ENVIRONMENTAL MANAGEMENT PROGRAMME:

THE PROPOSED CONSTRUCTION OF EMANGWENI BRIDGE, WARD 29 UNDER ALFRED DUMA LOCAL MUNICIPALITY

Indaloenhle

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THE PROPOSED CONSTRUCTION OF EMANGWENI BRIDGE, WARD 29 UNDER ALFRED DUMA LOCAL MUNICIPALITY REFERENCE:

Competent Authority Reference:

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PREFACE

This Environmental management program report was compiled to address the potential environmental, social, and economic impacts associated with the proposed project, by prescribing meaningful and practical mitigation measures through specialist consultation and adherence to relevant environmental legislation, and to prevent the occurrence of irreversible environmental degradation. These mitigation measures must be made binding to all contractors during all the project phases.

DEFINITIONS

Alien plants: Plants and animals which do not derive naturally from an area - they are brought in by humans. Alien plants often force indigenous species out of the area.

Auditing: A systematic and objective assessment of an organisation's activities and services conducted and documented on a periodic basis.

Biodiversity: The variety of life in an area, including the number of different species, the genetic wealth within each species, and natural areas where they are found.

Environment: The surroundings in which humans exist and which comprise: the land, water, and atmosphere of the earth; Micro-organisms, plant and animal life; any part or combination of a) and b) and the interrelationships among and between them; the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that can influence human health and well-being.

Environmental aspect: Those components of the company's activities, products and services that are likely to interact with the environment.

Environmental awareness training: A presentation given to the Contractor and its Sub-contractors to raise environmental awareness and ensure that all staff, Contractor(s) and Sub-contractor(s) are familiar with or made aware of the contents of the Environmental Authorisation (EA) and the Environmental Management Programme (EMPr).

Environmental impact: The change to the environment resulting from an environmental aspect (an activity) on the environment, whether desirable or undesirable. An impact may be the direct or indirect consequence of an activity.

Environmental Impact Assessment: The process of examining the environmental and social effects of a development in terms of the National Environmental Management Act (108 of 1998 as amended) and the Environmental Impact Assessment (EIA) Regulations, as published in Government Notice R.543 dated 18th June 2010 and as corrected by Correction Notice 1 (GN No. R. 660 of 30 July 2010) and Correction Notice 2 (GN No. R. 1159 of 10 December 2010).

Environmental Management Programme: A detailed plan of action prepared in accordance with the requirements of the National Environmental Management Act, Environmental Impact Assessment Regulations, 2014, to ensure that recommendations for enhancing positive

impacts and /or limiting or preventing negative environmental impacts are implemented during the life cycle of a project.

Environmental specification: Instructions and guidance for specific construction activities designed to help prevent, reduce and/or control the potential environmental implications of these activities.

General Waste: Waste that does not pose an immediate hazard or threat to health or to the environment and includes: - a) Domestic waste; b) building and demolition waste; c) business waste; d) inert waste.

Habitat: The physical environment that is home to plants and animals in an area, and where they live, feed, and reproduce.

Hazardous waste: Waste, even in small amounts, that can cause damage to plants, animals, their habitat, and the well-being of human beings, e.g., waste from factories, detergents, pesticides, hydrocarbons, etc.

Impact: A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social, or economic environment within a defined time and space.

Indigenous species: Plants and animals that are naturally found in an area.

Infrastructure: The network of facilities and services that are needed for economic activities, e.g., roads, electricity, water, sewerage.

Land use: The use of land for human activities, e.g., residential, commercial, industrial use.

Mitigation: Measures designed to avoid, reduce, or remedy adverse impacts

Natural environment: Our physical surroundings, including plants and animals, when they are unspoiled by human activities.

Pollution: The result of the release into air, water, or soil from any process or of any substance, which is capable of causing harm to man or other living organisms supported by the environment.

Policy: A set of aims, guidelines and procedures to help you make decisions and manage an organization or structure. Policies are based on people's values and goals. See Integrated Metropolitan Environmental Policy.

Applicant / Proponent / Client - Developer. Entity which applies for environmental approval and is ultimately accountable for compliance to the requirements of the EMPr.

Protected Plants: Plant species officially listed on the protected plants list (each province has one), and which may not be removed or transported without permit to do so from the relevant provincial authority.

Resources: Parts of our natural environment that we use and protect, e.g., land, forests, water, wildlife, and minerals.

Rehabilitation: Making the land useful again after a disturbance. It involves the recovery of ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily re-establish the pre- disturbance condition but does involve establishing geological and hydrological stable landscapes that support the natural ecosystem mosaic.

Runoff: The total water yield from catchment including surface and subsurface flow.

Subsoil: The soil horizons between the topsoil horizon and the underlying parent rock.

Storm water management: Strategies implemented to control the surface flow of storm water such that erosion, sedimentation and pollution of surface and ground water resources in the immediate and surrounding environments are mitigated. This is specifically important during the construction and decommissioning phases of a project.

Sustainable development: Development that is planned to meet the needs of present and future generations, e.g., the need for basic environmental, social, and economic services. Sustainable development includes using and maintaining resources responsibly.

Waste Management: Classifying, recycling, treatment and disposal of waste generated during construction and decommissioning activities.

Watercourse: means: a] a river or spring; b] a natural channel or depression in which water flows regularly or intermittently; c] a wetland, lake, or dam into which, or from which, water flows; and d] any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 [Act No. 36 of 1998] and a reference to a watercourse includes, where relevant, its bed and banks.

Wetlands: An area of land with water mostly at or near the surface, resulting in a waterlogged habitat containing characteristic vegetation species and soil types e.g., vleis, swamps.

LIST OF ACRONYMS

DEDTEA	Department of Economic Development, Tourism and Environmental Affairs
EA	Environmental Authorization
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act, 1989 [Act No. 73 of 1989]
ECO	Environmental Control Officer
EMPr	Environmental Management Programme
IAPs	Interested and Affected Parties

NEMA	National Environmental Management Act, 1998 [Act No. 107 of 1998]
NEM: BA of 2004]	National Environmental Management: Biodiversity Act, 2004 [Act No.10
NEM: WA	National Environmental Management: Waste Act [Act No.56 of 2008]
PM	Project Manager
SHE	Safety, Health and Environmental
WESSA – KZN	Wildlife and Environment Society South Africa

1. INTRODUCTION

Indaloenhle Environment Consultants (Pty) Ltd has been appointed by Abazingeli Civils (Pty) Ltd acting on behalf Alfred Duma Local Municipality to undertake a Basic Assessment (BA) in order to comply with the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment (EIA) Regulations as published in the Government Gazette 38282, Notice No. GNR 982 (2014, as amended).

Section 19 (1) of the EIA Regulations requires that where basic assessment must be applied to an application, the applicant must, within 90 days of receipt of the application by the competent authority, submit to the competent authority –

(a)a basic assessment report, inclusive of specialist reports, an EMPr and where applicable a closure plan, which have been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority.

To satisfy this condition, an Environmental Management Programme (EMPr) has been prepared. This EMPr will address the management of environmental impacts related to the construction of eMangweni bridge. The document provides a basis for managing, mitigating, and monitoring the environmental impacts associated with all construction and operational phases of development.

DETAILS OF THE EAP

The environmental team of Indaloenhle Environmental Consultants [hereafter referred to as Indaloenhle Consulting] are appointed as the Environmental Assessment Practitioner [EAP]. Indaloenhle Environmental Consultants is therefore undertaking the appropriate environmental studies for this proposed project.

Indaloenhle Environmental Consultants has been involved in and / or managed several environmental assessments in South Africa to date. A specialist area of focus is on assessment of linear developments [national and provincial roads, pipelines, and power lines], bulk infrastructure and supply [e.g., wastewater treatment works, pipelines, landfills], electricity generation and transmission. For the detailed experience of the EAP, refer to Appendix A of this EMPr.

