



DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT (EMPr)

JG AFRIKA REF NO: 5530

**PROPOSED REHABILITATION OF A SECTION OF
THE EXISTING ROAD D684, AND THE PROPOSED
CONSTRUCTION OF A NEW SECTION OF ROAD TO
LINK THE R104 AND THE D684, AT THE
SIKHULULIWE VILLAGE, NEAR MIDDELBURG,
MPUMALANGA PROVINCE**

March 2023

Competent Authority:



agriculture, rural development,
land & environmental affairs
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

Client:

Mafube Coal Mining (Pty) Ltd

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List of Abbreviations

BA	Basic Assessment
DARDLEA	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme Report
GIS	Geographic Information System
GPS	Global Positioning System
HIA	Heritage Impact Assessment
MDPWRT	Mpumalanga Department: Public Works, Roads and Transport
NEMA	National Environmental Management Act (Act 107 of 1998)
NWA	National Water Act (Act 36 of 1998)
PES	Present Ecological State
RDL	Red Data Listed
SAHRA	South African Heritage Resources Association

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1. INTRODUCTION

It is the intention of Mafube Coal Mining (Pty) Ltd on behalf of the Mpumalanga Department: Public Works, Roads and Transport to provide a new access road to the Sikhululiwe Village, which is located approximately 31.6km east of Middelburg in the Mpumalanga Province. Refer to Figures 1 and 2.

Currently access to the Sikhululiwe Village is obtained via the existing Provincial Road D684, which is a gravel road. The existing D684 takes a detour before joining the R104, with very sharp turns along the way (refer to Figure 1). The D684 runs in a north-south direction and passes the Sikhululiwe Village, situated to the west of the D684.

The residents of the Village approached Mafube Coal Mining (Pty) Ltd (hereafter referred to as Mafube Coal) with their issues and concerns regarding the safety and conditions of the existing access road. The residents requested Mafube Coal to assist with the provision of a new direct and safer access road.

Based on their request, Mafube Coal approached the Mpumalanga Department: Public Works, Roads and Transport with a development concept to provide a new access road to the Village that follows the alignment of the existing D684.



Figure 1: Locality Map (Small)

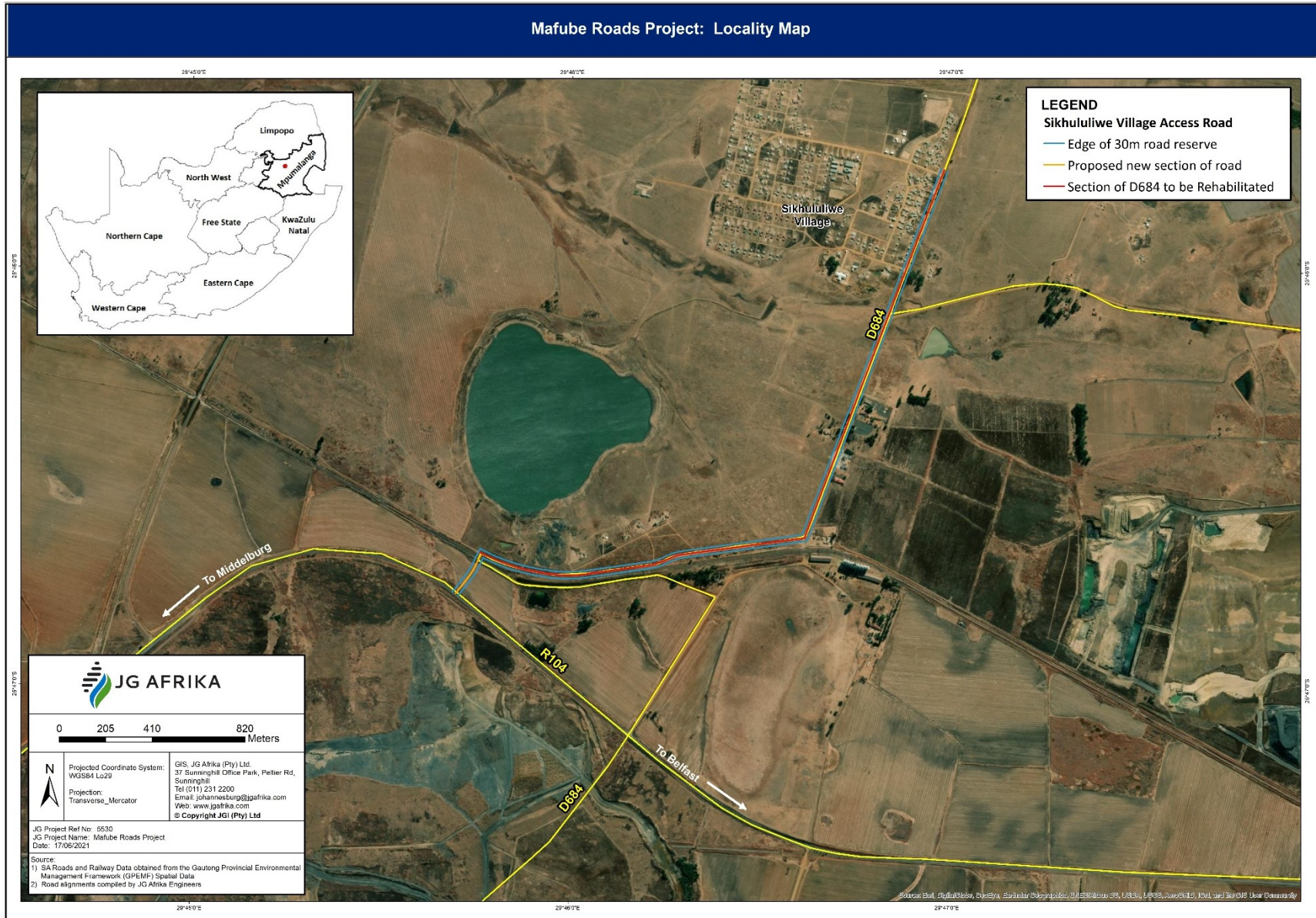


Figure 2: Locality Map (Large)

This EMPr has been compiled in accordance with Government Notice (GNR) 326, Appendix 4 of the Environmental Impact Assessment (EIA) Regulations (2014, as amended). In this regard, the EMPr provides mitigation measures for impacts identified in the Basic Assessment (BA) Report by defining the relevant objectives, outcomes and actions.

In accordance with the Integrated Environmental Management Guidelines published by the Department of Environmental Affairs & Tourism (DEAT) in 1992, the purpose of an EMPr is “to describe how negative environmental impacts will be managed, rehabilitated or monitored and how positive impacts will be maximised”.

Section 28 of NEMA (National Environmental Management Act, Act 107 of 1998) which pertains to “Duty of care and remediation of Environmental Damage” states that: "(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 be reasonably avoided or stopped, to minimise and rectify such pollution or degradation of the environment."

This EMPr must therefore form an integral part of the contract documents between the Mpumalanga Department: Public Works, Roads and Transport and the appointed contractor during the construction phase of the project. This document outlines the methodology and duties required, such that construction can be achieved in an environmentally sustainable manner; with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. Such mitigation measures will have a financial impact on the project’s costings.

This EMPr is a dynamic document that may need to evolve during its implementation period, such that it recognises any new issues that may arise; or changes in the parameters of identified issues which can be addressed with required / amended mitigation.

The Mpumalanga Department: Public Works, Roads and Transport and its contractors are formally notified and are therefore required to take cognisance of the following principles throughout construction:

THE POLLUTER-PAYS PRINCIPLE

This principle provides for “the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.” The Polluter Pays Principle must be rigorously applied throughout the construction phase of this project.

PROGRESSIVE REHABILITATION

Progressive rehabilitation must be undertaken throughout the construction phase of the project where areas have been impacted. Rehabilitation should commence as soon as construction is completed in the specific area and not at the end of the entire project.

2. PROJECT ENVIRONMENTAL ASSESSMENT PRACTITIONER

The EMPr was prepared by JG Afrika (Pty) Ltd. The details of the representative Environmental Assessment Practitioners (EAPs) who prepared the report are detailed in Table 1. Further, Curricula Vitae of the detailed EAPs are provided in Appendix A.

Table 1: Project Team

Name, Position in Firm & Qualification	Years' Experience	Professional Registration	Experience
<p>Mrs Cecilia Canahai</p> <p>Position in Firm: Technical Director / Engineering Geologist</p> <p>Qualification: MSC (Eng Geology), BSc (Eng Geology)</p>	30 Year	Pr.Sci.Nat (Registration No 400011/00)	Cecilia is a Technical Director with over 30 years of experience of which 16 as an Environmental Assessment Practitioner. Cecilia is a member of the International Association for Impact Assessment (IAIA) and the South African Institute for Environmental and Engineering Geologists. She has experience in project management, environmental impact assessments, public participation, environmental management plans and programmes, environmental control auditing, waste management, integrated development plans, and engineering geology.
<p>Mr Tom Speirs</p> <p>Position in Firm: Senior Associate</p> <p>Qualification: Bachelor of Science – University of Natal</p>	34 Years	Pr Sci Nat-Registration No. 400104/94. NHBRC (geotechnical). Registration No. 601708.	Tom Speirs has thirty-four years of experience in the fields of engineering geology, geotechnical and materials engineering. He has undertaken geotechnical, geological and materials work throughout Southern Africa, East, West and Central Africa, Madagascar and eastern Australia. His responsibilities have included all phases of projects from preparing initial proposals and cost estimates through the review and investigation stages to the compilation of completion reports, as well as providing technical input during construction. He currently manages the technical aspects of the geotechnical division in the Pietermaritzburg branch, including mentorship of subordinates, peer review and quality control. His fields of expertise include road and dam geotechnical investigations, foundations, identification of construction material sources, slope stabilisation, engineering geological and land utilisation mapping.
<p>Mrs Sonja van der Merwe</p>	16 Years	Pr.Sci.Nat	Sonja is a senior Environmental Scientist with 16 years of experience in the Environmental

Name, Position in Firm & Qualification	Years' Experience	Professional Registration	Experience
Position in Firm: Senior Environmental Scientist Qualification: BA (Hons) Geography and Environmental Management		(Registration No 115689)	Consultancy Field. She has experience in project management, environmental impact assessments, basic assessments, public participation, environmental management plans and programmes, environmental control auditing, and mine closure planning and Geographic Information Systems. Sonja is a member of the International Association for Impact Assessments (IAIA).

3. ACTIVITY INFORMATION

3.1. Location

The project is located in the Nkangala District Municipality, and the Steve Tshwete Local Municipality within Wards 7 and 9.

The coordinates of the project are provided in Table 2:

Table 2: Project Coordinates

Name	Section	Decimal Degrees (WGS84)		Deg Min Sec (WGS84)	
		X (East)	Y (South)	South	East
Proposed new section of road to be constructed	Start	29.762744	-25.77802	25° 46' 40.872" S	29° 45' 45.878" E
	Mid	29.762248	-25.778876	25° 46' 43.954" S	29° 45' 44.093" E
	End	29.761607	-25.779631	25° 46' 46.672" S	29° 45' 41.785" E
Section of D684 to be Rehabilitated	Start	29.762611	-25.777957	25° 46' 40.645" S	29° 45' 45.400" E
	Mid	29.777207	-25.77671	25° 46' 36.156" S	29° 46' 37.945" E
	End	29.783008	-25.762631	25° 45' 45.472" S	29° 46' 58.829" E

Refer to Figures 1 and 2 (Locality Maps). Copies of these maps are also attached to Appendix A of this EMPr.

