



**ENVIRONMENTAL MANAGEMENT PROGRAMME:  
PROPOSED DEVELOPMENT OF THE ROCABAR ACCESS ROADS AS  
PART OF THE N2 KOKSTAD INTERSECTION UPGRADE, GREATER  
KOKSTAD LOCAL MUNICIPALITY, KWAZULU-NATAL PROVINCE**

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<b>VERIFICATION PAGE</b>
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**TITLE:** Environmental Management Programme for the proposed development of the Rocabar access roads as part of the N2 intersection upgrade in Kokstad, Harry Gwala District Municipality, KwaZulu-Natal Province

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## DEFINITIONS

**Aspect** - Element of an organisation's activities, products or services that can interact with the environment.

**Auditing** - A systematic, documented, periodic and objective evaluation of how well the Environmental Management Programme (EMPr) is being implemented and is performing with the aim of helping to safeguard the environment by facilitating management control which would include meeting regulatory requirements. Results of the audit help the organisation to improve its environmental policies and management systems, while keeping track of their compliance with the Environmental Authorisation.

**Contamination** - Polluting or making something impure. The presence of a minor and unwanted constituent, contaminant or impurity in a material or natural environment.

**Corrective (or remedial) action** - Response required in addressing an environmental problem that is in conflict with the requirements of the EMPr. The need for corrective action may be determined through monitoring, audits or management review.

**Degradation** - The lowering of the quality of the environment through human activities, e.g., river degradation, soil degradation.

**Developer** – Entity which applies for environmental approval and is ultimately accountable for compliance to conditions stipulated in the EA (Environmental Authorisation) and EMPr.

**Environment** - The surroundings within which humans exist and that are made up of land, water and atmosphere of the earth, micro-organisms, plant and animal life: or any part or combination of the two and the interrelationships among them, the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being. Environmental Impact Assessment (EIA) - An

**Environmental Management Programme (EMPr)** - A document that provides a description of the methods and procedures for mitigating and monitoring negative environmental impacts identified as part of the environmental assessment. This document is developed in line with the principles of Integrated Environmental Management (EIM), the National Environmental Management Act (Act No. 107 of 1998) and Environmental Impact Assessment Regulations, 2014 as (amended).

**Environmental Impact Assessment (EIA)** - The process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of a proposed development. The EIA includes an evaluation of alternatives; recommendations for appropriate management actions for minimising or avoiding negative impacts and for enhancing positive impacts; as well as proposed monitoring measures.

**Environmental policy** – A statement of intent and principles in relation to overall environmental performance, providing a framework for the setting of objectives and targets.

**Habitat** - A habitat is an ecological or environmental area that is inhabited by a particular species of animal, plant, or other type of organism. It is the natural environment in which an organism lives, or the physical environment that surrounds a species population.

**Impact** - A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time, space, magnitude and intensity.

**Indigenous species** - Flora and Fauna species that are naturally found in an area.

**Infrastructure** - The network of facilities and services that are needed for economic activities, e.g., roads, electricity, water, sewerage, etc.

**Mitigation** - Measures designed to avoid, reduce or remedy adverse impacts. Actions that limit, stop or reverse the magnitude and/or rate of long-term effect on the environment.

**Natural environment** - Encompasses all living and non-living things occurring naturally on Earth or some region thereof. It is an environment that encompasses the interaction of all living species. Climate, weather, and natural resources that affect human survival and economic activity.

**Policy** - A set of aims, guidelines and procedures to help you make decisions and manage an organisation or structure. Policies are based on people or an organisation's values and goals.

**Process** - Development usually happens through a process - a number of planned steps or stages.

**Recycling** - A process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material. Collecting, cleaning and re-using materials.

**Rehabilitation, as defined by the United States National Research Council (1974)** - implies that the disturbed land will be returned to state and productivity level in accordance with an approved land use plan, ensuring that the system a stable ecological state; that it does not contribute to further environmental deterioration and is consistent with the surrounding aesthetic values (Wali, 1992).

**Resources** - Parts of our natural environment that we use and protect, e.g., land, forests, water, wildlife, and minerals.

**Storm Water Management** – Strategies implemented to control the surface flow of storm water such that erosion, sedimentation and pollution of surface and ground water resources in the immediate and surrounding environments are mitigated. This is specifically important during the construction and Operation phases of a project.

**Waste Management** – Classifying, recycling, treatment and disposal of waste generated during construction and operational activities. Generation, prevention, characterization, monitoring, treatment, handling, reuse and residual disposition of solid wastes

## LEGISLATIVE REQUIREMENTS FOR AN EMPr

The table below provides the Requirements for an Environmental Management Programme (EMPr) in terms of the 2014 EIA Regulations as amended, (Appendix 4) with reference to the relevant sections of this report or where these requirements are addressed.

Section	Content	Reference in report
An EMPr must comply with section 24N of NEMA and include-		
1(a)	Details of <ul style="list-style-type: none"> <li>(i) the EAP who prepared the EMPr; and</li> <li>(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae</li> </ul>	Chapter 2
1(b)	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Chapter 1
1(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Chapter 1
1(d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including- <ul style="list-style-type: none"> <li>(i) planning and design;</li> <li>(ii) pre-construction activities;</li> <li>(iii) construction activities;</li> <li>(iv) rehabilitation of the environment after construction and where applicable post closure; and</li> <li>(v) where relevant, operation activities;</li> </ul>	Chapter 7
1(e)	A description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Chapter 7
1(f)	A description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to – <ul style="list-style-type: none"> <li>(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;</li> <li>(ii) comply with any prescribed environmental management standards or practices;</li> <li>(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and</li> </ul>	Chapter 7

	(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	
1(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Chapter 7
1(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Chapter 7
1(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	Chapter 7
1(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Chapter 7
1(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Chapter 7 and 8
1(l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Chapter 8
1(m)	An environmental awareness plan describing the manner in which- <ul style="list-style-type: none"> <li>(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and</li> <li>(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and</li> </ul>	Section 5.3
1(n)	Any specific information that may be required by the competent authority.	-

## 1. BACKGROUND AND INTRODUCTION

### 1.1 Project Introduction and Activity Description

Terratest (Pty) Ltd, the independent Environmental Impact Assessors, have been appointed by JG Afrika (Pty) Ltd on behalf of the South African National Roads Agency SOC Limited (SANRAL) (the Applicant) to compile and submit an Environmental Management Programme (EMPr) as part of the Basic Assessment process for the proposed development of the Rocabar access roads (to the tradeport and future motor city) as part of the N2 intersection upgrade in Kokstad, KwaZulu-Natal Province.

This Environmental Management Programme (EMPr) has been compiled in accordance with 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 Report (BAR) by defining the relevant objectives, impacts and mitigation for the proposed project.

This EMPr also details the requirements the Construction and Rehabilitation Phases of the project to give effect to Section 28 (1) of the NEMA, which pertains to “Duty of Care and Remediation of Environmental Damage” principles which state that: *“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 SANRAL 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 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.

The following principles as contained in Section 2 of the NEMA are to be adhered to, in conjunction with this EMPr, throughout the development phases.

a) 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, which 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.

b) Progressive Rehabilitation Principle

Progressive rehabilitation must be undertaken throughout the phases of the project where areas have been impacted upon. Rehabilitation must commence as soon as works are completed in a specific area and not at the end of the entire project.

## 1.2 Project Location

The project site for the proposed development of access roads is located on a part of the remaining extent of the farm Koppies Kraal 289 (SG Code: N0ES0000000028900000), south of the Kokstad town and east of the R56 provincial road within the jurisdiction of Greater Kokstad Local Municipality of KwaZulu-Natal Province. The proposed development of the access roads will include the following:

- New road section of approximately 370m with an initial maximum road width of 18.5m (4m x 3.5m wide lanes, with a 1.5m shoulder on either sides and a 1.5m wide sidewalk on one side). Phase 1 of the construction the road will taper from 4 lanes (18.5m) to 2 lanes (11.5m) including shoulders and sidewalk.
- Second new access road approximately 310m x 10m wide (2 x 3.5m wide lanes, with a 1.5 m shoulder on either sides).
- Stream/wetland crossings culvert on a two (2) lane (11.5m). The culvert will be widened in the future to accommodate 4 lanes (18.5m).

Access to the site is gained via an existing gravel road that is linked to the R56 and the approximate centre co-ordinates for the key project components are indicated on **Table 1**. Refer to the **Figure 1** for the Locality Map of the project site.

*Table 1: Location of the key project components*

Section	Infrastructure	South	East
Road 1	Road Start at R56	30°33'54.28"S	27°25'57.41"E
	Road End at culvert	30°33'46.01"S	27°26'05.37"E
Road 2	Road Start at roundabout	30°33'50.15"S	27°25'59.45"E
	Road End	30°33'58.61"S	27°26'04.99"E

