# DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

## PROPOSED CONSTRUCTION AND OPERATION OF HYPERAMA BULK WATER PIPELINE TO REIGER PARK WITHIN CITY OF EKURHULENI, GAUTENG PROVINCE


PREPARED BY

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Prepared for

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**March 2019**

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|---|---|
| **Report Name:** | **Basic Assessment for the Water Augmentation to Elsburg: Reiger Park - Proposed Construction and Operation of Hyperama bulk water pipeline in Reiger Park within City of Ekurhuleni, Gauteng Province.** |
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| **Report compiled by:** | Scelo Ndima |
| **Report Date:** | February 2019 |
| **Status:** | **Draft Report** |
| This document presents the draft Environmental Management Programme for the construction and operation of Hyperama pipeline. The information and recommendations presented is based on the information supplied by the 'applicant', City of Ekurhuleni, specialists' studies, Interested and Affected Parties concerns and comments and observations made during the site visits conducted by the EAP for the duration of the assessment. | |

# DOCUMENT CONTROL

**Report No:** 1
**Report title**: Draft Environmental Management Programme for the Construction and Operation of Hyperama pipeline
**Prepared by:** DIGES Group
**Applicant:** City of Ekurhuleni

| | Name | Signature | Date |
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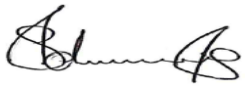
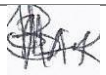
| **Prepared By** | Scelo Ndima |  | 18/02/2019 |
| **Reviewed and Approved By** | Brenda Makanza |  | 27/03/2019 |
| **Report Status** | Draft | | |

# EXECUTIVE SUMMARY

City of Ekurhuleni herein after referred to as COE or the 'City' is responsible for the provision of water supply within the areas in its jurisdiction, as such the 'City intends to upgrade the Reiger Park water supply network. Initially, the project was classified into four sub-projects with one sub-project focusing on the construction and operation of Hyperama pipeline. The works associated with the construction of the proposed pipeline at the stream crossing is listed in Government Notice, R327 of April 2017 as amended and requires an environmental and general authorization from the provincial authority, Gauteng Department of Agriculture and Rural Development (GDARD) and Department of Water and Sanitation (DWS) respectively. As such COE has appointed DIGES Group (herein after referred to as DIGES) to lodge an application with the Gauteng Department of Agriculture and Rural Development (GDARD) for the proposed development in terms of Section 24 and 24D of the National Environmental Management Act (Act No.107 of 1998). The Basic Assessment (BA) has been undertaken to comply with the Environmental Impact Assessment Regulations (Government Notice R326) of April 2017 as amended and an environmental authorization for the following activities has been applied for:

**Listing 1, Government Notice 327 (as amended)**

**Item 19 (i):** The infilling or deposition of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;

**Item 30:** Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act,2004 (Act No.10 of 2004).

Based on the information collected during the BA in terms of impacts anticipated during the project cycle, a project specific Environmental Management Programme (EMPr) is to be developed. This Environmental Management Programme details the principles, practices and procedures to be implemented by the contractor and COE to manage, remedy and mitigate potential adverse environmental effects anticipated during construction and operation of the power line. As such, the scope of this document is to give guidelines to the contractor and COE regarding the effective management of the environment during the construction of the Hyperama pipe line.

**THE MANAGEMENT PROGRAMME HAS LONG-TERM OBJECTIVES TO ENSURE THAT**:

- Environmental Management considerations are implemented from the start of the project and throughout the operational life-time of the pipe line;
- Precautions against damage and claims arising from damage are taken well in advance;
- The completion date of the contract is not delayed due to problems with the affected communities arising during the course of construction; and

- Regulatory requirements as well as the Environmental Authorisation are adhered to.

This document (hereafter referred to as the EMPr) sets the institutional framework for responsibilities and reporting of all environmental issues during the construction of the pipe line. It is important that the contractors' team and engineers be fully acquainted with the contents of this EMPr, to ensure that the potential negative impacts are avoided or identified in advance during construction and the specified mitigation measures detailed in this report are implemented, therein instilling a more proactive and less reactive work ethic throughout the construction process.

Should these recommended measures and corrective actions be adopted during the construction, operation/ maintenance and decommissioning phases of the proposed activity, DIGES finds that the predicted impacts of the proposed activities are within acceptable limits. Of note is that environmental management is dynamic and as such, the Final EMPr must be flexible in order to accommodate changing circumstances and requirements. On-going environmental monitoring and maintenance of the pipe line should be carried out throughout its life cycle, and COE and a dedicated Environmental Practitioner should identify and address new issues as they arise, and update or amend the management plan accordingly.

# REPORT STRUCTURE

***Section 1*** of this EMPr details the purpose and scope of the EMPr and also identifies the key legislative requirements applicable to the environmental aspects of the Project. It details the EMPr roles and responsibilities and the related training requirements for the construction phase of the Project.

**Section 2** presents the project description and the social and environmental management context of the Project.

**Section 3** details the standard and site specific mitigation measures to be implemented on-site. Environmental management standards and specifications for managing the significant environmental aspects of the construction, operation and decommissioning phase are discussed.

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## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| BA | Basic Assessment |
| COE | City of Ekurhuleni |
| 'City' | City of Ekurhuleni |
| CARA | Conservation of Agricultural Resources Act |
| EMPr | Construction Environmental Management Programme |
| CLO | Community Liaison Officer |
| CMS | Construction Method Statement |
| DWS | Department of Water and Sanitation |
| DME | Department of Minerals and Energy |
| EA | Environmental Authorization issued by GDARD |
| EAP | Environmental Assessment Practitioner |
| ECA | Environment Conservation Act |
| ECO | Environmental Compliance Officer |
| EIA | Environmental Impact Assessment |
| EO | Environmental Officer |
| GA | General Authorization |
| GDARD | Gauteng Department of Agriculture and Rural Development |
| HA | Hectares |
| HSO | Health and Safety Officer |
| IEM | Integrated Environmental Management |
| MSDS | Material Safety Data Sheet |
| NEMA | National Environmental Management Act |
| NHRA | National Heritage Resources Act |
| SAHRA | South African Heritage and Resources Agency |
| SANS | South African National Standards |
| SHEQ | Safety, Health, Environmental and Quality |
| WI | Work Instruction |
| WUL | Water Use License |

## DEFINITIONS

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| Alien Vegetation | Alien vegetation is defined as undesirable plant growth, which shall include, but not be limited to; all declared category 1, 2 and 3 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared undesirable. |
| Berm | A barrier designed to divert surface water flow. Berms will primarily be used along roads/tracks to prevent concentrated flow of water over particular areas, thereby reducing erosion of roads. |
| Bund | An impervious material, which forms the perimeter and floor of a compound and provides a barrier to retain liquid. Bunds are designed to contain spillages and leaks of liquids used, stored or processed above ground and to facilitate clean-up operations. |
| Batch Plant | Site for the mixing and production of concrete or plaster, and associated equipment and materials. |
| Construction Camp | is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), ablution facilities, waste and wastewater management. |
| Contractor | Construction companies as well as their sub-consultants and suppliers appointed to undertake the construction activities on behalf of City of Ekurhuleni. |
| Corrective action | Action to eliminate the cause of a detected nonconformity. |
| Developer | Developer of the project, City of Ekurhuleni. |
| Endemic | the natural distribution of an organism (plant or animal) restricted to the local environmental conditions within an area. |
| Environment | The aggregate of surrounding objects, conditions and influences that influence the life and habits of man or any other organism or collection of organisms. |
| Environment Authorization | A written statement from the GDARD that records its approval of a planned undertaking to construct the Hyperama pipeline and the conditions of such an approval. |
| Environmental Control Officer | An external environmental consultant appointed by COE to periodically monitor the level of implementation of the EMPr and suitable environmental management practices on site during the construction phase of the project. |
| Environmental Impact | A positive or negative change to the environment that results from the construction, operation and decommissioning of the activity. The impact can be direct or indirect result of the activities. |
| Environmental Management Programme (EMPr) | A programme that seeks to achieve a required environmental end state and describes how activities, that could have a negative impact on the environment, will be managed and monitored and impacted |

