

UPDATED
ENVIRONMENTAL MANAGEMENT PLAN
(EMP) FOR THE OPERATION AND
MANAGEMENT OF THE EXISTING UIS
SOLID WASTE DISPOSAL SITE



Prepared for



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October 2022

DOCUMENT DESCRIPTION

PROJECT NAME OPERATION AND MANAGEMENT OF THE EXISTING UIS
SOLID WASTE DISPOSAL SITE

DOCUMENT TYPE ENVIRONMENTAL MANAGEMENT PLAN (EMP)

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Updated: October 2022

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LIST OF ACRONYMS

DEA	Directorate of Environmental Affairs
DRP	Decommissioning and Rehabilitation and Plan
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GPS	Global Positioning System
MAWF	Ministry of Agriculture Water and Forestry
MEFT	Ministry of Environment, Forestry and Tourism
MoHSS	Ministry of Health and Social Service
MURD	Ministry of Urban and Rural Development
PCWMP	Pollution Control and Waste Management Policy

1. INTRODUCTION AND BACKGROUND

1.1 Introduction

The Erongo Regional Council as a sub-national government commits to deliver prompt quality and accessible services for the community upliftment through good governance for sustainable socio-economic development. The council is committed toward waste management within its jurisdiction through establishment and formalization of waste disposal sites within its jurisdictions.

In accordance with the Environmental Management Act (EMA No. 07 of 2007) and its Regulations (GN No.03 of 2012), all waste management, treatment, handling, and disposal activities cannot take place without an Environmental Impact Assessment (EIA) being carried out and Environmental Clearance Certificate being obtained.

As such, the Erongo Regional Council (ERC) has appointed Green Gain Consultants cc to apply for the renewal of the Environmental Clearance Certificate for the operation and management of the existing waste disposal site (dumpsite) in Uis. This report constitutes an updated Environmental Management Plan (EMP). The EMP synthesises all the proposed mitigation and monitoring measures, laid out according to the various stages of the project life cycle, with clearly defined follow-up actions and specific assigned responsibilities. It provides a link between the impacts identified in the EIA process and the required environmental management on the ground during the project implementation and operations. It is important to note that an EMP is a legally binding document and has been drafted in accordance with the Environmental Management Act (No. 7 of 2007) and its Environmental Impact Assessment Regulations (2012).

1.2 Objectives of the EMP

The EMP has the following objectives:

- To provide information on the potential negative impacts associated with the project and present mitigations measures for these impacts
- To provide guidelines for the management and monitoring of the identified environmental issues.
- To provide guidelines to the responsible persons to follow appropriate contingency plans in the case of various possible impacts.

2. RESPONSIBILITIES

It is the core responsibility of the ERC to ensure the successful implementation of this EMP and any condition to be imposed by the Ministry of Environment, Forestry and Tourism (MEFT). However, the implementation of this EMP also requires the involvement of various role players, each with specific responsibilities to ensure that the project is operated in an environmentally sensible manner.

2.1 The Developer: ERC/Uis Settlement Office

Responsibilities

- a). Implement the final EMP after approval by DEA and ensure the project comply with the EMP and conditions therein.
- b). Provide Environmental training and awareness on the EMP to all contractors, sub-contractors and employees involved in the management of the Solid Waste disposal site.
- c). Notify MEFT and EAP of any proposed changes to the Solid Waste disposal site and its surrounding.
- d). Appoint the responsible official/s to take the responsibility of the following;
 - Daily inspections and regular monitoring and review of the on-site environmental management and implementation of the EMP by the maintenance team or Contractor and sub-contractors.
 - Overall maintenance and control of the site
 - Audit the implementation of the EMP on a monthly basis
 - Keep environmental records, Compile and submit Environmental Reports to the Authority every after three (3) years for the renewal of the Environmental Clearance Certificate.
- e). The above responsibilities could be shared among different officials as per their respective job descriptions. However the overall responsibilities should lie with the line Manager.
- f). In the absence of this appointment, the proponent (ERC) shall collectively take responsibility.
- g). if deemed necessary, the ERC can appoint an external consultant to act as the Environmental Control Officer (ECO) to carry out the duties as described below.

2.2 Environmental Control Officer

The ERC may appoint an ECO to oversee the implementation of the EMP during site establishment, operation and possible decommissioning project phase. The ECO can be an employee of the proponent or an outside/independent EAP. The ECO should be responsible for the following tasks.

