

**PROPOSED UPGRADING OF THE FRANKFORT LANDFILL SITE ON THE
REMAINDER EXTENT OF THE FARM DORP FRANKFORT NO. 79, FREE
STATE PROVINCE**

ENVIRONMENTAL MANAGEMENT PLAN

February 2019

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LIST OF ACRONYMS AND ABBREVIATIONS

CER	-	Contractors Environmental Representatives
DEO	-	Designated Environmental Officer
DESTEA	-	Department of Economic, Small Business, Tourism and Environmental Affairs
DWS	-	Department of Water and Sanitation
ECO	-	Environmental Control Officer
EIA	-	Environmental Impact Assessment
EIR	-	Environmental Impact Report
EMP'r	-	Environmental Management Program Report
EPC	-	Engineering Procurement Contractor
I&AP's	-	Interested and Affected Parties
IDP	-	Integrated Development Plan
NEMA	-	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:BA	-	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NHRA	-	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NSBA	-	National Spatial Biodiversity Assessment
NERSA	-	National Energy Regulator of South Africa
NWA	-	National Water Act, 1998 (Act No. 36 of 1998)
PHRA	-	Provincial Heritage Resources Agency
PPP	-	Public Participation Process
SAHRA	-	South African Heritage Resources Agency
SDF	-	Spatial Development Framework

GLOSSARY OF TERMS

Alien species: A plant or animal species introduced from elsewhere: neither endemic nor indigenous.

Applicant: Any person who applies for an Authorisation to undertake an activity or undertake an Environmental Process in terms of the Environmental Impact Assessment Regulations – National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as contemplated in the scheduled activities listed in Government Notice (GN) No R. 327, 325 and 324.

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

Cumulative Impact: In relation to an activity, cumulative impact means the impact of an activity that in it-self may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Ecology: The study of the interrelationships between organisms and their environments.

Environment: All physical, chemical and biological factors and conditions that influence an object.

Environmental Impact Assessment: In relation to an application, to which Scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of the application.

Environmental Impact Report: In-depth assessment of impacts associated with a proposed development. This forms the second phase of an Environmental Impact Assessment and follows on from the Scoping Report.

Environmental Management Programme: A legally binding working document, which stipulates environmental and socio-economic mitigation measures that must be implemented by several responsible parties throughout the duration of the proposed project.

Heritage resources: This means any place or object of cultural significance. See also archaeological resources above

Precipitation: Any form of water, such as rain, snow, sleet, or hail that falls to the earth's surface.

Red Data species: All species included in the categories of endangered, vulnerable or rare, as defined by the International Union for the Conservation of Nature and Natural Resources.

Riparian: The area of land adjacent to a stream or river that is influenced by stream induced or related processes.

Soil compaction: Soil becoming dense by blows, vehicle passage or other type of loading. Wet soils compact easier than moist or dry soils.

1 INTRODUCTION

This Environmental Management Programme (EMPr), amongst others, describes the mitigation measures and identifies the specific role players that will be responsible for implementation of the mitigation measures, in order to ensure that impacts on the environment are minimised during the construction, operational and decommissioning phases of the proposed expansion of a landfill situated on the Remainder Extent of the Farm Dorp Frankfort No. 79, Free State Province.

This EMP'r must form part of the contractual agreement between the relevant Contractor(s) and the Developer/Applicant.

1.1 NEMA Regulation 19(4) Report Compliance

Regulation 19(4) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations of 2017 provides the content requirements for Environmental Management Programmes. The table below lists the relevant requirements, indicates whether the relevant information is included in this report or not, and provides cross-references as to where the relevant information can be found in this report.

Table 1: Environmental Management Programme requirements in terms of Regulation 19(4) of the EIA Regulations of 2017.

Reg.	EMP'r Content	Included (Yes, No or N/A)	Report Section Reference
(a)	A draft environmental management programme must comply with section 24N of the Act and include - details of:		
	(i) the person who prepared the environmental management programme; and	Yes	Chapter 3
	(ii) the expertise of that person to prepare an environmental management programme;	Yes	Chapter 3
(b)	A detailed description of the aspects of the activity that are covered by the EMP'r as identified by the project description;	Yes	Chapter 4
(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Yes	Chapter 2
(d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including –	Yes	Chapter 9
	(i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and, (v) where relevant, operation activities;		

Reg.	EMP'r Content	Included (Yes, No or N/A)	Report Section Reference
(e)	A description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Yes	Chapters 7 & 9
(f)	A description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to – (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and, (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Yes	Chapter 9
(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	YES	Chapter 9
(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	YES	Chapter 7
(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	YES	Chapter 9
(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	-	-
(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	YES	Chapter 9
(l)	A program for reporting on compliance, taking into account the requirements as prescribed by Regulations;	YES	Chapter 7
(m)	An environmental awareness plan describing the manner in which – (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and, (ii) risk must be dealt with in order to avoid pollution or the degradation of the environment; and,	YES	Chapter 8
(n)	Any specific information that may be required by the Competent Authority.	-	-

1.2 Report Layout

The table below summarises the content layout of this report.

Table 2: Summary of Report content layout.

Chapter	Chapter Heading	Content Summary
1	Introduction	Provides a brief background to the proposed project, and explains the compliance of this report with regards to Regulation 33 of the NEMA.
2	Environmental Assessment Practitioner	Provides details of the EAP who prepared this EMP'r, and provides information on the expertise of the EAP.
3	Project Description and Listed Activities Covered by this EMP'r	Provides a brief project description, and describes the relevant project phases and the NEMA Listed Activities triggered.
4	Existing Environmental and Impact Assessment Summary	Summarises the biophysical, social, economic and cultural aspects of the existing environment, and provides a summary of the impact assessment outcome.

Chapter	Chapter Heading	Content Summary
5	Persons Responsible for Implementing this EMP'r	Provides information on the persons who will be responsible for implementing this EMP'r, and explains requirements with regards to on-site communication, site instruction entries, method statements, and record keeping.
6	Monitoring, Performance Assessment and Reporting on EMP'r Compliance	Provides information on monitoring, performance assessment and reporting on EMP'r Compliance, ECO site inspection reports, and photographs.
7	Environmental Awareness Plan	Provides information on environmental awareness and risk training, and basic rules of conduct. Also provides an environmental risk plan.
8	Impacts and Mitigation Measures	Provides EMP'rs for the relevant project phases.
9	Emergency Response Plan	Provides information on the emergency response plan.
10	Incident Register	Stipulates the content requirements for incident registers.
11	Rehabilitation Measures and Closure Plan	Provides rehabilitation measures and closure plan objectives.
12	Prevent Triggering of Further Listed Activities	Warns the proponent not to contravene the NEMA by engaging in unauthorised NEMA Listed Activities.
13	References	Lists all references referred to in this EMP'r.