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| | areas rehabilitated. |
| Environmental Management System (EMS) | Part of an organisation's management system used to develop and implement its environmental policy and manage its environmental aspects. |
| Environmental Policy | Overall intentions and directions of an organisation related to its environmental performance as formally expressed by top management. |
| Erosion | The process by which material, such as rock or soil, is worn away or removed by wind or water. |
| General Waste | Domestic, commercial, non-hazardous waste and builders' rubble. |
| Hazardous Substance | Any substance that is of risk to health and safety, property or the environment. Hazardous substances have been classified under the SANS 10228-B The identification and Classification of Dangerous Goods and Substances'. |
| Heritage Site | A site that contains either archaeological artefacts, graves, buildings older than 60 years, meteorological or geological fossils, etc. |
| Method Statement | They 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. |
| "No-go" Areas | Areas identified as being environmentally sensitive, delineated on plan, demarcated on the site with pegs or fencing and which are out of bounds to unauthorised persons. Authorisation must be obtained prior to entry. |
| Non-conformity | Non-fulfilment of a requirement. A "non-conformance" is interpreted to include legal non-compliance, deviations from policy, objectives and targets not met, accidents, ineffective procedures, and deviations from specified conditions and from other requirements of the environmental management system. |
| PHRG | The Provincial statutory body responsible for heritage resource management in Gauteng Province. |
| Preventive action | Action to eliminate the cause of a potential non-conformity |
| Pollution | The direct and indirect alteration of the physical, chemical or biological properties of a resource which results in it being less fit for any beneficial purpose for which it may reasonably be expected to be used. |
| Project Manager | Person representing City of Ekurhuleni who is responsible for technical and contractual implementation of the works to be undertaken. |
| Risk | The probability of an event occurring multiplied by the consequences of that event. |
| SAHRA | South African Heritage Resource Agency - the statutory body responsible for heritage resource management. |
| Site | Areas that will be utilised by the contractor for the duration of the duration of the contract. This shall include the pipeline servitude, access roads to be used, construction lay-down areas, materials |

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| | storage and delivery requirements, contractors' offices, operational demarcation. |
| Slope | Means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units. |
| Storm-water | Water resulting from natural precipitation and/or accumulation and includes rainwater. |
| Topsoil | The upper outermost layer of soil (300mm) which has the highest concentration of organic matter. |
| Water body | Means a body containing water and includes dams and wetlands, whether ephemeral or permanent. |
| Watercourse | Means any river, stream and natural drainage channel whether carrying water or not. |
| Works | The construction operations and all related and incidental works, such as site works, earthworks, installation of services, rehabilitation etc, carrying to completion of the development. |
| Working area | Means the land and any other place on, under, over, in or through which the Works are to be executed or carried out, and any other land or place made available by the Employer in connection with the Works. The Working Area shall include the site office, construction camp, stockpile and laydown areas, assembly areas, batching areas, the construction corridor, all access routes and any additional areas to which the Project Manager permits access. |

# SECTION 1: INTRODUCTION

City of Ekurhuleni herein after referred to as COE or the 'City' is responsible for the provision of water supply within the areas in its jurisdiction, as such the 'City intends to upgrade the Reiger Park water supply network. Initially, the project was classified into four sub-projects with one sub-project focusing on the construction and operation of Hyperama pipeline. The works associated with the construction of the proposed pipeline at the stream crossing is listed in Government Notice, R327 of April 2017 as amended and requires an environmental and general authorization from the provincial authority, Gauteng Department of Agriculture and Rural Development (GDARD) and Department of Water and Sanitation (DWS) respectively. As such COE has appointed DIGES Group (herein after referred to as DIGES) to lodge an application with the Gauteng Department of Agriculture and Rural Development (GDARD) for the proposed development in terms of Section 24 and 24D of the National Environmental Management Act (Act No.107 of 1998).

In addition to the Basic Assessment Report and associated attachments, the application is also accompanied by an Environmental Management Programme (EMPr). The EMPr sets out the intended methods of effectively managing potential environmental impacts arising from the construction and operation of the pipe line. The responsibility for implementation of this document lies with the Contractor and shall be controlled by COE's Project Manager who shall work in conjunction with the Environmental Control Officer (ECO) to ensure it is implemented. In the event that the route has been authorised and some changes have been instituted, it is the Project Manager's responsibility to ensure that this document is revised and updated as necessary.

## *1.1 EAP's Experience*

As per the requirements of the National Environmental Management Act: NEMA, 1998 (Act No. 107 of 1998), as amended and Government Notice R326, Environmental Impact Assessment Regulations of 2017 as amended, the details of the person(s) who prepared the Environmental Management Programme and the expertise of that person(s) to prepare an environmental management programme are provided below:

**Table 1-1:** EAP Experience

| **Company** | **DIGES GROUP cc** |
|---|---|
| **EAP** | Scelokuhle Ndima |
| **Postal Address** | P.O. Box 7068, Midrand 1685 |
| **Telephone No.** | 011 312 2878 |
| **E-mail** | ndimas@diges.co.za |
| **Expertise** | Qualification(s)<br>BSc Environmental Science |

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|---|---|
| | Experience<br>A dedicated and passionate young Environmental Practitioner with valuable theoretical and experiential acumen in the areas of environmental conservation and administration. I have 2 years' experience gained through direct involvement in a number of conservation initiatives. Currently a Junior Environmental Consultant of DIGES Group responsible for leading, administrating and completing assessments on Environmental Impact Assessments, as well as overseeing studies and interpreting technical reports.<br>I leverage academic skills gained through a bachelor degree in Environmental Science alongside the proficient ability to actively and valuably participate in the development, design and implementation of environmental / conservation management policies and consultation initiatives; thereby supporting the highest standards of Environmental Management and Sustainable Development, in all undertakings. Reference is made to the CV attached in **Appendix A.** |

In terms of the National Environmental Management Act (Act 107 of 1998, NEMA) as amended and its EIA Regulation, it is necessary to undertake environmental investigations as an integral part of project planning in order to obtain environmental authorisation for a proposed activity that may have a potentially negative effect on the environment. As such, an Environmental Impact Assessment (EIA) has been undertaken to identify and assess the aspects of construction, operation and decommissioning of the 400kV power line that could have an environmental impact. This EMPr identifies the project management structure, roles and responsibilities concerning managing and reporting on the environmental impacts of the construction, operation and decommissioning phase.

## *1.2 The Purpose of the EMPr*

The purpose of this EMPr is therefore to describe the environmental management and monitoring procedures to be implemented during the Project's life span. The EMPr will enable the project team to construct the pipeline with the least adverse environmental effects. Overall implementation of this EMPr will ensure:

- Compliance with the conditions of resource consents and designations;
- Compliance with environmental legislation;

- Adherence to COE's environmental objectives; and
- Ensuring Environmental risks associated with the Project are properly managed.

This document will therefore define details of who, what, where and when environmental management and mitigation measures are to be implemented. It will also cover all anticipated construction, operation and decommissioning elements and present a framework of principles, environmental policy, objectives and performance standards as well as processes for implementing good environmental management.

## 1.3 Assumptions

The EMPr is based on the assumptions described below.

- The main works to be carried out will be limited to activities typically defined as the construction and operation of the pipe line;
- The works will be carried out within a 3m servitude in the 10m corridor assessed and will not involve relocation outside the assessed corridor;
- It is assumed that the Applicant has provided adequate details with regards to the activities to be carried out and the processes to be followed during the construction and operation phase;
- Information used to inform the assessment was limited to data and GIS coverage is available at a local, regional and national level at the time of the assessment. It is assumed that this data encompasses the site conditions;
- It is assumed that the specialists' reports are factual and give a correct indication of the environment and how the project activities will affect these resources.

## 1.4 EMPR Layout And Structure

All environmentally sensitive areas are indicated in Figure 2 in Section 2 and the relevant environmental management strategies to minimise negative impacts in these areas are dealt with in Section 3.

### 1.4.1 Method of Compiling EMPr (Specialist Assessments)

To identify specific areas along the proposed corridor the project team used specialists' reports, topographical maps and aerial photographs. Table 1-2 below indicates the team of specialists involved in the Basic Assessment and the compilation of this EMPr.

