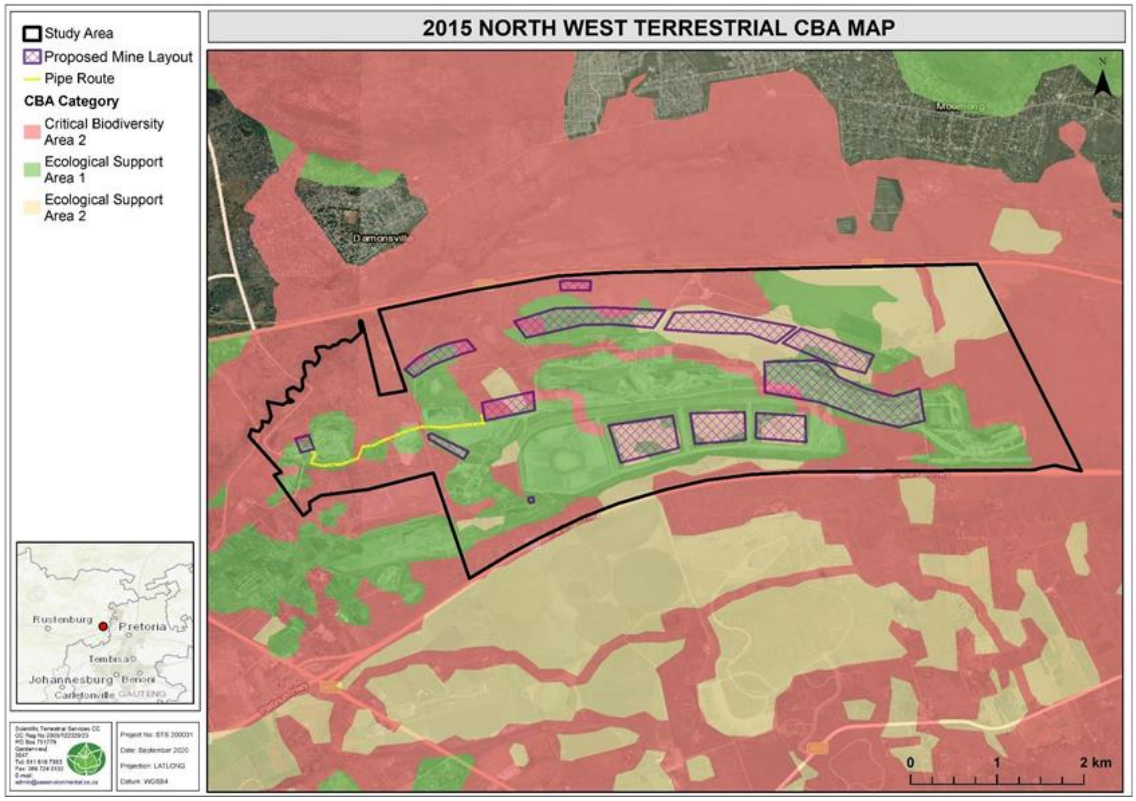


**Figure 60: Critical Biodiversity Areas and Ecological Support Areas relating to the Consolidated MR Surface Area according to 2015 North West Terrestrial CBA Map.**

### 9.1.14 Flora

Following the field assessment, four broad habitat units and nine finer-scale habitat units could be distinguished for the Consolidated MR Surface Area, refer to ***Figure 61***. The habitat units were determined based on species composition, vegetation structure, ecological function, biophysical environment and habitat condition.

The four broad habitat units include:

1. **Existing Footprint Areas:** These areas include current built-up or transformed areas. Two finer-scale habitat units fall in this category, namely the Mine Footprint and an existing crop field;
2. **Historic Footprint Areas:** These areas include two finer scale units, namely old crop fields and the Historic mine footprint. The key difference between these areas and the abovementioned Existing Footprint Areas is that the Historic Footprint Areas are no longer being used for mining or agriculture. These Areas have been vegetated (rehabilitated), albeit at varying stages of recovery but do not resemble the neighbouring natural vegetation (or the reference state – Marikana Thornveld vegetation type);
3. **Marikana Thornveld Habitat Unit:** Several sections of the Consolidated MR Surface Area retain vegetation that has not been modified historically by either mining or agricultural activities. Of this remaining natural vegetation, two finer scale units could be discerned, namely Thornveld habitat (best represented in the Area) and Mixed Bushveld habitat (where the woody species composition includes a higher diversity of broad-leaf species than the Thornveld unit and different soil composition); and
4. **Moisture-driven Habitat Unit:** This habitat unit is associated with all the surface water areas, drainage lines and ponding areas. The Moisture-driven Habitat includes watercourses, as delineated within the Freshwater and Aquatic Ecological Assessment (SAS, 2020); and non-watercourse habitat that is of an artificial nature and thus not considered a natural watercourse as defined in the NWA, 1998. The watercourse and non-watercourse habitat comprised a similar floral species composition. For the purposes of this report, the Moisture-driven Habitat is discussed under the categories: drainage lines consisting of both watercourse habitat (i.e., an unnamed tributary of the Crocodile River and a channelled valley bottom ("**CVB**") wetland) and not a natural watercourse habitat (forming part of the closed dirty water reticulation system of the mine), artificial dams and artificial ponding areas.

#### *9.1.14.1 Invader or exotic species*

Several alien invasive species are common to the Consolidated MR Surface Area. Of the declared invaders recorded during the field assessment, a high number are listed under NEMBA category 1b, two species under NEMBA category 2 and two species under NEMBA category 3 (Table 1). The Thornveld habitat, Mixed Bushveld habitat and the old crop fields were least invaded by AIPs, whereas the Moisture-driven Habitat (mainly the artificial drainage areas and unnamed tributary) and Footprint Areas (historic and existing) have a high abundance and diversity of AIPs.

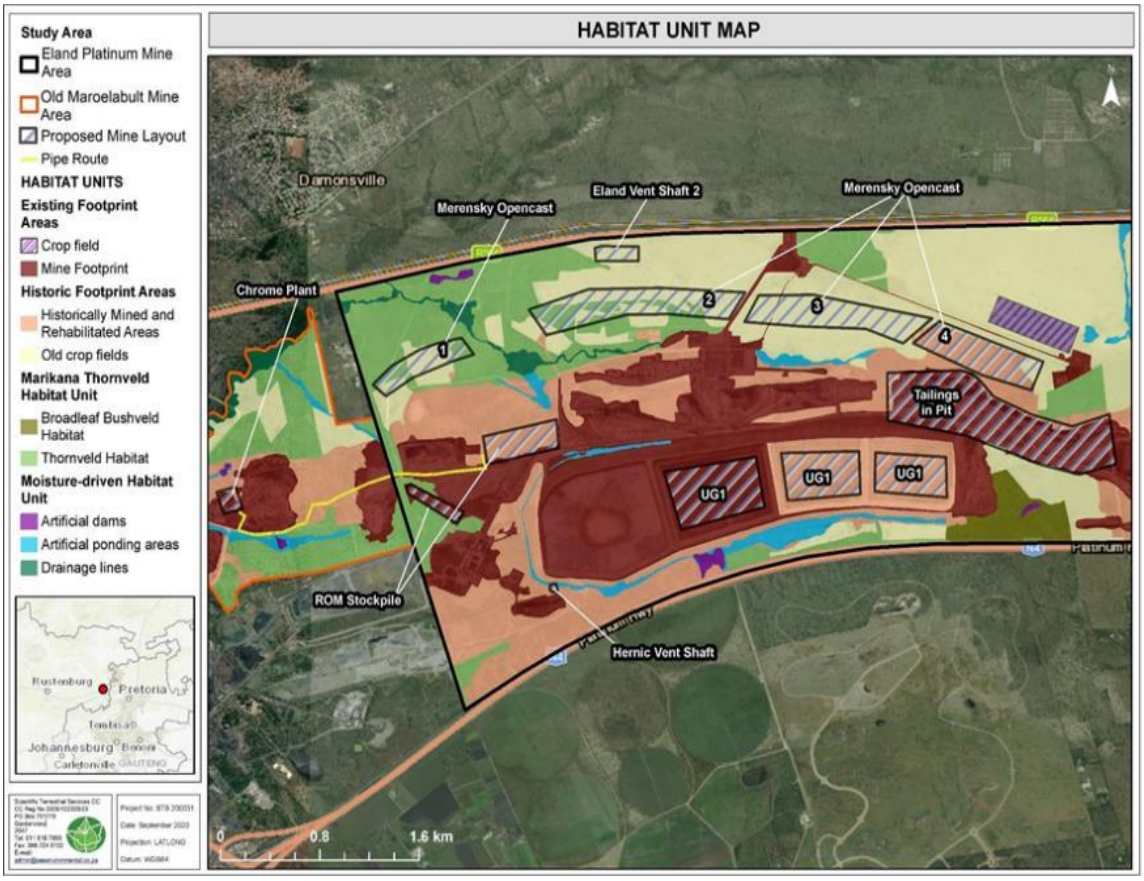


**Figure 61: Conceptual illustration of Project Area in relation to refined habitat units (STS, 2020).**

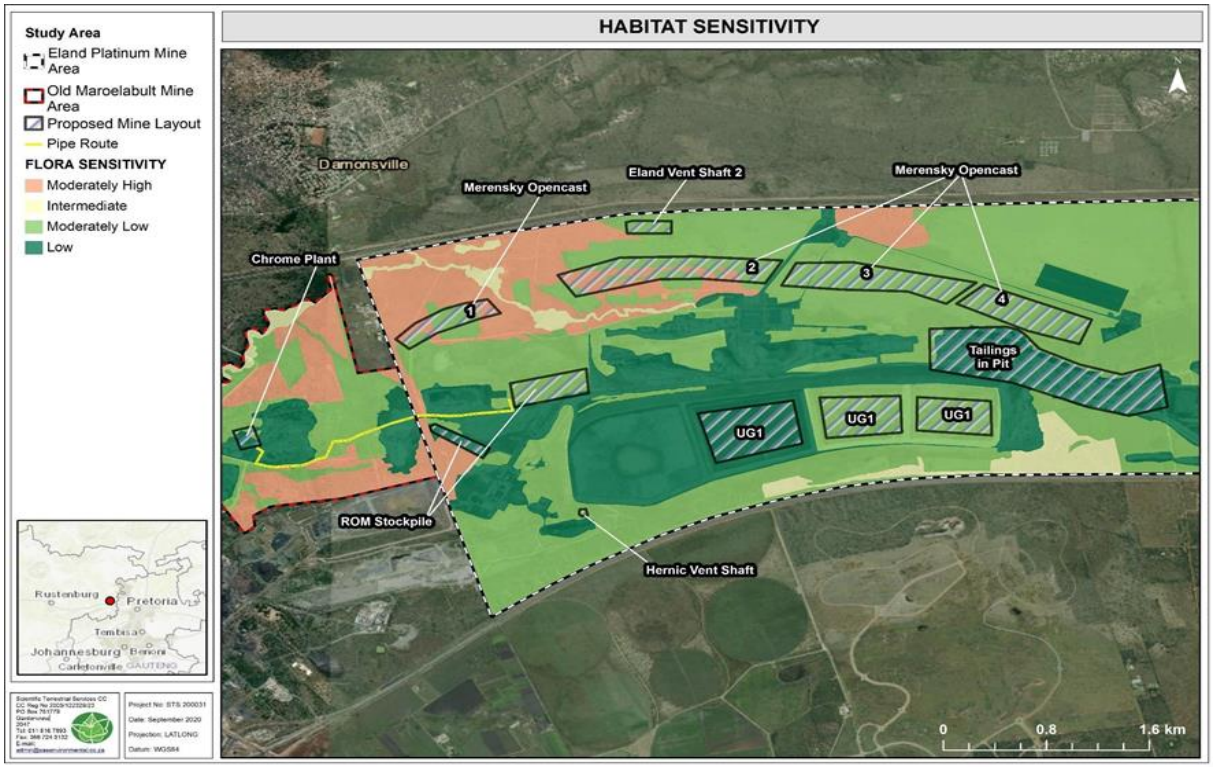


**Figure 62: The Project Area as it relates to the sensitivity assigned to the various habitat units.**

#### *9.1.14.1 Sensitivity Mapping*

Sensitivity is determined on the presence or potential for floral Species of Conservation Concern ("**SCC**"); habitat integrity and levels of disturbance; threat status of the habitat type; the presence of unique landscapes; and overall levels of diversity (compared to a reference type). ***Figure 62*** conceptually illustrates the areas considered to be of varying floral ecological sensitivity and how they will be impacted by the EP Proposed Projects.

#### *9.1.14.2 Impact of the EM Consolidation Project on the Flora*

The vegetation associated with the Consolidated MR Surface Area is largely in a degraded condition, with the Historic Footprint areas and Existing Footprint areas making up most of the habitat. Even the historic watercourses on the Area have been modified to the extent that only the far north-western section of the EM Surface Area and the western border of the MM are associated with natural watercourses. Patches of untransformed vegetation (i.e., Marikana Thornveld Habitat unit) is scattered throughout the Area, with the vegetation within the game park and within the Consolidated MR Surface Area's eastern section showing the least signs of disturbances.

No nationally threatened SCC, in terms of NEMBA Section 56, were recorded during the site assessment; however, the near threatened *Stenostelma umbelluliferum* was recorded within the Old Crop Fields (particularly within the Merensky Opencast 3 footprint). The Consolidated MR Surface Area is associated with a variety of protected floral species; mainly species provincially protected, with only *Sclerocarya birrea* subsp. *caffra* listed as nationally protected. Suitable habitat for SCC will be impacted by the proposed Merensky opencast 1 and 2 (within the Game Park and Eland Vent Shaft 2. No other footprint areas are considered to infringe on habitat where floral SCC could occur.

From a conservation perspective, the Merensky opencast 1 and 2 will impact on patches of the now endangered Marikana Thornveld vegetation type (as per the National Biodiversity Assessment, 2018) which is also a listed vulnerable ecosystem, as per the NEMBA Ecosystem List. Although the direct impact will be of a small extent, the footprint within this habitat should be minimised or avoided as far as possible.

Based on conservation significance; presence of SCC; and the level of habitat degradation, the habitat units' floral sensitivity varies between moderately high (Marikana Thornveld); intermediate (drainage lines and artificial dams within the game park); moderately low (degraded Marikana Thornveld Habitat Unit; artificial features; and Historic Footprint Areas) and low (Existing Footprint Areas).

The EP Proposed Projects will directly impact on floral habitat of moderately high sensitivity and infringe upon habitat where floral SCC were observed during the site assessment. With mitigation measures implemented, the impacts on floral habitat, diversity and floral SCC can be acceptably reduced from medium-high (Marikana Thornveld) and medium-low (all remaining impacted habitat), to low and very low levels (especially for habitat falling outside of the direct footprint). The impact significance on Marikana thornveld will however only be reduced to medium-low levels.

### 9.1.15 Fauna

As part of the Biodiversity Assessment the following terrestrial Habitat Units/Faunal Habitat Units were identified, namely (refer to ***Figure 63***):

- Marikana Thornveld Habitat (2 sub-habitats):
  - Mixed Bushveld; and
  - Thornveld;
- Moisture-driven Habitat (3 sub-habitats):
  - Artificial dams;
  - Artificial ponding areas; and
  - Drainage lines;
- Existing Footprint Areas (2 sub-habitats):
  - Crop Field; and
  - Mine Footprint;
- Historic Footprint Areas (2 sub-habitats):
  - Historically Mined and Rehabilitated Areas; and
  - Old Crop fields.

These habitat units are discussed briefly below. For a more detailed description and discussion of the vegetation composition associated with these habitat units, please refer to the attached Biodiversity Assessment.

#### 1. Marikana Thornveld Habitat

Several sections of the Consolidated MR Surface Area have retained vegetation that has not been modified historically by either mining or agricultural activities. Of the remaining natural vegetation, two finer scale units could be discerned, namely Thornveld (best represented in the Area) and Mixed Bushveld (woody species composition includes higher diversity of broad-leaf species than the Thornveld unit). Faunally the diversity and abundance of species associated with these areas was notably higher than the rest of the historic and existing footprint areas. Greater floral species richness offered specialist species increased opportunities, while increased structural diversity offered suitable habitat for most fauna where shelter was available. Grazing and browsing potential is also high in these locations. Only within the game park are there large herbivores, which maintain and mimic more natural processes and functions important for this vegetation type's maintenance and development. Reptiles with an arboreal lifestyle and species known to occur in rocky areas will favour this unit.

#### 2. Moisture-driven Habitat

This habitat unit is associated with all the surface water areas, drainage lines and ponding areas. The Moisture-driven Habitat include areas as delineated within the Freshwater Ecological Report (SAS, 2020), but also non-watercourse areas which includes a similar species composition to that of the wetlands, due to the presence of water or moisture-rich habitat; however, the source of water is artificial and thus not a natural watercourse habitat cannot be considered true watercourses as defined by the

NWA, 1998 (SAS, 2020). These habitats are valuable as drinking water sources for fauna and provide many water dependant fauna (mostly invertebrate, amphibian and avifaunal) with niche habitat. Notably, several of these portions within the Consolidated MR Surface Area rely on process water from the mining activities and, following closure, will no longer sustain the current faunal assemblages. The drainage lines tend to be more well wooded, offering better browsing for herbivores and greater structural diversity, which is often favoured by avifauna.

3. **Existing Footprint Areas**

These areas include current built-up or transformed areas. Two finer scale habitat units fall in this category, namely the mine footprint and an existing crop field. This habitat has been significantly transformed due to mining and agriculture, with large areas completely devoid of vegetation and the remaining areas comprising pioneer forb and alien plant species associated with heavy disturbance. Thus, this habitat unit is not considered intact and is of low ecological sensitivity and conservation significance from a faunal and resource management perspective due to the current disturbances in these localities. Some avifaunal SCC, which favour foraging in or on the margins of agricultural fields, will utilise this habitat, however they are likely to avoid the mine infrastructure areas.

4. **Historic Footprint Areas**

These Areas include two finer scale units, namely old crop fields and the historic mine footprint. The key difference between these areas and the abovementioned Existing Footprint Areas is that the Historic Footprint Areas are vegetated and/or recovering, albeit in differing stages of recovery. These Areas are no longer being used for mining or agriculture and have been revegetated / rehabilitated to varying degrees but do not resemble the neighbouring natural vegetation. This habitat is valuable habitat for mammals and avifauna, as suitable shelter and forage is present, yet the reduced forage breadth limits the potential of this habitat to be attractive to a high diversity of fauna, especially invertebrates. The AIP encroached locations offer reduced habitat suitability for most faunal classes, as they are homogenous and create few novel niches, which can be utilised by a diverse assemblage of fauna. Again, some avifaunal SCC will utilise this habitat, however they will avoid the active mine infrastructure areas.

#### *9.1.15.1 Sensitivity Mapping*

***Figure 64*** below conceptually illustrates the habitat units encountered within the study area, their associated ecological sensitivity. The areas are depicted according to their sensitivity, based on the: presence or potential for floral and faunal SCC; habitat intactness and disturbance levels; habitat type's threat status; presence of unique landscapes and overall levels of diversity. ***Table 30*** below presents the sensitivity of each identified habitat unit; and an associated conservation objective and implications for development.

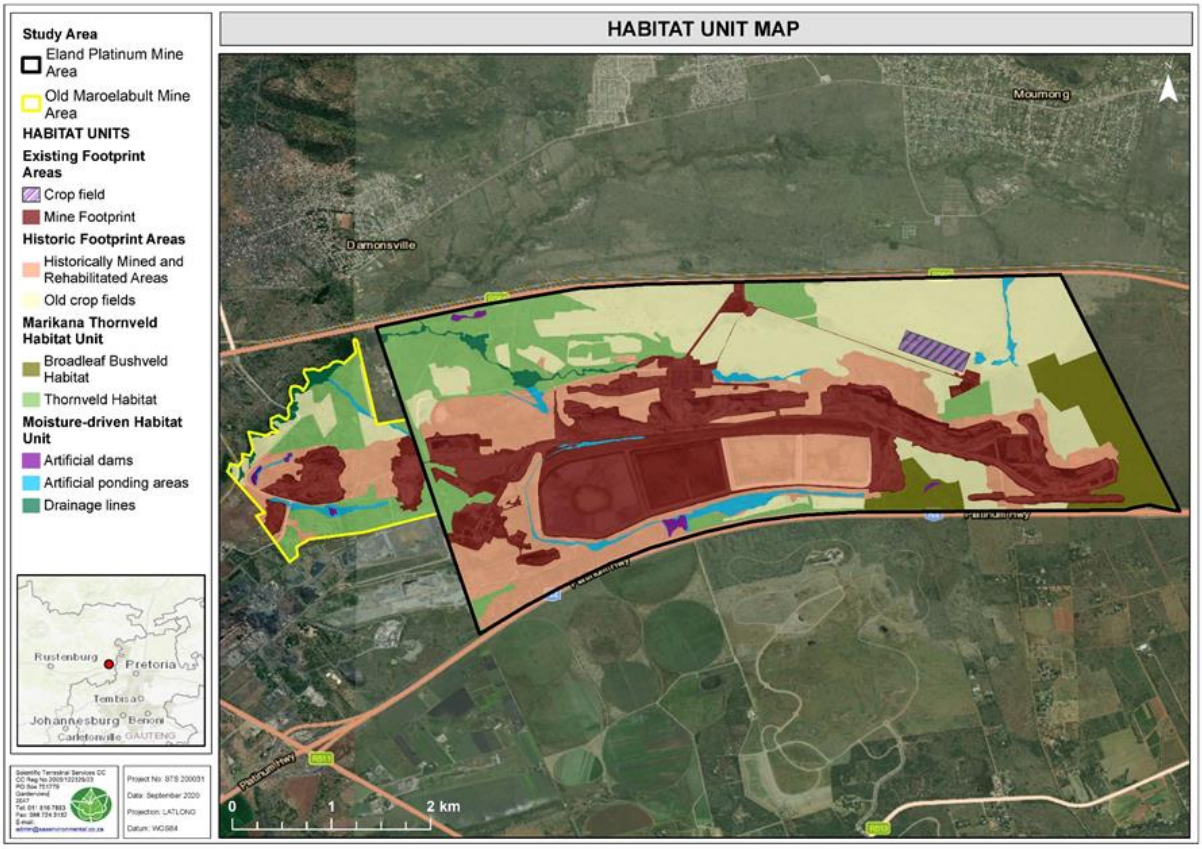


**Figure 63: Habitat units associated with the Consolidated MR Surface Area (STS, 2020).**

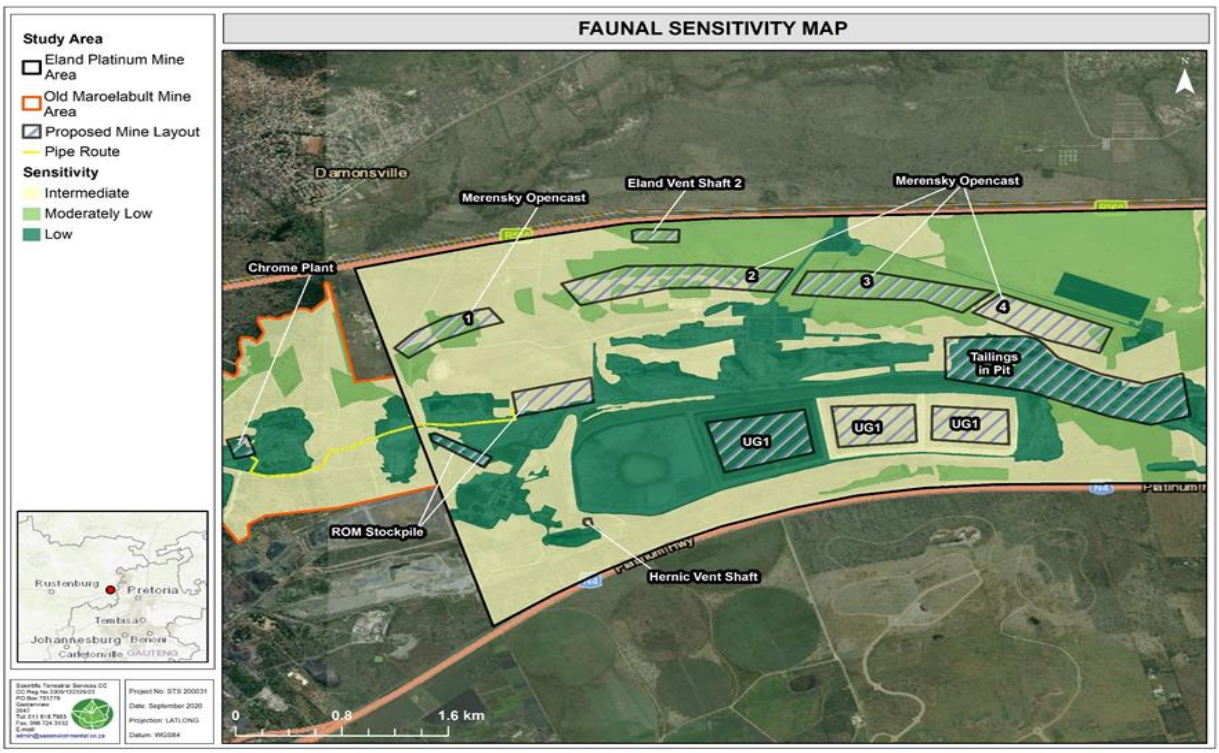


**Figure 64: Consolidated MR Surface Area layout in relation to the habitat sensitivity (STS, 2020).**

**Table 30: A summary of sensitivity of each habitat unit and implications for development (STS, 2020).**

| Habitat Unit | Sensitivity | Conservation Objective | Development Implications |
|---|---|---|---|
| Historic Footprint Areas (Old Crop fields) | Moderately Low | Optimise development potential while improving biodiversity integrity of surrounding natural habitat and managing edge effects. | The habitat integrity of these areas is considered moderately low and has been degraded due to historic agricultural activities and alien plant proliferation. Several faunal SCC may utilise this habitat for foraging purposes and are not reliant on the available habitat for breeding, thus the development will not reduce breeding productivity or potential. Development within this habitat unit is not expected to have a significant negative impact on the areas' local or regional ecology, provided mitigation measures are adhered to. |
| Existing Footprint Areas | Low | Optimise development potential. | This habitat is of low ecological importance. These areas have been, and to a degree still are, cleared of vegetation. Development in the associated areas will have little impact on the local ecology or species, notably SCC. Although these areas are located within the Magaliesberg IBA and a Biosphere Reserve, the habitat therein has been significantly disturbed and altered and, as such, is no longer capable of fulfilling the ecological roles necessary to support important birds or ecological functions. |
| Marikana Thornveld<br><br>Moisture-driven Habitat<br><br>Historic Footprint Areas (historic mining) | Intermediate | Preserve and enhance biodiversity of the habitat unit and surrounds while optimising development potential. | Areas of intermediate sensitivity include those that have: (i) been impacted on by previous mining and have re-established with mostly indigenous flora; and (ii) avoided any transformation, providing suitable habitat for fauna. Because of the fragmented nature of the Consolidated MR Surface Area mostly common species that have broad habitat requirements are likely to utilise the intermediate sensitivity areas for breeding, whilst most fauna within the vicinity will prefer foraging in these units. The fragmented nature of the remaining suitable vegetation and relatively homogenous structure and composition of the vegetation within the moisture-driven habitat and Historic Footprint Area reduces its appeal to SCC, who will readily favour neighbouring intact habitats to the east that have been exposed to less anthropogenic disturbance and edge effects. Although the Marikana Thornveld in the Game Park does offer a more species rich floral component, the isolated nature of the area and location between the mine, provincial road and farmland reduces the conservation potential of the unit.<br>Development within the proposed footprint areas is less likely to have significant impacts on faunal communities within the Consolidated MR Surface Area as the footprints are within less intact areas at present. However, should further portions of Marikana Thornveld be developed, large reductions in faunal diversity and abundance are considered likely. It remains important that edge effect impacts on areas outside of the direct footprint must be strictly managed and rehabilitation within these areas be completed to increase/return ecological functionality. |

#### *9.1.15.2 Impact of the EM Consolidation Project on Fauna*

The largely degraded nature of the landscape has resulted in a diminished faunal composition, with mostly common species anticipated to occur within the Consolidated MR Surface Area. SCC mammals will utilize the Area for breeding and the proposed Merensky opencast activities will reduce breeding habitat and increase resource competition for these species. Avifaunal SCC are unlikely to be affected, as these species will most likely only utilize the Consolidated MR Surface Area to forage and continue doing so intermittently after the EP Proposed Projects. Moreover, the current mining activities will already have conditioned many species to the impacts of mining.

The most sensitive habitat was the Marikana Thornveld within the Game Park, which hosts several SCC, and is composed of heterogenous flora, providing more opportunities to most fauna. Moisture-driven habitat provides important services and functions for channelling and filtering water and valuable niche habitats for water reliant faunal species. Degradation of floral and faunal species richness has occurred within the broader study area due to fencing, habitat fragmentation, historic mining and agriculture. Some broader landscape processes, such as large mammal movement and genetic flow, have been abated, reducing the study area's sensitivity and conservation potential.

The perceived impact significance of the EP Proposed Projects affecting faunal habitat, diversity and SCC will result in medium-high to low significance impacts, prior to mitigation. With mitigation, as stipulated in this report, and EP utilising best environmental practices, many of the impacts may be reduced to medium-low and very-low significance ratings. Thus, the EP Proposed Projects will not have a significant impact on the faunal assemblages.

### 9.1.16 Freshwater and Aquatic Ecology

***Refer to Appendix 16 for the Freshwater and Aquatic Ecological Assessment conducted by SAS Environmental.***

The Scope of the Freshwater and Aquatic Ecological Assessment comprised of the following:

- Freshwater Ecological Assessment
- Aquatic Ecological Assessment
- DWS Risk Assessment

A desktop assessment was undertaken and the results and are presented in the ***Table 31*** below.

