



GA Environment

**WASTE MANAGEMENT LICENSE APPLICATION AND BASIC
ASSESSMENT PROCESS FOR THE PROPOSED LICENSING OF
THE GROBLERSHOOP LANDFILL !KHEIS LOCAL
MUNICIPALITY; NORTHERN CAPE PROVINCE**

OPERATIONAL PLAN

February 2016

OPERATIONAL PLAN

For

THE PROPOSED LICENCING OF THE GROBLERSHOOP LANDFILL, !KHEIS LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE

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Applicant: !Kheis Local Municipality

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**THE PROPOSED OPERATION OF THE GROBLERSHOOP LANDFILL, !KHEIS LOCAL MUNICIPALITY,
NORTHERN CAPE PROVINCE**

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LIST OF ABBREVIATIONS / ACRONYMS

DENC	Northern Cape Department of Environment and Nature Conservation
DWA	Department of Water Affairs
ECA	Environmental Conservation Act (Act 73 of 1989)
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPR	Environmental Management Programme Report
G	General Waste
GCB	General Communal Landfill
GSB	General Small Landfill
GMB	General Medium Landfill
GLB	General Large Landfill
H	Hazardous Waste
HDPE	High-Density Polyethylene
H:H	Hazardous Landfill (Hazard Rating 1-4)
H:H	Hazardous Landfill (Hazard Rating 3-4)
IAP's	Interested And Affected Parties
IRD	Initial Rate of Deposition
IWMP	Integrated Waste Management Plan or Industry Waste Management Plan
KPI	Key Performance Indicators

GLOSSARY OF TERMS

This section provides a catalogue of terms and Definitions, which may be used in this report and, or other future waste management plans and documents. Where more than one definition for a term exists in the literature, additional definitions have been provided for clarity:

Term	Definition	Reference
Audit	A site inspection at which the condition of the site on that day is appraised in terms of a number of predetermined criteria.	Minimum Requirements (1998)
Buffer Zones	Buffer Zones are separations between the boundaries of registered landfill sites and residential developments. They may vary between 500m and 1000m in width, depending on the classification of the landfill. No residential development may take place within a proclaimed buffer zone. At the discretion of the local authority and the state departments, however, developments such as industrial development may be permitted.	Minimum Requirements (1998)
Cell	This is the basic landfill unit of compacted solid waste which, when completed at the end of each day, is entirely contained by cover material. The sides may be typically formed by 1,5m or 2,0m high soil or rubble berms, or sloped covered waste. Cell width is determined by the manoeuvring requirements of vehicles depositing waste at the working face.	Minimum Requirements (1998)
Co-Disposal	Co-disposal (General and Hazardous waste): The mixing and joint disposal of Hazardous (H) and General (G) waste in the same landfill. The co-disposal of general waste with hazardous waste as a means of facilitating disposal on a hazardous waste	Minimum Requirements (1998)

Term	Definition	Reference
	landfill is acceptable, whereas the co-disposal of any significant quantity of hazardous waste with general waste on a general waste landfill is unacceptable.	
Co-Disposal	Co-disposal: (Liquid with Dry waste): The mixing of high moisture content or liquid waste with dry waste. This affects the water balance and is an acceptable practice on a hazardous waste landfill site. This is only acceptable on a general waste landfill site when the liquid is not hazardous and the site is equipped with leachate management measures.	Minimum Requirements (1998)
Compliance Monitoring	Monitoring done in compliance with permit conditions	Minimum Requirements (1998)
Cover	The material used to cover waste. Cover material is usually soil, but may comprise builders' rubble, ash or other suitable material. Daily cover is usually 150mm thick, intermediate cover is usually 300mm thick and final cover or capping usually 500mm thick. Final cover may form part of a special capping design and, as is the case with intermediate cover, must be able to support vegetation.	Minimum Requirements (1998)
Cradle-To-Cradle	A philosophy and principle of industrial ecology involving the design of systems such that materials and waste products move in a cyclical process with zero wastage.	Minimum Requirements (1998)
Cradle-To-Grave	A policy of controlling of Hazardous Waste from its inception to its ultimate disposal.	Minimum Requirements (1998)

Term	Definition	Reference
Development Plan	A plan indicating the phasing of the development of a landfill from the landfill preparation, through the operation (which is usually divided into areal phases), to the final closure, rehabilitation and end-use. The phasing, and hence the Development Plan, forms part of the design.	Minimum Requirements (1998)
Disposal Site	A site used for the accumulation of waste with the purpose of disposing or treatment of such waste;	ECA
Duty Of Care	This requires that any person who generates, transports, treats or disposes of waste must ensure that there is no unauthorised transfer or escape of waste from his control. Such a person must retain documentation describing both the waste and any related transactions. In this way, the person retains responsibility for the waste generated or handled.	Minimum Requirements
Eco-Toxicity	Eco-toxicity is the potential to harm animals, plants, ecosystems or environmental processes.	Minimum Requirements (1998)
End-Use Plan	The purpose for which the area of the rehabilitated and closed landfill is used. This may be as a park, playing fields, or other suitable land-use.	Minimum Requirements (1998)
Environment	the surroundings within which humans exist and that are made up of— (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life;	NEMA

Term	Definition	Reference
	<p>(iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and</p> <p>(iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.</p>	
Extended Producer Responsibility	<p>Means measures that extend a person’s financial or physical responsibility for a product to the post-consumer stage of the product, and includes—</p> <p>(a) waste minimisation programmes;</p> <p>(b) financial arrangements for any fund that has been established to promote the reduction, re-use, recycling and recovery of waste;</p> <p>(c) awareness programmes to inform the public of the impacts of waste emanating from the product on health and the environment; and</p> <p>(d) any other measures to reduce the potential impact of the product on health and the environment.</p>	NEMWA (2008)
Fatal Flaw	<p>A factor or situation which prevents the development of an environmentally acceptable waste disposal facility, except as prohibitive cost.</p>	Minimum Requirements (1998)
General Waste	<p>Waste that does not pose an immediate threat to man or to the environment, i.e. household waste, builder’s rubble, garden waste, dry industrial and commercial waste.</p>	White Paper on IP&WM

Term	Definition	Reference
General Waste	Waste that does not pose an immediate threat to man or the environment, i.e. household waste, builders' rubble, garden waste, and certain dry industrial and commercial waste. It may, however with decomposition, infiltration and percolation, produce leachate with an unacceptable pollution potential	Minimum Requirements (1998)
General Waste	All urban waste that is produced within the jurisdiction of local authorities. It comprises rubble, garden, domestic, commercial and general industrial waste. It may also contain small quantities of hazardous substances dispersed within it such as batteries, insecticides and weed-killers discarded on domestic and commercial premises. General waste may be disposed of in a permitted landfill and may be equated to what is commonly referred to as domestic, solid waste and municipal waste, i.e. that which is normally managed by a local authority.	DWAF Waste Generation Baseline Studies
General Waste	Means waste that does not pose an immediate hazard or threat to health or to the environment, and includes— (a) domestic waste; (b) building and demolition waste; (c) business waste; and (d) inert waste.	NEMWA (2008)
General Waste	A landfill designed to accept only general waste. Depending	Minimum