**Table 1-2:** Specialist Input during CEMP

| Specialist | Company | Consultant |
|---|---|---|
| Archaeology | Vhubvo Archaeo- Heritage Consultants | Munyadziwa Magoma |
| Geotechnical Investigation Report | Gage Consulting | Brendon Jones |
| Wetland Delineation | EnviroSheq Consulting | Benard Madziwa |

## 1.5 Legislation And Other Requirements

This document has been compiled in accordance with the Integrated Environmental Management (IEM) philosophy (DEAT, 2004a) and Appendix 4 of the EIA Regulations R326 of 2017 as amended. This philosophy aims to achieve a desirable balance between conservation and development (DEAT, 1992). NEMA promotes the integrated environmental management of activities that may have a significant effect on the environment, while IEM prescribes a code of practice for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental and management tools that are appropriate for the various levels of decision-making. One such tool is an Environmental Management Programme.

### 1.5.1 National and Provincial Legislation, Regulations and Strategies

Construction and operation of the project must comply with a range of international, national, provincial and local legislation, regulations, strategies and policies in order to provide for the management of environmental effects. Key documents, national environmental legislation and regulations relevant to the Project are outlined in the table below:

**Table 1-3:** Relevant Legislation, Regulations and Standards

| TITLE OF LEGISLATION, POLICY OR GUIDELINE | APPLICABILITY TO THE PROJECT |
|---|---|
| The South African Constitution Act (Act 108 of 1996) | Human rights on the environment. |
| National Environmental Management Act (Act 107 of 1998) | Environmental Policy, in terms of environmental management. |
| National Environmental Management: Biodiversity Act (Act No. 10 of 2004) | It has regulations relating to listed threatened and protected species and ecosystems. |
| Environment Conservation Act of 1989 (Act No. 73 of 1989) | Provides for effective protection, control and utilization of the environment. |
| National Water Act 1998 (Act 36 of 1998) | Ensure that water resources are protected, used, developed, conserved, managed and controlled. |
| The National Heritage Resources Act (Act No. 25 of 1999) | Protection of historical structures, graves and archaeological objects |
| National Environmental Management: Air Quality Act (Act No. 39 of 2004) | Controls and manages air pollution (replaced the Atmospheric pollution prevention act) |
| Conservation of Agricultural Resources Act (Act No. 43 of 1983) | Control of weeds and invader plants as well as the control of the utilization and protection of wetlands and soil conservation. |
| National Road Traffic Act (Act No. 83 of 1996) | Movement of dangerous goods. |
| National Environmental Management: Waste Act (Act No. 59 of 2008) | Control of storage, transfer, treatment and disposal of waste on land. |
| Occupational Health and Safety Act (Act No. 85 of 1993) | Exposure of workers and waste products. |
| National Mineral and Petroleum Resources Development Act, 2002 (Act No. 28of 2002) | Controls land use and infrastructure on mining and prospecting areas. |

| TITLE OF LEGISLATION, POLICY OR GUIDELINE | APPLICABILITY TO THE PROJECT |
|---|---|
| SANS 10103 | The measurement and rating of environmental noise with respect to annoyance and to speech communication. |

## 1.6 Administration Management

This EMPr should be used as a working document and it should be available on the construction site. The stipulations and provisions of this report should be conveyed to and familiarized by the contractor's senior personnel and workers responsible for construction. The mitigation section should be issued as a stand-alone document to all parties involved with the planning, implementation and operation of the proposed project. The contractor and all sub-contractors working on the project shall be required to sign acknowledgement and acceptance to the terms and conditions of this EMPr and any revised versions.

## 1.7 Training And Awareness

The Environmental Control Officer (ECO) in conjunction with the contractor shall be responsible for compiling and conducting the Environmental Awareness Training Programme. This programme will aim at explaining the impacts anticipated during the project cycle and mitigation measures described in this report. The Programme will also be used to improve awareness of all employees on a continuous basis. General environmental awareness will be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout the project's duration. This will ensure that environmental accidents are minimized and environmental compliance maximized. Based on this:

- The contractor shall arrange for the site induction on the Environmental Awareness issues before commencement of the project;
- The contractor shall ensure that adequate environmental awareness training of all the personnel working on the site familiarise with the contents of the environmental site control measures, which are outlined in this document.
- The contractor shall also make this training and awareness programme be conveyed to the personnel on site to the satisfaction of the Environmental Control Officer (ECO), either in written format or verbal, in the employees' language of choice.
- The contractor should keep environmental training sessions, including names, dates and the information presented records of all.

The environmental training should as a minimum, include the following:

- The importance of conformance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- The potential consequences of departure from specified operating procedures; and

- The mitigation measures required to be implemented when carrying out their work activities.

## 1.8 Responsibilities

The proposed activities require the commitment of the people assigned responsibilities to undertake their duties to avoid negative impacts on the environment.

### 1.8.1 City of Ekurhuleni

COE is ultimately responsible for compliance with all conditions of approval of the development or any aspect thereof by any authority. COE is to:

- Ensure that all relevant approvals and permits have been obtained prior to the start of construction activities on site. Permits that may be needed include the following:
    i. Environmental Authorization; and
    ii. Water Use License/ General Authorization.
- Ensure that the requirements as set out in this EMPr and the Environmental Authorisation issued by GDARD and any other conditions of approvals by the relevant Authorities are adhered to and implemented by all involved in the project;
- Appoint a suitably qualified or experienced independent Environmental Control Officer to undertake environmental compliance audits per the requirements of this EMPr;
- Ensure that GDARD is given written notice (within the timeframe specified) prior to the construction start including name and contact details of proposed ECO;
- Provide all principal contractors working on the project with a copy of this EMPr as part of tender contract documentation to allow the contractors to cost for its requirements within their respective construction contracts.

### 1.8.2 City of Ekurhuleni: Project Manager

This designation refers to the representative of COE who is responsible for the technical and contractual implementation of the works/part of the works to be undertaken.

### 1.8.3 The Contractor

“The Contractor” refers to any directly/indirectly appointed company or individual undertaking the implementation of the works.

The Contractor is to:

- Ensure implementation of all applicable Environmental Management Specifications in this EMPr as well as all additional requirements related to approve method statements, during all works on site, failing which penalties the Project Manager may impose. The contractor should submit the following method statements:

*I. Site camp establishment*

*II. Vegetation clearing*

III. *Working in wetlands*
IV. *Erosion and Storm-water control*
V. Fuel storage and use
VI. Traffic accommodation
VII. *Waste management*
VIII. *Hazardous substances*
IX. *Cement and concrete batching*
X. *Emergency procedures*
XI. *Dust Control*
XII. *Site Disestablishment and Rehabilitation.*

### *1.8.4 Environmental Control Officer*

The Environmental Control Officer (ECO) will be appointed by COE to ensure the day-to-day implementation of the EMPr and suitable environmental management practices on site for the duration of the construction phase of the project. The ECO's duties, inter alia, must be to facilitate compliance with the EMPr on an ongoing basis during the construction phase through monitoring, proactive, and open communication channels with the project/site management.

The ECO's responsibilities include the following:

- Monitoring and verifying that the EMPr and Environmental Authorisation issued by GDARD is adhered to by inspecting the site and surrounding areas regularly during the construction start-up period and during environmentally sensitive work, periods of active construction with regard to compliance with the EMPr and notifying the Project Manager if the specifications are not followed;
- Assist the contractor with the Environmental Awareness Training;
- Manage and implement Non-conformance procedures (NCR's, Defect notifications, punch lists) and site instructions;
- Give site instruction as to environmental issues;
- Monitor the contractor's implementation of project specific environmental requirements;
- Conduct Environmental surveillance inspections and internal audits. Conducting a site inspection and auditing compliance of the EMPr;
- Reviewing and approving construction method statements together with the Project Manager;
- Assisting the Project Manager in finding environmentally responsible solutions to problems; and
- Give final release form to affected landowners to be managed.

## *1.9 Implementation*

During construction, the ECO will undertake ongoing inspections of the works to identify non-compliance with the provisions of the EMPr. The following parameters shall be utilised:

### 1.9.1 *Construction Method Statements (CMS)*

The EMPr provides the overall project strategy for management of environmental issues; however, a Construction Method Statement (CMS) will address environmental management issues at a site level. The contractor will be required to provide Method Statements prior to work commencing on aspects of the project deemed or identified to be of greater risk to the environment and/or which may not be covered in sufficient detail in the EMPr, when called upon to do so by the Project Manager and or ECO. Changes in the way the works are to be carried out must be reflected by amendments to the original approved Method Statement.