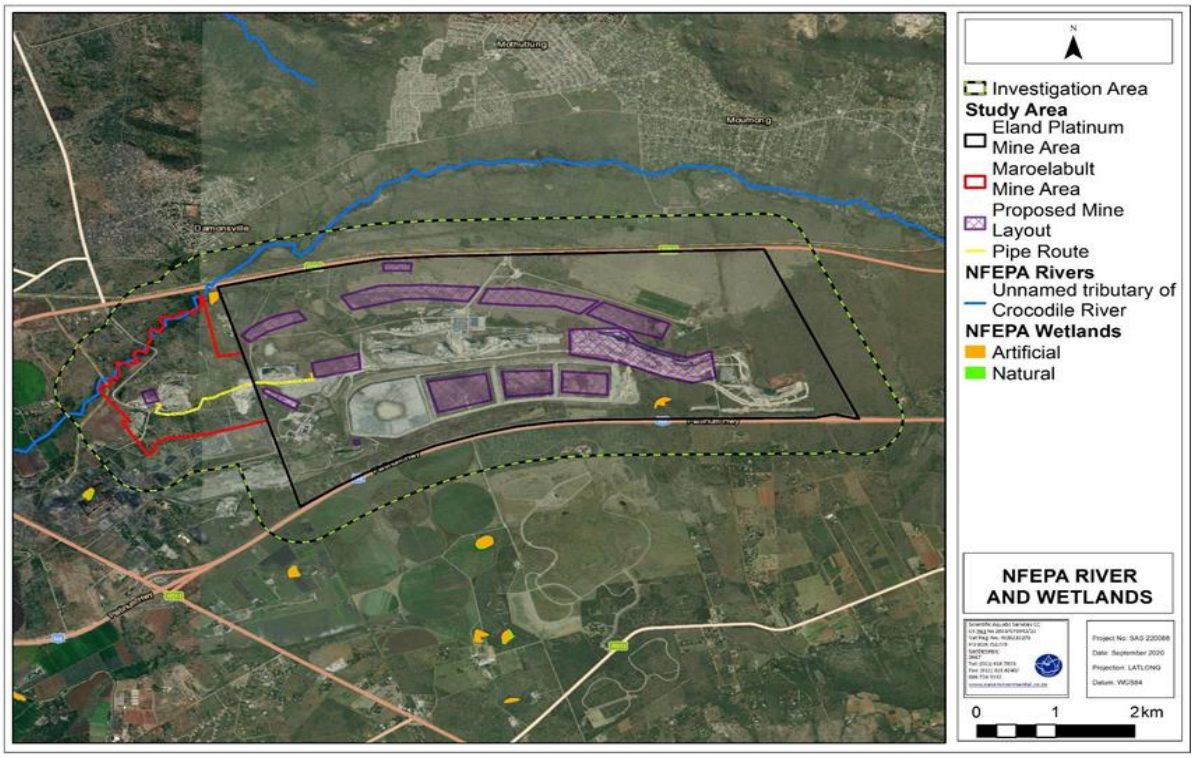


**Figure 65: River and wetlands associated with Consolidated MR Surface Area, according to National Freshwater Ecosystems Priority Areas (NFEPA) database (2011).**

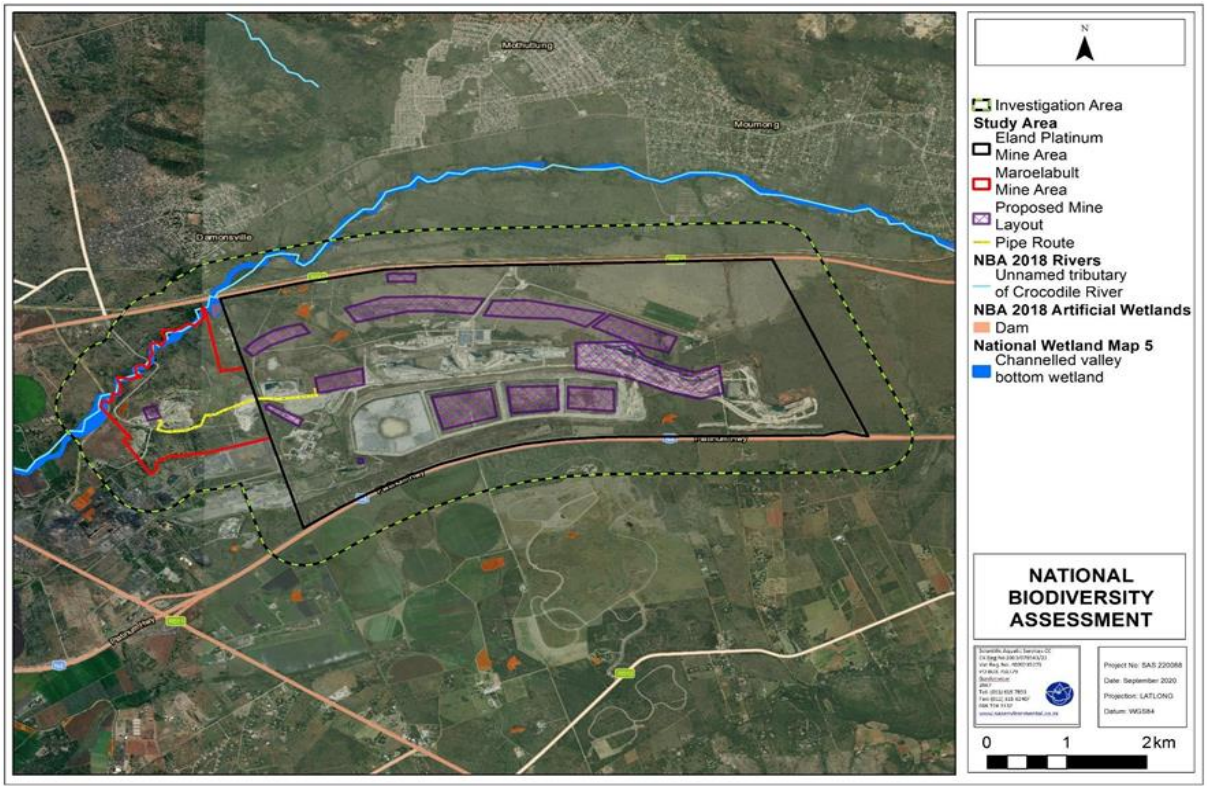


**Figure 66: Rivers, wetlands and other waterbodies associated with the Consolidated MR Surface Area according to the National Biodiversity Assessment (NBA) (2018).**

**Table 31: Desktop data relating to the character of watercourses associated with the study area (SAS, 2020).**

| Aquatic ecoregion and sub-regions in which the study area is located | | | Detail of the study area in terms of the National Freshwater Ecosystem Priority Area (NFEPA) (2011) database | |
|---|---|---|---|---|
| **Ecoregion** | Majority Western Bankenveld and remaining Bushveld Basin | | **FEPACODE** | The Consolidated MR Surface Area is situated within in an area currently not considered important in terms of fish and freshwater conservation. |
| **Catchment** | Limpopo | | | |
| **Quaternary Catchment** | A21J | | **NFEPA Wetlands** | According to the NFEPA Database, no natural wetlands are located within the Area. A single artificial CVB wetland is within the south-eastern portion of the Consolidated MR Surface Area. It is considered heavily to critically modified (Class Z3). |
| **WMA** | Crocodile (West) and Marico | | | |
| **subWMA** | Upper Crocodile | | | |
| **Dominant characteristics of the Bushveld Basin (8.05) and Western Bankenveld (7.04) Ecoregion Level 2 (Kleynhans *et al.*, 2007)** | | | **Wetland Vegetation Type** | The Area falls within the Central Bushveld Group 2 wetland vegetation type (Vulnerable). |
| **Ecoregion Level II** | 7.04 | 8.05 | **NFEPA Rivers** | An unnamed tributary of the Crocodile River is within the north-western portion of the Consolidated MR Surface Area. According to the NFEPA database, this tributary is largely modified (RIVCON Class Z), while the PES 1999 Classification considers the tributary as moderately modified (Class C). . |
| **Dominant primary terrain morphology** | Open Hills, Lowlands, Mountains; Moderate to high relief | Plains; low relief, slightly undulating plains | **Mining and Biodiversity Guidelines (2013)** | |
| **Dominant primary vegetation types** | Mixed Bushveld | Mixed Bushveld | | |
| **Altitude (m a.m.s.l)** | 900 to 1700 | 900 to 1500 | **Moderate Biodiversity Importance** | Small, scattered portions throughout Area are considered of moderate biodiversity importance. Moderate biodiversity importance areas include ESAs; vulnerable ecosystems; and focus areas for protected area expansion. These areas are of moderate biodiversity value and therefore pose a moderate risk to mining. EIAs and associated specialist studies should focus on confirming the presence and significance of these biodiversity features; identifying features (e.g., threatened species) not included in the existing datasets; and providing site-specific information to guide the application of the mitigation hierarchy. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations. |
| **MAP (mm)** | 400 to 700 | 400 to 700 | | |
| **Coefficient of Variation (% of MAP)** | 25 to 34 | 25 to 29 | | |
| **Rainfall concentration index** | 60 to 64 | 60 to >65 | | |
| **Rainfall seasonality** | Early to mid-summer | Early to mid-summer | | |
| **Mean annual temp. (°C)** | 16 to 20 | 16 to 20 | **High Biodiversity Importance** | Most of the Consolidated MR Surface Area (specifically the central and western portion) falls within an area considered of high biodiversity importance. High biodiversity importance areas include protected area buffers (around National Parks, World Heritage Sites and Nature Reserves); Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas); other identified priorities from provincial spatial biodiversity plans; and high-water yield areas, amongst others. These areas are important for conserving biodiversity; supporting / buffering other biodiversity priority areas; and maintaining important ecosystem services, for particular communities or the country as a whole. Mining options may be limited in these areas, and red flags for mining projects are possible. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations |
| **Winter temperature (July)** | 0 to 22 | 2 to 22 | | |
| **Summer temperature (Feb)** | 14 to 32 | 14 to 32 | | |
| **Median annual simulated runoff (mm)** | 20 to 100 | 40 to 100 | | |
| **Ecological Status of the most proximal sub-quaternary reach (DWS, 2014)** | | | | |
| **Sub-quaternary reach** | A21J-01026 (Unnamed tributary of Crocodile River) | | | |
| **Proximity to study area** | Western border of study area (upstream) | | | |
| **Assessed by expert?** | Yes | | | |
| **PES Category Median** | D (Largely Modified) | | | |
| **Mean Ecological Importance (EI) Class** | Moderate | | **Highest Biodiversity Importance** | The south-eastern and a portion of the south-western corners of the Consolidated MR Surface Area are considered of Highest Biodiversity Importance by the Mining and Biodiversity Guidelines (2013). Highest Biodiversity Importance areas include areas |
| **Mean Ecological Sensitivity (ES) Class** | High | | | |
| **Stream Order** | 1.0 | | | |

| | | | |
|---|---|---|---|
| **Default Ecological Class (based on median PES and highest EI or ES mean)** | B (High) | | where mining is not legally prohibited but where there is a very high risk that, due to their potential biodiversity significance and importance to ecosystem services (e.g., water flow regulation and water provisioning), mining projects will be significantly constrained or may not receive necessary authorisations |
| **Detail of the study area in terms of North-West Biodiversity Sector Plan (NWBSP, 2015).** | | **National Biodiversity Assessment (2018): South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (National Wetland Map 5 is included in the NBA)** | |
| **Aquatic Ecological Support Area 1** | The Consolidated MR Surface Area traverses several Aquatic Category 1 ESAs (ESA 1). These ESA 1 areas are modelled instream wetlands. This is a wetland layer developed by Dr. Nacelle Collins, based on a topographical wetland model that used the STRM 90m DEM as a base. Several Category 2 ESAs are associated with the traversed Category 1 ESAs.<br>ESA are aquatic areas that are not essential for meeting biodiversity targets but which nevertheless play an important role in supporting the ecological functioning of CBAs and/or in delivering ecosystem services that support the socio-economic development, such as water provision, flood mitigation or carbon sequestration. | According to the NBA 2018: SAIIAE, there are several dams located within the Consolidated MR Surface Area. The NBA 2018 Dataset classifies the Crocodile River's unnamed tributary as a natural CVB wetland. This wetland is seriously modified, as it is currently affected by an artificial feature; a degraded river system (the Crocodile River's unnamed tributary); and roads and railways (Class DEF). The Crocodile River's unnamed tributary is currently not protected (Ecosystem Protection Level) and the NBA Dataset considers it to be largely modified (Class D). | |
| **National Web Based Environmental Screening Tool (2020)** | | | |
| **The screening tool is intended for pre-screening of sensitivities in the landscape to be assessed within the EIA process. This assists with implementing the mitigation hierarchy, by allowing developers to adjust their proposed development footprint to avoid sensitive areas.** | | The aquatic sensitivity for the Consolidated MR Surface Area and surrounds has a very high sensitivity, due to the wetlands located within the Area being classified as aquatic CBAs. | |

**CBA = Critical Biodiversity Area; DWS = Department of Water and Sanitation; EI = Ecological Importance; ES = Ecological Sensitivity; ESA = Ecological Support Area; m.a.m.s.l = Metres Above Mean Sea Level; MAP = Mean Annual Precipitation; MBSP = Municipal Biodiversity Summary Project; NFEPA = National Freshwater Ecosystem Priority Areas; PES = Present Ecological State WMA = Water Management Area**

### *a) Ecological status of sub-quaternary catchment*

The Present Ecological State ("**PES**"), Ecological Importance ("**EI**") and Ecological Sensitivity ("**ES**") database, as developed by the DWS Resource Quality Services ("**RQS**") Department, was utilised to obtain additional background information on the project area.

**Table 32: Summary of ecological status of sub-quaternary catchment (SQ) reach of the Crocodile River's unnamed tributary (A21J – 01026) based on the DWS RQS PES/EIS database.**

| Synopsis (SQ reach unnamed tributary of Crocodile River (A21J – 01026)) | | | | | |
|---|---|---|---|---|---|
| **PES[1] category median** | **Mean EI[2] class** | **Mean ES[3] class** | **Length** | **Stream order** | **Default EC[4]** |
| D (Largely Modified) | Moderate | High | 25.87 | 1 | B (High) |
| **PES details** | | | | | |
| **Instream habitat continuity MOD** | Moderate | **Riparian/wetland zone MOD** | Large | | |
| **RIP/wetland zone continuity MOD** | Large | **Potential flow MOD activities** | Moderate | | |
| **Potential instream habitat MOD activities** | Large | **Potential physico-chemical MOD activities** | Large | | |
| **EI details** | | | | | |
| **Fish spp/SQ** | 11.00 | **Fish average confidence** | 1.0 | | |
| **Fish representivity per secondary class** | Moderate | **Fish rarity per secondary class** | Very high | | |
| **Invertebrate taxa/SQ** | 38.00 | **Invertebrate average confidence** | 2.95 | | |
| **Invertebrate representivity per secondary class** | High | **Invertebrate rarity per secondary class** | High | | |
| **EI importance: riparian-wetland- instream vertebrates (excluding fish) rating** | Low | **Habitat diversity class** | Low | | |
| **Habitat size (length) class** | Low | **Instream migration link class** | High | | |
| **Riparian-wetland zone migration link** | Moderate | **Riparian-wetland zone habitat integrity class** | Moderate | | |
| **Instream habitat integrity class** | Moderate | **Riparian-wetland natural vegetation rating based on percentage natural vegetation in 500m** | High | | |
| **Riparian-wetland natural vegetation rating based on expert rating** | | | High | | |
| **ES details** | | | | | |
| **Fish physical-chemical sensitivity description** | High | **Fish no-flow sensitivity** | High | | |
| **Invertebrates physical-chemical sensitivity description** | Moderate | **Invertebrates velocity sensitivity** | Very high | | |
| **Riparian-wetland-instream vertebrates (excluding fish) intolerance water level/flow changes description** | | | Low | | |
| **Stream size sensitivity to modified flow/water level changes description** | | | High | | |
| **Riparian-wetland vegetation intolerance to water level changes description** | | | High | | |

1 **PES** = Present Ecological State; confirmed in the database that assessments were performed by expert assessors
2 **EI** = Ecological Importance
3 **ES** = Ecological Sensitivity
4 **EC** = Ecological Category; default based on median PES and highest of EI or ES mean.

### *9.1.16.1 Watercourse Assessment*

Two watercourses were identified within the study area, specifically a CVB wetland and the Crocodile River's unnamed tributary, with an associated riparian habitat. Within the wetland delineated in the Consolidated MR Surface Area, various impoundments were observed during the time of the assessment.

These artificial features historically formed part of the pre-mining agricultural activities and are located within the Game Park but now form part of EM's closed dirty water reticulation system. These dams (known as the 'Farm Dam' and 'Lapa Dam', located within the Game Park) have been authorised as Section 21(g) water uses (disposing of waste in a manner which may detrimentally impact on a water resource) in the EM WUL as PCDs. Clean water diversions do however allow for the recharge with clean water into the downstream wetland and the two dams located within the north-western portion of the Consolidated MR Surface Area. The historical upstream portion of this wetland has also been diverted (to allow for the TSF's development). This diversion has been authorised in the EM WUL as Sections 21 (c) and (i) water uses and forms part of EM's clean water management system.

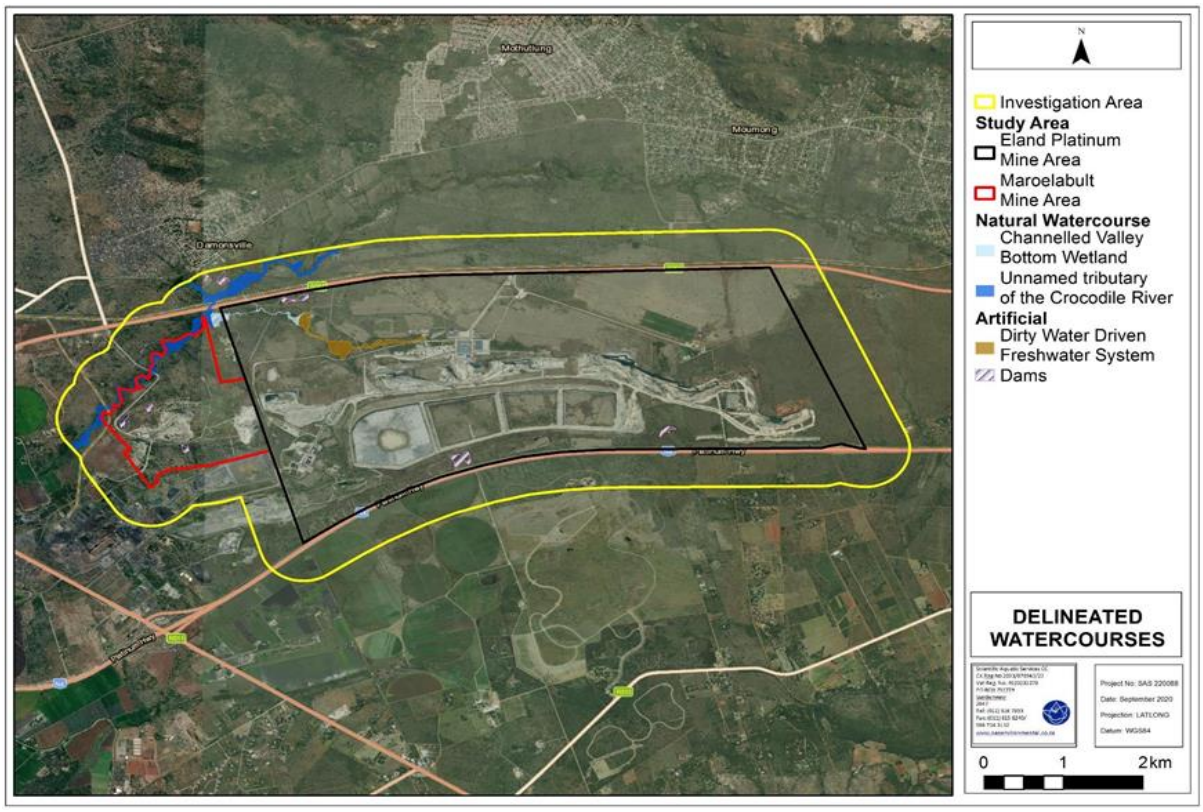


**Figure 67: Location of watercourses within the Consolidated MR Surface Area (SAS, 2020).**

#### *9.1.16.2 Aquatic Ecological Assessment*

The instream aquatic ecological assessment presents the results of a single aquatic survey, conducted in early spring, when the Crocodile River's unnamed tributary had low flows.

The Crocodile River's unnamed tributary is subject to various impacts from surrounding communities such as the Damonsville and Moumong townships. In addition, within the unnamed tributary's catchment, there are upstream agricultural and mining activities. Four sites with Consolidated MR Surface Area were evaluated in the aquatic ecological assessment: three were located on the Crocodile River's unnamed tributary and one on the CVB wetland associated with the mining activities.

A distinct sewage odour was present at monitoring points associated with Crocodile River's unnamed tributary. Other general instream impacts observed at the monitoring points include erosion, siltation

and littering, which were present particularly at the assessment point associated with the Crocodile River's tributary.

#### *9.1.16.3 Ecological Importance and Sensitivity Assessment*

As with the derived aquatic ecological category, the Ecological Importance and Sensitivity ("**EIS**") method (DWAF, 1999) was applied to the section of the Crocodile River's unnamed tributary, to ascertain the system's sensitivity and importance, considering the various impacts identified within the system. The assessment 's results are presented in ***Table 33*** below:

**Table 33: Results of EIS assessment for the Crocodile River's unnamed tributary within the Consolidated MR Surface Area.**

| Biotic Determinants | Score |
|---|---|
| Rare and endangered biota | **0** |
| Unique biota | **0** |
| Intolerant biota | **1** |
| Species/taxon richness | **1** |
| **Aquatic Habitat Determinants** | |
| Diversity of aquatic habitat types or features | **1** |
| Refuge value of habitat type | **2** |
| Sensitivity of habitat to flow changes | **3** |
| Sensitivity of flow-related water quality changes | **1** |
| Migration route/corridor for instream and riparian biota | **2** |
| Nature Reserves, Natural Heritage sites, Natural areas, PNEs | **0** |
| **RATINGS** | 1.1 |
| EIS CATEGORY | **Moderate** |

The EIS assessment of the unnamed tributary provided a score of 1.1, which is considered of **moderate importance and sensitivity**. The system has a moderately high sensitivity to flow related water quality changes and both the instream and marginal habitat is influenced by fluctuating flow regimes. A low diversity of habitat types exists, being comprised largely of instream vegetation and road crossings, which have resulted in flow impoundment. Refuge areas were regarded as moderate, albeit somewhat impacted due to the blanketing of benthos with algae. The Crocodile River's unnamed tributary is considered of low importance, due to the presence of intolerant macroinvertebrate taxa and no fish species were observed during the sampling assessment conducted in September 2020.

#### *9.1.16.4 Buffers Zone*

The delineated CVB wetland and the Crocodile River's unnamed tributary with an associated riparian habitat are depicted below. In addition, the applicable Zones of Regulation (ZoR) in terms of the NEMA and GN704 and GN509 are conceptually depicted in ***Figure 69*** below. These ZoRs must be taken into consideration during the EP Proposed Project's planning, construction and operational phases, in line with the mitigation hierarchy as advocated by the DEA et. al, 2013. Should they be encroached upon, the relevant authorisations will need to be obtained prior to the commencement of any activities. Due

to the artificial nature of the artificial impoundments and freshwater system associated with the dirty water system, no ZoR are deemed relevant for these features.


**Figure 68: Conceptual presentation of the delineated watercourses, the applicable zone of regulation in terms of NEMA, GN509 and GN704 as they relate to the NWA in relation to the surrounding area.**

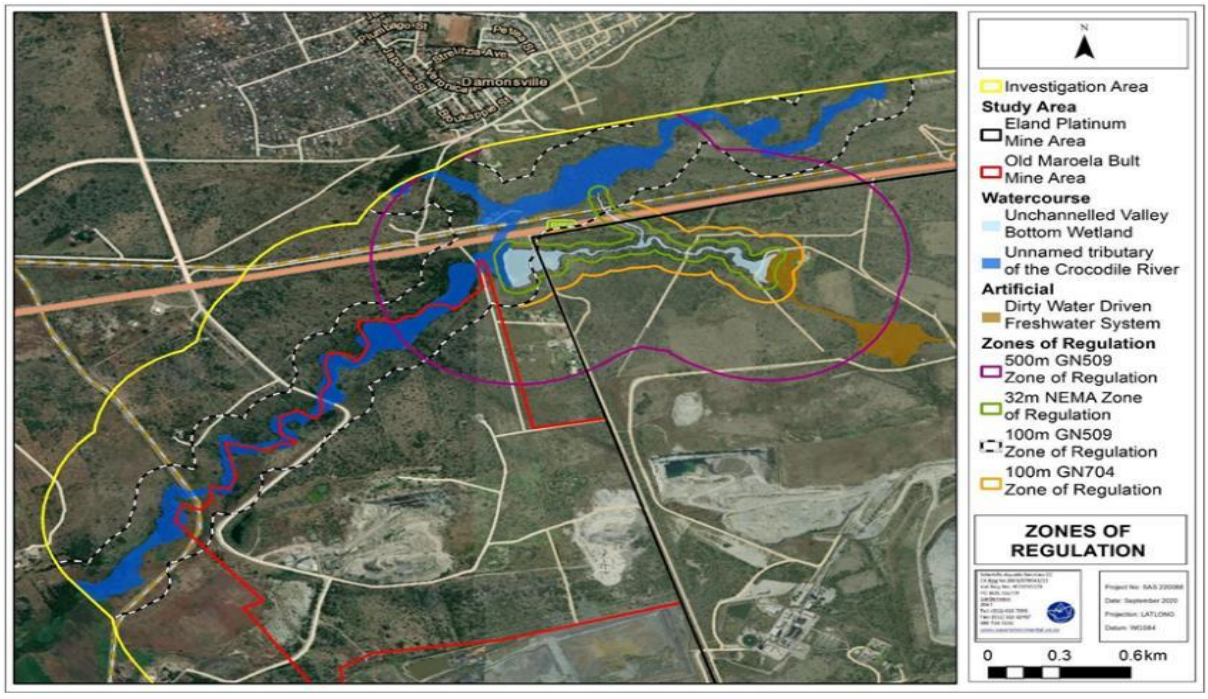


**Figure 69: Conceptual presentation of the delineated watercourses and applicable ZoR in terms of NEMA, GN509 and GN704 (SAS, 2020).**

#### *9.1.16.5 Impacts of EM Consolidated Project to Freshwater and Aquatic Ecology*

Two watercourses associated with the Consolidated MR Surface Area were identified, specifically a CVB wetland and the Crocodile River's unnamed tributary, with an associated riparian habitat. The ecological assessment's outcome indicates that these watercourses are in a largely modified ecological state; of moderate EIS; and, as a result, are likely to only provide intermediate levels of ecological services. The Crocodile River is however of significant strategic importance and an important system, providing water to the downstream farming community and mines.

The aquatic instream assessment's findings correlate with those of the WET Health Index, with an overall ecological category of D observed; and a moderate level of EIS. The decreased aquatic ecological integrity at the assessed points may be largely attributable to upstream impacts on water quality, such as ingress of organic effluent (which was noted by a distinct sewage odour during the assessment), prior to any potential impacts from EM and MM. In addition to impacts on dissolved oxygen (which was found to be significantly low) and dissolved salts (which were high at all assessment points), the absence of suitable habitat and flow was a limiting factor for sensitive and diverse macro-invertebrate communities' establishment within the assessed systems.

Following the assessment, the DWS risk assessment matrix was applied to ascertain the significance of possible impacts which may occur because of the EP Proposed Projects. The risk assessment's outcome showed that, assuming mitigation measures are strictly enforced, risk significance is predominantly of Medium Risk. This conclusion was drawn since risks are largely due to the potential edge effects, as no proposed infrastructure will encroach directly within the delineated freshwater systems according to the provided layout.

Based on the findings of the freshwater ecological assessment and the risk assessment's results, the freshwater ecologist's opinion is that the EP Proposed Projects do not pose a direct risk to the freshwater systems and given that the Project will be located within historically impacted areas, the impact significance will be significantly reduced. However, adherence to cogent, well-conceived and ecologically sensitive site development plans; the mitigation measures provided; and general good mining practice, is essential if the significance of perceived impact is to be reduced. This is particularly for cumulative impacts, which may arise from seepage and dewatering associated with the EP Proposed Projects within the areas where extensive mining occurs.

### 9.1.17 Air Quality

The Brits-Rustenburg Region is the industrial hub of the NWP, with all the platinum, chromium and vanadium mines located in this Region.

EM falls within the Waterberg-Bojanala National Priority Area, as contemplated in section 18(1) of NEM:AQA, 2004. The Waterberg-Bojanala National Priority Area was established due to the exceedance of the ambient air quality standards or alternatively that a situation exists within the Area which is causing or may cause a significant negative impact on air quality in the area and the area requires specific air quality management action to rectify the situation.

Existing key sources of air pollution surrounding the Consolidated MR Surface Area were identified during a desktop exercise and include:

- Mining activity (north and south-west of the Consolidated MR Surface Area);
- Vehicle dust entrainment on unpaved roads (surrounding areas);
- Commercial agricultural activities (surrounding areas);
- Industrial activity (west of the Consolidated MR Surface Area);
- Domestic fuel burning at informal settlements (north and north-east of the Consolidated MR Surface Area).:

Dust-fall, PM10 and PM2.5 are key pollutants of concern associated with existing and proposed operations at the Consolidated MR Surface Area and are emitted from the following key sources:

**Particulate Emissions:**

- Wind erosion from exposed areas;
- Storage of material (stockpiles, TSF);
- Truck loading and offloading operations;
- Material handling (front-end-loaders / excavators);
- Blasting;
- Bulldozing material (moving material, shaping stockpiles, etc);
- Conveyor transfer points;
- Crushing and screening; and
- Vehicle dust entrainment on unpaved haul roads.

#### *9.1.17.1 Dispersion Modelling*

The dispersion modelling study's approach was based on the Code of Practice for Air Dispersion Modelling in Air Quality Management in South Africa (DEA, 2014).

To investigate the potential impact of mining operations associated with the EM Consolidation Project on local ambient air quality, the following air pollutants were chosen to be quantified and modelled:

- Dust-fall; and
- Particulate matter (PM10 and PM2.5).

Two scenarios were modelled in the AQIA, as the different mining areas will not all be operational over the same period.

- Scenario one includes mining activities associated with:
    - Kukama underground (currently underway until year 2050);
    - Nyala underground (planned to recommence year 2024 and end year 2050);
    - Maroelabult underground (planned to recommence year 2023 and end year 2039); and
    - Zilkaatsnek opencast (planned to start year 2022 and end year 2028).
- Scenario two includes mining activities associated with:
    - Kukama underground (currently underway until year 2050);
    - Nyala underground (planned to recommence year 2024 and end year 2050);
    - Merensky Reef opencast (planned to start year 2036 and end year 2046); and

- Extraction of UG1 material at TSF Paddocks 2, 3 and 4 (planned to start year 2037 and end year 2046).

The emission factors and equations used in the AQIA are described in section 6.1 below. The following maximum material throughputs were used to quantify emissions:

- ~7000 tonnes per day of ROM feed to EM's Concentrator Plant (existing/planned);
- ~5800 tonnes per day of ROM from Kukama underground decline shaft (existing);
- ~1200 tonnes per day of ROM from Nyala underground shaft (planned);
- ~1200 tonnes per day of chrome produced at the Concentrator Plant (existing);
- ~120,000 tonnes per year of ROM from the proposed Zilkaatsnek opencast area (planned);
- ~1700 tonnes per day of ROM from Maroelabult underground shaft (planned);
- ~40,000 tonnes per month ROM dry feed to the MM CFP (planned); and
- ~250 tonnes per day of chrome produced at the CFP (planned).

**Table 34: Modelled sources of emissions associated with the EM Consolidation Project (Rayten, 2021).**

| SOURCE OF EMISSIONS INCLUDED IN DISPERSION MODEL | |
|---|---|
| **SCENARIO ONE** | |
| **Dust-fall** | **Eland Mine (Kukama / Nyala Underground):**<br>Wind erosion from exposed areas (ROM/product stockpiles, exposed area at TSF);<br>Truck loading / offloading activities;<br>Bulldozing (shaping ROM stockpiles, moving material);<br>Conveyor transfer points (at the Concentrator Plant, loading ROM stockpiles, loading ore silo);<br>Crushing and screening at the Concentrator Plant; and<br>Truck hauling unpaved roads.<br>**Maroelabult Underground:**<br>Wind erosion from exposed areas (ROM/product stockpiles);<br>Truck loading / offloading activities;<br>Conveyor transfer points (ROM Tip, proposed CFP);<br>Crushing and screening at proposed CFP; and<br>Truck hauling unpaved roads.<br>**Zilkaatsnek Opencast Pits:**<br>Wind erosion from exposed areas (opencast area, stockpiles);<br>Blasting in pits;<br>Bulldozing in pits;<br>Truck loading / offloading activities;<br>Mobile crusher; and<br>Truck hauling unpaved roads. |
| **Particulate emissions ($PM_{10}$ & $PM_{2.5}$)** | |
| **SCENARIO TWO** | |
| **Dust-fall** | **Eland Mine (Kukama / Nyala Underground):**<br>Wind erosion from exposed areas (ROM/product stockpiles, exposed area at TSF);<br>Truck loading / offloading activities;<br>Bulldozing (shaping ROM stockpiles, moving material);<br>Conveyor transfer points (at Concentrator Plant, loading ROM stockpiles, loading ore silo);<br>Crushing and screening at Concentrator Plant; and<br>Truck hauling unpaved roads.<br>**Merensky Reef Opencast Pits:**<br>Wind erosion from exposed areas (opencast area, stockpiles);<br>Blasting in pits;<br>Bulldozing in pits;<br>Truck loading / offloading activities; and<br>Truck hauling unpaved roads.<br>**Remining of UG1 material at TSF Paddocks 2, 3 and 4:**<br>Wind erosion from exposed areas;<br>Truck loading / offloading activities; and<br>Truck hauling unpaved roads. |
| **Particulate emissions ($PM_{10}$ & $PM_{2.5}$)** | |

### *9.1.17.2 Dispersion Model Output Plots for Dust-Fall, PM10 and PM2.5*

The dispersion model output plots for dust-fall rates, PM10 and PM2.5 concentrations due to existing and proposed mining activities associated with the EM Consolidation Project are given in the Figures below.

Predicted incremental dust-fall rates comply with the residential area standard of 600 mg/m$^2$/day and non-residential area standard of 1200 mg/m$^2$/day beyond the Consolidated MR Surface Area for both scenarios. Exceedances of the standards are predicted within the Consolidated MR Surface Area, in and around areas of mining activity i.e. near the ROM stockpiles, opencast areas and screening and crushing activity, Refer to ***Figure 70*** and ***Figure 71***.

Predicted daily average PM10 concentrations comply with the daily standard of 75 µg/m$^3$ south, east and north-east of the Consolidated MR Surface Area for both scenarios, refer to ***Figure 72*** and ***Figure 73***. Higher PM10 concentrations are projected north, west and south-west of the Consolidated MR Surface Area. Exceedances of the daily standard are predicted over the Damonsville residential area (north of the Area, parts of the Primindia industrial area (west of the Area) and over the Hernic Ferrochrome mining area (south-west of the Area).