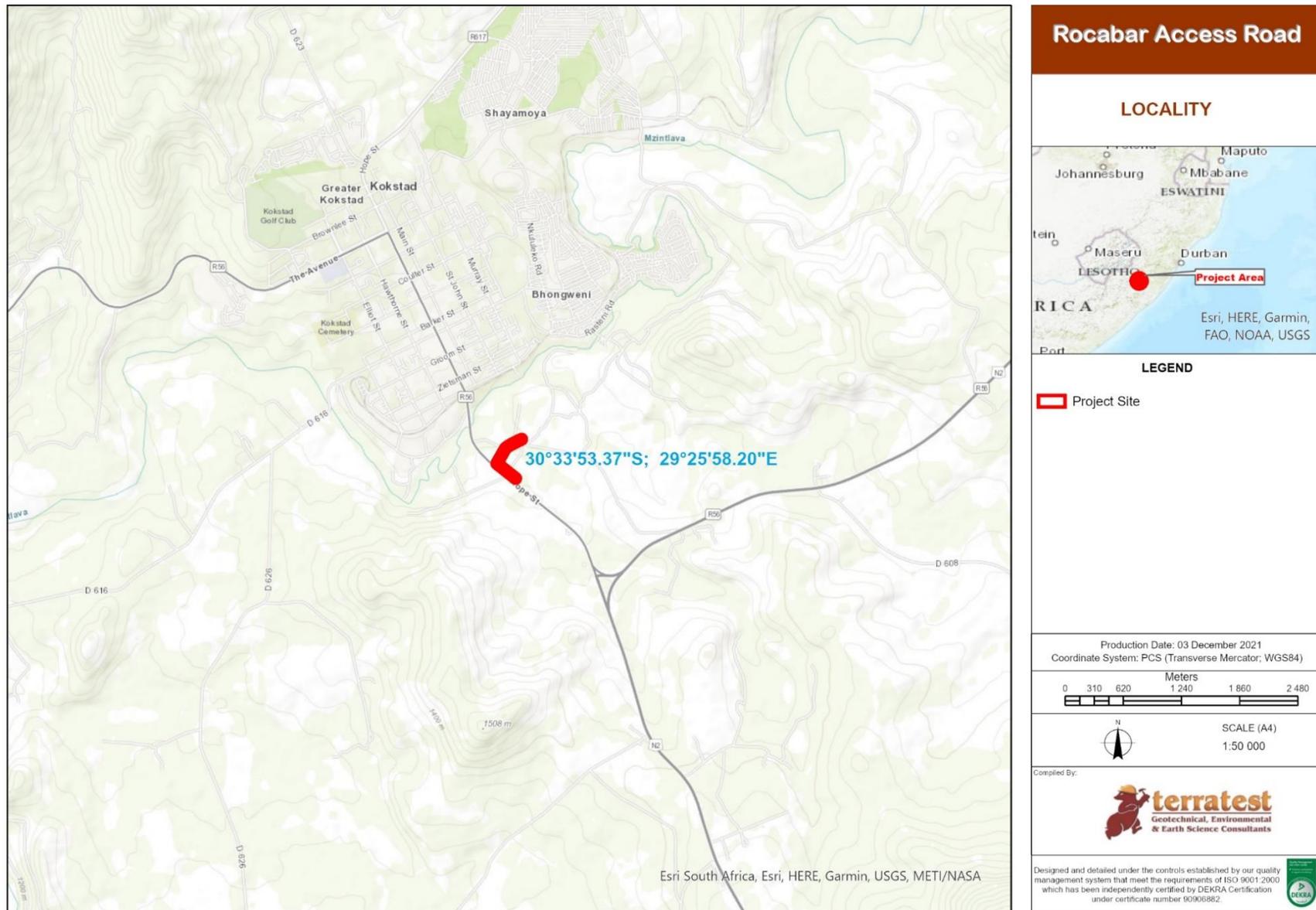


Figure 1: Locality Map of the project site

### 1.3 Purpose and Objectives this EMPr

This EMPr is one of the main outputs of the Basic Assessment process and has been compiled in accordance with the requirements of the National Environmental Management Act (No. 107 of 1998) (NEMA) legislation and Integrated Environmental Management (IEM) philosophy which aims to achieve a desirable balance between conservation and development (DEAT, 1992).

The purpose of this EMPr is to provide a framework within which the environmental risks and liabilities identified during the Basic Assessment process are managed for the duration of the project lifecycle. This document further provides mitigation measures to ensure legal compliance and environmental best practice during the construction of the proposed project.

The EMPr has the following key objectives:

- To ensure compliance of the with applicable environmental legislation;
- To communicate environmental expectations and requirements of the project
- To ensure that the roles and responsibilities of the various parties involved in the implementation of the EMPr are clearly outlined;
- To reduce adverse environmental impacts as a result of the project activities; and
- To ensure continuous improvement in terms of the environmental performance of the project.

### 1.4 Specific Mitigation Measures and Specialist Studies

All recommendations made by the specialists and all mitigation measures proposed by the specialists in their assessments, as incorporated in the EMPr should be implemented and adhered to; and all other conditions, monitoring and mitigation measures as provided in the EMPr should be adhered to. Some specific recommendations and mitigation measures highlighted in the Basic Assessment Report are also included in this EMPr.

### 1.5 Party/ies Responsible for implementing this EMPr

The compilation of this EMPr has been based on the findings of the on-site assessment undertaken by Terratest (Pty) Ltd, specialists involved in the project, input from the Department of Water and Sanitation (DWS), as well as other parties. All the environmental specifications and the procedures discussed in this document were also developed in accordance with the relevant legislation applicable to the development as well as environmental best practice. Therefore, the recommendations and all mitigation measures proposed by the Specialists in their assessments and all other conditions, monitoring and mitigation measures as provided in the MMP should be adhered to.

This EMPr must therefore form an integral part of the contractual documents between SANRAL, JG Afrika (Pty) Ltd and the appointed Contractor during the Pre-Construction, Construction and Rehabilitation Phases

the project, as it outlines the methodology and duties required, such that the proposed activities can be achieved in an environmentally sustainable manner.

## 2. PREPARATION OF THIS EMPr

### 2.1 Proponent and Environmental Assessment Practitioner

Terratest (Pty) Ltd has been appointed by JG Afrika (Pty) Ltd on behalf of SANRAL to undertake the environmental services required for the construction works associated with the proposed development of the Rocabar access roads (to the tradeport and future motor city) as part of the N2 intersection upgrade in Kokstad, Harry Gwala District Municipality, KwaZulu-Natal Province. Details of the qualified EAP involved in undertaking the BA Process are noted in Table 2 and the Curriculum Vitae (CV) of the EAP is attached as **Appendix H** of the BAR.

Table 2: Details of the EAP

COMPANY: TERRATEST (PTY) LTD			
Environmental Assessment Practitioner	Qualifications, Professional Registration and Affiliations	Experience	Contact details
Lethabo Maebana Environmental Scientist	BSc. Hons Limnology, SACNASP ( <i>Pr.Sci.Nat</i> ), IAIAsa	6 years	Tel: (033) 343 6700 Email: MaebanaL@terratest.co.za

### 2.2 Specialist Consultants

In accordance with the requirements of Appendix 6 of the NEMA EIA Regulations, 2014 (as amended), the Government Notice 320 (dated 20 March 2020) and Government Notice 1150 (dated 30 October 2020), both of which pertain to National Environmental Management Act: Procedures for assessment and minimum criteria for reporting on identified environmental themes, when applying for an Environmental Authorisation identified in terms of the National web-based environmental screening tool, the specialist studies indicated in Table 3 were undertaken as part of the Basic Assessment process for the proposed development.

Table 3: Details of Specialist studies and consultant

Specialist Study	Company Name	Contact Person and Contact Details
Terrestrial and Aquatic Biodiversity Assessment	Terratest (Pty) Ltd	Jake Alletson Tel: (033) 343 6700 Email: AlletsonJ@terratest.co.za
Wetlands Assessment	Terratest (Pty) Ltd	Jake Alletson Tel: (033) 343 6700 Email: AlletsonJ@terratest.co.za

<b>Heritage Impact Assessment</b>	Umlando: Archaeological Surveys and Heritage Management	Gavin Anderson Tel: (035) 753 1785 Email: umlando@gmail.com
<b>Geotechnical Investigation</b>	Terratest (Pty) Ltd	Denford Buwu Tel: 033 343 6789 Email: BuwuD@Terratest.co.za

These reports (as listed above) also contain additional recommendations and mitigation measures that should be considered during the construction and operational phases. The reports are attached to **Appendix F** of the BAR.

### 3. KEY APPLICABLE LEGISLATION

The management and mitigation of the environmental impacts during construction is governed by environmental legislation. It is of utmost importance that this project is constructed in compliance with all relevant environmental legislation whether; National, Provincial and/or Local.

It is understood that any development during its various phases is a dynamic activity within a dynamic environment. The common list of legislative references contained herein is by no means exhaustive but is applicable to the general principles of this document:

- Constitution of the Republic of South Africa (Act No. 108 of 1996);
- National Environmental Management Act (Act No. 107 of 1998);
- National Environmental Management: Biodiversity Act (Act 10 of 2004);
- National Heritage Resources Act (Act No. 25 of 1999);
- National Water Act, 1998 (Act No. 36 of 1998); and
- Occupational Health and Safety Act (Act No. 85 of 1993).

In addition to the above, other provincial and municipal legislation by relevant to the proposed development must also be adhered to.

### 4. ROLES AND RESPONSIBILITIES

To ensure adherence to the EMPr in the proposed development of the Rocabar access roads, various parties hold specific responsibilities. These parties and their associated responsibilities are presented below.

#### 4.1 Department of Economic Development, Tourism and Environmental Affairs (EDTEA)

The Department of Economic Development, Tourism and Environmental Affairs (EDTEA) are the designated provincial responsible for ensuring that the Applicant complies with the Conditions of the EMPr.

## 4.2 The Proponent

SANRAL is the project proponent and also the applicant for the application and will function as the primary employer for all other parties. The responsibilities of the proponent include:

- Acceptance of all liabilities associated with environmental compliance;
- Enforcement of this EMPr;
- Ensuring the adoption of the EMPr in all tender documents associated with the project and ensuring that the EMPr is binding on all Contractors;
- Ensuring that Contractors are compliant with the EMPr during planning, construction and rehabilitation;
- Contracting an independent Environmental Control Officer (ECO) should it be required;
- Ensuring the implementation of environmental monitoring and audits during planning, construction dredging and rehabilitation;
- Ensure that compliance and non-compliance records are maintained; and
- Ensure Environmental Audit Reports are submitted to the relevant Competent Authority where required.

## 4.3 The Project Engineer

The Engineer will be contracted by the Applicant to undertake the detailed design and supervision of the construction activities. The responsibilities of the Engineer will include:

- Preparation of a detailed site plan of the required dredging locations which is to be appended to the EMPr;
- Ensuring that Contractors are in compliance with this EMPr;
- To cease any work that is deemed to result in negative environmental impacts, or which is not in compliance with this EMPr; and
- To consult with the Proponent and the ECO or SANRAL Environmental Specialist in terms of decisions and actions that may impact on the environment or that may require an amendment to this EMPr.

## 4.4 The Contractor

The Contractor refers to the persons that will undertake construction activities associated with the overall project. This will include any land clearing or the relocation of material. The responsibilities of the contractor include:

- To formally accept and comply with the EMPr as one of their conditions of contract;
- To proactively implement the recommendations and actions required in the EMPr; and
- To follow the spirit of good environmental management and comply with Section 28(1) of the National Environmental Management Act of 1998, as amended (Duty of Care of the Environment).

