DEPARTMENT OF ENVIRONMENT, FORESTRY AND FISHERIES

NO. 834 **31 JULY 2020**

NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998)

CONSULTATION ON THE INTENTION TO ADOPT A GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME RELEVANT TO AN APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE DEVELOPMENT OR EXPANSION OF GAS TRANSMISSION PIPELINE INFRASTRUCTURE

I, Barbara Dallas Creecy, Minister of Forestry, Fisheries and the Environment, hereby consult on the intention to publish as an environmental management instrument in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), a draft *Generic Environmental Management Programme (EMPr) for Gas Transmission Pipeline Infrastructure (2020)* relevant to an application for environmental authorisation for gas transmission pipeline infrastructure which is located below ground or above ground for the purposes of connecting to above-ground infrastructure such as pigging stations or compressor stations and the expansion of such facilitates as set out in the Schedule hereto.

This generic environmental management programme, when implemented, will fulfil the requirement of section 24N (1A) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), and will be a generic environmental management programme as contemplated in regulations 19(4) and 23(4) of the Environmental Impact Assessment Regulations, 2014, as amended.

Members of the public are invited to submit written comments or input, within 30 days after the publication of this Notice in the *Gazette*, to the following address:

By post to: The Director-General
Department of Environment, Forestry and Fisheries
Attention: Dr. D Fischer
Private Bag X447
PRETORIA
0001

By hand at: 473 Steve Biko Road
ARCADIA
0083

By e-mail: dfischer@environment.gov.za

Comments or input received after the closing date may not be considered.

BARBARA DALLAS CREECY
MINISTER OF FORESTRY, FISHERIES AND THE ENVIRONMENT

SCHEDULE

1. An application for environmental authorisation for gas transmission pipeline infrastructure or the expansion of such infrastructure, where such infrastructure is located below ground or above ground for the purposes of connecting to above-ground infrastructure such as pigging stations or compressor stations, submitted in terms of the Environmental Impact Assessment Regulations, 2014, as amended, where such infrastructure triggers-

   (a) activity 60(i) and (ii) of Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended; or
   (b) activity 7(i) and (ii) of Environmental Impact Assessment Regulations Listing Notice 2 of 2014, as amended;

   and any listed or specified activity necessary for the realisation of such infrastructure, must use the *Generic Environmental Management Programme (EMPr) for Gas Transmission Pipeline Infrastructure* (2020) to comply with the requirements of Regulations 19(4), 23(4) and Appendix 4 to the Environmental Impact Assessment Regulations, 2014, as amended.

2. Any amendments to the *Generic Environmental Management Programme (EMPr) for Gas Transmission Pipeline Infrastructure* (2020) will be required to be consulted on through the publication for comment in the Government *Gazette*.

3. The document can be accessed at http://www.environment.gov.za/projectprogrammes/environmental_managment_instuments/

4. A hard copy of the documents can be viewed in the Department's library located at 473 Steve Biko Street, corner Soutpansberg and Steve Biko Road, Arcadia, Pretoria.

5. Hard copies of the document can also be requested from Ms M Masondo at +27 12 399 9277/9280.

Generic Environmental Management Programme (EMPr) for Gas Pipeline Infrastructure

2020






Prepared for: Department of Environment, Forestry and Fisheries, Department of Energy, Department of Public Enterprises, iGas, Eskom and Transnet

Prepared by: Council for Scientific and Industrial Research (CSIR) and South African National Biodiversity Institute (SANBI)

energy
Department:
Energy
REPUBLIC OF SOUTH AFRICA

environmental affairs
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Environmental Affairs
REPUBLIC OF SOUTH AFRICA

public enterprises
Department:
Public Enterprises
REPUBLIC OF SOUTH AFRICA

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SANBI
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South African National Biodiversity Institute

Eskom

TRANSNET

iGas

GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR) FOR GAS TRANSMISSION PIPELINE INFRASTRUCTURE

Prepared for:

Department of Environment, Forestry and Fisheries
Department of Mineral Resources and Energy
Department of Public Enterprises
iGas
Eskom
Transnet

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EMPr to be cited as:

Department of Environment, Forestry and Fisheries, 2020. Generic Environmental Management Programme for Gas Transmission Pipeline Infrastructure. CSIR Report Number: CSIR/SPLA/EMS/IR/2019/0073/B. Stellenbosch and Durban.

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PART A: BACKGROUND AND CONTEXT

1 INTRODUCTION

1.1 Background and Need

Section 24N of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA) requires that an environmental management programme (EMPr) be submitted where an environmental impact assessment (EIA) has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation (EA). There is a reliance on the EMPr to ensure that the actual environmental impacts of a project are consistent with those evaluated in the EIA process. The EMPr is therefore fundamental to the EIA process and should ensure that commitments given at the planning and assessment stage of a project are carried through to the development and operational stages. The EMPr plays a vital role in the implementation of consistent and continued environmental management for the duration of a project life cycle.

The content of an EMPr must either contain the information set out in Appendix 4 of the NEMA EIA Regulations, 2014, as amended (hereinafter referred to as the EIA Regulations) or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a Government Notice. Once the Minister has identified, through a Government Notice, that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including, but not limited to, the applicant and the competent authority (CA).

By way of an example, the final Strategic Transmission Corridors that were assessed as part of the 2016 Strategic Environmental Assessment (SEA) for Electricity Grid Infrastructure in South Africa were gazetted for implementation on 16 February 2018 under Government Notice No. 113 in Government *Gazette* No. 41445. Other than identifying the Strategic Transmission Corridors, the *Gazette* documented alternative procedures to be followed when applying for EA for large scale electricity transmission and distribution development or expansion activities when developed in the Strategic Transmission Corridors (i.e. a basic assessment (BA) process instead of the previously required S&EIR process). This streamlined environmental assessment process also includes a reduced decision-making timeframe for the CA (i.e. 57 days).

As part of the 2016 SEA for Electricity Grid Infrastructure, a Generic EMPr was compiled for the development and expansion of (a) overhead electricity transmission and distribution infrastructure; and (b) substation infrastructure for the transmission and distribution of electricity. On 22 March 2019, these two Generic EMPrs were gazetted for implementation under Government Notice No. 435 in Government *Gazette* No. 42323.

In December 2019 a SEA for the Development of a Phased Gas Pipeline Network in South Africa was finalised. This SEA similarly developed a Generic EMPr for gas transmission pipeline infrastructure.

1.2 Purpose

This document constitutes a Generic EMPr relevant to EA applications for proposed gas transmission pipelines and associated infrastructure, and all activities identified in terms of section 24(2)(a) and (b) of NEMA necessary for the realisation of such infrastructure. This Generic EMPr covers the expansion of all

such activities. This Generic EMPr provides a pre-approved template that is to be used by an applicant when preparing an EMPr for gas transmission pipeline infrastructure. It also aims to capture learning and best practice in managing the planning, development and operation of gas transmission pipelines in sufficient detail. The scope of this Generic EMPr is outlined in paragraph 1.4 below.

1.3 Objective

The objective of this generic EMPr is to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development and operation of gas transmission pipeline infrastructure. The use of a generic EMPr is intended to reduce the need for the environmental assessment practitioner (EAP) to prepare, and for the CA to review, individual EMPrs for applications of a similar nature.

This document forms part of the information requirements to enable CAs to make an informed and defensible decision on an application for EA.

1.4 Scope

The scope of this Generic EMPr applies to gas transmission pipeline infrastructure which is located below-ground or above-ground for the purposes of connecting to above-ground infrastructure such as pigging stations or compressor stations and associated listed or specified activities identified in terms of section 24(2)(a) and (b) of NEMA necessary for the realisation of such infrastructure which requires EA in terms of the NEMA, and is further described below:

- **Gas Pipeline Scale** – This Generic EMPr applies to the development and related operation of gas transmission pipeline infrastructure outside an industrial complex, using pipelines, exceeding 1 000 m in length, with a throughput capacity of more than 700 tons per day. This generic EMPr also applies to applications for EA for activity 7 (i) and (ii) of Environmental Impact Assessment Regulations Listing Notice 2 of 2014, as amended and activity 60 (i) and (ii) of Environmental Impact Assessment Regulations Listing Notice 1 of 2014 as amended, and all associated listed or specified activities necessary for the realisation of such infrastructure.
- **Applicants** – This Generic EMPr applies to iGas, Transnet and Eskom as well as any other potential gas transmission pipeline applicant.
- **Project Lifecycle** – This Generic EMPr applies to the design, development and operational related activities only.

1.5 Exclusions

This Generic EMPr does not apply to:

- Gas pipelines proposed within Zones 1 and 5 of the Gauteng Provincial Environmental Management Framework Standard as published under Government Notice No. 164 in Government *Gazette* No. 41473 of 2 May 2018;
- Gas pipelines that fall below the thresholds of the EIA Regulations;
- Development of compressor stations; and
- Above ground gas pipelines unless where a gas pipeline is needed to be routed above ground in order to connect to infrastructure such as pigging stations or compressor stations.

1.6 Structure and Framework of this Generic EMPr

The Generic EMPr is structured in five parts as indicated below and illustrated in Figure 1:

- **PART A: BACKGROUND AND CONTEXT:**
  - This section provides background and context of the Generic EMPr. It includes the purpose and scope of the EMPr, technical terms and definitions, roles and responsibilities of key persons involved in the development and operational stages, and reporting and documentation requirements, and is legally binding on the parties involved.

- **PART B: PRE-APPROVED GENERIC EMPR TEMPLATE:**
  - This section provides the generic environmental controls and requirements relevant to all gas transmission pipeline projects falling within the scope of this document. Controls in this section reflect minimum and general requirements for managing and mitigating impacts for specific gas transmission pipeline activities during the design, development and operational phases. This section also includes specific environmental controls applicable to the biomes and ecosystems assessed in the SEA, where applicable.

    This template must be completed by the contractor. The contractor is required to complete all columns within the template and each completed page must be signed and dated by the contractor and holder of an EA prior to commencement of the activity.

    Where an impact management outcome is not relevant, the words “not applicable” can be inserted in the template under the “responsible persons” column.

    The template is not required to be submitted to the CA.

    This template, once signed and dated, is legally binding. The holder of an EA will remain responsible for its implementation.

- **PART C: SITE SPECIFIC, PROJECT, APPLICANT AND EAP INFORMATION:**
  - This section needs to be completed by the EAP and the applicant. It requires the provision of details relating to the preliminary infrastructure layout and a declaration that the applicant will comply with the pre-approved generic EMPr template contained in Part B, and understands that the impact management outcomes and impact management actions are legally binding. The preliminary infrastructure layout must be finalized and submitted with the relevant basic assessment report or an environmental impact assessment report, ensuring that all impact management outcomes and actions have been either pre-approved in Part B or approved in terms of Part D. The basic assessment report or an environmental impact assessment report will be regarded as being incomplete if the final infrastructure layout and the signed declaration are not included.

    Once completed and signed, to allow the public access to the generic EMPr, the applicant must make the EMPr available to the public in accordance with the requirements of Regulation 26(h) of the EIA Regulations.

    It must be noted that, if the EA is to be transferred, Part C must be completed by the new holder and submitted with an application for an amendment of the EA in terms of Part 1 of Chapter 5 of the EIA Regulations 2014, as amended.

    The basic assessment report, or amendment basic assessment report, will be considered to be incomplete should a signed copy of Part C not be submitted to the CA. Once approved, Part C forms part of the EMPr for the development and the EMPr is legally binding to a holder of an EA.

- **PART D: DOCUMENTATION OF SITE-SPECIFIC SENSITIVITIES AND ATTRIBUTES:**

This section describes project specific environmental control requirements that are not covered in Part B of the Generic EMPr, and is only to be completed if there are environmental management measures applicable to the site which have not been included in the generic impact management outcomes or actions.

- These specific management controls must be referenced spatially, and must include impact management outcomes and impact management actions. Part D needs to be completed by an EAP, following the same format of the pre-approved template in Part B, and submitted to the CA together with the relevant basic assessment report or an environmental impact assessment report depending on the location of the pipeline in relation to the strategic pipeline corridors, for consideration and approval. This section needs to include mitigation measures and environmental control requirements specific to a particular project. These controls are in addition to the general controls described in Part B and must form part of the EMPr and will be legally binding. These requirements will be based on the findings of the basic assessment report or an environmental impact assessment report depending on the location of the pipeline.

- Once the activity has commenced, a holder of an EA may make amendments to the impact management outcomes and impact management actions in the following manner:

    - Amendments to the impact management outcomes must be made in line with the process as contemplated in Regulation 37 of the EIA Regulations; and
    - Amendments to impact management actions must be made in line with the process contemplated in Regulation 36 of the EIA Regulations.

- **Part E: Method Statements:**
    - Once the contractor has been appointed, the method statements required in Part E of the Generic EMPr must be prepared and appended to the pre-approved template. Each method statement must also be duly signed and dated on each page by the contactor and the EA holder. Once signed, these method statements are legally binding and the holder of the EA remains responsible for its implementation. The method statements do not need to be submitted to the CA for consideration or approval. Any amendments to the method statements must be signed by both the EA holder and the contractor and the changed method statements must be dated.

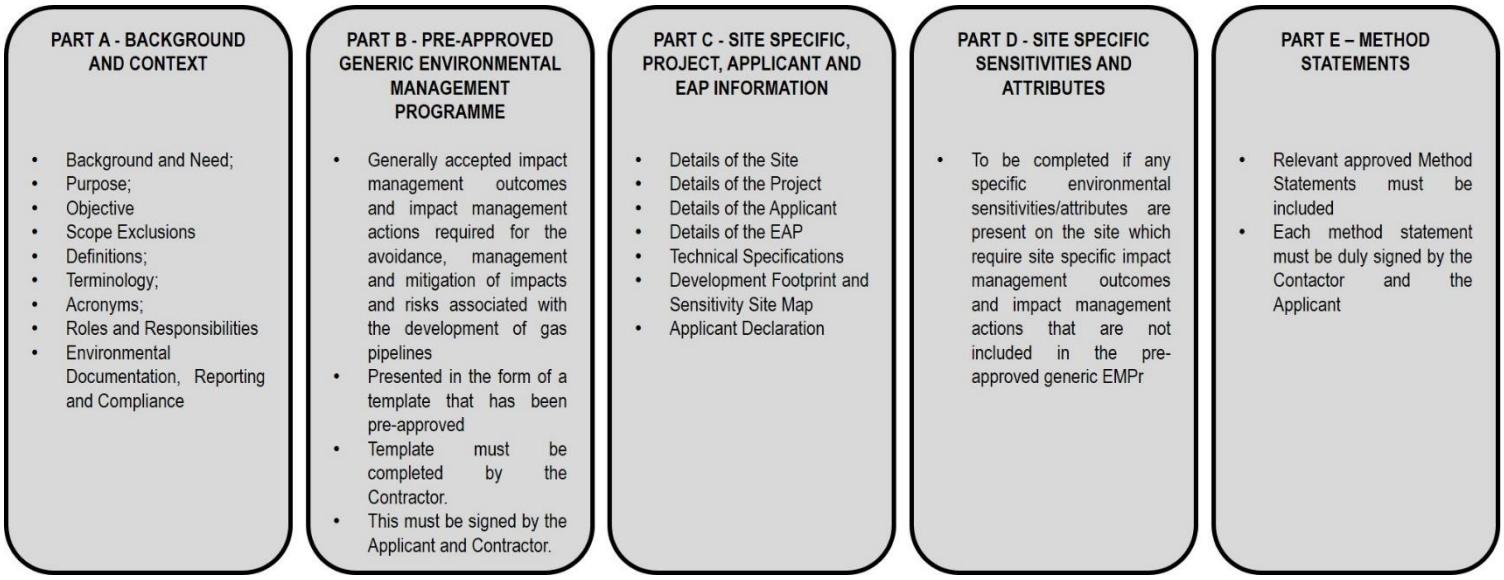

Figure 1: Framework for the Generic EMPr

1.7 Definitions and Terminology

Any word or expression used in this EMPr has the meaning that is assigned in the NEMA or EIA Regulations, unless the context requires otherwise, which is described in Table 1.