Table 1: Details of the EAP

	Detail	Indaloenhle Environmental Consultants
Indaloenhle Environmental Consultants	**Contact Persons**	Divhani Ramovha
	Address	62 Old Main Road, Kloof, 3610
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	E-mail	divhani@indaloenhle.co.za
	Qualification	BSc. Hons. Environmental Science SACNASP – Pr.Sci.Nat (118762) EAPASA – Registered EAP (2019/287)
	Experience	7 Years

2. PURPOSE OF THE DOCUMENT

The purpose of the EMPr is to formulate mitigatory measures that should be made binding to all contractors during construction of the proposed development, as well as measures that should be implemented during the operational phase. The EMPr is thus required to protect the natural, social, and socio-economic environment prior to, during and after construction. This EMPr is intended for the management of the impacts of construction of the proposed project and operation thereof, rehabilitation and revegetation of affected areas only. This EMPr is, therefore, a standalone document, which must be used on site during each phase of the development (planning, construction and operational phases including rehabilitation post-construction). This document should be flexible so as to allow the contractor and the Applicant to conform to the management commitments without being prescriptive. The management commitments prove that the anticipated risks on the environment will be minimised if they are adhered to consistently. The onus set out in the EMPr rests with Applicant and the contractor, which promotes responsibility and commitment. Any parties responsible for transgression of the underlying management measures outlined in this document will be held responsible of non-compliances and remedial thereof.

The primary objectives of the EMPr are as follows:

- Provide mitigation measures to limit environmental impacts, and improve management of activities thereby reducing the probability of impacts occurring; and
- Define organisational and administrative arrangements for environmental management and monitoring of the work contract, including defining the responsibilities of staff and co-ordination, liaison, and reporting procedures.

The EMPr has been developed with due reference to the following:

- Site visits and assessments – Indaloenhle Environmental Consultants, Abazingeli civils,ILZ Consulting ,Afzelia environmental Consultants and Department of Economic Development, Tourism and Environmental Affairs.
- Information on biophysical environment – Indaloenhle Environmental Consultants
- Information on the proposed works – Abazingeli Civils(Pty) Ltd
- Recommendations from the Authorities – Department of Economic Development, Tourism and Environmental Affairs.

3. LEGAL CONTEXT

A growing awareness of the environment and an increase in the number of environmental laws and regulations, present company management with a daunting task of monitoring, interpreting, and implementing systems to produce a workable plan to comply with legal requirements. The applicant will be responsible for ensuring that contractors and labourers do not contravene provisions of the following pieces of legislation and any other related and relevant legislations. Complying with these laws and regulations will minimise the risks in terms of legal, financial (claims) and rehabilitation costs. Non-compliance to environmental law is a criminal offence and, if prosecuted, the Alfred Duma Local Municipality will be liable for any environmental damage incurred.

3.1. OVERVIEW OF LEGISLATION

Table 2: Overview of legislation

Legislation	Relevance
Constitution of the Republic of South Africa (Act No. 108 of 1996)	Chapter 2 – Bill of Rights. Section 24 – environmental rights
National Environmental Management Act (Act No. 107 of 1998)	Section 24 – Environmental Authorisation (control of activities which may have a detrimental effect on the environment). Section 28 – Duty of care and remediation of

	environmental damage. Environmental management principles.
National Environmental Management Act: Waste Act (Act No. 59 of 2008)	The National Environmental Management Waste Act (Act No. 56 of 2008) (NEM: WA) regulates waste management.
National Environmental Management Act: Biodiversity Act 2004 (Act 10 of 2004) NEMBA	This act provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith
Occupational Health & Safety Act (Act No. 85 of 1993)	The Occupational Health and Safety Act (Act No. 85 of 1993) provides for the health and safety of people at work as well as the health and safety of persons using plant and machinery.
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	This act aims to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.

4. DESCRIPTION OF THE PROPOSED DEVELOPMENT

The Project Management Unit under the Technical and Infrastructural Services of Alfred Duma Local Municipality proposes to construct 20.37m length and 3.672m wide vehicular bridge and the construction of gravel road approaches.

Major aspects of the proposal entail the following:

- The excavation to the required depth or rock.
- construction and installation of precast concrete bases
- construction of a series of four 3.0m x 3.0m precast portals.
- The construction of earwigs and bases, 150mm concrete slab.
- The construction of concrete bollards construction of non-structural gabions and the construction of reno mattresses, fill within the structure, and construction of guardrails.

Activities associated with the construction of gravel road approaches do not constitute activities identified in terms of Section 24 of the National Environmental Management Act (Act No. 107 of 1998), only the bridge triggers listed activities in terms of the EIA regulations (2014, as amended) and therefore require an environmental approval in terms of Section 24 of NEMA. Details of the proposed bridge are as follows. The construction of the bridge will be 3m high and will have capacity to allow runoff to freely pass through without overflowing. As a result, the level of the gravel road will be affected.

5. ADMINISTRATIVE AND REGULATION OF ENVIRONMENTAL OBLIGATION

In line with this EMPr, management structures should be established clearly outlining and demonstrating environmental responsibilities, accountability, and liability of the contractor's employees.

5.1. ROLES AND RESPONSIBILITIES

Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the Project Manager, Site Manager, Competent Authority, Contractor's Safety, Health and Environmental (SHE) Officer, Community Liaison Officer (CLO) and Environmental Control Officer (ECO) for the construction phase of this project are as detailed below:

5.1.1. DEPARTMENT OF ECONOMIC DEVELOPMENT, TOURISM AND ENVIRONMENTAL AFFAIRS

DEDTEA is the mandated authority in terms of NEMA that determines whether authorisation can be issued for the project, following a decision-making process. DEDTEA also fulfils a compliance and enforcement role with regards to the authorisation. The Department may perform random inspections to checks compliance. The department will also review the monitoring and auditing reports compiled by the Environmental Control Officer (ECO).

5.1.2. THE CONTRACTOR

The contractor is bound to the EMP conditions through contract and is responsible for ensuring adherence to all conditions of the EMPr. The Contractor must thoroughly study the EMPr requirements before establishing on site and must request clarification on any aspect of the document, should they be unclear.

- The contractor must implement all the requirements of the EMPr as and when required.
- The contractor must comply with all instructions (whether verbal or written) given by the Engineer and ECO, in terms of the EMPr.
- Keeping a copy of the EMPr and Environmental Authorization on site and implementing the EMPr.
- Appointing a competent, full time SHE Officer to assist with daily compliance.
- Preventing negative impacts on the environment by responsible construction.
- Maintaining a register of complaints and queries by members of the public at the site office. This register should be forwarded to the ECO on a monthly basis.
- Maintaining all approved infrastructure in good working order to effectively fulfil its intended purpose and to prevent negative environmental impacts.
- Immediately remedying any factors that contribute to negative environmental impacts.
- Removing non-functional structures.
- Ensuring waste disposal at a suitable, permitted waste disposal facility.
- Ensuring that suitable arrangements are made to protect the environment against long term negative impacts arising from construction.
- Minimizing negative visual impacts.
- Cleaning up contaminants of the environment immediately.
- Preventing erosion through regular monitoring and rehabilitation of degraded areas and implementation of erosion controls.
- Rehabilitating site and maintaining for a minimum of 3 months thereafter.

5.1.3. PROJECT PROPONENT

Alfred Duma Local Municipality is the applicant in terms of NEMA and is also the Project Proponent for all components of the work related to the development and is ultimately responsible for the development and implementation of the EMPr and ensuring that the conditions in the Environmental Authorization are satisfied. The liability associated with environmental non-compliance rests with the Project Proponent.

5.1.4. PROJECT MANAGER

The Project Manager has over-all responsibility for managing the Contractors and for ensuring that the environmental management requirements are met. During the construction phase, the Project Manager will be the proponent's (or implementing agent's) construction manager. During the operation phase it is expected that this role will be fulfilled by the operations manager.

The Project Manager will be on site and the responsibilities of this party will include the following (amongst others):

- Overseeing of all environmental matters and compliance with all environmental requirements and authorisations; and
- Act as the interface between the ECO and the other project role players.