- Ensure that all contractor and sub-contractors are complying with the content of this EMP.
- Keep record of incidences during and take corrective actions i.e., issuing of penalties in case of transgressions etc. during project implementation.
- That all environmental impacts are managed according to the environmental principles of avoiding, minimizing, mitigating, and rehabilitation as contained in this EMP.
- Conduct monitoring and review of the on-site environmental management and implementation of the EMP by the Contractor and sub-contractors.
- Audit the implementation of the EMP on a regular basis
- Compile and submit an Environmental Reports (biannually) to the Authority

2.3 Erongo Regional Council

The ERC head office must play a pivotal and supervisory role toward the implementation of this EMP by ensuring the followings;

- Providing resources (financial, human, machinery and equipment) to the settlement office to carryout various solid waste management activities
- Provide Environmental training and awareness on the EMP to all contractors, sub-contractors and employees involved in the management of the Solid Waste disposal site. Environmental awareness training takes place in the language of the employees.
- Audit the implementation of the EMP on a monthly basis
- Ensure the review/update of this EMP as required and renewal of the ECC

2.4 The Contractor and Sub-contractors

It is expected that various contractors and sub-contractors will be appointed at various times and for various tasks throughout the life cycle of this project. All appointed contractors shall ensure to comply with the EMP and its conditions. The Regional Council must ensure that a copy of the EMP is given to all contractors before commencement of any work at the project. The contractor upon receiving this EMP should ensure;

- To undertake their activities in an environmentally sensible manner and within the context of this EMP
- To undertake good housekeeping practices during duration of the activities
- To ensure that adequate environmental awareness training takes place in the language of the employees.

2.5 Authorities

Different Government Ministries should provide supervisory and monitoring roles in order to ensure compliance of their respective regulations and laws by renewal or enforcement of respective laws. Of relevance to this project are; the Ministry of Urban Rural Development, Ministry of Health and Social Services, Ministry of Environment and Tourism.

- Ministry of Urban and Rural Development: being the line ministry under which all Local Authorities falls, MURD should avail or provide approval thereof for adequate funding and resources to allow the Municipality to carry out the necessary mitigation measures so as to reduce serious environmental and public health risks associated with the operation of the solid waste disposal site.
- Ministry of Health and Social Services should provide monitoring on the general public health and safety issues in town in consultation with the municipal Environmental Health official. Moreover, MoHSS is responsible for all medical waste as per the PCWMP.
- Ministry of Environment, Forestry and Tourism should conduct an Environmental compliance monitoring should any instances of non-compliance be found, this must be brought to the attention of the site foreman, along with recommended measures for rectifying the non-compliance.

3. LEGAL FRAMEWORK

There exist a number of international, national legislations which provides a broad range of principles related to pollution control and waste management. Some of these legislations are as follow;

Table 1: Applicable legislations

LEGISLATION	PROVISION AND REQUIREMENTS
1. Legislation of national importance	
Regional Councils Act, No. 22 of 1992 as amended	<p>An Act to establish regional councils in respect of regions determined in accordance with Article 103 of the Namibian Constitution; to provide for the election by regional councils of members of the National Council; and to define the rights, powers, duties and functions of such regional councils; and to provide for incidental matters.</p> <p>In addition to the powers conferred upon a regional council by Article 108 of the Namibian Constitution it shall, among other things, undertake planning functions and establish, manage and control settlement areas. Communal assets of a settlement area shall vest in the regional council who declared the area.</p>
Pollution Control and Waste Management Policy, 2003	<p>This policy serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management procedure.</p> <p>The bill provide framework for a multitude administration on pollution control and waste management in the country. Each authority identified by the bill shall play its respective roles.</p>
Environmental Management Act, No.07 of 2007	<p>Ensuring that the significant effects of activities on the environment are considered carefully and in time. To promote the sustainable management of the environment and the use of natural resources by establishing principles for decision making on matters affecting the environment.</p> <p>An ECC is required for this project and any changes to the current project should be subjected to an EIA and thus amendments to the EMP should be made. In this case of decommissioning, it should be done in accordance with the EMA and thus an EIA for the new dumpsite shall be undertaken. The ECC for this project should also be renewed every after three years.</p>
Public Health and Environmental Act, 2015	<p>The objectives of the PHE Act are to;</p> <ul style="list-style-type: none"> • Promote public health and wellbeing • Prevent injuries, diseases and disabilities • Protect individuals and communities from public health risks • Encourage community participation in order to create a healthy environment • Provide for early detection of diseases and public health risks <p>Section 2 requires that a). “Every local authority must take necessary reasonably and applicably measures to maintain its local authority area at all times in a hygienic and clean condition” b). Prevent occurrence of a health nuisance,</p>

