

Department of Transport



PROVINCE OF KWAZULU - NATAL - ISIFUNDAZWE SAKWAZULU - NATALI  
DEPARTMENT OF TRANSPORT  
UMNYANGO WEZOKUTHUTHA

**Draft Environmental Management Programme  
for the Construction and Operation of the Sani  
Pass (P318): Phase 2 Upgrade**

September 2011  
J27344

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# Draft Environmental Management Programme for the Construction and Operation of the Sani Pass (P318): Phase 2 Upgrade

## CONTENTS

| Chapter   | Description  | Page     |
|-----------|--|----------|
| <b>1.</b> | <b>INTRODUCTION</b>  | <b>1</b> |
| 1.1       | Objectives of the EMP  | 1        |
| 1.2       | Environmental Principles and Best Practice Guidelines            | 2        |
| 1.3       | Details of the Project Team                                      | 2        |
| 1.3.1     | Details of the Proponent: Department of Transport                | 3        |
| 1.3.2     | Details of the Project Engineer                                  | 3        |
| 1.3.3     | Details of the Environmental Assessment Practitioner: Arcus GIBB | 3        |
| 1.3.4     | The Environmental Authority: Department of Environmental Affairs | 4        |
| 1.4       | Organisational Requirements                                      | 4        |
| 1.5       | Roles and Responsibilities                                       | 7        |
| 1.5.1     | National and Provincial Environmental Authorities                | 7        |
| 1.5.2     | DOT Project Engineer   | 7        |
| 1.5.3     | Engineering Contractor   | 8        |
| 1.5.4     | Project Manager  | 9        |
| 1.5.5     | Environmental Control Officer                                    | 10       |
| 1.5.6     | Environmental Specialists  | 11       |
| 1.5.7     | Sub-contractor   | 11       |
| 1.5.8     | Public and Authorities Acting on Their Behalf                    | 12       |
| 1.6       | Environmental Awareness and Compliance                           | 13       |
| 1.7       | Environmental Authorisation                                      | 13       |
| 1.8       | EMP Revisions and Authorisation                                  | 13       |
| 1.9       | Non-Compliance with the EMP                                      | 14       |
| 1.10      | Compliance with Other Policies and Legislation                   | 15       |
| 1.11      | Environmental Audits   | 16       |
| 1.12      | Training and Induction of Contractors and Workers                | 16       |
| 1.13      | Complaints Register and Environmental Incidents Book             | 16       |
| 1.14      | Contractual Obligation   | 17       |
| 1.15      | Method Statements  | 17       |



|           |  |           |
|-----------|--|-----------|
| <b>2.</b> | <b>PROJECT CONTEXT</b>   | <b>19</b> |
| 2.1       | Brief Overview of the Proposed Project                         | 19        |
| 2.1.1     | Introduction   | 19        |
| 2.1.2     | Road Design and Construction Specifications                    | 19        |
| 2.2       | Key Activities Posing Environmental Impact Risk                | 22        |
| 2.3       | Potential Physical Environmental Impacts                       | 22        |
| 2.3.1     | Soil Erosion   | 22        |
| 2.3.2     | Soil Contamination   | 23        |
| 2.3.3     | Surface and Groundwater Contamination                          | 23        |
| 2.3.4     | Destruction and Loss of Fauna and Flora                        | 23        |
| 2.3.5     | Traffic Impacts  | 23        |
| 2.3.6     | Visual and Aesthetics Impacts                                  | 24        |
| 2.3.7     | Noise impacts  | 24        |
| 2.3.8     | Heritage Impacts   | 24        |
| <b>3.</b> | <b>ENVIRONMENTAL SPECIFICATIONS: PLANNING AND DESIGN PHASE</b> | <b>25</b> |
| 3.1       | Contractor's SHE Officer and Fire Officer                      | 25        |
| 3.2       | Pollution Control  | 25        |
| 3.3       | Safety Considerations  | 25        |
| 3.4       | Emergency Procedures   | 26        |
| 3.5       | Waste Management Control                                       | 26        |
| 3.6       | Stormwater and Erosion Control                                 | 26        |
| 3.7       | Site Layout  | 26        |
| <b>4.</b> | <b>ENVIRONMENTAL SPECIFICATIONS: CONSTRUCTION PHASE</b>        | <b>28</b> |
| 4.1       | Compliance Monitoring  | 28        |
| 4.2       | Construction Phase Specialist Environmental Specifications     | 28        |
| 4.2.1     | Vegetation   | 28        |
| 4.2.2     | Avifauna   | 32        |
| 4.2.3     | Cultural Heritage  | 34        |
| 4.2.4     | Visual Impacts   | 35        |
| 4.2.5     | Aquatic Biodiversity   | 37        |
| 4.2.6     | Social   | 38        |
| 4.3       | Construction Phase Environmental Specifications                | 40        |
| 4.3.1     | Health and Environmental Awareness                             | 40        |
| 4.3.2     | Emergency Preparedness   | 41        |
| 4.3.3     | Emergency Procedures   | 41        |
| 4.3.4     | Record Keeping   | 42        |
| 4.3.5     | Community Relations  | 42        |
| 4.3.6     | Non-working Times  | 43        |



|           |   |           |
|-----------|---|-----------|
| 4.3.7     | Safety at the Construction Site                           | 43        |
| 4.3.8     | Social Disruption   | 43        |
| 4.3.9     | Labour and Social Issues                                  | 43        |
| 4.3.10    | Consultation with Interested and Affected Parties (I&APs) | 44        |
| 4.3.11    | Working Areas and No-go Areas                             | 44        |
| 4.3.12    | Work Stoppage and Temporary Site Closure                  | 44        |
| 4.3.13    | Site Identification                                       | 44        |
| 4.3.14    | Site Demarcation  | 45        |
| 4.3.15    | Site Maintenance  | 45        |
| 4.3.16    | Vegetation Clearance                                      | 46        |
| 4.3.17    | Protection of Natural Features                            | 46        |
| 4.3.18    | Existing Services and Infrastructure                      | 47        |
| 4.3.19    | Prevention of Damage to Surrounding Infrastructure        | 47        |
| 4.3.20    | Unpleasant Visual Impact at the Construction Site         | 47        |
| 4.3.21    | Access and Traffic Control                                | 47        |
| 4.3.22    | Transport of Materials/Components                         | 48        |
| 4.3.23    | Soil Management   | 48        |
| 4.3.24    | Topsoil   | 49        |
| 4.3.25    | Excavations and Stockpiling                               | 49        |
| 4.3.26    | Storm Water Management and Erosion Control                | 50        |
| 4.3.27    | Concrete Batching   | 50        |
| 4.3.28    | Asphalt, Bitumen and Paving                               | 51        |
| 4.3.29    | Backfilling of Pipe or Cable Trenches                     | 52        |
| 4.3.30    | Sanitation  | 52        |
| 4.3.31    | Waste water and Contaminated Water Management             | 52        |
| 4.3.32    | Solid Waste Management                                    | 53        |
| 4.3.33    | Air Emissions and Odour Control                           | 53        |
| 4.3.34    | Noise Control   | 53        |
| 4.3.35    | Dust Control  | 53        |
| 4.3.36    | Hazardous Substances                                      | 53        |
| 4.3.37    | Fuels (Petrol and Diesel) and Oil                         | 54        |
| 4.3.38    | Fire Prevention and Control                               | 54        |
| 4.3.39    | Rehabilitation  | 55        |
| 4.4       | Construction Site Closure                                 | 56        |
| 4.4.1     | Materials and Infrastructure                              | 56        |
| 4.4.2     | Contaminated Substrates and Pollution Control Structures  | 56        |
| 4.4.3     | General   | 56        |
| 4.4.4     | Site Rehabilitation                                       | 56        |
| <b>5.</b> | <b>ENVIRONMENTAL SPECIFICATIONS: OPERATIONAL PHASE</b>    | <b>58</b> |
| 5.1       | Vegetation  | 58        |
| 5.2       | Solid Waste Management                                    | 58        |
| 5.3       | Maintenance Construction Activities                       | 58        |
| 5.4       | Hazardous Waste   | 59        |
| 5.5       | Emergency Procedures                                      | 59        |
| 5.6       | Erosion Control   | 59        |



5.7 Road Safety

60

**6. ENVIRONMENTAL SPECIFICATIONS: DECOMMISSIONING PHASE 61**

**APPENDICES**

Appendix A: Environmental Authorisation

Appendix B: List of Applicable Legislation

Appendix C: Construction Activities that will initially require Method Statements

**FIGURES**

**Figure 1: Organisational / Reporting Structure for implementation of the EMP ..... 5**

**Figure 2: 1:50 000 Location Map .....21**

**TABLES**

Table 1: Details of the Proponent ..... 3

Table 2: Details of the Project Engineer ..... 3

Table 3: Details of the EAP that prepared the EIA ..... 3

Table 4: Details of the DEA Case Officer ..... 4

Table 4: Breakdown of Roles and Responsibilities of the Project Team ..... 7



## GLOSSARY OF TERMS, DEFINITIONS AND ABBREVIATIONS

|                              |   |
|------------------------------|---|
| <b>Audit</b>                 | A verification process that is used to obtain information regarding the implementation of the EMP. It is an objective tool used to make improvements at the workplace.  |
| <b>Avi-fauna</b>             | All birdlife and their nests.   |
| <b>Berm</b>                  | A barrier that is designed to divert surface water flow. Berms will primarily be used along roads/tracks to prevent to concentrated flow of water over particular areas, thereby reducing erosion of roads.   |
| <b>Bunding</b>               | An impervious containment system for potential spillages from tanks / containers stored on site. The bunded area shall have a capacity greater than 110% of the total tankage contained. The bunding shall be constructed of a material impermeable and resistant to the stored material.   |
| <b>Client</b>                | For the proposed upgrade of Sani Pass project, the Department of Transport (DOT) is the client.   |
| <b>Construction Activity</b> | A construction activity is any action taken by the Contractor, his Sub Contractors, suppliers or personnel during the construction process.   |
| <b>Contractor</b>            | That main organisation appointed by the Developer, through the Project Manager, to undertake construction activities on the site.   |
| <b>Construction camp</b>     | The area allocated for the establishment of equipment, repair area, ablution facilities, lay down and rest areas, etc. It also serves as the central point for the storage of fuel and construction material.   |
| <b>DEA</b>                   | Department of Environmental Affairs   |
| <b>Demolition</b>            | The tearing down of buildings and other structures: the opposite of construction.   |
| <b>Developer</b>             | Dube TradePort Corporation  |
| <b>EA</b>                    | Environmental Authorisation   |
| <b>ECO</b>                   | Environmental Control Officer<br>Individual appointed by the project Manager and who is responsible for the implementation of the EMP, liaison between DoT, SSI, Contractor and Ezemvelo and monitoring, reviewing and verifying compliance with the CEMP by the Contractor.  |
| <b>EER</b>                   | Engineer's Environmental Representative   |
| <b>EMP</b>                   | Environmental Management Programme<br>The EMP for the project sets out general instructions that will be included in a contract document for the construction phase of the project. The EMP will ensure the construction activities are conducted and managed in an environmentally sound and responsible manner.<br><br>The EMP also details the organisational structure required to ensure the effective implementation of the EMP and measures to monitor and improve the application of the EMP. |
| <b>Environment</b>           | Means the surroundings within which humans exist and that are made up of: <ul style="list-style-type: none"> <li>• The land, water and atmosphere of the earth;</li> <li>• Micro-organisms, plant and animal life;</li> <li>• Any part or combination of a) and b) and the interrelationships among and between them; and</li> <li>• The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.</li> </ul>                 |



|                                      |  |
|--------------------------------------|--|
| <b>Environmental Specifications</b>  | Instructions and guidelines for specific construction activities designed to help prevent, reduce and/or control the potential environmental implications of these construction activities.  |
| <b>Fauna</b>                         | Any and all animals identified within or outside of the construction area. Animals may not be harmed in any way.   |
| <b>General Waste</b>                 | Domestic, commercial, non-hazardous waste and builders rubble e.g. paper, plastics, food, tins, etc.   |
| <b>Hazardous substance</b>           | Any substance that is of risk to health and safety, property or the environment. Hazardous substances have been classified under the SABS Code 0288: 'The Identification and Classification of Dangerous Goods and Substances'.  |
| <b>Hazardous Waste</b>               | Any inorganic or organic element or compound that because of its toxicological, physical, chemical or persisting properties, may exercise detrimental acute or chronic impacts on human health or development. Hazardous wastes are classified in accordance with the 'Minimum Requirement for the Handling, Classification and Disposal of Hazardous Waste' published by the Department of Water Affairs and Forestry (1998).   |
| <b>Hazardous Waste Landfill Site</b> | A waste disposal site that is designed and managed to accommodate the disposal of hazardous waste substances, and is permitted by the Department of Water Affairs and Forestry (DWAF).   |
| <b>Heritage site</b>                 | A site that contains either archaeological artefacts, graves, buildings older than 60 years, meteorological or geological fossils, etc.  |
| <b>Land owner</b>                    | The individual or company that owns the land through which the servitude crosses.  |
| <b>Method Statement</b>              | <p>A written submission by the Contractor to the Project Manager in response to the Specification setting out the plant, materials, labour, timing and method the Contractor proposes using to carry out an activity.</p> <p>The Method Statement shall cover applicable details with regard to:</p> <ul style="list-style-type: none"> <li>• Construction procedures</li> <li>• Materials and equipment to be used</li> <li>• Getting the equipment to and from site</li> <li>• How the equipment/material will be moved while on site</li> <li>• How and where material will be stored</li> </ul> <p>The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or solid material that may occur</p> <ul style="list-style-type: none"> <li>• Timing and location of activities</li> <li>• Compliance/ non-compliance with the Specifications</li> <li>• Any other information deemed necessary by the PM.</li> </ul> |
| <b>MSDS</b>                          | Material Safety Data Sheet   |
| <b>Project</b>                       | This refers to all construction activities associated with the proposed activities.  |
| <b>PM</b>                            | Project Manager or Representative of appointed firm responsible for overall management of the construction phase of the project including the management of all Contractors.   |
| <b>Rehabilitation</b>                | Rehabilitation is defined as the return of a disturbed area, feature or structure to a state that approximates to the state (where possible) that it was before disruption, or to an improved state.   |
| <b>Servitude</b>                     | A servitude is a right to access which allows a local authority access to a property for inspection or installation of roads, pipes, sewerage lines, electricity cables and so on. It is registered against the title deed.  |





|                           |   |
|---------------------------|---|
| <b>SHE</b>                | Safety, Health and Environment  |
| <b>Social Environment</b> | All the persons/farmers that are likely to be directly or indirectly affected by the Sani Pass upgrade construction activities.   |
| <b>Solid Waste</b>        | Means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers). |
| <b>Topsoil</b>            | The layer of soil covering the ground that allows for the successful germination of seeds, water penetration and is a source of micro-organisms and plant nutrient.   |
| <b>Watercourse</b>        | A natural channel in which water flows regularly or intermittently.   |
| <b>Workforce</b>          | All people involved in the construction activities of the Sani Pass upgrade, including people employed by the client or contractor, either permanent or casual staff.   |





## 1. INTRODUCTION

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The Department of Transport (DOT) proposes to construct Phase 2 of the project to upgrade the Sani Pass Road (P318) which transects the uKhahlamba Drakensberg Park World Heritage Site (UDP WHS) near Himeville, KwaZulu-Natal (KZN) [‘hereafter referred to as the ‘Road’]. This project originally consisted of three phases, of which the construction of Phase 1 has already commenced. Phases 2 and 3 have been combined into one phase, now referred to as Phase 2.

DOT appointed Arcus GIBB (Pty) Ltd as the Environmental Assessment Practitioner (EAP) to undertake the legally required Environmental Impact Assessment (EIA) of the proposed Sani Pass Road: Phase 2 Upgrade Project. This Draft Environmental Management Programme (EMP) is a required component of the EIA process and follows on from the Environmental Impact Assessment Report (EIAR), in as much as all the measures for mitigation of impacts that were identified during the EIA are incorporated into the EMP. The EMP covers the pre-construction planning and design, construction, operational and decommissioning phases of the Road upgrade project.

This Draft EMP will accompany the Final EIR to the competent authority, the Department of Environmental Affairs (DEA) for review and approval through an Environmental Authorisation, should it be granted. This document will then be updated accordingly to reflect the conditions set therein and finalised and approved by the DEA prior to construction commencing.

It is important to note that the EMP must also be amended to incorporate any additional specifications required in terms of the Environmental Authorisation and any additional requirements the proponent may find necessary.

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### 1.1 Objectives of the EMP

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It is imperative that the remedial and mitigation requirements identified during the EIA process are effectively realised during construction and operation, through to the final decommissioning phase of the project. Accordingly, the EMP plays a key role in the implementation of consistent and continued environmental management for the duration of the project life cycle.

Specifically, this EMP for the Upgrade of the Sani Pass: Phase 2 aims to:

- Draw attention to all the key environmental management requirements applicable to the project
- Organise environmental management requirements for the various phases of the project in a meaningful and structured way
- Provide an environmental management planning document for incorporation into the construction tender and contract documents, commissioning procedures, operational Environmental Management System (EMS), decommissioning and final site remediation procedures.
- Be used as an ‘environmental gate keeper’ for contractor assessment prior to appointment



- Define and outline the functions, roles and responsibilities of persons accountable for effective environmental management
  - Outline mitigation measures and environmental specifications which are required to be implemented during various phases of the project, in order to minimise the extent of and to manage environmental impacts associated with the project through effective control
  - Identify the requirements for detailed Method Statements (construction phase) and safe operating procedures (operational and decommissioning phases) for certain aspects or activities
  - Prevent long-term or permanent environmental degradation
  - Define requirements and procedures for monitoring
  - Outline procedures for environmental management and control, in the event of pollution or similar incidents.
- 

## **1.2 Environmental Principles and Best Practice Guidelines**

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- The environment is considered to be composed of both biophysical and social components.
  - Construction is a disruptive activity and all due consideration must be given to the environment, including the social environment during the execution of the project to minimise the impact on affected parties.
  - Minimisation of areas disturbed by construction activities (i.e. the 'footprint' of the construction area) should minimise many of the construction related environmental impacts of the project and reduce rehabilitation requirements and costs.
  - All relevant standards relating to international, national, provincial and local legislation, as applicable, should be adhered to. This includes requirements related to waste generation and emissions, waste disposal practices, noise regulations, road traffic ordinances, etc.
  - Every effort should be made to minimise, reclaim and/or recycle waste material.
- 

## **1.3 Details of the Project Team**

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This section provides details on the planning team that was involved in the development of the draft EMP which includes the proponent, the project engineers, and the Environmental Assessment Practitioner (EAP). Details of the contact persons are provided in Table 1.



