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icebo environment consultants

**Environmental Management Programme (EMPr) for the upgrade of Nyanda gravel road which will include installation of culverts and stormwater drainage systems at Nyanda rural area, within Abaqulusi Local Municipality**

A project of ABAQULUSI local municipality

16 April 2013

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**TERMS AND ABBREVIATIONS**

DWA -Department of Water Affairs

DAEA&RD -Department of Agriculture and Environmental Affairs & Rural Development

EMP - Environmental Management Programme

ECO - Environmental Control Officer

# introduction

## Purpose

In terms of The Constitution of the Republic of South Africa (Act No. 108 of 1996) everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for benefit of present and future generations, though reasonable legislation and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while prompting justifiable economic and social development. The needs of the environment as well as affected parties should thus be integrated into overall project management. The Environmental Management Plan (EMP) provides a tool for meeting this objective. It also ensures that management of construction activities meets the requirements of existing environmental legislation.

## Project Proponent

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| --- | --- |
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## Objectives of the EMP

The objective of this document is to:

* Encourage good management practices through planning and commitment to environmental issues;
* Define how the management of the environment is reported and performance evaluated;
* Provide rational and practical environmental guidelines to:
* Minimise disturbance of the natural environment;
* Prevent or minimise all forms of pollution;
* Protect indigenous flora and fauna;
* Prevent soil erosion and facilitate re-vegetation of affected areas;
* Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment; and
* Adopt the best practical means available to prevent or minimise adverse environmental impacts.
* Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;
* Describe all monitoring procedures required to identify impacts on the environment; and
* Train employees and contractors with regard to their environmental obligations.

## Sensitive Area’s

The development will have a minimum negative impact on the environment provided sensitive areas are respected and correct construction procedures are followed. The most obviously sensitive feature is the stream running through the site and the stream is inundated during periods of high rainfall or river flow. They are lentic (slow moving) systems with many different characteristics between different floodplains. If construction is not monitored closely and best practices employed, the stream could be subjected to negative impacts. Care must be taken however when installing headwalls and working on the road itself; not to contaminate the stream. If hazardous substances (any substance that poses a significant risk to health and safety, property or the environment) are to be used, measures must be taken to mitigate potential spills and contamination.

 The primary sensitive area relating to this particular development is the stream beneath the culvert proposed. Any work in and around natural water bodies must be considered to be potentially negative and cautionary practices should be employed. The secondary sensitive areas are the, communal taps in the area, the households along the roads, Eskom power lines, soil and limited disturbed grasslands on either side of the river. The footprint created by construction activities must be kept to a minimum wherever possible so that the above areas are not negatively impacted.

# legislation requirements

This EMPr, which forms an integral part of the contract documents, informs the contractor as to his / her 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 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 will prevail.

It is expected that the contractor is conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract. Some of the environmental legislation applicable to the construction, upgrading and resealing of roads include, but are not limited to, the following legislation:

* Constitution of South Africa (Act No 108 of 1996)
* Environmental Conservation Act, 1989 (Act 73 of 1989);
* Hazardous Substances Act (Act No 15 of 1973)
* National Environmental Management: Biodiversity Act (Act No 10 of 2004);
* National Environmental Management Act, 1998 (Act No. 107 of 1998);
* Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965);
* National Environmental Management: Air Quality Act (Act 39 of 2004);
* The National Water Act, 1998 (Act 36 of 1998);
* The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983);
* National Environmental Management: Protected Areas Act 57 of 2003;
* National Building Regulations and Building Standards Act (Act 103 of 1977)

# functions and responsibilities

Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the Project Proponent, Project Manager, Site Manager/Engineer and Contractor/Operator are as detailed below.

## The Project Proponent / Project Manager

* Ensure that the Site Manager/Engineer and the Contractor/Operator are aware of all specifications, legal constraints, standards and procedures pertaining to the project specifically with regard to the environment;
* Ensure that all stipulations within the EMP are communicated and adhered to by Site Manager/Engineer and the Contractor/Operator;
* Monitor the implementation of the EMP throughout the project by means of regular site visits and meetings; and
* Order the removal of any person(s) and/or equipment in contravention of the specifications of the EMP.

The Project Manager should be fully conversant with the Basic Assessment Report (BAR) for the project, the EMPr for the project, as well as all applicable environmental legislation (see Section 2 for list of potential applicable legislation).

## The Site Manager/ Engineer

* Be fully conversant with the BAR;
* Be fully conversant with the EMPr;
* Be fully conversant with all environmental legislation and ensure compliance (see Section 2);
* Have overall responsibility for the implementation of the EMPr;
* Liaise with the Project Manager and Contractor/Operator on matters concerning the environment;
* Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution on the site;
* Implement remedial measures in the event of pollution incidents or environmental impacts;
* Monitor and verify that environmental impacts are kept to a minimum;
* Review and approve construction methods where necessary; and
* Order the removal of any person(s) and/or equipment in contravention of the specifications of the EMPr.

