

ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR THE OPERATION AND MAINTENANCE OF THE EXISTING OKAHAO OXIDATION PONDS



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CLIENT Okahao Town Council

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LIST OF ACRONYMS

DEA	Directorate of Environmental Affairs
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DWA	Directorate of Water Affairs
EAP	Environmental Assessment Policy
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance certificate
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
IAP	Interested and Affected Parties
MAWF	Ministry of Agriculture Water and Forestry
MET	Ministry of Environment and Tourism
MoHSS	Ministry of Health and Social Services
NAMPOL	Namibian Police
OTC	Okahao Town Council

1. INTRODUCTION AND BACKGROUND

1.1 Introduction

The Okahao Town Council was granted an Environmental Clearance Certificate (ECC) for the operation and maintenance of the existing wastewater oxidation ponds. The ECC was granted in 2017 and expired in 2020. This report constitutes to an updated EMP submitted for renewal of the ECC in line with the Environmental Management Act, 07 of 2002 and its Regulations of April 2012. It is the core responsibility of the Okahao Town Council to ensure the implementation and enforcement of this EMP and its requirements. Should there be any conflict between the EMP and project specifications, then terms herein shall be secondary. This EMP upon approval by the competent authority (MET/DEA) will be considered a legally bidding and any transgression is punishable by the law as prescribed in the EMA number.

1.2 Purpose 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 Okahao Town Council to ensure the successful implementation of this EMP and any condition to be imposed by DEA. The implementation of the EMP also requires the involvement of various role players, each with specific responsibilities to ensure that the development is completed in an environmentally sensitive manner.

2.1 The Developer: Okahao Town Council

Responsibilities

- a). Implement the final EMP after approval by DEA and ensure the project comply with the EMP and conditions therein.

- b). Provide for Environmental Training and awareness of the EMP to all contractors, sub-contractors and employees involved in the management of the oxidation ponds
- c). Notify MET and EAP of any proposed changes to the oxidation ponds and its surrounding
- d). appoint the responsible person within the Department: Planning, Technical Services and Environment to take the responsibility of the following;
 - Conduct monitoring and review of the on-site environmental management and implementation of the EMP by the Contractor and sub-contractors.
 - To audit the implementation of the EMP on a monthly basis
 - Compile and submit Environmental Reports (annually) to the Authority during the validity of the Environmental Clearance Certificate (3years)
 - In the absence of this appointment, the proponent (Okahao Town Council) shall collectively take responsibility.

2.2 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, thus the Okahao Town 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 sensitive manner and within the context of this EMP
- To undertake good housekeeping practices during the duration of the activities
- To ensure that adequate environmental awareness training takes place in the language of the employees.

2.3 Authorities: Government Ministries (MAWF, MoHSS, MET etc)

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 i.e. MAWF-Waste Disposal Permit, MET-review of annual reports and renewal of the ECC, MoHSS-enforce the Public and Environmental Health Act etc. Line ministries should also provide necessary assistance i.e. information, expertise or materials/equipment as case maybe for the implementation of this EMP and sustainable operation of the project.

2.4 EAP

The EAP shall be responsible for the submission of Environmental Reports to the competent Authority (MET). The EAP should be available to provide information on this study whenever required by any party (IAP, Stakeholders, and Proponent etc). Lastly, the EAP may provide training on this EMP or make any amendments as requested by the proponent.

3. LEGAL REQUIREMENTS

It is expected that the project comply with the following legislation at all times.

Table 1: Applicable legislation

LEGISLATION	PROVISION AND REQUIREMENTS
Water Resources Management act 2004	This act provides provision for the control, conservation and use of water for domestic, agricultural, urban and industrial purposes. In addition the Act clearly gives provision that pertain with license or permit that required abstracting and using water as well as for discharge of effluent. The Town Council should ensure compliance with the conditions of the Waste Disposal Permit and also apply for renewal after the certificate has expired
Environmental Management Act	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. Any changes to the current project should be subjected to an EIA and thus amendments to the Scoping Report and EMP should be made
Draft Urban and Regional Planning Bill and Regulations	It is envisaged that the current system of land use planning and development controlled in Namibia will be comprehensively reformed by the enactment of the draft Urban and Regional Planning Bill and regulation. The Bill provides for the establishment of national, regional and urban structure plans, and the development of zoning schemes. It also deals with a variety of related land use control issues such as the subdivision and consolidation of land and the establishment and extension or urban areas. This project should form part of the Town Structural Plan
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. This Bill will license discharge into watercourses and emissions into the air.
Public Health and Environmental Act, 2015	The objectives of the PHE Act are to; <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
Labour Act (No 11 of 2007)	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; Any employment provided whether by the Town Council or by contractor at this site i.e. Security Services must be in accordance with the Labour Act.
Employment Service Act, 8 of 2011	To provide for the establishment of the National Employment Service; to impose reporting and other obligations on certain employers and institutions; to provide for the licensure and regulation of private employment agencies; and to deal with matters incidental thereto. Any employment provided whether by the Town Council or by contractor at this site i.e. Security Services must be in accordance with the Labour Act.
Sewerage and Drainage Regulations (amendments)	Affords the prevention of pollution and environmental damage caused by the improper construction of sewerage and water pipelines in drainage lines. Any upgrading of the ponds must be in line with this bill and of the required standard