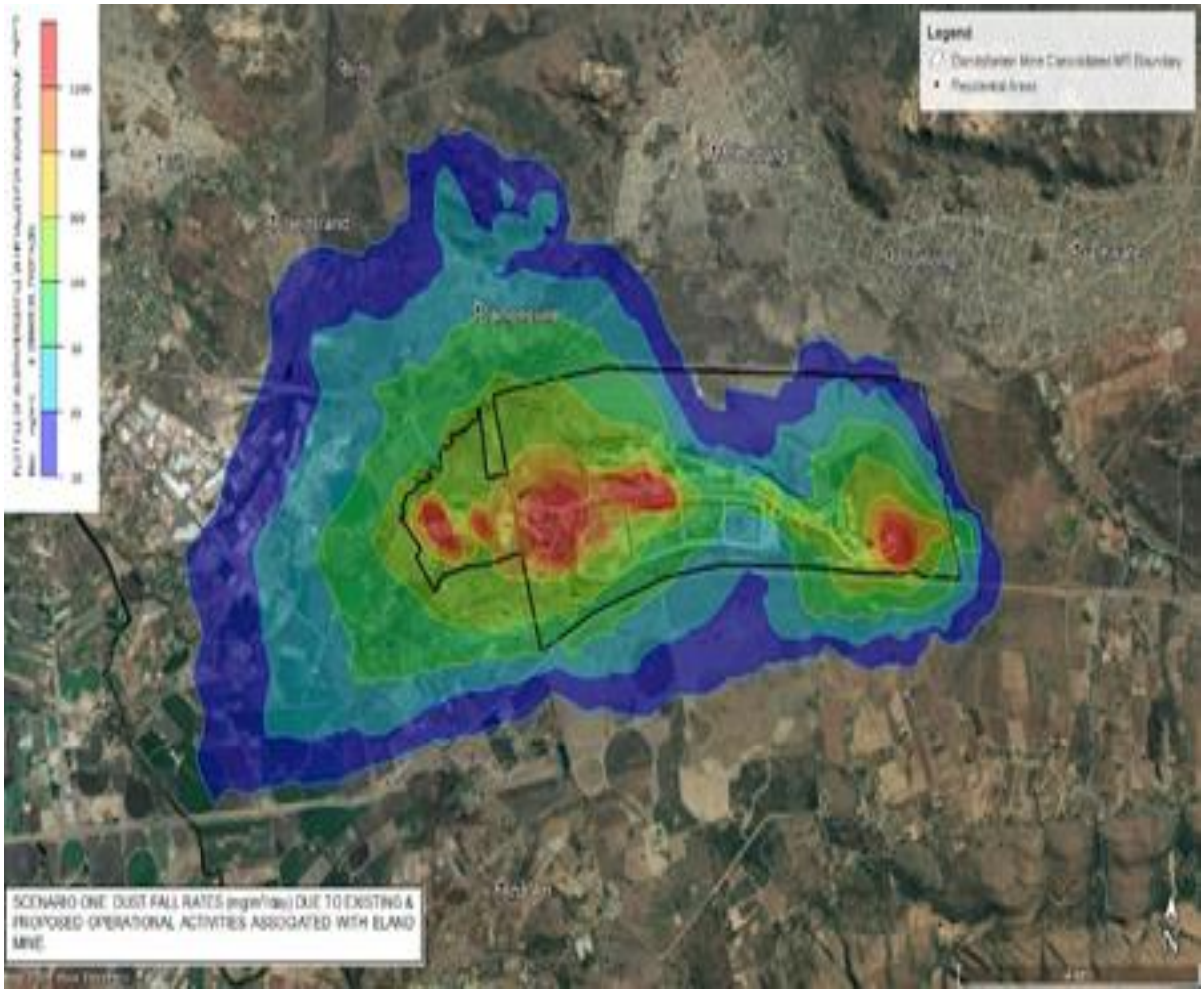


**Figure 70: Predicted Dust-Fall Rates associated with EM Consolidation Project – Scenario One.**

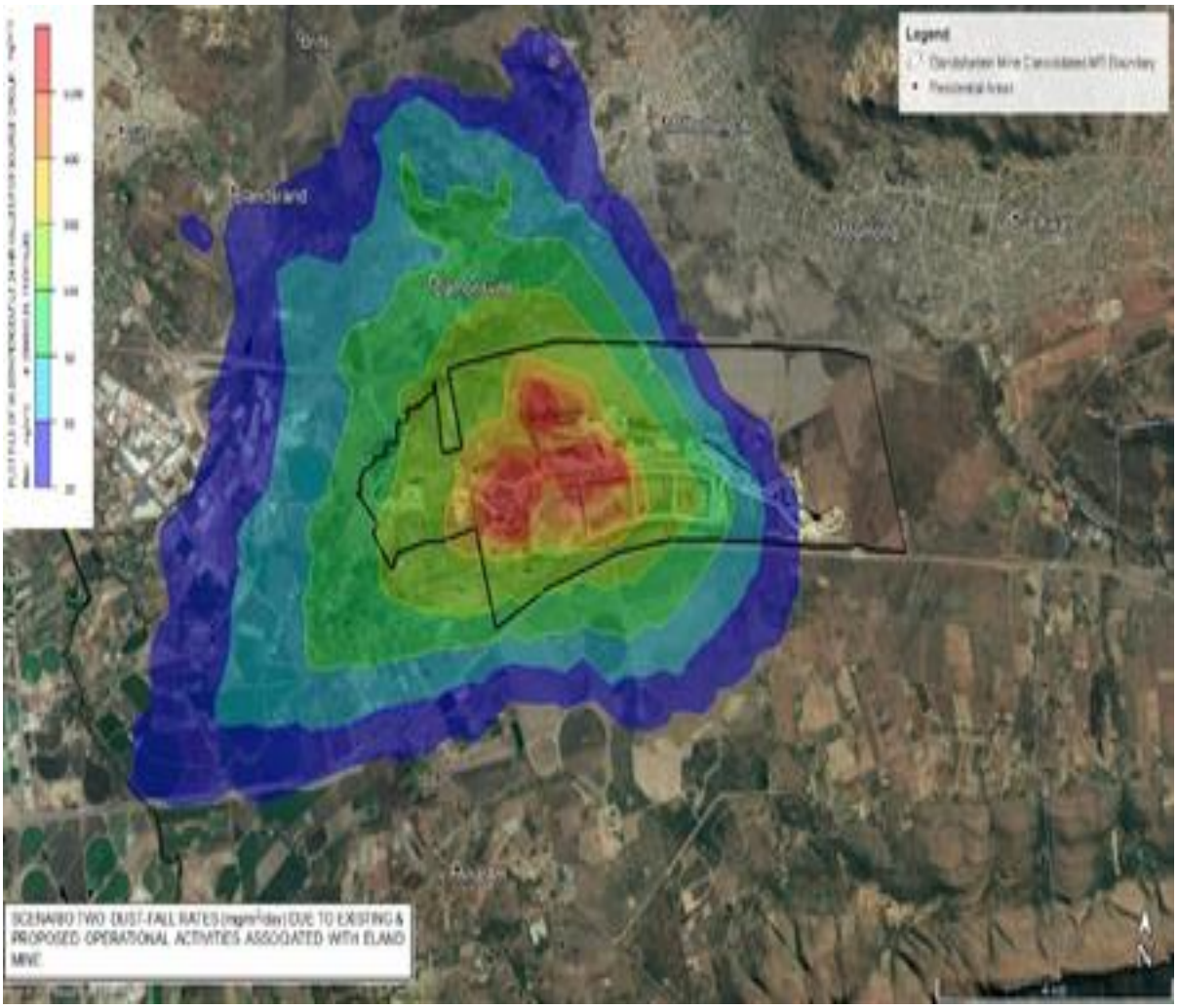


**Figure 71: Predicted Dust-Fall Rates associated with EM Consolidation Project – Scenario Two.**

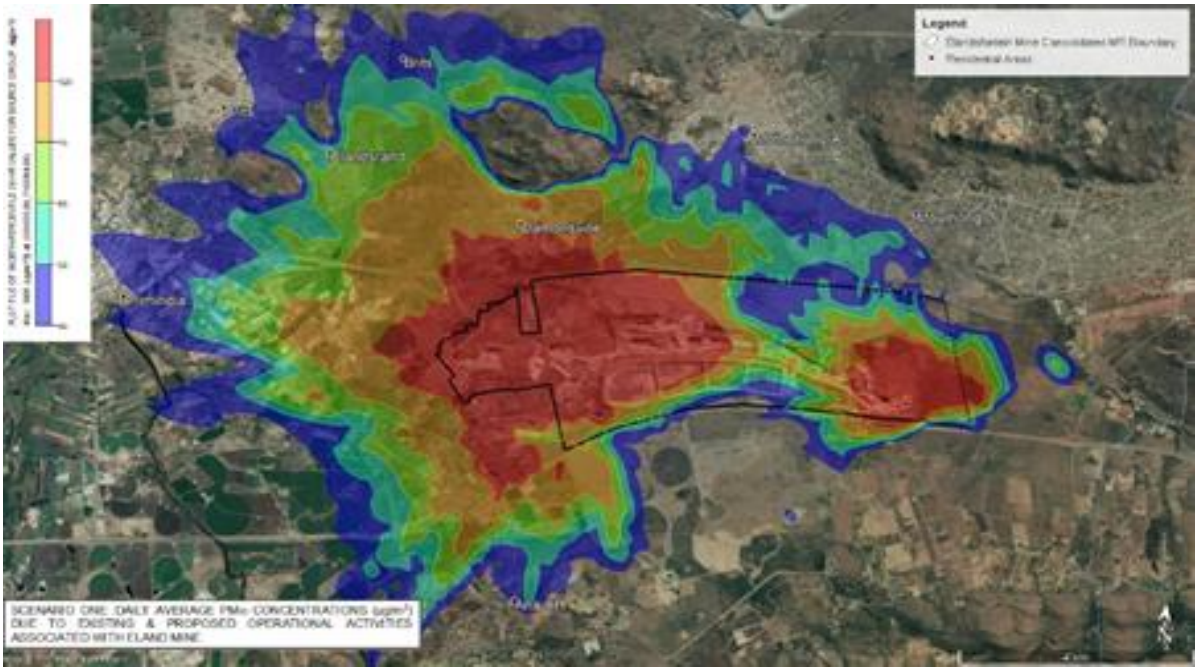


**Figure 72: Predicted Daily Average PM10 Concentrations associated with EM Consolidation Project – Scenario One.**

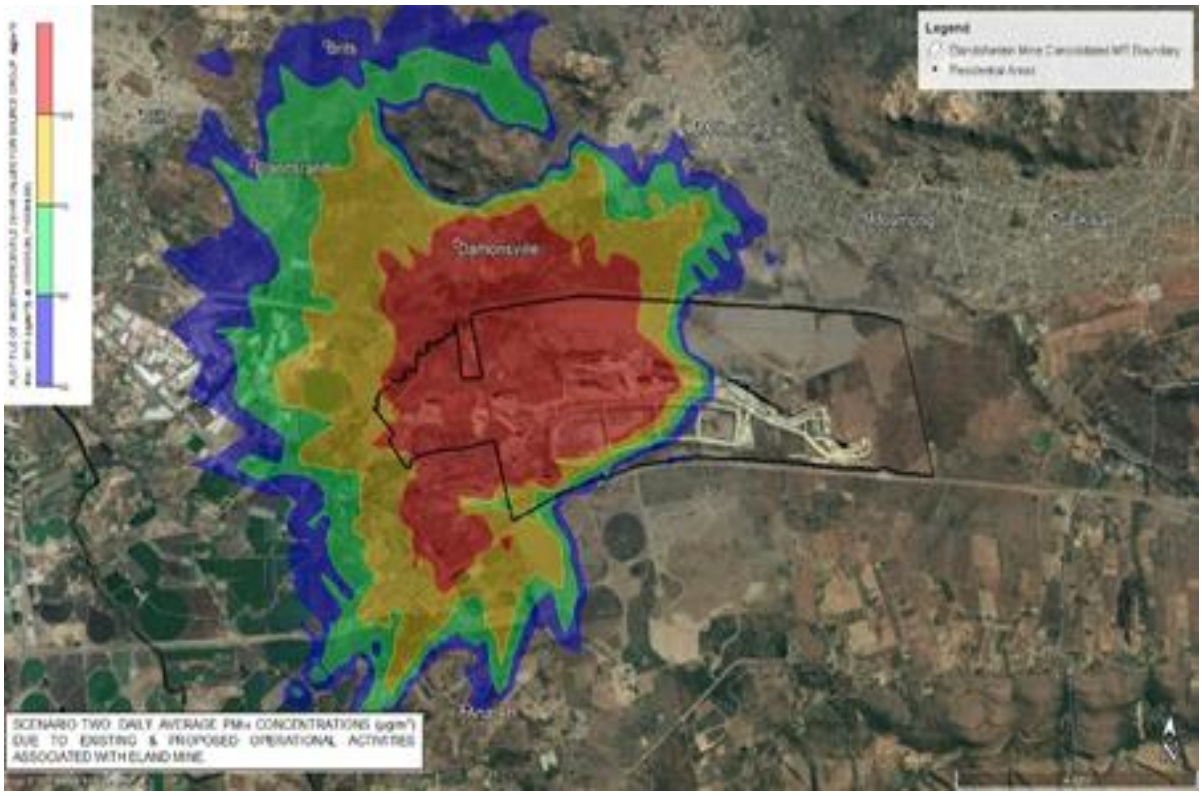


**Figure 73: Predicted Daily Average PM10 Concentrations associated with the Eland Platinum Mine Consolidation Project – Scenario Two.**

Predicted annual average PM10 concentrations comply with the annual standard of 40 µg/m3 outside of the Consolidated MR Surface Area for both scenarios, refer to ***Figure 74*** *and* ***Figure 75.*** Higher annual average concentrations, including exceedances, are limited to the Area's western and eastern sides.

Predicted incremental daily and annual average PM2.5 concentrations comply with the applicable standards beyond the Consolidated MR Surface Area for both scenario one and two, refer to ***Figure 76 - Figure 77*** (Daily) and ***Figure 78 - Figure 79***.

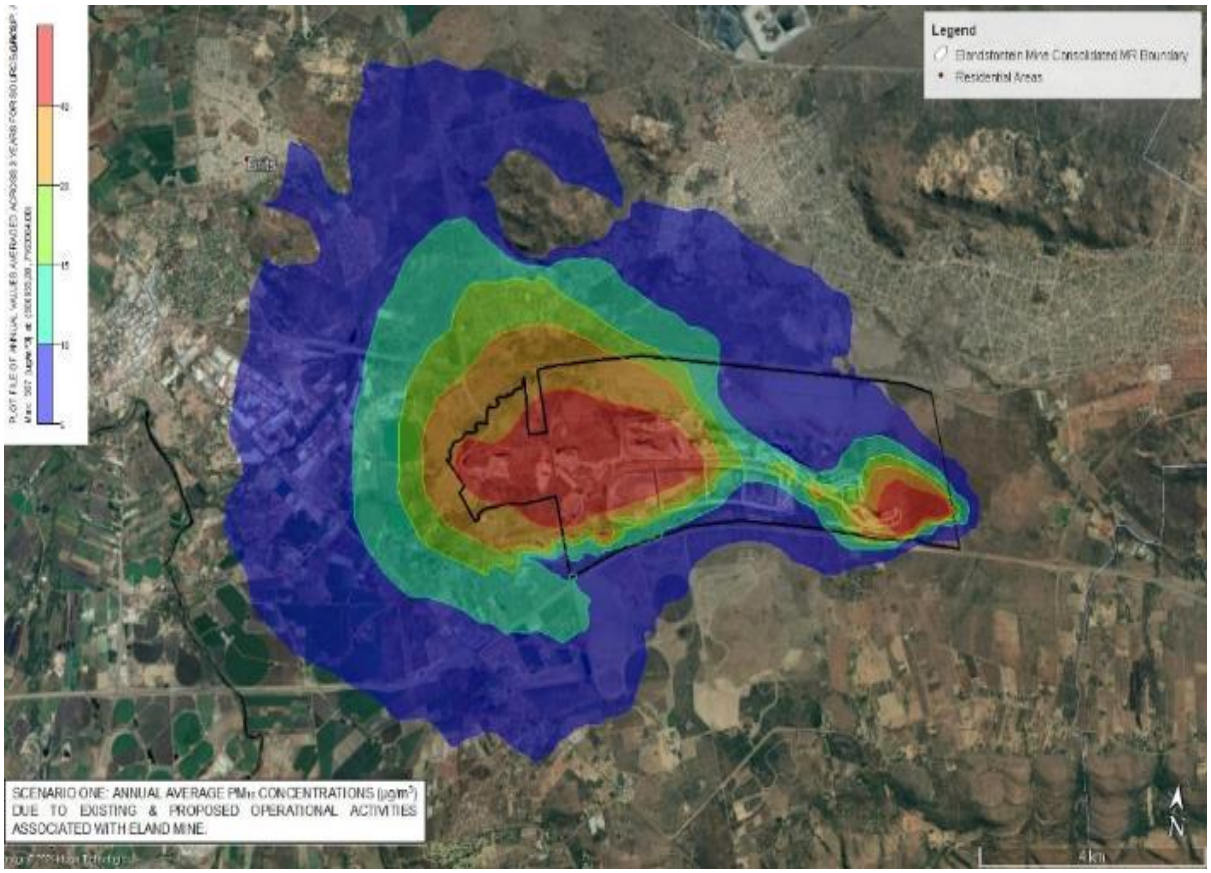


**Figure 74: Predicted Annual Average PM10 Concentrations associated with the EM Consolidation Project – Scenario One.**

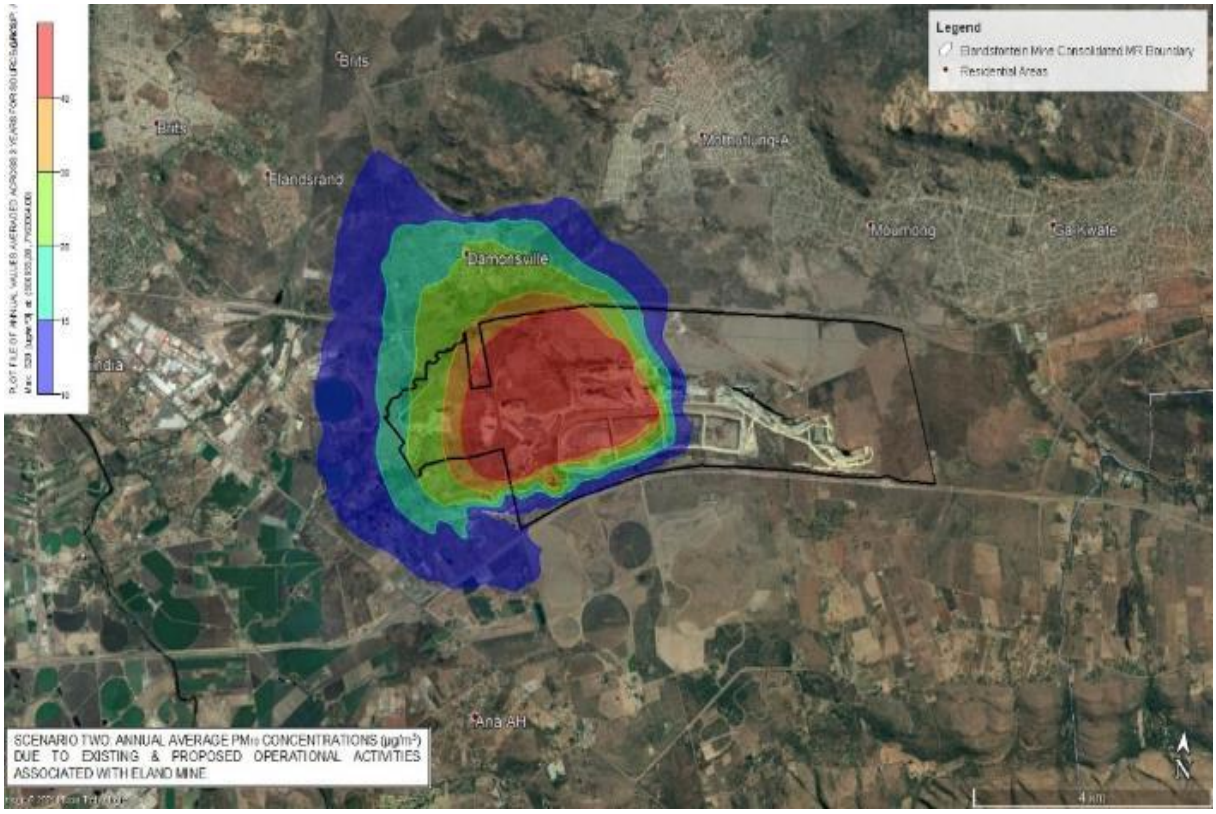


**Figure 75: Predicted Annual Average PM10 Concentrations associated with the EM Consolidation Project – Scenario Two.**

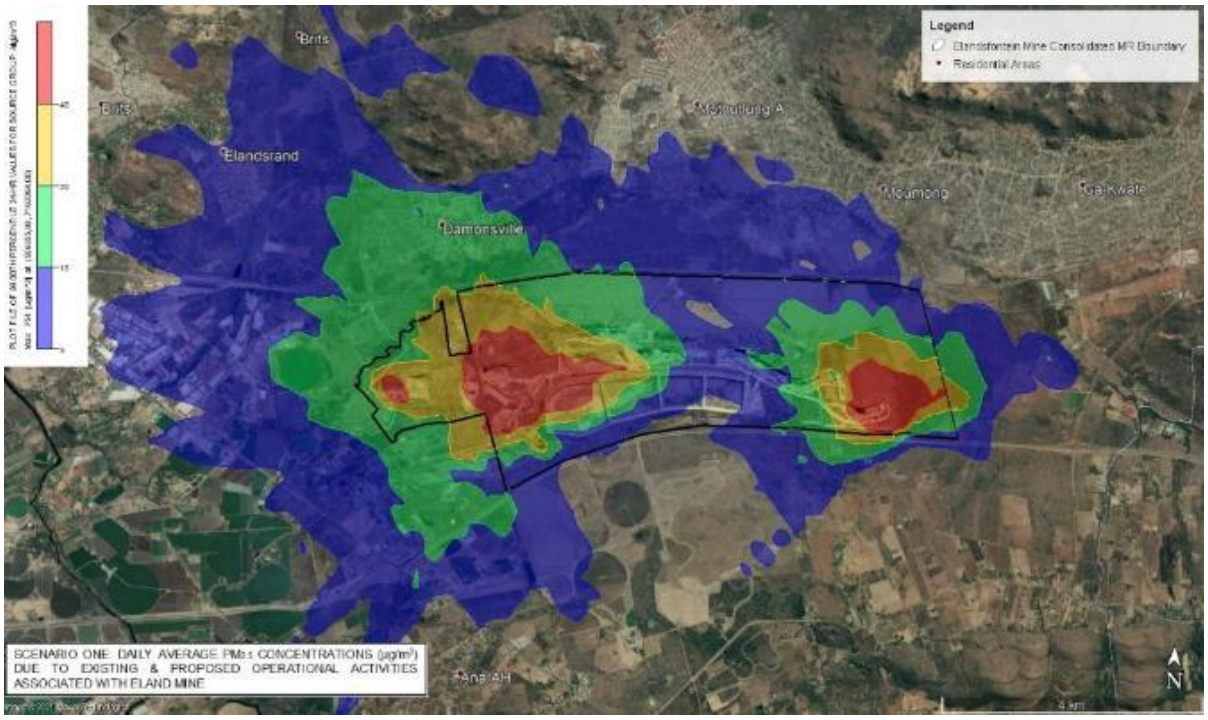


**Figure 76: Predicted Daily Average PM2.5 Concentrations associated with the EM Consolidation Project – Scenario One**

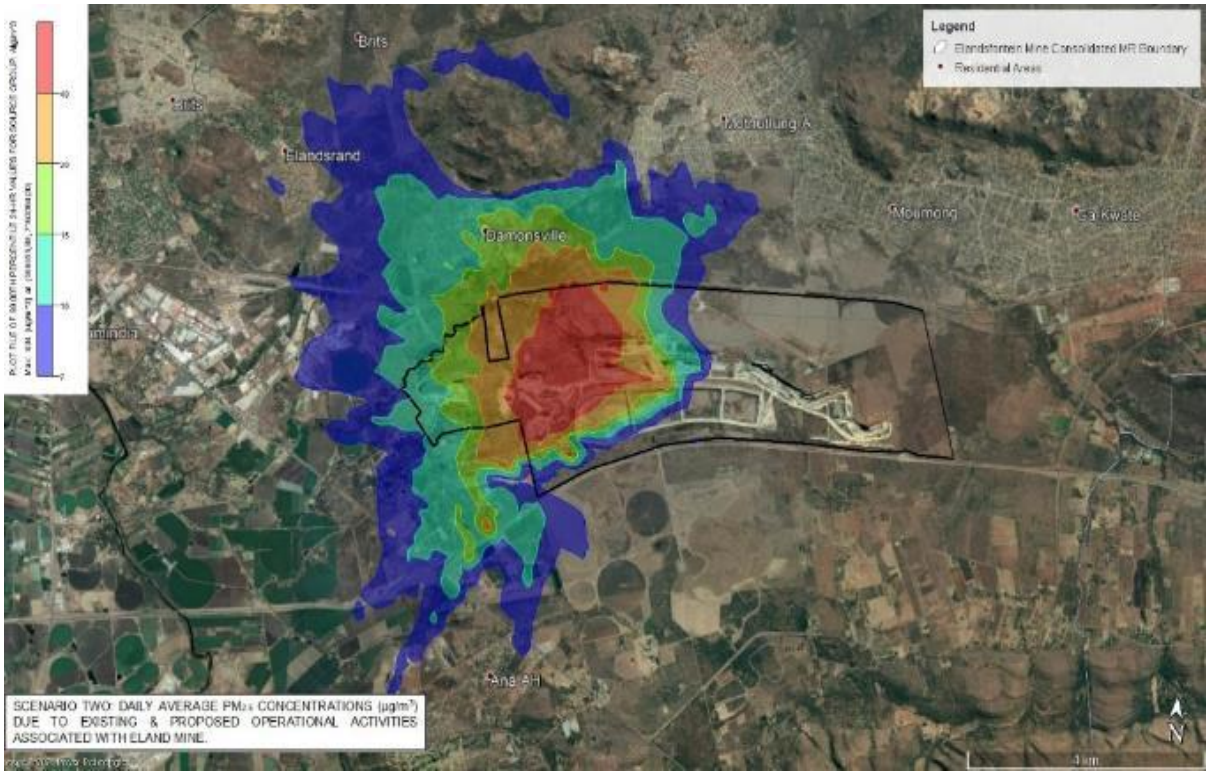


**Figure 77: Predicted Daily Average PM2.5 Concentrations associated with the EM Consolidation Project – Scenario Two**

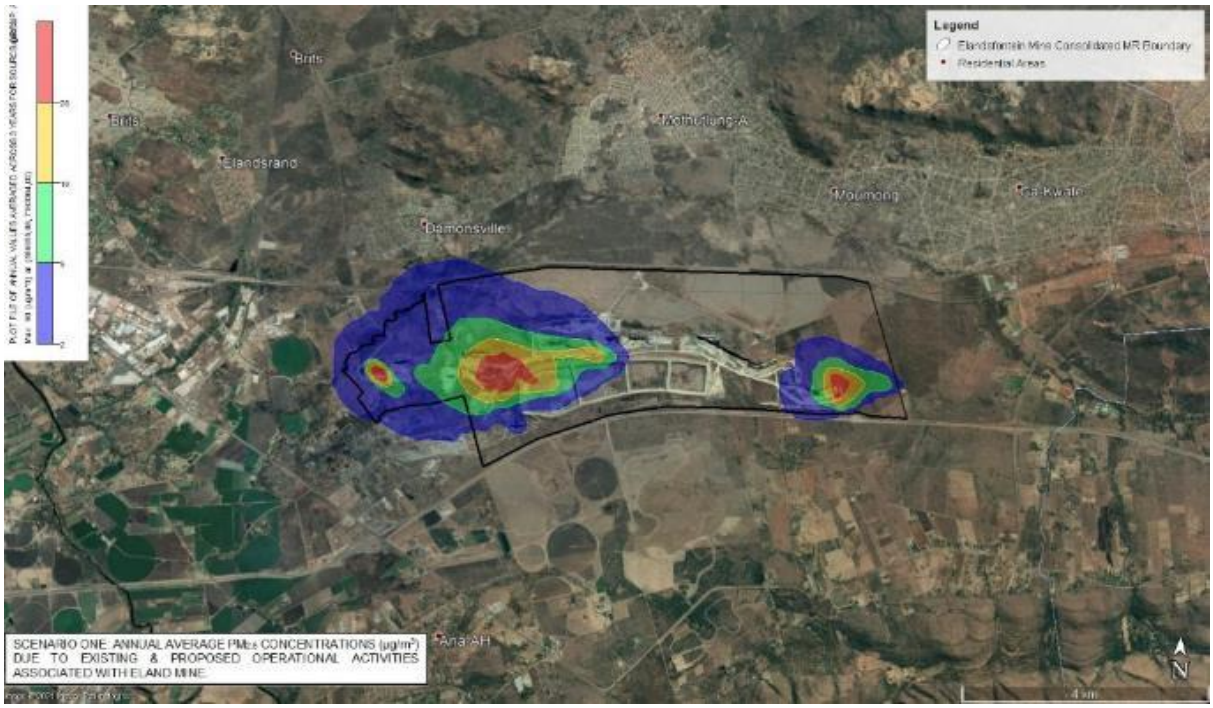


**Figure 78: Predicted Annual Average PM2.5 Concentrations associated with the EM Consolidation Project – Scenario One.**

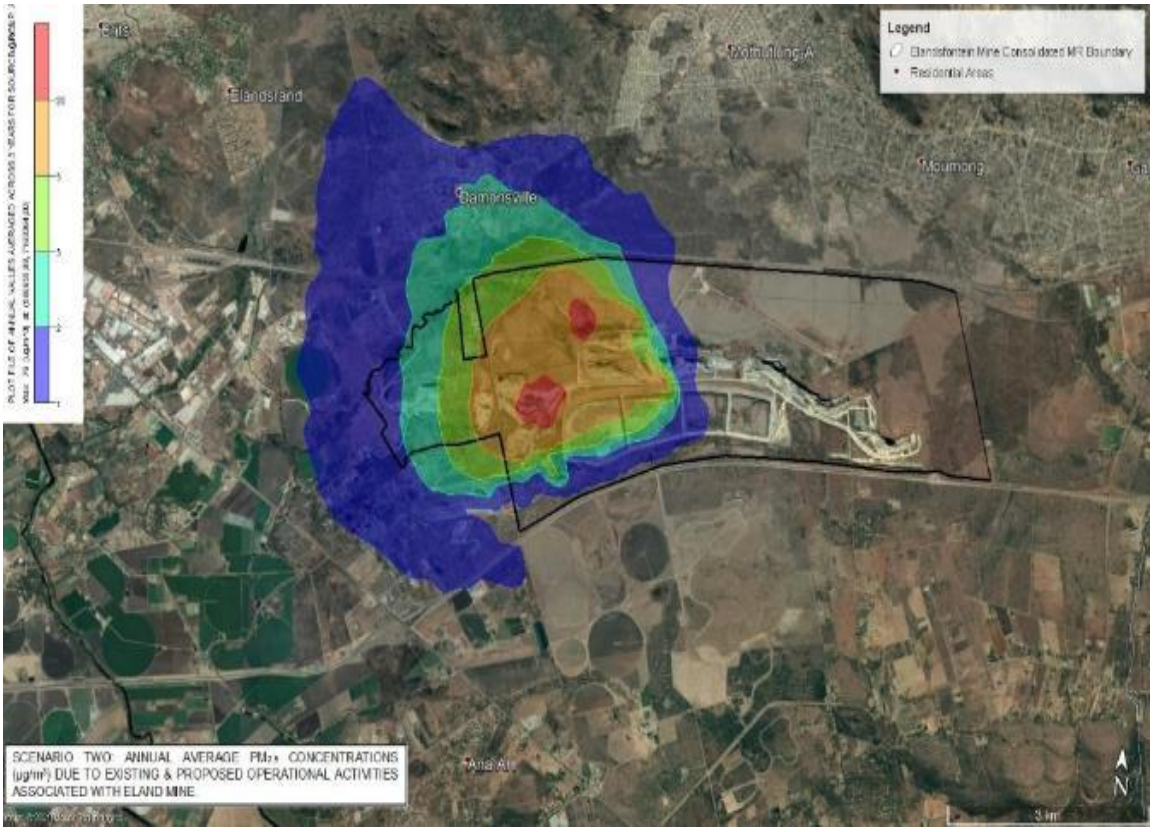


**Figure 79: Predicted Annual Average PM2.5 Concentrations associated with the EM Consolidation Project – Scenario Two.**

### *9.1.17.3 Dust Monitoring*

EM and MM have a network of single dust fallout monitoring buckets, to monitor monthly fallout in and around the operational are. The monitoring network consists of 19 monitoring points (11 on EM and 8

on MM), located within designated positions in and surrounding the Consolidated MR Surface Area. The location of the existing dust fallout monitoring stations is illustrated in ***Figure 80*** and ***Figure 81***.

### *9.1.17.4 Impact of the EM Consolidation Project on Air Quality*

Low predicted concentrations of PM10, PM2.5 and dust-fall rates are observed at most of the discrete receptors surrounding the Consolidated MR Surface Area, except for DR1 (Damonsville), which is situated in proximity to the northern parts of the Area's boundary. Emissions associated with opencast mining activity, material handling, stockpiles and crushing and screening at the EM and MM are identified as key emission sources. Implementing dust mitigation measures at the EM and MM, such as the mitigation measures considered in this AQIA, can reduce dust emissions generated from these key emission sources.