5.1.5. ENVIRONMENTAL CONTROL OFFICER

The ECO is a competent (minimum of 3 years' experience) and independent representative. The ECO will undertake monthly inspections of the site and compliance auditing against the EMPr and EA. The audit reports will be submitted to the project manager, and KwaZulu Natal Department of Economic Development, Tourism and Environmental Affairs (uThukela region).

The ECO will check the following:

- The record of environmental incidents (spills, impacts, legal transgressions, etc.) as well as corrective and preventive actions taken.
- The public complaints register in which all complaints are recorded, as well as actions taken; and
- Results from the environmental monitoring programme (air, noise, water quality, etc.).

Further duties of the ECO will include:

- Monitoring of compliance with the EMPr and the Project Specification.

- Make recommendations on how to best apply the environmental requirements on site and advise the Resident Engineer on the site instructions required to facilitate effective environmental compliance.
- Participate in the quality management system by issuing non-conformances when there are areas of the project environmental requirements that are not being met.

5.1.6. CONTRACTOR'S SHE OFFICER

The primary role of the competent SHE is to coordinate the environmental management activities of the Contractor on site. Specific responsibilities of the SHE, will include the following:

- Aiding the Contractor to comply with all the project's environmental management requirements.
- Assisting the Contractor in compiling Method Statements
- Facilitating environmental activities and environmental awareness training of relevant persons on site
- Exercise an internal compliance management system on behalf of the Contractor.
- Inspect the site as required to ensure adherence to the management actions of the EMPr and the Method Statements
- Provide inputs to the regular environmental audit report to be prepared by the ECO (as required)
- Liaise with the construction team on issues related to implementation of, and compliance with the EMPr.
- Maintain a record of environmental incidents (such as spills, impacts, legal transgressions) as well as corrective and preventive actions taken; and
- Maintain a public complaint register in which all complaints are recorded, as well as action taken.

5.1.7. GENERAL ITEMS

- Proper and continuous liaison between all parties is required to ensure that everyone is always informed.
- The IAPs shall be informed of the starting date of construction as well as the phases in which the construction shall take place, by the contractor and engineer, or through use of sign boards.
- The Contractors must adhere to all conditions of contract, including the EMPr and landowner/IAP special conditions.

- The work must be confined to demarcated areas and the approved location and no encroachment beyond will be permitted.
- The natural environment must be protected.
- In an event where environmental degradation occurs or conduct constituting nonconformance is identified, action must be taken to ensure that such conduct ceases.
- All manmade structures and natural environments shall be protected against damage at all times and any damage shall be rectified immediately.
- The Contractor shall ensure that all damaged areas are rehabilitated to the satisfaction of the ECO. This includes rehabilitation of the camp sites etc, as applicable.
- Effective document management and record keeping of all complaints and corrective actions must be undertaken.
- Environmental audits are to be carried out as per the specifications of the EA during the construction phase and upon completion of the works.

6. METHOD STATEMENT

Method statements are written submissions by the contractor in response to the requirements of this EMPr or request by the employer. The contractor is required to prepare Method statements for several specific construction activities and environmental aspects. The contractor shall not commence the activity for which the Method statement is required until the approval of the relevant Method Statement. Examples of method statements that may be required include but not limited to the following:

- Waste management method statement
- Erosion control method statement
- Emergency preparedness method statement
- River/ Stream crossing method statement
- Site establishment method statement
- Rehabilitation method statement
- Soil management method statement
- Dust control method statement

The approved Method Statement shall not let the contractor free from his obligations or responsibilities in terms of the contract. However, any damage caused to the environment through activities undertaken without an approved Method Statement shall be rehabilitated

at the Contractor's expense. The Method statement shall cover relevant details with regards to:

- Construction procedures and location of the construction site
- Start date and duration of the procedure.
- Materials, equipment, and labour to be used.
- How materials will be moved to and from the site as well as on site during construction.
- Storage, removal and handling of materials, excess materials, and waste materials.
- Emergency procedures in case of any reasonably potential accident/incident which would occur during procedure.

7. ENVIRONMENTAL MANAGEMENT PROGRAMME

The Planning (Pre-Construction) Phase

This EMPr offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development. While there is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g., this EMPr) during the planning phase, the necessary corrective action can be taken to further limit potential impacts.

The Construction Phase

The bulk of the impacts during this phase will have immediate effects (e.g., noise, dust, and water pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts can then be mitigated through the contingency plans identified in the planning phase.

The Operation Phase

By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, Environmental Management Programme in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

Rehabilitation phase

Site rehabilitation is an essential component of this EMPr. Monitoring by the ECO is recommended, this will ensure that areas where environmental degradation has been identified are receiving adequate attention and the environment is, where possible, restored

to its pre-establishment state. A meeting is to be held on site between the Engineer, ECO, and the Contractor to approve all remediation activities and to ensure that the site has been restored to a condition approved by the Engineer.

The Decommissioning Phase

The objective of providing guidelines during the decommissioning phase is to prevent structures from being left to deteriorate and look unsightly. It is imperative that non - functional structures be removed as soon as possible, and that the site is rehabilitated as soon as possible. If non - functional structures are not needed anymore, and not removed, it must be maintained that they will be used to prevent the environmental degradation of the site.

7.1. CONSTRUCTION MANAGEMENT PLAN

Environmental Aspect	Environmental Measures and Action Plans	Responsibility	Monitoring frequency
7.1.1. Preliminary Activities and Management of Construction Phase			
7.1.1.1. Legislation, Permits and Agreements	In all instances, the Developer, Service Providers, Contractors and Project Managers must remain in compliance with relevant local and national legislation. Particular attention must be paid to the requirements of the following national legislation: • National Environmental Management Act No. 107 of 1998 • National Water Act, No. 36 of 1998 • Water Services Act, No. 108 of 1997 • National Forest Act of 1998 • Occupational Health and Safety Act, No 85 of 1993 • Relevant regulations as promulgated under the Standards Act, No 30 of 1982 • Conservation of Agricultural Resources Act, No 43 of 1983 A Copy of the EMPr must be always kept on site during the construction period.	Applicant	Prior to, during and after construction
7.1.1.2. Environmental Education and Awareness	• The principal Contractor must appoint a senior staff member directly involved in the site construction activities as the Safety, Health and Environmental Officer (SHE). • Ensure that all site personnel have a basic level of environmental awareness training. It is the Contractor's responsibility to provide the site foreman with no less than 1 hour's environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff.	Contractor/ ECO	Prior to and during construction

	• All employees must undergo the necessary safety training and wear the necessary Personnel Protective clothing. • Prior to the commencement of construction, all staff need to know what possible archaeological of historical objects of value may look like, and measures to take if such objects are discovered. • On condition that archaeological features have been identified, work on site is to be halted and relevant authority such as Amafa a KwaZulu Natali notified. • The need for a 'clean site' policy needs to be explained to the construction workers.		
7.1.1.3. Review of method statement and project related documents	• The ECO and SHE must consult and review implementation progress and discuss and resolve inter alia environmental concerns, noncompliance (including environmental incidents) and any I&AP issues raised. • The contractor shall submit the method statement for all activities to be undertaken on site to the ECO for review and approval. • The method statements must at least indicate the activity to be conducted, resources to be used, how the activity will be conducted, and possible environmental impact and mitigation measures. • Employees and sub-contractors undertaking a task governed by a method statement must be trained on that particular method statement and have to read and/or understand their obligations prior to commencing work.	ECO / SHE	Prior to construction and during construction

