ENVIRONMENTAL IMPACT MANAGEMENT SERVICES

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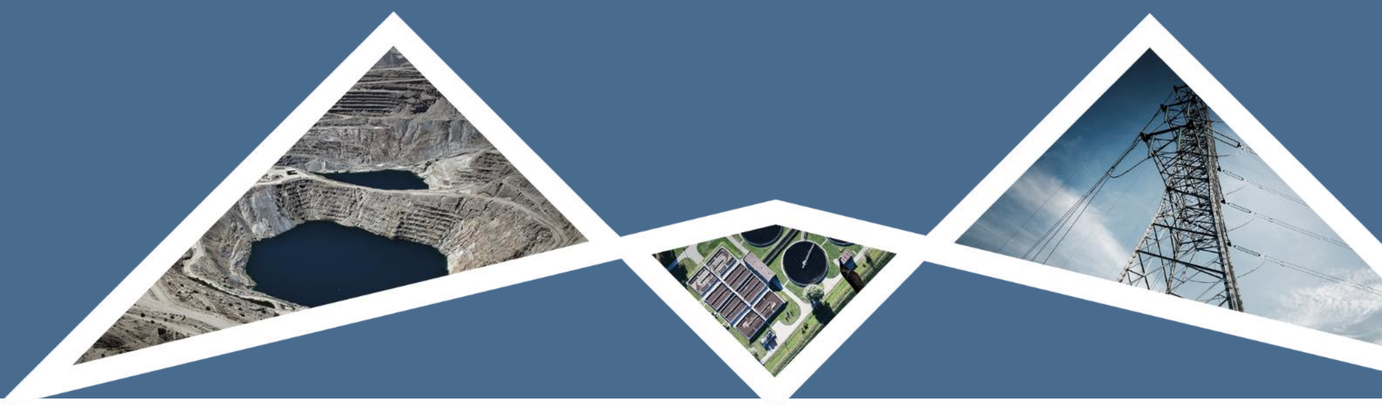
ENVIROMENTAL MANAGEMENT PROGRAMME

CLOVER ALLOYS RIETFONTEIN PLANT



EIMS REFERENCE:	1673
DOCUMENT TITLE:	Environment al Management Programme for Clover Alloys Rietfontein Plant

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REVISION AND AMENDMENTS

REVISION DATE:	REV #	DESCRIPTION
2026/02/02	ORIGINAL DOCUMENT	EMPr
2026/02/26	REVISION 1	EMPr

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1 INTRODUCTION

Environmental Impact Management Services (Pty) Ltd (EIMS) was appointed as the Environmental Assessment Practitioner (EAP) to assist Clover Alloys SA (Pty) Ltd (Pty) Ltd (hereafter referred to as the Applicant), to prepare and submit the Section 24G application and undertaking a Public Participation Process (PPP) for the retrospective licensing of the Rietfontein Plant and the associated documentation. The Environmental Management Programme is compiled as part of this application.

The Environmental Management Programme (EMPr) is an Integrated Environmental Management (IEM) Tool which typically is preceded by an Environmental Impact Assessment (EIA), and which aims to describe the objectives and management actions for managing and mitigating potential environmental impacts associated with a development proposal. Regulation 19 of the National Environmental Management Act (NEMA), EIA Regulations (GNR 982) requires the compilation and submission of an EMPr to the relevant Competent Authority together with the relevant Environmental Assessment Reports for consideration in the decision making on an Application for Environmental Authorisation (EA) for relevant Listed Activities.

The purpose of this EMPr is:

- to describe the impact management outcomes, including management statements;
- to identify the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development (planning and design, pre-construction, construction, post construction rehabilitation, and where relevant operation); and
- to provide a description of the relevant impact management actions which clearly defines what actions are to be taken, who is responsible for the actions, when such actions are to be undertaken, and how the implementation of such actions are to be monitored.

The ultimate objective of the EMPr is to ensure that undue or reasonably avoidable adverse impacts during the applicable phases of a development or activity are prevented, and that the positive benefits of the projects are enhanced.

2 SCOPE OF THIS DOCUMENT

This EMPr applies to the development activity described in Section 5. The purpose of the EMPr is to give effect to precautionary and mitigatory measures, which are to be put in place for controlling the activities that take place during the project. The EMPr also provides guidance to assist in ensuring compliance with relevant national legislative and regulatory requirements.

The EMPr is a working document that should be updated on a regular basis, as and when necessary. Formal risk identification forms an integral part of EMPr management and assists with prioritizing and focusing the control of risks. The EMPr thus supports this on-going proactive mitigation and the duty of care to the environment. The EMPr shall therefore allow for risk minimization, rather than just ensuring legal compliance. The purpose of this EMPr is thus also to allow the user to make minor amendments to ensure continual revision and improvement of risk mitigation through the continual re-assessment of risks associated with the activity. Any amendments must comply with formal amendment processes as define in the NEMA EIA Regulations.

3 DOCUMENT STRUCTURE

The structure of this document is guided primarily by the requirements for the content of an EMPr as prescribed by Appendix 4 of the NEMA EIA Regulations. Consideration has also been given to the content and structure requirements as prescribed by other guidelines, as well as EIMS's professional judgement and experience. Table 1 provides an itemised breakdown of the NEMA EIA Regulations Appendix 4 requirements together with a cross reference to the relevant section of this EMPr where this requirement is addressed.

Table 1: EMPr Structure

Appendix 4 Reference	Description	Section in EMPr
Appendix 4(1)(1)(a)	Details of – (i) The EAP who prepared the EMPR; and (ii) The expertise of that EAP to prepare an EMPR, including a curriculum vitae;	4 Appendix 1
Appendix 4(1)(1)(b)	A detailed description of the aspects of the activity that are covered by the EMPR as identified by the project description.	5
Appendix 4(1)(1)(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	6 Figure 4 and Figure 5
Appendix 4(1)(1)(d)	A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified though the environmental impact assessment process for all phases of the development including – (i) Planning and design; (ii) Pre-construction activities; (iii) Construction activities; (iv) rehabilitation of the environment after construction and in the case of a closure activity, closure; and (v) Where relevant, operation activities;	7
Appendix 4(1)(1)(f)	A description of proposed impact management actions, identifying the manner in which the impact management contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to – (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) Comply with any prescribed environmental management standards or practices; and (iii) Comply with any applicable provisions of the act regarding closure, where applicable.	10
Appendix 4(1)(1)(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	9
Appendix 4(1)(1)(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	9 10
Appendix 4(1)(1)(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	9 10

Appendix 4 Reference	Description	Section in EMPr
Appendix 4(1)(1)(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	9 10
Appendix 4(1)(1)(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	9 10
Appendix 4(1)(1)(l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	9
Appendix 4(1)(1)(m)	An environmental awareness plan describing the manner in which – (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	8.10
Appendix 4(1)(1)(n)	Any specific information that may be required by the competent authority.	None.

4 DETAILS OF THE EAP

In terms of Regulation 13 of the EIA Regulations, an independent Environmental Assessment Practitioner (EAP), must be appointed by the applicant to manage the application for EA. EIMS has been appointed by the Applicant as the EAP and is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations and Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

- Objective and independent;
- Has expertise in conducting EIA's;
- Comply with the NEMA, the Regulations and all other applicable legislation;
- Takes into account all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

EIMS was appointed by the Applicant as the EAP to compile this report. EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS has in excess of 30 years' experience in conducting EIA's. The details of the EIMS consultants who compiled this EMPr are presented in Table 2.

Table 2: EAP Details

Name of Practitioner	Ms Monica Niehof (EAP)	Mr Andre van Rooyen (Candidate EAP, compiler
Tel no:	+27 11 789 7170	+27 11 789 7170
E-mail:	Monica@eims.co.za	andre@eims.co.za

Name of Practitioner	Ms Monica Niehof (EAP)	Mr Andre van Rooyen (Candidate EAP, compiler
Qualifications:	BSc Hons Environmental Management University of South Africa. 13 years consulting experience	BSc Environmental Management and Zoology from the University of Johannesburg.
Expertise of the EAP:	Ms. Monica Niehof is a senior Environmental Assessment Practitioner (EAP) with over seven (13) years' working experience. Environmental assessment projects ranging from Environmental Screening, Basic Assessments, Section 102 Amendments and Scoping & Environmental Impact Assessments processes for Environmental Authorisations, Atmospheric Emission Licenses and Waste Management Licenses applications. In addition, Monica has undertaken Water Use Authorisations applications through both the General Authorisation and Water Use Authorisation processes. Monica is also an Environmental Auditor who has experience in various Environmental Authorisations, Environmental Management Programmes, Waste Management License, Atmospheric Emission License and Water Use Authorisations as well as Legal & Environmental Compliance Audits.	Environmental Assessment Practitioner with 2 years' working experience. Environmental assessment projects ranging from environmental screening, auditing, and compliance evaluation among others. Water Use Authorisations applications through both the general authorisation and water use authorisation processes.
EAPASA Registration:	Registered Environmental Assessment Practitioner with Environmental Assessment Practitioner Association of South Africa – EAPASA (Reg. No: 2024/8835).	Candidate Environmental Assessment Practitioner (EAP Reg. #2023/6845). Candidate Natural Scientist (with SACNASP) (Reg. #164675).

5 DESCRIPTION OF THE ACTIVITY

EIMS was appointed as the Environmental Assessment Practitioner (EAP) to assist the Applicant with undertaking the required authorisation processes, including the statutory public participation, and to compile and submit the required documentation in support of an application for:

- Retrospective Environmental Authorisation (EA) in accordance with the National Environmental Management Act - Act 107 of 1998 (NEMA) Section 24G for - Listed activities detailed in the Environmental Assessment Report.

In addition, the Applicant is also applying for:

- A Water Use Licence (WUL) amendment in accordance with the National Water Act – NWA (Act 36 of 1998) - Listed activity/ies:
    - Section 21 (a)

- Section 21 (c) and (i); and
- Section 21 (g).

In an effort to regularise its operations and address past non-compliance, the applicant is submitting an application in terms of Section 24G of the National Environmental Management Act, 1998 (Act No. 107 of 1998). This application seeks to obtain retrospective environmental authorisation for existing infrastructure and approval for planned developments. This Section 24G application is being submitted in response to a compliance notice issued by the North West Department of Economic Development, Environment, Conservation and Tourism (DEDECT) in October 2024, under reference number 18/2024ER. The applicant wishes to rectify unauthorised activities and obtain the necessary environmental approvals for both current and future infrastructure components. Through this application, the applicant seeks to achieve full environmental compliance, strengthen site water management practices, and continue operating the Rietfontein plant in a sustainable and responsible manner as part of its broader chrome mining operations.

5.1 PROJECT DESCRIPTION

The Applicant operates a chrome processing facility in the North West Province and is undertaking steps to ensure compliance with environmental legislation following the development of infrastructure without prior environmental authorisation.

The existing infrastructure at the Rietfontein plant includes two stockpile areas, a chrome wash plant, drying pads, weighbridges, a sump, as well as site offices and staff accommodation. These facilities support the processing, storage, and operational activities associated with chrome beneficiation.

In an effort to regularise its operations and address past non-compliance, the applicant is submitting an application in terms of Section 24G of the National Environmental Management Act, 1998 (Act No. 107 of 1998). This application seeks to obtain retrospective environmental authorisation for existing infrastructure and approval for planned developments.

The proposed infrastructure includes:

- The expansion of one of the existing stockpile areas;
- The construction of dirty water channels and culverts to manage contaminated surface runoff;
- The installation of a clean water channel to divert uncontaminated stormwater away from operational areas;
- A lined Pollution Control Dam (PCD) with a design capacity of 8 000 m^3, which will receive all dirty water collected on site; and
- A proposed pipeline approximately 2.5 km in length, consisting of two 144.5mm internal diameter slurry lines and two return water lines with an inner diameter of 136.4mm, to be constructed between the Rietfontein plant and the main mine, facilitating the transfer of materials or water as part of integrated operations.

5.1.1 PROJECT OVERVIEW

The Rietfontein plant was initially established as a temporary crushing and screening plant which later became the Rietfontein mud processing plant. The Rietfontein plant was issued a compliance notice dated October 2024 which necessitated that a Section 24G process be conducted to retrospectively license the facility and its associated operations as well as the addition of infrastructure to ensure that the plant has adequate environmental management infrastructure.

5.1.2 PROJECT TIMELINE

The plant is currently operational and its operation will continue in respect of the established operations. The construction of the proposed new infrastructure will commence once the section 24G process has been concluded and all relevant licensing/permitting of activities are in place.

5.1.3 PROJECT COMPONENTS

This section will discuss the existing and proposed infrastructure for the Rietfontein plant. Since the additional infrastructure will contribute to the project being more environmentally sound, it will be included in this application.

5.1.4 EXISTING INFRASTRUCTURE TO BE RETROSPECTIVELY LICENSED

The currently existing infrastructure at the plant consists of:

- Two stockpile areas located at the eastern and western sides of the site;
- A chrome mud processing plant;
- Two weighbridges;
- Site offices and staff accommodation, including Jojo tanks for water supply;
- A loading area adjacent to the plant area;
- Two tailings containment tanks;
- A stockpile drying pad; and
- A sump for wastewater.

5.1.5 PROPOSED INFRASTRUCTURE TO BE ADDED TO THE APPLICATION

This section provides a brief technical description of the proposed infrastructure at the Rietfontein plant. All information contained in this section was obtained from the MineLock Environmental Engineers Design report.

5.1.5.1 A NEW PCD AND ASSOCIATED INFRASTRUCTURE

The Pollution Control Dam (PCD) at the Rietfontein Plant is designed to manage dirty water runoff from operational areas, including the plant footprint and stockpile zones. It complies with GN704 of the National Water Act, which requires that the dam must not spill more than once in 50 years. The dam is sized to hold a total volume of 8 000 cubic metres, which includes 5 600 cubic metres for the 50-year design storm and an additional 2 400 cubic metres for operational flexibility. The catchment contributing to the PCD includes both stockpile areas and the plant footprint which will be conveyed using the dirty water channels .

The embankments are constructed using residual norite soils of G7 quality. Upstream excavation slopes are limited to a maximum of 1V:3H for vertical depths up to 4.0 metres, while fill embankments are built with slopes not steeper than 1V:1.5H for heights up to 1.5 metres. Fill is placed in 150 mm layers and compacted to at least 93% of Modified American Association of State Highway and Transportation Officials (AASHTO) Maximum Dry Density (MDD), with moisture content maintained between Optimum Moisture Content (OMC) and OMC +2%. The basin and embankment surfaces are ripped to a depth of at least 100 mm and re-compacted prior to liner installation.

The dam incorporates a Class C composite liner system. The secondary liner consists of a 750 g/m² non-woven geotextile and a 1.5 mm smooth High-Density Polyethylene (HDPE) geomembrane. A cuspated drainage sheet is placed between the liners to facilitate leakage detection. The primary liner is a 2 mm smooth HDPE geomembrane. Anchor trenches are constructed at the crest of the embankment, measuring 0.5 metres deep and 0.5 metres wide, and are backfilled with cement-stabilised soil in 150 mm layers compacted to 93% MOD AASHTO. A 1 metre gap is maintained between the anchor trench and the crest line. The factor of safety against sliding is calculated to be 8.66.

Leakage management includes a detection sump measuring 5 by 5 metres and 0.5 metres deep, with a 100 mm no-fines concrete base and filled with 19 mm washed stone. A DN160 HDPE pipe connects the sump to a monitoring manhole at a maximum gradient of 1:100. If water is detected in the sump, the dam must be emptied and the liner inspected. The estimated action leakage rate (ALR) for the primary drainage system ranges from 2,847 to 4,678 litres per hectare per day, depending on water depth. The secondary liner is expected to leak at a rate of approximately 150 litres per day.

Subsoil drainage is managed through collector and interception drains. The collector drain uses 110 mm perforated HDPE pipe, while the interception drains use 160 mm perforated HDPE pipe. These are encased in 19 mm washed stone and wrapped in 210 g/m² filtration geotextile. The sump manhole is constructed from precast concrete rings (ND 1250 mm), with a 150 mm reinforced concrete base slab and sealed joints.

Stormwater overflow is managed via a concrete-lined emergency spillway designed to handle a 100-year flood peak of 2.6 cubic metres per second. The spillway has a base width of 2 metres and a depth of 1.3 metres, with a minimum freeboard of 800 mm. The outlet structure includes a 300 mm thick reno mattress floor lined with 550 g/m² protection geotextile to prevent erosion.

Additional infrastructure includes perimeter fencing, a double-leaf access gate, life buoys, crawl nets, and safety boxes containing life jackets and emergency equipment. Construction quality assurance is implemented through material specifications, installation procedures, and testing requirements for geomembranes, seams, and drainage components. The HDPE geomembrane, not exposed to UV, is expected to have a service life exceeding 106 years at 35°C, which is significantly longer than the projected life of mine of approximately 30 years.

5.1.5.2 STORMWATER SYSTEM CONSISTING OF CLEAN-AND-DIRTY WATER SEPARATION

The stormwater management system at the Rietfontein Plant is designed to ensure effective separation of clean and dirty water, in compliance with GN704 of the National Water Act and the National Environmental Management: Waste Act (NEMWA). The system includes a network of dirty water channels, a silt trap, a settling pond, culverts, and a clean water separation berm. These components are integrated to manage runoff from the plant area, stockpiles, haul roads, and infrastructure, directing contaminated flows to the silt trap and ultimately to the PCD.

5.1.5.2.1 DIRTY WATER CHANNELS

Five dirty water channels are proposed to convey runoff from the plant and stockpile areas. The channels are designed to be trapezoidal in shape and lined with a 2 mm HDPE geomembrane over a 750 g/m² non-woven protection geotextile. Anchor trenches measuring 500 mm × 500 mm will be installed along the channel edges and backfilled with cement-stabilised G6 material, compacted to 93% Modified AASHTO Maximum Dry Density (MDD). Channel depths range from 0.4 m to 0.7 m, with flow velocities between 1.3 m/s and 2.65 m/s under 50-year flood conditions. A freeboard of 0.3 m is included to accommodate wave action and surges. All channels are constructed with side slopes of 1V:1.5H and are founded on compacted in situ soils after removal of black turf material.