3.2. Project Scope

3.2.1. Rehabilitation of a Section of the existing D684

This will involve the rehabilitation of a Section of the existing D684 gravel road, along its current alignment. The section to be rehabilitated is 3.19km in length and is shown in Figures 1 and 2. Coordinates are provided in Table 2. Rehabilitation will involve the resurfacing of the road (tarring of the road), and the upgrading of existing stormwater structures.

The new surfaced section of the D684 will consist of two 3.5m surfaced lanes with 1.5 m unsurfaced shoulders. A road reserve width of 25m will be applicable where space allows. The current road reserve width is also 25m.

New minor culverts may be required along this section to be upgraded. No bridges will be constructed along this section.

3.2.2. New Proposed Section of Road

The new proposed section of road will be 0.21 km (210 m) long and will provide a direct link between the rehabilitated section of the D684 and the R104. The proposed new section of road will have two 3.5 m wide surfaced lanes, with 1.5 m unsurfaced gravel shoulders.

The road reserve will be 30 m wide. This road will be a single carriageway with one lane in either direction.

3.2.3. Other Structures

Culverts will be located at the following locations, as presented in Table 3, along the D684 and the proposed new section of road.

Table 3: Location of Culverts

No	Culvert	Culvert Size	Decimal Degrees (WGS84)		Deg Min Sec (WGS84)	
			Y (South)	X (East)	South	East
1	0+037 New section of road	1 x 600 x 450 BC	-25.7793	29.7618	25° 46' 45.831" S	29° 45' 42.503" E
2	0+085 D684-A	1 x 600 x 450 BC	-25.7684	29.7806	25° 46' 6.423" S	29° 46' 50.120" E
3	0+994.900 D684-B	2 x 1500 x 900 BC	-25.7689	29.7803	25° 46' 8.0992" S	29° 46' 49.423" E
4	1+050.000 D684-B	2 x 1200 x 900 BC	-25.7783	29.7635	25° 46' 42.008" S	29° 45' 48.655" E
5	Village Road 1	750 dia PC	-25.7664	29.7812	25° 45' 59.377" S	29° 46' 52.442" E
6	Village Road 2	750 dia PC	-25.7628	29.7828	25° 45' 46.134" S	29° 46' 58.225" E

The location of the above culverts is depicted in Figure 3.

3.2.4. Physical Size of the Activity

Details about the project footprint is provided in Table 4.

Table 4: Development Footprint

Route Section	Route Length (m)	Servitude Width (m)	Area (m ²)	Area (ha)
New section of road	212.72	30	6,381.72	0.64
Section of D684 to be Rehabilitated	3,218.45	25	80,461.33	8.05

3.2.5. Site Access

The D684 is an existing road and therefore ready access exists for the upgrading of the section of the D684. Access to the new proposed access road is directly gained from the D684. No access road or construction roads will be required during the construction phase.

3.2.6. Preliminary Road Designs

A Preliminary Design for the rehabilitation of the D684 and for the new proposed section of road was compiled by the JG Afrika (Pty) Ltd roads engineers. Copies of the Preliminary Design and the Preliminary Design Report are attached to Appendix C of this EMPr.

3.3. Project Proponent

The Mpumalanga Department: Public Works, Roads and Transport is the project Applicant. The project is funded by Mafube Coal Mining (Pty) Ltd.

3.4. Project Need and Desirability

The existing Provincial Road D684 is a gravel road, which is in a poor condition, especially in wet weather. Access to the Sikhululiwe Village is currently obtained via the D684, however, there is currently no direct access between the D684 and the R104. The existing D684 takes an indirect route to the Sikhululiwe Village. By upgrading the D684, a surfaced road will be provided, which will help with the accessibility to the Sikhululiwe Village during rainy weather. A more direct route is also proposed, to decrease travel time to the village, with the establishment of a link between the existing R104 and the D684.

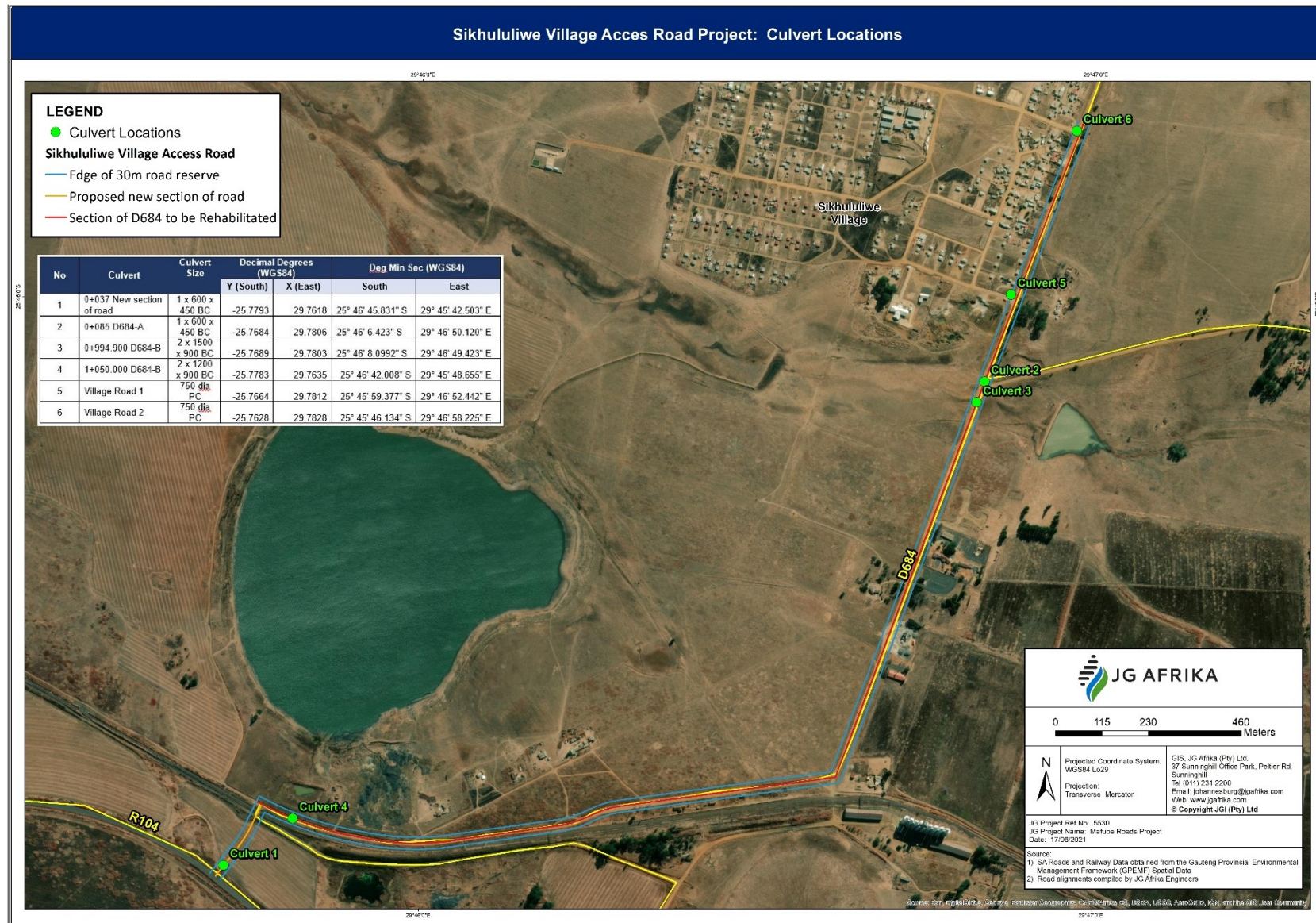


Figure 3: Location of Culverts

3.5. Affected Properties

The rehabilitation of the existing section of D684 gravel road will be undertaken within the existing road reserve, and no private land will be affected by the upgrade.

The proposed new 210 m section of road will be constructed on Portion 7 of the Farm Springboklaagte 416 JS (TOJS00000000041600007), which is currently being used for Agriculture. Portion 7 is owned by the Mafube Coal Mining (Pty) Ltd, and is being leased by Alzu Ondernemings (Pty) Ltd.

The new proposed section of road to be constructed will also cross a Transnet Railway line, at an existing level crossing. Suitable traffic measures will be implemented to improve the existing traffic and pedestrian safety measures.

3.6. Construction Camp

The construction camp will be situated on Mafube Coal property. Once a contractor has been appointed, the contractor should liaise with the Wetland Specialist (EnviRoss CC) to find the best suitable location for the construction camp to ensure that the camp is situated outside of the wetland areas.

3.7. Contractors Camp

No Contractors camp will be established. Contractors will overnight in Belfast or Middelburg and will travel to site daily. Transport will be provided by the contractor.

3.8. Construction Commencement and Duration

Should Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) decide to grant authorisation for this project, construction will likely commence in February 2022. A Water Use Authorisation is also required for this project, which must be in place, prior to the undertaking of any construction activities within areas regulated by the Department of Water and Sanitation.

3.9. Construction Methodology

A construction methodology was compiled by the JG Afrika (Pty) Ltd Roads Engineers. A copy of the construction methodology is attached to Appendix D of this EMPr.

The construction methodology utilised at the wetland crossing will be as follows:

- Prior to the commencement of any construction works within demarcated area a WULA will be obtained.
- The construction will take place during the drier winter months.
- Prior to construction commencing, photographs will be taken of the wetland area.
- The existing road layer works, and pipe culverts will be removed.
- A geotextile membrane will be placed across the wetland area.

- Dump rock will be placed on top of the geotextile membrane to create a pioneer layer.
- The rock fill layer will then be placed using a tipper and the material will be spread by a dozer. Water and roller passes will be as per the project specifications.
- The box culvert slabs will be construction and the box culverts installed using the open cut method.
- Upon completion of the installation of the rock fill layer the remainder of the road will be constructed using standard construction methods.
- Gabion mattresses will be installed at the inlet and outlets of the portal culverts to slow the velocity of the water.

3.9.1. General:

- Construction will take place in half widths with stop/go's so that traffic can utilised the existing portion of road while the other portion of road is being constructed.
- No traffic whatsoever will be allowed in the wetland area.
- Construction will take place during the drier winter months.
- Photographs will be taken throughout the construction process.
- Inspections will take place as per the requirements of the authorisation.
- Any alien vegetation will be removed manually.

A drawing showing the wetland crossings is included in Annexure A of the construction methodology which is attached to Appendix D of this EMPr.

3.9.2. Materials and construction equipment

The following equipment is likely to be used:

- Excavators
- Rollers
- TLB's
- Tipper trucks
- Water carts.

The following materials will be utilised for the construction of the road in the vicinity of the wetland crossing:

- Precast pipe culverts with cast in situ concrete bases
- Pioneer layer (rockfill) of 400mm (minimum) thickness in vlei/pan areas
- A stable subgrade compacted to 90% Mod AASHTO, using impact rolling or a heavy 20 tonne vibratory roller with in-situ subgrade of G10 material class quality
- A 300 mm thick G7/ G9 material class selected layer
- A 125 mm G7 or C5 cement stabilised subbase as an alternative for the detail design
- A 100 mm G4 material class base,
- Single seal surfacing for the general road with a 25 mm thick asphalt at intersections.

