

THE UPGRADE OF NATIONAL ROUTE R63 SECTION 16 BETWEEN N6 BRIDGE (KM 1.0) TO N2 PAST KOMGA (KM 43.64)

ENVIRONMENTAL MANAGEMENT PROGRAMME

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1 INTRODUCTION

The South African National Roads Agency SOC Ltd. (SANRAL) is proposing the upgrade of National Route R63 Section 16 between N6 Bridge (Km 1.0) to N2 past Komga (Km 43.64). UWP Consulting has been appointed by SANRAL as the project managers who subcontracted CES as the Environmental Assessment Practitioner (EAP).

This Environmental Management Programme (EMPr) has been prepared as part of the Environmental Impact Assessment process to provide specific environmental guidance for the planning, construction and operational phase of the proposed mining sites for the material needed for the road upgrade on the R63 Section 16, Eastern Cape. SANRAL require 8 mining sites to supply the necessary rock material for the proposed road construction. Four quarries and 4 borrow pits have been identified within the general Komga area within the Great Kei Municipality, Eastern Cape.

The competent authority, being the Department of Mineral Resources (DMR), requires that an EMPr be submitted in accordance with Regulation 33 of the National Environmental Management Act (No 107 of 1998; NEMA) Environmental Impact Assessment (EIA) Regulations (2014 as amended), which should be read with Section 24 N of NEMA. In terms of Section 106 of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002; MPRDA) SANRAL is exempted from the application for a Mining Application for the quarries and borrow pits but is not exempted from the application for environmental authorisation for the quarry and borrow pits.

1.1 Objectives of an EMPr

The EMPr has been compiled to provide recommendations and guidelines according to which compliance monitoring can be done during the construction of the R63 Section 16 road upgrade as well as to ensure that all relevant factors are considered to ensure for environmentally responsible development. The purpose of the EMPr is to provide specifications for "good environmental practice" for application during construction.

This EMPr informs all relevant parties (the Project Coordinator, the Contractor, the Environmental Control Officer (ECO) and all other staff employed by SANRAL at the site) as to their duties in the fulfilment of the legal requirements for the construction, operation and decommissioning of the R63 Section 16 upgrade with particular reference to the prevention and mitigation of anticipated potential environmental impacts.

All parties should note that obligations imposed by the EMPr are legally binding in terms of the environmental authorisation granted by the relevant environmental permitting authority.

The objectives of an EMPr are to:

- Ensure compliance with regulatory authority stipulations and guidelines which may be local, provincial, national and/or international;
- Ensure that there is sufficient allocation of resources on the project budget so that the scale of EMPr-related activities is consistent with the significance of project impacts;
- Verify environmental performance through information on impacts as they occur;
- Provide feedback for continual improvement in environmental performance;
- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant levels;
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project;
- Identify measures that could optimize beneficial impacts;
- Create management structures that address the concerns and complaints of I&APs with regards to the development;

- Establish a method of monitoring and auditing environmental management practices during all phases of the activity;
- Ensure that safety recommendations are complied with;
- Specify time periods within which the measures contemplated in the final environmental management programme must be implemented, where appropriate.

1.2 Form and function of an EMPr

An EMPr is focused on sound environmental management practices, which will be undertaken to minimise adverse impacts on the environment through the lifetime of a development. In addition, an EMPr identifies what measures will be in place or will be actioned to manage any incidents and emergencies that may occur during operation of the facility.

As such the EMPr provides specifications that must be adhered to, in order to minimise adverse environmental impacts associated with the operations of the Facility.

The content of the EMPr is consistent with the requirements as set out in Regulation 33 of the EIA Regulations stated below, for the construction and operation phases.

According to regulation 33 of GN R 326, an environmental management programme must include:

- (a) Details of –
 - (i) The person who prepared the environmental management programme; and
 - (ii) The expertise of that person to prepare an environmental management programme;
- (b) Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of –
 - (i) Planning and design;
 - (ii) Pre-construction and construction activities;
 - (iii) Operation or undertaking of the activity;
 - (iv) Rehabilitation of the environment; and
 - (v) Closure, where relevant.
- (c) A detailed description of the aspects of the activity that are covered by the draft environmental management programme;
- (d) An identification of the persons who will be responsible for the implementation of the measures contemplated in paragraph (b);
- (e) Proposed mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon;
- (f) As far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development, including, where appropriate, concurrent or progressive rehabilitation measures;
- (g) A description of the manner in which it intends to –
 - (i) Modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
 - (ii) Remedy the cause of pollution or degradation and migration of pollutants;
 - (iii) Comply with any prescribed environmental management standards or practices;
 - (iv) Comply with any applicable provisions of the Act regarding closure, where applicable;
 - (v) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;
- (h) Time periods within which the measures contemplated in the draft environmental management programme must be implemented;
- (i) The process for managing any environmental damage, pollution pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity;
- (j) An environmental awareness plan describing the manner in which –

- (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and
- (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment;
- (k) Where appropriate, closure plans, including closure objectives.

1.3 Legal requirements

Construction must be according to the best industry practices, as identified in the project documents. This EMPr, which forms an integral part of the contract documents, informs the contractor as to his 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. The Contractor should note that obligations imposed by the approved EMPr are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. 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.

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 must be complied with. The list of applicable legislation provided below is intended to serve as a guideline only and is not exhaustive:-

- The Constitution of the Republic of South Africa Act 108 of 1996
- Environment Conservation Act 73 of 1989 (ECA)
- National Environmental Management Act 107 of 1998 (NEMA)
- National Environmental Management: Protected Areas Act 57 of 2003 (NEMPA)
- National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA)
- National Water Act 36 of 1998 (NWA)
- National Road Traffic Act 93 of 1996 (NRTA)
- Conservation of Agricultural Resources Act 43 of 1983 (CARA)
- Hazardous Substances Act 15 of 1973 (HSA)
- National Heritage Resources Act 25 of 1999 (NHRA)
- Atmospheric Pollution Prevention Act 45 of 1965 (APPA)
- National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA)
- National Environmental Management: Waste Management Act 59 of 2008 (NEMWA)
- Health Act 63 of 1977 (HA)
- Occupational Health and Safety Act 85 of 1993 (OHSA)
- White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity
- All relevant provincial legislation, Municipal by-laws and ordinances.

1.4 Environmental authorisation

In accordance with the requirements of NEMA, and relevant EIA regulations made in terms of this Act and promulgated under Government Notice R326 (April 2017), and listed activities under (Government Notice R 327 and R 325), the proposed safety improvements of the R63 Section 16 was subject to Environmental Impact Assessment (EIA).

