

# HEALTH CARE RISK WASTE FACILITY

## DRAFT ENVIRONMENTAL MANAGEMENT PLAN

PARSONS BRINCKERHOFF REFERENCE №: ZA2155671A



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## 1. Introduction

An Environmental Management Plan (EMP) is a key document required for the approval of either a basic or full Environmental Impact Assessment (EIA) application. The EMP is a working document which consists of a set of mitigation measures that will be implemented to eliminate, offset or reduce adverse environmental impacts to acceptable levels. This section contains the following:

- Legislative requirement of the EMP (trigger to develop an EMP).
- A summary of all the significant adverse environmental impacts that have been identified.
- Description and technical details for each measure, including the type of impact to which it relates and conditions under which it relates and conditions under which it is required.
- Institutional arrangements with respect to assigning roles and responsibilities for carrying out the mitigation measures.
- Implementing schedule for measures to be carried out (phases).
- Monitoring and reporting procedures to ensure early detection of conditions, providing information of progress and results of mitigation.

## 2. Overview of the EMP requirements

The Environmental Management Plan (EMP) is the tool that can provide the assurance that the proponent has made suitable provisions for mitigation. The EMP describes the methods and procedures for mitigation and monitoring the impacts identified in the EIA report. The aim of the EMP is to:

- a) Ensure that the project complies with the goals of the Namibian Environmental Management Act 2007, (No. 7 of 2007), and;
- b) Provide a framework for implementing the management actions recommended in the EIA for construction, operational and decommissioning phases of the activities associated with the development of the proposed HCRW treatment facility.

This EMP is to be submitted to the Environmental Commissioner in the Ministry of Environment and Tourism as part of the application to receive an environmental clearance certificate for the proposed project. The EMP covers the same project scope as included in the EIA. The detailed description of the proposed development is contained in (Section 3) of the EIA report. The detailed description of the affected environment is also included in the EIA report (see section 4).

## 2.1 Objectives of the EMP

The objectives of this EMP report are to:

- (i) Provide a detailed summary and identification of all significant environmental impacts;
- (ii) Provide a description and technical details for each mitigation measure, including the type of impact to which it relates and the conditions under which it relates and is required including design and operation procedures;
- (iii) provide details of the institutional arrangements with respect to roles and responsibilities assigned for carrying out the mitigation measures; and
- (iv) Present the monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures, and provide information on the progress and result of mitigation.

The EMP is a living document and should be updated with additional information or actions during the construction, operation and decommissioning phases.

For each of the aforementioned phase, the following approach is adopted:

- Objectives are identified – broadly describing the environmental quality to be maintained;
- Risk sources are identified – as determined in the EIA report;
- Management actions are proposed – actions required to mitigate the significant negative impacts identified during the EIA process;
- Monitoring is proposed – to check whether the actions have been undertaken, and if so, whether they have been effective in achieving the overall objectives and desired levels of environmental quality.

## 3. A summary of the significant adverse impacts

This section provides an indication of the significant potential positive and negative environmental impacts relating to the proposed development. Once a potential issue and/or potential impact have been identified, it is necessary to identify which activity or aspect of the development would result in the impact. By considering the cause of the issue, the probability of the activity resulting in an impact can be determined. Once the significance of the impact has been established mitigation or management measures to address the impact will be developed. Impacts have been detailed under section 8 of the EIA report.

## **4. Role and Responsibilities**

This section describes the roles and responsibilities of the key stakeholders involved in the development, implementation and review of the EMP.

### **4.1. Competent Authority**

The Department of Environmental Affairs: Ministry of Environment and Tourism is responsible for the review of the draft and amended EMP documents.

### **4.2. Applicant (Municipality of Windhoek)**

The roles of the applicant is as follows:

- Review reports regarding the implementation of the EMP and make payments to the Contractor if the EMP is being implemented in a satisfactory manner.
- Give warnings and imposes fines and penalties on the Contractor if the Contractor neglects to implement the EMP satisfactorily.

