ENVIRONMENTAL MANAGEMENT PROGRAMME

CANNON ROCKS TO ALEXANDRIA BULK WATER SUPPLY PIPELINE, NDLAMBE MUNICIPALITY, EASTERN CAPE PROVINCE OF SOUTH AFRICA

Prepared for:

Amatola Water · Amanzi
bringing water to life

Prepared by:

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1 INTRODUCTION

Amatola Water has been appointed by the Department of Water Affairs (DWA), on behalf of Ndlambe Local Municipality to implement a regional bulk water supply scheme within Ndlambe Local Municipality (Figure 1.1). Amatola Water has contracted Coastal & Environmental Services (CES) as the Environmental Assessment Practitioner (EAP).

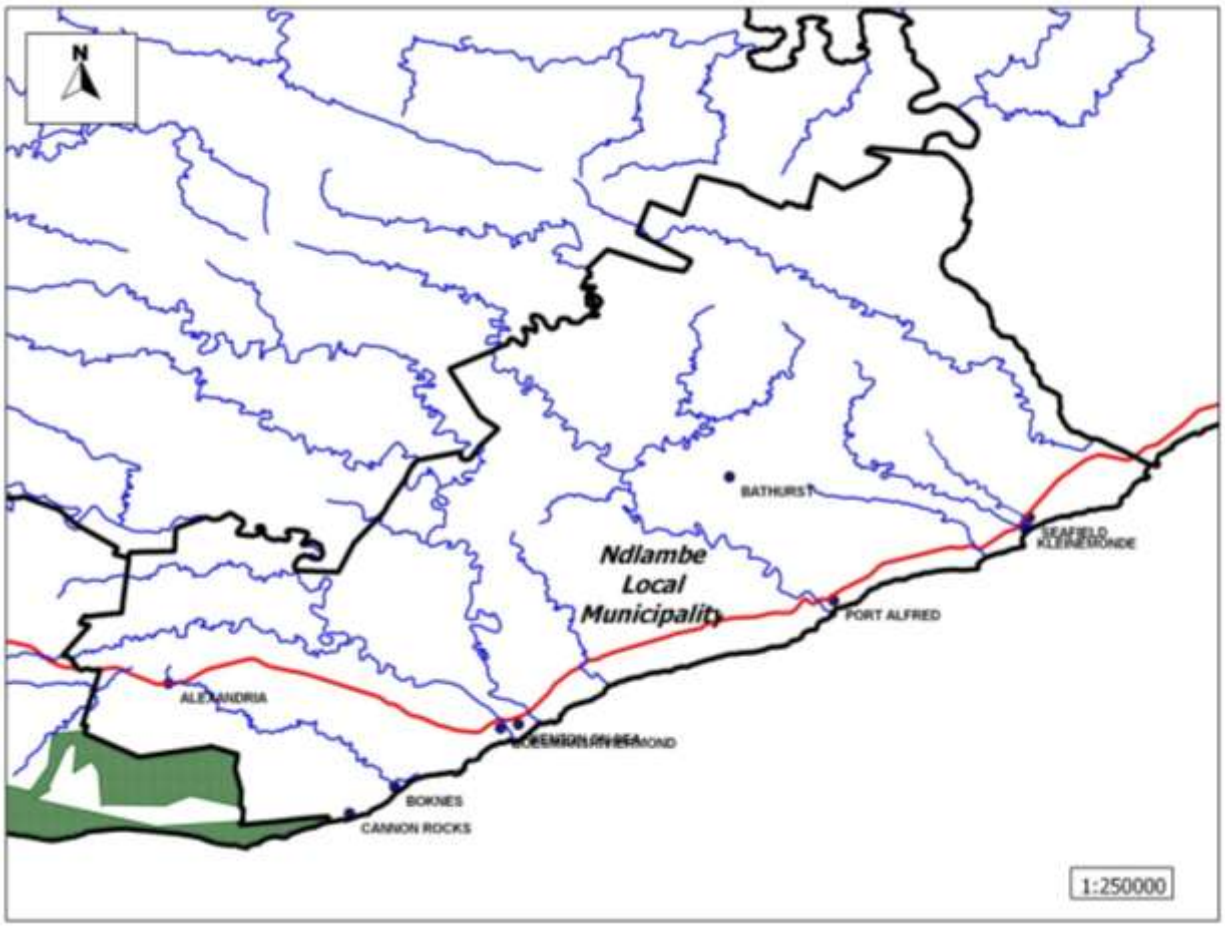

Figure 1.1. Ndlambe Local Municipality.