### 1.9.2 *Work Instructions (WIs)*

The Environmental Control Officer shall advise the site/project manager on issuing of detailed Environmental Work Instructions (WIs) in the form of environmental controls that provide “hands on” directions for on-site staff. These WIs should provide clear and concise instruction to site personnel in dealing with situations such as:

- environmental incidents;
- adverse weather conditions;
- complaints;
- controls and commitments detailed in the EMPr and CMS’s;
- a trigger point contained in the environmental inspection checklist or log; and
- General good site practice.

### 1.9.3 *Checking and corrective action*

#### 1.9.3.1 Monitoring and reporting

The ECO & COE should develop monitoring and reporting procedures at the outset in order to:

- identify any negative impacts from construction activities;
- assess the effectiveness of control measures;
- demonstrate compliance with regulatory conditions and objectives and targets set in the EMPr; and
- Identify if further controls/corrective action is required.

### 1.9.4 *Environmental inspections, audits and registers*

In addition to the routine monitoring conducted by the ECO, a schedule of regular inspections, audits and reporting will be required by the contractor. These inspections should provide a record of site conditions and activities and provide a mechanism by which the contractor, ECO and COE can establish the effectiveness of this EMPr.

### 1.9.5 Compliance and non-conformance

If criteria within this EMPr are not fulfilled and the contractor does not take, appropriate and corrective action a non-conformance may be raised by the ECO. It is the responsibility of the contractor to immediately initiate corrective actions and, once completed, provide details of the actions undertaken on the non-conformance/corrective action report and return it signed to the Eskom's project manager within 30 days.

## 1.10 Documentation

The Contractor for the development will establish a dedicated file to contain all documentation pertaining to environmental management of the works. The records below will form an integral part of the contractor's records:

- ✓ Environmental incidents involving Contractor employees and/or the public;
- ✓ Environmental complaints and correspondence received from the public to the Project Manager or the Environmental Control Officer;
- ✓ Record and report incidents that cause harm or may cause harm to the environment to the Environmental Control Officer;
- ✓ Record of all hazardous materials used on site;
- ✓ A record of all Hazardous Waste Disposal Manifests detailing the nature of the hazardous waste disposed of, the hazardous waste classification and the location of the site to which such waste was disposed.

### 1.10.1 Environmental Incidents Register

The ECO should put in place an Environmental Register and must ensure that the following information is recorded for all environmental incidents:

- ❑ Nature of incident;
- ❑ Causes of incident;
- ❑ Party/parties responsible for causing incident;
- ❑ Immediate actions undertaken to stop/reduce/contain the causes of the incident;
- ❑ Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the incident; and
- ❑ Timeframes and the parties responsible for the implementation of the corrective or remedial actions; and Copies of all correspondence received regarding incidents.

### *1.10.2 Public Complaints Register*

The ECO shall further maintain the Public complaints register that will:

- Contain environmental complaints and correspondence received from the public to the Contractor or the ECO.
- Nature of complaint and where possible an image of the issue;
- Cause of complaint;
- Party/parties in responsible for complaint;
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint including an image of the resolved action; and
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint.

# SECTION 2: PROPOSED PROJECT DESCRIPTION

## 2.1 Need and Desirability

City of Ekurhuleni herein referred to as COE or 'City' is responsible for the provision of water supply within the areas in its jurisdiction, as such the 'City intends to upgrade the Reiger Park water supply network. The existing asbestos pipeline that was connected to the Madeley supply to Reiger Park was experiencing constant leakages which resulted in the pipeline being closed off at Hyperama Shopping Centre along the Espri road access. To ensure a constant supply to Reiger Park, the City therefore intends to construct a new pipeline which will run parallel the existing line and the planned K110 road. This pipeline will be fed from Vogelfontein Reservoir and will be used in case the supply from Madeley Reservoir is not there.

## 2.2 Project Description

The proposed pipeline will be aligned along the future (planned) K110 road reserve and the Parkdene Extension 7 development. A 3m servitude in favour of the City of Ekurhuleni along the proposed road reserve and the existing Eskom servitude will be registered. In addition, aligning the proposed pipeline with the planned road and existing infrastructure may result in the removal of a portion of the existing asbestos pipe to accommodate the new pipe. The proposed project therefore entails the following:

i. Construction and operation of 450mm in diameter PVC-O Pipeline with a length approximately ± 1410m in a 3m servitude. In addition, the pipe will cross a stream such that construction method in the wetland area will be via the above ground pipe on a plinth similar to the existing stream crossing method used.

The works associated with the construction of the proposed pipeline at the stream crossing is listed in Government Notice, R327 of April 2017 as amended and requires an environmental and general authorization from the provincial authority, Gauteng Department of Agriculture and Rural Development (GDARD) and Department of Water and Sanitation (DWS) respectively. A Basic Assessment is prescribed to assess the damage that will be done during the project cycle (construction, operation and decommissioning) as the activities fall under Activity 19(i) and 30 of Government Notice, R327(as amended) stated below:

**Listing 1, Government Notice 326**

**Item 19 (i):** The infilling or deposition of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from: a watercourse.

**Applicability**

It is anticipated that more than 10cubic metres of soil will be excavated or removed from the stream during the construction of the plinths at the stream crossing.

**Item 30:** Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act,2004(Act No.10 of 2004).

**Applicability**

The dredging and infilling of soil in an area considered critically endangered/endangered.

In addition since the activity is within 500m of the stream and works will be undertaken on the stream bed, a General Authorization is required. This has since been issued on the 4th of March 2019.

## *2.3 Project Location*

The proposed development will be located on Farm Leeuwpoort 113IR. The proposed pipeline will connect on the existing 375mm along the Rondebult road (R21) and cross the entrance road of Boksburg Checkers and will be aligned parallel to the Parkdene Ext 7 and existing overhead powerline with the aim to avoid the K110 future road reserve. The pipeline will then cross the stream and cut on the wetland to supply water to Reiger Park. Reference is made to the Locality Map overleaf and Appendix B:

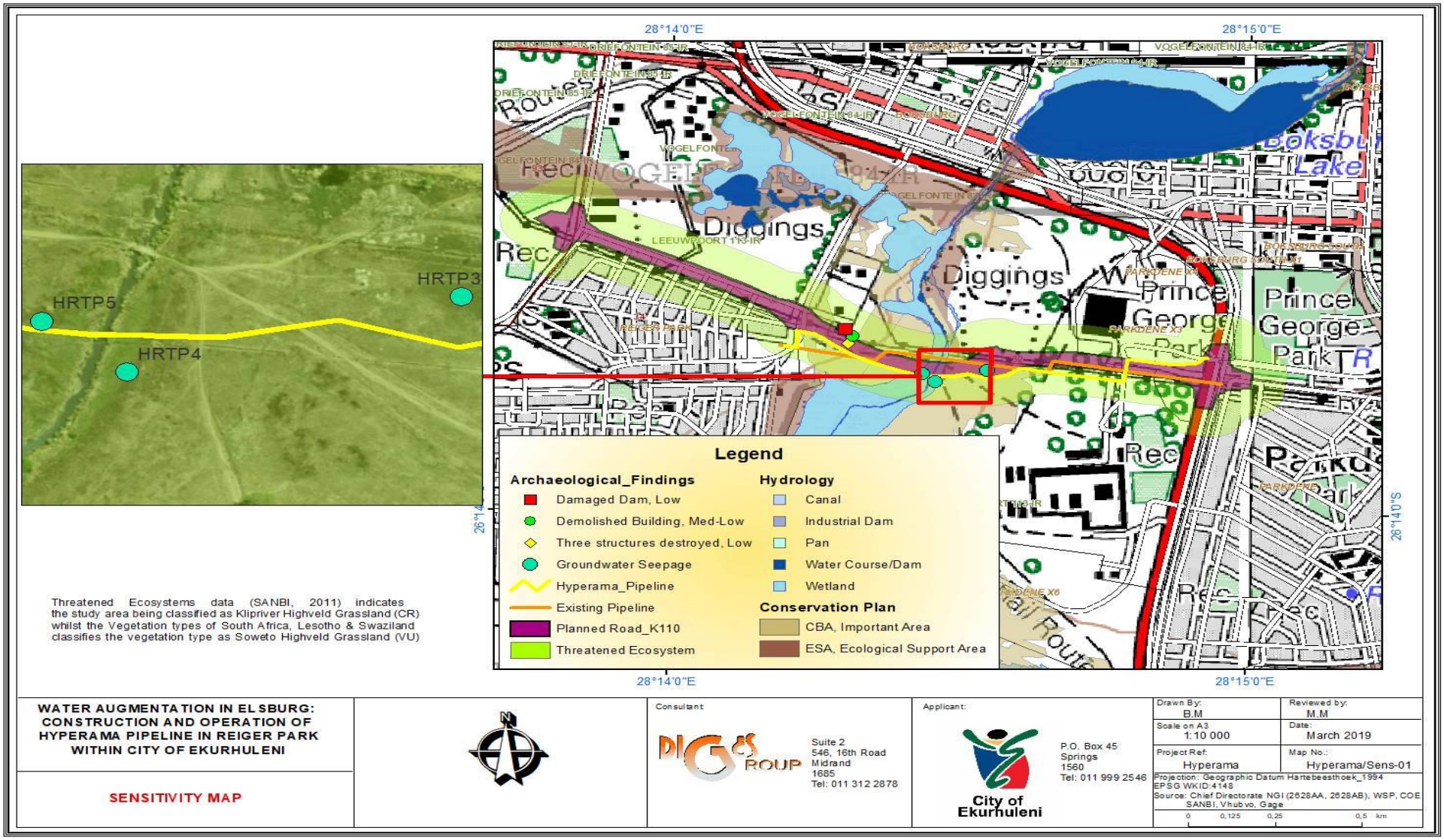


**Figure 1: Sensitivity Map**

# SECTION 3: ACTIVITIES AND MITIGATION MEASURES

The standard mitigations contained in the table overleaf are for the core standard mitigation measures/statements for the pre-construction, construction, operation and decommissioning phase of this project. Following extensive environmental impact assessment of the study area and stakeholder consultations. These statements also contain the requirements as stipulated in the mitigation measures recommended by specialists after the assessment. COE and the contractors are required to ensure that all the mitigation methods contained in the statements listed below are implemented at all times.

## *3.1 Pre-Construction and Construction Phase*

### *3.1.1 Tendering*

**Management Objectives**

- To improve the socio-economic status of the surrounding communities;
- To create employment for the local community;
- To train and capacitate the local communities.

**Targets**

- No complaints from the community;
- Equal opportunities for men and women;
- Training certificates;
- Gender equality strategy.

**Monitoring Responsibility and Frequency**

- Tender committee to monitor the tender adjudication;
- COE to continuously monitor the appointment of sub-contractors and the training programmes throughout the project duration.

| Activity | Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Awarding of contract | Job Creation | • Representatives from the various local municipalities can assist in determining local sub-contractors and labourers that should be considered for possible employment.<br>• The tender document should specify the use of local labourers or enterprises (where possible). It should be stipulated in the tender documentation that contractors use local labourers for manual and low skilled activities such as fencing and bush clearing. Where possible, on-site training should be undertaken to ensure long term benefits to the members of the community.<br>• COE's own internal policies and procedures should be used to ensure a fair and transparent recruitment process.<br>• Stakeholders should be mutually accountable for increased opportunities regarding skills and | COE |

| | | | |
|---|---|---|---|
| | | competency development (general education and technical training). This training should be concentrated on skills that can be readily transferred to other employment opportunities in the local area, and only suitable qualified candidates in project management activities should be used. | |

### *3.1.2 Site Establishment*

**Management Objectives**

- To plan construction methods that result in the least possible negative environmental impact and document these as Environmental Method Statements.
- To minimize unnecessary damage to vegetation by determining the degree of clearing required and demarcate 'No-Go areas' before clearing begins;
- To minimize damage to natural features;
- To protect the public and ensure their safety from the works;
- To prevent pollution of the environment;
- To increase the level of compliance with the environmental specifications contained in the EMPr by raising awareness of the requirements in environmental awareness training courses at all staff levels;
- To minimize environmental impact by siting the site camp/lay down area elements in areas where they have the least possible negative environmental impact whilst still being practical to the works.

**Target**

- No visible erosion scars once construction in an area is complete;
- All damaged areas are successfully rehabilitated one year after rehabilitation;
- All environmental method statements are provided by the Contractor prior to commencing with the activities governed by such method statements and are kept on file on site.
- Environmental awareness training registers are on file on site;
- The site camp and lay-down area is located in the approved position and its footprint minimized and demarcated, with no undue avoidable environmental impact e.g. on natural vegetation, storm water drainage, visual impact etc;
- Site is secure and there is no unauthorized entry;
- Adequate numbers of conveniently located site toilets are available on all work sites at all times in quantities related to the number of users; 1 toilet per 15 users.

**Monitoring Responsibility and Frequency**

- The Contractor shall monitor the site daily with respect to compliance with the specifications.
- The Environmental Control Officer shall monitor minimum weekly that the specifications are complied with and provide the Contractor and Project Manager with an inspection report of any specifications not adequately complied with and how to rectify this.
- The Environmental Control Officer shall provide summary reports of compliance to the project team and GDARD as per the requirements stated in the Environmental Authrisation.

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Establishment of construction camp | Removal of indigenous, grass species | • The construction camp, office and storage areas for material and equipment must be fenced in to prevent impacts and human interference to spread further than the site.<br>• During the construction phase, workers must be limited to areas under construction and access to neighboring undeveloped areas must be strictly regulated. | Contractor and Construction workers, ECO, COE. |
| | Impact on the visual environment | • The Contractor shall ensure that the construction site is maintained in a neat and tidy condition at all times so as to maintain the natural scenic beauty of the border area.<br>• All temporary stockpile areas, litter and rubble must be removed on completion of construction. All dumped material must be taken to an approved dump site in the area.<br>• Soil stockpiling areas and storage facilities must follow environmentally sensitive practices and be situated a sufficient distance away, approximately 100m, from drainage areas or drainage lines.<br>• The careful position of soil piles and runoff control during all phases of development will limit the extent of erosion occurring on the site. | |

### *3.1.3 Material Handling And Storage*

**Management Objectives**

- To ensure environmental best practice in terms of the storage and handling construction materials and equipment; and
- To ensure that storage and handling of chemicals and hydrocarbons on-site do not cause pollution to the environment or harm to people.

**Target**

- Storage facilities including approved location, ventilation, bunding and signage.
- All spillages are adequately treated.
- Required drip trays in place.

**Monitoring Responsibility and Frequency**

- The ECO to undertake weekly inspection of hazardous material storage areas to check for leakage;
- The contractor to undertake daily on-site vehicle checks for fluid leaks;
- Regular inspection of the oil catchment area around the transformers by the contractor and ECO; and
- The ECO to compile monthly audit reports on incident reports.

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Storage and Handling of hazardous substances including fuel and gas | Potential fuel/hazardous substance spillage | • All the necessary handling and safety equipment required for the safe use of petrochemicals and oils shall be provided by the contractor to, and used or worn by the staff whose duty it is to manage and maintain the supplier's plant, machinery and equipment.<br>• Petrochemicals, oils, asphalt and identified hazardous substances shall only be stored under controlled conditions.<br>• All hazardous materials will be stored in a secured, appointed area that is fenced and has restricted entry.<br>• The contractor shall provide proof that relevant authorisation to store such substances has been obtained from the relevant authority.<br>• In addition, hazard signs indicating the nature of the stored materials shall be clearly displayed on the storage facility or containment structure.<br>• Before containment or storage facilities can be erected, the contractor shall furnish the Engineer/ Project Manager with details of the preventative measures which are proposed to be installed in order to mitigate | Contractor, ECO |

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| | | against pollution of the surrounding environment from leaks or spillage.<br>• The preferred method shall be a concrete floor that is bunded.<br>• The proposals shall also indicate the emergency procedures to be implemented in the event of misuse or spillage of substances that will negatively impact on an individual or the environment.<br>• In the event of a spillage, the contractor is to appoint someone to clean up immediately. | |

*3.1.4 Vegetation Clearance*

**Management Objectives**

- To minimize damage to vegetation;
- To minimize possibility of erosion due to removal of vegetation/grass;
- To ensure alien plants do not become dominant in the project area and surrounding areas;
- To control alien and invasive species dispersal and encroachment; and
- To promote the natural re-establishment and planting of indigenous species.

