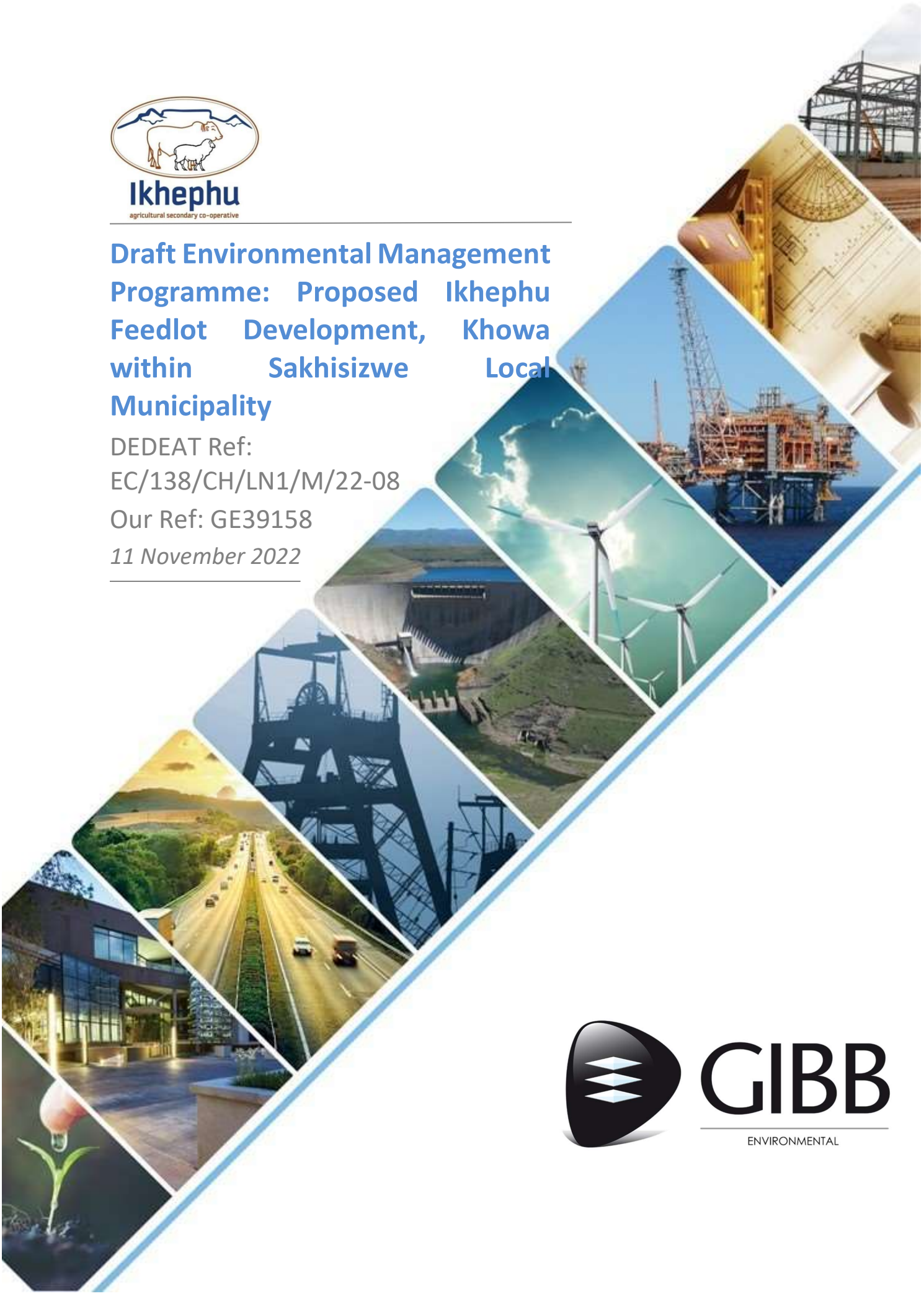
Ikhephu
agricultural secondary co-operative

Draft Environmental Management Programme: Proposed Ikhephu Feedlot Development, Khowa within Sakhisizwe Local Municipality

DEDEAT Ref: EC/138/CH/LN1/M/22-08

Our Ref: GE39158

11 November 2022



GIBB
ENVIRONMENTAL

Contact Information

Please contact the undermentioned should you require further information.

EAP Details: GIBB Environmental (Pty) Ltd	
Address: East London Office	GIBB House, 9 Pearce Street, Berea, East London, 5241
Website	www.gibbenvironmental.co.za
Contact Person	Zikhona Wana
Contact number	+27 43 102 0249
Email	zwana@gibbenvironmental.co.za

Proponent Details: Ikhephu Agricultural Co-operative	
Address:	12 Maclear Road, Khowa
Contact Person	Mr Gcina Madasa
Contact number	+27 45 931 2747
Email	madasagc2@gmail.com

Competent Authority Details: Eastern Cape Department of Economic Development, Environmental Affairs and Tourism	
Address:	Komani Office Park, Block E, Komani
Website	https://dedeaweb.azurewebsites.net/
Contact Person	Lelethu Booi/ Nondwe Mdekazi
Contact number	+27 45 808 4000
Email	Lelethu.Booi@dedea.gov.za / Nodwe.Mdekazi@dedea.gov.za

Disclaimer

This report, and information or advice, which it contains, is provided by GIBB Environmental (Pty) Ltd (GIBB) solely for internal use and reliance by its Client in performance of GIBB's duties and liabilities under its contract with the Client. Any advice, opinions, or recommendations within this report should be read and relied upon only in the context of the report as a whole.

The advice and opinions in this report are based upon the information made available to GIBB at the date of this report and on current South African standards, codes, technology and Environmental Legislation as at the date of this report. Following final delivery of this report to the Client, GIBB will have no further obligations or duty to advise the Client on any matters, including development affecting the information or advice provided in this report. This report has been prepared by GIBB in their professional capacity as Environmental Assessment Practitioners. This report is prepared in accordance with the terms and conditions of the GIBB contract with the Client. Regard should be had to those terms and conditions when considering and/or placing any reliance on this report. Should the Client wish to release this report to a Third Party for that party's reliance, GIBB may, at its discretion, agree to such release provided that:

a) GIBB's written agreement is obtained prior to such release, and
b) By release of the report to the Third Party, that Third Party does not acquire any rights, contractual or otherwise, whatsoever against GIBB and GIBB, accordingly, assume no duties, liabilities or obligations to that Third Party, and
c) GIBB accepts no responsibility for any loss or damage incurred by the Client or for any conflict of GIBB interests arising out of the Client's release of this report to the Third Party.

Draft Construction Environmental Management Programme for the Proposed Housing Development on Erf 43937, Mitchells Plain, Western Cape

CONTENTS

List of Figures

Appendices

Abbreviations / Acronyms / Definitions

BA	Basic Assessment
BAR	Basic Assessment Report
CE	Consulting Engineer
Construction Activity	A construction activity is any action taken by the Contractor, his

	subcontractors, suppliers or personnel during the construction process.
Contractor	That main organisation appointed by the Developer, through the Project Manager, to undertake construction activities on the site.
Developer	Ikhephu Agricultural Co-operative
DEDEAT	Eastern Cape Department of Economic Development, Environmental Affairs and Tourism
DWS	(Regional) Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EMPr	Environmental Management Programme
Environment	Means the surroundings within which humans exist and that are made up of the land, water and atmosphere of the earth; micro-organisms, plant and animal life; and any part or combination of amongst these and the interrelationships among and between these; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.
Environmental Specifications	Instructions and guidelines for specific construction activities designed to help prevent, reduce and/or control the potential environmental implications of these construction activities.
EO	Environmental Officer
ER	Engineers' Representative
GIBB Environmental	GIBB Environmental (Pty) Ltd.
GN	Government Notice
Eskom	Eskom Holdings SOC Limited
Method Statement	A written submission by the Contractor to the Project Manager in response to the Specification setting out the plant, materials, labour, timing and method the Contractor proposes using to carry out an activity. The Method Statement shall cover applicable details with regard to: • Construction procedures; • Materials and equipment to be used; • Getting the equipment to and from site; • How the equipment/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 solid material that may occur; • Timing and location of activities; • Compliance/ non-compliance with the Specifications; and • Any other information deemed necessary by the Project Manager.
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended
NWA	National Water Act, 1998 (Act No. 36 of 1998), as amended
Project	This refers to all construction activities associated with the proposed activities.
PM	Project Manager
Rehabilitation	Rehabilitation is defined as the return of a disturbed area, feature or structure to a state that approximates to the state (where possible) that it was before disruption, or to an improved state.
SHE	Safety, Health and Environment
Solid Waste	Means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).
WUA	Water Use Authorisation

1 Introduction

1.1 Background

Ikhephu Co-Operative (hereinafter referred to as Ikhephu) proposes to develop a cattle feedlot in Khowa (Elliot), under the jurisdiction of Sakhisizwe Local (SLM) and Chris Hani District Municipality (CHDM). The development will fall on Erf 1 of Elliot owned by the SLM, about five kilometres (km) north of Khowa and along R58 leading to Barkly East (**Figure 1** below).

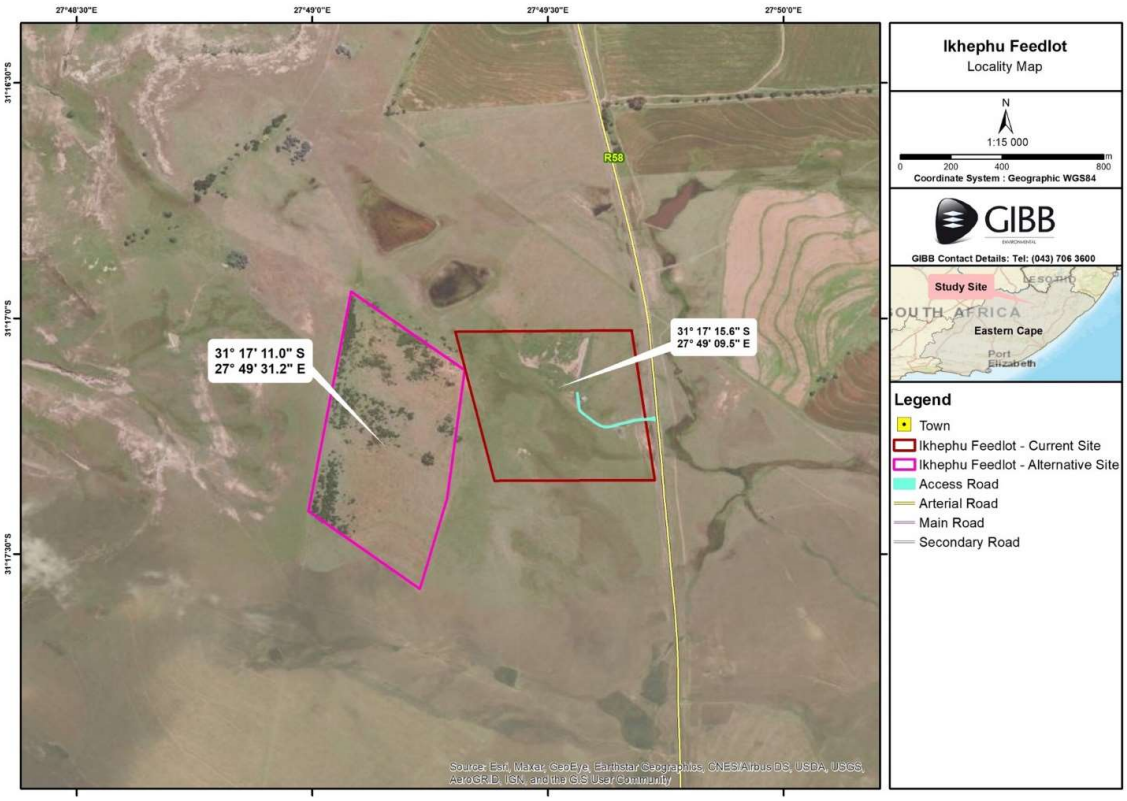


Figure 1: Locality of the current and alternative site

The Ikhephu Feedlot has an existing footprint developed by the CHDM, accessed through a gravel road with a boundary fence intact on all sides, however, the current site cannot be utilised to full capacity due to design issues. The Current Site measures about 33.3 hectare (ha) while the Alternative Site is approximately 38.4ha, of which only less than 20ha will be utilised for the proposed development. The land is relatively flat on the northern and western sides of the Alternative Site, occurring at an altitudinal range of 1 515 to 1 525 metres above mean sea level (mamsl), and slopes down towards the east and south side to an altitude of between 1 500 and 1 510 mamsl. The Current Site occurs at an average altitude of 1490 mamsl.

The existing facility infrastructure includes three-camp feedlot meant to house 450 animals, a steel storage structure utilised for feed storage and mixing, some water infrastructure (including a borehole), and incomplete offices (to be completed).

The proposed design will include:

- 2.3ha feedlot to house 1 500 head of cattle in camps not exceeding 150 head of cattle (15 square metres [m^2]/ animal) with feeding troughs and water reticulation;
- Load and offload facility (existing);
- Vehicle weigh bridge to be situated at the main entrance;
- Animal handling facility;
- Receiving and isolation pen;
- Water supply infrastructure (existing borehole);
- Feed storage and mixing shed (existing);
- Grain storage silo (2 x 30 ton) and hammer mill next to the existing feed storage and mixing shed;
- Vehicle storage/ workshop facility (18 x 40 metres [m] steel structure) to be situated near the existing feed storage and mixing shed facility;
- Office facilities (the existing incomplete structure is to be completed).
- The design makes provision for the control of runoff water (stormwater cut-off embankments), waste lagoon, temporary storage of waste, disposal of solid waste (composting), toilets and facilities for labour force and internal roads.
- Provision will be made for future expansion to 2 000 head of cattle in camps not exceeding 200 head of cattle (20m^2/ animal), this has been accounted for in the Integrated Environmental Authorisation (IEA) application and this BAR.

1.1.1 Stormwater Management

Stormwater cut off embankments are to be constructed along the entire western side of the feedlot to divert stormwater away from the feedlot so as to minimise stormwater coming into contact with the cattle dung and feed waste (contaminated stormwater). Further stormwater cut off embankments are to be installed on the eastern side of the feedlot to divert contaminated stormwater into the proposed 10 000 cubic metres (m^3) waste lagoon or storage dam. The contaminated stormwater in the storage dam will be utilised to irrigate arable lands/ pastures on site.

