

# **ENVIRONMENTAL ASSESSMENT FOR TSANDI LANDFILL SITE, OMUSATI REGION, NAMIBIA**



## **DRAFT ENVIRONMENTAL MANAGEMENT PLAN**

**UPDATED: MARCH 2022**

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## PROJECT DETAILS

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## **ABBREVIATIONS**

<b>ECC</b>	Environmental Clearance Certificate
<b>COA</b>	Conditions of Authorisation
<b>DWAF</b>	Department of Water Affairs and Forestry
<b>EC</b>	Environmental Clearance
<b>ECO</b>	Environmental Control Officer
<b>EAP</b>	Environmental Assessment Practitioner
<b>EMA</b>	Environmental Management Act (No. 7 of 2007)
<b>EMP</b>	Environmental Management Programme
<b>EIA</b>	Environmental Impact Assessment
<b>EO</b>	Environmental Officer
<b>I&amp;APs</b>	Interested and Affected Parties
<b>MET: DEA</b>	Ministry of Environment and Tourism: Department of Environmental Affairs
<b>MSDS</b>	Material Safety Data Sheets
<b>TB</b>	Tuberculosis
<b>STD</b>	Sexually Transmitted Diseases
<b>WTW</b>	Water Treatment Works
<b>IFC</b>	International Finance Corporation

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# 1 INTRODUCTION

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## 1.1 PURPOSE OF THIS EMP

This Environmental Management Plan (EMP) addresses the management of environmental impacts related to the operation of a general landfill site in Tsandi. The document should be used as a basis for managing, mitigating and monitoring the environmental impacts associated with the pre-construction (design), construction and operational phases of the Environmental Impact Assessment (EIA) Supplementation study, conducted by Namibia Environmental Consultants (NEC). The Environmental Assessment Report will be valuable as a reference source for understanding this EMP and for placing it into perspective.

The EMP is thus required to protect the natural, social and socio-economic environment during construction. This EMP is intended for the management of the impacts of construction of the landfill and the waste storage facility and operation thereof, rehabilitation and revegetation of affected areas only. This EMP is, therefore, a standalone document, which must be used on site during each phase of the development (planning, construction and operational phases).

This document should be flexible so as to allow the contractor and Tsandi Village Council to conform to the management commitments without being prescriptive. The management commitments prove that the anticipated risks on the environment will be minimised if they are adhered to consistently. The onus set out in the EMP rests with Tsandi Village Council, main Contractor and subcontractors, which promotes responsibility and commitment. Any parties responsible for transgression of the underlying management measures outlined in this document will be held responsible of non-compliances and will be dealt with accordingly.

## 1.2 OBJECTIVES AND PURPOSE OF THE EMP

The primary objectives of the EMP are as follows:

- To describe action plans for achieving the mitigation measures described in the EIA.
- To indicate responsibilities, schedules and staff resources regarding the implementation of these action plans.
- To highlight a monitoring programme, that will enable review of the success of the EMP and the provision of such information to the relevant decision-makers.
- To provide specific recommendations and mitigation measures on how to minimise negative impacts and therefore protecting the environment mostly on the biophysical as well as social level.
- In general, the purpose of this EMP is to formulate mitigatory measures that should be made binding to all contractors during construction of the proposed development, as well as measures that should be implemented during the operational phase.

It should be noted that, this Final Environmental Management Plan (EMP) only serves to provide guidance with regards to possible impacts which may result if the application for the proposed development is successful. This EMP should only be seen as a guideline and should be updated once the exact scope of activities on site has been determined.

In terms of the Environmental Assessment Policy of 1994 and the Environmental Management Act No 7 of 2007 (EMA), certain activities have been identified, which could have a substantially detrimental effect on the environment. These listed activities require an Environmental Clearance Certificate (ECC) from the competent environmental authority, i.e. Ministry of Environment and Tourism: Department of Environmental Affairs (MET:DEA), prior to commencing. The following activities identified in the EIA Regulations (**Table 1**) apply to the proposed project:

**Table 1:** List of triggered activities identified in the EIA Regulations which apply to the proposed project

<b>Activity description and No(s):</b>	<b>Description of relevant Activity</b>	<b>The portion of the development as per the project description that relates to the applicable listed activity</b>
Activity 2.1 Waste Management, Treatment, Handling and Disposal Activities	<i>The construction of facilities for waste sites, treatment of waste and disposal of waste.</i>	<i>The project entails the establishment of a landfill site.</i>
Activity 2.2 Waste Management, Treatment, Handling and Disposal Activities	<i>Any activity entailing a scheduled process referred in the Atmospheric Pollution Prevention Ordinance, 1976.</i>	<i>The project entails the processing or burning of waste on site.</i>
Activity 2.3 Waste Management, Treatment, Handling and Disposal Activities	<i>The import, processing, use and recycling, temporary storage, transit or export of waste.</i>	<i>There is a possibility that waste will be stored on site.</i>
Activity 5.1 (d) Land Use and Development Activities	The rezoning of land from – use for nature conservation or zoned open space to any other land use.	<i>The project area will be rezoned from public open space to be used for the establishment of a landfill site.</i>
Activity 8.9 Water resource developments	Construction and other activities within a catchment area.	<i>The project area is located in close proximity of catchment areas.</i>
Activity 10.1 (b) (Infrastructure)	The construction of – Public roads.	<i>The proposed project includes the construction of roads.</i>
Activity 10.2 (a) (Infrastructure)	The route determination of roads and design of associated physical infrastructure where – it is a public road;	<i>The proposed project includes the construction of roads.</i>

### **1.3 PROJECT INFORMATION**

Tsandi is a village in the Omusati Region of northern Namibia and the district capital of the Tsandi electoral constituency. It is situated on the main road MR123 (Outapi - Tsandi - Okahao). Tsandi is the residential place of the Uukwaluudhi Royal Homestead. It is also the trade centre for the whole constituency and one of the oldest villages in the Uukwaluudhi kingdom

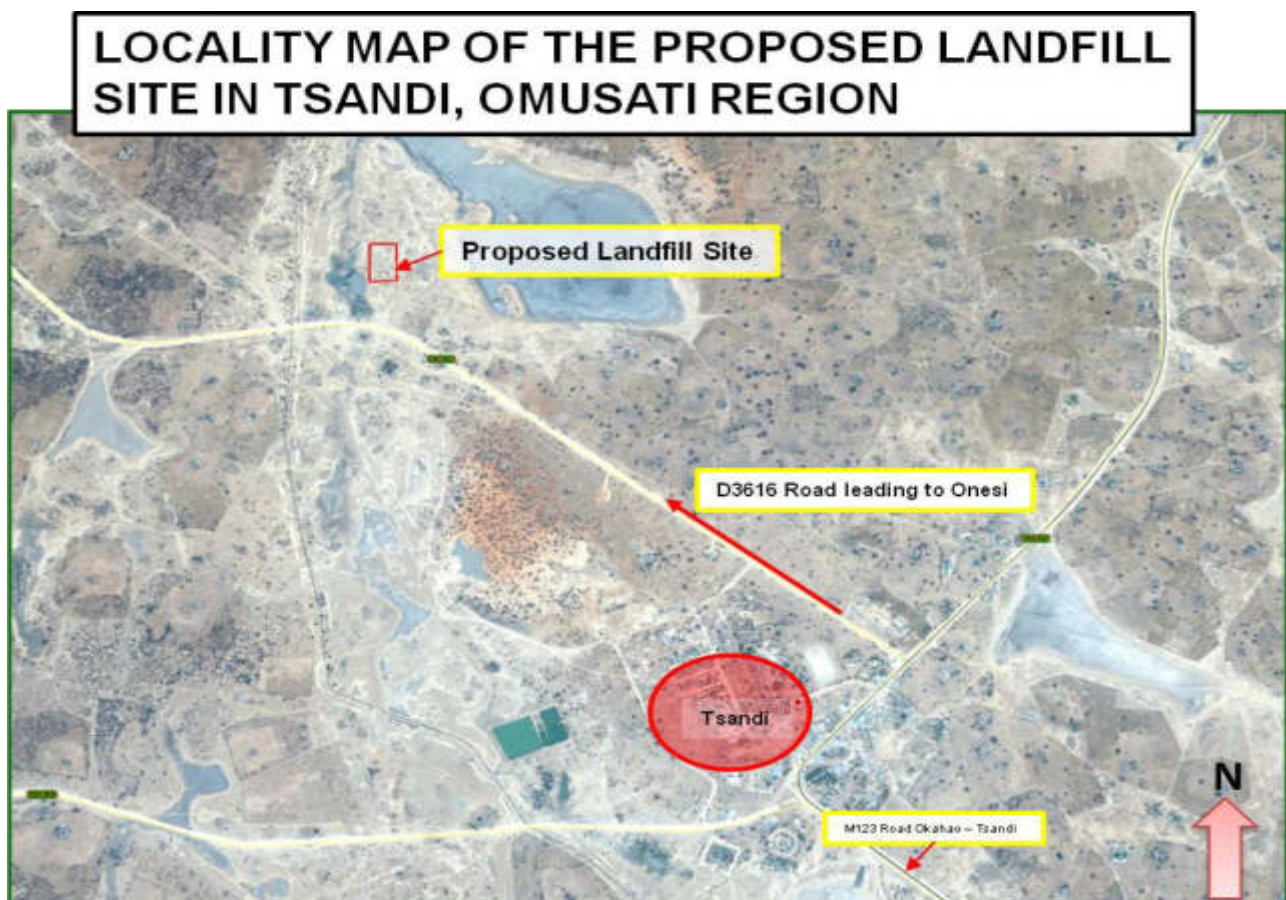
Tsandi Village Council (the proponent) is of the intention to develop and/or construct a landfill or dumping site for solid waste. The proposed landfill site will be situated in within the cadastral of Tsandi. The idea to develop a landfill site arose given the increase in the population density of the area. Tsandi is not in possession of any landfill site, hence the residents of the area would always dump their waste at unauthorised areas or transport waste to the nearest landfills.

Due to the increased quantities of domestic solid waste and their adverse environmental, aesthetic and health effects, and the economic burden they levy on the nation, serious measures are being taken to address this problem. There is a pressing need to manage solid waste via proper storage, collection, and disposal techniques. In addition to the quantities of waste generated, the physical, chemical compositions and densities provide essential information for determining appropriate collection, processing and disposal methods.