PROPOSED UPGRADING OF THE LANDFILL IN FRANKFORT, MAFUBE LOCAL MUNICIPALITY

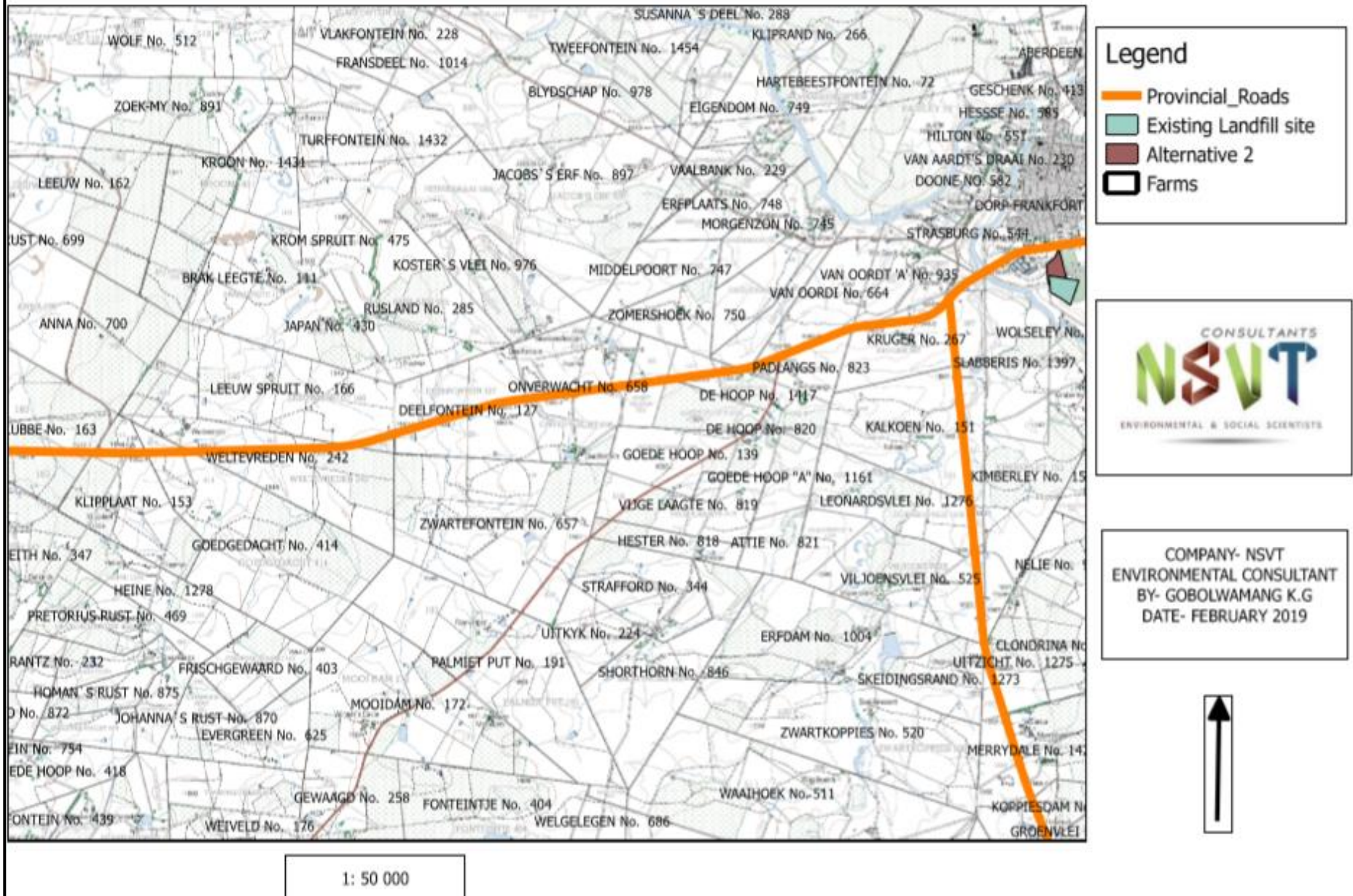


Figure 2: Layout Map of the Proposed Area.

3 ENVIRONMENTAL ASSESSMENT PRACTITIONER

This Environmental Management Programme Report was prepared by Teboho Modise from TIS Environmental Consulting. The sections below provide the details of the EAP, and explain the EAP's expertise to prepare this EMP'r.

3.1 Details of the EAP

Business name of EAP:	TIS Environmental Consulting
Physical address:	12 Bains Game Lodge, Bainsvlei, Bloemfontein
Postal address:	
Postal code:	9301
Telephone:	082 539 2102
E-mail:	info@tisenviron.co.za
Fax:	

3.2 Expertise of the EAP

Name of EAP	Education qualifications	Professional affiliations	Experience in environmental Assessments and Environmental Management (years)
Teboho Modise	B.Sc Honours Environmental Geography	IAIA	13 years

4 PROJECT DESCRIPTION AND LISTED ACTIVITIES COVERED BY THIS EMP-R

4.1 Brief Project Description

The Project Applicant, Mafube Local Municipality propose to upgrade the existing landfill site for disposal of domestic and general waste generated from the town of Frankfort and its surroundings. Frankfort is situated within the Fezile Dabi District Municipality in the Free State Province. The project was commissioned in order to meet the ever growing demand for waste disposal in the region. The assessment area is approximately 14.4 ha in size with two (2) Alternative sites being provided.

4.2 Project Phases

Two phases:

1. Construction Phase (includes planning, design, pre-construction and construction activities); and,
2. Operational Phase.

4.3 NEMA Listed Activities Triggered

As per the project's compiled Environmental Impact Reports.

5 EXISTING ENVIRONMENTAL AND IMPACT ASSESSMENT SUMMARY

The sections below summarise the existing environment, and the outcome of the impact assessment that was undertaken for the proposed project.

5.1 Specialist Investigations

On assessment of the proposed location for alternatives, the specialists determined the following:

Ecological Impact Assessment (EcoFocus Consulting – Mr Rikus Lamprecht)

The proposed landfill site expansion will in all probability completely transform the majority of the existing surface vegetation on the assessment area.

The Frankfort Highveld Grassland vegetation type (Gm 6) associated with the assessment area, is classified as vulnerable due to extensive cultivation activities and flooded dams in the larger region. The assessment area is; however, in a moderate to highly degraded state and scored a low PES value. The significant degradation has mainly been caused by anthropogenic activities associated with the existing landfill site as well as overgrazing by livestock from the Local Community and frequent burning. Numerous footpaths also traverse the entire area. The area is therefore not reminiscent of the natural climatic state of the relevant vegetation type.

With the exception of the two provincially protected species *Boophone disticha* & *Helichrysum nudifolium*, no Red Data Listed-, nationally protected- or any other species of conservational significance were found to be present within the assessment area. Due to the presence of the existing landfill site, the area is subjected to continued anthropogenic activity and disturbance. It is therefore not anticipated that any large or conservational significant faunal species would utilise the area for breeding and persistence purposes. No important bird species, unique or specialised bird habitats were observed or are expected to utilise the area for breeding or persistence purposes. The assessment area and surrounding landscape also does not fall within any Important Bird Area (IBA) as per the latest IBA map obtained from the Birdlife SA website.

All surface water runoff on the expansion area flows towards a single accumulation point on the western boundary of the area. From there it crosses JJ Hadebe Street and feeds into an ephemeral water drainage line which eventually discharges into the Wilge River located approximately 270 m south-west of the assessment area. The expansion area therefore forms part of the upper commencement of a small localised surface water catchment and drainage area. Due to a large portion of the expansion area along the access road being highly degraded and polluted by unmanaged and illegal dumped domestic and general waste will eventually find its way into the Wilge River during the rainy season. Active intervention should therefore be implemented as soon as practicably possible in order to prevent this from happening. Therefore, although the entire assessment area is categorised as an Ecological Support Area two (ESA 2), the proposed expansion area constitutes a moderate to highly degraded grassland landscape and subsequently scored a moderate EIS value. The proposed expansion area is not viewed as being of high conservation significance for habitat preservation and ecological functionality persistence in support of the surrounding ecosystem, broader vegetation type and surface water catchment and drainage area towards the Wilge River as well as contamination of ground water. These potential impacts can; however, be suitably reduced and mitigated to within acceptable residual levels. The project should therefore be considered by the Competent Authority for Environmental Authorisation and approval. It is recommended that the assessment area be applied for, for development purposes. Alternative 2 and 3 are therefore not recommended for development.

The proposed development may; however, only continue if all recommended mitigations measures as per this ecological report are adequately implemented and managed for both the construction and operational phases of the proposed project. All necessary Authorisations and Permits must also be obtained prior to any commencement.

Geo-Technical Investigation (Tucana Solutions – Mr Christiaan Vermaak)

With the available information at hand it can be concluded that:

1. The study area is situated on a poor aquifer system which is associated with boreholes with an average yield less than 0.4 l/s;
2. No boreholes could be identified in the vicinity of the study area and only one is currently in use;
3. Due to the low yields, no groundwater use was detected in the proximity of the SWS;
4. The risk for groundwater pollution is least due to the fact that the proposed site is situated on a poor aquifer; and,
5. Should pollution occur, it is expected to stay relatively localized and follow a topographical down gradient direction at a relatively slow rate.

It is therefore recommended that:

1. At least two boreholes must be drilled in the vicinity of the SWS. One borehole upstream and one downstream of the SWS. If groundwater flow direction should be determined, a third borehole will be necessary;
2. The newly drilled borehole should be tested in order to determine the aquifer parameters and enhance the understanding of groundwater flow in the vicinity of the SWS;
3. Water quality samples be collected after drilling of monitoring boreholes in the vicinity of the SWS;
4. A Water Monitoring Plan should be compiled and submitted to DWS for approval.

5.2 Environmental Impact Ratings

Please refer to the Environmental Impact Assessment Report.

6 RECOMMENDATIONS OF THE EAP

The Environmental Impact Assessment process has assessed impact associated with the proposed development and determined, based on the outcomes of a multitude of contributing information that the proposed development would not result in any unacceptable impact or fatal flaws and as such may be Authorized.

7 PERSONS RESPONSIBLE FOR IMPLEMENTING THIS EMPR

The “Responsibility” columns in the impact and mitigation tables provided below indicate which team member(s) are responsible for implementation of the identified mitigation measures; these team members include the following:

1. Construction contractor(s);
2. Construction manager;
3. Applicant / Developer; and the
4. Designated Environmental Officer

The sections below list further supplementary measures, which must also be implemented by the relevant team members.

During the **Construction Phase**, the **Construction Contractor** will:

1. Be responsible to have the EMP'r available on site at all times;
2. Provide the applicant with a "Method Statement" which will indicate the procedures that will be applied in order to meet the requirements of any aspect of the EMP'r; and
3. Ensure that all problems identified during environmental inspections, are addressed and rectified as soon as reasonably possible.