#### 4.5 The Contractor's Environmental Officer

The Contractor shall appoint a qualified Environmental Officer whose primary role will be to ensure compliance with the requirements of the EMPr. The Contractor shall submit the name and CV of the Environmental Officer, as well as an Environmental Plan detailing roles and responsibilities to the Project Engineer. These documents will be for the Project Engineer approval and no work can commence on site until this has been undertaken. The Contractor's Environmental Plan must typically consist of:

- Environmental Plan describing environmental management responsibilities of the Contractor's Project Manager, Contractor's Site Manager and the Contractor's Environmental Officer;
- Organisational Environmental Policy; and
- Method Statements.

It will be the responsibility of the Contractor's Environmental Officer to ensure, on a daily basis, that all work is conducted according to the approved Method Statements and that the requirements of the EMPr are implemented in a timeous and proper manner. The Contractor's Environmental Officer tasks will include the following:

- Collation of the Contractor's Environmental Site File which is to include at a minimum:
  - A copy of the approved Terratest (Pty) Ltd EMPr;
  - A copy of the contractors Environmental Plan detailed above;
  - Method Statements for project specific works required by the approved ECO and/or Project Engineer;
  - An Environmental Incidents Register and Reports;
  - Environmental Non-Conformance Register;
  - A Complaints Register which includes actions undertaken by the Contractor / Employer to address the complaint;
  - A Hazardous Substances Register and associated Material Safety Data Sheets (MSDS);
  - Copies of monthly internal Environmental Audit Reports;
  - Copies of monthly independent external ECO Audit Reports; and
  - Site close-out reports of rehabilitated areas.
- Daily, weekly and monthly inspections of the work area as per schedule;
- Preparation of activity-based Method Statements;
- Monitor compliance with the EMPr and Method Statements;
- Ongoing Environmental Awareness Training of the Contractor's site personnel;
- Reporting and recording of any environmental incidents caused by the Contractor or due to the Contractor's activities;
- Close out of environmental incidents;
- Attendance at all Safety, Health and Environmental meetings, toolbox talks and induction programmes;
- Waste Management on the site;
- Ensure that environmental signage and barriers are correctly placed; and
- Taking required corrective action within specified timeframes.

The Contractor's Environmental Officer will be expected to submit weekly progress and compliance reports to the Environmental Control Officer.

#### 4.6 The Independent Environmental Control Officer

An independent Environmental Control Officer (ECO) must be appointed to monitor compliance with the conditions of the EMPr. The ECO shall be an independent party to the Contractor and SANRAL. The ECO must conduct weekly environmental audits to assess compliance with the requirements of the EMPr and associated documents and other environmental permits/approvals. ECO monitoring and reporting is to be undertaken in accordance with the requirements of Appendix 7 of the NEMA: EIA Regulations of 2014, as amended.

#### 4.7 Organisational Structure

Details of the organisational structure are presented in **Figure 2**. The structure illustrates the reporting procedures for stakeholders responsible for the implementation of this MMP.

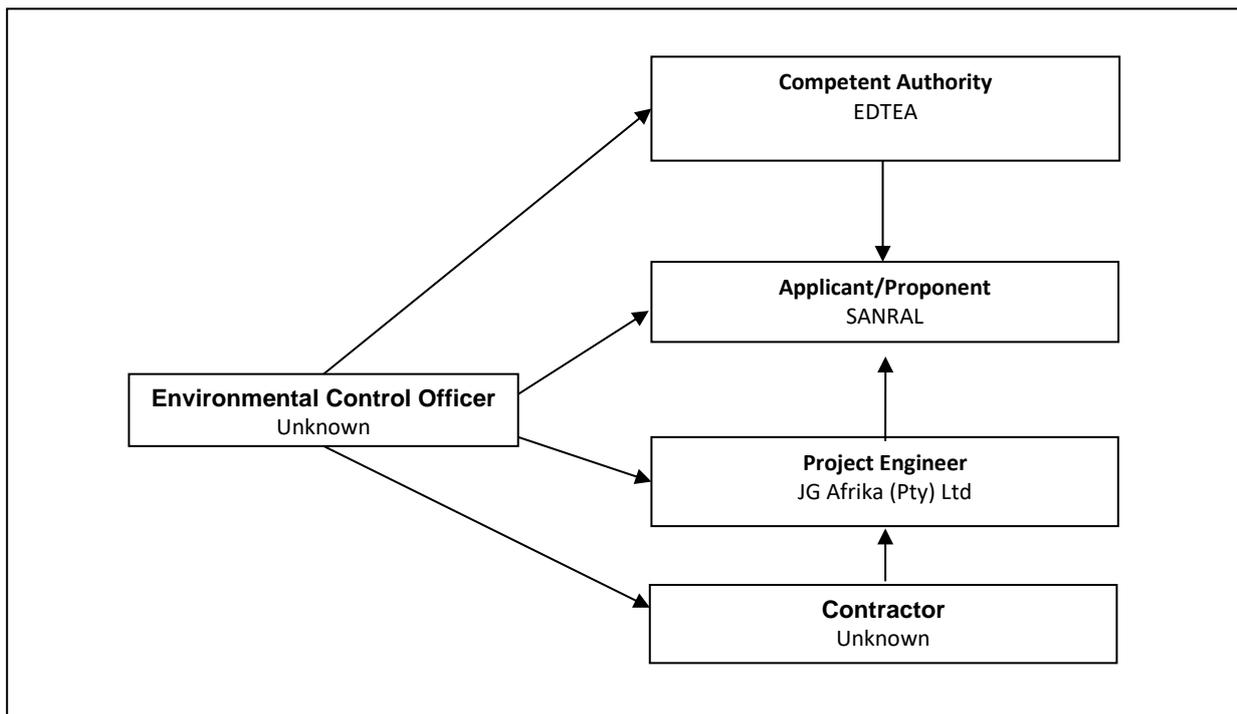


Figure 2: Organisational structure

An EMPr Acknowledgement Form is appended to this report and commits all parties involved to sound environmental practices during all phases of the project. This form must be signed and adhered to by the Contractor.

## 5. OPERATIONAL CONTROLS

The operations that are associated with the identified environmental aspects must be consistent with the objectives and conditions of the EMPr. The typical operational controls that must be put in place for a construction site are as follows:

### 5.1 Environmental-related Method Statements

Environmental-related method statements are written submissions to the Engineer by the Contractor, in collaboration with environmental personnel involved in the project. The Method Statements set out the plant, materials, labour and method that the Contractor proposes using to carry out an activity (identified by the Engineer) to address specific requirements and ultimately this EMPr.

All Method Statements, including those which may be required as ad-hoc or emergency construction method statements, must be submitted for approval prior to the commencement of any activity. Any changes to the method of works must be reflected by amendments to the original approved method statement and re-approved on the understanding that such changes are environmentally acceptable and in line with the requirements of this EMPr.

Typical environmental method statements that may be required for a construction development at the discretion of the ECO include:

- Removal of indigenous vegetation;
- Removal of alien vegetation;
- Dust Control;
- Concrete mixing and management;
- Management of Fire;
- Handling and storage of oils and chemicals;
- Management of accidental spills;
- Management of contaminated materials;
- Solid waste management;
- Management and storage of reusable materials; and
- Site refuelling of construction vehicles and plant on site.

### 5.2 Emergency Preparedness

In the event of emergency, the following elements must present and easily accessible on site for the management of such emergency:

- a) Emergency contact details
  - The Contractor must ensure that the numbers of the following persons are displayed at a prominent place on site at all times:
  - The local Police Stations;
  - The nearest Ambulance services/hospital;

- Resident Engineer, Project Engineer, ECO and a representative of the Contractor; and
- Representative of the Developer.

These details must be updated as and when necessary.

b) Fire extinguishers, spill kits and first aid

The Contractor must ensure that fire extinguishers, spill kits, first-aid kit(s) and associated equipment are present onsite and easily accessible for the potential occurrence of emergencies. The staff should be trained in the use thereof.

### 5.3 Environmental Training and Awareness

Prior to commencement of site establishment and construction activities, all personnel involved in construction activities on the project are to be briefed on their obligations towards environmental protection in terms of the requirements of this EMPr. The importance of the environmental awareness training is to also ensure all workers understand the risks involved as well as how to adequately implement mitigation measures. The education/awareness programme should be aimed at all levels of management and construction workers within the Contractor's team. All new employees arriving on site shall undergo environmental awareness programme.

It is recommended that the environmental awareness training be undertaken by the Environmental Site Representative (ESR) and the programme must include:

- Induction of all personnel in a language and method most suitable; and
- Signing of an Attendance Register and declaration of ensuring environmental protection. Proof of the induction must be kept.
- Indicative topics that must be included/ covered in the environmental training:
  - What is the environment and why must it be protected?
  - What are the environmental sensitivities of the area in which activities are being undertaken?
  - How construction activities can adversely impact of the environment;
  - What are the mitigation measures for adverse impacts?
  - What is the social responsibility of all site employees during construction?
  - How should environmental incidents be recorded?

*Awareness posters must also be placed at strategic places throughout the site to create environmental awareness. Refresher environmental awareness training sessions must be conducted when the need arises.*

a) Toolbox talks

The ESR must also ensure daily toolbox talks include alerting the workforce to particular environmental concerns associated with the tasks for that day or the area / habitat in which they are working, etc.

It is also recommended that the toolbox talks are conducted in an interactive way as to ensure the employees understand the content and purpose of the EMPr requirements. The Contractor shall keep

records of the environmental subjects discussed in the toolbox talk sessions. Signed registers documenting all employees' attendance must also be kept on record.

#### 5.4 Site Documentation

The following is a list of some examples of documentation that should be kept on site and made available to the ECO and/or any other relevant parties on request:

- A copy of this EMPr;
- The Project's Environmental Authorisation obtained from EDTEA;
- Water Use Authorisation obtained from the DWS;
- Site daily diary;
- Site instruction book;
- Tree removal permits/licenses (if applicable);
- A Complaint register;
- Incident register;
- Copies of environmental Audit Reports;
- Proof of environmental training undertaken by the Contractor and the ECO;
- Schedules for the ECO's environmental audits;
- Minutes of project meetings;
- Agreements;
- Non-compliance and corrective action reports; and
- Method statements signed by the Contractor, the ECO and Engineer.

#### 5.5 Communication Procedures

- Site instructions: The site instruction journal entries will be used for the recording of instructions as they relate to implementation of the EMPr, and/or any work orders given by the Engineer.
- Site Meetings: A clear channel of communication and coordination between the Developer and the Contractor is very crucial in any construction project. One way of ensuring this is through regular site meetings. The purpose of the meetings will be to discuss general progress of construction. Some of the environmental aspects to be discussed in the meeting shall include:
  - Efforts to lower the environmental, social and health risks involved;
  - Discuss and resolve non-conformance to environmental legislation / policies or the EMPr; and
  - Report on environmental performance of the construction works.