3.9.3. Handling of all materials, excess materials, and waste materials

- No construction materials may be stored or disposed of within the wetland area and buffer zone.
- All materials must be disposed of at an approved site
- No concrete batching within the wetland area or buffer zone
- No refuelling may take place within the wetland area or buffer zone.

3.9.4. General Notes:

- All construction will take place in accordance with the Environmental Management Programme Report (EMPr) and any specific requirements stipulated by the Department of Water and Sanitation and Department of Environmental Affairs in the relevant authorisations.
- A detailed method statement for the construction through the wetland will be provide by the appointed contractor prior to construction. This will be signed off by the ECO.

3.10. Provision of Services

During the construction phase a combination of municipal and groundwater will be used. Groundwater will be obtained from registered or licensed boreholes. Electricity will be obtained from the current municipal network within the study area. Back-up generators will be supplied where necessary.

3.11. Construction Waste Management

All solid waste generated during the construction phase will be stored in a designated area at the construction camp in Waste Skips. These skips will be emptied once a week and waste will be taken to the nearest municipal landfill site.

Very little solid construction waste will be generated during the construction phase. Excess backfill material will be spread along the servitude or disposed of at the nearest licensed municipal landfill site. Building rubble and concrete rubble must be disposed of at this landfill site.

3.12. Alternatives Considered

Two alternative alignments were initially investigated by the JG Afrika (Pty) Ltd roads Engineers. One of the alternatives looked at making use of the mine road, however, this alternative was eliminated as it is not feasible due to the safety risks associated.

Only one feasible alternative exists, and it is the alternative presented and discussed in this EMPr.

3.13. Affected Landowners / Communities

The upgrading of the existing D684 gravel road will be undertaken within the existing road reserve, and no private land will be affected by the upgrade.

The proposed new 210 m section of road will be constructed on Portion 7 of the Farm Springboklaagte 416 JS (T0JS00000000041600007), which is currently being used for Agriculture. Portion 7 is owned by the Mafube Coal Mining (Pty) Ltd, and is being leased by Alzu Ondernemings (Pty) Ltd.

The proposed new section of road will also cross a Transnet Railway line, at an existing level crossing. Traffic calming measures will be implemented to improve the existing traffic and pedestrian safety measures.

The residents of the Village approached Mafube Coal with their issues and concerns regarding the safety and poor conditions of the existing access road. The resident requested Mafube Coal to assist with the provision of a new direct and safer access road.

Based on their request, Mafube Coal approached the Mpumalanga Department: Public Works, Roads and Transport with a development concept to provide a new and improved access road to the Village that follows the alignment of the existing D684.

3.14. Employment Opportunities

Employment opportunities will be available during the construction phase of this project, and the local community will get preference. Sourcing and recruiting will be done through the Mafube Local Employment Procedure.

3.15. Operational Phase Details

No potable water will be required during the operational phase. No ablution facilities will be required during the operational phase.

Maintenance of the road will be undertaken if and when required. The most common maintenance activities to be undertaken will be vegetation maintenance within the road reserve, and inspection of the stormwater management infrastructure, and road surface. Road maintenance will be undertaken in accordance with the Mpumalanga Department: Public Works, Roads and Transport's Standard Road Monitoring and Maintenance Plan.

3.16. Future Decommissioning of the Project:

The proposed road upgrade to the Sikhululiwe Village will not be decommissioned in the foreseeable future. The road will become part of the Mpumalanga Road network and will remain in operation for many years to come.

As mentioned earlier in this Report, the residents of the Village requested Mafube Coal to assist with the provision of a new access road, and therefore this new road is needed, and will be needed for years to come as it will serve the village of Sikhululiwe.

4. SENSITIVE ENVIRONMENTS / FEATURES

4.1. Wetlands and Vegetation

The following studies were undertaken by EnviRoss CC in May 2021:

- A Surface Water Ecosystems Ecological, Delineation and Impact Survey. A copy of this specialist report is attached to Appendix E of this EMPr. EnviRoss CC also undertook the DWS Risk Assessment as part of their investigations. The DWS Risk Matrix is also attached to Appendix E.
- A Terrestrial Biodiversity Ecological and Impact Survey. A copy of this specialist report is attached to Appendix E of this Report.

The following conclusions and recommendations were made by EnviRoss:

- *Wetland habitat units were noted to be associated with the proposed development. The units were delineated and are presented in Figure 4.*
- *The development is associated with an existing roadway. Minimal impact significance is expected to occur as the road rehabilitation procedures couple to an existing road.*
- *The proposed new road section was shown to have an association with a wetland unit (Figure 5). Although not considered a fatal flaw due to the wetland unit having already suffered a major loss of ecological functionality, the overall ecological integrity of the immediate area would benefit from a minor alignment shift within this area to accommodate the wetland unit and its associated buffer zone. Figure 5 presents a more detailed account of the interaction that the proposed new section of road (showing the 30 m road reserve) has with the wetland features identified at the site. Although overall ecological functionality would benefit from a shift of the alignment to outside of the wetland features and associated buffers, the extent to which the wetland unit has lost ecological function due to historical land use and infrastructure development means that the development of the new road within this area would impose an impact of little significance to the feature.*
- *The impact significance of the potential impacting features showed medium to low overall significance, with many impacts rendered insignificant with the application of the proposed mitigation measures.*
- *The wetland units were shown to fall within a C to C/D PES class, with the major pressure and driver of ecological change being the existing infrastructure development, and agricultural activities within the catchment areas.*
- *No Red Data Listed (RDL) faunal or floral species were noted during the survey. The development is not thought to impact on RDL species conservation within the region in any significant way.*

- *Erosion control measures and avoidance of indiscriminate habitat destruction outside of the ultimate construction footprint are regarded as the most pertinent mitigation measures.*
- *Culvert development sites must be suitably reinstated and landscaped to avoid erosion formation.*
- *Culverts should be spread over the width of the watercourse so that the surface water flows are not constricted. Designing of culvert placement, numbers and capacities must take into consideration flood flow volumes. Constriction of the watercourse will result in erosion within the channel at the downstream side of the culvert and will also reduce the lateral extent of the associated wetland.*
- *The overall ecological impact significance of the proposed development activities is expected to be low and therefore no justifiable reasons for opposing the development can be offered.*

It should be noted that, to conserve the ecological structures within the region, a holistic habitat conservation approach should be adopted. This includes keeping general habitat destruction and construction footprints to an absolute minimum within the terrestrial habitat as well. Conserving the habitat units will ultimately conserve the species communities that depend on it for survival. This can only be achieved by the efforts of the contractor during the various processes of the construction phase.”

“Preferred Alternative:

No alignment alternatives were presented for analysis at the time of the survey. As the new road section has been shown to impinge on a wetland unit (as shown in Figure 5), the ecological functionality of the wetland unit would benefit from a slight shift in alignment to accommodate this feature. The alignment as presented does not, however, constitute a fatal flaw as the wetland unit has suffered a considerable loss of function due to historical land use and infrastructure development.”