During the **Construction Phase**, the **Contract Project Managers** will:

1. Have the authority to stop work and issue fines;
2. Receive reports from the ECO and report to the Client;
3. Enforce contractor obligations to the EMP-r; and,
4. Support the ECO in his/her roles and responsibilities.

During the **Construction Phase**, the **Environmental Control Officer** will:

1. Meet with the Contractor and Project Manager to hand over the site and go through the content of the EMP-r, including the "do's and don'ts" of the project, in order to ensure that the parties understand their responsibilities to the EMP-r;
2. Be accountable for monitoring and auditing activities to ensure compliance with the EMP-r and the Environmental Authorisation;
3. Work correctively with other role-players, but not be influenced in opinion and must report to the Applicant only;
4. May, in the event of there being a serious threat to or impact on the environment, correspond with the contract project manager to stop work;
5. Complete an ECO checklist after each site inspection and distribute this to the project team within 5 days; and,
6. Conduct a Final Environmental Audit of the project on completion of construction and rehabilitation, for submission to the DESTEA to review.

During the **Operational Phase** the **Applicant/Developer**, will be responsible to prevent negative environmental impacts, and as such will be responsible to:

1. Set aside a budget for maintenance;
2. Maintain all facilities and infrastructure in good working order to effectively fulfil its intended purpose and to prevent negative environmental impacts;
3. Not construct any additional buildings, infrastructure, etc. contrary to the Environmental Authorisation, without performing an Environmental Impact Assessment where listed activities of the 2017 NEMA EIA Regulations are triggered; and,
4. To immediately remedy any aspects that contribute to negative environmental impacts.

7.1 On-site Communication

The following sections describe the site communication measures that will need to be implemented.

7.1.1 Site Instruction Entries

The Site Instruction book must be used for the recording of general site instructions as they relate to the works on site. It must also be used for the issuing of **stop work orders** for the purposes of immediately halting any particular activities of the contractor in lieu of the environmental risk that they may pose.

7.1.2 Method Statements

Method statements from the Contractor will be required for specific sensitive actions on request by the Authorities or the ECO.

A method statement forms the baseline information on which work in sensitive environments takes place and is a “live document” allowing for modifications to be negotiated between the Contractor and ECO / Engineer, as circumstances unfolds.

A method statement describes the scope of the intended work, step-by-step, in order for the ECO and Engineer to understand the Contractor’s intentions. This will enable them to assist in devising any mitigation measures, which would minimise environmental impacts during these tasks. For each instance wherein it is requested that the Contractor submit a method statement to the satisfaction of the ECO, the format must clearly indicate the following:

1. **What** –a brief description of the work to be undertaken;
2. **How** – a detailed description of the process of work, methods and materials;
3. **Where** – a description/sketch map of the locality of work (if applicable); and
4. **When** – the sequencing of actions with due commencement dates and completion date estimates.

All method statements will form part of the EMP'r documentation and are subject to all terms and conditions contained within the EMP'r main document.

The Contractor must submit the method statement to the ECO before any particular construction activity is due to start. Work may not commence until the method statement has been approved by the ECO.

7.1.3 Record Keeping

All records related to the implementation of this EMP'r (e.g. site instruction book, method statements) must be kept together in an office where it is safe and can be retrieved easily. These records must be kept for two years and must at any time be available for scrutiny by any relevant Authority.

7.2 Monitoring

Several monitoring actions are proposed which would be undertaken by various project role players. For detail on these actions, "Responsible Person/Party", and "Monitoring Frequency" associated with the identified mitigation measures, refers to the "Monitoring" column in the impact assessment below (Chapter 8).

7.3 Performance Assessment and Reporting on EMP'r Compliance

A suitably-qualified Environmental Control Officer (ECO) must be appointed by the Applicant / Developer to oversee the implementation of the construction phase mitigation measures described in this EMP'r, as well as the conditions of authorisation as described in the Environmental Authorisation.

The ECO may not be someone appointed by the Contractor, engineer or other party involved with this project, other than the Applicant / Developer.

The following applies, amongst others, to the ECO's role:

1. The ECO must undertake **monthly site visits** during the **Construction Phase**,
2. The ECO must **report to** the Applicant / Developer only.
3. The ECO must present an **environmental site induction / awareness training session** to all personnel before work on site commences, as are also described below; and
4. After completion of the construction activities, an Environmental Audit must be undertaken by the CEO, before commencement of the Operational Phase, in order to determine compliance with the EMP'r and the Environmental Authorisation. The audit report must be submitted to the Competent Authority.

The ECO can recommend the stopping of works if in his/her opinion there is a serious threat to, or impact on the environment, caused directly from the construction operations. This authority is to be limited to emergency situations where consultation with the Engineer or Applicant is not immediately available. In all such work stoppage situations the ECO is to inform the Engineer and Applicant of the reasons for the stoppage as soon as possible.

Upon failure by the Contractor or his employee(s) to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the Engineer to have the contractor's representative or any employee(s) removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the contractor.

7.3.1 ECO Site Inspection Reports

The ECO site inspection reports (also called "ECO Checklists") will report on the compliance of the construction phase mitigation measures contained in the EMP'r, as well as the conditions of approval described in the Environmental Authorisation. The report must be submitted to the Applicant, within seven

1. days of the ECO site inspection, and must be made available to the construction Contractor. Copies of the inspection reports must be kept on site.

The contractor's meeting minutes must reflect environmental queries, agreed actions and dates of eventual compliance. These minutes form part of the official environmental record.

7.3.2 Photographs

It is recommended that photographs are taken of the site prior to, during and immediately after construction as a visual reference. These photographs must be stored with other records related to this EMP'r. If captured in digital format, hard copies, in colour, must be kept with all other records relevant to the implementation of this EMP'r.

8 ENVIRONMENTAL AWARENESS PLAN

8.1 Environmental Awareness and Risk Training

All contractor team members involved in work on site are to be briefed on their obligations towards environmental controls and methodologies in terms of this EMP'r, prior to work commencing. The briefing will usually take the form of an on-site talk and demonstration by the ECO. The education/awareness programmes must be aimed at all levels of management within the contractor team. See "basic rules of conduct" below.

8.1.1 Basic Rules of Conduct

The following list represents the basic *Do's* and *Don'ts* towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.

NOTE: ALL new site personnel must attend an environmental awareness/induction presentation. Please inform your foreman or manager if you have not attended such a presentation or contact the ECO.

DO:

1. Clear your work areas of litter and building rubble at the end of each day – use the waste bins provided and prevent litter from being blown away by wind.
2. Report all fuel or oil spills immediately and stop the spill from continuing.
3. Dispose of cigarettes and matches carefully, so to prevent veld fires (arson and littering is an offence).
4. Confine work and storage of equipment to within the immediate work area.
5. Use all safety equipment and comply with all safety procedures.
6. Ensure a working fire extinguisher is immediately at hand if any “HOT WORK” is undertaken e.g. welding, grinding, gas cutting etc.
7. Prevent excessive dust and noise.

DO NOT:

1. Do not litter - report dirty or full facilities, i.e. full dustbins and dirty or blocked toilets.
2. Do not make any fires.
3. Do not enter any fenced off or demarcated areas.
4. Do not allow waste, litter, oils or foreign materials into any storm water channels or drains or watercourses.
5. Do not litter or leave food lying around.

9 IMPACTS AND MITIGATION MEASURES

A number of potential environmental impacts that may arise during the project have been identified. These are outlined in the following table below, and guidelines and mitigation measures are provided.

The Contractor must familiarise himself with the requirements of the EMP'r, keeping in mind that other site-specific requirements as outlined in the Environmental Authorisation must also be complied with.