### 1.3.1 Details of the Proponent: Department of Transport

The DOT is the project proponent and the responsible authority for the management and maintenance of the South African road network of which the Sani Pass (P318) is a provincial road.

**Table 1: Details of the Proponent**

|                    |   |
|--------------------|---|
| Name of Applicant: | Department of Transport                           |
| Contact Person:    | Ms Sihle Mlhongo                                  |
| Address:           | 224 Prince Alfred Street<br>Pietermaritzburg 3201 |
| Postal Address:    | Private Bag X9043<br>Pietermaritzburg 3200        |
| Tel:               | 033 342 4082                                      |
| Fax:               | 031 355 8090                                      |
| E-mail:            | sihle.mhlongo@kztransport.gov.za                  |

### 1.3.2 Details of the Project Engineer

The project engineering team is a Joint Venture between SSI, Semenye Furumele Transportation Engineers and Ndizani Civilworks. SSI is the lead engineer and JV representative.

**Table 2: Details of the Project Engineer**

|                          |   |
|--------------------------|---|
| Name of Lead Consultant: | SSI   |
| Contact Person:          | Mr Eddy Gademan   |
| Address:                 | 30 Montrose Park Boulevard<br>Victoria Country Club<br>Montrose |
| Postal Address:          | P.O. Box 1066<br>Pietermaritzburg 3200                          |
| Tel:                     | 033 328 1080  |
| Fax:                     | 033 328 1005  |
| E-mail:                  | eddyg@pmb.ssi.co.za   |

### 1.3.3 Details of the Environmental Assessment Practitioner: Arcus GIBB

Arcus GIBB (Pty) Ltd, is a multi-disciplinary engineering and environmental consultancy organisation. Arcus GIBB's Environmental Division has a proven track record in the planning, co-ordination, management and execution of a wide range of environmental projects, including EIAs and EMPs.

**Table 3: Details of the EAP that prepared the EIA**

|                  |   |
|------------------|---|
| Name of the EAP: | Arcus GIBB (Pty) Ltd  |
| Contact Persons: | Mr Russell Stow   |
| Address:         | 2 <sup>nd</sup> Floor, IBM House<br>54 Norfolk Terrace<br>Westville, 3630 |
| Postal Address:  | PO BOX 1365<br>Westville<br>3630  |
| Tel:             | 031 267 8560  |



|         |  |
|---------|--|
| Fax:    | 031 266 3310   |
| E-mail: | <a href="mailto:rstow@gibb.co.za">rstow@gibb.co.za</a> |

#### 1.3.4 The Environmental Authority: Department of Environmental Affairs

The Department of Environmental Affairs (DEA) is the designated authority responsible for authorising the EIA and this EMP. The DEA has overall responsibility for ensuring that the applicant, the DOT, complies with the conditions of its Environmental Authorisation as well as this EMP.

**Table 4: Details of the DEA Case Officer**

|                 |  |
|-----------------|--|
| Name:           |  |
| Title:          |  |
| Postal Address: |  |
| Tel:            |  |
| Fax:            |  |
| Email:          |  |

---

#### 1.4 Organisational Requirements

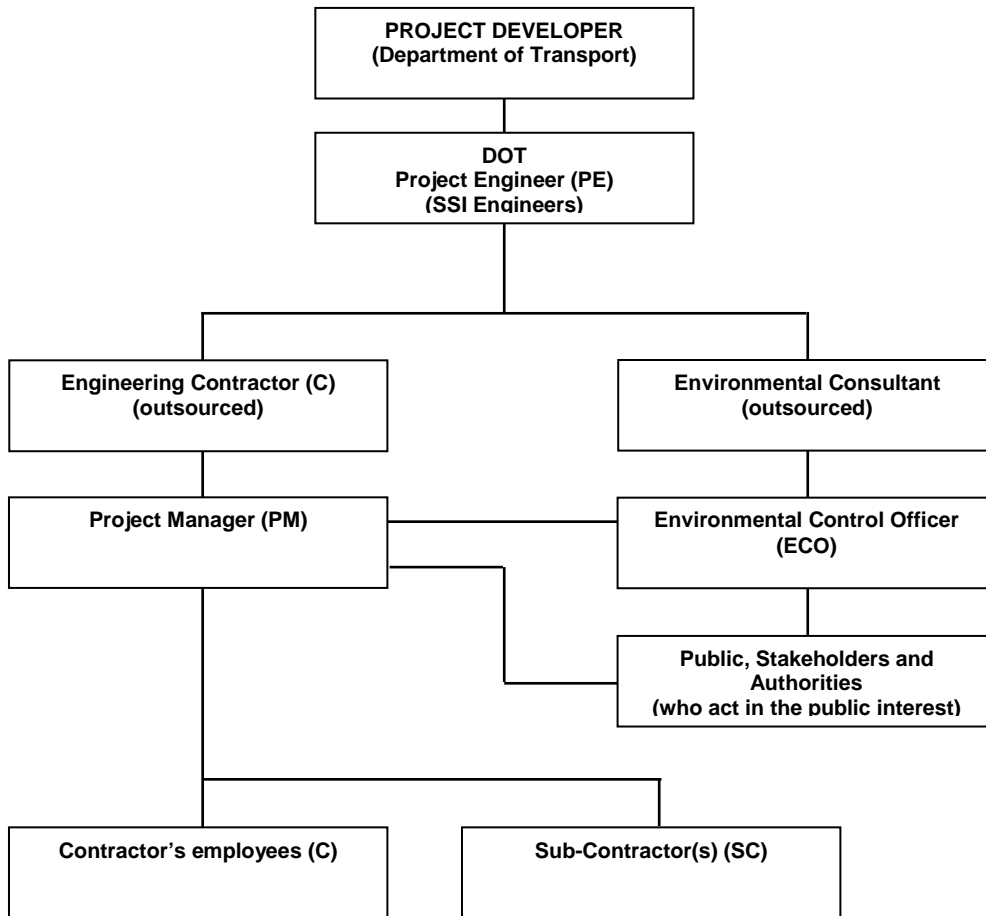
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In order to ensure sound development and effective implementation of the EMP, it is necessary to identify and define the responsibilities and authority of the various persons and organisations that will be involved in the project.

During construction, all instructions and official communications regarding environmental matters shall follow the generic organogram shown in **Figure 1**. The organisational structure identifies and defines the authority structure, and the communication structure for the various parties involved in the construction of the proposed development. The structure may require revision as the project unfolds.



**Figure 1: Organisational / Reporting Structure for implementation of the EMP**



DOT will appoint a Project Engineer (PE), who should appoint an Engineer Environmental Representative (EER) to represent DOT for the proposed development. DOT will also appoint an Engineering Consultant / Contractor (hereafter 'Contractor') to implement the project. DOT shall require each Contractor to appoint a Project Manager (PM) to direct and monitor all contractor activities during the construction of the development.

DOT shall appoint an Environmental Consultancy to fulfil the role of Environmental Control Officer (ECO) to oversee the implementation of the construction component of the EMP on site. It will be the responsibility of the ECO to consult with the PE and/or PM regarding instructions pertaining to contravention, corrective actions, and penalties or working methods. Except in an emergency situation, where instructions may be given directly to the Contractor's employees and sub-contractors, all instructions given by the ECO shall go through the PE. The ECO may be permanently based on site for the duration of the project if required by the DOT or EKZNW.

The EMP and environmental matters will be an item of the monthly site meetings, and the ECO must attend these meetings in order to provide input with respect to compliance with the EMP and the Environmental Authorisation (EA).

Key roles and responsibilities of each party are outlined in more detail in Section 1.5 below. It is important to note that, while parties are assigned various environmental



roles and responsibilities, parties are severally and jointly responsible to ensure compliance with all environmental legislation and best practice.



## 1.5 Roles and Responsibilities

**Table 5: Breakdown of Roles and Responsibilities of the Project Team**

| Role   | Responsibility  |
|--|---|
| <b>1.5.1 National and Provincial Environmental Authorities</b>   |   |
| The National Department of Environmental Affairs (DEA) is the authority responsible for compliance with all environmental legislation.   | <ul style="list-style-type: none"><li>• Convey legal requirement for the EMP and EA.</li><li>• Give directives in terms of specific requirements for EMP specifications.</li><li>• Review draft, final and possible revisions to the EMP.</li><li>• Undertake spot inspections of the site at its own discretion.</li><li>• Review ECO Audit Reports.</li><li>• Request and view any Environmental Incident Reports.</li><li>• Request and view the Complaints Register.</li><li>• Issue directives, notices and/or fines for significant transgressions to the EMP or environmental legislation.</li></ul>   |
| <b>1.5.2 DOT Project Engineer</b>  |   |
| The PE assumes overall responsibility for the environmental aspects and management of the Sani Pass Upgrade project. This includes compliance to all environmental regulatory and good management practice requirements for the duration of the project, in order to ensure effective minimisation of all environmental impacts. The PE or the EER is also responsible for the overall management and implementation, administration and enforcement of the EMP. | <ul style="list-style-type: none"><li>• Ensure that all designs appropriately incorporate the required environmental provisions as discussed in the Final Environmental Impact Report (EIR) and EMP.</li><li>• Ensure that the EMP is finalised and adequately describes the minimum environmental regulatory requirements at the time construction commences.</li><li>• Ensure that the EMP specifications are included in all tender documents issued to prospective engineering consultants/contractors for the development works and activities on site.</li><li>• Review and where necessary, revise the 'incident and associated penalty values list' and include the list in the tender document.</li><li>• Ensure that the prospective Tenderers/Contractors adequately provide for the provisions of the EMP in their submissions.</li><li>• Appoint the Engineering Contractor(s) and Environmental Consultants, and through them a PM and ECO respectively, for the duration of the construction period and ensure that their scope of work sufficiently covers responsibilities that will ensure implementation and compliance with the EMP and good environmental management throughout the project.</li><li>• Ensure that the EMP is fully implemented and remains so, and when necessary propose revisions</li></ul> |





| Role   | Responsibility  |
|--|---|
|  | <p>and ensure it is updated.</p> <ul style="list-style-type: none"> <li>• Give instructions regarding the development and implementation of Method Statements.</li> <li>• Ensure that the Contractor develops and provides all required Method Statements.</li> <li>• Review the Method Statements, with the assistance from the Environmental Consultant/ECO, to confirm their conformance with EMP as well as the overall EA requirements taking into account reasonable practicality and financial feasibility and lastly provide relevant feedback to the Contractor.</li> <li>• Approve acceptable Method Statements and inform the Environmental Consultant/ECO of such approval.</li> <li>• Keep record of all Method Statements and the associated review and approval status.</li> <li>• Review and approve drawings produced by the Contractor in connection with, e.g. construction site layout, access/haul roads, construction stormwater management plan, etc.</li> <li>• Be liable / accountable, to the relevant authority, DEA, for any contravention/non-compliance by any Contractor under their supervision.</li> <li>• Establish and maintain regular and proactive communications with the Consultant/PM, Contractor and Environmental Consultant/ECO.</li> <li>• Assist the Contractor in finding environmentally responsible solutions to problems with input from the ECO.</li> <li>• Undertake periodic audits, site visits and inspections to ensure that the environmental requirements are implemented.</li> <li>• Review and comment on environmental compliance assessments and/or reports.</li> <li>• Review the Complaints Register.</li> <li>• Give instructions on any procedures and corrective actions.</li> <li>• Report any significant environmental incidents or impacts to the relevant environmental authorities.</li> <li>• Instruct the Contractor on the requirements and procedures in terms of environmental non-compliance 'near misses', incidents and public complaints recording, investigation and reporting.</li> <li>• Order the removal of, or issue spot fines for, person(s) and/or equipment not complying with the specifications.</li> <li>• Issue fines, penalties or 'work suspend' orders for contravention of the EMP and give instructions regarding corrective action to the Contractor/PM.</li> </ul> |
| <b>1.5.3 Engineering Contractor</b>  |   |
| <p>The Engineering Contractor's role is to implement and comply with the</p> | <ul style="list-style-type: none"> <li>• Study the EMP and all its specifications carefully and gain a full understanding of its implications.</li> <li>• Provide for full compliance with the EMP and all its relevant specifications in the submitted Tender</li> </ul>   |



| Role  | Responsibility   |
|---|--|
| <p>recommendations and conditions of the EMP at all times. As such, the Contractor must incorporate and cover all the relevant EMP requirements in the budget plans, detail designs, planning, sub-contractor appointments and all project implementation activities. The Contractor also needs to appoint an individual for the role of Project Manager.</p> | <p>document; and/or provide motivation and/or alternative specifications through Method Statement(s) for any deviation from or 'tailor making' of the EMP for the DOT to consider.</p> <ul style="list-style-type: none"> <li>• Include all relevant EMP specifications in the tender documents and subcontractor appointments.</li> <li>• Avail him / her, as well as any employee he may identify, for induction training on the EMP by the ECO.</li> <li>• Notify the PE or EER and ECO of the anticipated programme of works and fully disclose all details of activities involved (includes off-site activities associated with the project).</li> <li>• Prepare all the required / agreed Method Statements for submission to the PE and Environmental Consultant / ECO.</li> <li>• Sign off on approved Method Statements.</li> <li>• Appoint a competent, experienced and responsible individual as PM to administer and implement EMP with regard to engineering and construction.</li> <li>• Ensure that the EMP environmental specifications (of this document including any revisions, additions or amendments) and all approved Method Statements are effectively implemented.</li> <li>• Implement on-site steps to mitigate environmental impacts.</li> <li>• Ensure that all employees and sub-contractors employed comply with the requirements and provisions of the EMP at all times through ongoing education and awareness training</li> <li>• Report any serious environmental incidents or impacts to the DOT PE/EER and ECO</li> </ul> |
| <p><b>1.5.4 Project Manager</b></p>   |  |
| <p>The Project Manager (PM) oversees the construction programme and all construction activities performed by the contractor and as such also any EMP implementation, EMP compliance and environmental related activities, issues and impacts.</p>   | <ul style="list-style-type: none"> <li>• Gain an in-depth understanding of the EMP.</li> <li>• Ensure implementation of all aspects and specifications of the EMP and approved Method Statements.</li> <li>• Oversee all site works.</li> <li>• Enforce the implementation of and compliance with this document with Contractor and Sub-contractor employees and Sub-contractors.</li> <li>• Monitor and verify that environmental impacts are kept to a minimum at all times.</li> <li>• Record and inform the PE and ECO of 'near miss' incidents or problems arising when implementing the EMP, including accidents and transgressions and recommend ways of improving it.</li> <li>• Take action to address all EMP, Method Statement and/or environmental legislation non-compliances.</li> <li>• Report and record all accidents, incidents resulting in injury or death or significant environmental liability immediately to the PE and ECO.</li> </ul>  |



| Role  | Responsibility   |
|---|--|
|   | <ul style="list-style-type: none"> <li>• Record all public complaints received and immediately inform the PE and ECO thereof.</li> <li>• Report progress towards implementation of and non-conformances with the latest EMP version and approved Method Statements at site meetings with the PE and ECO.</li> <li>• Ensure that suitable records are kept of all compliance status/feedback reports, incident reports and complaints register and that these documents are available for auditing by the PM or ECO at all times.</li> <li>• Communicate to the Contractor employees and Sub-contractors, verbally and in writing, the advice of the ECO and the content of the ECO reports.</li> <li>• Designate and manage the working areas as per approved construction site layout, including all identified sensitive environments.</li> <li>• Issue penalties for contravention of the EMP to Contractor Staff and Sub-contractor (as deemed necessary).</li> </ul>  |
| <b>1.5.5 Environmental Control Officer</b>  |  |
| <p>Fulfil an advisory consultancy, monitoring and reporting role with regard to overseeing the effective implementation and updating of the EMP. Making recommendations for addressing EMP and/or environmental legal non-compliances. Liaising with the relevant Environmental Authorities on any environmental issues to confirm their requirements, as and when required and communicating such requirement to the DOT Project Engineer and/or PM.</p> | <ul style="list-style-type: none"> <li>• Revise and update the EMP as and when necessary and submit such updates to the PE for review.</li> <li>• Submit copies of revised EMP to all relevant stakeholders for their information and review.</li> <li>• Ensure that the final EMP is approved by all relevant authorities.</li> <li>• Liaise with the environmental authorities and DOT Senior Management as and when necessary.</li> <li>• Advise the PE on necessary environmental authorisations and permits that would be required.</li> <li>• Prepare EMP introduction and environmental awareness training course material/manual and present this course to the PE, Contractor, PM and possibly sub-contractors, including any employee member they deem necessary, prior to them starting any work on site (once-off tool box talks). Keep record of everyone who attended the EMP introduction training course.</li> <li>• Provide appropriate training on the latest version of the EMP and all approved Method Statements to all employee and sub-contractors and keep record of such training (e.g. keep record of the date of training, version of the EMP the training was for, the employee/sub-contractor trained).</li> <li>• Keep record of all training courses undertaken for site staff.</li> <li>• Review and comment on all Method Statements relevant to environmental management and make recommendations to the PE on whether or not to accept the Method Statement and/or any amendments or revisions required.</li> <li>• Make recommendations on any additional Method Statements that may be required as the construction process progresses.</li> <li>• Undertake regular site inspections and liaison with the PE and/or Contractor (meetings) to monitor,</li> </ul> |