Tsandi Village Council appointed Namibia Environmental Consultants (NEC) to undertake the Environmental Assessment (EA) in order to obtain an Environmental Clearance Certificate (ECC) for the above activity in Tsandi. The competent authority is the Ministry of Environment and Tourism: Department of Environmental Affairs (MET: DEA).

#### 1.4 PROJECT LOCATION

Tsandi is a village of approximately 26,834 inhabitants situated in Omusati Region of northern Namibia and is the district capital of the Tsandi electoral constituency. The village is further located along the MR123. The proposed Tsandi Landfill development site is located north of the D3616 road leading to Onesi from Tsandi. The intended landfill site is further situated on Tsandi Town/state land. Refer to **Figure 1** below for locality map.



**Figure 1:** Locality map of proposed landfill site in Tsandi



## 1.5 PROJECT DESCRIPTION

The proposed project entails the construction of a landfill site to be used mainly for general waste. In this regard, the proponent wishes to also dig a pit within the site itself in which waste will be disposed off. The project area is located on the outskirts of the Tsandi cadastral or boundaries. It is estimated that the landfill site will be big enough to accommodate all waste generated from and within Tsandi.

The project area on which the proposed landfill site will be located does not have any zoning as this area is regarded as communal land given that it belongs to the Traditional Authority of Tsandi.

The proposed project area is located in areas where people do not reside hence, there are no neighbours to be considered. The area is further surrounded by oshanas except on the southern side of the site where either internal and external access roads or routes will be constructed.

The site area is currently vacant with no vegetation that is worthy of conservation to be considered, however it has short camel thorn shrubs or bushes. These shrubs are likely not to be removed given that no construction will be taking place on site. The site will only be fenced off and remains is except for the pit that will be dug for waste storage proposes.

The landfill site will only consist of a pit that will be used for waste storage purposes, it does not extent to any other activities (such as, guard house, ablution facilities, recycling facilities etc) to be considered.

Below are some of the pictures from the proposed site.



**Figure 2:** Pictures of the proposed Landfill Site

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## 2 LEGAL ENVIRONMENTAL FRAMEWORK

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### 2.1 THE CONSTITUTION OF THE REPUBLIC OF NAMIBIA

There are two clauses contained in the Namibian Constitution that are of particular relevance to sound environmental management practice, viz. articles 91(c) and 95(l). In summary, these refer to:

- Guarding against over-utilisation of biological natural resources;
- Limiting over-exploitation of non-renewable resources;
- Ensuring ecosystem functionality;
- Protecting Namibia's sense of place and character;
- Maintaining biological diversity; and
- Pursuing sustainable natural resource use.

The above therefore commits the State to actively promote and sustain environmental welfare of the nation by formulating and institutionalising policies to accomplish the above mentioned sustainable development objectives.

### 2.2 NAMIBIA'S ENVIRONMENTAL MANAGEMENT ACT (EMA)

In giving effect to articles 91(c) and 95 (l) of the Constitution of Namibia, general principles for sound management of the environment and natural resources in an integrated manner have been formulated. This resulted in Namibia's Environmental Assessment Policy of 1994. To give statutory effect to this Policy, the Environmental Management Act was approved in 2007, and gazetted on 27 December 2007 as the Environmental Management Act (Act No. 7 of 2007) (EMA), Government Gazette No. 3966. Part 1 of the Environmental Management Act describes the various rights and obligations that pertain to citizens and the Government alike, including an environment that does not pose threats to human health, proper protection of the environment, broadened locus standi on the part of individuals and communities, and reasonable access to information regarding the state of the environment. Part 2 of the Act sets out 13 principles of environmental management, as follows:

- Renewable resources shall be utilised on a sustainable basis for the benefit of current and future generations of Namibians.
- Community involvement in natural resource management and sharing in the resulting benefits shall be promoted and facilitated.
- Public participation in decisions affecting the environment shall be promoted.
- Fair and equitable access to natural resources shall be promoted.
- Equitable access to sufficient water of acceptable quality and adequate sanitation shall be promoted and the water needs of ecological systems shall be fulfilled to ensure the sustainability of such systems.
- The precautionary principle and the strategy of preventative action shall be applied.
- There shall be prior environmental assessment of projects and proposals which may significantly affect the environment or use of natural resources.
- Sustainable development shall be promoted in land-use planning.

- Namibia's movable and immovable cultural and natural heritage, including its biodiversity, shall be protected and respected for the benefit of current and future generations.
- Generators of waste and polluting substances shall adopt the best practicable environmental option to reduce such generation at source.
- The polluter pays principle shall be applied.
- Reduction, reuse and recycling of waste shall be promoted.
- There shall be no importation of waste into Namibia.
- Promotion of the coordinated and integrated management of the environment;
- The Minister of Environment and Tourism was enabled to give effect to Namibia's obligations under international environmental conventions;
- Certain institutions were established to provide for a Sustainable Development Commission and Environmental Commissioner.

As the organ of state responsible for management and protection of its natural resources, the MET: DEA is committed to pursuing these principles of environmental management.

### **2.3 ENVIRONMENTAL GUIDELINES**

The EMA, under section 5, states that if a proposal is likely to affect people, the following guidelines should be considered in Scoping / EA:

- The location of the development in relation to interested and affected parties (I&APS), communities or individuals;
- The number of people likely to be involved;
- The reliance of such people on the resources likely to be affected, the resources, time and expertise available for Scoping / EA;
- The level of education and literacy of parties to be consulted;
- The socio-economic status of affected communities;
- The level of organisation of affected communities;
- The degree of homogeneity of the public involved;
- History of any previous conflict or lack of consultation;
- Social, cultural or traditional norms within the community; and
- The preferred language used within the community.

The MET also released a Draft Procedures and Guidelines for conducting EIAs and compiling EMPs in April 2008. These guidelines outline the procedures and principles that are to be followed. It will be consulted throughout the EIA process to ensure an effective process and an EMP that addresses all identified impacts.

### **2.4 NAMIBIA VISION 2030**

The principles that underpin Vision 2030, a policy framework for Namibia's long-term national development, comprise the following:

- Good governance;
- Partnership;
- Capacity enhancement;
- Comparative advantage;
- Sustainable development;
- Economic growth;

- National sovereignty and human integrity;
- Environment; and
- Peace and security.

Vision 2030 states that natural environments are disappearing quickly. Consequently the solitude, silence and natural beauty that many areas in Namibia provide are becoming sought after commodities and must be regarded as valuable natural assets. Vision 2030 emphasises the importance of promoting Healthy Living which includes that the majority of Namibians are provided with basic services. The importance of developing Wealth, Livelihood and the Economy is also emphasised by Vision 2030. This development therefore supports the goals to be achieved in Vision 2030, because the bulk services will provide the community, currently living in non-favorable conditions, with potable water, electricity and waste removal services. Not only will this improve their health, it will also result in the further development of Tsandi.

## **2.5 BIODIVERSITY LEGISLATION AND POLICIES**

The following policies, aimed at biodiversity, may also be relevant for the proposed project:

- Convention on Biological Diversity (2000)
- Convention to Combat Desertification (1997)
- Namibian Water Corporation Act (1997)
- Pollution and Waste Management Bill (Draft)
- Soil Conservation Act (1969)
- United Nations Framework Convention on Climate Change (1992)
- Water Resources Management Act (2004)
- Climate Change Policy (Draft with Attorney General's office)

The applicability of the aforementioned policies and legislation has been explored in further detail during this EIA phase, based on the findings of the impact assessment and specialist investigations.

## **2.6 SOCIAL POLICIES**

### **2.6.1 The Ministry of Environment and Tourism (MET) Policy on HIV & AIDS**

The relevance of this policy for the proposed project stems from the fact that construction activities may involve the establishment of temporary construction workforce in Tsandi. Experience with other construction projects in a developing-world context has shown that, where construction workers have the opportunity to interact with local community, a significant risk is created for the development of social conditions and behaviors that contribute to the spread of HIV and AIDS.

In response to the threat the pandemic poses, MET has recently developed a policy on HIV and AIDS. This policy, which was developed with support from United States Agency for International Development (USAID), Gesellschaft für Technische Zusammenarbeit (GTZ) and the German Development Fund, provides for a non-discriminatory work environment and for workplace programs managed by a Ministry-wide committee.

## **2.7 ATMOSPHERE POLLUTION PREVENTION ORDINANCE (1976)**

This Ordinance generally provides for the prevention of the pollution of the atmosphere. Part IV of this ordinance deals with dust control. The Ordinance is clear in requiring that any person carrying out an industrial process which is liable to cause a nuisance to persons residing in the vicinity or to

cause dust pollution to the atmosphere, shall take the prescribed steps or, where no steps have been prescribed, to adopt the best practicable means for preventing such dust from becoming dispersed and causing a nuisance. Town and Regional Planners Act 9 of 1996.

## **2.8 WATER ACT NO.54 OF 1956**

This Act provides for Constitutional demands including pollution prevention, ecological and resource conservation and sustainable utilisation. In terms of this Act, all water resources are the property of the State and the EIA process is used as a fundamental management tool.

A water resource includes a watercourse, surface water, estuary or aquifer, and, where relevant, its bed and banks. A watercourse means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland lake or dam, into which or from which water flows; and any collection of water that the Minister may declare to be a watercourse. Permits are required in terms of the Act for undertaking the following activity relevant to the proposed project:

- Disposal of waste in a manner that may detrimentally impact on a water resource in terms of Section 21 (g).

## **2.9 WATER RESOURCES MANAGEMENT ACT OF NAMIBIA (2004)**

This act repealed the existing South African Water Act No.54 of 1956 which was used by Namibia. This Act ensures that Namibia's water resources are managed, developed, protected, conserved and used in ways which are consistent with fundamental principles depicted in section 3 of this Act. Part IX regulates the control and protection of groundwater resources. Part XI, titled Water Pollution Control, regulates discharge of effluent by permit. Thus developers are required to efficiently plan for sewage disposal.