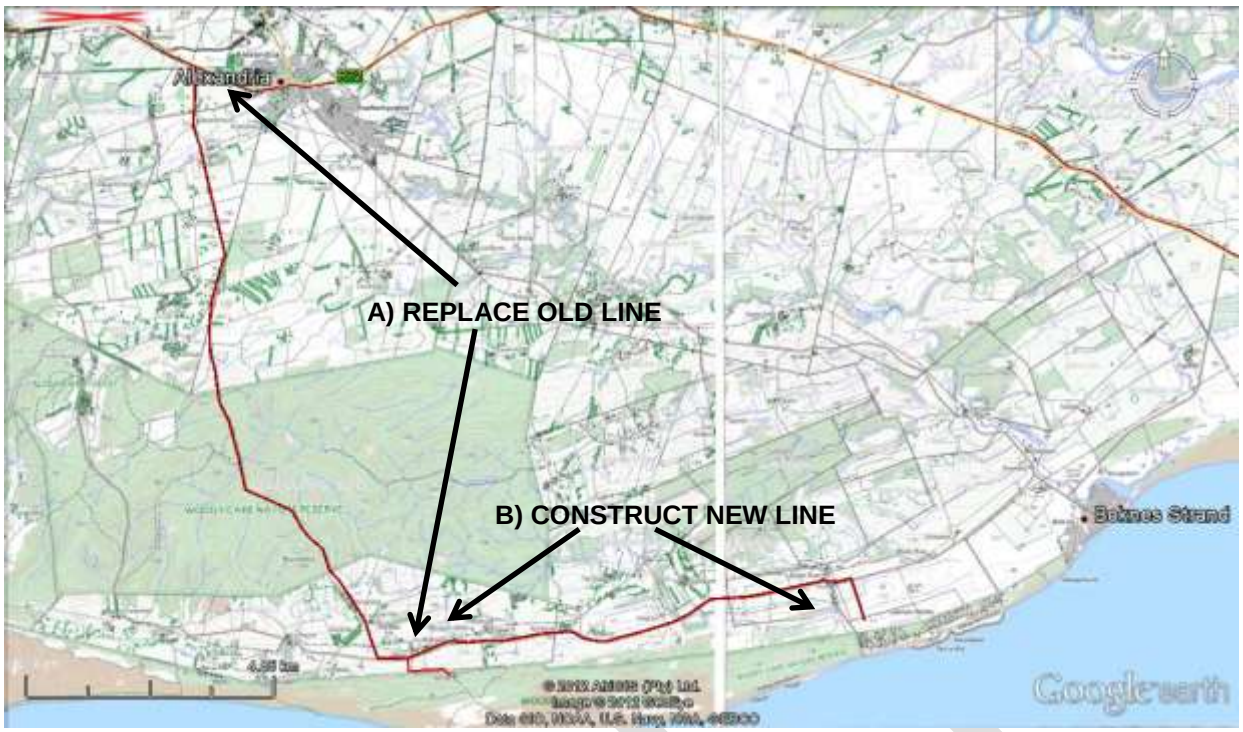

Figure 1.2: Location of the proposed pipeline between Alexandria and Cannon Rocks. The red line indicates the pipeline route.

This Environmental Management Programme (EMPr) has been prepared as part of the basic assessment process to provide specific environmental guidance for the planning, construction and operation of the bulk water supply pipeline between Cannon Rocks and Alexandria in the Eastern Cape.

The competent authority, being the Department of Environmental Affairs (DEA), requires that an environmental management programme (EMPr) be submitted in accordance with Regulation 33 of the regulations published in Government Notice No. R. 543 of 18 June 2010, which should be read with Section 24 N of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998), as amended.

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 pipelines as well as to ensure that all relevant factors are considered to ensure for environmentally responsible development.

This EMPr informs all relevant parties [the Project Coordinator, the Contractor, the Environmental Control Officer (ECO) and all other staff employed by Amatola Water at the site as to their duties in the fulfilment of the legal requirements for the construction, operation and decommissioning of these distribution lines 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;
- Respond to unforeseen events;

- 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 addresses 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:

According to regulation 33 of GN R 543, 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
- National Environmental Management Act 107 of 1998
- National Environmental Management: Protected Areas Act 57 of 2003
- National Environmental Management: Biodiversity Act 10 of 2004
- National Forests Act 43 of 1983
- National Water Act 36 of 1998
- Conservation of Agricultural Resources Act 43 of 1983
- National Veld and Forest Fire Act 101 of 1998
- Hazardous Substances Act 15 of 1973
- National Heritage Resources Act 25 of 1999
- Atmospheric Pollution Prevention Act 45 of 1965
- National Environmental Management: Air Quality Act 39 of 2004
- National Environmental Management: Waste Management Act 59 of 2008
- Mineral and Petroleum Resources Development Act 28 of 2002
- Health Act 63 of 1977
- Occupational Health and Safety Act 85 of 1993
- 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 the National Environmental Management Act (Act No 107 of 1998) (NEMA), and relevant EIA regulations made in terms of this Act and promulgated in August, 2010 (Government Notice R543), and listed activities under (Government Notice R 544,

545, 546), the proposed pipeline was subjected to a Basic Assessment (BA).