| Role   | Responsibility  |
|--|---|
|  | <p>audit and verify that all works comply with environmental legislation and the EMP compliance; that environmental impacts are kept to a minimum; and ascertain the level of such compliance and impact minimisation.</p> <ul style="list-style-type: none"> <li>• Keep record of EMP implementation, monitoring and audits.</li> <li>• Prepare regular monitoring/audit reports which reflect the EMP compliance status, findings, issues and recommended actions for addressing non-compliances and submit these to the project team and relevant Environmental Authorities (DEA).</li> <li>• Review 'near miss' reports, incident reports and complaints register and recommend corrective actions.</li> <li>• Report any serious environmental incidents or environmental impacts immediately to the PM, PE.</li> <li>• Assist the project team in finding environmentally responsible solutions to problems.</li> <li>• Maintain a photographic record of the site before, during and after construction.</li> <li>• Issue out Non-Compliance Reports (NCRs) to non-compliant contractors and sub-contractors</li> <li>• Advise the PM on the removal of person(s) and/or equipment not complying with the specifications.</li> <li>• Make recommendations to the PE and PM on the issuing of fines for transgressions of site rules and penalties for contravention.</li> <li>• Utilise and co-ordinate specialist input as required.</li> </ul> |
| <b>1.5.6 Environmental Specialists</b>   |   |
| <p>Fulfil an advisory consultancy, monitoring and reporting role to the ECO with regard to specific specialist environmental impacts. Specialists include botanical, avifaunal and aquatic</p> | <ul style="list-style-type: none"> <li>• Assess specific sites of known potential impact prior to construction initiation as a when required.</li> <li>• Provide site specific recommendations to be considered / implemented.</li> <li>• Monitor construction at the site to ensure the impact is minimised.</li> <li>• Provide feedback and report on the effectiveness of the task undertaken.</li> <li>• Provide further recommendations and advice</li> </ul>  |
| <b>1.5.7 Sub-contractor</b>  |   |
| <p>It is the Sub-contractor's role to implement and comply with recommendations and conditions of the EMP at all times.</p>  | <ul style="list-style-type: none"> <li>• Study all relevant EMP sections, specifications and approved Method Statements carefully and gain a full understanding of the implications thereof.</li> <li>• Prepare and provide Method Statement(s) as per the PM's instructions.</li> <li>• Implement and comply with all relevant EMP sections, specifications and approved Method Statements.</li> <li>• The EER will be responsible for conducting regular tool box talks to employees on site for the duration of construction</li> </ul>  |



| Role  | Responsibility  |
|---|---|
|   | <ul style="list-style-type: none"><li>• Notify the PM of the anticipated programme of works and fully disclose all details of activities involved.</li><li>• Avail him / her, as well as any employee he may identify, for induction training on the environmental requirements as per PM's instructions.</li><li>• Be responsible for Sub-contractor's employees.</li><li>• Report progress towards implementation of and non-conformances with the relevant sections of the latest EMP version and approved Method Statements to the PM.</li><li>• Notify the PM of any and all 'near misses', incidents, accidents and transgressions on site with respect to environmental management and non-compliance with the latest EMP version and approved Method Statements and seek advise from the PM for required corrective actions and/or site remediation.</li><li>• Record all incidents and the corrective actions/remedial action taken in incident report and submit these to the PM for signing off.</li><li>• Report and record all accidents and incidents resulting in injury or death immediately to the PM.</li><li>• Record all complaints received and immediately inform the PM thereof.</li></ul> |
| <b>1.5.8 Public and Authorities Acting on Their Behalf</b>  |   |
| The public, as well as the authorities responsible of acting on behalf of the public, watches over the project and reports on any non-compliances with the Environmental Authorisation and EMP. | <ul style="list-style-type: none"><li>• Monitor the EMP compliance.</li><li>• Register complaints on any EMP or Method Statement non-conformances.</li></ul>  |



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## 1.6 Environmental Awareness and Compliance

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The philosophy adopted in this Draft EMP is derived from the principles of the National Environmental Management Act (No. 107 of 1998) (NEMA) which states that development must be socially, economically and environmentally sustainable. Sustainable development requires that:

- The disturbance of ecosystems and loss of biodiversity are avoided (minimised or remedied)
- Pollution and degradation of the environment are avoided or minimised and remedied
- Waste is avoided or minimised and re-used or re-cycled where possible and otherwise disposed of in a responsible manner
- A risk averse and cautious approach is applied
- Negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot altogether be prevented, are minimised and remedied.

NEMA makes provision that anyone who causes pollution or degradation of the environment is responsible for preventing impacts occurring, continuing or recurring and for the costs of repair of the environment.

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## 1.7 Environmental Authorisation

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**(This section will be inserted once the Environmental Authorisation has been issued. It will provide a brief overview of the requirements and conditions of the authorisation and how these have been incorporated in the EMP.)**

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## 1.8 EMP Revisions and Authorisation

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The EMP and its associated environmental specifications may be amended at various stages of the Sani Pass Upgrade project. Anticipated events that would 'trigger' the need for an update and amendment of the EMP are as follows:

- Receipt of the Environmental Authorisation
- Significant change in applicable environmental legislation
- Instructions from DEA to do so
- Changing circumstances on site
- Changes in the project scope (which have been approved by the DEA)
- Amendments of the Environmental Authorisation by the DEA.

The EMP may also need to be amended should relevant authorities or key EMP role-players consider it necessary. The DOT shall consult with the DEA to establish whether the DEA wish to approve specific EMP amendments. If approval from the DEA is required, the DOT shall follow due process to gain approval for such amendments. DOT may consult with the ECO and/or another suitably experienced



party to assist with and/or accept the amendment of the EMP and/or assist with the application for approval of the amendments.

Although the EMP is a working and dynamic document and subject to revision, no significant amendments (relaxation or revision of any mitigation measures) may be allowed without approval from the DEA once it has been finalised after the issuing of the Environmental Authorisation for the project. Motivations for amendments to the EMP from any party must be made to the DOT who will then submit the proposed amendments to the DEA for consideration and approval.

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## 1.9 Non-Compliance with the EMP

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Difficulties may be encountered with carrying out mitigation measures that could result in future non-compliance. Penalties for non-compliance need to be discussed with the Contractor on appointment. The Contractor must make every effort to motivate staff members to comply with the EMP, and enforce non-compliance penalties. Allowances must be made for the contractor to rectify all non-compliances, prior to the DOT deciding on any penalties thereof. Failure to comply with the stipulations above could be considered a breach of the contract by the contractor.

The PE, in consultation or on the advice of the ECO, shall issue spot fines in the form of penalties to the Contractor's payment certificate if the Contractor infringes the environmental specifications set out in this EMP. The Contractor shall be advised in writing of the nature of the infringement and the penalty amount. The Contractor shall be liable for the penalty and it is his responsibility to recover the penalty value from the relevant employee. The Contractor shall also take the necessary steps (e.g. training) to prevent a recurrence of the infringement.

The Contractor is also advised that the imposition of penalties does not replace any legal proceedings the authorities, landowners and/or members of the public may institute against the Contractor. Where non-compliance has resulted in environmental damage or pollution, the penalties imposed will, as a minimum, be the cost to completely rehabilitate the damage caused including all time and costs of any specialist used to remediate the problem.

Spot fine penalties shall be between R500.00 and R20 000.00, depending upon the severity of the infringement. The decision on how much to impose the fine will be made by the PE / ECO and this will be final.

In addition to the spot fine, the Contractor shall be required to compensate for any damage caused as a result of the infringement at his own expense.

A preliminary list of infringements for which spot fines penalties will be imposed is as follows:

- Using areas outside the working areas without permission/accessing "no-go areas"
- Clearing and/or levelling areas outside of the working areas
- Spillage onto the ground or water bodies of oil, diesel, etc
- Picking / damaging plant material
- Damaging / killing wild animals / birds





- Littering of the site and surrounds
- Burying waste on site and surrounds
- Making fires on site
- Discharging effluent and / or stormwater onto the ground or into surface water
- Repeated contravention of the specifications or failure to comply with instructions
- Additional fines as determined by the ECO and added to this list
- Damage to heritage sites
- Driving anywhere outside the demarcated construction area whether to reverse
- or turn the machine or for any other reason whatsoever
- Damaging any tree outside of the construction area or any tree marked for protection within the construction footprint
- Damaging any rock outside of the construction area or any rock marked for protection within the construction footprint.

The PM shall:

- Retain records for fines issued. Monies for the spot fine penalties will be deducted from the Contractors monthly certificate and used as additional funds to ensure final rehabilitation of the construction area.
- On recommendation from the ECO, may also order the Contractor to suspend part or all the works if the Contractor repeatedly causes damage to the environment by not adhering to the CEMP (i.e. more than 3 cases of infringements). The suspension will be enforced until such time as the offending actions, procedure or equipment is corrected. No extension of time will be granted for such delays and all costs will be borne by the Contractor.

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## 1.10 Compliance with Other Policies and Legislation

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DOT and the Contractor shall commit to complying with the relevant provisions of the applicable environmental legislation and associated regulations promulgated in terms of these laws, through all phases of the project. In order to achieve this, these parties need to acquaint themselves with relevant environmental legislation and/or seek advice from the relevant authorities and/or a suitably qualified legal specialist. In addition to the environmental authorisation in terms of NEMA, the proposed Sani Pass Upgrade may require permission and compliance with a number of other authorisations from various departments, such as the Department of Water Affairs (DWA) and AMAFA KwaZulu Natali. Municipal bylaws of the Kwa Sani Municipality are also applicable.

A list of applicable legislation, not limited to the list below, includes:

- The Constitution of the Republic of South Africa (Act 108 of 1996)
- National Environmental Management Act No. 107 of 1998
- Environment Conservation Act No. 73 of 1989
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
- National Environmental Management: Protected Areas Act (Act No. 57 of 2003)



- National Water Act, No. 36 of 1998
- National Forest Act, No 30 of 1998
- Water Services Act, No. 108 of 1997
- Occupational Health and Safety Act, No 85 of 1993
- National Building Regulations and Building Standards Act, No 103 of 1977
- The National Heritage Resources Act 25 of 1999
- KwaZulu-Natal Heritage Act No. 10 of 1997

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## **1.11 Environmental Audits**

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Environmental audits must be undertaken on a regular basis during the construction phase, at predetermined intervals deemed necessary by the conditions of the Environmental Authorisation, ECO and PM.

To facilitate communication between the parties responsible for ensuring environmental compliance, it is vital that a chain of command is setup that will ensure that the ECO's recommendations have the full backing of the PM. In this way, penalties as a result of non-compliances with the EMP by the contractor may be justified as failure to comply with instructions from the highest authority.

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## **1.12 Training and Induction of Contractors and Workers**

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All parties involved in the construction of the facility are to be made aware of, and be familiar with the EMP, EA and conditions contained therein.

It is the responsibility of the ECO to prepare EMP introduction and environmental awareness training course material/manual and present this course to the PE, Contractor, PM and possibly sub-contractors, including any employee member they deem necessary, prior to them starting any work on site. It is then the responsibility of the contractor to ensure that training and awareness to his staff and subcontractors is provided in this regard.

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## **1.13 Complaints Register and Environmental Incidents Book**

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The Contractor must record any complaints received from the community in a complaints register kept on-site. The lodged complaint must be brought to the attention of the PM who will respond accordingly. The following information will be recorded:

- Time, date and nature of the complaint
- Person responsible for investigation and implementation of remediation measures
- Response and investigation undertaken
- Actions taken and by whom.



An investigation must ensue and a response to the complainant must be provided within seven working days.

All environmental incidents occurring on the site will be recorded by the contractor and submitted to the PM and copied to the ECO. The following information will be documented:

- Time, date, location and nature of the incident
- Actions taken and by whom
- Close Out.

The PM or the EER in conjunction with the ECO will identify and authorise remediation action where necessary.

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### **1.14 Contractual Obligation**

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In order to ensure that the EMP is enforced and implemented, this document must be given legal standing. This shall be achieved through incorporating the EMP as an addendum to the contract documents as conditions of the contract that must be met. This will ensure that the obligations are clearly communicated to the Contractor and that submitted tenders have taken into account, and budgeted for the environmental requirements specified in the EMP. The successful tender ultimately becomes the signed contract, thereby ensuring that the included EMP becomes legally binding to the appointed contractor.

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### **1.15 Method Statements**

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Method Statements indicate how compliance with the Engineering Specifications, contract and EMP will be achieved.

The Contractor shall submit a written Method Statements to the PM and ECO for the activities identified by the PM and/or the ECO as being potentially harmful to the environment, at least 10 working days prior to the proposed commencement of construction activities, to allow the PM (and/or ECO) time to study and approve the method statement.

The Contractor shall not commence work on that activity until such time as the Method Statement has been approved in writing by the ECO, which shall be done within 7 working days of receipt. The contractor must carry out the activities in accordance with the approved Method Statement.

Due to changing circumstances, it may be necessary to modify Method Statements. In such cases, the proposed modifications must be indicated and agreed upon in writing between the ECO and PM. The ECO may require changes to a Method Statement if it does not comply with the specification or if, in the reasonable opinion of the ECO, the proposal may result in, or carries a greater than reasonable risk of damage.



The ECO and PM must make approved Method Statements readily available on the site and communicate the content of the Method Statement to all relevant personnel must retain records of any amendments and ensure that the most current version of any Method Statement is being used.

Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the contract. No claim for delay or additional cost incurred by the Contractor shall be entertained due to inadequacy of a Method Statement.

**a) Content of Method Statements**

The Method Statement shall state clearly:

- The type of construction activity
- Locality where the activity will take place
- Timing of activities
- Materials to be used
- Equipment and staffing requirements
- Identification of activities, and resultant impacts that may result from the activity
- Methodology and/or specifications for impact prevention or containment
- The system to be implemented to ensure compliance with the specifications
- Emergency or disaster incident and reaction procedures
- Other information deemed necessary by the ECO.

The Contractor shall be responsible for the implementation of the method statements and must demonstrate that these measures are working effectively.

**b) Required Method Statements**

A list of Method Statements that are initially identified and required from the Contractor are listed below. The statements should be documents included under Appendix C of this EMP.

- Location, layout and preparation of the construction camp(s) and materials storage areas
- Location, layout and preparation of cement/concrete batching facilities including the methods employed for the mixing of concrete and the management of runoff water from such areas
- Contaminated water management plan, including the containment of runoff and polluted water
- Emergency construction Method Statements (including details of methods for fuel spills and clean up operations)
- Rehabilitation of disturbed areas and revegetation after construction is complete
- Solid waste management and removal of waste from site
- Crossing of drainage lines
- Construction of bridges and culverts
- Programme, location and method of blasting
- Clearing of surrounding areas after blasting.



## 2. PROJECT CONTEXT

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### 2.1 Brief Overview of the Proposed Project

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#### 2.1.1 Introduction

The proposed Phase 2 upgrade entails a complete re-grading and resurfacing of the Sani Pass from gravel to a hardened surface, all-weather road. The upgrade will include road widening, re-alignment of sections, new bridges, stormwater control and attenuation systems, bank and slope stabilisation and road servitude rehabilitation.

The Sani Pass Road currently provides access to, and passes through the UDP, which is a proclaimed World Heritage Site. Sustainable access to the UDP must be developed and carefully managed and Sani Pass Road (P318) forms an integral part of this initiative. A co-operation agreement was also signed in 2005 between Lesotho and South Africa to improve access between the two countries via Sani Pass. This project thus forms part of an overall initiative to improve accessibility between SADC countries. The intention is for South Africa to surface the P318 from Himeville to the Lesotho border and Lesotho to surface the section from the border to Mokhotlong approximately 60 km away. The ultimate goal is to have a hard-surfaced road through to Maseru.

#### 2.1.2 Road Design and Construction Specifications

The DOT provided the engineering consortium with the following Terms of Reference (TOR) for the proposed design of the road upgrade:

- Provide an all-weather, hardened surface road
- Provide a two-way road, thus one lane in each direction with road surface width of:
  - 7 m between km 14 and km 25 (lower section)
  - 6 m between km 25 and km 33 (upper section)
- Allow for a safe traffic speed for a short-wheel-based truck or bus of:
  - 50 km per hour (km/h) between km 14 and km 25 (lower section)
  - 30 km/h between km 25 and km 33 (upper section).
- Remain within the existing DOT road servitude and retain the current road alignment where possible, but adjust the alignment where necessary to achieve the abovementioned design specifications
- Widen the road where necessary, through appropriate cut, fill, retainment and bridge structures
- Make use of the approved borrow pit from the Phase 1 project for road construction materials.

Each proposed cutting and fill will be assessed in terms of in situ material and decisions will be taken on how to best position the road. The design options will more than likely be reviewed a number of times before the optimum alignment has been determined.

There will be certain predetermined locations where the construction traffic will need to turn. These areas will be formalised into view sites and/or new picnic sites. Where



possible, the turning locations will utilise existing view points and historical borrow pits and spoil areas.

**a) Construction**

The intention is to undertake the construction into two sections which will be constructed simultaneously:

- a) Phase A - km 14 to km 25
- b) Phase B - km 25 to km 33

In terms of the location of the construction camps, Phase A would use the construction camp currently being used by the Phase 1 Upgrade project. The most suitable location for a construction camp for Phase B, which starts at the current SA border post, would be at the border post. No new construction camp would need to be constructed and hence the impact on the environment is significantly reduced. This is, however, dependent on the future of the Border Post Relocation Project and whether the existing Border Post has been vacated by the time the of the construction of the proposed Sani Pass Phase 2 Upgrade. Once construction is completed, the Border Post will be dismantled and the site rehabilitated for inclusion back into the uKhahlamba Drakensberg Park (UDP) World Heritage Site (WHS), which is the intention of Ezemvelo KZN Wildlife (EKZNW).

Issues highlighted to date that will need to be managed during the construction phase include:

- Occupational Health and Safety (OHSA)
- Oil and diesel spillages
- Traffic Management
- Recovery of any vehicles and/or equipment which may fall into the valley
- Proposed site camps and their management
- Stockpiling of hazardous materials
- Blasting of rock.