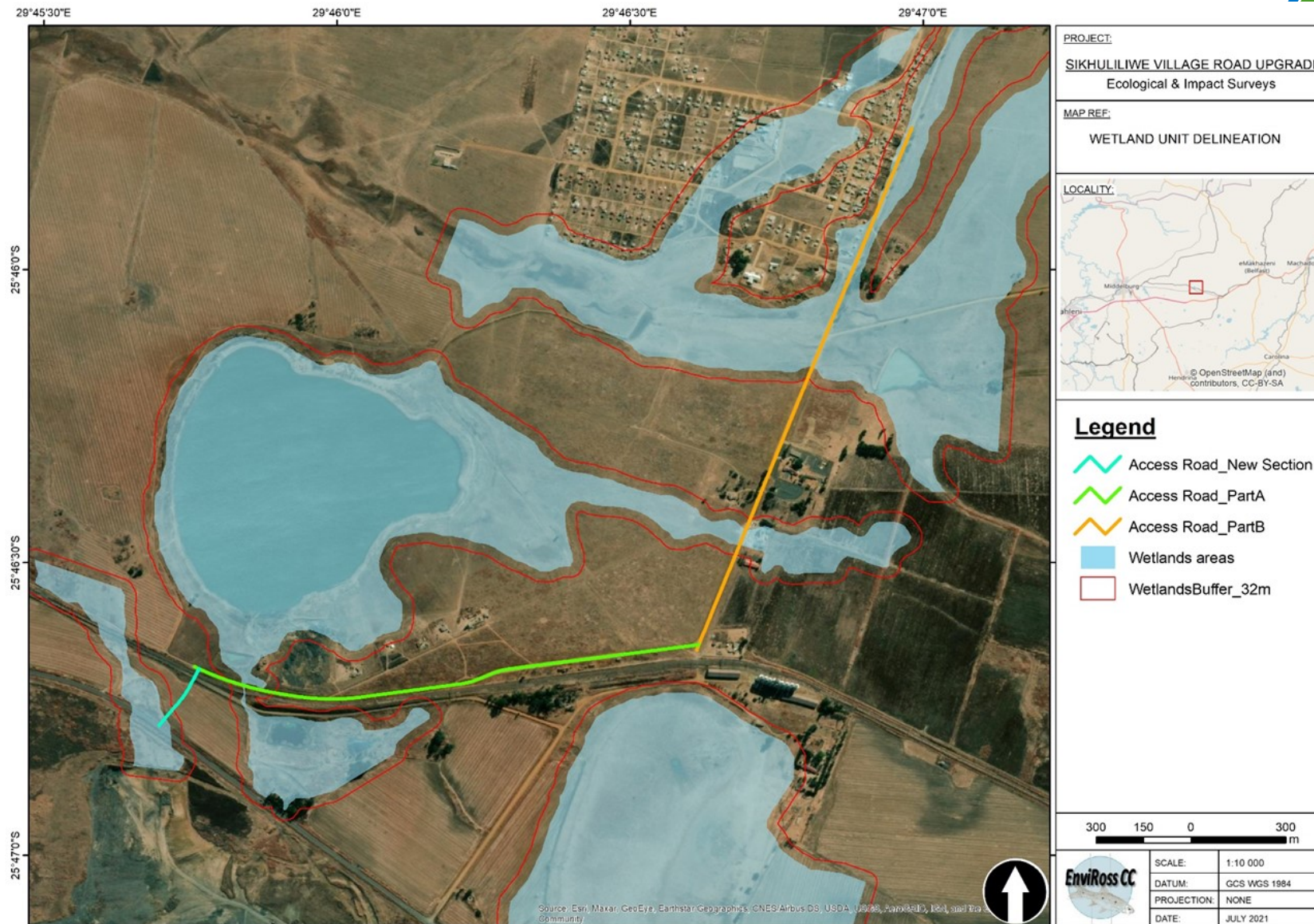


Figure 4: Wetland Habitat Units

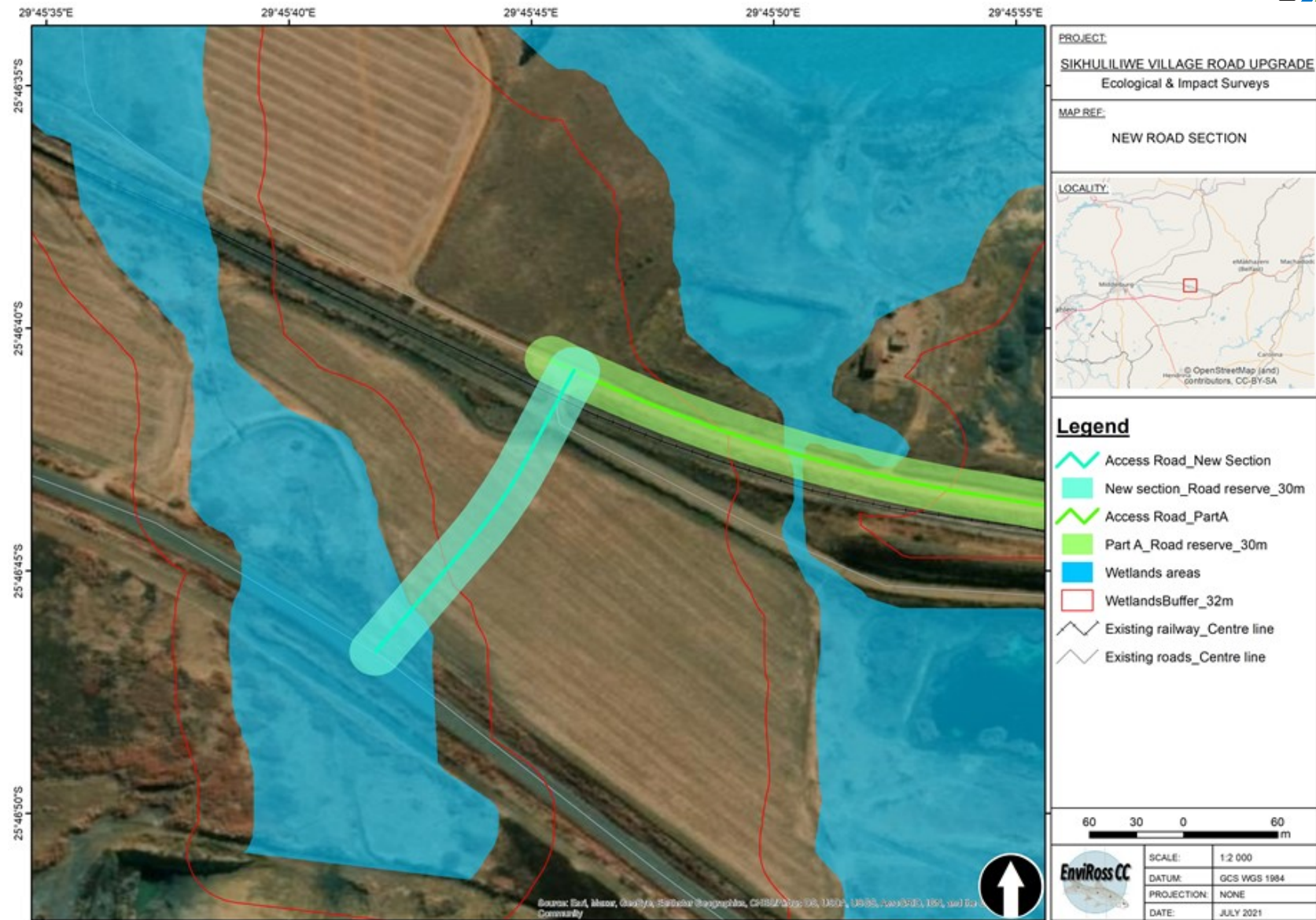


Figure 5: Details of the proposed new section of road and how it interacts with the wetland features identified within the immediate area.

4.2. Archaeological or Cultural Historical Features

A Phase 1 Cultural Heritage Impact Assessment was undertaken by Dr Johnny van Schalkwyk in May 2021. A copy of the Specialist Report is attached to Appendix E of this Report.

A summary of the findings and recommendations by the specialist is provided below:

- *“The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a pre-colonial element (Stone Age and Iron Age) as well as a much later colonial (farmer) component. The latter eventually gave rise to an industrial landscape, consisting of various mines, power stations and railway lines.”*
- *“During the survey the following sites, features or objects of cultural significance were identified.*
- *An informal burial site with at least 35 graves (shown in Figure 6). Most are only marked with stone cairns. In many cases the inscriptions on those with headstones are illegible. The death dates range between 1958 and 2003. Surnames such as Sibanyoni, Mahlangu and Mashiane could be determined. Significantly, according to the inscription on one grave, Adam Maloyi was born on 29 August 1801 and died 11 April 1865. Although the burial site is mostly overgrown with grass and weeds, some graves have recently been cleaned. In addition, the site is properly fenced-off.”*
- *A brick wall must be erected in the place of the wire fence. This wall can then also serve as a billboard where a site notice can be added cautioning drivers to be careful when passing the site.*
- *It should also be noted that it is only the road reserve that will encroach on the burial site and not the road or gravel shoulder of the road.*
- *Should impact on the burial site prove inevitable, full grave relocation is recommended for this site. This measure should be undertaken by a qualified archaeologist, and in accordance with relevant legislation, permitting, statutory permissions and subject to any local and regional provisions and laws and by-laws pertaining to human remains (as outlined in Addendum 12.4 of the attached Phase 1 Cultural Heritage Impact Assessment Report is attached to Appendix E of this EMPr).*

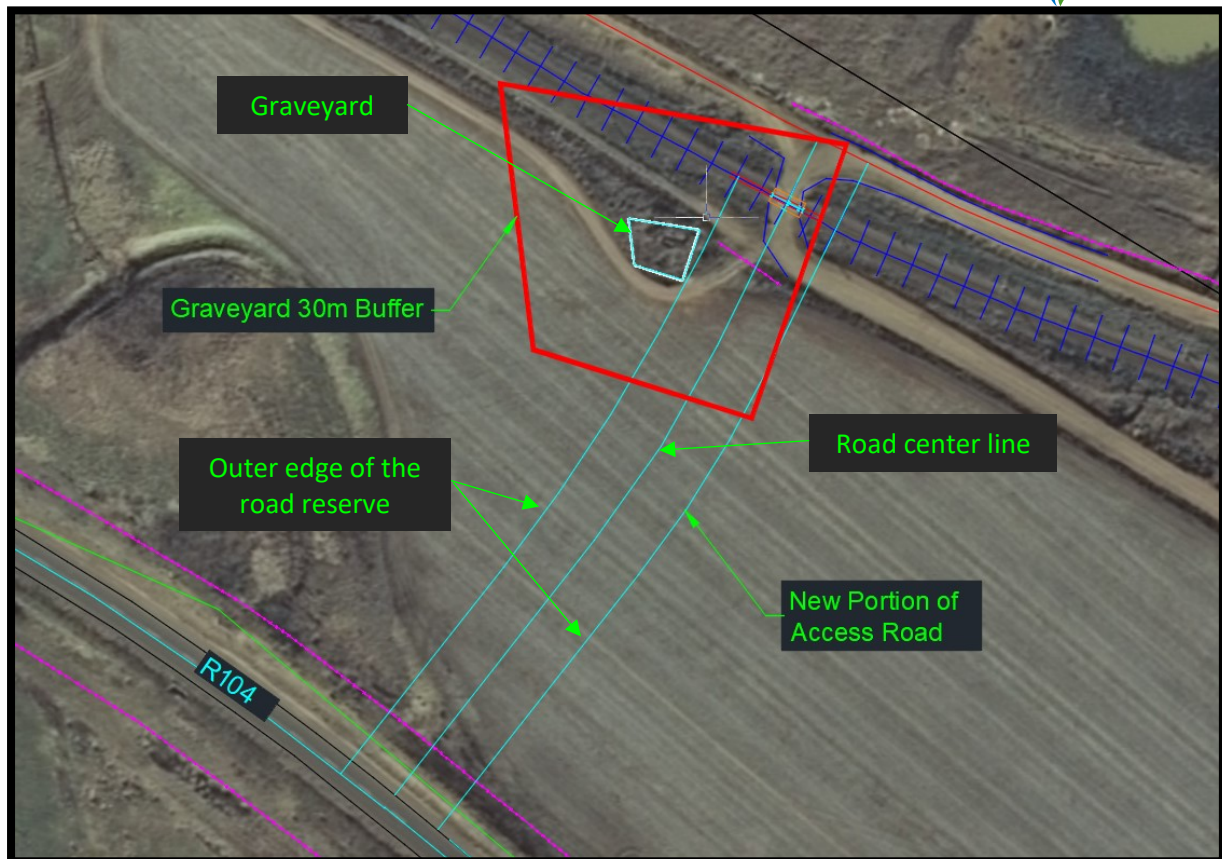


Figure 6: Graveyard buffer vs propped new section of road

4.3. Palaeontological Sensitivity

A Palaeontological Impact Assessment: Phase 1 Field Study was undertaken by Dr Heidi Fourie in May 2021. A copy of this Specialist Report is attached to Appendix E of this EMPr.

- *“The Phase 1: Field Study was undertaken in June and July 2021 in the winter in dry and mild conditions during the official Covid-19 Level 3 and 4 lockdowns, and the following is reported:*
 - *Field Observation: This project is not large, and the entire property is accessible, the Vryheid Formation and Bushveld Complex are present. A maize field is present where the proposed new section of road will be constructed, the existing road is a gravel road. There are several areas with good sandstone and granophyre outcrops. No fossils were found as they are usually not present in the sandstone or granophyre. A cemetery is present. The Project includes one locality Option partly present on the Vryheid Formation in the south.”*
- *“The potential impact of the development on fossil heritage is VERY HIGH and therefore a field survey was necessary for this development (according to SAHRA protocol). A Phase 1 Palaeontological Impact Assessment: Field Study was done. A Phase 2: Mitigation will be recommended if the Phase 1: Field Study finds fossils or if fossils are found during the development.”*
- *Concerns/threats to be added to EMPr:*

- *“Threats are earth moving equipment/machinery (for example haul trucks, front end loaders, excavators, graders, dozers) during construction, the sealing-in, disturbance, damage or destruction of the fossils by development, vehicle traffic, and human disturbance.”*
- *“Special care must be taken during the digging, drilling, blasting and excavating of foundations, trenches, channels and footings and removal of overburden not to intrude fossiliferous layers.”*
- *The recommendations are:*
 - *Mitigation will be needed if fossils are found during the construction.*
 - *No consultation with parties was necessary. The Environmental Control Officer must familiarise him- or herself with the formations present and its fossils.*
 - *The development may go ahead with caution.*
 - *The ECO must survey for fossils before and or after clearing, blasting, drilling, or excavating.*
 - *The EMPr already covers the conservation of heritage and palaeontological material that may be exposed during construction activities. For a chance fossil find, the protocol is to immediately cease all construction activities, construct a 30 m no-go barrier, and contact SAHRA for further investigation.*

5. LEGISLATIVE REQUIREMENTS

5.1. National Environmental Management Act

The Environmental Impact Assessment (EIA) Regulations, 2014, as amended, as promulgated in terms of Section 24(5) and Section 44 of the National Environmental Management Act (NEMA), Act 107 of 1998 consists of the following:

- Regulation 982 provide details on the processes and procedures to be followed when undertaking an Environmental Authorisation process.
- Listing Notice 1 define activities which will trigger the need for a Basic Assessment process.
- Listing Notice 2 define activities which trigger an Environmental Impact Assessment (EIA) process. If activities from both R 983 and R 984 are triggered, then an EIA process will be required.
- Listing Notice 3 define certain additional listed activities for which a Basic Assessment process would be required within identified geographical areas.

The above regulations were reviewed to determine which activities in terms of the above listing notices would be triggered by the proposed project, and what Environmental Authorisation Process would be required. Details of the listed activity triggered is provided in Table 5.