	unhygienic condition, an offensive condition or any condition which could be harmful or dangerous to the health of a person within its local authority or the local authority area of another local authority”
Atmospheric Pollution Prevention Ordinance, no. 11 of 1976	<p>To provide for the prevention of the pollution of the atmosphere, and for matters incidental thereto. The Ordinance deals with administrative appointments and their functions; the control of noxious or offensive gases; atmospheric pollution by smoke, dust control, motor vehicle emissions; and general provisions.</p> <p>According to the Ordinance, the ERC shall control and prevent atmospheric air pollution or emission of noxious or offensive gases by smoke.</p>
Hazardous Substances Ordinance 14 of 1974	<p>This Ordinance provides for the control of toxic substance and thus also relevant for pollution control. It covers for the manufacturing, sale, use, disposal, dumping, importing and exporting of hazardous waste.</p> <p>ERC shall control the manufacturing, used or disposal of hazardous waste as per this Ordinance</p>
The Soil Conservation Act No.76 of 1969	This Act is provides for the prevention and combating soil erosion, the conservation, improvement and manner of use of the soil and vegetation and the protection of water sources,
2. Relevant Legislations of international importance (Conventions)	
Basel and Rotterdam Convention, Framework Convention on Climate Change	Agreed to ensure environmentally sound management of hazardous waste and other wastes through the reduction of their movements, for the purpose of reducing their impacts on human health and environment.
Stockholm Convention on Persistent Organic Pollutants	Agreed on a list of Hazardous Chemicals that require an EA/EMP, waste minimization (reduction), reclamation and recycling strategy
3. Other related Legislations	
Labour Act (No 11 of 2007)	<p>To establish a comprehensive labour law for all employers and employees; to entrench fundamental labour rights and protections. Regulate basic terms and conditions of employment; ensure the health, safety and welfare of employees; to protect employees from unfair labour practices; to regulate the registration of trade unions and employers’ organisations; to regulate collective labour relations; to provide or the systematic prevention and resolution of labour disputes;</p> <p>Any employment provided whether by the Municipality or by contractor at this site i.e. Security Services must be in accordance with the Labour Act.</p>

4. ENVIRONMENTAL MANAGEMENT REQUIREMENTS

4.1 Environmental awareness training

All contractors and employees involved management or any work at the project should be briefed on their obligation towards environmental protection and methodologies in terms of the EMP prior to work commencing. The briefing should be done by the ERC or any ECO in the form of an onsite talk.

4.2 Record keeping

There should be an up to date filing system for the project whereby method statements, environmental incidents report, training records, audit reports and public complaints register are kept. It is advised that photographs of the site should be taken as a visual reference.

4.3 Non-compliance and penalties

In cases of transgressions and non-compliance to the EMP by the contractor, that contractor should be liable to a penalty fine (as per Engineering Standards or as applicable to the Municipality). Transgressions should be recorded in a dedicated register, and be filed. The official designated by the Municipality shall issue the penalties in terms of the severity on the environment.

Adherence to this EMP during operation of the project will ensure that the environmental impacts associated with the project will be mitigated to a greater extent thus promoting sustainable development. The commitment and co-operation of the identified responsible person(s) will ensure effective implementation of the EMP; therefore it is imperative that there is file dedicated for Environmental Documentation.

4.4 Environmental Reports (annually)

The Municipality should appoint a responsible person who among others should be responsible for conducting regular monitor of general operation of the ponds. This monitoring report should then be compiled into annually reports. These reports should be submitted to the competent Authority (MEFT) for the renewal of the Environmental Clearance Certificate.

5. PROJECT DESCRIPTION

5.1 Site location

The existing Uis solid waste disposal site is located south-east of town, about 2km from the existing residential area on the following GPS coordinate (26.34' 58.62"S, 18.9' 58.68"E).