	• Activities can only commence once the Method Statement has been accepted by the Environmental Control Officer and approved by the Site Manager or Project Manager.		
7.1.2. Site Establishment			
7.1.2.1. Construction Camp	• Choice of site for the Contractor's camp requires the ECO and Engineers permission and must take into account location of local residents, existing land uses, including flood zones and unstable zones and sensitive environmental features. • If the Contractor chooses to locate the camp site on private land, prior permission from both the Engineer and the landowner must be obtained. • The camp must be properly fenced off and secured. • The Contractor must attend to the drainage of the camp site to avoid standing water and/or sheet erosion.	Engineer/ ECO/ Contractor	During site establishment
7.1.2.2. Access to site	• Construction of new access routes must be avoided [where possible]. • Access route must be clearly defined with white stakes/painted rocks and disturbance outside these areas is not permitted. • Construction signs must be placed at the beginning of the project indicating details of the developer and the contractor. • Minimum disruption of access for local residents must be achieved and must have consent of the Engineer.	Contractor	Prior to construction

	• No trees/shrubs/groundcover may be removed, or vegetation stripped without the prior permission of the Engineer/ECO.		
7.1.2.3. Construction site boundaries	• The site boundaries of the project area within which the Contractor must operate must be agreed upon with the ECO and the Engineer prior to the start of the site operations. The Contractor must demarcate these areas at the very start of the project. • Areas outside of these boundaries must be deemed as no go areas. • Construction must be limited to the construction footprint.	ECO/ Contractor	Prior to construction and during site establishment
7.1.3. Socio-Economic benefits			
7.1.3.1. Employment opportunities	• Employment should be managed by selecting suitable employees according to a selection system that ensures transparent recruitment from local, impacted communities. This will ensure a fair recruitment process. • Local employment opportunities should be maximised, with appropriate skill transfers for outside or migrant workers to pass those skills onto local workers. • Appropriate Human Resources policies and procedures should be developed and implemented to ensure that recruitment is done in a fair and transparent way, and that job creation opportunities are maximised.	Contractor	Continuous
7.1.3.2. Local Economic Development	• Business opportunities should be advertised in order for the community members to be informed about opportunities in the area.	Contractor	Continuous

	• Local contractors or builders could be assisted to establish operation-related Small, Medium and Micro Enterprises (SMMEs)		
7.1.4. Equipment and secured storage areas			
7.1.4.1. Equipment & Storage Areas	• Fuel tanks must meet relevant specifications and be elevated so that leaks may be easily detected. • Material Safety Data Sheets (MSDSs) must be readily available on site for all chemicals and hazardous substances to be used on site. Where possible the available, MSDSs must additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes. • Choice of location for equipment and storage areas must take into account prevailing winds, watercourses, distances to adjacent land uses, general on – site topography and erodibility of the soil. • Fire prevention facilities must be present at all storage facilities. • In cases of fire, assembly points must be clearly marked, and fire prevention measures implemented by competent personnel. • The storage area must be securely fenced and all hazardous substances such as fuel, oils, chemicals, etc., must be stored therein. Drip trays, a thin concrete slab, or a facility with PVC lining, must be installed in such storage areas with a view to prevent soil and water pollution.	Contractor/ ECO	On going

7.1.4.2. General & Hazardous Substances and Materials	• All material must be stored at the site camp and taken to construction sites when required. Only limited storage of materials may be allowed at the construction site. • Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures. The Contractor must ensure that its staff is made aware of the health risks associated with any hazardous substances used and has been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training. • Storage areas must be secure to minimize the risk of crime. They must also be safe from access by children and animals. • Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals, and any hazardous materials to be used must be provided to prevent the seepage of spillage into the ground thus potentially contaminating groundwater. • These pollution prevention measures for storage must include a bund wall high enough to contain at least 110% of any stored volume. The Contractor must submit a method statement to the Engineer/ ECO for approval.	Contractor/ ECO	On- going
7.1.4.3. Source of Materials	• The Contractor must prepare a source statement indicating the sources of all materials (including topsoil, sands, natural gravels, crushed stone, asphalt,	Contractor/ Engineer	During construction

	etc.), and submit these to the Engineer for approval prior to commencement of any work. • Where possible, a signed document from the supplier of natural materials must be obtained confirming that they have been obtained in a sustainable manner and in compliance with relevant legislation.		
7.1.5. Waste Management			
7.1.5.1. Ablution Facilities	• Temporary chemical toilets must be provided by a company approved by the Applicant. These toilets must be made available to all staff and must be located closer to watercourses. • The contents of temporal toilets must be disposed of regularly at an approved sewage treatment facility. Proof of safe waste disposal must be kept on file. • One chemical toilet per 15 workers must be stationed on site, within easy walking distance of the workers, with toilet/s to be serviced at least once a week by a registered company. Toilet paper must be supplied, and the toilet/s and area around them is to be kept hygienically clean at all times. • Such facilities must comply with local authority regulations and their use must be strictly enforced • These facilities must be placed on an impermeable surface to ensure that the ground surface/soil is not contaminated in any way. Care must be taken to avoid	Contractor/ ECO	Prior to construction and during construction.

	contamination of soils and water, pollution, and nuisance to adjoining areas. The construction of long drop toilets is forbidden.		
7.1.5.2. Provision for camp waste disposal	• Bins and/or skips must be provided at convenient intervals for disposal of waste within the construction camp. • Individual skips for different types of waste (e.g., 'household' type refuse, building rubble, etc.) must be provided. The refuge must be stored in separated receptacles for various types of waste and workers must be encouraged to use them as per designated type of waste. • Proposed method of waste handling, storage and disposal must be confirmed and agreed upon in conjunction with the ECO, Engineer and Contractor. General waste produced on site includes: ➢ Office waste (e.g., food waste, paper, plastic). ➢ Operational waste (clean steel, wood, glass); and ➢ General domestic waste (food, cardboards, paper, bottles, tins). • Hazardous waste produced on site includes: ➢ Oil and other lubricants, diesel, paints, solvent. ➢ Containers that contain chemicals, oils, or greases; and ➢ Equipment, steel, other material (rags), soils, gravel and water contaminated by hazardous substances (oil, fuel, grease, chemicals, or bitumen).	Contractor/ ECO	During Construction

	• All waste and excessive material must be removed from site and disposed of at the nearest landfill site and waybills kept for proof of disposal. • Construction rubble must be disposed of in pre-agreed, demarcated spoil dumps that have been approved by the Engineer. • Hazardous waste disposal must be carried out by an approved waste Contractor and waybills kept for proof of disposal. • The excavation and use of rubbish pits on site are forbidden and the burning of waste is forbidden. • No waste shall be retained on site for a period exceeding 14 days. Waste containers must be emptied frequently to avoid rodents, insects or any other organisms accumulating on the site and becoming a health hazard to adjacent properties.		
7.1.6. Conservation of Natural Environment			
7.1.6.1. Flora and Fauna	• Removal of vegetation and trampling must be kept to a minimum • Existing roads must be used where feasible. • No vegetation may be cleared without the prior permission from the ECO. Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. • The ECO must be given a chance to mark vegetation that is to be conserved before the Contractor begins clearing the site. As work progresses the	Contractor/ SHE	During construction

	Contractor is to check that vegetation clearing has the prior permission of the Engineer and ECO. • Care must be taken to conserve existing plant and animal life on and surrounding the site. Disturbance to birds, animals and reptiles and their habitats must be minimised wherever possible. • Immediate re-vegetation of stripped areas and removal of aliens by weeding must take place. This significantly reduces the amount of time and money spent on alien plant management during rehabilitation. • Alien plant encroachment is particularly damaging to natural habitats and is often associated with disturbance to the soil during construction activities. Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas.		
7.1.6.2. Topsoil and Stockpile Management	• Topsoil is to be stripped to a depth of 150 mm and conserved to be used for the rehabilitation of the site. • Topsoil and subsoil must be stockpiled separately and replaced according to correct profile – i.e., topsoil replaced last. • Stockpiles are to be no more than 2m high and must be protected from wind and water erosion and be kept in a weed free condition. • Topsoil stripped from the construction camp and other construction areas must be stockpiled away from any potential disturbances. All earthworks	Contractor	During construction

	must be vegetated as soon after completion of construction as is practically possible with locally sourced indigenous vegetation. • If stockpiles are exposed to windy conditions or heavy rains, they must be covered either by vegetation or cloth, depending on the duration of the project. • Material stockpiles or stacks, such as pipes must be stable and well secured to avoid collapse and possible injury to site workers / local residents. • Stockpiles must not be situated such that they obstruct natural water pathways. • All stockpiles must be clearly demarcated.		
7.1.6.3. Soil Erosion	• Wind screening and storm water control must be undertaken to prevent soil loss from the site. • Erosion control measures must be implemented during both the construction and operation phases in areas sensitive to erosion such as near water supply points, edges of slopes etc. • Procedures that are in place to conserve topsoil during the construction phase of the project are to be applied to the site set up phase. **The following measures need to form part of the management of the site:** • Placing of hessian sheets on bare cleared sloping areas.	Engineers/ ECO/ Contractor	During Construction