In terms of the EIA process, all reports generated from the environmental studies form part of a series of documents for the project. The EIA identified potentially significant environmental impacts and investigated potentially significant environmental issues and recommended appropriate mitigation measures.

This EMPr interprets the findings of the EIA, and prescribes project-specific specifications to be achieved. In addition to the requirements of Regulation 33 of GNR 326, this EMPr is based on the principles of Integrated Environmental Management (IEM).

2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT TEAM

1. According to APPENDIX 4 of GN R 326, an environmental management programme must include:

- (a) Details of –
- (i) The EAP who prepared the environmental management programme; and
 - (ii) The expertise of the EAP to prepare an environmental management programme, including a curriculum vitae;

Project team:

- Dr Alan Carter
- Mr Roy de Kock

CES was established in 1990 as a specialist environmental consulting company. Recently EOH Group of Companies acquired the shares in CES. EOH is the largest provider of enterprise applications, technology, outsourcing, cloud and managed services. The group is active in South Africa, Africa and the United Kingdom and has a strong Black Economic Empowerment profile. This integration will allow CES to combine EOH's great reach and reputation with CES's recognised excellence in environmental and social advisory services, thus maximising CES's strengths and comprehensive offerings in the environmental and social fields.

Dr Alan Carter. Director of the East London Office, has extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He is a member of the American Institute of Certified Public Accountants and holds a PhD in Plant Sciences. He is also a certified ISO14001 EMS auditor with the American National Standards Institute and the British Standards Institute.

Mr Roy De Kock. Roy is a Principal Consultant holding a BSc Honours in Geology and an MSc in Botany from the Nelson Mandela Metropolitan University in Port Elizabeth. His MSc thesis focused on Rehabilitation Ecology using an open-cast mine as a case study. He has been working for CES since 2010, and is based at the East London branch where he focuses on Ecological and Agricultural Assessments, Geological and Geotechnical analysis, Environmental Management Plans, mining applications and various environmental impact studies. Roy has worked on numerous projects in South Africa, Mozambique and Malawi.

3 PROPOSED ACTIVITY

According to APPENDIX 4 of GN R 326, an environmental management programme must include:

- (b) A detailed description of the aspects of the activity that are covered by the draft environmental management programme as identified by the project description;
- (c) A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;

3.1 Description of proposed activity

SANRAL is proposing the upgrading of the National Route R63 section 16 between the N6 bridge (km 1.0) and the N2 intersection approximately 5km east of Komga (km 43.63) within the Amathole District Municipality (ADM) in the Eastern Cape Province (Figure 3.1). National Route R63 Section 16 including its road reserve is owned by SANRAL (the Applicant). SANRAL require 8 mining sites to supply the necessary rock material for the proposed road construction. Four quarries and 4 borrow pits have been identified within the general Komga area within the Great Kei Municipality, Eastern Cape.

3.1.1 Site Location

The following Figure shows the location and layout of the proposed R63 Section 16 road upgrade.

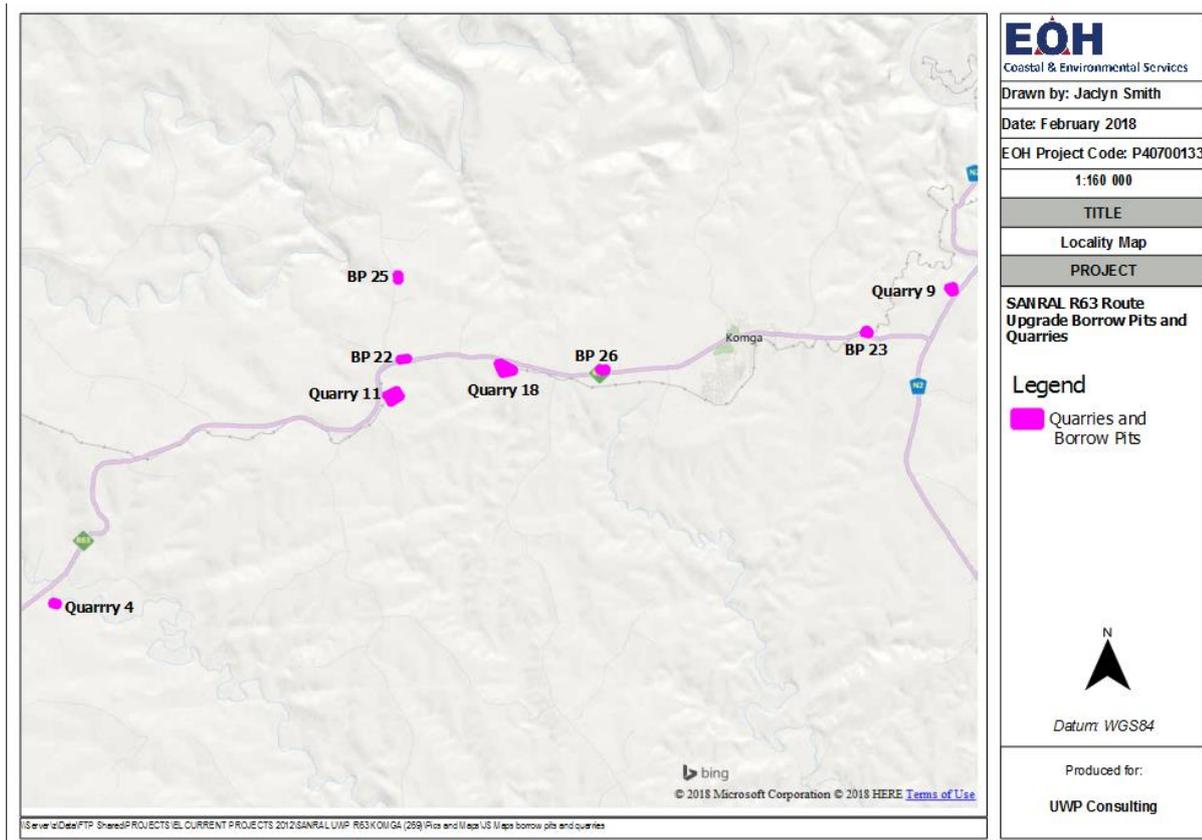


Figure 3.1: Locality map of the proposed borrow pit and quarry sites.