1.1.2 Water Supply

As alluded to above, a borehole exists within the Current Site. The registration status of the borehole is unknown, as per AGES Omega (2022) the borehole has a blow yield of 3.40 litres per second (l/s) and 0.80l/s sustainable yield.

Water supply for construction purposes will be sourced by the contractor either by using the water from the existing borehole, or carting water to site.

Water supply for operational purposes will be sourced from the existing borehole post testing. If the yield of the borehole is sufficient and should the registration of the borehole not be confirmed, the borehole will be registered with the regional Department of Water and Sanitation (DWS). Should the borehole not be found viable, a new borehole will need to be sited, drilled, and tested. The registration of existing borehole or establishment of a new one is not part of this application, nor the Water Use Authorisation (WUA) being undertaken by the EAP in conjunction with this application.

1.1.3 Wastewater and Sewer Management

The contractor will be responsible for sewer management during the construction phase, i.e., supply toilet facilities for construction personnel, which would be in the form of chemical toilets. These will be cleared from time to time as depicted in the Draft Environmental Management Programme (EMPr).

Sewer management during the operational phase will be through toilet facilities (French-drain septic tank) at the administration building that can be used by all personnel on site. A 6000 litre septic tank suited for use by 20 to 25 people will be installed within the Current Site, outside the delineated wetlands. The diameter of the tank will be 1 950 millimetres (mm), with a height of 2 080mm and length of 3 330mm. A 110mm diameter pipe of not more than 20m in length will convey the effluent from the toilets to the septic tank. French-drain septic tanks operate by settling of solids to the bottom, floating of scum to the top and the overflow of liquid through an outlet pipe into a distribution chamber, where it is directed into the septic field. The septic field is an effluent water disposal system, where the liquid is channelled through perforated pipes to different parts of a field of loose gravel.

1.1.4 Solid Waste Management

Solid waste from the construction site will be stockpiled in designated containers/ demarcated sites, whereafter it will be disposed of by the contractor at the municipal waste management facility.

During the operational phase solid waste to be generated will include feed waste stemming from the scraping of the feed pens (to remove the manure and excess feed, limit the amount of dust as well as moisture build-up on the surface at times when the weather is wetter). The concrete feedlot floor (pad), which will be provided with an interface layer to prevent groundwater contamination, will drain horizontally to the stormwater embankments. The pad will also be cleaned regularly to prevent contaminated runoff stemming from the pad to the open natural area immediately to the east and part of the north side of the feedlot. The cattle dung is to be heaped on a concrete area specifically developed to contain dung. The feed waste will be placed over a temporary dung heap (manure), below the feedlot and above the stormwater embankments and associated lagoon, from where it will be carted to the arable lands where it will be utilised as organic fertiliser.

1.1.5 Electrical Supply

There is an existing electrical supply point installed by Eskom Holdings SOC Limited (Eskom) on the Current Site, the operational activities will make use of this connection. Should more connections be required within the site, this will be the primary source.

Where possible, the contractor may negotiate to make use of the electricity during the construction phase. Alternatively, the contractor will need to provide their own electrical supply in the form of generators.

1.1.6 Site Access

Access to the Current Site already exists through a 350m long gravel road commencing from the R58 to the current offload facility. An existing 330m long track, to the north-western part of the Current Site, connects the Current Site to the Alternative Site. The track commences near the current offload facility, where the access road terminates, to a second Current Site gate situated at the north-western corner. It is the intention of the developer to gravel the track to a width of 6m, thereafter develop a new 870m long by 6m wide gravel road within the Alternative Site.

2 Legislative Context

2.1 National Environmental Management Act, 1998 (Act 107 of 1998) as amended, and National Environmental Management Waste Act, 2008 (Act 59 of 2008) as amended

The process is undertaken as part of the impact assessment for the proposed development as part of the Basic Assessment (BA) process due to the triggered activities in terms of Listing Notice 1 and 3 of the Environmental Impact Assessment Regulations, 2014 as amened (EIA Regulations) promulgated under the National Environmental Management Act, 1998 (Act 107 of 1998), as amended (NEMA) including Government Notice No. 921 of 2013 enacted in terms of the National Environmental Management Act, 2008 (Act 59 of 2008), as amended. An Integrated Environmental Authorisation (IEA) is therefore being undertaken.

2.2 National Water Act, 1998 (Act 36 of 1998), as amended

The water resources of South Africa are protected by the DWS as it is the custodian of the water resources of South Africa. As such Water Use Activities that require registration, General Authorisation or Water Use License (WUL) before commencement are listed under Chapter 4, Part 1, Section 21, Paragraph (a) – (k) of the National Water Act, 1998 (Act 36 of 1998), as amended (NWA).

Section 21, Paragraph (c), (i) and (g) are triggered by the proposed project.

2.3 National Heritage Resources Development Act, 1999 (Act No. 25 of 1999)

The proposed development also has implications for registration with the Eastern Cape Provincial Heritage Resources Authority (ECPHRA) as per Section 38, Subsection (1), Paragraph

(a), (c)(i), of the National Heritage Resources Development Act, 1999 (Act 25 of 1999), as amended (NHRA), as described below.

Section 38, Subsection (1): Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as:

- the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- any development or other activity which will change the character of a site exceeding 5 000m^2 in extent;
- the re zoning of a site exceeding 10 000m^2 in extent; or
- any other category of development provided for in regulations by South African Heritage Resources Agency or a provincial heritage resources authority;

must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

According to ArchaeoMaps (2022), two archaeological and cultural heritage resources were recorded within the site. These constitute partial Colonial Period kraal mound remains and Living Heritage (khowa habitat). The kraal remains are of no scientific or heritage conservation significance and it is recommended that these remains be destroyed without having to apply for site destruction permit from the ECPHRA. The living heritage characterises not only the Current Site but also the Alternative Site, albeit most prominently so within the wooded tree clusters typical of the mosaic landscape associated with the northern portion of the Alternative Site. The presence of the khowa is of High Local Significance and it is recommended that as much of the wooded habitat, but no less than a third (≥6ha) of the northern portion of the Alternative Site, be conserved thereby ensuring in part and on site, and in perpetuation of future generations the conservation of the mushroom habitat within the development framework (ArchaeoMaps, 2022). Additionally, a Heritage Management Plant must be developed by the applicant to guide the management of the conserved living heritage within the Alternative Site.

Based on sub-surface evidence, in support of a general anthropogenic sterile sub-surface at the Alternative Site and Current Site, it is unlikely although not impossible, that sub-surface archaeological and cultural heritage resources will be encountered during the course of construction (ArchaeoMaps, 2022). The Archaeological and Cultural Heritage Impact Assessment is attached as Appendix D3 of the Draft Basic Assessment Report (BAR).

A site-specific field survey of the development footprint was conducted on 10 September 2022 by a Palaeontologist, no fossiliferous outcrop was detected in the Current or Alternative Site. The apparent rarity of fossil heritage in the study site footprint suggests that the impact of the development will be of a Low significance in palaeontological terms (Banzai Environmental, 2022). It is therefore considered that the proposed development will not lead to damaging

impacts on the palaeontological resources of the area. The Palaeontology Impact Assessment is attached as Appendix D4 of the Draft BAR.

However, if heritage materials are encountered during the construction phase of the proposed development, works must cease and ECPHRA must be contacted immediately.

3 Structure an Objectives of the EMPr

3.1 Applicable Documentation

The following documentation is applicable to the proposed development, and must be read in conjunction with this EMPr:

- Draft BAR for the proposed development;
- Permits and/or licences that may be acquired before the construction of the proposed development, i.e. WUA in terms of NWA and IEA in terms of the EIA Regulations; and
- All acts, ordinances and by-laws relevant to the proposed project.

3.2 Structure of the Construction Environmental Management Programme

This EMPr provides mitigation and management measures for the following phases of the proposed development:

- Construction Phase: This section of the EMPr provides management principles for the construction phase of the proposed development. The environmental actions, procedures and responsibilities as required within the construction phase are specified. These specifications shall form part of the contract documentation and, therefore the Contractor will be required to comply with the specifications to the satisfaction of the Project Co-ordinator and Environmental Control Officer (ECO), in terms of the construction contract; and
- Operational Phase: This section of the EMPr provides management principles for the operational phase. The environmental actions, procedures and responsibilities as required within the construction phase are specified. These specifications shall form part of the operational documentation .

It should be noted that this EMPr is a dynamic document which should be updated as and when required, i.e. the granting of the IEA and WUA, etc. Any amendments made must be submitted to the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT), DWS, ECO and Proponent for approval prior to implementation.

3.3 Objectives of the EMPr

The EMPr has the following objectives:

- To outline functions and responsibilities of responsible persons;
- To state standards and guidelines which are required to be achieved in terms of environmental legislation;

- To outline mitigation measures and environmental specifications which are required to be implemented for all phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts; and
- To prevent long-term or permanent environmental degradation.

4 Functions and Responsibilities

4.1 Responsibilities

Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the various personnel for the proposed development are detailed below.

4.1.1 The Developer/ Proponent

- The proponent is ultimately accountable for ensuring compliance to the EMPr and conditions contained in the IEA and WUA, if granted. The ECO must be contracted by the developer as an independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of IEA (if granted), and the EMPr approved by the DEDEAT for the proposed development; and
- The developer is further responsible for providing and giving a mandate to enable the ECO to perform responsibilities. The developer must ensure that the ECO is integrated as part of the proposed project team.

4.1.2 The Consulting Engineer

Contracted by the developer to design and specify the proposed development engineering aspects. Generally, the engineer runs the work's contract. The Consulting Engineer (CE) may also fulfil the role of Project Manager (PM) on the proponent's behalf.

4.1.3 Project Manager

The PM has the over-all responsibility for managing the proposed development, contractors and consultants, as well as ensuring that the environmental management requirements are met. The CE may also act as the PM. All decisions regarding environmental procedures must be approved by the PM. The PM has the authority to stop any construction activity in contravention of the EMPr in accordance with an agreed warning procedure.

4.1.4 Engineers Representative

The consulting Engineer's Representative (ER) on site has the power or mandate to issue site instructions and in some instances, variation orders to the contractor, following request by the Environmental Officer (EO) or ECO. The ER oversees site works, liaise with Contractor and ECO.

4.1.5 Environmental Officer/ Manager

- Appointed by the CEs as their environmental representative on site, the EO is not independent but must rather act on behalf of the CEs with the mandate to enforce

compliance under the proposed project contract which must include this EMPr. The EO has the directive to issue non-conformance and hazard certificates. Further, in terms of accepted industry practice the EO could issue the equivalent of a "cease works" instruction only in exceptional circumstances where serious environmental harm has been or is about to be caused, i.e. in cases of extreme urgency and then only when the ER is absent;

- The EO must form part of the proposed project team and be involved in all aspects of the proposed project planning that can influence environmental conditions on site. On activities of this description, housing development, the EO must also be the liaison between the contractor and landowners (where required);
- The EO must attend relevant project meetings, conduct daily inspections to monitor compliance with this EMPr, and be responsible for providing reports and feedback on potential environmental problems associated with the proposed development to the project team and ECO;
- The EO must convey the contents of this EMPr to the Contractor's site team and discuss the contents in detail with the Contractor as well as conduct an induction and an environmental awareness training session prior to site handover to all contractors and their workforce; and
- The EO must be suitably experienced with the relevant qualifications and preferably competent in construction related methods and practices.

4.1.6 The Environmental Control Officer

- An independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of IEA and WUA, and the EMPr for the proposed project. The ECO must be on site prior to any site establishment and must endeavour to form an integral part of the proposed project team;
- The ECO must be proactive and have access to specialist expertise as and when required, these include all engineering and environmental specialists, etc.;
- The ECO must conduct audits on compliance to relevant environmental legislation, conditions of IEA and WUA, and the EMPr for the proposed development (a minimum of a monthly site inspection must be undertaken);
- The ECO must be the liaison between the relevant authorities, DEDEA and DWS, as well as the proposed project team. The ECO must communicate and inform the developer and CEs of any changes to the environmental conditions as required by the DEDEAT and/or DWS. The ECO must ensure that the registration and updating of all relevant EMPr documentation is carried out;
- The ECO must be suitably experienced with the relevant environmental management qualifications and preferably competent in construction related methods and practices; and
- The ECO must handle information received from whistle blowers as confidential and must address and report these incidences to the DEDEAT and/or DWS as soon as possible.

4.1.7 The Contractor

- Is to ensure that the environmental specifications of this document (including any revisions, additions or amendments) are effectively implemented. This includes the on-site implementation of steps to mitigate environmental impacts;
- Will ensure that all employees and co-contractors comply with the requirements and provisions of this EMPr;
- Prepares method statements;
- Monitors environmental performance and conformance with the specifications contained in this document during daily site inspections;
- Discusses implementation of and compliance with this document with staff at routine site meetings;
- Reports progress towards implementation of and non-conformances with this document at site meetings with the ECO;
- Will notify the ECO of the anticipated programme of works and fully disclose all details of activities involved;
- Will ensure that suitable records are kept and that the appropriate documentation is available to the ECO;
- Will notify the ECO of all incidents, accidents and transgressions on site with respect to environmental management as well as requirements of the EMPr and corrective or remedial actions taken;
- Reports and records all accidents and incidents resulting in injury or death;
- Informs the ECO of problems arising when implementing the EMPr and ways of improving the EMPr; and
- Informs the ECO of any complaints received.