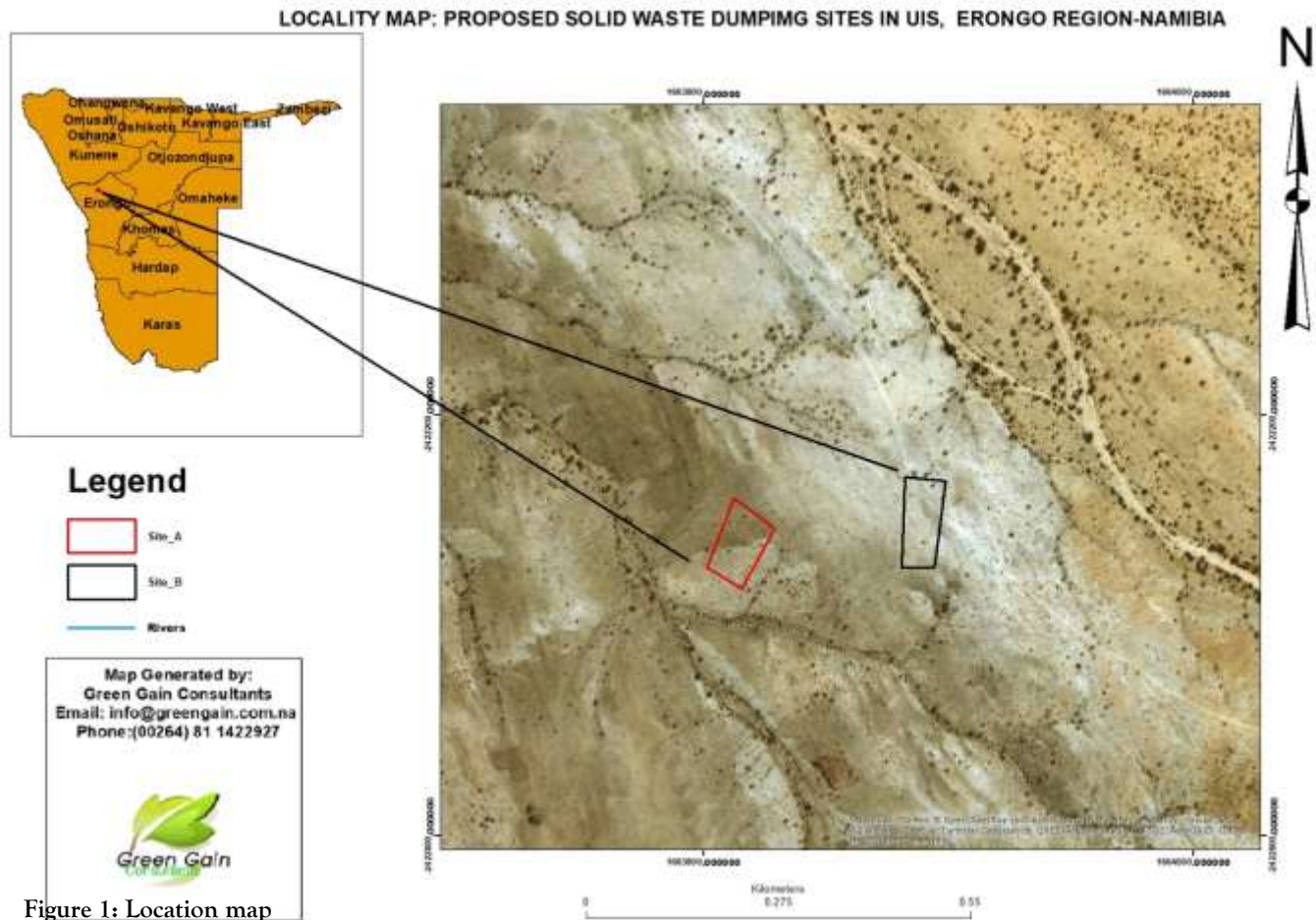


Figure 1: Location map

5.3 About the Town

Uis settlement has approximately 3,600 inhabitants and with re-opening of Uis Tin Mine in the process, which expected to direct and indirect create more employment opportunities, there expected to be a high influx of people to Uis. By 2020 it is expected that Uis population would increase to more than 5000 inhabitants (Uis, 2018).



Uis has about 490 houses made of three towns –Downtown (Imcor Township), Middle Town (Oudorp), and Upper Town (Location). There is also an informal Settlement (Tatamutsi Informal Settlement) with about 71 informal structures (corrugated iron houses). Despite high unemployment, housing is a big challenge in Uis and the situation is expected to improve soon especially if the mine start with operations.

Uis is home to the Brandberg Primary School and Petrus !Ganeb Secondary School, both for about 300 learners. There are few Government Institutions and parastatal such as Erongo Red and Namwater which employed a number Uis residents.

Being also situated on the C36, the main road between the coast and the Damaraland interior there is reasonable amount of traffic. The settlement holds a small supermarket, guesthouses, a bakery and a petrol station, together with a few other small shops and a brick factory which are the main sources of livelihood for the majority population of Uis Settlement.