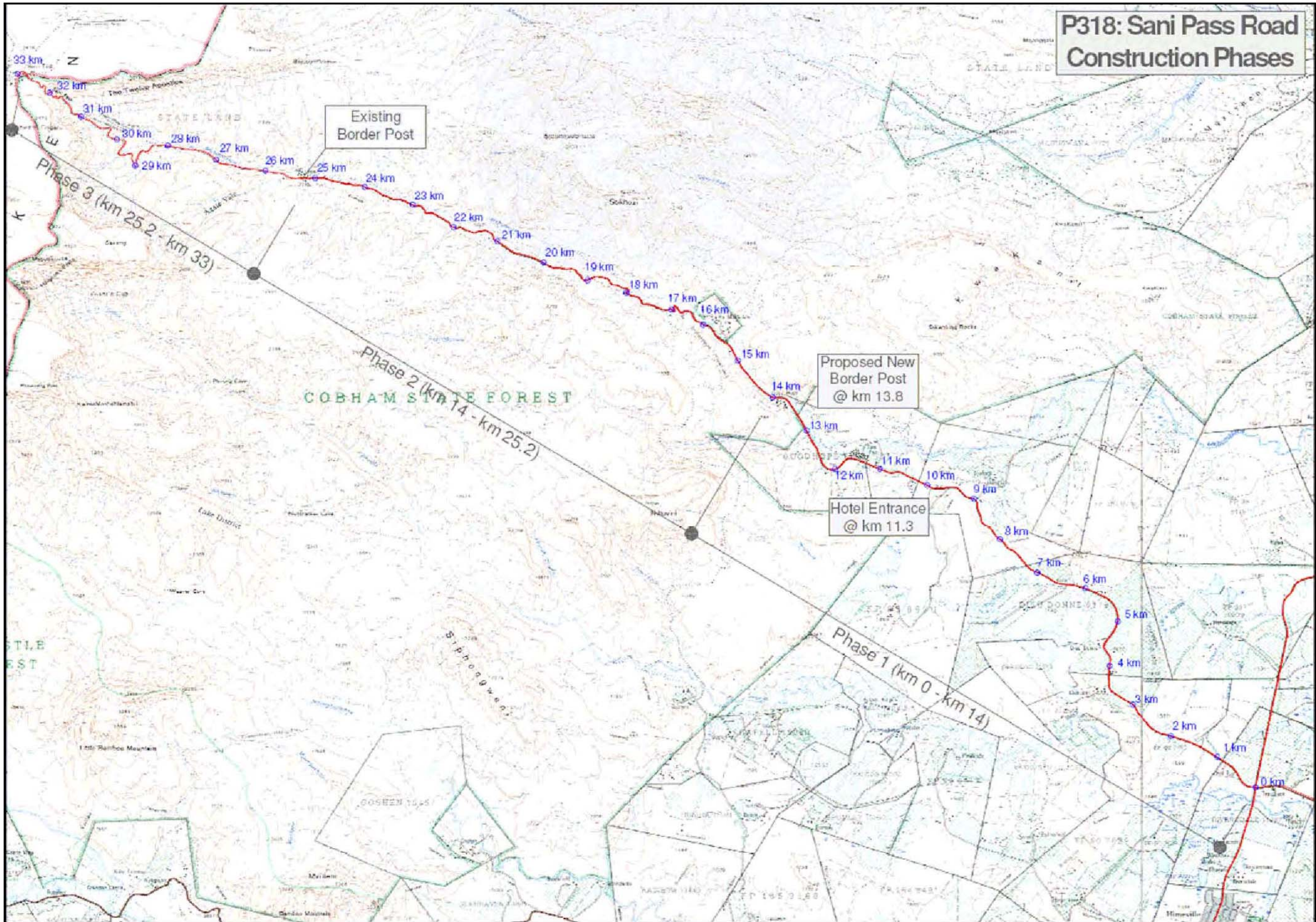
The above and other related issues will be highlighted in the project specification and Final Environmental Management Programme (Final EMP) compiled for the construction phase. The contractor will be required to complete risk assessments for every phase of work carried out and submit method statements for approval before construction can commence. All environmental issues will be managed by the independent Environmental Control Officer (ECO) appointed for the duration of the construction.

The on-site geotechnical engineer will manage every cut and fill on the project to ensure that the contractor conforms to the design. Should the in-situ material in the cuttings vary in any way from the geotechnical report, it will be the responsibility of the geotechnical engineer to alter the design in order to manage the variance.





Figure 2: 1:50 000 Location Map







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## 2.2 Key Activities Posing Environmental Impact Risk

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The activities undertaken during construction, maintenance and operation of the proposed road upgrade that could potentially have an impact on the environment, are listed below:

- Traffic congestion and disruption during construction
- Removal of vegetation
- Damage and / or destruction of key / critical environmental habitats and potential loss of rare and endemic species
- Transportation of equipment materials and for construction site access
- Use of transportation and construction vehicles and equipment
- Earth moving excavation and infilling
- Positioning of the construction camp site
- Construction camp activities
- Noisy construction activities, such as heavy vehicles, jack hammers, hoists, cranes, etc.
- Refuelling and maintenance of construction vehicles and plants
- Establishment and use of concrete batching equipment and/or a concrete batching facility
- Resourcing, introduction, storage and use of construction material such as water, concrete, brick, fuel, oils, steel structures, equipment, construction wastes and litter
- Storage and use of hazardous substances such as fuels, oils, paints, solvents, etc.
- Stormwater management on the construction site
- Disposal of construction rubble
- Waste management
- Ablution management
- Safety issues
- Poor maintenance and repairs to infrastructure

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## 2.3 Potential Physical Environmental Impacts

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The EIA compiled for the proposed project identified the following potential physical impacts which are generated by the construction and operation of the upgrade Pass road.

### 2.3.1 Soil Erosion

Earth grading, vegetation clearing and soil stockpiling for site preparation, and the construction of the new Pass road, access roads and off ramps may promote erosion and sedimentation particularly considering the nature of the weather conditions in the area (i.e. regular storms, downpours, high velocity water flow). During the operational phase of the road, soil erosion may occur from stormwater runoff onto exposed areas and at stormwater discharge points.



### **2.3.2 Soil Contamination**

Soil contamination may occur during the construction phase of the road as a result of improper management and use and storage, or disposal of hazardous substances such as fuel, oil and cement and the like. Furthermore, solid waste material generated during construction may impact on the surrounding environment if not correctly contained and disposed of. Operation of the road has the potential to cause soil contamination from spillages and leakages of petrol, fuels, oils and the like from vehicles and also from hazardous materials being transported in vehicles.

### **2.3.3 Surface and Groundwater Contamination**

Groundwater contamination may occur due to poor management of hazardous substances during construction of the road and to a less degree, during its operation. Contamination (oil and fuel spills) on the Pass could potentially lead to stormwater contamination should such contaminants drain into the Pass road's stormwater system. Furthermore, construction wastewater that is not correctly disposed of may contaminate surface and groundwater.

Poor management of any temporary latrines and ablution facilities used during the construction period may also result in water and groundwater contamination. The proposed route for the upgraded Pass road crosses many drainage lines with several wetland areas in relative close proximity or linked to the road. The potential for contamination of surface and groundwater in these drainage lines and wetlands is relatively high should stormwater become contaminated.

Once constructed, the upgraded infrastructure will improve stormwater control, and reduce thereby having a positive impact on the environment.

### **2.3.4 Destruction and Loss of Fauna and Flora**

The Pass is located within a sensitive environment within a World Heritage Site with many sections of the Pass populated with rare and endemic plant species, as well as hosting burrows and nests for many animals. Construction of the upgrade will cause damage to these habitats and could potentially result in significant damage to, or complete destruction of, these environments. With the exposure of excavated land, the potential for alien plants to invade and dominate is high.

The proposed upgrade will also provide an opportunity to alien invasive plants to be identified and removed during the clearing and excavation process. As such, positive impacts on the ecology of the Pass can also be expected with the correct rehabilitation implementation and management.

### **2.3.5 Traffic Impacts**

The requirement to keep the Pass open to normal traffic during construction is likely to cause significant traffic congestion which needs to be managed effectively. During the construction phase there will also be an influx of construction vehicles and vehicles transporting materials in the area. This, coupled with construction activities, is likely to cause a disruption to the traffic flow for the duration of the construction period. Delays and congestion of traffic at the border posts may also occur, increasing traveller frustration and potential for accidents.



Once construction is complete, it is anticipated that the upgrade (which includes new road safety measures) will reduce accident potential and improve safety as well as improve traffic control on the Sani Pass.

### **2.3.6 Visual and Aesthetics Impacts**

Visual and aesthetic impacts will result from the construction and operation of the road primarily from the construction of the retaining walls and road surface. Although mitigation measures are included in the design of the walls to make them look like the natural rock, the size of the structures will still have a visual impact. In addition to this, all construction activities are visually unappealing and will have an impact on the visual environment. Once constructed, the impact is expected to lessen as the infrastructure wears and fades and as users become accustomed to the new infrastructure.

### **2.3.7 Noise impacts**

Ambient noise levels are expected to rise during the construction of the Sani Pass Upgrade. Construction activities that may cause noise include:

- Plant machine and vehicle traffic (entering and exiting the site)
- Generator noise from construction equipment
- Noise from hydraulic hammers and winches
- Blasting
- Construction worker voices
- General construction noise.

It is anticipated that only the noise levels during the construction phase, which will be short lived, will impact on the surrounding environment, creating a nuisance impact. While the Pass does not generate noise, the noise levels associated with road users during the operational phase of the road are expected to be similar to current levels.

### **2.3.8 Heritage Impacts**

Heritage impacts were identified as being impacted by the construction of the upgrade although these relate primarily to sense of place and historical and cultural value. No artefacts or heritage sites were identified on or in close proximity the Pass.

However, should any heritage elements (graves, archaeological artefacts etc.) be uncovered during the construction phase, Amafa aKwaZulu Natali /Heritage KwaZulu-Natal must be contacted, and construction approved in writing, prior to works commencing / continuing.



### **3. ENVIRONMENTAL SPECIFICATIONS: PLANNING AND DESIGN PHASE**

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The following section details the minimum range of constraints, controls, procedures and standards that are required during the planning and design phase of the proposed Sani Pass Upgrade development.

The key activities undertaken during this phase involve:

- Additional specialist studies and/or investigations.
  - Final planning and design of the Sani Pass Upgrade infrastructure and micro-siting.
  - Development of a set of site management master plans, e.g. for stormwater, water supply, facilities, waste, remediation, etc.
  - Tendering, adjudication and induction of Contractor/s.
  - Addressing certain environmental requirements, concerns, roles and responsibilities in preparation for the construction phase; e.g. through contract negotiation.
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#### **3.1 Contractor's SHE Officer and Fire Officer**

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1. The name and letter of appointment of the Contractors SHE Officer and Fire Officer must be given to the ECO and the terms of reference for the work to be undertaken must be detailed including time on site, roles and responsibility, interaction with the Contractor, environmental offices, etc.
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#### **3.2 Pollution Control**

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1. Expected solid waste types, quantities, methods and frequency of collection and disposal as well as location of disposal sites must be identified and stated in a Method Statement.
  2. The Method Statement shall further include methods of minimising, controlling, collecting and disposing of contaminated water, and details of any hazardous substances / materials to be used, together with the transport, storage, handling and disposal procedures for the substances.
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#### **3.3 Safety Considerations**

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1. Provide details identifying what safety precautions will be implemented to ensure the safety of all staff, and the general public, on site during the construction period. This will include protective clothing requirements for all types of construction activities on site, e.g. protection against dust, noise, falling objects, work in trenches, work at heights, etc.



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### **3.4 Emergency Procedures**

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1. Provide details regarding all relevant emergency procedures that will be implemented for fire control and accidental leaks and spillages of hazardous substances (including fuel and oil).
  2. Detail the risk reduction measures to be implemented including fire fighting equipment, fire prevention procedures and spill kits.
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### **3.5 Waste Management Control**

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1. Provide details regarding how solid and liquid waste generated on the construction site and site camp will be collected, stored, transported and disposed off.
  2. Details of any service provider(s) appointed to manage this task must also be provided.
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### **3.6 Stormwater and Erosion Control**

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1. Provide details of how stormwater emanating within or adjacent to the construction site may impact on construction activities.
  2. Details on how the Contractor will deal with stormwater runoff and potential erosion within the construction footprint must further be provided. Details of any service provider(s) appointed to manage this task must also be provided.
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### **3.7 Site Layout**

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1. Determine the site for the construction camp in collaboration with the PM and ECO before the moving onto site, such that it is effectively isolated from the surrounding environment and takes into consideration:
  - The need to be further than 50 meters away from a water body in a location that will prevent storm water runoff from the site from entering a water body
  - The risk of public nuisance through, for example, noise generation, visual intrusion, light pollution or disruption to access
  - Security implications.
2. The construction camp should also be of sufficient size to accommodate the needs of all Sub Contractors that may work on the project.
3. Submit to the engineer for his approval a site layout plan at least 7 days before construction commences.
4. Provide the graphical representation with detailed notes of the location, layout and method of establishment of the construction camp, including the following:



- The extent of the Contractors site camp, and other required areas if not located within the site camp
- All Contractor's buildings, and/or offices
- Lay down areas
- Vehicle and plant storage areas, including wash areas
- Workshops and drip trays
- Fuel storage areas (including filling and dispensing from storage tanks)
- Cement/concrete batching areas (including the methods employed for the mixing of concrete and particularly the containment of runoff water from such areas and the method of transportation of concrete)
- Other infrastructure required for the running of the project.



## **4. ENVIRONMENTAL SPECIFICATIONS: CONSTRUCTION PHASE**

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The area surrounding Sani Pass possesses features of ecological, biophysical, cultural and tourism importance. The upgrading of the pass must be undertaken with care to ensure that these features are maintained and protected as far as possible. It is therefore essential that the Specialist specifications and general environmental specifications described are implemented effectively. These are incorporated into the contract documentation and must be adhered to during construction.

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### **4.1 Compliance Monitoring**

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1. The PM shall appoint a qualified and experienced ECO to ensure implementation of and adherence all parties to the EMP.
  2. The appointed ECO shall conduct a pre-construction site inspection to identify all sensitive environments, habitats, and No-Go areas.
  3. The ECO shall prepare a pre-construction audit report, which will include a photographic record of the site and will report on the key features of the site. The photographic record of the site shall serve as a measuring staff against which rehabilitation will be measured later.
  4. The ECO shall conduct regular audits to ensure that the system for implementation of the EMP is operating effectively. The audit shall check that a procedure is in place to ensure that:
    - The EMP and the Method Statements being used are the up to date versions.
    - Variations to the EMP, Method Statements and non-compliances and corrective actions are documented.
    - Emergency procedures are in place and effectively communicated to personnel.
    - The audit programme shall consist of the following at a minimum:
      - First audit no later than 1 month after construction commences
      - Thereafter audits at monthly intervals
      - An audit one week prior to practical completion of the project is granted
      - A post construction audit within 1 week after the Contractor has moved off site. This is to ensure that the Contractor has met all his environmental obligations in terms of the EMP as well those of the EA.
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### **4.2 Construction Phase Specialist Environmental Specifications**

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#### **4.2.1 Vegetation**

##### **a) Management of Road Reserve, Construction Phase**

1. A full time Environmental Control Officer (ECO) should be appointed to be available on a daily basis to supervise construction phase and ensure compliance with the EMP and to prepare regular site audit reports. The duties of the ECO should include the following:



- Traverse the route with the resident engineer to check the surveyed construction path to draw attention to the sensitive areas
  - Plant rescue within the construction path should start no later than 2-4 weeks before construction begins
  - Liaise with EKZNW to ensure that all wild flower rescue teams have permits to transport the plant material to nurseries or holding areas, and to supervise all collecting operations
  - Before machinery moves on site, check that the supervising engineer understands the extreme sensitivity of specially protected areas of conservation significance along the route
  - Provide training to drivers of heavy machinery, and all staff, regarding the fragile and very valuable vegetation before any work starts
2. Penalties must be imposed for any infringements, as listed below, to the drivers and staff of construction company and its subcontractors (to be included in tender documents):
- Driving anywhere outside the demarcated construction area (whether to reverse or turn the machine or for any other reason whatsoever)
  - Damaging any tree outside of the construction area or any tree marked for protection within the construction footprint.
  - Damaging any rock outside of the construction area or any rock marked for protection within the construction footprint.
3. All rubble after blasting to be removed, where possible, without causing undue further damage to the immediate surroundings outside of the construction zone
4. Litter from construction crews to be collected daily
5. There must be no plant collecting or collecting of firewood or kindling (any staff member found in possession of plant material to be ordered off site permanently)
6. Any new slope is to be stabilised or shaped to allow for immediate rehabilitation and not to be smoothed off perfectly. The slopes should rather be left with an uneven finish to reduce stormwater runoff and to hold seed material.
7. Rehabilitation should proceed as soon as each section of road is completed. Full rehabilitation work will only be possible from August to May each year. Interim measures to reduce runoff are needed during the winter months i.e. local mulch from the Pass. Geofabric should only be used as a last resort. (see 9.5 Vegetation Rehabilitation Plan)
8. All trees should be considered sensitive in this mountain region. Permission must be granted by the ECO before any tree is removed in the line of construction. In addition, the following must be noted: the first 200mm of a tree main stem (trunk) must not be covered with soil or rock (this would be the equivalent of ring-barking the tree). As soon as earth moving is completed in each section, the ECO must ensure that any trees in the construction area have been cleared at base to the original soil level.