Table 1: Definitions and Terminology

Term	Definition
Applicant	The applicant in this Generic EMPr is defined as the person that applies for the EA and if successful in obtaining an EA, is thereafter the holder of the EA. The roles and responsibilities of the various members of the applicant's team are specified in Table 3, which shows that the applicant's project manager is the individual that is overall responsible for implementing the Generic EMPr on behalf of the applicant.
Clearing	Clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified.
Construction camp	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), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management.
Contractor	The contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the environmental management programme and that method statements are implemented as described.
Hazardous Substance	A substance governed by the Hazardous Substances Act, 1973 (Act 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995.
Method Statement	Written submission by the contractor to the applicant's project manager in response to this EMPr or a request by the applicant's project manager and ECO. The method statement must set out the equipment, materials, labour and method(s) the contractor proposes using to carry out an activity identified by the applicant's Project Manager when requesting the method statement. This must be done in such detail that the applicant's Project Manager and ECO is able to assess whether the contractor's proposal is in accordance with this EMPr and/or will comply with the requirements of this generic EMPr.
Slope	The inclination of a surface expressed as one unit of rise or fall for so many horizontal units.
Solid Waste	Solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).
Spoil	Excavated material, which is unsuitable for use as material in the construction works or is material, which is surplus to the requirements of the construction works.
Topsoil	A varying depth (up to 300 mm) of the soil profile, including existing vegetation cover and soil seed bank, irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil.
Works	Works to be executed in terms of the contract.

1.8 Acronyms and abbreviations

The acronyms and abbreviations used in this Generic EMPr are described in Table 2.

Table 2: Acronyms and Abbreviations

Abbreviations	
ALARP	As Low as Reasonably Practicable, the acronym for the risk management approach ensures all threats are eliminated or at least minimised to ALARP level
BA	Basic Assessment
BLSA	BirdLife South Africa
CA	Competent Authority
CBA	Critical Biodiversity Area
CR	Critically Endangered
CEO	Contractor's Environmental Officer
COGTA	Department of Co-operative Governance and Traditional Affairs
DEFF	Department of Environment, Forestry and Fisheries
DisM	Disaster Management
DHSWS	Department of Human Settlements, Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAR	Environmental Audit Report
ECA	Environmental Conservation Act No. 73 of 1989
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EO	Environmental Officer
EMPr	Environmental Management Programme Report
EMS	Environmental Management System
EN	Endangered
EFZ	Estuarine Functional Zone
ERAP	Emergency Response Action Plan
ESA	Ecological Support Area
EWT	Endangered Wildlife Trust
FPA	Fire Protection Agency
FPO	Fire Protection Officer
GA	General Authorisation
HCS	Hazardous chemical Substance
HNC	Heritage Northern Cape
HDD	Horizontal Directional Drilling
I&APS	Interested and Affected Parties
IFC	International Finance Corporation
IDP	Integrated Development Plan
MHI	Major Hazard Installation
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
ONA	Other Natural Area
PM	Project Manager
PAMP	Protected Area Management Plan
PPE	Personal Protective Equipment
PIGS	Pipeline Intelligence Gauge Stations
RI&APs	Registered interested and affected parties
ROW	Right of Way. This is an area of about 30 – 50 m wide, and it is needed for trenching and construction activities, as well as for the storage and stockpiling of soil, pipes and equipment.
RSDF	Regional Spatial Development Framework
SS	Site Supervisor
SDF	Spatial Development Framework

Abbreviations	
SPLUMA	Spatial Planning and Land Use Management Act
SSC	Species of Conservation Concern
VU	Vulnerable
WULA	Water Use License Application

1.9 Roles and Responsibilities for the Implementation of the Generic EMPr

The effective implementation of this Generic EMPr is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the Generic EMPr gives guidance to the various environmental roles and reporting lines and defines responsibilities for each role within the institutional framework. However, project specific requirements will ultimately determine the need for the appointment of specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that in the event that no specific person, for example, an environmental control officer (ECO) is appointed, the holder of the EA remains responsible for ensuring that the duties indicated in this document for action by the ECO are undertaken. The environmental responsibilities and reporting structure are represented in Figure 2 and Table 3.

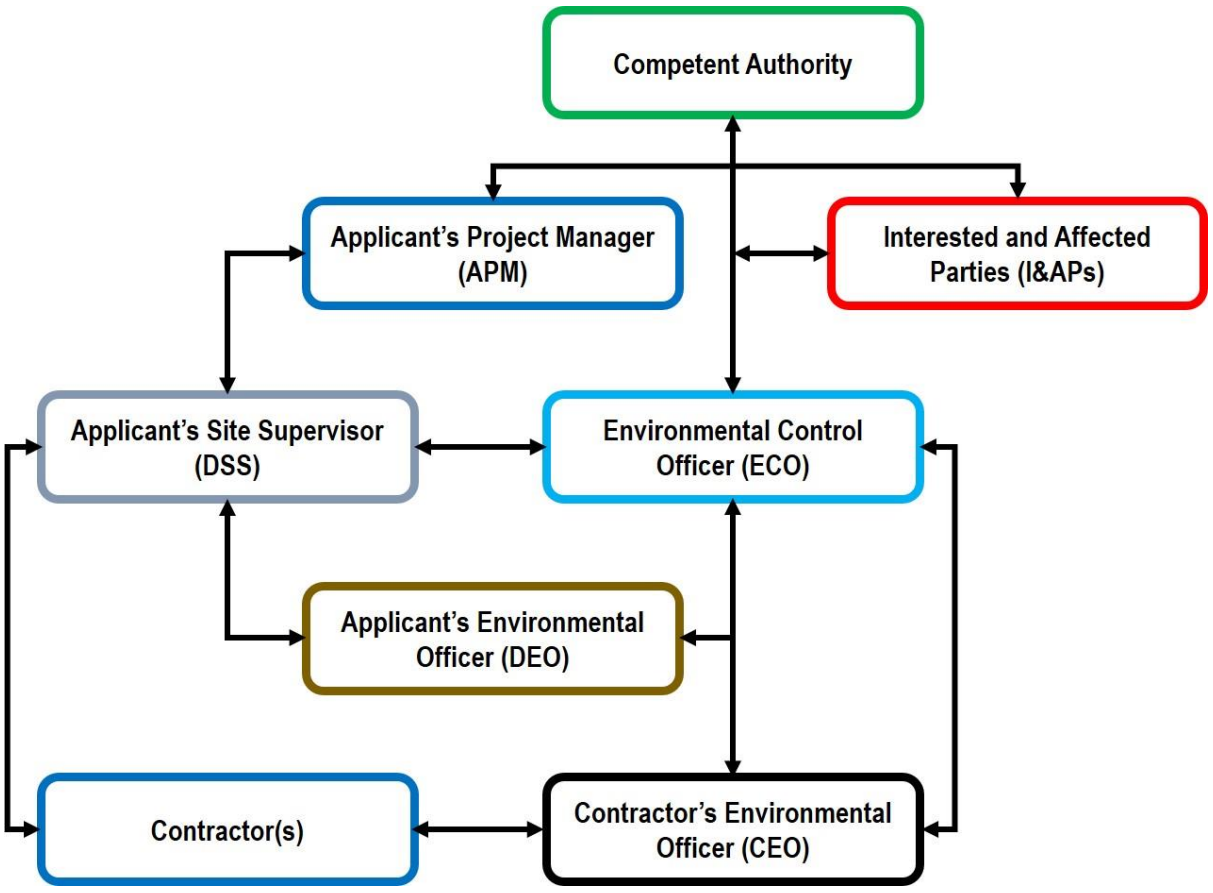

Figure 2: EMPr Roles and Responsibilities

Table 3: Roles and Responsibilities for the Implementation of the Generic EMPr

Function	Role and Responsibilities
Project Manager (PM) Wherever reference is made in the EMPr to the "EA holder it is understood that the "project manager" is the duly appointed representative of the EA holder.	**Role:** ▪ The project manager appointed by the EA holder will have overall responsibility for the management of the project and the implementation of the EMPr on behalf of the EA holder. ▪ The project manager is accountable for ensuring compliance with the EMPr and any conditions of approval from the CA on behalf of the EA holder. ▪ Where required, an environmental control officer (ECO) must be contracted by the project manager to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the EA. ▪ The project manager is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and must ensure that the ECO is integrated as part of the project team while remaining independent. **Responsibilities:** ▪ Be fully conversant with the conditions of the EA; ▪ Ensure that all stipulations within the EMPr are communicated and adhered to by the EA holder and its Contractor(s); ▪ Issuing of site instructions to the Contractor for corrective actions required; ▪ Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; ▪ Ensure that periodic environmental performance audits are undertaken on the project implementation; and ▪ Ensure all permits, authorisations and licenses are obtained, monitored and adhered to.
Site Supervisor (SS)	**Role:** ▪ The site supervisor reports directly to the project manager, oversees site works, and liaises with the contractor and the ECO. ▪ The site supervisor is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr. **Responsibilities:** ▪ Ensure that all contractors identify an environmental officer. ▪ Must be fully conversant with the conditions of the EA. Oversees site works, liaison with contractor, PM and ECO. ▪ Must ensure that all landowners have the relevant contact details of the site staff, ECO and contractor's environmental officer. ▪ Issuing of site instructions to the contractor for corrective actions required. ▪ Issuing all non-compliance notices to contractors. ▪ Ratify the monthly environmental audit report that is compiled by the ECO. However, feedback from the SS is not mandatory.
Environmental Control Officer (ECO) Note: The ECO is an independent quality controller and undertakes environmental inspections and compliance audits, and compiles monthly audit reports. The Contractor, Contractor's Environmental Officer and Environmental Officer must report non-compliance to the ECO. The ECO relies, *inter alia*, on input from the AEO.	**Role:** ▪ The ECO should be employed by the EA holder for the duration of the project. The ECO should have appropriate training and experience in the implementation of environmental management specifications. ▪ The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. ▪ In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. ▪ The ECO is also required to conduct compliance audits, verify the monitoring reports submitted by the Contractor's Environmental Officer. ▪ The ECO is to provide feedback to the SS and PM regarding all environmental matters. The SS and PM in turn reports back to the Contractor and Registered Interested and Affected Parties (RI&APs), as required. ▪ The Contractor, Contractor's Environmental Officer and the Environmental Officer are answerable to the ECO for non-compliance with the Performance Specifications as set out in the EA and EMPr. ▪ Issues of non-compliance raised by the ECO must be taken up by the PM, and resolved with the Contractor as per the conditions of contract. ▪ Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the PM.

Function	Role and Responsibilities
	▪ The ECO must also, as specified by the EA, report to the CA as and when required. **Responsibilities:** ▪ Be aware of the findings and conclusions of all BA documentation, and EA and licenses related to the development; ▪ Be familiar with the recommendations and mitigation measures of this EMPr; ▪ Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them; ▪ Undertake regular and comprehensive site inspections/compliance audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required; ▪ Educate the construction team about the management measures contained in the EMPr and environmental licenses; ▪ Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective; ▪ Monitoring the performance of the contractors using a weekly environmental checklist and ensuring compliance with the EMPr and associated method statements; ▪ In consultation with the SS order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses; ▪ Liaison between the PM, Contractors, authorities and other lead stakeholders on all environmental concerns; ▪ Issuing of site instructions to the contractor for corrective actions required; ▪ Compile a regular (monthly) environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr; ▪ Validating the regular site inspection reports, which are to be prepared by the CEO; ▪ Validating the findings of the regular environmental internal audits on the CEO which are to be prepared by the EO; ▪ To record all environmental incidents (spills, impacts, legal transgressions etc.) and corrective and preventive actions taken in the environmental incident log, with inputs provided by the CEO. ▪ Checking the CEO's public complaints register in which all complaints are recorded, as well as action taken; ▪ Assisting in the resolution of conflicts; ▪ Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the contractor and/or sub-contractors; ▪ In case of non-compliances, the ECO must first communicate this to the site supervisor, who has the power to ensure this matter is addressed in accordance with the relevant legislative requirements. Should no action or insufficient action be taken, the ECO may report this matter directly to the authorities as non-compliance; ▪ Maintenance, update and review of the EMPr; ▪ Communication of all modifications to the EMPr to the relevant stakeholders. ▪ Further note, the ECOs function is not limited to the construction phase alone, but is also an active role during the operational and later phases of the project. ▪ Arrange that the final environmental audit for construction is conducted by an independent auditor/consultant in accordance with the conditions of EA.
Environmental Officer (EO) The EO provides input to the ECO.	**Role:** ▪ The EO will report to the project manager. ▪ The EO is responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the project manager, ECO and Contractor, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities. ▪ The EO is the EA holder's environmental representative on site and works together with the ECO and Contractor; **Responsibilities:** ▪ Be fully conversant with: o the EMPr; o the conditions of the EA and any licenses; and o all relevant environmental legislation. ▪ Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures; ▪ Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) and its sub-contractor(s);

Function	Role and Responsibilities
	▪ Confine the construction site to the demarcated area; ▪ Conduct environmental internal environmental audits as agreed between the EA holder and the contractor with regards to EMPr and authorisation compliance; ▪ Assist the contractors in addressing environmental challenges on site; ▪ Assist in incident management: ▪ Report environmental incidents to the EA holder and ECO, and ensure that corrective action is taken, and lessons learnt shared; ▪ Assist the contractor in investigating environmental incidents and compile investigation reports; ▪ Follow-up on pre-warnings, defects, non-conformance reports; ▪ Measure and communicate environmental performance to the Contractor; ▪ Conduct environmental awareness training on site together with the ECO and CEO; ▪ Ensure that the necessary legal permits and / or licenses are in place and up to date.
Contractor	**Role:** ▪ The contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that method statements are implemented as described. ▪ External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the EA holder. ▪ The contractors are required, where specified, to provide method statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion gas pipeline infrastructure activities. ▪ The main contractor that is appointed by the EA holder and has a signed contract with the EA holder must appoint a contractor's environmental officer (CEO). The CEO of the main contractor will then be responsible for all sub-contractors working under the main contractor in terms of verifying that they abide by the requirements of the EMPr. **Responsibilities:** ▪ Implementation and compliance with recommendations and conditions of the EA and EMPr, including providing the contractor's environmental protection policy and the specific method statements for the project; ▪ Ensure all site staff are trained and kept updated in terms of the EA, EMPr and other legal requirements; ▪ Project delivery and quality control for the development services as per appointment; ▪ Employ a contractor's environmental officer to monitor and report to the AEO and ECO on the daily activities on-site during the construction period; ▪ Ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely; ▪ Attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones; ▪ Ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in this EMPr, to the satisfaction of the ECO.
Contractor's Environmental Officer (CEO)	**Role:** ▪ The CEO's primary role is to coordinate the environmental management activities of the contractor on site and to be responsible for on-site implementation of the EMPr (or relevant sections of the EMPr) applicable to the contractor. ▪ The CEO can be a dedicated environmental officer; or an independent consultant. ▪ The contractor must ensure that the CEO is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site contractors, labourers, the ECO and the public. ▪ The CEO ensures that all sub-contractors working under the contractor abide by the requirements of the EMPr. ▪ The contractor is answerable to the site supervisor for all environmental issues associated with the project. ▪ Contractor performance will, amongst others, be assessed on health, safety and environmental management criteria. **Responsibilities** ▪ Be on site throughout the duration of the project; ▪ Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site;

Function	Role and Responsibilities
	▪ Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and method statements; ▪ Attend the environmental site meeting; ▪ Undertaking corrective actions where non-compliances are registered within the stipulated timeframes; ▪ Report back formally on the completion of corrective actions; ▪ Environmental monitoring as required by applicable legislation; ▪ Assist the ECO and EO in maintaining all the site documentation; ▪ Prepare the site inspection reports and corrective action reports for submission to the ECO and EO; ▪ Assist the ECO and EO with preparing regular reports (e.g., monthly); and ▪ Where more than one Contractor is undertaking work on site, each company appointed as a contractor will appoint a CEO representing that company.

1.10 Environmental Documentation, Reporting and Compliance

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms shall be in place for all gas pipeline projects as a minimum requirement.

1.10.1 Document Control/Filing system

An approved filing system (that meets the requirements of ISO 9000) shall be established at the outset of the construction phase and shall be maintained throughout the lifespan of the project, and an EMPr file must be kept. The EA holder is solely responsible for the upkeep and management of the EMPr file. As a minimum, all documentation detailed below will be stored in the EMPr file. A hard copy of all documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate hard copy file will be maintained in the office of the site supervisor (where applicable). This duplicate file must remain current and up-to-date. The filing system must be updated and relevant documents added as required. Note that if a credible electronic filing system is being operated that is up-to-date and accessible at all times, then this can replace the hard copies.