5.4 Waste Management

5.4.1 Waste generation, collection and transportation

The Settlement Office is responsible for solid waste management activities in the town. These includes collection, transportation and disposal of different kinds of solid waste. Collection is done Monday to Friday every week as follow;

Table 2: Waste collection schedule and statistic in Uis

Location	Schedule	Amount of waste per Week	Total Month waste collected
Upper-town	Once (Thursday)	2trucks loads (6tons)	24tons
Downtown and Middle town	Twice (Wednesday, Tuesday)	1truck loads (3tons)	12tons
Businesses and Institutions	Mondays and Fridays	2trucks loads (6tons)	24tons
Own disposal	Daily	1tons	4tons
Total collected			64tons

Houses and business are allocated with refuse bins while the Upper Town are served with few container skip containers in which have to be rotated or moved around from places to places for people to throw in rubbles or rubbish which cannot be put in household refuse bins. The containers are emptied once full. The Settlement office planning to acquire more of these types of containers. The Ministry of Health and Social Services is responsible for healthcare and general waste originating from the clinic. General waste is disposed at the town disposal site while the healthcare waste is taken to the Omaruru district hospital for incineration.

Challenges faced by the town in terms of solid waste management includes insufficient collections bins and skips, misuse or improper use of available skips, illegal dumping in streets, unauthorised scavenging and burning of waste at the disposal site, lack of education and awareness on the solid waste management just to mention a few.

5.4.2 Waste disposal: current situation

The new site is enclosed in a barbed wire mesh fence with lockable gates. However, no security measures is enforced on site at the moment. The site is divided into different cells marked with signs for different types of waste. However, due to the lack of presence of security onsite, waste is dumped indiscriminatory regardless of the nature or types of waste.



Figure 2: Current situation

5.5 Biophysical environment of the site

Climate: The climate in Uis is referred to as “Pro-Namib’ which is the transition zone to the more mesic climate of central Namibia.

Average Rainfall: the average rainfall is 300 mm.

Temperature: Very hot temperatures can occur in the inland areas during the day, cooling at night is due to outgoing solar radiation under typically clear skies.

Wind Directions: includes prominent southerly and south-westerly winds during the summer, and north-easterly winds in the winter

Uis is located at the foot of the Brandberg, Namibia's highest mountain. The topography of Uis is consisting of different features such as mountainous savannah, hilltops, valleys/watercourse and open shrub and grassland. The proposed sites lies between 1000m-1500m above the sea level. Both site have a very flat surface and located far away from mountains and watercourse, however they are surrounded by some rocky outcrops.

The local occurring soil in Uis is mainly Regsoils with the hard rock terrain on the underlying. The surface geology is mainly of Swakop and Nosib Groups of the Damara Sequence. These soils have a moderately rapid to rapid infiltration rate and a high internal drainage

The area surrounding the new Uis dumpsite is a communal area which is predominantly used for small scale agriculture, mainly small stock farming. Further, the area of Uis is known to be rich in mineral resources such as Tin, industrial minerals, dimension stones, as result the area is surrounded by Mining Claims, EPLs and Mining Licences. There are also a number of small-scale minors exploring precious stones for local markets.

According to the national hydrogeological map, Uis area is located in the Omaruru River Basin. The Omaruru River is about 13 100km² and lies about 2080m above the sea level. The Omaruru River supports a diverse blend of agricultural activities, urban and rural settlements, vegetation and wildlife, about 98% of the catchment is defined as agricultural and 2% as recreational. Groundwater recharge is normally from rainfall and runoff seeping into the aquifer.

6. MANAGEMENT AND MITIGATION MEASURES

This section provide general operation and maintenance plan as well as mitigation measures during the Operation and Decommissioning phase of the existing solid waste dumpsite. It is the responsibility of the Municipality to ensure that all parties involved perform their respective roles in accordance with this EMP.

6.1 General Operation and Maintenance Plan for the dumpsite

As noted in the previous sections, there some of limitations that affects operation of the dumpsite. The following issues need to be addressed to ensure proper control and management of the dumpsite in order to reduce negative impacts and optimize the benefits.

6.1.1 Gates and Access control

The dumpsite must be provided with a lockable gates and a temporary guardhouse at the entrance to facilitate access control of vehicles and people and to allow for the directing of vehicles to the appropriate disposal units. There must be at least a guard on daily basis to control access. The gate should be made in such a way that it enable the gate guard to inspect the loads inside certain vehicles if deemed necessary.

