



ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE PROPOSED INSTALLATION OF A TRUNK WATER MAIN IN ASSAGAY, DURBAN

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1 INTRODUCTION

The eThekweni Municipality: Water & Sanitation Unit (hereafter referred to as 'EWS') proposes to install a 400mm steel water main pipeline (hereafter referred to as 'the Assagay Pipeline') within the road reserves of roads in the Assagay area, Outer West Region of the eThekweni Municipality (see Figure 1). The proposed Pipeline will be approximately 2.9km long and will extend from Gevers Road and connect to an existing water main in Fraser Road. The Pipeline is intended to supplement the existing 200mm diameter water main that currently feeds the Summerhills area, where there is a growing demand for additional water.

Arcus GIBB (Pty) Ltd (GIBB) was appointed by EWS as the independent Environmental Assessment Practitioner (EAP), to undertake the required Environmental Basic Assessment (BA) and compile an associated Environmental Management Programme (EMP) as part of the application for Environmental Authorisation for the proposed Assagay Pipeline Project.

This document constitutes the draft EMP for the pre-construction, construction and operational phases of the Assagay Pipeline Project. The draft Basic Assessment Report and EMP, was compiled by GIBB and submitted to the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development (DAEARD) for as part of the BA application process for environmental authorisation for the Pipeline project.

On approval of the BA Report and draft EMP by the DAEARD, Environmental Authorisation will be granted which details the environmental conditions to be adhered to during construction and operation of the Assagay Pipeline Project. This EMP will then be updated to reflect any condition stipulated within the Environmental Authorisation and will only then be finalised. However, it is important to note that the EMP is a 'working document which can be amended to suit specific on-site requirements as, and when, necessary during the construction process. All amendments must be submitted to the DAEARD for approval at each revision and before the amendments are implemented.

1.1 Report structure

This report is structured as follows:

Chapter 1	Provides the introduction, report structure, record of EMP revisions and details of project team
Chapter 2	Provides the objectives and scope of the EMP
Chapter 3	Provides definitions of terms
Chapter 4	Provides a project overview, technical details of the project and study area, Environmental Basic Assessment and potential identified impacts
Chapter 5	Provides the legislative framework
Chapter 6	Described the organisation, roles and responsibilities, compliance monitoring & staff training
Chapter 7	Provides details on method statements



Chapter 8 Provides the environmental specifications to be adhered to during pre-construction, construction and operational phases of the project

Chapter 9 Provides the conclusions to the EMP

1.2 Revisions

Revisions and updates to the EMP must be recorded. **Table 1** provides a list of revisions to the EMP to date and must be updated accordingly. All EMP revisions must be submitted to DAEARD for approval prior to implementation. Note that Annexures may require more frequent updating and it is therefore assumed that these revisions do not need to be sent to the DAEARD for approval. Amendments to Annexures must be documented but do not need to be sent to the DAEARD for approval.

Table 1: EMP Revision Record

Document name and version	Date	Author / reviser	Contact
Draft EMP for Public Review	April 2010	Rashieda Davids	rdavids@gibb.co.za 082 305 1352

1.3 Details of the Project Team

This section provides details on the project team, which includes the proponent organisation and contact person as well as the environmental authorities and the Environmental Assessment Practitioners (EAPs) that undertook the Basic Assessment and compiled this EMP.



1.3.1 The Proponent: eThekweni Municipality Water & Sanitation Unit

Name of Applicant:	eThekweni Municipality: Water & Sanitation Unit
Contact Person:	Mrs Leisel Bowes
Address:	3 Prior Road, Durban, 4001
Postal Address:	PO Box 1038, Durban, 4000
Tel:	031 311 8656
Cell:	082 809 0340
Fax:	031 311 8549
E-mail:	leiselbo@dmws.durban.gov.za

1.3.2 The Environmental Assessment Practitioner: Arcus GIBB (Pty) Ltd

Details of EAPs that prepared the draft Basic Assessment Report are as follows:

Company:	Arcus GIBB (Pty) Ltd
Name:	Mr Russell Stow Ms. Rashieda Davids
Address:	54 Norfolk Terrace, 2 nd Floor, IBM Building, Westville, 3630
Postal Address:	PO BOX 1365, Westville, 3630
Tel:	031 267 8560
Fax:	031 266 1352
E-mail:	rstow@gibb.co.za / rdavids@gibb.co.za

1.3.3 The Environmental Authority: Department of Agriculture, Environmental Affairs and Rural Development

The KwaZulu-Natal DAEARD is the designated authority responsible for authorising the BA and this EMP. DAEARD has overall responsibility for ensuring that the applicant (EWS) complies with the conditions of its Environmental Authorisation as well as this EMP. The Assagay Trunk Water Main BA was registered under reference number DM/0040/09.

The following DAEARD case officer was involved in handling the EIA application and EMP review:



Company:	Department: Agriculture, Environment Affairs & rural Development
Name:	To be determined
Address:	Department: Agriculture and Environment Affairs Private Bag X 6005 Hilton 3245
Postal Address:	
Tel:	031 302 2800
Fax:	031 302 2888
E-mail:	

2 OBJECTIVES AND SCOPE OF EMP

2.1 Objectives

The objectives of an EMP should include (Hill, 2000):

- Ensuring compliance with regulatory authority stipulations and guidelines which may be local, provincial, national and/or international from the start of the project
 - Ensuring that there is sufficient allocation of resources on the project budget so that the scale of EMP-related activities is consistent with the significance of project impacts
 - Verifying environmental performance through information on impacts as they occur
 - Responding to changes in project implementation not considered in the EIA
 - Responding to unforeseen events
 - Providing feedback for continual improvement in environmental performance.
-

2.2 Scope of the EMP

As per the National Environmental Management Act (Act No 107 of 1998) (NEMA) and associated EIA Regulations, an EMP must be compiled and approved by DAEARD, prior to the commencement of construction activities for the proposed project. The legislation states that an EMP is to be implemented by the appointed contractor, which will ensure that environmental impacts due to construction activities are mitigated on site.



The EMP will provide environmental management guidelines, which must be compiled with by the contractor in construction activities of the Assagay Pipeline Project. The Environmental Control Officer (ECO), acting on behalf of EWS, will monitor the implementation of the EMP. The EMP will form part of the contractual agreement to be entered into by EWS and the appointed contractor. Compliance with the EMP must, therefore, form part of all contractor's working tender documentation and be endorsed contractually. The recommendations and constraints, as set out in this document are enforceable under the General Conditions of Contract.

In order to achieve the above objectives, the generic scope of an EMP should include the following (Hill, 2000):

- Definition of the environmental management objectives to be realized during the life of a project (i.e. pre-construction, construction, operation and/or decommissioning phases) in order to enhance benefits and minimise adverse environmental impacts.
- Description of the detailed actions needed to achieve these objectives, including how they will be achieved, by whom, by when, with what resources, with what monitoring/verification, and to what target or performance level. Mechanisms must also be provided to address changes in the project implementation, emergencies or unexpected events, and the associated approval processes.
- Clarification of institutional structures, roles, communication and reporting processes required as part of the implementation of the EMP.
- Description of the link between the EMP and associated legislated requirements.
- Description of requirements for record keeping, reporting, review, auditing and updating of the EMP.

The purpose of the EMP is thus to:

- Ensure compliance with the Environmental Authorisation by incorporating all conditions into the EMP (to be included as **Appendix A** herewith once granted)
- Encourage good management practices through planning and commitment to environmental issues
- Promote understanding of the common environmental impacts associated with the construction and possible mitigation measures
- Recognise health and safety issues related to the project
- Define how the management of the environment is reported and how performance is evaluated
- Provide rational and practical environmental guidelines to:
 - Minimise disturbance of the natural environment
 - Prevent or minimise all forms of pollution
 - Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment
 - Adopt the best practicable 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
- Train employees and contractors with regards to environmental obligations.



3 DEFINITIONS OF TERMS

Table 2: Glossary of Terms

Audit	A verification process that is used to obtain information regarding the implementation of the EMP. It is an objective tool used to make improvements at the workplace
Avi-fauna	All birdlife and their nests.
Berm	A barrier that is designed to divert surface water flow. Berms will primarily be used along roads/tracks to prevent to concentrated flow of water over particular areas, thereby reducing erosion of roads.
Bunding	An impervious containment system for potential spillages from tanks / containers stored on site. The bunded area shall have a capacity greater than 110% of the total tankage contained. The bunding shall be constructed of a material impermeable and resistant to the stored material.
Client	For the proposed Assagay Trunk Water Main project, eThekweni Municipality: Water & Sanitation Unit (EWS) is the client.
Construction activities	Any action undertaken by the contractor, suppliers, sub-contractors or employees during the construction process.
Contractor	Construction companies as well as their sub-consultants and suppliers appointed to undertake the construction activities on behalf of the client.
Construction camp	The area allocated for the establishment of equipment, repair area, ablution facilities, lay down and rest areas, etc. It also serves as the central point for the storage of fuel and construction material.
Environment	The surroundings within which humans exist and include biophysical, social and economic aspects. Examples include water, air, soil, plants and animals.
Environmental Control Officer (ECO)	Individual appointed by the Project Engineer and who is responsible for the implementation of the EMP, liaison between EE, Contractor, landowners and monitoring, reviewing and verifying compliance with the EMP by the Contractor.
Environmental specification	A component of the contractor's construction activity that is likely to interact with and potentially impact on the environment.
Environmental impact	A positive or negative change to the environment that results from the effect of a construction activity. The impact may be a direct or indirect consequence of a construction activity.
Environmental Management Programme (EMP)	An EMP is to be implemented by the appointed contractor, to ensure that environmental impacts that may occur due to construction activities are mitigated on site. An EMP provides environmental management guidelines, which must be complied with by the Contractor in installing the Assagay Trunk Water Main. The undertaking of an EMP is in accordance with the requirements of the



	National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations.
Fauna	Any and all animals identified within or outside of the construction area. Animals may not be harmed in any way.
General waste	Domestic, commercial, non-hazardous waste and builders rubble e.g. paper, plastics, food, tins, etc.
Hazardous substance	Any substance that is a risk to health and safety, property or the environment. Hazardous substances have been classified under the SANS 10228: 'The Identification and Classification of Dangerous Goods and Substances'.
Hazardous waste	Any inorganic or organic element or compound that because of its toxicological, physical, chemical or persisting properties, may exercise detrimental acute or chronic impacts on human health or development. Hazardous wastes are classified in accordance with the 'Minimum Requirement for the Handling, Classification and Disposal of Hazardous Waste' published by the Department of Water Affairs and Forestry (1998).
Hazardous waste landfill site	A waste disposal site that is designed and managed to accommodate the disposal of hazardous waste substances, and is accordingly permitted by the Department of Water Affairs (DWA).
Heritage site	A site that contains either archaeological artefacts, graves, buildings older than 60 years, meteorological or geological fossils etc.
Land owner	The individual or company that owns the land adjacent to the construction site.
Method Statement (MS)	Method Statements indicate how compliance with the Environmental Specification will be achieved. The Contractor shall submit a written Method Statement to the ECO for approval, covering those activities, which are identified (in this document and/or by the ECO), as being potentially harmful to the environment.
Servitude	A servitude is a right to access which allows a local authority access to a property for inspection or installation of roads, pipes, sewerage lines, electricity cables and so on. It is registered against the title deed.
Site Diary	A logbook kept on site during construction to record the day to day construction activities.
Spoil	Uncontaminated soil removed during excavations, culverts and roads.
Topsoil	The layer of soil covering the ground that allows for the successful germination of seeds, water penetration and is a source of micro-organisms and plant nutrients.
Watercourse	A natural channel in which water flows regularly or intermittently.
Workforce	All people involved in the construction activities of the Assagay Trunk Water Main project, including people employed by the client or contractor, either permanent or casual staff.