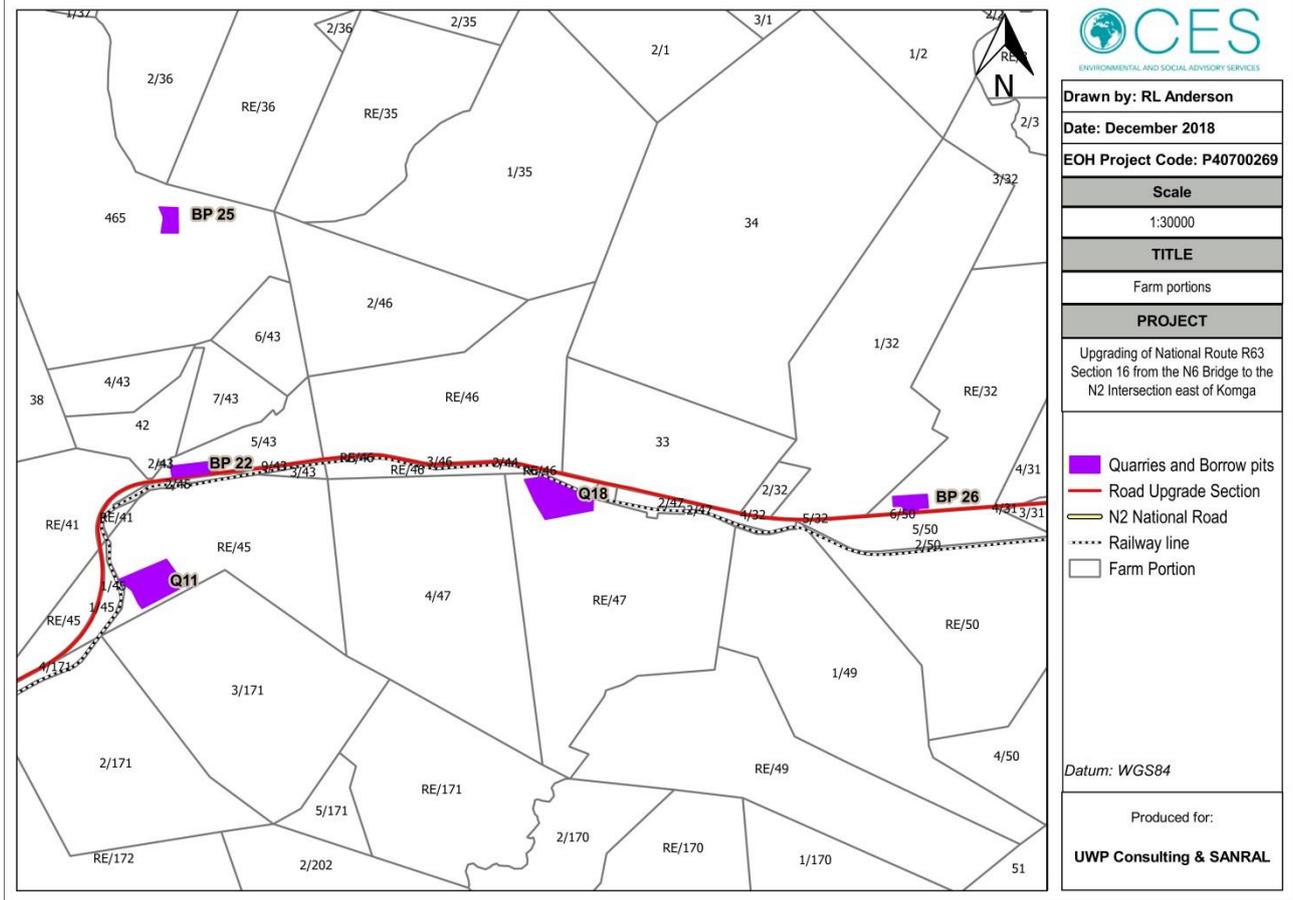


Figure 3.2: Location of the proposed R63 road upgrade in the Eastern Cape, the red line indicates the proposed upgrade.

3.1.2 Timescale for planning, construction and operation

The proposed works has been assessed to have an approximate construction period of approximately 60 months.

The proposed R63 Section 16 is expected to have an operational lifespan of 50 – 60 years during which it will require frequent maintenance.

4 SCOPE OF THE EMPr

In order to ensure a holistic approach to the management of environmental impacts during the construction and operation of the proposed substation, this EMPr sets out the methods by which proper environmental controls are to be implemented by the Contractor and all other parties involved.

The EMPr is a dynamic document subject to influences and changes as are wrought by variations to the provisions of the project specification.

4.1 Layout of the EMPr

The EMPr is divided into three phases of development. Each phase has specific issues unique to that period of the construction and operation. The impacts are identified and given a brief description. The three phases of the development are then identified as below:

4.1.1 Planning and Design Phase

This section of the EMPr provides management principles for the planning and design phase of the project. Environmental actions, procedures and responsibilities as required from SANRAL during the planning and design phase are specified. These specifications will form part of the contract documentation and therefore the Contractor will be required to comply with these specifications to the satisfaction of the Project Coordinator and Environmental Control Officer.

4.1.2 Construction Phase

This section of the EMPr provides management principles for the construction phase of the project. Environmental actions, procedures and responsibilities as required during the construction phase are specified. These specifications will form part of the contract documentation and therefore the Contractor will be required to comply with these specifications to the satisfactory of the Project Coordinator and Environmental Control Officer.

4.1.3 Operational and Maintenance Phase

This section of the EMPr provides management principles for the operation and maintenance phase of the project. Environmental actions, procedures and responsibilities as required from SANRAL during the operation and maintenance phase are specified.

5 ROLES AND RESPONSIBILITIES

According to APPENDIX 4 of GN R 982, an environmental management programme must include:

- (i) An indication of the persons who will be responsible for the implementation of the impact management actions;

5.1 South African National Roads Agency

SANRAL is the applicant and shall therefore be the entity monitoring the implementation of the EMPr and compliance with the authorisation. However, if SANRAL appoints a Contractor to implement the project and hence implement the proposed mitigation measures documented in this EMPr on their behalf, then the successful contractor's responsibilities are outlined in Section 5.2 below.

5.2 Contractor

The successful Contractor shall:

- Be responsible for the finalisation of the EMPr in terms of methodologies which are required to be implemented to achieve the environmental specifications contained herein and the relevant requirements contained in the environmental authorisation, if issued by DMR;
- Be responsible for the overall implementation of the EMPr in accordance with the requirements of SANRAL and the environmental authorisation, if issued by DMR;
- Ensure that all third parties who carry out all or part of the Contractor's obligations under the Contract comply with the requirements of this EMPr;
- Be responsible for obtaining any environmental permits which are required for the design, construction and operation of the R63 Section 16 road upgrade.
- Ensure that the appointments of the ECO and ESO are subject to the approval of SANRAL.