6.1.2 Information Notice Board

An information notice board which displays information to the clients regarding the various operations and hours, details of operators, contact numbers, etc. should be provided at the entrance of the site. **Only general municipal waste such as; household, garden refuse, building rubble, some industrial i.e. tires, scraps, wrecks must be allowed. Infectious waste and Hazardous i.e. oil must NOT be allowed at the dumpsite.**

6.1.3 Waste Disposal Control

The municipality must appoint responsible officials at the dumpsite to direct and control disposal of waste. If possible, it is advisable that different types of waste should be discarded at different sections. This will make it easy for those that want to recycle certain types of waste. All wind-blow waste must be covered with other heavy waste i.e. building rubble to prevent being flown away into the surrounding thereby polluting the area. Organic waste must be buried to avoid infestation of flies. All expired food must be discarded as soon as possible in the presence of the Municipal Environmental Health Officer or authorized officials. The control of waste disposal will not only make it easy for recycling of waste but also to avoid other environmental and public health risks but also help extending its life span.

6.2 Proposed mitigation measures during operation phase

In addition to the general operation plan described above, the following mitigation measures must be enforced to prevent, avoid and lessened negative environmental and public health risks that are associated with the operation of the dumpsite

Table 3: Proposed mitigation measures during the operation phase

RISK	OBJECTIVE	RECOMMENDED MITIGATION MEASURES	RESPONSIBILITY
1. General Waste Management			
1.1 littering: wind-blown waste can easily pollute the surrounding area.	Reduce pollution	<ul style="list-style-type: none"> All wind-blown litters must be covered with other heavy waste i.e. building rubble to prevent it from being blown away. Maintain the fence to contain windblown litters Encourage recycling of papers, plastics to reduce amount going to the dumpsite Assign a team to collect all wind-blown waste on regular basis Clean-up campaigns encourage residents to take part in the collection of waste in public open spaces. 	Health inspector, Line Manager
1.2 Danger of expired food -Expired food in the dumpsite attracts residents especially scavengers such as kids. This pose serious public health risks.	Ensure Public safety	<ul style="list-style-type: none"> All expired food items must be condemned at the disposal site as soon as possible. This should be done in the presence of the Health Inspector. No expired food must be condemned in the absence of the municipal official, if such official is not available on sit, any other authorized qualified municipal official must assist. 	Health Inspector
1.3 Unauthorized dumping i.e. dumping at unauthorized sites, dumping of hazardous waste etc. can lead to serious public health.	Proper use of the dumpsite	<ul style="list-style-type: none"> Create public awareness through campaign, meetings, etc. Install an Information Notice Board at the dumpsite entrance depicting all rules and regulations to the users. Enforce penalties for illegal dumping and non-compliance. 	Line Manager
1.4 Risks of fire from burning of waste which could spread to nearby residents or vegetation.	Ensure public safety	<ul style="list-style-type: none"> Do not leave fire unattended Avoid burning on windy day Do not burn waste on an elevated site and avoid site with vegetation cover 	Health Inspector
1.4 Dust and fumes from vehicle and plants may generate noise, dust,	Avoid nuisance	<ul style="list-style-type: none"> Avoid operating when its windy Implement dust suppression procedures Do not operate to many heavy implements at once to reduce noise 	Line manager