9.1 Construction Phase Environmental Management Programme

CONSTRUCTION PHASE: PROPOSED EXPANSION OF THE FRANKFORT LANDFILL SITE ON THE REMAINDER EXTENT OF THE FARM DORP FRANKFORT NO. 79, FREE STATE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	<u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
1. <u>ACTIVITY:</u> PERMITS AND AUTHORISATIONS				
1.1	<p>Aspects: Legislative compliance.</p> <p>Impact: Non-compliance with South African Environmental Legislation.</p> <p>Objective: Ensure compliance with all triggered Environmental Legislation.</p> <p>Target: Commence site establishment with all permission and approvals received and on hand.</p> <p>Mitigation/Management Measures:</p> <p>a. The Developer is to have the following permits on commencement:</p> <ul style="list-style-type: none"> • Environmental Authorisation; • Environmental Management Program; • General Water Use License; • Heritage Permit; and, • Building approval from the Municipality. 	Developer	<p>Monitoring Action:</p> <p>Obtain copies of all permits; Record Keeping</p> <p>Responsible Person/Party:</p> <p>Applicant</p> <p>Monitoring Frequency:</p> <p>Once off</p>	
2. <u>ACTIVITY:</u> SITE LAYOUT PLANNING				
2.1	<p>Aspects: Site Layout Plan.</p> <p>Impact: Negative impact on the environment of unmanaged and unplanned placement of Infrastructure.</p> <p>Objective: To ensure acceptable impact and management of environmental issues at the main site and storage site during construction by proper planning of layout of infrastructure placement.</p> <p>Target: All areas not demarcated for construction must remain vegetated and the impact must be minimised.</p>	Contractor	<p>Monitoring Action:</p> <p>Records of the Site Layout must be present on site.</p> <p>Responsible</p>	

**CONSTRUCTION PHASE: PROPOSED EXPANSION OF THE FRANKFORT LANDFILL SITE ON THE REMAINDER
EXTENT OF**

THE FARM DORP FRANKFORT NO. 79, FREE STATE PROVINCE

**RESPONSIBLE
PARTY/PERSON

(implementation
of mitigation
measures)**

**MONITORING:

ACTION, RESPONSIBLE
PERSON/PARTY AND

FREQUENCY**

**COMPLIAN
T? (for use
by ECO)**

Mitigation/Management Measures:

- a. Draw up and submit for approval a Site Layout Master Plan. This plan must show the final positions and extent of all permanent and temporary site structures and infrastructure (inclusive of the distance from any sensitive environmental areas);
- b. The planning for layout must be done in consultation, on-site, with the Environmental Control Officer (ECO);
 1. The contractor may not deface, paint, damage or mark any natural features situated in or around the site for survey or other purposes;
 2. The contractor must ensure that all construction personnel, labourers and equipment remain within the demarcated construction sites at all times;
 3. No servicing of vehicles may be permitted on site, unless for emergency purposes;
 4. Stockpiles may not be situated in such a manner that they obstruct pathways;
 5. Location of storage area must take into account prevailing winds, distance to water bodies and general on-site topography;
 6. Place infrastructure as far as possible on sites that have already been transformed;
 7. Facilities may not be used as staff accommodation;
 8. The Contractors camp layout must take into account availability of access for deliveries and services and any future works;
 9. The Contractors camp must be of sufficient size to accommodate the needs of all sub-contractors that may work on the project; and,
 10. The Contractor must implement the following as required:

Person/Party:

Contract Project
Manager / Engineer

Monitoring Frequency:

Once off

CONSTRUCTION PHASE: PROPOSED EXPANSION OF THE FRANKFORT LANDFILL SITE ON THE REMAINDER EXTENT OF THE FARM DORP FRANKFORT NO. 79, FREE STATE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	<ul style="list-style-type: none"> • Suitable sanitation facilities, adequate for the number of staff on site (1 for every 15 personnel and 1 for each gender); and, • Facilities for solid waste collection. 			
3. <u>ACTIVITY:</u> CONSTRUCTION PROGRAMME / SCHEDULE				
3.1	<p>Aspects: Project Management.</p> <p>Impact: Order and timing of construction activities and associated impacts.</p> <p>Objective: To Provide a clear indication of the order by which key construction activities will transpire.</p> <p>Target: Anticipate timing of impacts to coordinate the availability of any Specialists and/or Authorities who may be required to conduct site inspections.</p> <p>Mitigation/Management Measures:</p> <ol style="list-style-type: none"> Draw up and sign off a project schedule with all contributing parties and service providers to commit to a timeline during which time construction milestones will be completed; Communicate any deviation from this schedule to all parties, so as to provide parties with sufficient opportunity for alternative arrangements to be made; Establish a risk register to identify and monitor potential factors which may result in setbacks/ delays on tasks within the project schedule; Hold management meetings with representatives of the project manager, contractor, engineer and other contributing parties to monitor and anticipate changes; and, Should circumstances/ incidents arise which may pose a risk to the project schedule, the construction contractor, and engineer and ECO are to keep records of this and the latter communicate this in the ECO Monthly Audit Checklist. 	All Construction Parties	<p>Monitoring Action:</p> <p>Meetings; Risk Register; ECO Audit Checklist; Photographs</p> <p>Responsible Person/Party: Contract Project Manager / Contractor / ECO</p> <p>Monitoring Frequency:</p> <p>Once off</p>	

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4. ACTIVITY: COMMUNICATION WITH LAND-OWNERS				
4.1	<p>Aspects: Landowner Consent.</p> <p>Impact: Disturbance of existing land use.</p> <p>Objective: Maintain a conflict-free relationship with landowners / users.</p> <p>Target: No complaints received from landowners / users of affected property.</p> <p>Mitigation/Management Measures:</p> <ol style="list-style-type: none"> Landowners are to be aware and in agreement of site access arrangements; Landowner has to provide consent to the site supervisor of the construction contractor prior to entering the construction footprint area for safety purposes; All property gates are to be kept closed when not in use (or kept in the open/closed state in which it was found); and, Any complaint or liaison with regard to environmental aspects, compensation or disorder to economic activities, must not be addressed by the Contractor. A public complaint register must be kept on site and the contract project manager must inform the Developer and/or ECO to take further action. 	Contract Project Manager / Contractor & Applicant	<p>Monitoring Action:</p> <p>Meetings; Risk Register.</p> <p>Responsible Person/Party:</p> <p>Contract Project Manager / Contractor / ECO</p> <p>Monitoring Frequency:</p> <p>Monthly</p>	
5. ACTIVITY: SITE ESTABLISHMENT				
5.1	<p>Aspects: Demarcation of the site and vegetation removal.</p> <p>Impact: Direct impact on vegetation during construction and loss of species.</p> <p>Objective: Prevent unnecessary habitat destruction.</p> <p>Target: All areas not demarcated for construction must remain vegetated.</p>	Construction Contractor	<p>Monitoring Action:</p> <p>ECO to take photographs of site before clearance; ECO</p>	

<p style="text-align: center;">CONSTRUCTION PHASE: PROPOSED EXPANSION OF THE FRANKFORT LANDFILL SITE ON THE REMAINDER EXTENT OF THE FARM DORP FRANKFORT NO. 79, FREE STATE PROVINCE</p>	<p style="text-align: center;">RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)</p> <p style="text-align: center;">MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY</p> <p style="text-align: center;">COMPLIAN T? (for use by ECO)</p>
<p><u>Mitigation/Management Measures:</u></p> <ul style="list-style-type: none"> a. No natural surfaces are to be marked other than using droppers, beacons or other artificial object; b. Ensure the upkeep of demarcation boundaries throughout the period of construction until rehabilitation has been completed; <ul style="list-style-type: none"> 1. Construction areas must be fenced; d. Keep areas affected to a minimum, strictly prohibit any disturbance outside the demarcated foundation footprint area; e. Clear as little indigenous vegetation as possible, aim to maintain vegetation where it will not interfere with the construction or operation of the development, rehabilitate an acceptable vegetation layer according to rehabilitation recommendations of the relevant EMP'r, if possible; f. There must be a pre-construction environmental induction for all construction staff on site to ensure that basic environmental biodiversity principles are adhered to; g. Where the ECO deems it necessary (e.g. sensitive, natural areas) the ecologist appointed to do the vegetation study will be utilized; h. Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation; i. Impacts to sensitive sites (drainage lines) must be avoided; j. An additional ecological walkthrough be conducted prior to commencement of the project during the flowering period to ensure that no provincially- or nationally protected or significant species have been omitted; k. Posters of species of conservation concern should be kept on site where they will be visible to construction personnel; l. No vegetation may be gathered for the purpose of creating fire; and, m. Areas to be cleared should be agreed and demarcated before the start of the clearing operations. 	<p>Audit Checklist.</p> <p><u>Responsible Person/Party:</u> ECO</p> <p><u>Monitoring Frequency:</u> Monthly</p>

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5.2	<p>Aspects: Topsoil stripping and conservation.</p> <p>Impact: Destruction of topsoil.</p> <p>Objective: Conserve and protect topsoil from erosion and destruction.</p> <p>Target: Topsoil condition maintained.</p> <p>Mitigation/Management Measures:</p> <ol style="list-style-type: none"> In the absence of a distinguishable topsoil layer, strip the uppermost 300 mm of soil; Stockpile topsoil separately from subsoil, in heaps no higher than 2m; Topsoil stockpiles are to be kept free of weeds; Limit unnecessarily prolonged exposure of stripped areas and stockpiles; Topsoil stockpiles to be placed on a levelled area and measures to be implemented to safeguard the piles from being washed away in the event of heavy rains/ storm water; Topsoil need to be stored in designated areas only. This need to be planned and indicated on the site-layout plan; Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/ earthworks in that area; Strip and stockpile herbaceous vegetation, overlying grass and other fine organic matter along with the topsoil; Ensure that topsoil is not mixed with subsoil and/or any other excavated material; Temporarily stored topsoil must be re-applied within 6 months, topsoil stored for longer need to be managed according to a detailed topsoil management plan; Topsoil must be used in all rehabilitation activities, and may not be compacted to ensure that its plant support capacity remain of high quality; 	Construction Contractor	<p>Monitoring Action: ECO Audit Checklist; Photographs;</p> <p>Responsible Person/Party: ECO & DEO</p> <p>Monitoring Frequency: ECO – Monthly; DEO – Weekly.</p>	

**CONSTRUCTION PHASE: PROPOSED EXPANSION OF THE FRANKFORT LANDFILL SITE ON THE REMAINDER
EXTENT OF
THE FARM DORP FRANKFORT NO. 79, FREE STATE PROVINCE**

**RESPONSIBLE
PARTY/PERSON

(implementation
of mitigation
measures)**

**MONITORING:

ACTION, RESPONSIBLE
PERSON/PARTY AND
FREQUENCY** **COMPLIAN
T? (for use
by ECO)**

1. Provide containment and settlement facilities for effluents from concrete mixing and washing facilities;
2. Provide spill containment facilities for hazardous materials like fuel and oil;
3. Do not strip topsoil when it is wet; and,
4. Do not mix topsoil obtained from different sites, unless the ECO gives permission.