## The Contractor

* Be fully conversant with the BAR;
* Be fully conversant with the EMPr;
* Be fully conversant with all environmental legislation and ensure compliance (see Section 2);
* Ensure that all the environmental specifications contained within this EMP are adhered on the site;
* Regularly liaise with the Site Manger on matters relating to the environment; and
* Confine activities to the demarcated construction site.

The above responsibilities listed for the Contractor will also apply to any appointed sub-consultants.

## The Environmental Control Officer (ECO) will:

* Be fully conversant with the BAR;
* Be fully conversant with the EMPr;
* Be fully conversant with all environmental legislation and ensure compliance
* Ensure that all the environmental specifications contained within this EMP are adhered on the site;
* Regularly liaise with the Site Manger on matters relating to the environment; and
* Compile monthly reports as to the progress of the construction phases and report to all parties involved (Site Manager, Project Proponent).

# environmental management PROGRAMME

This section indicates the actions required to either prevent and/or minimise the potential impacts on the environmental that is associated with the road upgrade and Construction Camp.

**Environmental Aspect**

This section highlights the various aspects associated with the project i.e. the Contractor’s activities that will interact with the environment. These aspects are required according the EMPr guidelines stipulated by DAEA&RD.

**Environmental Measures and Action Plans**

This section indicates the actions required to either prevent and/or minimise the potential impacts on the environmental that is associated with the road upgrade and Construction Camp.

**RESPONSIBILITY**

This section indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr.

**Priority**

This section indicates when the actions for that specific aspect must be implemented and/or monitored.