4.2 General Guidelines

The following measures provide guideline solutions to frequently anticipated issues on most development activities:

- The prevention of any site degradation due to non-compliance, administrative or financial problems, and inactivity during the construction phase, illegal activities, delays caused by archaeological finds etc., is ultimately the responsibility of the applicant/ developer. Refer to Section 28 of the NEMA;
- The study area must be clearly defined according to the proposed development EA, if granted. All workforce members and other construction personnel are not to go beyond the designated footprint;
- The Contractors must adhere to the agreed and approved access points and routes;
- No camping is allowed on any private property;

- Damage to private or public property such as fences, gates and other infrastructure may occur at any time, all damage must be repaired immediately and to the satisfaction of the owner or his/ her representative;
- The Contractor must adhere to all conditions of the contract including this EMPr;
- Proper planning of the proposed construction process must be undertaken to allow for disruptions such as rain and very wet conditions;
- All private and public manmade structures near the proposed development site must be protected against damage at all times and any damage must be rectified immediately;
- Proper site management and regular monitoring of the proposed site works;
- Proper documentation and record keeping of all complaints and actions must be taken;
- Regular site inspections and good control over the proposed construction process throughout the construction period;
- A positive attitude towards environmental management by all site personnel must be motivated through regular and effective awareness and training sessions;
- An EO, on behalf of the Contractor, is to be appointed to implement this EMPr. The EO and not the Contractor is to deal with any landowner related matters;
- Environmental Audits to be carried out prior, during and upon completion of the proposed construction.

4.3 Awareness Training

The EO, or ECO where an EO is not appointed, is responsible for ensuring everyone on site is given an environmental awareness induction session which not only clearly defines what the environment is and gives specifics detailing the local environment but outlines the requirements of the EMPr as a management tool to protect the prevailing environment.

Refresher courses must be conducted as and when required. The EO must ensure daily toolbox talks include alerting the workforce to particular environmental concerns associated with the tasks for that day or the area/ habitat in which they are working. Awareness posters and a handout must be produced to create awareness throughout the site (as needed).

4.4 Contractor Environmental Method Statements

Method Statements are written submissions to the Engineer by the Contractor, in collaboration with the EO, in response to a request by the Engineer. The Method Statements set out the construction site, materials, labour and method that the contractor proposes using to carry out an activity, identified by the EO and/or Engineer. The Method Statements contain the appropriate detail such that the EO and Engineer are able to assess whether the Contractor's proposal is in accordance with the requirements of the EMPr. The contractor must sign each Method Statement along with the EO and Engineer to formalise the approved Method Statement.

All Method Statements including those which may be required as ad hoc or emergency construction method statements must be submitted to the Engineer for approval prior to the commencement of the activity.

Any changes to the method of works must be reflected by amendments to the original approved Method Statement. Any changes in this regard must be approved by the EO and Engineer on the understanding that such changes are environmentally acceptable and in line with the requirements of this EMPr.

The pro forma Method Statements attached (amongst others) must be used and method statements for the following activities must be submitted to the EO, ECO and Engineer for approval before construction commences inter alia:

- Solid waste management;
- Crew camps and construction lay down areas;
- Cement and concrete batching;
- Dust control;
- Noise control;
- Hydrocarbon and emergency spills procedures;
- Fire Management; and
- Diesel tanks and refuelling procedures (if applicable).

4.5 Site Documentation

The following is a list of documentation, amongst others, which must be held on site and must be made available to the ECO and/or Approving Authority on request:

- Site daily diary/instruction book/ incident reports;
- Records of all remediation/ rehabilitation activities;
- Copies of ECO reports (management and monitoring);
- EMPr;
- Complaints register;
- Method statements;
- WUA; and
- IEA.

4.6 Pro Forma Documentation

4.6.1 Prior to the Commencement of Construction Activities

The following attached pro forma documentation is to be filled out and is binding to the EMPr and project contract and includes, but is not limited to the following:

- Declaration of understanding by the Developer;
- Declaration of understanding by the Engineer;
- Declaration of understanding by the Contractor;
- Method statements; and
- ECO/ Engineer approval for method statements.

4.6.2 During Construction Activities

The following attached pro forma documentation is to be filled out and maintained. These are binding to the EMPr and project contract. They include, but are not limited to, the following:

- Amended Method Statements;
- ECO/ Engineer approval for amended method statements;
- Environmental incidents; and
- Records of all remediation/ rehabilitation activities.

5 Environmental Management Requirements

5.1 Planning and Pre-Construction Phase Activities

Activity Description	Mitigation Measure	Responsibility	Frequency	Notes
A.1. Project Contract and Programme				
Contingencies for minimising negative impacts anticipated to occur during the construction phase need to be implemented. Ensure environmental awareness and formalise environmental responsibilities and implementation.	(a) The EMPr must be included as part of the tender documentation thereby making it part of the enquiry document to make the recommendations and constraints, as set out in this document, enforceable under the general conditions of contract. (b) A copy of this EMPr must be available on site. The Contractor must ensure that all the personnel on site, sub-contractors and their team, suppliers, etc. are familiar with and understand the specifications contained in the EMPr.	Proponent	Once - off	
A.2. Appointments and Duties of Project Team				
Pro-forma documentation is to be filled out and is binding to the EMPr and project contract. Consideration needs to be given to duties of employers to their employees with regards to Health and Safety on site during construction.	**A.2.1 Pro-forma Documents and Contracts** (a) The contact details of the ECO, Contractor and SHE (Safety, Health and Environmental) officer must be completed as part of the pro-forma documents and a copy must be kept on site. This document must be made available to the approving authority on request. (b) Subcontractor(s) contracts with the principle contractor must contain a clause to the effect	Proponent	Once - off	

Activity Description	Mitigation Measure	Responsibility	Frequency	Notes
Consideration also needs to be given to general duties of employers and self-employed persons to persons other than their employees.	that the disposal of all construction-generated refuse/ waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMPr.			
Formal responsibilities are necessary to ensure that roles and responsibilities are executed efficiently.	**A.2.2 Roles and Responsibilities** (a) Before construction activities commence, role players must have a clear indication of their role in the implementation of this EMPr.	Proponent	Once - off	
A.3. Method Statements				
All Method Statements, must be submitted to the ECO for approval prior to the commencement of the activity.	(a) Certain method statement must be provided by the contractor. All activities which require method statements may only commence once the method statements have been approved by the engineer and/or ECO as applicable. (b) Where applicable, the contractor will provide job-specific training on an ad hoc basis when workers are engaged in activities, which require method statements.	PM/ Contractor	Prior to commencing activities requiring method statements, on site.	Approved method statements and relevant pro forma documents along with training records to be kept on file on site.
A.4. Emergencies, Non-Compliance and Communication				
Method Statements such as ad hoc or emergency construction method statements must be submitted to the ECO for approval.	**A.4.1 Emergencies and Communication** (a) The contractor must provide method statements on the protocols to be followed, and contingencies to be put in place for the following potential incidents before construction may begin: Contamination of	Contractor	On-going	

Activity Description	Mitigation Measure	Responsibility	Frequency	Notes
	water resources from spills; contamination of soils from spills; and fire. (b) Communication in emergencies must follow the suggested lines of communication.			
Ensure that all site staff remain appropriately trained, aware of and understand the contents and conditions of the EMPr, the key environmental issues and the consequences of non-compliance that are relevant to the activities in which they are or will be involved.	**A.4.2 Non-Compliance** (a) The contractor understands that failure to adhere to the requirements of the EMPr will result in fines over and above the costs incurred for any remediation required as result of the specific non-compliance.	Contractor	On-going	
A.5. Construction Camp Set Up (if required)				
Careful planning of the construction camp can ensure that the time and costs associated with environmental management and rehabilitation are reduced. Therefore the camp should be established on previously disturbed areas.	**A.5.1 Layout** (a) The choice of the Contractor's camp requires the PM's and ECO's permission and must ensure that the camp is located in an area that will ensure a minimum impact. (b) The camp must be located on already disturbed areas, such as school grounds, sports fields or previous construction camp sites. (c) The contractor must submit plans of exact location, extent and construction details of the temporary construction camp facilities to the PM for approval, prior to establishment of the camp.	PM/ Contractor	Prior to site establishment	

Activity Description	Mitigation Measure	Responsibility	Frequency	Notes
	(d) The layout plans must reflect the proposed camp's location in relation to any existing infrastructure (water mains, electricity cables, sewage mains, etc.) on site. (e) Access to the construction camp must be through an existing route that is clearly demarcated and agreed upon. (f) The construction camp can comprise of the following (as required): • Site office. • Ablution facilities. • Designated first aid area. • Eating area. • Laydown areas.			
The Contractor is to ensure that proper facilities for ablution are available on site for construction workers.	**A.5.2 Ablutions** (a) Ablution facilities must be provided and must be located within the construction camp at a ratio of 1:20 workers.	PM/ Contractor	On-going	
Waste generated during the construction process and in the contractors' camp will be the responsibility of the contractor.	**A.5.3. Provision for Camp Waste Disposal** (a) Bins and skips must be provided at convenient intervals for disposal of waste within the construction camp/ site. (b) Recycling and provision of separate waste receptacles for different types of waste must be encouraged.	PM/ Contractor	On-going	

Activity Description	Mitigation Measure	Responsibility	Frequency	Notes
A.6. Establishing Storage Areas				
Storage areas can be hazardous and unsightly. These storage areas can also cause environmental pollution if not designed and managed properly.	**A.6.1. General Substances and Materials** (a) When deciding on the location of temporary stockpiles, the following needs to be considered: • road access, • length of time the stockpile(s) will be kept. (b) Additionally all stockpiles must be located away from sensitive areas (stormwater channels) and protected from the prevailing winds. (c) Storage areas must be designated, demarcated and fenced if necessary. (d) Storage areas must be secured, to minimize the risk of crime and contamination.	EO/ ECO approval	During site establishment.	
Establishing storage areas can be unsightly and can also cause environmental pollution if not designed and managed properly.	**A.6.2 Hazardous Substances and Materials** (a) Fuel must be stored in a bunded area with at least a volume of 110% of the tank. (b) No smoking must be allowed in the vicinity of the fuel storage area. Erect at least one "no-smoking" warning sign, which is clearly visible at the fuel storage area, to warn all staff of associated dangers. (c) Provide adequate firefighting equipment at or close to the fuel storage and dispensing area(s). (d) Keep fuel under "lock and key" at all times.	EO/ ECO approval	During site establishment	

Activity Description	Mitigation Measure	Responsibility	Frequency	Notes
	(e) Hazardous chemical workings/ refuelling areas must be bunded with an impermeable liner. (f) Ensure that there is always a supply of absorbent material readily available to absorb/ break down any hydrocarbon spillage. (g) In the case of a spill, contaminated material must be removed from the site immediately and be treated or disposed of at a licensed hazardous waste facility.			
A.7. Set up of Waste Management Activities				
Activities in the construction site such as office work, usage of construction materials, etc., generate different types of waste that requires proper management. These wastes could result in environmental pollution such as soil contamination/ pollution of water environments or health hazards to employees working on-site, if not managed properly.	(a) A dedicated area must be allocated for waste sorting and storage. (b) Individual waste skips or wheelie bins for different types of waste must be provided. (c) Skips/bins which must be emptied on a regular basis by a contracted waste collector. These should remain within the demarcated areas and should be designed to prevent refuse from being blown out by wind. (d) Ensure correct handling, storage and disposal procedures followed (e.g. bunded storage areas to contain 110% of volume). (e) Ensure that all conventional waste is properly disposed of and removed from the site to a permitted landfill site, or where applicable to	EO/ ECO	During site establishment	

Activity Description	Mitigation Measure	Responsibility	Frequency	Notes
	an appropriately licensed waste recycling facility. (f) Separation of waste and recycling of waste must be considered prior to disposal. The disposal at the landfill site should be considered as the last option. (g) Hazardous waste that require disposal (oily rags, used fuel/oil, etc.) must be placed in a suitable skip or wheelie bin for disposal at an approved hazardous waste disposal facility. (h) The contractor is responsible for arranging the removal of all waste from site generated through construction activities. (i) Obtain safe waste disposal certificates for all wastes disposed and retain and keep these certificates on record for proof of appropriate disposal for at least 3 years (or alternatively in accordance with any other Municipal requirements). (j) No burning and littering of waste on site should be allowed.			
A.8. Education of Site Staff on General Environmental Conduct				
These points must be communicated to all staff prior to site establishment.	**A.8.1. Environmental Education and Awareness** (a) Ensure that all site personnel have a basic level of environmental awareness training. Topics covered must include: • What is meant by 'Environment'?	EO/ ECO	During staff induction and weekly "Toolbox Talks"	"Toolbox talks" and lunchtime Q&A.

Activity Description	Mitigation Measure	Responsibility	Frequency	Notes
	• Why do we have to protect the environment? • How construction activities can impact on the environment? • How can these impacts be mitigated? • Awareness of emergency and spills response provisions. • Social responsibility during construction, e.g. being considerate to local residents. • It is the contractor's responsibility to provide the site foreman with no less than 1 hour's environmental training (per week or as directed by the ECO) and to ensure that the foreman has sufficient understanding to pass the information onto the construction staff. (b) Translators are to be used where necessary. (c) The use of pictures and real-life examples is encouraged as these are easier to remember. (d) The need for a 'clean site' policy also needs to be explained to the construction workers.			
A general regard for the social and environmental wellbeing of the site and adjacent areas is expected of site staff.	**A.8.2. Worker Conduct on Site** (a) Under no circumstances may open areas or surrounding trees be used as toilet facilities. (b) A general regard for the social and ecological well-being of the site and adjacent areas is	PM/ Contractor	During staff induction, followed by on-going monitoring.	

Activity Description	Mitigation Measure	Responsibility	Frequency	Notes
	expected of the site staff. Workers need to be made aware of the following general rules: • No alcohol/drugs to be present on site. • No firearms allowed on site or in vehicles transporting staff to-or-from the site (unless authorised by security personnel). • Construction staff is to make use of facilities provided for them, as opposed to ad hoc alternatives.			
A.9. Water Quality				
Incorrect disposal of substances and materials and polluted run-off can cause serious negative impacts on surrounding water resources.	(a) Equipment and machinery must be in good operation condition, clean (power washed), free of leaks, excess oil and grease. The equipment must be washed/ cleaned in the wash bays or demarcated areas only. (b) Ensure that machinery is operated by a skilled driver who has been trained to use it correctly and who will be able to identify if something is wrong with the engine and conduct or call for a person who can conduct regular inspections identifying engine related leaks.	EO/ ECO	During site set up.	
A.10. Security and Safety				
Consideration also needs to be given to general duties of employers and self-employed persons to persons other than their employees.	(a) Material stockpiles or stacks such as cement, steel, bricks, corrugated iron sheeting, plastic piping, etc. must be stable and well packed to avoid collapse and possible injury to site workers. Stockpiles must also be covered to	PM/ Contractor	On-going	

Activity Description	Mitigation Measure	Responsibility	Frequency	Notes
	avoid seepage and groundwater pollution (where applicable). (b) No materials are to be stored in unstable or high risk areas such as in close proximity of the entrance road, excavated areas, etc.			