### **4.3. City of Windhoek (Project Manager)**

The Applicant will appoint the Project Engineer. The City of Windhoek's Environmental Division can also play the role of the Project Manager. The role of the project manager, will be:

- Liaising directly with the relevant authorities with respect to the preparation and implementation of the EMP and meeting the conditions documented in the environmental clearance certificate.
- Bear the overall responsibility for managing the project contractors and for ensuring that the environmental management requirements are met.
- Inform the contractors of the EMP and Environmental clearance certificate obligations.
- Approve all decisions regarding environmental procedures and protocols that must be followed.
- Have the authority to stop any construction in contravention with the EMP and RoD.

- In consultation with the Environmental Control Officer (ECO) has the authority to issue fines for transgressions of basic conduct rules and/or contravention of the EMP.
- Maintain open and direct lines of communication between the proponent, Contractor and Interested and Affected Parties (I&APs) with regards to environmental matters.
- Attend regular site meetings and inspections where required.

#### **4.4. City of Windhoek (Environmental Control Officer)**

An Environmental Control Officer (ECO) should be employed by the Contractor . This person should be available for the duration of the construction period and should have appropriate training and experience in the implementation of the EMP and overseeing construction process. This ECO will implement EMP at all levels and sections (sub-contractors) during the construction of the HCRW. During operation of the HCRW the City's Environmental Management Division will take over the role of ECO. The responsibilities of the ECO include the following:

- Assist the Project Manager and Contractor in finding environmentally responsible solutions to challenges that may arise.
- Conduct environmental monitoring as per EMP requirements.
- Monitor performance of the contractors and ensuring compliance with the EMP and associated method statements.
- Maintenance, update and review of the EMP.
- Liaison between the contractors, authorities and other key stakeholders on all environmental concerns.
- Validating regular site inspection reports which are prepared by the Contractor's Environmental Officer (EO).
- Checking the EO's record of environmental incidents as well as corrective and preventative actions taken.
- Checking the EO's public complaints register in which all complaints are registered and actions taken thereof.
- Issuing site instructions to the contractors ECO for corrective actions required.
- Assisting with the resolution of conflict.
- Communicating all amendments of the EMP to the relevant stakeholders.



- Conducting monthly audits to ensure that the system for implementing the EMP is effective.

#### **4.5. Contractor's Safety Officer**

- Implement the recommendations in the EIA and satisfy the conditions in the RoD.
- Ensure that safety is practiced for all activities on site.
- Prepare and implement safety procedures
- Communicate all safety related issues.

#### **4.6. Contractors**

The contractor should appoint the Contractor's representative who is suitably qualified to implement the EMP. The responsibilities of the Contractor include:

- Compliance with the relevant legislation and the EMP.
- Preparation and submission to the proponent through Project Manager the following Management Plans prior to commencing work:
  - Environmental Awareness Training and Inductions;
  - Emergency Preparedness and Response;
  - Waste Management; and
  - Health and Safety.
- Environmental awareness presentations (inductions) to be given to all site personnel prior to work commencement; the ECO is to provide the course content and the following topics, at least but not limited to, should be covered:
  - The importance of complying with the relevant Namibian, International and Best Practice Legislation.
  - Roles and Responsibilities, including emergency preparedness.
  - Basic Rules of Conduct (Do's and Don'ts).
  - EMP: aspects, impacts and mitigation;
  - Fines for Failure to Adhere to the EMP;
  - Health and Safety Requirements.
- Record keeping of all environmental awareness training and induction presentations; and
- Attend regular site meetings and environmental inspections.

## 5. Construction Phase

This section details mitigation measures proposed for the implementation during the construction phase.

### 5.1. Objective

To prevent, minimise and manage negative environmental impacts and enhance positive impacts associated with the construction activities of the development of the HCRW facility in Windhoek.