4 PROJECT OVERVIEW

4.1 Background

The primary responsibility of EWS is to provide water and sanitation services to all customers in the municipality. Eradicating the backlog of the provision of both services is a key priority for the EWS. The water backlog has been reduced to 15% of what it was in 1996 and the sewerage backlog stands at approximately 50% of the 1996 figure. The eThekweni Municipality has set as a target of supplying all households in Durban with access to potable water within 5 years of June 2008. As part of reaching this target the EWS has identified the probable water shortages that are eminent with the rapid expansion of the Summerhills area and wish to install a secondary pipeline to supply the additional water demand in the area. The proposed Pipeline is therefore key in supplying the Summerhills area with sufficient volumes of potable water in the near future.

4.2 Study area

The Assagay Trunk Water Main is proposed to be installed in Assagay, Durban. This area is mainly residential with some commercial and business use. The proposed pipeline will be aligned predominantly within the road reserve, which for the most part does not contain any sensitive environmental features. However, portions of the alignment do traverse narrow road reserves alongside steep slopes and a wetland.

4.3 Technical description of the Assagay Trunk Water Main Project

4.3.1 Type of Piping and Method of Installation

The Pipeline will be a 400mm diameter steel water main pipeline for the bulk supply of water to consumers. It will be laid in an approximately 1m wide by 3m deep trench. The type of pipe to be used is a 400mm diameter fusion bonded epoxy-lined pipe (externally), with a cementitious internal lining.

The installation of the Pipeline would take approximately one week per 100 metres. The Pipeline will not be joined with any couplings but will be continuously welded. At points where valves, fire hydrants or tie in points are required along the Pipeline, a flanged (class PN 16) will be welded onto the end of the pipe and the valves, fire hydrants, etc will be connected onto the pipe. The Pipeline will be laid with a general 1m cover and be surrounded by a 100mm thick bedding cradle of river sand (above and below the pipe). This bedding material will be free of stones/debris.



The EWS have stated that the intention is to install the Pipeline within the road reserve and stay outside of driveways and verges as far as possible, although some of the road reserve has been claimed as verges. Where the Pipeline is installed within the road itself, the road will be rebuilt above it according to the standards defined by the class of the road. No household tie-in connections will be made directly to the Pipeline along its path through Assagay as it is a trunk main (bulk main) line.

4.3.2 Proposed Pipeline Alignment

The preferred route alignment is approximately 2.9km in length and runs within the road reserve from a tie-in point at the intersection of Gevers and Assagay Roads, along Hlupeka Place and portions of Kassier Road, Acorn Grove, Assagay Crescent and Alverstone Road to the existing 400mm diameter main connection point in Fraser Road (see Figure 2).

Most of the Pipeline will be installed on the road verge and in the road, as there is sufficient space throughout the route. There would be only one reticulation line off this route and water interruptions would therefore be at a minimum.

This alignment traverses ± 6 Transnet pipes that cross at 13 Assagay Crescent. EWS have obtained the necessary approval from Transnet to traverse their pipes at this point with conditions that must be adhered to during construction and operation of the Pipeline (**Section 8.1.6**).

4.4 Environmental Impact Assessment

Arcus GIBB undertook the Basic Environmental Assessment (BA) and associated Public Participation Process of the proposed Assagay Trunk Water Main project.

4.4.1 Brief Process Summary

The BA process followed was in accordance with the EIA Regulations published in Government Notice No. Regulation 385 and 386 of 2006. These regulations, which were published under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), regulate and control activities which may have a detrimental effect on the environment. Accordingly, certain "listed activities" require environmental authorisation by way of an BA process. For the Pipeline project, these activities were listed in Regulation 386, namely, 1(k), 1(m) and 4.

The BA application has been registered with DAEARD Reference Number DM/0040/09. The draft Basic Assessment Report has been made available along with the draft EMP for public comment for a 40 day period. All comments received will be incorporated into the final BA Report, which will be submitted to DAEARD for a decision.

The following specialists were involve in the BA:



Table 3: Specialists Involved in the EIA Process

Aspect	Organisation/Specialist
Wetland Study	<i>Institute of Natural Resources</i> A. Teixeira-Leite
Geotechnical Investigation	<i>eThekweni Municipality</i> Dr TE Francis

4.4.2 Identified Impacts

The following potential environmental impacts were identified through the BA for the construction and operational phases of the Assagay Trunk Water Main.

a) Construction phase impacts

- Wetland impacts
 - Disturbance of wetland vegetation and habitat
 - Disturbance of wetland soils and alteration of wetland geomorphology
 - Erosion and sedimentation from construction activities
 - Invasion by exotic plants
- Stream / drainage line impacts (in wetland area)
 - Alteration of hydrological functioning within the stream channel
 - Pollution of the immediate and downstream environment (hazardous substances and general wastes)
 - Impact on stream morphology
 - Disturbance of in-stream habitat
- Construction related direct impacts on residents
 - Traffic disturbance and congestion to residents and commuters along affected roads in Assagay
 - Closure of Gevers Road (when Pipeline is installed across it)
 - Water interruptions
 - Visual and aesthetic impacts of construction site
 - Noise impact from trench excavation, pipe welding and construction vehicles and equipment.
- Construction related cumulative impacts
 - Emissions from construction vehicles and equipment
 - Use of relatively small quantities of water for construction purposes
 - Use of relatively small quantities of energy sources, mostly fuel for construction vehicles and equipment
 - Generation of a relatively small quantity of construction waste

b) Operational Phase impacts

- Adequate provision of water to the Summerhills consumers
- Potential re-disturbance of wetland for maintenance activities



- Potential construction impacts as listed above due to maintenance of Pipe.
- Wetland not adequately rehabilitated resulting in the following potential impacts:
 - Indigenous grasses not re-established
 - Disruption in flow of water through the wetland
 - Continuous erosion of bare ground
- Reduction in the backlog of water provision by eThekweni Municipality.

The recommendations for mitigation of the above impacts that were made in the BA, which are considered pertinent to the EMP, have been incorporated into the relevant sections of the EMP. Refer to the draft BA Report for further information on the identified impacts.

4.5 Key Activities Posing Potential Environmental Impact Risk

Activities that are undertaken during construction, maintenance and operation of the proposed pipeline installation, which potentially may have an impact on the environment, are listed below.

4.5.1 Project activities associated with construction

The project construction activities that may affect the environment include the following:

- The batching and use of concrete for foundations on site
- Trench excavation and soil stockpiling
- The storage and use of construction material such as water, concrete, fuel, transformer oils, pipes, steel structures, construction wastes and litter.

4.5.2 Project activities associated with operation

The project operational activities that may affect the environment include the following:

- Maintenance of the pipeline, which may involve digging up trenches and associated disturbance to residents.

5 LEGISLATIVE CONTEXT

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

- The disturbance of ecosystems and loss of biodiversity are avoided (minimised or remedied)
- Pollution and degradation of the environment are avoided or minimised and remedied
- Waste is avoided or minimised and re-used or re-cycled where possible and otherwise disposed of in a responsible manner



- A risk averse and cautious approach is applied
- Negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot altogether be prevented, are minimised and remedied.

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

5.1 National, Local and Regional Legislation

All legislation applicable to the development must be strictly enforced both during the construction and operational phases. The contractor must be acquainted with the relevant environmental legislation, including provincial and local government regulations, which are in place to ensure the protection of the environment. The environmental legislation applicable to the project includes, but is not limited to, the following:

- Constitution of the Republic of South Africa (Act 108 of 1996)
- National Environmental Management Act (Act 107 of 1998) (NEMA)
- Environment Conservation Act (Act 73 of 1989)
- National Water Act (Act 36 of 1998) (NWA)
- Hazardous Substances Act (Act 15 of 1973)
- Fire Brigade Services Act (Act No 99 of 1987)
- National Heritage Resources Act (Act 25 of 1999)
- National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA)
- Hazardous Substances Act (Act 15 of 1973)
- Occupational Health and Safety Act (Act 85 of 1993)
- Municipal Bylaws
- eThekweni Municipality Generic EMP

5.2 eThekweni Municipality's Environmental Management Policies and Commitments

eThekweni Municipality's Environmental Management Department is focused on a specialised area of environmental management, namely, the planning and protection of the city's natural resource base. In addition, the Environmental Management Department assists the Municipality and its partners in meeting the developmental needs of all its residents, while ensuring the sustainability and viability of the city's natural resource base, which is a critical foundation for all existing and future development.



6 ORGANISATION, ROLES AND RESPONSIBILITIES

6.1 Organisational Requirements

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

During construction, all instructions and official communications regarding environmental matters shall follow the generic organogram shown in **Figure 3**. The organisational structure identifies and defines the authority structure, and the communication structure for the various parties involved in the construction of the proposed development. The structure may require revision as the project unfolds.

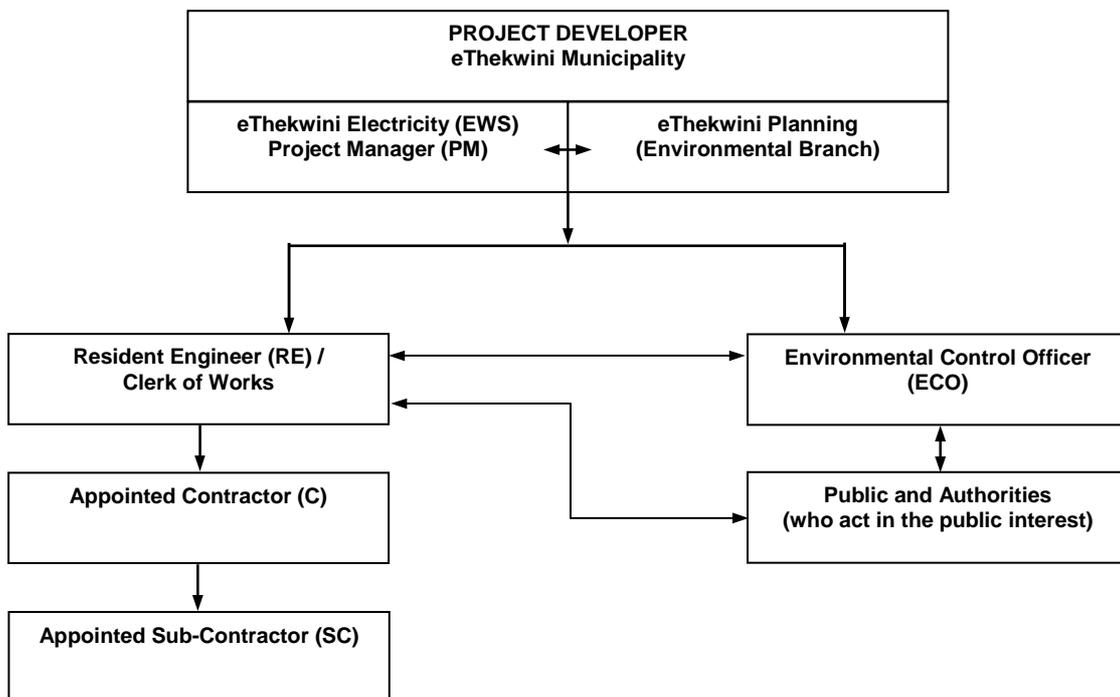


Figure 3: Organisational / Reporting Structure for implementation of the EMP

EWS will appoint a Project Manager who will be responsible for the proposed development. EWS might choose to appoint a consultant to implement the project. A Resident Engineer (RE)/Clerk of Works shall be appointed to direct and monitor Contractor activities during the construction of the development.