**Targets**

- Record of clearing activities.

**Monitoring Responsibility and Frequency:**

- Control of alien vegetation must be done monthly by the ECO;
- Alien plant distribution and clearing measure should be recorded after every three months by the ECO;
- Daily inspections when undertaking work at the stream crossing must be undertaken by the ECO; and
- The ECO should record all disturbances to essential habitats and vegetation communities.

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Clearing of site and riparian vegetation for construction. | Removal of indigenous grass species | • The municipality and ECO must identify and demarcate the exact clearing for the contractor to ensure that minimum debushing takes place. | Contractor, ECO, COE |
| | Introduction of alien species | • Must clear alien vegetation on a regular basis. | Contractor, ECO |

### *3.1.5 Wetland and Stream Crossing*

**Management Objectives**

- To prevent damage by avoiding any other wet areas; and
- To minimize or reduce ground water pollution.
- To minimise erosion of embankments and subsequent siltation of streams; and
- To minimise damage stream embankments.

**Target**

- Re-vegetation of disturbed riparian zones;
- No damage to wet areas;
- No complaints from DWS;
- Storm-water and erosion control in place.
- No new access roads through river and stream banks; and
- No visible erosion scars on embankments once construction is completed.

**Monitoring Responsibility and Frequency**

- ECO will undertake regular monitoring and maintenance of all sediment retention devices throughout the construction works to ensure the operation of such devices is optimized throughout construction works.
- The ECO shall monitor minimum weekly that the specifications are complied with and provide the Contractor and Project Manager with an inspection report of any specifications not adequately complied with and how to rectify this.

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Servicing and maintenance of construction vehicles on site. | Potential fuel and oil spills | • No maintenance/servicing construction vehicles must be done at a workshop. Places where hazardous material or substances are handled must be bunded.<br>• In the case of spillage, the contractor will be liable to arrange for a competent company to clear the affected area.<br>• Berms and containment measures for fuels and oils, also around transformers to prevent spills during accidents and maintenance.<br>• Proper storage of material during construction and cleanup after the construction is completed should be provided for and implemented. | COE, Contractor and Construction workers, ECO |
| Site clearing and the removal of vegetation | Loss of wetland Features Habitat and Ecological Structure | • The development footprint area should remain as small as possible and should not encroach onto surrounding areas beyond the proposed route; | |

| | | | |
|---|---|---|---|
| Potential indiscriminate driving through wetland feature<br><br>Earthworks in the wetland feature system<br>Spillage from construction vehicles and waste dumping. | | • Ensure that only essential activities must occur within the wetland features which are traversed by the proposed route, all other non-essential activities should occur outside of the freshwater features; the wetland areas not indicated within the linear developments footprint are off-limits to construction vehicles and personnel;<br>• Planning of temporary roads and access routes should avoid natural areas and be restricted to existing gravel roads where possible;<br>• Ensure that vegetation clearing and indiscriminate vehicle driving does not occur outside of the demarcated areas;<br>• Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities;<br>• Implement alien vegetation control program within the wetland features;<br>• Ensure that all activities impacting on the wetland features are managed according to the relevant DWS Licensing regulations (where applicable); and<br>• As far as possible, all construction activities should occur in the low flow season, during the drier winter months. | |
| Vegetation clearing;<br><br>Earthworks within the wetland features;<br><br>Unmanaged oil leaks from construction vehicles. | Changes to Ecological and Socio-Cultural Services Provision due to:<br>- water quality deterioration;<br>- Loss of phosphate, nitrate and toxicant removal abilities. | • During construction use techniques which support the hydrology and sediment control functions of the freshwater features; and normal as soon as possible after construction.<br>• Limit excavations to a limited extent to ensure that drainage patterns within the features returns to pre-development status.<br>• Restrict construction to the drier winter months if possible to avoid sedimentation of the freshwater feature and to minimize the severity of disturbance of the features and hydraulic function. | |

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|---|---|---|---|
| Site clearing and further removal of vegetation;<br><br>Disturbance of soils, topsoil stockpiling adjacent to the wetland features and runoff from stockpiles;<br><br>Earthworks in the vicinity of the wetland features;<br><br>Movement of construction vehicles within the wetland features. | Loss of hydrological function and sediment balance due to:<br>- increased runoff which leads to erosion and alteration of the geomorphology of the wetland features<br>- sedimentation of the system<br>- incision, erosion and altered runoff patterns;<br>- soil compaction. | • Any construction-related waste must not be placed in the vicinity of the wetland features;<br>• Limit the footprint area of the construction activity to what is absolutely essential in order to minimize environmental damage.<br>• Stockpiled soil must be removed and the area must be levelled to avoid sedimentation of the wetland features from runoff;<br>• Adequate storm water drainage system must be designed and maintained to adequately control the volume, speed, location of runoff, to avoid soil erosion and siltation of water courses;<br>• Re-profiling of the banks of disturbed wetland areas should be doneand<br>• As far as possible, all construction activities should occur in the low flow season, during the drier summer months. | |

*3.1.6 Soil*

**Management Objectives**

- To minimise erosion on site and along gravel access roads during construction;
- To provide permanent erosion and sediment control measures, where required; and
- To minimise the risk of sedimentation of water resources during the construction phase.

**Targets**

- No erosion scars.
- Minimised sedimentation of the stream.

**Monitoring Responsibility and Frequency:**

- The ECO and contractor should undertake on-going monitoring of areas with soil susceptible to erosion to ensure that formation of gullies is avoided;
- The ECO and contractor should undertake on-going monitoring of erosion and sediment control measures to determine their effectiveness;
- Daily visual inspection of sediment control devices should be done by the contractor;
- Sediment controls will be reviewed during site inspections and/or after significant rainfall (more than 10mm in 24hrs resulting in site runoff) by the ECO.

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Vegetation clearance | Erosion of topsoil by runoff waters and winds | • Topsoil must be stockpiled separately during trenching and refilled immediately after. | Contractor, ECO |

| | | | |
|---|---|---|---|
| | | • As much vegetation growth should be encouraged to protect soils. | |
| Removal of topsoil and of soil from the stream bed. | Soil erosion | • Topsoil must be stripped aside and be used for rehabilitation of trenches.<br>• Dumped soils should be removed and the area must be levelled to improve the flow of water;<br>• Reinforce banks where necessary with gabions and reno-mattresses;<br>• Monitor all areas traversed by the development for erosion and incision, during site clearing in the preconstruction phase and throughout the construction phase.<br>• All areas susceptible to erosion must be installed with temporary and permanent diversion channels and berms to prevent concentration of surface water and scouring of slopes and banks, thereby countering erosion.<br>• Special care needs to be taken during the construction phase to prevent surface storm water rich in sediments and other pollutants from entering the natural drainage systems/wetlands. In order to prevent erosion, mechanisms are required for dissipating water energy.<br>• The contractor shall be responsible for the safe siting, operation, maintenance and closure of any spoil site used during the contract period. This shall include existing spoil sites that are being re-entered.<br>• Before spoil sites may be used, proposals for their locality, intended method of operation, maintenance and rehabilitation shall be given to the Engineer for approval.<br>• No spoil site shall be located within 500 m of any watercourse. | |
| Maintenance and movement of construction vehicles | Potential spills of hazardous substances | • Construction vehicles must be well maintained and serviced to minimise leaks and spills.<br>• Drip pans can also be used during the servicing of construction vehicles. Used parts like filters should be contained and disposed of at a site licensed for dumping of these waste products. | |

| | | | |
|---|---|---|---|
| Improper installation and management of storm water drainage system | Topsoil removal and soil erosion | • Adequate storm water drainage system must be designed and maintained to adequately control the volume, speed, location of runoff, to avoid soil erosion. | Contractor, ECO |

*3.1.7 Archaeology*

**Management Objectives**

- Protection of archaeological sites and land considered to be of cultural value;
- Protection of known sites against vandalism, destruction and theft; and
- The preservation and appropriate management of new archaeological finds should these be discovered during construction.

**Target**

- No destruction of or damage to known archaeological sites;
- No litigation due to destruction of sites; and
- Management of existing sites and new discoveries in accordance with the recommendations of the Archaeologist.

**Monitoring Responsibility and Frequency**

- Visual monitoring should be undertaken by the site manager and the ECO during excavation activities.