#### 5.6 Other General Guidelines

The following measures provide guideline solutions to frequently anticipated issues on most development activities:

- The prevention of any site degradation due to non-compliance, administrative or financial problems, and inactivity during the construction phase, illegal activities, delays caused by archaeological finds etc. are ultimately the responsibility of the applicant / developer as per Section 28 of NEMA, 1998 (as amended) which discusses 'Duty of Care and remediation of environmental change';
- The study area must be clearly defined and surveyed according to the proposed activities. All workforce members and other construction personnel are not to go beyond the defined footprint;
- The Contractors must adhere to agreed and approved access points and no-go areas;
- Damage to private or public property such as fences, gates and other infrastructure may occur at any time. All damages are to be repaired as soon as practically possible;
- Landowners of the site and adjacent properties must be informed of the starting and completion dates of the construction activities;
- The Contractor must adhere to all conditions of contract including this EMPr;
- All private and public manmade structures near the project site must be protected against damage at all times and any damage must be rectified by no later than 7 days after occurrence;
- Proper documentation and record keeping of all complaints and actions taken must be kept at the site office;
- Regular site inspections and good control over the site activities should be undertaken;
- A positive attitude towards environmental management by all site personnel must be motivated through regular and effective awareness and training sessions; and
- Social issues in terms of safety for human life, on employees should be encouraged. All construction areas and activities should be cordoned off.

## 6. PROJECT PHASES AND ASSOCIATED ACTIVITIES

### 6.1 Pre-construction Phase

The 'Pre-construction Phase' refers to the period leading up to and prior to the commencement of the construction activities and is included to ensure pro-active environmental management measures with the goal of identifying avoidable environmental damage at the onset and sustain optimal environmental performance throughout the construction phase. Most impacts will occur during the construction phase and must be mitigated through the mitigation measures identified in the Pre-construction Phase.

### 6.2 Construction Phase

The 'Construction Phase' section refers to all construction activities associated with the construction of the road and culvert. This phase will include the clearance of vegetation for the proposed development and support infrastructure.

### 6.3 Rehabilitation Phase

An appropriate rehabilitation procedure must be followed, immediately after construction activities and prior to demobilisation. The objective of rehabilitating the site would be to re-instate the affected areas to a similar or better condition to the current environment. This phase will include the rehabilitation of areas disturbed by construction works and the removal of all construction equipment, disposal of rubble and any other waste generated during the Construction Phase.

## 7. ENVIRONMENTAL CONTROLS AND MANAGEMENT PROGRAMME IMPLEMENTATION

The point of departure for this EMPr is to ensure a pro-active rather than re-active approach to environmental performance by addressing potential problems before they occur. This will limit corrective measures needed during the construction activities.

This section describes the potential environmental impacts which may result from the identified aspects, the objectives of mitigating these impacts as well as the targets used to measure the level of environmental compliance.

The tables in this section of the EMPr present the objectives to be achieved and the management actions that need to be implemented in order to mitigate the negative impacts and enhance the benefits of the project. Associated responsibilities, criteria / targets and timeframes are specified.

The tables for the construction activities consists of seven parts which are included as key requirements of EMPr as defined in the NEMA EIA Regulations, 2014 (as amended). These sections are described below as follows:

- **Phase of development** – This section will identify either pre-construction (planning) or actual construction activities during the Operational phase.
- **Impact / issue** - This section will identify the issue being addressed, e.g., materials, site demarcation, heritage, etc.
- **Mitigation measure** - This column will include all the necessary mitigation measures for each impact / issue’.
- **Management objectives** - This column will indicate what the management objectives to be achieved for each mitigation measure.
- **Measurable targets** - This column will indicate what evidence is to be used as an indication to whether or not the ‘Management objectives’ have been implemented and hence achieved.
- **Frequency of action** - Provides time guidelines for the ‘Responsible party’ by which he / she is to action or manage the required mitigation.
- **Responsible party** – Provides the details of the responsible team member which should account for the implementation of the proposed mitigation measures.

## 7.1 Impact Management Objectives, Actions and Outcomes

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 4** and **Table 5** presents 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 Developer, an independent Environmental Control Officer (ECO), the Contractor and the Contractor's Environmental Site Representative (ESR) are the custodians of this EMPr.

An overview of the pre-construction and construction management objectives, actions and outcomes that are covered in this EMPr under the pre-construction and construction phases are as follows:

- Pre- construction
  - A1 Environmental Authorisations and Documentation
  - A2 Environmental Site Documentation and Records

*Table 4: Pre-construction Management Objectives, Actions and Outcomes*

(A) PHASE OF DEVELOPMENT: PRE-CONSTRUCTION					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
<b>A1 ENVIRONMENTAL AUTHORISATIONS AND DOCUMENTATION</b>					
a. Construction commencing without all required environmental permits and authorisations	<ul style="list-style-type: none"> <li>• Contingencies for minimising negative impacts anticipated to occur during the planning stages of the project.</li> <li>• Obtain all required environmental authorisations/ permits prior to the commencement of construction activities.</li> </ul>	i. A copy of the Environmental Authorisation, this EMPr, Water Use Authorisation and other management plans as well as other developer environmental obligations shall be kept on site during the construction phase. ii. Copies of all other project permits must be acquired and kept on site.	<ul style="list-style-type: none"> <li>• No fines due to unauthorised activities or absence of authorisations.</li> <li>• Compliance with Authorisations and Permits conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Developer</li> <li>• Contractor and ESR</li> <li>• ECO</li> </ul>	Monthly
<b>A2 ENVIRONMENTAL SITE DOCUMENTATION AND RECORDS</b>					

(A) PHASE OF DEVELOPMENT: PRE-CONSTRUCTION					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
Inadequate environmental documentation or records on site	<ul style="list-style-type: none"> <li>Contingencies for minimising negative impacts anticipated to occur during the planning stages of the project.</li> </ul>	<p>The following documents must be prepared and kept on site:</p> <ol style="list-style-type: none"> <li>Copy of this EMPr along with a signed declaration of understanding of the contents of the EMPr by the Contractor and ECO;</li> <li>Site daily diary / instruction book / incident reports;</li> <li>Copies of Environmental Audit Reports;</li> <li>A Complaints register;</li> <li>Proof of Environmental training undertaken by the ECO;</li> <li></li> <li>Proof of Environmental training undertaken by the Contractor;</li> <li>Schedules for environmental audits;</li> <li>Non-compliance and corrective action reports compiled by the Contractor;</li> <li>Method statements signed by the Contractor and approved by the ECO and the Engineer.</li> </ol>	<ul style="list-style-type: none"> <li>Environmental file that is up to date, with all the relevant environmental documentation.</li> </ul>	<ul style="list-style-type: none"> <li>Developer</li> <li>Project Engineer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Ongoing
<b>A3 ENVIRONMENTAL REPRESENTATIVE ON SITE</b>					
a. Inadequate implementation and monitoring of environmental requirements on site	<ul style="list-style-type: none"> <li>No construction activities must commence without an appointment of ESR on site</li> </ul>	<ol style="list-style-type: none"> <li>An independent ECO must be appointed to monitor and to provide environmental advisory services on site.</li> <li>Appoint a suitably qualified ESR to manage daily environmental issues on site.</li> </ol>	<ul style="list-style-type: none"> <li>Monthly environmental audits.</li> <li>Weekly/daily environmental inspection checklists.</li> </ul>	<ul style="list-style-type: none"> <li>Project Engineer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Ongoing
<b>A4 SITE ESTABLISHMENT</b>					

<p>a. Unnecessary environmental degradation and removal of natural vegetation</p>	<ul style="list-style-type: none"> <li>• Ensure no unnecessary degradation of the environment adjacent to authorised project footprint.</li> </ul>	<ol style="list-style-type: none"> <li>i. Areas of indigenous vegetation outside of the direct project footprint, should under no circumstances be fragmented or disturbed further;</li> <li>ii. Working footprint and area to be cleared should be limited to the access road, vehicle turning point and working area.</li> <li>iii. All activities must be restricted to the areas outside the watercourse.</li> <li>iv. No unnecessary loss of high sensitivity areas should be permitted. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon (including fencing off the defined project area).</li> <li>v. All infrastructure, with specific mention of the Contractor laydown areas/ site camps, and other temporary infrastructure, are to be placed outside the watercourse.</li> <li>vi. Locate laydown areas and construction camps outside the watercourse.</li> <li>vii. A detailed Method Statement for the proposed construction activities within the watercourse must be obtained from the project Engineers and updated if necessary prior to construction.</li> <li>viii. Design a stormwater management plan prior to the commencement of construction related activities which details how stormwater runoff from cleared compacted surfaces will be controlled in order to prevent the erosion and sedimentation of watercourses;</li> </ol>	<ul style="list-style-type: none"> <li>• No vegetation cleared or disturbed outside the working footprint.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor and ESR</li> <li>• ECO</li> </ul>	<p>Once off</p>
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(A) PHASE OF DEVELOPMENT: PRE-CONSTRUCTION					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
		<ul style="list-style-type: none"> <li>ix. Only clear vegetation immediately prior to the commencement of construction related activities in order to reduce the duration of exposure of bare soil;</li> <li>x. The Contractor must provide and maintain a Site layout indicating the proposed location of all key infrastructure which are:               <ul style="list-style-type: none"> <li>a) Waste storage areas</li> <li>b) Ablution facilities;</li> <li>c) Eating areas</li> <li>d) Smoking area</li> <li>e) Working areas</li> <li>f) Cement storage and concrete mixing areas (where applicable)</li> <li>g) Stockpile areas for topsoil and cleared vegetation</li> <li>h) Parking area</li> </ul> </li> <li>xi. Prior to the commencement of project activities, the site layout must be agreed upon by SANRAL, the ECO and the Engineer.</li> <li>xii. The following infrastructure should not be permitted on site:               <ul style="list-style-type: none"> <li>a) Vehicle washing areas</li> <li>b) Hazardous material storage areas with the exception of cement storage areas where applicable)</li> <li>c) Cooking Areas</li> </ul> </li> </ul>			
<b>A5 EXISTING SERVICES AND INFRASTRUCTURE</b>					