Either EWS or the Consultant shall appoint an Environmental Control Officer (ECO) to oversee the implementation of the construction component of the EMP on site. It will be the responsibility of the ECO to consult with the RE regarding instructions pertaining to contravention, corrective actions, and penalties or working methods. Except in an



emergency situation, where instructions may be given directly to the Contractor, all instructions given by the ECO shall go through the RE, who will then convey these to the Contractor.

Note that EWS might choose not to appoint external consultants, in which case the RE and ECO would report directly to the Project Manager.

The EMP will be an item of the monthly site meetings, and the ECO shall attend every second meeting in order to provide input with respect to compliance with the EMP. Copies of the minutes will be sent to EWS.

Key roles and responsibilities of each party are outlined in more detail in **Section 6.2**. It is important to note that, while parties are assigned various environmental roles and responsibilities, parties are severally and jointly responsible to ensure compliance with all environmental legislation and best practice.

6.2 Roles and Responsibilities

Table 4 outlines the roles and responsibilities in terms of the EMP for the following parties:

- eThekweni Water & Sanitation Project Manager (PM)
- eThekweni Environmental Manager (EEM)
- Resident Engineer (RE) / Clerk of Works
- Environmental Consultant and Environmental Control Officer (ECO)
- Contractor (C)
- Sub-contractor (SC)
- Public, which includes authorities who act on behalf of the public.
- Transnet Representative

Contact details for all key role-players are provided in **Appendix B**. These must be updated as necessary throughout out the project phases.

Table 4: Organisational Roles and Responsibilities

Role	Responsibility
6.2.1 Provincial Environmental Authorities (Department of Agriculture, Environmental Affairs and Rural Development – DAEARD)	
Authority responsible for compliance with all environmental legislation. Contact person: To be confirmed	<ul style="list-style-type: none"> • Convey legal requirement for the EMP • Give directives in terms of specific requirements for EMP specifications • Review draft, final and revision EMPs • Undertake spot inspections of the site • Review ECO Audit Reports • Request and view Environmental Incident Report



Role	Responsibility
<p>Contact No:</p> <p>Email:</p>	<ul style="list-style-type: none"> • Request and view the Complaints Register • Issue directives, notices and/or fines for significant transgressions with the EMP or environmental legislation
<p>6.2.2 eThekweni Water & Sanitation Project Manager (EWS PM)</p>	
<p>The PM assumes overall responsibility for the environmental aspects and management of the Assagay Trunk Water Main Project. This includes compliance to all environmental regulatory and good management practice requirements for the duration of the project, in order to ensure effective minimisation of all environmental impacts. The PM is also responsible for the overall management and implementation, administration and enforcement of the EMP.</p> <p>Contact person: Leisel Bowes</p> <p>Contact No: 031 311 8656 082 809 0340</p> <p>Email: leiselbo@dmws.durban.gov.za</p>	<ul style="list-style-type: none"> • Ensure that all designs appropriately incorporate the required environmental provisions as discussed in the Basic Assessment Report (BAR) and EMP. • Ensure that the EMP is finalised and adequately describes the minimum environmental regulatory requirements at the time construction commences. • Ensure that the final EMP is approved by all relevant authorities. • Ensure that the EMP specifications are included in all tender documents issued to prospective contractors for the development works and activities on site. • Ensure that the prospective Tenderers/Contractors abide by the provisions of the EMP. • Appoint the Environmental and Engineering Consultants (or alternatively the RE/Clerk of Works and ECO) for the duration of the construction period and ensure that their scope of work sufficiently covers responsibilities that will ensure implementation and compliance with the EMP and good environmental management throughout the project. • Ensure that the EMP remains fully implemented, revised and updated. • Include the EMP in the Tender Document for contractor appointment. • Review and where necessary, revise the 'incident and associated penalty values list' and include the list in the Tender Document. • Give instructions regarding the development and implementation of Method Statements • Review and approve all the Method Statements • Keep record of all Method Statements and the associated review and approval status • Be liable/accountable, to the relevant authority, DAEARD, for any contravention/non-compliance by any Contractor under their supervision. • Liaise with the environmental authorities and EWS Senior Management as and when necessary. • Establish and maintain regular and proactive communications with the Consultant/RE, Contractor and Environmental Consultant/ECO. • Undertake periodic audits, site visits and inspections to ensure that the environmental requirements are implemented. • Review and comment on environmental compliance assessments and/or reports. • Review the Complaints Register • Give instructions on any procedures and corrective actions



Role	Responsibility
	<ul style="list-style-type: none"> • Report any significant environmental incidents or impacts to the relevant environmental authorities. • Decide on dealing with policing, fining, penalties and discrepancies. • Issue fines or 'work suspend' orders for contravention of the EMP and give instructions regarding corrective action, through the RE.
6.2.3 eThekweni Environmental Manager (EEM)	
<p>The eThekweni Environmental Branch, which falls under the eThekweni Development Planning and Management Unit, is responsible for sound environmental management of any projects or activities undertaken within the eThekweni Municipal Area. As such they advise all eThekweni departments on environmental requirements for their projects and activities and will therefore support EWS on this project with advice and instruction on any environmental issue or requirement related to the project.</p> <p>Contact person: Kuben Samie</p> <p>Contact No: 031 311 7919</p> <p>Email: SamieK@durban.gov.za</p>	<ul style="list-style-type: none"> • Review the EMP and any revision thereof and ensure that it fully aligns with the Basic Environmental Assessment and associated Environmental Authorisation. • Review and approve any Method Statements that are prepared for the project. • Comment, advise and provide instructions for any additional environmental requirements for the project or any project activity. • Advise on specific environmental requirements for protected/sensitive areas (e.g. wetland to be traversed). • Liaise with other environmental authorities (eThekweni Environmental Department, DAEARD) as and when required. • Report any serious environmental issues to the relevant environmental authorities (eThekweni Environmental Department, DAEARD, Department of Water Affairs, etc.).
6.2.4 Resident Engineer (RE) / Clerk of Works	
<p>The RE oversees the construction programme and all construction activities performed by the contractor and as such also any EMP implementation, EMP compliance and environmental related activities, issues and impacts.</p> <p>Contact person: To be confirmed</p> <p>Contact No:</p> <p>Email:</p>	<ul style="list-style-type: none"> • Gain an in-depth understanding of the EMP. • Ensure implementation of all aspects and specifications of the EMP. • Ensure that the Contractor develops and provides all required Method Statements. • Ensure that all the Method Statements compiled by the contractor in connection with the EMP are thoroughly reviewed and approved, with the assistance of the ECO. • Review the EMP and Method Statements to confirm their reasonable practicality and financial feasibility and provide relevant feedback to the EWS Project Manager and Environmental Consultant. • Review and approve drawings produced by the Contractor in connection with, e.g. construction site layout, access/haul roads, construction stormwater management plan, etc. • Oversee all site works. • Enforce, oversee, monitor and verify the Contractor's compliance with environmental legislation, the EMP and specifications and the approved Method Statements.



Role	Responsibility
	<ul style="list-style-type: none"> • Inspect the site and surrounding areas on a daily basis with regard to compliance with the EMP • Monitor and verify that environmental impacts are kept to a minimum at all times. • Notify the ECO of any accidents and transgressions on site with respect to environmental management and non-compliance with the latest EMP version and approved Method Statements and seek advice from the ECO for required corrective actions and/or site remediation. • Assist the Contractor in finding environmentally responsible solutions to problems with input from the ECO. • Take action to address all EMP, Method Statement and/or environmental legislation non-compliances. • Instruct the Contractor on the requirements and procedures in terms of environmental non-compliance 'near misses', incidents and public complaints recording, investigation and reporting • Keep records of all activities, 'near misses' and incidents concerning the environment, EMP compliance status and issues in the site diary and distribute associated reports to the PM and ECO. • Communicate to the contractor, verbally and in writing, the advice of the ECO and the content of the ECO reports. • Designate and manage the working areas as per approved construction site layout, including sensitive environments. • Keep a register of all public complaints in the Site Office (to be situated in proximity to where the works are taking place) and deal with any community comments or issues. • Order the removal of, or issuing spot fines for, person(s) and/or equipment not complying with the specifications • Issue penalties for contravention of the EMP.
6.2.5 Environmental Consultant / Environmental Control Officer (ECO)	
<p>Fulfil an advisory consultancy, monitoring and reporting role with regard to overseeing the effective implementation and updating of the EMP. Making recommendations for addressing EMP and/or environmental legal non-compliances. Liaising with the relevant Environmental Authorities on any environmental issues to confirm their requirements, as and when required and communicating such requirement to the EE Project Manager and/or RE.</p> <p>(Note that the Environmental</p>	<ul style="list-style-type: none"> • Revise and update the EMP as and when necessary and submit such updates to the RE and Contractor for review. • Submit copies of revised EMP to all relevant stakeholders for their information and review. • Advise the PM on ensuring that necessary environmental authorisations and permits have been obtained. • Prepare EMP introduction and environmental awareness training course material/manual and present this course to the RE, Contractor and possibly sub-contractors, including any staff member they deem necessary, prior to them starting any work on site. • Keep record of everyone who attended the EMP introduction training course. • Review and comment on all Method Statements



Role	Responsibility
<p>Authorisation may specify that the ECO needs to be independent in which case EWS needs to outsource this function.)</p> <p>Contact person: Rashieda Davids</p> <p>Contact No: 031 267 8560 / 082 305 1352</p> <p>Email: rdavids@gibb.co.za</p>	<p>relevant to environmental management and make recommendations to the RE as appropriate.</p> <ul style="list-style-type: none"> • Make recommendations on any additional Method Statements that may be required as the construction process progresses. • Develop a strategy and system (e.g. checklist) for site inspections and EMP compliance monitoring and audits. • Undertake regular site inspections and liaison with the RE and Contractor (meetings) to monitor, audit and verify that all works comply with environmental legislation and the EMP compliance; that environmental impacts are kept to a minimum; and ascertain the level of such compliance and impact minimisation. • Keep record of EMP implementation, monitoring and audits. • Prepare regular monitoring/audit reports which reflect the EMP compliance status, findings, issues and recommended actions for addressing non-compliances and submit these to the project team and relevant Environmental Authorities (DAEADP). • Review 'near miss' reports, incident reports and complaints register and recommend corrective actions • Report any serious environmental incidents or environmental impacts immediately to the RE, the EWS Project Manager and the eThekwini Environmental Manager. • Assist the project team in finding environmentally responsible solutions to problems. • Keep records of all activities/incidents concerning the environment on site. • Maintain a photographic record of the site before, during and after construction. • Advise the RE on the removal of person(s) and/or equipment not complying with the specifications. • Make recommendations to the RE on the issuing of fines for transgressions of site rules and penalties for contravention.
6.2.6 Contractor	
<p>It is the Contractor's role to implement and comply with recommendations and conditions of the EMP at all times.</p> <p>Contact person: To be confirmed</p> <p>Contact No:</p> <p>Email:</p>	<ul style="list-style-type: none"> • Study the EMP and all its specifications carefully and gain a full understanding of its implications. • Provide for full compliance with the EMP and all its relevant specifications in the submitted Tender; and/or provide motivation and/or alternative specifications through Method Statement(s) for any deviation from or 'tailor making' of the EMP for EWS to consider. • Avail him / her, as well as any staff he may identify, for induction training on the EMP by the ECO. • Notify the RE and ECO of the anticipated programme of works and fully disclose all details of activities involved. • Prepare all the required / agreed Method Statements for submission to the RE and ECO. • Sign off on approved Method Statements. • Provide appropriate training on the latest version of the