## **b) Management of Invasive Alien Plants**

1. An Invasive Alien Plants (IAP) Management Plan must be compiled by the botanical consultant and reviewed by the DEA, Working for Water, EKZNW, and the ECO.
2. The DEA should appoint a team to work on Sani Pass before, during and after construction until the Pass through this World Heritage Site is reasonably clear of IAPs. It is recommended that this be a high profile programme to clear the World Heritage site of IAPs whilst also keeping the construction route clear of





- weeds. It will require liaison with EKZNW, private property owners and DOT. A successfully implemented programme should be considered a mitigating factor.
3. IAP occurrence needs to be mapped and photographed prior to construction. (Part of this process has been completed.)
  4. All IAP material removed during construction should be dumped in a landfill site or burnt
  5. Wood from wattle, gum and other trees should be made available under a controlled harvesting scheme to local communities, including those in Lesotho.
  6. Once construction of each section is completed, the new and open roadsides should be weeded by hand. If spraying is to take place, it should be done using the 'cut and spray' system where each team member uses a small hand operated (not pressurised) spray.
  7. IAPs should be the first priority, but emerging weeds should also be included where necessary. This particularly applies to the higher altitude sections of the Pass.
  8. This programme must be maintained until construction is completed and for at least two to three summers after construction. During the coldest winter months, control work could concentrate on the large scale infestations at the foot of the Pass. Once the roadsides have been rehabilitated invasion of IAPs will be limited and can be dealt with as part of routine park maintenance.

**c) Selection of Turning and Storage Areas**

1. Selection and planning of turning and storage areas should be undertaken by the engineers in consultation with the EAP, ECO and EKZNW prior to any construction being initiated. If carefully chosen in areas of least importance biologically, they can be turned into viewing sites when the road is completed.

**d) Vegetation Rehabilitation Plan, including Plant Rescue**

1. A budget adequate to meet the requirements of rehabilitating roadsides in a World Heritage Site must be allocated. A suitably qualified contractor must be appointed to handle this sensitive project.
2. Planning with the consulting engineers, contractor and botanical consultant should start prior to construction initiation. A committee of propagation experts (2-3 people) is recommended (including the curator of the Lesotho Botanic Garden at Khatse for high altitude species).
3. Liaison with the consultants of Stage 1 of the road construction would be useful, to see how and what rehabilitation has been undertaken to date and what success or failure has been achieved.
4. Only the roadsides in the path of actual construction should be cleared – not the whole pass at once. Damage to vegetation will be immediate once construction begins. It can be mitigated to a certain extent if all earthmoving, blasting, removal of material after blasting and stockpiling is carefully contained within the construction footprint. Turning areas and stockpile areas must be carefully selected and managed.
5. Rehabilitation should commence as soon as each section of the road has been completed. Full rehabilitation will only be possible from August to May each year. Interim measures to reduce run-off are needed during the winter months ie mulch.
6. It is recommended that EKZNW creates a database of suitably qualified plant growers who will be invited to remove any excess plants in the line of construction in consultation with the rehabilitation contractor. A percentage of the plants successfully cultivated by them will need to be returned to the



rehabilitation contractor in due course when required. Few of the plants on Sani Pass are currently being cultivated in South Africa.

**e) Rehabilitation Methods on a Mountain Pass**

1. The following rehabilitation recommendations were drawn up after discussions with the lead vegetation consultant on the Outeniqua Pass (OP) and as such, may be applicable to the Sani Pass Upgrade:
  - Set up experiments to test the most effective system to rehabilitate different types of roadside e.g. flat-soil, steep-soil, steep-rock, stream banks etc The most effective system found on the OP was a fynbos mulch (followed by two different types of geofabric).
  - Use the roadside rehabilitation experiments to test for the best time of year to do the rehabilitation.
  - Test before using geotextiles. It was found to be a problem behind gabions on the OP – the soil blocked the fabric, causing problems with drainage.
  - Every effort must be made to provide fill rather than a 'cut' finish on the roadsides.

**f) Preparations for Rehabilitation**

1. Remove the topsoil with machine-cut sods. Stockpile on tarpaulin to catch any seed material etc. Keep grass- and mixed-plant-sods separately.
2. Assign a recovery team under the guidance and supervision of the rehabilitation contractor and EKZMW to collect seed by hand.
3. Rescue all plant material which is suitable for stockpiling under nursery conditions.
4. Stockpile all brushwood and natural mulch, keeping separate material from each section of the road or at least, each vegetation type.
5. Permission is needed to collect mulch from adjacent hillsides.
6. Experiments showed that using chipped bark was not as effective as the natural mulch (with uneven shapes and sizes). This natural mulch holds seed material and was effective even after years of stockpiling. The quicker it is put to use, the more successful the rehabilitation.
7. If additional soil is required, particularly at the higher altitudes, check to see if soil quality and composition is important for rehabilitation.

**g) Rehabilitation**

1. Pack roadsides with topsoil sods where possible.
2. Hydroseed with local seed.
3. Lay mulch.
4. Where there is saved plant material e.g. Watsonias, they can be successfully planted or pegged onto steep banks.
5. Special attention must be given to re-vegetating viewing areas.
6. It is important NOT to smooth off surfaces. The success of rehabilitation is all about providing a variety of microclimates. Every small stone offers a warm and a cool side, providing suitable environment for e.g. a vygie on the one side and a Lobelia on the other. It is particularly important to leave as many crevices and shelves on cliff faces as possible. This will allow for accumulation of soil and plant litter, providing a suitable habitat for plants.



7. The rehabilitation contractor should aim to achieve 80% coverage over a 3-year period (OP)

**NOTE:** Some species benefit from loose soil and rocks on the unstable roadsides. Others are restricted to rockfalls, floodplain areas along streams and rivers, cliffs etc. When planning the final shape of roadsides, care should be taken to allow some unstable areas (where it is safe to do so), to ensure that the plant species adapted to these conditions can be re-introduced successfully.

#### **h) Rehabilitation Around Key Viewing Areas**

1. The surrounding hillsides and vegetation should be preserved, as a first choice, and rehabilitated carefully, as a second choice.
2. These sites will be heavily utilised by both construction vehicles and tourists once converted to viewpoints and proper management is critical to sustainable use.

#### **i) Rare and Endangered Species**

1. Where these species are growing in the road reserve, every effort should be made to avoid disturbing them at all during construction.
2. Discussion is needed with the consulting engineers regarding road design to either protect the vegetation in that area or to plan the rehabilitation with particular care.
3. Initiation of construction on a section of the Pass should be done under the guidance of either the vegetation specialist or ECO.

### **4.2.2 Avifauna**

#### **a) Direct Destruction and Degradation of Bird Habitats by Road Construction**

1. Relevant to habitat destruction and degradation, care needs to be taken during the construction phase to minimize the footprint of the road construction as far as possible, especially as regards issues such as borrow-pits, construction camps, and subsidiary roads and tracks needed for construction purposes. This is particularly important considering the formal conservation and World Heritage status of the area traversed by the road.
2. Particular care should be taken to ensure that damage to natural, indigenous vegetation, especially Leucosidea and Protea woodlands, and natural grassland, is minimized.
3. Road surfaces must be sprayed with water during the construction phase to ensure that surrounding vegetation does not become coated in dust and hence less hospitable to its associated avifauna.

#### **b) Disturbance to Birds from Roads and Road Construction**

1. Blasting with explosives during road construction activities could disturb the breeding habits of some of the larger cliff-nesting birds in the valley, e.g. Verreaux's Eagle and Black Stork. It is therefore suggested that consideration be given to restricting blasting activities to the period outside the early nesting periods (i.e. egg-laying, incubation and early nestling periods) of these large cliff-nesting species. The relevant period where blasting could be prohibited is May – August.



2. If blasting must occur during this period, its effect on these species at the nest should be directly monitored by an avifaunal specialist.
3. Road-surface materials that give off the least amount of noise when traversed by vehicles should be considered as different materials generate different noise levels.
4. Speed-control measures, both during and after construction, would reduce noise levels. Mitigation measures such as 'traffic calming' structures (speed bumps or rumble strips) could be implemented at the construction phase to regulate traffic speeds.

#### **c) Bird Mortalities Caused by Collisions with Motor Vehicles**

1. Vehicle collisions with birds, both during and after construction, are difficult to mitigate but can be tackled by careful management of the road verge habitats, e.g. with respect to vegetation.
2. Minimizing the presence of attractive bird perch and breeding sites would reduce mortalities such as culverts.
3. Prohibit grain spillage by trucks along the roads to reduce the attraction of some granivorous bird species to road and road-verge habitats.
4. Speed control measures can also be expected to reduce bird collision mortalities, as well as signage warning motorists of such hazards to birds and other wildlife generally. In the case of the Sani Pass road, rigorous speed control is likely the most critical factor in minimizing these mortalities.

#### **d) Additional Impacts on Birds**

1. Implement well planned and managed firebreaks to reduce fire risks both during and after construction.
2. Provide public education on the dangers of fires through signage and other marketing and media avenues.
3. Workers, maintenance cleaning crews, law enforcement and staff must be educated and supervised to increase awareness related to the problems of dumping and littering.
4. Prohibit illegal hunting by construction workers through proper education and supervision.
5. Closures of the Pass should be avoided as far as possible, especially if this involves road closures for any length of time, i.e. for more than a few hours at a time, and where unavoidable, should it be announced well in advance so as to minimise hindrance to tour groups.
6. Preferably concentrate road-building efforts along selected and varying stretches of road, leaving others relatively 'quiet', such that the entire length of the Pass is not subjected to intensive road-building disturbance throughout the entire construction period at least as far as this might be possible.

#### **e) Site-specific Mitigation Measures**

1. Seven sites were identified where mitigation measures relevant to cliff-nesting or cliffroosting bird populations might potentially have been required (refer to Sites 1-7 on Map 1; Photos 1-7, 10-11 and 25-28 in the Avifauna Impact Assessment). No specific mitigation measures seemed necessary or appropriate when considering each individual case.
2. These sites are largely already well-known and well-publicized stopping points for bird-watching. The primary recommendation in this regard is that suitable



facilities be maintained or established at these eight sites allowing easy, safe and spacious stopping points for birdwatchers and bird tour-guides (in conjunction, obviously, with Ezemvelo KZN Wildlife

3. At an eighth site, a small wetland was located of potential value to birds, especially waterbirds (see Map 1; Photos 12-14). Mitigation at this site should follow that mandated for wetlands generally as a matter of course.
4. Access to these eight existing, traditional bird-watching stopping points should be interfered with as little as possible during the actual construction phase. These may seem logistically convenient points to establish 'bases' for the road construction activities but this should be avoided such that these sites, and surrounding areas, are still available to visitors and in a relatively undisturbed state.
5. Habitat protection measures, especially relevant to indigenous vegetation, during the construction phase should be particularly stringently applied at, and around, these sites (including at the existing South African border post), especially if they are to become long-term, bird-viewing areas as recommended here.
6. A further two sites (Sites E and G on Map 1; Photo 17), which are apparently being considered for development as picnic/view sites, are not considered of particular importance relevant to avitourism (or bird conservation) and would not seem to require any mitigatory measures.

#### **4.2.3 Cultural Heritage**

##### **a) Intangible Heritage**

1. Construction activities should not be allowed to take place outside the area earmarked for the road upgrade.
2. The post development visual impacts are subject to recommendations that will emanate from other independent visual impact assessment study of the EIA exercise.
3. However, it must be ensured that the construction work should be done with minimum interference on areas that are not directly on the path of the existing Sani Pass Road servitude.
4. All temporary construction sites such as stock piles and construction camps should also be removed and rehabilitated immediately where necessary as soon as construction work is complete.

##### **b) Old Sani Pass Trading Store**

1. The ruins of the Old Sani Pass Trading Store should not be interfered with during the proposed development.
2. Since the structures are more than 60 years old, a permit must be secured from Amafa KwaZulu Natal heritage authority before any interference is allowed.
3. Should total protection not be possible during the proposed development, the ruins should be mapped, photographed, measured and documented before partial demolition is planned.

##### **c) Geological History**

1. A paleontologist / geologist should be retained to monitor all rock blasting sites during construction work in order to ensure that no chance fossil finds will be destroyed during the road construction work.



#### **d) Stonewall sites**

1. Stone wall enclosures identified in the general vicinity of road route in the lowland sections (border post area) may not be interfered with or disturbed during the proposed road works.
2. The contractors should be made aware that these stonewalls may not be interfered with during the proposed road works.
3. In particular, the stones from the walls may not be removed or used for road construction work.
4. The enclosures should be marked and a barrier created around them to ensure that the walls have maximum protection.

#### **e) General**

1. The foot print impact of road works should be kept to minimal and within the existing road reserve to limit the possibility of encountering chance finds outside areas assessed during this study.
2. Construction camps during construction phase should be approved as part of the project EMP and monitoring to ensure that no archaeological or historic sites will be affected
3. Although no significant rock shelters or overhangs were record along the road servitude during this study, as a precaution, any ravine with rocky sides, which may contain overhangs or shelters in the vicinity of the road servitude should be considered archaeologically sensitive during construction period and should not be interfered with.
4. Furthermore, the construction team should be informed about the value of the cultural heritage resources in general so as to ensure that they do not destroy the chance archaeological sites they may encounter during working on the linear road route.
5. Amafa KwaZulu Natali authorities may approve the project to proceed as planned subject to recommendations herein made and other applicable conditions to be set by environmental and parks management authorities.

### **4.2.4 Visual Impacts**

#### **a) Visually Prominent Project Components**

1. Appoint Landscape Architect during the design phase to integrate the project components with the surrounding landscape to ensure that the project blends in physically and aesthetically with environment.
2. All existing large trees that fall outside the construction area must be retained. These will assist in softening the forms of the structures and obscure views to them.
3. All bridges, stream crossings, culverts and road side protection barriers should be constructed of materials that reflect the texture and colours of the surrounding landscape. It is recommended that they are built or at least clad with stone and then stained with manganese and iron oxide products.

#### **b) Visually Obtrusive Roads / Access Roads and Road Reserves**

1. For access / service roads and servitudes, avoid straight edges and corridors. These lines should complement the landscape through which they pass.
2. Road surface materials should not contrast in colour with the surrounding landscape. The existing road and landscape colours and hues are a suite of





brown shades which would contrast with black and grey. Consideration should be made to pigment bitumen (if it is to be used) to a red / brown colour.

3. Exposed concrete that has been coloured would be a preferred surface material.
4. It is recommended that the concrete be coloured after installation to allow for an uneven brown / tan colour to be applied. Adding a tint to the concrete mix would result in a too uniform colour.
5. Special attention should be focused on the width of servitude actually required for the construction and operational phases. There is a tendency to make these servitudes wider than necessary and access roads built to a higher engineering specification than required resulting in excessive visual scarring that can be difficult to rehabilitate.

#### **c) Visually Obtrusive Concrete, Supports Retaining Walls And Rock Cuttings**

1. All exposed rock cuttings and concrete support panels need to be coloured and 'aged' to match the surrounding landscape colours.
2. Plant pockets need to be designed into the concrete retaining walls to allow for natural vegetation to become established.
3. It is recommended that a low planter be built in front and at the base of any vertical retaining wall to soften the edges.

#### **d) Visually Obtrusive Grading**

1. Incorporate sculpturing or shaping of the cut and fill slopes to angles and forms that are reflected in the adjacent landscape to reduce the visual impact.

#### **e) Visually Obtrusive Vegetation Stripping**

1. Vegetation stripping should be undertaken in a manner where the edges are organic (nongeometric) or curvilinear rather than straight or sharp-edged.

#### **f) Degradation and Soil Erosion**

1. A detailed landscape and rehabilitation plan should be developed by the landscape architect together with the flora specialist and the Ezemvelo KZN Wildlife. The general roadside landscaping should reflect the existing surrounding landscape.
2. Effective rehabilitation of the construction area and road reserves must take place. These specifications must be explicit and detailed and included in the contract documentation so that the tasks can be costed and monitored for compliance and result.
3. It is essential that all cut and fill slopes, as well as all areas disturbed or affected by construction activity, are suitably topsoiled and vegetated as soon as is possible after final shaping. The progressive rehabilitation measures will allow the maximum growth period before the completion of the project.
4. All areas beyond the works area must also be rehabilitated. This includes areas such as temporary access roads, construction campsites, workers campsites, borrow pits, lay down areas, etc.
5. The rehabilitation and stabilisation of vegetation of all buffer strips and new landforms must be completed as soon as the landforms are complete.
6. The vegetation programme should be monitored and managed to ensure that problems (e.g. erosion, die back and lack of grass cover) are identified early so that corrective measures can be taken.



#### **g) Scenic Views Not Utilized**

1. Attention must be given to provide the road user and tourist the opportunity to optimise the visual attributes of the scenic landscape.
2. Opening up vistas where cuttings may have blocked the views and/ or provide stop over points for travellers to appreciate and experience the views or landscape features.
3. All aesthetic amenities such as existing stream crossings, waterfalls, flora features, look out points, hikers' drop off points, etc. currently available to the pass users must remain visible and accessible.

#### **h) Loss of Natural Topsoil**

1. The special conditions of contract must include the stripping and stockpiling of topsoil from the construction areas for later re-use. Topsoil is considered to be at least the top 300 mm of the natural soil surface and includes grass, roots and organic matter.
2. The areas to be cleared of topsoil should all be areas that will be covered by roads and construction camps.
3. The presence of degraded and disused areas left over after development must be top-soiled and re-vegetated.

#### **i) Visual Impact from Dust**

1. All areas that will be affected by construction activities and where dust will be generated will require dust suppression by regular wetting, possibly by means of a water bowser or by means of a soil binding compound.

#### **j) Visual Mitigation Measures Not Complied With**

1. During construction the detailed requirements that would have been set during the design phase and incorporated in the contract documentation, must be monitored for compliance by the ECO.

### **4.2.5 Aquatic Biodiversity**

The following recommendations are made in support of ensuring the protection of river and wetland systems in the Sani Pass area:

1. All river and wetland areas identified and mapped during the assessment of aquatic ecosystems must be treated as sensitive and important areas, particularly those considered to be more significant systems. The more significant systems include all perennial river systems and the three dominant hillslope seepage wetlands.
2. Construction within or adjacent to river and significant wetlands must be minimized as far as possible. Where avoidance is not possible, necessary functionality assessments need to be undertaken to assess the risks and opportunities for the site.
3. Appropriate measures must be put in place to minimise erosion and the amount of sediment entering rivers and wetlands, particularly during the construction phase when the risk of such impacts will be high. Risks of erosion will become more problematic during the rainfall season.