Term	Definition	Reference
Landfill	on the Site Water Balance, it may or may not have a leachate management system.	Requirements (1998)
Generator	An industry or other party whose activities result in the production of waste. The responsibility for hazardous waste remains from cradle-to-grave with the generator of the waste and the generator is held liable for any damage that the waste may cause to humans or to the environment.	Minimum Requirements (1998)
Guidelines	While not requirements, guidelines are recommended actions, which represent good practice. They are not enforceable, but may form the basis for site specific permit conditions in which case they become mandatory.	Minimum Requirements (1998)
Hazard	a source of or exposure to danger.	NEMA
Hazardous Waste	Waste that may, by circumstances of use, quantity, concentration or inherent physical, chemical or infectious characteristics, cause ill-health or increase mortality in humans, fauna and flora, or adversely affect the environment when improperly treated, stored, transported or disposed of.	Minimum Requirements (1998)
Hazardous Waste	Waste, other than radioactive waste, which is legally defined as hazardous in the state in which it is generated, transported or disposed of. The definition is based on the chemical reactivity or toxic, explosive, corrosive or other characteristics, which cause, or are likely to cause, danger to health or to the environment, whether alone or when in contact with other waste.	Minimum Requirements (1998)
Hazardous	Waste, including radioactive waste, which is legally defined as	White Paper on

Term	Definition	Reference
Waste	“hazardous” in the state in which it is generated. The definition is based on the chemical reactivity or toxic, explosive, corrosive or other characteristics which cause, or are likely to cause, danger to health or to the environment, whether by itself or when in contact with other waste.	IP&WM
Hazardous Waste	means any waste that contains organic or inorganic elements of compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.	NEMWA (2008)
Incineration	Incineration is both a form of treatment and a form of disposal. It is simply the controlled combustion of waste materials to a non-combustible residue or ash and exhaust gases, such as carbon dioxide and water.	Minimum Requirements (1998)
Infectious Waste:	Any waste which is generated during the diagnosis, treatment or immunisation of humans or animals; in the research pertaining to this; in the manufacturing or testing of biological agents – including blood, blood products and contaminated blood products, cultures, pathological wastes, sharps, human and animal anatomical wastes and isolation wastes that contain or may contain infectious substances.	Minimum Requirements (1998)
Interested And Affected Parties (IAP’s)	Interested and Affected Parties are those people who will be affected in some way by the Hazardous Waste disposal process. Residents or farmers, a whole residential community, or the public at large may represent them.	Minimum Requirements (1998)
Landfill (V)	To dispose of waste on land, whether by use of waste to fill in excavations or by creation of a landform above grade, where	Minimum Requirements

Term	Definition	Reference
	the term “fill” is used in the engineering sense.	(1998)
Landfill (N)	The waste body created by land filling. This may be above or below grade, or both.	Minimum Requirements (1998)
Leachate	An aqueous solution with a high pollution potential, arising when water is permitted to percolate through decomposing waste. It contained final and intermediate products of decomposition, various solutes and waste residues. It may also contain carcinogens and/or pathogens. Sporadic/Significant.	Minimum Requirements (1998)
Litter	Any object or matter discarded or left behind by the person in whose possession or control it was.	Environmental Conservation Act (Act 73 of 1989)
Medical Waste Or Health Care Waste	Wastes emanating primarily from human and veterinary hospitals, clinics and surgeries, also from chemists and Sanitary Services. They may comprise, inter alia, sharps (used hypodermic needles and scalpel blades), malignant tissue, body parts, soiled bandages and liner, and spent or out dated medicines or drugs. They have the ability to affect and infect other living organics, and are considered hazardous.	Minimum Requirements (1998)
Minimum Requirement	A standard by means of which environmentally acceptable waste disposal practices can be distinguished from environmentally unacceptable waste disposal practices.	Minimum Requirements (1998)
Monitoring	The process of checking for changes in status or trends over time. This may be achieved by compiling successive audit or	Minimum Requirements

Term	Definition	Reference
	water quality analyses results.	(1998)
Operating Plan	A site-specific document which describes the way in which the landfill is operated. The Operating Plan commences at the level and detail of daily cell construction and continues through to the development and excavation sequence, access and drainage within a given phase of the Development Plan.	Minimum Requirements (1998)
Permit	The Permit issued by the Department of Water Affairs, & Forestry for the operation or closure of a landfill, in terms of Regulation 1549, promulgated under the Environment Conservation Act (Act 73 of 1989).	Minimum Requirements (1998)
Pollution	Any change in the environment caused by— (i) substances; (ii) radioactive or other waves; or (iii) noise, odours, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.	NEMA
Precautionary Principle	Where a risk is unknown; the assumption of the worst-case situation and making provision for such a situation.	Minimum Requirements

Term	Definition	Reference
		(1998)
Recycle	The use, re-use, or reclamation of material so that it re-enters the industrial process rather than becoming a waste.	Minimum Requirements (1998)
Remediation	The rectification of problems, caused by bad practices, through the implementation of remedial measures.	Minimum Requirements (1998)
Responsible Person	The Permit Holder or his legally appointed representative who takes responsibility for ensuring that all or some of the facets of any of the following are properly directed, guided and executed, in a professionally justifiable manner: investigatory work, design, preparation, operation, closure and monitoring.	Minimum Requirements (1998)
Standard	A criteria/measure by which the accuracy or quality of others is judged or a model for imitation, or the degree of excellence required.	Minimum Requirements (1998)
Toxic Waste	A form of hazardous waste that causes death or serious injury, such as burns, respiratory diseases, cancer or genetic mutations.	White Paper on IP&WM
Transporter	A person, organisation, industry or enterprise engaged in or offering to engage in the transportation of waste.	Minimum Requirements (1998)
Treatment	Treatment is used to remove, separate, concentrate or recover a hazardous or toxic component of a waste or to destroy or, at least, to reduce its toxicity in order to minimise	Minimum Requirements (1998)

Term	Definition	Reference
	its impact on the environment.	
Waste	Any matter, whether gaseous, liquid or solid or any combination thereof, which is from time to time designated by the Minister by notice in the Gazette as an undesirable or superfluous by-product, emission, residue or remainder of any process or activity (definition of 'waste' substituted by s. 1 (h) of Act 79 of 1992).	ECA
Waste	An undesirable or superfluous by-product, emission, or residue of any process or activity which has been discarded, accumulated or been stored for the purpose of discarding or processing. It may be gaseous, liquid or solid or any combination thereof and may originate from a residential, commercial or industrial area. This definition includes industrial waste water, sewage, radioactive substances, mining, metallurgical and power generation waste.	White Paper on IP&WM
Waste	Any matter, whether gaseous, liquid or solid or any combination thereof, originating from any residential, commercial or industrial area or agricultural area identified by the Minister of Environment Affairs as an undesirable or superfluous by-product, emission, residue or remainder of any process or activity.	DWAF Waste Generation Baseline Studies
Waste	Means any substance, whether or not that substance can be reduced, re-used, recycled and recovered— (a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of; (b) where the generator has no further use of for the	NEMWA (2008)

Term	Definition	Reference
	<p>purposes of production, reprocessing or consumption;</p> <p>(C) that must be treated or disposed of; or</p> <p>(d) that is identified as a waste by the Minister,</p> <p>but—</p> <p>(i) a by-product is not considered waste; and</p> <p>(ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste.</p>	
Waste Body	<p>This refers to the body of waste (and cover) that is contained in the landfill. Because it is subject to decomposition, it has the potential to generate leachate and must therefore be adequately separated from the water regime.</p>	<p>Minimum Requirements (1998)</p>
Waste Disposal Facility	<p>Means any site or premise used for the accumulation of Waste with the purpose of disposing of that waste at that site or on that premise.</p>	<p>NEMWA (2008)</p>
Waste Management Activity	<p>Means any activity listed in Schedule 1 or published by notice in the <i>Gazette</i> under section 19 of the NEM Waste Act, and includes—</p> <p>(a) the importation and exportation of waste;</p> <p>(b) the generation of waste, including the undertaking of any activity or process that is likely to result in the generation of waste;</p> <p>(c) the accumulation and storage of waste;</p>	<p>NEMWA (2008)</p>