In terms of the EIA process, all reports generated from the environmental studies form part of a series of documents for the project. The Basic Assessment Report (BAR) identified potentially significant environmental impacts and was the main report in the series. Additional Specialist Assessments served to supplement the assessment contained in the BAR.

This Environmental Management Programme (EMPr) interprets the findings of the BAR, and prescribes project-specific specifications to be achieved. In addition to the requirements of Regulation 33 of GNR 543, this EMPr is based on the principles of Integrated Environmental Management (IEM).

2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT TEAM

According to regulation 33 of GN R 543, 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

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Project team:

- Dr Alan Carter
- Dr Greer Hawley
- Dr Cherie-lynn Mack
- Mr Roy de Kock
- Ms Nikita Steele
- Mr Lungisa Bosman
- Ms Nande Suka

Coastal & Environmental Services (CES), established in 1990, is a specialist environmental consulting company based in Grahamstown (Eastern Cape Province). We believe that a balance between development and environmental protection can be achieved by skilful, considerate and careful planning.

CES has considerable experience in terrestrial, marine and freshwater ecology, the Social Impact Assessment (SIA) process, and state of environment reporting (SOER), Integrated Waste Management Plans (IWMP), Spatial Development Frameworks (SDF), public participation, as well as the management and co-ordination of all aspects of the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) processes. CES has been active in all of the above fields, and in so doing have made a positive contribution to towards environmental management and sustainable development in the Eastern Cape, South Africa and many other African countries.

Dr Alan Carter, a Director at CES, holds a PhD in Marine Biology and is a certified Public Accountant, with extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He has 15 years of experience in environmental management and has specialist skills in sanitation, coastal environments and industrial waste. Dr Carter is registered as a Professional Natural Scientist under the South African Council for Natural Scientific Professions (Figure 1.2).

Dr Greer Hawley(Senior Environmental Consultant) has a BSc degree in Botany and Zoology and a BSc Honours in Botany from the University of Cape Town. She completed her PhD thesis (Microbiology) at Rhodes University. Greer has been involved in a number of diverse activities. The core academic focus has been directed in the field of taxonomy both in the plant and fungal kingdom. Greer's research ranges from studying fresh and marine algae, estuarine diatoms, Restio species classification in the fynbos and forest vegetation and fungal species identification and

ecology. Greer's study of fungi have also contributed towards an understanding of soil ecology and "below ground" ecology. She is currently working on numerous impact assessments at the East London branch.

Dr Cherie-Lynn Mack (Senior Environmental Consultant)holds a PhD and MSc (with distinction) degrees in Environmental Biotechnology, with a BSc degree in Microbiology and Biochemistry. She has postgraduate research experience in industrial and domestic wastewater treatment technologies, with particular emphasis on the coal and platinum mining industries. Her interests lie in the water sector, with experience in ecological reserve determination and water quality monitoring and analysis. She has experience in water quality analysis and industrial wastewater treatment research. She is currently employed in the East London office of CES as a senior environmental consultant.

Mr Roy De Kock, holds a BSc in Botany and Geology and a BSc Honours in Geology from the Nelson Mandela Metropolitan University in Port Elizabeth. He is currently completing his MSc thesis in rehabilitation Ecology with the focus on Mine Rehabilitation. His Masters thesis titled; Bushclump Rehabilitation Within Couga Bontveld After Strip Mining focused on rehabilitation of mined Bontveld vegetation on limestones of the Nanaga Formation where he attempts to recognise the evolutionary path of the present landscape, as well as focussing on primary ecological processes such as hydrology, energy capture and nutrient cycling and the impact of mining on change in diversity and ecosystem health. Currently he is working on numerous impact assessments at the East London branch.

3 PROPOSED ACTIVITY

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

(c) A detailed description of the aspects of the activity that are covered by the draft environmental management programme;

3.1 Description of proposed activity

The current Basic Assessment Report relates to the following project:

A) Replacing an existing pipeline between the water treatment works (WTW) reservoirs in Alexandria and an existing pump station and reservoir on the edge of the Coastal Forest, and

B) Installing a new pipeline to join the existing bulk reticulation infrastructure (above) to the existing reverse osmosis (RO) WTW at Cannon Rocks.

- The new pipeline will run from the existing RO water treatment plant (33°44'50.76"S; 26°31'52.10" E) across a private farm to join the existing dirt road, where it will run within the road reserve for approximately 10km to join up with the route of the existing pipeline.
- The existing pipeline from the pump station (33°45'23.70"S; 26°26'37.18"E) to Alexandria will be replaced. This is approximately 14km of pipeline, of which 4.5km traverses the Woody Cape section of the Addo Elephant National Park.
- The existing pipeline route above the Woody Cape forest does not follow existing roads, but traverses private farm land before reaching the existing Alexandria WTW reservoirs.