Role	Responsibility
	<p>EMP and all approved Method Statements to all staff and sub-contractors and keep a record of such training (e.g. keep record of the date of training, version of the EMP the training was for, the staff/sub-contractor trained and their ID numbers and have the trainee sign off on the training received).</p> <ul style="list-style-type: none"> • Ensure that the EMP environmental specifications (of this document including any revisions, additions or amendments) and all approved Method Statements are effectively implemented. • Implement on-site steps to mitigate environmental impacts. • Ensure that all employees and sub-contractors employed comply with the requirements and provisions of the EMP at all times. • Monitor environmental performance and conformance with the specifications contained in the latest EMP version and the approved Method Statements during daily site inspections. • Inform the RE and ECO of problems arising when implementing the EMP and recommend ways of improving it. • Discuss implementation of and compliance with this document with staff at routine site meetings • Be responsible for all Contractor staff and sub-contractors. • Report progress towards implementation of and non-conformances with the latest EMP version and approved Method Statements at site meetings with the RE and ECO. • Prepare two weekly compliance status/feedback reports and submit these to the RE and ECO and keep copies thereof on record for the duration of the contract and at least three years after the contract expired. • Notify the RE and ECO of any accidents and transgressions on site with respect to environmental management and non-compliance with the latest EMP version and approved Method Statements and seek advise from the RE for required corrective actions and/or site remediation. • Report all 'near miss' incidents and actual incidents of environmental legislation and/or EMP non-compliances immediately to the RE. • Record all 'near miss' incidents and actual incidents and consequent corrective actions/remedial action taken in Near Miss Reports and Incident Reports and submit these within one week of the occurrence to the RE and ECO for signing off. • Report and record all accidents, incidents resulting in injury or death or significant environmental liability immediately to the RE and ECO. • Record all complaints received and immediately inform the RE and ECO thereof. • Ensure that suitable records are kept of all compliance status/feedback reports, incident reports and complaints register and that these documents are available for



Role	Responsibility
	auditing by the RE or ECO at all times.
6.2.7 Sub-contractor (if necessary)	
<p>Contact person: To be confirmed if necessary</p> <p>Contact No:</p> <p>Email:</p>	<ul style="list-style-type: none"> • Study all relevant EMP sections, specifications and approved Method Statements carefully and gain a full understanding of the implications thereof. • Prepare and provide Method Statement(s) as per the Contractor's instructions. • Implement and comply with all relevant EMP sections, specifications and approved Method Statements. • Notify the Contractor of the anticipated programme of works and fully disclose all details of activities involved. • Avail him / her, as well as any staff he may identify, for induction training on the environmental requirements as per Contractor's instructions. • Implement on-site steps to mitigate environmental impacts. • Be responsible for its staff. • Report progress towards implementation of and non-conformances with the relevant sections of the latest EMP version and approved Method Statements to the Contractor. • Notify the Contractor (or RE where the Contractor was unavailable) of any and all 'near misses', incidents, accidents and transgressions on site with respect to environmental management and non-compliance with the latest EMP version and approved Method Statements and seek advise from the Contractor (or RE) for required corrective actions and/or site remediation. • Record all incidents and the corrective actions/remedial action taken in incident report and submit these to the Contractor for signing off. • Report and record all accidents and incidents resulting in injury or death immediately to the Contractor (or RE). • Record all complaints received and immediately inform the Contractor (or RE) thereof.
6.2.8 Public and Authorities Acting on Their Behalf	
<p>The public, as well as the authorities responsible of acting on behalf of the public, watches over the project and 'blows the whistle' on any non-compliances with the Environmental Authorisation and EMP.</p> <p>Contact person: To be confirmed</p> <p>Contact No:</p> <p>Email:</p>	<ul style="list-style-type: none"> • Monitor EMP compliance. • Register complaints on any EMP or Method Statement non-conformances.



Role	Responsibility
6.2.9 Transnet Representative	
<p>Prior to commencement of the work, a representative of Transnet must be present to indicate the position of the pipelines and to undertake any work on Transnet's pipeline that may be necessary</p> <p>Contact person: To be confirmed</p> <p>Contact No:</p> <p>Email:</p>	<ul style="list-style-type: none">• Indicate position of Transnet pipelines on site• Assist with Transnet pipeline related information.

6.3 Compliance Monitoring and Reporting

As mentioned, EMP compliance is the responsibility of all the parties that make up the project team shown in Figure 3. Similarly all these parties have a role to play in EMP compliance monitoring and reporting in accordance with the authority structure. For example: sub-contractors must monitor their own compliance and report any discrepancies, non-compliances or incidents to the contractor, while the contractor must in turn monitor the sub-contractor compliance. In turn, the RE shall monitor the Contractor's EMP compliance on a day-to-day basis while the ECO has the role to undertake regular site inspections and audits and prepare audit reports.

The following inspection sheet and report templates are recommended and included in **Appendix B** respectively.

- Project Start Up Inspection Sheet
- Routine Site Inspection Sheet
- Construction Site Decommissioning Inspection Sheet
- Site Inspection Report Structure

6.4 Non-compliance, Penalties and 'Suspended Work' Orders

The RE, in consultation or on the advice of the ECO, shall issue penalties ('spot fines') if the Contractor infringes environmental specifications set out in this EMP. The Contractor shall be advised in writing of the nature of the infringement and the amount of the spot fine. The Contractor shall be liable for the fine and it is his responsibility to recover the fine from the



relevant employee. The Contractor shall also take the necessary steps (e.g. training) to prevent a recurrence of the infringement.

The Contractor is also advised that the imposition of spot fines does not replace any legal proceedings the authorities, landowners and/or members of the public may institute against the Contractor. Spot fines shall be between R500.00 and R20 000.00, depending upon the severity of the infringement. A list of typical EMP non-compliance incidents for which penalties may incur and associated fine value is included in **Appendix C**. For each subsequent similar offence, the penalty may, at the discretion of the RE be doubled in value to the maximum value to be determined by the RE. This list may be amended provided it is formally issued to the Contractor prior to an incident for which a penalty is imposed. The decision on when to impose a penalty will be at the discretion of the RE or ECO and will be final.

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

6.4.1 List of infringements that result in spot-fines

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

- Using any areas outside the working areas without permission
- Clearing and/or levelling areas outside of the working areas
- Spillage onto the ground or water bodies of oil, diesel, etc
- Picking/damaging plant material
- Damaging/killing animals/birds
- Untidiness and litter at camp
- Inappropriate use of bins and poor waste management on site
- Making fires on site
- Discharging effluent and/or stormwater onto the ground or into surface water
- Repeated contravention of the specifications or failure to comply with instructions
- Additional fines as determined by the ECO and added to this list
- Damage to any identified heritage sites.

A more comprehensive list of incidents and associated penalty values is provided in Appendix D. The RE shall retain records for spot fines issued. Monies for the spot fines will be deducted from the Contractors monthly certificate.

The RE at his own discretion, or on recommendation from the ECO, may also order the Contractor to place on-hold or suspend part or all the works if the Contractor repeatedly causes damage to the environment by not adhering to the EMP (i.e. more than 3 cases of infringements). The suspension will be enforced until such time as the offending actions, procedure or equipment is corrected. No extension of time will be granted for such delays and all costs will be borne by the Contractor. Work may also be placed on hold if a heritage artefact or feature or grave is uncovered or to prevent a potential significant incident from occurring or spreading.



6.5 Complaint Records

The Contractor must record any complaints received. The lodged complaint must be brought to the attention of the EWS Representative/PM who will respond accordingly. The following information will be recorded:

- Details of complainant
- Time, date and nature of the complaint
- Response and investigation undertaken
- Actions taken and by whom

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

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

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

The EWS Representative, in conjunction with the Appointed Construction Contractor, will identify and authorise remediation action where necessary.

6.6 Training and Induction of Contractors and Workers

All parties involved in the construction of the Assagay Pipeline Project are to be made aware of, and be familiar with, the EMP. It is the responsibility of the contractor to provide environmental awareness training to his staff.

7 METHOD STATEMENTS

Method Statements indicate how the Contractor will achieve compliance with environmental legislation, good management practice and the Environmental Specifications during the construction phase. Method Statements may be required for any identified specific activity or group of activities for which it is considered necessary to implement a detailed method to mitigate potential environmental impacts. In addition to the Method Statements identified in this EMP, the Contractor, RE and/or ECO may require additional Method Statements for effective environmental management and as the project unfolds.



7.1 Procedures and Content

The Contractor shall submit written Method Statement to the RE for approval, and shall only implement a Method Statement once he has received the RE's approval in writing. On receipt of a Method Statement the RE shall forward a copy thereof to the ECO. Both the RE and ECO shall review the Method Statement and come to an agreement as to whether the Method Statement is acceptable or requires amendments.

The Method Statement shall state clearly:

- Timing of activities
- Materials to be used
- Equipment and staffing requirements
- Proposed construction procedure designed to implement the relevant environmental specifications
- The system to be implemented to ensure compliance with the above
- Other information deemed necessary by the Contractor, RE and/or ECO.

The Method Statement shall be submitted at least 14 working days prior to the projected commencement of work on an activity, to allow the RE and ECO time to study and approve the Method Statement. The RE shall strive to review and approve the Method Statement within 7 working days of receipt thereof.

Once a Method Statement is approved it is binding and the Contractor must therefore ensure that all activities to which the approved Method Statement applies are carried out accordingly.

Due to changing circumstances, it may be necessary to modify Method Statements. In such cases, the proposed modifications must be reviewed by the RE and ECO. The Contractor may only implement a revised Method Statement once he receives formal written approval from the RE to do so. The Contractor must also obtain approval from the RE for any deviation from a Method Statement.

The ECO and RE must retain records of any amendments to any Method Statement and ensure that the most current version of all Method Statements are being used.

7.2 Required Method Statements

Method Statements that are identified and required from the Contractor in terms of this EMP are listed in **Appendix E**. These cover, for example, the following activities:



- Location, layout and preparation of the construction camp(s) and materials storage areas
- Location, layout and preparation of cement/concrete batching facilities including the methods employed for the mixing of concrete and the management of runoff water from such areas
- Stormwater management plan
- Contaminated water management plan, including the containment of runoff and polluted water
- Incidence Response Method Statements (including details of methods for fuel spills and clean up operations)
- Solid waste management and removal of waste from site
- Traffic diversions (only to be done in consultation with eThekweni Traffic Authority).

As mentioned, additional Method Statements may be identified and required by the Contractor, RE and/or ECO as the project unfolds.

8 ENVIRONMENTAL SPECIFICATIONS

This Section provides environmental specifications that must be adhered to during pre-construction, construction and operational phases of the Assagay Trunk Water Main Project. Since the environmental specifications are linked to the mitigation measures which were identified during the EIA and will in all probability form part of the conditions of Environmental Authorisation, it is essential that all the listed specifications are considered and appropriately incorporated into the planning, design and/or contract documentation, and adhered to during the respective phases of the project.