The EMPr file must be made available at all times on request by the CA or other relevant authorities. The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations and where relevant the EA.

1.10.2 Documentation to be available

At the outset of the project, the following documents shall be placed in the filing system and be accessible at all times:

- Copy of the EA;
- Copy of the generic and site specific EMPr as well as any amendments thereof;
- Copy of declaration of implementing the Generic EMPr and subsequent approval of site specific EMPr and amendments thereof;
- All the contractor's method statements;
- Completed environmental checklists;
- Copies of the accepted monthly environmental audit reports;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all non-compliances notices issued;
- A copy of all instructions or directives issued;
- Complaints register; and

- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that a clear reference is made to the non-compliance record.

1.10.3 Weekly Environmental Checklists

The ECO is required to complete a weekly environmental checklist, the format of which is to be agreed prior to commencement of the activity. The ECO is required to sign and date the checklist, retain a copy in the EMPr file and submit a copy of the completed checklist to the site supervisor on a weekly basis.

The checklists will form the basis for the monthly environmental audit reports complied by the ECO. Copies of all competed checklists will be attached as Annexures to the environmental audit report, as required in terms of the EIA Regulations.

1.10.4 Environmental Site Meetings

An environmental site meeting will take place at least bi-monthly (i.e. every two weeks). The meeting will be chaired by the EA holder's project manager or the EA holder's site supervisor and CEOs will be required to attend. All environmental issues shall be tabled at the meeting for discussion and resolution.

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the monthly report that is distributed to attendees. Each set of minutes must clearly record **matters for attention** that will be reviewed at the next meeting.

1.10.5 Required Method Statements

A Method Statement is a written submission by the contractor to the project manager, site supervisor or ECO in response to the EMPr, setting out the plant, materials, labour and method the contractor proposes using to carry out an activity. The method statement will be done in such detail that the ECO is enabled to assess whether the contractor's proposal is in accordance with the EMPr.

The Method Statement must cover applicable detail with regards to:

- construction procedures;
- materials and equipment to be used;
- getting the equipment to and from site;
- how the equipment and material will be moved while on site;
- how and where material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/ non-compliance with the EMPr; and
- any other information deemed necessary by the ECOs.

Unless indicated otherwise by the project manager, the contractor shall provide the following method statements to the project manager a minimum of 14 days prior to the commencement date of the activity:

- Site establishment – Camps, Lay-down or storage areas, satellite camps, infrastructure;
- Batch plants;
- Workshop or plant servicing;
- Handling, transport and storage of Hazardous Chemical Substances;
- Vegetation management – Protected, clearing, aliens, felling;
- Access management – Roads, gates, crossings etc.;

- Fire plan – to minimise the risk of fire on site;
- Waste management – transport, storage, segregation, classification, disposal (all waste streams);
- Social interaction – complaints management, compensation claims, access to properties etc.;
- Water – use (source, abstraction and disposal), access and all related information, crossings and mitigation;
- Emergency preparedness – Spills, training, other environmental emergencies;
- Dust and noise management methodologies;
- Blasting required for construction;
- Faunal interaction and risk management – only if the risk was identified – wildlife interaction especially on game farms; and
- Heritage and palaeontology management.

The ECO shall ensure that the contractors perform in accordance with these method statements.

1.10.6 Environmental Incident Log (Diary)

The ECO is required to maintain an up-to-date and current environmental incident log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents. An environmental incident in the context of this document is defined as:

- Any deviation from the listed environmental mitigation measures (listed in this EMPr) that may be addressed immediately by the ECOs. (for example a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the EMPr which as a single event would have a minor impact but which if cumulative and continuous would have a significant effect; and
- General environmental information such as road kills or injured wildlife.

The ECO is to record all environmental incidents in the environmental incident log. All incidents regardless of severity must be reported to the EA holder. The Log is to be kept in the EMPr file and at a minimum the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the responsible party and supervisor;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued, and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same person/s.

The Environmental Incident Log will be captured in the Environmental Audit Report.

1.10.7 Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECO via the SS or PM. The non-compliance notice must be issued in writing and a copy filed in the EMPr file. The notice must as a minimum include the following:

- Time and date of the non-compliance;
- Name of the responsible party and supervisor;

- Nature and description of the non-compliance;
- Recommended/required corrective action; and
- Date by which the corrective action needs to be completed.

The contractors shall act immediately when a notice of non-compliance is received, correct whatever is the cause for the issuing of the notice ensuring that this is in compliance with the conditions of the EA and the requirements of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Non-compliances must be reported to the relevant CA for them to deal with the transgression, as it deems fit. The contractor is deemed not to have complied with the EMPr if, inter alia:

- There is a deviation from the environmental conditions, impact management outcomes and impact management actions, as approved in the generic and site specific EMPr as relevant, which deviation has, or may cause, an environmental impact; or
- There is contravention of environmental legislation.

1.10.8 Corrective Action Records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the SS, the CEO will ensure that the corrective actions required take place within the stipulated timeframe and in accordance with the legislative requirements. On completion of the corrective action the CEO is to issue a Corrective Action Report in writing to the ECOs. If satisfied that the corrective action has been completed, the ECO is to sign-off on the corrective action report, and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report is signed off by the ECO.

1.10.9 Contractor Environmental Agreements

Each contractor working on site is required to sign a contractor environmental agreement. This agreement provides for signed acknowledgement by the contractor of the EMPr and the environmental controls and stipulations therein. The signed copies of the contractor environmental agreements are to be filed in the EMPr file. No contractor will be allowed to start work without having signed the contractor environmental agreement.

1.10.10 Photographic Record

A digital photographic record must be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project and this evidence can also be used in cases of damages claims if they arise. Each image must be dated and a brief description note attached.

The Contractor shall:

- Allow the ECO access to take photographs of all areas, activities and actions.

The ECO shall keep an electronic database of photographic records, which will include:

- Pictures of all areas designated as work areas, camp areas, construction sites and storage areas taken before these areas are set up;
- All bunding and fencing;

- Road conditions and road verges;
- Condition of all farm fences;
- Topsoil storage areas;
- All areas to be cordoned off during construction;
- Waste management sites;
- Ablution facilities (inside and out);
- Any non-conformances deemed to be "significant";
- All completed corrective actions for non-compliances;
- All required signage;
- Photographic recordings of incidents;
- All areas before, during and post rehabilitation; and
- Relevant photographs in the environmental audit report.

1.10.11 Complaints Register

The ECO shall keep a current and up-to-date complaints register. The complaints register is to be a record of **all** complaints received. The complaints register shall:

- Record the name and contact details of the complainant;
- Record the time and date of the complaint;
- Contain a detailed description of the complaint;
- Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECO to take relevant photographs); and
- Contain a copy of the ECO written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written response will include a description of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECO shall respond as described in Section 1.10.13 below.

1.10.12 Claims for Damages

In the event that a Claim for Damages is received, the ECO shall:

- Record the full detail of the complaint as described in Section 1.10.11 above;
- The PM will evaluate the claim and associated damage and submit the evaluation to the site supervisor for approval;
- Following consideration by the project manager, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the negotiator and legal department; and
- A formal record of the response by the ECO to the claimant as well as the rectification and the method of any making payments will be recorded in the EMPr file.

1.10.13 Interaction with Affected Parties

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The Contractor shall ensure that:

- All negotiations with affected parties are done with the affected parties, SS and ECO present;

- No oral agreements between the above parties shall be entered into. All agreements will be recorded in writing, signed by all parties and filed in the EMPr file;
- Affected parties will be informed by the CEO of any changes to the construction programme;
- The Contractor's contact telephone numbers are made available to all I&APs; and
- Contact with all affected parties will be courteous at all times.

The ECO shall ensure that:

- All queries, complaints and claims are dealt with within an agreed timeframe;
- Any or all negotiations take place with the affected parties, SS and Contractor present;
- Any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
- His/her contact telephone numbers are made available to all landowners and affected parties;
- A current and up-to-date list of affected parties and their contact details are available at all times in the EMPr file;
- Contact with affected parties is courteous at all times; and
- All documented agreements, settlements and claims are attached to the environmental audit report.

1.10.14 Environmental Audits

Internal environmental audits of the activity and implementation of the EMPr are undertaken as required. The findings and outcomes must be included in the EMPr file and in any external audit to be submitted to the CA at intervals as indicated in the EA.

An Environmental Audit Report must be prepared monthly. The report will be tabled as the key point on the agenda of the environmental site meeting. The report is submitted for acceptance at the meeting and the final report will be circulated to the project manager and, filed in the EMPr file. At a frequency determined by the EA with respect to external audits, the ECO shall submit the monthly reports to the CA, as part of any external audits conducted in terms of NEMA. At a minimum, the monthly environmental audit report is to cover the following:

- Weekly environmental checklists;
- Deviations and non-compliances with the checklists;
- Non-compliance notices issued;
- Completed and reported corrective actions;
- Environmental monitoring;
- General environmental findings and actions; and
- Minutes of the bi-monthly environmental site meetings.

1.10.15 Final Environmental Audit Report for Development and Rehabilitation

On final completion of the construction phase and rehabilitation, and in accordance with any audit requirements of the EA with respect to development and rehabilitation, a final environmental audit report is to be prepared by an independent consultant and submitted to the CA. The Developer's Project Manager must commission and appoint the independent consultant. The Environmental Audit Report must comply with Appendix 7 of the EIA Regulations, and shall contain the following:

- Details of the independent person who prepared the report;
- Details of the expertise of independent person that compiled the report;
- A declaration that the independent auditor is independent in a form as may be specified by the competent authority;

- An indication of the scope of, and the purpose for which, the Environmental Audit Report was prepared;
- A description of the methodology adopted in preparing the environmental audit report;
- An indication of the ability of the EMPr, and where applicable, the closure plan to-
  - Sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity on an on-going basis;
  - Sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the closure of the facility; and
  - Ensure compliance with the provisions of environmental authorisation, EMPr, and where applicable, the closure plan;
- A description of any assumptions made, and any uncertainties or gaps in knowledge;
- A description of any consultation process that was undertaken during the course of carrying out the environmental audit report;
- A summary and copies of any comments that were received during any consultation process; and
- Any other information requested by the competent authority.
- Acceptance and approval of the Final Environmental Audit Report by the Competent Authority with respect to development and rehabilitation will end the construction phase EMPr as successful and completed.
- Where an operational component is relevant, the audit requirements relating to operation, as contained in the EA, must be complied with.

PART B: ENVIRONMENTAL CONTROLS – PRE-APPROVED GENERIC EMPR TEMPLATE

2 INTRODUCTION

This section captures impact management outcomes and actions that are applicable to specific biomes and ecosystems assessed in the SEA, as well as those that are generic to proposed gas transmission pipelines. Overall, it provides a pre-approved Generic EMPr template with aspects and activities that are common to proposed gas transmission pipeline infrastructure. For each identified aspect or activity, a set of prescribed impact management outcomes and associated actions have been identified. The format of this is indicated in Table 4 below. Table 4 also shows those aspects that are pre-defined and those that still need to be completed by the Contractor prior to commencement of construction (i.e. Implementation and Monitoring). The sections highlighted in red need to be completed by the Contractor by providing the information under each heading for each environmental impact management action.

Table 4: Format of the Specific Environmental Controls per Biome and Ecosystem, and Generic Environmental Controls

Impact Management Outcome: PREDEFINED AS PART OF GENERIC EMPr						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
PREDEFINED AS PART OF GENERIC EMPr	TO BE COMPLETED BY CONTRACTOR	TO BE COMPLETED BY CONTRACTOR	TO BE COMPLETED BY CONTRACTOR	TO BE COMPLETED BY CONTRACTOR	TO BE COMPLETED BY CONTRACTOR	TO BE COMPLETED BY CONTRACTOR

A holder of an EA is responsible to ensure the implementation of these impact management outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or gas transmission pipeline infrastructure. It is important to re-iterate that the mitigation hierarchy must be implemented during all phases of the development. It is a key principle upon which this EMPr is based. Impacts must be:

- Avoided:
  - This includes the consideration of alternatives in the project location, siting, scale, layout, technology and phasing, to avoid impacts on biodiversity, ecosystems and people. This is the best option; however, it is not always possible.
- Minimised, mitigated or managed:
  - This includes considering alternatives in the project location, siting, scale, layout, technology and phasing, which would minimise impacts on the environment.
- Rehabilitated:
  - This includes rehabilitating areas where impacts are unavoidable and measures are provided to return impacted areas to near natural state or agreed land use after closure.
- Offset:
  - This includes measures over and above rehabilitation to compensate for the residual negative impacts on the environment after every effort has been made to minimise and then rehabilitate the impacts.

3 DESIGN / PLANNING PHASE

3.1 Terrestrial Ecology – Flora and Fauna

Impact Management Outcomes: To achieve planning of pipeline routes and infrastructure in a manner that results in minimal loss and/or disturbance of terrestrial ecosystems and sensitive species.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Use the environmental sensitivity maps generated in the SEA Report, the National Web-based Environmental Screening Tool, and any other relevant and recently available spatial information to inform initial desktop-level planning and routing design. 2. Conduct ground assessments and pre-construction field-work by a suitably qualified specialist in order to verify the sensitivity and micro-site the development footprint. 3. Identify and map the following features that fall within the pipeline route, right-of-way, and areas for all other associated infrastructure. This must be undertaken in consultation with local fauna and flora experts: a. threatened (Critically Endangered (CR), Endangered (EN), and Vulnerable (VU)), rare and range restricted species; b. location, extent and ecological condition of natural vegetation; c. natural forest areas; d. protected trees; and e. protected plant species. 4. As far as possible, ensure that the routing of the proposed infrastructure is based on the following: a. Avoidance of Protected Areas as far as possible. If avoidance of protected areas cannot, under any circumstances, be achieved ensure that any infrastructure is reflected in the Protected Area Management Plan (PAMP) and that there is approval from the management authority. b. Avoid Critical Biodiversity Area (CBA) 1 and CBA 2 as far as possible; and c. Minimise the impact in Ecological Support Areas (ESAs) and remnants of natural vegetation of least concern and areas identified as Other Natural Areas (ONA) in a systematic conservation or biodiversity plan. 5. Where areas have been identified and confirmed as natural, semi natural or degraded areas of CR and EN ecosystem types, they should be avoided completely and not be directly impacted by the project footprint.						

Impact Management Outcomes: To achieve planning of pipeline routes and infrastructure in a manner that results in minimal loss and/or disturbance of terrestrial ecosystems and sensitive species.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
6. Plan the placement of infrastructure in such a way that areas identified as Very High sensitivity (confirmed habitat of species of Species of Conservation Concern (SCCs)) or High sensitivity (confirmed locality of threatened species) are avoided. If avoidance is not possible, suitable engineering solutions must be used to traverse these areas. 7. Use existing roads as far as possible for access to the pipeline route. 8. Wherever possible, align the pipeline and associated infrastructure along existing servitudes and linear disturbance such as a road and through degraded or transformed (e.g. cultivated) areas. 9. Design the infrastructure to use as much common/shared infrastructure as possible with development in nodes, rather than spreading out. 10. Avoid burrows of porcupines, aardvarks and carnivores. 11. Minimise the development footprint as much as possible by undertaking comprehensive planning, and ensure that the planning makes provision for rehabilitation of cleared areas after construction is completed. 12. A rehabilitation plan must be developed based on site-specific issues and requirements including soft and hard engineering interventions and revegetation. 13. An ECO must be appointed to oversee the rehabilitation phase, and ensure least possible harm to biodiversity and ensure compliance to the rehabilitation plan. 14. Locate temporary-use areas such as construction camps and lay-down areas in previously disturbed areas as far as possible. 15. The seasonal timing of the construction phase should be taken into consideration and planned in order to avoid impact, such as to minimise impacts from any known animal migrations across the proposed construction area. 16. The schedule and progression of the construction work must be planned and designed in a manner in which any area is only disrupted for a short period. 17. Align and design the pipeline route such that hillslope hydrology and soil erosion impacts are minimised. 18. Avoid any construction on steep slopes (>25 degrees). 19. Avoid areas of high erosion vulnerability as much as possible. 20. Ensure proper design and planning for demolition activities, with an emphasis on using delayed explosion methods, if blasting is required. 21. Incorporate, and budget for, control of invasive species for all phases of the gas pipeline development and operation.						