5.2 Construction Phase Activities

Activity	Mitigation Measure	Responsibility	Frequency	Notes
B.1. Site Access				
The site staff must adhere to agreed and approved access points and roads.	(a) Existing access roads must be used as far as is possible. Please note that all existing access roads utilised will have to be maintained to the satisfaction of the neighbouring landowners. (b) Construction vehicles must be limited to a speed of 20km/h on access roads and keep to the speed limit on public roads.	Proponent	All the time during the construction phase	
B.2. Maintenance of Construction Camp (as applicable)				
The Contractor is to ensure that ablution facilities are provided for construction crew and does not lead to pollution of the environment.	**B.2.1 Ablution** (a) Portable chemical toilets must be acquired and placed at the proposed construction site. At least 1:20 must be erected. (b) The toilets must be located within the construction camp site(s) or as directed by the ECO/ PM. (c) Greywater must be disposed of off-site at a licensed waste treatment works.	Contractor	As per the developer's current procedures or as directed by the EO/ PM	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
The Contractor is to ensure that construction camp is maintained.	**B.2.2. Eating Areas** (a) Eating areas must be serviced and cleaned regularly to ensure the highest possible standards of hygiene and cleanliness. (b) All litter throughout the site must be picked up and placed in the appropriate recycling bins provided.	Contractor	Daily and Weekly inspection	
	B.2.3. Housekeeping (a) The contractor must ensure that his camp and working areas are kept clean and tidy at all times. (b) The contractor must implement good housekeeping practises to minimise the visual impact of waste and discarded materials.	Contractor	Daily	
B.3. Staff Conduct				
To achieve effective environmental management and ensure continued environmental due diligence and on-going minimisation of environmental harm, it is necessary to ensure that all personnel have the appropriate level of environmental awareness and competence. The appointed	(a) The contractor must monitor the performance of construction workers to ensure that all the topics that were covered in the induction meeting are properly understood, and followed. (b) HIV & AIDS (human immunodeficiency virus acquired immunodeficiency syndrome) awareness talks must be given at the construction camp site(s) on a regular basis by the relevant personnel.	Contractor	Daily/ Weekly	"Toolbox talks" and lunch time Q&A.

Activity	Mitigation Measure	Responsibility	Frequency	Notes
ECO will undertake Awareness training at staff induction.				
B.4. Waste Management				
Activities in the construction site such as office work, usage of construction materials, etc. generate different types of waste that requires to be managed properly. These wastes could result in environmental pollution such as soil contamination/ pollution or health hazards to employees working on-site, if not managed properly.	(a) Waste is grouped into "general" or "hazardous", depending on its characteristics. The classification determines the handling methods and the ultimate disposal of the material. The Contractor/ ECO must classify waste into general or hazardous based on the toxicity or hazard nature of waste. (b) Waste must be placed in the designated or marked skips/ bins which must be emptied on a regular basis by a contracted waste collector. These must remain within the demarcated areas and must be designed to prevent refuse from being blown out by wind. (c) Separation of waste and recycling of paper, glass, cans, scrap, metals, plastic bottles, etc., must be considered prior to disposal. The disposal at a licensed landfill site must be considered as the last option, after having taken into consideration the prevention of waste generation, reduction of waste generation, reuse and recycling. (d) Hazardous waste that requires treatment or disposal (oily rags, used fuel/ oil, etc.) must be placed in a suitable leak proof skips or wheelie	Contractor/ EO/ PM	During the start-up of construction on site and on-going thereafter. During waste collection. Prior to signing an agreement with the waste removal contractor.	ECO and PM need to ensure that all construction staff is educated on waste management.

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	bins for treatment or disposal at a licensed hazardous waste disposal facility. (e) A service provider should be appointed to transport, treat and/or dispose of the hazardous waste at a licensed waste management facility. (f) The contractor is responsible for arranging the removal of all waste from site generated through construction activities. Waste must be removed to a registered, appropriate disposal and recycling facility. (g) No burning and littering of waste on site must be allowed. (h) Keep waste in vermin proof bins with lids. (i) Request the following from the waste contractors: • Copies of the weighbridge receipt from the waste removal contractor for all waste collected from the proposed site. (j) It is therefore recommended that the applicant develop a waste management plan for the "waste oil" addressing the following issues amongst others: • Storage facility taking into account the volumes produced and protection of the environment.			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	• Measures to be taken to manage waste oil at this facility. • Transportation of the waste oil from the site by an accredited service provider to a licensed treatment and/or disposal facility. • There should be an arrangement with the concerned waste facility which should be attached to the application indicating that the facility is capable of handling the waste oil from the site. (k) The Contractor must put into practice ways in which to implement the waste hierarchy on site by identifying ways on site to: • Avoid and reduce waste generation; • Re-use waste materials generated; • Recover waste that can be recovered; • Recycle waste that cannot be reused; and • As a last resort, treat and dispose of wastes. (l) This must be done by way of the preparation of a Waste Management Method Statement. (m) In order to reduce pressure on general waste landfill sites, it is recommended that, as far as possible, general solid wastes is separated and sorted into its recyclable components (glass, plastic, metal, paper). This will require the			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	provision of separate waste bins within the site camp, and the removal of these wastes to appropriate recycling facilities. (n) The requirement to separate and sort general wastes should be included as part of the environmental induction and awareness programme. (o) All general waste bins on the site must be weather- and scavenger-proof. (p) Litter must be cleared from the site daily. (q) Hazardous wastes must be stored on an impermeable surface, in a bunded area. Such storage area must be clearly demarcated. (r) Should pest populations establish, steps must be taken to control these. (s) Wastes must be collected/ removed from site regularly to ensure that no overflow occurs. It is recommended that chemical ablution facilities be serviced once a week, by an authorised service provider. (t) Safe disposal slips must be maintained for all waste types generated on site and disposed of offsite.			
B.5. Construction Vehicles/ Equipment				
Engine machines such as compressors, pumps, air conditioners and arc welders	**B.5.1 Construction Equipment** (a) Vehicles and machinery are to be kept in good working order and to meet manufactures'	Contractor/ EO	On going	Contractor must follow a detailed checklist for machinery and

Activity	Mitigation Measure	Responsibility	Frequency	Notes
can have small leaks (usually oil) that can accumulate to become spills, which require clean-up. These leaks become more evident if the equipment remains in the same place for an extended period of time. Damaged fuel tanks, fuel hoses, and fuel pumps can be sources of significant fuel leaks. Hydraulic systems can blow gaskets or hoses resulting in large quantities of hydraulic fluid spilled to the ground.	specifications for safety, fuel consumption and emission. (b) Should excessive emissions be observed, the site manager needs to implement an effective vehicle and equipment service and maintenance plan. (c) Vehicle parking and equipment storage must be done on a hardened and sealed surface area such that oil, fuel and other fluid leaks do not pollute soil or groundwater sources. (d) Drip trays must be placed underneath vehicles when not in use.			equipment maintenance.
Increased noise and dust emissions from construction vehicles carrying out construction activities may occur.	**B.5.2 Dust and Noise Generation related to Construction Activities** (a) Use existing roads to access the site in order to limit the amount of dust on site. General housekeeping must also be maintained. (b) Avoid unnecessary movement of transportation vehicles on site. (c) Apply appropriate dust suppression methods. (d) No potable water may be used for dust suppression (as far as is practically possible). (e) Construction time must be restricted to working hours (07:00-17:00 in winter and 06:00 to 18:00 in summer) Monday to Friday	Contractor/ EO	On-going/ daily	Contractor/ EO must ensure that the necessary noise and dust control measures be implemented and applied throughout the entire construction phase of the project.

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	excluding public holidays (unless prior permission is obtained from the adjacent landowners. (f) All noise and sounds generated during the proposed activity must comply with the relevant South African National Standard codes. (g) All construction equipment or machinery must be switched off when not in use. (h) Construction equipment must be kept in good working condition. (i) Plant and vehicles must be in good working order and visually inspected daily. (j) Use silencers on all equipment, where appropriate. (k) Housekeeping on the construction site must be prioritised, to ensure that the area looks neat and tidy at all times. (l) The construction period must be kept to a minimum period as practically possible. (m) Dust minimisation and control measures must be implemented on the construction site at regular intervals. This could include irrigation (utilising a legal, non-potable water source) by water tankers. (n) The frequency of implementation of dust suppression measures should be increased			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	when it is expected that high wind conditions will develop. (o) Areas in which construction has been completed must be rehabilitated and revegetated as soon as possible, and not await till the completion of all construction activities, to minimise the time that bare soil is exposed. (p) A Complaints Register must be made available on the site for the duration of construction. Any dust-related complaints must be efficiently and effectively dealt with. (q) Vegetation clearing for each aspect of development should only take place immediately prior to the commencement of construction activities for the relevant aspect, in order to minimise the amount of exposed soil on the site. (r) Stockpile height must be managed, and if stockpiles are to be retained on site for extended periods, these must be appropriately covered or vegetated so as to minimise wind erosion and dust generation. (s) All construction processes must comply with the following standard best-practice: • All construction equipment utilised, and activities undertaken must be compliant			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	with the Noise Control Regulations as detailed in the Legal Requirements above. • No amplified music shall be allowed on site. The use of audio equipment shall not be permitted unless the volume is kept sufficiently low so as to be unobtrusive. The Contractor shall not use sound amplification equipment on site, unless in emergency situations. • If excessive noise is expected on the boundary of the site, neighbouring occupied properties must be informed in writing and in advance of when the high noise levels will occur and for how long they will occur. • The Contractor must post signage indicating contact details of the Contractor and/or ECO on the site to allow for reporting of complaints.			
B.6. Emergency Response to Spillages				
This section aims to provide measures to manage spillages from equipment used on site and measures for other construction materials handled on site.	**B.6.1 Emergency Response to Spillages** (a) The contractor must take into account the following prevention measures to be applied during spillages. • Immediately repair all leaks of hydrocarbons, oil, etc.	Contractor	During spillages	The ECO/ EO and contractor must ensure that the Emergency response procedure is well understood by all workers on site and