3.1.1 Site Location

The project will be undertaken predominantly along existing pipeline and road servitudes between Cannon Rocks (in the south) and Alexandria (in the north), in the Ndlambe Local Municipality, Cacadu District Municipality, Eastern Cape.

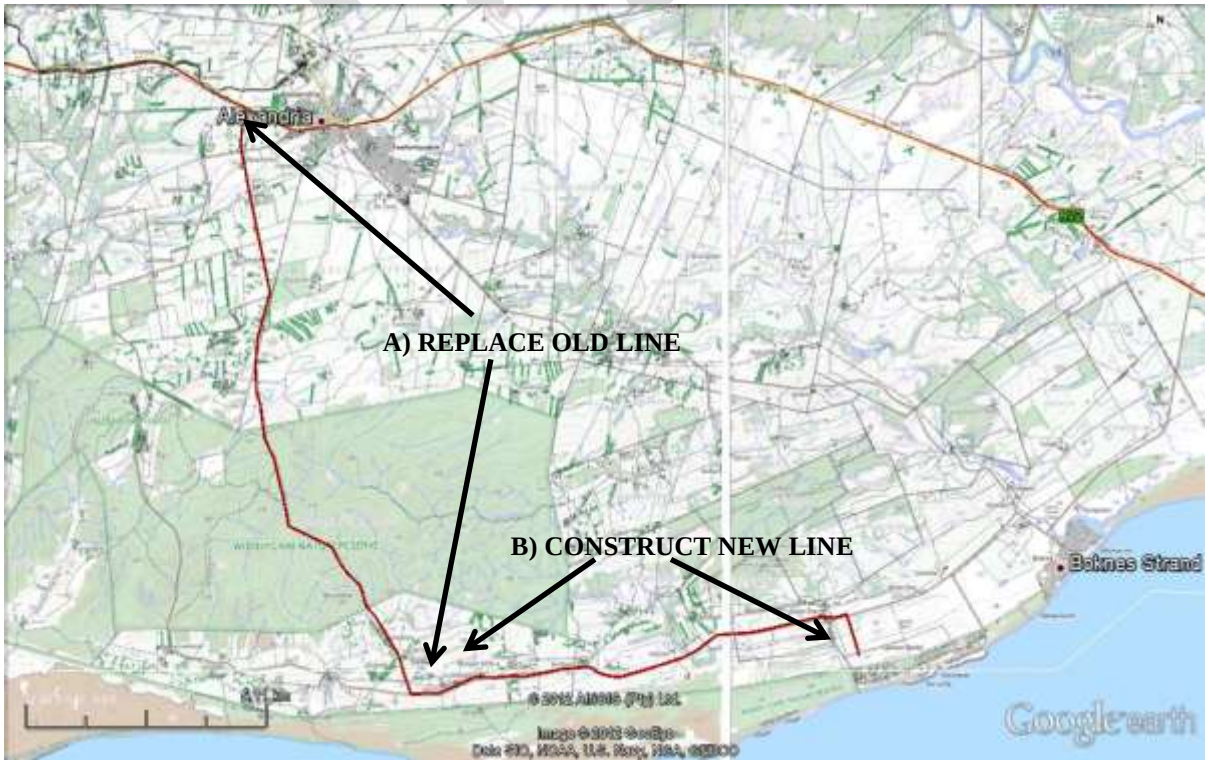

Figure 3.1: Location of the proposed pipeline between Alexandria and Cannon Rocks. The red line indicates the pipeline route.

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 wind farm, 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 of the distribution line and associated infrastructure. The impacts are identified and given a brief description. The three phases of the development are then identified as below:

4.1.1 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.

4.1.2 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 Eskom during the operation and maintenance phase are specified.

4.1.3 Closure and decommissioning phase

This section includes principles for the decommissioning and closure phase of the project. This section will be required to be re-visited and updated at the time of decommissioning.

5 ROLES AND RESPONSIBILITIES

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

(d) An identification of the persons who will be responsible for the implementation of the measures contemplated in paragraph (b);

5.1 Amatola Water (AW)

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

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 DEA;
- Be responsible for the overall implementation of the EMPr in accordance with the requirements of AW and the environmental authorisation, if issued by DEA;
- 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 Ndlambe Bulk Water Supply Project.
- Ensure that the appointments of the ECO and DEO are subject to the approval of AW.

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 Basic Assessment Report and Environmental Management Plan for the Cannon Rocks to Alexandria Bulk Water Supply Pipeline 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 AW, but not less frequently that once a month.

5.4 Environmental Control Officer

For the purposes of implementing the conditions contained herein, AW shall appoint an Environmental Control Officer (ECO) for the contract. The ECO shall be the responsible person for ensuring that the provisions of the EMPr as well as the environmental authorisation are complied with during the construction period. The ECO will be responsible for issuing instructions to the contractor where environmental considerations call for action to be taken. The ECO shall submit regular written reports to AW, 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 AW and/or DEA (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 AW.