1. ACTIVITY: SITE INFRASTRUCTURE PLACEMENT AND OPERATION

6.1 **Aspects:** Structures and lay-down areas.

Impact: Deterioration of site features and surrounding areas.

Objective: Prevent the deterioration of site features like soil, rainwater runoff and erosion.

Target: The preservation of site conditions evident on establishment of structures and lay-down areas.

Mitigation/Management Measures:

1. Locate all structures and storage areas, including offices, workshops and stores in approved locations as per the Site Layout Plan;
1. The camp with storage and laydown areas are to be kept secure and neat with access control measures adopted during construction;
1. Clearly define which activities are to occur within which areas of the site by erecting signage; and,
1. All hazardous substances, such as fuel, oil, diesel, paint, etc., must be stored in a secondary containment system (trays or bund) which is capable of storing at least 110% of the liquid capacity. If bund areas are used, it must be sealed to avoid seepages.

Construction
Contractor

Monitoring Action:

Photographs; ECO
Audit Checklist

**Responsible
Person/Party:**

ECO

Monitoring Frequency:

ECO – Monthly
DEO - Weekly

1. ACTIVITY: CONSTRUCTION SITE OPERATIONS

7.1 **Aspects:** Security and fencing.

Construction

Monitoring Action:

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	<p>Impact: Prevent danger to trespassing of persons.</p> <p>Objective: Keep the site secure from trespassing or theft and keep animals out.</p> <p>Target: Site remains secure during construction with no incidences of trespassing, theft and injury or death to animals.</p> <p>Mitigation/Management Measures:</p> <ol style="list-style-type: none"> Be responsive to open or closed status of gates; New or the upkeep of fences must be align to ensure safety of animals and maintain a reliable boundary area; Limit clearing of vegetation for fencing to the removal of trees and shrubs within 1 m of the fence line. All undergrowth must be maintained; Should construction activities require the removal of fences or gates to execute tasks, this must be replaced as soon as possible following completion; and, In all cases, the landowners on whose property any use of fences or gates, must be consulted, to ensure that parties are informed of construction activity, schedules and vehicle movement. 	Contractor	Photographs; ECO Audit Checklist <u>Responsible Person/Party:</u> ECO & DEO <u>Monitoring Frequency:</u> ECO – Monthly DEO – Bi-Weekly	
7.2	<p>Aspects: Existing Services and Infrastructure.</p> <p>Impact: Damage to existing services and infrastructure.</p> <p>Objective: No damages to existing services and infrastructure.</p> <p>Target: No damages to existing services and infrastructure.</p> <p>Mitigation/Management Measures:</p> <ol style="list-style-type: none"> Take cognisance of the position of existing services and infrastructure (e.g. roads, pipelines, power lines and telephone services) that may get damaged due to construction activities; Ensure that existing services are not damaged or disrupted unless required by the contract and with the permission of 	Construction contractor	<u>Monitoring Action:</u> Photographs; ECO Audit Checklist <u>Responsible Person/Party:</u> Contractor & DEO <u>Monitoring Frequency:</u>	

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	<p>the project manager; and</p> <p>c. In the event that infrastructure is damaged or services interrupted during construction, it will be done at the expense of the Contractor and shall receive top priority over all other activities.</p>		Monthly	
7.3	<p>Aspects: Traffic.</p> <p>Impact: Impact on traffic.</p> <p>Objective: Minimise the disruption of road users.</p> <p>Target: Minimal disruption of road users.</p> <p>Mitigation/Management Measures:</p> <p>a. All vehicles must be road-worthy and drivers must be qualified, made aware of the potential road safety issues, and need for strict speed limits;</p> <p>b. Vehicles used for transport of materials and sand must be fitted with tarpaulins to prevent the release of such material or items onto road surfaces;</p> <p>c. Construction vehicles may not leave the designated roads and tracks and turnaround points must be limited to specific sites;</p> <p>d. Abnormal loads must not be transported after dark;</p> <p>1. Abnormal loads must be timed to avoid times of year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods;</p> <p>2. Loads should be timed to avoid times of the day when traffic volumes are likely to be higher (06:00 – 09:00 and 16:00 – 18:00);</p> <p>3. Transport of materials must be limited to the least amount of trips possible; and</p>	Construction Contractor	<p>Monitoring Action:</p> <p>Incident Register;</p> <p>Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party:</p> <p>DEO & ECO</p> <p>Monitoring Frequency:</p> <p>ECO – Monthly</p> <p>DEO – When loads are expected.</p>	

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	h. Traffic deviations around the construction area must be planned in conjunction with the Local Authority to ensure safe and free flow of traffic. Safety signs must be utilised.			
7.4	<p>Aspects: Traffic.</p> <p>Impact: Traffic impacts associated with the movement of construction vehicles on site.</p> <p>Objective: To minimise the destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site.</p> <p>Target: Minimal destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site.</p>		<p>Monitoring Action:</p> <p>Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party:</p> <p>Contractor, DEO & ECO</p> <p>Monitoring Frequency:</p> <p>ECO – Monthly DEO – Daily</p>	
	<p>Mitigation/Management Measures:</p> <p>a. During construction create designated turning areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas;</p> <p>b. Monitor the establishment of (alien) invasive species and eradicate as soon as detected, before regenerative material can be formed;</p> <p>c. Abnormal loads and machinery must avoid movement over gravel roads during and immediately after rainfall events, so as to limit destruction of road surfaces and sedimentation of downhill rivers/streams;</p> <p>1. All vehicles must be road-worthy, be maintained to prevent fuel or oil leaks and drivers are to be licensed appropriately for the driving of their assigned vehicle. Drivers responsible for the transportation of personnel must be specifically licensed to do so;</p> <p>2. Construction vehicles may not leave the designated roads and tracks, whilst U-Turns are prohibited on all roads;</p> <p>3. Signage is to be placed on vehicles at all times;</p> <p>4. All construction vehicles must adhere to construction sites and avoid off road to minimise impact on vegetation and soil;</p>	Construction Contractor		

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	<p>h. After decommissioning, if access roads or portions thereof will not be of further use to the landowner, remove all foreign material and rip area to facilitate the establishment of vegetation, followed by a suitable revegetation program; and,</p> <p>i. Construction-related vehicles and machinery may not operate on site without reflective safety signage, car-top lights and reflective personnel gear.</p>			
7.5	<p>Aspects: Erosion Control.</p> <p>Impact: Loss of topsoil, formation of bare soil and deterioration of habitat quality.</p> <p>Objective: Prevent soil erosion.</p> <p>Target: No signs of soil erosion are evident on site.</p> <p>Mitigation/Management Measures:</p> <p>a. Disturb as little ground area as possible, stabilize that area as quickly as possible, control drainage through the area, and trap sediment on site;</p> <p>b. Conserve topsoil with its leaf litter and organic matter, and re-apply this material to local disturbed areas to promote the growth of local native vegetation;</p> <p>c. Apply erosion control measures before the rainy season begins and after each season of construction, preferably immediately following construction; and,</p> <p>d. Maintain and re-apply erosion control measures until vegetation is successfully established.</p>	Construction Contractor	<p>Monitoring Action:</p> <p>Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party:</p> <p>Contractor</p> <p>Monitoring Frequency:</p> <p>ECO – Monthly DEO – After Rainfall Occurred</p>	
7.6	<p>Aspects: Handling of general–and hazardous waste materials on the construction site.</p> <p>Impact: The presence of personnel and construction operations will increase the likelihood of littering and dumping of solid waste.</p>	Construction Contractor	<p>Monitoring Action:</p> <p>ECO Audit Checklist; Safe Disposal</p>	

