RED-DUNE CONSULTING CC

Application No: APP-001303

ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED WASTE DISPOSAL SITE AT NEUDAMM EXPERIMENTAL FARM, KHOMAS REGION

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DOCUMENT INFORMATION

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APPLICATION NO:	**APP-001303**
PROJECT TITLE	Environmental Management Plan For The Proposed Waste Disposal Site At Neudamm Experimental Farm
CLIENT	University of Namibia
PROJECT CONSULTANT	Mr. Ipeinge Mundjulu
LOCATION	Neudamm Experimental Farm, Khomas Region

ACRONYMS

DEA	Department of Environmental Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Compliance Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act (No. 7 of 2007)
EMP	Environmental Management Plan
FANR	Faculty of Natural Resources
MET	Ministry of Environment and Tourism
PPE	Personal Protective Equipment
RD	Red-Dune Consulting CC
SM	Site Manager
UNAM	University of Namibia

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1. Overview

This environmental management plan (EMP) plan is developed following the environmental impact assessment (EIA) undertaken for the proposed waste disposal site at Neudamm experimental farm. A comprehensive description of the project is contained in the scoping report. The proposed mitigation measures are practical and were developed with high level of certainty.

2. Purpose of the EMP

This Environmental Management Plan (EMP) is a risk strategy that contains logical framework, monitoring programme, mitigation measures, and management control strategies to minimize environmental impacts. It further stipulates the roles and responsibility of persons involved in the project. These strategies are developed to reduce the levels of impacts for the projects.

3. Compliance to the EMP

This EMP is a legally binding document as given under the provisions of the Environmental Management Act, 2007 (Act No. 7 of 2007). UNAM and its contractors must adhere to the framework of this document.

4. Roles and Responsibilities

4.1. Proponent

The proponent (UNAM), shall take overall responsibility for proper implementation of the EMP. It remains the responsibility of the proponent to appoint key personnel for the implementation of the EMP such e.g. Site Manager and ensure that all employees and contractors are conversant with the EMP.

4.2. Site Manager

The Site Manager (SM) represents the proponent on site. He/she shall be responsible for daily activities in ensuring environmental protection. All communication with regard to the implementation of EMP must be channelled through the SM.

4.3. Employees

It shall be responsibility of employees to adhere to the provision of EMP. At all times when on site, employees are expected to ensure their safety by wearing personal protective equipment clothing, report worn out PPE and request for replacement.

4.4. Environmental Compliance Officer

Compliance to EMP is enforce by the Environmental Compliance Officer (ECO) or the environmental inspector as provided for under Environmental Management Act (No. 7 of 2007)

5. Disciplinary Action

This EMP is a legally binding document, non-compliance to the EMP is punishable in accordance to the provisions of EMA.

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6. Policy and legal framework

The project approval and operation shall be subject by the following national and international laws (Table 1).

Table 1. Policy and Legal framework governing the project

REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY
The Namibian Constitution	The State shall actively promote and maintain the welfare of the people by adopting policies aimed at … The maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future	Protection of the environment and biodiversity
Environmental Management Act No. 7 of 2007	This act aims to promote the sustainable management of the environment and the use of natural resources and to provides for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters	The acts provide a list of activities that may not be undertake without an environmental clearance certificate to prevent environmental damages
Draft Pollution Control and Waste Management Bill	This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management	To protect the Environment from possible hydrocarbons and oil leaks from the machinery and vehicles

REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY
Environmental Policy framework (1995)	This policy subjects all developments and project to environmental assessment and provides guideline for the Environmental Assessment.	Consideration of all possible impacts and incorporate them in the development stages
National Solid Waste Strategy	The strategy to control and manage solid waste in Namibia	Solid waste dumped at the site
Regulations Related to the Health and Safety of Employees at Work. Reg No. 156	Promotes the Safety and Health of employees at the work place	Employees subjected to noise and dust
Public Health Act No. 1 of 2015	To Protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.	Application of proper mitigation measure to prevent aesthetic pollution and water pollution
Medicines and Related substances control Act No. 13 of 2003	To provide for the establishment of a Namibia Medicines Regulatory Council; for the registration of medicines intended for human and for animal use; for the control of medicines and scheduled substances; and to provide for incidental matters.	The handling and management of animal medicines
Veterinary and Veterinary Para-Professions Act, 2013 (Act No. 1 of 2013),	To provide for the establishment, constitution, powers and functions of the Namibian Veterinary Council; to regulate the registration of persons practising veterinary professions and	The establishment and operation of School of Veterinary Medicine is guided by this act.

REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY
	veterinary para-professions; to specify the education and training and qualifications of persons practising such professions; to provide for control over the practising of veterinary professions and veterinary para-professions; to prohibit the practising of any such profession without being registered; to repeal the Veterinary and Para-Veterinary Professions Proclamation, 1984; and to provide for matters incidental thereto	
Labour Act No. 11 of 2007	This Act outlines the labour laws which encompass protection and safety of employees at work.	This project will require labour during its operational stage and decommissioning stage.
Water Act No, 54 of 1956	All water resources belong to the State. It prevents pollution and promotes the sustainable utilization of the resource	Prevention of discharging contaminated water at unauthorised places
Soil Conservation Act No. 76 of 1969	To promotes the conservation of soil, prevention of soil erosion	Uncontrolled movement of heavy vehicles and truck at areas surrounding the site may cause land degradation
Water Resource Management Act No.11 of 2011	The Act stipulates the prevention of both Surface and Ground water sources.	Possibility of surface and groundwater contamination.

REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY
National Heritage Act No.27 of 2004	The Act gives provision of the protection and conservation of places and objects with heritage significance.	There were no heritage features identified on site or within the close vicinity of the site.

7. The EMP table

The EMP is divided into three components; Physical Environment, Biological Environment, and Human Environment in accordance with the project phases. This is to ensure for easy implementation.

7.1. Construction Phase

7.1.1. Human environment

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Employment	To ensure that locals benefit from the employment opportunities to be created during construction.	1. Ensure that all general work is reserved for local people unless in circumstances where specialized skills are required. 2. Fair compensation and labour practises as per Namibian Labour Laws must be followed 3. All employees must go through an induction course for the provision of the EMP 4. Staff operating specialised equipment and heavy vehicle must be properly trained	• Employees record Labour unrest over unfair compensation • Induction minutes, reports and attendance registers	Site Manager

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
HIV/AIDS, Alcohol and Drug Abuse	To sensitise employees about the dangers of alcohol, drugs and HIV/AIDS	5. Provide awareness to the employees on dangers of HIV/AIDS, alcohol and drug abuse 6. Provide condoms on site	• Awareness meeting minutes	Site Manager
Health	To ensure good health and safety of the employees and public	1. Abide to the Occupational Health and Safety and Labour Act of Namibia and other statutory requirements such as International Labour Practise (Organization?) (ILO) 2. Train employees on the possible health hazards to avoid potential risks 3. Employees must NOT be exposed to noise levels above the required -85dB (A) limit over a period of 8 hours 4. Adhere to the Labour Act which stipulates that non-toxic human dust exposure levels may not exceed 5mg/m3 for respiratory dust and 15mg/m3 for total dust. 5. Supply clean drinking water to the site	• Training minutes • Complaints of health issues by employees • First aid kit available	Site Manager

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Safety	To ensure good health of the employees	1. Ensure that there is a first aid kit onsite 2. Provide appropriate Personal Protective Equipment (PPE) to each employee which includes helmets, overalls, safety shoes, safety glasses, gloves, earmuffs, etc 3. Ensure that every employee goes through an induction course about safety 4. Only qualified and licenced personnel must be allowed to operate machinery and vehicles 5. Adequate safety signs must be displayed on site	• PPE for all employees • Licensed personnel operation specialized equipment • Safety signs on site	Site Manager
Visual Impact	To prevent litter/waste scattered all over and preserve aesthetic value	1. Maintain good house keeping 2. Excavated heaps and construction material must be stored well 3. Trenches must be rehabilitated (backfilled and compacted)	• Scattered litter, visual inspection • Construction site levelled and compacted	Site Manager
Archaeology/ Heritage	Preserve Heritage	1. Employees must be trained on the possible finding of archaeological material in the area 2. Implement a chance find and steps to be	• Sighting reports of heritage resources/artefacts	Management or Site Manager

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Resources/ Artefacts		taken when archaeological material findings e.g. heritage rocks, paintings and drawings, human remains or artefacts are unearthed Stopping the activity immediately: i. Informing the operational manager/supervisor ii. Cordoned off the area with danger tape and manager to take appropriate pictures iii. Manager/supervisor must report the finding to the National Museum (+ 264 61 276 800) or the National Forensic Laboratory (+ 264 61 240 461).		
Traffic	To ensure coordinated movement of heavy vehicles	1. Trucks must be installed with a rotating headlight beam light 2. Trucks must maintain a low speed to prevent excessive dust and accidents 3. Install warming signs where necessary	• Visible warning signs	Site Manager