Term	Definition	Reference
	<p><i>(d)</i> the collection and handling of waste;</p> <p><i>(e)</i> the reduction, re-use, recycling and recovery of waste;</p> <p><i>(f)</i> the trading in waste;</p> <p><i>(g)</i> the transportation of waste;</p> <p><i>(h)</i> the transfer of waste;</p> <p><i>(i)</i> the treatment of waste; and</p> <p><i>(j)</i> the disposal of waste.</p>	
Waste Management License	Means a licence issued in terms of section 49 of the NEM Waste Act (2008) for waste management activities listed under section 19 of the Act.	NEMWA (2008)
Waste Management Facility	All wastes or products stored on a temporary or permanent basis, that could impact on surface or groundwater quality, by leaching into or coming in contact with water, are referred to a “Waste Management Facilities”. See also the Waste Management Documents, “Minimum requirements for waste disposal sites” and “Minimum requirements for the handling and disposal of hazardous waste”.	Minimum Requirements (1998)
Waste management Services	Means waste collection, treatment, recycling and disposal services.	NEMWA (2008)
Waste Minimisation programme	Means a programme that is intended to Promote the reduced generation and disposal of waste.	NEMWA (2008)

Term	Definition	Reference
Waste Transfer Facility	Means a facility that is used to accumulate and temporarily store waste before it is transported to a recycling, treatment or waste disposal facility.	NEMWA (2008)
Waste Treatment Facility”	Means any site that is used to accumulate waste for the Purpose of storage, recovery, treatment, reprocessing, recycling or sorting of that Waste.	NEMWA (2008)

1 INTRODUCTION

1.1 Background

The best-designed landfill is of little value unless it is constructed and operated properly. This manual was prepared as a guidance document for the personnel working at the Topline Landfill Site to aid them in proper landfill operations. It also serves as a guide for operations supervisory personnel and sets forth contingency plans for special problems and situations that may arise.

This document is by no means comprehensive however it provides a framework for developing the operations guidance manual or plan and shall be developed along a site is developed through its various stages.

1.2 Use of this document

This Operation Environmental Management Plan has been designed to be useful both as a field reference document and as a training manual. Every employee working on the Site is expected to be familiar with its use and location at the site. The manual has been divided into two sections: the General Overview; and Standard Operating Procedures. The General Overview contains basic knowledge regarding personnel responsibilities, safety practices, weighbridge operations, and the overall operations of the landfill.

1.3 Key Requirements for Landfill Management and Operation

In order for the Municipality to ensure that the landfill site is operated optimally and within the minimum requirements, they will have to adequately address these key issues:

- Personnel, roles and responsibilities e.g. ensure that a competent landfill manager, based on the site fulltime and that sufficiently qualified personnel are employed;
- Ensure training of staff to ensure continuous professional development and skill development;
- Ensure that Occupational Health and Safety control measures are in place and are implemented;
- Ensure that that the physical and financial resources to overcome day-to-day operational needs of the site are adequately addressed;

- Ensure that that the sites are sufficiently resourced with qualified equipment;
- Ensure that once the site has been constructed that an authorized disposal plan to guide the operation is put in place prior to commissioning of the site;
- Ensure that Environmental monitoring is undertaken in accordance with the Waste License for that site and the Record of Decision issued by the Department of Environmental Affairs.

1.4 Personnel, roles and responsibilities

This section provides a brief overview of the personnel, roles and responsibilities that shall be designated by the Municipality in order to ensure that the landfill site is operated in a manner that is environmentally, economically and socially sustainable, and in a manner that meets the minimum requirements for waste management and landfill operations in South Africa.

The following roles and responsibilities are necessary for the proper functioning of the landfill;

- Site Permit Holder;
- Landfill Operator;
- Landfill Supervisor;
- Landfill Equipment Operators;
- Environmental Monitoring Coordinator; and
- Other landfill staff.

Each of these are discussed below:

1.4.1 Site Permit Holder

Specification	<ul style="list-style-type: none"> • The municipality shall remain the License Holder for the Topline Landfill Site. • The Site Permit shall not be transferable unless otherwise authorised by the Northern Cape Department of Environment and Nature Conservation (DENC).
Roles	<ul style="list-style-type: none"> • Organize, oversee and administer the functioning of the sites and ensure that the Municipality maintains the landfill site in accordance with the waste license and permits, regulations and all appropriate policies,

Responsibilities	<ul style="list-style-type: none"> • Make appropriate funding available. • Make appropriate appointments of suitably qualified personnel and or organisations to operate the sites and facilities in accordance with the permit requirements and conditions. • Make representations to the regulating authorities with regards to any issues related to the landfill sites. • Fulfil all the obligations as required of the permit holder in the site Record of Decision and Permit. • Handle user complaints or problems that the operator cannot handle and maintain a record of all such complaints,
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1.4.2 Landfill Operator

Specification	<ul style="list-style-type: none"> • The Municipality shall appoint an experienced and qualified site operator (individual or organisation) to operate the landfill site in accordance to the operational manual, specifications and according to the minimum requirements.
Roles	<ul style="list-style-type: none"> • Responsible for daily operation of the disposal site.
Responsibilities	<ul style="list-style-type: none"> • Report to the Site Manager • Meet, as required, with the Site Manager to brief the status of routine operations and any special issues, • Meet routinely with the Disposal Site Supervisors to maintain proper control of the site and to determine what, if any, problems exist or may be anticipated. • Attend to the following <ul style="list-style-type: none"> • Route Operational issues, • Regulatory Requirements, • Stakeholder Issues and other interested parties, • Equipment issues, • Special employee requests, • Special operating instructions; e.g., inclement weather, special waste, emergencies. • Schedule routine work as required, e.g., drainage channel cleaning, landfill surface repairs and litter control, etc. • Ensure that the need for any special operating conditions have been planned

	<p>for in advance; e.g., wet weather areas should be prepared in advance of the rainy season,</p> <ul style="list-style-type: none"> • Handle user complaints or problems that the Disposal Site Supervisors cannot handle and maintain a record of all such complaints,
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1.4.3 Landfill Operator

Specification	<ul style="list-style-type: none"> • The Municipality or the Site Operator shall appoint an experienced and qualified site supervisor/s to assist in the daily operation of the landfill site in accordance to the operational manual, specifications and according to the minimum requirements.
Roles	<ul style="list-style-type: none"> • Responsible for daily operation of the disposal site.
Responsibilities	<p>The Disposal Site Supervisor is responsible for supervising refuse disposal and associated activities at the site Landfill in accordance with appropriate methods, standards and requirements. Specifically, the Disposal Site Supervisors shall:</p> <ul style="list-style-type: none"> • Regularly brief the operator on the status of routine operations and any special problems, • Ensure that the landfill is properly staffed at the beginning of each day. There are several contingency plans, which can be used if a full staff compliment is not available to work at the landfill. For example: <ul style="list-style-type: none"> • Reassign duties of available personnel as required; e.g., shift a person stockpiling soil cover to a dozer for spreading and compacting refuse, • Recall additional personnel on overtime, • A Disposal Site Supervisor may fill-in for an equipment operator if the situation warrants, • Meet with employees periodically to maintain proper control of the site and to determine what, if any, problems exist or may be anticipated. Consider the following: <ul style="list-style-type: none"> • Operational Constraints, • Regulatory Requirements, • Equipment Problems, • Special Employee Requests, • Special operating instructions; e.g., bad weather, special waste, emergencies, etc.