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Digging and trenching | Discovering of archaeological attribute | • Familiarise all staff and contractors with procedures for dealing with heritage objects/sites;<br>• Care should be taken to conserve exposed archaeological objects in trenches;<br>• No destruction of any site shall be allowed. Should it be necessary to remove any archaeological objects, the necessary procedures shall be followed and permits obtained;<br>• Artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained.<br>• Discovered attributes of archaeological or historical importance must be reported to the South African Heritage Resources Agency and work must cease in that particular area until the necessary permits have been issued by SAHRA or the provincial heritage resources (PHRAG). | Contractor, ECO |

| | | | |
|---|---|---|---|
| | | • Should any undisturbed subsurface archaeological material be exposed during the construction activities, the archaeologist must activate all necessary mitigation measures to salvage such exposed heritage remains. | |

*3.1.8 Air Quality*

**Management Objectives**

- To minimize the generation of dust on the project site; and
- To minimize all potential odour issues relating to contaminated soil and water.

**Targets**

- No visible dust within the project site;
- No visible loose material from trucks; and
- No complaints from the public.

**Monitoring Responsibility and Frequency**

- The Project Manager and ECO should carry out a weekly inspection during site preparation;
- Daily inspection by the Contractor to monitor activities for dust generation and moisture content of exposed areas;
- Continuous monitoring by the ECO and the Contractor with regards to fires caused by burning of waste; and
- Pre-construction inspection and maintenance as required for construction vehicles.

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Clearing of site | Air pollution by dust particles | Cleared areas and roads must be suppressed with water to avoid dispersal of dust particles into the atmosphere. | Contractor |
| Burning of waste | Air pollution | Burning of waste must not be allowed on site. All waste must be stored adequately and disposed of at the relevant facility. | Contractor |
| Excessive burning of fossil fuel | Excessive hazardous smoke into the atmosphere | Burning of fossil fuels must not be allowed on site. | Contractor |
| Emissions from vehicles and dust from gravel roads | Air pollution | Vehicles should be well serviced to avoid excessive emissions. | Contractor |

### *3.1.9 Noise*

**Management Objectives**

- To minimize the generation of noise from construction activities.

**Target**

- No complaints received from the public.

**Monitoring Responsibility and Frequency**

- Routine inspections of plant and equipment must be carried out by the contractor; and
- Any noise complaints received from the public should be recorded, reported and monitored.

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| The use of construction machines and labourers on site create noise. | Noise pollution | • Construction must be limited to normal working hours.<br>• All machinery, including earthmoving vehicles needs regular maintenance to reduce noise intensity.<br>• Installation of sound vibration detectors on plant machinery is recommended.<br>• Construction vehicles must use designated entry and exit routes so that noise impacts can be largely confined to specific access routes.<br>• All construction activities must abide to national noise laws and municipality by-laws. | Contractor and ECO |

### *3.1.10 Visual*

**Management Object**

- To retain the visual status quo.

**Target**

- The site camp and lay-down area is located in the approved position and its footprint minimized and demarcated, with no undue avoidable environmental impact e.g. visual impact etc;

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Access routes | Aesthetic pollution | • Access for construction traffic will be required and maintained to all sites during the construction phase; | Contractor, ECO |
| Site Camp Establishment | | • If practically possible, locate construction camps in areas that are already disturbed or where it is not | Contractor, ECO |

| | | | |
|---|---|---|---|
| | | necessary to remove established vegetation like for example, naturally bare areas;<br>• Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance; and<br>• Screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2 m height. | |

*3.1.11 Health And Safety*

**Management Objectives**

- To promote good health; and
- To ensure security of workers and community.

**Target**

- No complaints from community;
- No litigation;
- No crimes recorded; and
- Good health.

**Monitoring Responsibility and Frequency**

- The Contractor's H&S officer shall monitor the site regularly with respect to compliance with the specifications. This shall be verified by the Contractor's external H&S Agent's monthly report.
- The ECO shall report to the Contractor's H&S Officer any safety concerns that were observed during his/her site inspections.

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Construction activities | Possible injuries to labourers | • The safety of all construction and operational personnel, as well as any member of the public on the site is the responsibility of the Contractor;<br>• Appropriate protective clothing must be used by labourers at all times of work;<br>• Opened trenches and pits must be rehabilitated immediately to avoid injuries to pedestrians;<br>• Ensure general good site management and health and safety awareness are employed;<br>• Ensure the site is appropriately signed to warn of the potential dangers; | Contractor and SHE Officer |

| | | | |
|---|---|---|---|
| | | • Access onto and off the site should be controlled by means of a register system. This includes visitors;<br>• The contractor and Health and Safety Officer (HSO) should ensure that first aid / emergency facilities / procedures are in place; and<br>• The HSO should ensure that all personnel are trained in basic site safety procedures. | |

*3.1.12 Waste Management*

**Management Objectives**

- To comply with waste management guidelines;
- To minimise production of waste;
- To keep the servitude clean and neat;
- To store and dispose waste in the specified manner; and
- To minimise the community's complaints.

**Target**

- The waste system is in place prior to any waste generation works;
- No waste/ rubble on site;
- Safe disposal certificates;
- Labelled bins; and
- All waste disposed of appropriately.

**Monitoring Responsibility and Frequency**

- The contractor should monitor waste pathways to ensure correct application of reuse and recycling;
- The Contractor shall monitor the site daily with respect to compliance with the specifications;
- The ECO shall monitor minimum weekly that the specifications are complied with and provide the Contractor and Project Manager with an incident reporting system which will be used to report non-conformance to the EMPr;
- A complaints register will be maintained in which any complaints from the community/ landowners will be logged. Complaints will be investigated and if appropriate acted upon.

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Construction activities | Generation of solid waste and asbestos waste. | • Waste materials should be disposed at the nearest licensed landfill site with asbestos pipe being disposed of at a landfill site that accepts such waste (Platkop Landfill). | Contractor, ECO |

| | | | |
|---|---|---|---|
| | | • The contractor's intended methods for waste management and waste minimization must be implemented at the outset of the contract, and approved by the ECO;<br>• All personnel shall be instructed to dispose of all waste in the proper manner;<br>• Solid waste shall be stored in a designated area covered, tip proof metal drums for collection and disposal;<br>• Signs will be located on each bin indicating type of bin and what waste may be placed in that bin.<br>• No waste shall be burned at the site offices, or anywhere else on the site<br>• Measures shall be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse.<br>• Oil collected by a mobile servicing unit should be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company.<br>• All used filter materials should be stored in a secure bin for disposal off site. | |

*3.1.13 Infrastructure*

**Management Objectives**

- Minimise damage to existing infrastructure- power lines, telephone lines and pipe lines;

**Targets**

- No damaged infrastructure.

**Monitoring Responsibility and Frequency**

- The site manager will monitor all excavations (as and when they are undertaken).

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Construction activities: digging, trenching. | Destruction of infrastructure | • The relevant servitude owners within the project area should be notified prior to construction; and<br>• No power lines/pipe lines/public and private infrastructure shall be damaged during the construction phase. | Contractor, Construction workers, COE, ECO |

### *3.1.14 Traffic Management*

**Management Objectives**

- To address traffic issues arising from construction of the pipe line;
- To reduce the number of accidents between construction vehicles and the public.

**Target**

- A decrease or zero number of accidents recorded;
- Minimal disturbance of normal traffic flow; and
- A low record of complaints received.

**Monitoring Responsibility and Frequency**

- The site manager and ECO will undertake general surveillance of access tracks and roads and surrounding areas for damage of access roads and impact on other road users;
- Routes and signage should be inspected daily to allow safe access; and
- Weekly reports to the Healthy and Safety Officer, including the number of the accidents, fatalities and the causes of the accidents.

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Access to and from site ( bringing in material and workers)<br><br>Movement of plant on site during site clearance and trenching. | Traffic Congestion on public roads<br><br>Accidents | ▪ Signposting, warning signs, barriers and traffic diversions: site will be clearly visible and the public warned of all potential hazards<br>▪ Traffic management system and staff training should be implemented, especially for site access and near-site heavy traffic;<br>▪ The contractor should ensure provision of safe passages and crossings for pedestrians where construction traffic interferes.<br>▪ Restrictions on the movement of vehicles may be placed so as to avoid any anticipated peak levels, as well as phasing of traffic movements to and from the site so as to avoid potential convoys which could cause local scale congestion.<br>▪ All trucks should not be over laden, and should be regularly serviced.<br>▪ Good driving practices will be required from all delivery drivers. | Contractor, ECO, COE |

### *3.1.15 Fire Management*

**Management Objectives**

- Minimise risk of fires;

**Target**

- A fire management plan is in place before construction;
- No fires started by the Contractor's work force; and
- No litigation.