<p>a. Damage to existing infrastructure</p> <p>b. Disruption in the provision of services in the vicinity of working area</p>	<ul style="list-style-type: none"> <li>• Avoiding impact on surrounding services such as access roads, sewer lines, and water lines.</li> <li>• All services providers with services in the vicinity of the site must be notified prior to construction.</li> </ul>	<ol style="list-style-type: none"> <li>i. Permission from landowner must be obtained before site establishment;</li> <li>ii. The location of all services including underground services must be identified and confirmed by the Surveyor during the Design phase of the project and the services be included in the Design drawings;</li> <li>iii. The Contractor must ensure that design layouts of all existing services are readily available and considered prior to the commencement of construction activities;</li> <li>iv. The Contractor shall ensure that all existing services are not damaged or disrupted by any activities prior to construction;</li> <li>v. With written permission from the service provider, the Contractor shall be responsible for the repair and reinstatement of any existing infrastructure that is damaged or services which are interrupted. Copies of the written permission must be kept on site;</li> <li>vi. Where applicable all existing services shall be protected by the Contractor;</li> <li>vii. The required wayleaves shall be obtained from the applicable service providers prior to the commencement of construction activities;</li> <li>viii. The relevant municipal and provincial departments shall be informed of all construction activities prior to commencement;</li> <li>ix. Prior to commencement of site establishment activities, SANRAL and the Contractor should ensure that formal written agreements are in place with the affected landowners with</li> </ol>	<ul style="list-style-type: none"> <li>• No impacts on services and infrastructure within the vicinity of the site.</li> </ul>	<ul style="list-style-type: none"> <li>• Developer</li> <li>• Project Engineer</li> <li>• Contractor and ESR</li> <li>• ECO</li> </ul>	<p>Ongoing</p>
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		<p>regards to dealing with damage to property caused as a result of construction activities (where applicable);</p> <p>x. Any damage caused to adjacent properties or infrastructure, as a result of construction activities, should be fixed by the Contractor to the satisfaction of the landowner. All repairs or reinstatement will be to the Contractor's cost and shall receive top priority over all other activities;</p> <p>xi. Any planned service interruptions should be communicated to relevant service providers and affected parties prior to the interruptions. Fourteen (14) days are recommended for the notification of possible affected parties.</p> <p>xii. Where infrastructure is damaged, the landowner and relevant service provider must be notified within 24 hours,</p>			
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(A) PHASE OF DEVELOPMENT: PRE-CONSTRUCTION					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
<b>A6 ENVIRONMENTAL AWARENESS TRAINING AND INDUCTION</b>					
a. Inadequate training and awareness about environmental protection	<ul style="list-style-type: none"> <li>Raise awareness about the importance of environmental protection including EMPr requirements and EA conditions.</li> </ul>	<ol style="list-style-type: none"> <li>The ECO must undertake an initial environmental induction during the site establishment for all key site staff.</li> <li>Environmental induction/ training shall be repeated by the ESR and extended in the weekly Toolbox Talks. This should also include awareness programmes (i.e., emergency and use of spill kits etc).</li> <li>Proof of all environmental training and awareness undertaken must be kept on site, both training material used and attendance registers.</li> <li>ECO shall review and approve training and awareness material content before material is presented to the site personnel.</li> <li>It is the Contractor's responsibility to provide ongoing environmental training to ensure that all staff have sufficient understanding to pass this information onto the construction staff.</li> <li>Use of environmental awareness posters on site where necessary, especially for the protection of the certain plant species around the working area.</li> <li>The Contractor must ensure that all subcontractors are informed of the importance of the adherence to the EMPr and their labourers are also inducted.</li> </ol>	<ul style="list-style-type: none"> <li>Records of environmental training and awareness programmes.</li> <li>Reduce and manage potential Environmental impacts.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and ESR</li> <li>ECO</li> </ul>	<ul style="list-style-type: none"> <li>Bi-weekly</li> </ul>

Table 5: Construction Management Objectives, Actions and Outcomes

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
<b>B1 WASTE MANAGEMENT</b>					
a. Pollution and environmental degradation b. Decrease in the aesthetic quality of the environment	<ul style="list-style-type: none"> <li>Minimise unwarranted environmental damage outside the footprint</li> <li>Maintain a clean and healthy working environment</li> <li>Control potential influx of vermin and flies and rats.</li> <li>Minimise potential of diseases onsite and influence the health of the employees</li> </ul>	i. Refuse bins with lids must be provided. ii. Bins must be emptied at least once a week or as and when the need arises and proof of disposal at a registered landfill must be kept. iii. Overspill of the bin(s) should not occur, and neither should waste be allowed to lie on the ground near the bin(s) or anywhere else on site. iv. Proof of safe disposal must be obtained from the service provider and kept in the environmental file. v. Hazardous waste must be disposed by a registered Waste Service provider. vi. Waste disposal management plan for the removal of vegetation must be compiled. vii. The Contractor must provide labourers with plastic bags or other containers to allow for the storage of litter during the clean-up of the construction site on a daily basis. These areas must then be inspected by the contractor or his / her ESR to ensure compliance with this requirement.  <u><b>Ablution facilities:</b></u> i. Chemical toilets (ration of 1:20 for each gender) must be provided. ii. Under no circumstances should pit toilets be constructed on site.	<ul style="list-style-type: none"> <li>No signs of pollution</li> <li>No complaints received from the landowners / I&amp;APs</li> </ul>	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Daily

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
		<ul style="list-style-type: none"> <li>iii. Under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied chemical toilets.</li> <li>iv. The location of all toilets must be approved by the ECO and must be located on areas that are already disturbed on site.</li> <li>v. Chemical toilets must be emptied / serviced on a regular basis to prevent them overflowing.</li> <li>vi. Waste from chemical toilets must be disposed of at a licensed disposal facility. Proof of this must be obtained from the service provider and made available during the environmental audits.</li> </ul> <p><b><u>Eating Areas:</u></b></p> <ul style="list-style-type: none"> <li>i. The Contractor must, in conjunction with the ECO, designate restricted eating areas for eating during working hours.</li> <li>ii. Under no circumstance should informal food traders be allowed on site.</li> <li>iii. Open fires must not be permitted anywhere on site.</li> <li>iv. The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited.</li> </ul>			
<b>B2 DUST AND AIR QUALITY MANAGEMENT</b>					

<p>Nuisance factor to surrounding landowners, communities and fauna</p>	<ul style="list-style-type: none"> <li>• Reduce dust fall out at construction site</li> <li>• Minimise loss of valuable soil material</li> </ul>	<ol style="list-style-type: none"> <li>i. The Contractor must provide and maintain a Method Statement for "dust control". The Method Statement must provide information on the proposed source of water to be utilised and the details of any licenses or permits required.</li> <li>ii. The construction site (including the site camp, access roads and working areas) must be watered during dry and windy conditions to control dust fallout. Preferably grey water or other dust suppressant substances must be used. Where water is used, ponding of the water must be avoided.</li> <li>iii. Construction vehicles must adhere to low speeds (&gt;30km/h) to avoid the generation of dust on the construction site.</li> <li>iv. All vehicles transporting material that can be blown off (e.g., soil, rubble, etc.) must be covered with a tarpaulin, and adhere to speed limits on public roads</li> <li>v. Excessive dust conditions must be reported to the ECO.</li> <li>vi. A continuous dust monitoring process needs to be undertaken during construction.</li> <li>vii. All construction vehicles must be maintained to avoid adverse impacts on air quality as a result of a lack of maintenance</li> </ol>	<ul style="list-style-type: none"> <li>• No visible signs of dust around the site</li> <li>• No complaints from I&amp;APs regarding dust</li> <li>• No incidences reported to ECO</li> <li>• No visible evidence of dust contamination on the surrounding environment</li> <li>• Method statements adhered to</li> </ul>	<ul style="list-style-type: none"> <li>• Developer</li> <li>• Contractor and ESR</li> <li>• ECO</li> </ul>	<p>Daily</p>
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<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
<b>B3 NOISE MANAGEMENT</b>					
Nuisance factor to surrounding landowners, communities and fauna	<ul style="list-style-type: none"> <li>Effectively manage noisy activities emanating from construction activities.</li> <li>Maintain noise levels below the zone sound level or, if no zone sound level has been designated, a noise level which exceeds the ambient sound level at the same measuring point by 7 dBA or more.</li> </ul>	<ol style="list-style-type: none"> <li>All construction vehicles must be in a good working order to reduce possible noise pollution.</li> <li>Contractors must endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc.</li> <li>The Contractor must inform all I&amp;APs in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the neighbouring residents</li> <li>The working hours stipulated in the Construction permit, where applicable, must be adhered to. Where this is not applicable, the following working hours must be adhered to: Monday to Friday from sunrise to sunset and where applicable on a Saturday, Sunday or Public Holiday in agreement with SANRAL and the Engineer which must be agreed upon between SANRAL and the Contractor unless otherwise stated in the Environmental Authorisation and/or Construction Permit.</li> </ol>	No complaints from site staff and landowners about noise from site.	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Daily
<b>B4 CEMENT STORAGE AND CONCRETE HANDLING</b>					

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
Contamination of the soil and runoff from concrete mixing	<ul style="list-style-type: none"> <li>Minimise the nuisance factor of the development</li> </ul>	<ol style="list-style-type: none"> <li>i. Mixing of concrete must only be permitted on site in designated and disturbed areas approved by the ECO</li> <li>ii. Under no circumstances should concrete be mixed directly on the ground but on an adequate liner to contain the volume of concrete mixed</li> <li>iii. Cement bags must be stored in a designated and secure area on site. Empty cement bags must be placed in litter bins</li> <li>iv. All concrete spillages must be cleaned immediately</li> </ol>	No complaints from surrounding landowners or I&AP's	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Daily
<b>B5 STOCKPILE AND SOIL MANAGEMENT</b>					
<ol style="list-style-type: none"> <li>a) Sedimentation and erosion</li> <li>b) Soil loss</li> <li>c) Poor stormwater Management</li> </ol>	<ul style="list-style-type: none"> <li>Minimise scaring of the soil surface and land features</li> <li>Minimise disturbance and loss of soil</li> <li>Minimise contamination of stormwater run-off</li> </ul>	<ol style="list-style-type: none"> <li><b>a) Sedimentation and erosion</b> <ol style="list-style-type: none"> <li>i. Stockpiles of any material must only be placed within demarcated areas which will not create nuisances to adjacent landowners by blocking access roads, servitudes etc .</li> <li>ii. Stockpiles must not be located within 100m from the edge of the watercourse or riparian area.</li> <li>iii. Loose and uncompacted soil stockpiles piles must be covered to prevent wind and water erosion during seasons when wind or rainfall is prevalent.</li> </ol> </li> <li><b>b) Soil loss</b> <ol style="list-style-type: none"> <li>i. Stormwater runoff from any stockpile sites and other related areas must be contained as far as possible</li> <li>ii. Stormwater must be discharged via many smaller outlets rather than few larger ones to spread out flows</li> </ol> </li> </ol>	No visible erosion scars once construction is completed	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Daily