The listed environmental specifications should be regarded as the minimum range of environmental constraints, controls, procedures and/or standards. They should not be regarded as exhaustive and therefore improvements and/or amendments should be made where reasonable and required.

Such requirements may be identified by stakeholders and/or other interested and affected parties, upon which the EMP and the relevant environmental specifications may require revision. Environmental specifications have been listed in tables in the sub-sections as per the following phases:

- Pre-construction planning phase
- Construction phase
- Operational phase.

For each specification the responsible implementing party/parties and responsible monitoring party/parties is indicated. Refer to the *Table of Content* at the beginning of the document for an index of specification topics.



Environmental Specification	Action	Responsible Implementing Party	Responsible Monitoring Party
8.1 PRE-CONSTRUCTION PHASE			
<p>8.1.1 Traffic impacts</p> <p><i>The intention is to install the Pipeline within the road reserve of the selected roads in Assagay. This may at most require that one lane of a certain road be closed for the period of construction there. In addition, due to the Pipeline crossing Gevers Road, this road will be closed when the Pipeline is being installed. It should be noted that some of the roads have narrow areas with major bends, which can be dangerous during construction if traffic not adequately controlled</i></p>	<ul style="list-style-type: none"> a) Provide a Method Statement that describes all construction access, route, traffic and transportation requirements and management. b) Submit the Method Statement to the PE, ECO, and if required the eThekweni Transport Authority, for their approval. c) The planning of the construction programme must be cognisant of the traffic impacts. d) Liaise with the eThekweni Traffic Authority on envisaged traffic impacts. e) Obtain approval from the eThekweni Transport Authority for any traffic diversions or road closures. f) Inform residents two weeks prior to construction of any proposed road closures g) Ensure that detours and appropriate signage are available for to traffic prior to closing and initiating construction across Gevers Road. 	PM	EWS
<p>8.1.2 Road rehabilitation</p> <p><i>Portions of the Pipeline will be installed within the road itself. Construction within the road must be done in consultation with the eThekiwini Transport Authority.</i></p>	<ul style="list-style-type: none"> a) Obtain approval from the eThekweni Transport Authority prior to any construction within the road itself. b) Ensure that any road that has been excavated for pipeline installation is rebuilt to a standard that is in line with the initial condition of the road. c) Prepare a Method Statement for the construction and post construction reconstruction of roads that have been excavated for the installation of the pipeline in consultation with eThekweni Transport Authority. 	PM / Contractor	EWS
<p>8.1.3 Wetland design considerations</p> <p><i>The alignment at the corner of Kassier Road and Hlupeka Place. In order to install</i></p>	<ul style="list-style-type: none"> a) Ensure that the design of the Pipeline includes an appropriate concrete casing for the portion of the Pipeline traversing the wetland. This casing must ensure protection from damage to the Pipeline and associated requirements for repair. b) A Method Statement for work across the wetland must be prepared and 	PM / ECO	EWS



<p><i>the Pipeline, a trench of crosses a wetland through excavation of a 1m wide x 3m deep trench.</i></p>	<p>approved by eThekweni Environmental Department prior to construction commencing.</p>		
<p>8.1.4 Water interruptions</p> <p><i>Only one scheduled/planned water interruption is expected during construction of the Assagay Trunk Water Main. However, water interruptions can also occur through accidental damage to water pipelines.</i></p>	<ul style="list-style-type: none"> a) Ensure that residents are informed on any scheduled water interruptions well in advance of such water interruptions. b) Any accidental damage to operating water pipes during construction must be repaired immediately to ensure that the duration of water interruptions is kept minimal. c) Should any accidental damage occur to existing reticulation water mains along the route or household connections during excavation, ensure that any water spills are immediately contained and that damaged pipes are repaired d) Any proposed water interruptions must be advertised at least two weeks prior to interruptions occurring. e) Interruptions must be planned to take place during nighttime when demand for water is low. 	<p>PM / Contractor</p>	<p>EWS</p>
<p>8.1.5 Permits and licensing</p> <p><i>Permits may be necessary from the Department of Water Affairs when working within a wetland or stream channel.</i></p>	<ul style="list-style-type: none"> a) If necessary, obtain approvals/permits from the relevant authorities, e.g. the Department of Water Affairs and eThekweni Water Services, for the abstraction or diversion of water from the stream. b) Provide a Method Statement for any required abstraction or diverting of water flows from the stream. c) Submit the Method Statement to the PE and ECO for their approval. 	<p>PM</p>	<p>Department of Water Affairs / DAEARD</p>
<p>8.1.6 Transnet Company's Standard Crossing Conditions and Requirements for Underground Services</p> <p><i>The proposed alignment traverses approximately 6 Petronet pipes that cross</i></p>	<ul style="list-style-type: none"> a) Prior to commencement of the work, a representative of Transnet must be present to indicate the position of the pipelines and to undertake any work on Transnet's pipeline that may be necessary. The Servitude Supervisor, Mr Pieter Venter can be contacted at (031) 710 9257 or 083 284 0962, at least 14 days before the date on which construction is intended to commence in the vicinity of the Transnet pipeline. b) Should the work be undertaken without Transnet Pipelines' 	<p>PM / RE</p>	<p>Transnet</p>



<p><i>just outside of 13 Assagay Crescent. EWS has obtained the necessary approval with conditions from Transnet (previously Petronet) to traverse its pipes at this point. However, this approval was granted with conditions, as provided in this EMP, which EWS has agreed to adhere to.</i></p>	<p>representative being contacted as mentioned above, Transnet Pipelines reserves the right to request that the pipeline be exposed at EWS' cost in order that an examination can be made for possible damage.</p>		
	<p>The following standard crossing conditions and requirements for underground services must be complied with.</p> <ul style="list-style-type: none"> a) Heavy plant or mechanical driven equipment (for example, excavator) shall not be used in the pipeline servitude b) All excavations must be done by hand in the pipeline servitude c) Hand-held compactors shall be used in the servitude area. d) It is imperative that the Transnet representative be contacted before work commencement to determine our pipeline levels and also assist with Transnet pipeline related information. e) It is also important that relevant Transnet representative must witness and approve all the crossings/works. f) The Contactor will be liable for the cost of repair of any damage to Transnet's pipelines due to construction activities. g) On completion of the work, EWS shall return a copy of the letter containing conditions to Transnet's office, duly endorsed and signed by the site representative as well as Transnet Pipelines' representative that the work was satisfactorily completed and conditions adhered to. 	<p>Contractor / RE</p>	<p>PM</p>
	<p>The service/s shall cross below the pipelines with a minimum clearance of 300mm. This level must be maintained for a minimum distance of 3m on either side of the centre line of the outermost pipelines.</p> <ul style="list-style-type: none"> a) Where the service run parallel to the pipelines it shall not encroach upon Transnet's pipeline servitude. b) No manholes or any other permanent structure shall be erected within the pipeline servitudes. c) It is preferred that no joints in a service shall be situated within the pipeline servitude. Should this, however, not be possible the joints shall 	<p>Contractor / RE</p>	<p>PM</p>



	<p>be placed such that they are equidistant from the centre line of the outermost pipelines.</p> <p>d) No blasting is allowed within the pipeline servitudes. An application to carry out blasting within 500m of a pipeline must be made to the Transnet Office in writing in terms of paragraph 17.1, chapter 10 of the regulations embodied in the Explosives Act and Regulations (Act 26 of 1956) as amended.</p> <p>e) Excavation and backfilling within the area of the pipeline servitude/s shall be undertaken by and at the EWS's cost. Such work must be undertaken by hand without the use of mechanical or power equipment.</p> <p>f) All excavation work to be carried out within Transnet's pipeline servitude/s will comply with the Occupational Health & Safety Act (Act No. 85 of 1993) and SASS 1200 D: Earthworks specification.</p> <p>g) In backfilling the excavation the applicant shall provide a minimum of 150mm of selected soft padding around the pipeline where they were exposed. The padding must be properly compacted, in layers, by hand. This padding sand must meet with the approval of Transnet Pipelines' representative on site.</p> <p>The pH value must not be less than 5,5. The bedding and padding material must be fine sand or fine non-cohesive soil, free from stone, gravel, lumps and which does not cake or form lumps when drying out. The P.I. (Plasticity Index) must not exceed 6. The diameter of the largest particle of sand must not be greater than 2mm. Prior to any delivery to site, an independent lab test will be required of the sand to be delivered on site and any number of tests may be conducted.</p> <p>Examples of padding sand which have been used in the past, amongst others, include the following:</p> <p>i) plaster sand ii) washed Umgeni River sand (KwaZulu-Natal)</p>	Contractor / RE	PM
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	<p>It should, however, be noted that crusher dust is not acceptable.</p> <p>No backfilling may be carried out unless authorised by Transnet's representative.</p> <p>h) The pipelines shall not be left exposed unnecessarily.</p> <p>i) All fragile services such as PVC pipes, earthenware, pitch fibre pipes and cables laid within the pipeline servitude/s shall be protected with concrete or similar protective slabs laid over them for a distance of 3m on either side of the centre line of the pipeline outermost pipelines.</p> <p>j) In the interest of safety to the applicants service it is recommended that the route of his service at the point/s of crossing be indicated by 6 metres of hazard tape being placed 600 mm below the ground and/or that the actual point/s of crossing be indicated by (three) 3 permanent and clearly visible markers. These markers should be provided and maintained by and at the EWS' cost.</p> <p>k) All steel pipes and cables crossing the pipelines shall be suitably wrapped or sheathed with an acceptable anti-electrolysis insulating covering for the full width of the pipeline servitude/s.</p> <p>l) It is, however, recommended that in this protection be extended for a minimum distance of 30m on either side of Transnet's pipelines measured perpendicular to its their axes.</p> <p>m) For steel pipes 100mm diameter or larger two flexible test leads shall be provided by EWS to enable the monitoring of possible electrolytic corrosion to Transnet's pipelines. Each test lead shall comprise of a sufficient length of led PVC insulated wire of 35mm² section soldered or brazed onto your service/s and suitably re-insulated. Transnet Pipelines shall provide two black test leads from its pipelines as well as a junction box. All test leads shall terminate inside this junction box. Costs incurred will be to the applicant's account. Where applicable, quotations will be furnished on request.</p>	Contractor / RE	PM
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	Should authorisation be granted that work may proceed, Transnet Pipelines' representative must be contacted prior to any work being undertaken within Transnet's pipeline servitudes. Details of contact person will be furnished when application is made to carry out work.		
8.2 CONSTRUCTION PHASE			
<p>8.2.1 Site monitoring, auditing and non-compliance penalties</p> <p><i>The purpose of the EMP is to prevent environmental impacts and minimise those which may occur during the various phases of development. Auditing is an essential component of the development process whereby activities on-site are monitored and audited to ensure compliance with the EMP.</i></p>	<p>a) Report any EMP non-compliance, environmental near-miss and/or incident to the PM immediately.</p> <p>b) Monitor EMP compliance and instruct the Contractor employees and Sub-contractors on any required corrective action to address non-compliances and mitigate environmental impact.</p> <p>c) Non-compliance rectification must be commenced within one week of the PM receiving any incident reports.</p> <p>d) Non-compliance with an audit report can result in a fine by the DAEARD or instruction to cease construction until the non-conformance is resolved.</p> <p>e) Record the following information in the environmental incidents log:</p> <ul style="list-style-type: none"> • Time, date and nature of the near-miss, incident and/or complaint • Type of communication (telephone, letter etc) • Name, contact address and telephone number of the complainant or person who reported the issue • Details of the environmental incident that occurred • Response and investigation undertaken • Actions taken and by whom. 	PM	EWS / ECO