	<ul style="list-style-type: none">• Communicate and train staff on routine work requirements as required; e.g. refuse handling, equipment operations, proper compactions, dirt operations, greens operations, safety issues, landfill surface repairs, litter control, etc.,• Meet with operator and other senior personnel as required, to review planned operations or special requirements,• Plan and coordinate the most efficient use of the landfill disposal areas to reduce traffic flow issues and conserve landfill space,• Periodically review landfill plan as an aid in scheduling employees and equipment needs and making assignments,• Check grades and contours to ensure that refuse placement and compaction conforms to engineered specifications and designs,• Periodically check with the Equipment Service Writer to ensure overhaul and maintenance schedules are being followed,• Ensure that services are performed on equipment, in a timely manner, by vendors and Municipality, through inspection of equipment and follow up communications,• Ensure that employees perform routine maintenance obligations through periodic inspection of equipment, daily monitoring of employee's reports and completion of supervisor's periodic reports,• Investigate and immediately report all equipment malfunctions and breakdowns, presenting facts in a clear manner, to all appropriate persons so that equipment is repaired and made available with minimum interruptions to landfill operations.• Maintain thorough, accurate and detailed records of landfill operations, personnel, equipment usage and other related matters,• Ensure there is sufficient inventory of office and field supplies (sanitary supplies, first aid, maintenance tools, construction materials, etc.) to avoid operational impacts,• Professionally and positively represent the Municipality if and when required.• Be sensitive to issues and people and give only the information that is within his authority and can be officially released,• Respond to complaints and inquiries promptly and tactfully as indicated by being even tempered and calm, discussing the issue, not the person, listening to and clarifying the problem, telling the person what action will be taken and
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	<p>offering information necessary to resolve the situation,</p> <ul style="list-style-type: none"> • Perform other duties that may be required as determined by the site operator or permit holder.
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1.4.4 Landfill Operator

Specification	The Municipality shall ensure that the landfill site is adequately resourced with all the necessary staff resources and personnel to efficiently and effectively operate the facilities
Roles	Heavy machinery operations, such as compactors, Tractor Loader and Backhoe(TLB), Dozers bailers, shredders etc.
Responsibilities	<p>The Landfill Equipment Operator shall be under the general supervision of a Disposal Site Supervisor, is directly responsible for the safe and proper operation of complex motorized equipment, as well as the proper handling and compaction of solid waste. Specifically, Landfill Equipment Operators shall:</p> <ul style="list-style-type: none"> • Perform daily equipment checks, complete pre-check and post-check of equipment, immediately report all equipment defects to the supervisor, verbally and in writing on vehicle check-out sheets, • Operate assigned equipment in a safe, proper and efficient manner following Municipality’s and manufacturer rules, regulations, policies and procedures, • Cut, maintain and finish grades as indicated on grade stakes or as directed by Disposal Site Supervisor or landfill engineer. • Excavate landfill cells according to engineering plans while keeping the excavated area in good working order, • Spread and compact refuse according to appropriate procedures. Push and compact refuse efficiently, taking the dozer past the hinge point, then half-tracking when backing down the lift, • Implement daily cover, obtain, spread and compact soil cover according to appropriate procedures, • Cover refuse efficiently, have area covered walked in tight and surface smooth using no more dirt than necessary. Leave surface area smooth with no refuse exposed, • Assist in site maintenance work as required; e.g. grade roads, drive water trucks, resurface roads, construct refuse lifts, and other duties as assigned,

	<ul style="list-style-type: none"> • Complete daily report forms for all equipment used, include mileage and service requests, • Know how to respond appropriately to all emergencies utilizing the emergency procedures (Municipality standard),
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1.4.5 Landfill Operator

The Municipality shall appoint a suitably qualified individual or organization to implement all the environmental monitoring requirements and programmes as shall be stipulated in the permits for the landfill site. Typically these programmes shall include Water Quality Monitoring (surface and Groundwater, Air Quality Monitoring, Vegetation Monitoring, and Environmental Auditing (Internal and external audits) at frequencies stipulated in the site permits and Record of decision.

1.4.6 Landfill Operator

Specification	<ul style="list-style-type: none"> • The Municipality shall ensure that the landfill site is adequately resourced with all the necessary staff resources and personnel to efficiently and effectively operate the facilities
Roles	<p>Such additional or other staff that will or may be required include:</p> <ul style="list-style-type: none"> • Administrator and weigh bridge operator • Equipment or machinery Operators • General Workers • Security • Cleaners • Litter Pickers • Spotters • Drivers
Responsibilities	<p>Responsibilities that will need to be designated include:</p> <ul style="list-style-type: none"> • Administration and data capture – due to the size of the landfill site, Municipality or the operator will decide on whether to have a dedicated Administrator or utilise the same person to fulfil other roles such as weigh bridge operator. <ul style="list-style-type: none"> ❖ The Administrator shall ensure all site related documents and records are kept and maintained on site.

	<ul style="list-style-type: none">❖ The administrator shall aide the site manager and supervisor to efficiently undertake their responsibilities.• General site maintenance including alien vegetation management.• Litter control
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2 LANDFILL OPERATION SPECIFICATIONS

2.1 Landfill hours of Operation

Specification	<ul style="list-style-type: none"> • The Landfill shall be open to accept waste from 8:30 am to 4:00 pm. • Monday through Friday and from 8:30 am to 4:00 pm. Operational hours for weekends and public holidays will be determined by the Municipality. • No waste must be accepted or received on site after 4:00pm. • Operational hours must be communicated to all waste transporters and the public by clearly inscribing these on a legible notice board at the site entrance.
Objective	<ul style="list-style-type: none"> • To ensure that the site is operated within normal working hours. • To allow the operator enough time and space to prepare the site before opening and to ensure that the site is tidy and in good condition at close of day.
Deviation	<ul style="list-style-type: none"> • The site operator must notify the landfill manager and public of any deviation from regular site operating hours or revisions to the schedule.
Risk	<ul style="list-style-type: none"> • Deviation from this schedule is likely to result into lack of covering of waste at the close of day and lack of prepared cells and cover material provision for the next working day. • It is also likely to result into illegal dumping and uncontrolled placement of waste on the landfill site

2.2 Site access, Security and Reception

Specification	<p><i>Access and Security</i></p> <ul style="list-style-type: none"> • The Municipality shall ensure that the Landfill shall have a fence at the recommended minimum of 1.8m high all around the site. • The security fence shall be inspected regularly to ensure that it is maintained and its integrity is not compromised and is • The Municipality shall ensure that the Landfill site has 24 hour security at all times. • Appropriate Signage (in at least 3 appropriate) languages, shall be placed at the entrance of the facilities.
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	<ul style="list-style-type: none"> • The site shall have only one entry/exit point and access via any other points shall be deemed illegal and unauthorized. • A record of all personnel and vehicles entering sites shall be maintained. • No unauthorized persons shall be allowed admittance on site. <p><i>Waste Reception</i></p> <ul style="list-style-type: none"> • Checking vehicles and loads • Record keeping of the details of each load • Directing to the working face or temporary storage area • Dealing with unaccepted wastes • On-site traffic control
Objective	<ul style="list-style-type: none"> • To ensure effective control of access to the site. • To ensure that no authorized personnel access the site.
Deviation	<ul style="list-style-type: none"> • Deviation from this shall be considered as unacceptable and is likely to be a non-compliance to permit conditions.
Risk	<ul style="list-style-type: none"> • Deviation from this schedule is likely to result into health and safety risks. • Deviation from this could lead to disposal of unauthorized or unacceptable substances on the site.