	• To reinforce points of confined discharge with reno-mattresses aimed at absorbing the impact of flow and spreading confined flows before discharge into the receiving environment. • Monitoring storm water exit points for any blockages and clearing them if found. • Fill in and re-vegetate eroded areas and monitoring from placing of topsoil to full revegetation phase. • Starting revegetation as soon as a practically possible to avoid soil erosion and alien plant proliferation.		
7.1.6.4. Geology	• Excavations must be done manually as far as possible. • In cases where excess noise will be generated as a result of blasting, local residents must be notified timely. • No excavation should be left open for longer periods. • Excavations should be clearly demarcated for safety of local communities. • Where required, provision must be made to accommodate or avoid collapsing settlement or structures • Structures must be founded below the collapsible horizon.	Engineer/ECO/Contractor	During construction
7.1.6.5. Disturbance to life in the surrounding area as a result of pollution	*Dust control:* • Employ dust suppression measures such as wetting of the project area during dry, windy periods. Unsurfaced roads and temporary roads must be regularly graded and watered to control dust.	Engineer/ECO/Contractor	During Construction

	• Active earth work areas, stockpiles and loads of soil being transported must be watered to reduce dust. • Measure must be taken to immediately mitigate a situation in which excessive fugitive dust is observed. Works being undertaken must be undertaken with caution, or phase down while the source is being actively investigated and suppression measures are implemented. • Disturbed soils, slopes and areas of open excavation must be minimised to avoid wind erosion. • Limit the height of stockpiles. • Where practical, do not leave large, cleared areas exposed for longer than necessary. • The area of disturbance must be kept to a minimum at all times and no unnecessary clearing of vegetation, digging or scraping should occur. • Vehicle speed should be limited to the lowest possible, and should not exceed 40km/h. *Noise* • Mitigation of this impact is difficult, but noise reduction measures should be implemented in all sensitive areas (e.g., adjacent to the streams) at sensitive times (e.g., at night). • No construction activities may take place between sunset and sunrise.		

	• Machinery that generates noise must be regularly maintained in order to ensure that no unnecessary additional noise is produced. • Construction activities must abide by the national noise laws and the municipal noise by-laws with regard to the abatement of noise caused by mechanical equipment. In the absence of bylaws, national regulations on noise control must be complied with. • The contractor shall institute noise control measures throughout the construction phase for all applicable activities, including the construction times. • Select vehicle routes carefully at selected intervals to avoid excessive disturbances to the surrounding community. • Where possible, fit efficient silencers and enclose engine compartments in plant vehicles. • Reduce noise at source by damping acoustic treatment, etc. • Isolate source by enclosure in acoustic building, room, etc. • Carefully select fixed plant site for remoteness from sensitive areas • Raise barriers or berms around noisy equipment. • Inform the community of planned noisy activities outside of working hours of 8am – 5pm and on weekends. • Ensure that the construction vehicles are under the control of competent personnel and are in proper working order.		

	Air pollution: • Diesel exhaust emissions from heavy machinery on site (excavators, front end loaders and hauling trucks) must be controlled and minimised by regular checks and servicing of vehicles. • Any construction vehicles found to be emitting excessive smoke should be stopped from operations for some mechanical attention before it could continue.		
7.1.7. Storm water and water quality Management			
7.1.7.1. Stormwater	• To prevent storm water damage, the increase in storm water run - off resulting from the construction activities must be estimated prior to construction and a storm water management plan must include specification for temporary storm water drainage structures. • Temporary cut-off drains and berms may be required to capture stormwater and promote infiltration during construction. • The storm water drainage system must not be contaminated by other waste sources and must therefore be separated from other wastewater drainage systems.	Engineer/ Contractor	During Construction

	• Drainage must be controlled to ensure that runoff from the site will not culminate in off-site pollution or cause water damage to properties further down from the site		
7.1.7.2. Hydrology and surface run-off	• No construction activities must be allowed within the delineated Floodline. • If necessary, these flood lines must be clearly demarcated on the layout plans and physically on site (where appropriate). • No construction activities must be allowed within the 10m buffer of the drainage lines, without prior approval. If necessary, these buffer areas must be clearly demarcated on the layout plans and physically on site (where appropriate). The incorrect handling, storage, transport and disposal of substances and materials, and polluted run-off can have serious negative effects on groundwater quality. Soil erosion and sediment is also detrimental to water quality. Other sources of pollution include polluted run-off from vehicle washing and wind dispersal of dry materials into rivers and water courses, which have detrimental effects on water quality	Contractor/ ECO/ SHE	During Construction
7.1.7.3. Water Quality	• The Contractor must compile a list of emergency contact numbers including those of the Department of Water and Sanitation and the ECO to refer to in order to deal with spillages and contamination of land and aquatic environments. • Storage areas that contain hazardous substances must be bunded with an approved impermeable liner.	Contractor/ ECO/ SHE	During Construction

	• All polluted run-offs must be collected on site and disposed of by a licensed treatment company.		
7.1.7.4.Spills Contingency Plan	A comprehensive spills contingency plan must be put in place so as to ensure that proper steps are followed with regards to the spills. The spills must be managed by the following procedure: • Stop the source of the spill. • Contain the spill. • If significant, spill must be reported to the DWS and other relevant authorities. • Remove the spilled product for treatment or authorised disposal. • Determine if there is any soil, groundwater, or other environmental impacts. • Remedial action must be taken in consultation with DWS and other regulatory authorities • The incident must be documented.	Contractor/ ECO/ SHE	During Construction
7.1.7.5. Concrete/Cement	• Ready mix concrete must be used where possible and no vehicles transporting concrete, asphalt or any other contaminating products to the site may be washed on site. • Concrete/Cement mixing must be restricted to hardened surfaces and mixing mats within the construction zone. It must take place on plastic liners where proper mats cannot be acquired to avoid contamination of soil.	Contractor/ ECO/ SHE	During Construction

	• Cleaning of cement mixing and handling equipment must only be done using proper cleaning trays. • All excess cement and concrete are to be contained on the construction site prior to disposal off site in a suitable landfill and waybills kept for proof of disposal.		
7.1.8. General Environmental Conduct			
7.1.8.1. Cultural and heritage artefacts	If any heritage artefacts are exposed during excavation the following must be done: • All construction work in that area must cease immediately and the Environmental Control Officer must be notified as soon as possible. • All discoveries must be reported immediately to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made. • Amafa aKwaZulu Natali must also be notified of discoveries. • Acting upon advice from specialists and authorities, the Environmental Control Officer will advise the necessary actions to be taken. • Under no circumstances must any artefacts be removed, destroyed, or interfered with by anyone on the site. Contractors and workers must be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological, or paleontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).	Contractor/ ECO	During construction

7.1.8.2. Record Keeping	• The ECO/ Engineer will continuously monitor the Contractor's adherence to the approved EMPr and must issue to the Contractor a notice of non-compliance whenever transgressions are observed. • The ECO/ Engineer must document the nature and magnitude of the non-conformance in a designated register, the action taken to discontinue the noncompliance, the action taken to mitigate its effects and the results of the actions. The noncompliance must be documented and reported and captured in a monthly report. • The Engineer is the primary responsible person with authority over the secondary responsible roles, duties and tasks of the ECO and the Contractor. • All monitoring conducted by the ECO must be recorded in writing and handed to the Engineer.	Engineer/ Contractor/ ECO	During construction
Post Construction Phase: Environmental Management Programme			
7.1.9. Management of Post Construction Phase			
7.1.9.1. Site Camp	• All structures comprising the construction camp are to be removed from site. • The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint etc. and these must be cleaned up.	Contractor /SHE	Prior to, during and after construction.