- Conducting annual environmental performance audits in respect of the activities undertaken relating to the project. The ECO shall also submit compliance audit reports to DEA, in accordance with the requirements of the environmental authorisation. Such reports shall be reviewed by AW, 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 the Ndlambe Bulk Water Supply Project and all relevant environmental legislation.

Amatola Water 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 regulation 33 of GN R 543, an environmental management programme must include:

(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-operations and operations activities;
(iii) operation or undertaking of the activity;
(iv) rehabilitation of the environment; and
(v) closure, where relevant.

(f) As far as 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 acceptable principle of sustainable development, including, where appropriate, concurrent or progressive 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;

(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;

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 is highlighted in Table 6-1 below.

6.1 Planning and Design Phase

POLICY COMPLIANCE

- Ensure that the development complies with relevant legislation and/or policy, e.g. ECBCP, Municipal By-laws, SDFs, etc.

LAND OWNERSHIP AND SERVITUDE ISSUES

- Ensure that prior to the start of construction, servitude agreements are in place and that the areas to be directly impacted are appropriately demarcated so that no undue impact is made on the surrounding environment.
- Public access to servitudes on private land could result in an increase in the poaching of livestock/wildlife and associated criminal activities.
- Access to servitudes through private land should be adequately fenced and secured, e.g. padlocked gates.

- Construction staff should be monitored while on site.

SOCIO-ECONOMIC

- Ensure that this aspect is incorporated into any contracts compiled for construction contractors. Temporary jobs created should be earmarked for the local communities as far as possible.

HERITAGE

- The results of the Phase 1 Heritage and Palaeontological assessments have been submitted to SAHRA – ensure that the recommended management measures are incorporated into the final design and planning for the pipeline construction.

GEOLOGY

- Ensure that as far as possible, the new pipeline avoids areas of inappropriate geological or soil structure.
- The recommendations of the geotechnical specialist MUST be adhered to.

PIPELINE MATERIALS

- Ensure that high quality, SABS approved materials are used for all elements of infrastructure installation.

CONSIDERATION OF ENVIRONMENTAL CONSTRAINTS

- Incorporation of the mitigation measures provided below will ensure proper route planning.
- Appoint an independent Environmental Control Officer (ECO) for the duration of the construction to monitor construction activities.
- Micro-siting of the final pipeline layout must be approved by the ECO.

DRAINAGE LINES

- Water bodies within 32 meters of the route must be demarcated and must not be accessible during construction.
- All trenches dug within 32 meters of any water body must be rehabilitated in full.
- No work camp or any other temporary construction infrastructure must be erected within 32 meters of any water body.
- Where necessary, water use licenses should be obtained from the Department of Water Affairs.

CLEARANCE OF PIPELINE ROUTE (through Woody Cape)

- Ensure that construction activities are limited to the pipeline route.
- Alternative methods such as above ground installation or manual labour for trenching for below ground pipeline may be used within the natural forest sections to avoid the need to widen the existing cleared pipeline route.
- If widening of the existing cleared pipeline route is required, consult with SANParks and DWAF (Mr Tabo Nokoya) to determine if and what permit applications are required.
- All relevant permits must be obtained before removal/trimming/destruction of any protected species takes place.

- When widening the route, every effort must be made to avoid protected species and species of special concern. This includes reducing clearance to 4 m, using manual labour and clearance route re-alignment in affected sections (See scenario illustrations and mitigations in Section 7.2).
- If possible, transplant any impacted trees. Sapling and seedlings especially must not be destroyed but rather removed and transplanted.
- The maximum total width that the existing cleared pipeline route may be widened to is 6 m.

ALTERNATIVE 2 – BELOW GROUND ROUTE ALTERNATIVE ALONG EXISTING ROADS, NO SECTION THROUGH ALEXANDRIA FOREST

As above, excluding pipeline route through Alexandria Forest, but including:
RIVER CROSSINGS

- Suitably qualified engineers must design pipeline crossings that will ensure that the pipeline is not at risk during flood events. This may require that the road crossing is upgraded.
- Water Use Licences will need to be obtained from the Department of Water Affairs for modifying the bed/banks of a watercourse.

TRAFFIC

- Suitable plans must be drawn up in conjunction with the relevant municipal department to provide temporary traffic diversion routes, etc. for the duration of construction.

ALTERNATIVE 3 – PIPELINE ROUTE AS PER ALTERNATIVE 1, ABOVE GROUND PIPELINE THROUGH THE ALEXANDRIA FOREST SECTION

SERVITUDE SURVEY

- The proposed clearance will need to be surveyed and mapped.
- Bush that needs to be cleared before construction must be clearly demarcated to prevent unnecessary destruction of vegetation.