<p>favorable conditions for survival and growth of microbial pathogen.</p> <p>2.3 Diseases transmission</p> <p>-Unattended wastes lying around attract flies, rats, and other animals that in return spread diseases.</p> <p>-Dumpsites closer to residential areas are always feeding places for dogs and cats. These pets, together with rodents, carry diseases to nearby homesteads.</p> <p>2.3 Contamination and infections</p> <p>-The dumpsite area may become children's sources of contamination due to the incubation and proliferation of flies, mosquitoes, and rodents.</p> <p>-Due to poor waste segregation, some medical waste maybe found mixed up with domestic waste and end up at the dumpsite. This pose a serious risk of infection with Hepatitis B, HIV, and other related diseases.</p>	<p>Avoid transmission of diseases associated with solid waste management</p>	<ul style="list-style-type: none"> • As above • Ensure proper maintenance of fence • All organic waste that could attract pets must be discarded • No unauthorized scavengers • Ensure access control • Ensure waste proper segregation at hospitals • Training of Waste collection team especially those collecting waste from health centres • Hospital and other health centres employees must also be well informed about segregation of waste domestic and medical waste. • All coloured plastics must be burned • Discourage use and/or recycle of plastic in town through campaigns and awareness 	<p>Health Inspector</p> <p>Health Inspector</p> <p>Gate guard/Health Inspector</p> <p>EHP-MoHSS, Health Inspector</p> <p>Health Inspector</p>
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<p>-Colored plastics are harmful as their pigment contains heavy metals that are highly toxic.</p> <p>2.4 Occupational Health risks</p> <p>-Direct handling of solid waste can result in various types of infectious and chronic diseases with the waste workers and rag pickers being the most vulnerable. These include: skin or blood, eye and respiratory and intestinal infections as well as cancer resulting from exposure to dust or hazardous compounds.</p> <p>-Direct exposure to municipal waste can lead to diseases through chemical exposure as the release of chemical waste into the environment leads to chemical poisoning and radioactive hazard. Many studies have established that there is a strong connection between exposure to waste and diseases.</p> <p>-Employees/workers can also be at risk of injuries from sharp objects at the dumpsite if they are not properly protected.</p> <p>-Employees are also at risk of accidents during waste handling, i.e. muscle disorders from lifting heavy containers, infectious wounds from contact with sharp objects or poisoning and chemical</p>	<p>Ensure safe working environment</p>	<ul style="list-style-type: none"> • All employees must receive training in line with their respective duties • Employees must be provided with Personal Protective Clothing/Equipment. 	<p>Line Manager</p>
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burns from chemical waste mixed with general waste.			
3. Soil contamination			
3.1 Contamination of soil with heavy metals from tins, cans etc.	Prevent soil contamination	<ul style="list-style-type: none"> Encourage recycling of tins, cans Avoid burying waste that contains lead i.e. tins, cans scrap metals 	Health Inspector
3.2 Oil leakage from vehicle, machinery could contaminate the soil	Prevent soil contamination	<ul style="list-style-type: none"> Clean up the contaminated soil Ensure proper and frequent servicing of vehicle an plant 	Health Inspector
3.3 Soil erosion from disturbed areas during waste disposal	Soil conservation	<ul style="list-style-type: none"> Do not extract soil from slope areas Provide erosion barrier to prevent soil form carrying away 	Health Inspector
4. Groundwater and Freshwater contamination			
4.1 Unlined dumping hole may pose serious risks of groundwater contamination by leachate.	Prevent groundwater contamination	<ul style="list-style-type: none"> No hazardous waste allowed Waste containing heavy metals may not be buried, unless a linear system is provided No burying of waste next to storm water course 	Health Inspector , Line Manager
4.2 Contamination of nearby watercourse	Prevent contamination of freshwater	<ul style="list-style-type: none"> Avoid major drainage lines when burying or disposing waste Storm water that is mixed with waste must be contained Storm water must be re-directed away from the waste heaps. 	Health Inspector
5. Operational Management and Maintenance			
5.1 Inadequate management if site operator is ill / on leave or resigns	Ensure effective and efficient management of the plant	<ul style="list-style-type: none"> At least two site operators must be fully trained in the operation of the site, so that one can stand in for the other in case of illness, leave, etc. 	Line Manager
5.2 Lack of skills on the part of the plant operator	Ensure effective and efficient management of the plant	<ul style="list-style-type: none"> The existing system requires only a moderate level of skill and technical expertise, which lowers the risk of malfunction due to lack of highly trained staff. Drivers and site Operators must be appropriate skilled and experienced for the task at hand Site operator/s must receive continuous training in all aspects of daily management of the plant (technical or administrative) Technical support must be available to the sewage plant operator 	Line Manager
5.3 Lack of proper and timely maintenance of vehicles, plant,	Ensure smooth operation	<ul style="list-style-type: none"> The fence and other site structures must be maintained regularly by replacing key components 	Site foreman

structures may compromise the functionality of the site		<ul style="list-style-type: none"> A maintenance plan must be in place to ensure that planning, such as budget allocation or procurement of service providers, can be put into motion sufficiently ahead of time. 	
5.4 Document control and access to information	Readily available of records and information about the site	<ul style="list-style-type: none"> Site foreman/Operator must ensure that all reports are available onsite and easily accessible 	Site foreman
6. Legislation requirement			
6.1 Lack of compliance with relevant legislations may cause transgression or conflicts with the law	Operating within the requirements of the law	<ul style="list-style-type: none"> This EMP must be updated every three years, concurrent with the renewal of the ECC Any upgrading of the Solid Waste disposal site should be of the required standard as per waste management bill 	Line Manager

6.3 Management and mitigation measures: decommissioning phase

The estimated service life span for the existing Uis dumpsite is over twenty years of which the site will be decommissioned. During the decommissioning phase, several mitigation measures will have to be implemented through the process until rehabilitation of the site has been completed.