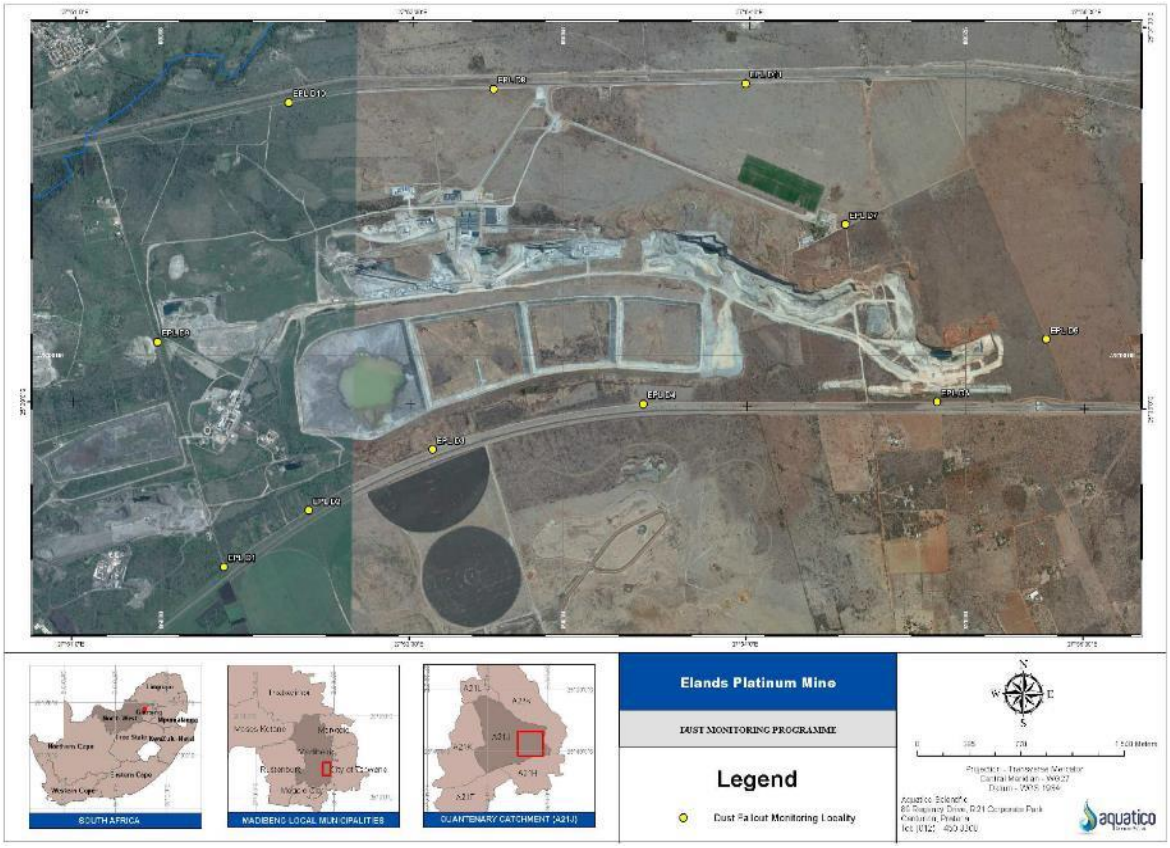


**Figure 80: Monthly dust fallout monitoring locations for EM (Aquatico, 2020).**

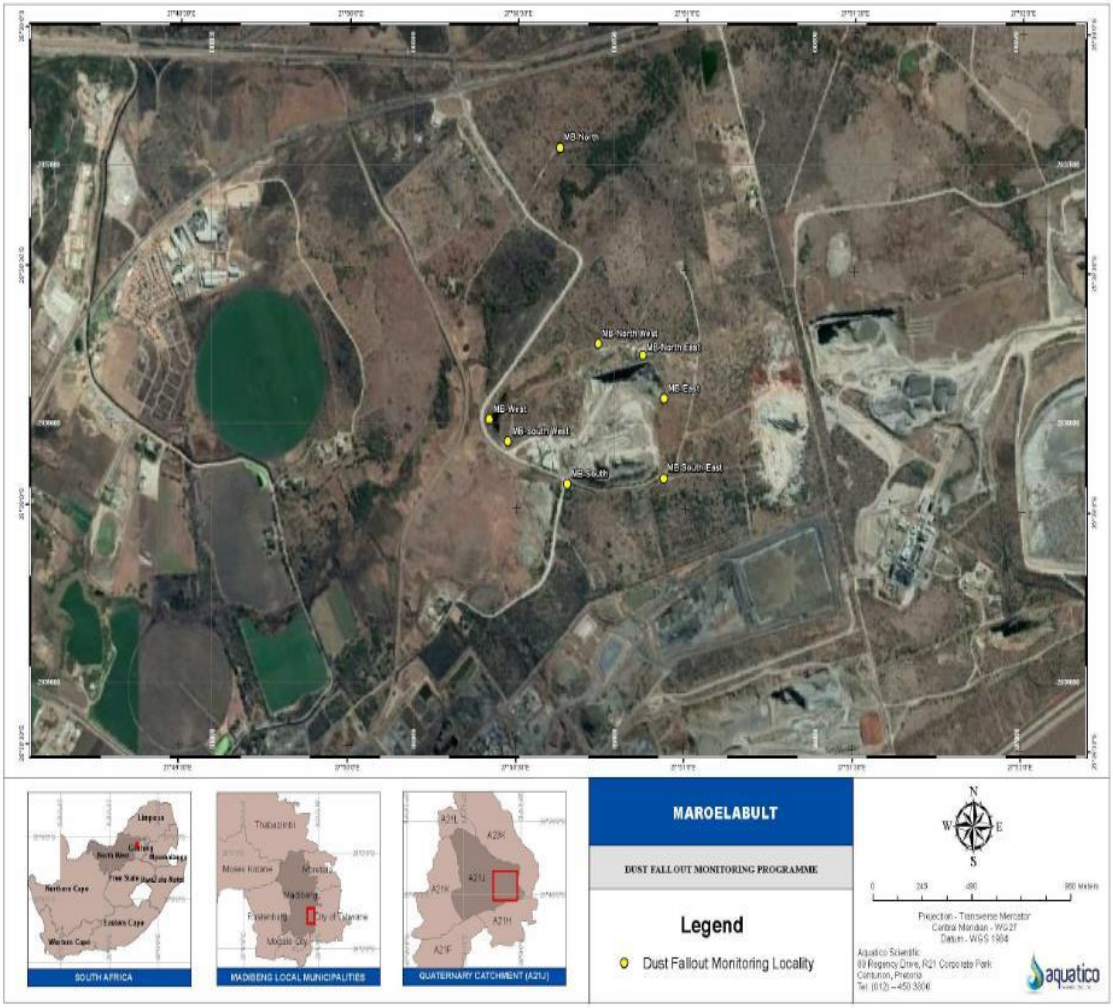


**Figure 81: MM Dust sampling sites (Aquatico, 2020).**

### 9.1.18 Noise

***Refer to Appendix 18 for the Noise Impact Assessment (NIA) conducted by Eares.***

The noise climate in the Consolidated MR Area is characterised by activities associated with farms and smallholdings; industrial and mining operations; and local communities. EM and MM are operational mines; and the development of the EP Proposed Projects will take place concurrently with existing mining activities.

#### *9.1.18.1 Sensitive Receptors*

Residential areas and potential noise-sensitive developments/receptors/communities were identified, considering a focus area up to 2,000 m from potential (noise-generating) infrastructure areas included in the EP Proposed Projects. These receptors are highlighted in ***Figure 82*** below.

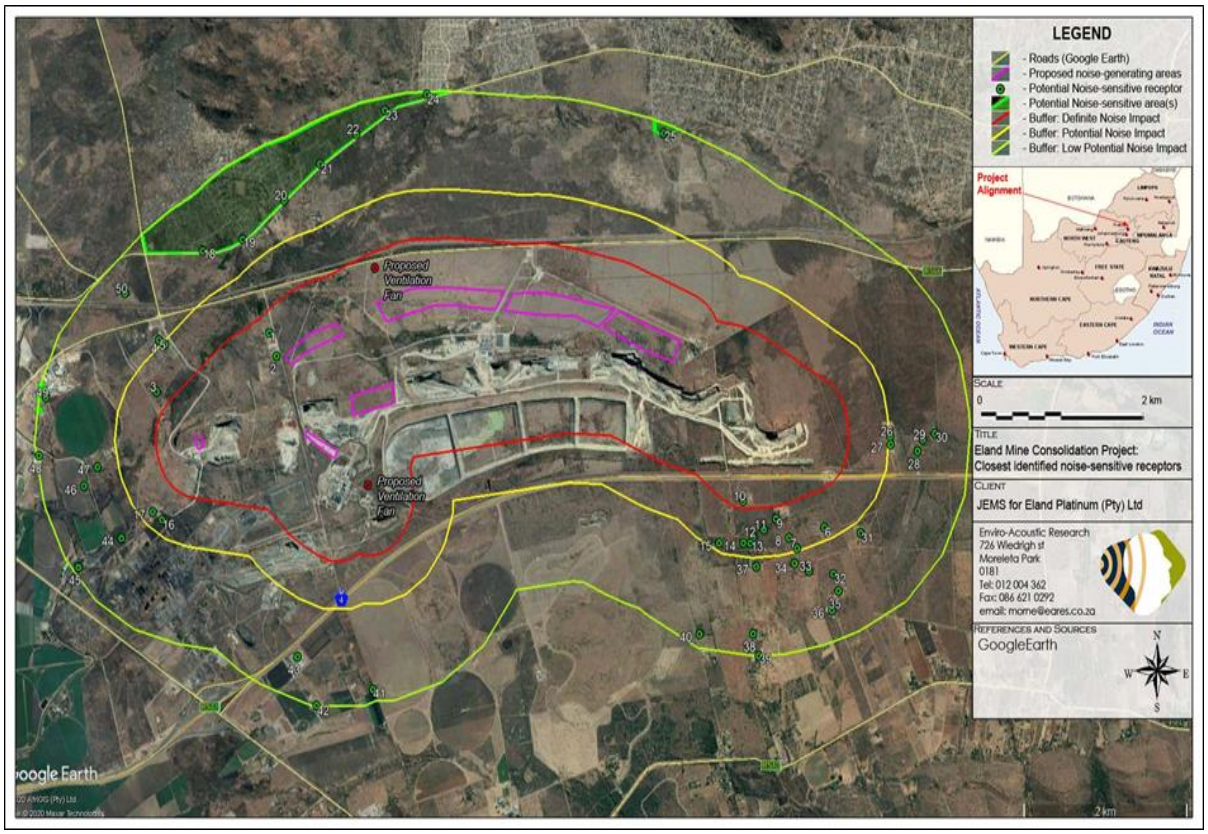


**Figure 82: Study Area and potential noise-sensitive receptors close to EP Proposed Projects (Eares, 2020).**

#### *9.1.18.2 Existing Noise Level*

Ambient (background) noise levels were measured during February 2016 and September 2020, in accordance with SANS 10103:2008 *"The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication*" and the protocols defined in the DEFF Screening Tool. The following noise levels were considered as part of the baseline noise levels of and around the EM and MM operational mines:

- Traffic:
  - Internal and external traffic on the EM and MM and surrounding roads (i.e., N4 Highway and R566).
- Mining Activities:
  - Conveyors and hauling activities;
  - Concentrator Plant and auxiliaries;
  - Ventilation Shafts and associated activities;
  - Other mining related activities.
- Surrounding land users
  - Farming and agricultural processes

Considering the results of the measurements, ambient sound levels in the vicinity of the Consolidated MR Surface Area are elevated, with traffic noises being a significant contributor to noise in the area. Based on the ambient sound levels and local and international guidelines, the recommended acceptable zone sound level will be:

- 55 dBA for daytime noise levels; and
- 45 dBA for night-time noise levels.

The NIA investigated two scenarios, namely:

- A conceptual scenario (existing), illustrating conceptualized noise contours around the Consolidated MR Surface Area (including road traffic noises as observed, excluding the noise from the Hernic Ferrochrome Plant);
- A conceptual future scenario, illustrating total future noise contours due to the proposed operational activities (considering a worst-case scenario).

A worst-case scenario was investigated, considering the conceptual noise-generating activities. The assessment only considered mining activities on the west-most mining area, as the other mining areas are far from potential Noise Sensitive Development ("**NSD**") locations. A conceptual scenario illustrating total future noise contours, due to potential mining activities, are illustrated daytime and night-time future noise rating level contours, refer to ***Figure 83*** and ***Figure 84***.

#### *9.1.18.3 Impact of the EP Proposed Project on the Ambient Noise Level*

Conceptual scenarios were conceptualized for the proposed construction and operational phases, with the output of the modelling exercise indicating a potential significant noise impact (for both day- and night-time activities). The EP Proposed Projects should not change the recommended rating levels with more than 7 dBA, nor should they change the existing ambient sound levels with more than 3 dB (IFC recommended increase above ambient).

Mitigation is required, identified and recommended, to ensure that the noise levels can be managed to minimize the noise impact's significance. Whilst the EP Proposed Projects could have a significant noise impact on the surrounding NSD, the implementation of appropriate mitigation measures could reduce the noise impact's significance to low.

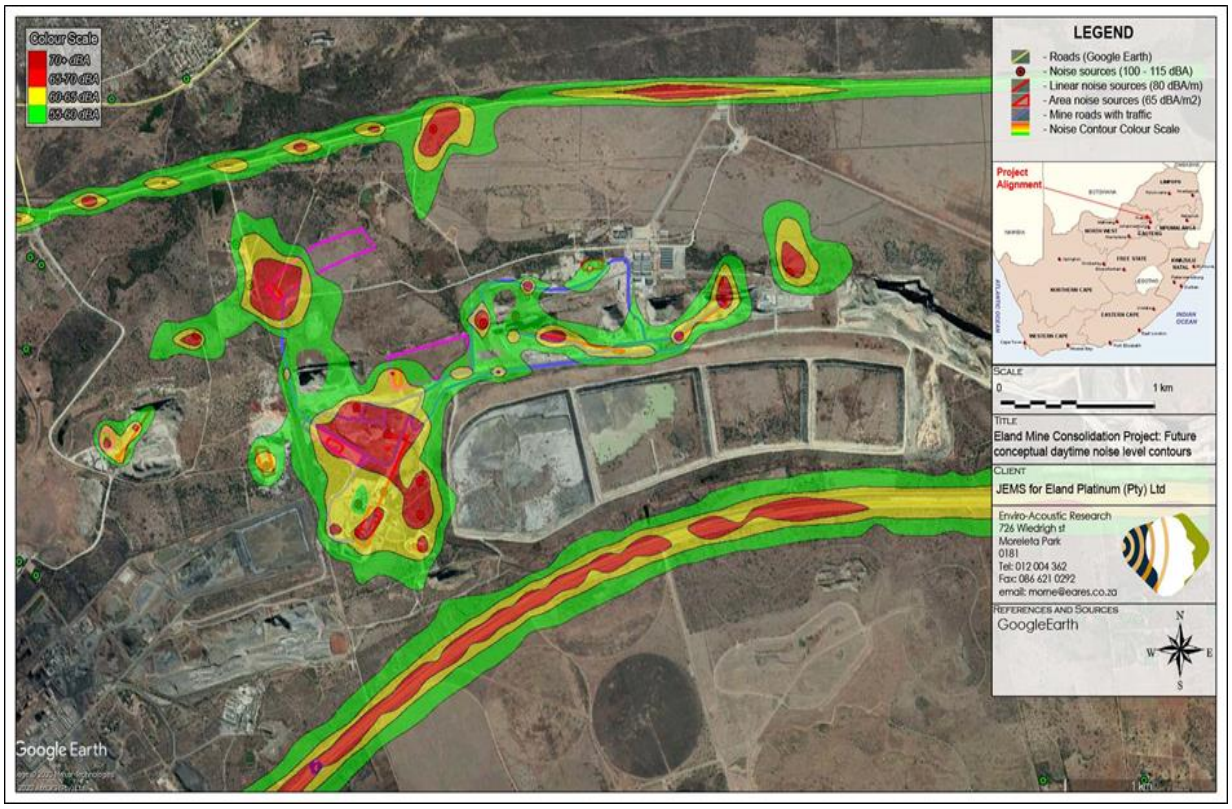


**Figure 83: Projected conceptual future daytime noise levels (Eares, 2020).**

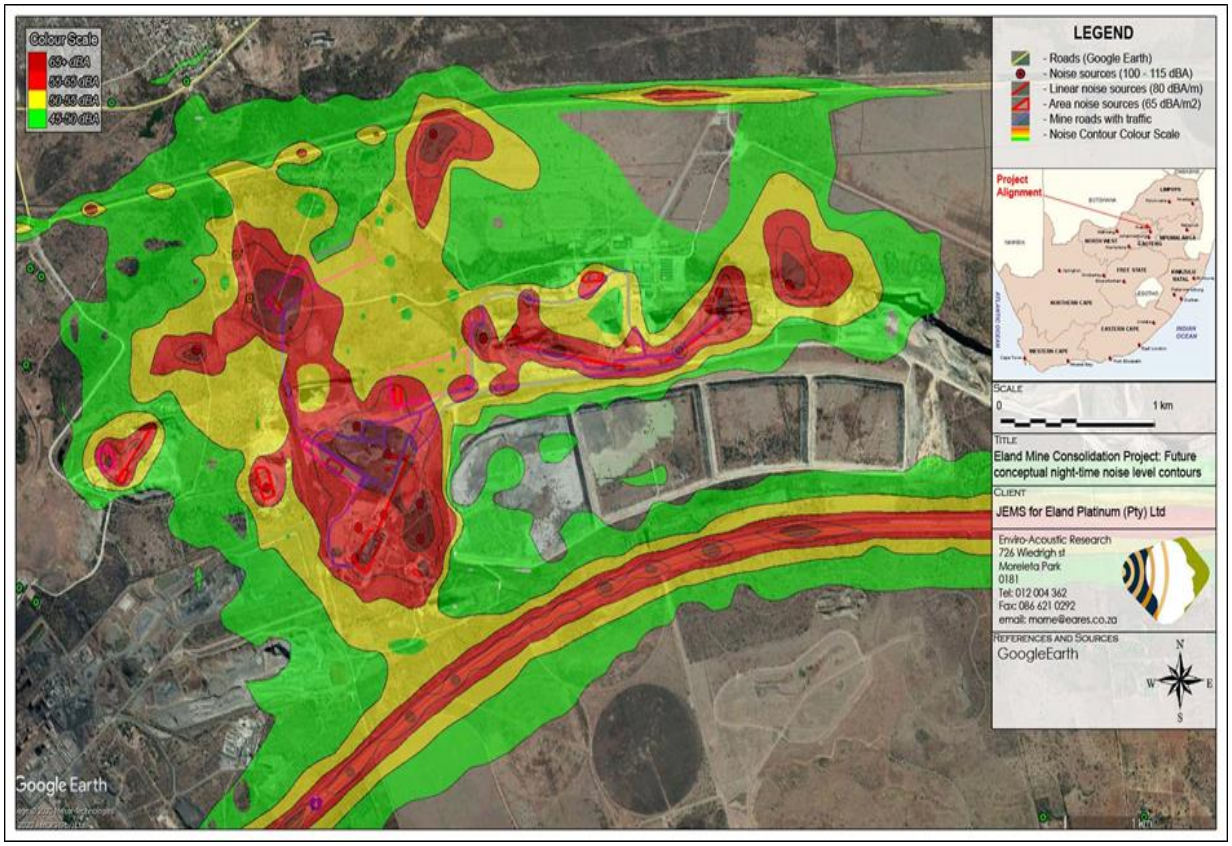


**Figure 84: Projected conceptual future night-time noise levels (Eares, 2020).**

### 9.1.19 Visual quality

***Refer to Appendix 19 for the Visual Quality Assessment conducted by JEMS.***

The EM Surface Area has been impacted by mining activities since it commenced in 2006 (SLR, 2012). The MM is also an existing operation and mining operations commenced in the early 2000s. Currently the land is used for mining and mineral processing related processes, with some areas of open veldt, agricultural lands, recreational area (game farm) and mining infrastructure (CHEMC, 2019). The surrounding area is characterised by a mixture of agriculture, urban areas, mining and industrial activities. Extensive mining to the west of the Project Area has resulted in the presence of opencast pits, WRDs and related infrastructure in the area (NLA, 2006).

#### *9.1.19.1 Landscape Character*

The topography of the Consolidated MR Area is relatively flat, with koppies and hills bordering the Area to the north, and the Magaliesberg mountain range to the south. The average elevation of land in and surrounding the Consolidated MR Area is 1 170 mamsl. Mountain peaks in the nearest section of the Magaliesberg rise to 1 500 – 1 600 mamsl; and the Hartbeespoort Dam lies at an altitude of approximately 1 200 mamsl.

The site slopes for the Project Area were calculated with most of the sites surroundings characterised by slopes under 10% (Highlands Hydrology, 2020). Elevations on the Area approximate 1190 mamsl, refer to ***Figure 85***. The lowest point on the site is at 1 142 mamsl, where a non-perennial stream leaves the Consolidated MR Surface Area, along the western boundary, north of the railway line. The topography in parts of the Consolidated MR Surface Area has been altered by existing infrastructure and operation.

#### *9.1.19.2 Views*

##### *a) Sensitive viewing areas*

Some of the most sensitive receptors in the area include:

- People who live and work adjacent to the Consolidated MR Surface Area;
- Communities where development results in changes in the landscape setting or valued views enjoyed by the community;
- People travelling through or past the affected landscape on the N4 or R556; and
- Tourist and people using recreational facilities in the area.

The most sensitive viewing areas are along the foothills of the Magaliesberg and the Magaliesberg itself. The Magaliesberg and Magaliesberg Protected Natural Environment's boundary is situated approximately 6 km from the Consolidated MR Surface Area (NLA, 2006). The EP Proposed Projects and supporting infrastructure will also be visible from the surrounding communities situated to the north of the R556. People travelling along the N4 Freeway and the R556 have visibility of the existing mining activities and supporting infrastructure of the EM and MM.

##### *b) Non sensitive viewing areas.*

Areas that are less sensitive to visual impact include the areas within or adjacent to the mining belt. The flat topography and the vegetation, consisting of medium to large trees, obstruct most of the negative

views associated with the EP Proposed Projects from the areas directly west and south east of the Consolidated MR Surface Area.

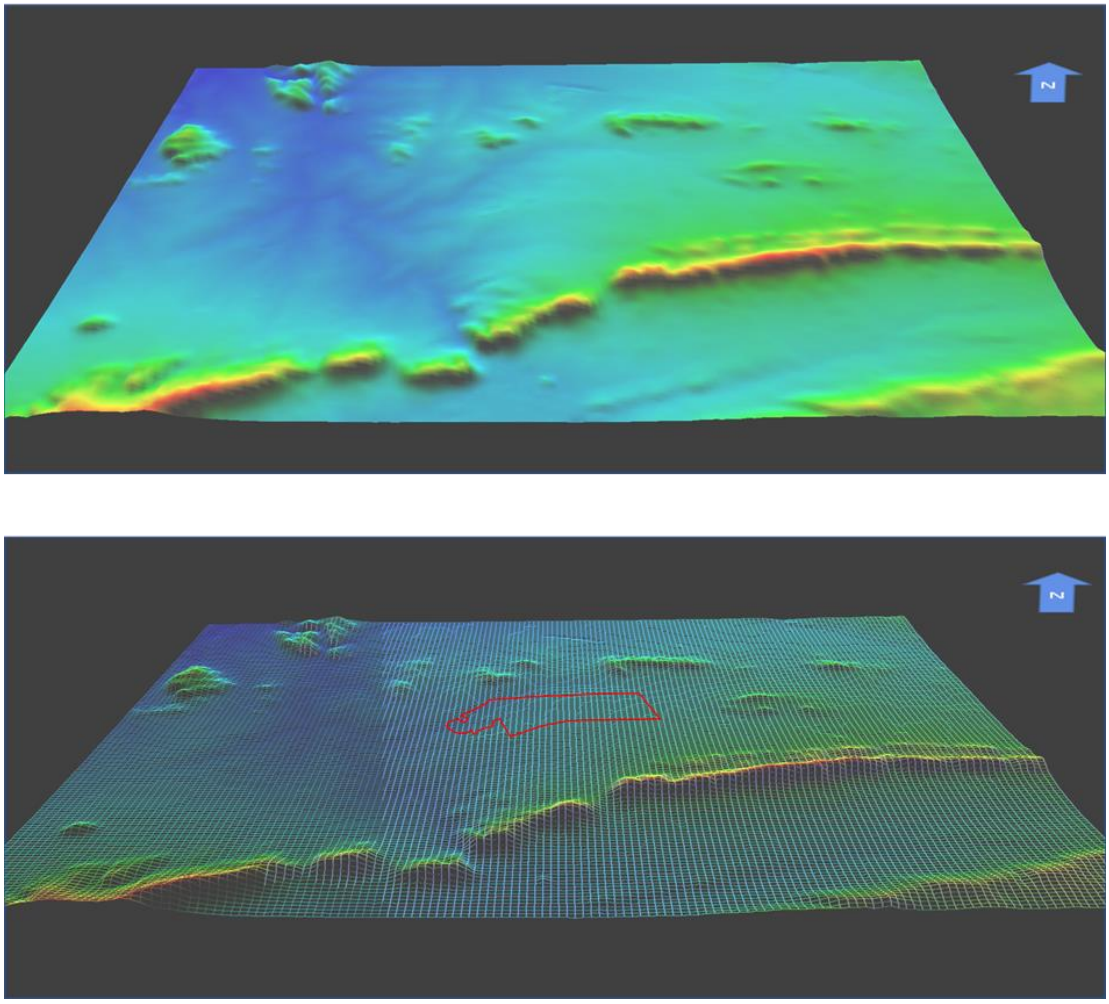

**Figure 85: 3D topographic rendering of the Consolidated MR Surface Area.**

#### *9.1.19.3 Visual Impact of the EP Proposed Projects*

The EP Proposed Projects will moderately change the landscape characteristics over a localised area. The Projects fall within an already existing mining operation and a larger regional mining belt and is thus compatible with the land use for the area. Most of the sensitive visual receptors are within 0.5 - 1 km range of the Consolidated MR Surface Area.

As captured from the PPP, various I&AP's have raised concerns regarding the EP Proposed Project's visual impact (JEMS, 2020). Several I&APs are however in support of the Proposed Projects, as they will have positive socio-economic impacts for the Local Communities.

The following possible high to moderate sensitive receptors have been identified for the EP Proposed Projects:

- Kleinsmit Farm Trust – Owner of Portion 160 of the Farm De Kroon 115 JQ and direct neighbouring property of EM and MM;
- Vehicles travelling on the R566; and

- Residents to the southern outskirts of Damonsville, Mothutlung and Moumong.

Refer to ***Figure 86*** below for the high, moderate and low visual receptors identified for the EP Proposed Projects. The visual impact during the construction and operational phases will be medium to high without mitigation measures.

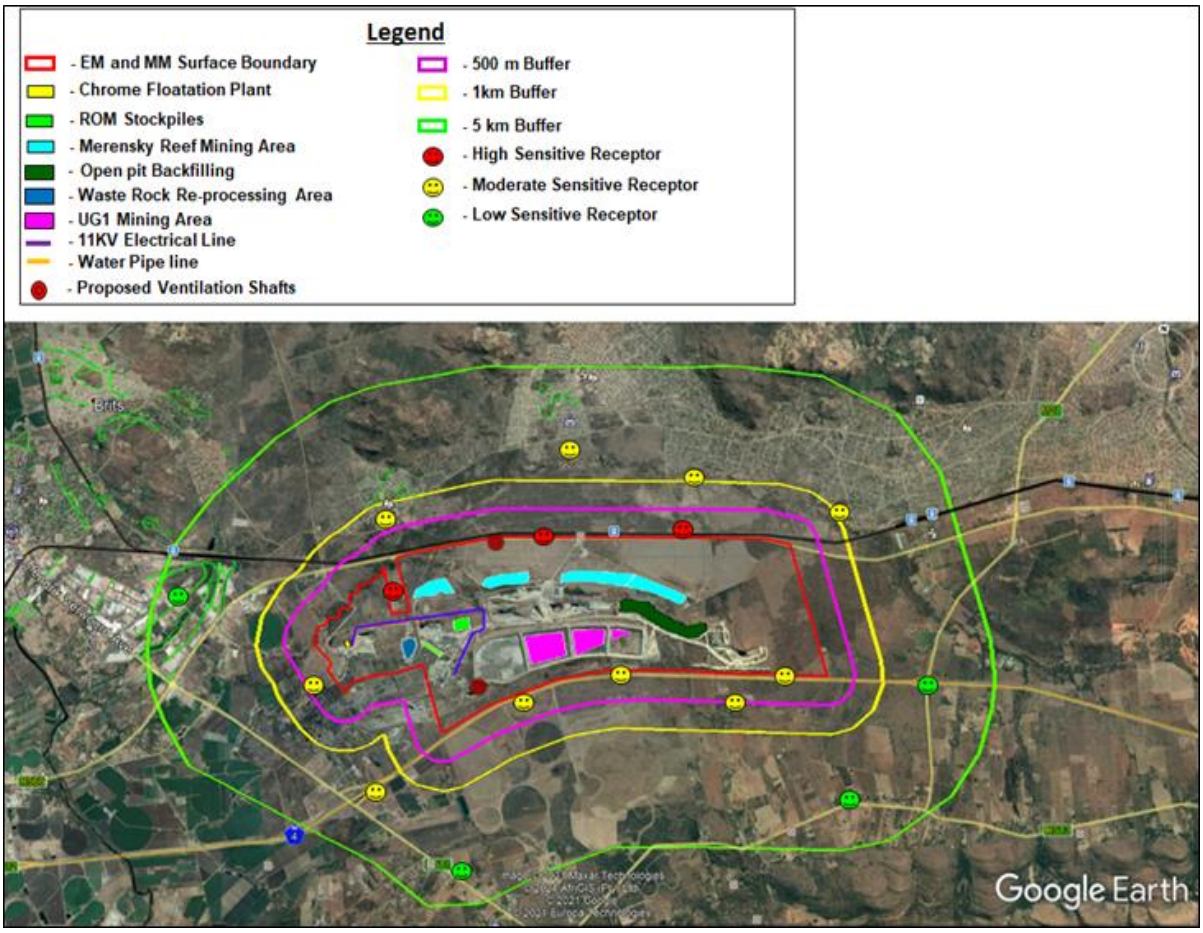


**Figure 86: High, Medium and Low Visual Receptors**

### 9.1.20 Heritage Environment

***Refer to Appendix 20 for the Heritage Impact Assessment (HIA) conducted by Dr. J A van Schalkwyk.***

Several Phase 1 HIA have been undertaken over the Consolidated MR Area, including:

- Huffman, T.N. 2000. Archaeological survey of the Crocodile River Mine, Brits. Johannesburg: Unpublished report.
- Pistorius, J.C.C. 2006. A Phase 1 HIA for the new Eland Platinum Mines (Pty) Ltd (Land Mines) near Madibeng in the Central Bankenveld of the North-West Province of South Africa. Pretoria: Unpublished report.
- Pistorius, J.C.C. 2010. A Phase 1 HIA for Portion 86 of the Fam Zilkaatsnek 439JQ and Portions 13 and 14 of the farm Schietfontein 437JQ for Eland Platinum Mines (Pty) Ltd (Eland Mines) near Madibeng in the North-West Province. Pretoria: Unpublished report.

An update of the HIA was undertaken in 2020 by Dr. J A van Schalkwyk.

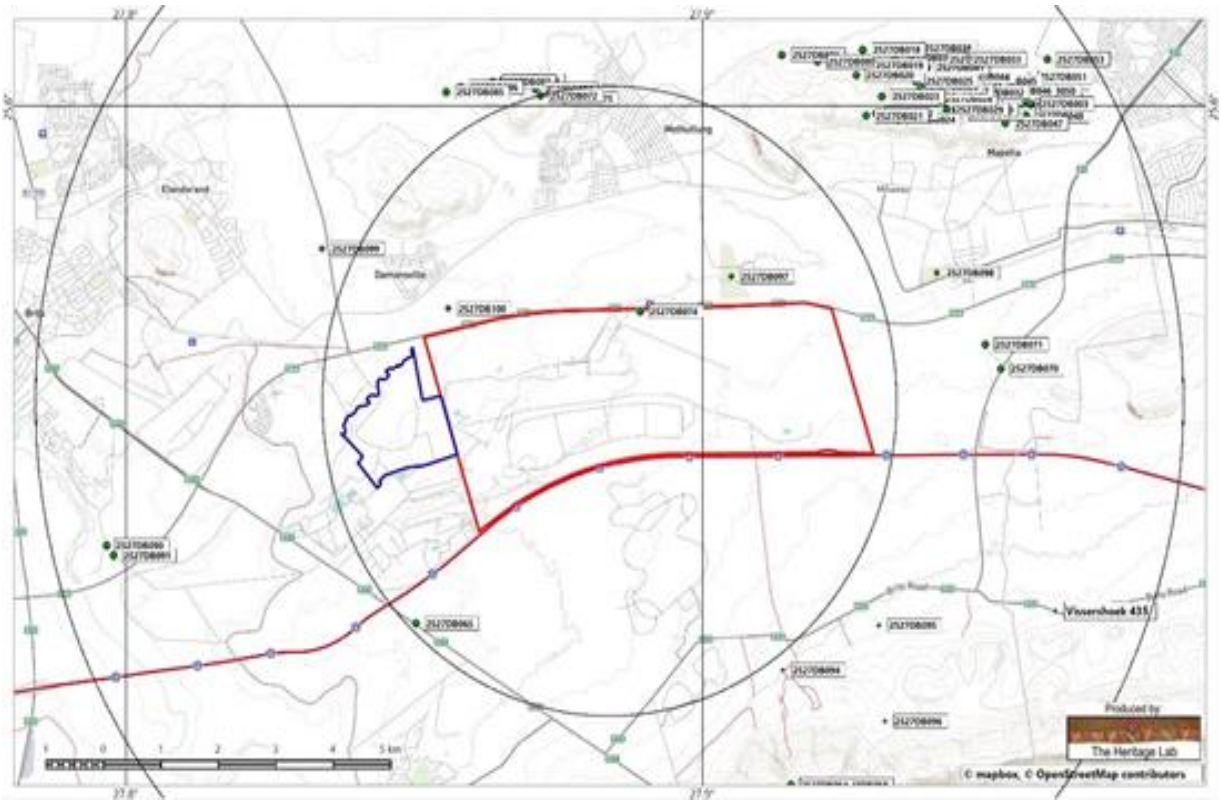


**Figure 87: Location of known heritage sites and features in relation to the Consolidated MR Surface Area (Van Schalkwyk, 2020).**

#### *9.1.20.1 Cultural Landscape*

The Consolidated MR Surface Area falls within a transitional environmental region in the NWP, known as the Bankenveld, situated between the Highveld in the south and the Pyramid Hills in the north. As a result of peculiar geo-processes, in particular the formation of the BIC, a landscape comprising a latitudinal series of hills and valleys came into existence, which fostered early human settlement and later accommodated a series of communities and cultures.

After Magaliesberg's formation, a continuous process of weathering, erosion and faulting resulted in the formation of neks (such as Saartjiesnek) and poorts (such as Hartbeespoort). Hartbeespoort was considered ideal for the construction of a dam to store water for irrigation by early white farmers, which eventually led to the construction of the present dam in the early 1920s.

***a) Stone Age***

An abundance of water, lush natural vegetation, large numbers of game, mild climate and the presence of quartzite for making tools and weapons were factors that attracted Stone Age communities to the area about half a million years ago. Evidence of periodic occupation since the Early Stone Age ("**ESAg**") is found at the Wonderboom Hand-Axe Site close to Wonderboom Nek in Pretoria. This site is one of the richest ESA depositories in South Africa. Signs of occupation by Middle Stone Age groups have also been found on the Magaliesberg and along river courses. The Late Stone Age ("**LSA**") is also well represented in the area, probably because LSA communities preferred to occupy rock shelters like caves and cliffs. During the latter part of the LSA the Hartbeespoort Dam area was probably occupied

from time to time by the San (Bushman) people's ancestors. The larger region is known for its Stone Age sites, such as Rissik, Jubilee Shelter, Silkaatsnek, Elizabeth Shelter, Cave James, Serpent Quarry, Xanadu, Hope Hill Shelter and Kloofendal Shelter (Wadley 1988).

***b) Iron Age***

The expansion of early farmers, who, among other things, cultivated crops, raised livestock, made ceramic containers (pots), mined ore and smelted metals, occurred in this area between AD 400 and AD 1100 and brought the Early Iron Age ("**EIAg**") to South Africa. They settled in semi-permanent villages. These communities migrated from the Lowveld and coastal areas to the higher regions in the interior (such as the Bankenveld) during the latter part of the EIAg. An important early settlement site with evidence of iron smelting and working is located near Broederstroom (provincial heritage site) in the Brits area (Huffman 1993). Sites were found within 100 m of water, either on a riverbank or at the confluence of streams.

New groups succeeded these EIAg communities about 600 years ago, speaking Bantu languages, like Nguni and Tswana-Sotho. By that time, groups of Tswana and Ndebele speaking people were moving into the area, occupying the different hills and outcrops, using the ample resources such as grazing, game and metal ores. These Late Iron Age ("**LIA**") farmers were moving to new farming areas, like the Highveld and Bankenveld, where due to climate changes, grasslands provided enough grazing. Because of a lack of trees in many areas, settlements were built with natural stone, mud and thatch. Remains of such stonewalled settlements and kraals can be found all over the Magaliesberg.