Table 5: Listed Activities triggered in terms of the EIA Regulations, 2014, as amended

Listing Notice and Activity No	Description of the Listed Activity	Applicability of the Activity
Listing Notice 1: 12	<p>The development of—</p> <ul style="list-style-type: none"> (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres: or (ii) <u>infrastructure or structures with a physical footprint of 100 square metres or more.</u> <p>where such development occurs—</p> <ul style="list-style-type: none"> (a) <u>within a watercourse.</u> (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse. <p>excluding—</p> <ul style="list-style-type: none"> (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies. (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies. (dd) where such development occurs within an urban area. (ee) <u>where such development occurs within existing roads, road reserves or railway line reserves;</u> or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development 	<p>“watercourse” means –</p> <ul style="list-style-type: none"> (a) a river or spring. (b) a natural channel in which water flows regularly or intermittently. (c) a wetland, pan, lake, or dam into which, or from which, water flows; and any collection of water which the Minister may, by notice in the <i>Gazette</i>, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998); and <p>a reference to a watercourse includes, where relevant, its bed and banks; and</p> <p>“wetland” means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.</p> <p>The upgrading of the D684 will not trigger this listed activity, as the upgrade will take place within an existing road reserve.</p> <p>The construction of the new section of road will trigger this activity as the new section of road will extend into the wetland area.</p>

Listing Notice and Activity No	Description of the Listed Activity	Applicability of the Activity
	and where indigenous vegetation will not be cleared.	
Listing Notice 1: 19	<p>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles, or rock of more than 10 cubic metres from a watercourse.</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving—</p> <ul style="list-style-type: none"> (a) will occur behind a development setback. (b) is for maintenance purposes undertaken in accordance with a maintenance management plan. (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies. (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies. 	<p>The upgrading of the D684 may require the construction of new minor culverts which may trigger this activity, depending on the extent of the wetland buffers.</p> <p>The construction of the proposed new section of road will trigger this activity, as this new section of road will extend into a wetland area.</p>
Listing Notice 3: 14	<p>The development of—</p> <ul style="list-style-type: none"> (i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres: or (ii) infrastructure or structures with a physical footprint of 10 square metres or more. <p>where such development occurs—</p> <ul style="list-style-type: none"> (a) <u>within a watercourse.</u> (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse. 	<p>In terms of the following data:</p> <ul style="list-style-type: none"> • Council for Scientific and Industrial Research. 2018 National Wetland Map 5 Ecosystem threat status and protection level [Vector] 2018. Available from the Biodiversity GIS website, downloaded on 26 November 2019 <p>The D684 and the proposed new section of road traverse's wetland areas.</p>

Listing Notice and Activity No	Description of the Listed Activity	Applicability of the Activity
	<p>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <p>f. Mpumalanga</p> <p>i. Outside urban areas:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies.</p> <p>(bb) National Protected Area Expansion Strategy Focus areas.</p> <p>(cc) World Heritage Sites.</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.</p> <p>(ee) Sites or areas identified in terms of an international convention.</p> <p>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p> <p>(gg) Core areas in biosphere reserves; or</p> <p>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve, where such areas comprise indigenous vegetation.</p>	

5.2. National Water Act

Section 21 of the National Water Act (Act 36 of 1998) defines a list of activities which require a Water Use Authorisation. Listed activities in terms of Section 21 include the following:

- 21(a) taking water from a water resource.
- 21(b) storing water.
- 21(c) impeding or diverting the flow of water in a watercourse.

- 21(d) engaging in a stream flow reduction activity contemplated in Section 36 of the Act.
- 21(e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1).
- 21(f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
- 21(g) disposing of waste in a manner which may detrimentally impact on a water resource.
- 21(h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process.
- 21(i) altering the bed, banks, course, or characteristics of a watercourse.
- 21(j) removing, discharging, or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people: and
- 21(k) using water for recreational purposes.

Construction activities associated with the Sikhululiwe Village Access Road will occur within a radius of 500m from the delineated edge of these wetland units. Activities (c) and (i) of Section 21 will be triggered, and a Water Use Authorisation will therefore be required for this project. Activity 21(c) is defined in the Act as “impeding or diverting the flow of water in a watercourse”.

5.3. National Heritage Resources Act

In terms of Section 38 of the Heritage Resources Act (Act 25, 1999), a Heritage Impact Assessment must be undertaken for the following developments:

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length.
- The construction of a bridge or similar structure exceeding 50 m in length.
- Any development or other activity which will change the character of a site
 - Exceeding 5 000 m² in extent; or
 - Involving three or more existing erven or subdivisions thereof; or
 - Involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority.
- The re-zoning of a site exceeding 10 000 m² in extent; or
- Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development.

A Heritage Impact Assessment is required in terms of Section 38 of the Heritage Act.

5.4. Mpumalanga Nature Conservation Act No 10 of 1998

The Mpumalanga Nature Conservation Act (No 10 of 1998) (MNCA), which came into commencement from 1 January 1999, provides a legislative guideline pertaining to biodiversity conservation at the provincial level. The MNCA provides a list of prohibited activities pertaining to collecting, hunting (including fishing), and/or destroying biodiversity and natural resources. It provides reference lists of fauna and flora species that (amongst others) are protected due to conservational concerns, trade limitations, collection pressure, habitat transformation and other drivers of ecological change.

6. IMPACT MANAGEMENT OBJECTIVES, ACTIONS AND OUTCOMES

GNR 326, Appendix 4 of the Environmental Impact Assessment (EIA) Regulations (2014, as amended), notes that the identified impacts of development are to be presented with the management actions and outcomes. Table 6 and Table 7 present the required information, together with the responsible person and the frequency to which the management objectives must be monitored during the pre-construction, construction and rehabilitation phases. In this regard, the Contractor, a designated on-site Environmental Manager (EM), an independent Environmental Control Officer (ECO) and the Employer are the custodians of this EMPr.

TABLE 6: Pre-construction management objectives, actions and outcomes

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Pre-Construction Phase - Actions to be completed prior to construction				
Pre-construction activities to be implemented to avoid environmental damage.	<ul style="list-style-type: none"> The contractor must prepare a Construction Site Development Plan to be approved by the ECO prior to establishment on site. This plan must indicate: <ul style="list-style-type: none"> – The boundaries of the site that encompass all construction related activities. – Vehicle and pedestrian access points and routes; and – Laydown area/s, offices, stockpile areas, storage areas, etc. Haulage roads and turning areas must be identified and clearly demarcated. Appropriate temporary traffic control and warning signage must be erected and implemented on all affected roads in the vicinity of the site. Temporary stormwater protection measures must be established. Methods of dust suppression must be formalised. An Emergency Method Statement must be drafted and submitted to the ECO detailing fire, accidental leaks, and spillage procedures, as well as emergency contact numbers. Adequate spill kits and containers for spilled and contaminated material must be provided. Waste bins with lids must be provided on site. 	<p>Limit construction impacts on the receiving environment.</p> <p>Ensure that the contractor, construction workers and site personnel are aware of the relevant provisions of the EMPr.</p> <p>Establish and maintain a record of all complaints and claims against the project and ensure that these are timeously and effectively verified and responded to.</p> <p>Education of the construction staff with regards to environmentally sensitive areas on site.</p>	<p>Implementation: Contractor</p> <p>Inspection: EM</p> <p>Verification: ECO</p>	<p>Implementation: Ongoing</p> <p>Inspection: <i>Ad hoc</i></p> <p>Verification: Monthly</p>

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
	<ul style="list-style-type: none"> • An appropriate number of chemical, portable, toilets (1 toilet for every 20 workers) must be provided for labourers during the construction phase. These must be maintained in a satisfactory condition and be located outside of the wetland areas and the associated 32m buffer areas. • Hazardous materials/dangerous goods should be stored in a clearly marked, lockable, designated storage area. • Material Safety Data Sheets (MSDS's) must be readily available on site for all chemicals and hazardous substances to be used. Where possible and available, MSDS's should additionally include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes. • Unauthorised entry, stockpiling, dumping or storage of equipment, material or waste shall be strictly prohibited in identified no-go areas (to be confirmed on receipt of Environmental Authorisation from the DARDLEA) during all phases of construction. • A Community Complaints Register shall be maintained by the Contractor detailing complaints and issues raised by the community members and the manner in which the problems were resolved. • An Incidents Register must be maintained and kept at the site camp. • Environmental training must be held to ensure all construction personnel are aware of the provisions contained in the EMPr. A record of environmental training undertaken must be kept at the site camp. 			
Site clearing and sensitive areas	<ul style="list-style-type: none"> • A Method Statement is to be developed, which will provide the details of how site clearing will be executed. • All existing infrastructure and structures, including powerlines, existing pipelines, the railway line, and roads are to be identified and taken cognisance of. • Sensitive areas including watercourses and drainage lines must be demarcated prior to commencement of construction activities on site. 	<p>Manage environmental impact associated with site clearing.</p> <p>Ensure that only areas that are specifically designated for the construction purposes are cleared.</p>	<p>Implementation: Contractor</p> <p>Inspection: EM</p> <p>Verification:</p>	<p>Implementation: Ongoing</p> <p>Inspection: Ad hoc</p> <p>Verification:</p>

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
	<ul style="list-style-type: none"> The construction team must be notified of the informal burial ground. The burial ground should be fenced with a brick wall as per the recommendations made by Dr Johnny van Schalkwyk in his Heritage Impact Assessment Report (Appendix E). The wall should be constructed prior to commencement of any site clearance and earthworks. 		ECO	Monthly
Construction camp establishment	<ul style="list-style-type: none"> The construction camp should be positioned on previously disturbed areas (if possible) and outside of the wetland areas and the associated 32m buffer areas. Appropriate stormwater management must be implemented at the construction camp to prevent ponding of water or erosion. Suitable waste bins must be provided within the construction camp. Storage areas / containers containing hazardous substances / material must be clearly signed and fire extinguishers must be located in close proximity. Designated areas for stockpiling of raw material must be provided. All stockpiling must be approved by the EM. Spill kits must be readily available at the construction camp and at construction areas. Drip trays must be readily available. Adequate toilet facilities must be provided at the construction camp for all staff. The camp must be adequately secured. Water for human consumption must be available at the construction camp and at other convenient locations on site. 	Minimise environmental impact associated with construction camp establishment.	Implementation: Contractor Inspection: EM Verification: ECO	Implementation: Ongoing Inspection: <i>Ad hoc</i> Verification: Monthly

TABLE 7: Construction and rehabilitation management objectives, actions and outcomes

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Construction and Rehabilitation Phase				
Access and traffic	<ul style="list-style-type: none"> • Signs must be placed alongside access roads to identify speed limits, travel restrictions and other standard traffic control information. • Speeding is prohibited. Flagmen and other traffic control measures must be implemented during the construction phase. • Any clearing for access or haul roads outside the demarcated works area shall only be undertaken after approval from the Project Manager / EM. • Existing roads shall be used as far as possible for construction purposes. • Access roads to be maintained in a suitable condition. • All utilised access roads are to be reinstated to their original state post construction. • Provide enough heavy vehicle storage areas in the proposed construction camp. • The proposed new section of road will also cross a Transnet Railway line, at an existing level crossing. Traffic calming measures will be implemented to improve the existing traffic and pedestrian safety measures. 	<p>Ensure that construction vehicles use only dedicated access routes to the construction site.</p> <p>Ensure that all road diversions and closures are clearly marked, and appropriate road signage displayed.</p> <p>Ensure that vehicle traffic which may obstruct traffic flow is scheduled outside of peak travelling time in the morning or afternoon.</p> <p>Ensure that heavy / large load traffic is appropriately routed, and appropriate safety precautions are taken to prohibit road collisions and traffic incidences.</p> <p>Ensure that vehicle operators are suitably licensed, have had appropriate environmental and safety induction, are aware of specific site procedures, and are well rested and cognisant when operating heavy or unsafe vehicles / machinery.</p>	<p>Implementation: Contractor</p> <p>Inspection: EM</p> <p>Verification: ECO</p>	<p>Implementation: Ongoing</p> <p>Inspection: Ad hoc</p> <p>Verification: Monthly</p>