2.3 Waste information system

Specification	<ul style="list-style-type: none"> • The Municipality shall ensure that a Waste Information System is developed and Implemented at the Landfill Site. • The Waste Information System shall be a recognised system that is compatible with the national system and meets the minimum requirements for WIS. • Entries will be made each day in the Daily Log. • Records shall be kept and maintained in a legible manner for the life span of the sites. • Records from the WIS shall be passed on to the Department of Environmental Affairs and Tourism for logging into the National WIS. • At the minimum WIS entries shall indicate tonnages by type and generator of waste, the number of vehicle loads accepted at the site and any irregular occurrences. • Daily Reports and Monthly reports indicating the above summaries shall be
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	produced by the WIS.
Objective	<ul style="list-style-type: none"> • To ensure effective planning for the site. • To record all the waste streams and tonnages handled by the site. • To meet national requirements for operation of waste handling facilities.
Deviation	<ul style="list-style-type: none"> • Deviation from this shall be considered as unacceptable and is likely to be a non-compliance to permit conditions.
Risk	<ul style="list-style-type: none"> • Penalty from DEAT • Poor Planning for the facilities.

2.4 Landfill Cell Development Plan

The waste cell is the basic building block of a landfill site. It is composed of several layers of solid waste compacted on a slope by heavy equipment and enclosed on all sides by soil cover material. This specification provides basic guidance for constructing waste cells with the materials accepted at the Landfill.

Specification	<ul style="list-style-type: none"> • The Municipality shall ensure that a cell development plan is developed and implemented during the construction and operation of the landfill site. • The cell development plan shall be kept and maintain at the site all times and shall be consulted regularly by the Landfill Engineer to ensure that the site is developed in accordance with this plan. • The cell development plan shall be updated regularly where necessary and the copies of the revised plan shall be kept and maintained on site. • At the minimum the cell development plan shall indicate the following: <ul style="list-style-type: none"> ○ layout drawing of all current and future cells of the site ○ Initial Cell Area and Capacity ○ Current or remaining cell capacity ○ Planned or projected cell height ○ Current Cell height
Objective	<ul style="list-style-type: none"> • To ensure that the site is developed according to plan and to allow for effective landfill site management.

Deviation	<ul style="list-style-type: none"> • Deviation from this shall be considered as unacceptable and is likely to be a non-compliance to permit conditions.
Risk	<ul style="list-style-type: none"> • Deviation from this likely to result in unnecessary loss of landfill airspace and reduction in landfill life span.

2.5 The working face

The working face is the portion of the uncompleted cell on which additional waste is spread and compacted.

Specification	<p><i>Working Face</i></p> <ul style="list-style-type: none"> • The optimal working face width shall be varied depending on the number of vehicles bringing wastes to the site and the equipment available for spreading and compacting. • The working face shall be wide enough to prevent a backlog of trucks; however, the width shall not be so wide as to be impractical to operate or to expose an undue amount of refuse to the wind. • The face width shall be reduced by compacting and covering portions of the face as traffic drops off at the end of the day. • For safety reasons, the width of the face should not be reduced to less than 12m or 40 ft. <p><i>Movement of Equipment</i></p> <ul style="list-style-type: none"> • Solid waste shall be dumped at the toe of the working face by the collection trucks and pushed up the slope. • For safety reasons a minimum of 2.5m to 4m separation between the trucks and the compactor or tractors. • The unloading area shall be kept level and clear of waste materials. <p><i>Placement of Waste in cell slope</i></p> <ul style="list-style-type: none"> • To maximize compaction, and to provide an optimal weight distribution of the tractor, the waste should be spread up a 3:1 slope in 1 to 2 foot layers. Fill in any holes that develop in the face with loose waste. • The operator shall use grade stakes to aid operators in keeping the slope of the
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	<p>final top fill surface at a grade of 3 percent. Grade stakes should be set according to instructions given by the Landfill Engineer.</p> <ul style="list-style-type: none"> • Stakes shall be checked frequently enough to allow operators to make sightings to them as required. <p><i>Cell Compaction</i></p> <p>A high degree of compaction extends the fill life, reduces cover material and long-term land requirements, reduces litter problems, and results in other beneficial effects.</p> <ul style="list-style-type: none"> • Good compaction shall be achieved by operating the compactor tractor up and down the working face between 3 and 5 times on 1 to 2 foot layers of waste until no further compaction occurs. • The top deck of the cell must also be compacted by running the landfill compactor across the top keeping it as level as possible.
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2.6 Waste Cover

Specification	<p><i>Availability of Cover Material</i></p> <ul style="list-style-type: none"> • The Operator shall ensure availability of adequate cover material for daily site operations. • The landfill engineer must regularly calculate the required waste: cover ratios and ensure that provisions are made to identify sources of adequate supply of cover material for the life span of the landfill site. • The various types of cover material shall be stockpiled in areas designated by the Landfill Engineer and Environmental Officer. • If material is to be used for cover for the day's operation, the stockpiles shall be placed where they will be easily accessible to the working face. • However, stockpiles shall not be located where they may block truck movement or other operations. • Excavation of soil for cover material should only be made from areas at the site designated as "borrow" areas. • No new borrow area shall be commenced on site unless otherwise permitted by the Department of Minerals and Energy (DME). • The landfill engineer and site operator must ensure that all cover new cover
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	<p>material borrow areas are authorised and such authorisations from the regulating authorities must be kept on site at all times.</p> <ul style="list-style-type: none"> • The Site Engineer and Environmental officer must regularly or periodically monitor the cover material borrow areas and stockpiles to ensure that they meet the requirements in all applicable environmental requirements. <p><i>Daily Cover</i></p> <ul style="list-style-type: none"> • All waste must be covered at the end of the day to protect against vectors, odors and debris leaving the landfill. • Cover soil or alternative daily cover (ADC) must be placed over exposed waste at the close of each day's operation. • The amount of soil required for daily cover may vary because of soil type. However, the thickness of compacted soil should not be less than 6 inches (15.24cm) after compaction. • When the cell is completed, no waste should be visible. <p><i>Imported Cover Material</i></p> <ul style="list-style-type: none"> • Where Imported cover (soil or other material that has been brought to the landfill) is intended to be utilized, the permit holder or the site operator shall ensure that such soil or material is not contaminated, and as such pose an environmental risk or deemed as an unacceptable waste material (for general landfill site). • All imported cover material shall be inspected by the environmental manager and qualified as acceptable to be utilized and must comply with permit requirements. <p><i>Intermediate Cover</i></p> <ul style="list-style-type: none"> • The top and side surfaces of a completed cell that is not to be covered within 180 days by another cell may be exposed to weather and truck traffic. • These surfaces should be covered with a layer of at least 12 inches (30.48cm) of compacted soil (as per engineering specifications). • This intermediate cover shall be thick enough to prevent erosion of the cover by wind, water, and traffic. If wastes become exposed, water can enter, and odors and gases may escape from the cells.
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	<p><i>Final Cover</i></p> <ul style="list-style-type: none"> • When landfilling has reached the final planned grade for the specific cell, a final cover of compacted soil shall be placed. The landfill engineer shall advise the depth of final cover to use for all completed sections of fill. • This final cover shall be made in line with the landfill closure plan. The final cover will also help keep the rain from seeping into the waste.
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2.7 Waste Handling and Placement