## **2.10 THE DRAFT WETLAND POLICY (1993)**

Requires that any wetlands and its associated hydrological functions form a part, to be managed in such a way that their biodiversity, vital ecological functions and life support systems are protected for the benefit of present and future generations.

## **2.11 DRAFT POLLUTION CONTROL AND WASTE MANAGEMENT BILL**

Only Parts 2 and 7 of the Bill applies to the proposed development of Tsandi landfill site.

Part 2 stipulates that no person shall discharge or cause to be discharged any pollutant to the air from a process except under and in accordance with the provisions of an air pollution licence issued under section 23. It further provides for procedures to be followed in licence application, fees to be paid and required terms of conditions for air pollution licences.

Part 7 states that any person who sells, stores, transports or uses any hazardous substances or products containing hazardous substances shall notify the competent authority, in accordance with sub-section (2), of the presence and quantity of those substances.

This bill aims to promote sustainable development and to prevent and regulate the discharge of pollutants into the environment. Once this bill is enacted it will make provision for the establishment of an appropriate framework for integrated pollution prevention and control.

## **2.12 PUBLIC HEALTH ACT 36 OF 1919 AND SUBSEQUENT AMENDMENTS**

The Act, with emphasis to Section 119 prohibits the presence of nuisance on any land occupied.

This Act controls the existence nuisances such as litter that can cause a threat to the environment and public health. The term nuisance for the purpose of this EIA is specifically relevant specified, where relevant in Section 122 as follows:

- any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable or preventable disease or injury or danger to health; or
- Any other condition whatever which is offensive, injurious or dangerous to health.

Potential impacts associated with the development of the proposed development of Tsandi are expected to include dust, air quality impacts and smoke emissions.

### **2.13 NATIONAL HERITAGE ACT (NO.76 OF 1969)**

The Act calls for the protection and conservation of heritage resources and artefacts. Should any archaeological material, e.g. old weapons, coins, bones found during the construction, work should stop immediately and the National Heritage Council of Namibia must be informed as soon as possible. The Heritage Council will then decide to clear the area or decide to conserve the site or material.

### **2.14 CUSTOMARY LAW**

A large number of Namibians live under indigenous customary law. Customary Law is recognised by the Namibian constitution under Article 66. Section 3 of the *Traditional Authorities Act No.25 of 2000*, gives certain powers to traditional authorities. One of the duties of the traditional authorities is to ensure that members of the traditional community use the environment and its resources in a sustainable manner. Thus the traditional authorities can institute measures to promote good waste management practices.

### **2.15 COMMUNAL LAND REFORM ACT NO. 5 OF 2002**

This Act provides for the allocation and administration of all communal land and makes provision for the mitigation of impacts on the natural environment such as littering.

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## 3 RESPONSIBLE PARTIES

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There are at least three role-players participating in the environmental management of the site, including:

- Tsandi Village Council
- Environmental Control Officer (ECO)
- Contractors, Sub-Contractors or Engineers

Tsandi Village Council as the proponent will be responsible for the implementation of this EMP during the construction phase of the project. The following people are also required during construction in order to implement various Environmental management related issues. This responsibility, in some instances may be delegated to contractors in the employ of Tsandi Village Council for practical purposes, but Tsandi Village Council will retain legal responsibility. In that capacity, Tsandi Village Council should delegate suitably qualified person(s) with the responsibility to ensure implementation of the EMP, and will:

- Know the contents and implications of the EIA and monitor the implementation of EIA findings using the EMP and Project Aspect Register.
- Revise the EMP as required and inform the relevant parties of the changes.
- Protect the environment and rehabilitate the environment as prescribed in the EIA. The

responsibilities of the Developer during the operational phase are inter alia to ensure that:

- All requirements of the EIA and EMP are, communicated to, understood and followed by all persons working on the project who may have an impact on the environment.
- A procedure exists for reporting incidents and resolving any problems rapidly.
- Keep good records relating to the compliance/non-compliance with the conditions of the authorisation.

### 3.1 ENVIRONMENTAL CONTROL OFFICER

Prior to the commencement of construction a suitably qualified and experienced Environmental Control Officer (ECO) shall be appointed by the Contractor / Proponent to ensure that the mitigation rehabilitation measures are implemented and to ensure compliance with the provisions of the EMP.

#### 3.1.1 Roles and responsibilities

The role of the ECO is to oversee and monitor compliance with and implementation of the construction phase EMP. The ECO is therefore responsible for the following responsibilities:

- i) Liaison with the community, Tsandi Village Council, Engineer and Environmental Authorities;
- ii) Monitoring of all the Contractor's activities for compliance with the various environmental requirements contained in this EMP;
- iii) Reviewing of the Contractor's Environmental Method Statements as well as ensuring Tsandi Village Council's approval thereof;
- iv) Ensuring that the requisite remedial action is implemented in the event of non-compliance;

- v) Ensuring the proactive and effective implementation and management of environmental protection measures;
- vi) Ensuring that a register of public complaints is maintained by the Contractor and that any and all public comments or issues are appropriately reported and addressed;
- vii) Routine recording and reporting of environmental activities on a monthly basis;
- viii) Recording and reporting of environmental incidents;
- ix) Notifying the Environmental Authorities immediately of any events or incidents that may cause significant environmental damage or breach the requirements of the EMP; and
- x) Environmental Awareness Training courses to be conducted to the Contractor's entire team of workers.
- xi) Ensure that periodic environmental performance audits are undertaken on the project implementation.
- xii) Take appropriate action if the specifications contained in the EMP are not followed.
- xiii) Monitor and verify that environmental impacts are kept to a minimum, as far as possible.
- xiv) Ensure that activities on site comply with all relevant environmental legislation.
- xv) Compile progress reports on a regular basis, with input from the Site Manager, for submission to the Project Manager, including a final post-construction audit carried out by an independent auditor/consultant.

The role of the Contractor or Sub-Contractor is to oversee and monitor compliance with and implementation of the construction phase EMP. The ECO is therefore responsible for the following responsibilities:

- Be fully conversant with the Environmental Management Plan.
- Be fully conversant with all relevant environmental legislation.
- Have overall responsibility for the implementation of the EMP.
- Ensure that audits are conducted to ensure compliance to the EMP.
- Liaise with the Project Manager or his delegate, the Environmental Control Officer and others on matters concerning the environment.
- Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution on the site.
- Confine activities to the demarcated construction site.

### **3.1.2 Site Visits and Reporting:**

- The ECO shall visit the site a minimum of once a month. More frequent visits may be required if the situation requires it.
- Monthly compliance reports shall be submitted to the Engineer and Tsandi Village Council and distributed as desired.
- The compliance report shall speak to the requirements of the construction EMP and the project specifications.
- It is recommended that an Environmental Audit Report be carried out six months after construction has been completed and submitted to the Environmental Authorities and Tsandi Village Council.



The Environmental Officer shall also provide information to the Site Manager or his representative, as required during external audits conducted by or on behalf of the Site Manager as part of the auditing programme. The information required will include the reports of internal audits conducted by the Environmental Officer.

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## 4 MANAGEMENT OBJECTIVES AND PRINCIPLES

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The following objectives provide the framework for the environmental principles for environmental management of the project:

- Minimise the potential for deterioration of air quality during all project phases.
- Avoid “disturbing” noise levels (an increase in the ambient noise level of 7dB (A) or more at the border of the property from which the noise emanates).
- Minimise the use of clean water and avoid water wastage.
- Prevent the contamination of surface and ground water as a result of the service station activities.
- Ensure that an appropriate Emergency Procedure is in place to safeguard the environment, local community and employees.
- Practise the reduction and recycling of waste materials.
- Enhance the creation of direct job opportunities for the surrounding community and contribution of the project to the local economy, especially during labour intensive phases (construction and decommissioning).
- Reduce the disturbance of the surrounding community from site activities to a minimum.
- Maintain transparent relations with the Interested & Affected Parties (IAPs) (including surrounding community, authorities and employees).
- Ensure that the community and employees are not subjected to increased safety hazards.

These guideline principles will form the basis for environmental management on site. Should these principles require modification or additions during the project this should be done at the discretion of the responsible person, who will ensure that any modifications are communicated, explained to and discussed with all affected parties.

The environmental operational procedures and environmental issues are identified and managed, under different phases of the project. The different phases are:

- Pre-construction (including design);
- Construction Phase;
- Operational Phase; and
- Decommissioning Phase

### 4.1 THE 5 R POLLUTION PREVENTION HIERARCHY

The 5 R pollution prevention hierarchy (Reduce, Reuse, Recycle, Recover, Residuals Management) is a useful tool for regional districts to use when looking at opportunities to improve their solid waste management system (see Figure 3). The order of preference in the pollution prevention hierarchy is for waste management at one level to only be undertaken when all feasible opportunities for pollution prevention at a higher level have been taken. For example, opportunities for recycling should be explored only after all opportunities for reduction and reuse of materials have been exhausted. There are benefits to this approach.

- Actions taken at higher levels in the pollution prevention hierarchy can eliminate or reduce the environmental management costs of actions at lower levels. For example, waste prevention programs can reduce costs associated with handling wastes in the first place.
- The pollution prevention hierarchy can potentially reduce the environmental impacts of product manufacturing and distribution. For example, reuse, and to a lesser extent recycling, will reduce the environmental impact of extracting and processing primary resources while the use of recycled material can reduce the energy cost of manufacturing new products.
- Adherence to the highest level of performance under the pollution prevention hierarchy can encourage innovation and investment by industry to improve product design and reduce waste.



**Figure 3: 5 R Pollution Prevention Hierarchy**

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## 5 CONSTRUCTION PHASE

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### 5.1 INTRODUCTION

The construction phase EMP is to be **included into all Tender and Contract documentation to ensure that the Contractor is aware of his obligations and is able to price the implementation of these requirements accordingly**. Failure to comply with these requirements could result in penalties or otherwise hold the Contractor accountable for any damages arising from irresponsible behavior or non-compliance with the requirements. This ensures that identified environmental issues receive adequate attention during the planning and construction phase.

### 5.2 SCOPE

The general principles contained within the EMP shall apply to all construction activities. All construction activities shall observe any relevant environmental legislation and in so doing shall be undertaken in such a manner as to minimise impacts on the natural and social environment.