**Table 1: Mitigation measures for the fro impacts anticipated during the construction phase**

Aspect	Impact	Mitigation measure	Performance indicator	Responsibility
Soil	<ul style="list-style-type: none"> <li>- Loss of topsoil</li> <li>- Erosion</li> <li>- Changes in soil properties</li> <li>- Contamination</li> </ul>	<ul style="list-style-type: none"> <li>- Protect topsoil stockpiles against erosion by covering with tarpaulin or similar material.</li> <li>- Prior to earthmoving operation all topsoil (top 300mm minimum) must be stripped and stockpiled separately from subsoil and rocky material.</li> <li>- Soil must be stripped in a phased manner to retain vegetation cover as</li> </ul>	No topsoil contamination and no visible erosion on site.	Contractor/ECO

Aspect	Impact	Mitigation measure	Performance indicator	Responsibility
		<p>long as possible.</p> <ul style="list-style-type: none"> <li>- All cut and fill surfaces need to be stabilised when major civil works are complete.</li> <li>- All equipment must be inspected daily for oil or fuel leaks before it is operated. Leakages must be repaired immediately. Containment trays must be placed on immobile equipment until such leakage has been repaired.</li> </ul> <p>Soil contaminated with oil must:</p> <ul style="list-style-type: none"> <li>- Be dug up to 30cm below the saturated oil mark.</li> <li>- Disposed at a Kupferberg landfill site.</li> </ul>		
ground water pollution	Ground water pollution as a result of fuel, oil, and chemicals and chemical toilets contamination.	<ul style="list-style-type: none"> <li>- All spillages (fuel, oil, chemicals) should be immediately removed and stored in designated area – such as bunded wall waste oil storage areas to prevent possible contamination of underground</li> </ul>	No pollution of water resources.	ECO



Aspect	Impact	Mitigation measure	Performance indicator	Responsibility
		<p>water. These spillages must be properly disposed off to the hazardous waste site by the appointed contractor.</p>		
<p>Surface water</p>	<p>Storm water runoff and sediment load from eroded areas, Contamination of storm water by fuel, oils and chemical spillages, Ponding and formation of pools in the borrowpit areas,</p>	<ul style="list-style-type: none"> <li>- Cement contaminated water must be collected, stored and disposed of at a site approved by the PM and ECO.</li> <li>- Concrete shall not be mixed directly on the ground. Plastic liners or mixing trays must be used.</li> <li>- All storm water drainage channels will be lined with loose rock boulders or gabions at appropriate sites to act as energy and flow velocity dissipation to reduce the flow strength of the run-off. There should be no unnecessary removal and clearing of vegetation.</li> </ul>	<p>No pollution</p>	<p>ECO</p>
<p>Noise</p>	<p>Noise nuisance from construction equipment and heavy machinery.</p>	<ul style="list-style-type: none"> <li>- Provide ear plugs and ear muffs to staff undertaking the noisy activity or working within close proximity thereof.</li> </ul>	<p>Appropriate scheduling of noisy activities</p>	<p>ECO and contractors</p>



Aspect	Impact	Mitigation measure	Performance indicator	Responsibility
		<ul style="list-style-type: none"> <li>- It is recommended that construction and associated construction vehicles be limited to normal working hours (08h00 to 18h00) and weekends and holidays should be avoided.</li> <li>- Implement noise monitoring programme to a grievance procedure.</li> <li>- Select equipment with low sound power level rating and ensure it is well maintained.</li> </ul>	<p>No complaints from staff and public.</p> <p><sup>1</sup>Day time (07.00 -18.00) noise has not exceeded 55 (one hour LAeq (dBA) for residential areas and</p>	

<sup>1</sup> According to IFC Standards.



Aspect	Impact	Mitigation measure	Performance indicator	Responsibility
Traffic	Congestion in traffic	<ul style="list-style-type: none"> <li>- Construction materials will have to be hauled to the site and it is recommended that the responsible contractor liase with the relevant traffic department to ensure that traffic flow along the affected route is accordingly channelled or diverted.</li> <li>- Drivers of these vehicles should be licensed and proficient in driving these vehicles; and</li> <li>- Drivers under the influence of narcotics and alcohol should not be allowed to operate these vehicles and must be removed from the site.</li> </ul>	No traffic congestion	Contractors
Hazardous substances	Substances such as fuels and oils.	Undertake environmental awareness training on handling, use, storage and disposal of hazardous substances to all staff.	No spills of hazardous substances.	Contractor



Aspect	Impact	Mitigation measure	Performance indicator	Responsibility
	<p>Equipment and vehicle maintenance and storage.</p>	<p>Keep a register of harmful substances on site and have information on management of spills and accidental ingestion.</p> <p>Store fuels in a storage area that is appropriately banded and drains to a sump in case of spills.</p>	<p>Regularly updated register of harmful substances.</p> <p>Storage areas are banded to 110% of the volume of substances stored.</p> <p>Parked vehicles have drip trays placed underneath.</p> <p>Equipment and vehicles are serviced regularly in a workshop.</p>	