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
		<ul style="list-style-type: none"> <li>iii. Infiltration of all stormwater runoff generated by the proposed development should be maximised as far as practically possible</li> <li>iv. The central collection and concentration of stormwater must be minimised as far as practically possible</li> <li>v. Stockpiles are to be stabilised if signs of erosion are visible.</li> <li>vi. Soils excavated from watercourses must be stored separately to terrestrial soils.</li> <li>vii. Topsoil stockpile must be separated to allow for reuse of the soil for rehabilitation</li> <li>viii. Topsoil stockpiles must be clearly demarcated as no-go areas. Where possible, topsoil must be conserved for rehabilitation purposes</li> <li>ix. Loose topsoil stockpiles should not be higher than 2.5 meters to avoid compaction, while the slopes of the stockpiles should not be steeper than 1 vertical to 1.5 meters horizontally</li> <li>x. Topsoil stockpiles must be monitored for invasive vegetation growth. The Contractors must remediate as and when required in consultation with the ECO</li> <li>xi. To reduce the loss of soil by erosion, the Contractor must ensure that disturbance on site is kept to a minimum and in areas agreed upon with the ECO</li> <li>xii. The Contractor is responsible for rehabilitating all eroded areas in such a</li> </ul>			

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
		<p>way that the erosion potential is minimised after construction has been completed</p> <p><b>c) Poor Stormwater Management:</b></p> <p>i. Special care must be taken to avoid spillage of tar or bitumen products such as binders or pre-coating fluid to avoid water-soluble compounds from entering the ground or contaminating surface water. Under no circumstances should the spilling of tar or bituminous products on the site, over embankments, or any burying, be allowed. Any spillage of tar or bituminous products must be attended to immediately and affected areas are to be promptly reinstated to the satisfaction of the Engineer and ECO.</p> <p>ii. Stormwater must be managed such that the stormwater from the site does not erode the surrounding area</p> <p>iii. Stormwater runoff from any stockpile sites and other related areas must be contained as far as possible. Erosion/sediment control measures must be placed around</p> <p>iv. the stockpiles to limit sediment runoff from stockpiles</p> <p>v. Stormwater must be discharged via many smaller outlets rather than few larger ones to spread out flows</p> <p>vi. The use of point source discharge outlets must be avoided or minimised in favour of infiltration systems</p>			

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
		vii. The central collection and concentration of stormwater must be minimised as far as practically possible.			
<b>B6 HANDLING OF HAZARDOUS GOODS AND SUBSTANCES</b>					
Potential spillage of hazardous substance into the environment	<ul style="list-style-type: none"> <li>Prevention of pollution of the environment</li> <li>Ensure hazardous substances are transported, used and disposed in a responsible manner</li> </ul>	i. Should there be storage of hydrocarbons on site, the Contractor must provide method statements for the “handling & storage of oils and chemicals” (where these will be kept on site) and “accidental spills management” ii. All chemicals kept on site must be clearly labelled and stored with MSDS to guide the handling of the chemicals. Copies of the MSDS’ must also be kept in the Environmental or Health and Safety File. iii. Leaking equipment must be repaired immediately or be removed from site to facilitate repair iv. Drip trays must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended. The drip trays must be large enough to catch any hydrocarbons that may leak from the vehicle while standing. v. Where possible and practical, all maintenance of vehicles and equipment must not be done on site vi. Spill kits must be obtained from reputable service providers and restocked once any material within the kit has been depleted vii. Contaminated material or spilled hazardous substances must be removed by registered service	<ul style="list-style-type: none"> <li>No pollution of the environment</li> <li>No litigation due to transgression of pollution control acts</li> <li>Method statements as set out by the contractor adhered to</li> </ul>	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Daily

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
		<p>provider to a licenced facility. Proof of all removal (i.e., waste manifest) must be kept by the Contractor.</p> <p>viii. Labourer must be trained on how to use the spill kits</p> <p>ix. A record must be kept of all spills (as an Incident report) and the corrective action taken</p> <p>x. Records of monitoring and measurement of hazardous substances must be kept</p>			
<b>B7 FIRE MANAGEMENT</b>					
a. Accidental fires	<ul style="list-style-type: none"> <li>Minimise risk of veld fires and loss of natural habitat</li> <li>Maintain safety on site and the community in general</li> </ul>	<p>i. The Contractor must provide smoking areas for construction workers</p> <p>ii. Fire extinguishers and an outdoor ashtray or similar suitable container must be provided in all smoking areas</p> <p>iii. Under no circumstances should fires be lit on site</p> <p>iv. Serviced fire extinguishers must be kept at the smoking area. At least one serviced fire extinguisher should be available on site at all times</p> <p>v. All site personnel in senior positions and who will be on site on a full-time basis must be trained on the usage of fire extinguishers</p> <p>vi. The Contractor to ensure that no person smokes in any place in which a flammable liquid is used or stored</p> <p>vii. The contractor must further affix a suitable and conspicuous no smoking sign notice at all entrances to areas prone to fire</p> <p>viii. No flammable material, including cotton waste, paper, cleaning rags or</p>	<ul style="list-style-type: none"> <li>No veld fires started by the contractor's workforce</li> <li>No claims from landowners for damages due to veld fires</li> <li>Method statement adhered to</li> </ul>	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Daily

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
		ix. similar material should be stored with flammable liquids Fire breaks should be clearly demarcated to prevent proliferation of fire during possible incident			
<b>B8 FAUNA MANAGEMENT</b>					
a) Loss of fauna due to habitat destruction b) Loss of fauna migration connectivity c) Disturbance of wetland, riparian and instream habitat. d) Intentional and unintentional killing of animals on site	<ul style="list-style-type: none"> <li>Minimise disturbance to animals and their habitats</li> </ul>	i. Any holes/excavations need to be demarcated with a snow netting to ensure that no fauna species can fall in. ii. Prevent excessive disturbance of watercourses during construction activities as far as possible. iii. Construction activities within the watercourses must be limited to the drier months as far as possible. iv. Portions of the watercourses and associated buffer areas or the 1:100year flood line, (whichever is greatest) that are located outside of the demarcated construction footprint must be designated as no-go areas. v. Construction impacts associated with the proposed project must be contained within the footprint of the demarcated areas as indicated on the final approved project layout plan. vi. Prior to construction, the final road alignment, road reserve and development footprint area must be demarcated on site to ensure that construction impacts are contained within this area. If necessary, these areas may be fenced or, alternatively, nearby	<ul style="list-style-type: none"> <li>No complaints from any I&amp;AP</li> <li>No evidence of killing or poaching of animals on site</li> </ul>	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Daily

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
		<ul style="list-style-type: none"> <li>vii. sensitive areas are to be fenced to prevent access.</li> <li>viii. The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on fauna. Construction is also not allowed to take place at night.</li> <li>ix. Movement of faunal species through the study area must be catered for during construction by.</li> <li>x. Existing access roads must be used to avoid further habitat loss.</li> <li>xi. Areas used during the construction phase and not during the operational phase should be rehabilitated.</li> </ul> <p><b>General Mitigation Measures:</b></p> <ul style="list-style-type: none"> <li>i. Ensure that all construction personnel are provided with appropriate training in ecological awareness, as appropriate to their work activities</li> <li>ii. Make use of existing access roads as much as possible to reduce the vegetation clearance</li> <li>iii. Off-road driving must be prohibited</li> <li>iv. No intentional killing or poaching of any animals may be allowed on site and it must be a condition of employment that any employee caught poaching must be disciplined accordingly.</li> <li>v. Where a snake or any other wild animal is encountered on site and must be removed, a specialist must be called in to safely relocate the animal.</li> </ul> <p>A As a minimum, the telephone</p>			

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
		vi. numbers of a snake catcher and the SPCA office operating within project area must be displayed in a conspicuous area on site. All construction activities must be limited to daylight hours.			
<b>B9 FLORA MANAGEMENT</b>					
a) Loss of Floral Habitat b) Introduction of alien invasive plants c) Erosion and soil compaction	<ul style="list-style-type: none"> <li>Minimal disturbance to vegetation where such vegetation does not interfere with construction</li> <li>Minimise scarring of the soil surface and land features</li> <li>Removal of alien plant species to encourage indigenous plant growth</li> </ul>	i. It is recommended that areas to be developed be specifically demarcated so that during the Construction Phase, only the demarcated areas will be impacted upon. ii. All construction/operational and access must make use of the existing roads to avoid further floral habitat loss. iii. Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species. iv. Construction activities should not take place at night unless written permission has been obtained from SANRAL and the ECO and if this is aligned with all project approvals v. The footprint area of the construction should be kept to a minimum and must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. vi. Where possible, vegetation within the working servitude but outside of the direct construction footprint should	<ul style="list-style-type: none"> <li>No litigation due to removal of vegetation without necessary permission</li> <li>No visible erosion scars once construction is completed</li> <li>The footprint does not exceeded the agreed boundaries</li> </ul>	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Daily

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
		<p>be cut to ground level rather than completely removed. This will assist with soil stabilisation and with the rehabilitation of cleared areas.</p> <p>vii. Removal of vegetation must only be done when essential for the construction of the proposed development. Do not allow any disturbance to the adjoining natural vegetation cover or soils. All disturbed areas must be prepared and then revegetated to the satisfaction of the ECO.</p> <p>viii. Construction vehicles should be restricted to travelling only on designated and existing roadways, to limit the ecological footprint of the proposed development activities</p> <p>ix. No littering or dumping of waste and construction material within natural areas outside of the development footprint area may be allowed.</p> <p>x. All excess material must be removed from the construction areas once construction has been completed.</p> <p>xi. The development footprint area must be kept as small as possible. This can be achieved through adequate planning and demarcation of infrastructure areas and areas required for construction activities.</p> <p>xii. Under no circumstances should chemicals be used in the removal of plant species</p> <p>xiii. Only indigenous plants must be used in the rehabilitation of disturbed areas</p>			