### 5.3 GENERAL

Tsandi Village Council, as the client, is responsible for:

- Ensuring that the objectives of EMP are given effect;
- Ensuring that all environmental impacts are managed in accordance with the EMP;
- Ensuring that all monitoring and compliance auditing occurs in line with the EMP;
- Ensuring that the environment is rehabilitated as far as practicable to its natural state or existing land use practices;
- Any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of activities both in and outside the site boundaries.

With regard to the above, the Contractor shall conduct his activities so as to cause the least possible disturbance to the existing amenities, whether natural or man-made, in accordance with the current statutory requirements. Special care shall be taken by the Contractor to prevent irreversible damage to the environment. The Contractor shall take adequate steps to educate all members of his workforce as well as his supervisory staff on the relevant environmental laws and protection requirements. The Contractor shall supplement these steps with prominently displayed notices and signs in strategic locations to remind personnel of environmental obligations.

A suitably qualified independent ECO shall be appointed by the Contractor to undertake the following tasks:

- Liaison with Contractor, Interested and Affected Parties (I&APs); and Engineer regarding environmental matters;
- Monitoring of all of the Contractor's activities for compliance with the various environmental requirements at regular intervals;
- Routine environmental auditing and reporting of the Contractor's performance against the EMP;
- Reporting of environmental incidents and routine reporting of environmental issues associated with construction activities; and

- Identifying environmental non-conformances and initiating measures to remedy such issues, including the institution of fines against the Contractor.

The Contractor shall construct and/or implement all the necessary environmental protection measures in each area before any construction work may proceed. The Engineer / ECO may suspend the Works at any time should the Contractor, in the Engineer / ECO's opinion, fail to implement, operate or maintain any of the environmental protection measures adequately. The costs of such suspension shall be to the Contractor's account.

#### **5.4 PLANNING AND DESIGN**

The Design Engineers must take cognisance of the outcomes and recommendations of the EMP. Tsandi Village Council and the Engineer must ensure that this EMP is included in the briefing documentation to the Contractor (to be appointed). The Engineer must advise the Contractor to familiarise himself with the EMP and ensure that adequate resources are made available to implement the requirements of the EMP.

#### **5.5 ENVIRONMENTAL AWARENESS AND COMPETENCE**

It is important to ensure that all personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental harm.

To achieve effective environmental management, it is important that employees, Contractors and Subcontractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMP. Environmental training may typically include the following:

- Employees must have a basic understanding of the key environmental features of the construction site and the surrounding environment;
- Employees will be familiar with the requirements of the EMP and the environmental specifications as they apply to the construction of the landfill site.
- Basic training in the identification of archaeological artefacts, and rare and endangered flora and fauna that may be encountered on the site.
- Awareness of any other environmental matters, which are deemed to be necessary by the ECO.
- Records must be kept of those that have completed the relevant training.

##### **5.5.1 Environmental, Health and Safety Induction Course**

The Contractor is responsible for informing employees and Sub-Contractors of their environmental obligations in terms of the EMP and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts.

The Contractor shall ensure that all his employees, and those of his Sub-Contractors, attend an Environmental, Health and Safety Induction Course. This course shall be structured to ensure that attendees:

- Acquire a basic understanding of the key environmental features on the site and its immediate environs;
- Become familiar with the environmental controls contained in the EMP;

- Are informed that natural features (e.g. rock formations) are not defaced or marked for survey or other purposes unless agreed beforehand with the engineer and natural water sources are not allowed to be used for the purposes of swimming, personal washing, and the washing of machinery or clothes;
- Are made aware of the need to conserve water and minimise waste;
- Receive pertinent, written instructions regarding compliance with the relevant environmental management requirements (viz. typical environmental “do’s” and “don’ts”);
- Are made aware of any other environmental matters as deemed necessary by the Engineer / ECO.
- Receive detailed training in site health and safety requirements, emergency responses and site evacuation procedures in terms of the Contractor’s health and safety plan;
- Are made aware that prostitution shall not be tolerated in the construction camp;
- Are aware that a copy of the EMP is readily available on site and that all site staff are aware of the location and have access to the document;
- Are aware of the requirements of any approved Method Statements that have bearing on their activities, and where necessary, any specialised training required to ensure compliance with the approved Method Statements has been provided; and
- Are informed that employee information posters, outlining the environmental “do’s” and “don’ts” (as per the environmental awareness training course) will be placed at prominent locations throughout the site.

The Environmental, Health, and Safety Induction Course should be conducted by the ECO and Contractor’s Health and Safety officer, who shall provide the site staff with an appreciation of the project’s environmental requirements, and how they are to be implemented. All new staff coming onto site after the commencement of construction activities must also attend the Environmental, Health and Safety Induction Course, and refresher courses should be undertaken on a quarterly basis. A detailed record of all training sessions, including a list of attendees must be compiled by the Contractor and submitted to the Project Manager on a regular basis.

The initial Environmental, Health, and Safety Induction Course shall be held within 14 days from the site mobilisation date, and subsequent courses shall be arranged for all new employees arriving after the initial training course.

The Contractor shall provide a suitable venue with necessary facilities and ensure that all employees attend the environmental, health and safety induction course. The course shall be held in the morning during normal working hours. No more than 30 people shall attend each course and the Contractor shall allow for sufficient sessions to train all personnel. The Contractor shall provide proof of attendance by all of his employees in the form of a signed attendance register.

### **5.5.2 Toolbox Talks**

Environmental, health and safety issues specific to each area of the works, shall form part of the daily toolbox talks in each area. The foreman responsible will provide feedback to his staff on their day-to-day environmental performance and address issues requiring attention and specific actions required. A synopsis of the topics discussed at each area shall be recorded on a register and submitted to the ECO on regular (typically weekly) basis. Environmental matters shall be dealt with in toolbox talks on a regular basis (typically at least once a week).

### 5.5.3 Safety of the Public

The Contractor shall take all reasonable measures to ensure the safety of people in the surrounding area. Where the public could be exposed to danger by any of the Works or site activities, the Contractor shall provide flagmen, barriers, and/or warning signs in Oshiwambo (native or most spoken language in the area), all to the approval of the Engineer / ECO.

All unattended open excavations shall be adequately demarcated (fencing shall consist of a minimum of three strands of wire wrapped with danger tape). Adequate protective measures must be implemented to prevent unauthorized access to the Working Area. No firearms shall be permitted on site without the prior approval of the Project Manager.

The Contractor shall implement appropriate measures to limit any adverse social impacts associated with the establishment of a construction camp and/or the accommodation of a construction workforce on the local communities. The following mitigation and management measures are prescribed in this regard:

- Measures to prevent crime:
  - Construction workers should be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. Construction workers could also be issued with identification tags in order to gain access to the construction site and campsite area.
  - The Contractor should establish clear rules and regulations for access to the construction site and offices to control loitering. Consultation should occur with the local Tsandi Namibian police branch to establish standard operating procedures for the control and/or removal of loiterers.

### 5.5.4 Human Resource and Opportunities Management

Job creation, inward migration of workers and accommodation of a workforce within a small community have the potential to result in significant social impacts. Tsandi Village Council and the Contractor must approach human resource management in a careful, cooperative and considered fashion so as to enhance the positive impacts, whilst minimising negative impacts associated with construction projects.

Given that Tsandi community will be most affected by the project, it is consistent with international best-practice standards (such as the Performance Standards of the IFC) that they should be given special consideration in terms of the benefits arising from the project. In order to enhance the benefits of employment creation for these communities, it is recommended that the following measures be implemented:

- The Contractor shall establish a formal and organised recruitment process.
- The Contractor should be encouraged to employ local labour (i.e. from Tsandi) where possible.
- The Contractor should be encouraged to recruit Namibian labourers.
- Tender criteria should require training and skills development of the workforce by the Contractor.
- Recruiting by the Contractor must be conducted through a central office and no on-site hiring should be allowed.
- The Contractor shall inform job seekers that they are hired for a contract period only.

### 5.5.5 Working Times

The Contractor shall restrict construction activities to the hours of 06h30 - 17h00 during summer and 07h00 - 17h00 during winter on Mondays to Saturdays and no work will be permitted on Sundays or public holidays.

### 5.5.6 Dust

The Contractor shall take all reasonable measures to minimise the generation of dust as a result of construction activity, to the satisfaction of the Engineer / ECO. Dust suppression measures shall be agreed upon in consultation with the Engineer / ECO. Appropriate dust control measures include the following:

- Dustex may be applied to the construction clearing activities to ensure 50% control efficiency on all the unpaved where applicable;
- Construction vehicles to only use designated roads;
- During high wind conditions the Contractor must make the decision to cease works until the wind has calmed down; and
- Cover any stockpiles with a suitable material, such as plastic or shade-cloth, to minimise windblown dust.

### 5.5.7 Noise

The Contractor shall limit noise levels (e.g. install and maintain silencers on machinery). Appropriate directional and intensity settings are to be maintained on all hooters and sirens and no amplified sound shall be allowed on Site other than in Emergency situations. Drivers and operators are to be instructed to not use their hooters unless absolutely required (i.e. operators of machinery should not use hooters for the purposes of general communication, which is typically seen on construction sites).

## 5.6 METHOD STATEMENTS

Any Method Statements required by the Engineer / ECO or called for by the Project Specification shall be produced within such reasonable time as specified by the Engineer / ECO or as stipulated in the Project Specification. Please refer to **Appendix B** for a generic example of a method statement. The Contractor shall not commence the activity until the Method Statement has been approved, except in the case of emergency activities. The Contractor shall allow the Engineer / ECO a one week period for the review and approval of the Method Statement. Such approval shall not be unreasonably withheld.

The Engineer / ECO may require changes to a Method Statement if the proposal does not comply with the Specification or if, in the reasonable opinion of the Engineer / ECO, the proposal may result in, or carries a greater risk of, damage to the environment in excess of that which can be tolerated.

Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. The Contractor shall carry out the works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract or any other law.