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<p><u>Objective:</u> Management and disposal of general–and hazardous waste in an appropriate manner.</p> <p><u>Target:</u> No record of pollution or site contamination by solid waste.</p> <p><u>Mitigation/Management Measures:</u></p> <ul style="list-style-type: none"> a. An adequate number of scavenger proof litter bins are to be placed throughout the site. Two waste bins at least must be present, one (1) for hazardous waste and one (1) for non-hazardous waste at each working site. Dumping of waste on site is prohibited; 1. Waste sorting and separation must form part of the environmental induction and awareness programme, to encourage personnel to collect waste paper, glass and metal waste separately; c. Keep all work sites including storage areas, offices and workshops neat and tidy; d. Dedicate a demarcated and signposted storage area on site for the collection of construction waste; 1. All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site (Frankfort Landfill site) as mentioned in the Basic Assessment Report; 2. The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste; 3. Littering by construction workers shall not be permitted; 4. Minimise waste by sorting wastes into recyclable and non-recyclable waste; 5. Ablution facilities must be serviced by a registered service provider, cleaned at least once a week, and safe disposal slips must be on file at the site office; 6. A bi-weekly (twice a week) litter patrol of the entire site shall be conducted by the Designated Environmental Officer (DEO); 		<p>Documentation & Photographs</p> <p><u>Responsible Person/Party:</u> ECO & DEO</p> <p><u>Monitoring Frequency:</u> ECO – Monthly DEO – Weekly</p>	

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	<p>k. Hazardous waste must be sorted from non-hazardous waste and disposed of at a hazardous treatment facility, records and proof of disposal must be kept; and,</p> <p>l. A register must be kept of the quantities of waste disposed and proof of disposal must be available at the site office.</p>			
7.7	<p>Aspects: Sewage waste.</p> <p>Impact: Pollution and site contamination due to sewage.</p> <p>Objective: Provide facilities for appropriate collection and disposal of sewage.</p> <p>Target: No record of pollution or site contamination by sewage.</p> <p>Mitigation/Management Measures:</p> <p>a. Provide portable chemical ablution facilities, situated at convenient locations in proximity to work areas. This must be in relation to the quantity of users on site, with 1 ablution facility per 15 users and for each gender;</p> <p>b. Locations for the placement of ablution facilities include the workshop and areas for resting and eating.</p> <p>c. Ablution facilities are to be maintained and cleaned regularly to ensure functionality and an adequate level of hygiene;</p> <p>d. Drinking water facilities, comprising of a water tank with a manual tap can be combined with hand washing facilities near site ablution; and,</p> <p>e. Only toilet paper is to be flushed down the chemical ablution facility. Personnel are to be informed on sanitary implementation as part of the environmental awareness.</p>	Construction Contractor	<p>Monitoring Action: ECO Audit Checklist; Safe Disposal Slips & Photographic Evidence</p> <p>Responsible Person/Party: ECO & DEO</p> <p>Monitoring Frequency: ECO – Monthly DEO – Weekly</p>	
7.8	<p>Aspects: Dust Generation and visual Impact.</p> <p>Impact: Dust nuisance from site operations and visual impact of site operations on surrounding land owners.</p> <p>Objective: To avoid dust from excavated materials and construction activity and unnecessary visual impact caused by site operations.</p>	Construction Contractor	<p>Monitoring Action: ECO to take photographs of the site; ECO Audit</p>	

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<p><u>Target:</u> Minimise the incidence of dust generation and visual impact.</p> <hr/> <p><u>Mitigation/Management Measures:</u></p> <ol style="list-style-type: none"> a. Dust masks are to be supplied to workers; b. The transfer of soil or aggregate must be done over the shortest possible distance; c. A speed limit of 30 km/h must be applied on gravel roads; d. Any complaints received by the Contractor regarding dust will be recorded and communicated to the ECO; e. Ensure all vehicles remain on designated roads and avoid the opening of detour or by-pass tracks; f. Access roads are to be kept clean; 1. Surface material that is scraped off during construction must be conserved and used for rehabilitation. Any spoil material must be disposed of in a manner that appears natural; 2. Lay-down area(s) must be screened with shade cloth in an earth tone or other appropriate neutral colour; 3. Site offices and structures must be limited to one location and carefully situated to reduce visual intrusion. Roofs must be grey and non-reflective; 4. Lights within the construction camp must face directly downwards (angle of 90°); 5. Avoid shiny materials in structures. Where possible shiny metal structures must be darkened or screened to prevent glare; 6. Litter must be strictly controlled, as the spread thereof through wind could have a very negative visual impact; and, 7. The minimum amount of topsoil and vegetation must be removed during construction, must be conserved and used for final rehabilitation. 		<p>Checklist; Public Complaints Register</p> <p><u>Responsible Person/Party:</u> ECO & DEO</p> <p><u>Monitoring Frequency:</u> ECO – Monthly</p>	

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<p>7.9</p>	<p>Aspects: Noise Generation.</p> <p>Impact: Noise nuisance from site operations.</p> <p>Objective: To avoid excessive noise generation from site operations.</p> <p>Target: Minimise the incidence of noise generation.</p> <hr/> <p><u>Mitigation/Management Measures:</u></p> <ol style="list-style-type: none"> a. Should multiple activities result in the excessive generation of noise, it must be strived to coordinate the incidence of these at the same time; b. Fit machinery with silencers; c. All stationary noisy equipment such as compressors and pumps must be contained behind acoustic covers, screens or sheds where possible; d. The regular inspection and maintenance of equipment must be undertaken to ensure that all components function optimally; e. Vehicles must avoid the use of their reverse gear as far as possible so as to avoid the sounding of sirens; <ol style="list-style-type: none"> 1. Where recurrent use of machinery is frequent, machines must be shut down during intermediate periods; 2. Unless otherwise specified by the DEO, normal working hours will apply (i.e. from 07H00–18H00, Mondays to Fridays); 3. No loud music is permitted on site or in the Camp; 4. Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during working hours and after hours; and, 5. Vehicles are to abide by speed restrictions on access roads and limit trip generation so as to minimise disturbance to surrounding land users. 	<p align="center">Construction Contractor</p>	<p><u>Monitoring Action:</u></p> <p>ECO to take photographs of site; Public Complaints Register; ECO Audit Checklist</p> <p><u>Responsible Person/Party:</u></p> <p>ECO & DEO</p> <p><u>Monitoring Frequency:</u></p> <p>ECO – Monthly DEO – Daily</p>	

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7.10	<p>Aspects: Fire Prevention.</p> <p>Impact: Uncontrollable fire.</p> <p>Objective: Prevent the outbreak of fires emanating from construction activity.</p> <p>Target: No incidences of fires are recorded for the site.</p> <p>Mitigation/Management Measures:</p> <ol style="list-style-type: none"> The potential risk of veld fires is heightened by windy conditions in the area, specifically during the dry, windy winter months; Assume acceptable precautions to guarantee that fires are not started as a result of works on site as specified below: the Contractor will be held responsible for any damage to structures or property on or neighbouring the Site as a result of any fire caused by personnel; The Contractor must ensure that construction related activities that pose a potential fire risk, such as welding etc., are properly managed and confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care must be taken during the high risk dry, windy winter months; The Contractor must provide fire-fighting training to selected construction staff and take cognisance of the Veld and Forest Fire Act, Act No. 101, 1998; As per the conditions of the Code of Conduct, in the event of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor must compensate the fire-fighting costs borne by farmers and local authorities; Equip vehicles and site structures with fire extinguishers. Rubber beaters must be stored on site; 	Construction Contractor	<p>Monitoring Action:</p> <p>ECO to take photographs of site before clearance; ECO Audit Checklist.</p> <p>Responsible Person/Party:</p> <p>ECO</p> <p>Monitoring Frequency:</p> <p>Monthly</p>	

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	<p>g. No open fires are allowed anywhere on site;</p> <p>h. In the event of a fire, the Contractor shall immediately employ such plant and personnel as is at his disposal and take all necessary action to prevent the spread of the fire and bring it under control;</p> <p>i. Storage of fuel or chemicals under trees is not permitted;</p> <p>j. Gas and liquid fuel is not to be stored in the same place;</p> <p>k. Smoking may only occur within a 3m radius from designated areas;</p> <p>l. Personnel must be adequately trained in the handling of firefighting equipment; and,</p> <p>m. Fuel, diesel, oil, or any other flammable substance must be stored 6m away from the smoking area.</p>			
7.11	<p>Aspects: Soil and water contamination due to construction activities such as the use of hazardous materials on site.</p> <p>Impact: Pollution of soil and water contamination by hazardous waste.</p> <p>Objective: Provide facilities for appropriate collection and disposal of hazardous waste.</p> <p>Target: No record of pollution or site contamination by hazardous waste.</p> <p>Mitigation/Management Measures:</p> <p>a. Concrete must be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose (preferable where no natural vegetation occur);</p> <p>b. Concrete mixing to be carried out away from sensitive areas and on impermeable surfaces;</p> <p>c. Material Safety Data Sheets (MSDSs) must be available on site for all chemicals and hazardous substances to be used on-site, including information on their ecological impacts and how to minimise the impacts in case of leakage;</p> <p>d. All spillage must be cleaned up immediately after they have occurred;</p> <p>e. Spillage of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be</p>	Construction Contractor	<p>Monitoring Action:</p> <p>Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party:</p> <p>DEO & ECO</p> <p>Monitoring Frequency:</p> <p>ECO – Monthly DEO – Daily</p>	