Table 1: Environmental Management Programme

| **ENVIRONMENTAL ASPECTS** | **ENVIRONMENTAL MEASURES AND ACTION PLANS** | **AREA APPLICABLE** | **PRIORITY** |
| --- | --- | --- | --- |
| Administration Requirements |
| Environmental Awareness, Roles and Responsibilities for Environmental Management | Appointed ContractorThe overall responsibility for the environmental management and cost associated with the implementation of the EMP lies with the appointed Contractor. | Client | Prior to, during and after construction |
|  | The Contractor must ensure that all permanent and temporary staff, sub-contractors and suppliers adhere to the EMP. | Contractor | During Construction |
|  | The Contractor must appoint a senior staff member directly involved in the construction activities as the Environmental Control Officer (ECO). | Contractor | Prior to Construction |
|  | **Environmental Control Officer (ECO)**The nomination of the ECO must be given, in writing, at least fourteen days before the start of any work, clearly setting out reasons for the nomination, and with sufficient detail to enable the Contractor to make a decision. The contractor will, within seven days of receiving the request, approve, reject or call for more information on the nomination. Once a nominated representative of the contractor has been approved he/she will be the ECO and will be the responsible person for ensuring: | Contractor | Prior to Construction |
|  | The on site implementation of the EMP. | ECO | During Construction |
|  | * Daily/weekly/monthly monitoring of activities to ensure compliance with the EMP
 | ECO | During Construction |
|  | * Ensuring environmental awareness among members of the workforce.
 | ECO | During Construction |
|  | * Ensuring that the contractor/s and members of the construction workforce are aware of the requirements of the EMP.
 | ECO | During Construction |
|  | * Implementing preventative and corrective actions in accordance with the requirements of the EMP and outcomes of environmental audits.
 | ECO | During Construction |
|  | * Reporting of environmental incidents that may occur on site in accordance with the requirements of the EMP and environmental legislation.
 |  |  |
|  | **Contractors, Sub-contractors, Suppliers and Employees**All contractors, sub-contractors, suppliers and employees must adhere to the EMP at all times. | ECO | During Construction |
|  | Provide evidence to the ECO that the EMP is being implemented and adhered to (either through inspections sheets or audit reports). | Contractor | During Construction |
| Environmental Training and Induction | In terms of section 2(h) and (j) of the National Environmental Management Act (No. 107 of 1998), the Contractor has the responsibility to ensure all personnel involved in the project are aware of, and familiar with, the EMP, the key environmental issues and consequences of non-compliance to the EMP. | Contractor | Prior to and During Construction |
|  | The EMP forms part of the formal site induction for all contractors, sub-contractors and casual labourers, preferably in their native language. The induction training will, 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 Consultant’s environmental management systems, including emergency preparedness and response requirements; and − The mitigation measures required to be implemented when carrying out their work activities.\_ The potential consequences of departure from specified operating procedures. | Client | Prior to and During construction |
|  | All contractors, sub-contractors and casual labourers must acknowledge their understanding of the EMP and environmental responsibilities by signing an induction attendance record. | Client | Prior to Construction |
| Environmental Awareness | An Environmental Awareness programme shall be implemented for all site personnel describing the key environmental issues and potential impacts thereof. | ECO | During Construction |
| Layout and Site Establishment (Construction Camp) |
| Site establishment | The site selected for the Construction Camp, should ensure potential impacts on the biophysical environment are kept to a minimum. | Contractor | Prior to Construction |
|  | The area to be disturbed for the developments of the Construction Camp, and access roads is to be kept to a minimum, only big enough to carry out the necessary activities. | Contractor | Prior to Construction |
|  | The size of the construction camp should be minimized (especially where natural vegetation or grassland has had to be cleared for its construction) | Contractor | Prior to Construction |
|  | Planning of development on terrain steeper than 1 vertical: 3 horizontal (>18) is not recommended. | Contractor | Prior to Construction |
|  | Any slopes where seepage activity develops may require the provision of suitable subsoil drainage controls as integral aspects of the proposed development. | Contractor | During Construction |
|  | The Construction Camp must be defined and fenced off and limited to authorised Contractors only. All activities must remain confined to the Construction Camp.  |  Contractor | Prior to Construction |
|  | Vegetation removed for the site establishment is to be kept to a minimum. No trees are to be removed, if possible, with the exception of alien weeds and invader plants. |  Contractor | Prior to and running construction |
|  | No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner. | Contractor | During Construction |
|  | The construction camp is to be located a minimum horizontal distance of 200m from any watercourse, above the 1:50 year flood line and away from the wetland habitat and silted dam located on site. |  Contractor | Prior to and running construction |
|  | The Construction Camp should be kept in an orderly state at all times. | Contractor | During Construction |
| Fires | Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break must be cleared around the perimeter of the Construction Camp. | Contractor | During Construction |
|  | No open fires or uncontrolled fires will be permitted on site. | Contractor | During Construction |
|  | Fire fighting measures such as fire extinguishers must be located on site. | Contractor | During Construction |
|  | The workforce must be made aware of fire prevention and fire fighting measures. | Contractor | During Construction |
|  | Lighting and noise disturbance or any other form of disturbance that may have an effect on the landowner/tenant/persons lawfully living in the vicinity must be kept to a minimum. | Contractor | During Construction |
| Sanitation | Sufficient ablution facilities are to be constructed and linked into the existing water bourne sewage system. | Contractor | Prior to Construction |
|  | In cases where facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance should be adhered to. | Contractor | Prior to and during Construction |
|  | Chemical toilet facilities or other approved toilet facilities such as a septic drain must be away from any wetland and must not be within the 1:100 year floodline of the river. | Contractor | Prior to and During Construction |
|  | All effluent water from the Construction Camp washing facility must be disposed of in a properly constructed french drain, situated as far as possible, but not less than 200 m from any stream, river, pan.  | Contractor | During Construction |