<p>Specification</p>	<p><i>General</i></p> <ul style="list-style-type: none"> • The permit for the landfill site shall specify all the acceptable or permissible types of waste to be received, handled and disposed of at the landfill site. • Certain wastes acceptable at may require special handling. These specifications provide guidance on basic methods to be used when managing such waste the so called ‘hard-to-handle waste’ <p><i>Bulky waste</i></p> <ul style="list-style-type: none"> • Crushable Wastes Crushable Items – such as furniture and appliances such items shall be dumped at the toe of the working face if traffic permits. • Use the tractor to crush the item on solid ground, and then push it into the toe of the fill. Fill in any holes with regular waste. • Construction waste / Rubble • Rubber Tyres - Do not try to compact unreduced rubber tires. Rubber tires shall be separated out and sent to a tire recycler. • Large Metal Waste – the first prize shall be to try and separate this kind of waste out and sent to a recycling facility. If not possible Metal wastes, such as pipes, rolls of cable, and wires should be placed directly at its position of disposal and covered by household or demolition wastes (bridged). This will prevent unnecessary machine damage and shutdown. <p><i>Low Density waste</i></p> <ul style="list-style-type: none"> • Waste types such as brush, leaves, and yard trimmings, synthetic fibers, loose plastic film or foam, and rubber and plastic scraps or shavings, shall require special handling. These materials present problems because they rebound after being run over by tractors.
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	<ul style="list-style-type: none">• These waste types shall be spread into 1 to 2 foot deep layers, and then covered with general waste and then compacted as usual at base of cell.• These wastes shall be compacted until the operator can no longer detect that the surface of the waste layer is being depressed more than it is rebounding. The weight of the general waste tends to keep the low-density material down. <p><i>Low Density waste</i></p> <p>Wastes such as sawdust and other dusts also require special handling. These wastes are problems because they are stirred up by the equipment and blown by wind. Once in the air, they may be harmful to personnel if they are inhaled or contact the skin. Personnel not working in enclosed cabs should wear protective clothing and dust masks. Some powdery wastes may be wetted down with water from a water truck and then covered immediately with soil or regular refuse. This procedure will help reduce blowing and dusting of the powdery waste. If water is not available, cover the powdery wastes with soil or refuse to reduce blowing and dusting of the waste.</p> <p><i>Medical Waste or Health Care Risk Waste</i></p> <ul style="list-style-type: none">• Medical solid wastes shall not be deposited on the site unless otherwise authorised by the Department of Environmental Affairs and Tourism (DEAT) and as such specified in the permit.• In the case that the permit permits disposal of low volumes of medical waste on site, the specific permit conditions and requirements must be complied with during the handling and placement of such waste on site.
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3 MECHANICAL EQUIPMENT

3.1 Landfill Equipment

<p>Equipment falls into three functional categories: waste movement and compaction, earth cover transport and compaction, and support functions. Selecting the type, size, quantity and combination of machines required to move, spread, compact and cover waste depends on:</p> <ul style="list-style-type: none"> • Waste amount and type; • Weather conditions; • Site and soil conditions: topography, soil moisture and difficulty of excavation; • The distance the cover material must be transported; • Amount and type of soil cover; • Compaction requirements; and • Supplemental tasks, such as maintaining roads, assisting in vehicle unloading, and moving other materials and equipment around 	
<p>Specification</p>	<ul style="list-style-type: none"> • The Municipality shall ensure that the site is adequately resourced with mechanical equipment required for operation of the landfill site. • An Inventory of the required equipment and the exact specifications will have to be developed by the landfill engineer or operator. • All equipment shall be maintained in good working order at all times. • At the minimum the following equipment will be required: <ul style="list-style-type: none"> ○ Tractor Loader and Backhoe (TLB) ○ Bulldozer ○ Service truck or a tractor with trailer ○ Honey sucker or tanker and pump to spray water on roads to control dust and carry leachate. ○ Steel wheel compactor ○ Shredder

4 LIBRARY OF ENVIRONMENTAL SPECIFICATIONS

4.1 Environmental Health and Safety Awareness

Specification	<ul style="list-style-type: none"> • Environmental, Occupational Health and Safety plan and induction manual is developed and implemented. • The above said Environmental, Occupational Health and Safety Plan as well as the Environmental Management Plan (This document and associated and their subsequent revisions) shall be maintained on-site at all times. • All employees, contractors, and personnel utilizing the site shall be briefed on the Environmental, Occupational Health and Safety issues and risks related to the sites, and shall sign shall sign a statement confirming that they understand their environmental, occupational, health and safety responsibilities when working on the site. This statement shall be signed prior to them accessing and commencing work on the site. • The above signed statement shall be maintained by Site Operator and or Permit Holder. • The security fence shall be inspected regularly to ensure that its integrity is not compromised and is maintained. • The Municipality shall ensure that the Landfill site has 24 hour security at all times. • Appropriate Signage (in at least 3 appropriate) languages, shall be placed at the entrance of the facilities. • The site shall have only one entry/exit point and access via any other points shall be deemed illegal and unauthorized. • A record of all personnel and vehicles entering sites shall be maintained. • No unauthorized persons shall be allowed admittance on site.
Objective	<ul style="list-style-type: none"> • To raise the employees, contractors and general's awareness of the environmental, occupation, health and safety risks and responsibilities related to the site.
Deviation	<ul style="list-style-type: none"> • Deviation from this shall be considered as unacceptable and is likely to be a non-compliance to permit conditions.
Risk	<ul style="list-style-type: none"> • Deviation from this schedule is likely to result increased into health and safety risks to site personnel, contractors, employees and the general public.

4.2 Vegetation Management

Specification	<ul style="list-style-type: none"> • Clearing of vegetation on site shall be controlled. • The perimeter of all areas designated to be cleared shall be clearly marked and delineated before disturbance. • An Alien Vegetation Control Plan shall be developed and implemented. • All alien vegetation shall be identified and controlled according to the alien vegetation control plan. • No Indigenous plants shall be cleared. • Site landscaping and vegetation screen development should utilize Indigenous plants and trees as much as possible. • Any garden waste (green waste) brought to the site shall be chipped to avoid transmittance of alien vegetation.
Objective	<ul style="list-style-type: none"> • To minimize loss of habitat, biodiversity and abundance of indigenous plants; and to ensure control of alien vegetation on site.
Deviation	<ul style="list-style-type: none"> • Deviation from this shall be considered as unacceptable and is likely to be a non-compliance to permit conditions.
Risk	<ul style="list-style-type: none"> • Deviation from this schedule is likely to result increased loss of biodiversity, habitats, as well as increased proliferation of alien vegetation on site.

4.3 Vector Control Procedures

<p>Vectors (any animals that carry diseases) are generally not present at a properly operated and maintained sanitary landfill. The provision of daily cover is the primary safeguard against vector problems. Well-compacted wastes and cover material effectively prevent vectors from emerging or burrowing into waste materials.</p>	
Specification	<p>The following are basic specifications shall ensure proper vector control on site:</p> <ul style="list-style-type: none"> • Cover waste on all slopes with six inches of compacted earth, followed by twelve inches on the top deck to prevent the emergence of houseflies from the fill. • Ensure good compaction of the cover material to discourage rodents or other animals from burrowing through it. • Maintain a narrow working face and cover all un-worked area to minimize coyote and bird foraging at the site.

	<ul style="list-style-type: none"> • Keep equipment, storage and leisure areas free of debris and food waste to prevent vectors from establishing residence in or near areas where employees, support personnel or the public work and eat.
Objective	<ul style="list-style-type: none"> • To Protect the health and safety of employees, as well as the public • To Eliminate potential exposure pathways to employees and public • To Reduce risk of contact with vectors and scavengers • To Maintains compliance with operating permit
Deviation	<ul style="list-style-type: none"> • Deviation from this shall be considered as unacceptable and is likely to be a non-compliance to permit conditions.
Risk	<ul style="list-style-type: none"> • Deviation from this schedule is likely to result increased into health and safety risks to site personnel, contractors, employees and the general public. • Increased exposure to vectors. • Unpleasant work conditions.