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	<p>removed for bio-remediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site;</p> <ol style="list-style-type: none"> 1. Do not locate any ablution facilities, sanitary convenience, septic tank or French drain within the 1:100 year flood line, or within a horizontal distance of 100m (whichever is greater) of a watercourse or drainage line; 2. Vehicles and machinery must be regularly serviced to avoid leakages; 3. At the work site the Contractor must maintain strict surveillance to ensure that no spills occur; 4. No water courses may be used to clean equipment, or for bathing. All cleaning operations must take place off site at a location where waste water can be disposed of correctly; 5. The discharge of any pollutants such as cement, concrete, lime, chemicals, etc. into the natural environment and the storm water system must strictly be prohibited; 6. Fuel and chemical storage must be done within a designated area only, which is properly bund and able to contain 110% of the capacity of fuel or chemicals stored within; 7. Construction vehicles must be inspected every morning before work commence to ensure that no leakages do occur; 8. All personnel must receive induction on how to report spillages, contain them and treat them accordingly; 9. Spill kits must be available at each working station; 10. Drip trays must be placed beneath all construction equipment that is stationary on site or within the site camp; and, 11. Hazardous waste must be stored in bins with a lid in a demarcated waste area, and must be disposed of at a hazardous treatment facility with records on file. 			
7.12	<p>Aspects: Water Conservation.</p> <p>Impact: Wasting water as a result of negligence.</p>	<p>Construction Contractor</p>	<p><u>Monitoring</u> <u>Action:</u> Incident Register;</p>	

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	<p>Objective: Promote and implement water use efficiency mechanisms.</p> <p>Target: No Water Wastage.</p> <p>Mitigation/Management Measures:</p> <ul style="list-style-type: none"> a. Re-use water were possible; b. Prevent leakages at taps and hoses by means of maintenance; c. Use buckets of water to clean tools instead of running water; d. Make sure that sediment, concrete, sand and rubbish does not end up going down the natural drainage line. Cover or filter stormwater inlets and drains; and, e. Require workers to use a broom rather than a hose to clean paths and gutters. If water use is necessary, use high pressure hoses which are both water efficient and more effective cleaners. 		<p>Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party: ECO & DEO</p> <p>Monitoring Frequency: ECO – Monthly DEO – Weekly</p>	
7.13	<p>Aspects: Health and Safety.</p> <p>Impact: Dangerous working conditions for workers.</p> <p>Objective: To prevent any casualties on site.</p> <p>Target: No Personnel casualties on site.</p> <p>Mitigation/Management Measures:</p> <ul style="list-style-type: none"> a. Ensure that PPE is available to Personnel; b. Adhere to the Occupational Health and Safety Act; c. Keep the first aid kit stocked; d. Issue all workers with necessary health and safety items; 	Construction Contractor	<p>Monitoring Action: Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party: Contractor Health and Safety Representative</p>	

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	<ul style="list-style-type: none"> e. Potentially hazardous areas must be demarcated with danger tape; f. Appropriate signage must be placed to caution Employees and contractors not to enter certain structures without Authorisation; g. Regular safety inspections must be conducted to ensure that participants are equipped with necessary safety equipment; and, h. All construction personnel to wear hard hats and reflector jackets at all times. 		<p>Monitoring Frequency:</p> <p>ECO – Monthly SHEQ Manager</p>	
7.14	<p>Aspects: Heritage Resources.</p> <p>Impact: Damage and destruction of vertebrate fossils during excavation activities.</p> <p>Objective: To prevent any destruction of valuable artefacts.</p> <p>Target: No destruction of any vertebrate fossils and artefacts.</p> <p>Mitigation/Management Measures:</p> <ul style="list-style-type: none"> a. Should any heritage resources (including but not limited to fossil bones, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and other built features, rock art and rock engravings) be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped. A trained palaeontologist or heritage specialist must be notified to assess the finds, and this must then be reported to the applicable Heritage Authority; b. Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the Heritage Authority. A registered Heritage Specialist must be called to the site for inspection and removal once authority to do so, has been given; c. Excavations must be limited to the footprint area and be maintained in a narrow corridor; 	Construction Contractor	<p>Monitoring Action:</p> <p>Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party:</p> <p>DEO & ECO</p> <p>Monitoring Frequency:</p> <p>ECO – Monthly DEO – Bi-Weekly</p>	

<p style="text-align: center;">CONSTRUCTION PHASE: PROPOSED EXPANSION OF THE FRANKFORT LANDFILL SITE ON THE REMAINDER EXTENT OF THE FARM DORP FRANKFORT NO. 79, FREE STATE PROVINCE</p>		<p style="text-align: center;">RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)</p>	<p style="text-align: center;"><u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY</p>	<p style="text-align: center;">COMPLIAN T? (for use by ECO)</p>
<p>7.15 Aspects: Spread and establishment of Alien and Invasive Species. Impact: Soil disturbances from construction will enhance the encroachment of Alien and Invasive vegetation that will out compete indigenous counterpart species for resources, displace and reduce faunal and flora biodiversity. Clearing current Invasive Alien species will increase the risk of spreading species if not properly removed and safety transported. Objective: Prevent Alien and Invasive growth on site. Target: Eradication of Alien and Invasive Species on site.</p>	<p>Construction Contractor</p>	<p><u>Monitoring</u> <u>Action:</u> Incident Register; Photographs; ECO Audit Checklist</p> <p><u>Responsible</u> <u>Person/Party:</u> DEO & ECO</p>		
<p>a. Alien plant material removed during construction and eradication efforts should be contained and disposed of properly</p>				

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	<p>to limit accidental spread;</p> <p>b. Construction activities must be limited to the smallest possible area;</p> <p>c. Designated authorised service roads must be used by all Construction vehicles; and,</p> <p>d. On-going Alien and Invasive vegetation removal should take place in and around the development footprint.</p>		<p>Monitoring Frequency:</p> <p>ECO – Monthly</p>	

9.2 Operational Phase Environmental Management Programme

The intention of providing an EMP'r for the operational phase is to provide guidelines for management of facilities and infrastructure to safeguard the environment against negative environmental impacts.

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1. ACTIVITY: OPERATIONAL PHASE IMPACTS				
1.1	<p>Aspects: Noise Generation.</p> <p>Impact: Noise nuisance from maintenance work.</p> <p>Objective: To avoid excessive noise generation from maintenance work.</p> <p>Mitigation/Management Measures:</p> <p>a. Should multiple activities result in the excessive generation of noise, it must be strived to coordinate the incidence of</p>	Applicant	<p>Monitoring Action:</p> <p>Noise Pollution</p> <p>Responsible Person/Party:</p>	

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	<p>these at the same time;</p> <p>b. Fit machinery with silencers;</p> <p>c. All stationary noisy equipment such as compressors and pumps must be contained behind acoustic covers, screens or sheds where possible;</p> <p>d. The regular inspection and maintenance of equipment must be undertaken to ensure that all components function optimally;</p> <p>e. Vehicles must avoid the use of their reverse gear as far as possible so as to avoid the sounding of sirens;</p> <p>f. Where recurrent use of machinery is frequent, machines must be shut down during intermediate periods;</p> <p>g. Unless otherwise specified by the DEO, normal working hours will apply (i.e. from 07H00–18H00, Mondays to Fridays);</p> <p>h. No loud music is permitted on site or in the Camp;</p> <p>i. Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during working hours and after hours; and,</p> <p>j. Vehicles are to abide by speed restrictions on access roads and limit trip generation so as to minimise disturbance to surrounding land users.</p>		Landfill Manager	
1.2	<p>Aspects: Biodiversity.</p> <p>Impact: Change of ecosystem by potential leakage of leachate.</p> <p>Objective: Ensure the minimal disturbance to the ecosystem.</p>	Applicant	<p>Monitoring Action:</p> <p>Regular inspection.</p> <p>Responsible</p>	