In 1821 a Nguni group, led by Mzilikazi, left KwaZulu-Natal and moved to the regions north of the Vaal River. Their numbers increased when they absorbed other refugees and conquered some of the indigenous communities. This was the origin of the Matabele (Ndebele) empire. Having established themselves originally in Sekhukhuneland (Mpumalanga and Limpopo Provinces), they relocated to the Tshwane region in the early 1830s and conquered the local Sotho, Tswana and Ndebele-speaking communities. It is possible that Mzilikazi established a major settlement, known as eKungwini, near Wonderboompoort. The Matabele relocated again to the Marico region (North-West Province) in the mid-1830s.

The difaqane coincided with the penetration of the interior of South Africa: travellers and hunters such as Cornwallis Harris and Andrew Smith, traders Robert Schoon and Andrew McLuckie, and missionaries James Archbell and Robert Moffat (Carruthers 2007).

***c) Historic period***

The Matabele conquest was followed by permanent occupation by white settler-farmers in the mid-1840s, and hence few traces of Iron Age occupation by earlier communities have been left behind. Voortrekker farmers established the farms that today form the area around Meerhof. These farms were subdivided many times over in more recent years and more farmsteads were established. Gradually the entire area was divided into farms. However, it was only since the 1880s that these farms were formally surveyed and mapped and when not only their names but also the names of rivers and other features became permanent fixtures on maps.

The Second South African War (1899-1902) Battle of Silkaatsnek (11 July 1900) took place in the area and some elements of the British garrisons guarding Silkaatsnek and Kommandonek were located

where Melodie is today. Before the Second South African War, General Hendrik Schoeman (son of Stephanus Schoeman) constructed a primitive dam in the Crocodile River. The potential of damming the river at the poort was recognised after the War. Between 1905 and 1910 the Transvaal Department of Irrigation conducted various preliminary investigations, which led to the passing of the Hartbeespoort Irrigation Scheme (Crocodile River) Act (Act No. 32) of 1914. This Act authorised the construction of a large dam in the Hartbeespoort gorge. World War I delayed the project, which was successfully completed only in 1923.

Johan Schoeman, son of General Hendrik Schoeman and grandson of the first owner of the farm, now covered by the lake, established the townships of Kosmos, Schoemansville and Meerhof (the latter on the Farm Rietfontein 485 JQ) in 1923 on the shores of the lake. The existing railway line passing the Consolidated MR Surface Area was originally completed in 1906, but, due to continuous increase in freight weight and usage, has been much upgraded in the past.

During the past 40 years, up until the early 1990s, the area to the north of the Consolidated MR Surface Area has been part of the former Bophuthatswana, where large numbers of so-called “surplus” people were resettled after being removed from “white” areas. This led to the rapid increase in urban development in the region. Several well-known townships were developed: GaRankuwa, Soshanguve, Winterveld, etc.

#### *9.1.20.2 Site specific review*

Older maps do not give provide information on the region, its development and occupation. Jeppe’s Map, dating to 1899, indicates that the region has been surveyed and divided into farms. A single road, travelling from Pretoria to Rustenburg, is indicated south of the Consolidated MR Surface Area. A later map dating to 1925, shows the same road to the south and the railway line and various stations that were completed in 1906. However, it gives no other information.

During the 1960s/early 1970s, the railway line was rerouted, cutting out most of the bends. In addition, some of the stations/halts were relocated from their original position. The official aerial photographs shows that the Consolidated MR Surface Area was subjected to intense farming (agricultural fields) activities. Some roads and tracks crisscross the Area, increasing from the older (1949) version to the more recent (1964) image. It is also possible to discern some non-agricultural activities, such as farmsteads and homesteads, which correspond to what is indicated on the later topographic map dating to 1969. On this latter map, various homesteads are indicated at MM but no mining activities are indicated.

The latest two images, dating respectively to 2004 and 2020, show how the mining activities have increased in the Consolidated MR Surface Area, in effect obliterating much of the previously identified (Huffman 2000; Pistorius 2006, 2010) built features. It should be stated clearly that the farmsteads and homesteads identified by both Huffman (2000) and Pistorius (2006, 2010) were accorded low significance by them and therefore mitigation measures, i.e., further documentation, was not required.

During the physical survey, the following sites, features and objects of cultural significance were identified in the EM Surface Area, ***refer to Figure 88***.

### *a) Stone Age*

No sites, features or objects of cultural significance dating to the Stone Age were identified..

### *b) Iron Age*

Huffman (2000) identified some LIA material, contemporary homesteads and possible graves. As the vegetation cover was very dense during the site visit and some mining structures have already been installed here, these sites and features could not be verified.

### *c) Historic period*

Three burial sites were identified during the recent survey, that are known to EP, which are listed below.

Burial sites are viewed as having high emotional and sentimental value. However, mitigation is possible if proper procedures have been followed.

- 7.3.1 - Burial site situated on the Farm Elandsfontein 440 JQ: High significance – Grade IV-A

A large burial site with at least 70 graves. It is still in use and new graves were noticed. The site is fenced off and has a gate for access.

- 7.3.2 - Burial site situated on the Farm Elandsfontein 440 JQ: High significance – Grade IV-A

Informal burial site with two graves marked with headstone, and possibly two others, that are only marked with stone cairns. The site is fenced off and has a gate for access..

- 7.3.3 - Burial site situated on the Farm Elandsfontein 440 JQ: High significance – Grade IV-A .

Informal burial site with two, or possibly three, graves. The graves are only marked with stone cairns. The site is fenced off and has a gate for access.

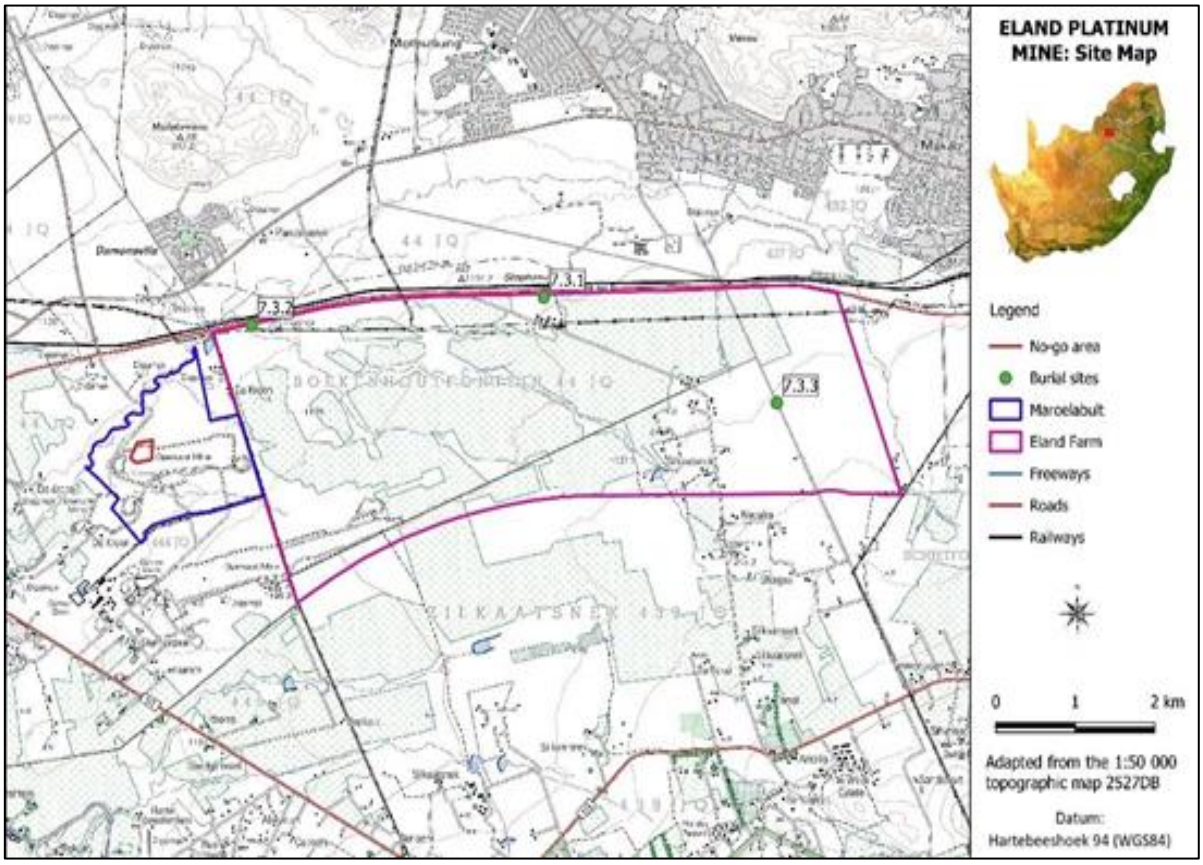


**Figure 88: Location of heritage sites in the Consolidated MR Surface Area (Van Schalkwyk, 2020).**

#### *9.1.20.3 Impact of the EM Consolidation Project on Heritage Features.*

The Palaeontological Sensitivity Map (SAHRIS) indicates that the Consolidated MR Surface Area has an insignificant to zero possibility of fossil remains to be found and therefore no palaeontological assessment was required. For the EP Proposed Projects, the assessment has determined that no sites, features or objects of heritage significance occur on the footprint of the EP Proposed Projects. If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision must be made regarding the application for relevant permits.

### 9.2 Description of the current land uses.

Refer to ***Table 10*** for the property description on which the EP Table 10: List of the Alternative 1 (preferred alternative) activities and the applicable property description. (Refer to ***Figure 1*** and ***Figure 2***):

The details of the properties and their respective ownership is detailed in ***Table 5.*** Other than the mining and mineral processing infrastructure situated on the properties, the properties are also utilised for agricultural uses (i.e., crop production, etc.); auxiliary uses (i.e., workshops, offices, mine clinic and training centre); and services (i.e., electricity and roads).

Refer to ***Figure 25*** and ***Figure 26*** for the plans indicating the proposed improvements to the surface infrastructure of the EM and MM.

### 9.2.1 Description of specific environmental features and infrastructure on the site.

The specific environmental features and infrastructure located across the EM Consolidated Surface Area and in relation to the EP Proposed Projects have been described in the sections above.

As mentioned above, the EP Proposed Projects will be located within the boundary of the EM Consolidated Surface Area (Refer to ***Figure 6***). The environmental features that may potentially be impacted by the proposed Alternative include the following:

- Groundwater;
- Surface Hydrology;
- Water Balance;
- Ecological Features
- Heritage
- Air Quality;
- Noise;
- Visual; and
- Socio-Economic

The abovementioned environmental features were assessed and discussed under Section 9.1.

## 9.3 Environmental and current land use map.

(Show all environmental and current land use features)

The existing combined mining, processing and auxiliary infrastructure on the Consolidated MR Surface Area comprise of the following:

### 9.3.1 Eland Mine

- Workshops and Stores;
- Overburden and Topsoil Stockpiles;
- Opencast Mining Pits;
- Concentrator Plant;
- On-site Laboratory;
- Mine clinic and training centre;
- Water Management Infrastructure (i.e., dams, channels and pipelines);
- Wastewater Treatment Plant and WTP;
- Decline Shafts (Maroelabult, Kukama and Nyala) and supporting infrastructure;
- TSF, comprising of four Paddocks;
- WRDs;
- Offices and auxiliaries;
- Recreational Area (Game Farm);

- Agricultural fields; and
- Haul and internal Roads.

### 9.3.2 Maroelabult Mine

The MM has been in care and maintenance from July 2013. It comprises of an underground operation, accessed via a decline shaft, with the following surface infrastructure (Elemental Sustainability, 2019):

- Administrative offices and parking;
- Main plant area;
- Stockpiles (topsoil, product, etc.);
- Haul roads;
- Two WRDs;
- Laydown areas;
- Water management structures / infrastructure (PCD, SWD, stormwater diversion berms / trenches, and associated pumps / piping);
- Conveyor belt system;
- Aboveground diesel tanks; and
- Septic tank.

Refer to ***Figure 2***, ***Figure 25*** and ***Figure 26*** that provide an overview of the existing infrastructure on the Consolidated MR Surface Area.

## 10. ACTIVITIES, IMPACTS AND RISKS IDENTIFIED

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

This part of the document focuses on the identification of the major potential environmental and socio-economic impacts due to activities, processes and actions associated with the EP Proposed Projects on the surrounding environment (as required in terms of Regulation 21(3) of the 2014 EIA Regulations).

Only impacts related to new activities being applied for will be included in the impact and risk assessment as part of the EIAR (Section A of this document). However, all impacts of the existing operation and new activities being applied for will be included in the EMPR, for purposes of the Environmental Licence Consolidation. The EMPR Report (**Appendix 7** of this document) will be a consolidation of all mitigation measures included in previously approved EMPRs, whilst considering recommendations from auditors regarding the suitability of the mitigation measures included in these approved EMPRs.

Impacts were identified by looking at the following four phases of the EP Proposed Projects and the associated alternatives:

- Planning and Construction Phase;
- Operational Phase;

- Decommissioning and Closure Phase; and
- Post Closure Phase.

Potential cumulative and residual impacts have also been identified, where applicable.

## 10.1 Alternative 1 (Preferred Alternative)

### 10.1.1 Activities and Phases leading to impacts

#### *10.1.1.1 Planning and Construction Phase*

Activities that will be carried out during the Construction Phase include the following:

- Establishing of construction camp;
- Vegetation Clearance and topsoil stripping;
- Establishing of Topsoil and Overburden Stockpiles;
- Earthworks, i.e., excavation and removal of soil and material;
- Concrete mixing and casting;
- Construction of the:
    - Two Ventilation Shafts and associated infrastructure;
    - Two new ROM Stockpiles and associated stormwater and pollution management infrastructure;
    - CFP and associated infrastructure at the MM Shaft, on an existing disturbed area;
    - New substation and associated electricity distribution infrastructure;
- Establishing of the infrastructure to convey tailings from the Concentrator Plant to the opencast pits for tailings backfilling;
- Upgrading and expansion of haul roads, for the transportation of material and general equipment movement;
- Expansion of existing and the development of new pipelines for the conveying of tailings and water;
- Managing building rubble and construction waste generated during the construction;
- Continued ground and surface water monitoring; and
- Dust suppression and monitoring.

#### *10.1.1.2 Operational Phase*

Activities that will be conducted in the Operational Phase include the following:

- Depositing tailings in the Zilkaatsnek opencast pits for rehabilitation;
- Mining of the Merensky Reef, including, possible blasting, trucking and hauling ROM to the Concentrator Plant;
- Operation of the Ventilation Shafts;
- Storage of ROM on the new ROM Stockpiles;
- Mining of the UG1 in TSF Paddocks 2, 3 and 4, including blasting, trucking and hauling ROM to Concentrator Plant;
- Concurrent rehabilitation of the Merensky Reef opencast pits;

- Operation of the CFP next to the MM Shaft;
- Crushing and re-working of the MM WRD;
- Pumping return water from the backfilled pits to the return water sump;
- Mining of the Boundary Pillar on the UG2 Reef horizon;
- Continuous inspection of the proposed facilities, to ensure they meet the EA and WUL requirements;
- Monitoring of the dust fallout, surface and groundwater for pollution;
- Continued ground and surface water monitoring; and
- Dust suppression and monitoring.

#### *10.1.1.3 Decommissioning and Closure Phase*

Decommissioning and closure activities will be conducted as per the closure plan for the Consolidated MR Area. A summary of the decommissioning and closure phase activities will included include the following:

- Identify the infrastructure (i.e., pipelines, channels, roads and other services); buildings (i.e., laboratory, offices and workshops); and post-mining structures (i.e., dams, Concentrator Plant, WTP, etc.) that will remain post-closure of the mining operation;
- Decommissioning of infrastructure and structures as the closure of the mine commences;
- Rehabilitation of the mining areas as per the Rehabilitation and Closure Plan; and
- Monitoring of environmental features as decommissioning activities continues (i.e., surface and groundwater, soil quality, contaminated land and dust fallout monitoring).

This list is provisional and will be revised annually, with a focussed and detailed evaluation and revision five years before planned end of the LOM.

#### *10.1.1.4 Post-Closure Phase*

Post-closure activities will gradually be phased in during the decommissioning and closure phase to ensure a stable post closure ecosystem, so that a closure certificate can be obtained from the DMRE. Possible activities that might be conducted during the post-closure phase include the following:

- Monitoring surface and groundwater for pollution;
- Implementing a judicious soil nutrient supplementation and grazing management system, to ensure the ground cover develops to a sustainable and acceptable level;
- Monitoring rehabilitated areas for signs of erosion, poor vegetation growth, fertility etc.;
- Monitoring the sustainability of rehabilitation; and
- Replacement of topsoil (Loss of topsoil by erosion and sterilisation).

This list is provisional and will be revised annually, with a focussed and detailed evaluation and revision five years before planned end of the LOM.

### 10.1.2 Impacts identified.

The main potential impacts identified for the EP Proposed Projects are listed below; these impacts were identified by the undertaking of investigation and studies by independent Specialist and possible concerns raised by I&APs (refer to ***Table 35***).

**Table 35: List of the potential impacts associated with the proposed activities.**

| Feature | Impact | Timing |
|---|---|---|
| **Air Quality** | Dust and associated emissions due to the following activities:<br>- In-pit operations (blasting, material handling, etc.);<br>- Wind erosion from exposed areas (i.e., stockpiles, TSF backfill area, etc.);<br>- Crushing/ screening of ROM, overburden and waste rock;<br>- Material handling, including loading and off-loading; and<br>- Vehicle dust entrainment on haul roads. | Planning and Construction,<br>Operational<br>Closure and<br>Post Closure. |
| | Vehicle emissions associated with the construction, operation and decommissioning phases. | |
| **Visual** | Visual impact on the following receptors:<br>- Users of the R511 and N4 Freeway road; and<br>- Land users situated directly west of EM and MM. | Planning and Construction,<br>Operational<br>Closure. |
| | Post closure residual visual impact due to the remaining mining infrastructure (i.e., TSF). | Post Closure. |
| **Aquatic Habitat** | Vehicular movement and vegetation removal in the vicinity of the freshwater features, potentially leading to:<br>- Exposure of soils, causing increased runoff from cleared areas and erosion of the freshwater features, and thus increased potential for sedimentation of the freshwater features;<br>- Increased sedimentation of the freshwater features habitat, leading to changes in instream habitat and potentially altering surface water quality;<br>- Decreased ecoservice provision;<br>- Proliferation of alien vegetation as a result of disturbances; and<br>- Further decreased ability to support biodiversity. | Planning and Construction |
| | Excavation, ground-breaking and topsoil removal associated with the stormwater management system, potentially leading to:<br>- Topsoil removal;<br>- Excavation activities leading to soil stockpiling;<br>- Loss of catchment yield resulting from stormwater containment, leading to reduced water volumes entering freshwater features;<br>- Potential for erosion, leading to sedimentation of the freshwater features;<br>- Limited reduction in water volumes entering the freshwater features, leading to reduced recharge; and<br>- Altered vegetation community structure and diversity due to moisture stress in some localized areas. | |
| | Excavation, ground-breaking and topsoil removal associated with the surface infrastructure, such as the CFP and proposed pipelines, potentially leading to:<br>- Disturbances of soils and increased alien vegetation proliferation and, in turn, further alteration of surrounding habitat, with the potential to affect the downgradient freshwater habitat;<br>- Altered runoff patterns, leading to increased erosion and sedimentation of the downgradient freshwater features; and<br>- Potential impacts on the water quality of runoff, which may potentially enter the downgradient freshwater features and soil contamination due to concrete being cast. | |
| | Backfill of pits with tailings, potentially leading to:<br>- Increased risk of sediment transportation from disturbed soils and earthworks; and<br>- Increased surface water turbidity. | |
| | Operation of opencast mining activities, potentially leading to:<br>- Increased risk of sediment transport in surface runoff from the overburden stockpile into the freshwater features, resulting in altered water quality, channel competency and vegetation community composition.<br>- Altered topography/geomorphology, resulting in altered runoff patterns and formation of preferential flow paths; | Operational |

| Feature | Impact | Timing |
|---|---|---|
| | - Nitrates from blasting, resulting in eutrophication of the receiving environment and loss of potable water within the catchment;<br>- Formation of a cone of depression, potentially resulting in loss of baseflow in the freshwater systems;<br>- the formation of a cone of depression in the proposed opencast activities, pulling the water towards the open pit area and over time resulting in impacts to the CVB Wetland; and<br>- Dewatering, contaminated water may enter the receiving environment leading to altered water quality. | |
| | Operation of the TSF, ROM Stockpile areas and stormwater management system, potentially leading to:<br>- Temporary and momentary increased velocity and flow of downgradient freshwater features;<br>- Reduced water quality, with specific mention of increased dissolved salt concentrations and potential introduction of toxins into the system;<br>- Negative impact on aquatic biota community diversity and integrity, due to deterioration of water quality;<br>- Increased risk of pollution of surface water resulting from seepage/runoff from infrastructure (e.g., chrome plant, ROM stockpiles); and<br>- Increased risk of pollution of groundwater and impaired water quality and soil salination. | |
| | Removal of surface infrastructure, rehabilitation of mining footprint areas and associated post-closure management activities, potentially leading to:<br>- Incorrect rehabilitation methods, specifically soil used soil sequencing and backfilling processes; and changes to the topography and natural water distribution patterns of the area; and<br>- Increased runoff volumes and formation of preferential surface flow paths from compacted and unvegetated soil, leading to alteration of hydrological recharge paths. | Closure. |
| | Decant of contaminated water from the rehabilitated mine area into the receiving environment, potentially leading to:<br>- Contamination of water within the receiving environment, and subsequent reduction in water quality (increase in salts and specific contaminants of concern and reduced pH);<br>- Subsequent negative impacts on biota and vegetation; and<br>- Altered flow regimes (increased hydroperiod). | Post Closure |
| **Surface water** | Increased sedimentation and silt loads of storm water and run-off. | Planning and Construction, Operational Closure and Post Closure. |
| | Impacts on the stormwater and run-off quality. | |
| | Habitat modification of the established drainage areas and watercourses | |
| | Changes to the Water- and Salt Balance. | |
| | Changes in the flow regime and quality of the diverted and existing non-perennial watercourses. | |
| | Nitrates from blasting, leading to eutrophication of the receiving environment and potable water loss within the catchment. | |
| **Groundwater** | Dewatering, leading to the formation of a dewatering cone; and reduced groundwater levels and water availability. | Planning and Construction, Operational Closure and Post Closure. |
| | Formation of a contamination plume, due to contaminants infiltrating into the groundwater | |
| | Reduction in the baseflow in the Kareespruit River system | |
| | Post-closure liability on the groundwater quality. | |
| **Noise** | Noise impact from construction, operation and decommissioning machinery and vehicles. | Planning and Construction, Operational Closure |
| | Blasting as part of mining | Operational |
| **Fauna and Flora** | Loss of floral habitat and SCC | Planning and Construction, |
| | Loss of floral habitat, species and SCC due to:<br>- Development footprint impacting on SCC;<br>- Edge effect;<br>- Fires;<br>- Dust generation; and | Construction, Operational |

| Feature | Impact | Timing |
|---|---|---|
| | - Lack and or no concurrent rehabilitation. | |
| | Loss of floral habitat, species and SCC due to:<br>- Lack of rehabilitation at closure; and<br>- AIP establishment.. | Closure and<br>Post Closure. |
| | Loss of faunal habitat, species and faunal SCC | Planning and Construction, |
| | Loss of faunal habitat, species and SCC due to:<br>- Development footprint impacting on SCC;<br>- Edge effect;<br>- Fires;<br>- Dust generation; and<br>- Lack and or no concurrent rehabilitation. | Construction, Operational |
| | Loss of Faunal habitat, species and SCC due to:<br>- Lack of rehabilitation at closure; and<br>- AIP establishment. | Closure and<br>Post Closure. |
| **Waste** | Building rubble and construction waste will be generated during the EP Proposed Projects' construction. | Planning and Construction,<br>Operational |
| | Depositioning of tailings material to rehabilitate the open pits. | Operational<br>Closure and<br>Post Closure. |
| **Traffic** | Increase in traffic leading to traffic incidents and accidents. | Planning and Construction,<br>Operational |
| **Socio-economic** | Tensions over limited employment opportunities and procurement contracts | |
| | Increase in informal settlements due to influx. | |
| | Increase in social pathologies (teenage pregnancies, school drop-outs, alcohol and substance abuse, crime) | |
| | Increase in communicable diseases | |
| | Unemployment at closure phase, which will lead to loss of income and collapse of social projects | |
| **Soil and Land Capability** | Disturbance to the functionality and productivity of the soil stripped for excavations and mining | Planning and Construction,<br>Operational<br>Closure and<br>Post Closure. |
| | Disturbance of the soil profile. | |
| | Soil erosion by means of water and wind movement. | |
| | Soil pollution due to spillages. | |
| | Soil compaction due to vehicle and machinery movement. | |
| | Soil degradation due to lack of / or incorrect rehabilitation and potential erosion during the Closure Phase. | |
| | Disturbance of the land capability on undisturbed footprints, potentially leading to:<br>- Loss of high potential land<br>- Loss of grazing land; and<br>- Loss of agricultural production. | Planning and Construction, |
| **Topography** | Potentially dangerous excavations pose a HS risk to humans and animals. | Operational<br>Closure and<br>Post Closure. |
| | Slope stability on stockpiles and opencast, including tailings backfill area | |
| | Surface subsidence above the mine workings, which could result in depressions occurring, leading to ponding and topography alteration. | |
| **Heritage** | Loss or damage to sites, features or objects of cultural heritage significance. | Planning and Construction,<br>Operational |
| **Raw Water (positive)** | Potential higher water recoveries. | Planning and Construction,<br>Operational |

| Feature | Impact | Timing |
|---|---|---|
| | Reduced water losses due to evaporation. | Closure and Post Closure. |
| **Socio-Economic (Positive)** | Creation of temporary and permanent jobs. | Planning and Construction, Operational |
| | Safe underground mine workings. | |
| | Skills transfer and development. | |
| | Multiplier effects on the local economy. | |
| | Optimal abstraction of PGM and chrome resources. | |
| | Contribute to water provision, social infrastructure and skills development through the SLP projects. | |
| | Contribution to Government revenue and the fiscals of the MLM, Provincial and National Spheres. | |
| | Promotion of agricultural skills. | |
| | Establishment of post mining land uses. | |
| | Continuation of business opportunities, additional to the mining after closure of the Consolidated MR Area. | |
| | Community development through SLP commitments | |
| | Improved housing for local employees. | |
| **Land (Positive)** | Historical disturbed area will be used for the location of majority of the activities. | Planning and Construction, Operational |
| | Promotion of post mining land-uses. | Closure and Post Closure. |
| **Waste (positive)** | Promotion of the waste management hierarchy. | Planning and Construction, Operational Closure and Post Closure. |
| | Future uses of tailings. | |

### 10.1.3 Cumulative Impacts

The proposed potential cumulative impacts, as presented in ***Table 36*** below, have been identified.

**Table 36: Proposed potential cumulative impacts.**

| Aspects originating to the Cumulative Impacts | Cumulative impacts |
|---|---|
| **Air Quality** | |
| Addition of EP Proposed Projects to the EM and MM in the current regional setting. | Cumulative impact of the EP Proposed Projects, considering the background/baseline dust-fall concentrations. |
| **Biodiversity** | |
| - Invasive and alien plant establishing on disturbed areas; and<br>- Soil compaction on stockpiles and un-vegetated areas. | Aspects will likely result in habitat degradation, which will likely reduce the fauna and flora specie distribution and diversity. |
| - Destruction of intermediate sensitivity habitat | Knock-on dispersal effect, leading to increased resource competition and possible increased mortality rates, resulting in a decreased species abundance and possible further loss of species diversity |
| **Aquatic Ecosystem** | |
| - Increased sedimentation to soil disturbance;<br>- High stormwater velocity flows; and<br>- Contamination of drainage lines and watercourses. | Aspects will likely result in a cumulative impact on the downstream water quality, which will likely impact on the aquatic species and biodiversity. |
| **Groundwater** | |
| Abstraction of groundwater and mining activities. | Aspect can potentially have an impact on the groundwater quality and water quantity for surrounding water users. This will likely impact their livelihood of water users that are dependent on groundwater. |
| **Surface Water** | |
| - Increased sedimentation to soil disturbance;<br>- High stormwater velocity flows; and<br>- Contamination of drainage lines and watercourses. | Aspects will likely result in a cumulative impact on the downstream water quality, which will likely impact on water users (i.e., agriculture, industry, etc.). |
| **Socio-economic** | |
| Mine closure will raise unemployment levels in the region and would increase significantly as more mines close. | The EP Proposed Projects will be decommissioned in correlation with the EM's closure. This will result in the cessation of jobs and demand for goods and services. |
| **Socio-economic (positive)** | |
| Skills development and training | Improved individual skills and training |
| Environmental Awareness training | Application and implementation of individual environmental awareness and skills. |

## 10.2 Alternative 2

Alternatives 2 include technology, layout and route alternatives (refer to ***Section 7.1.2*** in relation to Alternative ). The impacts will be similar to Alternative 1 (Refer to ***Table 35*** and ***Table 36***).

## 10.3 Specialist Investigations

The impacts considered of sufficient importance to warrant mitigation measures and management during the construction and operational phases of the EP Proposed Projects were assessed by Specialists of the relevant fields, in particular:

- Update of the Water Balance;
- Update of the Groundwater Impact Assessment;
- Update of the SWMP;

- Update of the AQIA;
- Terrestrial Biodiversity Assessment (Fauna and Flora);
- Freshwater and Aquatic Assessment;
- Update of the HIA;
- NIA;
- Waste Classification and Geochemical Assessment;
- Update of the Soil and Land Capability Assessment;
- Visual Impact Assessment; and
- Update of the SEIA.

Each of the Specialist reports has been used for the identification of the impacts and recommended mitigation measures, refer to the EMP and attached reports.

### 10.4 Limitations and Assumptions

A summary of the assumptions and limitations applicable to specific to the assessment process and mitigation measures proposed in specific Specialist studies have been attached to the EIAR (***Refer to Appendix 21 For the Limitations and Assumptions provided by the Specialist***). In terms of the EA process, the following assumptions and limitations were identified in the studies undertaken:

- That the EP Proposed Projects and associated infrastructure were designed according to engineer specification;
- That EP will act in a responsible manner and take action when incidents occur, to determine the cause and/or rectify the cause of the problem;
- That the available data, including topographical maps, geological maps and database information, are reasonably accurate.
- That all information extracted from historic specialist studies, EMPR(s) and Reports are correct.
- Only impacts related to new activities being applied for will be included in the impact and risk assessment as part of the EIAR. However, all impacts of the existing operation and new activities being applied for will be included in the EMPR, as this document will also be a Consolidated EMPR, as part of the Section 102 Application. The EMPR is a consolidation and an update of all mitigation measures included in previously approved EMPRs, whilst considering recommendations from auditors regarding the suitability of the mitigation measures included in these approved EMPRs.

## 10.5 The positive and negative impacts

(in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected. (Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

### 10.5.1 Alternative 1 (Proposed Alternative)

Refer to ***Table 35*** and ***Table 36*** under ***section 10.5***, for a description of the positive and negative impacts associated with the proposed Alternative 1.

### 10.5.2 Alternative 2 (Layout, Route and Technology Alternatives)

Alternative 2 include layout, technology and route alternatives in relation to Alternative 1.

### 10.5.3 No-Go Alternative

The No-Go option entails that the Proposed Project is not undertaken. Refer to ***Table 12*** for the preliminary risk identified if the No Go Alternative is considered.

## 10.6 Issues raised by interested and affected parties

As part of the PPP for the EM Consolidation Project an Issues and Response Report has been compiled, ***refer to Appendix 6***. This document records the issues of concern, questions and suggestions contributed by stakeholders during the Scoping and EIA Process. This report also includes the responses provided by relevant parties. Comments and issues raised were received through consultation sessions and written methods (emails and text message). Refer to section 8 for the issues raised by IAPs.

## 10.7 Process used in determining the significance of environmental impacts

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process were determined in order to decide the extent to which the initial site layout needs revision).

The potential impacts were determined by evaluating the different phases associated with the EP Proposed Projects' establishment and development . These phases were determined to be as follow:

- Pre-Construction Phase (I);
- Construction Phase (C);
- Operational Phase (O);
- Closure (CC); and
- Post-Closure Phase (P).

Different impacts are associated with the EP Proposed Projects' different phases . Potential impacts that may be caused by the Projects were identified, using input from the following:

- Views and inputs from the I&APs (local knowledge);
- Existing information and studies;

- Specialist investigations;
- Site visit with the project team; and
- Regulatory requirements.

The 2014 EIA Regulations requires that all identified potential impacts associated with the EP Proposed Project be assessed in terms of their overall potential significance on the biophysical and socio-economic environment. The 2014 EIA Regulations' criteria include the following:

- Nature of the impact;
- Extent of the impact;
- Duration of the impact;
- Probability of the impact occurring;
- Degree to which impact can be reversed;
- Degree to which impact may cause irreplaceable loss of resources;
- Degree to which the impact can be mitigated;
- Cumulative impacts; and
- Residual Impacts.

The impact assessment methodology used to determine the significance of impacts prior and after mitigation is presented below.

The significance was determined by calculating the impacts' extent (i.e., physical extent affected by the potential impact); duration (i.e., timeframe that the potential impact will be in effect); intensity (i.e., expected amplitude of the impact); and reversibility (severity of the impact). Once the impact's significance has been determined, the quantifiable likelihood or probability of the impact is given a percentage value that represents the significance of the impact. The environmental and socio-economic risk is determined by multiplying the significance with the probability of the impact occurring.

A description of the parameters used in this impact assessment is given in ***Table 37*** below.