7.1.2. Bio-Physical Environment

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Impact on Flora	To ensure sustainable conservation of the vegetation. The area is encroached by one species of Acacia Mellifera shrubs.	1. It is advisable to clear shrubs within the 2000m2 where waste will be disposed 2. Other shrubs within the fenced area may act as wind breakers and may only be removed during expansion, 3. Shrubs outside the site must not be removed 4. Use exiting access roads	• Physical inspection	Site Manager
Impact on Fauna	To ensure protection of animals. There may be crawling animal in the area, such as snakes.	1. Do not kill animals if found on site (unless it is an eminent danger to human life)	• Records of animals killed	Site Manager
Land Degradation	To prevent soil erosion	1. Movement of construction vehicles must be confined within the site boundary and only use existing access road	• Physical inspection	Site Manager

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Land Pollution / Surface and Ground Water Pollution	To prevent water pollution	1. Fueling of heavy vehicles on site must be well coordinated at designated places 2. Stationary vehicles must be provided with drip tray to capture oil, lubricants and hydraulic fluid leakages 3. All vehicles and machinery must be well serviced to avoid leakages 4. Provide and train on oil spill emergency response 5. Servicing of vehicles and machinery must take place at designated sites	• Physical inspections	Site Manager
Oil Leakages	Manage fuels, oils and lubricants leakages from vehicles and machinery to prevent pollution	1. Ensure all vehicle are well serviced and leak inspections are done, 2. Provide drip trays to stationary vehicle 3. Servicing of vehicles must be done at an approved site; 4. Re-fuelling and oil / replacement must be done on approved sites,	• Physical verification and routine monitoring	Management or Site Manager

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Waste Generation	To ensure good housekeeping and prevent littering	1. Provide skip bins to collect construction waste and be disposed of at an approved disposal site 2. Provide mobile toilets at the site 3. Used oil, grease and lubricants cans must be collected in appropriate drums and disposed of at an approved site.	• Waste bins on site • Physical inspection	Site Manager
Air Pollution	To prevent / minimize all source of air pollution	1. Adhere to the minimum speed limit of 30 km/hour; 2. Do not excavate and/or offload sand during heavy winds; 3. Trucks carrying construction materials must be covered, 4. Sand stock piles must be covered or regularly water sprayed with water; 5. On site where soil is loosened by vehicle movement, apply dust a suppression method such as water spraying, 6. Cement and concrete must be mixed with concrete mixers and not manually in the open,	• Physical inspection	Site Manager

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
		7. Cement bags must be stored and disposed of properly and may not be shaken in the open		
Noise Impacts	To prevent noise pollution	1. Heavy vehicles must be well serviced 2. Switch off engine off vehicles when not in use 3. Drive at 30 km/h while on site	• Complaints from farm workers	Site Manager

7.2. Operational Phase

7.2.1. Human Environment

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Employment	To ensure that locals benefit from the employment opportunities.	1. The waste site will be managed by existing UNAM employees; hence it is not envisioned that new employment opportunities will be created. 2. If an employment opportunity is created during operational phase, mitigation measure applied during construction phase must be applied.	• Employee records	Site Manager
HIV/AIDS, Alcohol and Drug Abuse	To sensitise employees about the danger of alcohol, drugs and HIV/AIDS	1. UNAM must provide awareness to the employees on the danger of alcohol, HIV/AIDS and drug abuse 2. UNAM must provide condoms at designated places on the experimental farm	• Awareness meeting minutes	Site Manager
Health	To ensure good health and safety of the employees and public	1. Abide by the Occupational Health and Safety and Labour Act of Namibia and other statutory requirement such as International Labour Practise (ILO)	• Induction Minutes • Valid driver licenses for	Site Manager

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
		2. Ensure compaction of waste as soon as bad odours appears or decomposition is seen that may cause vermin and diseases, 3. Train employees on the possible health hazards to avoid potential risks 4. Provide appropriate Personal Protective Equipment (PPE) 5. DO NOT dispose HAZARDOUSE waste on site 6. The contractor must take hazardous waste to Windhoek's Kupferberg landfill	heavy vehicles • Complain of health issues by employees • PPE registers all employees	
Safety	To ensure safety for the employees	1. Ensure controlled waste burning to prevent veld fires 2. The site must be fenced off to prevent access from animals 3. Provide personnel with full protective clothing (PPE)	• Health complaints from employees • Training minutes	Site Manager

7.2.2. Bio-physical Environment

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Biodiversity	The operation of the waste disposal site will not have impact on the biological environment as the area within the site will be cleared.			
Surface water pollution	To prevent surface water pollution from run off	1. Construct a storm water to prevent run off water into the site	• Physical inspection of storm water wall	Site Manager
Ground water pollution	To prevent ground water pollution through percolation	1. The base layer must be compacted with 150mm course and fine silt to attain some level of impermeable	• Physical inspection of compacted base layer	Site Manager
Safety	To ensure safety for the employees	4. Ensure controlled waste burning to prevent veld fires 5. The site must be fenced off to prevent access from animals 6. Provide personnel with full protective clothing (PPE)	• Health complaints from employees • Training minutes	Site Manager