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
		xiv. All construction vehicles and equipment as well as construction material should be free of plant material			
<b>B10 MANAGEMENT OF HERITAGE RESOURCES AND ARTEFACTS</b>					
a) Damage or loss of valuable heritage resources	<ul style="list-style-type: none"> <li>Avoid damage to heritage resources</li> <li>Report all finds of human remains or other heritage resources</li> <li>Implement chance find procedures in case where possible heritage finds area made</li> </ul>	<p>i. The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find.</p> <p>ii. All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the ECO will advise the necessary actions to be taken.</p> <p>iii. Should any graves be uncovered during the construction phase of the project, the applicant and appointed ECO must ensure in terms of section 38(6) of the Act, the responsible heritage resources authority, SAHRA (for graves), Amafa for all other Heritage Resources as well as the South African Police Service (SAPS) must be notified.</p> <p>Additional mitigation measures include:</p> <p>i. The ECO must train the Contractor to recognise any heritage features. Should there be a sign of such objects, construction must halt in that area</p>	Limited or no damage to heritage resources	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> <li>ECO</li> <li>Heritage Specialist (if required)</li> </ul>	Daily

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
		ii. immediately and a suitably qualified heritage specialist must be called to investigate through the ECO. Artefacts may not be removed under any circumstances			
<b>B11 MANAGEMENT OF PALAEOLOGICAL RESOURCES</b>					
Destruction of Fossil Heritage	<ul style="list-style-type: none"> <li>Report all finds of fossils to the ECO;</li> <li>Implement chance find procedures in cases where possible fossils may occur</li> </ul>	i. Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would occur. However, if fossils are found, once excavations and drilling have commenced then they should be rescued, activities must cease, and a palaeontologist called to assess and collect a representative sample.  ii. The ECO must survey for fossils before and or after clearing, blasting, drilling or excavating;  iii. Special care must be taken during the digging, drilling, blasting and excavating of foundations, trenches, channels and footings and removal of overburden as a site visit may have missed a fossiliferous outcrop;  iv. Should fossils be unearthed the Contractor shall notify the Palaeontologist, Amafa (through the ECO) and SAPS;  v. The area must be fenced-off with a minimum of 30 m barrier (or as later recommended by the Palaeontologist or Amafa) and the construction workers must be informed that this is a no-go area until the specialist determines the official buffer requirements.	Limited or no damage to fossil heritage	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> <li>ECO</li> <li>Heritage Specialist (if required)</li> </ul>	Daily

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
<b>B12 MANAGEMENT OF NO-GO / SENSITIVE AREAS</b>					
Environmental impacts outside working areas	Minimise unnecessary impacts outside the working footprint	i. All construction activities must be demarcated at the start of construction and maintained accordingly during the construction phase ii. The Contractor must communicate the importance of specific working methods in sensitive areas close to the site, e.g., working within watercourses iii. Mark and/ or demarcate all sensitive site	<ul style="list-style-type: none"> <li>Containment of footprint</li> <li>No impacts on sensitive areas</li> <li>No complaints from adjacent landowners</li> </ul>	<ul style="list-style-type: none"> <li>Developer</li> <li>Project Engineer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Daily
<b>B13 MANAGEMENT OF SOCIO-ECONOMIC IMPACTS</b>					
a) Enhance the positive economic impacts during the Construction Phase b) Reduce the Potential Negative Impacts on Traffic and Road Infrastructure c) Reduce Nuisance Impacts (Noise, Dust, Littering) Related to Construction Activities d) Reduce Negative Impacts on Community Safety e) Reduce Potential Negative Impacts on Local Infrastructure f) Reduce impact on Social Cohesion and Sense of Place	To ensure that communities in the vicinity of the facility are involved in the project and are able to improve their economic conditions through the acquisition of employment	i. A Community Liaison Officer (CLO) must be appointed on the project ii. As far as possible and based on the Developers' required skills for the construction of the proposed infrastructure, locals must be employed in line with SANRAL's 14-point plan that stipulates the principles concerning project liaison, sub-contracting and labour sourcing that shall be implemented iii. Access roads and entrances to the site should be carefully planned to limit any intrusion impacts, noise and dust pollution, as well as to limit any risks of accidents. iv. Construction vehicles should adhere to the speed levels.	The local community benefits from the employment opportunities created during the construction phase	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Ongoing
<b>B14 WATER RESOURCES MANAGEMENT</b>					

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
a) Changes in water quality due to foreign materials and increased nutrients b) Changes in water flow regime	To ensure that water resources are not impacted negatively	i. Design a stormwater management plan prior to the commencement of construction related activities which details how stormwater runoff from cleared compacted surfaces will be controlled in order to prevent the erosion and sedimentation of watercourses. ii. Energy dissipators should be included in the design of all culverts. iii. Construction affecting watercourses must be restricted to the dryer winter months iv. Use of SANRAL road standards in terms of drainage and stormwater where practical and possible within project agreements v. A temporary fence or demarcation must be erected around No-Go Areas outside the proposed works area prior to any construction taking place as part of the contractor planning phase when compiling work method statements to prevent access to the adjacent portions of the watercourse. vi. Effective stormwater management should be a priority during the construction phase. This should be monitored as part of the EMP. High energy stormwater input into the watercourses should be prevented at all cost. Changes to natural flow of water (surface water as well as water flowing within the soil profile) should be considered. vii. 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	<ul style="list-style-type: none"> <li>The focus of mitigation measures should be to reduce the significance of potential impacts associated with the residential development and thereby to:               <ul style="list-style-type: none"> <li>Prevent the unnecessary destruction of, and fragmentation, of the watercourses (including the riparian area); and</li> <li>Prevent the loss water resources and associated ecosystem services.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Daily

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
		<p>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.</p> <p>viii. 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> <p>ix. A stormwater management plan must be compiled and implemented by the Contractor to take the increased surface water run-off rates and volumes and their erosion potential into consideration.</p> <p>x. Should cement be mixed on site, mixing will take place within a demarcated fenced off concrete batching area at the Contractor's Camp. Cement must be mixed on an impervious surface</p>			
<b>B15 TRAFFIC MANAGEMENT</b>					
Disruption of access routes and daily movement patterns	To ensure that public roads around the site are safe and the flow of traffic is not disrupted	<p>i. There must be an erection of signage warning motorists about the presence of construction vehicles</p> <p>ii. Construction activities must be limited to daytime hours</p> <p>iii. Construction vehicles travelling on public roads must adhere to speed limits</p> <p>iv. Construction vehicles must not dispose of soil or other material on roads. Where this occurs, the material must immediately be removed before the end of the working day</p>	<ul style="list-style-type: none"> <li>No incidents of reported vehicle/ pedestrian accidents</li> <li>Adequate signage and alternative routes for traffic to flow</li> <li>No reports of spillages of soil or other material from construction vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> <li>ECO</li> </ul>	Daily
<b>B15 MANAGEMENT OF HEALTH AND SAFETY IMPACTS</b>					
Impacts associated with loss of human lives and risk of injuries	<ul style="list-style-type: none"> <li>To ensure safety of employees, site visitors as well as surrounding landowners</li> </ul>	<p><i>Detailed Health and Safety issues will be addressed in reports compiled by the Health and Safety Officer</i></p> <p>i. Contractor must appoint an independent Health and Safety Officer for the construction phase of the project</p>	No complaints from surrounding landowners and communities	<ul style="list-style-type: none"> <li>Developer</li> <li>Contractor and ESR</li> </ul>	Daily

<b>(B) PHASE OF DEVELOPMENT: CONSTRUCTION</b>					
Potential Impacts	Impact Management Objectives	Mitigation Measures	Measurable Target	Monitoring Responsibility	Monitoring Frequency
	<ul style="list-style-type: none"> <li>Minimise the potential for impacts associated with loss of human lives and risk of injuries</li> <li>Reduce the likelihood of the occurrence of traffic accidents as result of the presence of construction vehicles</li> </ul>	<ul style="list-style-type: none"> <li>ii. Suitable Personal Protective Equipment (PPE) must be worn at all times by all employees on site during the construction and maintenance phases of the project</li> <li>iii. With the exception of the project team members, no persons should be allowed to enter the construction site area. The site and crew are to be managed in strict accordance with the OHS Act</li> <li>iv. The contractor must ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of soil, accidents to employees and limiting casual access to the construction site for workers, use of hazardous substances and materials, etc.</li> <li>v. The Contractor must ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site</li> <li>vi. The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, including police and ambulance services must be available at prominent locations around the construction site</li> <li>vii. A Health and Safety Officer as well as an independent firm must be appointed to audit the site's compliance with the OHS Act during construction</li> </ul>		<ul style="list-style-type: none"> <li>Health and Safety personnel</li> </ul>	

Where applicable, the mitigation measures for the Construction Phase will be carried forward to other phases. In addition, the following specific measures presented in the table below will also apply.

Table 6: Post-construction Management Objectives, Actions and Outcomes

<b>(C) DEMOBILISING AND REHABILITATION STAGE</b>				
Potential Impacts	Impact Management Objectives	Mitigation Measures	Monitoring Responsibility	Monitoring Frequency
1. Proliferation of exotic vegetation and weeds in disturbed areas	To ensure that indigenous plants are well established	<ul style="list-style-type: none"> <li>All exotic flora and weeds to be eradicated according to the Approved Method Statement for the removal of alien vegetation</li> </ul>	Contractor, Developer & ECO	Monthly for the first year after rehabilitation.
2. Damage to plants established as part of rehabilitation	To ensure that indigenous plants are well established	<ul style="list-style-type: none"> <li>All areas under rehabilitation must be cordoned off as no-go areas. If necessary, these areas should be fenced off</li> <li>The survival rate of plant species established as part of rehabilitation must be monitored and replanted where necessary</li> </ul>	Contractor, Developer & ECO	Weekly for the first two months after establishment and after that, monthly for the first year after construction
3. Soil erosion	To ensure there are no visible erosion scars	<ul style="list-style-type: none"> <li>All areas that have been eroded by construction activities must be rehabilitated accordingly</li> </ul>	Contractor, Developer & ECO	Monthly for the first year after construction. Frequency must be increased during the rainy season
4. Riparian areas rehabilitation	To ensure the riparian areas are afforded the opportunity to recover.	<ul style="list-style-type: none"> <li>Rehabilitate any areas of watercourses located outside of the direct construction footprint which have been disturbed as a result of construction related activities.</li> </ul>	Contractor, Developer & ECO	Monthly for the first year after rehabilitation.