4. It is important that the vegetated buffer areas surrounding aquatic systems are maintained. These areas will help to absorb surface stormwater runoff thus allowing sediments to settle prior to reaching aquatic systems as well as provide additional filtering for other pollutants.
5. No dumping of excavated material and no storage of equipment and materials must be allowed within, and in close proximity to river and wetland areas.
6. The time periods during which bare soil surfaces remain exposed to the elements needs to be limited. Immediate efforts should be put in to action to revegetate such areas as soon as possible.
7. During both construction and operation, it is important that any accidental spills of fuels, construction materials, chemicals, effluents or other harmful substances are reported and acted upon immediately. Effective remediation and cleanup strategies and procedures need to be implemented.
8. Construction camps, equipment storage sites and ablution facilities serving the construction phase should be sited a reasonable distance away from aquatic systems. These areas need to be cordoned off and maintained throughout the development time period. This task must be undertaken in the advisement of the aquatic specialist.
9. If deemed required by the aquatic specialist, suitable buffer distances from wetland and aquatic systems would need to be defined and if necessary, more detailed site assessments undertaken for each individual situation. Alternatively, suitable buffers may be used based on a wetland buffers approach currently being developed for Ezemvelo KZN Wildlife.
10. Where aquatic ecosystems are impacted by construction activities, necessary action needs to be taken to fully rehabilitate the sites.
11. Sensitive aquatic systems that have been subjected to impacts arising from the current road situation should be rehabilitated to reduce ongoing deterioration to these systems. Observed sites of head-cut erosion occurring within wetlands need attention. Incised channels need to be plugged and rehabilitated to prevent further head-cutting and to restore the overall integrity of these systems.
12. Activity associated with the road upgrade, such as soil and vegetation disturbance provides opportunity for the further spread of alien invasive plants. A comprehensive alien plant eradication and rehabilitation programme needs to be implemented to remove alien plant infestations that are present in and around aquatic systems within the road buffer.
13. An appropriate stormwater management plan must be designed and implemented during the operation phase, to control significant changes in hydrology to receiving aquatic systems.
14. Speed limits and speed bumps should be installed in an attempt to limit traffic-related mortality of animals

#### **4.2.6 Social**

##### **a) Loss of sense of place**

1. Maximise socio-economic benefits to the affected communities during the construction phase through jobs and economic spin offs.
2. Ensure careful management and planning of operations to minimise visual, noise and dust pollution particularly in and surrounding Underberg, Himeville and other settlements.



#### **b) Reduction in 4 x 4 Drive Tourists and Tourism Facilities**

1. Careful consideration of the visual characteristics of the upgrade design could, however, help to minimize the loss of the 'untamed wilderness' characteristic of the Pass that is a key attraction for many of the tourists impacts.

#### **c) Socio-economic impacts from changes to the local economy**

1. Maximise the economic benefits that could accrue to the local economy through:
  - Supporting local accommodation and service sectors for housing temporary and permanent workers
  - Maximising the purchase of materials and equipment from local suppliers
  - Maximising employment opportunities for local people through preferential employment strategies
  - Skills development and training programmes to assist unskilled workers during the construction phase to set themselves up as SMMEs or be in a better position to seek employment in other sectors once the road construction is completed
  - Consultation with local residents' associations to develop management procedures to manage worker villages and the expectations around employment opportunities in order to minimize safety and security concerns and risks
  - Consultation with local authorities on the planning and siting of the construction of workers' villages and the supply of services to these villages (e.g. water, solid waste disposal, etc.)

#### **d) Change to Quality of Life of Local Residents**

1. Maximise socio-economic benefits to the affected communities during the construction phase through jobs and economic spin-offs.
2. Ensure careful management and planning of operations to minimise potential impacts to services and infrastructure and crime and security.

#### **e) Road Safety**

1. Implement strict safety regulations during the construction phase to avoid incidents of collisions between road users and construction vehicles, or risks of accidents on areas under construction due to poor conditions.



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## 4.3 Construction Phase Environmental Specifications

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### 4.3.1 Health and Environmental Awareness

1. Provide adequate health and environmental training.
2. Ensure that all employees undergo project induction on environmental awareness and conduct such training in the language of the employees.
3. Provide evidence that the environmental awareness induction courses have been presented.
4. Place emphasis on any (potential) environmental impacts relating to the construction activities on site and to the related environmental precautions taken to avoid or mitigate these impacts.
5. The environmental training should, as a minimum, include the following:
  - The importance of conformance with all environmental policies.
  - The significance of environmental impacts, actual or potential, as a result of their work activities.
  - Their roles and responsibilities in achieving conformance with the environmental policy and procedures, including emergency preparedness and response requirements.
  - The mitigation measures required to be implemented when carrying out their work activities.
  - The importance of not littering.
  - The need to use water sparingly.
  - Details of, and encouragement to, minimise the production of waste and re-use, recover and recycle waste where possible.
  - Details regarding archaeological and/or historical sites which may be unearthed during construction and the procedures to be followed should these be encountered.
  - The procedures which should be followed should a grave site be encountered or unearthed during the construction phase.
  - Details regarding fauna and flora of special concern, including protected/endangered plant and animal species, and the procedures to be followed should these be encountered during the construction phase.
6. Conduct a training needs analysis in consultation with the ECO, to identify the appropriate environmental and health training programmes, and the appropriate target groups amongst the employees of the Contractor.
7. File the results of the environment and health training needs analysis with the environmental records.
8. Environmental awareness training programmes should contain the names, positions and responsibilities of personnel to be trained, the framework for appropriate training plans, and a schedule for the presentation of the training courses.
9. Maintain records of all training interventions. The ECO shall monitor the records and undertake regular follow ups.



### 4.3.2 Emergency Preparedness

1. Compile and maintain environmental emergency procedures to ensure an appropriate response to unexpected or accidental incidents that may cause environmental impacts.
2. Activities that may be addressed in the environmental emergency procedures include, for example, accidental exposure of employees to hazardous substances, veld fires and accidental spillage of hazardous substances.
3. These plans should include as a minimum:
  - A list of key personnel
  - Details of emergency services applicable to the various areas along the route that turbine components will need to be transported and for the site itself (e.g. the fire department, spill clean-up services, etc.)
  - Internal and external communication plans, including prescribed reporting procedures where required by legislation
  - Actions to be taken in the event of different types of emergencies
  - Incident recording, progress reporting and remediation measures required to be implemented
  - Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release
  - Training plans, testing exercises and schedules for effectiveness.
4. Comply to emergency preparedness and incident and accident-reporting requirements, as required by the Occupational Health and Safety Act, 1993 (Act No 85 of 1993), the National Environmental Management Act, 1998 (Act No 107 of 1998), the National Water Act, 1998 (Act No 36 of 1998) and the National Veld and Forest Fire Act, 1998 (Act No 101 of 1998) as amended and/or any other relevant legislation.
5. Maintain an environmental incidents register to record incidents that occur on site as a result of the activities associated with the contract. Environmental incidents constitute all those activities and incidents that may have a negative impact on the surrounding natural environment.
6. Ensure that each environmental incident is investigated by the ECO and forward an environmental incident report to the Contractor, Proponent and relevant authority, including details on the manner in which the incident was remedied.
7. Ensure that each environmental incident report contains as a minimum, a description of the incident, a statement on the severity and significance of the impact, and actions taken to remediate the resultant damage.

### 4.3.3 Emergency Procedures

1. Ensure that employees and Sub Contractors on site are aware of the procedure for dealing with accidental spills and leaks of hazardous materials.
2. Ensure that the necessary materials and equipment for dealing with the above spills and leaks are available on site at all times.
3. The site shall have a supply of absorbent material readily available to absorb any accidental hydrocarbon spills. The quantity of such material shall be able to absorb/ deal with a minimum of 200 litres of spill.
4. Contain any spill using sand berms, sandbags, sawdust or absorbent materials.
5. The area shall be cordoned off and secured.
6. Notify the ECO, PM/EER and relevant authorities of any spills that occur.





7. Assemble and clearly list the relevant emergency telephone contact numbers for staff and brief staff on the required procedures. These contact details shall be listed in English, and any other relevant language, in the site office, construction camp and any other suitable areas.
8. The treatment and remediation of areas affected by emergencies shall be undertaken to the satisfaction of the PM, EER and ECO at the cost of the Contractor where his staff have been proven to be responsible for the emergency.

#### **4.3.4 Record Keeping**

1. Inspect the site on a daily basis to ensure that the environmental specifications of the EMP are adhered to.
2. Provide the PM with a written report, at least fortnightly, detailing compliance with the EMP as well as environmental performance.
3. Maintain a record of incidents (spills, impacts, complaints, legal transgressions, etc.) as well as corrective and preventive actions taken, for submission to the PM at the scheduled project meetings.
4. Maintain an environmental site file containing at a minimum the following documents:
  - Final Environmental Impact Assessment Report compiled for the Sani Pass Road Upgrade
  - Latest version of Environmental Management Programme
  - Final design documents and diagrams issued to and by the Contractor
  - All communications detailing changes of design/scope that may have environmental implications
  - Site monitoring reports
  - Complaints register
  - Training manual
  - Training attendance registers
  - Incident and accident reports
  - Emergency preparedness and response plans
  - Disciplinary procedures
  - Monthly site construction meeting minutes
  - All relevant permits
  - Letters or legal documents authorising identified site staff to act in a specified authoritative capacity relating to the protection and preservation of the environment, and on behalf of the Contractor
  - Environmental Authorisation on the EIA from the DEA
  - All method statements from the Contractor for all phases of the project.

#### **4.3.5 Community Relations**

1. Erect and maintain information boards in the positions, quantities, designs and dimensions required by municipal specifications. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the ECO.
2. Keep a Complaints Register on site, containing contact details of complainants, the nature of the complaint, details on the complaint itself, as well as the date and time that the complaint was made and resolved.



3. The Contractor, or if required the ECO, shall be responsible for responding to queries and/or complaints and may request assistance from the Contractor's Management Staff.

#### **4.3.6 Non-working Times**

1. Daily timeframes for construction works is to be agreed to by the PM and Contractor in consultation with the ECO, EKZNW, DOT and project steering committee representing authorities, local communities and residents.
2. For any deviation from the ordinary working hours the written approval of the PM must be obtained before such works commences.

#### **4.3.7 Safety at the Construction Site**

1. Safety precautions must be taken to ensure that residents in the area do not come to harm. The construction site shall be off limits to the general public at all times during the construction period and during site clean-up.
2. Clearly demarcate construction areas, open sewers, trenches and other potential construction-related danger areas with hazard tape and/or appropriate fencing.
3. Erect hazard warnings and maintain in good condition warning signs in the relevant languages and at appropriate positions, warning traffic of construction activities ahead and at problem sites.
4. Ensure that all staff is compliant with the relevant safety regulations on site and wear applicable safety clothing and gear at all times while on site.

#### **4.3.8 Social Disruption**

1. Staff shall, in no way, be a nuisance to residents or clients seeking the services of the established businesses in the area. Any complaints received by the PM will be investigated, addressed and, if deemed necessary, the relevant persons will be suspended from the project.
2. Contractor is to give at least seven days notice to the residents in the vicinity of the construction activities of his intention to begin construction activities in their area.
3. The PM may request a representative of the Contractor to be available to discuss issues raised by residents and make information available to them on construction activities.

#### **4.3.9 Labour and Social Issues**

1. The criteria for and selection of labourers, contractors and suppliers for the project should demonstrate preference for the local community. Such requirements should be included in contract documents and be monitored by DOT.
2. Contractors must ensure proper supervision of employees at all times, undertake regular inspections of the workplace, enforce the wearing of safety equipment / clothing and ensure compliance with all relevant rules and procedures.
3. Staff should be educated as to the need to refrain from indiscriminate waste disposal and / or pollution of local soil and water resources and receive the necessary safety training.
4. The provision and proper utilisation, maintenance and management of toilet, wash and waste facilities for staff during construction must be ensured.



5. Machine / vehicle operators should receive clear instructions to remain within demarcated access routes.
6. Suitable control measures over the contractor's yard, plant and material storage to mitigate any visual impact of the construction activity must be implemented.
7. Contractors must adhere to approved working hours and ensure that all machinery is in a good state of maintenance to mitigate noise.

#### **4.3.10 Consultation with Interested and Affected Parties (I&APs)**

1. Preventative measures, such as screening, muffling, dust control, timing and pre-notification of affected parties are recommended to minimise complaints regarding dust, noise and vibration nuisances.
2. Open liaison channels should be established between the PM, Contractor, the sub-contractors and I&APs such that any queries, complaints or suggestions can be dealt with quickly and by the appropriate person(s).

#### **4.3.11 Working Areas and No-go Areas**

1. The Construction Site shall be divided into working areas and 'no-go' areas and shall be marked on appropriate plans for reference. Working areas are those areas required by the Contractor to construct the works and as approved by the PM.
2. 'No-go' areas are generally those large areas outside the designated working areas, and may include, but not be limited to:
  - Any area outside the designate 'site construction area'
  - Privately owned land (unless a formal agreement has been signed for access, use or impact)
  - Watercourses
  - Any heritage sites that receives the protection from AMAFA
  - Natural or special features and Sensitive Environments.
3. The Contractor shall ensure that all "no go" areas are demarcated and that no unauthorised entry, litter, stockpiling, dumping or storage of equipment or materials shall be allowed within the demarcated "no go" areas.
4. Once construction within an area has been completed and the area has been rehabilitated and revegetated, it shall be considered a "no go" area.
5. In the event that any damage is caused to the 'no-go' areas, the Contractor will be required to repair, restore, reinstate and/or rehabilitate these areas to a standard required by the ECO and PM at the Contractor's cost.
6. Any deviations from the demarcated working area must be agreed upon by the Contractor, PM, DOT and the ECO concerned.

#### **4.3.12 Work Stoppage and Temporary Site Closure**

1. The PM, in consultation with the ECO, shall have the right to order work to be stopped in the event of significant infringements of the Project Environmental Specifications until the situation is rectified in compliance with the specifications. In this event, the Contractor shall not be entitled to claim for delays or incurred expenses.

#### **4.3.13 Site Identification**



1. Produce a Site Layout Plan illustrating the location and layout of the proposed site camp in each cluster and the working areas. This plan must be approved by the PM.
2. Ensure that the site camp is fenced and provided with a lockable access gate to prevent vandalism, theft and unauthorised entry by the public, where necessary.
3. Produce a photographic record of the area earmarked for the site camp prior to site establishment. This will serve as the benchmark against which rehabilitation will be measured and shall be kept in the site environmental file.
4. Ensure that the site camp is reinstated to its original condition once the project has been completed.
5. Do not use the land for the site camp for any purpose other than for the proper carrying out of the works under the contract.

#### **4.3.14 Site Demarcation**

1. Prior to construction commencing, the ECO, Contractor, and PM shall inspect the site and identify any sensitive environments in the vicinity of the proposed construction camp.
2. Where necessary, demarcate the construction footprint areas using materials as specified by the PM. These may include fencing, rope, hazard tape, wire mesh, or other approved materials or means.
3. The Contractor will be required to maintain all demarcation fencing and other demarcating materials for the duration of construction activities or as otherwise instructed by the PM.

#### **4.3.15 Site Maintenance**

##### **a) General**

1. The Construction Site and surrounds are to be maintained in a clean orderly and presentable condition at all times.
2. Regular inspections by the Contractor (and ECO) will be undertaken using checklists to ensure a minimum standard of orderliness is maintained.
3. Construction activities shall avoid causing unnecessary disruption and nuisance to adjacent landowners and the public as a whole
4. The contractor may not cause the pollution of any surface water resource.
5. Provide a comprehensive first aid kit and make sure that there are adequate staff members who are trained in first aid.
6. Provide sufficient fire-fighting equipment at the contractor's camp and work areas, and make sure that there are staff members who know how to use the equipment.
7. Make sure that the necessary safety equipment and protective clothing, required for specific construction work are used, and inform staff about safety procedures and possible dangerous working conditions.
8. Provide sufficient temporary ablutions facilities on site and maintain these facilities in a good working and hygienic condition.
9. A designated eating area must be provided for staff and labourers.
10. No fires will be allowed on site.
11. Sufficient weather and vermin proof bins must be provided at the Contractors' camp site.

##### **b) Workshop**



1. If an on-site workshop is to be established for the duration of construction, obtain the approval of the PM prior to commencing activities and confine maintenance activities to the identified workshop area.
2. Ensure that there is no contamination of soil or surface water from the on-site workshop.
3. Maintain a spill control kit and staff appropriately trained to utilise it.

#### **c) Equipment Maintenance and Storage**

1. Keep all vehicles and equipment in good working order in the site camp or an area approved by the PM.
2. Inspect all vehicles and plant daily for leaks and spills. Log and sign off maintenance checks in a site maintenance file after each inspection.
3. Repair or remove leaking equipment from the site immediately.
4. Stationary plant must be supplied with drip trays to prevent soil contamination after hours and when not in use.

#### **d) Cooking Facilities**

1. Designate an all weather cooking and eating area, subject to the approval of the PM.
2. Any cooking on site shall be done on either well-maintained gas cookers or by contained fires (e.g. in a drum), located away from flammable vegetation or construction materials with the construction camp. No fires for heating purposes shall be allowed on site.
3. Keep the cooking and eating areas kept tidy and clean at all times to prevent the luring of vermin, domesticated or wild animals.
4. Provide sufficient bins with vermin proof lids for waste disposal, within a 5m radius of the cooking/eating area at all times.