Impact Management Outcomes: To achieve planning of pipeline routes and infrastructure in a manner that results in minimal loss and/or disturbance of terrestrial ecosystems and sensitive species.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
22. An Alien Invasive Species (AIS) Management Plan must be developed for implementation throughout the project phases. 23. Permits for removal of any protected and SCC plant species must be obtained from the relevant authority prior to the cutting or clearing of the affected species. Such permits must be maintained on file. 24. Design and compile a monitoring plan that collects data, which can detect, for example, trends and undesirable outcomes in time for remedial action to be taken. The following should be considered: a. The establishment of a baseline prior to construction to ensure that changes are documented and compared to areas not affected by the construction; b. For Fynbos, Renosterveld and Grassland, the most basic monitoring would be to track fire incidence, i.e. how frequently a given area burns in a fire. Fire occurrence data are available from 2000 onwards and can be used to determine the historical fire frequency (and season). This information can be used to determine whether fire occurrences are changing as a result of the pipeline development. c. Individual threatened terrestrial species-level monitoring (flora and fauna).						

3.2 Freshwater Ecosystems (Watercourses, Rivers and Wetlands)

Impact Management Outcomes: To achieve planning of pipeline routes and infrastructure that results in minimal loss and/or disturbance of freshwater ecosystems and sensitive species.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. The planning of the gas pipeline routing and associated infrastructure placement must align with catchments of low to medium sensitivity, as best as possible. 2. Use the environmental sensitivity maps generated in the SEA Report, the National Web-based Environmental Screening Tool, and any other relevant and recently available spatial information to inform initial desktop-level planning and routing design. Avoid the placement of the following infrastructure within or close to wetlands or rivers (including the associated buffer habitat), and if avoidance is not possible the footprint must be minimised: a. Gas pipeline, pigging stations (within right of ways (ROWs)) and b. Construction camps, pipeline stockpiles, and access roads. 3. Desktop validation of selected pipeline routes must be undertaken by a suitably qualified freshwater specialist using aerial/satellite imagery and available data layers. Validation						

Impact Management Outcomes: To achieve planning of pipeline routes and infrastructure that results in minimal loss and/or disturbance of freshwater ecosystems and sensitive species.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
checks must be undertaken to determine whether the gas pipeline and infrastructure pass through freshwater ecosystems and minimum required buffer areas. 4. All areas must be ground-truthed in conjunction with field-work by a suitably qualified freshwater specialist where gas pipeline and associated infrastructure are placed within freshwater ecosystems and/or specified buffers. The freshwater specialist must: a. Confirm the presence of freshwater and inland aquatic sensitivities (i.e. ecosystem types, habitats and species) with recommendations (including specified buffers) to avoid sensitive areas. b. Include rehabilitation plans (including erosion control measures) developed for watercourse crossings. c. Include stormwater management plans (including engineering layout and designs) produced for planned watercourse crossings.						

3.3 Estuaries

Impact Management Outcomes: To achieve planning of pipeline routes and infrastructure so that it avoids the Estuarine Functional Zone (EFZ) and surrounding areas in order to avoid habitat destruction, loss of estuarine and riparian habitat (e.g. mangroves, saltmarshes, reeds, swamp forest), and degradation and reduction in ecological function and productivity of affected estuaries. To ensure optimum planning to such a level that estuarine physical and sediment dynamics are unaltered, water quality does not deteriorate, and loss of connectivity and habitat fragmentation between upper catchment and/or marine environment does not materialise.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. As far as possible, no pipeline or associated infrastructure and activities (e.g. roads, Pipeline Intelligence Gauge Stations (PIGS), trenching, pipe jacking, or ROW clearance) should be developed within or below the EFZs. 2. If development within the EFZ cannot be avoided, detailed specialist sedimentary studies and assessments must be undertaken to determine the depth to which Horizontal Directional Drilling (HDD) needs to be undertaken in the EFZ (this is typically to bedrock level or levels below potential bed scouring (1:100 year return period) and would involve HDD across the entire length of the EFZ at depth potentially exceeding 20 m). 3. Avoid, as far as possible, coastal freshwater ecosystems potentially linked to estuaries (e.g. inflowing rivers and/or wetlands/seeps within a 10 km radius of the EFZ). 4. Where these coastal freshwater ecosystem types cannot be avoided, the assessment undertaken through the BA must determine whether the fine-scale, micro-sited gas pipeline alignment and development footprint can avoid the actual estuary, EFZ, associated coastal freshwater ecosystems, and associated buffers, as well as to determine appropriate management actions to be implemented as required which must be included as Part D of the EMPr. 5. Preference should be given to the position of gas pipelines within areas that have no natural vegetation remaining. 6. Avoid, as far as possible, natural estuarine indigenous vegetation such as mangroves and saltmarsh when selecting the infrastructure placement and pipeline route. 7. Appropriate rehabilitation procedures/measures should be planned to minimise the risk of increased sediment load in coastal rivers leading to downstream deposition in associated estuaries.						

3.4 Ground Water Resources

Impact Management Outcomes: To achieve a gas pipeline route that is acceptable from a ground water perspective.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. If groundwater is predicted to occur within the depth of the pipeline excavations, even if seasonally, then the vulnerability of geohydrological features/aquifers must be determined using appropriate and relevant assessment methods, such as the DRASTIC method (a GIS based model used for groundwater vulnerability assessment). 2. If shallow aquifers cannot be avoided and/or dewatering of excavations are required, determine the following: d. dewatering technique to be employed; e. anticipated dewatering flow rate, volume and duration; f. water quality; and g. options for water collection, storage and/or disposal (based on established water quality) to reduce potential impacts to groundwater and the surrounding environment.						

3.5 Avifauna

Impact Management Outcomes: To achieve an acceptable gas pipeline route from an avifaunal perspective.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Ensure that the route and infrastructure placement planning results in the least impact on threatened avifauna species and their nests (especially for ground-dwelling / ground-nesting species). 2. Nest surveys, if needed, should be undertaken by a suitably qualified avifaunal specialist to identify all active nests of threatened avifauna species in the construction right-of-way and immediately adjacent areas prior to the commencement of the servitude clearing. a. On discovery of a nest, the avifaunal specialist must be provided with a work schedule which will enable him/her to ascertain, if, when and where the breeding birds could be impacted by the clearing activities. Appropriate management measures would need to be implemented, the nature of which will depend on the conservation status of the species and the location of the nest.						

Impact Management Outcomes: To achieve an acceptable gas pipeline route from an avifaunal perspective.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
b. In the event that a nest cannot under any circumstances be avoided: Remove eggs and/or chicks to a rehabilitation facility if the nest will be destroyed. c. If the nest falls outside the actual pipeline servitude, the timing of construction activities to avoid the disturbance of the breeding birds must be considered and implemented.						

3.6 Bats

Impact Management Outcomes: To achieve an acceptable gas pipeline route that has the least impact to bats, as best as possible.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Avoid, as best as possible, placing infrastructure in the vicinity of known and potential bat roosts, especially known large maternity roosts and near areas utilized by bats of conservation importance. While species differ in their preferences, the following act as ideal habitats for bats to roost: a. Large trees or bush clumps; b. Caves and sinkholes; c. Rock crevices; d. Disused or old mining adits; e. Tunnels; and f. Dwellings/buildings with sufficient roosting space under roofs. 2. Bats require adequate surface water for feeding and drinking, particularly for insectivorous bats which hunt insects congregating above water bodies or wet soil. Such areas should also be avoided in the planning of infrastructure, wherever possible (Refer to ***Section 3.2: Freshwater Ecosystems***). 3. If the above avoidance cannot be achieved, ensure that the development footprint is minimised in order to reduce disturbance to habitat that could be utilised by bats.						

3.7 Agricultural Resources

Impact Management Outcomes: To achieve a reduced amount of disturbance on productive agricultural land as a result of the implementation of the impact management actions.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Plan the fine-scale positioning of the gas pipeline, block valves, pigging stations, access roads, storage areas and construction camps to have minimal disturbance on agricultural activities and agricultural land. 2. Where possible the gas pipeline infrastructure must be positioned on existing boundaries or edges of agricultural units of land (fields) wherever possible, so as not to interfere with agricultural activities within a unit. 3. Avoid, wherever possible, the pipeline route from running through: a. areas that are utilised for and/or are suitable for deep rooted agricultural and forestry crops; and b. lands that have contour banks. Where the above avoidance is not possible, ensure that the construction is undertaken in the least productive agricultural season or period in order to minimise the impact on agricultural processes. 4. Existing farm based accommodation and settlements must be taken into consideration during the fine-scale positioning of the gas pipeline and associated infrastructure, as best as possible.						

3.8 Seismicity

Impact Management Outcomes: To confirm the susceptibility of the gas pipeline and associated infrastructure to ground movement that could result in damage.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. The following regions within the development footprint, should be mapped and designated as “sensitive”, with input from a suitably qualified specialist: a. Steep topography prone to landslides; b. Thick near-surface low-seismic-velocity layers that could cause site amplification; and c. Problem soils and sands that could collapse or liquefy when shaken. 2. Avoid sites that are susceptible to earthquake damage, as best as possible. 3. Ensure that the gas pipeline and associated infrastructure is designed with appropriate mitigation measures; such as but not limited to:						

Impact Management Outcomes: To confirm the susceptibility of the gas pipeline and associated infrastructure to ground movement that could result in damage.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
a. Pipelines must be built to the most recent applicable international standards. b. Pipelines must be equipped with valves that will stop gas flow in a specific section if there is a significant drop in pressure. c. Prior to construction, sites prone to landslides, lateral spreading and liquefaction must be identified. The sites must either be avoided; or the pipeline must be strengthened or made more flexible as deemed appropriate; or the ground conditions must be improved; or some combination of the above measures must be implemented.						

3.9 Settlement Planning, Disaster Management and Social Aspects

Impact Management Outcomes: To build local community capacity and municipal support, avoiding key areas (where possible) and providing decision support.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
Settlement Planning and Social Aspects: 1. The servitude planning and proclamation will need to comply with local land use planning regulation and be included in negotiations as part of Local SDF and Land Use Management Schemes all of which need to comply with the Spatial Planning and Land Use Management Act (SPLUMA) regulations or provincial regulations where provincial planning legislation is in place. 2. The development of a Regional Spatial Development Framework (RSDF) (provision for this framework is included in Section 19-20 of SPLUMA) should be investigated as a suitable spatial planning tool for the gas pipeline. If determined to be the appropriate tool, a RSDF should be developed for the gas pipeline. The development of a RSDF would mean that municipalities do not need to alter their SDFs and IDPs specifically to accommodate the gas pipeline and the outcomes of the SEA will support the content of the RSDF. 3. The cost of improving the state of readiness of all spheres of government, especially municipalities, to deal with the implementation of the gas transmission pipeline servitude planning must be considered when the planning and implementation of the servitude is undertaken.						

Impact Management Outcomes: To build local community capacity and municipal support, avoiding key areas (where possible) and providing decision support.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
4. When referring to regulatory capacity, special mention should be made to the need for compliance monitoring and enforcement for successful implementation of the gas transmission pipeline project. 5. Transmission pipelines should avoid crossing through town areas, service towns, dense rural settlements and high-density population areas. 6. Use existing infrastructure servitudes where viable and agreed to. 7. Ensure that the gas transmission pipeline is sited so as avoid the need for resettlement. Where involuntary resettlement cannot be avoided, the relocation of affected households and/or compensation for economic displacement should be guided by national and/or international best practice (such as a Resettlement Action Plan) to manage the impact of resettlement. 8. Ensure a fair compensation process is implemented by the EA holder, where required, in line with the most recent and relevant Standards (such as the International Finance Corporation (IFC) Performance Standards). 9. All planning must take the current and future growth potential of towns into consideration in selecting the final gas transmission pipeline alignment. The EA holder must check growth direction of nearby settlements as well as existing and approved township development applications and land use rights. New development areas indicated in SDFs and applicable municipal infrastructure masterplans must also be taken into consideration. 10. Location of servitudes should not exclude existing or potential businesses or industries that use or would benefit from access to a high volume, regular source of natural gas. 11. The pipeline design must be carefully considered together with relevant design and building standards should it be constructed in the vicinity of populated areas, including the higher density population areas and economic nodes such as eThekwini, Cape Town, Nelson Mandela Bay and Gauteng. 12. Where avoidance of a populated area is not possible, the following management measures need to be put in place: a. Detailed route design considering existing and planned land use and developments to minimise impact on people and livelihoods as far as possible. b. Consult and inform the stakeholders. c. Ensure agreed time frames are respected. d. Ensure alternative access to properties is identified. 13. Timeous negotiations and detailed studies must be undertaken to minimise negative impact in vulnerable communities especially in traditional authority areas.						

Impact Management Outcomes: To build local community capacity and municipal support, avoiding key areas (where possible) and providing decision support.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
14. Ensure transparency in decision-making to provide clarity and ensure clean processes. 15. All negotiations and planning process should ensure that the phasing is clear, that schedules for the construction is limited and clearly communicated to limit the impacts on the population and their livelihoods. 16. A servitude agreement must be drawn up and signed by the EA holder and land owner(s). The agreement must stipulate the requirements of the agreement, as well as the activities that may and may not be undertaken within the servitude, such as growth of deep rooted plants.						
Disaster Management: 17. Ensure that pipelines located in high population density areas or areas requiring high levels of protection for the public, are designed to leak minimally rather than break (full bore rupture) in the event of an incident, e.g. if impacted, for example, by an excavator, or if some material failure occurs. 18. Ensure that pipelines are designed and built according to international and national standards and in accordance with the surrounding land-use. 19. The pipeline design must take into account the latest technology in order to prevent leaks and to monitor volumes of natural gas transmitted. This must include a suitable system to manage and monitor the transmission of the gas through the pipeline. 20. A Leak Detection Monitoring Plan must be compiled. 21. Pigging stations must be located in areas accessible to 24 hour emergency services. 22. Identify and consult with the municipalities affected by the final routing of the gas transmission pipeline. Determine what support would be required, should a disaster occur. 23. The EA holder must have discussions with the National Department of Co-operative Governance and Traditional Affairs (COGTA), as well as affected provinces, about municipal Disaster Management (DisM) capacity-building measures. 24. Ensure the Department of Mineral Resources and Energy are consulted with to determine the location of mining areas. 25. The DisM capacity of the affected municipalities needs to be investigated in detail, and a comparative matrix established as a baseline status quo situation. 26. Draft a set of interventions to build municipal Disaster Management capacity by working with provincial governments.						

Impact Management Outcomes: To build local community capacity and municipal support, avoiding key areas (where possible) and providing decision support.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
27. Develop an emergency plan for implementation during the construction and operational phases, based on widespread consultation and awareness-raising. 28. Include municipalities and Fire Protection Associations in their disaster management planning procedures. 29. Ensure that a community emergency response plan is devised and coordinated with appropriate community representatives. This should include: a. The warning signs of a possible gas leak, such as: I. Dirt being blown or appearing to be thrown into the air; II. A white vapour stream or mist-like cloud over the pipeline; III. Dead or dying vegetation in an otherwise green area; IV. A dry area in a wet field; V. Flames coming from the ground or appearing to burn above the ground; VI. Continuous bubbling in wet or flooded areas; VII. Unexpected frost or ice on the ground; VIII. A roaring, blowing or hissing sound; IX. An unusual “rotten egg” odour (Natural gas actually has no smell, but gas producers add chemicals to create a smell, and this helps with identification of leaks). b. Important steps emergency responders can take during the initial stages of an incident: I. If it is safe to do so, turn off any mechanized equipment and ignition sources in the vicinity of the suspected leak; II. Secure the site and determine a plan to evacuate or sheltering place; III. Monitor for hazardous atmospheres; IV. Control and redirect traffic; and V. Provide immediate access to representatives from the pipeline company. c. The role of the local responders: I. Handling traffic control and evacuation; II. Securing the site; III. Firefighting; IV. Making appropriate contacts if it appears other agencies, facilities or local authorities are impacted by the pipeline incident; V. Handling search and rescue; and VI. Providing medical assistance.						

Impact Management Outcomes: To build local community capacity and municipal support, avoiding key areas (where possible) and providing decision support.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
d. The emergency response plan should also include a continuing-education program for all first responders and the public residing adjacent to the pipeline.						