## 8. REPORTING, MONITORING AND REVIEWING

### 8.1 Reporting on EMPr compliance

In order to ensure sufficient levels of compliance with the EMPr, regular environmental monitoring has to be undertaken and the results of the monitoring be reported on regular basis. In order to control the reporting on the EMPr Compliance, it is imperative that the following be borne in mind:

- Typical report description;
- Document control procedures;
- System for documenting environmental training; and
- Frequency of reports.

Each of these are briefly discussed below:

#### 8.1.1 Typical report description

A typical report used to indicate the level of environmental compliance on the project must adhere to Appendix 7 of NEMA EIA Regulations, 2014 (as amended), which must include the following:

- a) details of the—
  - (i) independent person who prepared the environmental audit report; and
  - (ii) expertise of the independent person that compiled the environmental audit report.
- b) a declaration that the independent auditor is independent in a form as may be specified by the competent authority;
- c) an indication of the scope of, and the purpose for which, the environmental audit report was prepared;
- d) a description of the methodology adopted in preparing the environmental audit report;
- e) an indication of the ability of the EMPr, and where applicable, to—
  - (i) sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity on an on-going basis;
  - (ii) sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the closure of the facility; and
  - (iii) ensure compliance with the provisions of environmental authorisation, EMPr, and where applicable, the closure plan;
- f) a description of any assumptions made, and any uncertainties or gaps in knowledge;
- g) a description of any consultation process that was undertaken during the course of carrying out the environmental audit report;
- h) a summary and copies of any comments that were received during any consultation process; and
- i) any other information requested by the competent authority.

In addition to the above, the **Environmental Audit Report** must include the following

- Project Background Information;
- Terms of Reference of various project team members;
- Scope of audit and the audit period;

- Objectives of the Environmental Audit;
- Methods used for undertaking of Compliance Audits;
- Roles and Responsibilities of different parties involved in ensuring the compliance of the EMPr;
- Summary of main findings;
- Checklist used for checking compliance;
- Photographs of observations of audit; and
- Any other documents deemed important to support the audit findings.

#### 8.1.2 Document control procedures

To ensure the Environmental Auditing Reports are of good quality, these must undergo an internal review prior to submission to relevant parties. An indication of the document history indicating as a minimum the revision number and date as well as the names and signatures of the compiler, reviewer and approver must be provided.

#### 8.1.3 System for documenting environmental training

The Developer, Project Engineer, Contractors and subcontractors must develop a system for documenting environmental monitoring, training and reporting. This system must as a minimum include the following:

- Plans on relevant parties to train and the frequency of training to ensure that all parties; working on the site/providing services are aware of the necessity to adhere to the EMPr;
- An indication of items to be discussed in typical training sessions; and
- Typical documents/material to be used for training and proof of the undertaking of training.

#### 8.1.4 Frequency of audit reports

The reports compiled to record the findings of the audit must be provided at frequencies required by the EDTEA where stated, or by SANRAL.

### **8.2 Monitoring of the EMPr**

In order to ensure that the EMPr is being correctly implemented and remains relevant to site activities, the following must be undertaken:

#### 8.2.1 Environmental auditing

Internal Audits as well as External Audits (where required by the EDTEA) of the EMPr must be undertaken at the periods and according to procedures outlined below unless otherwise stated in the Authorisation conditions:

- Internal Audits - these must be undertaken at periods and according to procedures prescribed by the Developer/Project Engineer (if applicable). Records associated with this auditing must be kept. The Contractor shall undertake their own Internal Audits and must communicate their procedure to the ECO. All Internal Audits must also be aligned to the SANRAL's audit process in terms of internal environmental policy requirements. Where required, the EDTEA will also be provided with copies of all audit reports.

- External Audits – if required by the EDTEA, these must be undertaken by a suitably qualified and experienced Environmental Control Officer (ECO). Similar to the Internal Audits, these must entail the checking of Environmental Compliance based on the EMPr and the Environmental Authorisations as well as any other requirements including environmental best practice. All External Audits must also be aligned to the SANRAL audit process in terms of internal environmental policy requirements. In order to undertake the external audits, the ECO must adopt the following methods and approaches as a minimum:
  - Review of background information to acquaint the ECO with various aspects of the project;
  - Document review;
  - Observations during site walkabout. Photographs must be undertaken during the walkabout;
  - Interviews and Questioning (open-ended questions will be asked); and
  - Completion of checklists to report and discuss the findings of each of the areas within the construction site.

Audit reports will be compiled and submitted to the relevant parties within the project. These must include the SANRAL as the Project Developer, the Project Manager and the Contractor.

### 8.2.2 Corrective Actions

The Contractor must compile an Environmental Action Plan to ensure that the non-compliances are addressed and ensure that the issues are addressed within a certain target date set by the ECO. The Contractor must ensure that corrective actions arising as a result of non-compliances are undertaken and recorded accordingly. These records must be kept for review by the ECO and/or any other party with authority to undertake this exercise.

## 8.3 Review of the EMPr

The EMPr must be reviewed by and with the Project Team, should the need arise. The discussion of this item must preferably be led by the ECO. The frequency of the review of the EMPr must be decided between the ECO and SANRAL. All records of this review must be kept by the ECO on behalf of the Project Engineer and SANRAL. Any amendments to the EMPr must be communicated to the Project Team by the ECO. Proof of the communication must be kept.

### 8.3.1 Amendment of the EMPr (where required)

The NEMA EIA Regulations, 2014 (as amended) regulate the procedures and criteria for the submission and consideration of the EMPr including its content. It must be noted that the EMPr is a living document that can be amended should the need for this arise. The amendment must however be undertaken according to the EIA Regulations that will be relevant at the time of the required amendment. It must be noted that the NEMA EIA Regulations 2014 (Sections 35-37) (which were applicable during the compilation of this EMPr) introduce a defined process with regard to the type of amendment of the EMPr as outlined below:

- **First amendment** type applies to the amendment of the EMPr as a result of audit findings.
- **Second amendment** type pertains to an amendment of a specific impact management action of an EMPr.
- **Third amendment** gives opportunity to the holder of the EA to amend the EMPr, and also requires the involvement of the Competent Authority (CA) and the undertaking of Public Participation (PP).

It is important that the Developer and the Contractor follow these defined processes during the implementation phase as deviating from this process is regarded as a non- conformance.

In terms of the NEMA EIA Regulations 3, Developers must ensure compliance with the conditions of the EMPr by undertaking an Environmental Audit in a structured and systematic manner. It is a requirement of the environmental compliance audit process that risks to the environment are identified and these possible risks should be considered during the Planning and Construction Phases of the development, these risks are presented in this EMPr. The implementation of this EMPr, through the appointed Contractor, remains the responsibility of the Developer, i.e., SANRAL.

## 9. REFERENCES

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Terratest. 2019a. Assessment of the terrestrial and aquatic vegetation along new roads in the Rocabar project area in Kokstad, KwaZulu-Natal.

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## APPENDIX 1: ALIEN PLANT CONTROL

Best practice measures that should be undertaken during clearing include the following:

- (i) Cut plants as low to ground as possible.
- (ii) All alien plants must be removed carefully and exposed soil should be covered with cut vegetation or leaf litter that is free of weed seeds to ensure that regrowth will not occur.
- (iii) Press any loosened soil down carefully and firmly and mulch with plant material where possible.
- (iv) All alien seeds, fruit bulbs, tubers and stems must be collected and placed in a sealable container/plastic bag for disposal at a landfill site.
- (v) The roots system of mature trees including alien invasive play an important role in stabilising soil and therefore the uprooting of large mature specimen of trees is not advocated. It is better to fell the trees and paint the stump with the relevant herbicides.

### Control methods

METHOD	DESCRIPTION
<b>MECHANICAL METHOD</b>	
Hand pulling/ hoeing	<ul style="list-style-type: none"> <li>• Hand pulling is most effective with small (30cm), immature or shallow rooted plants.</li> <li>• Shake the excess sandy material from the plant, this makes the plant easier to stockpile and lighter to transport.</li> <li>• However, make sure there is no seed on the plant first to eliminate the spread of seed while shaking.</li> </ul>
Chopping/ cutting/ slashing	<ul style="list-style-type: none"> <li>• This method is most effective for plants in the immature stage, or for plants that have relatively woody stems/ trunks.</li> <li>• This is an effective method for non-re-sprouters or in the case of re-sprouts (coppicing) it must be done in conjunction with chemical treatment of the cut stumps.</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• Cut/slash the stem of the plant as near as possible to ground level.</li> <li>• Paint re-sprouting plants (i.e., Black Wattle, Lantana and Port Jackson willow) with an appropriate herbicide immediately after they have been cut.</li> <li>• Stockpile removed material into piles as prescribed.</li> </ul>
Felling	<ul style="list-style-type: none"> <li>• De-branch trees and where possible remove all material.</li> <li>• Where possible large trees that are to be felled such that they fall uphill.</li> <li>• Cut the tree down as low as possible to the ground.</li> <li>• Apply herbicide immediately (no later than 30mins) to the cambium layer.</li> <li>• Ensure all the cuts in the cambium layer are treated.</li> </ul>
Ring barking	<ul style="list-style-type: none"> <li>• Remove bark in a 30-40cm centimetre band and leave the tree to die</li> <li>• Can be used with or without chemicals but is more successful when herbicide is used</li> </ul>

**APPENDIX 2: EMPR ACKNOWLEDGEMENT FORM**

**PROPOSED DEVELOPMENT OF THE ROCABAR ACCESS ROADS AS PART OF THE N2 KOKSTAD INTERSECTION UPGRADE, GREATER KOKSTAD LOCAL MUNICIPALITY, KWAZULU-NATAL PROVINCE**

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 management, mitigation and rehabilitation measures for the project outlined above, and the environmental conditions contained in the civil and other construction contract documents.

**APPLICANT / EMPLOYER:**

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

**IMPLEMENTING AGENT:**

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

**CONTRACTOR:**

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

**EMPLOYER'S REPRESENTATIVE / ENVIRONMENTAL MANAGER**

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

**SUB - CONTRACTOR:**

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