**Table 37: Impact Assessment Methodology.**

| Parameter | Description |
|---|---|
| **Extent:** | Physical extent affected by the potential impact:<br>• Direct – Actual footprint of the activity (weight value – 1)<br>• Onsite – Within specific mine/development boundary (weight value – 2)<br>• Local – Within municipal boundary (weight value – 3)<br>• Regional – Outside municipal boundary (weight value – 4)<br>• National/International – Two or more provinces and ultimately outside the RSA (weight value – 5) |
| **Duration:** | Timeframe that the potential impact will be in effect:<br>• Immediate - 1 Year or less (weight value – 1)<br>• Short-term – 1-2 Years (weight value – 2)<br>• Medium-term – 2-5 Years (weight value –3)<br>• Long-term – 5 Years to Life of Operation (weight value – 4)<br>• Permanent – 15 years and beyond (weight value – 5) |
| **Intensity:** | The expected amplitude of the impact:<br>• Minor - The activity will only have a minor impact on the affected environment in such a way that the natural processes or functions are not affected (weight value – 1)<br>• Low – The activity will have a low impact on the affected environment (weight value – 2)<br>• Medium – The activity will have a medium impact on the affected environment but function and process continue, albeit in a modified way (weight value – 3)<br>• High – The activity will have a high impact on the affected environment, which may be disturbed to the extent where it temporarily or permanently ceases (weight value – 4)<br>• Very High - The activity will have a remarkably high impact on the affected environment, which may be disturbed to the extent where it temporarily or permanently ceases (weight value – 5) |
| **Reversibility** | The reversibility of an impact is the severity of the impact.<br>• Completely reversible - The impact is reversible without any mitigation measures and management measures (weight value -1)<br>• Nearly completely reversible - The impact is reversible without any significant mitigation and management measures. Some time and resources required - (weight value -2)<br>• Partly reversible - The impact is only reversible with the implementation of mitigation and management measures. Substantial time and resources required (weight value -3)<br>• Nearly irreversible - The impact can only marginally be reversed with the implantation of significant mitigation and management measures. Significant time and resources required to ensure impact is on a controllable level (weight value -4)<br>• Irreversible - The impact is irreversible - (weight value -5) |
| **Significance of Impact / Consequence** | Significance is determined through a combination of the various impact characteristics and represents the combined effect of the Extent, Duration, Intensity and Reversibility<br>Significance = Extent + Duration + Intensity+ Reversibility |
| **Probability:** | The likelihood of an impact occurring:<br>• Improbable - 0 – 25% chance (weight value – 1)<br>• Low – 26 – 50% chance (weight value – 2)<br>• Medium – 51 – 75% chance (weight value – 3)<br>• High – 76 – 100% chance (weight value – 4) |
| **Environmental Risk Refer to the table below** | Multiplication of the significance of the impact by the probability of the impact occurring produces a conclusion of the overall risk that an impact poses to the surrounding environment.<br>Significance of Impact X Probability = High/Medium/Low Environmental Risk |

**Table 38: Environmental risk and impact significance matrix.**

| Significance of Impact | | | | |
|---|---|---|---|---|
| | | Low Impact (4-8) | Medium Impact (9-15) | High Impact (16-20) |
| Probability | Definite / Highly Likely 4 | 16-32 | 36-60 | 64-80 |
| | Medium 3 | 12-24 | 27-45 | 48-60 |
| | Low 2 | 8-16 | 18-30 | 32-40 |
| | Improbable/ Unlikely 1 | 4-8 | 9-15 | 16-20 |

| Environmental Risk | Guidelines for Control Strategies |
|---|---|
| (H) – High | Proactively reduce risk level, short-term response. |
| (M - H) - Medium to High | Proactively reduce risk level, short-term response. |
| (M) – Medium | Management strategies to reduce risk level, short to medium-term response. |
| (L - M) - Low to Medium | Management strategies to reduce risk level, short to medium-term response, operational control and housekeeping. |
| (L) – Low | Operational control and housekeeping. |

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

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

The EIA process is based on impacts and risks identified being mitigated with measures that are necessary to avoid, minimize or offset predicted adverse impacts and, where appropriate, to incorporate these into an environmental management plan or system (DEAT, 2004). The following **objectives/ criteria** will be kept in mind while mitigation measures are identified during the EIA Phase, to:

- Find more environmentally sound ways of undertaking specific activities;
- Enhance any environmental and social benefits of a proposed activity;
- Avoid, minimise or remedy negative environmental impacts;
- Apply a lifecycle approach to resources and products (cradle to cradle); and
- Ensure that any residual negative environmental impacts are environmentally acceptable.

Identifying appropriate mitigation measures will be conducted in a hierarchal manner:

1. Preventative measures will be identified to avoid, where possible, negative impacts that may arise due to the proposed activity;

2. Measures will be identified to minimise and/or reduce the negative impacts to *"as low as practicable"* levels; and

3. Measures will be identified to compensate or remedy residual negative impacts that are unavoidable and cannot be minimised or reduced any further (DEA, 2006).

Proposed mitigation measures will be communicated to EP for review as part of compiling the draft EMPR. EP will comment on the feasibility and practicality of implementing the mitigation measures. The mitigation measures may be adjusted based on EP's comments.

## 10.9 Assessment of each identified potentially significant impact and risk

### 10.9.1 Air Quality

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| Dust and associated emissions due to the following activities:<br>▪ In-pit operations (blasting, material handling, etc.);<br>▪ Wind erosion from exposed areas (i.e. stockpiles, TSF backfill area, etc.);<br>▪ Crushing/ screening of ROM, overburden and waste rock;<br>▪ Material handling, including loading and off-loading; and<br>▪ Vehicle dust entrainment on haul roads | I, C, O, CC, PC | 3 | 4 | 3 | 3 | 13 | 4 | 52 | • Monitor dust impacts monthly, as per the current dust monitoring protocol.<br>• Earthworks should be limited on windy climatic conditions, where possible, and dust suppression increased.<br>• Employ good housekeeping, both inside and outside the construction site, including cleaning up rubbish and debris, sweeping and hosing down stockpiles or roadways.<br>• Dust suppression methods currently utilised on the EM Surface Area should be applied where required.<br>• Revegetation of rehabilitation areas, to minimise wind erosion impacts and establish self-sustaining ecosystems.<br>• Traffic and movement over stabilised areas should be restricted and controlled and damage to stabilised areas should be repaired and maintained, to the satisfaction of the HSEC Department.<br>• Long-term topsoil stockpiles will be revegetated as soon as practically possible.<br>• Reduce height of material transfer (e.g. conveyor transfer points). Increase moisture content of material with water sprays prior to or during conveying, crushing and screening of material.<br>• Partial or complete enclosure of conveyor material transfer points, conveyor belts and screening/crushing units. Enclosures should be regularly inspected to prevent gaps, cracks or holes which can result in reduced dust suppression.<br>• Undertake regular maintenance (e.g. weekly, monthly, quarterly) on conveyors and | 3 | 4 | 2 | 2 | 10 | 2 | 22 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | screening/crushing units, to ensure optimal functioning. Water spray fittings should be regularly inspected, to ensure they are operating effectively.<br>• Water sprays for material handling operations (e.g., wet material before loading trucks and the hopper).<br>• Water spraying for stockpiles and material storage areas.<br>• Wind breaks at ROM Stockpile areas or fine material storage piles that are prone to dust emissions.<br>• Immediate clean-up of any material (i.e., overburden / ROM) spillages. Trucks transporting product offsite must use covers (e.g., tarpaulin covers), to prevent windblown dust during transportation.<br>• Conduct regular site inspections, to ensure the dust mitigation measures are being implemented. Regular visual site inspections are recommended, to assess whether further mitigation is required for any of the dust emission sources. | | | | | | | |
| Vehicle emissions associated with the construction, operation and decommissioning phases. | C, O, CC | 1 | 1 | 1 | 3 | 6 | 4 | 24 | • Maintain vehicles according to the manufacturing specifications.<br>• Regularly inspect and service vehicles. | 1 | 1 | 1 | 2 | 5 | 2 | 10 |

### 10.9.2 Topography

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| Potentially dangerous excavations pose a health and safety risk to humans and animals. | C, O, | 1 | 4 | 3 | 1 | 9 | 3 | 27 | • The opencast mining operation and Ventilation Shafts are classified as potentially dangerous excavations.<br>• The opencast mine will comprise initial boxcuts with mining progressing along the seam in either direction.<br>• Except for the initial boxcuts, the mined out opencast pits should be backfilled and rehabilitated as mining progresses.<br>• Concurrent rehabilitation must be implemented.<br>• Trenches for the laying of pipelines could be potentially dangerous. Where possible, these trenches will be backfilled or alternatively barricaded.<br>• The site that has been fenced is the area between the N4 and the R566. | 1 | 4 | 2 | 1 | 8 | 2 | 16 |
| Slope stability on stockpiles and opencast, including tailings backfill area | C, O, CC PC | 1 | 4 | 3 | 1 | 9 | 3 | 27 | • From a HS perspective, access to the opencast, stockpiles and return water sump must also be restricted.<br>• Until opencast mining has been completed and the area rehabilitated, barriers (e.g., fences and berms) and other safety measures (e.g., warning signs) will be required to ensure objects don't roll onto people, animals and machinery.<br>• Comply with the Code of Practices for slope stability. | 1 | 4 | 2 | 1 | 8 | 2 | 16 |
| Surface subsidence above the mine workings, which could result in depressions occurring, leading to ponding and altering the topography. | O, CC, PC | 1 | 5 | 1 | 3 | 10 | 4 | 40 | • Comply with the Code of Practice to combat rock fall and rock burst accidents.<br>• EP should use a backfill technique designed to compensate for this and actively monitor for signs of settlement with maintenance, as appropriate.<br>• The underground mine plan has been designed in a manner to prevent surface subsidence above the underground workings.<br>• Sufficient support must be provided in the underground workings to ensure this.<br>• EP should landscape land disturbed by subsidence; and investigate properties and communicate with property owners for any damage that may have resulted. | 1 | 5 | 1 | 2 | 10 | 3 | 30 |

### 10.9.3 Visual

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| Visual impact on the following receptors:<br>▪ Users of the R511 and N4 Freeway road<br>▪ Land users situated directly west of EM and MM. | C, O, CC | 3 | 4 | 3 | 2 | 12 | 4 | 48 | • Construct a berm from topsoil, at least 5 m high, to obscure visual impacts from the R566 and the neighbouring Farm to the west of the mine whilst the Merensky reef mining is undertaken.<br>• A combination of tall indigenous trees and shrubs have been planted along the southern site boundary and on the berm, to assist in screening the view.<br>• The TSF comprises of paddocks constructed from waste rock. The starter walls and subsequent lifts (side walls) have been covered with topsoil and re-vegetated with a combination of indigenous plants and trees.<br>• Ensure that the TSF side walls and berms are vegetated, and cover is maintained.<br>• An agricultural project and Game Farm have been established and do mitigate the visual impact on the northern boundary of EM Surface Area.<br>• Remove the minimum amount of vegetation necessary and retain as much of the natural vegetation as possible.<br>• Implement dust suppression on all dirt roads.<br>• Utilise non-shiny structures for the hard park and toilets, i.e., avoid unpainted roofs.<br>• Conduct concurrent rehabilitation, in line with the EMPr commitments, where possible.<br>• Repair and rehabilitate visual signs of erosion.<br>• Lighting during night-time operations must be directed away from residential areas. | 3 | 4 | 2 | 2 | 11 | 2 | 22 |
| Post closure residual visual impact due to the remaining mining infrastructure (i.e., TSF). | PC | 3 | 4 | 2 | 1 | 10 | 3 | 30 | • Restore the landscape to the pre-mining topography, as far as practical and in-line with the closure plan.<br>• Ensure that the final landform is free draining.<br>• Manage rehabilitated areas (e.g., remove alien invasive plants, etc.).<br>• Repair and rehabilitate visual signs of erosion and surface subsidence. | 3 | 2 | 2 | 2 | 9 | 2 | 18 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | • Monitor vegetation establishment for at least 2 seasons, to ensure effective rehabilitation. | | | | | | | |

### 10.9.4 Soil and Land Capability

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| Loss of Soil resources by means of:<br>▪ Disturbance to the functionality and productivity of the soil stripped for excavations and mining.<br>▪ Disturbance of the soil profile.<br>▪ Soil erosion due to water and wind movement.<br>▪ Soil compaction due to vehicle and machinery movement. | C O CC | 1 | 4 | 4 | 2 | 11 | 3 | 33 | • The opencast mine and infrastructure areas must be rehabilitated after mining operations have been completed. It is important that the soil is managed correctly, so that it can support the proposed post-mining land use and loss of the soil resource in the area can be minimised.<br>• The topsoil layer will be stockpiled separately from the underlying black turf soil, which will also be stockpiled separately from the lower decomposed norite (overburden).<br>• Rehabilitation should involve the replacement of material, as per the rehabilitation and soil conservation procedure.<br>• Natural slope gradients at the site are not significant and therefore do not add to erosion potential.<br>• Vegetation establishment in disturbed areas must be undertaken as soon as is practical, within the growing season. The TSF Paddocks' side slopes have been profiled and revegetated.<br>• Where disturbed areas cannot be revegetated during the LoM, appropriate measures will be taken to control erosion. These may include contours, berms, runoff diversion canals, energy dissipaters and application of straw mulches or soil binders to exposed soils. | 1 | 1 | 2 | 2 | 6 | 2 | 12 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | • Implement the design features as described in the SWMP.<br>• EP must observe the following requirements of the DLRDD in the design of effective erosion control measures on bare soils::<br>➢ Erosion control measures are required in all areas where slope gradients exceed 2%;<br>➢ Engineered erosion control measures are required where slope gradients exceed 15%;<br>➢ Erosion controls must be included in the designs of linear infrastructure and points of water discharge.<br>➢ Linear infrastructure should be inspected on a weekly basis, to check that the associated water management infrastructure is effective in controlling erosion.<br>• Energy dissipaters must be constructed at points where there are concentrated discharges of water into the environment (such as culverts and outflows of water from diversion berms or canals). | | | | | | | |
| Disturbance of the land capability on undisturbed footprints, potentially leading to loss of:<br>▪ high potential land;<br>▪ grazing land; and<br>▪ agricultural production. | CO | 1 | 2 | 1 | 1 | 5 | 2 | 10 | • The high potential land in the south-eastern part of the Project Area will not be disturbed, except in the existing approved Zilkaatsnek mining area. The irrigated land in the north-western part of the Project Area is outside of the proposed mining activities.<br>• The land will not be subdivided and, hence, no fragmentation is foreseen.<br>• Crops are being produced on 14 Ha and will not be influenced by the development because it will remain under production.<br>• Approximately 104 Ha will be used for mining purposes and will last for the LoM, after which it must be rehabilitated and revert to grazing.<br>• Although no livestock is on the Project Area, there can potentially be a loss of production opportunity. 104 Ha are lost for the LoM.<br>• No agriculture related infrastructure will be lost.<br>• The sites disturbed by opencast mining should be rehabilitated to grazing land. | 1 | 2 | 1 | 1 | 5 | 2 | 10 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | • Where practical, rehabilitation must take place during the life of the EP Proposed Projects (construction and operational phases) and should involve:<br>➢ The species used for revegetation being selected based on their ability to bind and cover soil (afford erosion protection) and their tolerance towards the prevailing environmental conditions; and<br>➢ Species that can become invasive or a problem in the future use of the rehabilitated land being avoided. Species that will enhance the land's grazing potential should be used, where possible, and the biodiversity of the veld classification (Norite Black Turfveld) maintained. | | | | | | | |
| Soil pollution due to spillages. | C<br>O<br>CC | 1 | 4 | 3 | 3 | 11 | 3 | 33 | • Soil contamination should be avoided at EM by implementing the water and waste management systems.<br>• Adequate ablution facilities must be provided for contractors during the EP Proposed Project's construction phase and in areas away from formal sewage facilities.<br>• As a general principle, storage areas and vehicle maintenance areas should be surfaced with impermeable substrates and have appropriate runoff containment measures in place, such as oil traps, bunds and canals, in particular:<br>○ appropriately bunded areas with impermeable flooring (including collection drains and sumps) and appropriate levels of security and ventilation for:<br>○ new and used fuels and lubricants;<br>○ drums containing chemicals and waste oil (to be stored upright);<br>○ paints;<br>○ waste handling facilities.<br>○ vehicles should be:<br>○ parked in designated areas;<br>○ serviced in appropriate workshops, in accordance with manufacturers | 1 | 1 | 3 | 2 | 7 | 2 | 14 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | | After Mitigation | | | | | |
| | | | | | | | | | maintenance plan. Where this is not possible (e.g., during a breakdown), a drip tray must be placed under the vehicle to collect spills and in-field servicing vehicles should have the capacity, to contain waste oil drained from the sumps of machines. No oil from sumps will be drained directly into the soil; and<br>○ refuelled on an impermeable surface, with appropriate drainage to direct and collect fuel spillages.<br>• Pipelines must be monitored continuously, to limit spillages.<br>• Spill kits must be provided at all appropriate locations or machinery, to mitigate spillages effects, should they occur.<br>• There should be an incident management system, including procedures and training for dealing with incidents. Major spillage incidents must be reported to the relevant authorities.<br>• If spills do occur and soils become contaminated, the appropriate remedial measures must be identified, in consultation with an appropriately qualified specialist.<br>• Polluted soils should be remediated in the soil farm. | | | | | | | |

### 10.9.5 Surface Water

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| **Deterioration in water quality**<br>▪ Habitat modification of the established drainage areas and watercourses<br>▪ Impacts on the storm water and run-off quality.<br>▪ Increased sedimentation and silt loads of storm water and run-off. | C, O, CC, PC | 3 | 4 | 3 | 3 | 13 | 3 | 39 | • In all phases, infrastructure associated with the mine have been constructed, operated and maintained to comply with the NWA and GN 704 or any future amendments thereto.<br>• Implement the recommendations of the SWMP.<br>• Key related issues are to ensure that:<br>➢ lean water systems are separated from dirty water systems;<br>➢ The location of all activities and infrastructure should be outside of the specified zones and/or floodlines of watercourses. If this is unavoidable, the necessary exemptions/approvals must be obtained;<br>➢ The size of dirty areas is minimised; and dirty water is contained in systems that allow the reuse and/or recycling of this dirty water;<br>➢ Dirty water discharges may only occur in accordance with authorisations that are issued in terms of the relevant legislation specifications and must not result in negative health impacts for downstream surface water users; and<br>➢ The site wide water balance is refined on an ongoing basis, with the input of actual flow volumes, and used as a decision-making tool for water management and impact mitigation.<br>• Continue to undertake monthly monitoring of surface water points, as per the WUL and monitoring programme.<br>• Undertake Biannual Biomonitoring, as per the WUL.<br>• The designs of any permanent and potentially polluting structures to be constructed, must take account of the requirements for long-term surface water pollution prevention.<br>• EP should monitor the water quality in all potentially affected surface water resources and | 3 | 4 | 2 | 3 | 12 | 2 | 24 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | use the monitoring results to implement appropriate mitigation measures to achieve the surface water quality objectives. Should any contamination be detected at the compliance monitoring points, EP must immediately notify the Regional Director of DHSWS. It should then identify the source of contamination; identify measures for the prevention of any contamination due to MM and EMs' operation (in the short and long-term); and then implement these measures.<br>• Where monitoring results indicate that third party water supply has been polluted by EM and MM, EP should ensure that an alternative water supply will be provided.<br>• Potential pollution must be managed by implementing the following processes:<br>➢ Maintenance of equipment;<br>➢ Education and training of workers (permanent and temporary);<br>➢ Appropriate management of hazardous materials and waste; and<br>➢ The required steps to enable containment and remediation of pollution incidents.<br>• Specifications for post-rehabilitation audit criteria, to ascertain whether the remediation has been successful and, if not, to recommend and implement further measures. | | | | | | | |
| Changes in the flow regime and quality of the diverted and existing non-perennial watercourses. | C, O, CC, PC | 3 | 4 | 3 | 3 | 13 | 3 | 39 | • Implement the SWMP's recommendations.<br>• Continue to undertake monthly monitoring of surface water points, as per the WUL and monitoring programme.<br>• Undertake Biannual Biomonitoring, as per the WUL. | 3 | 4 | 2 | 3 | 12 | 2 | 24 |
| Changes to the Water- and Salt Balance. | C O CC | 3 | 4 | 4 | 2 | 13 | 4 | 52 | • The water balance for EM and MM should be refined on an ongoing basis during the LoM. Flow meters must be installed in MM and EM's water circuit, to enable refinement of the water balance. The water balance should be used to check, on an ongoing basis, that the capacity of the dirty water holding facilities is adequate, considering the operational distribution and use of water. | 3 | 4 | 3 | 2 | 12 | 2 | 24 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | • An annual report on MM and EMs' water balance must be submitted to DHSWS. This will provide information on the status of the water balance in the wet and dry season and under conditions of extreme rainfall. The routine monitoring data will be documented, interpreted and reported; and included in annual reporting to DHSWS.<br>• A Salt Balance must be developed and updated annually. | | | | | | | |
| Nitrates from blasting leading to eutrophication of the receiving environment and potable water loss within the catchment. | C<br>O<br>CC<br>PC | 3 | 5 | 4 | 3 | 15 | 3 | 45 | • Topsoil stripped for mining activities should be utilised as part of the rehabilitation activities and as fill materials post mining<br>• Water to be collected through stormwater trenches/berms; and recycled and utilised within the mine water circuit, or pumped to the PCDs for evaporation.<br>• Re-use mining affected water as far as possible.<br>• Continue to utilise the artificial wetland to remediate nitrates.<br>• Implement the recommendations of the Water Balance.<br>• Continue to undertake monthly monitoring of surface water points, as per the WUL and monitoring programme.<br>• Undertake Biannual Biomonitoring, as per the WUL. | 3 | 5 | 2 | 2 | 12 | 2 | 24 |

### 10.9.6 Groundwater

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | | Before Mitigation | | | | | | | | | After Mitigation | | | | | |
| Dewatering leading to the formation of a dewatering cone; and reduced groundwater levels and water availability. | CO CC PC | 2 | 4 | 3 | 3 | 12 | 2 | 24 | • Implement a Class 4 liner for the proposed ROM Stockpiles.<br>• Relocate the existing monitoring and abstraction boreholes that will be affected by the Merensky Reef Mining. Obtain approval from DHSWS before boreholes are relocated.<br>• The monitoring network and programme installed must be followed diligently, as per the WUL requirements.<br>• Refurbish the current dewatering and water supply boreholes (electrical and pumping equipment) where required.<br>• Equip all dewatering boreholes with flow meters and maintain a record of volumes abstracted.<br>• Seepage capturing boreholes installed around TSF Paddocks must be maintained and monitored quarterly.<br>• Where monitoring results indicate that third party water supply has been polluted by EM/MM, EP must ensure that an alternative water supply will be provided.<br>• Local and regional water monitoring should be undertaken for at least 12 months, according to the monitoring protocol provided in the groundwater impact assessment.<br>• Monitoring points should be installed at MM, downstream of the PCD at the discharge points. and south and north of MM, to measure upstream and downstream impacts.<br>• The presence of the fault zone at or near MM should be investigated and the impact on the mining sequence determined. A possible increased ingress of groundwater is associated with this preferential flow path, which should be considered during the mine planning. | 2 | 4 | 2 | 2 | 10 | 2 | 20 |
| Formation of a contamination plume due to infiltration of contaminants into the groundwater. | | 2 | 4 | 3 | 4 | 13 | 3 | 39 | | 2 | 4 | 2 | 4 | 12 | 2 | 24 |
| Reduction in the baseflow in the Kareespruit River system | | 2 | 4 | 4 | 3 | 13 | 2 | 26 | | 2 | 4 | 3 | 3 | 12 | 2 | 24 |
| Post-closure liability on the groundwater quality. | | 2 | 5 | 4 | 4 | 15 | 4 | 60 | | 2 | 5 | 3 | 4 | 14 | 3 | 42 |

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| | | | | | | | | | • Surface depressurization wells should be installed, to decrease the pressure and resultant underground inflows associated with this zone.<br>• The groundwater flow model must be updated every 24 months with the recorded monitoring data.<br>• Surface depressurization wells should be installed, to decrease the pressure and resultant underground inflows associated with this zone.<br>• The routine monitoring data will be documented, interpreted and reported to DHSWS, as per WUL requirements.<br>• Complete detailed geophysics around the open pits before backfilling commences.<br>• Install monitoring and scavenger wells before backfilling commences, both up and down gradient of the open pits to 10m below the base of the pits. | | | | | | | |

### 10.9.7 Noise

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| Noise impact from construction, operation and decommissioning machinery and vehicles. | C,O, P | 3 | 4 | 3 | 3 | 13 | 4 | 52 | • EP should construct berms between the Merensky mining areas and land users to the west.<br>• EP must ensure that noise levels are less than 52 dBA at night, by conducting regular monitoring.<br>• Include a component covering environmental noise in the HS Induction, to sensitize all employees and contractors about this subject, especially those that travel past receptors at night or might be required to do work within 650 m from sensitive receptors at night.<br>• Establish a complaints' register, with an open line to a relevant person that can act if there is a noise complaint. The register should be kept at the EM's entrance.<br>• A noise monitoring programme should be developed and implemented.<br>• All vehicles and equipment must be maintained to limit noise emissions. | 3 | 4 | 2 | 2 | 11 | 2 | 22 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | • Adequate Personal Protective Equipment (PPE) must be used.<br>• If complaints are received about disturbing noise from neighbouring landowners and / or communities, EM must:<br>➢ Respond timeously to these complaints;<br>➢ Identify the noise source; and<br>➢ Implement appropriate noise reduction management measures or technologies where possible.<br>• It is a Mine HS requirement that all vehicles be fitted with reverse hooters. EP will however ensure that potential future vehicle safety technology options be investigated. | | | | | | | |
| Blasting as part of mining | O | 2 | 3 | 3 | 3 | 11 | 3 | 33 | • Undertake a blasting impact assessment prior to commencing with mining of the Merensky Reef and UG1 in the TSF.<br>• Inform sensitive receptors prior to blasting.<br>• A complaints register will be kept at the entrance of EM.<br>• If complaints are received about disturbing noise from neighbouring landowners and / or communities, EP will:<br>➢ Respond timeously to these complaints;<br>➢ Identify the noise source; and<br>➢ Implement appropriate noise reduction management measures or technologies, where possible. | 2 | 3 | 3 | 2 | 10 | 3 | 30 |