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	• Take reasonable measures to prevent further spills or leaks. • Treat and/or dispose of contaminated materials in a location designated thereto, for further disposal at a licensed landfill site. • The contractor must have its own spill response plan in the event of any spills (oil, fuel, hazardous materials) from his machinery or equipment used on site.			that a summary is available for site visitors.
This section aims to provide measures to prevent pollution of the environment as well as to minimise the chance of transgression of the acts controlling pollution.	**B.6.2 Oil and Chemicals** (a) The contractor must provide method statements for the "handling & storage of oils and chemicals", "fire", and "emergency spills procedures". (b) These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall. These areas must be imperviously bunded with adequate containment (at least 110% the volume of the fuel) for potential spills or leaks. (c) Drip trays (minimum of 10cm deep or appropriate alternative *viz*. eco-blocks) must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of	Contractor	On-going/ daily	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	leaking must not be left unattended, drip trays must be utilised. (d) The surface area of the drip trays will be dependent on the vehicle and must be large enough to catch any hydrocarbons that may leak from the vehicle while standing. (e) The depth of the drip tray must be determined considering the total amount/ volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle. (f) Spill kits must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles in the construction site. Spill kits must be made up of material/ product that is in line with environmental best practice (SUNSORB is a recommended product that is environmentally friendly). (g) All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site, (this includes contaminated soils, and drenched spill kit material).			
B.7. Cement Handling				
This section aims to provide measures to minimise the possibility of cement residue	**B.7.1 Concrete Batching and Mixing** (a) The contractor must provide and maintain a method statement for "cement and concrete	Contractor	On-going/ daily	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
entering the surrounding environment.	batching". The method statement must provide information on proposed storage, washing & disposal of cement, packaging, tools and plant. (b) The mixing of concrete must only be done at specifically selected sites on mortar boards or similar structures to contain run-off into soils, streams and natural vegetation. (c) No mixing of cement/ concrete must take place within 30m of wetland features to be retained. (d) Cleaning of cement mixing and handling equipment must be done using proper cleaning trays and at designated areas only. (e) Water used to clean concrete off of machinery must be treated as greywater and recycled and/or disposed of at a licensed water treatment works.			
This section aims to provide measures to minimise pollution of soil, surface and groundwater resources.	**B.7.2 Storage and Disposal Requirements** (a) All empty cement bags must be stored in a dedicated area and later removed from the site for appropriate disposal at a licensed facility. The burning of cement bags is strictly forbidden. (b) Any spillage that may occur must be investigated and immediate remedial action must be taken.	Contractor	On-going/ daily	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(c) The visible remains of concrete, either solid, or from washings, must be physically removed immediately and disposed of as waste to a licensed landfill site. (d) Cement batching areas must be located in consultation with the ECO to ensure residues are contained and that the proposed location does not fall within sensitive areas such as wetland areas proposed to be retained.			
B.8 Dangerous and Toxic Materials				
This section aims to provide measures to prevent pollution of soil, surface and groundwater resources in the immediate and surrounding environments. It also proposes measures to minimise the chance of transgression of the legislation controlling pollution.	(a) Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas. (b) Sufficient care must be taken when handling these materials to prevent pollution. Training on the handling of dangerous and toxic materials must be conducted for all staff prior to the commencement of construction. (c) In the case of pollution of any surface or groundwater, the regional representative of the DWS must be informed immediately. (d) Storage areas must display the required safety signs depicting “no smoking”, “no naked lights” and “danger” containers must be clearly marked to indicate contents as well as safety requirements.	Contractor	On-going/ daily	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(e) The contractor must supply a method statement for the storage of hazardous materials at tender stage. (f) Material Safety Data Sheets (MSDS) must be prepared for all hazardous substances on site and supplied by the supplier where relevant. MSDS's must be updated as required.			
B.9. Bulk Storage of Fuels and Oils (as applicable)				
This section aims to provide measures to prevent pollution of soil, surface and groundwater resources in the immediate and surrounding environments. It also proposes measures to minimise the chance of transgression of the acts controlling pollution.	(a) The contractor must provide and maintain a method statement for "diesel tanks and refuelling procedures". (b) Bulk fuel storage tanks onsite must be on an impervious surface that is bunded and able to contain at least 110% of the volume of the tanks. The filler tap must be inside the bunded area where possible and the bund wall must not have a tap or valve. (c) The bunded area must have a water/ fuel sump separator. (d) A Flammable Liquid License must be obtained for diesel volumes greater than 200 litres. (e) Bulk fuel storage tanks must be located in a portion of the construction camp where these will not pose a high risk in terms of water pollution. (f) Bulk fuel storage tanks must be placed so that these are out of the way of traffic, and so that	Contractor	Once of as required	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	the risk of the tanks being ruptured or damaged by vehicles is minimised. (g) Bulk fuel storage areas must be covered during the rainy season. (h) No fuel storage, refuelling, vehicle maintenance or vehicle depots must be allowed within 30m of the edge of any sensitive areas (wetland areas to be retained). (i) Refuelling and fuel storage areas, and areas used for servicing or parking of vehicles and machinery must be located on impervious bases and must have bunds around them. (j) Bunds must be sufficiently high to ensure that all the fuel kept in the area will be captured in the event of a major spillage.			
B.10. Use of Dangerous and Toxic Materials				
This section aims to provide measures to prevent pollution of soil, surface and groundwater resources in the immediate and surrounding environments. It also proposes measures to minimise the chance of transgression of the acts controlling pollution.	(a) The contractor must keep the necessary materials and equipment on site to deal with spills/ fire of the materials present should they occur. (b) The contractor must set up a procedure (which will be stipulated in a method statement) for dealing with spills/ fire, which will include notifying the ECO and the relevant authorities prior to commencing with construction. These procedures must be	Contractor	As required	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	developed with consultation and approval by the appointed EO. (c) A record must be kept of all spills and the corrective action taken.			
B.11. Stockpile Handling				
Stockpiles need to be managed in accordance with the outlined specifications in order to minimise the scarring of the soil surface and land features, disturbance and loss of soil, construction footprint; maintain the integrity of the topsoil for landscaping, containment of invasive plant growth as well as the contamination of stormwater run-off.	(a) All stockpiled material must be easily accessible without any environmental damage. (b) All temporarily stockpiled material must be stockpiled in such a way that the spread of materials are minimised. (c) The stockpiles may only be placed within the demarcated areas the location of which must be approved by the ECO. (d) The contractor must avoid all clearly marked vegetated areas that will not be cleared. (e) Stormwater run-off from the stockpile sites and other related areas must be directed into the stormwater system with the necessary pollution prevention measures such as silt traps and may not run freely into the immediate and surrounding environments. (f) Stockpiles are to be stabilised if signs of erosion are visible. (g) During construction, all materials and stockpiles will be covered with tarps to prevent erosion as well as dust, and to	Contractor	On-going/ daily	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	mitigate the visibility thereof (where required and as directed by the ECO). (h) Soils from different horizons must be stockpiled such that topsoil stockpiles do not get contaminated by sub-soil material. (i) Topsoil stockpiles must be monitored for invasive exotic vegetation growth. Contractors must remediate as and when required in consultation with the ECO. (j) No workforce or any construction related activities may be allowed onto the topsoil stockpiles. (k) Topsoil stockpiles must be clearly demarcated as no-go areas. (l) Stockpiles must not be higher than 2m to avoid compaction thereby maintaining the soil integrity and chemical composition. (m) No spoil material, including stripped topsoil, must be temporarily stockpiled within 30m of the edge of any sensitive area (wetlands areas to be retained).			
B.12 Fire Management				
This section aims to provide measures to minimise the destruction of remnants of natural flora as well as	(a) The contractors must provide and maintain a method statement for "fires", clearly indicating where and for what reason fires will be utilised and details on the fuel to be utilised.	Contractor	On-going/ daily	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
maintain the general safety on site.	(b) Absolutely no burning of waste is permitted. (c) No open fires permitted on site at any time. (d) No wood is to be collected, chopped or felled for fires from private or public property. (e) Employ a fire officer for on-site control. (f) Fire-fighting equipment to be kept on site and serviced regularly.			
B.13. Erosion and Sedimentation				
This section aims to provide measures to minimise the damage caused by erosion, impedance of the natural flow of water, scarring of the soil surface and land features, disturbance and loss of topsoil as well as enable the re-growth of disturbed areas.	(a) To reduce the loss of material by erosion, the contractor must ensure that disturbance on site is kept to a minimum. The contractor is responsible for rehabilitating all eroded areas in such a way that the erosion potential is minimised after construction has been completed. (b) Should there be any disturbed areas during the construction phase, this must be rehabilitated during (where possible) and after the completion of the construction phase. (c) These areas must be cordoned off so that vehicles or construction personnel cannot gain access to these areas. (d) Limit the footprint area of the construction activities to what is absolutely essential in order to minimise environmental damage.	Contractor	On-going/ daily	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
B.14. Affected Hydrological Features				
This section aims to provide measures to minimise the damage caused by construction activities on the various hydrological features found around the study area (northern portion of site where the dune slack wetlands will be retained).	**B.14.1 Footprint Management** (a) Limit the footprint area of the construction activities to what is absolutely essential in order to minimise environmental damage. (b) Construction vehicles must use existing roads where possible. (c) Appropriate sanitary facilities must be provided during the construction phase and all waste removed to an appropriate waste facility.	Contractor	On-going/ daily	
	B.14.2 Vehicle Access (a) In the event of a breakdown, maintenance of vehicles must be taken with caution and the collection of spillage must be practiced near the surface area to prevent ingress of hydrocarbons into topsoil. (b) It must be ensured that all hazardous storage containers and storage areas comply with the relevant South African Bureau of Standards to prevent leakage. All vehicles must be regularly inspected for leaks. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil. (c) All spills must be immediately cleaned up and treated accordingly. **B14.3 General Management**	Contractor	On-going/ daily	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(a) Vegetation clearing activities must only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected, vegetation clearing activities should be put on hold. In this regard, the contractor must be aware of weather forecasts. (b) Unnecessary removal of groundcover from slopes must be prevented, especially on steep slopes. Prior to the stripping, infilling, excavation and reshaping of any wetland within the development footprint/corridor, a search and rescue of indigenous vegetation must be undertaken prior to habitat destruction for use in rehabilitation. Arrangements must be made to store and/or relocate the relevant species into suitable onsite or offsite habitats or in a temporary nursery/storage area. This process should be led by the appointed ECO. (c) Thereafter, topsoil and vegetation from areas to be excavated should be stripped and stored at the designated soil stockpile area outside of the wetland for use later in rehabilitation. Topsoil and subsoil to be stored separately. (d) In cases where natural vegetation will be cleared as a result of the movement of people			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	or stockpiling of building materials, revegetation should take place. Preceding revegetation efforts occurring in cleared and degraded areas, it is essential that all solid wastes are removed from these areas as well as their immediate surroundings. Following the removal of solid waste, a mixture of indigenous species should be introduced. The reestablishment of vegetation will enhance these systems' capability to maintain biodiversity, it will aid in reducing the velocity and quantity of runoff waters into wetlands, the retardation of water movement through a wetland which will in turn assist with trapping sediment and improving the overall quality of water. Where possible, vegetation should be cut to ground level rather than removing completely so as to assist with binding/stabilising the soil during land-clearing operations. (e) No clearing of indigenous vegetation outside of the defined working servitudes is permitted for any reason (i.e., for firewood or medicinal use). No persons may remove, damage, deface, paint or disturb any flora (plants) outside of the demarcated construction areas, unless specifically authorised by the ECO in consultation with			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	the resident engineer. Any indigenous vegetation suitable for rehabilitation should be stored appropriately for later use. Indigenous wetland vegetation removed from the construction footprint and suitable for rehabilitation activities must be carefully removed and stored in an appropriate facility for rehabilitation purposes. (f) As a consequence of the proposed development, the wetland system will possibly encounter anthropogenic disturbances. Therefore, in order to manage and mitigate these threats faced by the wetland a suitable buffer should be determined. Therefore, during periods of construction there should be minimal human disturbances by minimising activities that would lead to excessive pollution and run off into the wetland such as no driving of vehicles on areas other than pre-existing roads, no movement of people on the site unless on designated footpaths, lavatory facilities should be set up and made use of outside of the wetland and its buffer, and rubbish disposal facilities should be made readily available outside of the wetland and its buffer for disposal of rubbish and should be emptied at regular intervals to prevent overflowing of			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	trash. During the construction phase the recommended wetland buffer is 14m. (g) During the construction phase all measures should be taken in order to prevent contamination of wetland areas by vehicles. Before commencement of the construction phase contractors must submit method statements detailing protocols to control potential pollution such as: • Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas; • These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall; • Storage of materials as described above may not be within the 1:100 floodline, watercourses or associated buffer areas; • In the case of pollution of any surface or groundwater, the Regional Representative of the DWS must be informed immediately and corrective action taken;			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	• All equipment should be parked overnight and/or fuelled at least 500m from the watercourse; • Drip trays (minimum of 10cm deep) must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised; and • Drip trays must be utilised during repairs and maintenance of all machinery. The depth of the drip tray must be determined considering the total amount/ volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle. (h) If any spills of diesel, petrol, oil, or corrosive fluid occur a spill kit should be kept on site to immediately address this. All vehicles and machinery should therefore be kept off site in a bunded, platformed location in order to avoid such contamination in the watercourses. (i) All vehicles should only be allowed to stand overnight and refuelled only on impervious surfaces. Additionally, materials not to be stockpiled within the buffer area; all materials			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	should strictly be kept 30m away from the watercourses on site. (j) An appropriate Contingency-Spill Response Plan is to be compiled and stored on site, for implementation where necessary. Contractors are to be trained in spill response and familiar with spill plan. Contact details for a reputable company to handle large spill events (e.g., SpillTech) must be included in the spill plan and must be available on hand at the site during construction and business operation. (k) No equipment laydown or storage areas must be located within 14m of any watercourse and/or within the 1:100 year floodline. (l) Sedimentation and erosion control measures must be implemented to prevent slope destabilisation and increased sediment loads entering freshwater systems. Increased sediment loads can be identified by a change in the clarity of the water, or if vegetation is covered by layers of silt or other deposits. If the water appears more 'murky' or brown in colour than previously experienced, this could be as a result of an increase in sediment load within the watercourse. This can be double checked by the use of a turbidity meter.			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(m) Exposed slopes are highly prone to erosion, so drainage control features such as earth dikes, perimeter dikes/ swales, and diversions can be used to intercept and convey runoff from above disturbed areas to suitable dispersal areas or drainage systems. This helps to reduce the sedimentation from exposed areas. Sediment traps should be utilised to detain sediments in stormwater runoff to protect receiving water bodies, and the surrounding area. Silt fences can be used by entrenching them into the ground and stretched between anchoring posts spaced at regular intervals along the lower side of a site. Sediment is filtered out as runoff flows through the fabric. Such fences should be used only where there is sheet. Gullies and other areas of active erosion should be stabilised (using catch water drains, raising headwalls or providing protective measures including grassing, stone pitching, concrete paving or gabions/ mattresses) and rehabilitated to minimise sediment entering the aquatic resource from these sources. (n) Soil required for construction purposes must not be derived from the wetlands. Only approved borrow areas are to be used under the supervision of the ECO. Soil stockpiles			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	must be established on flat ground at least 20m away from delineated watercourses. Erosion/ sediment control measures such as silt fences, low soil berms or wooden shutter boards must be placed around the stockpiles to limit sediment runoff from stockpiles. Subsoil and topsoil are to be stockpiled separately. Stockpiled soil must be replaced in the reverse order as to which it was removed (subsoil first followed by topsoil). Stockpiles of construction materials must be clearly separated from soil stockpiles in order to limit any contamination of soils. The stockpiles may only be placed within demarcated stockpile areas, which must fall within the demarcated construction area. The contractor shall, where possible, avoid stockpiling materials in vegetated areas that will not be cleared. Stockpiles shall be located outside of freshwater habitat. Stockpiled soils are to be kept free of weeds and are not to be compacted. The stockpiled soil must be kept moist using some form of spray irrigation on a regular basis as appropriate and according to weather conditions. If soil stockpiles are to be kept for more than 3 months, they must be hydro-seeded. The slope and height of stockpiles must be limited to 1.5 - 2m and are			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	not to be sloped more than 1:2 to avoid collapse. (o) To diminish the requirement to alter the flow of water away from the construction area when crossing watercourses, all construction activities within wet areas should preferably occur in the dry season/ winter (May to September). Construction within/ across watercourses should advance as quickly as practically possible in order to lessen the risk of surpassing the temporary diversion capacity. Diversions must be temporary in nature and no permanent walls, berms or dams should be installed within the watercourse. Following completion of the construction at the site, the diversions should be removed to restore natural flow patterns. Under no circumstances should the creation of a new channel be considered to divert flows away from the current channel position. Upon completion of the construction at the site, the diversions shall be removed to restore natural flow patterns. (p) Options for temporary flow diversion when working within channels may include: • diversion of the entire watercourse through use of a bypass large diameter			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	pipe; or the installation of removable coffer dams; and • use of removable sandbags. (q) The topsoil layer must be stripped from the construction footprint and stockpiled separately from overburden (subsoil and rocky material). The thickness of the topsoil for harvesting must be obtaining from the Geotechnical Report and if not defined in the report, the top 30cm must be harvested. Stockpiled soil is to be kept free of weeds and not to be compacted. The slope and height of stockpiles must be limited to 1.5 to 2m to avoid soil compaction and destruction of soil microbes. (r) Effective implementation of a Draft EMPr that outlines stringent measures to minimise erosion and manage runoff from disturbed areas. (s) Management of wetland margins and buffer areas as "no-go" areas for all construction personnel and vehicles, unless engaged in specific activities related to the establishment or construction of these areas. (t) Allowance for the rehabilitation of any conservation areas disturbed as a result of construction-associated activities.			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(u) Allowance for short-term irrigation (but not from local groundwater) of landscaped channels, if necessary, until the development is complete and channelled flow is established. Note that irrigation should not be carried out using nutrient-enriched water (e.g., treated sewage effluent). (v) Implementation of a strict waste management programme on the site, to prevent or address impacts associated with construction waste (e.g., litter, rubble etc.).			