4.4 Litter Control Procedures

Specification	<p><i>Litter control at working face</i></p> <ul style="list-style-type: none"> • Keep waste well confined at the working face to reduce the amount of waste susceptible to wind. • Deposit waste at the toe of the fill slope face and spread it upward. • If possible, work the waste with the exposed cell face pointed into the wind so that any loose debris flies onto the working face. The compacted waste already on the face presents a relatively rough surface that helps trap litter. Working with the exposed face into the wind also helps keep waste away from the undercarriages of unloading vehicles. • Cover the compacted waste as soon as possible to minimize blowing litter. For example, as the number of trucks arriving at the site decreases toward the end of the day, the working face size can be reduced. <p><i>Control with Litter fences</i></p> <ul style="list-style-type: none"> • Position fences near the fill face as wind and fill operations change. • Move or lengthen semi-permanent litter fences that are strung around the area to conform to filling operations and prevent migration of litter off the
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	<p>site.</p> <p><i>Litter Pickup</i></p> <ul style="list-style-type: none"> ▪ Litter crews are to pick any litter off the fences to prevent the fence from being clogged and subject to overturning by the wind. ▪ Promptly pick up any litter not trapped by the fences to prevent off-site migration. <p><i>Litter in Heavy Wind Conditions</i></p> <ul style="list-style-type: none"> ▪ Install litter fences prior to windy weather and relocate as required. ▪ If lightweight material cannot be contained within the site, then use the water truck to wet down the litter to prevent it from blowing.
Objective	<ul style="list-style-type: none"> • To ensure Compliance with operating permit • Reduction in amount of litter migrating out of waste cell. • Ensure that the site is tidy and neat.
Deviation	<ul style="list-style-type: none"> • Deviation from this shall be considered as unacceptable and is likely to be a non-compliance to permit conditions.
Risk	<ul style="list-style-type: none"> • Poor Aesthetics • Complaints from public • Penalties from authorities

4.5 Dust Control Procedures

Specification	<ul style="list-style-type: none"> ▪ Designated unpaved roads of the landfill must be sprayed, with <i>reclaimed</i> water, periodically throughout the day to comply with our operating permit. Water must also be sprayed at the fill face whenever dust occurs. ▪ Maintain good visual awareness of people and vehicles as you make water passes and shut off nozzles to avoid contact whenever possible. Let vehicles or pedestrians pass prior to resuming dust control activities. ▪ On windy days, keep excavation of cover material with low moisture content to a minimum by wetting the cut area. ▪ Place dusty loads at the toe of the face of the refuse and bridge over as quickly as possible. ▪ Recycled water is the primary water source for this activity. However, operational or maintenance requirements may occasionally preclude the use of this water source. In these cases the use of potable water to maintain
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	regulatory compliance is authorized. *Note – If potable water will be required for more than one day notify the Environmental Officer so the event can be recorded for monitoring and measurement purposes.
Objective	<ul style="list-style-type: none"> • Creates a cleaner, safer work environment • Ensures compliance with minimum requirements • Helps maintain a positive aesthetics • Saves a valuable (potable water) resource
Deviation	<ul style="list-style-type: none"> • Deviation from this shall be considered as unacceptable and is likely to be a non-compliance to permit conditions.
Risk	<ul style="list-style-type: none"> • Poor Aesthetics • Complaints from public • Penalties from authorities

4.6 Leachate Management

Specification	<ul style="list-style-type: none"> • The Municipality shall ensure that a Water Management Plan for the site which includes Leachate management is developed and implemented. • Leachate shall not be allowed to come into contact with the environment.
Objective	<ul style="list-style-type: none"> • Minimizes potential impact to the environment • Keeps the contaminated water (leachate) contained within a lined system • Avoids unnecessary ponding on the landfill • Maintains compliance with operating permit
Deviation	<ul style="list-style-type: none"> • Deviation from this shall be considered as unacceptable and is likely to be a non-compliance to permit conditions.
Risk	<ul style="list-style-type: none"> • Deviation from this schedule is likely to result increased potential for Exposure of Environment to contaminants.

4.7 Water Management

Specification	<ul style="list-style-type: none"> • The Municipality shall ensure that a Water Management Plan for the site is developed and implemented. • The Water management plan shall be in line with the site permit conditions. • The water management plan shall include specification for management of all water streams arising from the site including: <ul style="list-style-type: none"> • Clean storm water • Contaminated storm water (surface run off) • Leachate
Objective	<ul style="list-style-type: none"> • To ensure that water emanating from the site is adequately controlled and to minimize pollution of water resources and surrounding environment.
Deviation	<ul style="list-style-type: none"> • Deviation from this shall be considered as unacceptable and is likely to be a non-compliance to permit conditions.
Risk	<ul style="list-style-type: none"> • Deviation from this schedule is likely to result increased pollution to the environment.

4.8 Record keeping

Specification	<ul style="list-style-type: none"> • The Municipality shall ensure that appropriate records are kept and maintained on site. Such records shall include: <ul style="list-style-type: none"> • Waste volumes and Waste analysis results. • Liner compatibility testing (where a liner system is considered appropriate). • Location of waste placement, including a map. • Depth of waste below the final cover surface. • Inventory of daily cover material used and stockpile. • Frequency of waste application. • Equipment operation and maintenance statistics. • Environmental monitoring data and results. • Inspection reports, including photographs. • Design documents, including drawings and certifications. • Cost estimates and other financial data. • Plans for unit closure and post-closure
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	<ul style="list-style-type: none"> • Daily log of activities. • Calendar of events. • Personal information and work history for each employee, including health • Information such as illness reports. • Accident records. • Work environmental records. • Occupational safety records, including safety training, surveys, personnel requirements etc.
Objective	<p>Record keeping is a vital part of cost-effective, efficient waste management unit operations. Records should be maintained for an appropriate period of time, but it is a good idea to keep a set of core records indefinitely. Records help evaluate and optimize unit performance. Over time, these records can serve as a valuable almanac of activities, as well as a source of cost information to help fine tune future expenditures and operating budgets. Data on waste volume, for example, can allow a prediction of remaining site life, any special equipment that might be needed.</p>
Deviation	<ul style="list-style-type: none"> • Deviation from this shall be considered as unacceptable and is likely to be a non-compliance to permit conditions.
Risk	<ul style="list-style-type: none"> • Deviation from this schedule is likely to result in loss of valuable site information and history.

4.9 Training and Qualifications

- The Municipality shall ensure that employees on site have undergone the necessary training required to operate the facilities according to the design specifications, operating plan, and the minimum requirements:

Such train shall at the minimum include:

- Waste management operations.
- Hazardous waste identification.
- Monitoring equipment operations.
- Emergency shut-off procedures.
- Overview of safety, health, and other hazards present at the site.
- Symptoms and signs of overexposure to hazards.
- Proper handling of waste
- Procedures, equipment operation, and safe driving practices.
- Emergency response topics, such as spill response, fire suppression, hazard analysis, and location and operation of emergency equipment.
- Requirements for personal protective equipment, such as hard hats, gloves, goggles, safety shoes, and high-visibility vests.