	• All hardened surfaces within the construction camp area must be ripped, all imported materials removed, and the area must be top-soiled and re-vegetation if appropriate. • The contractor must arrange the cancellation of all temporary services.		
7.1.9.2. Access Roads	All roads used by construction vehicles must be rehabilitated, at least to their original condition, by the contractor.	Contractor/ Engineer	Post Construction
7.1.9.3. Vegetation	• All areas that have been disturbed by construction activities (including the construction camp area) must be cleared of alien vegetation. • Alien plants must be treated according to the species type using guidelines set in the invasive Alien Plants in KwaZulu Natal Management and Control Wildlife Handbook by WESSA – KZN. • Open areas/exposed soils that are not developed are not to be promptly re-vegetated. • All vegetation that has been cleared during construction phase is to be removed from site or used as much as per the re- vegetation specifications (except for seeding alien vegetation). The contractor is to water and maintain all planted vegetation until the end of the defects liability period and is to submit a method statement regarding this to the engineer.	Contractor/ SHE/ ECO	Post Construction and rehabilitation

7.9.1.4. Materials	• All residual stockpiles must be removed to spoil or spread on site as directed by the Engineer. • All excess building materials must be removed from the site. All construction rubble must be removed from the site and disposed of at a licensed waste disposal site. The Contractor responsible for the removal of rubble/ waste must supply a certificate indicating safe disposal of such rubble at a permitted waste disposal site.	Contractor/SHE/ECO	Post construction and rehabilitation.
7.9.1.5. Landscaping	• All disturbed areas or areas which have been engineered for the purpose of the development, must be rehabilitated with indigenous vegetation, which must be sourced from surrounding local nurseries where possible. This will aid in preventing erosion within the site. • All plants material must be obtained either from nurseries; from a phased "search and rescue" operation on the site prior to clearing; or from an area in close proximity to, and of the same veld type as, the site, as indicated by the Engineer/ ECO. Living plant material obtained from the site must include whole plants, cuttings (propagation material), bulbs, corms, runners, rhizomes, grass sods, etc. • No plants or plants with exposed roots must be subjected to prolonged exposure to drying winds and sun or subjected to water logging or force feeding at any time after purchase.	PM/ECO/Contractor	Post construction and Rehabilitation

	• The contractor must ensure that the plants are in good condition and free from plant diseases and pests. Contactor must immediately remove plants containing any diseases and / or pests from the site. • All plants supplied by the Contractor must be healthy, well formed, and well rooted. Roots must not show any evidence of having been restricted or deformed at any time, unless these were plants rescued from natural habitats for replanting. • The potting materials used must be weed free. There must be sufficient topsoil around each plant to prevent desiccation of the root system. Where plants are stored on Site prior to planting they must be maintained to ensure that the root systems remain moist. • All indigenous plants that have been removed from a site prior to clearing, must be identified and labelled and returned to the same habitat, aspect and, where possible, position from which they were removed. Where possible, GPS co-ordinates must inform final placement of these plants.		
7.1.9.6. Rehabilitation	• Rehabilitation must be done in accordance with the Rehabilitation Plan that will be drawn once the proposed development has been authorised. • The Contractor must repair any damage that the construction works has caused to neighbouring properties. • Surfaces are to be checked for waste products from activities such as concreting or asphalting and cleared in a manner approved by the Engineer.	PM/ECO/ Contractor	Post Construction and Rehabilitation

	• Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas during and following rehabilitation. • All surfaces hardened due to construction activities are to be ripped and imported material thereon removed. • All rubble is to be removed from the site to an approved disposal site as approved by the Engineer. Burying of rubble on site is prohibited. • Contractor is to check that all storm water channels and watercourses are free from building rubble, spoil materials and waste materials. • The Contractors' camp sites must be rehabilitated to its pre-establishment condition or agreed alternative. Final payment and the certificate of completion must not be processed until rehabilitation has been concluded to the satisfaction of the ECO and Engineer.		
7.1.9.7. Monitoring and Maintenance Programmes	• Any erosion scars found on site during monitoring and maintenance inspections must be rehabilitated immediately. Once rehabilitated the affected areas must be monitored for an appropriate amount of time to ensure no further erosion risks. • Alfred Duma Local Municipality must ensure appropriate maintenance of infrastructure. • A meeting is to be held on site between the Project Manager, Engineer, ECO, and the Contractor to approve all remediation activities and to ensure that the site has been restored to a condition approved by the Project Manager	Engineer/ECO/Contractor	Post construction and Rehabilitation

	and Engineer. A representative of DEDTEA must be present at the final meeting or when the site is handed over on completion of construction.		
Operational Phase: Environmental Management Programme			
7.1.10. **Management of Operational Phase**			
7.1.10.1. Vegetation / Landscape Management	Previously disturbed areas to be monitored to assess the extent of environmental damage imposed during construction phase; these areas are to be prioritized for rehabilitation to prevent degradation from recurring.	Alfred Duma Local Municipality	Post construction and operation
7.1.10.2. Noise Control	Noise level associated with the operation phase are rated as Negative low.	-	-
7.1.10.3. Traffic / Transport	• Appropriate signage must be installed to enhance safety of pedestrians. • Road users are going to be affected during the construction phase, it is a requirement that road users are notified and consulted prior to the construction phase with regards to the construction schedules, transportation corridors, construction of additional temporal access roads [where applicable] and construction methods to be used. • Limit the movement of construction vehicles in areas where sensitive receptors are situated e.g., schools and pedestrians.	Alfred Duma Local Municipality	Post construction and rehabilitation

7.1.10.4. Storm Water Management	The storm water management system for the development needs to be maintained and monitored on a regular basis as directed by the engineer.	Alfred Duma Local Municipality	Post construction and operation
7.1.11. Decommissioning Phase			
The objective of providing guidelines during the decommissioning phase is to prevent structures from being left to deteriorate and look unsightly. It is imperative that non - functional structures be removed as soon as possible, and that the site is rehabilitated as soon as possible. If non - functional structures are not needed anymore, and not removed, it must be maintained that they will be used to prevent the environmental degradation of the site.			
Rehabilitation: Environmental Management Programme			
7.1.12. Management of rehabilitation			
7.1.12.1. Returning the construction site camp to almost its pre-establishment state	• All structures used for the establishment of the construction camp are to be removed from site. Disassemble all infrastructure units and remove components from the working and storage areas. This will include temporary office and storage structures and containers, water supply pipelines, water storage containers, waste storage containers, power supply, etc. • Drain all portable chemical toilets, with no spillage of the contents. Transfer the contents to an appropriate disposal site. Safe waste disposal certificates must be kept.	Contractor	Post construction

	• Disassemble all fencing around the camp and either sell, auction, or donate the components to the local community or transfer the waste components to a disposal site or the contractor's base. • Excavate all areas of contaminated substrate, transfer the contaminated substrate to an appropriate disposal site and treat the affected areas with appropriate ameliorants. • Remove all plastic linings used for pollution control and transfer to an appropriate disposal site. • Break up all concrete structures that have been created (e.g., working and parking surfaces) and remove concrete waste to an appropriate disposal site. These sites must be top soiled and re-grassed. • All residual stockpiles must be removed to spoil or spread on site as directed by the Engineer. • Temporary roads which were used during the construction phase must be closed and rehabilitated.		
7.1.12.2. Waste	• Remove all excess construction materials from the storage area and construction site and either sell, auction, donate to the local community or transfer to the Contractor's base. • Drain all collection sumps and dispose of the contaminated liquid and solids at an approved disposal site.	Contractor	Post construction