5.3 Environmental Site Officer

The Contractor shall appoint a nominated representative of the Contractor as the Environmental Site Officer (ESO) for the contract. The ESO will be site-based and shall be the responsible person for implementing the environmental provisions of the construction contract.

There shall be an approved ESO on the site at all times. It may be necessary to have more than one ESO.

The ESO's duties will include, inter alia, the following:

- Ensuring that all the environmental authorisations and permits required in terms of the applicable legislation have been obtained prior to construction commencing.
- Reviewing and approving construction method statements with input from the ECO and Engineer, where necessary, in order to ensure that the environmental specifications contained within the construction contract are adhered to.
- Assisting the Contractor in finding environmentally responsible solutions to problems.
- Keeping accurate and detailed records of all activities on site.
- Keeping a register of complaints on site and recording community comments and issues, and the actions taken in response to these complaints.
- Ensuring that the required actions are undertaken to mitigate the impacts resulting from non-compliance.
- Reporting all incidences of non-compliance to the ECO and Contractor.
- The ESO shall submit regular written reports to the ECO, but not less frequently than once a month.

The ESO must have:

- The ability to manage public communication and complaints;
- The ability to think holistically about the structure, functioning and performance of environmental systems; and
- The ESO must be fully conversant with the Environmental Impact Report and Environmental Management Plan for the safety improvements along the R63 Section 16 and all relevant environmental legislation.
- The ESO must have received professional training, including training in the skills necessary to be able to amicably and diplomatically deal with the public as outlined in bullet point one above.

The ECO shall be in the position to determine whether or not the ESO has adequately demonstrated his/her capabilities to carry out the tasks at hand and in a professional manner. The ECO shall therefore have the authority to instruct the contractor to replace the ESO if, in the ECO's opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the construction contract. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required and within what timeframe. The ECO shall visit the development site and in addition to the responsibilities listed in section 5.4 below, review the performance of the ESO and submit regular performance reviews to SANRAL, but not less frequently than once a month.

5.4 Environmental Control Officer

For the purposes of implementing the conditions contained herein SANRAL shall appoint an Environmental Control Officer (ECO) for the contract. The ECO shall be the responsible person for ensuring that the provisions of the EMP as well as the environmental authorisation are complied with during the construction period. The ECO will be responsible for issuing instructions to the contractor and where environmental considerations call for action to be taken. The ECO shall submit regular written reports to SANRAL, but not less frequently than once a month.

The ECO will be responsible for the monitoring, reviewing and verifying of compliance with the EMPr and conditions of the environmental authorisation by the Contractor. The ECO's duties in this regard will include, inter alia, the following:

- Confirming that all the environmental authorisations and permits required in terms of the applicable legislation have been obtained prior to construction commencing.
- Monitoring and verifying that the EMPr, Environmental Authorisation and Contract are adhered to at all times and taking action if specifications are not followed.
- Monitoring and verifying that environmental impacts are kept to a minimum.
- Reviewing and approving construction method statements with input from the ESO and Engineer, where necessary, in order to ensure that the environmental specifications contained within this EMPr and environmental authorisation are adhered to.
- Inspecting the site and surrounding areas on a regular basis regarding compliance with the EMPr, Environmental Authorisation and Contract.
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel on site.
- Ensuring that activities on site comply with all relevant environmental legislation.
- Ordering the removal of, or issuing spot fines for person/s and/or equipment not complying with the specifications of the EMPr and/or environmental authorisation.
- Undertaking a continual internal review of the EMPr and submitting any changes to SANRAL and/or DMR (in case of major changes) for review and approval.
- Checking the register of complaints kept on site and maintained by the ESO and ensuring that the correct actions are/were taken in response to these complaints.
- Checking that the required actions are/were undertaken to mitigate the impacts resulting from non-compliance.
- Reporting all incidences of non-compliance to SANRAL.

- Conducting annual environmental performance audits in respect of the activities undertaken relating to the project. The ECO shall also submit compliance audit reports to DMR, in accordance with the requirements of the environmental authorisation. Such reports shall be reviewed by SANRAL, prior to submission.
- Keeping a photographic record of progress on site from an environmental perspective. This can be conducted in conjunction with the ESO as the ESO will be the person that will be onsite at all times and can therefore take photographic records weekly. The ECO would need to check and ensure that the ESO understands the task at hand.
- Recommending additional environmental protection measures, should this be necessary.
- Providing report back on any environmental issues at site meetings.

The ECO must have:

- A good working knowledge of all relevant environmental policies, legislation, guidelines and standards;
- The ability to conduct inspections and audits and to produce thorough, readable and informative reports;
- The ability to manage public communication and complaints;
- The ability to think holistically about the structure, functioning and performance of environmental systems; and
- Proven competence in the application of the following integrated environmental management tools:
 - Environmental Impact Assessment.
 - Environmental management plans/programmes.
 - Environmental auditing.
 - Mitigation and optimisation of impacts.
 - Monitoring and evaluation of impacts.
 - Environmental Management Systems.

The ECO must be fully conversant with the Environmental Impact Assessment, Environmental Management Plan/Programme, Environmental Authorisation (if issued) for rehabilitation of the R63 Section 16 and all relevant environmental legislation.

SANRAL shall have the authority to replace the ECO if, in their opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the EMPr or this specification. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required and within what timeframe.

6 MITIGATION AND/OR MANAGEMENT MEASURES

According to APPENDIX 4 of GN R 326, an environmental management programme must include:

- (d) Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of –
- (i) Planning and design;
 - (ii) Pre-construction;
 - (iii) construction activities;
 - (iv) Rehabilitation of the environment after construction and where applicable post closure; and
 - (v) where relevant, operation activities;
- (e) a description and identification of impact outcomes required for the aspects contemplated in (d).
- (f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable include actions to –
- (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
 - (ii) Comply with any prescribed environmental management standards or practices;
 - (iii) Comply with any applicable provisions of the Act regarding closure, where applicable;
 - (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;

A variety of potential impacts are associated with the construction activities for this project. These impacts can be categorised as general construction related impacts as well as construction impacts specifically related to this site. General best practice rules to construction should be followed at all times. In addition to this the specific mitigation measures and recommendations as highlighted by the EIR and various specialists for this specific site are highlighted below.