3.10 Surveying and Staking for the Final Pipeline Route

Impact Management Outcomes: Impact to the environment is minimised through adherence to EMPr requirements. No environmental degradation occurs as a result of the survey and pegging operations.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. No vegetation clearing must occur during survey and pegging operations. 2. No new access roads must be developed to facilitate access for survey and pegging purposes. 3. The surveyor is to demarcate (peg) access roads/tracks in consultation with the ECO. No deviations will be allowed without the prior written consent from the ECO.						

4 CONSTRUCTION PHASE

4.1 Environmental Awareness Training

Impact Management Outcome: The development and execution of an effective environmental awareness training programme to ensure that all staff are aware of their responsibilities in terms of the Generic EMPr.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. All staff must receive environmental awareness training prior to being involved in the construction activities. This includes newly appointed staff after the commencement phase. 2. The Contractor must allow for sufficient sessions to train all construction personnel with no more than 20 personnel attending each course at a time. 3. Refresher environmental awareness training must be available as and when required. 4. All staff must be aware of the conditions and controls linked to the Environmental Authorisation (EA) and within the EMPr, within their respective work areas, and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr. 5. The Contractor must erect and maintain information posters at key locations on site, and the posters must include, as a minimum, information on safety notifications and cautions against littering. 6. Environmental awareness training must include, as a minimum, the following: a. Description of significant environmental impacts, actual or potential, related to their work activities; b. Mitigation measures to be implemented when carrying out specific activities; c. Emergency preparedness and response procedures; d. Procedures to be followed when working near or within sensitive areas; e. Wastewater management procedures; f. Water usage and conservation; g. Solid waste management procedures; h. Sanitation procedures; i. Fire prevention and awareness on the dangers of open and/or unattended fires; j. Disease prevention; and k. Chance find procedure for archaeological/paleontological/historical sites unearthed during construction. 7. A record of all environmental awareness training courses undertaken as part of the EMPr must be maintained on file and be available.						

Impact Management Outcome: The development and execution of an effective environmental awareness training programme to ensure that all staff are aware of their responsibilities in terms of the Generic EMPr.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
8. An attendance register of all staff that have received environmental awareness training must be maintained on file and be available. 9. Course material must be available to any personnel that may need to refer to it, and it must be presented in appropriate languages so that all staff are able to understand the information given.						

4.2 Construction Site Establishment

Impact Management Outcome: Impacts to the environment during site establishment are minimised and the development footprint is limited and demarcated.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. A Method Statement must be provided by the Contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management. 2. Location of construction camps must be carefully considered and within the approved area to ensure that the site does not impact on sensitive areas identified during the Environmental Assessment phase or field work. 3. Sites must be located, where possible, on previously disturbed areas. 4. The construction camp must be fenced in accordance with ***Section 4.12: Fencing and gate installation***. 5. The use of existing accommodation for contractor staff, where possible, is encouraged. 6. Every effort must be made to keep the footprint as small as possible.						

4.3 No-Go and Restricted Areas

Impact Management Outcome: To establish effective demarcation and management of No-Go and restricted areas in order to reduce resultant environmental impacts.		
Impact Management Actions	**Implementation**	**Monitoring**

	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
1. Identification of No-Go and restricted areas is to be informed by the Environmental Assessment, site field-work, the EA and any additional areas identified during construction. 2. Erect, demarcate and maintain a temporary fence or barrier around the perimeter of any No-Go and restricted area. This must have clear signage, and colour coding could be used if appropriate. 3. Fencing of No-Go and restricted areas is to be undertaken in accordance with ***Section 4.12: Fencing and gate installation***. 4. Unauthorised access and construction related activities inside No-Go and restricted areas are prohibited.						

4.4 Freshwater Ecosystems (Watercourses, Wetlands and Water Bodies)

Impact Management Outcome: Construction of pipeline routes and infrastructure that results in minimal to no loss and/or disturbance of freshwater ecosystems and sensitive species, and reduced erosion, pollution and contamination of watercourses.

Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
1. Identification and demarcation of "no-go" areas must be undertaken as per ***Section 4.3 (No-go and Restricted Areas)***. 2. Control and supervision of heavy machinery and vehicles operating within (and in proximity to) watercourses and wetlands must be undertaken. 3. Supervision of personnel, construction materials, cement batching, and fuel/oil/waste being processed or stored in proximity to watercourses and wetlands must be undertaken. 4. Inspection of trenches (including both excavation and back-filling) and low fences for fauna must be undertaken. 5. Permits for removal of any protected and plant species must be obtained from the relevant authority prior to the removal of the affected species. Such permits must be maintained on file. 6. All construction should take place during the dry season, as far as possible. 7. All watercourses and water bodies must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities. 8. In the event of a spill, prompt action must be taken to contain and clear the polluted or affected areas. 9. Where possible, construction equipment should not traverse any seasonal or permanent wetland.						

Impact Management Outcome: Construction of pipeline routes and infrastructure that results in minimal to no loss and/or disturbance of freshwater ecosystems and sensitive species, and reduced erosion, pollution and contamination of watercourses.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
10. Excavation or construction in a watercourse and wetland area must be avoided unless exceptional circumstances require that such activities cannot be avoided. The necessary environmental approvals for such activities must be obtained beforehand. 11. Development of permanent watercourse crossings must only be undertaken where no better-fitting alternative access to the construction right of way and pigging station positions is available. 12. Existing crossing points must be favoured over the creation of new crossings (including temporary access). 13. No excavation or construction shall be permitted within the 1:100 year flood line or riparian zone (whichever is the greatest) of a watercourse or within 500 m from the boundary of a wetland area without prior approval from the Competent Authority in the form of a water use authorisation. 14. Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris. The integrity of the river banks must be maintained by only trimming parts of trees directly affecting the gas transmission line routing. 15. When working in or near any watercourse and wetland, the following environmental controls and considerations must be taken: a. Water levels during the period of construction; b. The bed, banks, course or characteristics of a watercourse must not be altered, where possible; c. During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained; d. Where earthworks is being undertaken in proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and e. Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as construction allows.						

4.5 Estuaries

Impact Management Outcome: Construction of pipeline routes and infrastructure that results in minimal to no loss and/or disturbance of estuarine ecosystems and sensitive species.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Construction activities associated with the establishment of access roads through inflowing associated coastal wetlands or rivers (if unavoidable) connected to and within 10 km of an estuary should be restricted to a working area of 10 m in width either side of the road, and these working areas should be clearly demarcated. No vehicles, machinery, personnel, construction material, cement, fuel, oil or waste should be allowed outside of the demarcated working areas. 2. Ensure adequate freshwater watercourse crossings (i.e. culverts of the correct specification) are designed and constructed where roads traverse these areas so that the concentration of flow (particularly during high flow conditions) is minimised as far as possible. In the case of river crossings, bank stabilisation measures (gabions, eco logs, geofabric, sediment fences) are required when wetland or watercourse banks steeper than 1:5 are denuded during construction. 3. Construction camps, toilets, temporary laydown areas and borrow pits should be located outside of the EFZ and any buffer areas (as recommended by a suitably qualified specialist during environmental assessment or planning/design phase) around inflowing coastal wetlands and rivers within 10 km of an estuary and should be rehabilitated following construction. 4. Timing of all construction activities (including establishment of construction camps, temporary lay-down areas, construction of haul roads and operation of heavy machinery) within the proximity of estuaries and/or coastal freshwater ecosystems within 10 km of an estuary should occur in the dry season as far as is practicable. 5. As far as possible, adopt below ground pipe construction methods (such as HDD rather than trenching). 6. Avoid clearing of estuarine vegetation within the EFZ in any manner to prevent estuarine erosion, or if unavoidable, implement rehabilitation of estuarine vegetation as soon as possible to stabilise soil. 7. Avoid clearing of riparian indigenous vegetation upstream of estuaries within 10 km of the EFZ as far as possible, or if unavoidable, implement rehabilitation of riparian vegetation as soon as possible to stabilise soil. 8. Pits and/or excavations should be checked regularly by the on-site ECO and plans put in place for species rescue and relocation. 9. The following is not allowed within 30 m of the edge of any estuary, coastal river or coastal wetlands: a. Fuel storage, refuelling, vehicle maintenance or vehicle depots. b. Washing of vehicles and machinery. c. Temporary or permanent stockpiling of spoil material, including stripped topsoil.						

Impact Management Outcome: Construction of pipeline routes and infrastructure that results in minimal to no loss and/or disturbance of estuarine ecosystems and sensitive species.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
10. Refuelling and fuel storage areas, and areas used for the servicing or parking of vehicles and machinery, should be located on impervious bases and should have containment around them. The containment should be sufficiently high to ensure that all the fuel kept in the area will be captured in the event of a major spillage. 11. No effluents or polluted water should be discharged directly into any estuary, river or wetland areas. 12. Workers should be made aware of the importance of not destroying or damaging the vegetation along estuaries, coastal rivers and coastal wetland areas, of not undertaking activities that could result in the pollution of drainage lines or wetlands, and of not killing or harming any animals that they encounter. 13. Fixed point photography must be undertaken to record and monitor vegetation changes and potential site impacts occurring during the construction phase. 14. Avoid the use of herbicides in close proximity (close than 50 m) to wetlands or rivers and do not disturb riparian/or wetland buffer areas. 15. Care should be taken at all times not to destabilise riparian areas and increase the sediment load downstream to the estuary.						

4.6 Terrestrial Ecology – Flora

Impact Management Outcomes: Vegetation clearance is minimised via adherence to the EMPr vegetation clearance requirements, which is restricted to the authorised development footprint of the proposed infrastructure; and alien vegetation is effectively controlled.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
<u>General</u> 1. Ensure that the development footprint area and physical extent of construction activities are as per the site plan and rehabilitate cleared areas after construction is completed. 2. Avoid any unnecessary vegetation clearance. Vegetation clearing must be limited to the construction right-of-way and access roads only. 3. Minimise the duration of the construction activities on site. 4. Indigenous vegetation that does not interfere with the construction must be left undisturbed. 5. Search, rescue and replanting of all rare, protected and threatened plant species likely to be damaged during the construction phase within the development footprint must be identified and undertaken by a relevant and suitably qualified specialist, prior to any development, breaking of						

Impact Management Outcomes: Vegetation clearance is minimised via adherence to the EMPr vegetation clearance requirements, which is restricted to the authorised development footprint of the proposed infrastructure; and alien vegetation is effectively controlled.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
ground or clearing of vegetation. This must be undertaken only where the impact on rare, protected and threatened plant species cannot first be avoided as identified on the site plan. 6. The Environmental Audit Report must confirm that all identified species have been rescued, retained in a nursery and/or replanted and that the location of replanting is compliant with conditions of approvals. 7. Species removed and trees felled due to construction activities must be documented in an inventory. 8. A record must be taken of vegetation clearance where permit conditions apply – e.g. document number of trees removed in comparison to what is approved on the permit. 9. If possible, cut trees in the construction zone in a way that will allow them to re-sprout, provided that they do not impact on the pipeline during the operational phase in relation to deep roots within the pipeline servitude. 10. Debris resulting from vegetation clearing shall not be burned under any circumstances. 11. All threatened species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance with ***Section 4.3: No-Go and Restricted Areas***. 12. Vegetation must be trimmed or removed where the root system is likely to intrude on the gas transmission pipeline. 13. Vegetation that does not grow deep enough to cause interference with the construction, must not be cut or trimmed unless it is growing in the road access area, and then only at the discretion of the Project Manager. 14. Where clearing for access purposes is essential, the maximum width to be cleared within the construction right-of-way and servitude must be in accordance to distance as agreed between the landowner and the EA holder. 15. Deep valleys and environmentally sensitive areas that restrict vehicle access, or legally protected areas, must not be cleared of vegetation provided that the vegetation poses no threat to the construction process. 16. Train the construction workers and inspectors with regards to their responsibilities regarding biodiversity and ecological impacts, and monitor their actions (refer to ***Section 4.1: Environmental Awareness Training***). 17. Where fragmentation of key habitats has occurred use landscape design methods to re-establish ecological connectivity such as use of indigenous seeds and plants for landscaping, and creation of riparian strips. 18. No collection of 'fuelwood' should be allowed on site.						

Impact Management Outcomes: Vegetation clearance is minimised via adherence to the EMPr vegetation clearance requirements, which is restricted to the authorised development footprint of the proposed infrastructure; and alien vegetation is effectively controlled.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
19. During construction maintain top soil for later rehabilitation. 20. Ensure that the valuable top layer of the soil containing the seed banks is carefully removed and stored. The top layer of the soil (100 to 150 mm deep) should be stripped and replaced in a way that minimises disturbance (e.g. no tillage). The deeper layers of the soil can then be removed and stockpiled as well. It is best to keep these layers separate and the replace the layers in the same sequence in which they were removed. 21. The time that it is stored for should be kept to the absolute minimum. 22. If more soil needs to be removed for any reason then that soil should be stored separately and replaced first. The initial top layer stripping and replacement is essentially a form of top-dressing which contains most if not all of the seedbank and is critical for successful rehabilitation. <u>Management of Alien Invasive Plants:</u> 23. Identify and map invasive species along and within the planned pipeline route and infrastructure placement areas prior to construction. 24. Alien invasive vegetation must be managed and removed in accordance with a costed plan that is in line with relevant municipal, provincial, and national legislation, procedures, guidelines and recommendations. Remove alien invasive plants, preferably before they set seed, and re-vegetate as soon as possible with perennial fast-growing indigenous vegetation. Ensure that re-vegetated areas are not disturbed, all livestock are kept away (as applicable), and no off road driving is undertaken. 25. All cut plant material and removed alien invasive plants must be removed from site and disposed of at a licensed waste disposal facility and based on consultation with suitably qualified specialists. Proof of disposal must be retained and kept on file. 26. The use of herbicides must be in compliance with the relevant legislation enforced at the time. 27. Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator. 28. A daily register must be kept of all relevant details of herbicide usage. 29. Ensure that machinery is properly cleaned before being brought onto site and also before moving it from a section of the route where invading species were controlled to a section that is free of invading species.						

Impact Management Outcomes: Vegetation clearance is minimised via adherence to the EMPr vegetation clearance requirements, which is restricted to the authorised development footprint of the proposed infrastructure; and alien vegetation is effectively controlled.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
30. Minimise import of materials that could contain propagules of invasive species, particularly plants and/or screening such materials to ensure they are propagule free. 31. Do not use sand sources contaminated with invasive alien plant seed for bedding of the pipe or for construction work.						

4.7 Terrestrial Ecology - Fauna

Impact Management Outcomes: Impact to fauna is minimised during construction.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Ensure that the development footprint area and physical extent of construction activities are minimised as much as possible and rehabilitate cleared areas after construction is completed. 2. Minimise the duration of the construction activities on site. 3. No threatened species identified in areas of Very High and High Sensitivity on the National Web-based Environmental Screening Tool and/or threatened species as listed according to the National Environmental Management: Biodiversity Act (Act 10 of 2004) and relevant provincial ordinances, may be removed and/or relocated without appropriate authorisations/permits. 4. Where impact cannot be avoided, search and rescue along the proposed pipeline route and infrastructure placement areas must be completed by a suitably qualified specialist prior to any development, breaking of ground or clearing of vegetation, in order to ensure that no animals (e.g. porcupine, aardvark, carnivores) are harmed. Alternatively, animals can be flushed out of the area of the pipeline footprint to avoid being harmed. 5. If animals are required to be captured and moved, then permits for removal must be obtained from the relevant authorities prior to the removal of the affected species, and they must be kept on file. 6. No deliberate or intentional killing of fauna is allowed. Ensure that all staff understand that no animals may be intentionally harmed or killed for any purpose. 7. Poaching or illegal collection of rare or threatened species must not be tolerated under any circumstances. All instances of illegal collection should be reported to the applicable Provincial Nature Conservation Authorities. 8. Ensure the use of surveillance and monitoring of snares, debarking, hunting etc. in order to minimise poaching. 9. Develop community education programs near vulnerable sites to minimise poaching. 10. All animal dens in proximity to the construction work areas must be marked as ***No-Go and Restricted Areas (Refer to Section 4.3)***. 11. If roads or structures are fenced, use plain strands and not jackal proof fencing to ensure animals can still move through fences in accordance with ***Section 4.12: Fencing and gate installation***.						