#### **e) Water for human consumption**

1. Water for human consumption should be available at the site offices and at other convenient locations on site.

### **4.3.16 Vegetation Clearance**

1. Vegetation clearance shall take place strictly in accordance with the Site Layout Plan developed by the Contractor and approved by the ECO and vegetation specialist in conjunction with the PM.
2. Collection or wilful damage to any plants outside of the areas demarcated for clearing is not allowed.
3. Only trees and shrubs directly affected by the works may be felled or cleared, subsequent to approval from the ECO or PM in writing.

### **4.3.17 Protection of Natural Features**

1. The Contractor shall not deface, paint, damage or mark any natural features situated in or around the Site for survey or other purposes unless agreed beforehand with the ECO. Any features affected by the Contractor in contravention of this clause shall be restored / rehabilitated to the satisfaction of the ECO.



2. The Contractor shall not permit his employees to make use of any natural water sources (e.g. springs, streams, and open water bodies) for the purposes of swimming, personal washing and the washing of machinery or clothes.

#### **4.3.18 Existing Services and Infrastructure**

1. Take cognisance of the position of existing services and infrastructure (e.g. roads, pipelines, power lines and telephone services) that may get damaged due to construction activities.
2. Ensure that existing services are not damaged or disrupted unless required by the contract and with the permission of the PM.
3. The repair and reinstatement of any infrastructure that is damaged or services that are interrupted during construction will be done at the expense of Contractor and shall receive top priority over all other activities.
4. Adhere to the time limit for the repairs as stipulated in consultation with the PM.

#### **4.3.19 Prevention of Damage to Surrounding Infrastructure**

1. Be extra vigilant, during the construction activities, to prevent damage from occurring to any buildings, road furniture and motor vehicles located in the vicinity of the construction site, particularly those buildings of cultural heritage value.
2. The Contractor shall be responsible, at his own cost, for the repair and reinstatement of any damages to existing structures resulting from the construction works.
3. Investigate any complaints received from the public regarding any of the listings above. If substantiated, the above listings may result in a fine, or suspension or dismissal of the guilty party.

#### **4.3.20 Unpleasant Visual Impact at the Construction Site**

1. Keep the construction site neat and tidy at all times during the construction phase of the project.
2. Locate the construction camp(s) inconspicuously in the landscape to reduce visual impact severity.
3. Keep signage and other infrastructure to a minimum within the requirements of safety and efficiency
4. Minimise new road construction where possible.
5. Minimise night lighting of the construction sites within requirements of safety and efficiency.
6. Contain and store general and construction related waste, upon approval by the PM, as prescribed by relevant specifications.
7. Maintain good housekeeping on site to avoid litter and minimise waste.
8. Ensure that any lighting installed on site for his activities does not interfere with road traffic or cause an unreasonable disturbance to the surrounding community.

#### **4.3.21 Access and Traffic Control**

1. Person and vehicle access should be restricted during construction so as to control access to otherwise potential dangerous excavations and materials.
2. Liaise with the KwaSani Traffic and Transport Department on envisaged traffic impacts and inform them at least a week in advance if the traffic in the area is affected during construction.





3. Adequate signage and warnings must be erected to control traffic at the construction sites.
4. Train construction staff to show respect to other road users and give public vehicles the right of way.
5. Minimize construction activities inside the road during peak hours.
6. Minimize congestion and traffic obstruction e.g. by keeping lanes open and introducing traffic control measures.
7. Ensure that construction vehicles keep to the speed limits on all public roads.
8. The movement of trucks to and from the construction site must be well coordinated by the PM together with the Contractor, so as to cause the least disruption to landowners in the area.
9. Do not leave large trucks and other heavy-duty machinery unattended outside the Contractor's site camp or designated area.
10. Erect appropriate signage indicating construction works ahead of strategic locations along the site access road(s), clearly observable by all road users by day and night. Warning signs must comply with the applicable municipal or DOT specifications governing road works.
11. All temporary or permanent traffic calming measures, if required, must be erected according to the appropriate municipal or DOT specifications governing road works.

#### **4.3.22 Transport of Materials/Components**

1. Secure and ensure safe passage for components and materials between destinations. Loads including, but not limited to sand, stone chip, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent it from spilling over the side of the vehicle during transit.
2. Be responsible for any clean-up resulting from the failure by staff or supplier to properly secure materials to be transported.

#### **4.3.23 Soil Management**

1. Stockpiled soil should be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet season.
2. Soil stockpiles should be located away from drainage lines, watercourses and areas of temporary inundation.
3. All soil excavated during construction must, where practical, be separated into top- and subsoil. Subsoil must be used for backfilling and topsoil for landscaping and rehabilitation of disturbed areas.
4. Where contamination of soil is expected, analysis must be done prior to disposal of excess soil to determine the appropriate disposal route. Proof from an applicable waste disposal site where contaminated soils are dumped, if and when a spillage / leakage occurs, must be forwarded to the ECO.
5. On completion of the backfilling of pipe or cable trenches, the topsoil should be replaced and the ground restored to its former condition, e.g. grass, artificial surface, etc.
6. Where topsoil has become mixed with subsoil or is not up to the original standard, fertiliser or new topsoil should be provided by the contractor.
7. All accumulated and surplus excavated material should be disposed of in a suitable place and manner to prevent translocation of invasive plant species, modification of drainage and contamination of surface water
8. Wherever possible excavated material must be used as backfill.
9. Determine if soil is contaminated and dispose at an appropriate waste disposal site.



#### 4.3.24 Topsoil

1. Top soil and subsoil excavated during trenching may be stockpiled next to the trench, but must be set back from the edge of the trench by a minimum distance of 1 m.
2. Topsoil can only be stripped from the following areas in or adjacent to the construction site or site camp:
  - Areas which is to be used for temporary storage of soil and/or materials
  - Areas which could be polluted by any aspect of the construction activity
  - Areas within the footprint of the proposed infrastructure to be constructed.
3. Undertake the stripping of topsoil in a manner that minimises erosion by wind or runoff.
4. Topsoil will be stripped to a depth not exceeding 150 mm from the original ground level, unless greater depth is required during the execution of the construction phase of the project.
5. Clear areas from which the topsoil is to be removed of any foreign material which may come to form part of the topsoil during removal including bricks, rubble, any waste material, litter, excess vegetation and any other material which could reduce the quality of the topsoil.
6. Ensure that subsoil and topsoil are not mixed during stripping, excavation, reinstatement and rehabilitation.
7. Topsoil will be temporarily stockpiled, separately from (clay) subsoil and rocky materials.
8. Topsoil will be stockpiled in areas designated by the ECO.
9. Topsoil must not be stockpiled on drainage lines or near watercourses without proper risk assessment conducted and prior consent from the PM and ECO.
10. Topsoil stockpiles will either be vegetated with indigenous, covered by a suitable fabric or maintained in some other suitable way approved by the PM and ECO to prevent erosion and invasion of weeds.
11. Stockpiled topsoil will not be compacted and shall not exceed 2 m in height.

#### 4.3.25 Excavations and Stockpiling

1. The movements of the construction vehicles must be confined to the immediate vicinity of each tower location.
2. Rocks and debris are to be stockpiled separately within the immediate construction site, and used as fill where necessary.
3. Rocks can be stacked as walls to prevent the loss of top and subsoil on cut or fill banks.
4. Banks should not be steeper than 1:2 and cut back where the PM and ECO deem necessary.
5. Berms may be specified on sloped sites, depending on the gradient and length of slope affected.
6. Soils should be exposed for the minimum time possible once cleared.
7. Any stockpiling of gravel, cut, fill or any other material including spoil shall be in areas approved by the ECO within the defined working area.
8. Ensure that stockpiled material is not lost due to exposure to the elements. If the stockpiled material is in danger of being washed or blown away, cover it with a suitable material, such as hessian or plastic. Do not cover stockpiles of topsoil with plastic.



9. Do not allow stockpiling of any material within the 100 m of any residential areas or 20 m of any “no go” area.

#### **4.3.26 Storm Water Management and Erosion Control**

1. The following areas will require appropriate erosion control measures and re-vegetation methods as these are regarded as being of high erosion risk:
  - Slopes > 20°
  - Slopes with convergent sub-surface drainage (percolines)
  - Road culverts
  - Cut and fill slopes in areas of slope instability or erodable geology.
2. Take all reasonable measures to control storm water and the erosive effects thereof and provide a Method Statement for approval by the PM and ECO.
3. Protect streams, rivers, pans, wetlands, dams, and their catchments from erosion, direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous products.
4. Protect areas susceptible to erosion by installing necessary temporary or permanent drainage works as soon as possible.
5. Areas affected by construction related activities and/or susceptible to erosion must be monitored regularly for evidence of erosion.
6. Inspect storage containers regularly to prevent leaks into the aquatic system.
7. Weather forecasts of up to three days in advance must be monitored on a daily basis to avoid exposing soil or building works or materials during a storm event and appropriate action must be taken in advance to protect construction works should a storm event be forecasted.
8. On any areas where the risk of erosion is evident, special measures may be necessary to stabilise the areas and prevent erosion. These may include, but not be restricted to:
  - Confining construction activities
  - Using cut-off berms
  - Using mechanical cover or packing structures such as geo-fabric to stabilise steep slopes or hessian, gabions and mattress and retaining walls
  - Straw stabilising
  - Brush cut packing
  - Constructing anti-erosion berms.
9. The erosion prevention measures must be implemented to the satisfaction of the PM and ECO.
10. Where erosion does occur on any completed work/working areas, reinstate such areas and areas damaged by the erosion at the expense of the Contractor and to the satisfaction of the PM and ECO.
11. Restrict and control traffic and movement over stabilised areas.
12. Repair and maintain any damage to the stabilised areas to the satisfaction of the PM and ECO.
13. The Contractor shall be liable for any damage to downstream property caused by the diversion of overland storm water flows.

#### **4.3.27 Concrete Batching**

1. Concrete batching plants shall be located in an area of low environmental sensitivity, as identified by the PM (in consultation with the ECO).



2. In particular, the concrete batching plant shall be located in a low flood risk area.
3. Should the batching plant be established on ground without any hardstanding, topsoil shall be removed from the batching plant site and stockpiled as per the Environmental Specification.
4. Run-off from batching operations must be contained and not be allowed to discharge off site or into stormwater system.
5. The batching plant site shall be bunded with concrete bunds or sandbags such that runoff cannot escape from the plant site.
6. Small scale concrete mixing is to take place with the Contractor's camp or an alternative location approved by the PM and ECO. Concrete mixing areas need to be concentrated so that the area of contamination is minimised.
7. *Ad hoc* concrete mixing at the active working area should be avoided wherever possible. If small volumes are mixed (manually), mixing is to be undertaken on a hard surface covered in plastic sheeting so that concrete waste and runoff can be contained.
8. If large volumes are generated, the following requirements must be met:
  - Mixing area must be underlain by an impermeable surface that is large enough to trap spillages.
  - Surface runoff from the grout mixing area is to be contained and channelled into a collection point.
  - The concrete batching works shall be kept neat and clean at all times.
  - Cement bags are to be considered "waste" and therefore stored and disposed of at a licensed waste disposal facility.
  - Concrete transportation shall not result in spillage.
  - Cleaning of equipment and flushing of mixers shall not result in pollution of the surrounding environment.
  - Suitable screening and containment shall be in place to prevent wind blown contamination associated with any bulk cement silos, loading and batching.
  - Waste concrete and cement sludge shall be scraped off the site of the batching plant and removed to an approved disposal site.
  - All visible remains of excess concrete shall be physically removed on completion of the plaster or concrete and disposed at an approved disposal site. Washing the remains into the soil is not permitted.
  - All excess aggregate and sand shall also be removed.
  - After closure of the batching plant or any area where concrete was mixed, all waste concrete/cement sludge shall be removed together with any contaminated soil/sand.
  - Should any open ground be affected, the surface shall then be ripped to a depth of 150mm and the topsoil replaced evenly over the site and re-grassed as per the Environmental Specification.

#### **4.3.28 Asphalt, Bitumen and Paving**

1. Overspray of bitumen products outside of the road surface and onto roadside vegetation shall be prevented using a method approved by the PM.
2. When heating bitumen products, only LPG or a similar zero emission fuel shall be used and the Contractor shall take cognisance of appropriate fire risk controls.
3. Stone chip/gravel excess shall not be left on road/paved area verges. This shall be swept / raked into piles and removed to an area approved by the PM.
4. Milled or cut out bitumen shall be removed to an area approved by the PM.



5. Water quality from runoff from newly / fresh bitumen surfaces shall be monitored by the PM and remedial actions taken where necessary.
6. Drums / tanks shall be safely and securely stored in the construction camp.
7. Materials requiring disposal shall be disposed of at an appropriate waste facility.

#### **4.3.29 Backfilling of Pipe or Cable Trenches**

1. Backfilling of pipe trenches should commence immediately after a section of the pipework has successfully passed the tests and inspections specified.
2. On completion of the backfilling of pipe or cable trenches, the topsoil should be replaced and the ground restored to its former condition, e.g. grass, artificial surface, etc.
3. Where topsoil has become mixed with subsoil or is not up to the original standard, fertiliser or new topsoil should be provided.

#### **4.3.30 Sanitation**

1. Provide adequate washing and toilet facilities at the construction site camp.
2. Provide portable chemical toilets at a ratio of one toilet per 15 workers.
3. The toilet facilities must be easily accessible.
4. All temporary/portable toilets shall be secured to the ground to the satisfaction of the PM to prevent them from toppling over or being blown over by wind.
5. The type and exact location of the toilets shall be approved by the PM prior to establishment. No septic tanks are to be established.
6. Ensure maintenance of all toilets in a clean sanitary condition to the satisfaction of the PM. Toilets are to be serviced daily and toilet paper shall be provided.
7. Ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from the site to an appropriate location/facility. The Contractor/service provider is to provide proof that the toilet contents are disposed of at an appropriate facility.
8. Discharge of waste from toilets into the environment and burial of toilet waste is strictly prohibited.

#### **4.3.31 Waste water and Contaminated Water Management**

1. Prepare a Method Statement on the control and management of waste water on site, including providing for the appropriate disposal of contaminated water.
2. No grey water runoff or uncontrolled discharges from the site/working areas (including wash down areas) to adjacent or nearby water bodies shall be permitted.
3. Discharge water containing environmental pollutants into a conservancy tank, where appropriate, for removal from site.
4. Prevent runoff loaded with sediment and other suspended materials from the site/working areas from discharging to adjacent watercourses and/or stormwater infrastructure.
5. Potential pollutants of any kind and in any form shall be kept, stored and used in such a manner that any escape can be contained.
6. Wash down areas must be approved by the PM, EER and ECO and shall not pollute the surrounding environment.
7. Notify the PM, EER and ECO of any pollution incidents on site.



#### **4.3.32 Solid Waste Management**

1. Prepare and submit a Method Statement on waste control and management at the site.
2. No burning, burying or dumping of any waste materials, vegetation, litter or refuse shall be permitted.
3. Remove, or appoint a suitable service provider to remove solid waste from site on a weekly or fortnightly basis.
4. Solid waste must be recycled where possible and the remainder disposed at an approved municipal land fill site or waste disposal service provider.
5. Disposal certificates for each waste removal event shall be issued and kept in the site environmental file for auditing purposes.
6. Burning of clearing of vegetation is not allowed on site. Chipping or composting of vegetation shall be allowed where deemed viable by the ECO.

#### **4.3.33 Air Emissions and Odour Control**

1. Ensure that all vehicles and plant used are maintained in good working order to help reduce air emissions.
2. The burning of substances that may emit foul smelling smoke or vapour, e.g. oil rags, tar paper etc., is not permitted.

#### **4.3.34 Noise Control**

1. Keep noise level within acceptable limits in compliance with all relevant guidelines and regulations.
2. All vehicles and machinery shall be fitted with appropriate silencing technology that shall be properly maintained.
3. Reverse hooters of heavy earthmoving vehicles must be set at such a level that the beeping sound does not create a nuisance to Pass users.
4. The use of all plant and machinery shall be appropriate to the task required in order to reduce noise levels and / or environmental damage.
5. Notify affected residents and ECO, should the PM approve any noisy construction activities outside of normal working hours, at least 5 days in advance of the event.

#### **4.3.35 Dust Control**

1. Control dust arising from construction operations and activities, through regular spraying of working/exposed areas with water at an application rate that will not result in soil erosion or runoff. The frequency of spraying will be agreed with the PM.
2. Avoid the excavation, handling and transport of erodable materials under high wind conditions.
3. Soil stockpiles shall be wetted and/or sheltered from the wind, as required.

#### **4.3.36 Hazardous Substances**

1. All potentially hazardous raw and waste materials are to be handled by the Contractor's trained staff and stored on site in accordance with the manufacturer's instructions and legal requirements.
2. Provide appropriate training for the handling and use of such materials as necessary. This includes providing for any spills and pollution threats that may occur.





3. Clearly label all hazardous products and provide symbolic safety / hazard warning signs.
4. Ensure that areas for the storage of fuel and other flammable materials comply with standard fire safety regulations.
5. Locate fuel and chemical depot(s) at least 50m from any water body.
6. If potentially hazardous substances are to be stored on site, provide a Method Statement detailing the substances/materials to be used together with the procedures for the storage, handling and disposal of the materials in a manner which will reduce the risk of pollution that may occur from day to day storage, handling, use and/or from accidental release of any hazardous substances used.
7. Store hazardous chemical substances used during construction in secondary containers.
8. Retain the relevant Material Safety Data Sheets (MSDS) on site. Procedures detailed in the MSDS shall be followed in the event of an emergency situation.
9. Where hazardous substances is removed from site for disposal, proof of disposal for auditing purposes shall be kept in the form of disposal certificates.