Aspect	Impact	Mitigation measure	Performance indicator	Responsibility
Health and safety	Public safety	<ul style="list-style-type: none"> <li>- The responsible contractor must ensure that all staff members are briefed about the potential risks of injuries on site.</li> <li>- The contractor is further advised to ensure that adequate emergency facilities, including first aid kits, are available on site.</li> <li>- Equipment housed on site must be placed in a way that does not encourage criminal activities.</li> <li>- For safety and security reasons it is recommended that security personnel be employed to safeguard the premises and avert criminal activities.</li> <li>- Submit prior to construction a public communication plan indicating how and when the public will be informed of construction hours and propose route and schedule.</li> <li>- All construction contractors and sub-</li> </ul>	<p>No complaints from the public.</p> <p>No injuries to the public.</p>	Contractor



Aspect	Impact	Mitigation measure	Performance indicator	Responsibility
		<p>contractors on-site must be trained in the implementation of effective Health and Safety policies;</p> <ul style="list-style-type: none"> <li>- A First Aid Team must be trained and equipped with adequate equipment should a health and safety incident occur;</li> <li>- Appropriate signage and a demarcated construction area must be established around the construction site creating awareness of employees on-site of the potential Health and Safety risks.</li> </ul>		
Waste	<ul style="list-style-type: none"> <li>- Littering</li> <li>- Pollution due to mismanagement of waste</li> </ul>	<ul style="list-style-type: none"> <li>- Waste must be categorised by the contractor and disposed of in a suitable manner into different waste streams (including general and hazardous waste);</li> <li>- General waste is to be collected either by the Municipality or via a waste disposal contractor;</li> </ul>	No pollution due to waste	ECO and Contractor

Aspect	Impact	Mitigation measure	Performance indicator	Responsibility
		<ul style="list-style-type: none"> <li>- The contractor should provide an adequate number of waste receptacles for general waste at points around the construction site, and a single collection point for hazardous waste;</li> <li>- Contaminated soil must be removed and disposed of at Kupferberg hazardous waste cell;</li> <li>- Particular care shall be taken with the disposal of materials that could be wind-borne or waterborne to ensure that the release of these materials is minimised (the latter is considered advisable for hazardous waste). The use of netting covers or sealed containers may be considered. Areas should be demarcated for specific activities including food consumption, with suitable waste receptacles provided;</li> <li>- No wastewater shall be disposed to soil;</li> </ul>		



Aspect	Impact	Mitigation measure	Performance indicator	Responsibility
		<ul style="list-style-type: none"> <li>- Litter and waste that is generated to be adequately stored and disposed of in an approved manner;</li> <li>- No burning of waste is allowed;</li> <li>- The use of temporary toilets during the construction phase of the development must not cause any pollution to water resources as well as pose a health hazard. In addition, these toilets must be situated out of the 1: 100 year flood line of a watercourse.</li> </ul>		
Visual	Aesthetics	<ul style="list-style-type: none"> <li>- Ensure night lights are focussed on the areas required, with shields around the globes to limit straneous light where necessary.</li> <li>- Implement a progressive rehabilitation of the site.</li> <li>- Keep the site clean and orderly at all times to limit visual nuisance.</li> <li>- Minimise visual impact by</li> </ul>	Impact on visual aesthetics is minimised.	Contractor

Aspect	Impact	Mitigation measure	Performance indicator	Responsibility
		introducing shields and careful planning. - Integrate as much as possible, the design of the area's infra-structure with the surrounding landscape - Where possible blocking off areas visible to the public should be done in order to minimise the visual impact caused by construction activities..		
Diseases – HIV/AIDS	Prevention of the spread of HIV/AIDS	- Promote HIV/AIDS awareness by talks with staff and surrounding communities. - Promote the use of condoms by placing these discreetly but accessible to workers.	Awareness training has been provided to all workers	Contractor

## 6. Operations Phase

Major issues during the operational phase are air quality, odour, safety and security.

