

**FINAL ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE PROPOSED UPGRADING OF  
THOKOZA ACCESS ROAD  
WARD 18, TUGELA FERRY, KWAZULU NATAL  
(Prepared in Terms of EIA Regulations, 2014) (As Amended)**

Prepared for:

**UMSINGA LOCAL MUNICIPALITY**



Prepared by:

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<b>DOCUMENT TITLE</b>	<b>DATE</b>
<b>Environmental Management Programme for the proposed upgrade of Thokoza Access Road in Tugela Ferry, Kwa Zulu Natal</b>	<b>Jan. 2019</b>

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ACRONYMS

<b>BAR</b>	<b>Basic Assessment</b>
<b>EMPr</b>	<b>Environmental Management Programme</b>
<b>DEDTEA</b>	<b>Department of Economic Development, Tourism and Environmental Affairs</b>
<b>DWS</b>	<b>Department of Water and Sanitation</b>
<b>MDM</b>	<b>Mzinyathi District Municipality</b>
<b>MLM</b>	<b>Msinga Local Municipality</b>
<b>I &amp;AP</b>	<b>Interested and Affected Parties</b>
<b>ECO</b>	<b>Environmental Control Officer</b>
<b>RE</b>	<b>Resident Engineer</b>

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## ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

### 1 INTRODUCTION

Isolendalo Environmental Consulting has been appointed by Msinga Local Municipality to undertake the required services in terms of the (amended) EIA Regulations, 2014 promulgated in terms of the National Environmental Management Act 107 of 1998 (NEMA) for the proposed upgrading of Thokoza access road in Tugela Ferry, Kwa-Zulu Natal. The proposed development upgrades will not affect the width and the length of the access road but will include construction of the road surface, stormwater, retaining walls and signage.

This EMPr has been developed to form part of this BAR for the proposed upgrading of Thokoza access road. The intention in compiling this EMPr is in accordance with the Integrated Environmental Management Guidelines published by the Department of Environmental Affairs & Tourism (DEAT) in 2014, which states that 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"*. This EMPr therefore organises and coordinates environmental mitigation, rehabilitation and monitoring so that positive impacts are enhanced, and negative impacts and damage to the environment are avoided, minimised or rectified where required. Due to the sensitiveness of the area, a wetland specialist has been appointed to; -

- Delineate wetland systems along Thokoza Access Road, as well as a 500m assessment buffer according to the Department of Water Affairs and Forestry<sup>1</sup> "Practical field procedure for the identification and delineation of wetlands and riparian areas".
- Classify the identified wetland habitats in accordance with the latest approach; 'Classification System for Wetlands and other Aquatic Ecosystems in South Africa' (Ollis et al., 2013).
- Determine the Present Ecological State score (PES) and Functional Integrity of any identified wetlands using the WET-Health and WetEcoServices approach.
- Determine the Ecological Importance and Sensitivity (EIS) of the identified wetlands.
- Identify current and possible negative future impacts on any identified wetlands and watercourses from the upgrade of the access road.
- Recommend mitigation measures to lessen these impacts on wetlands/watercourses delineated within the study site and the implementation of suitable rehabilitation measures.

This EMPr notes and records some of the above which are contained in all detail within the Wetland Impact Assessment Report attached within Annexure E in this Basic Assessment Report. All members of the project team must adhere to all environmental legislation relevant to the project as highlighted in document. This project is aimed at providing a safe road access to the communities for whom this road is intended, and this document aims assist in doing so without compromising the environment.

**1.1 Contact Details**

Below are the details of the project team including the developer, EAP, Engineer and Competent Authority.

ORGANISATION/COMPANY	ROLE	CONTACT PERSON	CONTACT DETAILS
uMsinga Local Municipality	Developer	Mr SL Sokhela	Private Bag x530, Tugela Ferry 3010 Tel: 033 493 0760 Fax: 033 493 0757 Email: SL_sokhela@msinga.org
Isolendalo Environmental Consulting	EAP	Mr Onesimo Jiba	19 Valley Road Margate, 4275 Tel: 039 315 0437 Fax: 039 315 0407 Cell: 065 831 3657 Email: One.jiba@isolendalo.co.za
Department of Economic Development, Tourism and Environmental Affairs	Competent Authority	MR. Gerald Willis - Smith	PO BOX 1965 Dundee 3000 Tel: 034 299 7913 Cell: 081 591 4982 <a href="mailto:GeraldWillisSmith@kznedtea.gov.za">GeraldWillisSmith@kznedtea.gov.za</a>

## 2 THE ENVIRONMENTAL PROCESS

### SUMMARY OF THE WETLAND IMPACT ASSESSMENT REPORT UTILISED

One HGM unit was delineated within the assessment area (lineage of Thokoza Access road) based on the four wetland indicators. This was classified as a Seep system that flows in a southerly direction for approximately 1.5km from the road before forming a watercourse which is a tributary of the Mazabeko River.

#### Wetland Health

According to the specialist report, the Seep was assessed with regards to its health according to the Wet-Health methodology and was classified as Largely Modified (PES Category D). Also noted is that there have been a number of changes to the catchment and wetland system; these include the development of rural nodes including road infrastructure, housing, subsistence agriculture and livestock grazing. The report notes the result to be the cultivation of the entire Seep system, both historically and currently. These changes have resulted in an increase in hardened surfaces within the catchment, as well as a decrease in basal cover, facilitating the formation of erosion gullies within the wetland system.

#### Ecosystem goods and services

Ecosystem goods and services were calculated for the Seep wetland. Scores received ranged from Low to Moderate for all ecosystem service resources. The Seep system received moderate scores for natural ecosystem services associated with flood attenuation, sediment trapping; and filtration (i.e. phosphate, nitrate and toxicant trapping). As this Seep is utilised for cultivation it received high scores for the provision of natural resources as well as the use of the wetland for the cultivation of food. This use of the wetland has resulted in a decline in the health of the system.

#### Ecological importance and sensitivity

An Ecological Importance and Sensitivity (EIS) assessment was undertaken to rank the identified water resources in terms of provision of goods and services or valuable ecosystem functions which benefit people; biodiversity support and ecological value as well as the reliance of subsistence users (especially basic human needs uses). The EIS scores for the Seep were Low. This is largely due to the location of this system within a rural settlement area. The wetland system is utilised for livestock grazing (decreasing the basal cover) and subsistence cultivation, leading to a decrease in basal cover and an increase in the disturbance within the wetland. This lowers the use of the area by faunal species due to suboptimal conditions. This further limits the opportunity for this system to contribute to the maintenance of biodiversity within the larger catchment.

The Risk Assessment for the proposed project as per the General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for Water Uses as defined in Section 21 (c) and (i) (Notice 509 of 2016) was undertaken.

Impacts associated with the proposed project received Low Risk Scores with impacts to the water resources being small and easily managed. Several general and specific measures are proposed to mitigate these impacts on the water resources.

#### **IMPACTS:**

##### SOIL EROSION, SEDIMENTATION AND DEGRADATION OF WATERCOURSES

Description of impact Construction activities (i.e. excavations and vegetation clearing) expose soil to environmental factors including rainfall and wind. The exposure to these factors will result in the continued erosion of soil within the disturbed construction areas. This is particularly so, in areas where soil will be compacted by heavy machinery. The eroded soil will quickly be washed downstream

in the erosion gullies situated along the road and being deposited downstream. This will lead to disturbances to the hydrological flow of these systems and the continued formation of erosion gullies. Impacts such as reduced basal cover provide favourable conditions for the encroachment of invasive alien plant species within and adjacent to the wetland system. Invasive vegetation was noted during the investigation however, this was limited and largely confined to the edges of erosion gullies and areas of elevated disturbance. Species recording included *Cirsium vulgare* and *Tagetes minuta*

#### Mitigation Options

- To counter existing soil erosion along the road, care must be taken at the design stage that the correct placement of water directing techniques be designed and specified in a manner that will best mitigate the effects of stormwater runoff.
- The use of sustainable drainage systems (SUDS) must be incorporated into the design of the road and associated drainage systems and include:
  - The use of swales (a shallow vegetated channel to convey road runoff).
  - The use of filter drains/infiltration trenches which are roadside trenches filled with permeable media to provide treatment and temporary storage of runoff before infiltration or conveyance to the receiving environment.
  - The use of filter strips which are maintained grassed areas of land that are used to manage shallow overland stormwater runoff through several filtration processes in a similar manner to buffer strips.
  - Other erosion protection measures can include using energy dissipaters to slow the velocity of water coming from any stormwater pipes (particularly at the erosion gully)
  - It is important to maintain any SUDS feature that are installed along the road route. Un-maintained SUDS features may eventually fail operationally as a result of sediment build up and the effect this has on vegetation growth. If properly designed and regularly maintained, vegetated swales and other SUDS can last indefinitely and are far more cost effective than the maintenance of hardened or semi-hardened structure
  - The use of SUDS features can also be used to remediate parts of the Seep system. The SUDS will aid in erosion control and the attenuation of water, allowing for the build-up of sediment in the erosion gullies and ultimately the 're-wetting' of this system. This in turn, will promote vegetation growth in this area and help to stabilise the system.