|  | Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container at a collecting point and collected on a regular basis and disposed of at a recognised disposal facility. Specific precautions must be taken to prevent refuse from being dumped on or in the vicinity of the site. | Contractor | During Construction |
|  | Biodegradable refuse generated from the construction camp and storage area or any other area must either be handled as indicated above or be buried in a pit excavated for that purpose and covered with layers of soil, incorporating a final 0.5 metres thick layer of topsoil (where practicable). Provision should be made for future subsidence of the covering. Local authorisation must be obtained before any refuse is allowed to be buried. Another options is sending this waste to the local municipal waste site. | Contractor | During construction |
| Closure | Where a Construction Camp has been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface must be ripped and vegetated. | Contractor | After Construction |
|  | Areas containing french drains must be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface. | Contractor | After Construction |
|  | The site must be seeded with a vegetation seed mix adapted to reflect the local indigenous flora. | Contractor | After Construction |
|  | If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the contractor may require that the soil be analyzed and any deleterious effects on the soil arising from the construction be corrected and the area be seeded with a vegetation seed mix to his or her specification. | Contractor | After Construction |
|  | Photographs of the Construction Camp, and Road sites, before and during the operation and after rehabilitation, must be taken at selected fixed points and kept on record for the information of the Construction. | Contractor | Prior to, during and after construction |
| Site Access |
|  | The site access route must be selected based on the minimum number of bushes or trees that are felled and existing fence lines should be followed as far as possible. | Contractor | Prior to Construction |
|  | Water courses and steep gradients should be avoided as far as possible. | Contractor | Prior to and during construction |
|  | Adequate drainage and erosion protection in the form of cut-off berms or trenches must be provided around the sites and where necessary. | Contractor | Prior to and during construction |
|  | The liberation of dust into the surrounding environment must be effectively controlled by the use of water spraying and/or other dust-allaying agents. The speed of haul trucks and other vehicles must be strictly controlled to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used. | Contractor | During Construction |
| Vehicle Maintenance Yard and Secured Storage Areas |
|  | The vehicle maintenance yard and secured storage area will be above the 1 in 5 year flood level mark within the boundaries of the Construction Camp. | Contractor | Prior to Construction |
|  | The area chosen for these purposes must be the minimum required and involve the least disturbance to trees and plant life. Topsoil must be handled as described in section 4.7 below. | Contractor | During Construction |
|  | The storage area must be securely fenced and all hazardous substances such as fuel, oils, chemicals, etc., must be stored therein. Drip trays, a thin concrete slab or a facility with PVC lining, must be installed in such storage areas with a view to prevent soil and water pollution. | Contractor | Prior to and During Construction |
|  | The location of both the vehicle maintenance yard and the storage areas are to be indicated on the layout plan determined by the Contractor. | Contractor | Prior to Construction |
|  | No vehicle may be extensively repaired in any place other than in the maintenance yard. | Contractor | During Construction |
|  | The maintenance of vehicles and equipment used for any purpose during the operation will take place only in the maintenance yard area within the construction camp. | Contractor | During Construction |
|  | Equipment used for excavations and construction of the road must be adequately maintained so that during operations there is no spillage of oil, diesel, fuel, or hydraulic fluid on the ground or in the River.  | Contractor | During Construction |
|  | Machinery or equipment used on site must not constitute a pollution hazard in respect of the above substances. The Constructor must order such equipment to be repaired or withdrawn from use if they consider the equipment or machinery to be polluting and irreparable. | Contractor | During Construction |
|  | Suitably covered receptacles must be available at all times and conveniently placed for the disposal of waste. All used oils, grease or hydraulic fluids must be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a registered or licensed disposal facility. | Contractor | During Construction |
|  | All spills should be cleaned up immediately to the satisfaction of the Contractor by removing the spillage together with the polluted soil and by disposing of them at a recognised Hazardous Waste facility. | Contractor | During Construction |
|  | On completion of all operations, the areas must be cleared of any contaminated soil, which must be handled as referred to in section. | Contractor | After Construction |
|  | All buildings, structures or objects in the vehicle maintenance yard and secured storage areas must be dealt with removed according to the relevant legislated procedures.  | Contractor | After Construction |
|  | The construction camp area and access road surfaces must then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent the site, must be spread evenly to its original depth over the whole area. The area must then be fertilised if necessary (based on a soil analysis) and revegetated. | Contractor | After construction |
| Pollution Control Measures |
|  | Material Safety Data Sheets (MSDS) for on site chemicals, hydrocarbon materials and / or waste and hazardous substances must be readily available. MSDS’s should include information pertaining to environmental impacts and measures to minimise and mitigate against any potential environmental impacts which may result from a spill. | Contractor | During Construction |
|  | The Contractor should prepare a method statement and plans for the storage of hazardous substances and emergency procedure. | Contractor | Prior to and During Construction |
|  | Static tanks containing fuel, oil, grease or bituminous material should be confined to specific secure areas. | Contractor | During Construction |
|  | These containment facilities should be checked and maintained at all times. | Contractor | During Construction |
|  | Provide proper warning signage to make people aware of the activities within the designated areas. |  |  |
|  | In the event of rain, water collected within these containment facilities, can be released if not contaminated. If the contents of containment facilities are contaminated the material should be removed and disposed of as hazardous waste. | Contractor | During Construction |
|  | In the case of a spill of hydrocarbons, chemicals or bituminous material in the Construction camp or on the construction site, the spill should to be contained and the material together with any contaminated soil collected and disposed of as hazardous waste. | Contractor | During Construction |
|  | Should a pollution incident occur on site the ECO must:* Implement reasonable measures immediately to contain and minimise the impacts of the incident;