## 6.1. Objective

To prevent, minimise and manage negative environmental impacts and enhance positive impacts associated with the construction activities of the development of the HCRW facility in Windhoek.

**Table 2: Mitigation measures for the fro impacts anticipated during the operational phase**

Aspect	Impact	Mitigation	Performance Indicator	Responsibility
Air quality	Odours from stack, smoke and from exhaust fumes	<ul style="list-style-type: none"> <li>- Quality control methods and routine sampling of the gas fuel for the incinerator will be implemented to ensure the emissions targets are achieved.</li> <li>- Real-time in-stack monitoring of gaseous and particulate matter will be used to qualify emissions or as recommended by the Competent Authority,</li> <li>- CoW to ensure compliance with emissions standards (As mentioned in the Air Quality Assessment report, attached in appednix 3a of the EIA report); and</li> <li>- A base-line monitoring program will be established prior to and during plant operation, and will be detailed in the EMP.</li> <li>- Segregate medical waste so that waste that does</li> </ul>		ECO (from CoW)

Aspect	Impact	Mitigation	Performance Indicator	Responsibility
		<p>not have to be incinerated is excluded. This will reduce the loading on the incinerator. Further segregation of the infectious/hazardous waste is required to ensure that radioactive wastes and materials which contain heavy metals are excluded from the waste stream;</p> <ul style="list-style-type: none"> <li>- Discarded or broken medical equipment such as mercury thermometers, sphygmomanometers, blood pressure devices, dilation and feeding tubes must not be incinerated;</li> <li>- Employ the use of pollution abatement equipment on the incinerator</li> </ul>		
Noise	Nuisance noise on the neighbours	<ul style="list-style-type: none"> <li>- Unlikely to be significant or noticeable if the incinerator is kept in optimal working condition and is serviced according to the manufacturers</li> </ul>	No noise complains from the adjacent neighbors	ECO
Ground and Surface water	Water and land pollution Possible contamination by fuel, oil and chemical spillages	<ul style="list-style-type: none"> <li>- Proper containment structures should be constructed to avoid any possible leachate and leakages.</li> <li>- All accidental surface spills of oil or fuel must be</li> </ul>	No pollution on ground or surface water	ECO

Aspect	Impact	Mitigation	Performance Indicator	Responsibility
		contained on-site and diverted to the oil/water separator - Vehicles must be serviced regularly to avoid oil spillages; - Areas to store any hazardous material must be 150% bunded.		
Safety and security	Health of the employees and workers around the proposed site	- All employees on-site must be trained in the implementation of effective Health and Safety policies; - The First Aid Team must be competent and equipped with adequate equipment should a health and safety incident occur; - Personnel must be trained and their duties understood; - Ensure that fire-fighting equipment is readily available and accessible and functioning; - Ensure that all staff are trained in case of emergency such as on-site fire or explosion; - Employees to wear protective clothing when dealing with waste to be incinerated;	No complains from the neighbours regarding health effects  No injuries	CoW

Aspect	Impact	Mitigation	Performance Indicator	Responsibility
		<ul style="list-style-type: none"> <li>- A system must be devised to record any incidents and/or accidents.</li> </ul>		
<p>Pollution due to hazard substances</p>	<ul style="list-style-type: none"> <li>- Spillages of hazardous substances</li> <li>- Effect on human health</li> </ul>	<ul style="list-style-type: none"> <li>- Have a designated crossing defined on the main road so that motorists are aware that they may need to stop to facilitate the movement of waste across the road. Designate times when traffic flow is low to move waste across the road if possible, to reduce the possibilities of accidents;</li> <li>- If waste is likely to be moved when it is dark, the carts should have fluorescent markings for easy identification at night. They should also be marked with the internationally recognised symbol for hazardous/infectious waste;</li> <li>- Use an enclosed leak and puncture proof cart to transport waste across the road. Carts must be regularly inspected to ensure there are no defects which can cause leakage of the contents or spills;</li> <li>- The Emergency Response Plan will address potential spills and workers will be trained on the actions that are to be taken if such an event were to</li> </ul>	<p>No spillages of hazardous substances</p>	<p>Safety officer, CoW</p>