### 10.9.8 Biodiversity

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| Loss of floral habitat and SCC | C | 2 | 4 | 3 | 3 | 12 | 3 | 36 | • Minimise loss of indigenous vegetation, where possible, through adequate planning and, where necessary, by incorporating recommendations of the biodiversity report and other Specialist studies.<br>• It must be ensured that, as far as possible, all proposed infrastructure, including temporary infrastructure, is placed outside of sensitive habitat units.<br>• Access roads should be kept to existing roads, to reduce fragmentation of existing natural habitat.<br>• It is recommended that, prior to the commencement of construction activities, the entire construction area be fenced off and clearly demarcated.<br>• An AIP Management/Control Plan should be implemented by a qualified professional. No chemical control of AIPs to occur without a certified professional and no chemical control to be permitted in watercourses.<br>• Due to the potential for a higher diversity of floral SCC occurring within the study area than what was observed during the field investigation (seasonal constraints), it is recommended that another walkdown of the footprint area take place prior to vegetation clearing – especially associated with the Merensky opencast areas and the Elands Ventilation Shaft 2. This walkdown must coincide with the flowering period of all potentially occurring SCC (typically October – March, but November – January is more ideal) and be conducted by a suitably qualified specialist. Where possible, these species must be relocated to suitable habitat outside of the direct footprint area. If this is not possible, the necessary permits from the relevant provincial and national authorities must be obtained before these species are destroyed. | 2 | 4 | 2 | 2 | 10 | 2 | 20 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | • A licence from the DALRRD is required for the removal of any NFA protected tree species (none recorded within the direct footprint). For the removal, destruction or relocation of protected flora in terms of the TNCO, a license is required from NWREAD. | | | | | | | |
| Loss of floral habitat, species and SCC due to:<br>▪ Development footprint impacting on SCC;<br>▪ Edge effect;<br>▪ Fires;<br>▪ Dust generation; and<br>▪ Lack and/or no concurrent rehabilitation. | C<br>O | 3 | 4 | 3 | 3 | 13 | 3 | 39 | • All construction personnel should be educated in environmental awareness.<br>• The construction footprint must be kept as small as possible, to minimise impact on the surrounding environment (edge effect management).<br>• Vegetation removal must be restricted to what is necessary and remain within the approved development footprint.<br>• All areas of increased ecological sensitivity must be designated as No-Go areas and off limits to all unauthorised construction vehicles and personnel.<br>• No additional habitat is to be disturbed during the project's operational phase outside of the demarcated approved footprints (being applied for). Informally, weekly monitoring and recording of the footprint areas must be done by EPs environmental officer and photographic records kept. A formal monthly incidents report must be submitted.<br>• Vehicles should be restricted to travelling only on designated roadways, to limit the construction activities' ecological footprint.<br>• Planning of temporary and access routes should take the site sensitivity plan into consideration. If possible, they should be constructed outside of the sensitive habitat and planned so that they will not lead to habitat fragmentation. It is recommended that existing roads be utilised.<br>• No dumping of litter, rubble or cleared vegetation on site should be allowed. Infrastructure and rubble removed due to the construction activities should be disposed of at an appropriate registered dump site, away from the development footprint. No temporary dump | 3 | 4 | 2 | 2 | 11 | 2 | 22 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | sites should be allowed in areas with natural vegetation. Waste disposal containers and bins must be provided during the construction phase for all construction rubble and general waste. Vegetation cuttings must be carefully collected and disposed of at a separate waste facility.<br>• If any spills occur, they must be cleaned up immediately to avoid soil contamination which has the potential to hinder floral rehabilitation down the line. Spill kits should be kept on-site within workshops.<br>• In the event of a breakdown, maintenance of vehicles must take place with care and the recollection of spillage should be practised, preventing the ingress of hydrocarbons into the topsoil.<br>• Upon completion of construction activities, it must be ensured that no bare areas remain and that indigenous species be used to revegetate the disturbed area.<br>• Any unauthorised collection of floral material must be prohibited.<br>• Monitoring of any rescued and relocated floral SCC should commence during the construction phase and continue until it is evident that relocated species have successfully established.<br>• Harvesting of protected floral species by construction and operational personnel should be strictly prohibited.<br>• No illicit fires must be allowed during any phases of the EP Proposed Projects.<br>• Firebreaks should be maintained during the mining phase.<br>• Adequate stormwater management must be incorporated into the proposed development's design, to prevent topsoil erosion land floral habitat loss.<br>• Rehabilitation of natural vegetation should proceed in accordance with the rehabilitation plan (Closure and Rehabilitation Plan. Report). This rehabilitation plan should consider all phases of the EP Proposed Projects, indicating | | | | | | | |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | rehabilitation actions to be undertaken during and once construction has been completed; ongoing rehabilitation during the operational phase of the project; and rehabilitation actions to be undertaken after operations have ceased;<br>• Any natural areas beyond the direct footprint, which have been affected by the construction activities, must be rehabilitated using indigenous species,<br>• Floral monitoring should be done annually during operational activities.<br>• Rehabilitation must be implemented concurrently, as per the rehabilitation plan, and disturbed areas must be rehabilitated as soon as they become available. This will not only reduce the total disturbance footprint but will also reduce the overall rehabilitation effort and costs associated with it; and<br>• All soils compacted because of construction activities falling outside of the Project Area should be ripped and profiled. Special attention should be paid to alien and invasive control within these areas.<br>• No construction rubble to be disposed of outside of demarcated areas and must be taken to a registered waste disposal facility.<br>• All soils compacted due to construction and operational activities must be ripped, profiled and reseeded.<br>• An AIP Management and Control Plan must be implemented to monitor and control alien floral recruitment. Priority areas for AIP control have been recommended in a memorandum provided by STS (STS 200031, 2020b);<br>• The Environmental Control Officer ("**ECO**") or Environmental Manager is the person responsible for the monitoring of the AIP Management Plan's implementation during all phases of the AIP control activities and for reporting on the degree of compliance. | | | | | | | |
| Loss of floral habitat, species and SCC due to:<br>▪ Lack of rehabilitation at closure; and | CC<br>PC | 2 | 5 | 4 | 2 | 13 | 3 | 39 | • All disturbed areas should be rehabilitated to a point where natural processes will allow the ecological functioning and biodiversity of the | 2 | 5 | 2 | 2 | 11 | 2 | 22 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| ▪ AIP establishment. | | | | | | | | | area to be re-instated. The Closure and Rehabilitation Plan states that the intended post-closure land-use of rehabilitated sites should reflect the local indigenous flora (i.e., the Marikana Thornveld) and that, as far as possible, species will be used for revegetation that will enhance the grazing potential of the land (Closure and Rehabilitation Plan).<br>• All infrastructure and footprint areas should be rehabilitated, in accordance with the rehabilitation plan.<br>• Edge effects, such as erosion and AIP proliferation, which may affect adjacent or downstream sensitive habitat, need to be strictly managed adjacent to the footprint areas and as part of the rehabilitation phase.<br>• Ongoing AIP monitoring and clearance should take place throughout the rehabilitation phase of the project; and<br>• An AIP Management and Control Plan must be designed and implemented, to monitor and control alien floral recruitment in disturbed areas. The Plan must be implemented for at least 3 years post-rehabilitation. Considering the extent of AIP proliferation, this period might be longer and the need for ongoing AIP control should be reassessed at the end of the 3-year period post-rehabilitation. | | | | | | | |
| Loss of faunal habitat, species and faunal SCC | C | 2 | 4 | 3 | 3 | 12 | 3 | 36 | • At all times, ensure that sound environmental management is in place during the planning phase.<br>• During the site-pegging phase of surface infrastructure, any faunal SCC on nests or in burrows that may be harmed or injured by surface infrastructure must be noted and, where possible, relocated to suitable habitat surrounding the disturbance footprint. The relevant permits must be applied for from the NWDEDECT prior to construction. Any action should be undertaken by someone who is suitably qualified to handle the relevant species.<br>• Minimise indigenous vegetation loss, where possible, through refining the final development | 2 | 4 | 2 | 2 | 10 | 2 | 20 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | footprint; optimising the design within the habitat of lowered EIS; avoiding development within the sensitive habitats (Marikana Thornveld within the Game Park), as far as possible; and maintaining the desired aesthetic effect envisioned for the development;<br>• Prior to vegetation clearing activities in the Marikana Thornveld (Mixed Bushveld and Thornveld), the Project Area should be inspected for the presence of mammal and scorpion burrows, reptiles and baboon spiders. If located, these species should be carefully excavated, ensuring no harm to the specimens; and relocated to similar surrounding habitat outside of the footprint area.<br>• Design of infrastructure should be environmentally sound; all construction equipment utilised must be in a good working condition; and all possible precautions taken to prevent potential spills and /or leaks.<br>• Prior to the commencement of mining activities on the Project Area, a biodiversity action and rehabilitation plan, should be developed for implementation throughout all the project phases. This plan must investigate feasibly migratory corridors for faunal species movement between the sensitive areas.<br>• Prior to the commencement of proposed activities on the Project Area, an AIP management plan should be compiled for implementation throughout all development phases.<br>• A SWMP should be designed and implemented for all phases of the EP Proposed Project, to ensure changes in the hydrological cycle and its influence on Freshwater Habitat is mitigated for. | | | | | | | |
| Loss of faunal habitat, species and SCC due to:<br>▪ Development footprint impacting on SCC;<br>▪ Edge effect<br>▪ Fires;<br>▪ Dust generation; and<br>▪ Lack and or no concurrent rehabilitation. | C<br>O | 3 | 4 | 3 | 3 | 13 | 3 | 39 | • The development footprint should be demarcated and it should be ensured that no development related activities take place outside of the demarcated footprint. This final footprint area should be reviewed by a faunal specialist, to ensure no detrimental impacts to faunal assemblages occur. | 3 | 4 | 2 | 2 | 11 | 2 | 22 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | • Faunal habitat beyond the demarcated area should not be cleared or altered.<br>• Construction equipment should be restricted to travelling only on designated roadways, to limit the development activities' ecological footprint . Additional road construction should be limited to what is necessary, and the footprint thereof kept to a minimal. A faunal specialist should do a walkdown of any proposed new roads prior to clearing.<br>• No dumping of litter, rubble or cleared vegetation on site should be allowed. Vegetation cuttings (especially AIP) must be carefully collected and disposed of at a separate waste facility.<br>• Excavated topsoil must be stored with associated native vegetation debris for subsequent use in rehabilitation.<br>• If any spills occur, they should be immediately cleaned up to avoid soil contamination that can hinder later floral rehabilitation and recolonization. Maintenance of vehicles must take place in a breakdown with care and collection of spillages should be practised, preventing the ingress of hydrocarbons into the topsoil.<br>• No hunting/trapping or collecting of faunal species is allowed.<br>• An AIP control plan must be developed for the Project Area and must include ongoing AIP monitoring and clearing/control throughout all phases of the development.<br>• The project perimeters should be regularly checked for AIP establishment and to prevent spread into surrounding natural areas.<br>• AIP that is removed must not be allowed to lay on unprotected ground, as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility, which complies with legal standards.<br>• No collection of faunal SCCs within the study area may be allowed by construction personnel. | | | | | | | |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | • Edge effect control needs to be implemented, to prevent further degradation and potential loss of faunal SCC habitat outside of the proposed development footprint.<br>• Should any sessile faunal species (scorpions or baboon spiders) or birds on nets protected under the NEMBA or the North West Biodiversity Management Act, 2016 (Act No. 4 of 2016) be encountered, construction should be halted and a suitably qualified specialist consulted. Authorisation to relocate such species must be obtained from NWDEDECT however, with nesting species, this is not feasible and development will have to be halted.<br>• Edge effect control needs to be implemented, to ensure no further degradation and potential loss of faunal SCC outside of the Project Area.<br>• Should SCC be identified within the Project Area, a suitable rescue and relocation plan should be developed and overseen by a suitably qualified specialist, to ensure species loss during construction activities is kept to a minimum.<br>• Smaller species, such as scorpions and reptiles, are likely to be less mobile during the colder period. If any are observed in the Project Area during clearing and operational activities, they must be carefully and safely moved to an area of similar habitat outside of the disturbance footprint. Construction personnel must be educated about these species and the need for their conservation. Smaller scorpion species and harmless reptiles should be carefully relocated by a suitably nominated construction person or staff member. For larger venomous snakes, a suitably trained official or specialist should be contacted, to affect the relocation of the species, should it not move off on its own.<br>• No illicit fires must be allowed during the construction phase of the EP Proposed Projects.<br>• An adequate SWMP must be incorporated into the design of the proposed development, to | | | | | | | |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | prevent, hydrocarbon ingress; erosion of topsoil; and siltation of watercourses, leading to faunal habitat loss through the discharge of water into the receiving environment. In this regard, special mention is made of:<br>○ sheet runoff from cleared areas and access roads that need to be curtailed; and<br>○ runoff from paved surfaces that should be slowed down by the strategic placement of berms and water dissipation structures.<br>• Stormwater runoff has potential to cause harm to the sensitive Moisture-driven Habitat units which fauna utilise. As far as possible, the hydropedological regimes must not be altered.<br>• All rehabilitated areas should be rehabilitated to a point where natural processes will allow the ecological functioning and biodiversity of the area to be reinstated. The Closure and Rehabilitation Plan states that the intended post-closure land-use of rehabilitated sites should reflect the local indigenous flora, i.e., the Marikana Thornveld, and that, as far as possible, species will be used for revegetation that will enhance the grazing potential of the land (Closure and Rehabilitation Plan. Report).<br>• Any natural areas beyond the development footprint, that have been affected by the construction activities, must be rehabilitated using indigenous plant species. | | | | | | | |
| Loss of Faunal habitat, species and SCC due to:<br>▪ Lack of rehabilitation at closure; and<br>▪ AIP establishment. | CC<br>PC | 2 | 5 | 4 | 2 | 13 | 3 | 39 | • All vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the development activities.<br>• No dumping of litter or cleared AIP material should be allowed to remain on-site. As such, vegetation cuttings must be carefully collected and disposed of at a separate waste facility.<br>• No hunting/trapping or collecting of faunal species is allowed.<br>• Ongoing AIP monitoring and clearing/control should take place throughout the operational phase. The project perimeters should be regularly checked for AIP establishment to | 2 | 5 | 2 | 2 | 11 | 2 | 22 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
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| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | prevent spread into surrounding natural areas, which may alter the habitat's suitability for faunal species.<br>• An AIP Management and Control Plan, designed and implemented as part of the mining operations, must include control and eradication for a period of at least 5 years after decommissioning and closure.<br>• AIP that is removed must not be placed on unprotected ground, as seeds might disperse. All cleared AIP must be disposed of at a licensed waste facility, which complies with legal standards.<br>• No collection of faunal SCCs within the study area may be allowed by operational phase personnel.<br>• Should any other faunal species (primarily avifauna and invertebrates in burrows), protected under the NEMBA or the North West Biodiversity Management Act, 2016 (Act No. 4 of 2016) be encountered within the mining footprint, a suitably qualified specialist should be consulted. Should it be deemed necessary to move the taxa, authorisation to relocate such species must be obtained from NWDEDECT or the DEA. Species not at risk of harm can be chased off.<br>• Smaller species, such as scorpions and arachnids, are likely to be less mobile during the colder period. Therefore, should any be observed during decommissioning activities, they are to be carefully and safely moved to an area of similar habitat outside of the disturbance footprint. Personnel are to be educated about these species and the need for their conservation. Smaller scorpion species and harmless reptiles should be carefully relocated by a suitably nominated construction person or staff member. For larger venomous snakes, a suitably trained official or specialist should be contacted to relocate the species, should it not move off on its own. | | | | | | | |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | • Where bare soils are left exposed due to construction activities, they should be immediately rehabilitated. Rehabilitation efforts should continue to be monitored throughout the operational phase, until natural processes will allow the ecological functioning and biodiversity of the area to be re-instated.<br>• All infrastructure and mining footprints should be rehabilitated in accordance with a rehabilitation plan, compiled by a suitable specialist.<br>• All rehabilitated areas should be rehabilitated to a point where natural processes will allow the ecological functioning and biodiversity of the area to be re-instated, as per the post-closure objective (to be provided in detail in a Biodiversity Management Plan ("**BMP**").<br>• Rehabilitation efforts must be implemented for a at least five years after decommissioning and closure.<br>• Rehabilitation of natural vegetation should proceed in accordance with a rehabilitation plan compiled by a suitable specialist. This plan should consider all development phases of the project; indicate rehabilitation actions to be undertaken during and once construction has been completed; ongoing rehabilitation during the operational phase of the project; and rehabilitation actions to be undertaken during mine closure. This will reduce the total disturbance footprint and the overall rehabilitation effort and cost.<br>• As part of a BMP, faunal monitoring should ideally be done annually; and<br>• Following heavy rains, access roads are to be inspected for signs of erosion which, if found, must be immediately rectified through appropriate erosion control measures. | | | | | | | |

### 10.9.9 Aquatic and Freshwater

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| Vehicular movement and removal of vegetation near freshwater features, potentially leading to:<br>▪ Exposure of soils, causing increased runoff from cleared areas and erosion of the freshwater features, and thus increased potential for sedimentation of the freshwater features;<br>▪ Increased sedimentation of the freshwater features habitat, leading to changes in instream habitat and potentially altering surface water quality;<br>▪ Decreased ecoservice provision;<br>▪ Proliferation of AIP due to disturbances; and<br>▪ Further decreased ability to support biodiversity. | C | 2 | 4 | 4 | 1 | 11 | 4 | 44 | • Contractor laydown areas and material storage facilities are to remain outside of the 100m GN704 ZoR.<br>• All vehicle refuelling is to take place outside of the 100m GN704 ZoR.<br>• It should be feasible to utilise existing roads to gain access to sites and crossing the freshwater features or the 100m GN704 ZOR in areas where no existing crossing is apparent should be unnecessary but, if it is essential, crossings should be made at right angles.<br>• Sensitive areas, such as the freshwater features, should be demarcated as no-go areas and defined as areas in which no activities should occur, unless approval has been obtained. | 2 | 4 | 2 | 1 | 9 | 2 | 18 |
| Excavation, ground-breaking and topsoil removal associated with the stormwater management system, potentially leading to:<br>▪ Removal of topsoil;<br>▪ Excavation activities, resulting in soil stockpiling;<br>▪ Loss of catchment yield resulting from stormwater containment, causing reduced water volumes entering freshwater features;<br>▪ Potential for erosion, leading to the freshwater features sedimentation;<br>▪ Limited reduction in water volumes entering the freshwater features, causing reduced recharge; and<br>▪ Altered vegetation community structure and diversity, due to moisture stress in some localized areas. | C | 2 | 4 | 4 | 1 | 11 | 4 | 44 | • Excavated material (from the trenches) should not be contaminated. It should be ensured that the minimum surface area is taken up and the stockpiles may not exceed 2m in height.<br>• All exposed soil must be protected for the duration of the construction phase, to prevent potential edge effects on the freshwater features.<br>• Where pipelines trenches are present, once the trench has been excavated, a bedding layer (such as clean gravel) should be placed; spread evenly; and compacted uniformly to a firm, but not hard, support. | 2 | 4 | 2 | 1 | 9 | 2 | 18 |
| Excavation, ground-breaking and topsoil removal associated with the surface infrastructure, such as the CFP and proposed pipelines, potentially leading to:<br>▪ Disturbances of soils, potentially causing increased AIP proliferation and, in turn, further alteration of surrounding habitat, with potential to affect the downgradient freshwater habitat;<br>▪ Altered runoff patterns, causing increased erosion and sedimentation of the downgradient freshwater features; and | C | 2 | 1 | 2 | 1 | 6 | 3 | 18 | • With regards to ground-breaking activities:<br>o during excavation activities, the topsoil and vegetation should be stockpiled separately from other material outside of the applicable ZoR. The indigenous vegetation, where present, must be kept moist, until it can be used to rehabilitate the exposed areas;<br>o excavated materials should not be contaminated and it should be ensured that the minimum surface area is taken up, | 2 | 1 | 2 | 1 | 6 | 1 | 6 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| ▪ Potential impacts on the water quality of runoff, which may potentially enter the downgradient freshwater features; and soil contamination due to concrete being cast. | | | | | | | | | however the stockpiles may not exceed 2m in height. Mixture of the lower and upper layers of the excavated soil should be kept to a minimum, for later use as backfill material.<br>• No mixed concrete may be deposited outside of the designated construction footprint.<br>• Protective equipment should be provided, onto which any mixed concrete can be deposited whilst it awaits placing.<br>• Concrete spilled outside of the demarcated area must be promptly removed and taken to a suitably licensed waste disposal site.<br>• The excavated trenches must be backfilled to the same level as the surrounding soil and compacted, to ensure that the trench does not become a preferential surface flow path for stormwater and lead to erosion.<br>• Backfilling of the trench must take place as soon as possible once the pipeline has been installed.<br>• The trench must be suitably rehabilitated, through the loosening of topsoil and reseeding of vegetation, to ensure AIP proliferation does not occur. | | | | | | | |
| Backfilling of historical mining pits with tailings, potentially leading to:<br>▪ Increased risk of transportation of sediment from disturbed soils and earth works; and<br>▪ Increased turbidity of surface water. | C O | 2 | 3 | 3 | 4 | 13 | 3 | 39 | • The engineering designs must be environmentally and structurally sound and all possible precautions taken to prevent surface water contamination. | 2 | 3 | 2 | 2 | 9 | 2 | 18 |
| Operation of opencast mining activities, potentially leading to:<br>▪ Increased risk of sediment transport in surface runoff from the overburden stockpile into the freshwater features, causing altered water quality, channel competency and vegetation community composition;<br>▪ Altered topography/geomorphology, causing altered runoff patterns and formation of preferential flow paths;<br>▪ Nitrates from blasting, causing eutrophication of the receiving environment and potable water loss within the catchment.<br>▪ Formation of a cone of depression, potentially causing baseflow loss in the freshwater systems; | O | 3 | 4 | 3 | 3 | 13 | 3 | 39 | • Blasting should be carried out with extreme caution to avoid cracking of the underlying parent material of the adjacent areas, which might lead to leakages of the impermeable underlying material and altering the hydropedological properties of the surrounding area.<br>• During blasting, airborne dust can be reduced through:<br>o damping dust generation areas with freshwater (although not in sufficient quantities to generate runoff); and<br>o use of hessian or brush barrier fences. | 3 | 4 | 2 | 2 | 11 | 2 | 22 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| ▪ The proposed opencast activities may potentially causing the formation of a cone of depression, pulling the water towards the open pit area, and over time impacting the CVB Wetland; and<br>▪ Dewatering, causing contaminated water to enter the receiving environment and altered water quality. | | | | | | | | | • Pollution prevention through infrastructure design, to prevent, eliminate and/or control potential pollution of soil groundwater and surface water should be implemented.<br>• Implement a monitoring programme to detect and prevent soil, surface water and groundwater pollution.<br>• If possible, the overburden stockpiles should be within areas where it would not impact on any of the local hydrological drivers of the freshwater features, outside the 100m GN704 ZoR. | | | | | | | |
| Operation of the ROM Stockpile areas and stormwater management system, potentially leading to:<br>▪ Temporary and momentary increased velocity and flow of downgradient freshwater features;<br>▪ Reduced water quality, particularly increased dissolved salt concentrations and potential introduction of toxins into the system;<br>▪ Negative impact on aquatic biota community diversity and integrity due to deterioration of water quality;<br>▪ Increased risk of pollution of surface water, resulting from seepage/runoff from infrastructure (e.g., CFP and ROM stockpiles); and<br>▪ Increased risk of pollution of groundwater and impaired water quality and salination of soil. | O | 3 | 4 | 3 | 3 | 13 | 3 | 39 | • The risk of decant must be determined by a suitably qualified geohydrologist and the mitigation measures applied must be in line with those provided by the suitable specialist.<br>• Clean and dirty water systems must be kept separate, in line with GN704.<br>• Special attention needs to be paid to the use of the disposal of tailings generated and the lining of the facilities to be used, according to the specifications of the NEMWA.<br>• Stormwater trenches/berms must be constructed, and water contained therein may be recycled and utilised within the mine water circuit (dust suppression). Runoff from dirty areas should be captured and re- used as process water of the mine.<br>• The stormwater outlet should be constructed from energy dissipating structures (such as Armorflex or reno mattresses), to slow down the water outflow velocity.<br>• It is recommended that the infrastructure such as pipelines and the TSF be regularly inspected for leaks, or more often should there be any sign or reports of a leak.<br>• Should leakage or seepage occur, all possible steps are to be taken to prevent the pollution of the downgradient watercourse systems during repair. | 3 | 4 | 2 | 2 | 11 | 2 | 22 |
| Removal of surface infrastructure, rehabilitation of mining footprint areas and associated post-closure management activities, potentially leading to: | CC PC | 3 | 5 | 3 | 3 | 14 | 3 | 42 | • The final backfilled opencast landscape should be free draining, to allow natural retention and distribution of runoff in the landscape and | 3 | 5 | 2 | 2 | 12 | 2 | 24 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| ▪ Incorrect rehabilitation methods, particularly soil used soil sequencing and backfilling processes; and changes to the topography and natural water distribution patterns of the area; and<br>▪ Increased runoff volumes and formation of preferential surface flow paths from compacted and unvegetated soil, causing the alteration of hydrological recharge paths. | | | | | | | | | ensure recharge of adjacent freshwater systems.<br>• Bare areas should be revegetated within suitable indigenous vegetation species.<br>• Rehabilitation measures stipulated in Maintenance and Management Plan must be implemented and overseen by a suitably qualified Environmental Site Officer ("**ESO**") with wetland rehabilitation experience. The ESO must sign off the rehabilitation before the relevant contractors leave site. | | | | | | | |
| Decant of contaminated water from the rehabilitated mine area into the receiving environment, potentially leading to:<br>▪ Contamination of water within the receiving environment and subsequent reduction in water quality (increase in salts and specific contaminants of concern and reduced pH);<br>▪ Subsequent negative impacts on biota and vegetation; and<br>▪ Altered flow regimes (increased hydroperiod). | CC PC | 3 | 5 | 3 | 3 | 14 | 3 | 42 | • The management and mitigation measures, as recommended in the geohydrological study, should be implemented, to mitigate the potential impacts arising from decant of contaminated water from the mine into the receiving environment.<br>• Wetland management objectives, as outlined in the Eland closure and rehabilitation plan, must be adhered to, to ensure maintenance and, where feasible, improvement of the ecological functioning of the delineated freshwater features; and<br>• A monitoring programme, to detect and prevent the pollution of soils, surface water and groundwater must be integrated in the post-closure management plan. | 3 | 5 | 2 | 2 | 12 | 2 | 24 |

### 10.9.10 Socio Economic

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| Tensions over limited employment opportunities and procurement contracts. | C O CC | 3 | 3 | 4 | 4 | 14 | 3 | 42 | • Continue working with community representatives, to prepare an open and transparent recruitment process, that is widely disclosed to community members.<br>• As a requirement set out in EP's procurement policies, maintain recruitment procedures, including the employment of the local Community's members.<br>• Provide employment options that allow a range of people to benefit from employment opportunities, where possible (e.g., non-shift or part-time work).<br>• Ensure contractors hire Local Community members.<br>• As with current practice, continue using various mechanisms to advertise employment opportunities in neighbouring communities.<br>• Maintain recruitment and employment records, distributing short-term opportunities to as many Community members as possible; and<br>• Continue to regularly provide feedback to the Communities, including disclosing any updates to employment figures. | 2 | 3 | 3 | 3 | 11 | 2 | 22 |
| Increase in informal settlements due to influx. | C O CC | 3 | 4 | 4 | 3 | 14 | 4 | 56 | • Identify social management plans (i.e., SLP and Stakeholder Engagement Plan) that can assist with managing the impacts associated with project-induced influx.<br>• Draw on the existing recruitment procedure to discourage in-migrants and job seekers from settling in the area.<br>• Coordinate influx management measures with other mines in the area.<br>• Assist the MLM with developing and implementing a land management system to prevent illegal squatting in the area. | 3 | 2 | 3 | 3 | 11 | 3 | 33 |
| Increase in social pathologies (teenage pregnancies, school drop-outs, alcohol and substance abuse, crime) | C O CC | 4 | 4 | 3 | 4 | 15 | 4 | 60 | • Consult with clinics and the police stations in the area to monitor and measure increases in social pathologies.<br>• Adopting a clear Code of Conduct, which defines the principles for the appropriate | 3 | 3 | 3 | 3 | 12 | 3 | 36 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | | | | | | | | | behaviour of employees in neighbouring communities (including contractors).<br>• Prohibit employees from abusing alcohol and drugs; and implement stringent measures to address offenders.<br>• The mine closure plan should consider mechanisms to assist retrenched employees with developing coping mechanisms, and where feasible, finding alternative employment opportunities. | | | | | | | |
| Increase in communicable diseases | C<br>O<br>CC | 4 | 4 | 3 | 4 | 15 | 4 | 60 | • Where possible, partner with local government, community clinics, NGOs and neighbouring mines to support integrated HIV and TB prevention and implement management programmes that consider the workplace, local communities and, in particular, high risk/vulnerable groups.<br>• Where possible, develop and implement HIV/AIDS awareness programme that includes adequate access to HIV/AIDS-related information and condoms for all employees. Contractors should develop similar procedures.<br>• Support intensive information, education and communication campaigns on communicable diseases in the workplace and in neighbouring communities.<br>• Where possible, support capacity building for healthcare service providers, including community clinics and NGOs providing HIV and TB prevention, diagnosis and treatment services. | 3 | 3 | 3 | 3 | 12 | 3 | 36 |
| Unemployment at closure phase that will lead to loss of income and collapse of social projects | CC<br>PC | 4 | 5 | 4 | 3 | 16 | 3 | 48 | • Continue working with community representatives to develop open and transparent communications on the closure phase.<br>• As with current practice, continue to use various mechanisms to advertise job opportunities during the closure phase in local communities.<br>• Continue to provide skills development training for local people through internships, scholarships, and/or vocational and skills training programmes during the closure phase. | 4 | 5 | 3 | 2 | 14 | 2 | 28 |
| Creation of temporary and permanent jobs (positive) | C | 3 | 3 | 3 | 1 | 10 | 3 | 30 | | 3 | 3 | 4 | 1 | 11 | 4 | 44 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| | O<br>CC | | | | | | | | • Drawing on the requirements set out in the existing local recruitment procedure, review local skills registers and employee databases to employ local workers, if qualified applicants with the appropriate skills are available.<br>• Ensure Contractors' Agreements make provision for contractors to hire locals, if the skills are available.<br>• Continue working with community representatives to develop open and transparent recruitment procedures that are disclosed to community members and business forums.<br>• As with current practice, continue to use various mechanisms to advertise job opportunities in local communities.<br>• Continue to provide skills development training for local people through internships, scholarships, and/or vocational and skills training programmes. | | | | | | | |
| Skills transfer and development (positive) | C<br>O<br>CC<br>PC | 3 | 3 | 3 | 1 | 10 | 3 | 30 | | 3 | 3 | 4 | 1 | 11 | 4 | 44 |
| Safe underground mine workings (positive) | C<br>O | 3 | 4 | 4 | 4 | 15 | 4 | 60 | Development of the proposed vent shafts will increase ventilation to the underground workings. | 3 | 4 | 4 | 4 | 15 | 4 | 60 |
| Multiplier effects on the local economy (positive) | C<br>O | 3 | 4 | 4 | 4 | 15 | 4 | 60 | Positive impact requires no mitigation. | 3 | 4 | 4 | 4 | 15 | 4 | 60 |
| Optimal abstraction of PGM and chrome resources (positive) | C<br>O | 3 | 4 | 4 | 4 | 15 | 4 | 60 | Positive impact requires no mitigation. | 3 | 4 | 4 | 4 | 15 | 4 | 60 |
| Contribute to water provision, social infrastructure and skills development through the SLP projects (positive) | O | 3 | 4 | 4 | 4 | 15 | 4 | 60 | • If necessary, obtain authorisation and permits to become a water service provider.<br>• Upgrade the mining infrastructure to cater for the SLP project.<br>• Engage the Municipality and Farmers to the south on the process going forward. | 3 | 4 | 4 | 4 | 15 | 4 | 60 |
| Contribution to Government revenue and the fiscals of the MLM, Provincial and National Spheres (positive) | C<br>O | 3 | 3 | 4 | 1 | 11 | 4 | 44 | Positive impact requires no mitigation. | 3 | 3 | 4 | 1 | 11 | 4 | 44 |
| Promotion of agricultural skills (positive) | C<br>O | 3 | 3 | 4 | 4 | 14 | 3 | 52 | Implement the SLP projects | 3 | 3 | 4 | 4 | 14 | 3 | 52 |
| Establishment of post mining land uses (positive) | PC | 3 | 5 | 3 | 4 | 15 | 3 | 45 | • Rehabilitate the disturbed area to the post mining land-use.<br>• Promote and implement concurrent rehabilitation. | 3 | 5 | 3 | 4 | 15 | 3 | 45 |
| Continuation of business opportunities, additional to the mining after closure of the Consolidated MR Area (positive) | PC | 3 | 5 | 3 | 4 | 15 | 3 | 45 | Positive impact requires no mitigation. | 3 | 5 | 3 | 4 | 15 | 3 | 45 |

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| Community development through SLP commitments (positive) | C O | 3 | 3 | 3 | 4 | 13 | 3 | 39 | • Continue to provide regular feedback to the Stakeholder Engagement Forum, comprising local government representatives, key project stakeholders, and community representatives.<br>• Ensure 100% compliance with the SLP commitments including SLP commitments, projects, and programmes.<br>• As with current practice, continue to implement community development programmes in partnership with the Local Government. | 3 | 4 | 4 | 4 | 15 | 4 | 60 |
| Improved housing for local employees (positive) | C O | 2 | 2 | 2 | 2 | 9 | 2 | 18 | • In partnership with the MLM, develop and implement a housing strategy.<br>• Prioritise local employees for housing benefits.<br>• Ensure housing application processes are fair, open and transparent. | 2 | 3 | 4 | 4 | 13 | 4 | 52 |

### 10.9.11 Waste

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| Building rubble and construction waste will be generated during the EP Proposed Project's construction. | C, O | 1 | 3 | 3 | 3 | 10 | 4 | 40 | • Provide suitable containers and temporary storage areas, as close to the point of generation as practically possible.<br>• Re-use waste during construction, where possible.<br>• Separate waste at source and recycle wherever possible.<br>• Ensure unusable waste is disposed of in an environmentally responsible manner at licensed disposal facilities only ("cradle to grave" responsibility).<br>• An approved waste removal contractor should transport and dispose of the general waste at the Brits Landfill Site. Safe disposal certificates must be kept for record purposes. | 1 | 3 | 2 | 2 | 8 | 2 | 16 |
| Depositioning of tailings material to rehabilitate the open pits. | C; O | 1 | 2 | 1 | 3 | 7 | 3 | 21 | • Conduct detailed geophysics up and down gradient of the open pits to map and locate discrete fracture and preferential flow paths.<br>• Install monitoring and scavenger wells both up and down gradient of the open pits to 10m below the base of the open pits.<br>• Monitoring monthly during life of project and for 24 months post capping of material. Update the Groundwater model accordingly each 12 months. | 1 | 2 | 1 | 2 | 6 | 2 | 12 |
| Promotion of the waste management hierarchy by re-mining of the tailings in Paddocks 2,3 and 4 (Positive) | O, CC | 1 | 3 | 4 | 1 | 9 | 4 | 36 | Positive impact requires no mitigation. | 1 | 3 | 4 | 1 | 9 | 4 | 36 |

### 10.9.12 Traffic

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| Increased traffic volumes may lead to the following impacts:<br>▪ Increased pressure on surrounding routes; and.<br>▪ Increase in traffic incidents and road safety. | C, O CC | 3 | 4 | 3 | 2 | 12 | 4 | 52 | • Mine traffic should be managed through a Transport Management Plan. This Plan should include provisions for speed bumps; road safety signs; and facilitating road safety training and education programmes.<br>• EP makes use of the following two separate access points for mining and mineral processing related traffic: (i) off the R566 between Brits and Rosslyn for mining related traffic; and (ii) along the Hernic road off the R511 past Hernic Ferrochrome's smelter for mineral-processing related traffic. Access roads and intersections must be maintained.<br>• Most of the ore that will be transported to EM will be sourced from facilities situated to the west of EM. The concentrate that will be generated will be transported to Thabazimbi for further processing. EP will record and respond appropriately and without delay to any complaints about usage of roads by mine vehicles.<br>• Hauling companies must be requested to make use of dedicated routes and ensure road users' safety.<br>• Implementation of a traffic safety programme.<br>• Education and awareness training of workers.<br>• Placement of signage to create awareness.<br>• Implementation of a traffic complaints procedure.<br>• Implement emergency response procedure. | 3 | 4 | 2 | 2 | 11 | 2 | 22 |

10.9.13 **Blasting**

| Impact | Phase | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk | Proposed Mitigation Measures | Extent | Duration | Intensity | Reversibility | Significance | Probability | Environmental Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | | | | | After Mitigation | | | | | | |
| Mining and blasting activities will potentially result in damage and cracks to nearby landowner structures and buildings. | O | 3 | 4 | 3 | 3 | 13 | 4 | 52 | • Undertake a blasting impact assessment prior to the commencement of mining for the UG1 TSF mining and Merensky Reef.<br>• All blasts to be designed and implemented such that the:<br>o peak particle velocity at third party structures is below the damage causing threshold. Generally this is 12 mm/sec for structures that have been built in accordance with relevant building standards. The damage threshold for the N4 is 150 mm/sec.<br>o air blast at third party structures must be below the disturbance threshold; generally this is 125dB.<br>o fly rock does not damage people or their property (structures, vehicles and animals). The closest area of concern is the N4 highway, which is approximately 250m from the open pit.<br>• A key related issue is to plan and design the blasts correctly. This must be followed by precise control of the charging up operation; auditing prior to detonation; and monitoring of blasts and related impacts. The following procedures should be followed during blasting:<br>o exercise ongoing care and control during all stages of the drilling and blasting operation, including a redundancy system of checks.<br>o holes must receive the correct quantity of explosive. Correct stemming lengths must be used.<br>o as a safety measure, fly rock zones (500-meter radius) must be cleared of people and animals and a pre-blast warning sounded;<br>o circulating a blast schedule on a weekly / monthly basis, to condition people into expecting a blast and when the blast takes place, so that it is not totally unexpected. | 3 | 4 | 2 | 2 | 11 | 2 | 22 |

| | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | ○ disturbance from all blasts must be monitored and blast design parameters recorded. This information is essential when reviewing blast designs, to ensure that the predicted and recommended vibration amplitudes and air blast levels are not exceeded.<br>○ seismographs should be positioned at sensitive or potentially sensitive locations.<br>○ a pre-blast crack survey must be carried out on the various structures (e.g., farm structures, houses, boreholes and roads) located around the planned pit extension. 1,000 m, measured from the pit, must be used. All structures within this area should be examined internally and externally.<br>• Any damage identified should be quantified, using an engineering reference framework and digitally photographed. A report describing the damage and linking it to a photo database should be produced. The crack survey's findings should be used to characterise the structural integrity, which in term must be used to inform blast designs. EP will action a way forward, based on the assessment's findings. | | | | | | | |

## 10.10 Summary of specialist reports

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):

| STUDIES UNDERTAKEN | APPENDIX ATTACHED | RECOMMENDATIONS OF SPECIALIST REPORTS |
|---|---|---|
| **1. Socio-Economic Assessment** | Appendix 8 | **The Socio-Economic Assessment support the following conclusions:**<br>• In the identification, rating and mitigation of impacts, impacts were grouped according to the following impacts: Economic; Social; and HS.<br>• Overall, none of the potential socio-economic impacts identified during the socio-economic impact assessment warrant the Project not proceeding.<br>• There is no reason, from a socio-economic impact assessment point of view, why the EP Proposed Projects should not proceed. This would require EP implementing the mitigation and management measures recommended in the SEIA, alongside the following management plans:<br>○ Cultural Heritage Management Plan;<br>○ Integrated Waste and Water Management Plan;<br>○ Air Quality Management Plan;<br>○ Stakeholder Engagement Plan and Grievance Procedure;<br>○ Human Resources Policies and Procedures;<br>○ SLP;<br>○ Transport Management Plan; and<br>○ Mine Closure Plan. |
| **2. Soil and Land Capability Assessment** | Appendix 10 | **The Soil and Land Capability Assessment support the following conclusions:**<br>• EP intends to expand its mining activities, which will include four areas for opencast mining, two stockpile areas, a CFP, an area for tailings and two Ventilation Shafts. Only the opencast mining areas will be located on virgin land, all the other activities will be on land that is already used for mining and associated activities.<br>• There are 14,5 Ha of land in the Project Area's north-eastern part that are under irrigated crop production. The area available for grazing is 688 Ha. The EP Proposed Projects will be mainly on land that is used for mining and associated activities. The Projects will take place on approximately 104 Ha and could lead to the loss of 10 Livestock Grazing Units.<br>• The deep structured soil in the Project Area's south-eastern part is the only high potential soil. 14 Ha of irrigated land have a high potential. The land does not have any significant special use, for which it would need to be preserved in terms of the GNR.<br>• Regarding the EP Proposed Projects, the Pit Backfill Area will be located on an already disturbed area. This land is erroneously indicated by the Sensitivity Tool as very high sensitivity. The four opencast areas are on medium sensitive land. All the other activities, i.e., stockpiles and Ventilation Shafts are either insignificant in size or are located on land that is not suitable for farming purposes.<br>• *The actual loss of high potential land, grazing land, agricultural production or farming infrastructure due to the EP Proposed Projects is small and is not considered as significant*. |
| **3. Hydrology and SWMP** | Appendix 11 | **The Hydrology and SWMP results support the following conclusions:** |