5.1.5.2.2 SILT TRAP

The silt trap is designed to be located downstream of the dirty water channels and serves to remove suspended solids before water enters the PCD. It has a basin depth of 1.55 m, with a footprint of 12 m × 12 m, providing a total capacity of 400 m³. A 1:8 sloped ramp is included to allow access for mechanical cleaning. The trap is constructed on compacted G5 material, with all black turf soils removed from the foundation area. A 1.2 m high, 3 m wide overflow weir directs water from the silt trap into the PCD.

5.1.5.2.3 CLEAN WATER SEPARATION BERM

A clean water separation berm is proposed along the northern boundary of the site to divert clean runoff away from the dirty water system. The berm will be formed from compacted in situ soils and hydroseeded to establish vegetation cover. It is designed to prevent clean water from entering the contaminated catchment areas, thereby reducing the volume of water requiring treatment.

5.1.5.2.4 CULVERTS

Seven precast rectangular portal culverts will be installed along the dirty water channels to maintain site access. The culverts are designed for Class 1 loading in accordance with SANS 986 and are constructed with base slabs and rubber seals compliant with SANS 677-1986. Culvert dimensions vary, with widths of 0.75 m and heights ranging from 0.45 m to 0.75 m. Each culvert is 10 m in length and includes precast inlet and outlet wingwalls. A minimum cover of 1 m is maintained over all culverts, and road layer works are reconstructed to accommodate abnormal heavy loads.

5.1.5.3 AN EXPANSION OF THE EXISTING STOCKPILE AREA

The product stockpile area at the Rietfontein Plant is being expanded to accommodate increased volumes of sand and product resulting from re-processing activities. The final footprint of the expanded stockpile area is:

- Total area: 31,900 m² (3.19 hectares);
- Topsoil removal: Approximately 4,785 m³ of topsoil (150 mm depth) stripped and stockpiled for future landscaping;
- Black turf excavation: Approximately 15,950 m³ of reworked residual norite (black turf) removed to spoil; and
- Compacted subgrade: Approximately 4,785 m³ of remaining black turf scarified and compacted to ≥93% Modified AASHTO Maximum Dry Density (MDD).This engineered subgrade provides both structural stability and a semi-impermeable base, reducing infiltration and supporting temporary stockpile operations.

5.1.5.4 A PIPELINE FROM RIETFONTEIN PLANT TO THE MAIN RCM MINE

The pipeline system at the Rietfontein Plant includes two slurry pipelines and two return water pipelines, proposed to connect the plant to Rustenburg Chrome Mine (RCM). These pipelines are intended to transport approximately 25% of the processed material as slurry back to RCM's tailings storage facility, while return water is conveyed to support water reuse in the plant operations. The pipelines are routed above ground and intersect with floodlines and wetland buffer zones, requiring specific structural and environmental design considerations.

The pipelines are designed to utilise 180 mm outer diameter HDPE pipes. The slurry pipelines are specified as SDR9 (Standard Dimension Ratio of 9 HDPE pipe) with a mass of 10.17 kg/m, and the return water pipelines as SDR11 with a mass of 8.5 kg/m. The pipelines will be supported on precast concrete sleepers or reinforced concrete stub columns, depending on the location and environmental sensitivity of the crossing.

Within the 500-metre wetland buffer zones, the pipelines are proposed to be elevated on standard F4 1065 mm gauge precast concrete sleepers. These sleepers are placed on compacted G7 material after removal of the reworked residual norite (black turf) soils. The fill is placed in 150 mm layers and compacted to 93% Modified AASHTO Maximum Dry Density (MDD). The bearing capacity of the foundation is limited to 75 kPa. If the black turf material is not removed, the bearing capacity is reduced to 25 kPa, which is not recommended due to potential swell and settlement.

Two installation options are proposed for sleeper placement. Option 1 places all four pipelines on a single sleeper at 3.5 m intervals. Option 2 separates the slurry and return water pipelines onto individual sleepers, with intervals of 6 m for slurry and 8.5 m for return water pipelines. Both options are structurally viable, but Option 1 offers faster installation.

At floodline intersections, the pipelines are proposed to be supported on reinforced concrete stub columns to elevate them above the 1:100-year flood level. A steel plate is bent over the pipes and anchored into the stub columns using HD galvanized bolts.

To manage potential leaks and erosion at stream crossings, berms and paddocks are proposed upstream of the crossings. These structures are intended to contain any spillage and facilitate clean-up. The pipeline sections within the buffer zones are proposed without flanges and are recommended to include continuous HDPE internal liners for wear and corrosion protection.

The pipeline infrastructure is integrated with the stormwater management system to ensure minimal impact on surface water flow. Elevation of the pipelines allows stormwater to pass beneath, maintaining natural drainage patterns and preventing erosion. The design ensures compliance with environmental regulations and supports operational efficiency and water reuse.

6 DESCRIPTION OF THE SITE AND RELEVANT SENSITIVITIES

The project is located on Portion 23 and Portion 24 of the farm Rietfontein 338 JQ, within the Rustenburg Local Municipality, North West Province. The site is approximately 15km southeast of Rustenburg, along the N4. The centre point of the site is 25°44'54.40"S 27°21'52.69"E. Please refer to Figure 1 for the project locality map.

6.1 DESCRIPTION OF THE PROPERTY

Table 3 indicates the farm portions that fall within the proposed project including details on the project location as well as the distance from the proposed project area to the nearest towns.

Table 3: Locality details

Property	Portion 23 and Portion 24 of the Farm Rietfontein 338 JQ
Application Area (Ha)	12
Magisterial District	Bojanala District Municipality
21 Digit Surveyor General Codes	Farm Name: Portion 23 of Farm Rietfontein 338 JQ 21-Digit SG Code: T0JQ00000000033800023
	Farm Name: Portion 24 of Farm Rietfontein 338 JQ

	21-Digit SG Code: T0JQ00000000033800024
Distance and direction from nearest towns	The site is located approximately 12km southeast of Rustenburg and approximately 6km southeast of Kroondal.

A map indicating the locality of the Rietfontein plant current and planned operations is presented in Figure 1, Figure 2 and Figure 3.

6.2 SENSITIVE AREAS

No “no-go” areas were identified within the project area. The only identified sensitive areas on site relate to the terrestrial, aquatic and heritage sensitivities. The sensitivity map is provided in Figure 4 and Figure 5.

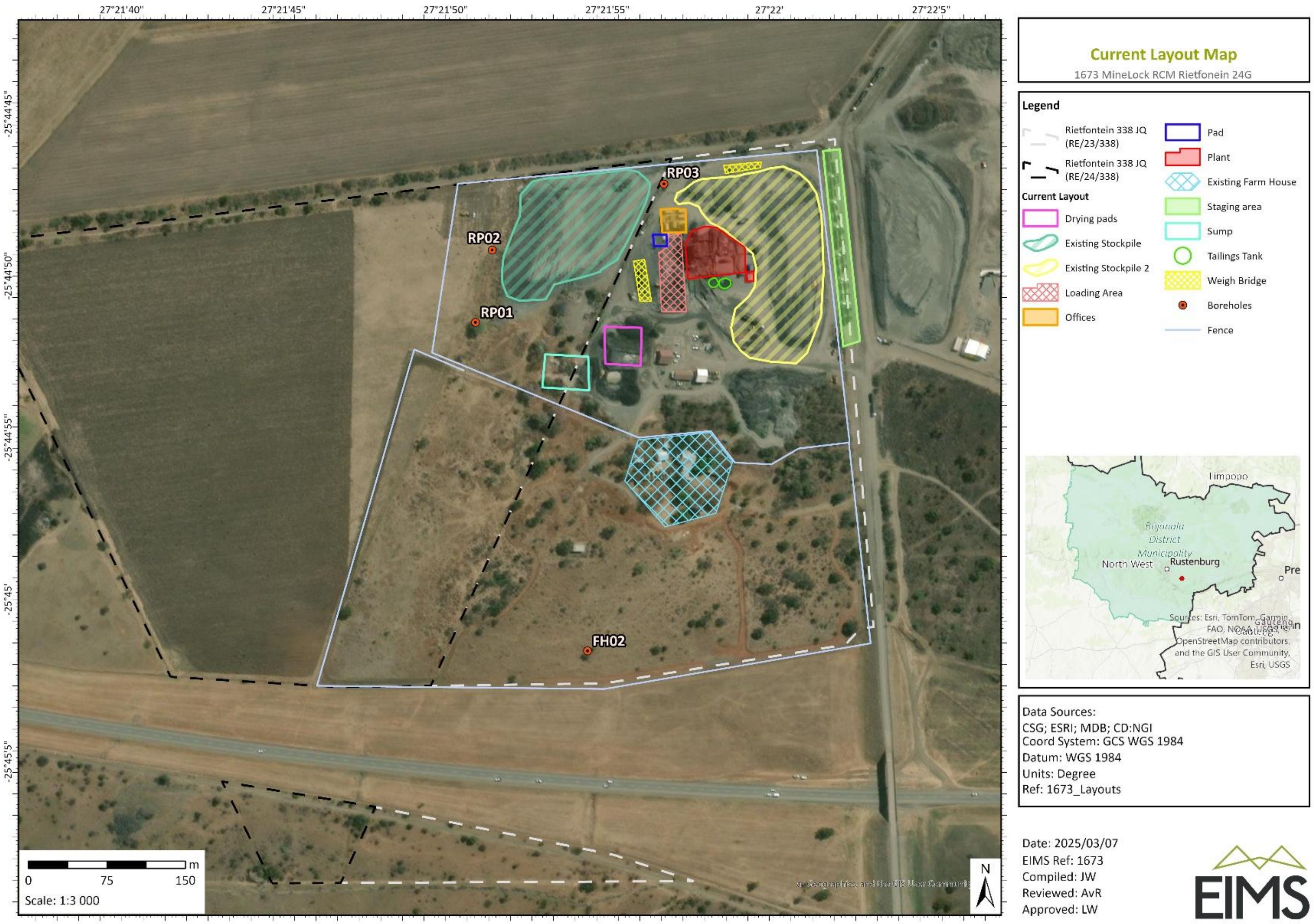

Figure 1: Locality and current layout of Rietfontein Plant.

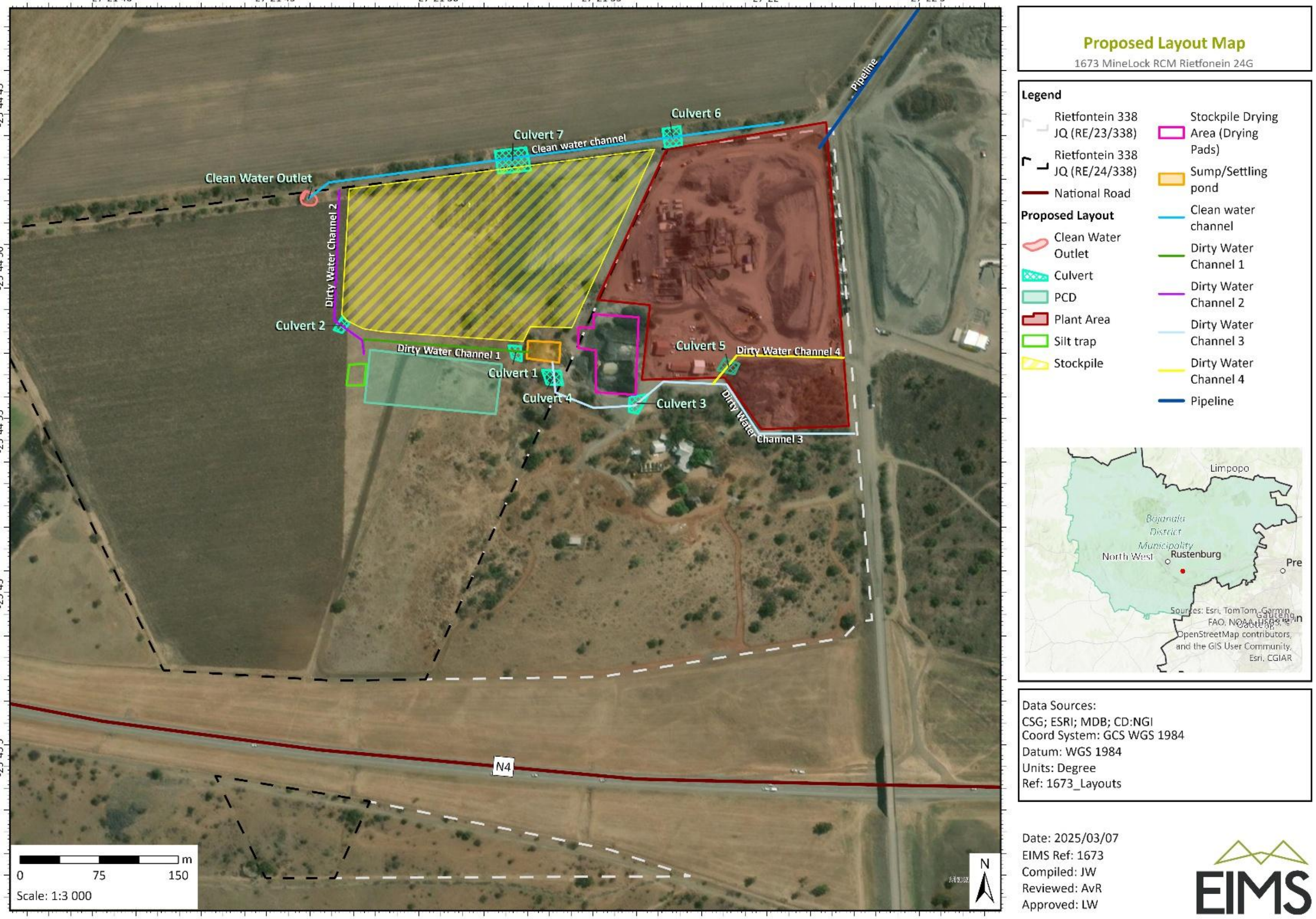

Figure 2: Proposed site layout for new infrastructure

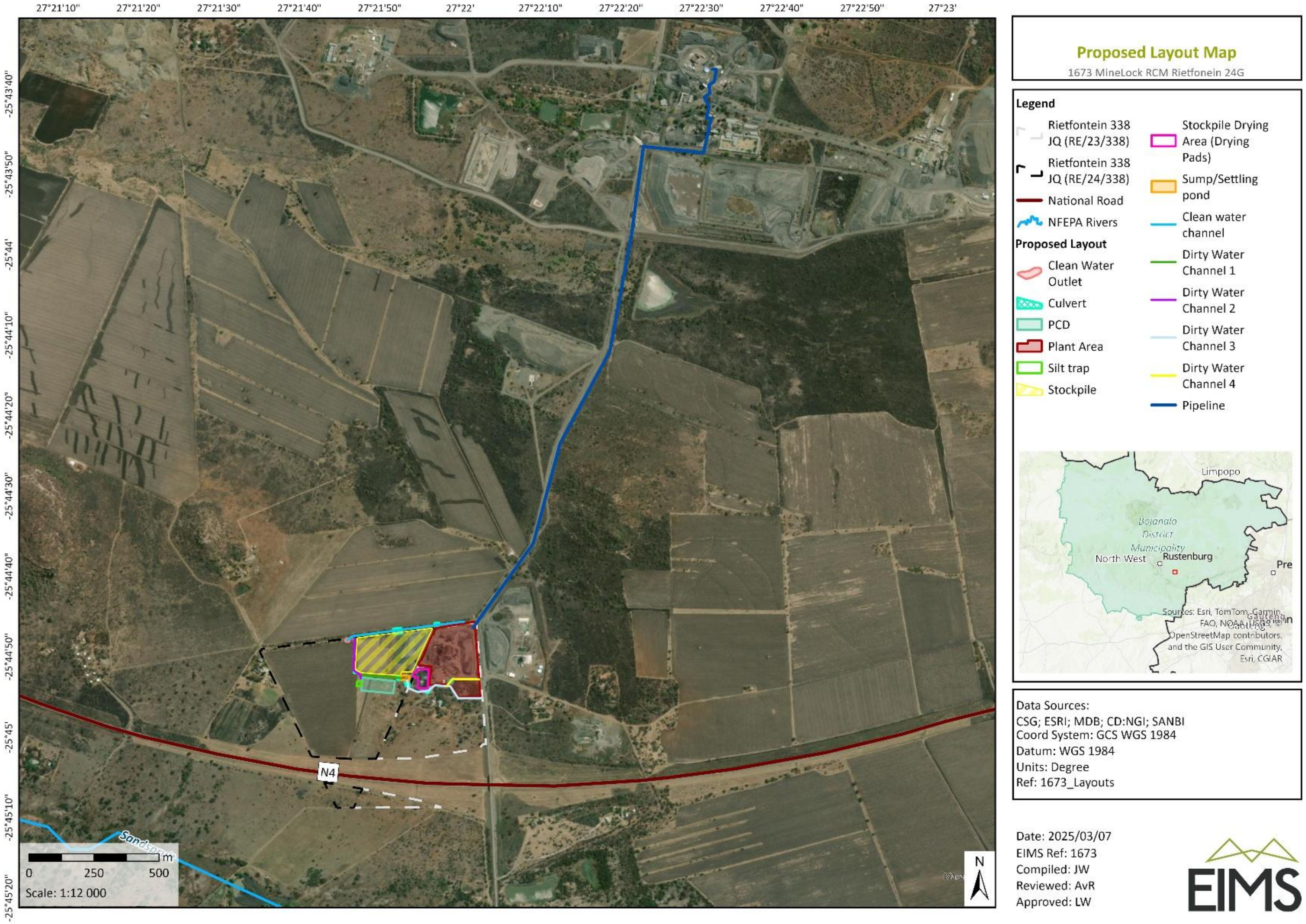

Figure 3: Proposed Pipeline Route and Layout.