6.1 Planning and Design Phase

RISK	MITIGATION MEASURES
Eastern Cape Biodiversity Conservation Plan (ECBCP)	<ul style="list-style-type: none"> The planning and design of the proposed mining sites must adhere to the recommendations of the ECBCP, where possible.
Amathole District Municipality (ADM) Integrated Development Plan	<ul style="list-style-type: none"> The planning and design of the mining sites associated with the National Route R63 Section 16 should be consistent with the IDP.
Great Kei Local Municipality (GKLM) SDF and IDP	<ul style="list-style-type: none"> The design of the National Route R63 Section 16 must be consistent with the Great Kei Local municipality SDF and IDP
Compliance with relevant environmental legislation and policy	<ul style="list-style-type: none"> All relevant legislation and policy must be consulted and the proponent must ensure that the project is compliant with such legislation and policy. These should include (but are not restricted to): MPRDA, NEMA, Local and District Spatial Development Frameworks, Eastern Cape Biodiversity Conservation Plan (ECBCP), Local Municipal bylaws.

RISK	MITIGATION MEASURES
Design of the mining sites	<ul style="list-style-type: none"> The mining sites must be designed by an appropriately qualified engineer.
Disturbance to the topography of the study area	<ul style="list-style-type: none"> During the planning and design phase an appropriate mining rehabilitation and closure plan must be developed.
Storm water	<ul style="list-style-type: none"> Appropriate stormwater structures must be designed and implemented. All stormwater structures must be designed in line with SANRAL and DWS requirements.
Impact on sites of archaeological and cultural significance	<ul style="list-style-type: none"> All access roads, construction activity and planned mining activities must avoid the identified heritage sites. The mitigation measures in the Heritage Impact Assessment specific to each identified sensitive site, must be considered during the planning and Design phase. Where damage to these sites is unavoidable, permits must be obtained prior to the construction phase.
Paleontological findings	<ul style="list-style-type: none"> During the planning and design phase the ECO and contractor must be made aware of potential fossil findings. They should familiarise themselves with the sort of fossils they may be found in this area.
Disturbance of sensitive areas	<ul style="list-style-type: none"> A buffer zone of 32 metres must be kept from all perennial and non-perennial rivers. No development activities may occur within this area. If any construction or mining activity takes place inside or within 32 meters of any water body, authorisation from DWS must be obtained.
Loss of endangered and protected vegetation	<ul style="list-style-type: none"> The mining area must be surveyed prior to topsoil removal in order to locate SCC and transplant them into the neighbouring undeveloped environment. A Plant Rescue & Protection Plan must be implemented and managed by a vegetation specialist familiar with the site in consultation with the appointed EM. The prescribed financial provision for rehabilitation (based on the quantum calculation for rehabilitation) must be submitted to DMR.

6.2 Construction Phase

ACTIVITY	MITIGATION MEASURES
Visual intrusion associated with the establishment of the mining sites	<ul style="list-style-type: none"> All construction activity should take place during daylight working hours (i.e. 7 – 5pm). All construction activity and equipment must be limited to the demarcated areas.
Sanitation facilities	<ul style="list-style-type: none"> Sanitation facilities must NOT be located within 50m of any water resources or water drainage areas. Sanitation facilities must be located within the mining sites footprints. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.
Demarcation of	<ul style="list-style-type: none"> The boundaries of the mining sites must be adequately demarcated to

ACTIVITY	MITIGATION MEASURES
<p>mining pit sites</p>	<p>restrict construction and other (eating, washing and ablution) activities. All plant, equipment and other materials must remain within the demarcated boundaries.</p> <ul style="list-style-type: none"> • The sites must be access controlled with a lockable gates and security monitoring movements.
<p>Socio-economic</p>	<ul style="list-style-type: none"> • No mitigation measure.
<p>Waste management</p>	<ul style="list-style-type: none"> • Ensure there are sufficient containers for collecting waste. • No waste must be buried on site. • Waste must be collected on a regular basis and disposed of at a licensed landfill site.
<p>Impact on sites of archaeological and cultural significance</p> <p>(During the construction phase sensitive heritage sites could be damaged or destroyed.)</p>	<ul style="list-style-type: none"> • If any graves/heritage features are damaged during construction then construction must stop immediately. • Any damage to heritage features must be reported to the EM, Heritage Specialist and SAHRA. • The mitigation measures in the Heritage Impact Assessment (P.12-56), specific to each identified sensitive site, must be implemented during the construction phase to avoid damage to the sensitive sites. Where damage to these sites is unavoidable, permits must be obtained prior to the construction phase.
<p>Impact on sites of archaeological and cultural significance</p> <p>(During the construction phase potential unidentified heritage features may be uncovered and damaged.)</p>	<ul style="list-style-type: none"> • If human graves are uncovered during construction then all activity must stop immediately. • The police and ECPHRA must to be notified immediately. • If any other archaeological artefacts are uncovered during construction then construction must stop and these should be reported to the EM, Heritage Specialist and SAHRA/ECPHRA immediately.
<p>Palaeontological Findings</p>	<ul style="list-style-type: none"> • The ECO and contractor for this project must be made aware of the fact that the Lower Beaufort Group sediments may contain fossil remains, albeit mostly exposed during infrastructure development. • Should important new fossil remains be exposed during construction, the contractor must report this to the ECO and ECPHRA immediately.
<p>Loss of natural vegetation</p>	<ul style="list-style-type: none"> • The construction footprint must be surveyed and demarcated prior to construction commencing to ensure that there is no unnecessary loss of natural vegetation outside the approved road upgrade footprint. • Where vegetation has been cleared, site rehabilitation in terms of soil stabilisation and revegetation must be undertaken.
<p>Rehabilitation of disturbed areas</p>	<ul style="list-style-type: none"> • All temporarily impacted areas must be rehabilitated back to their original condition. • Only topsoil from the immediate area must be used for rehabilitation. • All temporarily impacted areas must be restored as per the