6.2 Construction Phase

AIR POLLUTION

- Cleared surfaces must be dampened whenever possible and especially in dry and windy conditions to avoid excessive dust generation.
- Any soil excavated, and not utilised for rehabilitation, must be removed from site or covered and no large mounds of soil should be left behind after construction.

NOISE POLLUTION

- Construction activity close to farm houses, which includes the movement of construction vehicles, must be restricted to normal working hours (7:00am – 17:00pm).

HAZARDOUS SUBSTANCE STORAGE & USAGE

- Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act 85 of 1993 and the SABS Code of Practise must be adhered to. This applies to solvents and other chemicals possibly used in the construction process.
- Oil trays must be placed under parked machinery to avoid soil contamination.

<u>CONCRETE BATCHING</u>

- Concrete should not be mixed directly on the ground, or during rainfall events when the potential for transport to the stormwater system is the greatest (as per the EMPr).
- Concrete must be mixed only in the area demarcated for this purpose and on an impermeable substratum.
- All areas affected during the Construction Phase should be rehabilitated.

HAZARDOUS CHEMICAL SPILLS

- The individual responsible for or who discovers the spill must report the incident to the Project Coordinator, ECO and or Contractor as soon as reasonably possible.
- The problem must be assessed and the necessary actions required will be undertaken.
- The immediate response must be to contain the spill.
- Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.
- The ECO must determine the precise method of treatment of polluted soil.
- This could involve the application of soil absorbent materials or oil-digestive powders to the contaminated soil.
- If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent materials.
- Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.

HAZARDOUS CHEMICAL STORAGE

- Staff that will be handling hazardous materials must be trained to do so.
- All hazardous chemicals must be properly stored in a secure, bunded and contained area.

WORKER HEALTH AND SAFETY

- Fire fighting equipment should be present on site at all times as per Occupational Health and Safety Act.
- All construction foremen must be trained in fire hazard control and fire fighting techniques.
- All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances.
- No open fires will be allowed on site unless in a demarcated area identified by the ECO.
- No smoking near flammable substance.
- All cooking shall be done in demarcated areas that are safe in terms of runaway or uncontrolled fires.
- The Contractor shall have operational fire-fighting equipment available on site at all times. The level of fire fighting equipment must be assessed and evaluated thorough a typical risk assessment process.
- Failure to provide adequate onsite sanitation and clean drinking water may result in runoff transferring contaminants into the surrounding environment.
- Adequate sanitary and ablutions facilities must be provided for construction workers
- The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.
- Contaminated wastewater must be managed by the Contractor to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the camp shall be collected and removed from the site for appropriate disposal at a licensed commercial facility.

WASTE MANAGMENT

- Littering by the employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite.
- All waste must be removed from the site and transported to a licensed landfill site.
- Hazardous waste e.g. used oils, offcuts, etc., could pollute surface and groundwater resources if not properly contained.
- All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at the licensed hazardous landfill site in Mt Frere.
- Contaminants must be stored safely to avoid spillage
- Machinery must be properly maintained to keep oil leaks in check.

SOCIO-ECONOMIC

- If manual labour is used for the section of pipeline to be replaced through the Alexandria Forest, this benefit would increase in significance.

RIVERS & STREAMS

- All construction rubble must be removed from all rivers and streams after completion of work.
- The river/stream must be returned to its natural state after construction.

STORM WATER MANAGEMENT

- The site must be managed in a manner that prevents pollution of drains, downstream watercourses or groundwater, due to suspended solids, silt or chemical pollutants.
- Temporary cut-off drains and berms may be required to capture storm water and promote infiltration.
- The area must be monitored by an ECO on a regular basis as described in the EMPr.

HERITAGE

- Any shell middens that are exposed during the course of construction, need to be reported to the heritage Impact assessor, the ECO and SAHRA immediately.
- If any graves or remains are exposed during construction phase, then all work in that area needs to be stopped and SAHRA needs to be informed immediately.

ALTERNATIVE 1 - BELOW GROUND ROUTE ALTERNATIVE FROM CANNON ROCKS TO ALEXANDRIA VIA ALEXANDRIA FOREST

General impacts as above, including:

REMOVAL OF TREES TO WIDEN SERVITUDE

- Ensure that construction activities are limited to the pipeline route.
- Alternative methods such as above ground installation or manual labour for trenching for below ground pipeline may be used within the natural forest sections to avoid the need to widen the existing cleared pipeline route.
- If widening of the existing cleared pipeline route is required, consult with SANParks and DWAF (Mr Tabo Nokoya) to determine if and what permit applications are required.
- All relevant permits must be obtained before removal/trimming/destruction of any protected species takes place.
- When widening the route, every effort must be made to avoid protected species and species of special concern. This includes reducing clearance to 4 m, using manual labour and clearance route re-alignment in affected sections (See scenario illustrations and mitigations in Section 7.2).
- If possible, transplant any impacted trees. Sapling and seedlings especially must not be destroyed but rather removed and transplanted.
- The maximum total width that the existing cleared pipeline route may be widened to is 6 m.