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Construction and Rehabilitation Phase				
Management of construction camp and eating areas	<ul style="list-style-type: none"> Stormwater management must be implemented and maintained at the construction camp to avoid standing water or erosion. Designated waste bins / skips must be utilised at all times. Bins must be emptied on a regular basis. Spill kits must be readily available at the construction camp. Eating areas must be designated and demarcated. Litter must be collected on a daily basis. Refuse bins must be placed at all eating areas. Adequate ablution facilities must be provided All construction waste must be disposed of off-site at an approved landfill site, and waste disposal slips must be kept on record at the construction camp. Rehabilitation of the construction camp must commence immediately after completion of construction activities. On completion of the project, the appointed contractor must ensure that all necessary infrastructure contained within the construction camp, including the construction plant, equipment, storage containers and temporary services used during construction are removed. 	Minimise environmental impacts associated within the construction camp and eating areas.	Implementation: Contractor Inspection: EM Verification: ECO	Implementation: Ongoing Inspection: <i>Ad hoc</i> Verification: Monthly
Preservation of vegetation and fauna	<ul style="list-style-type: none"> Construction activities must be restricted to the construction footprint area only. The construction footprint must be kept to an absolute minimum. Workers must be limited to areas under construction within the road reserve. The ecologically sensitive features have been delineated and mapped by EnviRoss CC. Conservation buffer zones have also been designated to these areas. Indiscriminate habitat destruction to be avoided and the proposed development should remain as localised as possible (including support areas and services). The ecological integrity of the wetland unit associated with the proposed new road section would benefit from a minor shift in the road alignment to accommodate the feature and associated buffer zones. The alignment as presented does not, however, constitute a fatal flaw as the wetland unit has suffered a considerable loss of function due to historical land use and infrastructure development. 	Prevention of the introduction and spread of alien invasive species in the area due to construction activities. Preservation of existing fauna and flora	Implementation: Contractor Inspection: EM & ECO Verification: ECO	Implementation: Ongoing Inspection: <i>Ad hoc</i> Verification: Monthly

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Construction and Rehabilitation Phase				
	<ul style="list-style-type: none"> Site personnel must undergo Environmental Training and be educated on keeping any vegetation disturbance to a minimum. All construction areas should be demarcated prior to construction to ensure that the footprint of the impacts is limited (including areas where vehicles may traverse). No animal, reptile or bird of any sort found on site may be killed. This specifically includes snakes or other animals considered potentially dangerous discovered on site. If such an animal is discovered on site an appropriately skilled person should be summoned to remove the animal from the site. Consideration should be given to selection and nomination of such a person prior to site establishment. If no-one is available, training should be provided to at least two site staff members. No construction equipment, vehicles or unauthorised personnel will be allowed onto areas that have been rehabilitated. Post construction, the areas disturbed outside of the road reserve must be rehabilitated by appropriate landscaping, topsoil dressing, alien plant rehabilitation and vegetation establishment. 			
Prevent soil contamination	<ul style="list-style-type: none"> Hazardous materials / dangerous goods must be stored in a clearly marked, lockable, designated storage area. Hazardous materials / dangerous goods must be stored within a bunded area of a 110% of the total storage capacity of the container / tanks, etc. stored within these bunded areas. All stationery vehicles, equipment and receptacles of hazardous waste must be supplied with drip trays to prevent soil contamination. When decanting hazardous substances, drip trays must be used. Drip trays are to be cleaned out daily and material collected disposed of as hazardous waste. Should a spillage occur, absorbent sand (or an appropriate alternative as supplied in a spill kit) must be spread on the affected areas. The contaminated soil must be lifted and placed within an impermeable container or a high-density plastic bag and disposed of at a recognised disposal site. An Incident Report must be completed for spills and saved in the Environmental File to be kept at the construction camp. 	Avoidance of soil contamination Re-use of viable soils in rehabilitation	Implementation: Contractor Inspection: EM & ECO Verification: ECO	Implementation: Ongoing Inspection: <i>Ad hoc</i> Verification: Monthly

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Construction and Rehabilitation Phase				
	<ul style="list-style-type: none"> • Ablution facilities are to be cleaned / emptied on a regular basis by a registered service provider. • Should cement be mixed on site, mixing will take place within a demarcated fenced off concrete batching area at the Contractors Camp. Cement must be mixed on an impervious surface, and water from the cement mixing area should be channelled to a conservancy tank for removal from the site to a licensed disposal facility. • A specific area will be demarcated for the coating and storage of stone chippings. Coating of stone chippings with pre-coating fluid should be undertaken on an impervious surface to avoid soil contamination. The coated stone chippings should be stored on an impervious surface, and stormwater from this storage area should be channelled to a conservancy tank for removal from the site to a licensed disposal facility. • All disturbed areas must be rehabilitated. 			
Prevent soil loss	<ul style="list-style-type: none"> • Erosion must be strictly controlled through the utilization of silt traps, silt fencing, Gabions, etc. This is especially pertinent within areas of steeper gradients. • Topsoil stockpiles should be protected from erosion through the utilization of silt traps, silt fencing, Gabions, etc. • The site must be monitored weekly for any signs of off-site siltation and erosion. All areas impacted by earth-moving activities must be re-shaped post-construction to ensure natural flow of runoff and to prevent ponding. All exposed earth must be rehabilitated promptly with suitable vegetation to stabilise the soil. • Topsoil should be excavated and stockpiled separately from the subsoils to be used during the rehabilitation of the road verges. Drip trays shall be provided in construction areas for stationary plant and for "parked" plant; Drip trays, sumps and bunds must be emptied regularly, especially before a known rain event and after a rain event, and the contents disposed of at a licensed disposal facility. • All vehicles and equipment shall be kept in good working order and serviced regularly; Leaking equipment shall be repaired immediately or removed from the Site. 	<p>Re-use of viable soil in rehabilitation.</p> <p>Prevent loss of topsoil or soils from the site during construction.</p>	<p>Implementation: Contractor & Engineer</p> <p>Inspection: EM and ECO</p> <p>Verification: ECO</p>	<p>Implementation: Pre-construction and prior to implementation of rehabilitation</p> <p>Inspection: Ad hoc and weekly as a minimum</p> <p>Verification: Monthly</p>

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Construction and Rehabilitation Phase				
	<ul style="list-style-type: none"> All areas disturbed during the construction phase (such as road verges etc) shall be rehabilitated as soon as construction activities are completed to prevent erosion issues. The removal of vegetation must be kept to a minimum where possible. The time that soil is exposed must be limited and re-vegetation or another covering method must be applied during the construction and post construction phase. The establishment of exotic plants must be avoided. Where possible the area where construction will take place should be demarcated. Demarcation of the construction areas will ensure that only the required area is cleared of vegetation 			
Material handling, hazardous substances and storage	<ul style="list-style-type: none"> Hazardous substances and materials are those that are potentially poisonous, flammable, carcinogenic or toxic. Examples of these include diesel, petroleum, oil, bitumen, solvent based paints and lubricants. Such substances must be managed appropriately. All hazardous substances are to be stored in a covered, lockable bunded area and handled in accordance with the relevant MSDS. Staff dealing with these materials / substances must be aware of their potential health and environmental impacts and follow the appropriate safety measures. Spill kits must be clearly marked and visible when utilising hazardous or dangerous materials to ensure that all spills are immediately contained and removed. Significant spills must be reported to the Department of Water and Sanitation (DWS) and Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA). Contamination assessments must follow significant spillage events to determine specific risks, impacts and mitigation actions. In the event of a fire, the appropriate fire management system, as per the MSDS and onsite emergency response plan, must be implemented. All vehicles and equipment shall be kept in good working order to reduce the likelihood of oil leaks occurring. All stationery vehicles must be supplied with drip trays to prevent soil contamination. 	Ensure all hazardous substances are handled in accordance with the material safety data sheets (MSDS).	Implementation: Contractor Inspection: EM Verification: ECO	Implementation: Ongoing Inspection: <i>Ad hoc</i> and weekly as a minimum Verification: Monthly

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Construction and Rehabilitation Phase				
	<ul style="list-style-type: none"> Should cement be mixed on site, mixing will take place within a demarcated fenced off concrete batching area at the Contractors Camp. Cement must be mixed on an impervious surface, and water from the cement mixing area should be channelled to a conservancy tank for removal from the site to a licensed disposal facility. A specific area will be demarcated for the coating and storage of stone chippings. Coating of stone chippings with pre-coating fluid should be undertaken on an impervious surface to avoid soil contamination. The coated stone chippings should be stored on an impervious surface, and stormwater from this storage area should be channelled to a conservancy tank for removal from the site to a licensed disposal facility. 			
Water resources	<ul style="list-style-type: none"> Appropriate stormwater / surface water management measures must be put in place before construction commences and maintained throughout the lifetime of the development. Indiscriminate destruction of wetland habitat must be avoided and the construction footprint, which includes the service areas used to facilitate the construction process, must be kept to an absolute minimum. An appropriate number of toilets (1 toilet for every 20 workers) must be provided for labourers during the construction phase. These must be maintained in a satisfactory condition and a minimum of 50m away from any water resources or outside of the wetland areas and the associated 32m buffer areas. Any contaminated water associated with construction activities must be contained in separate areas or receptacles such as Jo-Jo tanks or water-proof drums and must not be allowed to enter into any watercourse. Where necessary sumps must be installed for the containment of contaminated water. Appropriate silt control mechanisms must be installed around all soil excavations to prevent silt from entering the surrounding watercourses. Should any excavations require dewatering, this is to occur through an adequately designed silt trap prior to discharge. All silt traps are to be regularly monitored and maintained to ensure efficient and effective use. 	<p>Ensure that watercourses (wetlands) are protected and incur minimal negative impacts to resource quality.</p> <p>The Environmental Manager will be on site full time during the construction phase to monitor construction activities within wetland areas.</p>	<p>Implementation: All</p> <p>Inspection: EM</p> <p>Verification: ECO</p>	<p>Implementation: Ongoing</p> <p>Inspection: <i>Ad hoc</i> and weekly as a minimum</p> <p>Verification: Monthly</p>