* Notify all persons whose health may be affected by the incident;
* Undertake clean up procedures immediately;
* Notify the Contractor of the incident immediately who will advise the employee as to the measures that should be implemented;
* Record the incident in the Environmental Incident Register; and
* Implement measures to prevent similar incidents from occurring in the future.
 | Contractor | During Construction |
|  | Spills should be cleaned up immediately to the satisfaction of the Contractor by removing the spillage together with the polluted soil and by disposing of it at a recognised facility. | Contractor | During Construction |
|  | Soil and construction material stockpiles are to be bermed to prevent leachate and polluted run-off water from leaving the Construction Camp. | Contractor | During Construction |
|  | Concrete mixing must be confined to as few areas as possible and ad hoc mixing is to be avoided. Areas where concrete was mixed must be cleaned up after use. Concrete mixing is to be undertaken on an impervious surface and any run-off contained. | Contractor | During Construction |
|  | A security officer should be on duty at the Construction Camp after hours and over weekends, in order to prevent unauthorised people from entering and tampering with equipment and materials. | Contractor | During Construction |
| Solid Waste Management |
| General Waste | General waste produced on site includes:* Office waste (e.g. food, waste, paper, plastic);
* Operational waste (clean steel, wood, glass); and
* General domestic waste (food, cardboards, paper, bottles, tins).
 | Contractor | During Construction |
|  | An adequate number of general waste receptacles must be arranged around the Construction Camp, on site to collect all domestic refuse, and to minimise littering. | Contractor | During Construction |
|  | Bins should be clearly marked and lined for efficient control and safe disposal of waste. | Contractor | During Construction |
|  | Different waste bins, for different waste streams must be provided to ensure correct waste separation. | Contractor | During Construction |
|  | General waste produced on site is to be collected in skips for disposal at the local municipal waste site. Hazardous waste in not to be mixed or combined with general waste earmarked for disposal at the municipal landfill site. | Contractor | During Construction |
|  | No general waste is to be disposed of at the spoil area. | Contractor | During Construction |
|  | Under no circumstances is waste to be burnt or buried on site. | Contractor | During Construction |
|  | Waste bins should be cleaned out on a regular basis to prevent any windblown waste and/or visual disturbance. | Contractor | During Construction |
|  | All general waste must be removed from the construction areas on a daily basis and disposed of in suitable waste receptacles at the Construction Camp. | Contractor | During Construction |
| Hazardous waste | Hazardous waste produced on site includes:* Oil and other lubricants, diesel, paints, solvent;
* Containers that contained chemicals, oils or greases; and
* Equipment, steel, other material (rags), soils, gravel and water contaminated by hazardous substances (oil, fuel, grease, chemicals or bitumen).
 | Contractor | During Construction |
|  | Hazardous waste is to be disposed at a Permitted Hazardous Waste Landfill Site. The ECO must identify an approved waste disposal site at the inception of the project. | Contractor | During Construction |
|  | Hazardous waste bins must be clearly marked, stored in a contained area (or have a drip tray) and covered (either stored under a roof or the top of the container must be covered with a lid). | Contractor | During Construction |
|  | A hazardous waste disposal certificate must be obtained from the waste removal company as evidence of correct disposal. | Contractor | During Construction |
|  | It may be feasible for the waste to be transported to a central point where it can be collected in bulk by the waste disposal company. It should however be noted that:* Transport of hazardous materials must be done in accordance with legislative control; and
* Relevant SABS Codes of Practice should be adhered to.
 | Contractor | During Construction |
| Industrial waste | The industrial waste must be stored in skips and taken to a hazardous landfill site. Safe disposal certificates must be provided for this. | Contractor | During construction |
| Wastewater | All waste water generated at the proposed Development must be disposed off in a suitable manner so as not to cause any surface or sub surface water pollution or health hazard. Waste water including cement-contaminated water shall not enter any water course and shall be managed by the site manager to ensure that the existing water resources on and of site are not polluted by activities emanating from the above development. | Contractor | Prior and during construction |
|  | Contaminated wastewater including cement-contaminated water shall not enter any watercourse and shall be managed by the site manager to ensure that the existing water resources on and of site are not polluted by activities emanating from the above development i.e. uMvoti River. | Contractor | Prior and during construction |
| Spoil and Topsoil and Erosion |  |  |
| Topsoil | Topsoil removed from roadsides and Construction Camps must be stockpiled in a designated area. This area must be established in accordance with pollution control measures set out in this EMP. | Contractor | During Construction |
|  | The removed topsoil must be stored in a bund wall on the high ground side of the construction camp area outside the 1:50 year flood level. | Contractor |  |
|  | Topsoil must be kept separate from overburden and must not be used for building or maintenance of access roads | Contractor | During Construction |
|  | The developer must exercise suitable precautions with the storage, handling and transport of all materials that could adversely affect the environment. If pollution of any surface or groundwater occurs, it shall immediately be reported to this Department and appropriate mitigation measures must be employed. | Contractor | During Construction |
| Spoil | Spoil site should not be located within the 1:50 year flood line. | Contractor | During construction |
|  | Litter and general waste is to be removed from the soil and spoiling before stockpiling. | Contractor | During construction |
|  | Spoil sites will be shaped to fit the natural topography.  | Contractor | After construction |
|  | Spoil sites must receive a minimum of 75mm topsoil and be grassed with the recommended seed mixture. | Contractor | After construction |
|  | Removal polluted topsoil should be transported to a licensed landfill site. |  |  |
| Soil Erosion | Soil erosion on site must be prevented at all times, i.e. pre, during and post construction activities. Suitable erosion control measures must be implemented in areas sensitive to erosion such as near water supply points and edges of slopes. These measures could include: * The suitable use of sand bags or Hessian sheets.
* The prompt rehabilitation of exposed soil areas with indigenous vegetation to ensure that soil is protected from the elements.
* The removal of vegetation, only as it becomes necessary for work to proceed.
* Preventing the unnecessary removal of vegetation especially on steep areas. Taking necessary precautions in terms of design and construction and earthworks, cuts and fills must be taken.