Impact Management Outcomes: Impact to fauna is minimised during construction.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
12. Where fragmentation of key habitats has occurred use landscape design methods to re-establish ecological connectivity such as green bridges or wildlife crossings, establishment of conservation corridors, and underpasses for migrating animals. 13. No dogs or other pets should be allowed on site. 14. Night driving should be limited on site. 15. Appropriate lighting should be installed to minimise negative effects on nocturnal animals. 16. Speed limits should be set on all roads on site. Vehicle speeds must kept slow to minimise potential collisions with animals. 17. Electrical fences, if installed, should be erected at least 30 cm from the ground or according to relevant the norms and standards of the Nature Conservation Authorities. 18. Wherever possible, time construction activities to avoid the breeding or migration periods of the threatened or important taxa that may occur along the gas pipeline route. 19. Equip open trenches with suitable ramps or steps every 50 m so that trapped animals can escape. In areas where there is high animal activity, fine-mesh fences should be laid out around the open section of trenches and secured to minimise the likelihood of animals falling in. 20. Conduct daily patrols to rescue any animals trapped in the pipeline trench.						

4.8 Avifauna

Impact Management Outcomes: To avoid avian mortality and displacement due to nest destruction, habitat destruction and sensory disturbance during the construction phase.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Activities must be restricted to the construction right-of-way, development footprint and servitude width as far as is practical possible. 2. No access must be allowed to property and habitats beyond the servitude and development footprint. 3. Maximum use must be made of existing access roads to prevent the unnecessary construction of new roads. 4. Implement noise and dust reduction measures according to industry best practice.						

4.9 Bats

Impact Management Outcomes: To ensure least disturbance and harm to bats during the construction phase.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Keep working areas damp to reduce dust production in order to prevent the reduction of foraging potential of an area. 2. Keep soil workings contained in order to prevent the reduction in fresh water availability and displacement of bats.						

4.10 Heritage Resources

Impact Management Outcomes: Impact to heritage resources is minimised.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in ***Section 4.3: No-go and Restricted Areas***. 2. Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance. 3. Any buffer areas identified by the Heritage specialist in the assessment report must be adhered to (e.g. graves, caves, kraals, ruins and palaeontological features). 4. All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/palaeontologist, or the South African Heritage Resources Agency (SAHRA) (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before construction recommences.						

4.11 Access Roads

Impact Management Outcomes: To establish effective access and movement of vehicles within authorised areas on site in order to minimise resultant environmental impacts.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Access to the construction right of way, site camps, storage areas, and pigging station positions must be negotiated with the relevant landowner. Such access roads must fall within the assessed and authorised area. 2. An access agreement must be formalised and signed by the Project Manager (PM), Contractor and landowner before commencing with the construction activities. 3. The access roads to the construction right of way, site camps, storage areas, and pigging station positions must be signposted after access has been negotiated and before the commencement of the construction activities. 4. All contractors must be made aware of all these access routes. 5. Restrict all vehicle traffic within the authorised disturbance area. 6. Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the expense of the Contractor. 7. Maximum use of both existing servitudes and existing roads must be made. 8. In circumstances where private roads must be used, the condition of such roads must be recorded in accordance with ***Section 1.10.10: Photographic Record***; prior to use and the condition thereof agreed by the landowner, the PM, and the Contractor. 9. All private roads used for access to the construction right of way and pigging station positions must be maintained and upon completion of the works, be left in at least the original condition. This must be agreed with the asset owner. 10. Access roads and bridges shall only be constructed where necessary at watercourses, on steep slopes or where boulders prohibit vehicular traffic (refer to ***Section 4.4 Freshwater Ecosystems (Watercourses, Wetlands and Water Bodies)*** for controls when seeking access in proximity to a water course or water body). 11. As far as possible, access roads must follow the contours in hilly areas, as opposed to winding down steep slopes. 12. Access roads must be constructed in accordance with relevant design standards.						

4.12 Fencing and Gate Installation

Impact Management Outcomes: The erection of fencing and management of fencing is to be undertaken in accordance with relevant legislation.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Use existing gates available to gain access to all parts of the area authorised for development, where possible. 2. Existing and new gates are to be recorded and documented in accordance with ***Section 1.10.10: Photographic Record***. 3. All gates must be fitted with locks and be kept locked at all times during the construction phase, unless otherwise agreed with the landowner. 4. At points where the pipeline routing crosses a fence in which there is no suitable gate within the extent of the construction right of way, on the instruction of the Project Manager (PM), a gate must be installed at the approval of the landowner. 5. Original tension must be maintained in the fence wires. 6. All gates installed in electrified fencing must be re-electrified. 7. All demarcation fencing and barriers must be maintained in good working order for the duration of the gas transmission pipeline construction activities. 8. Fencing must be erected around the construction site camp, batching plants, hazardous storage areas, and all designated No-Go and restricted areas, where appropriate and would not cause harm to sensitive flora and fauna. 9. Any temporary fencing to restrict the movement of live-stock must only be erected with the permission of the landowner. 10. All fencing must be constructed with high quality, SABS approved, material. 11. The use of razor wire as fencing must be avoided. 12. Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff are away from site. Site security will be required at all times.						

4.13 Water Supply Management

Impact Management Outcome: To ensure that water use during the construction phase is minimised as best as possible and is compliant with the National Water Act (Act 36 of 1998, as amended).						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. All abstraction points or boreholes must be registered with the DHSWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis. 2. The Contractor must ensure the following if water abstraction is needed and authorised: a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river; b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and c. All reasonable measures to limit pollution or sedimentation of the downstream watercourses are implemented. 3. Ensure water conservation is being practiced by: a. Minimising water use during cleaning of equipment. b. Undertaking regular audits of water systems. c. Including a discussion on water usage and conservation during environmental awareness training; and d. Encouraging the use of grey water.						

4.14 Storm Water and Waste Water Management

Impact Management Outcomes: To manage construction storm water and waste water discharges in accordance with relevant national and provincial legislation and local by-laws.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Appropriate pollution control facilities necessary to prevent discharge of water containing pollutants or visible suspended materials into watercourses or water bodies shall be designed and implemented. 2. Runoff from the cement/concrete batching areas must be strictly controlled, and contaminated water shall be collected, stored and either treated or disposed of off-site, at an authorised facility approved by the Project Manager (PM). 3. All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material. The used absorbent material must be disposed of at an appropriate and authorised waste disposal facility. Proof of disposal must be retained on file.						

Impact Management Outcomes: To manage construction storm water and waste water discharges in accordance with relevant national and provincial legislation and local by-laws.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
4. Natural storm water runoff not contaminated during the construction phase and clean water can be discharged directly to watercourses and water bodies, subject to the approval from the PM and support from the ECO. 5. Water that has been contaminated with natural suspended solids only, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the approval from the PM and support from the ECO.						

4.15 General Solid Waste Management

Impact Management Outcomes: To manage general solid waste in accordance with relevant national and provincial legislation and local by-laws.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. All measures regarding waste management must be undertaken using an integrated waste management approach. 2. Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided. 3. A suitably positioned and clearly demarcated waste collection site must be identified and provided on site. 4. The waste collection site must be maintained in a clean and orderly manner. 5. Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal. 6. Staff must be trained in waste segregation. 7. Recycling of waste types must be maximised. 8. Bins must be emptied regularly and the resulting waste disposed of correctly. 9. General waste produced on site must be disposed of at a registered waste disposal sites or via a recycling company. 10. Certificates of safe disposal for general and recycled waste must be maintained and retained on file. 11. Under no circumstances shall any waste be disposed of, burned or buried, on site.						

4.16 Hazardous Waste Management

Impact Management Outcomes: To manage hazardous waste in accordance with relevant national and provincial legislation and local by-laws.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. All measures regarding hazardous waste management must be undertaken using an integrated waste management approach. 2. Sufficient, covered waste collection skips (scavenger and weatherproof) must be provided for the collection of hazardous waste. Where required, necessary approvals for such collection must be obtained from the relevant authority in terms of the National Environmental Management: Waste Act (Act 59 of 2008, as amended). 3. A suitably positioned and clearly demarcated hazardous waste collection site must be identified and provided on site. 4. The hazardous waste collection site must be maintained in a clean and orderly manner. 5. Hazardous waste produced on site must be disposed of at a registered hazardous waste disposal site. 6. Certificates of safe disposal for hazardous waste must be maintained and retained on file. 7. Under no circumstances shall any waste be disposed of, burned or buried, on site.						

4.17 Safety of the Public

Impact Management Outcomes: All precautions are taken where possible to minimise the risk of injury, harm or complaints.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc. 2. All unattended open excavations must be adequately fenced or demarcated. 3. Adequate protective measures must be implemented to prevent unauthorised access to and climbing of protective scaffolding. 4. Ensure structures vulnerable to high winds are secured. 5. Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged. 6. Ensure that an awareness campaign is undertaken prior to the commencement of construction to inform surrounding landowners, land users and occupiers, as well as Interested and Affected Parties of the proposed construction, and inform them of the potential risks associated with prohibited activities within the gas pipeline servitude, such as illegal excavations. 7. Ensure that all surrounding Interested and Affected Parties have access to a contact number for the Contractor and Pipeline Operator for emergency situations.						

4.18 Sanitation

Impact Management Outcomes: No pollution or disease arises on-site as a result of sanitation facilities or lack thereof.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Mobile chemical toilets must be installed on site if no other ablution facilities are available. 2. The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the environment for the purposes of ablutions must be permitted under any circumstances. 3. Ablution facilities shall be located within 100 m of any work place and must be sufficient enough to accommodate the workforce (minimum requirement of 1:15 workers on site). 4. Where mobile chemical toilets are required, the following must be ensured: a. Toilets are located no closer than 100 m to any watercourse or water body;						

Impact Management Outcomes: No pollution or disease arises on-site as a result of sanitation facilities or lack thereof.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
b. Toilets are secured to the ground to prevent them from toppling due to wind or any other cause; c. No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr; d. Toilets are emptied before long weekends and workers holidays, and must be locked after working hours; and e. Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards. 5. A copy of the waste disposal certificates must be maintained.						

4.19 Prevention of Disease

Impact Management Outcomes: The risk of the occurrence and spread of disease is minimised through the effective implementation of EMPr actions.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Undertake environmentally-friendly pest control in the camp area. 2. Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV/AIDS, or other highly infectious viruses such as COVID-19. 3. The Contractor must ensure that information posters on HIV/AIDS and COVID-19 are displayed in the Contractor site camp area. 4. Information and education relating to sexually transmitted diseases and COVID-19 are to be made available to both construction workers and the local community, where applicable. 5. Free condoms at central points must be made available to all staff on site. 6. Medical support must be made available. 7. Provide access to Voluntary HIV Testing and Counselling Services.						

4.20 Emergency Procedures

Impact Management Objective: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.		
Impact Management Outcomes: All emergency situations are managed in accordance with the emergency procedures.		
Impact Management Actions	**Implementation**	**Monitoring**

	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
1. Compile an Emergency Response Action Plan prior to the commencement of the proposed project. 2. The Emergency Response Action Plan must deal with accidents, potential spillages and fires in line with relevant legislation. 3. All staff must be made aware of emergency procedures as part of environmental awareness training. 4. The relevant local authority must be made aware of a fire as soon as it starts. 5. In the event of an emergency, necessary mitigation measures to contain a spill or leak must be implemented (see ***Hazardous Substances, Section 4.21***).						

4.21 Hazardous Substances

Impact Management Outcomes: The management of hazardous substances is undertaken in accordance with relevant legislation.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. The Occupational Health and Safety Act (Act 85 of 1993) and its associated regulations must be complied with at all times. 2. The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible. 3. All hazardous substances must be stored in suitable containers. 4. Containers must be clearly marked to indicate contents, quantities and safety requirements. 5. An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis. 6. All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS). 7. All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet. 8. Employees handling hazardous substances/materials must be aware of the potential impacts and follow appropriate safety measures. 9. Appropriate personal protective equipment (PPE) must be made available. 10. The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers. 11. All storage areas must have sufficient containment in order to contain a spill/leak from the stored containers. Containment areas to be suitably lined with a SABS approved liner.						

Impact Management Outcomes: The management of hazardous substances is undertaken in accordance with relevant legislation.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
12. Provision must be made for refuelling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained. 13. No unauthorised access into the hazardous substances storage areas must be permitted. 14. No smoking must be allowed within the vicinity of the hazardous storage areas. 15. Adequate fire-fighting equipment must be made available at all hazardous storage areas. 16. Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used. 17. An appropriately sized spill kit must kept onsite and available at all times. The spill kit size must be relevant to the scale of the activities involving the use of hazardous substances. 18. An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken. 19. The responsible operator must have the required training to make use of the spill kit in emergency situations. 20. In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to ***Section 4.14*** for procedures concerning storm and waste water management, ***Section 4.15*** for general solid waste management, and ***Section 4.16*** for hazardous waste management.						

4.22 Workshop, Equipment Maintenance and Storage

Impact Management Outcomes: Soil, surface water and groundwater contamination is minimised.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area. 2. During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. 3. Leaking equipment must be repaired immediately or be removed from site to facilitate repair. 4. Workshop areas must be monitored for oil and fuel spills. 5. An appropriately sized spill kit must kept onsite and available at all times. The spill kit size must be relevant to the scale of the activities involving the use of hazardous substances. 6. An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken. 7. The responsible operator must have the required training to make use of the spill kit in emergency situations. 8. The workshop area must have a concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil/water separator where maintenance work on vehicles and equipment can be performed. 9. Water drainage from the workshop must be contained and managed in accordance with ***Section 4.14: Storm Water and Waste Water Management***.						

4.23 Batching Plants

Impact Management Outcome: The management, handling and storage of sand, stone and cement is undertaken in accordance with the EMPr.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Concrete mixing must be carried out on an impermeable surface (such as on boards or plastic sheeting and/or within a bunded area with an impermeable surface). 2. Batching plant areas must be fitted with a containment facility for the collection of cement laden water. This facility must be impervious to prevent soil and groundwater contamination.						

Impact Management Outcome: The management, handling and storage of sand, stone and cement is undertaken in accordance with the EMPr.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
3. Contaminated water from the batching plant must be contained to prevent soil and groundwater contamination. 4. Bagged cement must be stored in an appropriate facility and at least 10 m away from any watercourses, gullies and drains. 5. A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted. 6. Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licensed disposal facility. 7. Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site. 8. Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to ***Section 4.24: Dust emissions***). 9. Any excess sand, stone and cement must be removed or reused from site on completion of the construction period and disposed at a registered disposal facility. Certificates of safe disposal for general and recycled waste must be maintained and retained on file. 10. Temporary fencing must be erected around batching plants in accordance with ***Section 4.12: Fencing and gate installation***.						

4.24 Dust Emissions

Impact Management Outcome: Dust prevention measures are applied to minimise the generation of dust and deposition on the surrounding land.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Take all reasonable measures to minimise the generation of dust as a result of construction activities to the satisfaction of the ECO. 2. Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible. 3. Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present. 4. During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether						

Impact Management Outcome: Dust prevention measures are applied to minimise the generation of dust and deposition on the surrounding land.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
construction work operations must cease altogether until the wind speed drops to an acceptable level. 5. Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind. 6. Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO. 7. Vehicle speeds must be kept slow and must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas, in order to minimise potential collisions with animals and dust creation. 8. Appropriate dust suppression measures must be used when dust generation is unavoidable, e.g. dampening with water; particularly during prolonged periods of dry weather in summer. Such measures must also include the use of temporary stabilising measures (e.g. chemical soil binders, straw, brush packs, chipping). 9. Straw stabilisation must be applied at a rate of one bale/10 m^2 and harrowed into the top 100 mm of top material, for all completed earthworks. 10. For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.						

4.25 Blasting

Impact Management Outcome: Impact to the environment is minimised through a safe blasting practice.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Any blasting activity must be conducted by a suitably licensed blasting contractor. 2. Minimise blasting operations to mid-day, where required. 3. Notification of blasting activities must be provided to surrounding landowners, emergency services, and site personnel 24 hours prior to such activities taking place on site. 4. Sign-boards of the blasting operation and times must be placed at the boundary of the site camp and on the main access road leading to site.						

4.26 Noise

Impact Management Outcomes: Noise management is undertaken in accordance with SANS 10103 and requirements of the EMPr.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. The Contractor must keep noise levels within acceptable limits. 2. Restrict the use of sound amplification equipment for communication and emergency only. 3. All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained. 4. Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction staff. 5. Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. 6. Operating hours during the construction phase as determined by the EA must be adhered to. Where not defined, it must be ensured that construction activities must still meet the impact management outcome related to noise management.						