During the construction phase of a development, earth grading for site preparation, removal of vegetation cover and keeping of soil stockpiles can leave surfaces uncovered and unprotected which may facilitate erosion and sedimentation.	**B.14.4 Soils and Geology Conditions** (a) All soils compacted as a result of construction activities must be ripped and profiled. (b) Special attention must be paid to alien and invasive species control within the development area. (c) Alien and invasive vegetation control must take place throughout all construction phase. (d) Monitor all systems for erosion and incision. (e) Plant material must be free of fuel leaks and must be parked in a solid surface area with containment of any leaks that might occur. (f) Dirty and clean stormwater must be separated on site, the dirty stormwater must be treated accordingly or be taken to a facility that deals with water of this quality.	Contractor	On-going/ daily	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(g) Soil berms must be constructed to route surface water flow/ runoff from the proposed feedlot to a pond that is lined with an impervious lining to inhibit the contamination of soil. (h) The feedlot pad must be provided with an interface layer to prevent soil contamination during the operation phase. (i) The proposed feedlot and pond site should be moved to the south, not to overlay the dolerite dyke and thin dolerite sheet, as both have a high probability of acting as conduits for possible pollution to downstream springs and the existing borehole. (j) Consider fencing off springs to protect them from animal activity. (k) Dedicated monitoring boreholes must be developed both upgradient and downgradient of the facility which monitors the shallow perched, as well as deeper fractured aquifer.			
B. 15. Potential Cultural and Heritage Resource Disturbance				
The Contractor is to ensure that the protocol for chance finds are implemented should a heritage or cultural resource	(a) Any cultural and/or heritage chance finds must be reported to ECPHRA as a matter of urgency.	Contractor	During the construction phase	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
be found on site during construction.	(b) No contractor or his/her workers are allowed to take from site the chance finds discovered during excavation. (c) A qualified archaeologist or palaeontologist must be called to site in an instance of a find. (d) The proposed development construction works must be ceased around the area of the finds. (e) The living heritage within the current site may be destructed without any application to the ECPHRA. (f) Construction workers must be inducted on the possibility of encountering archaeological and/or palaeontological resources that may be accidentally exposed during subsurface clearance before the commencement of work on the site to ensure appropriate mitigation measures and that course of action is afforded to any chance finds. (g) The footprint impact of the proposed development should be kept to a minimal to limit the possibility of encountering chance finds. (h) Should chance archaeological and/or palaeontological materials or human remains be exposed during subsurface construction work on any section of the proposed development laydown sites, work should			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimise disruption in construction scheduling while recovering archaeological, palaeontological and any affected cultural heritage data as stipulated by the NHRA Regulations. (i) Preceding any collection of fossil material, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an accredited collection (museum or university collection), while all fieldwork and reports should meet the minimum standards for palaeontological impact studies suggested by SAHRA.			
B. 16. Potential Traffic Issues Due to Construction Vehicles				
The Contractor is to safety of all road users in the vicinity of the site and the surrounding roads and nuisance of dust entrainment is minimized.	(a) Vehicles used during the construction phase must be parked in a designated area. (b) Signage on all the affected roads relating to the construction of the proposed development must be in place. (c) The construction vehicle drivers must look out for children and other people as the proposed	Contractor	During the construction phase	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	development is to be situated within highly developed area. (d) Vehicles travelling on unsurfaced roads must travel at a speed that creates minimal dust entrainment. (e) Avoid unnecessary movement of construction vehicles. (f) All construction vehicles must be kept in good working condition. (g) Measures for the optimisation of the amount of travel on the local road, thereby reducing impact, must be compiled and implemented. (h) Provision for the timeous notification of the affected community of any road closures required during the construction phase (whether temporary or permanent). (i) A requirement to identify alternate routes, to allow road users to avoid construction works. (j) Minimum standards/ requirements for the clear signposting of road closures (permanent and temporary), as well as alternate routes. (k) Any damage caused to existing road surfaces by construction vehicles or plant must be repaired at the applicant's cost.			
B. 17. Visual Pollution				
The Contractor must ensure that the construction activities	(a) Exposed soil stockpiles shall be covered.	Contractor and applicant	During the construction phase	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
do not lead to negative visual impacts (including complaints from neighbours) on the surrounding receptors.	(b) Soil stockpiles must not be kept for a prolonged period of time. (c) Excavations must not be left open for a prolonged period of time. (d) The contractor must bring as little construction material as necessary. (e) The area must be returned to a visually pleasing condition once construction has ceased. It is understood that the environment cannot be returned to the state before the construction, but this must be mimicked as practical as possible to enable natural processes, i.e. stormwater flow. (f) Housekeeping on the construction site must be prioritised, to ensure that the area looks neat and tidy at all times. (g) The construction period must be kept to a minimum period as practically possible. (h) Soil stockpiles must be limited to 2 m to avoid visual disturbance.			
B. 18. Monitoring				
The Applicant must adhere to the conditions of the EA, including the appointment of the ECO to monitor and audit the construction works.	(a) An ECO must be appointed to oversee the construction works. (b) The appointed ECO must undertake a pre-construction audit and monthly audits thereafter for the duration of the construction period.	Contractor, ECO and applicant	During the construction phase	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(c) The ECO must again undertake a post-construction audit before the site is handed over to the applicant. (d) Audit reports must be compiled based on each audit and submitted to both the DEDEAT and the applicant. (e) The audit programme must be compiled and submitted to the DEDEAT along with the construction commencement notification.			
B. 19. Noise management				
Noise Screening Report must be implemented	(a) All construction processes must comply with the following standard best-practice: (b) All construction equipment utilised, and activities undertaken must be compliant with the Noise Control Regulations. (c) Construction activities must be undertaken during the vacant hours when an influx of people are not occupying the area. (d) Restrict construction activities generating noise outputs of 85 decibels (A) or more to the hours of 08h00 to 17h00 Mondays to Fridays. Should the Contractor need to do this work outside of these hours, the approval of the ECO must be obtained, and surrounding communities must be informed prior to the work taking place.	Contractor, ECO and applicant	During the construction phase	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(e) No amplified music shall be allowed on site. The use of audio equipment shall not be permitted unless the volume is kept sufficiently low so as to be unobtrusive. The Contractor shall not use sound amplification equipment on site, unless in emergency situations. (f) If excessive noise is expected on the boundary of the site, neighbouring occupied properties must be informed in writing and in advance of when the high noise levels will occur and for how long they will occur. (g) The Contractor must post signage indicating contact details of the Contractor and/or ECO on the site to allow for reporting of complaints. (h) Where reasonable and feasible, the proponent will apply best practice noise mitigation measures including: Minimising consecutive works in the same locality; and orienting equipment away from noise sensitive receptors. (i) As far as reasonably practicable, sources of significant noise should be enclosed. The extent to which this can be done depends on the nature of the machines to be enclosed and their ventilation requirements.			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(j) Driver practices when approaching and leaving the site should minimise noise emissions created through activities such as unnecessary acceleration and breaking squeal, especially on the access road to the construction site. (k) Minimise reversing of machinery or equipment to prevent nuisance caused by reversing alarms. (l) Site inductions should cover the importance of noise control and available noise reduction measures. (m) Construction contractors should be required to use equipment that is in good working order and that meets current best practice noise emission levels. This should be achieved by making it a component of contractual agreement with the construction contracts.			
B. 20. Air quality management				
Measures to manage air quality nuisance must be managed adequately	(a) Dust minimisation and control measures must be implemented on the construction site at regular intervals. This could include irrigation (utilising a legal, non-potable water source) by water tankers. (b) The frequency of implementation of dust suppression measures should be increased	Contractor, ECO and applicant	During the construction phase	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	when it is expected that high wind conditions will develop. (c) Areas in which construction has been completed must be rehabilitated and revegetated as soon as possible, and not await till the completion of all construction activities, to minimise the time that bare soil is exposed. (d) A Complaints Register must be made available on the site for the duration of construction. Any dust-related complaints must be efficiently and effectively dealt with. (e) Vegetation clearing for each aspect of development should only take place immediately prior to the commencement of construction activities for the relevant aspect, in order to minimise the amount of exposed soil on the site. (f) Stockpile height must be managed, and if stockpiles are to be retained on site for extended periods, these must be appropriately covered or vegetated so as to minimise wind erosion and dust generation. (g) Electrically powered equipment instead of pneumatic or internal combustion powered equipment shall be used, where feasible.			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(h) Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be managed adequately. (i) Construction site and haul-road speed limits shall be established and enforced during the construction period. (j) The use of noise-producing signals, including horns, whistles, alarms, and bells shall be for safety warning purposes only. (k) The on-site construction supervisor shall have the responsibility and authority to receive and resolve noise complaints. A clear appeal process to the adjacent landowners shall be established prior to construction commencement that will allow for resolution of noise problems that cannot be immediately solved by the site supervisor. (l) Construction vehicles, plant and machinery must be maintained and fitted with silencers. (m) Regular maintenance on vehicle and equipment to be done.			
B. 21. Socio-economic management measures				
The objectives of the Integrated Development Plan must be implemented	(a) As far as possible, labour for the construction phase must be sourced from the local community. (b) Contractors should be required to seek out and implement opportunities for skills	Contractor, ECO and applicant	During the construction phase	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	development and transfer, as well as capacity building with local labour and Exempted Micro-Enterprise (EME) contractors. (c) Accommodation must be provided at suitable locations in and surrounding the area. (d) Ensure that during the project construction process and the operational phase of the project, employees receive adequate health support from the project team for work-related health problems. (e) Unskilled labour should be sourced from the surrounding local communities as far as possible. (f) Skills development opportunities should be granted to community members and local job seekers, where needed. (g) Project contracts between the developer and the appointed sub-contractors should stipulate the use of local labour for unskilled and semi-skilled positions and tasks; (h) As far as possible, ensure that local businesses, especially those of Historically Disadvantaged Individuals, women and of Small, Medium and Micro Enterprises get allocated an appropriate share of project related business opportunities; and (i) Ensure that the Labour Relations Amendment Act, 2002 (Act No. 12 of 2002) as well as the			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	necessary policies and procedures are taken into consideration to ensure the correct procurement procedures. (j) The developer should ensure that their recruitment policy incorporates a robust gender policy, which should aim to achieve broadly equal outcomes for women and men. To achieve this, the developer should: • Provide equal remuneration for women and men for work of equal or comparable value; • Remove barriers to the full and equal participation of women in the workforce; • Provide full and genuine access to all occupations, including to leadership roles for women and men; • Eliminate discrimination on the basis of gender particularly in relation to family and caring responsibilities for both women and men; and • Encourage workplace consultation between employers and employees on issues concerning gender equality in employment and in the workplace.			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
B. 23. Fauna and flora management				
Measures to manage terrestrial biodiversity on site	(a) The construction footprint including service roads, construction camps, stock piles, etc. must stay out of all areas containing natural vegetation and areas marked highly sensitive (wetlands). (b) If the sensitive areas cannot be avoided then the biodiversity must be recreated using species found typically in these areas. This must be guided by a suitably qualified botanist or horticulturalist. (c) Prior to any removal of indigenous vegetation, a walk-through of the sensitive areas must be undertaken by a suitable qualified botanist or horticulturalist and any plants that can be relocated must be rescued and replanted in the newly created habitats. (d) All areas that need revegetating during or after construction must be planted only with indigenous grass species found in the immediate vicinity and not with the standard species mix commonly used in construction projects. A botanist or rehabilitation specialist must be consulted in this regard. (e) An independent ECO must be appointed to oversee construction activities. (f) As far as possible, construction should take place during the dry winter months to help	Contractor, ECO and applicant	During the construction phase	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	minimise contamination of delineated watercourses and runoff from the construction site polluting downstream watercourses. (g) An ecologically-sound Stormwater Management Plan (SMP) must be implemented during construction and appropriate water diversion systems put in place. (h) During construction, erosion must not be allowed to develop on a large scale before effecting repairs. (i) All areas susceptible to erosion must be protected and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. (j) Surface water or stormwater must not be allowed to concentrate, or flow down cut or fill slopes without erosion protection measures being in place. (k) Areas exposed to erosion during construction should be revegetated with species naturally occurring in the area. Natural trees, shrubbery and grass species must be retained wherever possible. (l) Stormwater infrastructure must designed in such a way that it does not impact on or erode			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	the surrounding natural areas, especially the delineated watercourses. (m) Vehicles used during the construction phase must be parked in a designated area and containers should be used to hold any oil leaks. (n) Formal solid waste management systems must be implemented and formal waste removal services provided. Recycling of solid waste must be encouraged. (o) Formal bulk water and sewer reticulation services must be installed. Fail safe measures must be included in the engineering design, including an Emergency / Risk Management Plan. (p) Dumping of solid waste and litter in natural areas by construction workers and cattle feedlot workers must be prohibited. This must be discouraged through education initiatives and the provision of ample waste disposal facilities. (q) If possible, electricity should be supplied via buried cables rather than overhead lines. (r) Should overhead lines be implemented, these should be routed alongside roads and must avoid crossing natural and open areas as far as possible. To avoid electrocution by larger species such as raptors, the vertical phase-			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	earth clearance should be greater than 1.8m. All jumpers at transformers, T-offs and strain structures must be insulated. Only pole structures that are approved as "bird friendly" by Eskom's ENVIROTECH Forum should be used. Lines traversing open areas such as wetlands must be marked with anti-collision devices. This includes low voltage lines. Bird flight diverters on the earth wires must be installed as per specifications devised by the Endangered Wildlife Trust (EWT) / Eskom Partnership. (s) Surrounding natural vegetation must not be disturbed to minimise chances of invasion by IAP species. Emergence of IAP species should be monitored on a bi-annual basis by a suitably qualified botanist. (t) An IAP species Management and Monitoring Plan must be compiled by a suitably qualified botanist and implemented whereby all emergent IAP species are removed during construction. (u) During the construction phase, all IAP seedlings and saplings must be removed as they become evident for the duration of the construction phase. Manual / mechanical removal is preferred to chemical control.			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(v) All construction vehicles and equipment, as well as construction material must be free of plant material before coming on site. Equipment and vehicles must be thoroughly cleaned prior to access to the construction site. (w) No domesticated animals must be allowed on the construction site by construction and/or feedlot workers. (x) During construction, all food should be securely stored away to prevent attraction of faunal species and all rubbish should be disposed of away from the site. Bins located around the site should have tightly fitting lids to prevent raiding by faunal species. (y) Upward lighting should be avoided to minimise light pollution. Light can be restricted by fitting shields that direct the light below the horizontal plane, at preferably an angle less than 70 degrees. Limiting the height of lighting columns and directing light at a low level reduces the ecological impact of the light. (z) Insects are attracted to brighter light that is emitted over a broad band of long wavelengths such as high-pressure sodium or mercury lamps. Such lighting must be avoided, and rather light that is emitted at one			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	wavelength, contains no ultraviolet (UV) light and has a low attraction to insects, such as low-pressure sodium lamps, should be used. (aa) If possible, construction should take place during daylight hours to avoid the need for artificial lighting and to reduce the impact of noise and vibrations on nocturnal animals. (bb) Foot traffic by people and domestic animals in the surrounding natural areas must be kept to a minimum. Livestock grazing in the natural areas must be kept at a minimum and at sustainable levels. (cc) The feedlot employees should be educated in the importance of looking after the natural environment and the sustainable utilisation of natural resources. This can be achieved through educational posters, for example. (dd) Harvesting of fuel wood from indigenous species within the natural areas should be discouraged, and rather the wood of IAP species such as wattle be utilised. (ee) Formal designs must include standard pollution control mechanisms and an appropriate stormwater drainage system. Any water released into the environment must be cleaned of all impurities. (ff) No wild animal may under any circumstance be handled, removed, or be interfered with by			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	construction workers or by operational phase staff. (gg) During the construction and operational phases, no wild animal may under any circumstance be hunted, snared, captured, injured, or killed. This includes animals perceived to be vermin. (hh)			