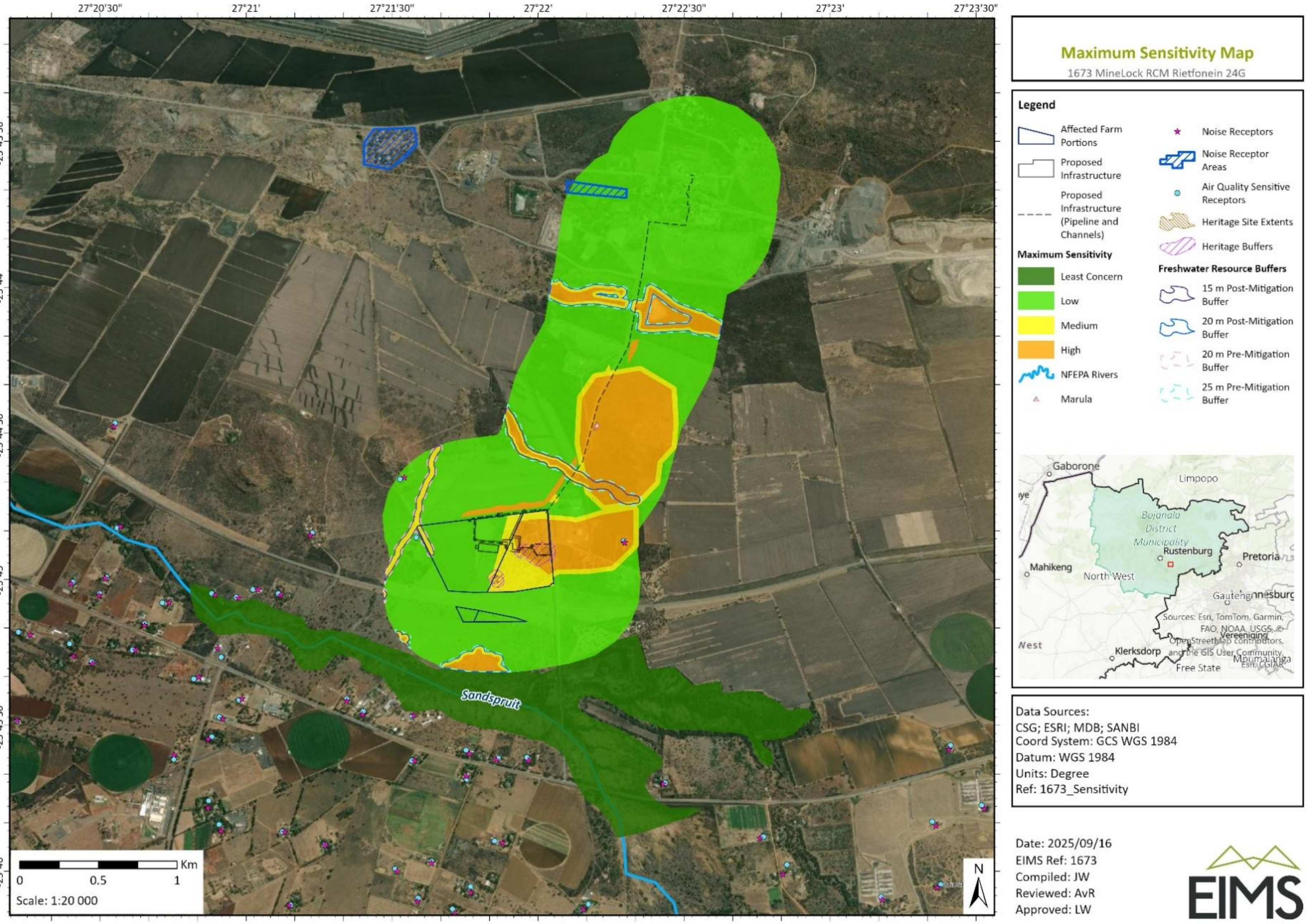

Figure 4: Maximum sensitivity map

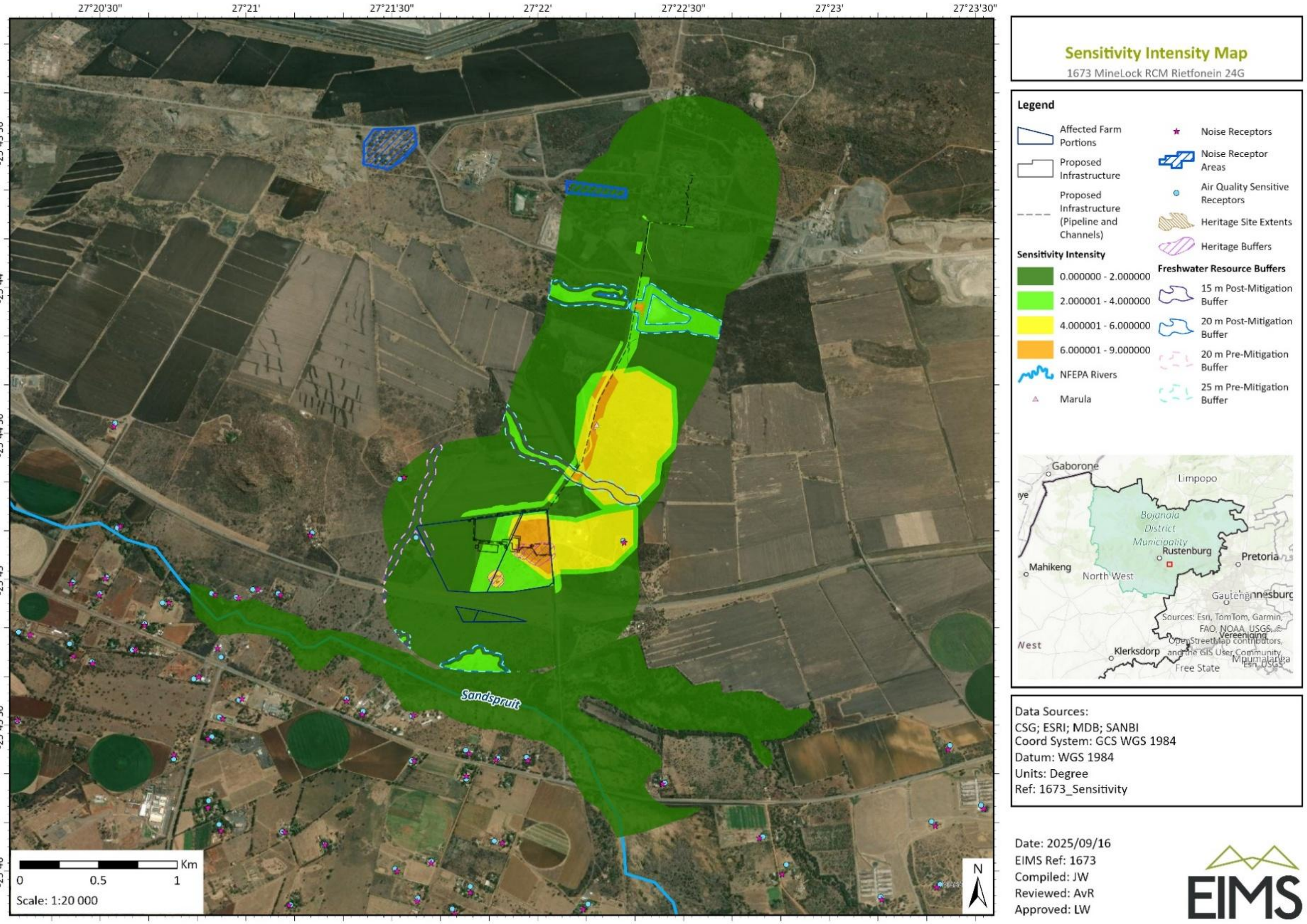

Figure 5: Intensity map for sensitive areas

7 IDENTIFIED IMPACTS AND MANAGEMENT OUTCOMES

An environmental assessment has been undertaken as prescribed by the NEMA EIA Regulations. The EIA has identified relevant anticipated impacts and risks associated with the proposed activity. These impacts have been assessed in terms of the nature, extent, duration, magnitude, and probability and assigned an impact significance rating. The hierarchy of mitigation has been applied to the identified impacts and where possible the impacts have been avoided, or where avoidance is not possible, relevant actions for the management and mitigation have been provided. A re-assessment of the impact significance, post mitigation, was concluded. The impacts identified during the different phases of the activity and the significance of these impacts (post mitigation), together with the proposed impact management outcomes are listed in Table 4. These significance rating set the pre-emptive prediction of level of impact. The actual observed level of impact should be considered during the project development phases and where necessary reconsidered together with associated impact management outcomes and impacts, in consultation with the appointed Independent Auditor.

Table 4: Impact Management Outcomes.

Identified Impact	Relevant development Phase	Relevant Infrastructure	Post Mitigation Significance	Proposed Impact Management Outcome
Soil compaction, Soil erosion, Land degradation and Soil contamination	Construction	Existing Infrastructure	Low -	• Prevent soil erosion and sediment loss. • Minimise soil contamination. • Preserve soil resources for reuse. • Prevent soil from unnecessary degradation, compaction and disturbance. • Ensure proper stripping, stockpiling, and reuse of topsoil. • Rehabilitate and restore disturbed soils. • Comply with all relevant soil protection legislation and permit conditions. • Prevent the introduction and spread of invasive species.
Soil compaction, Soil erosion, Land degradation and Soil contamination	Construction	Proposed Infrastructure	Low -	
Soil compaction, Soil erosion, Land degradation and Soil contamination	Decommissioning	Existing Infrastructure	Medium to low -	
Soil compaction, Soil erosion, Land degradation and Soil contamination	Decommissioning	Proposed Infrastructure	Medium to low -	
Soil compaction, Soil erosion, Land degradation and Soil contamination	Operation	Existing Infrastructure	Low -	
Soil compaction, Soil erosion, Land degradation and Soil contamination	Operation	Proposed Infrastructure	Low -	
Soil compaction, Soil erosion, Land degradation and Soil contamination	Rehab and Closure	Existing Infrastructure	Low -	

Identified Impact	Relevant development Phase	Relevant Infrastructure	Post Mitigation Significance	Proposed Impact Management Outcome
Soil compaction, Soil erosion, Land degradation and Soil contamination	Rehab and Closure	Proposed Infrastructure	Low -	
Increased dust from demolition activities.	Decommissioning	Existing and Proposed Infrastructure	Medium to low -	• Maintain ambient air quality at sensitive receptors. • Minimise visible dust plumes crossing the site boundary. • Minimize fugitive dust from earthworks, unpaved roads, material handling, and stockpiles. • Control exhaust emissions from construction equipment and vehicles (mobile sources). • Prevent nuisance dust, odour and smoke. • Control open burning. • Identify and manage hazardous air pollutants. • Control and minimise the release of Greenhouse Gas Emissions. • Implement monitoring and responsive communication to address air-quality complaints promptly.
Continuous dust generation from hauling, tipping, and stockpiling.	Operation	Existing and Proposed Infrastructure	Medium to low -	
Gaseous emissions (SO_2, NOx, CO_2) from mine vehicles and processing plants.	Operation	Existing and Proposed Infrastructure	Medium to low -	
Dust emissions from land clearing, excavation, and material transport affecting local air quality.	Construction	Existing and Proposed Infrastructure	Medium to low -	
Emissions from construction vehicles and equipment contributing to greenhouse gases.	Construction	Existing and Proposed Infrastructure	Medium to low -	
Ongoing habitat destruction and disturbance to fauna from noise, dust, and artificial lighting.	Decommissioning	Existing Infrastructure	Medium to low -	• Avoid and minimize impacts on natural habitats and species through site selection, design, and construction planning. • Minimise habitat fragmentation and maintain ecological connectivity during construction.

Identified Impact	Relevant development Phase	Relevant Infrastructure	Post Mitigation Significance	Proposed Impact Management Outcome
Ongoing habitat destruction and disturbance to fauna from noise, dust, and artificial lighting.	Decommissioning	Proposed Infrastructure	Medium to low -	• Protect legally protected areas, critical habitats, and species of conservation concern in compliance with applicable standards and law. • Control invasive alien species and prevent their introduction or spread. • Implement progressive rehabilitation and habitat restoration as soon as practicable.
Ongoing habitat destruction and disturbance to fauna from noise, dust, and artificial lighting.	Operation	Existing Infrastructure	Medium to high -	
Increased human-wildlife conflicts due to habitat fragmentation (litter, pollution, road mortalities, poaching, etc.).	Operation	Existing Infrastructure	Medium to low -	
Environmental pollution due to water/ mine drainage runoff.	Operation	Existing Infrastructure	Medium to low -	
Ongoing habitat destruction and disturbance to fauna from noise, dust, and artificial lighting.	Operation	Proposed Infrastructure	Medium to high -	
Increased human-wildlife conflicts due to habitat fragmentation (litter, pollution, road mortalities, poaching, etc.).	Operation	Proposed Infrastructure	Medium to low -	

Identified Impact	Relevant development Phase	Relevant Infrastructure	Post Mitigation Significance	Proposed Impact Management Outcome
Environmental pollution due to water/ mine drainage runoff.	Operation	Proposed Infrastructure	Medium to low -	
Impacts on water quality by plant operations (Current and future Waste rock dumps)	Operation	Existing and Proposed Infrastructure	Medium to low -	• Prevent contamination of surface water and groundwater from amongst other sediment, fuels, chemicals, and wastewater. • Maintain natural drainage patterns and minimize alteration of hydrology. • Control stormwater runoff to prevent erosion, flooding, and off-site sedimentation. • Minimise the change in stormwater runoff from pre-development to post-development conditions. • Ensure proper storage and handling of hazardous substances to avoid leaks and spills. • Manage wastewater and concrete washout to prevent uncontrolled discharge. • Monitor water quality and implement corrective actions where exceedances or pollution risks occur. • Promote water conservation and efficient use during construction activities. • Avoid encroachment into watercourses and wetlands through buffer zones and site planning. • Implement dewatering controls to prevent erosion and turbidity in receiving waters. • Ensure sanitary wastewater from camps and ablutions is treated before discharge. • Prevent illegal discharge of any liquid waste into stormwater systems. • Use environmentally safe soil binders and dust suppressants to avoid water pollution. • Protect groundwater recharge zones from compaction and contamination.
Impacts on water quantity by abstraction boreholes. (Pumping from production boreholes)	Operation	Existing and Proposed Infrastructure	Medium to low -	

Identified Impact	Relevant development Phase	Relevant Infrastructure	Post Mitigation Significance	Proposed Impact Management Outcome
				• Ensure emergency response procedures are in place for water pollution incidents. • Engage with local authorities and communities regarding water use and protection.
Destruction, loss and fragmentation of the vegetation community	Construction	Existing Infrastructure	Medium to high -	• Avoid and minimize impacts on natural habitats and species through site selection, design, and construction planning. • Minimise habitat fragmentation and maintain ecological connectivity during construction. • Protect legally protected areas, critical habitats, and species of conservation concern in compliance with applicable standards and law. • Control invasive alien species and prevent their introduction or spread. • Implement progressive rehabilitation and habitat restoration as soon as practicable.
Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).	Construction	Existing Infrastructure	Medium to high -	
Introduction of alien species, especially plants	Construction	Existing Infrastructure	Low -	
Indirect loss, disturbance and degradation of wetlands	Construction	Existing Infrastructure	Medium to low -	
Degradation of wetland vegetation and the introduction and spread of alien and invasive vegetation	Construction	Existing Infrastructure	Medium to low -	
Destruction, loss and fragmentation of the vegetation community	Construction	Proposed Infrastructure	Medium to high -	

Identified Impact	Relevant development Phase	Relevant Infrastructure	Post Mitigation Significance	Proposed Impact Management Outcome
Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).	Construction	Proposed Infrastructure	Medium to high -	
Introduction of alien species, especially plants	Construction	Proposed Infrastructure	Low -	
Indirect loss, disturbance and degradation of wetlands	Construction	Proposed Infrastructure	Low -	
Degradation of wetland vegetation and the introduction and spread of alien and invasive vegetation	Construction	Proposed Infrastructure	Medium to low -	
Degradation of wetland vegetation and proliferation of alien and invasive species	Decommissioning	Proposed Infrastructure	Medium to low -	
Slow regrowth of natural vegetation and potential further spread of alien and invasive species.	Rehab and Closure	Existing Infrastructure	Medium to low -	
Slow regrowth of natural vegetation and potential further spread of alien and invasive species.	Rehab and Closure	Proposed Infrastructure	Medium to low -	

Identified Impact	Relevant development Phase	Relevant Infrastructure	Post Mitigation Significance	Proposed Impact Management Outcome
Risk of accidents related to operational activities and transport of hazardous materials.	Operation	Existing and Proposed Infrastructure	Low -	
Erosion due to overland flow	Construction	Existing Infrastructure	Low -	• Prevent soil erosion and sediment loss. • Minimise soil contamination. • Preserve soil resources for reuse. • Prevent soil from unnecessary degradation, compaction and disturbance. • Ensure proper stripping, stockpiling, and reuse of topsoil. • Rehabilitate and restore disturbed soils. • Comply with all relevant soil protection legislation and permit conditions. • Prevent the introduction and spread of invasive species.
Decrease in subsurface flows and return flows	Construction	Existing Infrastructure	Medium to low -	
Erosion due to overland flow	Construction	Proposed Infrastructure	Low -	
Decrease in subsurface flows and return flows	Construction	Proposed Infrastructure	Medium to low -	
Erosion due to overland flow	Operation	Existing Infrastructure	Low -	
Decrease in subsurface flows and return flows	Operation	Existing Infrastructure	Low -	
Erosion due to overland flow	Operation	Proposed Infrastructure	Low -	
Decrease in subsurface flows and return flows	Operation	Proposed Infrastructure	Medium to low -	
Erosion due to overland flow	Rehab and Closure	Existing Infrastructure	Low -	