4.27 Fire Prevention

Impact Management Outcomes: Fire prevention measures are carried out in accordance with relevant legislation and the EMPr, in order to prevent uncontrollable fires.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Designate smoking areas where the fire hazard could be regarded as insignificant. 2. Open and unattended fires must not be allowed on site under any circumstances. 3. Educate workers on the dangers of open and/or unattended fires. 4. Firefighting equipment must be available on all vehicles located on site. 5. The local Fire Protection Agency (FPA) must be informed of construction activities. 6. Contact numbers for the FPA and emergency services must be communicated in the environmental awareness training and displayed at a central location on site. 7. The ECO must send the FPA their contact details, and must also make a note of the FPA's contact details.						

4.28 Stockpiling and Stockpile Areas

Impact Management Outcomes: Stockpiling management is undertaken in accordance with the requirements of the EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
1. All material that is excavated during the construction phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, wetlands, estuaries and water bodies. 2. Stockpiles must be located on flat areas where runoff will be minimised, and at least 10 m away from storm water channels and drains, and at least 32 m away from any watercourse, water body, estuary or wetland (refer to ***Sections 4.4 and 4.5***). 3. All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods. 4. Topsoil stockpiles must not exceed 2 m in height. 5. During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.). 6. Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.						

4.29 Agricultural Resources

Impact Management Outcomes: To maintain soil capability levels and to achieve reduced levels of erosion and disturbance on productive agricultural land as a result of the implementation of the impact management actions.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
Activities that Disturb the Land Surface: 1. Implement an effective system of run-off control, using furrows and banks, wherever it is required, that collects and safely disseminates run-off water from all hardened and disturbed surfaces and prevents potential down slope erosion. Such a system is required wherever run-off water will tend to accumulate and then flow with the potential to cause erosion. 2. Apply soil surface stabilising measures in all areas that are highly susceptible to erosion or on which erosion occurs that cannot be controlled by the run-off control system. 3. If any contour banks are disturbed, fully restore their integrity and that of the run-off system of which they are a part, after disturbance. 4. Inspect the entire site for any evidence of erosion. Keep a record at each inspection of all occurrences of erosion with their GPS positions and photographs. If there are no occurrences of erosion, that must also be recorded. **Excavation and Backfilling of Excavations:** 5. Before excavation, the topsoil with its original vegetation, to a depth of 30 cm, must be stripped from the entire surface of the excavation area and stockpiled for re-spreading after backfilling. Underlying subsoil that is excavated must also be stockpiled, but separately from the topsoil. In addition, significantly different subsoil layers must also be stored in separate stockpiles from one another. 6. Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them. 7. When backfilling, the separate soil layers must be backfilled in their same, original vertical sequence i.e. deepest soil layer at the bottom, and topsoil at the top. 8. Ensure that the trench is backfilled in a manner that allows the surface to be free draining and prevents erosion. Subsidence (and resultant channelling of run-off) can make the backfilled trench susceptible to erosion. 9. Erosion must be controlled if necessary on newly backfilled areas, which are likely to be susceptible to erosion.						

Impact Management Outcomes: To maintain soil capability levels and to achieve reduced levels of erosion and disturbance on productive agricultural land as a result of the implementation of the impact management actions.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
10. The Contractor and ECO must sign off after every backfilling event that soil has been backfilled in the correct order with topsoil at the surface, and that the backfilled area is higher than the surrounding surface. 11. Inspect the entire site for any evidence of erosion. Keep a record at each inspection of all occurrences of erosion with their GPS positions and photographs. If there are no occurrences of erosion, that must also be recorded.						

4.30 Seismicity

Impact Management Outcomes: To confirm the susceptibility of the gas pipeline and associated infrastructure to ground movement that could result in damage.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Undertake ongoing monitoring of seismicity. If necessary, re-evaluate design specifications and implement changes. 2. Install seismic sensors and monitor both weak and strong ground motion in “sensitive” regions to improve hazard assessments.						

4.31 Settlement Planning, Disaster Management and Social Aspects

Impact Management Outcomes: To build local community capacity and municipal support, avoiding key areas and providing decision support.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Ensure effective Disaster Management training capacity-building/awareness are established for municipalities. 2. Where avoidance of a populated area is not possible, the following management measures need to be put in place:						

Impact Management Outcomes: To build local community capacity and municipal support, avoiding key areas and providing decision support.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
a. Consult and inform the stakeholders. b. Ensure agreed time frames are respected. c. Ensure all engagement, management and communication with workers are in line with the requirements stipulated by the Department of Labour. Labour management measures that fall within the ambit of the Department of Labour include employment contracts, working hours, minimum wage, working clothing and compensation for occupational injuries and diseases. 3. Develop and implement communication strategies to facilitate public participation. 4. Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process. 5. Sustain continuous communication and liaison with neighbouring owners and residents. 6. Ensure contractors implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories. 7. Develop a recruitment process and/or use a recruitment agency to advertise job and secure positions beforehand, thereby minimising the amount of job opportunities offered on-site during the construction phase. 8. Ensure that the number and availability of jobs is clearly mentioned and discussed during the awareness sessions that would be undertaken when the final alignment of a proposed section of the pipeline has been confirmed. 9. Develop a Code of Conduct for the construction phase. The code should identify which types of behaviour and activities are not acceptable, such as trespassing, hunting, stock theft etc. 10. The EA holder and/or the appointed contractor should provide transport to and from the site on a daily basis for construction workers. This will enable the contactor to effectively manage and monitor the movement of construction workers on and off the site. 11. Depending on the duration of the contract, the EA holder and or the contractor(s) should make the necessary arrangements for construction workers from outside the area to return home over weekends and/ or on a regular basis. This would reduce the risk posed to local family structures and social networks. 12. Where feasible, no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site. This would reduce the risk to local farmers. 13. Accommodation must be found in existing settlement or the construction camp must be located in or adjacent to existing settlements. 14. Ensure that construction camps do not remain permanent and should not be permanently occupied for more than 3 months.						

Impact Management Outcomes: To build local community capacity and municipal support, avoiding key areas and providing decision support.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
15. Ensure that clear access to public facilities and public transport is maintained (e.g. detour less than 500 m (walking distance)), as well as clear 24 hour access to emergency services). 16. Ensure that competent personnel are appointed for welding operations.						

4.32 Excavation and Installation of Foundations

Impact Management Outcome: Impact to the environment is minimised through adherence to EMPr requirements. No environmental degradation occurs as a result of excavation or installation of foundations.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. All excess spoil generated during the excavation for foundations must be disposed of in an appropriate manner and at a recognised disposal site, if not used for backfilling purposes. Certificates of safe disposal for general and recycled waste must be maintained and retained on file. 2. Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes. 3. Management of equipment for excavation purposes must be undertaken in accordance with ***Section 4.22: Workshop, equipment, and maintenance storage***; and 4. Hazardous substances spills from equipment must be managed in accordance with ***Section 4.21: Hazardous substances***. 5. Batching of cement to be undertaken in accordance with ***Section 4.23: Batching plants***; 6. Residual cement must be disposed of in accordance with ***Sections 4.15 and 4.16: General Solid Waste Management; and Hazardous Waste Management***.						

4.33 Pipeline Stringing

Impact Management Outcomes: Impact to the environment is minimised through adherence to EMPr requirements. No environmental degradation occurs as a result of stringing.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. No services (electrical distribution lines, telephone lines, roads, railways lines, pipelines fences etc.) must be damaged because of stringing operations. Where						

Impact Management Outcomes: Impact to the environment is minimised through adherence to EMPr requirements. No environmental degradation occurs as a result of stringing.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
disruption to services is unavoidable, persons affected must be given reasonable notice, in writing. 2. Where stringing operations cross cultivated land, damage to crops is restricted to the minimum required to conduct stringing operations, and reasonable notice, in writing, must be provided to, and agreed by, the landowner. 3. Transport of the pipes from the laydown area to the construction right-of-way to be undertaken in accordance with ***Section 4.24: Dust Emissions.***						

4.34 Civil Works for Pigging Stations

Impact Management Outcomes: Impact to the environment is minimised through adherence to EMPr requirements.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Where terracing is required, topsoil must be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone. 2. Areas to be rehabilitated include terrace embankments and areas outside the pigging station yards. 3. Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled. 4. These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly. 5. Rehabilitation of the disturbed areas must be managed in accordance with ***Section 5.1: Landscaping and rehabilitation***. 6. All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a legally operated landfill site. Certificates of disposal must be retained and maintained on file. 7. Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes.						

5 POST-CONSTRUCTION PHASE: REHABILITATION, OPERATIONS AND MAINTENANCE

5.1 Landscaping and Rehabilitation

Management Outcomes: Landscaping and rehabilitation is in undertaken in accordance with the approved rehabilitation plan/specification						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Time Period**	**Responsible Person**	**Method of Implementation**	**Mechanism for Monitoring Compliance**
1. Implement rehabilitation measures and interventions according to the site-specific rehabilitation plan. 2. Personnel and equipment must be restricted to a minimum to execute the on-site work. 3. A suitably qualified rehabilitation expert or specialist with expertise in restoration ecology must be appointed to manage the process in order to recreate the natural environment as best as possible and to ensure that ecosystem structure and function recover. 4. Monitor and evaluate rehabilitation procedures implemented, including the use of an unmanned aerial vehicle (UAV) or drone to assess the effectiveness of implementation, if feasible. 5. All areas disturbed by construction activities must be subject to landscaping and rehabilitation. Working footprints must be kept to a minimum. No further destruction and disturbance of surrounding vegetation must take place during the rehabilitation phase. 6. Vehicles to remain on designated tracks and avoid oil, diesel, petrol leaks and spills (Refer to ***Section 4.21: Hazardous Substances*** and ***Section 4.22: Workshop, Equipment Maintenance and Storage***). 7. Keep noise levels to a minimum (Refer to ***Section 4.26***). 8. Rehabilitation efforts to mimic or be more pristine natural habitat than the pre-construction conditions. 9. Establish natural topography. 10. All spoil and waste must be removed and disposed of at a registered waste disposal facility and certificates of disposal must be retained and maintained on file. 11. On completion of the construction phase all temporary fences are to be removed, and where possible re-used by the Contractor on other projects. Alternatively, the temporary fences (if in a useable condition) could be donated to surrounding affected communities based on agreements and discussions with community leaders. 12. The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.						

Management Outcomes: Landscaping and rehabilitation is in undertaken in accordance with the approved rehabilitation plan/specification						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Time Period**	**Responsible Person**	**Method of Implementation**	**Mechanism for Monitoring Compliance**
13. Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition. 14. Where new access roads have crossed cultivated farmlands, that land must be rehabilitated as agreed to by the EA holder and the landowners. For example, ripping must be undertaken to a depth of 600 mm. 15. Indigenous species of the local area must be used for replanting. The species and grasses selected must compliment or approximate the original condition. 16. During re-vegetation, all-terrain vehicles, agricultural equipment, seed drills etc. must be used for ground applications, and helicopters and/or fixed wing aircrafts must be used for aerial applications. 17. Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following: a. Annual and perennial plants are chosen; b. Pioneer species are included; and c. Species chosen must be indigenous to the area, and must grow in the area without any problems. 18. Root systems must have a binding effect on the soil; and 19. The final product must not cause an ecological imbalance in the area. 20. Planting of plant stock and reseeding should be timed to maximise the likelihood of successful recruitment. 21. Stockpiled topsoil must be used for rehabilitation (refer to ***Section 4.28: Stockpiling and Stockpiled Areas***). 22. Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion. 23. Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed. 24. Subsoil must be ripped before topsoil is placed. 25. Topsoil must be stored adjacent to the cleared area. Topsoil contains viable seeds, rhizomes and root stock. 26. The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment.						

Management Outcomes: Landscaping and rehabilitation is in undertaken in accordance with the approved rehabilitation plan/specification						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Time Period**	**Responsible Person**	**Method of Implementation**	**Mechanism for Monitoring Compliance**
27. Where impacted through construction related activities, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled as per the instruction from the ECO. 28. Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly. 29. Return plants removed during the plant rescue operation (i.e. those that are suitable for placement in a pipeline servitude (excluding deep-rooted trees)). 30. Rescued plants that cannot be returned to the servitude can be placed in suitable areas adjacent to the servitude, close to their removal site. 31. Intense and appropriate alien invasive control must be implemented during the rehabilitation phase. 32. Ensure that appropriate follow-up operations are continued until the invading species are effectively under control. a. In the Fynbos biome, many of the Fynbos invaders are woody plants, which have deep roots and would have to be controlled if they occurred in the pipeline servitude. Alien grasses are particularly aggressive invaders in the Sand Fynbos and Renosterveld communities and possibly also the Strandveld communities. Studies of invasive species control measures have shown that eradication of a species cannot be achieved except in the initial stage of establishment. Therefore, effective control in this context should be that alien plant species cover within the pipeline servitude is reduced to, and maintained at, less than 5% canopy cover. b. In the Albany Thicket biome, the following must be considered with regards to alien invasive plants and restoration plans: i. There is a high vulnerability to overgrazing by livestock, in particular *Portulacaria* dominated vegetation types. This is particularly relevant when rehabilitating sensitive habitat where livestock may be present. ii. There is a high vulnerability of some thicket types to fire damage. iii. Invasive alien vegetation, especially rooikrans (*Acacia cyclops*) poses a real threat to Thicket by increasing the fuel load. This renders it prone to hot fires that will severely damage if not destroy the succulent and tree component. iv. There is a slow re-growth and recovery after vegetation removal. This is particularly true for arid and some mesic thicket vegetation types.						

Management Outcomes: Landscaping and rehabilitation is in undertaken in accordance with the approved rehabilitation plan/specification						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Time Period**	**Responsible Person**	**Method of Implementation**	**Mechanism for Monitoring Compliance**
v. Disturbance in arid areas of succulent thickets are prone to invasion of karroid species and arid adapted alien vegetation.						

5.2 Pipeline Commissioning

Impact Management Outcomes: Impact to the environment is minimised through adherence to EMPr requirements.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. The relevant authorities must be notified in writing prior to any venting being undertaken. 2. As best as possible, ensure that the volume of methane vented is kept as low as possible. 3. It is recommended that venting is undertaken during suitable atmospheric conditions, such as during windy conditions and at an elevated ambient temperature. 4. As best as possible, venting must be avoided at night. 5. Venting must be closely monitored and controlled. Ensure that all possible sources of ignition are eliminated or controlled.						

5.3 Temporary Site Closure

Impact Management Outcomes: Site closure procedures are implemented in accordance with the EMPr.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Containment areas must be emptied (where applicable) in accordance with the impact management actions included in ***Sections 4.21: Hazardous Substances*** and ***4.22 Workshop, Equipment Maintenance and Storage.*** 2. Hazardous storage areas must be well ventilated. 3. Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service.						

Impact Management Outcomes: Site closure procedures are implemented in accordance with the EMPr.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
4. Emergency and contact details must be displayed. 5. Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel. 6. Night hazards such as reflectors, lighting, traffic signage etc. must be checked. 7. Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; 8. Stockpiles shall be appropriately secured. 9. Structures vulnerable to high winds must be secured. 10. Wind and dust mitigation must be implemented. 11. Cement and materials stores must have been secured. 12. Toilets must have been emptied and secured. 13. Refuse bins must have been emptied and secured. 14. Drip trays must have been emptied and secured.						