5.3 Operational Phase Activities

Activity	Mitigation Measure	Responsibility	Frequency	Notes
C.1. Site Rehabilitation				
There applicant must ensure that all alien invasive plant species are eradicated following completion of construction activities. All construction rubble and general and hazardous waste must be cleared from the site following the construction works.	(a) An alien invasive eradication and monitoring plan must be compiled and implemented whereby all emergent invasive species are removed. The monitoring plan must also ensure that the re-emergence of invasive species is monitored continuously during the operational and decommissioning phases (if and when applicable) and that monitoring and eradication continues post decommissioning, should the project come to an end. (b) The construction area and immediate surroundings should be monitored regularly for emergent invasive vegetation and all seedlings and/or saplings must be removed.	Proponent	Daily	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(c) The study area must be monitored for a minimum of two years after construction to identify re-emergence of alien species and to initiate eradication. (d) Manual / mechanical removal is preferred to chemical control. (e) There must be daily monitoring of the areas surrounding the site, so that emergent invasive species are removed manually, so as to avoid the spread of alien species to the adjacent properties. Continuous removal and monitoring is necessary. (f) Waybills issued by the contractor who removed non-recyclable material to the landfill site must be kept for auditing purposes.			
C.2. Maintenance of internal roads and general facility management				
To ensure that internal roads are in good condition for all road users.	(a) The condition of the roads will be visually checked and repaired/ maintained. (b) Active dust management must be an integral part of road maintenance. (c) As far as possible, labour for the operational phase must be sourced from the local community. (d) Maintenance contractors should be required to seek out and implement opportunities for skills development and transfer, as well as	Proponent	Visual inspections will be conducted annually and the maintenance will be conducted as and when necessary.	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	capacity building with local labour and EME contractors. (e) An experienced person in managing cattle feedlots and handling cattle medicine must form part of the employee's team.			
C.3. Surface and groundwater management				
To ensure long-term sustainability of the wetlands, groundwater and stormwater depression wetland.	(a) No further disturbances should be experienced by the wetland systems on site. The recommended wetland buffer during the operational phase is 14m. Ideally the wetlands should also be restricted from overgrazing by cattle. (b) Exposed slopes are highly prone to erosion, so drainage control features such as earth dikes, perimeter dikes/ swales, and diversions can be used to intercept and convey runoff from above disturbed areas to suitable dispersal areas or drainage systems. This helps to reduce the sedimentation from exposed areas. Sediment traps should be utilised to detain sediments in stormwater runoff to protect receiving water bodies, and the surrounding area. Silt fences can be used by entrenching them into the ground and stretched between anchoring posts spaced at regular intervals along the lower side of a site. Sediment is filtered out as runoff flows	Proponent	Once-off for reshaping and planning of indigenous plants. Maintenance must be on-going.	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	through the fabric. Such fences should be used only where there is sheet. Gullies and other areas of active erosion should be stabilised (using catch water drains, raising headwalls or providing protective measures including grassing, stone pitching, concrete paving or gabions/ mattresses) and rehabilitated to minimise sediment entering the aquatic resource from these sources. (c) The focus of the rehabilitation of wetlands is to ensure the reestablishment of what was the natural hydraulic regime as much as possible. Where the watercourse's hydraulic regime is improved, the vegetation will improve as well for the wetland habitat which can lead to the reintroduction of riparian specific species. It is, however, not possible to completely re-establish the natural hydrological regime at the catchment level as this is what is needed to improve the current state of the wetlands. The main function of rehabilitation efforts must aim to restore the natural function and improve the aesthetic nature of the wetlands. (d) The careful control of the dispersion of IAP within a wetland is imperative due to their degradation causing properties. The key to controlling the dispersion of IAP is through early detection and removal. The removal and			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	management of IAP is essential in maintaining the ecological integrity of a wetland as well as its ability to maintain biodiversity. An IAP Control Plan should be compiled and implemented. This includes details of removal as well as monitoring to ensure the IAP are kept in control throughout the life of the activity. (e) IAP and weed control must take place within remaining wetland habitats and 20m buffer areas on site post onsite rehabilitation in accordance with an IAP Control and Management Programme aligned with the NEMBA Invasive Species Regulations. Initial control and follow-up maintenance to take place. Integrated control (combination of mechanical and chemical control) to be implemented, with specific controls to be tailored to the species of IAPs to be managed. Herbicide use to be controlled and herbicides or pesticides use to be restricted within delineated wetlands unless herbicides are non-toxic to watercourses and authorised for use in wetlands. (f) Stormwater management reduces the negative effects (erosion, increase sedimentation, contamination, etc.) of stormwater runoff. Management of			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	stormwater comprises of controlling flooding, reducing erosion and improving water quality. This can be achieved by implementing measures known as BMPs. Such BMPs include the installation of a porous pavement, i.e. around the administration office, which are interlocking tiles or bricks that allows stormwater runoff to infiltrate the pavement and thereafter enters the soil which removes fine grain pollutants and provides erosion control. In addition there are vegetative BMPs which include a number of landscaping practices. Grassed swales, or ditches, can be placed in areas requiring rehabilitation. This BMP helps lessen the peak runoff downstream through processes of infiltration and storage. Filter strips are designed to direct stormwater from impervious areas into a stone trench, which evenly distributes the runoff over a grass strip. (g) Retention, detention, attenuation, sustainable and controlled release of stormwater runoff into watercourses is to be practiced in order to prevent erosion and/or sedimentation of wetlands. SuDS principles are to be implemented whereby the number of outlets to watercourses to reduce concentrated flows at high volumes and			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	velocities are to be maximised, separate 'clean' and 'dirty' stormwater management systems are to be developed in accordance with DWS requirements and erosion control measures are to be determined by the engineers. (h) Allowance for short-term irrigation (but not from local groundwater) of landscaped channels, if necessary, until the development is complete and channelled flow is established. Note that irrigation should not be carried out using nutrient-enriched water (e.g., treated sewage effluent). (i) Nutrients, i.e., Nitrates (NO_3), Phosphates (PO_4), magnesium and calcium are produced through the cattle manure, these must be monitored in both the soils and surface water as they may result in pollution when in excess. Eutrophication in surface water bodies may be a sign of contamination. (j) Heavy metals at feedlots include zinc, selenium, copper, cadmium, arsenic, iron and aluminium, these may contribute to soil and consequentially water contamination. (k) A dry stockpile will not produce leachate, a thick black smelly tar-like substance, which contains toxic substances should not emerge at any point from the manure heap. Under no			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	circumstances should the manure heap release runoff to the vegetated and/or rehabilitated areas, a connection embayment between the heap area the stormwater embayment directing contaminated runoff to the lagoon must be utilised. (l) The lagoon must be emptied regularly to prevent overspilling. Any incident of this nature must be reported, immediately, to the DEDEAT and regional DWS. (m) Sludge accumulated at the bottom of the lagoon must be properly cleaned, scraped, and cleared. (n) The lagoon must be routinely monitored for any leaching. (o) Only approved pesticide products must be used to control intrusive pests (flies) and should be applied strictly as prescribed as these will bind to the manure and may form part of runoff. The use of protective clothing during application is mandatory. Secure storage of pesticides on site must also be provided. (p) The effluent emanating from the French-drain must be monitored for any contaminants that may affect the quality of soil and groundwater.			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(q) Water quality monitoring must be conducted on the surface water bodies situated at a lower hydrological gradient than the feedlot and septic tank. (r) Dirty and clean stormwater must be separated on site, the dirty stormwater must be directed to the lagoon. (s) Nutrients, i.e., NO_3, PO_4, magnesium and calcium are produced through the cattle manure, these must be monitored in both the soils and groundwater as they may result in pollution when in excess. (t) Heavy metals at feedlots include zinc, selenium, copper, cadmium, arsenic, iron and aluminium, these may contribute to soil and consequentially water contamination. (u) Temporary storage of manure in heaps must be kept to minimal. (v) A dry stockpile will not produce leachate, a thick black smelly tar-like substance, which contains toxic substances should not emerge at any point from the heap. Under no circumstances should the manure heap release runoff to the vegetated and/or rehabilitated areas, a connection embankment between the heap area the stormwater embankment directing			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	contaminated runoff to the lagoon must be utilised. (w) The lagoon must be emptied regularly to prevent overspilling. Any incident of this nature must be reported, immediately, to the DEDEAT and regional DWS. (x) Sludge accumulated at the bottom of the lagoon must be properly cleaned, scraped, and cleared. (y) The lagoon must be routinely monitored for any leaching. (z) Only approved pesticide products must be used to control intrusive pests (flies) and should be applied strictly as prescribed as these will bind to the manure and may form part of runoff. The use of protective clothing during application is mandatory. Secure storage of pesticides on site must also be provided. (aa) It is recommended to sample the existing borehole before the proposed feedlot is operational and once operational the borehole is to be sampled on a 6 monthly basis and the water samples sent to a reputable laboratory for analyses to determine if there is any contamination occurring. (bb) The monitoring borehole's water level should be measured and recorded monthly:			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	• The levels measured are to be kept on record (database and backup) together with the date; and • The time-series groundwater levels are to be compared to precipitation (geohydrological) and water quality analysis regularly. (cc) Complete organic and inorganic as well as micro-biological analysis after development of monitoring boreholes. Baseline Indicator analyses to include pH, Electrical Conductivity (EC), PO_4, Ammonium (NH_4), NO_3, Chemical Oxygen Demand (COD). If pollution or increasing trend is noted, do comprehensive analyses. Complete organic and inorganic as well as micro-biological analysis. This must take place once-off, on a monthly basis and finally bi-annually. (dd) The effluent emanating from the French-drain must be monitored for any contaminants that may affect the quality of soil and groundwater. (ee) Water quality monitoring must be conducted on the groundwater bodies situated at a lower hydrological gradient than the feedlot and French-drain.			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
C.4. Waste Management				
Domestic waste will be generated during the operational phase as the activity involves residential development.	(a) Waste must be placed in the designated or marked skips/ bins which must be emptied on a regular basis by a contracted waste collector. These must remain within the demarcated areas and must be designed to prevent refuse from being blown out by wind. (b) Separation of waste and recycling of paper, glass, cans, scrap, metals, plastic bottles, etc., must be considered prior to disposal. The disposal at a licensed landfill site must be considered as the last option, after having taken into consideration the prevention of waste generation, reduction of waste generation, reuse and recycling. (c) No burning and littering of waste on site must be allowed. (d) Keep waste in vermin proof bins with lids. (e) Request the following from the waste contractors: Copies of the weighbridge receipt from the waste removal contractor for all waste collected from the proposed site. (f) The residents must put into practice ways in which to implement the waste hierarchy on site by identifying ways on site to: Avoid and reduce waste generation; Re-use waste materials;	Proponent	Daily waste management Weekly solid waste disposal	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	Recycle waste; Recover waste; and As a last resort, treat and dispose of wastes. (g) All general waste bins on the site must be weather- and scavenger-proof. (h) In order to reduce pressure on general waste landfill sites, it is recommended that, as far as possible, general solid wastes be separated and sorted into its recyclable components (glass, plastic, metal, paper). This will require the provision of separate waste bins within the site, and the removal of these wastes to appropriate recycling facilities. The requirement to separate and sort general wastes should be included as part of the environmental induction and awareness programme. (i) The property manager must put into practice ways in which to implement the waste hierarchy on site by identifying ways on site to: • Avoid and reduce waste generation; • Re-use waste materials; • Recycle waste; • Recover waste; and • As a last resort, treat and dispose of wastes.			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(j) All general waste bins on the site must be weather- and scavenger-proof. (k) In order to reduce pressure on general waste landfill sites, it is recommended that, as far as possible, general solid wastes be separated and sorted into its recyclable components (glass, plastic, metal, paper). This will require the provision of separate waste bins within the site, and the removal of these wastes to appropriate recycling facilities. (l) The requirement to separate and sort general wastes should be included as part of the environmental induction and awareness programme. (m) Litter must be cleared from the site daily. (n) Should pest populations establish, steps will need to be taken to control these. (o) Hazardous wastes must be stored on an impermeable surface, in a bunded area. Such storage area must be clearly demarcated (p) Wastes must be collected/ removed from site regularly to ensure that no overflow occurs. It is recommended that chemical ablution facilities be serviced once a week by an authorised service provider. (q) Safe disposal slips must be maintained for all waste types generated on site and disposed of offsite.			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(r) The lagoon must be emptied regularly to prevent overspilling. Any incident of this nature must be reported, immediately, to the DEDEAT and regional DWS. (s) Sludge accumulated at the bottom of the lagoon must be properly cleaned, scraped, and cleared. (t) The lagoon must be routinely monitored for any leaching. (u) Only approved pesticide products must be used to control intrusive pests (flies) and should be applied strictly as prescribed as these will bind to the manure and may form part of runoff. The use of protective clothing during application is mandatory. Secure storage of pesticides on site must also be provided. (v) Temporary storage of manure in heaps must be kept to minimal. (w) Plastic and glass bottles (used to contain cattle medicine) must be placed in separate containers that are sealed until they transferred to the local veterinary clinic. Under no circumstances should this waste be disposed of with the general waste. (x) Carcass must be managed sufficiently: if to be buried on site, a hole must be dug (above the water table) and must be fenced off; or if to be			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	disposed of in a different facility, waybill or deposit slips must be retained on site.			
C.5. Vegetation management				
To ensure that natural vegetation is protected	(a) A SMP must be compiled for the operational phase and stormwater infrastructure designed in such a way that it does not impact on or erode the surrounding natural areas, especially the wetlands. (b) During the operational phase, the washing of cars within the surrounding natural areas, especially wetlands must be prohibited. (c) Formal solid waste management systems must be implemented, and formal waste removal services provided. Recycling of solid waste should be encouraged. (d) Dumping of solid waste and litter in natural areas by residents must be prohibited. Residents should be discouraged from doing so through education initiatives and the provision of ample waste disposal facilities. (e) Surrounding natural vegetation must not be disturbed to minimise chances of invasion by IAP. Emergence of IAP species should be monitored on a bi-annual basis by a suitably qualified botanist. (f) The IAP species Management and Monitoring Plan must also ensure that the re-emergence	Proponent	Once-off for reshaping and planning of indigenous plants. Maintenance must be on-going.	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	of IAP species is monitored continuously during the operational phase. This plan must include the immediate surroundings where natural vegetation prevails. (g) During the operational phase, the site must be searched for IAP on a regular basis and all IAP seedlings and saplings removed as they become evident. (h) Formalised waste disposal systems and services must be provided to avoid dumping of refuse into natural areas. (i) Upward lighting should be avoided to minimise light pollution. Light can be restricted by fitting shields that direct the light below the horizontal plane, at preferably an angle less than 70 degrees. Limiting the height of lighting columns and directing light at a low level reduces the ecological impact of the light. (j) Insects are attracted to brighter light that is emitted over a broad band of long wavelengths such as high-pressure sodium or mercury lamps. Such lighting must be avoided, and rather light that is emitted at one wavelength, contains no UV light and has a low attraction to insects, such as low-pressure sodium lamps, should be used.			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(k) The IAP Monitoring Programme must ensure that the re-emergence of IAP species is monitored and controlled at regular intervals during the operational phase within the development footprint and in the surrounding natural areas. (l) Foot traffic by people and domestic animals in the surrounding natural areas must be kept to a minimum. Livestock grazing in the natural areas must be kept at a minimum and at sustainable levels. (m) The feedlot employees should be educated in the importance of looking after the natural environment and the sustainable utilisation of natural resources. This can be achieved through educational posters, for example. (n) Harvesting of fuel wood from indigenous species within the natural areas should be discouraged, and rather the wood of IAP species such as wattle be utilised.			
C.6. Geology and soils				
To ensure the quality of soils does not deteriorate	(a) Dirty and clean stormwater must be separated on site, the dirty stormwater must be directed to the lagoon. (b) Nutrients, i.e., NO_3, PO_4, magnesium and calcium are produced through the cattle	Proponent	Monthly	