ACTIVITY	MITIGATION MEASURES
Material Stockpiling	Rehabilitation Management Plan. <ul style="list-style-type: none"> • During the construction phase no construction material must be stored within 50m of a watercourse. • Stockpiles within 100m of watercourses must be monitored for erosion and mobilisation of materials towards watercourses. If this is noted by an ECO, suitable cut-off drains or berms must be placed between the stockpile area and the nearest watercourse.
Water Quality (During the construction phase, accidental contamination of wet concrete (highly alkaline) in the rivers/wetland systems could result in flash kills of macro-invertebrates and fish species in the vicinity (see Aquatic Impact Assessment).	<ul style="list-style-type: none"> • During the construction phase no concrete mixing must take place within 32 m of any river bank or wetland system. • A serviced fire extinguisher (to neutralise pH levels if a spill occurs) must be available on site in the event that wet concrete is accidentally spilled into the river. • The mitigation measures in the Aquatic Assessment (Appendix A) must be used in conjunction with this report.
Water Quality (During the construction phase, accidental chemical spills or other spills (sewage, etc.) in the vicinity of the rivers/wetlands will result in water pollution, adversely affecting the aquatic ecosystem.)	<ul style="list-style-type: none"> • During the construction phase no machinery must be parked overnight within 50 m of the rivers/wetlands. • All stationary machinery must be equipped with a drip tray to retain any oil leaks. • Chemicals used for construction must be stored safely on bunded surfaces in the construction site camp. • Emergency plans must be in place in case of spillages onto road surfaces or within water courses. • No ablution facilities should be located within 50 m of any river or wetland system. • Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution.
Impact on integrity of dams	<ul style="list-style-type: none"> • During the construction phase no stockpiles should be placed within the 50 m dam buffer. • No ablution facilities must be located within the 50 m dam buffer. • There should be no destruction of dam walls or excavation within the 50 m dam buffer.

6.3 Operational Phase

RISK	MITIGATION MEASURES
Compliance with relevant environmental legislation and policy	<ul style="list-style-type: none"> • The proponent must ensure that mining is compliant with the relevant legislation and policy. • These should include (but are not restricted to): MPRDA, NEMA, Local and District Spatial Development Frameworks, Eastern Cape Biodiversity Conservation Plan (ECBCP), Local Municipal bylaws.
Visual intrusion associated with mining activities	<ul style="list-style-type: none"> • Mining activities should only take place during normal work hours (7am to 5pm). • Mining activities must be limited to the designated areas and not encroach into surrounding areas.
Sanitation facilities	<ul style="list-style-type: none"> • Sanitation facilities must be located more than 50m from any water resources or water drainage areas. • Sanitation facilities must be located within the mining sites footprints. • The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.
Demarcation of mining sites	<ul style="list-style-type: none"> • The boundaries of the mining sites must be adequately demarcated to restrict mining and other (eating, washing and ablution) activities. All plant, equipment and other materials must remain within the demarcated boundaries. • The sites must be access controlled with a lockable gate and security monitoring movements
Storm water	<ul style="list-style-type: none"> • Water runoff must be controlled and the stormwater management plan implemented.
Spillage of hazardous substances	<ul style="list-style-type: none"> • All oils, fuel and other maintenance equipment and supplies must be stored in a secure area with a compacted surface. • Spill kits must be kept on-site and maintained and stored more than 50 m away from any water course.
Dust control	<ul style="list-style-type: none"> • During windy periods un-surfaced and un-vegetated areas should be dampened down. • Vegetation should be retained where possible as this will reduce dust travel. • Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas. • A speed limit of 30km/h must not be exceeded on dirt roads. • Any complaints or claims emanating from the lack of dust control must be attended to immediately.
Noise	<ul style="list-style-type: none"> • Drilling, blasting and movement of heavy machinery should be limited to normal working hours (7 AM to 5 PM). • Ensure there is a facility for nearby residents to make complaints. These must be addressed and recorded.

RISK	MITIGATION MEASURES
Waste management	<ul style="list-style-type: none"> • Sufficient waste containers must be available. • No waste must be buried on site. • Waste must be collected on a regular basis and disposed of at a licensed landfill site.
Socio-economic	<ul style="list-style-type: none"> • No mitigation measures.
Identification of archaeological and sites of cultural significance	<ul style="list-style-type: none"> • If human graves are uncovered during mining then all activity must stop immediately. • The police and ECPHRA must to be notified immediately. • If any other archaeological artefacts are uncovered during mining activity then mining must stop and these should be reported to the EM, Heritage Specialist and SAHRA/ECPHRA immediately.
Palaeontological Findings	<ul style="list-style-type: none"> • The ECO and contractor for this project must be made aware of the fact that the Lower Beaufort Group sediments may contain fossil remains, albeit mostly exposed during infrastructure development. • Should important new fossil remains be exposed during construction, the contractor must report this to the ECO and ECPHRA immediately.
Loss of endangered and protected vegetation	<ul style="list-style-type: none"> • All areas that will be impacted must be surveyed by a suitably qualified botanist/ecologist prior to topsoil removal in order to locate and rescue any SCC within the area and relocate them. • No SCC must be removed from site. All SCC must be relocated immediately outside of the construction and operational footprint • The contractor's staff must not poach or trap wild animals. • The contractor's staff must not harvest any natural vegetation.
Inadequate rehabilitation	<ul style="list-style-type: none"> • A Rehabilitation Management Plan must be implemented. • An Alien Removal Plan must be implemented and run during the operational phase.
Impact on surrounding fauna and flora	<ul style="list-style-type: none"> • The mining areas must be clearly demarcated/ fenced in. No mining activity must extend beyond the demarcated areas.
Stormwater management	<ul style="list-style-type: none"> • Stormwater infrastructure should be monitored post construction to ensure rivers and wetlands do not have changes in sediment levels caused by the ingress of sediment-laden stormwater.

6.4 Decommissioning Phase

RISK	MITIGATION MEASURES
Final rehabilitation and decommissioning	<ul style="list-style-type: none"> • All infrastructures, equipment, machinery and other items used during the mining period must be removed from the sites. • Waste material of any description, including receptacles, scrap, rubble and tyres, must be removed entirely from the mining area and disposed of at a recognized landfill facility. No waste must be buried or burned on the site.

RISK	MITIGATION MEASURES
	<ul style="list-style-type: none"> • The mining sites access roads, storm water control areas and any other affected areas must be rehabilitated. • The sites must be covered with locally occurring grass and shaped/ levelled correctly. • All exposed areas must be re-vegetated where possible. • Mining areas must be inspected weekly for soil stability until rehabilitation is complete. • Alien invasive plant species must be eradicated until rehabilitation is complete. • The close mining sites must pose no safety risks. • Rehabilitation must be completed in such a manner that the land can be optimally used post-mining. • Final rehabilitation must be completed within a period specified by the Regional Manager (DMR).
<p>During the decommissioning phase failure to comply with the closure requirements could result in unnecessary environmental degradation and failure to obtain a closure certificate from DMR.</p>	<ul style="list-style-type: none"> • Closure must comply with the MPRDA (Act 28 of 2002), NEMA (Act 107 of 1998) and the NEMA Regulations (2014) requirements for mine closure. • A closure plan must be compiled using the guidelines described in Appendix 5 of the NEMA Regulations (2014) and submitted to DMR. • A closure certificate must be obtained from the Minister of Mineral Resources.