#### Other mitigation measures relating to the construction phase include:

- No stockpiling of any materials may take place adjacent to the Seep. Erosion control measures must be implemented in areas sensitive to erosion and where erosion has already occurred. These measures include but are not limited to the use of sand bags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes.
- Topsoil stockpiles must be appropriately protected using for example silt fences or sand bag barriers.
- Do not allow surface water or stormwater to be concentrated, or to flow down slopes without erosion protection measures being in place.
- Vegetation clearing must not be undertaken more than 10 days in advance of the work front. Vegetation clearing must only be undertaken when construction activity is actually underway at this point and such areas must be rehabilitated within 2 weeks of initial clearing occurring. The entire road construction servitude must not be stripped of vegetation prior to commencing construction activities.
- Disturbed sites must be rehabilitated as soon as construction in an area is complete or near complete and not left until the end of the project to be rehabilitated.



- Install sediment barriers across the entire construction right-of-way, to prevent sediment flow into the Seep.
- Erosion protection measures must be installed at stormwater drainage pipes outlets located along the route. This is in addition to velocity control measures.

#### POLLUTION OF WATER RESOURCES AND SOIL

Description of the impact Sediment release from a construction site into the receiving environment is one of the most common forms of waterborne pollution. Furthermore, mismanagement of waste and pollutants including hydrocarbons, construction waste and other hazardous chemicals will result in these substances entering and polluting these sensitive environments either directly through surface runoff during rainfall events, or subsurface water movement. The linked nature of the Seep will likely result in pollutants being carried downstream from the construction site. In addition to this, hardened surfaces are recognised as a source of various pollutants which can originate from a wide variety of sources. The pollutant concentration in road runoff can be highly variable and dependant on a wide variety of factors including location, traffic volumes, extent of dry period before a rainfall event, and nature of the surface. The increase in hardened surfaces as a result of the project will lead to the increase in the flushing of these pollutants into the Seep system during the operational phase of this development.

#### Mitigation Options

- All waste generated during construction is to be disposed of as per an Environmental Management Programme (EMPr) and washing of containers, wheelbarrows, spades, picks or any other equipment that has been contaminated with cement or chemicals within the erosion gullies, or watercourses, must be strictly prohibited.
- Proper management and disposal of construction waste must occur during the upgrade of the road.
- No release of any substance i.e. cements or oil that could be toxic to fauna or faunal habitats; Wet cement and/ or concrete must not be allowed to enter the Seep.
- Portable toilets must be placed outside of a 100m buffer from the wetland system.
- Do not locate the construction camp or any depot for any substance which causes or is likely to cause pollution within a distance of 100m of the Seep.
- Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed, and the affected area rehabilitated immediately. Consult with a wetland/aquatic specialist if spills occur.

#### INVASIVE ALIEN SPECIES ENCROACHMENT

Description of the impact Any removal of vegetation within the Seep will lead to further disturbance within the area having a negative impact on the functionality of the already degraded vegetation community. Invasive alien species will further encroach into disturbed areas. Alien species generally out-compete indigenous species for water, light, space and nutrients as they are adaptable to changing conditions and are able to easily invade a wide range of ecological niches (Bromilow, 2010). Alien invader plant species pose an ecological threat as they alter habitat structure, lower biodiversity (both number and “quality” of species), change nutrient cycling and productivity, and modify food webs (Zedler, 2004).

#### Mitigation Options

- An invasive alien management programme must be incorporated into the Environmental Management Programme.

- Ongoing alien plant control must be undertaken. Areas which have been disturbed will be quickly colonised by invasive alien species. An ongoing management plan must be implemented for the clearing/eradication of alien species.
- Construction staff and vehicles must stick to the construction servitude and not be allowed to access sensitive areas.
- Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge. This requirement is in fulfilment of the terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004). Areas which have been disturbed will be quickly colonised by invasive alien plant species.

#### **CONCLUSION**

Currently stormwater runoff from the existing road has contributed to the formation of erosion gullies within the Seep and this must be addressed during the construction phase of the road.

#### **EAP RECOMENDATIONS**

In order to address these impacts, the implementation of a site-specific mitigation measures that are aimed at reinstating favourable hydrological conditions and allow for the regeneration of the functional integrity of the watercourses along the road route are required.

**NB// Detailed impacts are contained within the wetland Impact Assessment report, including negative impacts and the mitigation measures provided by the specialist. The Wetland Impact Assessment report was compiled to form part of this report (BAR) and should be considered in assessing this application.**

Considering the above summary of the Wetland Impact Assessment Report for the proposed Thokoza Access Road; The National Environmental Management Act (Act No. 107 of 1998) imposes a duty of care on every person who causes, has caused or may cause significant pollution or degradation of the environment, he is authorised by law and cannot reasonably avoid the Act's requirement, that the pollution be minimised and rectified. For the proposed project, this EMPr will serve as a guideline with the specific objectives to:

1. Highlight mitigation measures for the impacts of the project activities
2. Encourage good environmental management practices
3. Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project.
4. Ensure that the safety recommendations are complied with.
5. Provide feedback for the continuous improvement in environmental performance.
6. Serve as a framework for the acceptable implementation of environmental and social initiatives.
7. Be able to stand as a structure which addresses the relevant concerns of the public regarding the development.

All activities and earthworks associated with this construction will be undertaken in accordance with SABS 1200 standards, which deal with guidelines for civil engineering and general construction works. Any environmental issues that are identified during or after construction will be addressed in consultation with the Environmental Control Officer (ECO). This EMPr informs the developer of his duties with particular reference to the prevention and mitigation of environmental impacts caused by construction and operational activities associated with the project. As such, it should be noted that this document is a dynamic document that may require updating or revision where necessary. Should the Developer be permitted to continue with the upgrade of the access road, it will be his responsibility to ensure implementation of recommended mitigation measures as approved and directed by the DEDTEA.

### 3 LEGISLATION

Environmental legislation applicable to the formulation of an EMPr includes but is not restricted to the following:

1. Environment Conservation Act (Act No. 73 of 1989)
2. National Environment Management Act (Act No. 107 of 1998)
3. Integrated Environmental Management (IEM)
4. National Water Act (Act No. 36 of 1998)
5. National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004).
6. The National Heritage Resources Act (Act No 25 of 1999 as amended)
7. Development Facilitation Act (Act No 67 of 1995).
8. Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
9. South African Constitution Act (Act No. 107 of 1998), including the Bill of Rights (Chapter 2, Section 24).  
In terms of the above, all regulations framed there under and amendments there to.
10. The relevant Municipal norms and standards

### 4 PARTIES INVOLVED

#### a. Project Manager / Engineer (PM / E)

The Project Manager / Engineer are the administrators of the project acting in line with requirements and scope of work from the developer. The engineer is responsible for all direct communication with the contractor.

#### b. Contractor (C)

The main Contractor(s) appointed by the developer for the construction of the road and any other associated works, or portion of the Project. The main Contractor(s) is required to adhere to the EMPr and is responsible to ensure that all sub-contractors, suppliers and staff appointed by them also adhere to the EMPr.

#### c. Environmental Control Officer (ECO)

An independent Environmental Assessment Practitioner appointed by the Developer to act on behalf of the Developer in matters concerning the day-to-day implementation of the EMPr and for liaison with the Engineer and Contractor. The ECO must monitor this development on a regular basis during the construction and rehabilitation phases to ensure compliance with the EMPr. Non-compliances identified must be communicated with the Project Manager (PM), Contractor and Developer with open channels of communication and liaison between these parties. Reports are to be compiled by the ECO which must include photographs taken during inspection and must be submitted to the Project Manager and Developer on a monthly basis.