4. ENVIRONMENTAL MANAGEMENT REQUIREMENTS

4.1 Environmental awareness training

All contractors and employees involved in 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 Town Council prior to any work 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. These records should be kept for a minimum of **two (2) years** after completion of the project.

4.3 Non-compliance and penalties

In cases of transgressions and non-compliance to the EMP by the contractor, the contractor should be liable to a penalty fine (as per Engineering Standards or as applicable to the Town Council). Transgressions should be recorded in a dedicated register, and be filed. The resident engineer or any person designated by the Town Council 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 proposed development 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 a file dedicated for Environmental Documentation.

4.4 Environmental Reports (annually)

The Town Council 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 annual reports to be submitted to the competent Authority (MET). In addition, the Town Council should keep tract of the validity of the Waste Disposal Permit (issued by MAWF) and ensure the renewal of this permit. The general operation of the ponds should be in accordance with the conditions of this permit.

5. POTENTIAL IMPACTS AND MITIGATION MEASURES

This section provide a narrative of the possible negative environmental impacts of the oxidation ponds as identified in the Scoping Assessment. It also provide the possible mitigation measures to correct, reduce or mitigate these potential impacts thus allowing the project to be operated in a sustainable manner without posing any threat or risks to the physical environment and surrounding communities.

5.1 Overflows due to capacity constrains

Impacts: The current capacity of the ponds seems to be constrained and not enough to contain both the current and future growth of the town. This is based on the fact that the ponds are frequent with overflows as reported by the neighbouring community. These overflows expose community to the dangerous wastewater and also contaminate the freshwater and groundwater resources within the surrounding. It also put community at risks of contacting waterborne diseases i.e. gastro-enteritis, skin discoloration etc. which could result from wading through the wastewater or as a result of direct consumption or consumption of contaminated food.

Mitigation measures: The above impacts can be mitigated through expansion of the current capacity in order to accommodate the future town growth. This expansion should be based on the population forecasts. The population forecast should be based on the population connected to the sewage collection systems (i.e. including schools, hospitals, nearby villages etc.) and not necessarily on the population of the town.

The Town Council must consider making improvements at the old ponds which are not lined. These improvements shall include desludging of ponds and removal of the reeds. Once the ponds are emptied, sludge at the bottom of the ponds should be allowed to drain. As the dry sludge at the bottom will be stabilized, it could be gathered by mechanical means and removed to the municipal dumpsite.

The inner part of the ponds must also be lined, and concrete slope protection be installed on the inside slopes of all ponds from elevation- 0.75m' below high liquid levels to the dike tops. This improvement will create enough storage space, eliminate breeding sites for mosquitoes, and protect the ponds from overflows.

The other best option is to explore the use of wastewater in order to reduce the need for storage of wastewater. The wastewater can be used in a number of ways, i.e. irrigation of animal feeds, ornamental horticulture, nursery production and landscaping i.e. watering of gardens/parks in and around the town. This may require changes of the current sewage treatment systems in order to obtain best wastewater quality for instance, converting wastewater into Purified Effluents (PE) which can be used in Nursery or Landscaping. Should the Town Council consider this option, a Feasibility Study, include cost benefit analysis for converting and utilizing wastewater from the ponds needs to be undertaken.

5.2 Public Health risks

Impacts: The oxidation ponds are said to be associated with number of issues which compromises the safety and health of the community. These are such as; **foul smell, mosquitoes, snakes, birds** that are housed in the ponds but become a nuisance to the nearby houses. The foul smell emitted from the ponds is considered a nuisance and also pose some breathing problems to the community. Mosquitoes are the main cause of Malaria and thus a major health risks to the community. Lastly, snakes and birds that are housed in the ponds become predators for the domestic animals, i.e. chicken.