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Visual impact	To prevent litter / waste scattered all over and preserve aesthetic value	1. Encourage recycling of recyclable material, explore memorandum of understanding with recycling companies; 2. Only appropriated vehicles with mesh that prevent waste from being blown away can be used to transport waste to the site 3. Implement bi-monthly filling and compaction to prevent waste from being blown away; 4. Leave a buffer zone of shrubs to act as wind breakers and protect the site from wind 5. In the absence of compaction, burn the waste in an appropriate manner that does not risk fire outbreaks		

8. Closure / Decommissioning Plan

It is envisioned that the site will have a lifespan of more than 50 years. be decommissioned in the near future. Practically, a lot would change by the time UNAM intends to decommission the site. It is recommended that a comprehensive decommissioning plan be undertaken during that time.

8.1. Decommissioning procedures

The following decommissioning procedure are adopted from the guideline developed by M. Ryan in December 2009, for the closure of Non-Containment Municipal Solid Waste Landfill Sites. These guidelines are only applicable to class B&C land fill sites.

8.1.1. Site Clean up

The initial stage of the closure of the waste disposal site is the site clean-up. The site and the surrounding has to be cleaned in preparation for closure. During cleaning, the following must be undertaken;

i. Employees must be provided with adequate Personal Protective Equipment to ensure that they are safe from injuries such as broken glasses, sharp objects and from vermin and diseases.
ii. Material such as scrap metals and recyclable material should be removed for recycling purposes;
iii. All waste hanging to the fence and in the surrounding must be collected and placed in the waste disposal site;
iv. If hazardous waste is found (Oil cans, Veterinary Medicines), remove it for disposal at the Windhoek's Kupferberg hazardous land fill;

8.1.2. Site Grading and Compaction

The waste disposal site will be excavated to make a shallow cell for waste henceforth, grading is necessary to level the site. Therefore;

i. Scattered waste need to be collected and pushed in the middle of the cell and levelled;
ii. Use machinery such as bulldozer to compact waste;
iii. Shape and grade to achieve even ground level

8.1.3. Final Cover

The waste disposal site must to be covered with proper compacted material to prevent water infiltration. Therefore;

i. Use the overburden soil to cover the surface of the waste disposal. These material must be properly compacted to achieve some level of impermeable, especially when it rains;
ii. After compaction, the compacted material must be covered with top soil for at least 60cm to allow revegetation;
iii. If available, introduce grass seed for fast revegetation and to achieve soil stability, and prevention of wind erosion
iv. Ensure that the final cover must not yield surface ponding

8.1.4. Storm water control

To ensure that the site is protected from storm water;

i. Install an up-gradient on sides of the site for water diversion;
ii. Ensure the site sides are properly compacted for smooth running of storm water.

8.1.5. Location records

The site coordinates are contained in this document. This GPS information must be kept permanently. It is important to install beacon, or permanent markers on site boundaries as a future reminder.

8.1.6. Site Access after closure

As the saying goes “old habits dies hard”, there could people that may “dump” waste in the area after site closure therefore;

i. Stop access to the site permanently by ensuring roads, gates to the site are closed;
ii. Install signage at the turn to the site or gate entrance such as, STOP, DANGER, NO ENTRY, NO DUMPING and applicable fines if found dumping;
iii. Install a placard with information of the new waste disposal site

8.1.7. Summary of the site closure

After the approval of this closure plan, a summary of decommissioning and rehabilitation must be submitted to the approving authority (MET). Consequently, a joint inspection must be undertaken with MET official.

8.1.8. Site Monitoring

As mentioned above, this is a non-containment dumpsite where leachate is not seen or detected.

8.1.9. Future Use

In general, introduction of seed to ensure revegetation is recommended.

9. Conclusion and Recommendations

9.1. Conclusions

The proposed waste site shall cater for less than 50 people, with lessor people during holiday hence minimal waste production. Hazardous waste shall not be disposed of at the site. Leachate is not expected. It is estimated that the proposed lifespan for the new site will be over 60 years. With adequate implementation of this EMP, the site is not expected to pose threat to the environment.

9.2. Recommendations

This study recommends to the approving authority the followings;

- Issuance of the Environmental Clearance Certificate for the proposed site;
- UNAM undertake biannual environmental auditing to monitor the environmental performance in relation to the waste site;
- Adequate implementation of the mitigation measures / EMP.

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