	<p>f) Keep the following records and documentation on site at all times:</p> <ul style="list-style-type: none"> • Environmental Authorisation (EA) issued for the project • EMP (latest approved version) • Method Statements (latest approved version) • Site daily diary • Environmental near-miss and incidents log • Complaints register • Records of all remediation / rehabilitation activities • Waste disposal consignment notes • ECO inspection and audit reports <p>g) Ensure that the documentation are signed by all relevant parties</p>	Contractor	PM
<p>8.2.2 Site & Contractors Camp Layout</p> <p><i>A construction campsite will need to be established to accommodate piping and associated attachments. In addition, excavated material would need to be stockpiled adjacent to areas of construction.</i></p>	<p>a) Prepare a Method Statement for site camp delineation and site establishment layout and submit the Method Statement to the PE and ECO for their approval.</p> <p>b) Locate the campsite outside the 1:50 year floodline.</p> <p>c) Locate all on-site hazardous substances storage areas and portalos outside the 1:100 year floodline.</p> <p>d) Locate all fuel and flammable substance storage facilities/areas at least 3.5m from building, boundaries and any other combustible or flammable materials, or any other distance which the eThekweni Chief Fire Officer has specified or approved.</p> <p>e) Take availability of public access and service delivery into account.</p> <p>f) Identify and consider existing above and underground infrastructure in the site camp planning.</p> <p>g) Plan for a construction site camp layout that would provide for effective and neat camp site management of all relevant contractor and sub-contractor activities.</p> <p>h) Keep the footprint of the site camp to a minimum to minimise environmental impacts.</p> <p>i) Identify working and no-go areas. Working areas are those areas required by the contractor and his sub-contractors to construct the Assagay Pipeline. No-go areas are generally those large areas outside</p>	Contractor	PM



	<p>the designated working areas that include for example existing services and infrastructure, private property, sensitive environments (e.g. wetland area) which should not to be affected by the project.</p> <p>j) Provide for the contractors' camp to be fully fenced and for site access to be controlled.</p> <p>k) Provide appropriate aesthetically pleasing visual screening of the campsite during construction.</p> <p>l) Include a site camp layout plan in the abovementioned Method Statement that illustrates the following:</p> <ul style="list-style-type: none"> • Working and no-go areas • Survey of existing above and underground infrastructure • Perimeter fence • Visual screens • Access route and gates • Physical security measures • Dedicated material (including waste) lay-down and stockpile areas and stores • Dedicated ablution and other staff facilities • Effluent and stormwater drainage and management system. 		
<p>8.2.3 Working within the wetland and stream channel</p> <p><i>In order to install the Pipeline, a trench of 1m wide x 3m deep would need to be excavated. Based on the Aquatic Assessment, the Pipeline may proceed across the channel; however this can only be done through the implementation of prescribed mitigation measures.</i></p>	<p>a) Bury the pipeline at sufficient depth of at least 2m or more below the channel bed.</p> <p>b) The existing gabion barrier may be exploited to trap any sediment washing off the works area and to prevent scouring of the streamline in case of heavy flows and also to provide protection for the downstream section of the wetland, for almost the entire length of the Pipeline across the stream channel and stream banks.</p> <p>c) Appoint a suitably qualified wetland specialist to oversee construction within the wetland and stream channel.</p>	PM / Contractor	EWS
	<p>(a) Disturbance of wetland vegetation and habitat</p> <p>a) The construction zone must be clearly demarcated prior to the commencement of construction activities to ensure that activities do not unduly disturb the wetland/riparian zone</p> <p>b) Minimise the width of the construction servitude across the wetland</p>		EWS / ECO



	<p>zone.</p> <ul style="list-style-type: none"> c) Areas to be cleared of vegetation must be demarcated. d) Appoint a suitably qualified wetland specialist to identify indigenous wetland vegetation to be safely removed. e) Once identified, indigenous wetland plant species (<i>Typha capensis</i> mainly) requiring removal shall be removed appropriately with their root ball intact. f) Wetland vegetation removed shall be stockpiled neatly on the periphery of the area being stripped, for use in wetland rehabilitation. g) Stockpiled vegetation is to be properly demarcated such that it is not unnecessarily disturbed by construction activities. h) Wetland vegetation should be placed in a shaded area or covered using an appropriate material and kept moist. i) Any indigenous grasses may be retained for use in rehabilitation of the channel. j) Where possible, cut vegetation to ground-level rather than removing completely, leaving root systems to ensure rapid re-colonisation. 	<p>PM / Contractor / ECO / Appointed Wetland Specialist</p>	
	<ul style="list-style-type: none"> (b) Disturbance of wetland soils and alteration of wetland geomorphology a) Minimise servitude width as far as possible within the wetland zone. b) Stockpile wetland topsoil (top 300mm) removed during construction separately from terrestrial soils. c) Stockpiled wetland soil should be demarcated, kept free of weeds and is not to be compacted. d) Wetland soils are to be handled twice only, firstly to strip and stockpile, and secondly to replace, level, shape and reinstate wetland vegetation. e) Depending on timescales of construction, the stockpiled soil may need to be kept moist using some form of spray irrigation on a regular basis as appropriate and according to weather conditions. f) Do not use wetland soils for construction purposes. g) If standing water or saturated soils are present, or if construction equipment causes ruts or mixing of the topsoil and subsoil in wetlands, use low-groundweight construction equipment, or operate normal equipment on riprap or prefabricated equipment mats. 	<p>PM / Contractor / ECO</p>	<p>EWS / ECO</p>



	<p>(c) Alteration of hydrological functioning of the wetland channel</p> <ul style="list-style-type: none"> a) Construction must not permanently alter the surface or subsurface flow of water through the wetland. b) Do not stockpile construction materials, including spoil material in wetland/riparian areas. c) Fill and stabilise any artificial channels/erosion gullies initiated as a result of construction once pipeline installation is complete. d) Construction should proceed mainly during the dry, winter months, when flows are low. e) Bury the pipeline at a sufficient depth below the active stream channel to prevent exposure along the channel bed. f) During trenching, divert flows around the section of trench being excavated, to reduce silt loads and ensure flows continue within the channel and to allow for continued ecological functioning of the stream during construction. g) Under no circumstance should consideration be given to the excavation of an alternative channel or the damming of the stream in such a manner as to totally restrict the flow. Water diversion must be temporary and only one diversion made at a time. h) An effective roughness element may need to be re-introduced by the fixing of large boulders on to the surface of the pipeline, in order to dissipate flow. 	<p>PM / Contractor / ECO t</p>	<p>EWS / ECO</p>
	<p>(d) Potential pollution of immediate downstream environment</p> <ul style="list-style-type: none"> a) Remove and properly disposed of any contaminated soil from the construction site. b) Clean up spillages immediately and properly drain contaminants. c) Implement a preventative maintenance system to ensure that work vehicles are maintained in an acceptable condition. This would involve routinely checking vehicles for leaks before construction begins and not allowing vehicles with significant leaks to operate or be repaired within the construction site. d) Drip trays must be provided for all vehicle repairs. 	<p>PM / Contractor / ECO</p>	<p>EWS / ECO</p>



	<ul style="list-style-type: none"> c) Ensure the use of coffer dams/piped culverts and sand bags to re-direct flow and thus allow for a dry construction. d) Riparian areas immediately downstream of the pipeline crossing must be appropriately protected. A layer of coarse immovable material could be used. e) Store excavated soil and sediments away from the riparian zone. f) Undertake the pipeline crossing work during low flow season to reduce the risk of high flow/flood impacts. 		
<p>8.2.4 Accidental Spillages</p> <p><i>Accidental or unplanned spillages, both non-hazardous and hazardous, can have a significant impact on the environment and site operations if not properly contained and managed. Preparations for such events require clear and detailed procedures to minimise the potential for spillages and ensure maximum contamination prevention and effective cleanup.</i></p>	<p>(a) Hazardous Substance</p> <ul style="list-style-type: none"> a) The accidental or negligent spillage of any fuels or hazardous substances must be cleaned up immediately using the most appropriate methodologies, equipment and materials. b) The Contractor must ensure that the necessary materials and equipment and chemicals are available on the site to deal with spills of any of the hazardous materials present (e.g. Drizit). c) A "Clean-up Kit" containing suitable spillage clean-up equipment must be on-site at all times and used in the event of a spill. d) The clean up of spills and damage caused by a spill will be for the Contractors' account. e) Any contaminated soil or water must be removed and stored appropriately until it can be disposed of at a permitted disposal site. f) All spillages shall be reported to the PM and ECO in charge immediately so that appropriate clean-up measures can be implemented. g) No spills may be hosed down into drains leading to wetlands/riparian areas. 	Contractor	EWS / ECO
	<p>(b) Spillages of oil and fuel on porous surfaces</p> <ul style="list-style-type: none"> a) The affected area must be scraped off to the depth of contamination. b) The contaminated soil must be handled as hazardous waste and stored and disposed of accordingly at a waste handling site where safe disposal certificates will be issued. Safe disposal certificates must be 	Contractor	EWS / ECO



	<p>submitted to EWS.</p> <p>c) Removed contaminated soil must be replaced with clean top soil.</p>		
	<p>(c) Spillage of oil and fuel on hard surface</p> <p>a) Use must be made of a spill kit, Spill Sorb flakes or Spill Sorb sausage / bag to absorb and clean up any fuel or oil spills.</p> <p>b) Where spill kits or Spill Sorb are not available, an absorbent material such as sawdust or sand to absorb any fuel or oil spills must be used.</p> <p>c) All the absorbent material or sawdust must be swept together and disposed of into a heavy-duty plastic bag, skip or any suitable container. The heavy-duty plastic bags must be handled as hazardous waste and disposed of accordingly.</p> <p>d) Areas where spillages have occurred can be cleaned using environmentally friendly products as a detergent (Dimol should NOT be used).</p>	Contractor / PM	EWS / ECO
<p>8.2.5 Concrete Batching</p> <p><i>Concrete to be used in the construction has the potential to contaminate soil and groundwater.</i></p>	<p>a) Concrete foundations must be laid with minimal impact to the environment.</p> <p>b) Concrete mixing must only take place in a designated area approved by the ECO.</p> <p>c) No concrete mixing will be allowed outside of the designated area or in the sugarcane fields.</p> <p>d) Concrete trucks shall not be washed on site after depositing concrete into foundations.</p> <p>e) Any spilled concrete shall be cleaned up immediately.</p> <p>f) No mixed concrete shall be deposited directly onto the ground. A batter board or other suitable platform/mixing tray shall be provided onto which any mixed concrete can be deposited whilst it awaits placing.</p> <p>g) Concrete spilled outside of the demarcated area must be promptly removed and taken to a permitted waste disposal site.</p> <p>h) Wash water from cement must not to be released into the environment. This water must be collected, stored and disposed of at an approved</p>	Contractor	EWS / ECO