Mitigation measures:

The main cause of smell is scum which develops on the top of lagoons and requires management to reduce accumulation. Scum, grit and floating debris must be removed from the ponds on a regular basis and effluent quality must be monitored. The monitoring of effluent quality be done at least twice per year, in collaboration with the Ministry of Agriculture: Directorate of Water Affairs. The effluent quality is greatly influenced by the following parameters; *pH, total dissolved solids, conductivity, free and saline ammonia, magnesium, oxygen absorbed, Kjeldahl nitrogen, chemical oxygen demand, phosphate and faecal coliforms.*

Moreover, Town Council in collaboration with other relevant stakeholders (MoHSS) should provide necessary support to the affected communities, these includes:

- The Town Council should consider a regular cleaning of reeds.
- Vector control by conducting an Indoor Residual Spraying campaign in the nearby houses to prevent mosquito from breeding (This should be done in collaboration with MoHSS)
- Provide mosquito nets and other material for the control of mosquito to the affected community
- Erect weatherproof warning notices on the ponds fence, indicating that the site is out of bounds and human consumption or any other use of the sewage effluent is prohibited,
- Ensure compliance with the Waste Water Treatment Permit

Due to the current negative consensus toward the project, it is recommended that the Town Council do conduct public meeting (at least once a year) with the community in order to engage them. These community dialogue and engagement may help to reassure residents that their concerns can be addressed, and may help avoid any public conflict over the project.

5.3 Freshwater contamination

Impact: Due to the risks of overflows of wastewater from the ponds, it is likely that this can contaminate the freshwater sources in the surrounding which in turn pose serious human health risks. Animals may consume wastewater during overflows.

Mitigation measures: the Town Council must ensure that

- Regular inspection and monitoring of the ponds and deal with any overflow as soon as possible
- Any overflow must be contained by digging a trench or a temporary dam/well to avoid mixture with freshwater sources
- Create awareness among the community on the danger of consuming wastewater
- No borehole shall be drilled within 500m of the pond
- The oxidation ponds shall be protected against storm water flow by contour walls or storm water channels.

5.4 Groundwater contamination

Impact: Due to the fact that the water table in the area of Okahao is found on a relatively shallow depth (0-20m) there is a high risk of groundwater contamination, especially from the old ponds which are not lined. Groundwater contamination can also occur on the lined ponds as a result of overflows or direct seepage if ponds are not properly lined.

Mitigation measures: the Town Council must ensure that

Although no confirmation can be made at this stage of any possible groundwater contamination from the ponds, it is highly recommended that a detailed investigation on the "Potential groundwater pollution in Okahao Area with emphasis on the village of Oshuukwa" be conducted to establish the current state and predict any potential risk of groundwater contamination. This is based on the fact that, the water table in the area is at a very shallow depth (0-20m) and thus at high risk of contamination. It is also believed that environmental impacts do take time to occur but once occurred, it is very expensive to remedy them, i.e. removing contamination from groundwater, it is therefore better to be safe. It must also be noted that water has become a scarce commodity and thus groundwater serves as a future source of water for the nation and thus maximum protection of these sources should be ensured at all times.

6. IMPLEMENTING THE EMP: ROLES AND RESPONSILITIES

This section provide a manner in which the EMP is to be implemented. It is the responsibility of the Okahao Town Council to ensure that all parties involved perform their respective roles in accordance with this EMP.

Table 1: Management Plan during the Operation phase

EMP for the Operation of the Oxidation Ponds			
ISSUE	POSIBLE IMPACTS	MITIGATION MEASURES	RESPONSIBILITIES
<p>1. Overflows</p> <ul style="list-style-type: none"> • Wastewater in the environment • Safety of community 	<p>Overflows normally runs into the surrounding thus causing secondary impacts</p> <p>Possibility of drowning (accidental or suicidal)</p> <p>Fish in the ponds may attract illegal fishermen</p>	<ul style="list-style-type: none"> • Increase the capacity based on the population forecasts • Maintenance of the ponds embankment to control and prevent overflows • Explore best option of re-using wastewater to reduce the need for storage of large quantity of wastewater • Regular maintenance of the fence • Provide warning signs • Ensure gates are locked every time • Security services must be ensured (24hrs) 	<p>Town Council</p>
<p>2. Public Health Risks</p> <ul style="list-style-type: none"> • Odour/Smell • Waterborne diseases 	<p>Ponds emits foul smell which is a nuisance and may pose some breathing problems.</p> <p>Exposure to waste water, especially in cases of overflows force people and animal to wade through the waste water which could put them at risk of number of waterborne diseases i.e. <i>gastro-enteritis, diarrhea, skin discoloration etc</i></p> <p>Animal may consume wastewater from overflows</p>	<ul style="list-style-type: none"> • Regular removal of scum in the ponds • Regular monitoring of effluent quality • Application of chemical (<i>Choline</i>) to control smell • Control overflows to avoid unnecessary exposures • In case of overflows, an alternative access for the affected community must be provided to avoid them to wade through the wastewater. 	<p style="text-align: center;">Town Council, MAWF</p> <p style="text-align: center;">Town Council, Constituency Council.</p>