Identified Impact	Relevant development Phase	Relevant Infrastructure	Post Mitigation Significance	Proposed Impact Management Outcome
Decrease in subsurface flows and return flows	Rehab and Closure	Existing Infrastructure	Low -	
Erosion due to overland flow	Rehab and Closure	Proposed Infrastructure	Low -	
Decrease in subsurface flows and return flows	Rehab and Closure	Proposed Infrastructure	Low -	
Continuous low-frequency noise affecting local settlements and livestock.	Operation	Existing and Proposed Infrastructure	Medium to low -	• Prevent exceedance of applicable noise limits at sensitive receptors. • Minimize community disturbance by scheduling noisy activities and using engineering controls. • Control noise at source through equipment selection, maintenance, and mufflers. • Implement monitoring and complaint response mechanisms to maintain compliance and community trust. • Protect workers from occupational noise exposure per OHS standards (handled under H&S section).
Increased noise and vibrations from earth-moving equipment affecting nearby communities and wildlife.	Construction	Existing and Proposed Infrastructure	Low -	
Loss of fossil Heritage	Construction	Existing and Proposed Infrastructure	Low -	• Protect tangible and intangible cultural heritage from adverse impacts of construction activities and support its preservation. • Identify, avoid, and minimize impacts on archaeological sites, built heritage, cultural landscapes, and natural features of cultural significance. • Implement a robust system to respond to chance finds to ensure protection of cultural heritage discovered unexpectedly during construction activities and prevent disturbance until proper assessment is completed. • Comply with heritage legislation and permitting, including South Africa's NHRA Section 38 where applicable.
Loss of fossil Heritage	Decommissioning	Existing and Proposed Infrastructure	Low -	
Loss of fossil Heritage	Operation	Existing and Proposed Infrastructure	Low -	

Identified Impact	Relevant development Phase	Relevant Infrastructure	Post Mitigation Significance	Proposed Impact Management Outcome
Loss of fossil Heritage	Planning	Existing and Proposed Infrastructure	Low -	
Historical site disturbed	Construction	Existing and Proposed Infrastructure	Low -	
Disturbed suspected graves/unidentified site	Operation	Existing and Proposed Infrastructure	Low -	
Undisturbed suspected grave	Decommissioning	Existing and Proposed Infrastructure	Low -	
Archaeological site disturbed	Construction	Existing and Proposed Infrastructure	Low -	
Job creation and economic benefits for surrounding communities.	Operation	Existing and Proposed Infrastructure	Low +	• Fair treatment, non-discrimination, equal opportunity for all workers, including subcontracted and migrant workers. • Worker–management relationship strengthened; respect freedom of association and collective bargaining consistent with national law. • Compliant terms and conditions of employment (contracts, wages, working time, leave, termination) per applicable law/standards. • No child or forced labour in the project or primary supply chain; robust age verification and anti-coercion controls. • All necessary precautions linked to the spread of disease are taken.
Potential skills development and training programs for employees.	Operation	Existing and Proposed Infrastructure	Low +	
Temporary job creation and increased demand for local goods and services.	Construction	Existing and Proposed Infrastructure	Low +	

Identified Impact	Relevant development Phase	Relevant Infrastructure	Post Mitigation Significance	Proposed Impact Management Outcome
				• Accessible worker grievance mechanism (WGRM) with confidentiality, non-retaliation, and timely resolution. • Decent worker accommodation and welfare.
Continuous stripping of topsoil for opencast mining, leading to ongoing land degradation, including erosion	Operation	Existing Infrastructure	Medium to high -	• Prevent soil erosion and sediment loss. • Minimise soil contamination. • Preserve soil resources for reuse. • Prevent soil from unnecessary degradation, compaction and disturbance. • Ensure proper stripping, stockpiling, and reuse of topsoil. • Rehabilitate and restore disturbed soils. • Comply with all relevant soil protection legislation and permit conditions. • Prevent the introduction and spread of invasive species.
Continued encroachment by alien and invasive plant species	Operation	Existing Infrastructure	Low -	
Continuous stripping of topsoil for beneficiation plant, leading to ongoing land degradation, including erosion	Operation	Proposed Infrastructure	Medium to high -	
Continued encroachment by alien and invasive plant species	Operation	Proposed Infrastructure	Low -	
Clearing of vegetation leading to soil erosion and loss of topsoil.	Construction	Existing Infrastructure	Medium to high -	
Increased risk of contamination (soil and water resource) from fuel	Construction	Existing Infrastructure	Medium to low -	

Identified Impact	Relevant development Phase	Relevant Infrastructure	Post Mitigation Significance	Proposed Impact Management Outcome
spills, construction waste, and hazardous materials.				
Clearing of vegetation leading to soil erosion and loss of topsoil.	Construction	Proposed Infrastructure	Medium to low -	
Increased risk of contamination (soil and water resource) from fuel spills, construction waste, and hazardous materials.	Construction	Proposed Infrastructure	Medium to low -	
Increased risk of soil erosion and instability due to removal of infrastructure.	Decommissioning	Existing Infrastructure	Medium to low -	
Increased risk of soil erosion and instability due to removal of infrastructure.	Decommissioning	Proposed Infrastructure	Medium to low -	
Increased bare surfaces, runoff and potential for erosion	Construction	Existing Infrastructure	Medium to low -	• Prevent contamination of surface water and groundwater from amongst other sediment, fuels, chemicals, and wastewater. • Maintain natural drainage patterns and minimize alteration of hydrology. • Control stormwater runoff to prevent erosion, flooding, and off-site sedimentation. • Minimise the change in stormwater runoff from pre-development to post-development conditions. • Ensure proper storage and handling of hazardous substances to avoid leaks and spills.
Increased sediment loads to downstream reaches	Construction	Existing Infrastructure	Medium to low -	
Contamination of wetlands with hydrocarbons due to machinery leaks and eutrophication of wetland	Construction	Existing Infrastructure	Medium to low -	

Identified Impact	Relevant development Phase	Relevant Infrastructure	Post Mitigation Significance	Proposed Impact Management Outcome
systems with human sewerage and other waste.				• Manage wastewater and concrete washout to prevent uncontrolled discharge. • Monitor water quality and implement corrective actions where exceedances or pollution risks occur. • Promote water conservation and efficient use during construction activities. • Avoid encroachment into watercourses and wetlands through buffer zones and site planning. • Implement dewatering controls to prevent erosion and turbidity in receiving waters. • Ensure sanitary wastewater from camps and ablutions is treated before discharge. • Prevent illegal discharge of any liquid waste into stormwater systems. • Use environmentally safe soil binders and dust suppressants to avoid water pollution. • Protect groundwater recharge zones from compaction and contamination. • Ensure emergency response procedures are in place for water pollution incidents. • Engage with local authorities and communities regarding water use and protection.
Alteration of hydrological regime	Construction	Existing Infrastructure	Low -	
Increased bare surfaces, runoff and potential for erosion	Construction	Proposed Infrastructure	Medium to low -	
Increased sediment loads to downstream reaches	Construction	Proposed Infrastructure	Medium to low -	
Contamination of wetlands with hydrocarbons due to machinery leaks and eutrophication of wetland systems with human sewerage and other waste.	Construction	Proposed Infrastructure	Medium to low -	
Alteration of hydrological regime	Construction	Proposed Infrastructure	Low -	
Disruption of wetland soil profile, hydrological regime and increased sediment loads	Decommissioning	Proposed Infrastructure	Medium to low -	
Increased water inputs (clean) to downstream wetlands	Operation	Existing Infrastructure	Medium to low -	

Identified Impact	Relevant development Phase	Relevant Infrastructure	Post Mitigation Significance	Proposed Impact Management Outcome
Increased water inputs (clean) to downstream wetlands	Operation	Proposed Infrastructure	Medium to low -	

The specific impact management actions or mitigation measures applicable to each of these impacts are presented in Section 10.

8 ENVIRONMENTAL MANAGEMENT FRAMEWORK

The compilation of an EMPr for an activity which is likely to result in significant environmental impacts is typically compiled at the culmination of a thorough investigation into the receiving environment and the identification and assessment of likely environmental impacts (i.e. EIA). This EMPr forms part of an EA application process. This EMPr aims to comply with the requirement of Appendix 4 of the EIA Regulations, 2014. These requirements are systematically addressed in the subsequent sections of this report. The primary objectives of the EMPr are as follows:

- To promote sustainability and describe an action programme to mitigate negative impacts as far as possible;
- To be a practical document that sets out both the goals and actions required in mitigation. Though the term “mitigation” can be broad in definition, it means in this context to “allay, moderate, palliate, temper or intensify.” Mitigation of a negative impact means that its effect is reduced. Mitigation of a positive impact means that its effect is increased or optimised; and
- To indicate responsibilities for the implementation of these action items within the EMPr.

This EMPr shall be deemed to have legal and contractual standing on the basis that its contents and specifically objectives are a detailed expansion of the environmental risks and consequent requirements of the EA (if, and when issued). Where relevant the Applicant[1] is responsible for delegating responsibility for compliance to designated parties (internal or external). Such delegation must be legally binding to the extent relevant.

The objectives and targets in this EMPr are further guided by the NEMA, and specifically by the EIA Regulations. The underlying principles of sustainable development are the ultimate objectives and target of this report. The environmental assessment process and this consequent EMPr includes measures to ensure the development activity complies with the following principles, as instilled in the NEMA, amongst others:

i. That the disturbance of ecosystems and loss of biological diversity are minimised and remedied;

ii. That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;

iii. That waste is avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner;

iv. That a risk-averse and cautious approach is applied, which considers the limits of current knowledge about the consequences of decisions and actions; and

v. That negative impacts on the environment and on people’s environmental rights be anticipated, prevented and remedied.

An effective EMPr is not a static and isolated management tool and should rather be implemented in a systematic and dynamic manner. The EMPr should be supported by senior management and involve engagement between the applicant, its contractors and workers, and relevant external stakeholders (including the project affected communities).

8.1 ENVIRONMENTAL MANAGEMENT PRINCIPLES

NEMA establishes a general framework for environmental law, in part by prescribing national environmental management principles that must be applied when making decisions that may have a significant impact on the environment. These principles are briefly summarised below:

8.1.1 HOLISTIC PRINCIPLE

The Holistic principle, as defined by NEMA (Section 2(4) (b)) requires that environmental management must be integrated, acknowledging that all elements of the environment are linked and inter-related and it must take

[1] According to NEMA, the applicant is a person who has submitted an application for an environmental authorization to the competent authority and has paid the prescribed fee. This EMPr utilizes this term to refer to the person who is ultimately issued with the EA or equivalent permission and who is ultimately responsible for compliance therewith and the associated EMPr.

into account the effect of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option (defined below in Section 8.1.2). Holistic evaluation does not mean that a project must be looked at as a whole. It rather means that it must be accepted that there is an all-inclusive whole into which a project is introduced. If the indications are that the project could have major adverse effects, the project must be reconsidered and where appropriate, re-planned or relocated to avoid an adverse impact or to ensure a beneficial impact.

8.1.2 BEST PRACTICABLE ENVIRONMENTAL OPTION

When it is necessary to undertake any action with environmental impacts, the different options that could be considered for the purpose must be identified and defined. The Best Practicable Environmental Option (BPEO) is defined in NEMA as "the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term." Other guidelines typically used for environmental management in terms of other legislation include BPM which is the Best Practicable Means and BAT which is the Best Available Technology.

8.1.3 SUSTAINABLE DEVELOPMENT

The concept of sustainable development was introduced in the 1980's with the aim to ensure that the use of natural resources is such that our present needs are provided without compromising the ability of future generations to meet their own needs. The constitution of South Africa is built around the fact that everyone has the right to have the environment protected through reasonable legislative and other measures that secure ecologically sustainable development. The National Environmental Principles included in the NEMA require development to be socially, environmentally and economically sustainable.

8.1.4 PREVENTATIVE PRINCIPLES

The preventative principle is fundamental to sustainable development and requires that the disturbance to ecosystems and the pollution, degradation of the environment and negative impacts on the environment be avoided, or, where they cannot be altogether avoided, are minimised and remedied.

8.1.5 THE PRECAUTIONARY PRINCIPLE

The precautionary principle requires that where there is uncertainty, based on available information, that an impact will be harmful to the environment, it is assumed, as a matter of precaution, that the said impact will be harmful to the environment until such time that it can be proven otherwise. The precautionary principle requires that decisions by the private sector, governments, institutions and individuals need to allow for and recognise conditions of uncertainty, particularly with respect to the possible environmental consequences of those decisions. In South Africa, the DWS (then DWAF) adopted a BPEO guideline in 1991 for water quality management and in 1994 in the Minimum Requirements document for waste management.

In terms of DWAF Minimum Requirements for the Handling and Disposal of Hazardous Waste, 1994, the precautionary principle is defined as, "Where a risk is unknown; the assumption of the worst-case situation and the making of provision for such a situation." Here the precautionary principle assumes that a waste or an identified contaminant of a waste is "both highly hazardous and toxic until proven otherwise."

In the context of the EIA process in South Africa, the precautionary principle also translates to a requirement to provide sound, scientifically based, information that is sufficient to provide the decision-making authority with reasonable grounds to understand the potential impacts on the environment, the extent thereof and how impacts could be mitigated. If such information is not adequate for this purpose, the relevant authority cannot be satisfied as is required and then the authority should require that further information be collected and provided.

8.1.6 DUTY OF CARE AND CRADLE TO GRAVE PRINCIPLE

In terms of the NEMA Section 28, "*Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from* *occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment*."

By way of example, the principle of "duty of care" in terms of waste management emphasises the responsibility to make sure that waste is correctly stored and correctly transported, as it passes through the chain of custody to final point of disposal. This means that waste must always be stored safely and securely. The company removing and disposing of waste also holds the responsibility to hold the relevant licenses, and that waste is transported alongside the necessary paperwork.

"Cradle to Grave" refers to the responsibility a company takes for the entire life cycle of a product, service or program, from design to disposal or termination. Section 2(4)(e) explicitly states that companies are responsible for the environmental health and safety consequences of a policy, programme, project, product, process, service, or activity throughout its life cycle.

8.1.7 POLLUTER PAYS PRINCIPLE

The "polluter pays principle" holds that the person or organisation causing pollution is liable for any costs involved in cleaning it up or rehabilitating its effects. It is noted that the polluter will not always necessarily be the generator, as it is possible for responsibility for the safe handling, treatment or disposal of waste to pass from one competent contracting party to another. The polluter may therefore not be the generator but could be a disposal site operator or a transporter. Through the 'duty of care' principle, however, the generator will always be one of the parties held accountable for the pollution caused by the waste. Accordingly, the generator must be able to prove that the transferral of management of the waste was a responsible action. The polluter pays principle acceding to NEMA dictates that "the cost of remedying pollution, environmental degradation and consequent adverse effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment."

8.2 DUTY OF CARE RESPONSIBILITIES

Section 28 of the NEMA makes provision for duty of care, and remediation of environmental damage. The binding principles are described below:

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

   (1A) Subsection (1) also applies to a significant pollution or degradation that-

   a) occurred before the commencement of this Act;
   b) arises or is likely to arise at a different time from the actual activity that caused the contamination; or
   c) arises through an act or activity of a person that results in a change to pre-existing contamination.

2. Without limiting the generality of the duty in subsection (1), the persons on whom subsection (1) imposes an obligation to take reasonable measures, include an owner of land or premises, a person in control of land or premises or a person who has a right to use the land or premises on which or in which-

   a) any activity or process is or was performed or undertaken; or
   b) any other situation exists, which causes, has caused or is likely to cause significant pollution or degradation of the environment.

3. The measures required in terms of subsection (1) may include measures to-

   a) investigate, assess and evaluate the impact on the environment;

b) inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment;

c) cease, modify or control any act, activity or process causing the pollution or degradation;

d) contain or prevent the movement of pollutants or the cause of degradation;

e) eliminate any source of the pollution or degradation; or

f) remedy the effects of the pollution or degradation.

8.3 FAILURE TO COMPLY WITH ENVIRONMENTAL CONSIDERATIONS

Within the provisions of the relevant environmental legislation, there are a number of penalties for non-compliance or offences. Below a few extracts are presented for information purposes, however these must not be read in isolation, and the reader is reminded that there are other Acts, or sections of Acts, that may be applicable to the relevant project:

- National Environmental Management Act:
  - NEMA Section 49B(1): A person convicted of an offence in terms of section 49A(1)(a), (b), (c), (d), (e), (f) or (g) is liable to a fine not exceeding R10 million or to imprisonment for a period not exceeding 10 years, or to both such fine or such imprisonment- this includes commencing with a listed activity without an EA or the non-compliance with conditions of any EA and associated EMPr;
  - NEMA Section 49B(2): A person convicted of an offence in terms of section 49A(1)(i), (j) or (k) is liable to a fine not exceeding R5 million or to imprisonment for a period not exceeding 5 years, and in the case of a second or subsequent conviction to a fine not exceeding R10 million or to imprisonment for a period not exceeding 10 years, and in both instances to both such fine and such imprisonment;
  - NEMA Section 49B(3): A person convicted of an offence in terms of section 49A(1)(h), (l), (m), (n), (o) or (p) is liable to a fine or to imprisonment for a period not exceeding one year, or to both a fine and such imprisonment;
- National Water Act:
  - NWA Section 151 (1c): No person may fail to comply with any condition attached to a permitted water use under this Act;
  - NWA Section 151 (2): Any person who contravenes any provision of subsection (1) is guilty of an offence and liable, on the first conviction, to a fine or imprisonment for a period not exceeding five years, or to both a fine and such imprisonment and, in the case of a second or subsequent conviction, to a fine or imprisonment for a period not exceeding ten years or to both a fine and such imprisonment;
- National Environmental Management: Biodiversity Act:
  - NEM:BA Section 102 (1): A person convicted of an offence in terms of section 101 is liable to a fine not exceeding R10 million, or an imprisonment for a period not exceeding ten years, or to both such a fine and such imprisonment.
- National Environmental Management: Waste Act:
  - NEM:WA Section 68 (1): A person convicted of an offence referred to in section 67(1)(b), (c), (d), (e), (f), (i), (j), (k) or (l) or section 67(2)(a), (b), (c), (d) or (e) is liable to a fine not exceeding R5 000 000 or to imprisonment for a period not exceeding five years, or to both a fine and such imprisonment, in addition to any other penalty or award that may be imposed or made in terms of the National Environmental Management Act;

- NEM:WA Section 68 (2): A person convicted of an offence referred to in section 67(1)(b), (c), (d), (e), (f), (i), (j), (k) or (l) or section 67(2)(a), (b), (c), (d) or (e) is liable to a fine not exceeding R5 000 000 or to imprisonment for a period not exceeding five years, or to both a fine and such imprisonment, in addition to any other penalty or award that may be imposed or made in terms of the National Environmental Management Act;
- NEM:WA Section 68 (3): Any person convicted of an offence referred to in section 67(1)(m) is liable to a fine or to imprisonment for a period not exceeding six months or to both a fine and such imprisonment;
- NEM:WA Section 68 (4): A person who is convicted of an offence in terms of this Act and who persists after conviction in the act or omission that constituted the offence commits a continuing offence and is liable on conviction to a fine not exceeding R1 000 or to imprisonment for a period not exceeding 20 days, or to both such fine and such imprisonment, in respect of each day that person persists with that act or omission;

A procedure for non-compliances (i.e. incentives or disincentives for conformance and non-conformance with the EMPr requirements) must be employed to ensure that the EMPr is adequately implemented. The system to be used must be determined before the project commences, included in the tender documents and contracts, and made clear to all project workers. The system may include that the independent Environmental Control Officer (ECO) can be authorized to impose spot fines on the Contractor and/or his subcontractors for any of the defined transgressions. Such fines should be issued in addition to any remedial costs incurred as a result of non-compliance with the environmental specifications and or legal obligations.