#### d. Local Community

People residing or present in the region and near the project site.

e. Public

Any individual or group concerned with or affected by the Project and its consequences, including the local community, local, regional, and national authorities, investors, workforce, customers, consumers, environmental interest groups, and the general public.

5 PROJECT DETAILS

Thokoza access road is a project constituting of 3 sections of road (Figure 1); Section 1 – total of 2.83 km, Section 3 – total of 2.10 km and Section 2 – total of 2.40km. Each 'section' contributes to the initially known size of the project which is 7.33 km (Edtea comment 04, received on 13 /08 /2018 as attached on annexure D). The application lodged is for section 2 of the road which maintains the project name, Thokoza access road. As from hereon wards, the name refers to the section applied for.

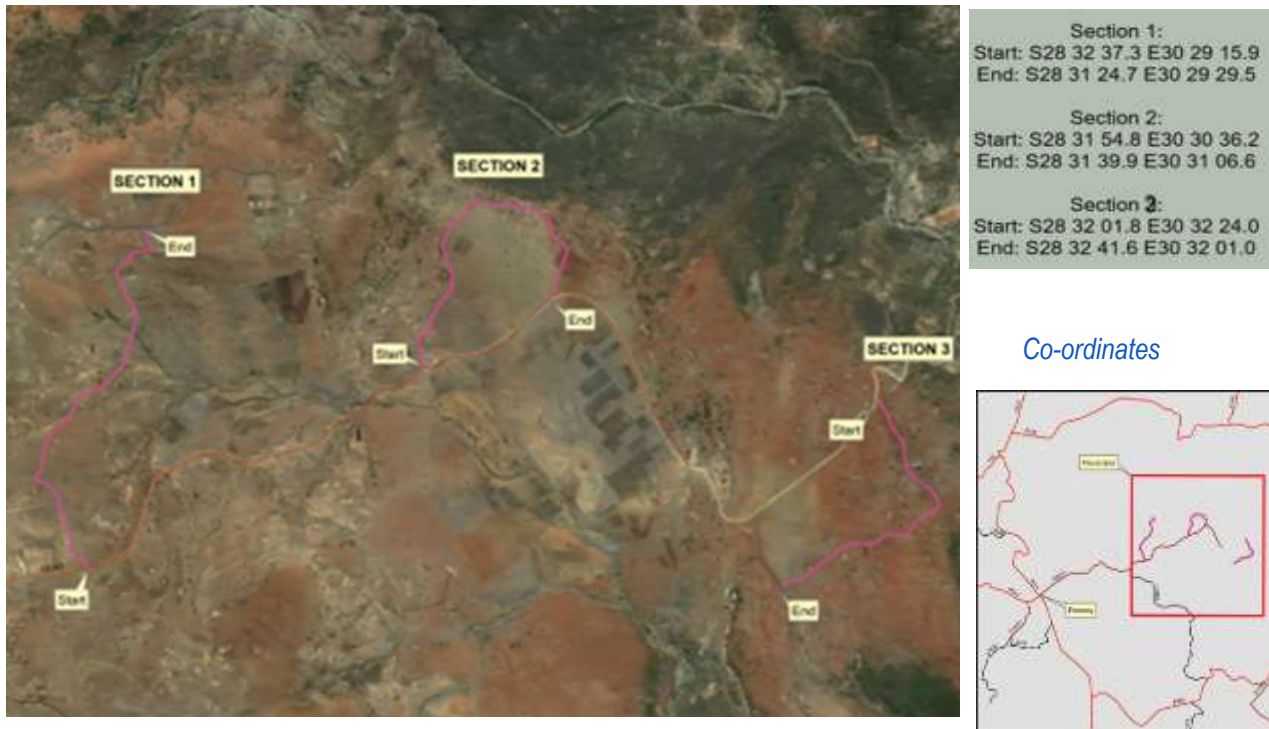


Figure 1: An image showing the location of the 3 sections of Thokoza access road.

Main roads around thokoza access road. (and Pomeroy)

Thokoza access road starts off intersecting with District road 2287 (D2287) at co-ordinates noted in the above figure (figure 1). Between the road's start and the road's end, which is the same road at the co-ordinates noted in the figure above, the road is a lineage of bare ground and tire tracks.

Tire tracks run from 0km to 1.8 km, where bare ground is curved to characterize an area regularly used by vehicles. See map below;

-

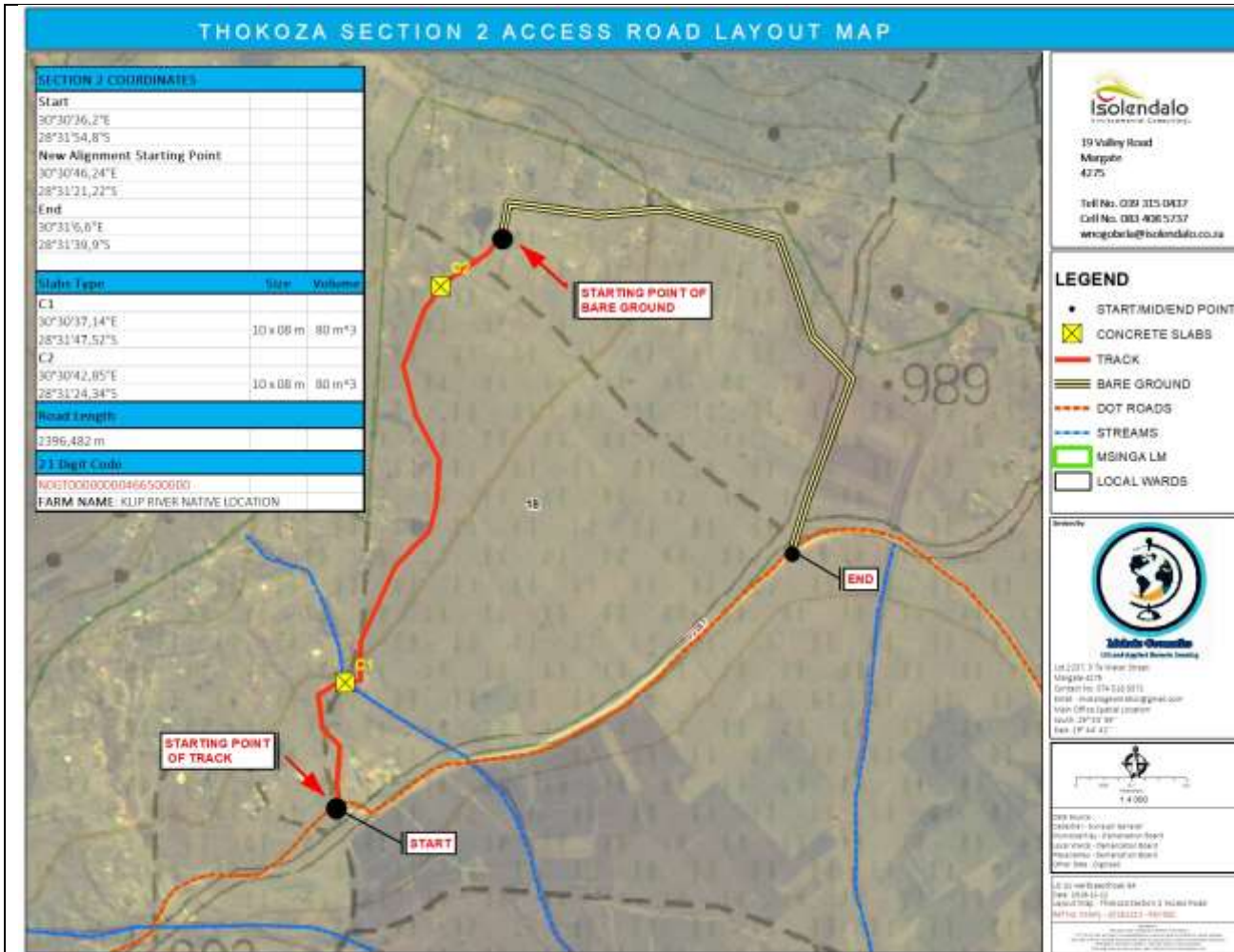


Figure 2: A site route plan depicting the different surfacing forming 'Thokoza Access Road'. An A3 hardcopy is attached on Annexure A.