Constant cognisance of the inherent high erosion risk potential of all soils and sites on the property should be taken and appropriate control and preventative measure put in place. | Contractor | Prior to, during and after construction |
|  | The stockpiling of soil or any other materials shall not be allowed near a watercourse or water body to prevent pollution or impediment to surface runoff. The developer must control and establish suitable mitigation measures to prevent the erosion of the stockpiles. | Contractor | Prior to, during and after construction |
| Water Management |
| Surface water | The flow direction of any surface water run-off must be established prior to disturbing any area. | Contractor | Prior to and During Construction |
|  | Buffer zones should be maintained between the hard standing and the water course to allow for reduction in flow velocities there minimising the risk of erosion from the site. | Contractor | During Construction |
|  | A good vegetation cover along the length of the water courses should be established and maintained to reduce the likelihood of scour of the channel that would lead to erosion. | Contractor | During Construction |
|  | Attenuation and retention facilities (e.g. paddocks/attenuation ponds) need to be designed and implemented to regulate runoff in terms of retention, attenuation and percolation thus ensuring that post flow conditions closely reflect the pre-development hydrological conditions. These facilities should be sized and placed in such a manner so as not to impact general runoff conditions. The design of these facilities needs to be based on the outcomes as set out in the hydrological assessment. | Contractor | During Construction |
|  | The contractor must submit to the client his plan for prevention, containment and rehabilitation measures against environmental damage of the identified water and drainage systems in and around all the sites.  | Contractor | During and after construction |
|  | Dirty water originating from the construction camp and on the construction site is to be contained and disposed of correctly, to prevent the contamination of soil and/or any uMvoti River. | Contractor |  |
|  | The construction camp must have adequate drainage and the development of areas of standing water must be prevented. | Contractor |  |
|  | Washing of vehicles, equipment, machinery or materials is prohibited at the construction camp or on the construction site, unless done in a contained area that has a suitable impervious floor and is designed for this purpose. | Contractor |  |
|  | Bathing or washing of clothes, equipment or machinery within any watercourse is prohibited. | Contractor |  |
|  | Erosion and loss of soil must be prevented by minimising the construction areas exposed to surface water run-off. | Contractor |  |
|  | Bare areas are to be rehabilitated as soon as the areas become available or after use. | Contractor |  |
| Storm water Management | A storm water management plan/system needs to be drawn up and implemented to ensure proper management of storm water on the site during and after construction to ensure that pollutants and sediment are not released into uMvoti River. |  |  |
|  | Contractor | Prior to and during construction |
| Wetlands/River Management |
|  | When working in and around natural water systems, contaminants must be prevented from entering the stream as these will flow downstream and pollute the environment below. The integrity of the environment must be maintained and contamination avoided. Typical contaminants associated with construction activities are hazardous substances which may include, but are not limited to: oil and other lubricants, diesel, solvent, cement and *general* litter |  |  |
|  | Where possible, construction activities should occur during dry (winter months) when water levels and seepage in wetlands / rivers are lower. | Contractor | during construction |
|  | Disturbance to any wetlands during construction should be minimized. | Contractor | during construction |
|  | Should cement mixing need to occur within the boundaries of the wetland, this should be done on impervious lined material. Any spillage of cement must be immediately cleared up. | Contractor | during construction |
|  | After construction of the road has been completed, these disturbed banks should be returned to their original profiles as far as possible. All disturbed River banks should be suitably rehabilitated and protected with a geotextile or similar material to protect reinstated topsoil and any re-seeded vegetation. | Developer | After construction |
|  | All machinery and construction personnel should access the bridge construction sites via the existing road. | Developer | During/ After construction |
| Air Quality |
|  | Stockpiles may become sources of wind generated dust. These must be covered during windy periods or watered. | Contractor | During construction |
| Areas under construction may become sources of wind generated dust and dust suppression techniques must be implemented when necessary. | Contractor | Prior to and during construction |
| Dust entrained from vehicular movement must be minimised by road wetting and by implementing speed limits. | Contractor | During Construction |
| Construction vehicles should be covered in order to minimise dust entrainment. | Contractor | During Construction |
| No burning of waste, such as plastic bags, cement bags and litter, is permitted on site. | Contractor | During Construction |
| A complaints register should be provided to report any excessive dust incidents. | Contractor | During construction |
| Noise |
|  | Construction activities should be undertaken according to during daylight working hours between the hours of 07:00 – 17:00 on weekdays and 07:30 – 13:00 on Saturdays. No construction will be allowed on Sundays. | Contractor | During construction |
| Construction vehicles and equipment generating excessive noise should be fitted with appropriate noise abatement measures. | Contractor | During Construction |
| Construction workers must be provided with the appropriate PPE i.e. ear plugs | Contractor | During Construction |
| A complaints register should be provided to report any excessive noise. | Contractor | During Construction |
| Truck traffic should be routed away from noise sensitive areas, where possible | Contractor | During Construction |
| With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the contractor and the ECO should liaise with local residents on how best to minimise impact, and the local population should be kept informed of the nature and duration of intended activities. | Contractor | During Construction |
| Protection of Fauna and Flora |
|  | The extent of the area disturbed should be kept to the minimum required to successfully implement the road construction activities, thus minimising the destruction of any fauna and flora. | Contractor | Prior to and during construction |
| A significant buffer zone must be established around the entire lower hygrophilous forest system approximating 45m in width. | Contractor | During construction |
| All wetlands must be allocated a 20m set back. | Contractor | Prior to and during construction |
| An appointed ECO will be on site during the construction period to ensure that sensitive areas are not encroached on. | Contractor | During construction |
| Mowing of grass should be restricted to the road reserve. | Contractor | Prior to, during and after construction |
| No natural vegetation is to be collected for use as firewood. | Contractor | During construction |
| No animals are to be disturbed unnecessarily and no animals are allowed to be shot, trapped or caught for any reason. | Contractor | During construction |
| Protected trees may not be removed or cut without a permit from the Department of Water Affairs and Forestry (DWAF). | Contractor | During construction |
|  | Invader species and weeds must be removed and disposed of in accordance with existing legislation on a regular basis. | Contractor | Prior to and during construction |
| The removal of indigenous/endemic shrubs and small trees should be kept to a minimum and only be removed if absolutely necessary. | Contractor | During construction |
| Fires for cooking must be kept within designated areas at the construction camp. All fires are to be contained. | Contractor | During construction |
| Workers are to be provided with firewood for cooking and are not permitted to cut down any vegetation for this purpose. | Contractor | During construction |
| Excavations |
| Archaeological Sites | If an artefact on site is uncovered, work in the immediate vicinity must be stopped immediately. | Contractor | During construction |
| The contractor must take reasonable precautions to prevent any person from removing or damaging any such object and must immediately, upon discovery thereof, inform the Construction Engineer of such discovery. | Contractor/ Engineer | During Construction |
| The National Monuments Council is to be contacted who will appoint an archaeological consultant. | Contractor | During Construction |
| Work may only resume once clearance is given in writing by the archaeologist. | Contractor | During Construction |
| Public Safety |
|  | Members of the public adjacent to the construction area should be notified of construction activities in order to limit unnecessary disturbance or interference | Contractor | During construction |
| Dedicated pathways for pedestrians should be developed to ensure safe passage around construction activities. | Contractor |  |
| Construction activities should be undertaken according to during daylight working hours between the hours of 07:00 – 17:00 on weekdays and 07:30 – 13:00 on Saturdays. No construction will be allowed on Sundays. | Contractor | During construction |
| A safety officer is to be appointed who will continuously monitor safety conditions during construction activities. | Contractor | During construction |
| Flag men should be appointed and provide ample warning of road hazards. | Contractor | During construction |
| Construction vehicles must avoid public roads during peak hours. | Contractor |  |
| The dangers associated with entry and exit points for the construction camp should be given special consideration. | Contractor | During construction |
| All members of the construction workforce working on the site or near the roads are to be provided with the appropriate high visibility clothing to ensure that they are seen by motorists. | Contractor | During construction |
| All construction workers handling chemical or hazardous substances must be trained in the use of such substances and the environmental, health and safety consequences of incidents. | Contractor | Prior to and during construction |
| The workforce is to be provided with sufficient potable water and under no circumstances are they to use untreated water from local watercourses for drinking. | Contractor | During construction |
| **Traffic and Transport** |  |  |  |
| Construction routes must be clearly defined | Contractor | During Construction |
| The construction trucks routes and times of operation should be carefully planned. | Contractor | During Construction |
| Vehicles and equipment shall be serviced regularly to avoid the contamination of soil from oil and hydraulic fluid leaks etc. | Contractor | During Construction |
| Servicing must be done off-site. | Contractor | During Construction |
| Complaints and Environmental Incident Register  |
|  | Complaints received from the community and other I&AP’s must be registered and recorded by the ECO and also brought to the attention of the Contractor. Both parties will respond accordingly. The following information must be recorded in the case of any complaint/incident:− Time, date and nature of complaint;− Response and investigation undertaken; and− Actions taken and by whom. | Contractor | During construction |
| All complaints will be investigated and a response is to be given to the complaint within 7 days of receipt. | Contractor | During construction |
| Social Impacts |
|  | Construction vehicles and equipment must have appropriate noise abatement measures. | Contractor | During construction |
| Tender documents should include statements to include the use of local communities or local community organisation in supplying services and labour to the construction activities. | Contractor | Prior to construction |
| Contractors should use labour intensive construction methods where possible. Local labourers should be used for such methods.  | Contractor | During construction |
|  | Due to the concentration of a workforce in the area over the construction period, the contractor shall implement an HIV/AIDS Awareness Programme on site. The contractor shall appoint an HIV/AIDS Awareness Officer for the duration of the construction period. Activities for HIV/AIDS awareness and prevention will be broad based, targeting both individuals and groups. They may consist of:* Information posters in public places both on and off site (eating places, bars, guest houses, etc);
* Peer educators (reference people) drawn from the local labour force and trained in HIV/AIDS issues for discussions with colleagues (estimate 1 per 30 employees);
* Small focus group discussions and information covering key issues should be held;
* Inclusion of HIV/AIDS activities at site meetings and other discussions; and
* Voluntary Counselling and Testing (VCT).