**Monitoring Responsibility and Frequency**

- The Contractor shall ensure that all inductions and training is carried out to facilitate fire response and evacuation and shall ensure that all fire- fighting equipment is available and inspection registers are up to date.

| | | | |
|---|---|---|---|
| | Destruction of infrastructure and biodiversity | A fire management plan must be identified, implemented and maintained, commencing prior to construction and maintained throughout the operational phase. The following additional measures must be included:<br>• No fires may be made for the burning of vegetation and waste.<br>• No open fires are to be made on site; cooking facilities must be provided.<br>• Fire fighting equipment must be readily available on site during all times. | COE, Contractor, ECO |

## 3.2 Operation Phase

### 3.2.1 Vegetation

**Management Objectives**

- To minimize damage to vegetation;
- To minimize possibility of erosion due to removal of vegetation/grass;
- To ensure alien plants do not become dominant in the project area and surrounding areas;

**Targets**

- Rehabilitate areas.

**Monitoring Responsibility and Frequency:**

- Control of alien vegetation must be regularly done by COE.

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Debushing during maintenance | Removal of flora | • Selective bush clearing must take place, i.e. the entire road/pipe line servitude should not be cleared. Indigenous vegetation which does not interfere with the safe operation of the internal access roads and pipelines should be left undisturbed. | COE |

### 3.2.2 Wetlands and Stream Crossing

**Management Objectives**

- To minimize or reduce ground water pollution.
- To minimise erosion of embankments and subsequent siltation of streams; and
- To minimise damage stream embankments.

**Target**

- Re-vegetation of disturbed riparian zones;
- No complaints from DWS;

**Monitoring Responsibility and Frequency**

- COE to regularly monitor the re-vegetation of the riparian area.

| Activity That Causes Environment Impact | Environmental Impacts | Mitigation Measures | Responsible Person |
|---|---|---|---|
| Poor rehabilitation of wetland features | Loss of wetland Features Habitat and Ecological Structure due to: | • Any areas where active erosion within the wetland features are observed must be immediately rehabilitated in such a way as to ensure that the | COE |

| | | | |
|---|---|---|---|
| Potential movement of vehicles through wetland features during follow up work to ensure adequate rehabilitation and the alien vegetation control is taking place. | - alien plant proliferation and erosion of construction areas | hydrology of the area is reinstated to conditions which are as natural as possible;<br>• Cutting/ clearing of the herbaceous layer within the wetland areas along the linear development should be avoided so as to retain soil stability provided by the grass root structures | |
| Decrease ability to assimilate toxicants, phosphates and nitrates.<br><br>Decrease in biodiversity. | Changes to Ecological and Socio-Cultural Services Provision due to:<br>- loss of wetland vegetation and increased runoff;<br>- loss of habitat and the introduction of alien plant species. | • Monitor the wetland feature for erosion and incision;<br>• Maintain the REC for each of the wetland features, as stated within the report during the life of the development; and<br>• Implement an alien vegetation control program within the wetland features and ensure establishment of indigenous species within areas previously dominated by alien vegetation. | |
| Increased runoff volumes;<br><br>Disturbed soils may form erosional gulley's, leading to altered hydrological flow patterns and increased sedimentation of downstream features. | Loss of hydrological function and sediment balance due to:<br>- compacted soils | • Vehicles should not be driven indiscriminately within the wetland features during maintenance activities to prevent soil compaction. | |

## *3.3 Rehabilitation*

After completion of the laid down and infilled on the Hyperama pipeline, all areas that were disturbed by the excavation of the trench, the site should be rehabilitated. The following measures are required to address the issues of the negatively impacted site.

**Management Objectives**

- Establishment of vegetation in areas previously disturbed by construction where feasible to stabilise the site and improve aesthetics;
- Stabilisation of soils;
- Control of alien invasive plant species;
- To ensure and encourage site rehabilitation of disturbed areas; and
- To ensure that the site is appropriately rehabilitated following the execution of the works, such that residual environmental impacts are remediated or curtailed.

**Targets**

- Monitoring of all construction areas including construction equipment camps and working areas, cleared of equipment and temporary facilities;
- Topsoil replaced on all areas and stabilised;
- Disturbed areas rehabilitated and acceptable plant cover achieved on rehabilitated areas; and
- Closed site free of erosion and alien invasive plants.

**Procedures**

- The Contractor must ensure that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project. Pre-construction imagery can be taken to determine the loss of natural landscape and later compared to the rehabilitated land to obtain an indication of overall success in re-vegetation and rehabilitation;
- Compacted areas that are no longer needed post-construction (e.g. laydown areas and the crane) shall be ripped and scarified;
- Necessary drainage works and anti-erosion measures shall be installed, where required, to minimise loss of topsoil and control erosion;
- The contractor should replace stockpiled topsoil in disturbed areas where rehabilitation is to be undertaken as a layer of at least 10cm in thickness; and
- The ECO should ensure that the contractor implements immediate surface restoration and re-sloping in order to prevent erosion, taking cognisance of local contours and landscaping.

Stream Crossing

- Re-establishment of natural vegetation across the entire wetland site by grass species should be undertaken.
- Re-landscaping the wetland area to allow flows to spread across the full wetland front should be undertaken.
- Repair erosion damage within the delineated wetland on site and areas outside the delineated area that show potential erosion and /or erosion.
- The wetland delineation and rehabilitation must be conducted in such a way that surface water flow through the site is not contaminated or the flow disrupted.

**Monitoring Responsibility and Frequency**

- The Project Manager shall monitor all rehabilitation areas to ensure that they are establishing well and are free from alien invasive vegetation.
- The ECO is to comment on the progress and success of re-vegetation efforts.

### *3.3.1 Monitoring Programme*

Upon completion of all work, the ECO shall survey all rehabilitated areas to ensure compliance with the construction phase specifications. Some impacts may need ongoing monitoring and/or management (e.g. maintenance activities such as erosion control, removal of invasive species and impacts on wetland). If deemed necessary, the monitoring programme may need to be established to ensure the long-term viability of the rehabilitated areas.

# 4. CONCLUSION

Should these recommended measures be adopted in the planning, construction, operation/ maintenance and decommissioning phases of the proposed activity, DIGES finds that the predicted impacts of the proposed activities are within acceptable limits.

It should be noted however, that environmental management is dynamic and as such the EMP must be flexible in order to accommodate changing circumstances and requirements. Ongoing environmental monitoring of the pipeline should be carried out throughout its life cycle, and such should be conducted by a dedicated ECO within CoE, to identify and address new issues as they arise, and to update or amend the management plan accordingly.

# 5. REFERENCES


- DEAT (2002), Ecological Risk Assessment, Integrated Environmental Management, Information Series 6. DEAT. Pretoria;
- DEAT (2004), Environmental Management Plans, Integrated Environmental Management, Information Series 12. DEAT. Pretoria;
- DEAT (2004), Review in EIA, Integrated Environmental Management, Information Series 13. DEAT. Pretoria;
- Envirosheq Consulting. 2018. Wetland Delineation and Assessment Report-Upgrade/Construction of Hyperama Pipeline in Reiger Park, City of Ekurhuleni. Envirosheq. Pretoria. South Africa;
- Gage Consulting. 2018. Geotechnical Investigation at Hyperama Pipeline Reiger Park.Gage. Fourways. South Africa.
- Vhubvo Archaeo-Heritage Consultants. 2019. Phase 1 Archaeological Impact Assessment Specialist Study Report for the proposed construction of Hyperama pipeline located in Reiger Park within City of Ekurhuleni, Gauteng Province. Vhubvo. Pretoria. South Africa;
- WSP.2018. Water Augmentation Elsburg: Reiger Park-Addendum to Detailed Design Report. WSP. Bryanston. South Africa


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# APPENDIX A: EAP'S CV

# APPENDIX B: SENSITIVITY MAP