The specialist report attached herewith notes that, "Based on the current identification of the four wetland indicators, one HGM unit was delineated within the assessment area. This was classified as a Seep system that flows in a southerly direction for approximately 1.5km from the road before forming a watercourse which is a tributary of the Mazabeko River." The Map above shows the point as C2. A concrete slab is proposed within this area. The image below shows a photographic image of the area and photographic representation of the delineation findings from page 24 of the specialist report;





Figure 3: An image showing the wetland area which has been identified and confirmed by the wetland specialist; C2 on figure 2.



Figure 4: A portion of Thokoza access road within which a concrete slab is also proposed, C1 on figure 2.

*(larger images are contained within annexure C, Site Photos)*

The image above shows another portion of the road within which a concrete slab will also be installed. However, though this area bears the characteristics of a wetland, it is important to point out that the findings of the specialist indicate otherwise (not a wetland). The proposed project is to unify the road by upgrading the entire road into a type 7A gravel road. The proposed upgrades include the installation of stormwater management gullies and road signage. However, the triggering aspect of the road is the installation of the concrete slab within an identified wetland within the road lineage. Specifications as to the size of the concrete structure and the location are provided below; -

The road is being upgraded to a 7A gravel type access road that has the following storm water drainage pipes and width of 6m and an unaltered / unelongated 2.4 km length; -

**Concrete slab 1:** (28°31'50.7"S 30°30'36.0"E)

- Total length – 8 m
- Width – 10 m
- Height – 1 m

- Development footprint – 80 m<sup>3</sup>

**Concrete slab 2:** (28°31'24.2"S 30°30'42.9"E)

- Total length – 8 m
- Width – 10 m
- Height – 1 m
- Development footprint – 80 m<sup>3</sup>

**Noting comment number 05 of the Comments received from EDTEA on 15/ 10/ 2018 (see annexure D), commencement of the road may occur whilst maintaining a 50m buffer on Either side of the identified wetland in terms of the Specialist report compiled by Malachite Ecological Services, annexure E. The wetland is at co-ordinates (28°31'24.2"S 30°30'42.9"E), as noted above.**

Hence from KM 0 – KM 1 and from KM 1.2 to KM 2.33, the road may commence. The contractor will however have to be restricted to working areas to avoid damage to neighboring places.

**6 RECORD KEEPING**

Should the construction of the access road be given permission to continue, provisions of the EMPr must be implemented accordingly with especially rehabilitation and operational measures. An Environmental Control Officer must be appointed to monitor implementation. All reports by the ECO and copy of the EMPr must be kept on site.

**7 COMPLIANCE AND PENALTIES**

The duration over which the Contractor's controls shall be in place cover the construction period of the project as well as the limited time after the contract completion in the General Conditions of Contract, and the project specifications, as the defects liability period.

The Developer/Contractor is deemed not to have complied with the EMPr if:

1. There is evidence of contravention of clauses with the boundaries of the site, site extensions and access roads;
2. Environmental damage occurs due to negligence;
3. The contractor fails to comply with corrective or other instructions issued by the Project Manager or Engineer or Environmental Control Officer within a specified time frame;
4. The contractor fails to respond adequately to complaints from the public or local community.

The Contractor must act immediately after a notice of non-compliance is received, and correct the cause for the issuing of the notice. Application of a penalty clause will apply for incidents of non-compliance. The penalties imposed per incident or violation will be as follows:

<b>Incident / Violation</b>	<b>Penalty</b>
Failure to stockpile material correctly	R 2 500
Pollution of water bodies	R 8 000
Failure to control storm water runoff	R 3 000
Failure to provide adequate sanitation	R 5 000
Unauthorized clearing / removal of vegetation	R 5 000
Failure to provide adequate waste disposal facilities and services	R 15 000
Failure to reinstate disturbed areas within specified time period	R 5 000
Failure to rehabilitate disturbed areas within 3 months of completion	R 7 000
Any other contravention of the environmental specification	R 2 000

The imposition of such a penalty will not preclude the relevant provincial authority from applying an additional penalty in accordance with statutory powers. Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as deemed fit. The polluter-pays principle applies.

The “polluter-pays” principle provides that *“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. NEMA imposes a duty of care on every person who causes, has caused or may cause significant pollution or degradation of the environment is authorised by law or cannot reasonably be avoided, NEMA requires that the pollution be minimised and rectified.*

Furthermore, NEMA makes provision for damages to be awarded by the courts where loss or damage has occurred as a result of a contravention of certain environmental statutes. For example, offences under the National Water Act No. 36 of 1965 and the Environmental Conservation Act No. 73 of 1989 may result in penalties being imposed in terms of NEMA. Importantly, NEMA provides for the liability on conviction of employees, managers, agents and directors for any offences resulting from the failure to take all the reasonable steps that were necessary under the circumstances to prevent the commission of an offence.

**8 AMENDMENTS TO THE EMPr**

Any amendments to the EMPr shall be made in agreement between the ECO and Project Manager. Some of the provisions within the EMPr may be altered during the construction phase as is seen necessary by the ECO.

**9 SIGNING OF THE EMPr**

The acknowledgement form at the back of the EMPr is to be signed by the Developer and Contractor.

**10 PROCEDURE**

**10.1 Pre-construction Phase**

A pre-construction meeting will be conducted with the professional team to understand the contents of the EMPr and address any arising issues prior the commencement of construction activities. The requirements of the EMPr must be incorporated into any tender/contract



documents by way of specific clauses that convey the impact and mitigation required. These clauses are to be agreed between the responsible professional members of the team and the environmental consultant.

### **10.2 The Construction Phase: Responsibilities and General Matters**

Miscellaneous environmental matters and the relationships between the Contractors, ECO and the other members of the professional team are outlined in this section.

### **10.3 Activity**

This section highlights the various aspects or impacts related with the project i.e. the Applicant / Contractor's activities that will interact with the environment.

### **10.4 Management/Mitigation Measures**

This section in the table indicates the actions required to either prevent and / minimize the potential impacts on the environment that is associated with the project

### **10.5 Responsibility**

The section indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr. Formal responsibilities are necessary to ensure that key procedures are executed.

### **10.6 Frequency/Timing**

This section indicates when and/how often the actions for that specific aspect must be implemented and /or monitored. Environmental Audits shall be undertaken at least once a month until the construction is complete.

A. PRE-CONSTRUCTION PHASE

Activity	Management / Mitigation	Responsibility	Frequency / Timing
<b>A1 - Legislation, permits, agreements and EA requirements</b>	All members of the project team must adhere to all environmental legislation relevant to the project as highlighted in Section 3.	All	Pre-, during and post construction.
	<ol style="list-style-type: none"> <li>1. The EMPr must be kept on site at all times.</li> <li>2. All members of the project team must be provided with adequate environmental training.</li> <li>3. Any and all mitigation measures that must be set up prior construction must be implemented.</li> <li>4. Monitoring and control programmes must be put in place to manage alien invasive plants.</li> <li>5. The working area is to be clearly demarcated and all construction work is to be kept within the demarcated area.</li> </ol>	All	Ongoing
<b>A2 - Access to site</b>	<b>11 A2.1 Routing</b>		
<i>Sound environmental principles must be followed</i>	1. Existing access route must be used. Movement of vehicles within the site must be limited to access route and disturbed areas to avoid creating new disturbances.	ECO, C & PM	Prior to moving onto site and during construction
<b>A3 - Setting up the construction camp</b> <i>Careful planning of the construction camp can ensure that time and costs associated with environmental management and rehabilitation are reduced.</i>	<b>A3.1 Layout &amp; Location</b>	E / C / PM / ECO	During surveys and preliminary investigations and prior to moving onto site
	a. If there are already building structures on the site, one must be used to house the site office to avoid new disturbances.		
	b. The area used for site camp including laydown areas must be kept neat at all times.	E / C / PM / ECO	During site establishment
	<b>A3.2 Ablutions</b>		
	a. Temporary chemical toilets must be provided by a company approved by the Engineer.	PM / C / ECO	During set-up
	b. The construction of a “long-drop” is forbidden.	E / PM / ECO	On-going
	c. A service plan for the maintenance of the toilets must be provided by the Contractor and is to be approved by the Engineer and ECO to ensure toilets are properly serviced and hygienic.		
<b>A3.3 Provision for Camp Waste Disposal</b>			