Education will cover:* Stigma and discrimination issues;
* Preventative behaviours including partner reduction, condom use, and awareness and importance of treatment of STDs;
* Skills including negotiating safer sex, correct condom use, purchase without embarrassment;
* Referral to local health centres and services available.
 | Contractor | During construction |
| Monitoring, Reporting and Record Keeping |
| Environmental Monitoring | Environmental monitoring will be undertaken by the ECO on a monthly basis, or at a frequency deemed appropriate by the DAEA&RD. | ECO | During construction |
| This monitoring will be undertaken in order to ensure compliance with all aspects or requirements of the EMP. | ECO | During construction |
| The results of the monthly assessments will be made available to DAEA&RD upon request. | ECO | During construction |
| The ECO is to inspect and monitor on and off-site operations and to implement the necessary actions to ensure compliance with the EMP. | ECO | During construction |
| The ECO should report and discuss any difficulties with the implementation of the EMP with the Environmental Consultant. | ECO | During construction |
| The ECO and Environmental Consultant should review and modify the EMP on an annual basis or as required. | ECO | During construction |
| Complaints register and environmental incident book | Complaints received from the community and other I&AP’s must be registered and recorded by the ECO and also brought to the attention of the contractor. Both parties will respond accordingly. The following information must be recorded in the case of any complaint/incident:* Time, date and nature of complaint;
* Response and investigation undertaken; and
* Corrective and preventative actions taken and by whom.
 | ECO | During construction |
|  | All complaints received will be investigated and a response is to be given to the complainant within 7 days. | ECO | During construction |
|  | All environmental incidents occurring on the site will need to be recorded in an Environmental Incident Book. The following information must be provided:* Time, date and nature of complaint;
* Response and investigation undertaken; and
* Corrective and preventative actions taken and by whom.
 | ECO | During construction |