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<p><u>Mitigation/Management Measures:</u></p> <p>a. Any landscaping implemented in the development must make use of indigenous vegetation in order to limit or eliminate the introduction of Alien and/or invasive species;</p> <p>b. A leakage detection and collection layer of 150mm compacted clay liner, 150mm bases preparation layer and an in-situ layer must be installed.</p>			<p><u>Person/Party:</u></p> <p>Applicant</p> <p><u>Monitoring Frequency:</u></p> <p>Monthly</p>	
1.3	<p><u>Aspects:</u> Soil and water contamination due to operational activities such as the use of effluent on site.</p> <p><u>Impact:</u> Pollution of soil and water contamination by hazardous waste.</p> <p><u>Objective:</u> Provide facilities for appropriate collection and disposal of hazardous waste.</p>			
<p><u>Mitigation/Management Measures:</u></p> <p>a. It should be ensured that all associated infrastructure (sewerage pipes) operate within their design measure. Should it happen that a pipe is blocked/leaking it must be reported to the Municipality at once to ensure that effluent does not drain into the natural environment;</p> <p>1. Stormwater Management should be designed to ensure no dirty water is released into the natural environment;</p> <p>c. Where vegetation has been utilised as part of the stormwater management system, it is important to ensure that the vegetation is maintained for effective infiltration;</p> <p>d. Drip trays should be placed beneath all stationary construction equipment in order to ensure no spillage occur;</p> <p>e. All Hazardous Materials should be stored within a bund area capable of storing 110% of the volume stored within;</p> <p>f. A spillkit must be present on site, on spills must be properly cleaned as listed in Section 10 of the report; and,</p> <p>g. Stormwater practises should allow for clean water to be diverted away from the landfill to ensure that it does not</p>		Applicant	<p><u>Monitoring Action:</u></p> <p>Regular inspection Of all infrastructure On site.</p> <p><u>Responsible Person/Party:</u></p> <p>Applicant</p> <p><u>Monitoring Frequency:</u></p> <p>Monthly</p>	

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	become contaminated.			
1.4	<p>Aspects: Odours</p> <p>Impact: Spread of odour and landfill gas emanating from the landfill site.</p> <p>Objective: Limited odour emanating from the landfill in order not to disturb surrounding landowner.</p>			
	<p>a. Emission rates must be reduced by limiting the extent of uncapped areas on non-operational areas of the site;</p> <p>b. Special cells may be constructed for the disposal of putrescible general waste. Such waste should be deposited and covered immediately with a layer of soil at least 0.5 m thick. This will prevent odours and discourage uncontrolled savage;</p> <p>c. Accidental fires on landfills where burning is not permitted must be extinguished immediately. Appropriate operational procedures involving the spreading and smothering of burning waste, rather than the application of water, must be implemented;</p> <p>d. On site, windbreaks can be utilised to limit pollution on surrounding areas of the landfill site;</p> <p>e. All Landfill vehicles must be fitted with at least one fire extinguisher and rubber beaters must be available on site;</p> <p>f. No open fires will be permitted on site, and designated smoking areas must be available to all staff members on site.</p>	Applicant	<p>Monitoring Action: Complaints Register</p> <p>Responsible Person/Party: Applicant</p> <p>Monitoring Frequency: Bi-annually</p>	
1.5	<p>Aspects: Visual Disturbance</p> <p>Impact: Visual and aesthetic degradation of the surrounding environment.</p> <p>Objective: Limit visual exposure to the surrounding landowners.</p>			

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<ul style="list-style-type: none"> a. The compaction and cover approach should be implemented on a daily basis; b. Rehabilitation of cells should begin immediately after the cell has been filled; c. The rehabilitation can occur concurrently with the operation and filling of the cell where applicable; d. Areas should be landscaped using indigenous vegetation; e. All litter that gathers around the fence should be regularly cleaned; f. Comply with the rehabilitation and stability management plan; g. The site must be fenced with walls or palisade to obscure the inside operations and contain any windblown litter; h. Operation activities must observe good housekeeping principles and the site must be kept neat at all times; and, i. Daily compaction of waste and cover must be maintained to prevent windblown litter leaving the site. 	<p style="text-align: center;">Applicant</p>	<p><u>Monitoring Action:</u> Complaints Register</p> <p><u>Responsible Person/Party:</u> Applicant</p> <p><u>Monitoring Frequency:</u> Bi-annually</p>	

9.3 Impacts during the Decommissioning Phase

The activity will not be decommissioned in the future and therefore the proposed impacts therefore were not assessed.

10 EMERGENCY RESPONSE PLAN

The following table is provided to assist the ECO and construction Contractor with remedial work options and problem solving:

Observation or Event	Action by Inspector or Observer	Action by Construction Contractor
<p>Spillage of diesel or hydrocarbons on soil</p>	<p>Report to construction Contractor and continue observations.</p> <p>Also check:</p> <ul style="list-style-type: none"> ➤ That the source causing the spillage has ceased, and that the affected area is isolated to prevent spreading of the hazardous substance, where after it must be rehabilitated. 	<p>Action will be required as soon as possible (ASAP) by following the next steps:</p> <ul style="list-style-type: none"> ➤ Dig down into the soil to see how far down the pollution penetrated, ➤ If less than 300mm penetrated: <ul style="list-style-type: none"> a. Turn the soil over to expose it to the air. b. Apply Mono Ammonium Phosphate (MAP) at a rate of 58gr/m² to the overturned soil. c. Water enough to keep the soil moist. ➤ If penetration is greater than 300mm: <ul style="list-style-type: none"> a. Remove the affected soil and spread in a layer not more than 300mm thick. b. Apply MAP at a rate of 50gr/m². c. Water enough to keep the soil moist. ➤ Repeat the above steps every 6 weeks or until the soil is clean.
<p>Erosion</p>	<p>Report to construction contractor and continue observations.</p> <p>Also check:</p> <ul style="list-style-type: none"> ➤ That all vehicular movement is restricted to existing access routes to prevent crisscrossing of 	<p>Action will be required ASAP:</p> <ul style="list-style-type: none"> ➤ Implement erosion protection works at identified problem areas. ➤ Implement remedial works at affected areas in order to restore the area to its previous or better status.

Observation or Event	Action by Inspector or Observer	Action by Construction Contractor
	tracks through undisturbed areas.	

11 INCIDENT REGISTER

INCIDENT REGISTER: PROPOSED EXPANSION OF THE FRANKFORT LANDFILL SITE ON THE REMAINDER EXTENT OF THE FARM DORP FRANKFORT NO. 79, FREE STATE PROVINCE					
NAME OF PERSON REPORTING THE INCIDENT	INCIDENT	DATE OF INCIDENT IDENTIFIED	HOW WAS INCIDENT ADDRESSED?	DATE OF RECTIFICATION	SIGNATURE

12 REHABILITATION MEASURES AND CLOSURE PLAN

The rehabilitation phase follows completion of construction works and entails site clean-up and site rehabilitation following the removal of the Contractor from site. The underlying aim of rehabilitation is the process of returning land within the site boundary to some degree of its former natural state.

Key aspects within this process include the:

1. Removal of structures and infrastructure;
2. Handling of inert waste and rubble;
3. Handling of hazardous waste and pollution control;
4. Final shaping of the terrain;
5. Topsoil replacement and soil amelioration;
6. Ripping and scarifying of surfaces;
7. Planting of indigenous occurring vegetation (if deemed necessary); and
8. Maintenance.

12.1 Rehabilitation Measures

Removal of structures and infrastructure
<ol style="list-style-type: none">1. On completion of a section of works, the area must be rehabilitated by suitable landscaping, levelling, topsoil dressing, land preparation, alien plant eradication and where ascribed for by the ECO, vegetation establishment;2. Clear and completely remove from site all construction structures and temporary infrastructure;3. All permanent infrastructure must be returned to a useable state.
Inert waste and rubble
<ol style="list-style-type: none">1. Remove all inert waste and rubble, such as excess rock, any structural foundations and remaining aggregates. Only once this material has been removed, the site shall be re-instated and rehabilitated.2. Domestic waste must be completely removed from the site and disposed of at a landfill site.
Topsoil replacement and soil amelioration
<ol style="list-style-type: none">1. The reinstatement of disturbed areas must follow immediately after the removal of structures and temporary infrastructure;2. Topsoil backfilling must be undertaken when the soil is dry, and not following any recent rainfall events;3. The replacement of topsoil must be sought in situ with construction where possible, or as soon as construction in an area has been completed;4. All stockpiled topsoil together with herbaceous vegetation must be replaced and redistributed over a disturbed area such as temporary access roads;5. Topsoil must be returned to the same site from where it was stripped;6. When insufficient topsoil remains, soil of a similar quality can be obtained from a nearby area within the

construction area which was disturbed;

1. Once topsoil has been returned to the ground, stripped vegetation must be randomly spread by hand over the area.

Maintenance

1. All re-growth of invasive vegetative material will be monitored by the Developer for one year;
2. All areas under rehabilitation are to be treated as no-go areas using danger tape and steel droppers/fencing and cordoned off, to prevent vehicular, pedestrian and livestock access;
3. Any re-vegetation must be done using plant species in occurrence on site;
4. Control invasive plant species and weeds using approved methods of manual or chemical intervention;
5. The re-establishment of vegetation must be allowed several rainy seasons, given the arid nature of the climate and region.