	<p>a. Bins and / or skips must be provided at convenient intervals for the disposal of waste within the camp. The bins must be covered. Bins should have liner bags for efficient and safe disposal of waste.</p> <p>b. Recycling and the provision of separate waste receptacles for different types of waste should be encouraged. Where possible, plastics, paper, glass and cans should be separated from other domestic waste for recycling. If waste is to be recycled, appropriately labelled waste receptacles must be made available.</p> <p>c. Any potentially hazardous containers must be punctured or disabled prior to disposal.</p>	PM / C / ECO	During site set-up and on-going
<p><b>A4 – Establishing Equipment Lay-Down &amp; Storage Areas</b></p> <p><i>Storage areas can be hazardous, unsightly and can cause environmental pollution if not designed and managed carefully. Hazardous substances are those that are potentially poisonous, flammable, carcinogenic, or toxic. Some examples are: diesel, petrol, oil, bitumen, cement, solvent based paints, lubricants, explosives, drilling fluids, pesticides, herbicides, LPG.</i></p>	<p><b>A4.1 – General Substances and Materials</b></p>		
	<p>a. Location for equipment lay-down and storage areas must be located within previously disturbed areas for this project.</p>	PM / E / C / ECO	During site set-up
	<p>b. Fire extinguishers must be present at all storage facilities.</p>		
	<p>c. Storage areas must be secure so as to minimise the risk of crime. They must be safe from access by children and animals etc.</p>		
	<p><b>A4.2 –Hazardous Substances and Materials</b></p>		
	<p>a. Storage areas for hazardous substances or materials must be fenced and access controlled.</p>	PM / E / C / ECO	
	<p>b. These storage facilities must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources. The Contractor shall submit a method statement to the Engineer and ECO for approval.</p>		
<p>c. Material Safety Data Sheets (MSDSs) must be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs must additionally include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes.</p>	Ongoing		
<p>d. Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures. The Contractor must ensure that its staff is made aware of the health risks</p>			

	associated with any hazardous substances used and has been provided with the appropriate protective clothing / equipment in case of spillages or accidents and have received the necessary training.		During construction
	e. All concrete mixing must take place on a designated, impermeable surface.		
<b>A5 – Education of site staff on general and environmental conduct</b>	<b>A5. 1 – Education</b>		
<i>These points need to be made clear to all staff on site before the project begins</i>	a. The Contractor must ensure that all site personnel have a basic level of environmental awareness training. Environmental awareness posters must be used on site.	PM / C / ECO	During staff induction and on-going
	b. Staff operating equipment shall be adequately trained and sensitized to any potential hazards associated with their tasks	PM / E / C / ECO	During staff induction, followed by on-going monitoring
	c. The Engineer / ECO must be on hand to explain more difficult / technical issues and to answer questions which may be raised.		
	d. No operator shall be permitted to operate critical items of mechanical equipment without having been trained by the Contractor and certified competent by the Project Management.		
	e. All employees must undergo the necessary safety training.		

	<p><b>A5.2 – Worker conduct on site</b></p>	<p>PM / C</p>	<p>During staff induction, followed by on-going monitoring</p>
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	<p>a. A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following rules:</p> <ul style="list-style-type: none"> <li>a. No alcohol / drugs to be present on site, no vehicles or machinery are to be operated whilst under the influence of alcohol or drugs.</li> <li>b. Prevent excessive noise to minimize disturbances to local residents.</li> <li>c. No firearms allowed on site or in vehicles transporting staff to / from the site (unless used by security personnel).</li> <li>d. Bringing pets onto site is forbidden.</li> <li>e. Construction staff are to make use of facilities provided for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility is strictly forbidden). No fires to be permitted on site. The use of gas-operated cookers for preparation of food on site must be encouraged.</li> <li>f. Trespassing on private / commercial properties adjoining the site is forbidden.</li> <li>g. Only <b>pre-approved</b> security staff and workers shall be permitted to live on the construction site.</li> <li>h. No worker may be forced to do work that is potentially dangerous or for what he / she is not trained to do.</li> <li>i. The staff conduct rules are described in a separate table of Rules (Section F of the EMP). This is aimed at providing staff with the basic information regarding worker conduct on site)</li> </ul>		
<p><b>A6 – Social Impacts</b> <i>It is important to take notice of the needs and wishes of those</i></p>	<p><b>A6.1 Public Participation</b></p>		
	<p>a. All Interested and Affected Parties (IAPs) must be notified of the starting date of construction and the proposed duration.</p>	<p>E / PM/ C</p>	<p>Prior to moving onto the site and on-going</p>

<i>living or working adjacent to the site. Failure to do so can cause disruption to work and increase cost in the form of delays.</i>	b. Open liaison channels must be established between the developer, the contractors and Interested and Affected Parties (IAPs) such that any queries, complaints or suggestions can be dealt with quickly and by the appropriate person(s). The IAPs can be identified as those that live close by the site, work close to the site, will have their services / infrastructure affected by the project, have a general interest in the project, and / or the ward Councillor in which the construction is taking place.	E / PM	Prior to moving onto site and on-going
	c. Adequate designated parking must be provided for site staff and visitors.	C / PM	Prior to moving on site
	d. A complaints register must be kept on site. IAPs need to be made aware of the existence of the complaints book and the method of communication available to them. Details of complaints must be incorporated into the audits as part of the monitoring process. This must be in carbon copy format, with numbered pages.	C / PM / ECO	On-going
	<b>A6.2 Noise Impacts</b>		
	a. Construction vehicles / machines are to be fitted with standard silencers prior to the beginning of construction. Operating and service standards must be followed as per operating instructions of the vehicles and machines.	E / PM / C	During surveys and Prelim Investigations and site set up.
<b>A8 Soil Erosion</b>	<b>A.8.1 Conservation of Valuable Soil Resources</b>		
<i>The stripping of vegetation during preliminary activities on site greatly increases the risk of soil erosion.</i>	a. Procedures that are in place to conserve topsoil during the construction phase of the project are to be applied to the set-up phase.	E / PM / C / ECO	Throughout the duration of the project
<b>A9 Stormwater</b>	<b>A.9.1 Storm water Damage Prevention</b>		
	a. To prevent storm water damage, the increase in storm water runoff resulting from the construction activities must be estimated and the drainage system assessed accordingly. A drainage plan must be submitted to the Engineer.	E / ECO / PM	During surveys and preliminary investigations.
<b>A.10 Water Quality</b>	<b>A.10.1 Maintenance of Water Quality</b>		
	a. Storage areas that contain hazardous substances must be bunded with an approved impermeable liner.	E / PM / ECO	During site set up.

<p><i>Incorrect disposal of substances and materials and polluted run-off can have serious negative effects on groundwater quality.</i></p>	<p>b. Vehicle washing, and maintenance must be in such that it does not result in harm on the surrounding environment. A set-up must therefore be made to ensure no polluted water enters the natural environment.</p>		
<p><b>A.12 Set up of Waste Management</b></p>	<p><b>A.12.1 Waste Management</b></p>		
	<p>a. The contractor is responsible for the internal collection of refuse and for transporting it to a registered landfill site once every week; unless a service agreement is entered into between the contractor and the municipality.</p>	<p>C</p>	<p>During site set up</p>
	<p>b. The excavation and use of rubbish pits is forbidden.</p>	<p>PM / ECO / C</p>	<p>During site set up</p>
	<p>c. Burning of waste is forbidden<sup>1</sup>.</p>		
	<p>d. A fenced area must be allocated for waste sorting and storage prior to removal.</p>	<p>C / PM / ECO</p>	<p>During site set up and on going</p>
<p>e. Individual skips/bins for different types of waste (e.g. 'household' type refuse, building rubble, etc.) must be provided.</p>			
<p><b>A.13 Safety and Security</b></p>	<p><b>A.13.1 Fencing / Demarcation</b></p>		
	<p>a. all necessary signage must be obtained prior to the commencement of construction activities.</p>	<p>PM / C / ECO</p>	<p>On-going.</p>
	<p><b>A.13.2 Lighting</b></p>		
	<p>a. Lighting on the construction campsite is to be set out to provide maximum security and to enable policing of the site, without creating a visual nuisance to local residents or businesses.</p>	<p>PM / C / ECO</p>	<p>On-going</p>
	<p><b>A.13.3 Risks Associated with Materials on Site</b></p>		
<p>a. All IAPs must be notified in advance of any known potential risks associated with the construction site and the activities on it. Examples of these are blasting, earthworks / earthmoving machinery on steep slopes above houses / infrastructure, risk to residences along haulage roads / access routes.</p>			

<sup>1</sup> A possible exception to this may be that the alien invasive vegetation, which is removed from the site, should be burned to prevent the spread of the plants.