Method Statements that shall be provided by the Contractor 14 days prior to the mobilisation on site include:

1. Mobilisation plan, covering:
  - a. The location and layout of all offices, storage containers, gates and fences, fuel storage areas and protection bunds, material lay-down areas, ablution facilities, carpentry areas, hazardous chemical storage facilities, wash bays, workshops and Works service and maintenance areas, oil separators and grease traps, storm- water layout, first aid facilities, recess, training, eating and meeting areas, central waste storage areas, access / haul roads and any other facilities associated with the Contractor's yard.
  - b. Security and access control to the site.
  - c. The design and location of all waste storage facilities, in particular the central waste storage area.
  - d. The central waste storage area shall include a separate, weather proof, water-tight vessel for the disposal of hazardous waste and contaminated soil recovered during spills.
  - e. The system of collection and disposal of wastes, including the name and location of the point of final disposal, to an appropriately landfill site.
  - f. Initiatives for the control and recovery of litter on and around the Site and Contractor's yard.
  - g. Fuels and fuel spills: Methods of refuelling vehicles and details of methods for fuel spills and clean-up operations.
  - h. Sedimentation and Erosion Control: Sedimentation and erosion control of bulk earthworks and the management of sediment into rivers.
  - i. Storm water management: Provisions to manage storm water during the construction phase, especially during phases involving bulk earthworks as well as at the culvert where the pipeline will go through underneath the road.
2. Operational and rehabilitation plan, covering:
  - a. Procedure for the clearing of vegetation, grubbing of the works and handling, stockpiling and disposal of the debris arising from the grubbing operations;
  - b. Measures to be used to protect the topsoil stockpiles against contamination or erosion;
  - c. Measures used to protect cleared areas from erosion, windblown dust and suspended solid contaminated runoff;
  - d. Method to be used for backfilling, shaping, spacing and shape of erosion protection berms and the redistribution of stockpiled topsoil (care to be taken that topsoil is not over diluted with sub-soil); and
  - e. Seeding and aftercare of planted materials and control of alien invasive. It is encouraged that concurrent rehabilitation practices are used where possible.

## **5.7 ENVIRONMENTAL CONSIDERATIONS PERTAINING TO SITE LAYOUT**

### **5.7.1 Employee Eating and Recess Areas**

The Contractor shall identify a suitable area, which is shaded if possible and away from construction noise and dust, where employees can eat and take work recesses in relative comfort. The eating areas shall be provided with scavenger proof rubbish bins which are to be emptied into

the central waste storage vessel daily. Potable water and other sanitary conveniences shall also be located within reasonable range of the designated eating area. The Contractor shall prevent his employees from eating or recessing anywhere else but in the designated eating area.

### **5.7.2 Site Division and Site Demarcation**

The Contractor shall restrict all his activities, materials, equipment and personnel to the designated Site. The Contractor shall erect and maintain permanent and/or temporary fences of the type and in the locations directed by the Engineer / ECO. Such fences shall, unless otherwise directed by the Engineer / ECO, be erected before undertaking other designated activities within the fenced-off area. Fences and gates shall be maintained throughout the Contract. All areas outside of the demarcated site shall be deemed as “no-go” areas for all construction personnel and equipment.

The Contractor shall ensure that the clearance of vegetation is restricted only to that required to facilitate the execution of the works. Non-conformances related to over-clearance of vegetation shall be regarded as a serious offence and dealt with to the full extent of these specifications. A preventative approach to rehabilitation is emphasised, site clearance shall occur in a planned manner, over or accidental clearance will be prevented.

The Contractor shall peg the boundaries for the proposed works before commencing with any clearing operations. These demarcations shall be used by the clearing teams as a guide to control and prevent accidental over clearance of vegetation. No clearing of vegetation will commence until the alignment boundaries is finalised and commencement authorised by the ECO / Engineer.

### **5.7.3 Access, Traffic and Haul Roads**

The Contractor shall be held responsible for the control of all project related traffic, including that of his suppliers, in ensuring that vehicles associated with the project remain on designated routes and within the designated working times. Construction traffic shall be controlled to ensure minimal disruption to normal road users. All existing access roads that may be affected during construction shall be kept open and in a good state of repair, where this is not possible, unobstructed and safe alternative access routes through the Works must be provided. The following mitigation measures are further proposed to limit the impact of traffic in the area:

- The absolute minimum new roads / tracks should be established. Vehicles should stay on existing roads / tracks as far as possible.
- Should new roads / tracks need to be established, a plan should be provided for the road before construction commences.
- New roads / tracks should not be constructed if the quality of existing roads deteriorates. Where possible, repair or upgrade existing roads / tracks.
- Road construction methods should ensure good road surfaces to preclude vehicles driving off road to find smoother surfaces with less corrugations or potholes.
- The area to be cleared for road construction should be as small as possible.
- Road surface should be regularly assessed and upgraded where appropriate.
- No off-road driving is allowed except where the clearing route for service infrastructure is planned.
- No operator will operate any equipment when he is under the influence of alcohol.
- Make sure all vehicles are roadworthy. Repair faulty brakes, exhausts etc. immediately/
- Good driving and adherence to safety rules at all times.

- Drivers must keep their headlights on when driving on gravel roads.
- Drivers must have the correct licence for the vehicles they are driving.
- Roads which were constructed for the purposes of this project and will not be required for further use shall be.
- The following minimum standards for access roads should be followed:
  - Enter and exit roadways and construction areas should be demarcated at the entrances.
  - Erect signage to warn motorists about construction activities and heavy vehicle movement where appropriate.
  - Use 3-point turns and not U-turns and confine turning to the road.
  - Prevent shortcuts between roads.

No new parking bay, haul or access road or passage of any sort shall be opened or be caused to be opened without the prior consent of the Engineer / ECO. Establishing new burrow pits are strictly prohibited. Any contraventions of this clause shall result in penalisation.

#### **5.7.4 Solid Waste Management**

The Contractor shall provide sufficient number of rubbish bins with secured lids. Rubbish bins shall always be placed in pairs, to ensure that one is always present while the other is being emptied. As a minimum, rubbish bins shall be located at every point of entry / exit to the site, any building, work area, ablutions facility or recess area, Areas where rubbish is likely to be generated in higher quantities shall be equipped with an additional rubbish bins according to the activities occurring there and the volume of waste being generated. Area requiring additional rubbish bin will include for example:

- Canteens and eating areas (4);
- Materials lay down areas;
- Any other area where an accumulation of litter and rubbish is noted or as instructed by the ECO.

No waste materials, including domestic, organic or construction wastes shall be burnt, dumped or buried on the Site. Bins shall be emptied daily or as required. The waste may be stored temporarily on site in a central waste area that is weather and scavenger proof, as approved by the Engineer / ECO. The Contractor shall, at his own cost, make available the time and resources required in recovering any litter or other wastes that have accumulated or have been dispersed as a result of his activities on the Site. The ECO shall monitor this strictly and institute strict penalties in the event of non-compliances.

#### **5.7.5 Equipment Maintenance and Storage**

All vehicles and equipment shall be kept in good working order and shall be operated by designated and competent operators. Leaking or damaged equipment shall be repaired immediately or removed from the Site. Where emergency, *in situ* maintenance operations are required, the Contractor shall ensure that the soil or vegetation does not become contaminated. Drip trays shall be provided in construction areas for stationary and parked plant as well as for the emergency servicing of vehicles. Drip trays shall be inspected and emptied daily, or as required. The contents of the drip trays shall be disposed of at an appropriately authorised facility.

The washing of equipment shall be restricted to urgent or preventative maintenance requirements only during which the use of detergents for washing shall be restricted to low phosphate and nitrate containing, low foaming type detergents.

The Contractor shall ensure that oil and lubricant containers are stored in an area where the ground has been protected. The containers shall be inspected regularly to ensure that no leakage occurs. When oil / lubricants are dispensed, the proper dispensing equipment shall be used, and the storage container shall not be tipped in order to dispense the oil / lubricant. The dispensing mechanism of the oil / lubricant storage container shall be stored in a waterproof container when not in use. The Contractor shall take all reasonable precautions to prevent accidental and incidental spillage during the use of oils.

In the event of oil / lubricant or other hazardous spill, the source of the spillage shall be isolated, and the spillage contained. The Contractor shall clean up the spill by removing the contaminated soil to the hazardous waste vessel and the application of absorbent material to the affected area. Treatment and remediation of the spill area shall be undertaken to the reasonable satisfaction of the Engineer / ECO.

## **5.7.6 Materials**

### **5.7.6.1 Materials Handling, Use and Storage**

The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions, including “no-go” areas and designated haul routes.

All material shall be stored within the designated Site boundaries and all material stockpiles shall be located no less than 20 m from any water resource. The Contractor shall ensure that all material lay-down areas, workshops and stores, including temporary lay-down areas within the Works, are kept in a neat and orderly fashion on a daily interval, and to the satisfaction of the Engineer / ECO. The Contractor shall set aside the time and resources required to remedy any contraventions of this clause at his own expense.

Materials shall be appropriately secured and covered to ensure safe passage between destinations. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

### **5.7.7 Trenching (only where applicable)**

Trenches where envisaged shall be demarcated appropriately and securely and regularly monitored during operations to ensure that pedestrian (and vehicular) access to these areas is strictly prohibited. Where appropriate, sign boards, alerting pedestrians and road users to the potential dangers presented by the construction activities, shall be erected. The Contractor shall ensure that the time a trench is left exposed is kept to a minimum, and that open trenches are inspected on a daily basis for animals which may have fallen or become trapped.

### **5.7.8 Fire Control**

Fires are only permitted in designated area and shall not be left unattended. Cooking places shall be located at a safe distance from fuel / hazardous materials storage area and vehicle parking areas. All grass and bushes shall be removed around fireplaces. Any fires that occur outside of designated areas shall be reported to the Engineer / ECO immediately. Employees shall be made aware that the collection and removal of firewood is prohibited, except where indicated by the contractor as clearing takes place. Burning of waste for disposal purposes is not permitted.

### **5.7.9 Emergency Procedures**

The Contractor shall ensure that his employees are aware of the procedure to be followed for dealing with leaks and spills, which shall include notifying the Engineer / ECO. The Contractor shall ensure that the necessary materials and equipment for dealing with leaks and spills are available on Site at all times. Treatment and remediation of spills shall be done to the satisfaction of the Engineer / ECO.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The affected areas shall be cordoned off and secured. The Contractor shall ensure that there is always sufficient supply of absorbent material on Site to absorb / breakdown or encapsulate at least a 200ℓ liquid hydrocarbon spill. Any soil contaminated by such a spill must be removed and disposed of at an appropriately registered waste site.