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	manure, these must be monitored in soils as they may result in pollution when in excess. (c) Heavy metals at feedlots include zinc, selenium, copper, cadmium, arsenic, iron and aluminium, these may contribute to soil contamination. (d) Temporary storage of manure in heaps must be kept to minimal. (e) A dry stockpile will not produce leachate, a thick black smelly tar-like substance, which contains toxic substances should not emerge at any point from the heap. Under no circumstances should the manure heap release runoff to the vegetated and/or rehabilitated areas, a connection embayment between the heap area the stormwater embayment directing contaminated runoff to the lagoon must be utilised. (f) The lagoon must be emptied regularly to prevent overspilling. Any incident of this nature must be reported, immediately, to the DEDEAT and regional DWS. (g) Sludge accumulated at the bottom of the lagoon must be properly cleaned, scraped, and cleared. (h) The lagoon must be routinely monitored for any leaching.			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(i) Only approved pesticide products must be used to control intrusive pests (flies) and should be applied strictly as prescribed as these will bind to the manure and may form part of runoff. The use of protective clothing during application is mandatory. Secure storage of pesticides on site must also be provided. (j) Water quality monitoring must be conducted on the surface and groundwater bodies situated at a lower hydrological gradient than the feedlot and French-drain. (k) The effluent emanating from the French-drain must be monitored for any contaminants that may affect the quality of soil and groundwater. (l) It is recommended to sample the existing borehole before the proposed feedlot is operational and once operational the borehole is to be sampled on a 6 monthly basis and the water samples sent to a reputable laboratory for analyses to determine if there is any contamination occurring. (m) The monitoring borehole's water level should be measured and recorded monthly: • The levels measured are to be kept on record (database and backup) together with the date; and			

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	• The time-series groundwater levels are to be compared to precipitation (geohydrological) and water quality analysis regularly. (n) Complete organic and inorganic as well as micro-biological analysis after development of monitoring boreholes. Baseline Indicator analyses to include pH, EC, PO_4, NH_4, NO_3, COD. If pollution or increasing trend is noted, do comprehensive analyses. Complete organic and inorganic as well as micro-biological analysis. This must take place once-off, on a monthly basis and finally bi-annually.			
C.7. Noise and air quality management				
	(a) A strict schedule must be followed within the feedlot. Cattle must be provided with the feed at the same time daily. (b) No amplified music shall be allowed on site. The use of audio equipment shall not be permitted unless the volume is kept sufficiently low so as to be unobtrusive. (c) If excessive noise is expected on the boundary of the site, neighbouring occupied properties must be informed in writing and in advance of when the high noise levels will occur and for how long they will last.	Proponent	-	-

Activity	Mitigation Measure	Responsibility	Frequency	Notes
	(d) Dust minimisation and control measures must be implemented on site at regular intervals. This could include irrigation (utilising a legal, non-potable water source) by water tankers. (e) The frequency of implementation of dust suppression measures should be increased when it is expected that high wind conditions will develop. (f) The cattle urine keeps the pad moist, during dry periods regular sprinkling with water may be necessary. Sprinkling is also done to reduce the dust. (g) A dry stockpile will not produce leachate, a thick black smelly tar-like substance, which contains toxic substances should not emerge at any point from the manure heap. (h) Temporary storage of manure in heaps must be kept to minimal. (i) The application of chlorine in the lagoon may aid in containing air pollution within the lagoon, however, cattle feedlots use the additive Rumensin in their feed as it reduces some Methane gas emissions.			

Appendix A: Declaration of Understanding by the Developer

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Plan for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness 2: _____

Appendix B: Declaration of Understanding by the Engineer

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Plan for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness 2: _____

Appendix C: Declaration of Understanding by the Contractor

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Plan for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness 2: _____

Appendix D: Method Statement for Solid Waste Management

CONTRACT: …….. **DATE**: ……..

WHAT WORK IS TO BE UNDERTAKEN? [Give a brief description of the works to be undertaken on site that will generate waste (hazardous and non-hazardous wastes)]: * Note: please attach extra pages if more space is required.

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (Where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:
Start Date: …….. **End Date:** ……

HOW IS WASTE TO BE MANAGED ON SITE? (Provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

1) ENGINEER
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

Appendix E: Method Statement on Crew Camps and Construction Lay Down Areas

CONTRACT: …… **DATE**: ……

WHAT CREW CAMPS AND CONSTRUCTION LAY DOWN AREAS ARE REQUIRED ON SITE DURING CONSTRUCTION? (Give a brief description of these): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

WHERE ARE THE CREW CAMPS AND CONSTRUCTION LAY DOWN AREAS TO BE LOCATED? (Where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:
Start Date: …….. **End Date:** …….

HOW ARE CREW CAMPS AND CONSTRUCTION LAY DOWN AREAS TO BE MANAGED? (Provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

1) ENGINEER
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

Appendix F: Method Statement on Cement and Concrete Batching

CONTRACT: …… **DATE**: ……

WHAT WORK IS TO BE UNDERTAKEN? (Give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (Where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:
Start Date: …….. **End Date:** …….

HOW ARE THE WORKS TO BE UNDERTAKEN? (Provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

1) ENGINEER
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated: _____

2) ECO
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

Appendix G: Method Statement on Dust Control

CONTRACT: …… **DATE**: ……

WHAT WORK IS TO BE UNDERTAKEN ON SITE THAT COULD GENERATE DUST? (Give a brief description of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: …….. **End Date:** ……

HOW ARE THE WORKS TO BE UNDERTAKEN SO AS TO MINIMISE AND CONTROL DUST GENERATION ON SITE? (Provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

Appendix H: Method Statement on Hydrocarbon and Emergency Spill Procedure

CONTRACT: …… **DATE**: ……

WHAT HAZARDOUS SUBSTANCES (INCL. FUELS) ARE TO BE STORED ON SITE? (Give a brief description of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

WHERE ARE THE THESE SUBSTANCES TO BE STORED ON SITE? (Where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: …….. **End Date:** …….

HOW ARE HAZARDOUS SUBSTANCES TO BE MANAGED TO AVOID SPILLAGES AND WHAT EMERGENCY PROCEDURES ARE TO BE IMPLEMENTED IN CASE OF A SPILLAGE? (Provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

Appendix I: Method Statement on Fire Management

CONTRACT: …….. **DATE**: ……..

WHAT WORK IS TO BE UNDERTAKEN? (Give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (Where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: …….. **End Date:** ……..

HOW ARE THE WORKS TO BE UNDERTAKEN? (Provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

Appendix J: Method Statement on Diesel Tanks and Refueling Procedures

CONTRACT: …… **DATE**: ……..

WHAT WORK IS TO BE UNDERTAKEN? (Give a brief description of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

WHERE ARE THE WORKS TO BE UNDERTAKEN? (Where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: …….. **End Date:** ……..

HOW ARE THE WORKS TO BE UNDERTAKEN? (Provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

Appendix K: Method Statement on Noise Pollution Control

CONTRACT: …….. **DATE**: ……..

WHAT WORK IS TO BE UNDERTAKEN ON SITE THAT COULD GENERATE DUST? (Give a brief description of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: …….. **End Date:** ……

HOW ARE THE WORKS TO BE UNDERTAKEN SO AS TO MINIMISE AND CONTROL DUST GENERATION ON SITE? (Provide as much detail as possible, including annotated sketches and plans where possible):

***Insert additional pages as required**

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

Appendix L: Penalty Fines

TYPICAL INCIDENTS INCURRING PENALTIES	VALUE
Failure to secure construction site from public access	R5,000
Failure to demarcate working areas and servitudes and/or maintain fences and/or demarcation tape.	R1,000
Failure to stockpile topsoil correctly (per incident)	R2,000
Failure to stockpile materials in designated areas (per incident)	R500
Discharging effluent and/or polluted storm water onto the ground or into surface water (per incident)	R2,000
Failure to provide adequate sanitation, waste disposal facilities or services (per incident)	R1,000
Failure to demarcate construction area boundaries before commencing construction clearance and other activities (per incident)	R5,000
Venturing into or undertaking construction related activities within no-go areas, without formal written approval from the ECO (per incident)	R5,000
No induction regarding environmental matters and site housekeeping practices (per employee)	R2,000
Stockpile of soils and materials outside demarcated areas (per incident)	R1,000
Inappropriate mixing of cement/concrete and poor management of concrete slurry (per incident)	R2,000
Burning of waste on site (including cement bags) (per incident)	R 2,000
Untidiness and litter at camp (per incident)	R200
Unauthorised removal of indigenous trees, medicinal or other plants (per incident)	R2,000
Damaging/killing animals/birds (per incident)	R 1,500
Failure to erect temporary fences as required (per incident)	R2,000
Failure to reinstate disturbed areas within the specified timeframe (per incident)	R2,000
Fire – costs of runaway fires will be borne by the Contractor, should he/she be proven responsible for such fires (per incident)	R25,000
Failure to provide adequate equipment for emergency situations (per incident)	R5,000
Defacing, painting or damaging natural or heritage features (per incident) – mandatory removal of employee from site	R5,000
Damaging cultural, historical and/or archaeological sites of importance (per incident) – mandatory removal of employee from site	R5,000
Failure to maintain basic safety measures on site	R1,000

TYPICAL INCIDENTS INCURRING PENALTIES	VALUE
Failure to carry out required community liaison, damage to property etc., without prior negotiation and/or compensation and other social infringements (per incident)	R1,000
Persistent and un-repaired oil leaks from machinery. The use of inappropriate methods of refuelling (per incident)	R2,000
Failure to provide drip trays and/or empty them frequently (per incident)	R500
Inappropriate use of bins and poor waste management on site (per incident)	R500
Inappropriate off-site disposal of waste from site (per incident)	R10,000
Deliberate lighting of illegal fires on site (per incident)	R1,000
The eating of meals on site outside the defined eating area. Individual not making use of the site ablution facilities (per incident)	R200
Inappropriate use of adjacent watercourses and water bodies – such as for unapproved water abstraction, washing of vehicles, wastewater disposal and use by employees for washing (per incident)	R1000
Any person, vehicle, item of plant, or anything related to the Contractor's operations causing a public nuisance (per incident)	R500
Construction vehicles not adhering to speed limits (per incident)	R200
Failure to maintain and register incidents in the incident register (per incident)	R1,000
Failure to remove all temporary features and leftovers from the construction site and works areas upon completion of the works (per incident)	R50,000
Any contravention with a Method Statement (per incident)	R5,000
Repeated contravention of the specifications or failure to comply with instructions (per incident)	R5,000

Note: The subjection and payment of a penalty does not absolve the contractor from fully remedying any transgression or environmental damage. Should the contractor fail to address his non-conformance, the developer has the right to remedy the incident and recover the costs from the contractor.

Appendix M: Incident and Environmental Log

ENVIRONMENTAL INCIDENT LOG				
Date	**Environmental Condition**	**Comments** *(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)*	**Corrective Action Taken** (*Give details and attach documentation as far as possible)*	**Signature**