B. CONSTRUCTION PHASE



This pertains to all environmental impacts associated with construction and is not limited to the land on which the Project is located. It includes the site footprint, construction campsites, access roads and tracks, as well as any other area affected or disturbed by construction activities. The EMPr (particularly the specifications for rehabilitation) is relevant for all areas disturbed during construction. Furthermore, the EMPr takes into account all secondary impacts on the local community and the public.

Activity	Management / Mitigation	Responsibility	Frequency / Timing
<b>B1 – Access to the site</b>	<b>B1.1 Maintenance of the access</b>		
	a. Access to the site must be controlled and managed in such that it does not result in excessive environmental damage.	PM / E	Initial set up and on-going
	b. Contractors must ensure that access roads are maintained in good condition by attending to any damage as it occurs.	E / C / ECO	Establish at setup
	c. Unnecessary compaction of soil by heavy vehicles must be avoided; construction vehicles must be restricted to demarcated access, haulage routes and turning areas.	PM / C / EC	On-going, and specifically after heavy rain
	d. The construction signs must be placed at the beginning of the project indicating all necessary information such as Contractor and Municipality. Approval must be sought from the relevant authority for the installation of the signage.	PM / E / C / ECO	
	e. Machine / vehicle operators must receive clear instructions to remain within demarcated access routes. Movement of heavy-duty vehicles and vehicles connected with work in progress must be restricted to the construction zone.	E / C / PM	On-going, and specifically after heavy rains
<b>B.2 Maintenance of Construction Camp</b>	<b>B.2.1 Surfaces</b>		
	a. The Contractor must monitor and manage drainage of the campsite.	PM / C / ECO	Weekly inspection
	b. Run-off from the campsite must not discharge into neighbours' properties.		
<b>B.2.2 Ablutions</b>			

	a. Temporary chemical toilets must be provided by a company approved by the Engineer. The toilets must be made available to all staff and must be no closer than 50m from any watercourse. These facilities must comply with local authority regulations, be maintained in a clean and hygienic condition. Their use must be strictly enforced.	C/ECO	On-going
	b. The construction of a “long-drop” is forbidden and Contractor is to ensure that open areas or the surrounding bush are not being used as a toilet facility.	C / ECO	On-going
	c. There shall be a minimum of 1 toilet for every 20 workers and these must be situated no further than 100m from the work front. A toilet must also be provided at campsite.	PM / ECO	On-going
	d. Under no circumstances may open areas or the surrounding bush or degraded and built up areas be used as a toilet facility.	PM / ECO	On-going
	e. A registered chemical waste company is to be used to remove waste from chemical toilets on site on a regular basis. Proof of toilet service and safe disposal of effluent must be kept on site for each service.	PM / ECO	On-going
<b>B.2.3 Camp Waste Disposal</b>			
	a. The Contractor must ensure that all litter is collected from the work and camp areas daily. The construction area must be cleared of litter, debris (e.g. Cement packets, bitumen residues etc.) and other domestic waste on completion of the day’s work.	PM / C / ECO	On-going
	b. Bins and / or skips must be emptied regularly and waste must be disposed of at a registered landfill site. Waybills for all such disposal are to be kept by the Contractor for review by the Engineer / ECO.	PM / C / ECO	Daily
<b>B.2.4 Eating Areas</b>			
	a. Eating areas must be regularly serviced and cleaned to ensure the highest possible standards of hygiene and cleanliness.	E / PM / C	Weekly monitoring

	b. All litter throughout the site must be picked up on a daily basis and placed in the bins provided with waste to be separated according to type of waste.	E / PM / C	On-going monitoring
	<b>B.2.5 Housekeeping</b>		
	a. The Contractor must ensure that his camp and working areas are kept clean and tidy at all times.	PM / C	On-going
<b>B.3 Staff Conduct</b>	<b>B.3.1 Environmental Education and Awareness</b>		
	a. The Contractor must monitor the performance of the construction workers to ensure that the points relayed during their induction have been properly understood and are being followed. If necessary, the ECO should be called to the site to further explain aspects of environmental or social behaviour that are unclear.	PM / C / ECO	On-going
	<b>B.3.2 Worker Conduct on Site</b>		
	a. The rules that are explained in the worker conduct section must be followed at all times. Non-compliance of these rules could result in the removal of workers by the contractor.	PM / C / ECO	On-going
<b>B4 – Dust / Air Pollution</b>	<b>B.4.1. Dust &amp; Air Pollution</b>		
<i>Main causes of air pollution are dust particles from vehicle movements and stockpiles, vehicle emissions and fires</i>	a. Vehicles travelling to and from the construction site must adhere to the speed limits so as to avoid producing excessive dust. A speed limit of 40 km/h must be adhered to on the construction site.	E / C / PM	As directed by Engineer
	b. Construction operational hours must be limited to between 07h00 and 17h00 will reduce congestion and disturbance in surrounding areas and minimize road deterioration and consequent dust creation.	E / C / PM	As directed by Engineer
	c. Access points and other cleared surfaces must be dampened whenever necessary and especially in dry and windy conditions to avoid excessive dust.	PM / C	On-going

	d. Should excessive emissions be observed from vehicles and machines; the Contractor is to have the equipment seen to immediately.	PM / C / ECO	On-going
	e. Stockpiles may cause dust and must therefore be managed in accordance with the guidelines in Materials Management.	PM / C / E	On-going
	f. Stockpiles not used in three (3) months after stripping must be seeded to prevent dust and erosion.	E / PM / ECO	On-going
<b>B5 – Soil Erosion</b>	<b>B.5.1 Topsoil Stripping and Stockpiling</b>		
	a. Excavated soil and other material must be deposited in a spoil area as agreed with ECO and engineer.	PM / C / ECO	As each activity is completed.
	b. Erosion prevention measures must be implemented: Berms and sand bags may be used to contain all sediment whilst energy dissipaters must be constructed at all outflow points. The site must be monitored weekly for any sign of off-site siltation. All exposed earth must be rehabilitated promptly with suitable vegetation to protect the soil.	E / PM / C / ECO	On-going
	<b>B.5.2 Exposed Surfaces</b>		
	a. Side tipping of soil and excavated materials must not be permitted.	E / C / PM	As directed by the Engineer
	b. Storm water control and wind screening must be undertaken to prevent soil erosion on site.	E / ECO / PM	As directed by the Engineer
	c. There must be no offsite impacts of storm water. A general rule is that the storm water velocity eddies on the site must be the same as the predevelopment area.	E / ECO / PM / C	As directed by the Engineer
	d. In areas where steep slopes are excavated, erosion control measures need to be initiated and these may include the planting of indigenous vegetation at short intervals to prevent the formation of gullies.	E / ECO / PM / C	As directed by the Engineer

	f. A Storm Water Management Plan must be developed, provided and implemented by the engineer. Drainage must be controlled to ensure that runoff from the access road will not lead to erosion and offsite pollution of any water resources along the road. The storm water drainage system must not be contaminated by other waste sources generated during construction phase of the development.	PM / E / C / ECO	On-going and as directed by the Engineer
	g. Battering of all banks shall be such that cut, and fill embankments are no steeper than previous natural slopes unless otherwise permitted by the Engineer. Cut and fill embankments steeper than previous ground levels shall be re-vegetated immediately on completion of trimming or shall be protected against erosion using measures approved by ECO and Engineer.	PM / E / C / ECO	Ongoing and as directed by the Engineer
	h. If cut and fill earthworks are required, these must be limited to the minimum necessary for the proposed development. Cut and fill banks must not be sloped steeper than 1: 1.5. All fill must be well compacted in layers on placement and must not be loose end-tipped. No cut or fill slope must exceed 2.5 m vertical height. All earthworks must be vegetated as soon after completion of construction as is practically possible with locally sourced indigenous vegetation where possible.	E / PM	Directed by the Engineer
	i. All embankments, unless otherwise directed by the Engineer, shall be protected by a cut off drain to prevent water from cascading down the face of the embankment and causing erosion.	E / C / ECO	Directed by the Engineer
<b>B6 – Storm Water</b>	<b>B6.1 General Principles</b>		
<i>Construction activities frequently result in diversion of natural water flow resulting in concentration of flow and an increase in the erosive potential of the water</i>	a. The Contractor must not in any way modify nor damage the banks or beds of streams, rivers, wetlands, other open water bodies and drainage lines adjacent to or within the designated area, unless required as part of the construction project specification. Where such disturbance is unavoidable approval must be obtained from the ECO.	E / PM / ECO	As surface becomes exposed