8.4 ROLES AND RESPONSIBILITIES

The effective implementation of this EMPr depends on clearly defined roles, responsibilities, and reporting lines within an established institutional framework. This section provides guidance on the key environmental roles and associated reporting structures; however, project-specific requirements will ultimately determine the appointment of designated personnel to fulfil these roles. It is important to note that, in the absence of a formally appointed individual—such as an Environmental Control Officer (ECO)—the holder or applicant of the EA or associated enabling permission remains accountable for ensuring that all duties assigned to such roles in this document are carried out. This approach ensures accountability, promotes effective communication, and supports compliance with legal and regulatory obligations throughout the project lifecycle.

Roles and responsibilities presented herein are broad and must be read in conjunction with the specific roles and responsibilities identified in Section 10 pertaining to specific impact management actions.

8.4.1 PROJECT APPLICANT/PROPONENT

The applicant is the principal party (Proponent) of the project and is the Holder of the relevant approvals (Authorisations, Licences and Permits). The legal accountability for correct implementation of the requirements of the relevant approvals, and this EMPr, falls primarily upon the applicant and must therefore be built into all contractor’s contractual agreements. The applicant’s role typically includes:

- Provide for all necessary supervision during the execution of the project including appointment of key personnel to act on his/her behalf during the project (e.g.: Project Manager, ECO, etc). The key personnel will be tasked with ensuring that the various contractors/developers comply with the necessary provisions of the approvals and EMPr;
- Ensure that the various contractors and applicable sub-contractors appoint a suitably qualified, competent Environmental Officer (CEO) that will be responsible for among others, ensuring daily compliance with the approvals and EMPr throughout the execution of the relevant project components;
- Notify the relevant competent authority of changes in the development activities resulting in significant environmental impacts;
- Assess the various contractor’s environmental performance during the survey, in consultation with the DPM and ECO;
- Ensure compliance with relevant environmental legislation and associated regulations;

- To implement the projects as per the approved project plan;
- To ensure that implementation is conducted in an environmentally acceptable manner;
- To inform and educate all employees about the environmental risks associated with the different activities that should be avoided during the survey process and lessen significant impacts to the environment;

The Applicant is responsible for the development and implementation of the EMPr and, where relevant, ensuring that the conditions in the relevant approvals are satisfied. Where activities are contracted out (e.g. to Contractors and Subcontractors), the liability associated with non-compliance still rests with the Applicant (unless otherwise agreed upon between the authorities, the Applicant and the contracting parties). The Applicant (and not the Contractor) is therefore responsible for liaising directly with the relevant authorities with respect to the preparation and implementation of the EMPr and meeting authorisation conditions.

8.4.2 DEVELOPERS PROJECT MANAGER

The developers project manager (DPM) is the duly appointed representative of the EA holder for the purposes of ensuring compliance with the EMPr and other applicable conditions (authorisation, permits, and /or licences).

During the development, it is envisaged that there may be several contractors and sub-contractors undertaking various activities on the project. The DPM would oversee all contractors and sub-contractors from a project management point of view. The roles and responsibilities of the DPM typically include the following:

- Roles:
  - The DPM acts on behalf of the Applicant regarding the administration of contracts to sub-contractors, etc. and will has overall responsibility for the management of the project and the implementation of the EMPr on behalf of the EA holder.
  - Where required, an environmental control officer (ECO) must be contracted by the DPM to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and other applicable conditions. The DPM is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent.
- Responsibilities:
  - Be fully conversant with the conditions of the EA and other applicable permissions, authorisations and licences.
  - Ensure that all stipulations within the EMPr are communicated and adhered to by the EA holder and its Contractor(s).
  - Issuing of site instructions to the Contractor for corrective actions required.
  - Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings.
  - Overall management of the project and EMPr implementation.
  - Ensure that periodic environmental audits are undertaken on the project implementation.
  - Ensure all permits, authorisations and licenses are obtained, monitored and adhered to.
  - Arrange that the final environmental audit for construction is conducted by an independent auditor/consultant in accordance with the conditions of EA.

8.4.3 ENVIRONMENTAL CONTROL OFFICER

The ECO is appointed by the Applicant or the DPM and must be independent from the Applicant and the Contractors and remains appointed for the duration of the activity. The ECO must have a tertiary qualification in an Environmental Management or appropriate field and must have an appropriate level of experience.

The ECO provides feedback to the DPM regarding all environmental matters. The ECO's key role is auditing the implementation of the EMPr. For the purposes of implementing the conditions contained herein, the ECO should be appointed sufficiently in advance of commencement of development activities. The ECO is responsible for the auditing function as well as the clarification of environmental conditions contained in this EMPr to anyone working on the site.

The roles and responsibilities of the ECO typically include the following:

- Roles
    - The ECO must have appropriate training and experience in the implementation of environmental management specifications.
    - The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts.
    - The Contractor, Contractor's Environmental Officer and the Environmental Officer are answerable to the ECO for non-compliance with the Performance Specifications as set out in the EMPr and other applicable conditions. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise.
    - The ECO is also required to conduct compliance audits, verify the monitoring reports submitted by the Contractor's Environmental Officer.
    - The ECO is to provide feedback to the DPM regarding all environmental matters. The DPM in turn reports back to the Applicant, the Contractor, and Registered Interested and Affected Parties (I&APs), as required.
    - Issues of non-compliance raised by the ECO must be taken up by the PM, and resolved with the Contractor as per the conditions of contract.
    - Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the PM.
    - The ECO must also, as specified by the EA, report to the Competent Authority/ies (CA) as and when required.
    - Further note, the ECOs function is not limited to the construction phase alone, but is also an active role during the operational and later phases of the project where applicable.
- Responsibilities:
    - Be aware of the findings and conclusions of all BA documentation, and EA and licenses related to the development.
    - Be familiar with the recommendations and mitigation measures of this EMPr.
    - Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them.
    - Undertake regular and comprehensive site inspections/compliance audits of the construction site according to the EMPr and applicable licenses in order to monitor compliance as required.

- Educate the construction team about the management measures contained in the EMPr and environmental licenses.
- Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective.
- Monitoring the performance of the contractors using an environmental compliance checklist and ensuring compliance with the EMPr and associated method statements.
- In consultation with the DPM order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses, or have not adequately remedied such.
- Issuing of site instructions (in consultation with the DPM) to the contractor for corrective actions required.
- Compile regular ECO reports highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr. ECO reports must be submitted to the DPM and where applicable be available for the Environmental Audits.
- Validating the regular site inspection reports, which are to be prepared by the CEO.
- Validating the findings of the regular environmental internal audits on the CEO which are to be prepared by the EO.
- To monitor and review all environmental incidents (spills, impacts, legal transgressions etc.) and corrective and preventive actions taken in the environmental incident log, with inputs provided by the CEO.
- Checking the CEO's public complaints register in which all complaints are recorded, as well as action taken.
- Assisting in the resolution of conflicts.
- Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the contractor and/or sub-contractors.
- In case of non-compliances, the ECO must first communicate this to the DPM, who has the power to ensure this matter is addressed in accordance with the relevant legislative requirements. Should no action or insufficient action be taken, the ECO may report this matter directly to the authorities as non-compliance.
- Maintenance, update and review of the EMPr with due consideration of the NEMA processes applicable thereto.
- Communication of all modifications to the EMPr to the relevant stakeholders.
- Facilitate and advise on the environmental audits.

It is important to note that where opportunity for interpretation occurs within the conditions of this EMPr, the interpretation of the ECO will take preference. If necessary further clarification may be sought from the relevant competent authority.

*The role of the ECO and Independent Auditor can, depending on the scale and complexity of the activity, be fulfilled by the same entity/ person.

8.4.4 CONTRACTOR

The contractor is usually a third party appointed by the applicant/DPM to undertake the actual development activities. In instances where the Applicant will be implementing the project activities then the obligations and responsibilities assigned to the contractor will fall on the applicant. For the purposes of this section, any contractor (regardless of who appointed them) is referred to as the "contractor".

The relevant contractors are answerable to the DPM and ECO for all environmental issues associated with the project. The principal contractor/s, any other contractors and sub-contractors will be required to comply with the provisions contained herein, and accordingly, the EMPr and its provisions must form part of any contractual arrangements between the applicant and contractors, and contractors and their sub-contractors, etc. The contractor must comply with EMPr and ensure that all his employees and sub-contractors appointed by him/her are familiar with the EMPr.

The roles and responsibilities of the Contractor/s include the following:

- Roles:
    - The contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that method statements are implemented as described.
    - External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the EA holder.
    - The contractors are required, where specified, to provide method statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development of the project.
    - The main contractor that is appointed by the EA holder and has a signed contract with the EA holder must appoint a contractor's environmental officer (CEO). The CEO of the main contractor will then be responsible for all sub-contractors working under the main contractor in terms of verifying that they abide by the requirements of the EMPr.
- Responsibilities:
    - Implementation and compliance with recommendations and conditions of the EA and EMPr, including providing the contractor's environmental protection policy and the specific method statements for the project.
    - Ensure all site staff are trained and kept updated in terms of the EA, EMPr and other legal requirements.
    - Project delivery and quality control for the development services as per appointment.
    - Employ a CEO to monitor and report to ECO on the activities on-site during the construction or contracted period.
    - Ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely.
    - Attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones.
    - Ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in this EMPr, to the satisfaction of the ECO.

8.4.5 CONTRACTOR ENVIRONMENTAL OFFICER

The principal contractor shall appoint a Contractors Environmental Officer (CEO), who is responsible for implementation of the EMPr. Depending on the complexity of the project the principal contractor may appoint and assign a CEO who is responsible for applying the CEO duties for the principal contractor as well as associated sub-contractors. The scope of the CEO must be such that the CEO is adequately resourced to be able to effectively implement the specified roles and responsibilities. Should the CEO delegation or assignment not be adequate then the DPM may issue instruction to the contractor to supplement the resources[2].

The Contractor must ensure that the Contractor's EO is suitably qualified and competent to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other Contractors, labourers, the ECO and the public (if necessary). The Contractor's EO ensures that all sub-contractors working under the Contractor and sub-contractors abide by the requirements of the EMPr. The costs related to the implementation of the EMPr will be the responsibility of the relevant Contractor/ sub-contractor.

The roles and responsibilities of the CEO/s include the following:

- Roles:
  - The CEO's primary role is to coordinate the environmental management activities of the contractor on site and to be responsible for on-site implementation of the EMPr (or relevant sections of the EMPr) applicable to the contractor.
  - The CEO can be a dedicated environmental officer; or an independent consultant.
  - The contractor must ensure that the CEO is suitably qualified and experienced to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site contractors, labourers, the ECO and the public.
  - The CEO ensures that all sub-contractors working under the contractor abide by the requirements of the EMPr.
  - The contractor is answerable to the DPM and ECO for all environmental issues associated with the project.
  - Contractor performance will, amongst others, be assessed on health, safety and environmental management criteria.
- Responsibilities:
  - Ensure all their staff are aware of the relevant environmental requirements, conditions and constraints with respect to all of their activities on site.
  - Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr, method statements and/or other licences and permits.
  - Review the contractors safe work procedures/risk assessments/induction training/DSTI's (daily safe task instruction) during the survey and include information relating to the relevant environmental risks and appropriate mitigation measures;
  - Establishing and maintaining an environmental incident and non-compliance register;
  - To record, implement and monitor all environmental incidents (spills, impacts, legal transgressions etc.) and corrective and preventive actions taken in the incident and non-compliance register.
  - Establishing and maintaining a stakeholder grievance or complaints register;
  - Respond to enquiries and requests from the ECO.
  - Undertaking corrective actions where non-compliances are registered within the stipulated timeframes.

[2] It is noted that where impact management outcomes and associated management actions relate to post construction phases and there is not a specific contractor or implementing agent, then the role of the CEO can, where applicable, be allocated to an internal representative of the applicant or proponent.

8.4.6 ENVIRONMENTAL AUDITOR

The Independent Environmental Auditor (IEA) is an impartial and suitably qualified professional appointed to evaluate and verify compliance with the conditions of the Environmental Authorisation (EA), the approved Environmental Management Programme (EMPr), and any other relevant environmental obligations. The IEA operates independently of the project proponent or applicant, contractor, CEO, and any party with a vested interest in the activity, ensuring objectivity and transparency in the auditing process.

The responsibility of the IEA includes the following:

- Roles:
  - Independent compliance monitoring and reporting to the competent authorities.
- Responsibilities
  - Undertake audits in accordance with Regulation 34 of the NEMA EIA Regulations, 2014 (as amended) to determine compliance with the EA, EMPr, and closure plan (if applicable).
  - Ensure audits are performed at the frequency specified in the EA or, if not specified, at intervals not exceeding five years.
  - Compile audit reports in line with the requirements of Appendix 7 of the NEMA EIA Regulations, including findings, non-compliances, corrective actions, and recommendations for improvement.
  - Confirm that the report reflects accurate, evidence-based observations and professional judgment.
  - Declare independence and confirm no conflict of interest in relation to the audited activity, except for fair remuneration for services rendered.
  - Ensure that remuneration is not linked to approval or decision-making outcomes.
  - Submit or ensure the submission of the audit report to the relevant Competent Authority/ies within the prescribed timeframe.

The IEA role as well as the ECO role represent independent and objective oversight. As such, depending on the nature of the specific activity the role of the ECO and the IEA may be assigned to one specific person or entity. The key distinction between the IEA and the ECO is that the IEA will be the role that prepares and submits the Environmental Audit Report as prescribed by regulation 34 of the EIA Regulations.

8.5 DOCUMENT CONTROL

A formal document control system should be established. The document control system must provide for the following requirements;

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

The responsibility for establishing a suitable document control system rests with the DPM.

8.6 RECORD KEEPING

It is essential that an official procedure for control of records be developed to ensure records required to demonstrate conformity to environmental standards are maintained. The Applicant, or the DPM is therefore required to develop and maintain a procedure for the identification, storage, protection, retrieval, retention and disposal of records as part of the EMPr. Records must be legible, identifiable and traceable.

8.7 RECORDING AND RESPONDING TO NON-COMPLIANCES

Non-compliance will be identified and managed through the following four key activities including:

- Inspections of the activities;
- Monitoring of selected environmental quality variables (where relevant);
- Audits of the activities and relevant documentation; and
- Reporting.

An environmental incident and non-compliance (NC) register must be prepared and maintained by the CEO throughout the relevant project activity phases to track and monitor environmental concerns, incidents, and non-compliances. The register must include details of date, location (coordinates), description of the NC or Incident, applicable environmental commitment/standard, corrective action taken, adequacy of corrective action, date rectified, etc.

Non-compliance with the EMPr or any other environmental legislation, specifications or standards shall be recorded by the CEO in the incident and non-compliance register. This register shall be maintained by the CEO and will be sent to the Applicant or DPM, Contractor, and ECO on a regular basis. The DPM shall ensure that the responsible party takes the necessary corrective actions. NCs' may only be closed out in the register by the ECO upon confirmation that adequate corrective action has been taken and/or documented proof provided. The register should be utilised to measure overall environmental performance.

8.8 ENVIRONMENTAL INCIDENCES AND NON-COMPLIANCE

For the purposes of this project, an environmental incident can be divided into three levels, i.e. major, medium and minor. All environmental incidents shall be recorded in the incident and non-compliance register. Definitions of environmental incidents are provided in Table 5.

Table 5: Description of incidents and non-compliances for the purpose of the project

Non-Compliance	An Environmental Non-Compliance (NC) refers to any failure to adhere to the conditions, commitments, or requirements stipulated in an Environmental Authorisation (EA), Environmental Management Programme (EMPr), or applicable environmental legislation. Such non-compliance may result in environmental harm, legal liability, or reputational risk for the project proponent. Environmental non-compliance encompasses any deviation from approved environmental management measures, legal obligations, or performance standards that could directly or indirectly lead to adverse environmental, health, or safety outcomes. Key elements include: 1. Deviation from Approved Measures o Failure to implement specified impact management actions or monitoring requirements as outlined in the EMPr or EA. 2. Contravention of Legal Obligations o Breach of principles under the National Environmental Management Act (NEMA), EIA Regulations, or other sector-specific environmental laws. 3. Failure to Meet Performance Outcomes

	○ Inability to achieve the impact management outcomes defined in the EMPr, such as biodiversity protection, pollution prevention, or rehabilitation targets. 4. Unauthorized Activities ○ Commencing or continuing listed activities without obtaining the necessary environmental authorisation or permits. 5. Deviation from Work Standards or Procedures ○ Any departure from established work practices, operational procedures, or management system requirements that could cause: ▪ Injury or illness to personnel or communities ▪ Damage to the workplace or surrounding environment (including marine or aquatic ecosystems) ▪ Legal transgression or regulatory breach.
Major Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in widespread, long-term, irreversible significant negative impact on the environment and/or has a high risk of legal liability. A major environmental incident usually results in a significant pollution and may entail risk of public danger. Major environmental incidents usually remain an irreversible impact even with the involvement of long-term external intervention i.e. expertise, best available technology, remedial actions, excessive financial cost etc. Major environmental incidents must be reported to the authorities. The ECO shall make the final decision as to whether a particular incident should be classified as a Major incident.
Medium Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in widespread or localised, short term, reversible significant negative impact on the environment and/or has a risk of legal liability. A medium environmental incident may be reported to the authorities, can result in significant pollution or may entail risk of public danger. The impact of medium environmental incidents should be reversible within a short to medium term with or without intervention. The ECO shall make the final decision as to whether a particular incident should be classified as a Medium incident.
Minor Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, where the environmental impact is negligible immediately after occurrence and/or once-off intervention on the day of occurrence.
Non-compliance	Any failure to adhere to the conditions, commitments, or requirements stipulated in an EA, EMPr, or relevant environmental legislation. Key elements of an NC may include: • Deviation from approved measures: Not implementing the specified impact management actions or monitoring requirements. • Contravention of legal obligations: Breaching NEMA principles, EIA Regulations, or sector-specific environmental laws. • Failure to meet performance outcomes: Not achieving the impact management outcomes defined in the EMPr. • Unauthorized activities: Commencing or continuing listed activities without proper environmental authorization.