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| | | • A new consolidated conceptual SWMP has been developed for the EM and MM. The consolidated SWMP was developed based on the previous SWMP (Highlands Hydrology, 2018) but also includes the additional Merensky opencast expansion areas (to the north) and MM (to the west).<br>• The conceptual SWMP was developed based on the requirements of GN 704 and best practice guidance (BPG1).<br>• It is recommended that discussions are held with the DHSWS regarding the proposed SWMP. The lining requirements for stormwater management infrastructure should also be agreed with the DHSWS, to ensure that the stormwater calculations can be revised accordingly during detailed design and prior to construction of infrastructure.<br>• It is further recommended that a more detailed elevation survey (LiDAR) be conducted for the mine during the detailed design phase, to confirm the accuracy of this SWMP. The "recommended volumes" of the proposed sumps should be investigated further during the detailed design phase and final water balance modelling, to ensure operational storage volumes are accounted for, without compromising the dams' ability to contain the "minimum volumes", as per GN 704. It is recommended that priority is given to the re-use of dirty water within the process water circuit. |
| **4. Integrated Water Balance Simulation Model (IWBSM)** | Appendix 12 | **The IWBSM results support the following conclusions:**<br>• EP will be able to safely implement the SLP water supply project to local communities and also the farmers to the south.<br>• By diverting the water that is lost to the environment at present from the MM PCD to the TSF artificial wetlands, a huge saving of water purchased from the Hartbeespoort Canal could be achieved.<br>• The current big losses to overflows at the Lapa Dam can almost be completely eliminated if the TSF artificial wetlands are correctly fed, to ensure that the Anthropogenic Aquifers are properly managed, which will then have adequate reserves to feed the WTP demand.<br>• Overflows at the Lapa Dam and the MM PCD are mostly limited to occur only during the simulated 1-in-50-year flood rainfall events.<br>• The water reserves available at EM are adequate to support all the planned new mining operations at MM, the five Merensky opencast Pits and the UG1/UG2 developments.<br>• The transfer rate of water from the Lapa Dam to the Western Quarry may be limited by the constraints of the TSF Paddocks. |
| **5. Groundwater Impact Assessment** | Appendix 13 | **The Groundwater Impact Assessment results support the following conclusions:**<br>• The operations are drained by non-perennial streams and dewatering of underground mining and opencast mining.<br>• The Cumulative Rainfall Departure (CRD) trend mimics the groundwater level trends, therefore proving that recharge is recorded on site.<br>• The average groundwater level is 19 mbgl and ranges from 0.2 – 80 mbgl. The groundwater flow is generally towards the north-west but localized towards the major drainages, opencast mining and abstraction boreholes.<br>• The water strikes depths range from 16 – 185 mbgl.<br>• Minimal effect from dewatering of underground and opencast mining is seen in the shallow aquifer. Some very localised drawdown is seen around abstraction boreholes around these areas.<br>• The total simulated inflows for the entire complex are between 100-120 l/s. Most of the dewatering is present at MM due to the fault zone to the west of it.<br>• In 2044 Kukama dewatering ramps up in the model due to the deeper mining. Some drawdown can be seen around the fault at MM as underground mining advances.<br>• The simulated drawdown in terms of hydraulic heads is minimal for underground mining, except around the fault zone at MM. Opencast mining and abstraction boreholes cause localised drawdown.<br>• The drawdown extends about 800 m in the fractures rock aquifer. In the shallow aquifer minimal impact is seen.<br>• The simulated mass migration from the TSF Paddocks is contained on site by opencast mining and abstraction boreholes. |

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| | | The following recommendations can be made with confidence:<br>• Refurbishment of the current dewatering and water supply boreholes (electrical and pumping equipment). Equip all boreholes with flow meters.<br>• Local and regional water monitoring should be undertaken for at least 12 months, according to the monitoring protocol.<br>• Monitoring points should be installed on MM, downstream of the PCD at the discharge points; and towards the south and north of the MM, to measure upstream and downstream impacts.<br>• The presence of the fault zone at or near MM should be investigated and the impact on the mining sequence determined. A possible increased ingress of groundwater is associated with this preferential flow path, which should be considered during the mine planning.<br>• Surface depressurization wells should be installed, to decrease the pressure and resultant underground inflows associated with this zone.<br>• The groundwater flow model must be updated every 24 months with the recorded monitoring data.<br>• EP continues to abstract 1 663 500 $m^3$/a water from the boreholes. |
| **6. Waste Classification and Geochemical Analysis** | Appendix 14 | **The Waste Classification and Geochemical Analysis results support the following conclusions:**<br>• Although the regulatory classification process indicated the mineral waste classifying as Type 3, it is recommended, following the geochemical model results as well as the Regulation 635 leach test, which indicated no constituents occurring in the leachate in concentrations greater than the LCT0 values, that the mineral waste be regarded as Type 4 waste, i.e. inert.<br>• A follow-up study to quantify long-term total nitrogen concentrations in the post-closure groundwater system is recommended if the post-closure land-use options deem the elevated concentrations of nitrate in the groundwater to pose a risk to water users.<br>• According to the waste classification assessment, all waste material classifies as Type 4, i.e. low risk waste.<br>• Detailed geophysics should be conducted along the southern (up gradient) and northern (down gradient) boundaries of the open pits to map and delineate any potential preferential flow paths.<br>• Elevated nitrate concentrations within the TSF process water and downstream groundwater compared to the 2019 hydrocensus baseline may suggest that nitrates are possibly assimilated and leached within the TSF.<br>• Initial geochemical findings indicate that in-pit tailings disposal and RoM Stockpiles have associated risks in terms of the likelihood of leachate containing contaminants (nitrate) exceeding regulatory guideline values as well as localised baselines and thus pose risks in the long-term.<br>• In-pit tailings disposal can have utility as a reclamation option as the backfill material will be deposited above the regional groundwater table and the backfill material will be capped and revegetated post deposition which will minimize water ingress.<br>• It is suggested by the distilled water leach tests as well as the geochemical models that the risk of leaching of metal(loid)s and inorganic anions is insignificant. The contamination of groundwater by leachate contaminants from the pit backfill material in the post operational phase is therefore unlikely due to prevailing physiochemical conditions and adsorptive processes.<br>• Monitoring should be conducted monthly for the duration of the project (~2.5 years) and continue quarterly for 24 months post closure. Seepage capturing should continue for the duration of the project and continue for 24 months post closure. The abstracted water should be contained within the contact water circuit and re-utilised in the operations. |

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| | | • Scavenger wells and monitoring wells should be implemented on both the up gradient and down gradient boundaries of the open pits and stockpiles to capture and monitor any seepage originating from the rehabilitation and depositioning process.<br>• The leachate does not contain significant sulphate concentrations, as the XRD as well as the ABA and sulphur speciation analyses indicated that sulphide mineral content is minimal and is thus not a significant contributor to the tailings backfill geochemical system.<br>• The numerical groundwater flow and mass transport model indicated the potential source and migration associated with the rehabilitation of the open pits by means of backfilling with tailings material and the RoM stockpiles. The mass migration is limited to the site and contained within a proximity of 300m during the rehabilitation process.<br>• The risk for the development of acid mine drainage conditions for all tailings material and pit backfill is insignificant, as the laboratory data indicated that acid producing sulphide mineral content is minimal in the waste material and site lithology.<br>• This assessment shows that environmental geochemical risks are likely due to the persistence of nitrogen species in the groundwater and mitigation and remediation measures need to be designed into the facility infrastructure. Additional investigations with regards to long term nitrate concentrations and potential decrease of total nitrogen concentrations over time need to be considered if the risk of elevated nitrate concentrations in the groundwater is deemed unacceptable. The acceptability of elevated nitrogen in the groundwater will depend on the post-closure land use options being considered. |
| **7. Terrestrial Biodiversity Assessment** | Appendix 15 | **The Terrestrial Biodiversity Assessment results support the following conclusions:**<br>• The vegetation in the Project Area is largely in a degraded condition, with the Historic Footprint areas and Existing Footprint areas making up most of the habitat. Even the historic watercourses on the Area have been modified to the extent that only the EM Surface Area's far north-western section and the MM's western border is associated with natural watercourses. Patches of untransformed vegetation (i.e., Marikana Thornveld Habitat unit) are scattered throughout the Project Area, with the vegetation within the Game Park and the Project Area's eastern section showing the least signs of disturbances.<br>• No nationally threatened SCC, in terms of NEMBA Section 56, were recorded during the site assessment; however, the near threatened *Stenostelma umbelluliferum* was recorded within the Old Crop Fields (particularly within the Merensky Opencast 3 footprint). The Project Area is associated with a variety of protected floral species; mainly species provincially protected (in terms of the TNCO), with only *Sclerocarya birrea* subsp*. caffra* listed as nationally protected under the NFA.<br>• Suitable habitat for SCC will be impacted by the proposed Merensky Opencast 1 and 2 (within the Game Park), as well as the Eland Ventilation Shaft 2. No other footprint areas are considered to infringe on habitat where floral SCC could occur.<br>• From a conservation perspective, the Merensky Opencast 1 and 2 will impact on patches of the now endangered Marikana Thornveld vegetation type (as per the NBA) which is also a listed vulnerable ecosystem as per the NEMBA Ecosystem List. Although the direct impact will be of a small extent, the footprint within this habitat should be minimised or avoided as far as possible.<br>• Based on conservation significance, presence of SCC and the level of habitat degradation, the floral sensitivity of the habitat units varies between moderately high (Marikana Thornveld); intermediate (drainage lines and artificial dams within the Game Park); moderately low (degraded Marikana Thornveld Habitat Unit, artificial features and Historic Footprint Areas); and low (Existing Footprint Areas).<br>• The EP Proposed Projects will directly impact on floral habitat of moderately high sensitivity and infringe upon habitat where floral SCC were observed during the site assessment. With mitigation measures implemented, the impacts on |

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| | | floral habitat, diversity and floral SCC can be acceptably reduced from medium-high (Marikana Thornveld) and medium-low (all remaining impacted habitat), to low and very low levels (especially for habitat falling outside of the direct footprint). The impact significance on Marikana Thornveld will only be reduced to medium-low levels.<br>• Given the above, the impact from the EP Proposed Projects is unlikely to significantly impact on the floral ecology associated with the Project Area, provided mitigation measures are implemented. It is recommended that a walkdown of the Merensky Opencast 1, 2 and 3 take place prior to construction activities, where floral SCC within the footprint and within a 5 m buffer around the footprint are rescued and relocated. This will reduce the anticipated impact on the SCC populations within the direct footprint. Furthermore, although the direct impact on the endangered Marikana Thornveld will be of small extent, this habitat unit is significant from a conservation perspective and, as far as possible, the footprint within this habitat should be minimised or avoided.<br>• It is the opinion of the ecologists that this study provides the relevant information required to implement Integrated Environmental Management and ensure that the best long-term use of the ecological resources in the Project Area will be made in support of the principle of sustainable development. |
| **8. Freshwater and Aquatic Assessment** | Appendix 16 | **The Freshwater and Aquatic Assessment results support the following conclusions:**<br>• Two watercourses associated with the Project Area were identified, specifically a CVB wetland and the Crocodile River's unnamed tributary, with an associated riparian habitat. The ecological assessment's outcome indicates that these watercourses are in a largely modified ecological state; of moderate EIS; and, as a result, are likely to only provide intermediate levels of ecological services. The Crocodile River is however of significant strategic importance and a very important system, providing water to the downstream farming community and mines.<br>• The aquatic instream assessment's findings correlate with those of the WET Health Index, with an overall ecological category of D observed and a moderate level of EIS. The decreased aquatic ecological integrity at the assessed points may be largely attributable to upstream water quality impacts, such as ingress of organic effluent (which was noted by a distinct sewage odour during the assessment), prior to any potential impacts from the mine. In addition to impacts on dissolved oxygen (which was found to be significantly low) and dissolved salts (which were high at all assessment points), the absence of suitable habitat and flow is a limiting factor for sensitive and diverse macro-invertebrate communities establishment within the assessed systems.<br>• Following the assessment, the DWS risk assessment matrix was applied, to ascertain the significance of possible impacts which may occur because of the EP Proposed Projects. The outcome of the risk assessment showed that, assuming mitigation measures are strictly enforced, risk significance is predominantly of Medium Risk. This conclusion was drawn since risks are largely due to the potential edge effects, as no proposed infrastructure will encroach directly within the delineated freshwater systems according to the provided layout.<br>• Based on the freshwater ecological assessment's findings and risk assessment's results, the freshwater ecologist's opinion is that the EP Proposed Projects do not pose a direct risk to the freshwater systems and, given that the proposed infrastructure will be placed within historically impacted areas, the impact significance will be significantly reduced. However, adherence to cogent, well-conceived and ecologically sensitive site development plans; the recommended mitigation measures; and general good mining practice, is essential if the perceived impact's significance is to be reduced, particularly cumulative impacts which may arise from seepage and dewatering associated with the proposed activities within the area where extensive mining occurs. |
| **9. Air Quality Impact Assessment** | Appendix 17 | **The Air Quality Impact Assessment results support the following conclusions:**<br>• The land use immediately surrounding the Consolidated Surface Area consists predominantly of cultivated land; built-up areas to the north and north-west; and mining activity directly south-west. The area is classified as rural in nature, with urban informal residential areas located north, near the Area. EM and MM also fall within the Waterberg-Bojanala Air |

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| | | Quality Priority Area. Existing key sources of air pollutant emissions surrounding the Consolidated Surface Area were identified as follows:<br>o Mining activity (north and south-west of Consolidated Surface Area);<br>o Vehicle dust entrainment on unpaved roads (surrounding areas);<br>o Commercial agricultural activities (surrounding areas);<br>o Industrial activity (west of Consolidated Surface area); and<br>o Domestic fuel burning at informal settlements (north and north-east of the MR area).<br>• Dustfall, PM10 and PM2.5 are key pollutants of concern associated with existing operations and EP Proposed Projects at EM and MM and are emitted from the following key sources:<br>o Wind erosion from exposed areas;<br>o Storage of material (stockpiles, TSF);<br>o Truck loading and offloading operations;<br>o Material handling (front-end-loaders / excavators);<br>o Blasting;<br>o Bulldozing material (removal of topsoil, moving material, shaping stockpiles, etc)<br>o Conveyor transfer points;<br>o Crushing and screening; and<br>o Vehicle dust entrainment on unpaved haul roads.<br>• Based on the dispersion model output plots, the predicted incremental dustfall rates and PM2.5 concentrations comply with the applicable standards beyond the Consolidated Surface Area for both scenarios assessed. Higher PM2.5 concentrations and dustfall rates are predicted in and around areas of mining activity i.e., near the ROM Stockpiles, opencast areas and screening and crushing activity.<br>• The predicted daily average PM10 concentrations comply with the daily standard of 75 µg/m3 south, east and north-east of the Consolidated Surface Area for both scenarios. Higher PM10 concentrations are projected north, west and south-west of the Area. Exceedances of the daily standard are predicted over the Damonsville residential area (north of the Consolidated Surface Area), parts of the Primindia industrial area (west of the Area) and over the Hernic Ferrochrome mining area located south-west of EM. The predicted annual average PM10 concentrations comply with the annual standard of 40 µg/m3 outside of the Consolidated Surface Area for both scenarios.<br>• The maximum predicted incremental PM10 and PM2.5 concentrations and dust-fall rates at the identified nearby sensitive receptors (represented as discrete receptors) surrounding the Consolidated Surface Area are mostly low and comply with the applicable standards. Higher concentrations and dustfall rates are predicted around discrete receptor 1 (Damonsville), which is in near proximity to the northern parts of the Area.<br>• Mitigation measures that were considered in this modelling study were limited and included dust suppression, using water trucks on the unpaved haul roads (achieving at least 40% reduction). No other dust mitigation measures were considered. As dust is the key pollutant of concern associated with surface activities at the Consolidated Surface Area, dust suppression measures, such as using water sprays at the crushing/screening unit; full or partial enclosure of the crushing/screening units; and wetting of material prior to material handling and conveyor transfer, etc. should be implemented reduce dust emissions as far as possible.<br>• In conclusion, the dispersion modelling results indicate moderately low incremental dustfall rates, PM2.5 concentrations and annual average PM10 concentrations. However, high incremental daily average PM10 concentrations with exceedances are projected over areas situated north, west and south-west of the Consolidated Surface Area. Emissions associated with opencast mining activity, material handling, stockpiles and crushing and screening at the Consolidated Surface Area are identified as key emission sources. |

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| | | • The implementation of the recommended dust mitigation measures at EM and MM can reduce dust emissions generated from these key emission sources. |
| **10. Noise Impact Assessment** | Appendix 18 | **The Noise Impact Assessment results support the following conclusions:**<br>• Conceptual scenarios were provided for the future proposed construction and operational phases, with the output of the modelling exercise indicating a potential significant noise impact (for both day- and night-time activities). Mitigation is required, identified and recommended, to ensure that the noise levels can be managed, to minimize the noise impact's significance. Mitigation would include the development and implementation of an active noise monitoring programme for the EP Proposed Projects.<br>• While the EP Proposed Projects could have a significant noise impact on the surrounding receptors, implementing appropriate mitigation measures could reduce the noise impact's significance to a low risk.<br>• Therefore, with the appropriate implementation of mitigation measures, it is recommended that the EP Proposed Projects be authorized (from a noise impact perspective). |
| **11. Visual Quality Assessment** | Appendix 19 | **The Visual Quality Assessment results support the following conclusions:**<br>The baseline conditions around the Project Area are already impacted by mining and agricultural activities. During the construction phase a medium to high impact is predicted, with the implementation of mitigation measures this can be reduced to medium to low impact. Mitigation measures should be implemented to limit the impacts from vehicle movements and dust entrainment but the visual impact from the Merensky Area cannot be avoided. The operational phase of the Merensky Area will have a high negative impact on the receptors to the north of the R566 and the neighbouring farm (Kleinsmit) to the west.<br>The visibility of the remaining EP Proposed Projects from most of the viewpoints is predicted to be partially obscured by established vegetation, existing strategic placed berms, stockpiles and mining infrastructure (TSF). Visibility from higher vantage points, for example from the Magaliesberg to the south and the Koppies to the north, is expected, as the EM and MM are situated in a valley that drains towards the Kareespruit.<br>In terms of the available layout and technology alternatives considered, the alternatives are predicted to rate identical in terms of the methodology provided. The specialist's recommendation is that the EP Proposed Projects be approved, as the anticipated impacts, although medium to high, are within an existing mining operation's the footprint.<br><br>The following recommendations are provided to reduce the EP Proposed Projects' potential visual impact:<br>• Remove minimal vegetation and topsoil from the construction area. Vegetation removal should be done in a natural manner, avoiding straight lines.<br>• Natural vegetation should be retained as far as possible.<br>• A vegetated berm be placed on the Merensky Area's northern and western boundary, to obscure the visual impact from the R566 and surrounding communities.<br>• Trees and shrubs should be planted, especially along the boundaries, to reduce the visual impact on surrounding neighbours.<br>• The supporting infrastructure should be visually appealing and blend in with the existing landscape, as far as possible.<br>• Concurrent rehabilitation should take place, to minimize the visual impact. This is specifically important for the Merensky Area;<br>• The vegetation cover of existing berms, TSF sidewalls, Topsoil Stockpiles and Dumps should be inspected and maintained.<br>• External lighting must be minimized as far as possible since light at night travels great distances. Lighting should be localised to the areas where needed and directed away from sensitive receptors.<br>• Dust suppression on dirt roads should be implemented across the operation. |

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| **12. Heritage Impact Assessment** | Appendix 20 | **The Heritage Impact Assessment results support the following conclusions:**<br>• The mitigation measures' implementation is subject to SAHRA/PHRA and DMREs' approval.<br>• The Palaeontological Sensitivity Map (SAHRIS) indicate that the Project Area has an insignificant to zero possibility of fossil remains to be found and therefore no palaeontological assessment is required.<br>• During the physical survey, the following sites, features or objects of cultural significance were identified:<br>o 7.1.1 Huffman (2000) identified some LIA material, contemporary homesteads and possible graves in this area. As the vegetation cover was very dense during the site visit and some recent mining structures were installed here, these sites and features could not be verified.<br>o 7.3.1 – 7.3.3 Three different burial sites were identified, which are all known to the mine management and have been fenced off.<br>• For the EP Proposed Projects, the assessment determined that no sites, features or objects of heritage significance occur in the Project Area. If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision must be made regarding the application for relevant permits.<br>• From a heritage point of view, it is recommended that the EP Proposed Projects be allowed to continue, on acceptance of the following conditions:<br>o the various mitigation measures, as presented in Section 8 of this report, should be implemented; and<br>o should archaeological sites or graves be exposed during construction work, they must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. |

## 10.11 Environmental Impact Statement

### 10.11.1 Summary of the key findings of the environmental impact assessment

Considering that the EP Proposed Projects will be undertaken within the Consolidated Surface Are, that was established in the early 2000's, the Projects can be expected to have the following overall impacts:

**Table 39: Summary of the Environmental Risk before and After Mitigation for every phase of the development.**

| Phase | Environmental Risk | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Before Mitigation | | | | | After Mitigation | | | | |
| | High | Medium to High | Medium | Low to Medium | Low | High | Medium to High | Medium | Low to Medium | Low |
| **Negative** | | | | | | | | | | |
| **Overall Construction Operational Decommission and Closure** | | 17 | 19 | 3 | 1 | | | 7 | 26 | 7 |
| **Total** | | 17 | 19 | 3 | 1 | | | 7 | 26 | 7 |
| **Positive** | | | | | | | | | | |
| **Overall Construction Operational Decommission and Closure** | | 7 | 5 | 1 | | | 11 | 2 | | |
| **Total** | | 7 | 5 | 1 | | | 11 | 2 | | |

A total of forty (40) negative impacts were identified and assessed for the EP Proposed Projects. In addition, thirteen (13) positive impacts were also identified.

None of the impacts had a high significance rating, after mitigation. The medium to high impacts were positive impacts, relating to the socio-economic and sustainable resource management benefits of the EP Proposed Projects.

No "fatal flaw" or adverse impacts that cannot be adequately mitigated are anticipated with the EM Consolidation Project. The EP Proposed Project will be undertaken within the Consolidated Surface Area, on properties included in the Section 102 Application and will increase ensure EM's sustainability and LOM .

The EP Proposed Projects' will make use of existing infrastructure and, as far as possible, be located on already disturbed footprints. The long-term potential impacts identified, which include potential groundwater and surface water contamination, have all been found to be manageable, should the current monitoring and mitigation measures be implemented and continued.

Environmental impacts will occur in EP Proposed Project's construction and operational phases. While the environmental impacts can be mitigated to a degree, the impacts will still add to the existing impacts of the Concentrator Plant and mining activities taking place at EM and that have taken place at MM.

To avoid/manage the EP Proposed Projects' potential negative and cumulative impacts, an EMPR has been compiled. The Consolidated EMPR forms the basis for the management and mitigation of impacts and risks associated with the existing mining activities. It also states the proposed management and mitigation measures; the responsible party for ensuring the mitigation measures are complied with; and the frequency of compliance monitoring to be undertaken. The EMPR should be updated regularly.

The EP Proposed Projects are considered the preferred alternative by the EAP.

### 10.11.2 Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers. Attach as Appendix 4

The final site map is attached under ***Appendix 4***.

### 10.11.3 Summary of positive and negative impacts and risks of the proposed activity and identified alternatives.

#### *10.11.3.1 Proposed Alternative 1:*

The EP Proposed Projects have the following associated negative and positive impacts:

***a) Negative:***

There are negative impacts and risks associated with the EP Proposed Projects. The negative risks and impacts identified were associated with the surrounding and direct environmental aspects. The negative risks and impacts associated with the proposed alternative are relative to the following environmental aspects:

- Air Quality;
- Topography;
- Visual Quality;
- Traffic;
- Blasting;
- Noise;
- Waste;
- Groundwater;
- Surface water;
- Biodiversity;
- Land and Soil;
- Heritage; and
- Socio-Economic.

Most of the EP Proposed Projects will be undertaken on current and previously anthropogenic impacted footprints (i.e., mining or agriculture). The proposed alternative will be taking place within the Consolidated Surface Area, with established impact management/mitigation measures (i.e., clean and

dirty water system, EMPRs, etc.); and an established extensive monitoring programme (i.e., Dust, Biomonitoring, Ground- and Surface Water) continuously being implemented. Similar development on undisturbed land, lacking the current management measures available at EM, would be rated significantly higher.

The negative impacts will be managed and mitigated to a reasonable level, with the provisional mitigation measures made important.

***b) Positive:***

The positive and or benefits associated with the EM Consolidation Project are mainly due to the socio-economic and resource beneficiation opportunities. The EP Proposed Projects will have the following positive impacts that are in line with the National Development Plan:

- Continuation of the current land use;
- Maintain EM's LOM ;
- Economic benefit to the local and regional business sectors;
- Promotion of sustainable development by proficiently utilising natural resources;
- Job Creation;
- Community upliftment and augmentation of an additional source of water to surrounding communities;
- Latent Liability Reduction; and
- Skills development and opportunities.

#### *10.11.3.2 Alternative 2 (No site alternatives):*

Alternative 2 include layout, technology and route alternatives to Alternative 1. The impacts will be similar to Alternative 1.

#### *10.11.3.3 No-Go Alternative*

The no-go option entails that none of the EP Proposed Projects will be undertaken. MM was placed under care and maintenance in 2008 due to the mining method utilised not being feasible and operational challenges. A substantial amount of employment and business opportunities were lost due this.

EP concluded a sale agreement with Barplats and is in the process of acquiring the MM. Refer to ***Table 12*** for the Risks associated with the No-Go Alternative.

### 10.12 Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

Refer to Section 10 for the impact management objectives and outcomes that will be included as part of the Consolidated EMPR (***Refer to Appendix 7***). Specialist recommendations which could be included as conditions have been discussed under Section 10.10. Specialist management measures and the impacts' significance prior and post-mitigation are provided under Section 10.9 and contained in the respective studies.

### 10.13 Final Proposed Alternative

Refer to Section 7.

## 11. ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION.

Any aspects which must be made conditions of the Environmental Authorisation.

The following conditions must be included as part of the Authorisation:

- EP must take all necessary and reasonable steps to adequately safeguard and protect the environment; the Project Area; and any person/s using or entitled to use the Consolidated MR Area, from any possible damage or injury.
- Groundwater and surface water monitoring must continue, as per the EP and MM WUL and any consolidated WUL.
- All solid waste to be disposed of at an authorised and correctly lined waste facility.
- The mitigation measures in the Consolidated EMPR should be incorporated, as far as possible, into EP's operational plan.
- Strict monitoring and enforcement of the Consolidated EMPR must be undertaken, to ensure that employees, contractors and operators adhere to it.
- Compliance of the Consolidated EMPR's conditions and authorisation must be audited monthly by a dedicated EP representative during the construction and decommissioning phases; and annually during the operational phase by an external consultant.
- The EMPR's mitigation measures as specified within are to be included in the IEA and must be implemented.
- Mining operations must be conducted in accordance with the Mining Work Programme (**"MWP**") (or any amendments to such MWP) and the approved EMPR.
- Once mining has ceased, areas that have been impacted in the Consolidated MR Area must be rehabilitated, and a closure certificate applied for in terms of section 43(3) of the MPRDA.
- The EP Proposed Projects must be included as part of the annual rehabilitation plan (as per G.N.R 1147) and the final closure plan once available.

## 12. DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE.

Please refer to Section 10.4 giving a description of all the “Limitations and Assumptions”.

## 13. REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

### 13.1 Reasons why the activity should be authorized or not.

Mining and its associated impacts have already commenced at the EM and MM and the Consolidated Surface Area has been disturbed by adjacent mining activities and past agricultural activities. Considering this and the relatively low to medium nature of the potential impacts, as discussed throughout this document, the EP Proposed Projects will be the most suitable land use in terms of environmental and economic cost-benefit. The foreseen environmental impact can be considered as manageable and will maintain EM’s LoM.

Not authorising the EP Proposed Project will potentially have a significant socio-economic impact. The findings of the Specialist studies, undertaken within this EIAR/EMPR, assess both the benefits and potential negative impacts anticipated due to the Proposed Project. The findings conclude that, provided the recommended mitigation and management measures are implemented, there are no environmental fatal flaws that, with implementation of the proposed mitigation measures, should prevent the EP Proposed Projects from proceeding.

EM also has an extensive monitoring programme (i.e., air, ground- and surface water) currently and continuously taking place within / in proximity to the Project Area. This is beneficial, as the baseline of the air, ground- and surface water is known, and potential future water or air quality degradation trends can be determined beforehand.

Please refer to ***Section 10.11*** for the impact statements.

### 13.2 Conditions that must be included in the authorisation

Refer to the EM Consolidated EMPR and Section 11

## 14. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED.

The EP Proposed Project will be undertaken as part of the current and approved EM and Concentrator Plant activities. The infrastructure will be decommissioned, as per EM’s closure plan. Thus, the EA should make provision to be valid for as long as the Consolidated EM Mining Area and Concentrator Plant are operational.

## 15. UNDERTAKING

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Environmental Impact assessment report and the Environmental Management Programme report.

The EAP herewith confirms:

**a)** the correctness of the information provided in the reports; ☒

**b)** the inclusion of comments and inputs from stakeholders and I&APs; ☒

**c)** the inclusion of inputs and recommendations from the specialist reports where relevant; ☒ and

**d)** the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed. ☒

JEMS Environmental

Company

Date

Signature of EAP

## 16. FINANCIAL PROVISION

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

The financial provision is provided for in the closure costing allocated for the closure of the Elandsfontein, Zilkaatsnek and Maroelabult Mining Rights. In terms of the 2020 Closure Quantum Report (***Refer to Appendix 22: 2020 Closure Quantum for Eland Platinum and Maroelabult Mining Operation***) the following amounts have been provided for:

- Maroelabult: R60.076 million.
- Zilkaatsnek and Elandsfontein: R189 million.

### 16.1 Explain how the aforesaid amount was derived

The DMRE Closure Quantum methodology was used as per the guideline document "*Guideline document for the evaluation of the quantum of closure-related financial provision provided by a mine"* (Department of Minerals and Energy, 2005).

The deadline for compliance with the Financial Provisioning Regulations for existing mining rights, as set out in GN 1147, has been extended to 19 June 2021.

The DMR Guideline format makes use of a set template for which defined rates and multiplication factors are used. The multiplication and weighting factors which ultimately define the rate to be used are determined by, amongst others, the topography, classification of the mine according to mineral mined, risk class of the mine; and its proximity to built-up or urban areas.

### 16.2 Confirm that the financial provision will be provided as determined

EP will provide the financial provision as specified by means of a bank guarantee.

## 17. DEVIATIONS FROM THE APPROVED SCOPING REPORT AND PLAN OF STUDY

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation).

### 17.1 Deviations from the methodology used in determining the significance of potential environmental impacts and risks.

No deviations were made to the methodology used and as outlined in the report.

#### 17.1.1 <u>Motivation for the deviation</u>

Not applicable.

## 18. OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

Compliance with the provisions of sections 24(4)(a) and (b) read with sections 24(3)(a) and (7) of the NEMA. The EIA report must include the: -

- Impact on the socio-economic conditions of any directly affected person.
- Impact on any national estate referred to in section 3(2) of the NHRA.
- Other matters required in terms of sections 24(4)(a) and (b) of NMEA.

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

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as Appendix 2.19.1 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12. herein).

EM has an existing SLP with socio-economic provisions and community upliftment projects. A SLP has been submitted as part of the Section 102 Application to unite the socio-economic needs of the Local Communities. The EP Proposed Projects' socio-economic impacts were assessed and addressed under ***Section 9.1.2*** and in the SEIA (***Refer to Appendix 8: Socio-Economic Impact Assessment***).

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

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

A Phase 1 HIA was undertaken for the EP Proposed Projects. The findings of the HIA are discussed under Section 9.1.20 and a copy of the HIA is attached. No features of cultural or heritage significance will be affected by the EP Proposed Projects.

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

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

Not applicable, please refer to Section 7 for a description of alternatives.

## 19. CONCLUSION AND RECOMMENDATIONS

The DEIAR process has been carried out in accordance with NEMA and the 2014 EIA Regulations. The DEIAR was compiled based on the structure and template from the DMRE.

The EM Consolidation Project has been subjected to a comprehensive Scoping / EIA process and the potential environment impacts associated with the EP Proposed Projects have been identified, investigated, assessed and subsequent mitigated in accordance with the 2014 EIA Regulations. Potential positive impacts associated with the EM Consolidation Project include the following:

- Reduced environmental liability associated with the utilisation of tailings as backfill material in the opencast pits;
- Continuance of the current land use within existing mining operations;

- Potential economic benefit associated with the existing MM operation's rejuvenation that has been under care and maintenance for almost a decade;
- Socio-economic benefits associated with job creation; capital and operational expenditure on contractors, materials and equipment; and downstream spending;
- Promotion of the waste management hierarchy of controls by reusing tailings as backfill material;
- Promotion of sustainable development by proficiently utilising natural resources (i.e., long-term raw water use conservation by means of reduced evaporation on TSF Paddocks); and
- Streamlined and more efficient environmental management and administration and reporting to the DMRE will benefit both the DMRE and EP, with the grant of the Environmental Licence Consolidation Application.

The potential negative impacts identified include the following aspects:

- Socio-economic effects associated with the current local economic and social constraints;
- Loss of floral and faunal habitat and potential SCC;
- Visual and noise intrusion and nuisance to surrounding land users;
- Contamination of groundwater by means of infiltration and plume migration;
- Groundwater quantity;
- Loss of soil and land with agricultural potential;
- Sedimentation and increased salt loads of surface water, influencing the water quality of downstream users; and
- Land degradation associated with erosion and AIP establishment.

However, from the Specialist studies commissioned and the impact assessment undertaken for the Project Area and the Consolidated Surface Area, it has been determined that the potential negative impacts associated with the preferred alternative can be mitigated to an acceptable level. In addition, the positive impacts associated with the EM Consolidation Project outweighs the No-Go Alternative.

Based on the outcomes of the impact and risk assessments conducted, coupled with the Specialists' recommendations, the EAP has established that the EM Consolidation Project will contribute positively to the local and region socio-economic sphere; likely ensure viability/sustainability of the operation, as the potential negative environmental impacts will be managed in accordance with the mitigation measures and Specialists' recommendations.

The EAP therefore finds it rational to recommend that the EM Consolidation Project be authorised to proceed as it is the most preferred option, subsequent to the satisfaction of the regulatory processes and collaboration of the authorities, I&APs and stakeholders.

## 20. REFERENCES


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