	b. Earth, stone and rubble is to be properly disposed of so as not to obstruct natural pathways over the site. i.e. these materials must not be placed in storm water channels, drainage lines or rivers.	E / PM / ECO / C	On-going
	c. The provisions of the National Water Act 36 of 1998 shall be complied with at all times.	PM / C / E / ECO	On-going
	d. The Contractor is to ensure that impediments to natural water flow is avoided during construction, or is temporarily diverted.		
	e. There must be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.		
<b>B.6.2 Un-channelled Flow</b>			
	a. During construction un-channelled flow must be controlled to avoid soil erosion.	PM / C / E / ECO	On-going monitoring
	b. Where surface runoff is concentrated (e.g. along exposed tracks), flow must be slowed by contouring.	E / ECO / PM	On-going
<b>B7 – Water</b>	<b>B7.1 Water Quality</b>		
<i>Water quality is affected by the incorrect handling of substances and materials. Soil erosion and sediment is also detrimental to water quality. Mismanagement of polluted runoff from vehicle and plant washing and wind dispersal of dry materials into rivers and watercourses are detrimental to water quality.</i>	a. The Department of Water Affairs and the ECO as well as other emergency contact numbers provided by the Municipality must be contacted in order to deal with spillages and contamination. The Contractor is to compile a list of emergency contact numbers to refer to in order to deal with fire, spillages and contamination of land and aquatic environments.	PM / E	On-going monitoring
	b. Every effort must be made to ensure that any chemicals or hazardous substances do not contaminate the soil or ground water on site.	PM / E / ECO	On-going monitoring / as the work progresses
	c. Care must be taken to ensure that runoff from vehicle or plant washing does not enter surface or ground water. Vehicles and machinery may only be cleaned at a designated place at the construction camp.		

	d. Mixing / decanting of all chemicals and hazardous substances must take place either on a tray or on an impermeable surface.	PM / E / C	
	e. Contaminated wastewater must be managed by the site manager to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the camp shall be collected and removed from the site for appropriate disposal at a licensed commercial facility.	PM / C / ECO	
	f. Site staff shall not be permitted to use any watercourse or natural water source adjacent to the designated site for the purposes of bathing, washing of clothing or for any construction related activities. Municipal water (or another source approved by the Contractor) must instead be used for all activities such as washing of equipment or disposal of any type of waste, dust suppression, compacting etc.	PM / C / ECO	
	g. Dewatering of vessels, tanks, etc is to take place in a controlled manner. No uncontrolled release of water shall be allowed onto the site area. Water wastage must be avoided and where possible water must be recycled.	PM / C / ECO	
<b>B7.2 Water Supply</b>			
	a. Any existing potable water source affected by the road construction is to be maintained for domestic use during construction.	E / PM	
<b>B8 – Conservation of the Natural Environment</b>	<b>B8.1 Fauna and Flora</b>		
	a. The Contractor is to check that vegetation clearing has the prior permission of the E / ECO. Vegetation that is removed is to be replanted and excavation is to be kept to a minimum.	ECO / PM / E / C	On-going monitoring / as the work progresses
	b. Development infrastructure must be screened wherever possible from ecologically sensitive areas to reduce the human disturbance factor.	C / PM / ECO	

	c. Alien vegetation encroachment onto the site as a result of construction activities must be controlled during construction. Immediate re-vegetation of stripped areas and removal of aliens by weeding must take place.	ECO / PM / E	
	<b>B8.2 Geology</b>		
	a. In the event of excavation, the material that is removed must be separated into topsoil and subsoil. The top 150mm would be considered topsoil and must be stockpiled separately.	PM / C / ECO	On-going monitoring
	b. In the event of infilling, replacement of subsoil must precede the topsoil replacement, and all material must be well compacted.		
<b>B9 – Materials Management</b>	<b>B9.1 Stockpile Management</b>		
	a. Stockpiles must not be situated such that they obstruct natural water pathways.	PM / C / ECO	On-going monitoring
	b. Stockpiles must not exceed two (2) metres in height unless otherwise permitted by the Engineer or be left for longer than three (3) months.	PM / C / ECO / E	On-going monitoring
	c. Stockpiles must be protected from erosion using appropriate measures for conditions the stockpiles are exposed to which may include construction of berms or low brick walls around their bases.	PM / C / E / ECO	On-going monitoring
	d. Stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding.		
	<b>B9.2 Handling of Hazardous Materials</b>		
	a. Cement, bitumen and other potential environmental pollutants must be mixed on an impermeable surface with special provisions for storm water management.	E / PM / C / ECO	On-going
	b. All empty containers must be removed from the site for appropriate disposal at a licensed facility and must be treated as hazardous waste.		
	c. No vehicles transporting concrete may be washed on site.		



	d. All substances required for vehicle maintenance and repair must be stored in sealed containers until they can be disposed of / removed from the site.		
	e. Hazardous substances / materials are to be transported in sealed containers or bags.		
	f. The Contractor is to outline a method statement for the dealing with accidents / spillages of hazardous materials. This statement must be handed to the Engineer as well as ECO.		
<b>B9.3 Sourcing construction materials</b>			
	a. Wherever possible, materials that have been produced locally must be used for the construction of the site camp (e.g. bricks, window frames, etc)	E / C / PM	On-going monitoring
<b>B10 – Waste Management</b>	<b>B10.1 On-site Waste Management</b>		
<i>Definition; “Refuse” refers to all construction waste (such as rubble, cement, bags, timber, cans etc)</i>	a. The Contractor shall ensure that all refuse is collected from the camp and work areas daily.	PM / ECO	Monitored weekly and at the start of the builders holidays
	b. All material used for construction and maintenance must be removed from the site after construction or maintenance work.	PM / ECO	On-going
	c. Refuse must be placed in the designated skips / bins which must be regularly emptied. These must remain within demarcated areas and must be covered to prevent wind-blown rubbish and scavenging by people and animals.	PM / C / ECO	On-going
	d. In addition to the waste facilities within the construction camp, provision must be made for waste receptacles to be placed at intervals along the work front.	ECO / PM / C	On-going
	e. Littering on site is forbidden and the site shall be cleared of litter at the end of each working day.	ECO / PM	On-going
	<b>B.10.2 Waste Disposal</b>		
<b>Non – hazardous waste</b>			
	a. All waste must be removed from the site and transported to a registered landfill site.	E / PM / ECO	On-going

	b. Any construction rubble shall be disposed of at registered disposal sites.	PM / E / C / ECO	On-going
	c. Waste from chemical toilets must be disposed of regularly and in a responsible manner by a registered waste contractor. Care must be taken to avoid contamination of soils and water, pollution and nuisance to adjoining areas.	PM / ECO	On-going
	<b>Hazardous Waste</b>		
	a. Contaminated water associated with construction activities must be contained in separate areas with berms and must not be allowed to enter into the natural drainage system.	PM / C / ECO	On-going
	b. Chemical waste must be stored in appropriate containers and disposed of at licensed disposal facilities.	PM / C	On-going
	d. Soil that is contaminated with, e.g. cement, bitumen, petrochemicals or paint must be disposed of at a registered hazardous landfill site.	PM / ECO / C	On-going
	e. A sump must be created for concrete waste. This is to be de-sludged regularly and the cement waste is to be removed to a tip site as approved by the local authority.	E / PM / ECO	At least 24 hours prior to the activity taking place.
<b>B.11 Social Impacts</b>	<b>B.11.1 Disruption of Infrastructure and Services</b>		
<i>Regular communication between the Contractor and the IAPs is important for the duration of the contract.</i>	a. Contractors activities and movement of staff is to be restricted to designated construction areas.	PM / C	On-going
	b. Should the construction staff be approached by members of the public or other stakeholders, they must assist them in locating the Engineer or Contractor or provide a number on which they may contact the Engineer or Contractor.	E / PM / C	Monthly
	c. The conduct of the construction staff when dealing with the public or stakeholders shall be in a manner that is polite and courteous at all times. Failure to adhere to this requirement may result in the removal of staff from the site by the Engineer.	E / PM / C	

	d. Disruption of access for local residents must be minimised and must have the consent of the Engineer.	E / PM / ECO	
	e. The Contractor is to inform neighbours in writing of disruptive activities at least 24 hrs beforehand.	PM / C / ECO / E	
	f. Drivers of construction vehicles must exercise care when travelling to and from the site specifically when travelling through. Drivers of construction vehicles must be considerate of other road users. They are to be especially careful at narrow sections and water crossings or where livestock is being herded.	PM / C	
<b>B.11.2 Visual Impacts</b>			
	b. The site must be kept clean to minimize the visual impact of the site.	PM / C / ECO	As required
<b>B.11.3 Noise</b>			
	a. Machinery and vehicles are to be kept in good working order for the duration of the project to minimize noise nuisance to neighbours.	PM / C / ECO	On-going
	b. Notice of particularly noisy activities must be given to residents adjacent to the construction site. Noisy activities must be restricted to the times given in the Project Specification or General Conditions of Contract.	PM / C / ECO	On-going
<b>B.11.4 Communication with Interested and Affected Parties (IAPs)</b>			
	a. The Engineer and Contractor are responsible for on-going communication with those people that are interested / affected by the project.	PM / C / E / ECO	On-going
	b. Queries and complaints are to be handled by: - documenting details of such communications; - submitting these for inclusion in the complaints register; - bringing issues to the Engineers attention immediately; - taking remedial action as per Engineer's instruction.		