The following incident reporting procedures shall apply to this project:

- All environmental incidents shall be reported to CEO, and the ECO, and shall be recorded in the incident and non-compliance register;

- An incident and non-compliance report shall be completed by the relevant party responsible for the incident or non-compliance for all medium and major incidents and the report shall be submitted to the DPM and the ECO as soon as possible but preferably no later than 5 calendar days of the incident;
- The ECO shall in consultation with the CEO advise on the appropriate measures and timeframes for corrective action; and
- In the event of an emergency incident (unexpected sudden occurrence), including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed, the Applicant shall notify the relevant authorities in accordance with Section 30(3) of the NEMA. The Applicant shall engage the ECO who shall assess all major incidents and shall advise the Applicant when any such incident must be reported to the authorities as per the above requirement.

8.9 REVIEW AND REVISION OF THE EMPR

It is important to note that this EMPr is made legally binding on the Applicant through the relevant approvals. The EMPr is a dynamic document which may require such alteration and /or amendment as the project evolves. Conditions under which the EMPr would require revision may include:

- Changes in legislation;
- Occurrence of unanticipated impacts or impacts of greater intensity, extent and significance than predicted;
- Inadequate mitigation measures (i.e. where environmental performance does not meet the required level despite the implementation of the mitigation measure);
- Secondary impacts occur as a result of the mitigation measures;
- Instances where the implementation of the specified management, as a result of changes in circumstances, may become impractical or unreasonable to implement; and
- Where the outcome of an Environmental Audit has identified shortcomings in the EMPr or associated compliance.

The Applicant in consultation with the ECO should be responsible for ensuring that the registration and updating of all relevant EMPr documentation is carried out. It shall be the responsibility of the Applicant, in consultation with the DPM and ECO, to ensure that all personnel are performing according to the requirements of the document control procedure, and to initiate the revision of controlled documents, when required by changes in process or operations.

The ECO must undertake a risk assessment of any proposed changes to the EMPr. This risk assessment must be included in the applicable environmental audit report undertaken by the IEA, and where applicable supported by the necessary proof of public consultation. It is important to note that if alterations and/or amendments are required these may only be affected in accordance with the relevant legal processes. The present legislation requirements stipulate that once the activity has commenced, a holder of an EA may make amendments to the impact management outcomes and impact management actions in the following manner:

1. Amendments to the impact management outcomes must be made in line with the process as contemplated in Regulation 37 of the EIA Regulations; and
2. Amendments to impact management actions must be made in line with the process contemplated in Regulation 36 of the EIA Regulations.

Prior to initiating or implementing any EMPr amendments the relevant Competent Authority should be engaged to confirm the correct process.

8.10 ENVIRONMENTAL AWARENESS PLAN AND TRAINING

Training and environmental awareness is an integral part of a complete EMPr. The overall aim of the training will be to ensure that all applicable staff are informed of their requirements and obligations pertaining to the relevant approvals and this EMPr and any environmental risk which may result from their work.

The DPM and contractor must ensure that all relevant employees are trained and capable of carrying out their duties in an environmentally responsible and compliant manner and can comply with the relevant environmental requirements. To obtain buy-in from staff, individual employees need to be involved in:

- Identifying the relevant risk;
- Understanding the nature of risks;
- Devising risk controls; and
- Given incentive to implement the controls in terms of legal obligations.

The DPM and contractor, with guidance from the ECO, shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. All training must be formally recorded, and attendance registers retained.

The specific requirements for environmental training include:

- Environmental Induction Training: All workers must receive induction training which shall be presented by the Contractors Environmental Representatives. The induction training must include an environmental management component which will be prepared by the CEO and presented where possible by the CEO. The training material must include general environmental awareness with an overview of the approved EMPr and applicable approvals. Health and safety expectations including communication and reporting to key personnel, including incidents and during emergencies, should also be outlined. Any key sensitive environmental areas or features must be identified and described in this training. The Induction Training Material must be reviewed and approved by the ECO;
- Regular Environmental Toolbox Talks will be prepared by the CEO to cover a range of environmental topics and must be presented to relevant staff during applicable times during the implementation of the development activities. The aim of these toolbox talks will be to inform employees of general environmental requirements pertaining to specific activities, as well as specific EMPr and approval requirements and obligations. The ECO shall review environmental toolbox talks on a periodic basis to ensure the material is relevant and appropriate. The ECO may identify supplementary training or additional topics that must be covered;
- Informal training of all relevant staff is also required on an on-going basis through informal discussions, on-site supervision and through facilitation of day-to-day activities. Such training must be given or otherwise facilitated by the CEO; and
- The CEO must review all safe work procedures/risk assessments/DSTI's (daily safe task instruction) from the safety department and include the relevant environmental risks and appropriate mitigation measures where necessary. Since the above procedures are specific to the applicable activity being undertaken, the inclusion of environmental measures aims to ensure each activity is undertaken in an environmentally responsible manner.

Training must include as a minimum the following topics:

- EA and EMPr conditions and roles/responsibilities (tailored to specific teams depending on their individual roles).
- Emergency preparedness and response procedures.
- Fire prevention and response.
- Procedures/ requirements for working in proximity to sensitive areas.
- Waste management.

- Water management and conservation.
- Code of conduct for interacting with internal and external stakeholders.
- Heritage sites: known heritage sensitives and associated controls as well as potential unknown heritage features and the implementation of the Chance Finds Procedure.

8.11 EMERGENCY RESPONSE PLAN

The DPM and contractor must identify potential emergencies and develop procedures for preventing and responding to them. There are several options for dealing with high priority impacts and risks, as the paradigm has two components, probability and consequence. The design of control measures rests on understanding the cause and effect. Best practice is to intervene with the ultimate factors where feasible, rather than treat the outcomes. Emergency response therefore has the option of reducing probability or reducing the consequence while reducing the probability is the preferred option.

The DPM and Contractor shall be required to develop and implement an Emergency Preparedness and Response Plan (EPRP) prior to commencing work. The Applicant must ensure that the Emergency Preparedness and Response Plan makes provision for environmental emergencies, including, but not limited to:

- Fire Prevention;
- Fire Emergency Response;
- Spill prevention;
- Spill Response;
- Accidents to employees; and
- Use of hazardous substances and materials, etc.

The DPM and Contractor must ensure that lists of all emergency telephone numbers/contact persons (including fire control) are kept up to date and that all numbers and names are posted at relevant locations.

8.12 SPILL RESPONSE PROCEDURE

The DPM and Contractor must ensure that all employees, staff and labourers are informed and instructed regarding implementation of spill prevention measures and spill response procedures. In the event of a spill, the following general requirements shall apply, and the detailed spill procedure must cater for these requirements:

- Immediately reporting of spills to the relevant supervisor and CEO (this requirement must be including in induction training);
- Take immediate action to contain or stop the spill where it is safe to do so;
- Contain the spill and prevent its further spread;
- Dispose of any contaminated materials according to appropriate waste disposal procedure. Note: Waste from spills of hazardous materials shall be disposed of as hazardous waste at a suitably licensed waste disposal facility;
- The CEO shall record details of the spill in their respective incident and non-compliance register;
- Photographic evidence shall be obtained of the spill clean-up; and
- Relevant waste manifests retained.

In the case of large spills, the services of a specialist spill response agency shall be required, who shall advise on appropriate clean-up procedures and follow-up monitoring (if required).

The Applicant must also, (as per Section 30 of the NEMA) notify the Director-General (DWS, Competent Authority, DFFE), South African Police Services, Provincial Environmental Authority, the Local Municipality, and any persons whose health may be affected of the nature of an incident including:

- Any risks posed to public health, safety and property;

- Toxicity of the substance or by products released by the incident; and
- Any step taken to avoid or minimise the effects of the incident on public health and the environment.

8.13 MEASURES TO CONTROL OR REMEDY ANY CAUSES OF POLLUTION OR DEGRADATION

The broad measures to control or remedy any causes of pollution or environmental degradation because of the proposed activities taking place are provided below:

- Ensure that the environmentally sensitive areas are adequately understood by applicable staff and adequately demarcated;
- Contain potential pollutants and contaminants (where possible) at source;
- Handling of potential pollutants and contaminants (where possible) must be conducted in controlled areas;
- Ensure the timeous clean-up of any spills;
- Implement a waste management system for all waste streams present; and
- Investigate any third-party claims of pollution or contamination as a result of the project activities.

9 MONITORING AND AUDITING

Effective monitoring and auditing are essential components of this Environmental Management Programme (EMPr), ensuring that all impact management actions are properly implemented and maintained throughout the project life cycle. This section outlines the method of monitoring the implementation of the impact management actions, the frequency of monitoring the implementation of the impact management actions, the mechanism for monitoring compliance with the impact management actions, and a program for reporting on compliance. Together, these elements provide a structured approach to safeguarding public health and the environment, enabling timely identification of issues and facilitating continuous improvement in environmental performance.

The sub-sections below set out the requirements for compliance monitoring, auditing and reporting as well as the required environmental monitoring necessary to quantify and verify the impact on the environment.

9.1 AUDITING AND REPORTING PROCEDURES

Reporting procedures must be developed at the start of the project, for conveying information from the compliance monitoring activities and to ensure that management is able to take rapid corrective action should certain thresholds be exceeded. Different reporting procedures may include:

- Inspections;
- Accidents and emergencies;
- Measuring performance indicators and interpreting and acting on the indicators;
- Records of monitoring activities to test the effectiveness of mitigation measures and impact controls, as well as for compliance auditing purposes; and
- Training programmes and evidence of appropriate levels/amount of skills/capacities created.

All monitoring and auditing must be accompanied by applicable records and evidence (e.g. delivery slips, photographic records, etc.). All reports must be retained and made available for inspection by the Applicant, the IEA, the ECO and /or the Relevant Competent Authorities. All reports shall be signed by the relevant parties to ensure accountability. The Applicant must use the audit report findings to continually ensure that environmental protection measures are working effectively through a system of self-checking. The EMPr should be viewed as a dynamic document aimed at continual environmental performance improvement.

Table 6 stipulates the compliance monitoring and auditing obligations for the relevant development activity phases.

Table 6: Compliance Monitoring

Activity Phase	Audit Deliverable	Description	Responsible Party	Frequency
Construction Phase	Environmental Diary:	These reports must be prepared by the contractors' EO and must aim to monitor and report on day-to-day activities so as to ensure compliance with the relevant authorisations, licences and permits, the approved EMPr, and environmental method statements.	CEO	Daily
	Monthly Compliance Reports (CEO):	These reports must be prepared by the contractors' CEO and must aim to provide a concise monthly performance report, including copies of relevant documents (e.g. waste manifests, incident registers, consultation registers, etc).	CEO	Monthly
	Compliance Audit Reports:	The ECO must compile compliance reports (audits) which are to be submitted to the Applicant for review and correction of non-compliance issues. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified. Depending on the outcome of the authorisation processes it may be a requirement to submit these to the relevant authorities. These compliance audits will comply with the requirements of Appendix 7 of the EIA Regulations.	ECO	Monthly
	Regulation 34 Environmental Audits:	Compiled by the appointed IEA. These compliance audits will comply with the requirements of Regulation 34 and Appendix 7 of the EIA Regulations and must be undertaken at the frequencies specified in the EA, this EMPr, or every 5 years (where not otherwise specified).	IEA	Bi-annually
Operations	Compliance Audit Reports:	The ECO must compile compliance reports (audits) which are to be submitted to the Applicant for review and correction of non-compliance issues. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified. Depending on the outcome of the authorisation processes it may be a requirement to submit these to the relevant authorities. These compliance audits will comply with the requirements of Appendix 7 of the EIA Regulations.	Environmental Control Officer	Annually

9.2 ENVIRONMENTAL MONITORING

The purpose of monitoring is not merely to collect data, but to provide information necessary to make informed decisions on managing and mitigating potential impacts. Monitoring therefore serves the following functions:

- Serve as early warning system to detect any potential negative impacts;
- To provide information to feedback into management controls to avoid, prevent or minimise potential negative impacts;
- Provide quantitative data that can serve as evidence for the presence of negative impacts or the lack thereof;
- Allows for trending, modelling and prediction of future conditions or potential impacts;

Table 7 provides a breakdown of the environmental monitoring requirements for this project.

Table 7: Environmental Monitoring Plan.

Phase	Activity	Performance Indicator/ Target	Roles and Responsibilities	Frequency	Compliance and Reporting Mechanism
Immediate and ongoing	Groundwater Quality	SANS 241 & SAWQG standards and or Water Use License (WUL) Limits.	Developer's Project Manager Hydrogeologist	Quarterly sampling and analysis	Accredited lab analysis; submission to DWS Regional Head; comparison to SANS 241 & SAWQG standards and Water Use License.
Immediate and ongoing	Groundwater Levels	Minimal variation from Baseline Levels.	Developer's Project Manager	Monthly	Manual or automated level logging; data logged and reported
Immediate and ongoing	Water Abstraction Volumes	WUL Limits.	Developer's Project Manager	Monthly	Calibrated mechanical/electronic flow meters; data included in quarterly reports
RP01–RP03: Existing; RP04–RP09: To be drilled prior to construction.	Monitoring Boreholes (RP01–RP09, FH01, FH02, H/BH4)	Qualified Hydrogeologist sign-off.	Developer's Project Manager Hydrogeologist	Monthly levels, quarterly quality	Borehole network expansion; geophysical surveys; aquifer testing (48–72 hrs)
Immediate and ongoing	Surface Water Quality	SANS 241 & SAWQG standards and or Water Use License (WUL) Limits.	Developer's Project Manager Water Quality Specialist	Monthly quality	Accredited lab analysis; submission to DWS Regional Head; comparison to SANS 241 & SAWQG standards and Water Use License
Immediate and ongoing	Biomonitoring	Water Use License and regulations.	Developer's Project Manager Wetland Specialist	Bi-annually during dry and wet season and an annual report.	Biomonitoring by a suitably qualified specialist and as per regulations and the Water Use License.
Operation (once infrastructure is installed and	Stormwater Management (PCD)	Engineering Designs as approved by Department of Water Sanitation.	Developer's Project Manager Environmental Officer	Continuous visual inspection; quarterly water quality	Lined PCD; water balance modelling; GN704 & NEMWA compliance.