<ul style="list-style-type: none"> • Breeding site for mosquitoes, snakes and birds 	<p>Community may be attracted to fetch water from the ponds, especially in case of drought or water scarcity</p> <p>The ponds serves as a breeding sites for mosquitoes which in turns compromise the public health, i.e. possible cause of malaria</p> <p>Ponds also attracts snakes which prey on domestic animals and also a risks to the nearby residents.</p> <p>Reeds in the ponds housed different types of birds which preys in domestic animals, i.e. chicken.</p>	<ul style="list-style-type: none"> • People and animal must be prevented from consuming wastewater (Control and manage overflows) • Ensure regular removal of reeds from the ponds • Ensure control of vector by spraying of DDT at the affected community • Assist with mosquito nets and other necessary support to the affected community whenever requested by the community • Educate community on the prevention of malaria • Control reeds in the ponds which provide habitants for these birds • All employees responsible or involved in the chemical applications must be provided with protective clothing and must be trained on the danger of the chemical to be used. • Ensure that chemical used is environmentally friendly and must be applied as recommended 	<p>Town Council, Constituency Council</p> <p>Town Council</p> <p>Town Council with Ministry of Health</p> <p>MoHSS/Town Council</p> <p>MoHSS</p> <p>Town Council</p> <p>Town Council, Contractor</p>
<p>3. Fresh water contamination</p>	<p>Overflows from ponds often connects to freshwater sources and thus contaminate freshwater sources</p>	<ul style="list-style-type: none"> • Ensure maintenance of the pond embankments to prevent overflows. • Any overflows must be controlled as soon as possible to prevent freshwater contamination. • All natural drainage must be de-linked from the pond drainage system by means of appropriate measures 	<p>Town Council, Resident Engineer</p>
<p>4. Groundwater contamination</p>	<p>The water table in the area is very shallow (0-20m) thus could easily be contaminated by unlined ponds</p>	<ul style="list-style-type: none"> • Ensure lining of ponds (old ponds) and maintenance of the lining of the new ponds. • Conduct the special study; Potential of groundwater contamination in order to determine the risks of groundwater contamination in the area. • Findings from this study will be incorporated in this report and also be used for future management of the ponds 	<p>Town Council, EAP</p>

<p>5. Legislation requirement</p>	<p>Non-compliance to various legislation may cause secondary impacts and thus an infringement of the law</p>	<p>The following compliance must be ensured</p> <ul style="list-style-type: none"> • Implement the conditions of the Waste Water Treatment Permit and also apply for renewal once the certificate has expired. • Any upgrading of the oxidation ponds is subjected to the EIA as per EMA. • Any employment (both direct or secondary) should be in accordance with the National Labour Act • Any upgrading of the oxidation ponds should be of the required standard as per waste management bill 	<p>Town Council and line Ministries (MAWF, MoHSS, MET etc.)</p>
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7. CONCLUSION

This is not a stand-alone document, thus it must be read in conjunction with the Scoping Report. This EMP has been prepared based on the current project level. Therefore any upgrading or changes to be made to this project should result in the amendments of this document. While most of the identified issues can be solved by applying the proposed mitigation measures, it is requested for the Town Council to take note of the recommendation to undertake two identified specialist studies namely, Public Health Risks Assessment and Potential Groundwater pollution in the Okahao area. These will also form part of the condition for the Environmental Clearance Certificate and thus, failure to implement this recommendation tantamount to transgression of the EMA. The two proposed specialist studies are to generate detailed information in order to determine the current and future impacts of the project.

The Town Council should play a pivotal role in the implementation of this EMP as outlined in the report. . Compliance monitoring provides useful information for determining environmental performance for the duration of the project. The Town Council 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.