Emergency equipment including spill kits and fire extinguishers shall be positioned at accessible locations near to areas or facilities where such emergencies may arise.

### **5.7.10 Erosion, Water Quality, and Storm Water Control**

The Contractor shall take all reasonable steps to prevent or remediate damage to the environment resulting from the Works in the form of erosion and sedimentation. The Contractor shall immediately remedy any situation that is or has the potential to result in soil erosion, water pollution and sedimentation from the works as a result of storm water flows. A preventative approach must be adopted whereby the extent of clearance and disturbance is limited to those areas required to complete the Works. If required, the Contractor shall establish necessary storm water control mechanisms in agreement with the engineer, to effectively control the movement of water onto, through and off the construction site.

## **5.8 PROTECTION OF NATURAL FEATURES AND HERITAGE RESOURCES**

### **5.8.1 Protection of Freshwater Ecosystems**

Heavy construction vehicles should be kept out of the seasonal and ephemeral drainage channels and the movement of construction vehicles should be limited where possible to the existing roads / tracks. Contaminated runoff from the construction site should be prevented from entering the water courses as far as possible. Where pipelines cross streams, they should do so in a manner that does not impeded or divert the flow in the channels. Riparian areas disturbed should be rehabilitated, by the removal of alien vegetation where found and the re-vegetation of these disturbed zones with suitable indigenous vegetation.

The following mitigation measures are proposed for the protection of watercourses:

- Contaminated runoff from the construction site should be prevented from entering the river / water bodies as far as possible.
- Avoid the use of herbicides in the area due to the many tributaries draining the ephemeral drainage lines in the area.
- Avoid development in and destruction of the drainage lines throughout the area.
- All materials on the construction site should be properly stored.
- Disposal of waste from the sites should be properly managed.
- Construction workers should be given ablution facilities at the construction sites that are located at least 30m away from the catchment areas and regularly serviced.

### 5.8.2 Protection of Natural Systems

The Contractor shall ensure that the disturbance of vegetation and faunal communities and their habitats is kept to a minimum. The following mitigation and management measures are prescribed in this regard:

- The Contractor shall ensure that the disturbance of vegetation is kept to a minimum.
- The Contractor shall ensure that the bulldozer operators are clearly instructed and are informed about the objectives of the EMP.
- Vegetation should only be removed where it is absolutely necessary.
- Do not clear cut the entire development site, but rather keep the few individuals and/or clumps of trees/shrubs not directly affecting the developments as part of the landscaping especially important for shade in the hot climate.
- Prevent contractors from collecting wood, veld food, etc. during the construction phase.
- Show overall environmental commitment by adapting a minimalistic damage approach during the construction phase.
- Inform construction contractors/workers regarding the above mentioned issues prior to development and monitor for compliance thereof throughout.

### 5.8.3 Protection of Archaeological Sites

The proposed development site is deemed to result in a **Very-Low** to **Negligible (negative)** impact on the cultural or heritage resources due to the area being located close to catchment areas. The project management should however be made aware of the provisions of the National Heritage Act regarding the prompt reporting of archaeological finds. In the event of such finds, the project management or contractors should contact the National Heritage Council of Namibia immediately.

All earthworks equipment operators shall be informed to cease operating immediately if any artefact is unearthed and to report the finding immediately to the Engineer / ECO and Tsandi Village Council, who in turn shall notify the National Heritage Council. The Contractor shall take reasonable measures to protect any such find against further damage until its value can be properly assessed. Work in the immediate vicinity of such a find shall also be discontinued until the Engineer / ECO, and the National Heritage Council issues a clearance to recommence.

## 5.9 EXISTING AND REHABILITATION

The Contractor shall, on completion of the Contract, ensure that all materials, temporary structures, temporary fences, equipment and waste are completely removed from the Site.

For the purposes of this EMP, the landscaping and rehabilitation of disturbed areas shall entail the clearing, shaping, trimming, and scarification of the area, replacement of stockpiled topsoil where relevant, as relevant topped by randomly distributed stone and gravel surface and spraying down with water.

### 5.9.1.1 Shaping and Trimming

All slopes which do not form part of the Permanent Works shall be graded so that no slope exceeds a maximum gradient of 1:3 or as otherwise directed by the Engineer. Contour drains may be provided to control erosion where required by the Engineer. Excavation and fills shall be formed in such a manner that the final profile shall appear as a natural extension to the adjacent, undisturbed ground profiles. Trimming shall consist of bringing the existing or previously shaped ground to a smoothly flowing surface with the final levels generally following the original surface and tying in with adjacent undisturbed areas as directed by the Engineer / ECO.

## 5.10 SUMMARY OF CONSTRUCTION AND OPERATIONAL PHASE MANAGEMENT ACTIONS

The tables below are only a summary of the management actions to be taken in order to minimise negative impacts. Please turn back to the relevant section above for more detail on the various management actions to be taken for each impact.

**Table 2:** Planning Environmental Management Plan for the proposed Waste Disposal Site

Aspect	Management actions	Responsibility
Planning	<ul style="list-style-type: none"> <li>It is the duty of the responsible person to ensure that the Minimum Requirements for the operation of the landfill site are applied to the degree equal with its class to the satisfaction of the Department of Environmental Affairs.</li> <li>All construction activities within the landfill must be limited to daylight hours. Should there be a need to undertake construction at night, such will require approval from the Project Manager and the Environmental Monitoring committee be notified of such intentions.</li> </ul>	Tsandi Village Council
Appointment and Duties of ECO	<ul style="list-style-type: none"> <li>Eskom must appoint an independent Environmental Control Officer (ECO) who must monitor the contractor's compliance with the environmental management plan.</li> <li>The Eskom must provide the ECO and contractor with a copy of the EMP.</li> <li>The priority of the ECO is to maintain the integrity of the development conditions outlined in the EMP and must be enforced and adhered to at all time.</li> <li>The ECO must form part of the project management team and attend all project meetings.</li> <li>The contractor must ensure that the construction crew attend an environmental briefing and training session presented by the ECO prior to commencing activities on site.</li> </ul>	Tsandi Village Council, ECO
EMP	<ul style="list-style-type: none"> <li>This EMP must be made binding to the main contractor as well as individual contractors and should be included in tender documentation for the construction contract.</li> </ul>	Tsandi Village Council, ECO
Environmental Incidents	<ul style="list-style-type: none"> <li>The contractor must take corrective action to mitigate an incident appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves.</li> </ul>	Contractor, ECO

**Table 3: Summarized Construction Phase Management Table**

Aspect	Management Objective	Management actions	Responsibility
Responsible management	To ensure that construction activities are carried out so as to cause the least possible disturbance to the existing amenities, whether natural or man-made.	<ul style="list-style-type: none"> <li>The Contractor shall take adequate steps to educate all members of his workforce as well as his supervisory staff on the relevant environmental laws and protection requirements.</li> <li>A suitably qualified independent ECO shall be appointed by the Contractor.</li> <li>The Contractor shall construct and/or implement all the necessary environmental protection measures in each area before any construction work may proceed.</li> </ul>	Contractor
Site Establishment	To monitor unauthorised movement of construction crew.	<ul style="list-style-type: none"> <li>Any construction camp required by the contractor must be established in an area as agreed with the ECO.</li> <li>The area must be properly demarcated prior to establishment to prevent the construction camp from being unnecessarily large. The camp must be properly fenced.</li> <li>The ECO must liaise with surrounding parties to ensure that the construction camp is not located in an area where it will cause a nuisance.</li> </ul>	ECO, Contractor
Environmental awareness	To ensure that all employees and Sub-Contractors are informed of their environmental obligations.	The Environmental, Health, and Safety Induction Course should be conducted by the ECO and Contractor's Health and Safety officer.	ECO
		The foreman responsible will provide feedback to his staff on their day-to-day environmental performance and address issues requiring attention and specific actions required.	Contractor
Safety to the public	To reduce the risks posed by the project to the public.	<ul style="list-style-type: none"> <li>Where the public could be exposed to danger by any of the Works or site activities, the Contractor shall provide flagmen, barriers, and/or warning signs in Oshiwambo (native or most spoken language in the area).</li> <li>No firearms shall be permitted on site without the prior approval of the Project Manager.</li> <li>The Contractor shall implement appropriate measures to limit any adverse social impacts associated with the establishment of a construction camp and/or the accommodation of a construction workforce on the local communities.</li> <li>Ensure that only suitably qualified personnel use construction vehicles</li> <li>Site notices informing the public of the planned activities must be placed at visible locations a few days prior to any blasting.</li> <li>Based on the preferred footprint area chosen for the proposed landfill site that certain trees and vegetation may need to be removed. In this case vegetation clearing should only be done where necessary and areas not required for construction should be preserved or avoided.</li> </ul>	Contractor
Human resource and opportunities management	To ensure that job creation, inward migration of workers and accommodation of a workforce within a small community does not result in significant social impacts.	<ul style="list-style-type: none"> <li>In order to enhance the benefits of employment creation for these communities, it is recommended that the Contractor shall establish a formal and organized recruitment process in line with this EMP.</li> </ul>	Contractor