BIODIVERSITY

- Construction activities must be restricted within the existing pipeline cleared route within the Alexandria forest.
- An ECO must be on site twice a week or more during construction in the Alexandria forest to monitor construction activities.
- Site, site camps, storage facilities and ablution facilities may impact on vulnerable Alexandria forest through inappropriate waste management (litter, sewage and hydrocarbon pollution) and potential break-away fires.
- Camps and ablution facilities are to be placed in currently impacted areas, at least 100 meters away from any forest area.
- An appropriate waste management programme must be implemented throughout the construction phase.
- Fires for cooking must be located within an enclosed, demarcated area.
- No fires will be allowed in the Alexandria forest.
- Fire-fighting equipment must be kept onsite in order to contain an accidental fire.

SOIL EROSION

- Ensure that construction sites are stabilised and soil is prevented from unnecessary exposure.
- Implement vegetation re-establishment as part of a detailed Rehabilitation Plan.
- Building unnecessary access roads may result in high level surface erosion of these tracks.
- Ensure that current road infrastructure is used to access remote areas of the pipeline layout.
- Cut and fill of soil on steep slopes within the Alexandria forest section may affect protected trees.
- Avoid cut and fill of soil on steep slopes within the Alexandria forest where protected trees will be affected.

COMPLIANCE WITH THE EMPr

- An ECO MUST be on site a minimum of two days per week while construction occurs within the forest.
- The ECO will determine the extent to which bush is cleared and will clearly demarcate which plants/trees are to be avoided.

ALTERNATIVE 2 – ROUTE ALTERNATIVE ALONG EXISTING ROADS

General impacts as above, including

STREAM CROSSINGS

- Construction of any river crossings MUST comply with an EMPr approved by the Department of Water Affairs and by the Department of Environmental Affairs
- Use MUST be made of ecologically acceptable temporary diversion methods if necessary.
- Construction of stream crossings MUST be done under supervision of the ECO.

ALTERNATIVE 3 – PIPELINE ROUTE AS PER ALTERNATIVE 1, ABOVE GROUND PIPELINE THROUGH THE ALEXANDRIA FOREST SECTION

General impacts as above, including

PIPELINE ANCHORING

- All concrete MUST be mixed on a suitably bunded temporary area.
- Contaminated water from concrete mixing should be collected and disposed of according to the instructions of the ECO

SOIL EROSION

- Ensure that construction sites are stabilised and soil is prevented from unnecessary exposure.
- Implement vegetation re-establishment as part of a detailed Rehabilitation Plan.
- Cut and fill of soil on steep slopes within the Alexandria forest section may affect protected trees.
- Avoid cut and fill of soil on steep slopes within the Alexandria forest where protected trees will be affected.

COMPLIANCE WITH THE EMPr

- An ECO MUST be on site a minimum of two days per week while construction occurs within the forest.
- The ECO will determine the extent to which bush is cleared and will clearly demarcate which plants/trees are to be avoided.

6.3 Operational Phase

MAINTENANCE

- Regular inspection of the pipeline must take place to monitor its operational status.
- Pipelines MUST be regularly monitored for leaks. If these are identified or reported by the public, immediate actions must be taken to remedy the situation.

- Service roads should remain within the servitude as much as possible. Avoid creating permanent tracks. Monitor for erosion and rehabilitate if necessary.

7 ENVIRONMENTAL MONITORING

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

(e) proposed mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon;

7.1 General environmental monitoring

A monitoring programme will be implemented for the duration of the construction of the Bulk Water Supply Pipeline. 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
- Bi-weekly (fortnightly) monitoring during the first month of construction where after monthly audits will be conducted by the Environmental Control Officer 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.
- While construction is taking place inside the Woody Cape Nature Reserve, the ECO must be on site at least twice a week to ensure that protected plant and tree species are adequately demarcated.
- 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 regulation 33 of GN R 543, an environmental management programme must include:

(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;

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.
- 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 documentation 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 have been 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.
- 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 regulation 33 of GN R 543, an environmental management programme must include:

(e) Proposed mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon;

(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;

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.
- 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 t fires.
- Accidental spillage of hazardous substances.
- Accidental toxic emissions into the air.
- 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.
- 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.
- 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 DEA 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 DEA 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 ongoing 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.
- 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 DEA 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 the Project is provided below, and all applicable documentation must be included in the environmental filing system catalogue or document retrieval index.

- Final Environmental Impact Assessment Report.
- Environmental Management Plan.
- 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 DEA.
- 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.
- 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 Bulk Water Supply Pipeline as detailed in the BAR and specialist reports. The EMPr could thus change daily, and if managed correctly lead to a 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 DEA 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.