	<p>site.</p> <ul style="list-style-type: none"> i) Cement bags are to be considered “waste” and therefore stored and disposed of at a licensed waste disposal facility. j) Small scale concrete mixing is to take place at a location approved by the EWS. Concrete mixing areas need to be concentrated so that the area of contamination is minimised. k) <i>Ad hoc</i> concrete mixing at the active working area should be avoided wherever possible. 		
<p>8.2.6 Consultation with Interested and Affected Parties (IAPs)</p> <p><i>Interaction and consultation with IAPs during the construction is particularly significant to ensure immediate and efficient conflict resolution should activities on-site be reported to be impacting on IAPs</i></p>	<ul style="list-style-type: none"> a) Open liaison channels should be established between Contractor, the developer and IAPs, including all residents along the alignment of the Assagay Trunk Water Main. b) A complaints register must be maintained as per Section 6.5. 	ALL	ALL
<p>8.2.7 Site Closure</p> <p><i>At the closure of site every day the Contractor’s Safety Officers (as defined by the Occupational Health and Safety Act, No. 85 of 1993) must check the site, ensure that the following conditions pertain and report on compliance with this clause:</i></p>	<ul style="list-style-type: none"> a) Store any fuels / flammables / hazardous materials securely in bunded areas and locked in the designated storage area. b) Secure all foundation areas. c) Display all emergency and management contact details are prominently. 	Contractor	EWS



<p>8.2.8 Eating / Break Areas</p> <p><i>Labourers are permitted to take tea and lunch breaks.</i></p>	<p>a) Designate an area for staff and labourers to eat during breaks. b) No fires will be allowed on site.</p>	<p>Contractor</p>	<p>EWS</p>
<p>8.2.9 Fire Prevention and Control</p> <p><i>Minimising the potential for fire-related accidents and explosions on-site, is important in protecting the safety of the workers.</i></p>	<p>a) Smoking is prohibited in the vicinity of flammable substances. b) Ensure the availability of sufficient fire extinguishers. c) Ensure any welding or other sources of heating of materials is done in a controlled environment and under appropriate supervision, in such a manner as to minimise the risk of fires and/or injury to staff. d) Provide training to the staff members in the use of the appropriate fire-fighting equipment.</p>	<p>Contractor</p>	<p>EWS</p>
<p>8.2.10 Wastewater Management</p> <p><i>All wastewater must be appropriately contained, filtered and discharged to ensure the environment and surrounding neighbours are not impacted upon.</i></p>	<p>a) Any waste oils, greases, fuels, chemicals etc. should be collected and disposed of in an appropriate manner off site. Waste oil, grease and/or fuel disposal/storage containers should under no circumstances be voided to the surrounding environment. b) Any water discharged must comply with the relevant Water Quality limits/guidelines specified by the Department of Water Affairs.</p>	<p>Contractor / PM</p>	<p>EWS</p>
<p>8.2.11 Solid Waste Management</p> <p><i>Construction activities generate waste which must be disposed of appropriately before the site camp can be closed.</i></p> <p><i>A solid waste control and removal system must be implemented to ensure there is no contamination of the site and surrounding</i></p>	<p>a) Discharge of waste into the environment or burying of waste is strictly prohibited. b) Remove all left-over construction materials (e.g. sand, cement, gravel) from the site at the end of each day. c) Remove all construction debris, litter and domestic waste from the site and working areas and transfer to a permitted disposal site. d) The waste storage area must be kept clean and tidy at all times and not littered with waste around the waste bins. e) Waste may not be burned on site.</p>	<p>Contractor</p>	<p>EWS</p>



<p><i>environment by the waste generated and / or collected on-site. All general waste must be disposed of at a licensed landfill site.</i></p>	<p>f) Littering will not be tolerated.</p>		
<p>8.2.12 General Rules</p> <p><i>General rules by which activities on-site are undertaken must be adhered to.</i></p>	<p>a) Provide a comprehensive first aid kit and make sure that there are adequate staff members who are trained in first aid. b) Provide sufficient fire-fighting equipment at the work areas, and make sure that there are staff members who know how to use the equipment. c) Make sure that the necessary safety equipment and protective clothing, required for specific construction work are used, and inform staff about safety procedures and possible dangerous working conditions. d) Ablution must not be permitted anywhere other than in available toilets on site. a) No alcohol / drugs are permitted on site. b) No unsocial behaviour or unruly behaviour will be permitted. e) No Smoking on-site is permitted on site.</p>	<p>Contractor</p>	<p>EWS</p>
<p>8.2.13 Labour and Social Issues</p> <p><i>The management of social issues such as health and safety, instructions, control etc., particularly related to contractors and workers on-site, must be given priority during the construction of the development.</i></p>	<p>a) Ensure proper supervision of employees at all times, undertake regular inspections of the workplace, enforce the wearing of safety equipment/clothing and ensure compliance with all relevant rules and procedures. b) Ensure the provision and proper utilisation, maintenance and management of wash and waste facilities for staff during construction. c) Machine / vehicle operators should receive clear instructions to remain within demarcated access routes. d) Adhere to normal working hours and ensure that all machinery is in a good state of maintenance to mitigate noise.</p>	<p>Contractor</p>	<p>EWS</p>
<p>8.2.14 Safety</p> <p><i>Construction sites are potentially hazardous environments as the activities that take place can affect the health and safety of the labourers.</i></p>	<p>a) An Emergency Plan must be compiled and approved by eThekwini Municipality. b) Telephone numbers of emergency services must be posted conspicuously around the construction site. c) Potentially hazardous areas are to be demarcated with danger tape. d) All trenches must be secured. e) Material stockpiles such as equipment must be stable and well secured to avoid collapse and possible injury. f) Flammable materials must be stored as far as possible high risk areas</p>	<p>Contractor</p>	<p>EWS</p>



	e.g. concentration of workers, and must be clearly marked and stored appropriately.		
8.2.15 Trenches <i>The excavation of trenches along the route will include the excavations of roads, verges and driveways within the eThekweni Municipality owned road reserve.</i>	a) Trenches shall be appropriately and securely demarcated and regularly monitored during operations to ensure that pedestrian (and vehicular) access of these areas is strictly prohibited. b) Sign boards, alerting pedestrians and road users to the potential dangers presented by the construction activities, shall be erected.	Contractor	EWS
8.2.16 Visual & aesthetics	a) Ensure that soils stockpiles from trench excavation are kept neat and situated at equal distances from each other along the construction route. b) The construction camp site must be located in an area that is not visually sensitive. c) Appropriate aesthetically pleasing visual screening of the campsite must be implemented during construction.	Contractor	EWS
8.2.17 Stockpiles <i>Stockpiles of construction materials are susceptible to collapse and extensive damage if not located or stacked correctly</i>	a) Ensure that soil stockpiles are neatly kept to avoid soil dispersing b) Stockpiles are not to exceed 2m in height unless otherwise permitted by the PM. c) The PM must direct stockpiling of materials and designate a formal stockpile area. d) Stockpiles must be positioned in areas sheltered from the wind and rain to prevent erosion and dispersion of loose materials.	Contractor / PM	EWS
8.2.18 Noise <i>Noise will be generated by construction activities such as trench excavation, pipe welding and construction vehicles. Since the construction activities will mainly be undertaken in a residential area, its important that noise levels be kept low.</i>	a) Restrict noisy construction activities, e.g. jack hammering, to daytime activities to between 07h00 and 18h00, unless otherwise agreed to and approved by eThekweni Municipality and adjacent landowners. b) Ensure that all vehicles and where possible, noisy equipment, are fitted with silencers that are properly maintained. c) Construction employees must be trained and made aware of not creating unnecessary noise such as hooting and shouting.	Contractor	EWS



8.3 OPERATIONAL PHASE			
<p>8.3.1 Maintenance activities</p> <p><i>Maintenance of the pipeline may be required during the operational phase.</i></p>	<p>a) Any maintenance activities that require water interruptions must be undertaken during the nighttime when demand for water is low.</p>	EWS	DAEARD
<p>8.3.2 Wetland rehabilitation</p> <p><i>The presence of wetland soils and the importance of the channel as a functioning stream within the drainage network necessitate the mitigation against impacts that are likely to occur during the construction of the Pipeline, in order to protect the integrity of the immediate and downstream environment.</i></p>	<p>b) Once construction is completed, or at such time as rehabilitation is deemed applicable, implement the guidelines for the rehabilitation of disturbed wetland/riparian areas as detailed in Appendix F.</p>	PM / Appointed Wetland Specialist	DAEARD



9 CONCLUSION

This EMP builds on the environmental process that has preceded it, namely the Basic Environmental Assessment process. It has been compiled using the various inputs including the EAPs, relevant Authorities and IAPs. These inputs facilitated the identification of relevant and implementable mitigation measures, which may now be used by eThekweni Water & Sanitation and the construction team to respond to the tender documentation respectively.

Penalties to be imposed for the transgression of environmental specifications are also noted along with the roles and responsibilities of all stakeholders. In order to ensure compliance, all parties undertaking the design, construction and operation of the Assagay Pipeline must be fully acquainted with the contents of the EMP. This will ensure that potential negative impacts are identified, avoided or mitigated.



Appendix A

Environmental Authorisation



Appendix B

List of important contacts and emergency numbers



Department	Contact person	Contact No.	Email	Postal
Department of Agriculture, Environmental Affairs and Rural Development – DAEARD)		031 302 2800		
eThekwini Electricity Project Engineer				
eThekwini Environmental Manager		031 311 7919		
eThekwini Transport Authority		033 311 1111		
Department of Water Affairs		031 336 2700		
Engineering Consultant				
Project Manager (PM)				
Environmental Consultant / Environmental Control Officer				
Contractor				
Sub-contractor				
Public and Authorities Acting on Their Behalf				
Drizit - Environmental - Sales of absorbant products		084 464 0069		
Drizit - 24-Hour Emergency Number for incidents		0800 202 202		



Appendix C

Inspection Sheet and Report Templates



Project Start Up and Site Inspection Sheet

PROJECT START UP INSPECTION SHEET

Project: _____
Contract No.: _____
Contractor: _____

Date _____
Completed by: _____

ES	ENVIRONMENTAL ASPECT	YES NO N/A	COMMENTS	ACTION
PLANNING				
ESTABLISHMENT				
CLEARANCE				

PROJECT START UP INSPECTION SHEET

Routine Site Inspection Sheet

ROUTINE SITE INSPECTION SHEET

Project: _____

Date _____

Contract No.: _____

Completed by: _____

Contractor: _____

ES	ENVIRONMENTAL ASPECT	YES NO N/A	COMMENTS	ACTION
HOUSEKEEPING				
CONSTRUCTION ACTIVITIES				
REINSTATEMENT AND REHABILITATION				

Site Decommissioning Inspection Sheet

Site Inspection Report Structure

Purpose of the Site Inspection Report

The purpose of the Site Inspection Report is to describe the results of the site inspections undertaken by the Environmental Control Officer (ECO) or delegated responsible person so that the level of compliance with the Environmental Management Plan (EMP) can be monitored throughout the contract.

In particular, it will be expected to summarise the following:

- The key results
- Trends observed
- Key issues observed
- Problems encountered
- Actions required and response taken or to be taken
- Recommendations.

The Site Inspection Report should conclude with a commentary on the overall performance of the Contractor in terms of meeting the requirements of individual/groups of Environmental Specifications and/or EMP as a whole.

Preparation of the Site Inspection Reports

Site Inspection Reports are expected to be prepared regularly throughout a given construction contract, including (but not limited to) the following:

- Prior to the handover of the site to the Contractor
 - At regular stages throughout the construction works, and particularly with the commencement of particularly significant activities
 - At the decommissioning of the site and prior to the handover of the site to the Employer/Operator.
-

Recommended Structure for the Site Inspection Reports

The following report structure is suggested for the Site Inspection Report:

Introduction

By way of setting the context for the Site Inspection Report, this section should outline the following:

- The need for the Site Inspections, and reporting.
- Purpose of the Site Inspection Report.
- The scope of coverage of the Site Inspection

Report.