	• Remove all construction debris, litter and domestic waste from the construction site and transfer to an appropriate disposal site. Remove all waste receptacles and either donate to the local community, auction, or transfer to Contractor's base.		
7.1.12.3. Alien vegetation	• All areas that have been disturbed by construction activities (including the construction camp area) must be cleared of alien vegetation. • Existing and newly established alien vegetation must be removed from the property and replaced, where necessary, with suitable indigenous / endemic plant species. During this process, it is imperative that indigenous vegetation is not removed or disturbed. • All vegetation that has been cleared during construction is to be removed from site or used as much as per the re-vegetation specification, (except for seeding alien vegetation (except for seedling alien vegetation).	Contractor	Construction and post construction
7.1.12.4. Revegetation	• All areas of bare soil must be re-vegetated and rehabilitated. Open areas are to be re-planted as per the re-vegetation specification. Only indigenous species should be used for landscaping. No exotic plants are to be introduced.	Contractor	Post construction, as and when required

	• It is important that the re-vegetation activities be planned in advance to ensure that seed and plant stockiest are able to supply the required volume when required. • The contractor is to water and maintain all planted vegetation until the end of the defects liability period and is to submit a method statement regarding this to the Engineer.		
7.1.13. Specialists recommendations – Aquatic Ecological Impact Assessment			
7.1.13.1 Construction Footprint Limit & Demarcation	• Prior to construction, the footprint must be demarcated to prevent work being undertaken within the watercourse riparian zone downstream. • The demarcation must be signed off by the Environmental Control Officer (ECO). • The demarcation must be maintained until the repairs are completed. • Laydown, site offices and other storage areas must be clearly demarcated and located at least 30m from • The boundary of any riverine or wetland habitat, ideally on flat surfaces.		
7.1.13.2. Soil Erosion Control Measures	• Sediment barriers must be installed in areas sensitive to erosion such as near water supply points and actively eroding areas nearby stream banks. These measures include but are not limited to - the use of sandbags, hessian sheets, silt fences, geotextiles, rock gabions, etc. The silt fence / curtain must be maintained regularly to ensure that they function effectively.		

	• After every rainfall event, the contractor must check the site for erosion damage and immediately repair. any damage recorded. • Unnecessary clearing of natural areas should be kept to a minimum in order to make use of natural erosion. • suppressors, such as good grassland cover
7.1.13.3. Soil Management	• Prior to commencing with earthworks, the topsoil must be stripped and stockpiled separately from subsoil. • Topsoil must be kept for use during rehabilitation of landscaped areas. • Topsoil must be stockpiled in stockpiles not exceeding 2m in height. • All stockpiles must be kept free of weeds and invasive alien plants. • If soil stockpiles are at risk of being eroded, they must be secured with sandbags around the base of the • stockpile. • All stockpiles must be established outside the 30m buffer of the Riparian Zone and on flat ground
7.1.13.4. Pollution Prevention Measures	• Any soil contaminated by hydrocarbons (fuel and oils), asphalt, bitumen, binding agents, concrete and/or any other chemical must be removed, and the affected area rehabilitated immediately.

	• Chemical toilets must be provided to workers during the construction phase. A single chemical toilet must be provided for every 10 employees. • Chemical toilets must be placed away from sensitive areas and must be serviced regularly by a registered. service provider and waybills must be retained as proof of servicing. • Fuel must be stored in a bunded structure with a roof. The bund must be able to contain at least 110% of the volumes of fuel. • Mixing and/or decanting of all chemicals and hazardous substances must take place on a tray, shutter boards or on an impermeable surface. • Drip trays should be utilised at all dispensing areas. • A chemical spill kit must be present onsite at all times. • All solid waste must be collected and placed in bins.

7.1.13.5. Dust Control and Suppression	• The control and suppression of dust emanating from the construction zone is of critical importance. • Watering of the road surface must take place during the day to keep the topsoil most and minimise the flocculation of dust from the construction site. • The movement of heavy vehicles should be kept to a minimum and only when necessary. • Care must be taken to not apply excessive water to the road surface during dust suppression exercises, to ensure that sediment run-off and erosion of the road surface is kept to a minimum.
7.1.13.6. invasive Alien Plant Control	• The control and eradication of listed invasive alien species must be carried out by means of methods that are appropriate for the species concerned and the environment in which it occurs in. • All invasive alien plants must be removed from the construction area. • Mechanical control methods such as digging, hoeing, pulling out of weeds and invasive plants are recommended. • Use of chemical treatment methods must be kept to a minimum. • Where chemical treatment methods are used, the contractor must ensure that he uses watercourse friendly herbicides. • The methods employed to control and eradicate a listed invasive species must also be directed at the new growth, propagating material and re-growth of such invasive species in order to prevent such species from producing offspring, forming seed, regenerating or re-establishing itself in any manner.

7.1.13.7Temporary River/Stream Diversion	• A method statement must be compiled to guide the river diversion process from start to finish. • Use of coffer dams and gravity flume pipes is recommended for the project. A whole section of the river channel is isolated using barriers that span the full width of the river. This keeps a stretch of the river dry, and the water is transferred downstream of the works area through gravity fed flumes/pipes. The flume is normally placed on the bed of the watercourse through the works area and outfalls at the downstream • barrier, if present, or far enough downstream to prevent the water backing up into the work area. Safety requires that every cofferdam, and every component thereof, shall be of robust design and construction, of suitable and sound materials and of sufficient strength and capacity for the site in which it is used • Proper construction of the cofferdam, verification that the structure is being constructed as planned, monitoring the behaviour of the cofferdam and surrounding area, provision of adequate access, light and ventilation, and attention to safe practices on the part of all workers and supervisors is require • The cofferdam construction shall be properly maintained. • Diversions shall be temporary in nature and no permanent walls, berms or dams may be installed. • Under no circumstance shall a new channel or drainage canals be excavated to divert water away from the site

	• construction activities. Upon completion of the construction at the site, the diversions shall be removed to restore natural flow patterns, and the channel and riparian zone rehabilitated/restored to their original configurations as soon as practically possible. • If excess debris and sediment has collected upstream of the structure, remove the material before the dam is removed and dispose of the material properly.
7.1.14. Specialist recommendations – Geotechnical assessment	
7.1.14.1. General Earthworks It is recommended that all earthworks be carried out in accordance with SABS 1200 (current version) to promote stable site development.	
7.1..4.2 Recommended Subgrade Treatment As a general indication, subgrade treatment should comprise a simple rip and re-compact procedure. The surface of the road should therefore be ripped to at least 300mm depth, wet and re-compacted to minimum 93% MDD where a CBR of 10 may be adopted for design.	
7.1.14.3. Pavement Design Options The pavement design for this proposed road was not provided however general classification of materials investigated is stated in the section above. Materials encountered on site are generally suitable for use as ..subgrade, material >G10 will need to be improved chemically for use as subgrade	
7.1.15.4 Surface Drainage The road should be kept in a dry condition as follows: • Mitre drains to be constructed along sections of steeper grade • Generous, lined side-drains to be constructed at road edge along the toe of cuttings	

• Generous cross drainage to be allowed for at bends along steeper grade areas
7.1.16.5 Subsurface Drainage While at the time of investigation there was a general no groundwater seepage evident in the inspection pits put down, this situation could be expected to change significantly during or after the wet season or sustained rain periods. Groundwater seepage may gain ingress into road layers and destroy the material compaction and result in subgrade softening leading to bearing capacity failure. It is therefore recommended that adequate subsoil drainage be allowed for in the tender document for along all sections of the road where the elevation of the vertical alignment drops below natural grade.

8. TRANSGRESSIONS AND NON-CONFORMANCES

The applicant/contractor will be responsible for all costs incurred in the rehabilitation of the site and for ensuring that all procedures required to rehabilitate the site are implemented. If third parties are called to site to perform clean up and rehabilitation procedures, the applicant/contractor will be responsible for all costs. The competent authority may issue a compliance notice if conditions contained in this EMPr are contravened.