	c. Selected staff are to be made available for formal consultation with IAPs in order to explain the construction process; answer questions.		
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**C. POST-CONSTRUCTION**

Activity	Management / Mitigation	Responsibility	Frequency / Timing
<b>C.1 Construction Camp</b>	<b>C.1.1 Construction Camp Rehabilitation</b>		
	a. All structures comprising the construction camp are to be removed from site.	E / PM / C / ECO	Project completion.
	b. The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint and fuels, etc. and these must be cleaned up.		
	c. All hardened surfaces within the construction camp area must be ripped, all imported materials removed, and the area shall be top-soiled and re-grassed using the guidelines set out in the re-vegetation specification.		
	d. The Contractor must arrange the cancellation of all temporary services.		
<b>C2 – Vegetation</b>	<b>C.2.1 Landscaping</b>		
	a. All disturbed areas or areas, which have been engineered for the purpose of the development, are to be rehabilitated with indigenous vegetation, which must be sourced from surrounding areas where possible. This will aid in preventing erosion within the site.		
	b. There must be ongoing weeding of vegetated areas especially areas around the wetland and other areas with sensitive vegetation to remove alien plant species.		
<b>C3 – Land Rehabilitation</b>	<b>C.3.1 Land Rehabilitation</b>		

	a. Excavated soil and soil disturbance – excavated soil not used in the development must be disposed of in a designated area as agreed with Engineer. Surfaces are to be checked for waste products from activities such as concreting and asphaltting and cleared in a manner approved by the engineer.	E / PM / C / ECO	Project Completion
	b. Rehabilitation must be executed in such a manner that surface runoff will not cause erosion of disturbed areas during and after rehabilitation.	E / PM / C / ECO	Project Completion
	c. All rubble is to be removed from the site to an appropriate disposal site as approved by the Engineer. Burying of rubble on site is prohibited.		
	d. The site is to be cleared of all litter.		
	e. All embankments are to be trimmed, shaped and re-planted to the satisfaction of the Engineer and ECO.	E / PM / C / ECO	
	f. All trimmed and / or compacted areas must be left rough to facilitate binding of topsoil and vegetation.	E / PM / C	
<b>C4 – Materials and Infrastructure</b>	<b>C.4.1 Removal of Barriers, Remediation of Damage</b>		
	a. All material used for building and maintenance must be removed from site after construction or maintenance.	PM / C / ECO	As completed
	b. The Contractor must repair any damage that the construction works has caused to adjacent areas.	PM / C / ECO	Continually as necessary
	c. Fences, barriers and demarcations associated with the construction phase are to be removed from the site unless stipulated otherwise by the Engineer.	PM / E / C	On completion
	e. All residual topsoil stockpiles must be removed and disposed of as agreed with ECO and Engineer.	PM / E / C	On completion
	f. All areas where temporary services were installed are to be rehabilitated to the satisfaction of the Engineer and ECO.	PM / E / ECO / C	On completion

<b>C5 – General</b>	<b>C.5.1 General Remediation</b>		
	a. Temporary road works must be closed and access across these blocked.	E / PM / C	On completion of the construction and maintenance phases.
	b. All areas where temporary services including the borrow pit are to be rehabilitated to the satisfaction of the Engineer and ECO.	E / PM / C / ECO	
	c. A Meeting is to be held on site between the Engineer, ECO, and the Contractor to approve all remediation activities and to ensure that the site has been restored to a condition approved by the Engineer and ECO.		

**D. OPERATIONAL PHASE**

<b>Activity</b>	<b>Management / Mitigation</b>	<b>Responsibility</b>	<b>Frequency / Timing</b>
<b>D1 – Vegetation / Landscape Management</b>	a. All rehabilitated areas will need to be maintained and re-seeded with local indigenous vegetation where necessary on a regular basis.	The Local Municipality	On-going
<b>D2 – Noise Control</b>	a. All vehicles must be in good condition and follow the norms and standards for noise control that are applicable for race cars.		
	b. Trees may be planted, or walls built around the property to buffer the noise that is released to the surrounding community.		
	c. All neighbours must be notified in due time of the construction activities.		
	d. The sound system must be tested before events to ensure that sound levels are high enough to be heard within the property with as little impact on the surrounding community as possible.		
<b>D 5.4 Storm water Management</b>	a. The storm water management system implemented as part of the road must be monitored and maintained to ensure continued efficient functionality.		

D 5.5. Solid Waste / Refuse Removal	a. Any waste which is produced from maintenance activities must be appropriately disposed of without any harm to the environment.		
D6 - Soil Erosion	a. The following measures need to form part of the management of the site: 1. Monitoring storm water exit points. 2. Fill in and re-vegetate eroded areas.		
D7 – Management of the Development	a. The development must be controlled to ensure that there are no further damages to the affected environment.		
	b. Local environmental authority must be informed in due time of any intended changes or developments which may affect the environment. Furthermore, the Competent authority may at any point visit the site to monitor whether any further environmental degradation has occurred.		

**E. DECOMMISSIONING PHASE**

It is imperative that non-functional structures be removed as soon as possible, and that the site is rehabilitated as soon as possible. If non-functional structures are not needed anymore, and not removed, it must be maintained that they will be used to prevent the environmental degradation of the site.

**F. STAFF CONDUCT CONTROL AND INFORMATION SHEET**

1	<p><u>ALL STAFF MUST OBEY THE FOLLOWING RULES:</u></p> <p><b>DO NOT</b> leave the construction site untidy and strewn with rubbish that will attract animal pests.</p>
2	<p><b>DO NOT</b> bring your pets to the construction site.</p>
3	<p><b>DO NOT</b> trespass on private properties not linked to the project.</p>

4	<b>DO NOT</b> carry a weapon on the construction site or in the vehicles transporting workers to and from the construction site.
5	<b>DO NOT</b> set fires unnecessarily.
6	<b>DO NOT</b> cause any unnecessary disturbing noise at the construction camp/site or at any designated worker collection/drop off points.
7	<b>DO NOT</b> drive a construction-related vehicle under the influence of alcohol.
8	<b>DO NOT</b> exceed the national speed limits on public roads or exceed the recommended speed limits in this management plan (where applicable) whilst driving a construction vehicle.
9	<b>DO NOT</b> drive a vehicle that is generating excessive noise (noisy vehicles must be reported and repaired as soon as possible).
10	<b>DO NOT</b> litter along the roadsides, including both public and private roads.
11	<b>DO NOT</b> remove or destroy vegetation at the construction camp/construction site without the prior consent of the Project Manager and Environmental Control Officer.
12	<b>DO NOT</b> tamper with, destroy or remove vegetation from any areas that have been fenced off or marked.
13	<b>DO NOT</b> pollute watercourses, whether flowing or not.





**12. ACKNOWLEDGEMENT FORM**

Record of signatures providing acknowledgment of being aware of and committed to complying with the contents of this Environmental Management Programme (EMPr), which relates to the environmental mitigation measures for the project outlined below, and the environmental conditions contained in the civil and other construction contract documents.

**PROJECT NAME:**  
**THOKOZA ACCESS ROAD**

**DEVELOPER / PROPONENT:**

Signed: ..... Date: .....

**PROJECT MANAGER:**

Signed: ..... Date: .....

**CONTRACTOR:**

Signed: ..... Date: .....

**ENVIRONMENTAL CONTROL OFFICER**

Signed: ..... Date: .....