Example of Manager and Supervisor Training needs

- Waste Management and Landfill Operations
- Unit basics:
- Siting
- Waste containment
- Daily operations
 - Owning and operating costs
 - Machine types
 - Equipment maintenance
 - Maximizing airspace
 - Labor management
 - Production analysis
 - Application of production rate data
 - Budgets and data tracking:
- Operating budget
- Cover soil budget
- Airspace budget

- Waste handling techniques
- Waste management techniques
- Cover soil placement
- Safety issues and safety meetings
- Record keeping
- Emergency response plan
- Regulatory requirements for operation

Source: Bolton, N. 1995. The Handbook of Landfill Operations: a Practical Guide for Landfill Engineers, Owners, and Operators.

5 HEALTH AND SAFETY PROCEDURES

- The Municipality Standard Occupational Health and Safety Procedures shall apply
- The Municipality shall develop an emergency preparedness plan for the site prior to commissioning.
- Once the emergency preparedness plan has been developed, it shall be incorporated into this section. Please refer to next section

6 EMERGENCY RESPONSE PLAN

6.1 Purpose of the Emergency preparedness and response plan

An emergency is an unplanned event when a project operation loses control, or could lose control, of a situation that may result in risks to human health, property, or the environment, either within the facility or in the local community. Emergencies do not normally include safe work practices for frequent upsets or events that are covered by occupational health and safety. Proper emergency planning and response are important elements of the site Environmental, Health and Safety Plan of a Hazardous Waste Handling, Storage and Disposal facility, and that help minimize employee exposure and injury.

There are a number of regulations, guidelines, standards which requires that the employer develop and implement a written emergency response plan to handle possible emergencies before performing hazardous waste site operations.

The permit Holder for the facility in this case the !Kheis Local Municipality **MUST** develop an emergency preparedness and response or action plan complying to ensure the safe evacuation of personnel.

6.2 Content of the Emergency preparedness and response plan

The Emergency Preparedness and Response Plan must be commensurate with the risks of the facility and at the minimum include the following elements:

- Administration
- Pre-emergency planning,
- Emergency recognition and prevention,
- Emergency medical and first-aid treatment,

- Methods or procedures for alerting on-site employees,
- Safe distances and places of refuge,
- Site security and control,
- Personal protective and emergency equipment,
- Evacuation routes and procedures. and
- Training and Awareness

In addition to the above requirements, the plan must include site topography, layout, prevailing weather conditions, and procedures for reporting incidents to local authorities, the South Africa Police Services (SAPS), and regulating agent i.e. DEAT and Department of Labour etc.

6.3 Use of the Emergency preparedness and response plan

The procedures must be compatible with and integrated into the operational management plan of the site. The plan requirements also must be rehearsed regularly, reviewed periodically, and amended, as necessary, to keep them current with new or changing site conditions or information.

6.4 Administration of the EP&RP

- **Policy**

The Municipality’s Disaster Management Policy and Plan shall apply, and this plan shall be further developed within the overall context of the municipal disaster management plan.

- **Distribution**

This Plan and procedures contemplated in this plan must be distributed to all personnel working on the site and the following designated responsible persons:

Designation	Name	Contact Number
Disaster Management		
Environmental Manager		
Site Operator		
Site Supervisor		
Site Employees		

- **Definitions**

The procedures must be compatible with and integrated into the operational management plan of the site. The plan requirements also must be rehearsed regularly, reviewed periodically, and amended, as necessary, to keep them current with new or changing site conditions or information.

- **Organogram**

An organogram for the emergency response plan must be developed and communicated.

- **Personnel roles and responsibilities**

The Roles and Responsibilities must be defined and outlines at the site.

- **Communication procedures**

The communication lines established in Section 2 shall apply to the emergency response plan.

- **Emergency Calls and First-Aid Calls**

In the event of an emergency the following the emergency phone numbers must be called depending on the nature of emergency. An example of Emergency Contact Information is indicated in the

Table 1:

Emergency Contact Information		
Persons/Departments		Phone Number
First Aid Officers		
Ambulances		

Fire Brigade		
Police		
	Police flying squad	
Health Safety and Environmental Officers		
Hospitals		









6.5 Personal Protective Equipment and Emergency Actions

This section presents a summary of recommended practices for various substances. These recommendations supplement general work practices (e.g., no eating, drinking, or smoking where chemicals are used) and should be followed if additional controls are needed after using all feasible process, equipment, and task controls. **Tables 1 and 2** explain the codes used. Each category is described as follows:

Table 2: PPE Guidance Table 1

SKIN	Recommends the need for personal protective clothing
EYES	Recommends the need for eye protection
WASH SKIN	Recommends when workers should wash the spilled chemical from the body in addition to normal washing (e.g., before eating)
REMOVE	Advises workers when to remove clothing that has accidentally become wet or significantly contaminated.
CHANGE	Recommends whether routine changing of clothing is needed.
PROVIDE	Recommends the need for eyewash fountains and/or quick drench facilities.

Table 3 :PPE Guidance Table 2

SYMBOLIC SIGN OF EQUIPMENT												
DESCRIPTION	Gas Mask	Dust Mask	Ear Protection	Safety harness	Rain Jacket	Hard Hats	Gum Boots	Safety Shoes / boots	Gloves	Safety Glasses	Cap and Sun block	High visibility vests
AREA/ TASK												
Site Operations		X	X					X	X	X	X	X
First aiders									X			

The Site Operator Must Identify the Areas, Tasks and Roles of all personnel working and site and assign the appropriate Personal Protective Equipment as per the above PPE Guidance table.

6.6 Training and Awareness

- Before implementing the EP&RP, the SHE Coordinator and facility Managers/Supervisors shall designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees.
- The EP&RP must be reviewed with all employees at the following times:
 - Initially when the plan is developed,
 - whenever the employee's responsibilities or designated action under the plan change,
 - and whenever the plan is changed.
- At least annually employee meetings are to be held to train employees of the contents of the EP&RP and revise the plan as appropriate.
- Drills will be conducted and full participation encouraged.
- All training must be documented in writing and copies sent to Safety, Health and Environmental Manager of the Power Station.

6.7 Review of EP&RP

- A copy of the Emergency Preparedness and Response Plan must be sent to the Local Municipality Safety, Health and Environmental, SHE Manager and this must be reviewed to ensure compliance with the overall emergency preparedness and response plan for the power station.
- Once the EP&RP Plan has been approved by the SHE Manager of the Power station, it must be integrated into the overall emergency preparedness and response plan for the power station.
- The EP&RP must be reviewed during the routing SHE inspections;
- The EP&RP must be maintained by the facility SHE Coordinator and made available to all employees and users of the facility.

7 WATER QUALITY MONITORING

- The Municipality shall develop and implement a Water Monitoring Plan and Programme in line with permit conditions.
- The Water Monitoring Programme shall at the minimum include:
 - A surface water monitoring network and programme; and
 - A groundwater monitoring network and programme.
- The water monitoring programme shall at the minimum meet the minimum requirements for water monitoring at waste management facilities, DWAF 1998.

8 LANDFILL GAS MONITORING

- The Municipality shall develop and implement a landfill gas (LFG) Monitoring Plan and Programme in line with permit conditions.
- Once the Landfill Gas Monitoring Plan has been developed, it shall be incorporated into this section.

9 REFERENCES

1. ASTM. 1993. Standard Practice for Maintaining Health and Safety Records at Solid Waste Processing Facilities. E 1076-85.
2. Bagchi, A. 1994. Design, Construction, and Monitoring of Landfills. John Wiley & Sons Inc.
3. Bolton, N. 1995. The Handbook of Landfill Operations: A Practical Guide for Landfill Engineers, Owners, and Operators. Blue Ridge Solid Waste Consulting.
4. DWAF 1998. Waste Management Series, Minimum Requirements.
5. Robinson, W. 1986. The Solid Waste Handbook: A Practical Guide. John Wiley & Sons Inc