7 ENVIRONMENTAL MONITORING

According to APPENDIX 4 of GN R 982, an environmental management programme must include:

- (g) The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
- (h) The frequency of monitoring the implementation of the impact management actions contemplated in (f);

7.1 General environmental monitoring

A monitoring programme will be implemented for the duration of the construction of the safety improvements along the R63 Section 16. This programme will include:

- Establishing a baseline through the taking of photographs of identified environmental aspects and potential impact sites along the routes prior to construction;
- Monthly audits will be conducted by the ECO for the remainder of the construction phase to ensure compliance to the EMPr conditions, and where necessary make recommendations for corrective action. These audits can be conducted randomly and do not require prior arrangement with the Project Coordinator; and
- Compilation of an audit report with a rating of compliance with the EMPr. The ECO shall keep a photographic record of any damage to areas outside the demarcated site and construction area. The date, time of damage, type of damage and reason for the damage shall be recorded in full to ensure the responsible party is held liable. All claims for compensation emanating from damage should be directed to the ECO for appraisal. The Contractor shall be held liable for all unnecessary damage to the environment. A register shall be kept of all complaints from the Landowner or community. All complaints / claims shall be handled immediately to ensure timeous rectification / payment by the responsible party.

8 ENVIRONMENTAL AWARENESS

According to APPENDIX 4 of GN R 326, an environmental management programme must include:

- (m) An environmental awareness plan describing the manner in which –
- (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and
 - (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment.

Contractors shall ensure that its employees and any third party who carries out all or part of the Contractor's obligations are adequately trained with regard to the implementation of the EMPr, as well as regarding environmental legal requirements and obligations. Training shall be conducted by the ECO where necessary.

Environment and health awareness training programmes should be targeted at three distinct levels of employment, i.e. the executive, middle management and labour. Environmental awareness training programmes shall contain the following information:

- The names, positions and responsibilities of personnel to be trained;
- The framework for appropriate training plans;
- The summarised content of each training course; and
- A schedule for the presentation of the training courses.

The ECO shall ensure that records of all training interventions are kept in accordance with the record keeping and documenting control requirements as set out in this EMPr. The training records shall verify each of the targeted personnel's training experience.

The Developer shall ensure that adequate environmental training takes place. All employees shall be given an induction presentation on environmental awareness and the content of the EMPr. The presentation needs to be conducted in the language of the employees to ensure it is understood. The environmental training shall, as a minimum, include the following:

- The importance of conformance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Agency's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities;
- Environmental legal requirements and obligations;
- Details regarding floral/faunal species of special concern and protected species, and the procedures to be followed should these be encountered during the construction of the bridge, main access roads, approach roads or construction camps;
- The importance of not littering;
- The importance of using supplied toilet facilities;
- 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; and
- Details regarding archaeological and/or historical sites which may be unearthed during construction and the procedures to be followed should these be encountered.

Recommended Environmental Education Material is provided in Appendix 1

8.1 Monitoring of environmental training

The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed. If necessary, the ECO and / or a translator should be called to the site to further explain aspects of environmental or social behaviour that are unclear. Toolbox talks are recommended.

9 COMPLIANCE WITH THE EMPr

According to APPENDIX 4 of GN R 326, an environmental management programme must include:

- (j) The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
- (k) The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);

A copy of the EMPr must be kept on site at all times during the construction period. The EMPr will be binding on all contractors operating on the site and must be included within the Contractual Clauses.

It should be noted that in terms of the National Environmental Management Act No 107 of 1998 (Section 28) those responsible for environmental damage must pay the repair costs both to the environment and human health and the preventative measures to reduce or prevent further pollution and/or environmental damage (The 'polluter pays' principle).

9.1 Non-compliance

The contractors shall act immediately when notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints.

Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as it deems fit.

The Contractor is deemed not to have complied with the EMPr if, *inter alia*:

- there is evidence of contravention of the EMPr specifications within the boundaries of the construction site, site extensions and roads;
- there is contravention of the EMPr specifications which relate to activities outside the boundaries of the construction site;
- environmental damage ensues due to negligence;
- construction activities take place outside the defined boundaries of the site; and/or
- the Contractor fails to comply with corrective or other instructions issued by the Engineer within a specific time period.

It is recommended that the engineers/contractors institute penalties for the following less serious violations and any others determined during the course of work as detailed below:

- Littering on site;
- Lighting of illegal fires on site;
- Persistent or un-repaired fuel and oil leaks;
- Any persons, vehicles or equipment related to the Contractor's operations found within the designated "no-go" areas;
- Excess dust or excess noise emanating from site;
- Possession or use of intoxicating substances on site;
- Any vehicles being driven in excess of designated speed limits;
- Removal and/or damage to fauna, flora or cultural or heritage objects on site; and
- Urination and defecation anywhere except at designated facilities.

9.2 Emergency preparedness

The Contractor shall compile and maintain environmental emergency procedures to ensure that there will be an appropriate response to unexpected or accidental actions or incidents that will cause environmental impacts, throughout the construction period. Such activities may include, *inter alia*:

- Accidental discharges to water and land;
- Accidental exposure of employees to hazardous substances;
- Accidental fires;
- Accidental spillage of hazardous substances;
- Accidental toxic emissions into the air; and
- Specific environmental and ecosystem effects from accidental releases or incidents.

These plans shall include:

- Emergency organisation (manpower) and responsibilities, accountability and liability;
- A list of key personnel and contact details;
- Details of emergency services available (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; and
- Training plans, testing exercises and schedules for effectiveness.

The Contractor shall comply with the emergency preparedness and incident and accident-reporting requirements, as required by the Occupational Health and Safety Act, 1993 (Act No 85 of 1993), the NEMA, 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.

9.3 Incident reporting and remedy

If a leakage or spillage of hazardous substances occurs on site, the local emergency services must be immediately notified of the incident. The following information must be provided:

- the location;
- the nature of the load;
- the extent of the impact; and
- the status at the site of the accident itself (i.e. whether further leakage is still taking place, whether the vehicle or the load is on fire).