Aspect	Impact	Mitigation	Performance Indicator	Responsibility
		<p>occur;</p> <ul style="list-style-type: none"> <li>- All washdown from inside the incinerator building will be directed to a sump equipped with an oil/water separator to trap and filter oil from wastewater before it is discharged to the drains;</li> <li>- Workers handling waste for incineration and operating the incinerator must be attired in protective gear to prevent contact with infectious waste or burns associated with incineration.</li> <li>- The storage of oils, materials, chemicals, fuels, etc. to be used during the construction phase must not pose a risk to the surrounding environment. Such storage areas must be located out of the 1:100 year flood line of any river and unauthorised access to these areas must be controlled;</li> <li>- Arrangements for the proper disposal of the waste oil collected in the oil/water separator will be made.</li> </ul>		
Waste generation	<ul style="list-style-type: none"> <li>- Soil contamination</li> <li>- Impact on water quality</li> </ul>	<ul style="list-style-type: none"> <li>- General waste is to be collected either by the Municipality or via a waste disposal contractor;</li> <li>- The contractor should provide an adequate number</li> </ul>		ECO, CoW



Aspect	Impact	Mitigation	Performance Indicator	Responsibility
	<ul style="list-style-type: none"> <li>- Effect on human health</li> </ul>	<ul style="list-style-type: none"> <li>- of waste receptacles for general waste at points around the construction site, and a single collection point for hazardous waste hazardous waste must be disposed off at Kupferberg hazardous waste cell;</li> <li>- Litter and waste that is generated to be adequately stored and disposed of in an approved manner;</li> <li>- Good house-keeping should be maintained.</li> </ul>		
Ash dump	<ul style="list-style-type: none"> <li>- Effects on human health.</li> <li>- Pollution to water (surface and ground water)</li> </ul>	<ul style="list-style-type: none"> <li>- Segregate waste to ensure that materials which contain heavy metals are excluded from the waste stream as far as possible;</li> <li>- Workers removing ash from the incinerator must be attired in protective gear to prevent inhalation of the fine particles and skin contact;</li> <li>- Bottom ash and fly ash must be containerized in a leak proof container and sent to Kupfberg landfil site for disposal. Special arrangement should be made with the landfil Management for receiving this waste due to the special handling required.</li> </ul>		CoW



## 7. Environmental Monitoring Plan

Environmental monitoring plan is part of the EMP performance assessment and will need to be compiled and submitted as determined by the Environmental Commissioner. The process of monitoring performances against the objectives and documenting all environmental activities is part of internal and external auditing. This will be coordinated by the Environmental Control Officer (ECO) / External Consultant / Suitable qualified in-house resource person. Tables 3 and 4 outline the type of information that shall need to be recorded on a regular basis by the Environmental Control Officer (ECO) as part of the monitoring process of the activities and the effects.

**Table 3: Monitoring of environmental awareness training.**

Mitigation	Compliance	Follow-up action required	By whom	By When	Completed
Is there an Environmental awareness training programme?					
How many people have been given environmental awareness training?					
Is a copy of the EMP on site?					
How effective is the awareness training? Do people understand the contents of the EMP? Where are the weaknesses? Ask 3 people at random various questions about the EMP.					



## 7.1. Monitoring Reporting Implementation

The City of Windhoek through the project manager is wholly responsible for environmental monitoring reports. The monitoring reporting requirements shall be implemented or achieved during construction and operation phases. The EMP outlines a large number of management actions to be implemented and the environmental performances that must be reported. The Environmental Control Officer will maintain a written record of the implementation of these actions. If for any reason these actions and monitoring requirements are not implemented or achieved, the Environmental Control Officer must inform the Project Manager. During construction, if the community has an environmentally related complaint against proposed tourism activities or ongoing tourism activities, they shall have the opportunity to inform the Environmental Control Officer, who will maintain a record of such complaints.

**Table 4: Example of details contained in a monitoring report**

Name of project:	Date:
ECO:	Contractor:
Report number:	
Introduction	
Summary of activities and progress	
Construction area visited:	
Nature of non-compliance:	Recommended actions:
Relevant section of EMP:	Outstanding issues of non-compliance:
Conclusion	