Aspect	Management Objective	Management actions	Responsibility
	Construction activities shall be restricted to specified hours in order to limit disturbance to the public.	The Contractor shall restrict construction activities to the hours of 6h30 - 17h00 during summer and 07h00 - 17h00 during winter on Mondays to Saturdays and no work will be permitted on Sundays or public holidays.	Contractor
Dust on Air Pollution	To limit dust levels.	<p>Appropriate dust control measures must be implemented.</p> <ul style="list-style-type: none"> <li>Active earth work areas, stockpiles and loads of soil being transported must be watered to reduce dust.</li> <li>Measure must be taken to immediately mitigate a situation in which excessive fugitive dust is observed. Works being undertaken must be undertaken with caution, or phase down while the source is being actively investigated and suppression measures are implemented.</li> <li>All areas disturbed during construction that are not required for a specific activity must be revegetated.</li> <li>Disturbed soils, slopes and areas of open excavation must be minimised to avoid wind erosion.</li> <li>Diesel exhaust emissions from heavy machinery on site (excavators, front end loaders and hauling trucks) must be controlled and minimised by regular checks and servicing of vehicles. Any construction vehicle found to be emitting excessive smoke should be stopped from the operations for some mechanical attention before it could continue.</li> </ul>	Contractor
Noise	To limit noise levels.	<p>Appropriate measures shall be implemented to limit noise levels.</p> <ul style="list-style-type: none"> <li>Institute noise control measures throughout the construction phase for all applicable activities, including the construction times.</li> <li>Fit efficient silencers and enclose engine compartments in plant vehicles.</li> <li>Select vehicle routes carefully by means of internalising the roads.</li> </ul>	Contractor , ECO
Erosion, water quality, surface and ground water	To prevent or remediate damage to the environment resulting from the Works in the form of erosion and sedimentation shall be taken.	<ul style="list-style-type: none"> <li>The Contractor shall take all reasonable steps to prevent or remediate damage to the environment resulting from the Works in the form of erosion and sedimentation.</li> <li>The Contractor shall immediately remedy any situation that is or has the potential to result in soil erosion, water pollution and sedimentation from the works as a result of storm water flows.</li> <li>Storm water should be managed appropriately at the culvert crossing where the pipeline are planned to go through underneath the road, so that blockage does not occur.</li> <li>All cells must be lined with an HDPE or GCL liner, or both, which will prevent the generation of leachate.</li> <li>Construction activities must preferably take place during the dry winter months. If construction activities take place in the wet months appropriate measures must be taken to control storm water and implemented to prevent erosion.</li> <li>Ensure that excavated and stockpiled soil material is stored and bermed on the higher lying areas.</li> <li>Vegetation clearance must be kept to a minimum to reduce the risk of siltation.</li> <li>Adequate provision must be made for sanitation for the construction workers. Chemical toilets on site are to be emptied weekly.</li> </ul>	Contractor, Tsandi Village Council

Aspect	Management Objective	Management actions	Responsibility
		<ul style="list-style-type: none"> <li>Construction vehicles are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants. No servicing of vehicles is to be undertaken in close proximity to watercourses.</li> <li>Construction and the use of construction machinery should be limited between 06h00 and 18h00 on weekdays. However if construction activities need to be outside of these times or on weekends, this needs to be approved by the Project Manager and the Authorities must be informed.</li> </ul>	
Removal/Stripping of vegetation	To ensure that vegetation is only cleared or removed where necessary.	<ul style="list-style-type: none"> <li>The working strip required for the construction of the landfill and Waste Storage Facility must be effectively monitored to prevent excessive vegetation removal. By maintaining the maximum amount of stabilising vegetation, the extent of erosive action will be contained.</li> <li>Should the construction phase occur in the rainy season, the erection of berms may be necessary in areas prone to erosion (e.g. steep slopes or erosive soils). These bermed areas must be monitored frequently for signs of erosion. The topsoil cleared must be retained. The topsoil contains most of the inorganic matter, decomposed organisms and nutrients, thus the removal of the topsoil constitutes a major loss in terms of ecosystem function. In order to ensure that the minimal amount of soil is removed with vegetation clearance, it is strongly advised that vegetation be harvested as close to ground level as possible before earthworks machinery is utilised.</li> </ul>	Tsandi Village Council, ECO, Contractor
Method statements	To ensure effective and formal communication between the Project Management Team and the Contractor on construction issues throughout all stages of the project	System regarding method statement compilation, submission, review and approval to be rigorously implemented.	Contractor / ECO
		Method Statements that shall be provided by the Contractor 14 days prior to the mobilisation on site include: <ul style="list-style-type: none"> <li>Mobilisation plan; and</li> <li>Operational and rehabilitation plan.</li> </ul>	Contractor / ECO
Environmental considerations pertaining to site layout	Suitable area identified where employees can eat and take work recess.	<ul style="list-style-type: none"> <li>The Contractor shall identify a suitable area, which is shaded and away from construction noise and dust, where employees can eat and take work recesses in relative comfort.</li> <li>The eating areas shall be provided with scavenger proof rubbish bins, potable water and other sanitary conveniences.</li> </ul>	Contractor
Ablution facilities	Temporary toilets shall be provided by the contractor.	<ul style="list-style-type: none"> <li>Temporary / portable toilets shall be supplied by the Contractor for the workers at a maximum ratio of 1 toilet per 15 workers and be within walking distance of the work area.</li> <li>The toilets shall be placed at appropriate locations to the approval of the Engineer / ECO.</li> <li>Toilets shall be kept in a good state of repair and shall be serviced at intervals sufficient to ensure that they are kept in clean and sanitary condition.</li> </ul>	Contractor
Site demarcation	The Contractor shall restrict all his activities, materials, equipment and personnel to the designated Site.	<ul style="list-style-type: none"> <li>The Contractor shall ensure that the clearance of vegetation is restricted only to that required to facilitate the execution of the works.</li> <li>The Contractor shall peg the route for the proposed pipeline before commencing with any clearing operations.</li> </ul>	Contractor

Aspect	Management Objective	Management actions	Responsibility
Access, traffic and haul roads	Construction traffic shall be controlled to ensure minimal disruption to normal road users.	The Contractor shall be held responsible for the control of all project related traffic, including that of his suppliers, in ensuring that vehicles associated with the project remain on designated routes and within the designated working times.	Contractor
Solid waste management	To ensure that there is no illegal disposal of waste.	<ul style="list-style-type: none"> <li>The Contractor shall provide sufficient number of rubbish bins with secured lids.</li> <li>No waste materials, including domestic, organic or construction wastes shall be burnt, dumped or buried on the Site.</li> <li>Ensure that no refuse wastes are burnt on the premises or on surrounding premises.</li> <li>No fires will be allowed on site unless in designated areas approved by the ECO.</li> <li>The construction site must be kept in a clean and orderly state at all the times.</li> <li>Ensure that no litter, refuse, wastes, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent/surrounding properties during or after the construction period of the project are disposed of at dumping site as approved by the Council.</li> </ul>	Contractor, ECO
Fuel and oil	To ensure that all liquid fuels are stored appropriately and adequate fire fighting equipment is stored on site.	<ul style="list-style-type: none"> <li>The Contractor shall ensure that all liquid fuels are stored in tanks or mobile bowsers with lids that are kept firmly shut.</li> <li>All tanks and/or mobile bowsers shall be situated in a bunded area.</li> <li>The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel storage areas.</li> </ul>	Contractor
Equipment maintenance and storage	All vehicles and equipment are kept in good working order.	<ul style="list-style-type: none"> <li>Leaking or damaged equipment shall be repaired immediately or removed from the Site.</li> <li>Drip trays shall be provided in construction areas for stationary and parked plant as well as for the emergency servicing of vehicles.</li> </ul>	Contractor
Stockpiling and stockpile areas	All plant and materials shall be stored in designated areas to minimise the disturbance to vegetation and topsoil.	<ul style="list-style-type: none"> <li>Plant and materials shall be stored within the demarcated construction camp or batching areas.</li> <li>The areas where excavated soil will be stockpiled must be bordered by berms to prevent soil loss caused by rain.</li> </ul>	Contractor
Excavation		<ul style="list-style-type: none"> <li>Topsoil must not be stockpiled for an extensive period (&gt; 3 months). This is to prevent the redundancy of the existing seed bank as well as the alteration of the soil characteristics (permeability, bulk density etc.).</li> <li>Erect signs and/or danger tape around the exposed excavations to warn the public of the inherent dangers.</li> <li>Trucks removing excavated material can cause compaction of soil if new pathways are created. Vehicles should, therefore, use existing roads. If the creation of new roads is unavoidable, these temporary roads should be ripped and re-vegetated after use.</li> <li>Ensure that excavated and stockpiled soil material is stored and bermed on the higher lying areas of the site and not in any storm water run-off channels or any other areas where it is likely to cause erosion or where water would naturally accumulate.</li> </ul>	Tsandi Village Council, ECO, Contractor

Aspect	Management Objective	Management actions	Responsibility
Materials handling, use and storage	All delivery drivers are informed of the on-site procedures and restrictions.	<ul style="list-style-type: none"> <li>The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions, including "no-go" areas and designated haul routes.</li> <li>All material shall be stored within the designated Site boundaries.</li> </ul>	Contractor
Hazardous substances	Any hazardous substances are stored appropriately.	<ul style="list-style-type: none"> <li>Hazardous chemical substances used during construction shall be stored in secondary containers.</li> <li>The relevant Material Safety Data Sheets (MSDS) shall be available on site.</li> <li>Procedures detailed in the MSDS shall be followed in the event of an emergency situation.</li> </ul>	Contractor
Cement and concrete batching	Cement and concrete batching takes place in designated areas.	<ul style="list-style-type: none"> <li>The batching of concrete shall take place on a smooth, impermeable surface (plastic) and shall be enclosed with a bund and sloped toward a sump to contain any spillages.</li> <li>The Contractor shall take all reasonable measures to prevent the spillage of cement / concrete during batching and construction operations.</li> </ul>	Contractor
Trenching	Trenches are appropriately demarcated and secured.	Trenches shall be demarcated appropriately and securely and regularly monitored to ensure that pedestrian (and vehicular) access to these areas is strictly prohibited.	Contractor
Fire control	To reduce the risk of fires	<ul style="list-style-type: none"> <li>Fires are only permitted in designated area and shall not be left unattended.</li> <li>Fire extinguishers shall be readily available.</li> <li>The Contractor shall take all reasonable and precautionary steps to ensure that uncontrolled fires are not started as a consequence of his activities on site.</li> <li>The Contractor shall ensure that all site personnel are aware of the fire risks and how to deal with any fires that occur. This shall include, but not be limited to: <ul style="list-style-type: none"> <li>Regular fire prevention talks</li> <li>Posting of regular reminders to staff.</li> </ul> </li> </ul>	Contractor
Emergency procedures	All employees are aware of emergency procedures.	<ul style="list-style-type: none"> <li>The Contractor shall ensure that his employees are aware of the procedure to be followed for dealing with leaks and spills.</li> <li>The Contractor shall ensure that the necessary materials and equipment for dealing with leaks and spills are available on Site at all times.</li> <li>The source of the spill shall be isolated and the spillage contained using sand berms, sandbags, sawdust, absorbent material and/or other materials approved by the Site Agent.</li> <li>The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/breakdown the spill.</li> <li>The Contractor shall notify the relevant authorities of any spills that occurs.</li> <li>If potentially hazardous substances are to be stored on site, the Contractor shall provide a Method Statement detailing the substances/materials to be used together with the procedures for the storage, handling and disposal of the materials in a manner which will reduce the risk of pollution that may occur from day to day storage, handling, use and/or from accidental release of any hazardous substances</li> </ul>	Contractor