#### **4.3.37 Fuels (Petrol and Diesel) and Oil**

1. Obtain all necessary approvals regarding storage and dispensing, where fuel is to be stored on site, from the appropriate authorities.
2. Ensure that the location of the fuel storage area is approved by the PM and ECO.
3. Ensure that all liquid fuels and oils are stored in tanks with lids and that these are kept firmly locked at all times. The design and construction of the storage tanks shall be in accordance with a recognised code and as approved by the PM.
4. Situate the tanks in a bunded area that has a volume of at least 110% of the volume of the largest tank. The floor of the bunded area must be impermeable and the bunds must be without leaks.
5. Remove storage tanks on completion of the works.
6. No smoking shall be allowed in the vicinity of the fuel storage area. Erect at least one no-smoking warning sign, which is clearly visible at the fuel storage area, to warn all staff of associated dangers.
7. Provide adequate fire fighting equipment at or close to the fuel storage and dispensing area(s).
8. Keep fuel under lock and key at all times.
9. Where reasonably practical, plant shall be refuelled at a designated refuelling area or at the workshop as applicable. If it is not reasonably practical then the surface under the temporary refuelling area shall be protected against pollution to the reasonable satisfaction of the PM prior to any refuelling activities.
10. Ensure that there is always a supply of absorbent material readily available to absorb/break down any hydrocarbon spillage. The quantity of such materials shall be able to handle a minimum of 200 litres of hydrocarbon liquid spill. This material must be approved by the PM prior to any refuelling or maintenance activities.
11. In the case of a spill, contaminated material must be removed from the site immediately and disposed of at an appropriate hazardous waste facility.

#### **4.3.38 Fire Prevention and Control**

1. Take all reasonable and precautionary steps to ensure that fires are not started as a consequence of construction activities.



2. Ensure that there is basic fire-fighting equipment available on site. Fire-fighting equipment must be in working order and serviced to date.
3. Appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedures to be followed. Forward the name of the Fire Officer to the ECO for his approval within 7 days of being on site.
4. Flammable materials should be stored under conditions that will limit the potential for ignition and the spread of fires.
5. Set smoking areas must be designated. Smoking outside of these areas within the construction area will not be allowed.
6. Hold fire prevention talks with staff to create an awareness of the risks of fire.

#### **4.3.39 Rehabilitation**

1. Rehabilitation shall be undertaken in line with the Rehabilitation Plan developed for the project by the Vegetation Specialist during the final design phase.
2. Rehabilitation shall be required for all specified areas disturbed by the works and site camp.
3. Rehabilitation shall ensure that all specified areas disturbed by the works are returned to a similar or better state than before the construction works commenced.
4. The Contractor shall rehabilitate all disturbed areas to the satisfaction of the PM and the ECO.
5. Implement a programme of progressive rehabilitation, i.e. rehabilitation and/or re-vegetation must commence once works are complete in a particular area with acceptable regrowth being achieved after 3 months.
6. A programme of progressive rehabilitation will provide an opportunity to assess whether or not the methods employed are suitable and successful. Where rehabilitation of an area is not successful, the Contractor will rehabilitate these areas at no additional cost to the Developer.
7. Rehabilitation includes, but is not limited to, the following activities:
  - Clearance of rubble associated with construction, including removal of surplus materials, excavation and disposal of consolidated waste concrete and concrete wash water, litter etc.
  - Removal of all soil/sand contaminated by hydrocarbons by excavation to the depth of contaminant penetration and removal to an appropriate landfill site.
  - Backfilling and contouring using stockpiled subsoil removed during site clearing.
  - Finishing and grading of final levels of all disturbed areas shall be consistent with the master plan for the site.
  - Rehabilitation of all drainage lines affected by construction to approximately their original profile. Where this is not feasible due to technical constraints, the profile is to be agreed upon by the PM.
  - Ripping along the contour of compacted disturbed areas, including stockpile areas, to a depth of 150 mm prior to the replacement of topsoil, except where otherwise specified by the PM.
  - The eradication of young invasive/alien species that may have grown up during the construction period in impacted and rehabilitated areas.
  - The removal of visually detracting or environmentally unacceptable piles of blast rock and boulders to an approved spoil site.



8. Areas compacted by vehicles during construction must be scarified to allow penetration of plant roots and the regrowth of natural vegetation.
  9. Excess subsoil shall be spoiled in a pre-identified location or be used, where possible, as infill material or building material, in conjunction with the ECO's approval.
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#### **4.4 Construction Site Closure**

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##### **4.4.1 Materials and Infrastructure**

1. All remaining building materials must be removed from the site.
2. Residual stockpiles must be removed.
3. Disassemble all infrastructure from the working areas and Contractors' camp, including temporary office and storage structures, containers, water pipes, water storage containers etc.
4. Drain all portable chemical toilets being careful not to spill the contents. Transfer the contents to a permitted disposal site.
5. Drain all wastewater and sewerage associated with temporary ablution facilities and transfer the waste to an appropriate permitted disposal site.
6. Disassemble all fencing around the Contractors' camp and remove to the Contractors depot.

##### **4.4.2 Contaminated Substrates and Pollution Control Structures**

1. Excavate all areas of contaminated substrate, transfer the contaminated material to a permitted disposal site and treat the affected areas with appropriate ameliorants.
2. Remove all plastic linings used for pollution control and transfer to a permitted disposal site.
3. Break up all temporary concrete structures that have been created (e.g. temporary working and parking surfaces) and remove concrete waste to a permitted disposal site.

##### **4.4.3 General**

1. All areas where temporary services were installed are to be rehabilitated to the satisfaction of the PM and ECO.
2. A meeting must be held on site between DOT, the PM, the ECO and the Contractor to approve all remediation activities, and to ensure that the site has been restored to a condition approved by the PM and ECO.

##### **4.4.4 Site Rehabilitation**

1. Once construction is completed, the contractor must ensure that all redundant construction materials and waste are removed from site and disposed of in an appropriate manner.
2. Rehabilitation shall ensure that all specified areas disturbed by the works are returned to a similar or better state than before the construction works commenced.
3. The method of vegetation removal and establishment where required will be specified by the PM
4. All surfaces should be re-vegetated accordingly.



5. Pack roadsides with topsoil sods and where possible Hydroseed with local seed
6. Mulch should be used to re-establish grasses
7. Where plant material has been saved, they can be successfully planted onto the road verges.



## **5. ENVIRONMENTAL SPECIFICATIONS: OPERATIONAL PHASE**

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This section details specifications to be adhered to by the DOT, PM and Contractor during the Operational Phase. Many of the operational and maintenance tasks and activities that have the potential to impact on the environment are the same as those used in the construction of the upgraded Pass road, and as such, the construction section above is applicable in most aspects to the operational / maintenance phase. It should thus be noted that the specifications for the operational phase are inclusive of those of the construction phase detailed above.

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### **5.1 Vegetation**

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The following mitigation measures must be undertaken to minimize impacts on adjacent vegetation:

1. A contract needs to be in place to check on the rehabilitated roadsides. Any die-offs or slippage of plant material and mulch should be repaired or replanted as soon as possible. This should be included in the vegetation rehabilitation contract.
  2. Erosion of rehabilitated surfaces will need to be repaired as soon as possible until the vegetation has grown sufficiently to secure exposed soil.
  3. Speed restrictions must be enforced for safety of vehicles and pedestrians.
  4. The construction of a hiking path should be considered by EKZNW as a safer option to walking up the road.
  5. A programme to control IAPs should be in place in perpetuity.
  6. A waste management plan should be compiled and managed by EKZNW as the implementing agent.
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### **5.2 Solid Waste Management**

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1. The Waste Management Plan should include measures to ensure regular clearing, emptying and disposal of all waste and litter collected along the Pass during the operational phase of the Pass Road.
  2. Procedures for the collection and disposal of sewage should also be incorporated into the Waste Management Plan.
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### **5.3 Maintenance Construction Activities**

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1. All road maintenance activities on the Pass during operation must comply with the construction measures detailed in the construction phase section of this EMP.



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## 5.4 Hazardous Waste

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1. Hazardous materials (if any) which may be generated during the operation phase (spills / leaks) must be contained, collected and disposed of at a DEA approved hazardous waste landfill site.
2. The Proponent or Contractor acting on his behalf shall ensure that an emergency preparedness plan is in place for implementation in the case of a spill.

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## 5.5 Emergency Procedures

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1. The Proponent or Contractor acting on his behalf shall compile and maintain environmental emergency procedures during the operational phase of the project to ensure that there will be an appropriate response to unexpected or accidental environment-related incidents, e.g. during routine maintenance and servicing.
2. These environmental emergency procedures must be submitted to EKZNW for integration in to the Integrated Management Plan for the uKhahlamba Drakensberg Park.
3. These plans should include:
  - A list of key personnel, including responsibilities, accountability and liability
  - Details of emergency services applicable to the various areas along the route that the turbine components will need to be transported as well as for the site itself
  - Internal and external communication plans, including prescribed reporting procedures where required by legislation
  - Actions to be taken in the event of different types of emergencies.
  - Incident management plans for the Pass
  - Incident recording, progress reporting and remediation measures required to be implemented
  - Information on hazardous materials, including the potential impact associated with each and measures to be taken in the event of accidental release
  - Fire fighting strategy
  - Training plans and testing exercises and schedules for effectiveness.

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## 5.6 Erosion Control

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1. The various protective measures that were installed during the construction phase to prevent or minimise erosion must be properly maintained, e.g. the vegetation of road verges and cut faces must be inspected and maintained on a regular basis.





2. All side drains and culverts must be regularly checked for blockages, and soil deposition and cleared if necessary.
  3. All stormwater discharge points must be regularly checked for damage and erosion. Where evidence of erosion exists, maintenance and repair must be immediate.
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## **5.7 Road Safety**

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1. The road must be maintained at the required road construction standards once operational to ensure the positive road safety impacts remain in place. Poor and / or irregular maintenance will result in the positive impact reversal.
2. Strict road safety controls must be maintained on the Pass, otherwise increased travelling speeds could reverse the benefits of the upgrade. Examples of these could include:
  - Regular speed checks should be installed to ensure safe operating speeds are not exceeded
  - Worn and damaged safety barriers must be maintained - particularly on sharp bends
  - Strict enforcement of weight restrictions must be undertaken to ensure over-loaded vehicles are not permitted on the Pass
  - Viewing sites must be maintained both in terms of safety and amenities to encourage road users to stop to rest or enjoy the views
  - All accidents should be recorded and those points where regular accidents occur (e.g. a particular hairpin bend), should be assessed for additional mitigation measures to reduce the occurrence (e.g. additional warning signs, rubble strips, barriers).



## 6. ENVIRONMENTAL SPECIFICATIONS: DECOMMISSIONING PHASE

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The lifespan of the road cannot be defined at this stage. Due to the function of the Pass as not only a tourist attraction but as the only road link between South Africa and Lesotho from KwaZulu-Natal, no tangible specifications can be made during this time in terms of decommissioning. It is therefore recommended that prior to decommissioning of the road at some future date, a comprehensive decommissioning EMP be prepared that can reassess the potential environmental and socio-economic impacts at the time. This decommissioning EMP should be based on the construction EMP as the impacts and mitigation measures will be very similar with significant focus on remediation and rehabilitation. Specifications applicable to the Developer and the Contractor would need to be defined in the decommissioning EMP based on the environmental, social and economic considerations at the time.



# DOCUMENT CONTROL SHEET (FORM IP180/B)

**CLIENT** : DOT  
**PROJECT NAME** : DOT Sani Pass Upgrade EIA **PROJECT No.** : J30188  
**TITLE OF DOCUMENT** : Draft Environmental Management Programme  
**ELECTRONIC** : P:\J27344 - DOT Sani Pass Upgrade\Phase B - Assessment\REPORTS\EMPJ27344 -  
**LOCATION** : Draft EMP v5.doc

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## **Appendix A**

### **Environmental Authorisation**



## **Appendix B**

### **List of Applicable Legislation**



## ENVIRONMENTAL LEGISLATION AND POLICY

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### Environmental Policies and Guidelines

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The Developer is required to develop an environmental management policy before commencement of the proposed works. This policy must consider:

- The Developer's mission, vision and core values
- Guiding principles
- Requirements of, and communication with interested and affected parties (I&APs)
- The commitment to prevent pollution and ecological degradation
- The importance of coordination with other organisational policies (e.g. quality, occupational health and safety, etc.)
- Reference to specific local and/or regional conditions
- A commitment to comply with relevant environmental laws, regulations, by-laws.

The policy, once approved by Project Manager, EER and ECO, must be communicated to all employees and Contractors (and sub-Contractors), and made available to the public, if requested.

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### Legislative Framework

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This EMP informs all parties as to their duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. All parties associated with the project should note that obligations imposed by the approved EMP are legally binding in terms of environmental statutory legislation. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter shall prevail.

#### Statutory and Other Applicable Legislation and Standards

The Contractor shall identify and comply with all South African national and provincial environmental legislation, including associated regulations and all local by-laws relevant to the project. Key legislation currently applicable to the design, construction and implementation phases of the project include:

- National Environmental Management Act (Act No. 107 of 1998) (as amended)
- NEMA EIA Regulations, 2006 (GN R. 385, R. 386 and R. 387)
- NEMA EIA Regulations, 2010 (GN R. 543, R. 544 and R. 545)
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
- Environment Conservation Act (Act No. 73 of 1989)
- National Heritage Resources Act (Act No. 25 of 1999) (NHRA)
- Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA)
- Air Quality Act (Act No. 39 of 2004) (AQA)
- Electricity Regulation Act (Act No. 4 of 2006)
- Occupational Health and Safety Act (Act No. 85 of 1993) (OHSA)
- Agricultural Resources Act (Act No. 43 of 1983) (ARA)
- The Protected Areas Act (Act 57 of 2003) Section 17 (PAA)





- Department of Environmental Affairs and Tourism (DEAT) Integrated Environmental Management Information Series No.2
- Regulations and Guidelines Governing Noise
- Planning Approvals and Subdivision of Land Act (Act No. 70 of 70)
- Land Use Planning Ordinance (LUPO)
- South African National Standard (SANS)
- World Health Organisation (WHO)
- Noise Control Regulations (NCR)
- Reference Legislation Governing Visual Impacts
- National Veld and Forest Fire Act, 1998 (Act No 101 of 1998) as amended

The following permit requirements would be relevant to the proposed project:

- Water Use Licence Application from Department of Water Affairs and Forestry
- Permit for the removal of protected plants on the site
- Approval from AMAFA KwaZulu Natali on cultural issues
- Hazardous chemicals permit for asphalt plants, if to be used – obtained from the Department of Environmental Affairs (DEA)
- Health permits for sanitation (Provincial health authorities)
- Fuel storage permit (temporary and permanent) – obtained from DEA
- Blasting permit – obtained from the Department of Mineral Resources (DMR), if required;

The list of applicable legislation and permits provided is intended to serve as a guideline only and is not exhaustive.



**Appendix C**  
**Construction Activities that will Initially Require Method**  
**Statements**



| ACTIVITY   | SPECIFICS  |
|--|--|
| Access Routes and Roads                              | Upgrading and construction of access routes<br>Rehabilitation of temporary access routes<br>Location of proposed access routes   |
| Blasting   | Details of all methods and logistics associated with blasting if required  |
| Excavation   | Method for all excavations, including minimisation of environmental impact.  |
| Bunding  | Method for the bunding of static plant   |
| Cement/Concrete Batching                             | Location, layout and preparation of cement/ concrete batching facilities including the methods employed for the mixing of concrete including the management of runoff water from such areas.   |
| Contaminated Water                                   | Contaminated water management plan, including the containment of runoff and polluted water   |
| Drilling and Jack Hammering                          | Method of drill coring with water or coolant lubricants<br>Methods to prevent pollution during drilling operations   |
| Dust   | Dust control plan  |
| Earthwork, Erosion Control and Stormwater management | Method for the control of erosion during bulk earthworks operations<br>Method of erosion control of spoil materials<br>Method of undertaking earthworks, including hand excavation and spoil management<br>Construction of earth and stormwater control berms or drainage ditches around campsite to contain dirty water   |
| Emergency  | Emergency response plan<br>Emergency procedures must include but not be limited to electrical hazards, fires, spills, and contamination of ground and surface water, accidents to employees and damage to services   |
| Environmental induction training                     | Ensure that all site employees are aware of, and understand the contents and conditions of the EMP, the key environmental issues and the consequences of non-compliance  |
| Fire, Hazardous and Poisonous substances Management  | Handling and storage of hazardous waste in impermeable banded areas with separate storage of incompatible substances<br>Construction and location of concrete platform / bund wall to accommodate hazardous substances<br>Emergency spillages procedures and compounds to be used<br>Emergency procedures for fire<br>Emergency remediation / clean-up procedures for spills or leaks of hazardous substances<br>Location of hazardous substance storage areas<br>Methods of the disposal of hazardous building materials, including asbestos, fibre claddings, refrigerants and coolants.<br>Details of methods for fuel spills and clean up operations<br>Rehabilitation of batching plant area at completion of construction. |
| Health and safety                                    | Compile a Construction Health and Safety Plan<br>Take all necessary precautions to effectively address any potential health and safety hazards   |



| ACTIVITY                     | SPECIFICS   |
|------------------------------|---|
|                              | Display appropriate hazard warning signs conspicuously at all potential hazards that may affect public members  |
| Rehabilitation               | Rehabilitation of disturbed areas and re-vegetation after construction is complete  |
| Site Camp Establishment      | Layout and preparation of the construction camp<br>Location, layout, preparation and operation of all wash areas, including vehicle wash, workshop washing and paint washing and clearing<br>Construction camps, equipment storage sites and ablution facilities serving the construction phase should be sited a reasonable distance away from the river<br>Location of storage areas for materials, equipment, plant and vehicles<br>Method of vegetation clearing<br>Installation of ablution facilities with chemical toilets prior to construction commencing (minimum of one toilet to 15 people) |
| Traffic                      | Any traffic diversions must be undertaken with approval of the relevant Transport Authority and in accordance with relevant legislation.  |
| Waste Control and Management | Types of wastes generated<br>Location of designated waste areas<br>On-site disposal facilities<br>Collection arrangements<br>Disposal procedures<br>Disposal site verification<br>Solid waste and sewerage collection and disposal procedures   |
| Water abstraction            | Water abstraction from water resources if undertaken  |
| Community Relations          | Community relations must be managed through a steering committee set up to monitor the construction process and feedback to the local communities and road users.   |