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Construction and Rehabilitation Phase				
	<ul style="list-style-type: none"> Where necessary use must be made of gabions, rock packs, or other such hard-stabilising structures. However, the use of retaining walls constructed of bricks, blocks, or concrete, is not recommended as such structures are often ineffective and can accelerate erosion processes in some cases. Watercourses must be protected from erosion and direct or indirect spills of pollutants, e.g. sediment, sewage, cement, oils, fuels, chemicals, wastewater; All general waste, construction plant equipment, surplus rock, and other foreign materials must be completely removed from site post-construction. The soil excavated from watercourse trenches must be retained and be returned in the reverse order to which it was removed in order to re-establish the original soil profile as best possible. 			
Preserve air quality	<ul style="list-style-type: none"> Heavy vehicles and machinery must be serviced regularly to minimise exhaust fumes. Soil stockpiles must be located in areas to limit the erosive effects of wind. This will serve to limit dust impacts. Removal of vegetation must be avoided until such time as soil stripping is required. This will serve to limit dust impacts. Water or an appropriate environmentally friendly soil stabiliser, must be utilised to suppress dust. Equipment must be operated within its specifications and capacity and must not be overloaded. 	Reduce air quality impacts. Reduce on-site dust.	Implementation: Contractor & Engineer Inspection: EM Verification: ECO	Implementation: Ongoing Inspection: <i>Ad hoc</i> and weekly as a minimum Verification: Monthly
Prevent noise pollution	<ul style="list-style-type: none"> Potential increase in noise from the operation of machinery and equipment, as well as the construction vehicle traffic. Ensure that the potential noise source will conform to the South African Bureau of Standards recommended code of practice, SANS Code 0103:1983, so that it will not produce excessive or undesirable noise when it is released. All the Contractors' equipment shall be fitted with effective exhaust silencers and shall comply with the South African Bureau of Standards recommended code of practice and 	No ambient noise impacts relating to plant operations. Compliance to municipal by-laws. No nuisance conditions created.	Implementation: Contractor Inspection: EM & ECO Verification: ECO	Implementation: Monthly or at the prescribed vehicle/plant manufacturers specifications

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Construction and Rehabilitation Phase				
	<p>the South African National Standard (SANS) Code 0103:1983, for construction plant noise generation.</p> <ul style="list-style-type: none"> Operational Hours: No works shall be executed between sunset and sunrise and on the non-working and special non-working days as stated in the Contract Data unless otherwise agreed between the Engineer and Contractor; and Construction personnel should be made aware of the need to prevent unnecessary noise such as hooting and shouting. Equipment should be operated within its specifications and capacity and should not be overloaded. No amplified music will be allowed on the site. The use of radios, tape recorders, compact disc players, television sets etc. will not be permitted unless at a level that does not serve as an intrusion to adjacent landowners. The Contractor will take preventative measures (e.g., screening, muffling, timing, pre-notification of affected parties) to minimise complaints regarding noise and vibration nuisances from sources such as power tools. 			<p>Daily for management measures</p> <p>Inspection: <i>Ad hoc</i> and weekly as a minimum</p> <p>Verification: Monthly</p>
Prevent visual unsightliness	<ul style="list-style-type: none"> Watering roads to prevent dust from construction vehicles (where required). Should lighting be required, it must be undertaken in such a manner as to preclude the lighting from becoming intrusive. Screening of highly reflective material must be undertaken. The site will be shielded from the adjacent landowners to minimise the visual impact where this is feasibly possible. 	The prevention or the mitigation of unsightliness.	<p>Implementation: Contractor</p> <p>Inspection: EM & ECO</p> <p>Verification: ECO</p>	<p>Implementation: Monthly or at the prescribed vehicle/plant manufacturers specifications</p> <p>Daily for management measures</p> <p>Inspection:</p>

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Construction and Rehabilitation Phase				
				<i>Ad hoc</i> and weekly as a minimum Verification: Monthly
Prevent the spread of waste	<ul style="list-style-type: none"> ● All solid waste generated during the construction process must be placed in a designated waste collection area within the construction camp and must not be allowed to become windblown, be accessible to animals, or be placed in piles adjacent to the skips / bins. ● All waste receptacles are to have lids. ● Separation and recycling of different waste materials must be supported. ● No burying, dumping or burning of waste materials, vegetation, litter or refuse shall occur on site. ● All solid waste must be disposed of at the nearest licensed landfill and safe disposal certificates must be obtained and kept on site at all times during construction. ● A daily litter collection programme must be implemented. ● Contaminated soil must be treated as hazardous waste and disposed of at a permitted waste disposal site. The affected area is to be rehabilitated immediately. ● Ablution facilities on site need to be regularly serviced by a licenced service provider on a weekly basis. The contractor is to encourage all staff and sub-contractors to use these facilities. The use of the surrounding environment for urination or defaecation is strictly prohibited. ● Handling of hazardous liquids shall be done over drip trays to intercept spills. ● Generators and fuel storage bowsers must be contained within drip trays or appropriately banded. Where necessary sumps must be installed to contain any spillages. ● Excess excavated material shall not be allowed to accumulate on site. ● On completion of the project all construction waste shall be disposed of at a registered waste disposal site. 	No environmental contamination associated with waste.	Implementation: Contractor Inspection: EM & ECO Verification: ECO	Implementation: Daily and <i>ad hoc</i> Inspection: <i>Ad hoc</i> and weekly as a minimum Verification: Monthly

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Construction and Rehabilitation Phase				
Safety and security	<ul style="list-style-type: none"> First aid must be available on site. Smoking is prohibited in the vicinity of flammable substances. Fire extinguishers must be available and easily accessible at all times. Emergency contact details must be displayed on site. Any construction personnel found trespassing must be subjected to a disciplinary hearing. Construction worker's / construction vehicles must take heed of normal road safety regulations; thus, all personnel must obey and respect the law of the road. A courteous and respectful driving manner must be enforced and maintained so as not to cause harm to any individual. Open trenches must be adequately demarcated and must be checked daily to ensure the adopted demarcation method is still operational. The use of warning signs is also encouraged. Material stockpiles must be stable to avoid collapse and possible injury to workers. 	Prevent unnecessary incidents.	Implementation: Contractor Inspection: EM & ECO Verification: ECO	Implementation: Daily and <i>ad hoc</i> Inspection: <i>Ad hoc</i> and weekly as a minimum Verification: Monthly
Socio-economic	<ul style="list-style-type: none"> Local people should be employed where possible. A Community Liaison Officer could assist in raising any concerns / complaints noted by the affected community. The Local Ward Councillor, Cllr Johan Matshiane is very involved with the Local Community, and he will act as the Community Liaison Officer. Photographs must be taken before and after construction activities to ensure that infrastructure is reinstated to the same condition post construction. 	Creation of job opportunities for skilled and non-skilled personnel Skill development of the local community through employment opportunities Protect agricultural practices	Implementation: Contractor Inspection: EM & ECO Verification: ECO	Implementation: Daily and <i>ad hoc</i> Inspection: <i>Ad hoc</i> and weekly as a minimum Verification: Monthly
Prevent unnecessary loss of heritage and palaeontological artefacts	<ul style="list-style-type: none"> Mitigation will be needed if fossils are found during the construction. No consultation with parties was necessary. The Environmental Control Officer must familiarise him- or herself with the formations present and its fossils. The development may go ahead with caution. 	Protection of heritage and palaeontological resources. The Environmental Manager will be on site full time during the construction phase to	Implementation: Contractor Inspection: EM & ECO	Implementation: Daily and <i>ad hoc</i> Inspection:

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Construction and Rehabilitation Phase				
	<ul style="list-style-type: none"> • The ECO must survey for fossils before and or after clearing, blasting, drilling, or excavating. • For a chance fossil find, the protocol is to immediately cease all construction activities, construct a 30 m no-go barrier, and contact SAHRA for further investigation • An informal burial site with at least 35 graves. Most are only marked with stone cairns. In many cases the inscriptions on those with headstones are illegible. The death dates range between 1958 and 2003. Surnames such as Sibanyoni, Mahlangu and Mashiane could be determined. Significantly, according to the inscription on one grave, Adam Maloyi was born on 29 August 1801 and died 11 April 1865. Although the burial site is mostly overgrown with grass and weeds, some graves have recently been cleaned. In addition, the site is properly fenced-off.” • A brick wall must be erected in the place of the wire fence. This wall can then also serve as a billboard where a site notice can be added cautioning drivers to be careful when passing the site. • It should also be noted that it is only the road reserve that will encroach on the burial site and not the road or gravel shoulder of the road. • Should impact on the burial site prove inevitable, full grave relocation is recommended for this site. This measure should be undertaken by a qualified archaeologist, and in accordance with relevant legislation, permitting, statutory permissions and subject to any local and regional provisions and laws and by-laws pertaining to human remains (as outlined in Addendum 12.4 of the attached Phase 1 Cultural Heritage Impact Assessment Report is attached to Appendix E of this EMPr). • If an artefact on site is uncovered, work in the immediate vicinity must be stopped immediately. • The contractor must take reasonable precautions to prevent any person from removing or damaging any such article and must immediately, upon discovery thereof, inform the Construction Engineer of such discovery which in turn must contact a registered archaeologist and SAHRA. Work may only resume once clearance is given in writing by the archaeologist and SAHRA. 	monitor any chance fossil finds, or the uncovering of any artefacts, etc.	Verification: ECO	<i>Ad hoc</i> and weekly as a minimum Verification: Monthly

TABLE 8: Operational Phase objectives, actions, and outcomes

Take note:

Maintenance of the road will be undertaken if and when required. The most common maintenance activities to be undertaken will be vegetation maintenance within the road reserve, and inspection of the stormwater management infrastructure, and road surface. Road maintenance will be undertaken in accordance with the Mpumalanga Department: Public Works, Roads and Transport’s Standard Road Monitoring and Maintenance Plan.

Some objectives, actions and outcomes to be monitored during the operational phase is presented in Table 8. However, additional activities may be involved that will require additional monitoring. It will be the responsibility of the Mpumalanga Department: Public Works, Roads and Transport to ensure that maintenance is undertaken in line with best environmental practise.

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Operational Phase				
Prevent Soil Erosion and Contamination	<ul style="list-style-type: none"> Erosion must be strictly controlled through the utilization of silt traps, silt fencing, gabions, etc. This is especially pertinent within areas of steeper gradients. Topsoil stockpiles should be protected from erosion through the utilization of silt traps, silt fencing, etc. Care should be taken to avoid accidental leaks and spillages during the operational phase. Road maintenance should be undertaken in line with the Mpumalanga Department: Public Works, Roads and Transport’s Standard Road Maintenance Plan. Regular maintenance of stormwater infrastructure should be undertaken to avoid erosional impacts. 	Avoidance of soil contamination Re-use of viable soils in rehabilitation	Implementation: MDPWRT maintenance team or relevant appointed contractor Inspection: MDPWRT Verification: MDPWRT	Implementation: During maintenance as and when required Inspection: <i>Ad hoc</i> Verification: During maintenance as

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Operational Phase				
Preservation of vegetation and fauna	<ul style="list-style-type: none"> Road maintenance should be undertaken in line with the Mpumalanga Department: Public Works, Roads and Transport’s Standard Road Maintenance Plan. Construction phase mitigation measures are applicable. The operational phase of the development should include follow-up surveys to control the encroachment of exotic floral species. 	<p>Prevention of the introduction and spread of alien invasive species in the area due to construction activities.</p> <p>Preservation of existing fauna and flora</p>	<p>Implementation: MDPWRT maintenance team or relevant appointed contractor</p> <p>Inspection: MDPWRT</p> <p>Verification: MDPWRT</p>	<p>and when required</p> <p>Implementation: During maintenance as and when required</p> <p>Inspection: <i>Ad hoc</i></p> <p>Verification: During maintenance as and when required</p>
Avoid contamination of surface and groundwater	<ul style="list-style-type: none"> No fuel to be stored at or near watercourses or waterbodies; Equipment to be properly maintained and serviced; Fuel storage and pump areas to be bunded to avoid accidental leakage; No refuelling should be done within the riparian zones (exceptions are made for stationery motors i.e., pumps). Accidental spills must be reported and cleaned immediately. Contaminated soils must be removed and disposed of at a registered disposal site. Soil erosion must be managed as an ongoing concern throughout the development process. 	Ensure that watercourses (wetlands) are protected and incur minimal negative impacts to resource quality.	<p>Implementation: MDPWRT maintenance team or relevant appointed contractor</p> <p>Inspection: MDPWRT</p> <p>Verification: MDPWRT</p>	<p>Implementation: During maintenance as and when required</p> <p>Inspection: <i>Ad hoc</i></p> <p>Verification: During maintenance as</p>