APPENDIX 1

PROPOSED ENVIRONMENTAL EDUCATION COURSE

WHAT IS THE ENVIRONMENT?

- Soil
- Water
- Plants
- People
- Animals
- Air we breathe
- Buildings, cars and houses

WHY MUST WE LOOK AFTER THE ENVIRONMENT?

- It affects us all as well as future generations
- We have a right to a healthy environment
- A contract has been signed
- Disciplinary action (e.g. construction could stop or fines issued)

HOW DO WE LOOK AFTER THE ENVIRONMENT?

- Report problems to your supervisor/ foreman
- Team work
- Follow the rules in the EMP

WORKING AREAS

Workers & equipment must stay inside the site boundaries at all times

RIVERS & STREAMS

- Do not swim in or drink from streams
- Do not throw oil, petrol, diesel, concrete or rubbish in the stream
- Do not work in the stream without direct instruction
- Do not damage the banks or vegetation of the stream

ANIMALS

- Do not injure or kill any animals on the site
- Ask your supervisor or Contract's Manager to remove animals found on site

TREES AND FLOWERS

- Do not damage or cut down any trees or plants without permission
- Do not pick flowers

SMOKING AND FIRE

- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Do not light any fires without permission
- Know the positions of fire fighting equipment
- Report all fires
- Do not burn rubbish or vegetation without permission

PETROL, OIL AND DIESEL

- Work with petrol, oil & diesel in marked areas
- Report any petrol, oil & diesel leaks or spills to your supervisor
- Use a drip tray under vehicles & machinery
- Empty drip trays after rain & throw away where instructed

DUST

Try to avoid producing dust –

Use water to make ground & soil wet

NOISE

- Do not make loud noises around the site, especially near schools and homes
- Report or repair noisy vehicles

TOILETS

- Use the toilets provided
- Report full or leaking toilets

EATING

- Only eat in demarcated eating areas
- Never eat near a river or stream
- Put packaging & leftover food into rubbish bins

RUBBISH

- Do not litter – put all rubbish (especially cement bags) into the bins provided
- Report full bins to your supervisor
- The responsible person should empty bins regularly

TRUCKS AND DRIVING

- Always keep to the speed limit
- Drivers – check & report leaks and vehicles that belch smoke
- Ensure loads are secure & do not spill

EMERGENCY PHONE NUMBERS

Know all the emergency phone numbers:

- Ambulance:
- Fire:
- Police:
- **Local Municipality:**

FINES AND PENALTIES

- Spot fines of between

To be confirmed by Engineer

- Your company may be fined
- Removal from site
- Construction may be stopped

PROBLEMS - WHAT TO DO!

- Report any breaks, floods, fires, leaks and injuries to your supervisor
- Ask questions!

APPENDIX 2

PRO-FORMA: PROTECTION OF THE ENVIRONMENT

To be signed by Contractors

PRO FORMA

Employer_____

Contract No_____

Contract title_____

PROTECTION OF THE ENVIRONMENT

The Contractor will not be given right of access to the site until this form has been signed.

I/ we_____(Contractor) record as follows:

1. I/ we, the undersigned, do hereby declare that I/ we am/ are aware of the increasing requirement by society that construction activities shall be carried out with due regard to their impact on the environment.

2. In view of this requirement of society and a corresponding requirement by the Employer with regard to this Contract, I/ we will, in addition to complying with the letter of the terms of the Contract dealing with protection of the environment, also take into consideration the spirit of such requirements and will, in selecting appropriate employees, plant, materials and methods of construction, in so far as I/ we have the choice, include in the analysis not only the technical and economic (both financial and with regard to time) aspects but also the impact on the environment of the options. In this regard, I/ we recognise and accept the need to abide by the "precautionary principle" which aims to ensure the protection of the environment by the adoption of the most environmentally sensitive construction approach in the face of uncertainty with regard to the environmental implications of construction.

3. I/ we acknowledge and accept the right of _____ to deduct, should they so wish, from any amounts due to me/us, such amounts (hereinafter referred to as fines) as the Resident Engineer and Environmental Site Officer shall certify as being warranted in view of my/ our failure to comply with the terms of the Contract dealing with protection of the environment, subject to the following:

   3.1 The Resident Engineer and Environmental Officer, in determining the amount of such fine, shall take into account *inter alia*, the nature of the offence, the seriousness of its impact on the environment, the degree of prior compliance/non-compliance, the extent of the Contractor's overall compliance with environmental protection requirements and, in particular, the extent to which he considers it necessary to impose a sanction in order to eliminate/reduce future occurrences.

   3.2 The Resident Engineer and Environmental Officer shall, with respect to any fine imposed, provide me/ us with a written statement giving details

of the offence, the facts on which the Resident Engineer and Environmental Officer has based his assessment and the terms of the Contract (by reference to the specific clause) which has been contravened.

Signed_____
CONTRACTOR

Date_____