Aspect	Management Objective	Management actions	Responsibility
		<p>used.</p> <ul style="list-style-type: none"> <li>The relevant Material Safety Data Sheets (MSDS) shall be available on Site. Procedures detailed in the MSDS shall be followed in the event of an emergency situation.</li> <li>Hazardous chemical substances used during construction shall be stored in secondary containers.</li> <li>The Contractor must ensure that all hazardous chemical substances are labelled, packed, transported and stored in order to avoid the spread of contamination.</li> </ul>	
Protection of natural systems and archaeological sites.	Impacts to natural systems are kept to a minimum.	<ul style="list-style-type: none"> <li>Disturbance of vegetation and faunal communities and their habitats is kept to a minimum.</li> <li>Heavy construction vehicles should be kept out of the seasonal and ephemeral stream channels and the movement of construction vehicles should be limited where possible to the existing roads.</li> <li>All earthworks equipment operators shall be informed to cease operating immediately if any artefact is unearthed and to report the finding immediately to the Engineer / ECO and Tsandi Village Council, who in turn shall notify the National Heritage Council.</li> <li>Under no circumstances shall archaeological artefacts be removed, destroyed or interfered.</li> </ul>	Contractor, ECO
Rehabilitation	On completion of the Contract all materials, temporary structures, temporary fences, plant, equipment and waste are completely removed from the Site.	<ul style="list-style-type: none"> <li>Rehabilitation operations and re-vegetation of all disturbed areas shall commence as soon as possible and even run concurrently where appropriate.</li> </ul>	Contractor, ECO
Penalties	To ensure that environmental requirements are strictly adhered to.	Penalties will be issues for certain specified transgressions.	Contractor

**Table 4: Summarized Operational Phase Management Table**

Aspect	Management actions	Responsibility
General	<ul style="list-style-type: none"> <li>• A maintenance plan for the landfill site must be developed to ensuring that good working order is achieved.</li> </ul>	Tsandi Village Council
Monitoring	<ul style="list-style-type: none"> <li>• A monitoring and eradication programme should be put in place whereby the distribution and abundance of alien and invader fauna are monitored through fixed trapping points.</li> </ul>	Tsandi Village Council
Waste composition, inventory and inspection	<ul style="list-style-type: none"> <li>• Landfill operator must ensure that a register is kept throughout the life of the facility of the quantities and characteristics of the deposited.</li> <li>• Information on waste register must include the origin of waste, type of waste, date of delivery, identification of the producer or collector.</li> <li>• Regular visual inspection of the waste at the point of deposit should be undertaken to ensure that waste is properly sorted/separated at the site.</li> </ul>	Tsandi Village Council
Management of landfill gas and odours	<ul style="list-style-type: none"> <li>• Emission rates must be reduced by limiting the extent of uncapped areas on non operational areas of the site.</li> <li>• Accidental fires on landfills where burning is not permitted must be extinguished immediately. Appropriate operational procedures involving the spreading and smothering of burning waste, rather than the application of water, must be implemented.</li> <li>• An area or cell should be regularly covered with temporary cover material to reduce gas emissions from the area. The prompt covering of malodorous waste to reduce odour problems is a Minimum Requirement. In extreme cases, odour suppressants such as spray curtains may be required.</li> </ul>	Contractor, Tsandi Village Council
Requirements for Waste Management and Collection Contractors	<ul style="list-style-type: none"> <li>• General waste shall be collected by a recognised service provider and be disposed off in registered waste site.</li> <li>• Recyclable waste shall be collected by a recognised recycling service provider for appropriate recycling purposes.</li> <li>• Scrap metals, steel, and glass must be collected in separate waste skips and each container intended for identified recyclable waste must be clearly marked, i.e. scrap metals only.</li> </ul>	Tsandi Village Council
Health and Safety	<ul style="list-style-type: none"> <li>• An emergency plan (including fire management) must be developed and implemented; the relevant authority must approve this plan.</li> <li>• Ensure that all fire extinguishers are replaced on or before their expiry dates.</li> <li>• Site Safety checks should be carried out in accordance with the pertinent Occupational Health and Safety requirements prior to site closure.</li> </ul>	Tsandi Village Council, Contractor
Stormwater Management	<ul style="list-style-type: none"> <li>• Storm water, wherever possible, must be allowed to soak into the land in the area on which the water has been discharged.</li> </ul>	Tsandi Village Council

Aspect	Management actions	Responsibility
	<ul style="list-style-type: none"> <li>In the event that silt runoff occurs off the development site, the cause of this must be investigated and suitable mitigation measures employed. This may include the</li> <li>vegetation of bare areas, installing flow diversion channels in consultation with an engineer, installing velocity reducing structures etc.</li> </ul>	
Penalties	Penalties will be issues for certain specified transgressions.	Contractor

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## 6 DECOMMISSIONING PHASE

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Given the nature and purpose of the infrastructure, it is unlikely that this infrastructure will be decommissioned in the foreseeable future. In the unlikely event that use of the infrastructure is discontinued by Tsandi Village Council, the infrastructure should be “mothballed” or made available or sold to the surrounding land users. Removal of the infrastructure is likely to cause more environmental harm than its abandonment.



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## 7 CONCLUSION

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In conclusion it should be noted that this EMP should be regarded as a living document and changes should be made to the EMP as required by project evolution while retaining the underlying principles and objectives on which the document is based.

The compilation of the EMP has incorporated impacts and mitigation measures from the Environmental Assessment Report, as well as incorporating principles of best practice in terms of environmental management.

In addition, provided this project is mitigated, as per the EMP, the project will result in impacts that should not negatively affect the environment. It is the applicant's responsibility to ensure that this EMP is made binding on the contractor by including the EMP in the contract documentation. The contractor should thoroughly familiarise himself with the requirements of the EMP and appoint an environmental Control Officer (ECO) to oversee the implementation of the EMP on a day-to-day basis.

Parties responsible for transgression of this EMP should be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour/negligence should receive penalties.

# **APPENDIX A**

## **Curriculum Vitae of Environmental Assessment Practitioner**

# **APPENDIX B**

## **Generic Method Statement Example**

## **INFORMATION ON METHOD STATEMENTS**

Method Statements are to be completed by the person undertaking the work (i.e. the Contractor). The Method Statement will enable the potential negative environmental impacts associated with the proposed activity to be assessed and potentially significant environmental aspects mitigated at the planning stage.

The Method Statement can only be implemented once approved by the ECO.

The Contractor (and, where relevant, any Sub-Contractors) must also sign the Method Statement, thereby indicating that the works will be carried out according to the methodology contained in the approved Method Statement.

The ECO will use the Method Statement to audit compliance by the Contractor with the requirements of the approved Method Statement.

Changes to the way the works are to be carried out must be reflected by amendments to the original approved Method Statement; amendments require the signature of the ECO, denoting that the changed methodology or works are necessary for the successful completion of the works, and are environmentally acceptable. The Contractor will also be required to sign the amended Method Statement thereby committing him/herself to the amended Method Statement.

This Method Statement **MUST** contain sufficient information and detail to enable the ECO to apply their minds to the potential impacts of the works on the environment. The Contractor will also need to thoroughly understand what is required of him/her in order to undertake the works. A method statement should clearly answer to following:

- What does the activity entail;
- Why is the activity required;
- When will it commence and how long;
- Where will the activity be undertaken;
- How will the activity be undertaken
  - What equipment and machinery will be required;
  - What materials (Chemicals) will be used in the process;
- What are the potential environmental, health and safety concerns associated with this activity and what mitigation measures will be employed to manage these risks.

The time taken to provide a thorough, detailed method statement is time well spent. Insufficient detail will result in delays to the works while the method statement is rewritten to ECO's satisfaction. The page overleaf provides a pro forma method statement sheet, which needs to be completed for each activity requiring a method statement in terms of the EMP.

**EXAMPLE OF METHOD STATEMENT**

CONTRACT: ..... DATE: .....

PROPOSED ACTIVITY (give title of Method Statement and reference number):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

**Start Date:**

**End Date:**

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated maps and plans where possible): Note: please attach extra pages if more space is required

## DECLARATIONS

### 1) ENVIRONMENTAL CONTROL OFFICER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

\_\_\_\_\_  
*(Signed)*

\_\_\_\_\_  
*(Print name)*

\_\_\_\_\_  
*(Signed)*

\_\_\_\_\_  
*(Print name)*

**Date:** \_\_\_\_\_

### 2) PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ECO will audit my compliance with the contents of this Method Statement:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
*(Signed)*

\_\_\_\_\_  
*(Print name)*

**Date:** \_\_\_\_\_

### 3) ENGINEER

The works described in this Method Statement are approved:

\_\_\_\_\_  
*(Signed)*

\_\_\_\_\_  
*(Print name)*

**Date:** \_\_\_\_\_

### 4) APPROVING AUTHORITY

The works described in this Method Statement are approved:

\_\_\_\_\_  
*(Signed)*

\_\_\_\_\_  
*(Print name)*

**Date:** \_\_\_\_\_

**APPENDIX C: AN EXAMPLE OF INCIDENT AND ENVIRONMENTAL LOG**

<b>ENVIRONMENTAL INCIDENT LOG</b>				
<b>Date</b>	<b>Env. Condition</b>	<b>Comments</b>	<b>Corrective Action Taken</b> <i>(Give details and attach documentation as far as possible)</i>	<b>signature</b>

## **APPENDIX D: EXAMPLE OF WASTE COLLECTION REGISTERS**

<b>Site</b>	<b>Time</b>	<b>Supplier Details</b>	<b>Waste Type</b>	<b>Approximate Quantities</b>	<b>Responsible Persons</b>	<b>Signature (Supplier)</b>