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Operational Phase				
Waste Management	<ul style="list-style-type: none"> All waste generated on-site during maintenance must be adequately managed. Separation and recycling of different waste materials is encouraged. All solid waste must be disposed of at a registered landfill site and records maintained to confirm safe disposal. Adequate scavenger-proof refuse disposal containers must be supplied to control solid waste on-site during the undertaking of maintenance activities. Chemical waste must be stored in appropriate containers and disposed of at a licensed disposal facility. Portable sanitation facilities must be erected for maintenance personnel. Use of these facilities should be enforced (these facilities should be kept clean so that they are a desired alternative to the surrounding vegetation). These facilities should also be monitored and serviced regularly to prevent contamination of the wetlands. The maintenance site must be inspected for litter daily. Extra care should be taken on windy days. Precautions must be taken to avoid litter from entering the wetland areas. Soil that is contaminated with, e.g., cement, petrochemicals, or paint, must be disposed of at a registered waste disposal site and is NOT to be deposited into the wetland areas. It must be ensured that all hazardous contaminants are stored in designated areas that are sign-posted, lined with an appropriate barrier and banded to 110% of the volumes of liquid being stored to prevent the bio-physical contamination of the environment (ground and surface water and soil contamination). Hazardous substance storage must not take place within the wetland areas or the associated 32m buffer areas. Any significant spills on-site must be reported to the relevant Authority (e.g., Department of Water and Sanitation / DARDLEA etc.) and must be remediated as per the EMPr. 	No environmental contamination associated with waste.	Implementation: MDPWRT maintenance team or relevant appointed contractor Inspection: MDPWRT Verification: MDPWRT	and when required Implementation: During maintenance as and when required Inspection: <i>Ad hoc</i> Verification: During maintenance as and when required
Road and Pedestrian Safety	<ul style="list-style-type: none"> A designated speed limit must be set by the developer to limit possible road collisions. Traffic calming measures should be provided where necessary to ensure pedestrian safety. Signage should be displayed to warn road users of the grazing cattle. 	Prevent unnecessary incidents.	Implementation: MDPWRT Inspection: MDPWRT	Implementation: Throughout the life of the road. Inspection: <i>Ad hoc</i>

Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Monitoring	
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>	<i>Responsibility</i>	<i>Frequency</i>
Operational Phase				
			Verification: MDPWRT	Verification: Throughout the life of the road.
Prevent unnecessary loss of heritage and palaeontological artefacts	<ul style="list-style-type: none"> Mitigation will be needed if fossils are found during the maintenance phase. For a chance fossil find, the protocol is to immediately cease all construction activities, construct a 30 m no-go barrier, and contact SAHRA for further investigation The Heritage Specialist suggested that a brick wall be constructed along the cemetery boundary to better protect the site, and to serve as a billboard where a site notice can be added cautioning drivers to be careful when passing the site. This wall should be maintained throughout the life of the project to ensure that the burial site is protected. 	Protection of heritage and palaeontological resources.	Implementation: MDPWRT maintenance team or relevant appointed contractor Inspection: MDPWRT Verification: MDPWRT	Implementation: During maintenance as and when required Inspection: <i>Ad hoc</i> Verification: During maintenance as and when required

7. MONITORING

7.1. Method and Frequency of Monitoring

- An independent, external ECO must audit the construction site during the construction phase of the project on a monthly basis, unless otherwise specified by DARDLEA.
- In internal ECO (either from the MDPWRT or from the contractor) should be on site full time, as construction will be undertaken within wetland areas, and in the event of a chance fossil find.
- A monthly construction Environmental Audit Report is to be drafted by the ECO and submitted to the Applicant / Employer for review and implementation prior to the following site audit.
- The relevant party (i.e. ECO or Applicant, as designated by the Environmental Authorisation) has the responsibility to submit the site audit report to the DARDLEA: Compliance and Monitoring Department for the duration of the construction period.

7.2. Roles and Responsibilities

The implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different, but vital role to ensure sound environmental management during the construction phase. The stakeholders are discussed below:

7.2.1. DARDLEA

The DARDLEA is the designated provincial authority responsible for authorising the EMPr related to the project. The DARDLEA has overall responsibility for ensuring that the Applicant complies with the Conditions of the Environmental Authorisation and EMPr.

7.2.2. Applicant: Mpumalanga Department: Public Works, Roads and Transport

Under South African environmental legislation, the Applicant is accountable for the potential impacts of the activities that are undertaken and is responsible for managing these impacts. The Mpumalanga Department: Public Works, Roads and Transport as the Applicant/Employer therefore has overall environmental responsibility to ensure that the implementation of this EMPr complies with the relevant legislation and the Conditions of the Environmental Authorisation.

7.2.3. Environmental Control Officer

An appointed independent ECO will monitor and review the on-site environmental management and implementation of this EMPr by the contractor throughout the project. This will be done by conducting site audits and issuing monthly audit reports to the Applicant and DARDLEA's Compliance Monitoring and Enforcement Section, as applicable.

The DARDLEA requires that the ECO be at the forefront of all environmental management issues.

7.2.4. Environmental Manager

The Environmental Manager, or his appointee, will conduct daily inspections of the site to identify potential non-compliances and potential negative impacts to the environment. The inspections will take the form of an inspection sheet and will be kept as a record. Findings thereof will be made available to the ECO and raised in construction meetings for mitigation or avoidance measures.

7.2.5. Contractor

This refers to the main contractor(s) appointed by the Applicant for the construction of the project, or a portion of the project. The main contractor(s) will be responsible for complying with the EMPr commitments and any other legislative requirements, as applicable to the contractors' appointment for the proposed development. The contractor/s will also be responsible for drafting method statements appropriate to activities under his direct control.

The contractor must ensure that all employees under their appointment receive appropriate training prior to the commencement of construction, taking cognisance of this EMPr and the Conditions of the Environmental Authorisation.

7.2.6. Organisational Structure

Details of the organisational structure are presented in Figure 7. The structure illustrates the reporting procedures for all stakeholders responsible for the implementation of this EMPr.

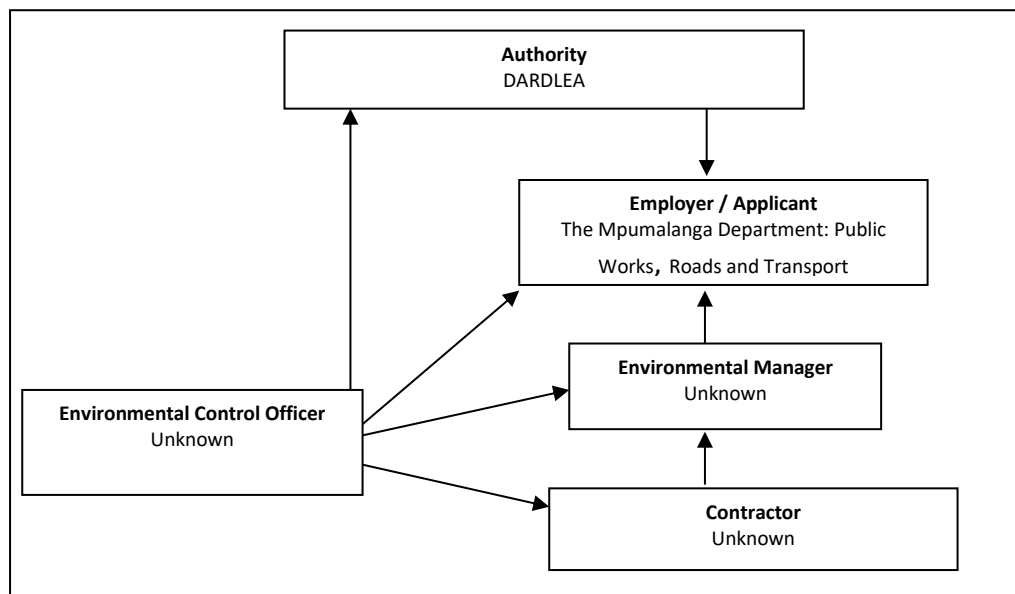


Figure 7: Organisational structure

7.3. Method Statements

Method Statements are written submissions by the contractor to the ECO in response to the requirements of this EMPr, or to a request by the ECO. The contractor shall be required to prepare Method Statements for several specific construction activities and/or environmental management aspects.

The contractor shall not commence the activity for which a Method Statement is required until the ECO has approved the relevant Method Statement.

Method Statements must be submitted at least 20 working days prior to the date on which approval is required to the ECO. The ECO must in turn accept or reject the Method Statement within 10 working days of receipt.

Failure to submit a Method Statement may result in suspension of the activity concerned until such time as a Method Statement has been submitted and approved.

An accepted Method Statement shall not absolve the contractor from any of his obligations or responsibilities in terms of the contract. However, any damage caused to the environment through activities undertaken without an approved Method Statement shall be rehabilitated at the contractor's expense.

The Method Statements shall cover relevant details with regards to:

- Construction procedures and location of the construction site / camp.
- Start date and duration of construction.
- Materials, equipment and labour to be used.
- How materials, equipment and labour would be moved to and from the site, as well as on site during construction.
- Storage, removal and subsequent handling of all materials, excess materials and waste materials of construction.
- Emergency procedures in case of any reasonably potential accident / incident which would occur during construction.
- Compliance/non-compliance with any EMPr specification and motivation if non-compliant.

7.3.1. Required Method Statements (MS)

Based on the specifications in this EMPr, the following Method Statements (MS) are required as a minimum:

- MS1: Site layout and establishment
- MS2: Hazardous substances
- MS3: Traffic accommodation
- MS4: Solid waste control system
- MS5: Wastewater control system

- MS6: Watercourse crossings (Construction within wetland areas). Such a method statement was compiled by JG Afrika (Pty) Ltd and is attached to Appendix D of this EMPr.
- MS7: Stormwater Control
- MS8: Fire control and emergency procedures

8. ENVIRONMENTAL AWARENESS TRAINING

The contractor shall ensure that adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the EMPr and conditions of the Environmental Authorisation (not yet issued). The presentation shall be conducted, as far as possible, in the employees' language of choice.

As a minimum, training shall include:

- Explanation of the importance of complying with the EMPr.
- Discussion of the potential environmental impacts and environmental risks presented by construction activities.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the mitigation measures that must be implemented when carrying out their activities.
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr.

The contractor shall keep records of all environmental training sessions, including names, dates and the information presented. These records will be presented to the ECO on request during his/her audits.

APPENDIX A:
EAP Curricula Vitae

APPENDIX B:

Maps

APPENDIX C:

Preliminary Design and Design Report

APPENDIX D:
Construction Methodology

APPENDIX E:

Specialist Reports and DWS Risk Martix