Environmental Requirements	Management	This section should summarise the environmental requirements for the contract and for the construction works, and against which environmental performance is assessed.
Methodology		<p>This should describe the activities undertaken during the particular site inspection, such as:</p> <ul style="list-style-type: none">• A site walkabout with the Project Manager (PM).• A review of documents and records, such as complaints records and/or incidents reports maintained by the Contractor and/or ECO.• Consultations with pertinent parties on site.
Findings of the Inspection	the Site	<p>This should contain reference to the following:</p> <ul style="list-style-type: none">• A commentary on the level of compliance with key aspects of the Environmental Specifications, as listed in the checklist(s).• Details of issues, infringements, problems and non-compliances encountered.• Recommendations on actions to be undertaken to address any issues, infringements and/or non-compliances.
Conclusions		This should include an overall statement on the level of compliance observed during the site inspection.
Annexures		<p>Annexures should be used to store supporting information to the main document, such as:</p> <ul style="list-style-type: none">• Photographs.• A quick reference, summary table of issues of concern and the necessary corrective measures required to address these issues.

Annexure D

List of incidents and associated penalties

TYPICAL INCIDENTS INCURRING PENALTIES	VALUE
Failure to submit Method Statements timeously.	R5,000.00
Failure to secure construction site from public access.	R5,000.00
Failure to stockpile topsoil correctly.	R1000.00
Failure to stockpile materials in designated areas.	R500.00
Pollution of water bodies – including increased suspended solid loads.	R1000.00
Discharging effluent and/or stormwater onto the ground or into surface water	R 500.00
Failure to provide adequate sanitation, waste disposal facilities or services.	R1,000.00
Failure to demarcate construction area boundaries before commencing construction clearance and other activities	R1,000.00
Insufficient education of employees regarding environmental matters and site housekeeping practices	R500.00
Use of soil in an unspecified manner	R500.00
Inappropriate mixing of cement/concrete and poor management of slurry	R1,000.00
Unauthorised removal of indigenous trees, medicinal or other plants.	R1,000.00
Damaging/killing animals/birds.	R 1,500.00
Failure to reinstate disturbed areas within the specified timeframe.	R1,000.00
Fire – costs of runaway fires will be borne by the Contractor, should he/she be proven responsible for such fires.	R5,000.00
Failure to provide equipment for emergency situations	R1,000.00
Defacing, painting or damaging natural or heritage features and private property	R1,000.00
Damaging cultural, historical and/or archaeological sites of importance	R5,000.00
Failure to maintain basic safety measures on site	R1,000.00
Failure to obey site protection measures specified by the Project Manager	R1,000.00
Failure to carry out required community liaison, damage to property etc, without prior negotiation and/or compensation and other social infringements	R500.00
Persistent and un-repaired oil leaks from machinery. The use of inappropriate methods of refuelling.	R500.00
Failure to provide drip trays and/or empty them frequently.	R500.00
Inappropriate use of bins and poor waste management on site.	R200.00
Inappropriate off-site disposal of waste from site.	R1,000.00
Deliberate lighting of illegal fires on site.	R500.00
Eating of meals on site outside the defined eating area. Individual not	R100.00

TYPICAL INCIDENTS INCURRING PENALTIES	VALUE
making use of the site ablution facilities.	
Dust or excess noise on or emanating from the site.	R500.00
Inappropriate use of watercourses and water bodies – such as for unapproved water abstraction, washing of vehicles, wastewater disposal and use by employees for washing.	R1000.00
Failure to comply with specifications for working within a wetland and stream.	R 10 000.00
Any person, vehicle, item of plant, or any thing related to the Contractor's operations causing a public nuisance.	R1000.00
Improper use of plant or equipment.	R500.00
Construction vehicles not adhering to speed limits.	R250.00
Failure to maintain a register of incidents on site.	R1,000.00
Failure to remove all temporary features and leftovers from the construction site and works areas upon completion of the works.	R20,000.00
Any contravention with a Method Statement.	R5,000.00
Repeated contravention of the specifications or failure to comply with instructions	R5,000.00

Annexure E

List of Construction Activities that Require Method Statements

Construction Activities that will require Method Statements

ACTIVITY	SPECIFICS
Blasting	Details of all methods and logistics associated with blasting if required.
Excavation	Method for all excavations, including minimisation of environmental impact such as siltation and sedimentation of the wetland and associated stream channel.
Borrow Pit	Establishment and use of any new borrow pit.
Bunding	Method for the bunding of static plant.
Cement/Concrete Batching	Location, layout and preparation of cement/ concrete batching facilities including the methods employed for the mixing of concrete including the management of runoff water from such areas.
Contaminated Water	Contaminated water management plan, including the containment of runoff and polluted water.
Drilling and Jack Hammering	<ul style="list-style-type: none"> • Method of drill coring with water or coolant lubricants • Methods to prevent pollution during drilling operations
Dust	Dust control plan
Earthwork, Erosion Control and Stormwater management	<ul style="list-style-type: none"> • Method for the control of erosion during bulk earthworks operations • Method of erosion control of spoil materials • Soil stockpiles to be kept outside the 1:100 year floodline • Method of undertaking earthworks, including hand excavation and spoil management • Construction site drainage design and management • Construction site stormwater management plan to be approved by eThekweni Municipality Water Services • Construction of earth and stormwater control berms or drainage ditches around campsite to contain dirty water
Emergency	<ul style="list-style-type: none"> • Emergency response plan • Emergency procedures must include but not be limited to electrical hazards, fires, spills, and contamination of ground and surface water, accidents to employees and damage to services
Fire, Hazardous and Poisonous substances	<ul style="list-style-type: none"> • Handling and storage of hazardous waste in impermeable banded areas with separate storage of

ACTIVITY	SPECIFICS
Management	<p>incompatible substances.</p> <ul style="list-style-type: none"> • Construction and location of concrete platform / bund wall to accommodate hazardous substances • Emergency spillages procedures and compounds to be used • Emergency procedures for fire • Emergency remediation / clean-up procedures for spills or leaks of hazardous substances • Location of hazardous substance storage areas (outside 1:100 floodline) • Methods of refuelling vehicles and plant • Details of methods for fuel spills and clean up operations • Refuelling of construction vehicles in high flow areas • Hazardous substance management during site remediation prior to commencement of remediation and construction • Rehabilitation of batching plant area at completion of construction
Health and safety	<ul style="list-style-type: none"> • Compile a Construction Health and Safety Plan • Take all necessary precautions to effectively address any potential health and safety hazards • Display appropriate hazard warning signs conspicuously at all potential hazards that may affect public members
Rehabilitation	<ul style="list-style-type: none"> • Rehabilitation of wetland and other disturbed areas and re-vegetation after construction is complete • Method for implementation of the rehabilitation specifications set out in the EMP.
Services Commissioning and Decommissioning	<p>Method of commissioning the various service infrastructure to ensure minimisation of environmental health and safety risk</p>
Site Camp Establishment	<ul style="list-style-type: none"> • Layout and preparation of the construction camp • Location, layout, preparation and operation of all wash areas, including vehicle wash, workshop washing and paint washing and clearing • Construction camps, equipment storage sites and ablution facilities serving the construction phase should be sited a reasonable distance away from the

ACTIVITY	SPECIFICS
	<p>river, outside of the 1:100 floodline</p> <ul style="list-style-type: none"> • Location of storage areas for materials, equipment, plant and vehicles • Method of vegetation clearing • Installation of ablution facilities with chemical toilets prior to construction commencing (minimum of one toilet to 15 people).
Sources of materials	Details of materials imported to the site (where applicable)
Traffic	Any traffic diversions must be undertaken with approval of eThekweni Transport Authority and in accordance with relevant legislation.
Waste Control and Management	<ul style="list-style-type: none"> • Types of wastes generated • Classification of waste • Location of designated waste areas • On-site disposal facilities • Collection arrangements • Disposal procedures • Disposal site verification • Record keeping of waste consignment notes • Solid waste and sewerage collection and disposal procedures • Methods for the disposal of vegetation cuttings, tree trunks and/or building materials.
Wastewater management	<ul style="list-style-type: none"> • Supply wastewater management system in compliance with legal requirements.
Water abstraction	Water abstraction from water resources

Appendix F

Wetland Rehabilitation Measures

Phase 1	<ul style="list-style-type: none"> • Stockpiled wetland soil shall be replaced in the reverse order as to which it was removed (subsoil first followed by topsoil). • Reinstated wetland soil is not to be compacted too heavily, as this will prevent water saturation and proper plant growth during rehabilitation. • Should significant compaction occur, the area is to be ripped to reduce the bulk density of the soil. • The pipeline should ideally be covered with coarse material such as boulders to create habitat diversity.
Phase 2	<ul style="list-style-type: none"> • The pre-construction profile of the stream channel and banks shall be returned to one similar as before construction, with no major net increase in slope transversely or longitudinally. • The channel bed should be restored as far as possible to the original condition and stream banks reinstated as close as possible to the original contours in order to reduce potential scouring. • All fill material, cofferdams, causeways or any other structures used to provide a footing in the river must be completely removed. • The channel embankments must be rehabilitated to ensure both longitudinal and cross sectional stability against summer floods. Depending on the circumstances, this may necessitate stabilizing structures such as gabions or renomattresses.
Phase 3	<ul style="list-style-type: none"> • All waste products (spoil, construction materials, hazardous substances and general litter) need to be removed from the stream and disposed of in proper local waste facilities.
Phase 4	<ul style="list-style-type: none"> • The removal of exotic vegetation species from the disturbed wetland and adjacent areas will need to occur. Implement an integrated alien weed control programme to ensure that alien plants are eradicated from the disturbed site, and so they do not impact on the pipeline itself.
Phase 5	<ul style="list-style-type: none"> • Once the soil and topography of the riparian zone has been returned to its preconstruction state, and waste products removed, stockpiled riparian vegetation is to be reinstated. Re-instate the area affected with suitable indigenous grasses (Antelope grass) and bulrushes, such as those found at the site. • Stream banks should be re-vegetated as soon as practically possible with indigenous species similar to those occurring in the original habitat.

DOCUMENT CONTROL SHEET (FORM IP180/B)

CLIENT : eThekwini Water & Sanitation Unit
PROJECT NAME : Assagay Trunk Water Main Pipeline **PROJECT No.** : J29003
TITLE OF DOCUMENT : Assagay Trunk Water Main Project Environmental Management Plan
ELECTRONIC LOCATION : P:\J29003 - eThekwini Trunk Water Main BA\REPORTS\EMP\J29003-Assagay Trunk Water Main EMP for client review.doc

	Approved By	Reviewed By	Prepared By
ORIGINAL	NAME Wiero Vogelzang	NAME Russell Stow	NAME Rashieda Davids
DRAFT			
DATE JUNE 2010	SIGNATURE	SIGNATURE	SIGNATURE

	Prepared by	Prepared By	Prepared By
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DATE	SIGNATURE	SIGNATURE	SIGNATURE

	Approved By	Reviewed By	Prepared By
REVISION	NAME	NAME	NAME
DRAFT			
DATE	SIGNATURE	SIGNATURE	SIGNATURE

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