Phase	Activity	Performance Indicator/ Target	Roles and Responsibilities	Frequency	Compliance and Reporting Mechanism
operational) ongoing		No obstructions or signs of tears in the lining.			
Pre-construction Construction	Heritage Resources (e.g. Riet06a–m, SG01–SG06, Riet07, Riet08)	Destruction Permit SAHRA requirements and sign-off by qualified archaeologist.	Heritage Specialist Archaeologist ECO	Pre-construction 3 months for permitting; 3 months for excavation; 6 months for grave relocation (if needed) prior to construction. Construction: Phase 2 Mitigation Monitoring	SAHRA permits; stakeholder engagement; buffer zones (30 m for graves); photographic and mapping documentation
Immediate upon discovery during construction	Chance Finds Procedure (Heritage)	Chance Finds Procedure (Heritage) as per specialist study.	ECO Heritage Specialist	As needed during construction	Site demarcation; halt construction; specialist evaluation; contingency planning
Construction and Operation: As per WUL and EMPr conditions	Reporting to Authorities	Proof of submission of reports to and acceptance by authorities.	Developer's Project Manager	Quarterly (groundwater); As required (heritage) As required by WUL and EA and any other permits or licenses and legislation.	Submission to DWS, DEDECT, SAHRA; ECO monthly checklists; mitigation reports

Phase	Activity	Performance Indicator/ Target	Roles and Responsibilities	Frequency	Compliance and Reporting Mechanism
Construction Operation Closure	Hydropedological (Soil Flow Paths & Recharge)	Report signed-off by a hydropedologist suitably qualified and experienced and registered where required.	Contractor Developer's Project Manager ECO	Quarterly inspections; Annual flow path verification	Hillslope hydrology mapping; flow path impact assessments; mitigation effectiveness reviews
Construction Operation Closure	Soil Erosion & Compaction (Hydropedological & Agricultural)	No signs of soil erosion and or compaction.	Contractor Contractor's EO Developer's Project Manager ECO	Throughout construction and operation; Annual soil assessments	Rehabilitation plans; tilling records; erosion control implementation; soil heap management
Construction Operation Decommissioning Rehabilitation	Agricultural Resource Protection – soil fertility and compaction assessments;	EMPr Audit Report Waste Management Plan Spill response plan Rehabilitation plan	Contractor Contractor's EO Developer's Project Manager ECO	Annual soil fertility and compaction assessments; Continuous during construction	EMPr implementation; waste management plans; spill response plans; vegetation re-establishment monitoring
Construction Operation Post-construction	Wetland Buffer Compliance & Rehabilitation	Wetland Buffer Rehabilitation Plan	Contractor Contractor's EO Developer's Project Manager ECO	Weekly inspections during construction; Monthly invasive species surveys; Quarterly vegetation survival surveys	Buffer demarcation; photographic records; invasive species removal logs; ECO sign-off

Phase	Activity	Performance Indicator/ Target	Roles and Responsibilities	Frequency	Compliance and Reporting Mechanism
Construction Operation	Stormwater & Drainage Management	SANS 241 & SAWQG standards and or Water Use License (WUL) Limits.	Contractor Contractor's EO Developer's Project Manager ECO	Monthly inspections; Water sampling during rain events; Daily checks during construction	Water quality logs; discharge point sampling; bunded area inspections; PCD capacity logs
Construction	Pipeline Crossing Wetlands	Rehabilitation plan	Contractor Contractor's EO Developer's Project Manager ECO	Weekly site inspections; ECO sign-off before and after construction	Above-ground pipeline supports; soil horizon reinstatement; vegetation rehabilitation; emergency response protocols
Construction Operation	Waste & Spill Management	Spill kits on site; waste manifests; ECO audits; containment verification	Contractor Contractor's EO Developer's Project Manager ECO	Weekly bund inspections; Incident log reviews	Spill kits on site; waste manifests; ECO audits; containment verification
Post-construction Rehabilitation	Vegetation Rehabilitation & Alien Species Control	Rehabilitation Plan AIP Management Plan	Developer's Project Manager ECO	3, 6, and 12-month vegetation survival surveys; Monthly alien species checks	Rehabilitation progress reports; invasive species removal records; ECO verification
Operation	Revegetation & rehabilitation	Rehabilitation Plan	Developer's Project Manager ECO	Quarterly (for 2 years post-closure)	Vegetation cover assessments; erosion control

Phase	Activity	Performance Indicator/ Target	Roles and Responsibilities	Frequency	Compliance and Reporting Mechanism
Life of operation	Alien species control (AIP Management Plan)	AIP Management Plan	Contractor Contractor's EO Developer's Project Manager ECO	Biannually	AIP mapping; removal records
Pre-construction	Protected plant walkdown	Signed-off report by suitably qualified and registered botanist.	Botanist Developer's Project Manager ECO	Once-off	Permit verification; species tagging
Life of operation	Fire management plan	No fires recorded/reported and or signs of fires.	Contractor's EO	During fire season	Firebreak inspections; training logs
Life of operation	Waste management (Solid Waste Plan)	Waste Management Plan Norms and Standards WML	Contractor Contractor's EO Developer's Project Manager	Weekly	Waste manifests; disposal receipts
Life of operation	Dust management (Dust Management Plan)	Dust Management Plan and National Dust Control Regulations limits.	Contractor Contractor's EO Developer's Project Manager	Monthly	Dustfall monitoring; visual inspections
Life of operation	Environmental awareness training	Copy of topics and discussions and attendance registers.	Contractor Contractor's EO	As needed	Attendance registers; refresher sessions

Phase	Activity	Performance Indicator/ Target	Roles and Responsibilities	Frequency	Compliance and Reporting Mechanism
			Developer's Project Manager ECO		
Life of operation	Pipeline leak detection & erosion mitigation	Leak detection logs.	Contractor Contractor's EO Developer's Project Manager	Weekly	Leak detection logs; vegetation buffer checks
Construction	Noise from construction equipment	Noise Control Regulations	Contractor Contractor's EO	As needed during construction	Noise complaints register; community engagement; equipment inspections
Operation	Operational noise (low-frequency)	Noise Control Regulations	Developer's Project Manager	As needed or upon complaints	Noise sampling at NSRs; equipment maintenance logs
Life of operation	Noise monitoring (ambient surveys)	Noise Control Regulations	Environmental Specialist	Upon complaints or periodically	Type 1 SLM measurements; calibration certificates; survey reports

10 IMPACT MANAGEMENT OUTCOMES AND ACTIONS

This section captures impact management outcomes and actions that are applicable to specific project activities. For each identified aspect or activity, a set of prescribed impact management outcomes and associated actions have been identified. It is important to distinguish in this EMPr between the Impact Management Outcomes and the Impact Management Actions.

- Impact Management Outcomes: These are the desired end states or results that must be achieved to manage, mitigate, or enhance environmental impacts identified. They describe what success looks like in terms of environmental performance (e.g., "No contamination of surface water resources during construction"). These outcomes are measurable and auditable, forming the basis for compliance monitoring and reporting.
- Impact Management Actions: These are the specific measures, tasks, or interventions that must be implemented to achieve the stated impact management outcomes. They detail how the outcomes will be achieved, including operational controls, procedures, and responsibilities (e.g., "Install silt fences and sediment traps along drainage lines before earthworks commence").

Table 8 presents the impact management outcomes and actions applicable to this project, and to which the project must comply.

Table 8: Environmental management outcomes and impacts.

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
Air Quality							
AQ1. Vehicle activity on unpaved roads	• Regular water sprays on unpaved roads to ensure at least 75% control efficiency. Literature indicates an application rate >2 litre/m²/hour should achieve this. • Monthly physical inspection of road surface, daily visual observation of entrained dust emissions from unpaved road surfaces.	Construction Operation Decommissioning	Ongoing for the duration of project phase	Project Applicant / Proponent ECO	Contractor (in the event complaints are received)	NAAQS for PM10 and PM2.5 NDCR for dustfall	National ambient air quality standards and dust control regulations are met at all off-site AQSRs SRs
AQ2. Materials handling and frontend loader	• Drop height into haul trucks to be kept at a minimum for ore and product. • Tipping onto ROM and product storage piles to be controlled through water sprays. This should result in a 50% control efficiency. • Keep material handled by frontend loaders moist to achieve a control efficiency of 50%, especially during dry periods. • Regular clean-up at loading areas	Construction Operation Decommissioning	Ongoing for the duration of project phase	Project Applicant / Proponent ECO	Contractor (in the event complaints are received)	NAAQS for PM10 and PM2.5 NDCR for dustfall	National ambient air quality standards and dust control regulations are met at all off-site AQSRs
AQ3. Wind erosion	• Water sprays at ROM stockpiles can achieve 50% control efficiency. Increase in moisture	Construction Operation	Ongoing for the duration	Project Applicant / Proponent	Contractor (in the event complaints are received)	NAAQS for PM10 and PM2.5	National ambient air quality standards and dust control

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
	content provides higher threshold friction velocity and ensures that particulates are not as easily entrained due to high surface winds. • Wind screens around the stockpile areas could achieve a further 30% control efficiency. • Reshape all disturbed areas to their natural contours. • Cover disturbed areas with previously collected topsoil and replant native species.	Decommissioning	of project phase	ECO		NDCR for dustfall	regulations are met at all off-site AQSRs
Noise							
NOI1 Vehicle activity on unpaved road	Various attenuation measures may be implemented including: • General good practice measures • Maintenance	Construction Operation Decommissioning	Ongoing throughout duration of project phase	Project Applicant / Proponent ECO	Contractor (in the event complaints are received)	Draft Environmental Noise Standards	Draft Environmental Noise Standards met at all off-site NSRs
NOI02 Plant equipment	Various attenuation measures may be implemented including: • General good practice measures. • Specifications and equipment design • Equipment enclosure • Use and siting of equipment	Operation	Ongoing throughout duration of project phase	Project Applicant / Proponent ECO	Contractor (in the event complaints are received)	Draft Environmental Noise Standards	Draft Environmental Noise Standards met at all off-site NSRs .

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
	• Maintenance						
NOI03 Construction and demolishing of structure	• Attenuation measures may be implemented including general good practice measures.	Construction Decommissioning	Ongoing throughout duration of project phase	Project Applicant / Proponent ECO	Contractor (in the event complaints are received)	Draft Environmental Noise Standards	Draft Environmental Noise Standards met at all off-site NSRs
Heritage							
HIA01 General project area	• Implement a chance to find procedures in case where possible heritage finds are uncovered. • Additionally, implement a monitoring brief during any preconstruction/constructional activities (e.g. bush clearing) along the pipeline where it goes through the approximated Iron Age localities seen in the heritage Impact Assessment and Environmental assessment report.	Construction	During construction	Project Applicant / Proponent ECO Heritage Specialist	ECO (monthly/as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under section 34-36 and 38 of NHRA	ECO Monthly Checklist/Report
HIA02 Intangible heritage sites	Riet08 is generally protected by the NHRA, however, no impact is foreseen considering the above ground pipelaying will be constrained to the other side of the road. If development should wish to occur on the memorial crosses' side of the road, Stakeholder Engagement must be followed	Pre-construction	Pre-construction	Project Applicant / Proponent Archaeologist SAHRA	Monthly	Ensure compliance with relevant legislation and recommendations from SAHRA under section 2/3 of the NHRA	Report after construction

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
	to engage with the family on how to move or avoid the memorial cross.						
HIA03 Historical sites	Newly identified site (Riet04) is protected by the NHRA but currently lies outside of the development footprint. Additionally, newly identified Riet07 must be protected by a minimum buffer of 5 m ensured with temporary fencing during construction. Additionally, archaeological monitoring must be ensured during constructional activities 10m away from the site. The potential for burials at Riet07 cannot be overlooked, should burials be discovered through any type of excavation, a 30 m buffer is suggested in place of the minimum 5m buffer currently suggested. All BGG must be retained and avoided with a buffer zone of 30 m as per SAHRA guidelines. If this is not possible, the graves could be relocated after completion of a detailed grave relocation process, that includes a thorough stakeholder engagement component, adhering to the requirements of section 36 of the NHRA and its regulations as well as the National Health Act (Act 12 of 2013) and its regulations.	Pre-construction	After the approval of the Environmental Authorization (EA) and before construction occurs	Project Applicant / Proponent ECO Archaeologist		Ensure compliance with relevant legislation and recommendations from SAHRA under section 35, 36 and 38 of the NHRA	ECO Monthly Checklist/Report
HIA04 Archaeological	Previous mitigation measures of Site 1 (Coetzee 2008) included:	Construction	Construction/ During Construction	Project Applicant / Proponent Archaeologist	Monthly	Ensure compliance with relevant legislation and recommendatio	ECO Monthly Checklist/Report after construction

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
l sites	• The settlement should be surveyed and mapped. • Apply for a permit from the SAHRA for the construction of a training/educational centre on the site. • Conservation management plan must be compiled for the site. PGS is in agreement with the original recommendations. However, current non-compliance has led to the situation where it has already been destroyed./damaged with a section of the site remaining. Therefore, PGS newly proposes a Phase 2 mitigation, which includes excavations at Site 1/Riet06a-m and Riet03, site layout drawings, photographic records and a mitigation report along with SAHRA permits must be completed in a rescue effort for the site before construction may begin for the Chrome Wash Plant Expansion. It should be noted that the Phase 2 mitigation will include not just the affected Site 1/Riet06a-m and Riet03, but also the identified larger Iron Age complex identified through aerial photography to understand the occupation of the site as a whole. The potential for burials at Site 1/Riet06a-m cannot be overlooked, should burials be discovered a 30 m buffer is indicated. All BGG should be retained and avoided with a buffer zone of 30 m as per SAHRA guidelines. If this is not possible, the graves			SAHRA ECO Heritage specialist		ns from SAHRA under sections 35, 36 and 38 of NHRA	

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
	could be relocated after completion of a detailed grave relocation process, that includes a thorough stakeholder engagement component, adhering to the requirements of section 36 of the NHRA and its regulations as well as the National Health Act (Act 12 of 2013) and its regulations. Previous mitigation measures of sites SG01-SG06 and US01 (Coetzee 2014) included: • Damage to Heritage site would constitute a wilful act and the perpetrator(s) could face criminal prosecution • The Heritage Sites will be clearly demarcated. • A buffer zone of at least 50 metres will be maintained between the Plant Operation and Heritage site. • Prohibiting access to and any form of interference with the Heritage sites by unauthorised persons. • All relevant Clover Alloys personnel and contractor personnel will be properly briefed on the locations of the sites and the importance of avoiding damage to them. • Heritage site could become a tourist attraction in conjunction						

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
	with the North West Government Tourist Department. PGS is in agreement with the original recommendations. However, current non-compliance has led to the situation where it has already been destroyed/damaged with only potentially site SG05 remaining. Therefore, PGS newly proposes a Phase 2 mitigation, which includes excavations at SG01, SG02, SG03, SG 04, SG 06 and US01, site layout drawings, photographic records and a mitigation report along with SAHRA permits must be completed in a rescue effort for the site before construction may begin for the Chrome Wash Plant Expansion. It should be noted that the Phase 2 mitigation will not include SG05 as it possibly remains undisturbed. Instead a 30 m buffer is suggested. All BGG must be retained and avoided with a buffer zone of 30 m as per SAHRA guidelines. Should that not be feasible, the grave if confirmed could be relocated after completion of a detailed grave relocation process, that includes a thorough stakeholder engagement component, adhering to the requirements of section 36 of the NHRA and its regulations as well as the National Health Act (Act 12 of 2013) and its regulations.						
Groundwater							
GW01	Currently there are no groundwater monitoring boreholes at the Rietfontein Chrome Plant. Geophysical surveys need to	Construction Operation	Prior to construction and ongoing	Project Applicant / Proponent	Monthly water levels and quarterly	Ensure compliance	No legal directives Legal compliance audit scores

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
	be conducted on site and around the facility to determine the placement of monitoring boreholes in an upgradient position, on-site and down gradient position of the stockpiles, pollution control dam and plant.		throughout lifespan of mine		groundwater quality samples	with relevant legislation	
GW02	Monitoring of abstraction boreholes water quality to ensure water quality is to standard required by plant.	Construction Operation	Prior to construction and ongoing throughout lifespan of mine	Project Applicant / Proponent	Monthly water levels and quarterly groundwater quality samples	Ensure compliance with relevant legislation	No legal directives Legal compliance audit scores
GW03	48–72-hour aquifer testing of the three boreholes (RP01, RP02 and RP03) to determine a sustainable yield for the aquifer and the effect on each other.	Construction Operation	Prior to construction and ongoing throughout lifespan of mine	Project Applicant / Proponent	One off	Ensure compliance with relevant legislation	No legal directives Legal compliance audit scores
GW04	Monitoring of abstraction volumes and monitoring boreholes water levels to ensure abstraction rates are sustainable and managed.	Construction Operation	Prior to construction and ongoing throughout lifespan of mine	Project Applicant / Proponent	Daily measurement of abstractions rates through flow meter on abstraction boreholes	Ensure compliance with relevant legislation	No legal directives Legal compliance audit scores
GW05	Stormwater management infrastructure through a lined PCD dam will be in place to mitigate the risk to groundwater.	Construction Operation	Prior to construction and ongoing throughout lifespan of mine	Project Applicant / Proponent	Once off	Ensure compliance with relevant legislation	
Soils and Agriculture							

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
SOIL01	Cleared areas must be rehabilitated and stabilised to avoid impacts to adjacent areas	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor Environmental Officer	Throughout phase	Rehabilitation implemented	Implement a rehabilitation plan
SOIL02	Make use of existing access routes as much as possible before new routes are considered. Any selected "new" route must be authorized, minimizing disturbances to the wetland areas.	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor Environmental Officer	Throughout phase	All routes authorised	Design engineer to consider this for final layout
SOIL03	Keep excavation and soil heaps clear of potential contaminates or waste	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor Environmental Officer	Throughout phase	Soil heaps are managed	Separate topsoil and sub-soil
SOIL04	Lightly till any disturbed soil around the development footprint to avoid compaction	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor Environmental Officer	Throughout phase	Plan is implemented	Implement a rehabilitation plan
SOIL05	Ensure soil stockpiles sand are sufficiently safeguarded against rain wash	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor Environmental Officer	Throughout phase	Plan is implemented	Implement soil management plan
SOIL06	The use of herbicides is not recommended (opt for mechanical removal).	Construction	Prior to construction and ongoing throughout	Contractor Environmental Officer	Throughout phase	Avoided buffer area	Demarcate buffer area

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
			lifespan of mine				
SOIL06	Make sure all excess consumables are removed from site and deposited at an appropriate waste facility	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor Environmental Officer	Throughout phase	Restricted to demarcated area	Restrict to designated working/storage/se rvice areas
SOIL07	Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g., concrete) in such a way as to prevent them leaking and entering wetlands or buffer areas	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor Environmental Officer	Throughout phase	Restricted to demarcated area	Restrict to designated working/storage/se rvice areas
SOIL08	Provide appropriate sanitation facilities for workers during construction and service them regularly	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor Environmental Officer	Throughout phase	Ablution facilities provided and serviced	Provide service ablution for contractors/labour
SOIL09	The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected must be disposed of at a licensed disposal facility	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor Environmental Officer	Throughout phase	Plan is implemented	Implement waste management plan
SOIL10	The Contractor must be in possession of an emergency spill kit that must be complete and available at all times on site	Construction	Prior to construction and ongoing throughout lifespan of mine	Contractor Environmental Officer	Throughout phase	Plan is implemented	Implement spill response plan
SOIL11	Any possible contamination of topsoil by hydrocarbons must be avoided. Any	Construction	Prior to construction	Contractor	Throughout phase	Plan is implemented	Implement spill response plan

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
	contaminated soil must be treated in situ or be placed in containers and removed from the site for disposal in a licensed facility		and ongoing throughout lifespan of mine	Environmental Officer			
SOIL12	Implement dust suppression on stockpiles like the gravel roads.	Construction Operational	Prior to construction and ongoing throughout lifespan of mine	Contractor Environmental Officer	Throughout phase	Plan is implemented	Implement scheduled dust suppression plan
SOIL13	Implement erosion control methods like mulching, geotextile sheets, reduce soil compaction, chemical spills which can affect soil fertility.	Operational	From operational and ongoing throughout lifespan of mine	Developer's Project Manager	Throughout phase	Implement an alien vegetation management plan	Implement an alien vegetation management plan
SOIL14	Ensure successful rehabilitation of areas disturbed during construction and these areas are stabilized to avoid impacts to adjacent areas	Operational Decommissioning and rehab	From operational and ongoing throughout lifespan of mine including Rehabilitation and closure Phase	Contractor Environmental Officer	Throughout phase	Implement soil re-vegetation, spillage or residual waste contamination rehabilitation plan	Should be assessed once a year for soil compaction, fertility, and erosion.
SOIL15	Rehabilitation of the Project area will be undertaken, including the ripping of the compacted soil surfaces and establishment of vegetation.	Decommissioning and rehab	Rehabilitation and closure Phase	Contractor Environmental Officer	Throughout phase	Implement soil compaction rehabilitation	Implement erosion control, revegetation and alien vegetation management plan on disturbed areas
SOIL16	Ensure rehabilitation of contaminated soil by removal of pollutants by implementing	Decommissioning and rehab	Rehabilitation and closure Phase	Contractor Environmental Officer	Throughout phase	Implement soil spillage or residual waste	Should be assessed once a year for soil compaction,