Transgressions relate to actions by the contractor or contractor team members whereby damage or harm is inflicted upon the environment or any feature thereof and where any of the conditions or specifications of the EMPr are infringed upon. In the instance of environmental damage, the damage is, where possible, to be repaired and rehabilitated using appropriate measures as specified and undertaken by relevant parties (e.g., ECO and competent authorities), for the account of the applicant, contractor, or other guilty party. In cases of non-repairable damage upon the environment or non-compliance with any of the EMPr obligations is registered, the applicant/contractor may face a penalty.

In cases where severe environmental damage occurs, the competent authority law enforcement division may take legal action against the responsible parties. The reason for this could include, but not limited to:

- Not implementing the conditions of this EMPr
- Major spillage that results in environmental damage
- Incorrect handling and storage of construction materials and chemicals
- Sensitive areas that are not clearly demarcated
- Performing ablutions in areas other than facilities provided for such actions; and
- Occurrence of unattended and out of control fire.

Transgressions are most likely to occur with respect to litter on site, damage to vegetation on site, disturbance of sensitive areas and erosion, commencing a listed activity without obtaining and environmental authorization and other conduct constituting non-conformances. If excessive infringement with regard to any of the specifications is registered, the Applicant reserves the right to terminate the Contractor's contract.

Should the contractor still not comply with the clause of the EMPr after two repeated offenses, the ECO, in consultation with the Applicant, has the right to suspend the construction works, after having served the contractor with only one written warning, until the contractor complies with the clause of this EMPr. All delays resulting from the suspension shall be for the expense of

the Contractor. All additional time, travel, and other expenses for the ECO shall be covered by the Contractor and payable within 10 working days of receipt of invoice.

9. GENERAL

Cultural and Natural Heritage

IMPORTANT:

If any heritage resources, artefacts, graves, and the likes are discovered during the course of the work, they should be cordoned off and AMAFA a KwaZulu Natali should be notified. Work at these sites may only continue once AMAFA have assessed the site and the necessary permits issued.

Communication with the Public

The Contractor must provide signage at the site camp indicating the contact details of the Engineer and Contractor; also ensure that staff is able to provide the public with the relevant contact details. A complaints register must be provided at the site office where the public may lodge a complaint. Tribal and local authorities must be notified of construction commencement. Labourers required to work on this project must also be sourced from the traditional authority in the area. It is common courtesy that local residents should be kept informed at all stages regarding progress and future work that is to take place. Permission should be obtained before any infrastructure is removed or relocated.

Liaison with Affected Parties

The Engineer must ensure that all necessary liaison with landowners, land users, community leaders, service providers and other affected parties must take place prior to construction and where required, the relevant consent obtained.

Water Supply

Ensure that the water use for the project is permissible under the General Authorisations. If not, a license will be required in terms of the National Water Act, Act 36 of 1998.

Below are the emergency contact details of personnel to be contacted as and when required:

Table 3: Emergency contact details

Contacts	Number
Department of Economic Development and Environmental Affairs (EDTEA) –uThukela District	060 9694 044
Department of Water and Sanitation	0800 200 200

KZN Emergency medical services	(033) 395-2111
KwaZulu-Natal Wildlife Services	(033) 845-1999
AMAFA	(033) 394-1137
ENVIRONMENTAL SPILLAGES Indaloenhle Environmental	031 003 3241
Environmental Control Officer	-

10. CONCLUSION

Implementation of measures outlined in this EMPr will ensure that construction and operational phases of the project will have minimal impact on the environment. If the measures outlined are not strictly adhered to, the contractor or responsible party will be prosecuted in terms of the applicable legislation. This Management Programme will govern all activities on the project site and the actions of all employees and agents of the Contractor.

Monitoring is required to ensure that the receiving environment at the study area is suitably safeguarded against the identified potential impacts, and to ensure that the EMPr requirements are adequately implemented and adhered to during the construction phase.

Compliance monitoring will commence in the pre-construction phase to ensure that the construction works are planned for taking into account the opinion of the DEDTEA, provisions of this EMPr and all the relevant legislations. Compliance monitoring will be completed at the end of the defects liability period to check the performance of rehabilitation measures and whether the related objectives have been met.

A document handling system must be established to ensure accurate updating of EMPr documents, and availability of all documents required for the effective functioning of the EMPr. Supplementary EMPr documentation could include:

- Method Statements
- Site instructions
- Emergency preparedness and response procedures
- Record of environmental incidents
- Non-conformance register
- Training records

- Site inspection reports
- Monitoring reports
- Auditing reports; and
- Public complaints register (single register for maintained for overall site).

The Contractor shall also develop and submit a Site Layout Plan illustrating the planned site layout, access routes, storage facilities, site camp area, parking areas, etc. This Site Layout Plan must first be approved by the Applicant and ECO prior to site establishment activities commencing.

APPENDICES

Appendix A: Detailed CV of the EAP

Appendix B: Complaints Register

Appendix C: Environmental Incident Reporting

Appendix D: Waste Profile Material Sheet

APPENDIX A: DETAILED CV OF THE EAP

APPENDIX B: COMPLAINTS REGISTER

The following table must be completed for each reported complaint. All complaints received must be investigated and a response (even if pending further investigation) is to be given to the complainant within 7 days. Add pages, as necessary.

TIME & DATE	CONTACT DETAILS OF COMPLAINANT	NATURE OF COMPLAINT	INVESTIAGTION UNDERTAKEN

APPENDIX C: ENVIRONMENTAL INCIDENT REPORTING

All environmental incidents occurring on the site must be recorded in the following table. Add pages, as necessary.

DATE & TIME	LOCATION & NATURE OF INCIDENT	ACTION TAKEN

APPENDIX D: WASTE PROFILE MATERIAL SHEET

A. Owner/ Operator information

Generator information	**Collector/ Transporter information**
Generator:	Collector:
Site address	Pick up address:
Contact No.	Contact No:
Email:	Email:

B. Waste stream information

<table>
<tr><td colspan="3">Waste name:</td><td colspan="5"></td></tr>
<tr><td colspan="3">Description of facility/ site history:</td><td colspan="5"></td></tr>
<tr><td colspan="3">Describe the process and source of the generated waste:</td><td colspan="5"></td></tr>
<tr><td colspan="3">Typical colours</td><td colspan="5"></td></tr>
<tr><td rowspan="2">Strong odour</td><td>Yes</td><td>No</td><td colspan="5" rowspan="2">Describe:</td></tr>
<tr><td></td><td></td></tr>
<tr><td colspan="3" rowspan="2">State</td><td>Solid</td><td>Liquid</td><td>Powder</td><td>Semi solid/ sludge</td><td>Other:</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="3">Waste composition:</td><td colspan="5" rowspan="4">If Yes, Describe</td></tr>
<tr><td>Question</td><td>Yes</td><td>No</td></tr>
<tr><td>Is waste containing material mixed with any hazardous substances?</td><td></td><td></td></tr>
<tr><td>Is waste containing material mixed with any regulated waste?</td><td></td><td></td></tr>
<tr><td colspan="3">Is waste containing material mixed with any radioactive or toxic substances?</td><td></td><td></td></tr>
<tr><td rowspan="2">Waste reactive</td><td>Yes</td><td>No</td><td colspan="5" rowspan="2">If yes, describe:</td></tr>
<tr><td></td><td></td></tr>
</table>

C. Sample information

	Yes	No
Sample submitted with profile		
Laboratory analysis submitted		
Material safety datasheet submitted		

D. Waste volume

	Yes	No
One time event		
Ongoing waste generation		
Estimated quantities (indicate unit of measure)		

E. Special handling comments

F. Certification

I hereby certify that the information submitted in this profile and all attached documents contain true and accurate description of the waste material and that the waste is non-hazardous/ hazardous (Delete inapplicable)

Name Signature Date