5.4 Terrestrial Ecology – Flora and Fauna

Impact Management Outcomes: Impact to fauna is avoided or mitigated during the operational phase.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. The access routes for maintenance activities must be kept as limited as possible and access should be controlled by gating access routes. 2. Vehicle speeds must be kept slow to minimise potential collisions with animals and dust creation. 3. Time environmental inspections to avoid the breeding season of conservation important taxa. Where avoidance is not possible, ensure that the inspections are carried out as efficiently as possible with least disturbance. 4. Ensure the use of surveillance and monitoring of snares, debarking, hunting etc. in order to minimise poaching. 5. Develop community education programs near vulnerable sites to minimise poaching. 6. Keep all livestock out of rehabilitated natural areas. 7. Off road driving in rehabilitated areas must not take place. 8. Access roads and tracks to pigging stations and any other locations must be regularly maintained, especially their drainage, to ensure that ongoing disturbances of the						

Impact Management Outcomes: Impact to fauna is avoided or mitigated during the operational phase.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
ecosystems are minimised. This is particularly important in areas with deep, sandy soils where there is a natural tendency for them to widen and the tracks to deepen over time. 9. Ensure that re-vegetation is occurring according to the rehabilitation plan. 10. There should be regular inspections by personnel trained to understand the local vegetation and to be able to monitor its recovery using recognised procedures (e.g. permanent survey and photo-plots). These surveys should be done once a year in the early stages (1-3 years) and bi-annually after that. The surveys should be in the same season so that trends can be assessed and any adverse trends in the species diversity, ecosystem structure or ecosystem function identified and addressed. Expert advice should be sought if deemed necessary. 11. An Alien Invasive Species (AIS) Management Plan must be implemented during the operational phase of the development, which makes provision for regular alien clearing and monitoring. Clearing of such exotic species must be undertaken at least annually. 12. Carry out regular surveys to identify invading species and implement the necessary control operations where they are found. 13. When the gas pipeline is closed, ensure that any invasions are controlled as part of the closure processes. As part of the hand-over process, ensure that the landowner's responsibility to maintain the cleared areas is acknowledged in writing. 14. Generic requirements regarding herbicides apply (refer to ***Section 4.6***). 15. Ensure sound soil and water management to prevent erosion and repair it when identified. 16. If unintended subsurface drainage (e.g. desiccation of wetlands or creation of new wetlands), piping or erosion is identified, take remedial action such as excavation drains or putting in plugs. 17. Post-construction rehabilitation monitoring should be conducted twice yearly for the first two years and then annually thereafter. a. In the Fynbos Biome, during the first two years, a third survey should be carried out in the autumn to assess the degree of summer-time mortality in the winter rainfall region. b. Erosion monitoring; and c. Monitoring for alien species invasions. The plan should include types of invasive species, growth forms, densities and levels of infestation, potential dispersal mechanisms, knock-on impacts to terrestrial and freshwater ecosystems caused during implementation, as well as monitoring of the effectiveness of the control treatments (initial control and follow-ups), and the recording of any new invasive						

Impact Management Outcomes: Impact to fauna is avoided or mitigated during the operational phase.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
species. If new species are observed, their control needs to be integrated into the control programme.						

5.5 Freshwater Ecosystems (Watercourses, Rivers and Wetlands)

Impact Management Outcomes: To minimise disturbance of freshwater ecosystems during patrol and maintenance activities.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Development of a plan for attachment to the EMPr template to guide the clearing of natural deep-rooted wetland or riparian vegetation to maintain the pipeline servitude, and annual control of invasive alien plants (including quantifiable targets and objectives). 2. Implement plans for clearing of vegetation and control of invasive alien plants, and application of herbicides (Refer to ***Section 4.6***). 3. Monitor vegetation within pipeline servitudes that are within or proximal to watercourses, using an unmanned aerial vehicle (UAV) or drone to assess the effectiveness of implementation, if feasible.						

5.6 Estuaries

Impact Management Outcomes: To minimise disturbance of estuarine ecosystems during patrol and maintenance activities.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Ensure natural indigenous vegetation such as mangroves and saltmarsh are avoided as best as possible, and that there is regular control of alien invasive plants in line with a control plan. 2. Monitor the condition of the infrastructure to ensure that there is no exposed section, ongoing erosion occurring or leakages. 3. Should the pipe become exposed it would require the suspension of operations and the HDD of the pipe at greater depths below ground within 6 months, once sediment engineering studies have been done to confirm new burial depth. 4. Operational staff should be made aware of the sensitivities of estuarine and freshwater environments. 5. Fixed point photography could be used to monitor long-term vegetation changes and potential site impacts. 6. Where impacts to estuaries (i.e. HDD) and/or coastal freshwater ecosystems within 10 km of estuaries cannot be avoided, monitoring measures should be implemented at a minimum, with additional supporting input from in-depth studies where required. 7. For all construction work within the 10 km above an estuary as delineated by the EFZ, monitoring of potential impacts is recommended at suitable sites to be determined in-field by estuarine and/or freshwater ecosystems specialists as required. Sampling is required prior to construction taking place to allow for the establishment of the systems baseline condition (i.e., its state prior to development activities). Monthly monitoring is recommended for the duration of construction to evaluate trends, with summer and winter monitoring at three year intervals recommended thereafter during the operational phase. 8. Depending on the impact site, monitoring/sampling is to be conducted by estuarine/freshwater specialists with relevant qualifications pertaining to estuarine sediment dynamics, physical processes, water quality and ecology (or freshwater aquatic ecology if in coastal freshwater ecosystem). Resource Quality Objectives as set under the National Water Act (Act 36 of 1998, as amended) provide the benchmark conditions to maintain in estuaries or rivers. These requirements are specifically important in the event of HDD through an estuary and its EFZ is impossible to avoid. Monitoring of other aspects (e.g. water quality, microalgae, invertebrates, fish and						

Impact Management Outcomes: To minimise disturbance of estuarine ecosystems during patrol and maintenance activities.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
birds) are required even if the estuary or EFZ is not directly impacted, but where upstream activities may cause indirect impacts to an estuary. 9. In cases where freshwater ecosystems upstream of estuaries are likely to be affected by gas pipeline development appropriate measures of monitoring should be considered, including: a. Upstream and downstream biomonitoring to include appropriate indicators/measures of assessing rivers (e.g. diatoms, water quality/clarity, macro-invertebrates using the SASS5 method, instream and riparian habitat using the IHI method) and wetland habitats (e.g. WET-Health and WET-EcoServices) of a potential impact is recommended at suitable sites to be determined in-field by a specialist. b. Monitoring/sampling is to be conducted by suitably qualified specialists (e.g. DHSWS accredited SASS 5 practitioners) with sufficient experience in assessing aquatic ecology and water quality; c. A single sampling event is recommended prior to construction taking place to serve as a reference condition; d. Monthly monitoring is recommended for the duration of construction to evaluate trends; and e. Biannual monitoring is recommended thereafter during the operational phase, up to the point in time when the monitoring can establish that the systems are stable.						

5.7 Avifauna

Impact Management Outcomes: To reduce avian mortality and displacement due to nest and habitat destruction, and sensory disturbance during patrol and maintenance activities.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. In the event of aerial monitoring to inspect the pipeline servitude and associated infrastructure, avoid flying below 500 m above ground to limit sensory disturbance to nesting birds. If this is unavoidable, then ground-based monitoring should be undertaken with the least amount of disturbance as possible. 2. Consider the use of drones for aerial inspections to limit the disturbance factor, if feasible.						

Impact Management Outcomes: To reduce avian mortality and displacement due to nest and habitat destruction, and sensory disturbance during patrol and maintenance activities.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
3. Schedule ground-based programs to occur outside of breeding windows. 4. When conducting ground-based programs (walking or driving) stay near the ditch-line to limit disturbance to breeding birds. 5. Plan a once-off pass through as opposed to an "in and out" methodology in order to limit potential disturbance to birds. 6. If feasible, schedule repairs outside of the breeding windows. 7. Activities must be restricted to the servitude width. 8. Ensure that no access is allowed to properties and habitats outside the servitude. 9. Implement noise and dust reduction measures according to best practices. 10. If activity occurs within breeding windows, conduct nesting surveys. 11. Temporary removal of a nestlings and/or eggs by a qualified avifaunal rehabilitation expert for the duration of the repair activities must be considered.						

5.8 Seismicity

Impact Management Outcomes: Reduced susceptibility of the gas pipeline and associated infrastructure to ground movement that could result in damage.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Monitor both weak and strong ground motion in the above-mentioned "sensitive" regions (noted in ***Section 3.8***) to improve hazard assessments. If necessary, increase the sensitivity and/or density of the sensors. Relocate, reinforce or protect the gas pipeline if a significant increase in hazard or risk is indicated. 2. Ensure that ongoing monitoring of seismicity is undertaken. If necessary, re-evaluate design specifications and upgrade structures.						

5.9 Maintenance and Settlement Planning, Disaster Management and Social Aspects

Impact Management Outcomes: To build local community capacity and municipal support.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
1. Ensure maintenance is undertaken as per the required schedule and appropriate corrective actions implemented timeously. Normally, leaks are detected by abnormal pressure drops and a loss of transported volumes. Risk Based Inspection via scheduled intelligent pigging of the pipeline must be undertaken in order to set an initial baseline and thereafter monitor the condition of the pipeline. 2. Ensure that gas pipeline infrastructure is regularly inspected for signs of corrosion or any potential perforation of the pipeline walls that could result in gas leaks and subsequent explosions. 3. Ensure that the latest technology is used during integrity testing (in particular to detect general corrosion, pitting corrosion, stress corrosion cracking, etc.) – for example automated ultrasonics, electromagnetic acoustic transducer (EMAT). 4. Ensure that risks to the pipeline due to any changes in the environmental conditions surrounding the pipeline (e.g. increase in moisture in the drainage line where the pipe is laid down) are considered. 5. Ensure that the location class of a section of existing pipeline is changed in the event of land use change. Where there are changes in land use planning (or existing land use) along the alignment of an existing pipeline, a safety assessment must be carried out and additional control measures determined to ensure that the risk associated with a rupture or leak is ALARP. 6. During a pipeline-related disaster, the key strategies that apply to all natural gas emergencies are to establish a command and safe staging area, secure the scene, evacuate at-risk occupants and bystanders, effect viable rescues, eliminate ignition sources, and co-operate with the local utility company. 7. Implement the community emergency response plan. 8. Plans should be developed for safeguarding critical infrastructure. 9. Training exercises of first responders must take into account critical infrastructure. Preferably, joint exercises with providers of critical infrastructure services should be regularly scheduled.						

PART C: SITE SPECIFIC, PROJECT, APPLICANT AND EAP INFORMATION

This section of the Generic EMPr needs to be completed by the EAP and applicant It requires the provision of details relating to the preliminary infrastructure layout, the EAP, applicant and general project.

Contact Details of the Developer and EAP, and Details of the Project and Specifications

Details of the applicant	
Name of applicant:	
Tel Number:	
Fax Number:	
Postal Address:	
Physical Address:	
Details and Expertise of the EAP	
Name of EAP:	
Tel Number:	
Fax Number:	
E-mail Address:	
Expertise of the EAP (Curriculum Vitae included):	
Details of the Project	
Project name:	
Description of the project:	
Project location (per project component i.e. pipeline, pigging station, block valve etc.):	
Farm name (if applicable)	
Farm number (if applicable)	
Portion name	
Portion number	
Latitude	
Longitude	
Preliminary Technical Specification of the Gas Transmission Pipeline	
Pipeline Depth Below Ground	
Pipeline Length	
Pipeline Diameter	
Pipeline Pressure	
Pipeline Material Composition	
Pipeline Throughput	
Gas Product Composition or Specification	
Pipeline Markers	
Number of markers	
Composition of markers	
Marker spacing	
Marker height	
Marker colour	
Block Valves	
Number of block valves	
Composition and visual description of block valves	
Block valve spacing	
Pigging Stations	
Number of Pigging Stations	
Composition and visual description of pigging stations	
Pigging station spacing	

Footprint of the Pigging Station (m^2)	
Footprint of construction area and storage areas (m^2)	
Anticipated construction duration	
Anticipated number of staff during the construction phase (permanent and temporary)	

Development Footprint and Sensitivity Site Map

A site sensitivity map overlaid with the preliminary infrastructure layout must be created and included in this section. From a sensitivity perspective, the map must be prepared from the National Web-based Environmental Screening Tool (https://screening.environment.gov.za/screeningtool) and must:

- Consider the findings of the screening process;
- Be displayed according to the four sensitivity tiers i.e. Very High, High, Medium or Low or two tier sensitivity where this is relevant;
- Identify the nature of each sensitive feature e.g. raptor nest, threatened plant species, archaeological site, etc.
- Identify features both within the planned working area and any known sensitive features in the surrounding landscape.

From an infrastructure and technical perspective, the map must also include the following:

- The route of the gas transmission pipeline and all associated infrastructure assessed in the basic assessment or S&EIR process illustrated at an appropriate resolution to enable fine scale interrogation. It is recommended that <20 km of gas transmission pipeline length is illustrated per page in A3 landscape format.
- All above ground infrastructure such as, but not limited to, block valves, pipeline markers and pigging stations should be labelled and numbered accordingly on the map.
- Farm portion names and gate access points.
- The location of pipeline within existing infrastructure servitudes, where relevant.

Figure 3 provides an example of a development footprint and sensitivity map.

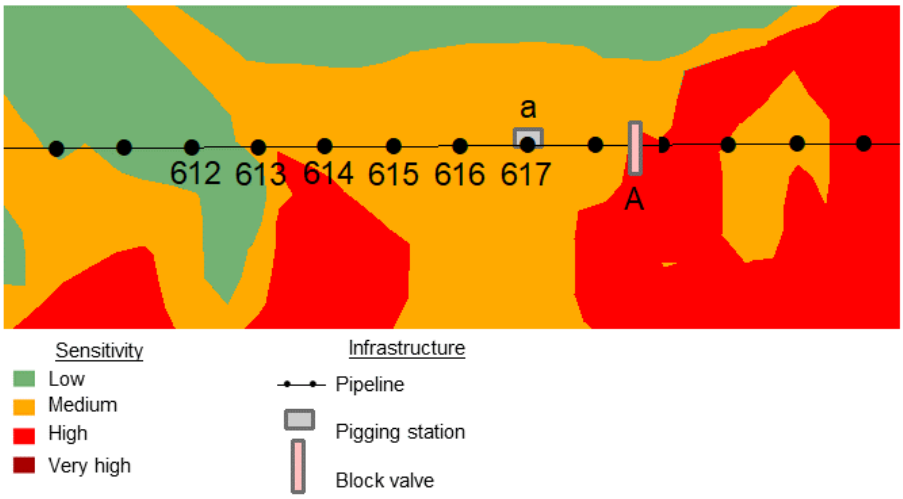

Figure 3: Example of a Development Footprint and Environmental Sensitivity Map in the context of a final gas transmission pipeline profile

Beneath each development footprint and sensitivity map, the landowner contact details and any specific requirements regarding each land parcel as required by the landowner must be included. An example template to provide such information is indicated in Table 5. Furthermore, specific mitigation measures as determined by the findings of the basic assessment or S&EIR process, field-work and screening tool site sensitivity map with reference to specific positions of the infrastructure should be identified. An example of this template is provided in Table 6. Where considered appropriate, photographs of sensitive features in the context of above-ground infrastructure shall be used.

Table 5: Example Template for Landowner Details and Specific Access Requirements

Land Owner and Access Details			
Block Valve, Pipeline Marker, Pigging Station Number	Example: 419-422	Example: 423-429	Example: 430-437
Farm Name			
Farm Owner			
Farm Manager (or other managerial or supervisory contact if different from owner or if owner is not permanently on the Farm)			
Contact Name			
Contact Number			
Special request by landowner			
Access requirements			

Table 6: Example Template for Project Specific Environmental Controls

Project Specific Environmental Controls		
Block Valve, Pipeline Marker, Pigging Station Number	Environmental Aspect	Site Specific Mitigation
Example: 419-422		
Example: 423-429		
Example: 430-437		

Declaration

The applicant must sign the following declaration as confirmation of understanding of the legality of the Generic EMPr.

The applicant affirms that he/she:

- will abide by and comply with the prescribed impact management outcomes and actions as stipulated in Part B of the Generic EMPr;
- has the understanding that the impact management , outcomes and actions are legally binding; and
- will provide written notice to the CA approximately 14 days prior to the date of commencement of construction in order to facilitate compliance inspections.

Signature: Applicant Date:

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PART D: DOCUMENTATION OF SITE-SPECIFIC SENSITIVITIES AND ATTRIBUTES

If any specific environmental sensitivities/attributes are present on the site, which require more specific impact management outcomes and actions that are not included in the pre-approved generic EMPr template (Part B), these must be included in this section. This Site Specific EMPr must follow the same template as that of Part B (i.e. pre-approved Generic EMPr template).

The information in this section must be prepared by an EAP. The name and expertise of the EAP, including the curriculum vitae, must be included in this section of the EMPr.

Once approved, Part D will form part of the EMPr for the site and is legally binding.

Part D only applies to additional management outcomes and actions that are necessary. This section will not be required if there are no specific environmental sensitivities or attributes within the affected site that needs to be managed.

PART E: METHOD STATEMENTS

Method Statements must be prepared by the Contractor prior to commencement of the activity on a project specific basis, and to be updated regularly, as required. The method statements are not required to be submitted to the CA.