Decommissioning of the solid waste dumpsite would need to be conducted with great care and under supervision by a specialist in this field, as there numerous risks involved The decommissioning process should be done in consultation with the Ministry of Environment, Forestry and Tourism, Department of Environmental Affairs (DEA).

The Municipality must appoint an environmental consultant to advice on applicable legislation and appropriate measures for impact mitigation and management. Legislations that need to be complied with will include environmental and waste-related legislation, occupational health and safety legislation, and any other applicable legislation, by-laws and standards. If decommissioning is planned, a detailed Decommissioning and Rehabilitation Plan (DRP) must be compiled, taking into account the conditions on and around the site at that time, as well as applicable legislation.

7. ENVIRONMENTAL COMPLIENCE MONITORING

In order to ensure adherence to this EMP, it is advisable to keep monitoring of certain environmental elements. Compliance monitoring provides useful information for determining environmental performance for the duration of the project. This monitoring is ultimate responsibility of the proponent. Monitoring activities should be conducted by the qualified official at different interval/frequencies as indicated in the table below throughout the project life span. The monitoring report should be prepared and submitted to the Environmental Commissioner whenever required.

7.1 Monitoring

Table 4: Monitoring Schedule

Issue to be monitored	What need to be monitored	Monitoring frequency	By Who?	Report to Who?
<i>Leachate</i>	Generation liquid waste at the dumpsite	After rainy season	Health Inspector	Line Manager
<i>Infestation of insect and parasite</i>	Fly population, etc.	Weekly or regularly	Health Inspector	Line Manager
<i>Air quality</i>	Presence of smoke or dust particles in the air	Bi-monthly monitoring	Health Inspector	Line Manager
<i>General operation of the dumpsite</i>	Fences, gates, access, use	Daily	Site foreman	Line Manager
<i>Implementation of Mitigation measures</i>	Ensure total compliance to this EMP and adherence to the regulative measures	Annually	Line Manager	CEO

7.2 Site Environmental Monitoring Checklist

The following checklist should be used during the monitoring program. The checklist will enable the project to cope with new circumstances and/or requirements of community or the Authorities as they arise. The checklist should be filled in regularly as per monitoring schedule outlined in the table above. This is only an example, the Municipality shall prepare a detailed checklist outlining all environmental parameters which needs to be monitored as depicted in Table 4 above.

Table 5: Site Checklist (Example)

	<i>KEPT AT STANDARD LEVEL?</i>		<i>Comments</i>
	<i>YES</i>	<i>NO</i>	
<i>Leachate (any contamination of storm water with waste)</i>			
<i>Parasite infestation (population of fly at the dumpsite)</i>			
<i>Air quality (presence of smoke, thick particles in the air)</i>			

This information is true and correct to the best of my knowledge

Name of person inspecting site: _____

Signature: _____

Date of site inspection: _____

8. CONCLUSION AND RECOMMENDATIONS

It is concluded that the existing solid waste disposal can be implemented without posing any serious threats both to the public and environment, provided that operational plan and various mitigation measures outlined in this document are duly implemented. However, the site needs to be decommissioned once it reach its full capacity or when the proposed township extensions in the close proximity of the sites are fully established.

Upon approval by the authorities, this EMP shall be considered legally bidding and any deviation or transgression from this EMP is punishable by law as per the Environmental Management Act, No. 07 of 2007. The preparation of this EMP is based on the current information about the project, any upgrading or changes to the project shall trigger changes to this EMP. A copy of this EMP shall be kept by the Municipality or responsible person/department at all time. The Municipality should play a pivotal role in the implementation of this EMP as outlined in the report. The Municipality should therefore ensure effective monitoring of the implementation of this EMP and provide annual Environmental Report to the competent authority. Information from the monitoring process can be used to determine how effective mitigation plans might be in achieving objectives of the EMP. The Authority after reviewing the annual report will determine whether the corrective actions are adequate or any new actions or any modifications are required.

The validity of this EMP is indefinite until all required actions are implemented or the project has been decommissioned and the area has been rehabilitated to the satisfaction of the Ministry of Environment and Tourism. Moreover, the MEFT is mandated to conduct regular monitoring and inspections on this project. The Regional Council liable to provide regular (annually) reports on this project or as required by the authority.

To this end, it is recommended that; the Environmental Commissioner should consider issuing an Environmental Clearance Certificate to the Erongo Regional Council for the operation and maintenance of the existing Uis dumpsite.