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
	methods such as bioremediation and phytoremediation					contamination rehabilitation plan	fertility, and erosion.
Palaeontology							
Paleo01	Mitigation involves the collection and documentation of fossils, together with recording data on the surrounding sedimentary matrix within the proposed development footprint by a qualified palaeontologist. This work should be undertaken after preliminary vegetation clearance but prior to ground levelling for construction. Excavation of fossil heritage requires a permit from the South African Heritage Resources Agency (SAHRA), and all recovered material must be curated in a recognised institution with the necessary permit. All fieldwork and reporting must comply with the minimum standards for palaeontological impact assessments set by SAHRA. These measures should be incorporated into the Project's Environmental Management Programme (EMPr).	Operation	Operation	Developer's Project Manager and specialist	None	Fossils	Finding of fossils
Vegetation and Habitats							
TER01	Offsets may be required for the CBA 2 areas, and at the required ratio for the EN ecosystem, pending discussions with the provincial authorities. Offsets are at the discretion of the department.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager	Ongoing	Develop Offset Strategy	Offset Strategy

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
TER02	Mitigation measures and buffers must be implemented as stipulated in the wetland report (TBC, 2025).	Planning Phase, Pre-Construction	Planning Phase, Pre-Construction	Developer's Project Manager Contractor Environmental Officer	Ongoing	Buffer implementation	Buffer demarcation
TER03	Laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) must be limited to already modified areas and should take up the smallest footprint possible.	Construction	Construction Phase	Developer's Project Manager Contractor Environmental Officer	Ongoing	Minimum laydown footprint	Site plan
TER04	It is recommended that areas to be developed/disturbed be specifically demarcated so that during the construction/activity phase, only the demarcated areas be impacted upon.	Construction	Construction Phase	Developer's Project Manager Contractor Environmental Officer	Ongoing	Development demarcation	Site plan
TER05	Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager	Ongoing	Maintenance of indigenous vegetation units	Biodiversity management
TER06	The clearing of vegetation must be minimised where possible. All activities must be restricted to within the authorised areas.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor Environmental Officer	Ongoing	Minimise vegetation clearing	Boundary compliance checks
TER07	Materials may not be stored for extended periods of time and must be removed from the PAOI once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be	Construction Operation	Construction and Operational Phase	Developer's Project Manager Contractor Contractor's Environmental Officer	Ongoing	Temporary storage areas	Storage logs & site clearance certificates

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
	allowed outside of the designated laydown areas.						
TER08	Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species. All grazing mammals must be kept out of the areas that have recently been re-planted.	Operation	Operational phase	Developer's Project Manager	Quarterly for up to two years after the closure	Revegetation	Rehabilitation progress reports & vegetation monitoring
TER09	All activities must make use of existing roads and tracks as far as practically and feasibly possible. No new roads are to be constructed under any circumstance. Parking of vehicles may only occur in already modified areas.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager	Ongoing	No construction of new roads	Vehicle movement logs & site maps
TER10	A habitat rehabilitation plan must be compiled and implemented for all areas that must be rehabilitated back to Thornveld.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager	Ongoing	Rehabilitation plan development & implementation	Rehabilitation plan & monitoring reports
TER11	A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. The water resources must to be protected and all activities that could result in a spill should occur away from them. • Drip trays or any form of oil absorbent material must be placed underneath	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor Contractor's Environmental Officer	Ongoing	Zero hydrocarbon spills	Spill incident logs & equipment inspection records

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
	vehicles/machinery and equipment when not in use. • No servicing of equipment on site unless necessary. • All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. • Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment. • Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting the functioning of the ecosystem. All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the PAOI.						
TER12	It must be made an offence for any staff member to remove any indigenous plant species from the PAOI or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor Contractor's Environmental Officer	Ongoing	No movement of plants into or out of site (outside of rehab)	Staff induction records & incident reports
TER13	A protected plant walkdown must be conducted prior to development activities to confirm the presence and location of any protected plant species that may be found on site. The confirmed protected tree species (*Sclerocarya birrea*) is not to be disturbed in any way without acquiring the	Planning Pre-construction	Planning Phase, Pre-Construction	Developer's Project Manager Contractor Contractor's Environmental Officer	Once-off	Protected plant walkdown	Walkdown report & permit records

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
	relevant permits for its relocation or destruction.						
TER14	Areas that have been disturbed but will not undergo development must be revegetated with indigenous vegetation.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager	Ongoing	Revegetation	Rehabilitation records & site inspections
TER15	A fire management plan needs to be compiled and implemented to restrict the impact fire would have on the surrounding areas.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor	During Phase	Implementation of fire management plan	Approved plan & fire drill records
TER16	All construction waste must be removed from site at the closure of the construction phase.	Construction	Construction phase	Contractor Contractor's Environmental Officer	During Phase	Waste removal	Waste removal certificates & site clearance reports
Fauna							
FAU01	A qualified environmental control officer must be on site when activities begin. A site walk through must be performed by a suitably qualified ecologist prior to any activities taking place and any SSC or protected species should be noted. In situations where these species are observed and must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development and implementation of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated.	Construction	Construction Phase	Developer's Project Manager ECO Contractor Contractor's Environmental Officer	During phase	Site walkthrough	ECO attendance register & walk-through report

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
FAU02	Clearing and disturbance activities must be conducted in a progressive linear manner, always outwards and away from the centre of the PAOI and over several days, so as to provide an easy escape route for all small mammals and herpetofauna.	Construction	Construction Phase	Developer's Project Manager Contractor's Environmental Officer	Ongoing	Progressive land clearing operations and the movement of fauna	Clearing schedule & daily logs
FAU03	The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.	Construction Operational	Construction/ Operational Phase	Developer's Project Manager Contractor's Environmental Officer	Ongoing	Site demarcation & signage	Site inspection & incident reports
FAU04	The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance on fauna.	Construction	Construction	Developer's Project Manager Contractor's Environmental Officer	Ongoing	Disturbance over shortest feasible time	Construction schedule & completion reports
FAU05	Noise must be kept to an absolute minimum during the evenings and at night to minimise all possible disturbances to amphibian species and nocturnal mammals	Construction	Construction	Developer's Project Manager Contractor's Environmental Officer	Ongoing	No construction noise at night	Noise monitoring logs
FAU06	No trapping, killing, or poisoning of any wildlife is to be permitted and must be made a punishable offense.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor's Environmental Officer	Ongoing	Zero tolerance for wildlife harm	Incident reports and staff disciplinary records
FAU07	Outside lighting should be designed and limited to minimise impacts on fauna. All outside lighting should be directed away from any sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible.	Construction Operational	Construction/ Operational Phase	Developer's Project Manager Contractor Contractor's Environmental Officer	Ongoing	Use of sodium vapor lights	Lighting plan & site inspections

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
FAU08	All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited.	Operation Construction Decommissioning	Life of operation		Ongoing	100% of operators to complete environmental induction & comply with speed limits	Training records & speed monitoring logs
FAU09	Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons. In this case, activities should take place during the day.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor's Environmental Officer	Ongoing	Activities should take place during the day	Activity schedule & ecological monitoring
FAU10	Any holes/deep excavations must be dug in a progressive manner and should not be left open overnight. Should any holes remain open overnight they must be properly covered temporarily to ensure that no small fauna species fall in. Holes must be subsequently inspected for fauna prior to backfilling.	Planning Construction	Planning and Construction	Developer's Project Manager Contractor's Environmental Officer	Ongoing	No open holes overnight	Excavation logs & inspection records
FAU11	If fencing is required: wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area.	Planning Construction	Planning and construction	Developer's Project Manager Contractor's Environmental Officer	Ongoing	Installation of wildlife permeable fencing where required	Fencing design & installation records
Invasive Alien Plants							
AIP01	An Alien Invasive Plant Management Plan must be compiled and implemented. This should be regularly updated to reflect the annual changed in AIP composition.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor's Environmental Officer	Twice a year	Compile, implement, & update the plan annually	Plan document & annual review reports

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
AIP02	The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths.	Operation Construction	Construction/ Operational Phase	Developer's Project Manager Contractor's Environmental Officer	Life of operation	Keep all construction footprints to the minimum and within demarcated areas	Site maps and inspection reports
AIP03	A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor's Environmental Officer	Life of operation	Implement pest control plan with no use of poisons	Plan & pest monitoring records
Dust Pollution							
DUST01	Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all areas of construction or bare ground. This includes wetting of exposed soft soil surfaces.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor's Environmental Officer	As per the air quality report and the dust monitoring program.	Apply dust suppression	Dust monitoring results and suppression logs
DUST02	A dust management plan must be compiled and implemented.	Operation Construction Decommissioning	Life of Operation	Developer's Project Manager Contractor's Environmental Officer	Dust monitoring program	Compile & implement a dust management plan before construction	Plan & dustfall monitoring reports
Waste management							
WM01	Waste management must be a priority and a Solid Waste Management Plan must be developed and implemented. All waste must be collected and stored effectively. All solid waste collected shall be disposed of at a licensed disposal facility	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor	Weekly	All waste collected, stored, and disposed at licensed facilities	Waste manifests & disposal certificates

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
WM02	Litter, spills, fuels, chemical and human waste in and around the PAOI must be minimised and controlled according to the waste management plan.	Construction Closure	Construction/ Closure Phase	Developer's Project Manager Contractor's Environmental Officer	Daily	Zero visible waste	Daily inspection logs
WM03	Cement mixing may not be performed on the ground. It is recommended that only closed side drum or pan type concrete mixers be utilised. Any spills must be immediately contained and isolated from the natural environment, before being removed from site.	Construction	Construction Phase	Contractor's Environmental Officer	Every occurrence	No cement mixing on ground	Incident logs & site inspections
WM04	Toilets at the recommended Health and Safety standards must be provided. These should be emptied regularly and once no longer required, they must be pumped dry to prevent leakage into the surrounding environment and removed from site.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor Contractor's Environmental Officer	Daily	Toilets per Health and Safety standards	Toilet maintenance logs
WM05	The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility within every 10 days at least.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor Contractor's Environmental Officer	Ongoing	Waste bins & timeous disposal	Bin logs & waste collection records
WM06	Where a registered disposal facility is not available close to the PAOI, the Contractor shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor Contractor's Environmental Officer	Ongoing	No burning of waste	Method statement & inspection reports
WM07	Refuse bins must be emptied and secured. Temporary storage of domestic waste must be in covered waste skips. Maximum domestic waste storage period will be 10 days. Recycling is encouraged.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor	Ongoing	All bins secured & covered	Site inspection & recycling records

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
				Contractor's Environmental Officer			
Environmental Awareness Training							
AW01	All personnel to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of species, their identification, conservation status and importance, biology, habitat requirements and management requirements within the Environmental Authorisation and the EMPr.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor's Environmental Officer	As needed	100% of personnel to complete environmental awareness training before site access	Signed attendance register
Erosion							
ERO01	A habitat rehabilitation and revegetation plan must be developed and implemented to reduce the occurrence of bare soil areas and the associated damage due excessive erosion.	Operation Closure	Operational Phase and Closure	Developer's Project Manager Contractor's Environmental Officer	During Phase	Develop and implement plan	Plan & rehabilitation progress reports
ERO02	Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds where relevant.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor Contractor's Environmental Officer	Ongoing	Enforce speed limits & wet soil surfaces as needed	Speed monitoring & dust suppression logs
ERO03	Only existing access routes and walking paths may be made use of.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor's Environmental Officer	Ongoing	No new access roads	Route maps & inspection reports

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
ERO04	A stormwater management plan must be compiled and implemented.	Operation Construction Decommissioning	Life of operation	Project manager, Environmental Officer	Before construction phase: Ongoing	Compile & implement plan before construction	Plan & stormwater inspection records
ERO	A pipe leak spill management plan must be put in place to ensure that should there be any pipe leaks, bursts or overflow that it does not run into the surrounding areas. This includes the installation of leak warning and detection systems. Precautions must be taken against the erosion damage that would be caused by unplanned pipe leaks, such as the planting of dense indigenous pioneer grass seeds across all bare earth areas surrounding the pipes. Monitoring of the pipeline must be undertaken to detect leaks and monitoring should be undertaken at least once a week. Water monitoring must also be undertaken to ensure that there has been no runoff into the nearby water sources.	Operation Construction Decommissioning	Life of operation	Developer's Project Manager Contractor Contractor's Environmental Officer	During Phase and Ongoing Monitoring	Zero uncontained pipe leaks	Leak detection logs & water quality monitoring
Wetlands							
WET01	Install the pipeline above ground when crossing the watercourse, ensuring supports span the entire width wherever feasible. Limit all other activities in watercourse areas to those explicitly authorised.	Construction	During watercourse crossing	Developer's Project Manager Contractor Contractor's Environmental Officer ECO	Weekly	100% of watercourse crossings use above-ground supports where feasible; no unauthorised activities in watercourse	Photographic records of crossings
WET02	If supports must be constructed within the watercourse, remove and replace soil in the order it was excavated, with topsoil and	Construction	During excavation and backfilling	Developer's Project Manager Contractor	Daily	Soil horizons reinstated in correct order;	Soil profile photographs, soil stockpile checks for

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
	subsoil stockpiled separately. Store stockpiles on a flat surface outside the watercourse, protected from rain and erosion.			Contractor's Environmental Officer ECO		no evidence of sedimentation or erosion	erosion and photographic record of any backfilled areas
WET03	Minimise the construction footprint and restrict vegetation clearing to the designated construction area. Rehabilitate any disturbances within the watercourse by manually tilling the soil and replanting with native vegetation.	Construction Operation	During and after construction	Developer's Project Manager Contractor Contractor's Environmental Officer ECO	Monthly – Construction Quarterly (1 year) - Operation	No clearing outside demarcated area; 100% of disturbed areas rehabilitated with native species	Vegetation clearance maps; rehabilitation progress reports; native species survival survey data
WET04	Monitor and manage invasive species in disturbed areas.	Construction Operation Decommissioning	Throughout all phases	Developer's Project Manager Contractor Contractor's Environmental Officer ECO	Monthly	No new invasive species established; all detected invasives removed within 2 weeks	Survey and removal records; ECO verification
WET05	Prohibit mixing of chemicals or concrete within the watercourse. Store all fuels and chemical mixtures in a bunded area, away from the watercourse.	Construction	Throughout construction	Developer's Project Manager Contractor Contractor's Environmental Officer	Weekly	Zero incidents of chemical/concrete mixing in watercourse; all storage areas bunded and compliant	Incident log reviews; Storage area inspection, ECO spot checks
WET06	Perform regular maintenance and inspections of the pipeline to ensure its integrity and prevent increased volumes of water (with potential contaminates) from entering the watercourse.	Operation	As per maintenance schedule	Developer's Project Manager ECO	As per maintenance schedule	100% of scheduled inspections completed; no unreported leaks or failures	Maintenance and inspection records

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
WET07	Develop and implement emergency response protocols for potential pipeline leaks.	Operation	Annual drills; as needed	Developer's Project Manager ECO	Annual drills; as needed	Emergency response plan in place and tested; response time within 2 hours of incident	Drill and incident records; ECO review
WET08	Implement and maintain a stormwater management system that diverts clean runoff away from contaminated areas and directs potentially contaminated water to treatment facilities before discharge.	Operation	Throughout all phases	Developer's Project Manager ECO	Monthly	No evidence of contaminated runoff entering watercourse; system operational at all times	Stormwater system inspection logs; water quality analysis reports (turbidity, hydrocarbons, nutrients) at discharge points
WET09	Ensure all dirty water reports to a PCD (Pollution Control Dam).	Construction Operation	Throughout all phases	Developer's Project Manager Contractor Contractor's Environmental Officer ECO	Daily	100% of dirty water directed to PCD; no overflow or bypass events	Capacity and discharge logs
WET10	Regularly inspect and maintain bunded areas around fuel, chemical, and waste storage.	Construction Operation	Throughout all phases	Developer's Project Manager Contractor Contractor's Environmental Officer ECO	Weekly	All bunded areas intact and functional; no leaks or spills detected	Bund inspection checklists; spill incident logs; audit reports
WET11	Ensure all solid and hazardous waste is stored in designated, impermeable areas and regularly removed to licensed facilities.	Construction Operation	Throughout all phases	Developer's Project Manager Contractor Contractor's Environmental Officer	Monthly	No waste stored outside designated areas; all waste removed to licensed	Waste storage inspection and audit reports

No.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
				ECO		facilities within 7 days	
WET12	Prevent any waste dumping or littering near the wetland.	Construction Operation	Throughout all phases	Developer's Project Manager Contractor Contractor's Environmental Officer ECO	Daily	Zero incidents of illegal dumping or littering	Waste storage inspection and audit reports
WET13	Limit vehicle and machinery movement near the wetland to designated routes.	Construction Operation	Throughout all phases	Developer's Project Manager Contractor Contractor's Environmental Officer ECO	Daily	No evidence of off-route vehicle/machinery movement	Access route inspection and audit reports
WET14	Maintain access roads to prevent erosion and sedimentation.	Construction Operation	Throughout all phases	Developer's Project Manager Contractor Contractor's Environmental Officer ECO	Monthly	No visible erosion or sedimentation from access roads	Road condition inspection logs; post-rainfall erosion checklists; maintenance activity logs