Written records must be kept on the corrective and remedial measures decided upon and the progress achieved therewith over time. Such progress reporting is important for monitoring and auditing purposes. The written reports may be used for training purposes in an effort to prevent similar future occurrences.

9.4 Penalties

Where environmental damage is caused or a pollution incident, and/or failure to comply with any of the environmental specifications contained in the EMPr, the developer and/or contractor shall be liable.

The following violations, and any others determined during the course of work, should be penalised:

- Hazardous chemical/oil spill and/or dumping in non-approved sites;
- Damage to sensitive environments;
- Damage to cultural and historical sites;
- Unauthorised removal/damage to indigenous trees and other vegetation, particularly in identified sensitive areas;
- Uncontrolled/unmanaged erosion;
- Unauthorised blasting activities (if applicable);
- Pollution of water sources; and
- Unnecessary removal or damage to trees.

10 CLOSURE PLANNING

According to regulation 33 of GN R 543, an environmental management programme must include:

(k) where appropriate, closure plans, including closure objectives.

Final site cleaning - the contractor shall clear and clean the site and ensure that everything not forming part of the permanent works is removed from site before issuing the completion certificate or as otherwise agreed.

Rehabilitation - the contractor (landscape architect/horticulturist) shall be responsible for rehabilitating and re-vegetation of all areas disturbed/areas earmarked for conservation during construction to the satisfaction of the engineer and ECO.

10.1 Post-Construction environmental audit

A post-construction environmental audit must be carried out and submitted to DMR at the expense of the developer so as to fulfil conditions of the Environmental Authorisation granted. Objectives should be to audit compliances with the key components of the EMPr, to identify main areas requiring attention and recommend priority actions. The audit should be undertaken annually and should cover a cross section of issues, including implementation of environmental controls, environmental management and environmental monitoring.

Results of the audits should inform changes required to the specifications of the EMPr or additional specifications to deal with any environmental issues which arise on site and have not been dealt with in the current document.

10.2 Management review and revision of the EMPr

The EMPr is to be reviewed annually for the first three years and then once every five years thereafter, by an independent environmental consultant, unless otherwise specified by the authorities. The auditor is to highlight issues to be addressed in the EMPr or changes required during the annual audit. These points are to be included as an annexure to the EMPr and to be considered during the review process. Recommended changes to the EMPr must be forwarded to DMR for approval and comment, before subsequently being incorporated into the EMPr.

10.3 General review of EMPr

The EMPr will be reviewed by the ECO on an on-going basis. Based on observations during site inspections and issues raised at site meetings, the ECO will determine whether any procedures require modification to improve the efficiency and applicability of the EMPr on site.

Any such changes or updates will be registered in the ECO's record, as well as being included as an annexure to this document. Annexure of this nature must be distributed to all relevant parties.

11 REPORTING

11.1 Administration

Before the contractor begins each construction activity, the Contractor shall give to the ECO and engineer a written method statement setting out the following:

- The type of construction activity;
- Locality where the activity will take place;
- Identification of impacts that might result from the activity;
- Identification of activities or aspects that may cause an impact;
- Methodology and/or specifications for impact prevention for each activity or aspect;
- Methodology and/or specifications for impact containment for each activity or aspect;
- Emergency/disaster incident and reaction procedures; and
- Treatment and continued maintenance of impacted environment.

The contractor may provide such information in advance of any or all construction activities provided that new submissions shall be given to the ECO and/or engineer whenever there is a change or variation to the original.

The ECO and/or engineer may provide comment on the methodology and procedures proposed by the Contractor but he shall not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the contractor shall demonstrate at inception and at least once during the contract that the approved measures and procedures function properly.

11.2 Good housekeeping

The contractor shall undertake "good housekeeping" practices during construction. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods that leaves production in a safe state from the ravages of weather to include the care for and preservation of the environment within which the site is situated.

11.3 Record keeping

The engineer and the ECO will continuously monitor the contractor's adherence to the approved impact prevention procedures and the engineer shall issue to the contractor a notice of non-compliance whenever transgressions are observed. The ECO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the engineer in the monthly report. These reports shall be made available to when requested.

The Contractor shall ensure that an electronic filing system identifying all documentation related to the EMP is established.

A list of reports likely to be generated during all phases of R63 Section 16 Project is provided below, and all applicable documentation must be included in the environmental filing system catalogue or document retrieval index.

- Final Draft Environmental Impact Report;
- 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;

- Daily, weekly and monthly site monitoring reports;
- Complaints register;
- Medical reports;
- Training manual;
- Training attendance registers;
- Incident and accident reports;
- Emergency preparedness and response plans;
- Copies of all relevant environmental legislation;
- Permits and legal documents, including letters authorising specific personnel of their duties as part of emergency preparedness teams e.g. fire teams, etc.;
- Crisis communication manual;
- Disciplinary procedures;
- Monthly site meeting minutes during construction;
- All relevant permits;
- Environmental Authorisation on the EIA from the DMR; and
- All method statements from the Contractor for all phases of the project.

11.4 Document control

The Contractor and resident engineer shall be responsible for establishing a procedure for electronic document control. The document control procedure should comply with the following requirements:

- Documents must be identifiable by organisation, division, function, activity and contact person;
- Every document should identify the personnel and their positions, who drafted and compiled the document, who reviewed and recommended approval, and who finally approved the document for distribution; and
- All documents should be dated, provided with a revision number and reference number, filed systematically, and retained for a five year period.

The Contractor shall ensure that documents are periodically reviewed and revised, where necessary, and that current versions are available at all locations where operations essential to the functioning of the EMPr are performed. All documents shall be made available to the independent external auditor.

12 CONCLUSIONS

Although all foreseeable actions and potential mitigations or management actions are contained in this document, the EMPr should be seen as a day-to-day management document. The EMPr thus sets out the environmental and social standards, which would be required to minimise the negative impacts and maximise the positive benefits of the R63 Section 16 road upgrade as detailed in the BAR and specialist reports. The EMPr could thus change daily, and if managed correctly lead to successful construction and operational phases.

Further guidance should also be taken for any conditions contained in the Environmental Authorisation, if the project is granted approval, and that these DMR conditions must be incorporated into the final EMPr.

All attempts should be made to have this EMPr available, as part of any tender documentation, so that the engineers and contractors are made aware of the potential cost and timing implications needed to fulfil the implementation of the EMPr, thus adequately costing for these.