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| **ENVIRONMENTAL ASPECTS** | **ENVIRONMENTAL MEASURES AND ACTION PLANS** | **AREA APPLICABLE** | **PRIORITY** |

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| Emergency Procedures |
|  | To avoid the occurrence of any incidents, the contractor will ensure that the entire workforce that will be responsible for the operation are trained on the operation of the facility. | Contractor | Prior to and during construction |
| The ECO will ensure that all the emergency procedures relevant to the above mentioned incidents are developed and the workforce is trained on these procedures to ensure that correct actions are followed during emergency situations. | ECO | During construction |
| The list of the emergency telephone numbers will be maintained on site. | ECO | During construction |
| Rehabilitation |
|  | All remaining construction infrastructure, building rubble and waste are to be removed from the site.  | Contractor | After construction |
| All disturbed surfaces compacted by construction and operation activities including the ablutions and loading areas should be ripped to a minimum depth of 30cm to allow organic contaminants to breakdown and promote vegetation establishment. | Contractor | After construction |
| The construction camp site should be landscaped to ensure efficient drainage of the site. Water should not be allowed to pond on the site. | Contractor | After construction |
| The area designated for the deposition of spoil material is to be levelled and shaped to ensure efficient drainage of the site. Water should not be allowed to pond on site. Under no circumstances is general or hazardous waste to be disposed of at this site. | Contractor | After construction |
| Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from construction camp and disposed of at a recognised landfill facility.  | Contractor | After construction |
| Final rehabilitation must be completed within a period specified by the Engineer. | Contractor | After construction |

# environmental code of conduct

One of the objectives of the EMP is to ensure that all the workforce, contractors, sub-contractors and construction staff have an understanding of environmental issues and potential impacts on site activities. This environmental code of conduct provides the basic rules that should be strictly adhered to. It is the responsibility of the ECO to ensure that each contractor, sub-contractor and workforce understand and adhere to the Code of Conduct.

**ENVIRONMENTAL CODE OF CONDUCT**

**ALL PERSONS ARE OBLIGED TO KEEP TO THE RULES OF THIS CODE OF CONDUCT**

You must study and keep to the rules – ignorance, negligence, recklessness or a general lack of commitment will not be tolerated!

**ENVIRONMENTAL RULES**

* Preventing Pollution
* Littering will not be tolerated.
* Put all waste in the correct waste containers provided.
* Use the toilet facilities provided.
* Immediately report to your supervisor when you spill, or notice a hazardous substance being spilled or when you see a vehicle, piece of machinery or container that is leaking fuel, oil or other hazardous substances.
* Do not Trespass
* Never climb over any fence or trespass on private property. You are not allowed to enter neighbouring properties.
* Maintaining the Character and Visual Quality of the Area
* Never deface, draw or cut lettering or any other markings on trees, rocks or buildings in the area.
* Digging, excavation and the erection of any permanent or semi-permanent structures of any kind are prohibited.
* If you spot any litter lying around – please pick it up and throw it in the correct waste container.
* Fire Control
* Make sure you are familiar with fire fighting procedures.
* Make sure you are aware of the locations of all fire fighting equipment.
* No fires are allowed outside the confines of the Construction Camp.
* No burning of waste is allowed.
* Caring for Plants and Animals
* Strictly leave all animals alone – never tease, catch or set devices to trap or kill any animal.
* Never damage, chop down or remove any tree or shrub (unless you are instructed to do so).
* Use commercially bought firewood.