

**WALVIS BAY CEMETERY**

**DRAFT ENVIRONMENTAL MANAGEMENT PLAN  
WALVIS BAY CEMETERY**

**FOR**

**MUNICIPALITY OF WALVIS BAY**

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## Document Controls

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# 1 INTRODUCTION

The Municipality of Walvis Bay through the Section: Parks and Cemeteries has the responsibility to plan and manage the establishment and maintenance of enough grave spaces within the town of Walvis Bay. The cemeteries are run operated under the guidance of the Municipality of Walvis Bay: Cemetery Regulations which were gazetted in March 2001 (Annexure 1). Currently, the town of Walvis Bay is served with three cemeteries operated by the Council. These cemeteries are strategically located to serve different suburbs; Kuisebmond, Narraville and Walvis Bay (town).

Cemeteries bring families together and are known to have the following importance for the community:

- **A connection between families:** Cemeteries can hold deep significance for families with loved ones buried in the area. Local cemeteries help offer a space that brings comfort to families as they struggle with their grief while remembering loved ones. It can provide a serene environment in which to place flowers on important occasions and to spend time speaking on a spiritual level with the person that has passed.
- **A location of memorial for the deceased:** Beyond their functional value as an area in which to place people after they've passed, cemeteries can act as a place of memorial. They can become the host of ritual events for families and post-funeral events, allowing the family to give their loved one a respectful and dignified burial process at the end of their life. A cemetery therefore holds great significance to communities and their values.

As per the Environmental Management Act (EMA), No.7 of 2007 and its 2012 Environmental Impact Assessment (EIA) Regulations all existing cemeteries are required to have an Environmental Management Plan (EMP) for their existing operations. This document describes the current operations at the Walvis Bay Cemetery and recommend remedial measures to be followed for continual improvement.

## 2 SITE DESCRIPTION

### 2.1 Site location

The Walvis Bay Cemetery is located at on Portion 196, Rikumbi Kandanga Road. The cemetery covers an area of 38 604.8 m<sup>2</sup>.



### 2.2 Climate

Walvis Bay is situated in the most arid part of the Namib Desert. The climate is characterized by mild summers and cool winters, with average minimum and maximum temperatures ranging between 10°C and 24°C. The cold water Benguela system along the coast has a moderating effect on the coastal climate.

Fog is a common occurrence in the central coastal Namib, often providing the only source of moisture. In spring and summer sea breezes move moisture inland, resulting in the formation of fog early and late in the day. In winter the fog is more the result of moist oceanic air blowing on shore.

Walvis Bay experiences small amounts of summer convective rainfall from the north and east, and winter frontal storms from the south. This results in highly variable, normally very low, seasonal rainfall in the area. The long term mean annual rainfall for Walvis Bay is less than

20 mm per annum, with annual totals ranging from 0 mm to 100 mm (Municipality of Walvis Bay, 2008).

Annual evaporation in the area is fairly high and evenly spread throughout the year. Although the evaporation is reduced by fog and low mean daily temperature range, the high mean wind speed increases the evaporation considerably. With minimal rainfall, most of the waste stream is expected to dry out, rather than decomposing.

Wind is an important environmental factor in the Walvis Bay area, particularly in the migration of sand dunes. There are predominantly two wind trends namely: (1) high velocity and high frequency south to southeasterly winds during the year but with extremes in September to December, and (2) high velocity and low frequency east to northeasterly winds predominantly during winter. Dust storms/sandstorms are common and not viewed as inclement weather.

### **2.3 Topography and drainage**

The Central Namibia is essentially a flat plain with a gradual 1% gradient in elevation from the coast up to the foot of escarpment. Despite several river valleys, inselbergs, and dunes, there are no major landscape features that would influence the macro-climate between oceans and escarpment (Eckhardt et al., 2013).

Locally, the subject site is located within the Coastal Plain region of the Namib which is an extensive, low-relief area that is bounded by the sea on one side and by some type of relatively high-relief sand dunes on the landward side.

### **2.4 Geology and soils**

The geology underlying the Namib Desert consists of Precambrian basement with granite, gneiss and shale. The oldest Tertiary rocks are part of the Tsondab-Sandstone-Formation, which underlies most of the central Namib south of the Kuiseb. North of the Kuiseb a flat gravel plain on a crystalline basement is found. The underlying rocks consist of calcareous and gypsic metamorphic bedrock or granite.

The dune area south of the Kuiseb River reaches 100 km inland from the Atlantic Ocean and ranges from Lüderitz in South of Namibia nearly to Walvis Bay. In addition to the Precambrian basement, paleochannels have been identified, which are incised in the Tsondab Sandstone and the basement. According to Klaus et.al (2008), the paleochannels are filled with a 40 – 90 m thick layer of calcareous silty fine sands and covered by up to 100 m of sand dunes. The movement of the sand dunes is also said to be contributing to the development of the different

paleochannels by forcing the Kuiseb River to repeatedly change its course to develop new flow pathways.

Along the coast from Walvis Bay to Ugabmund, halomorphic soils such as solonchaks prevail. Solonchaks are soils with a high content of soluble salts; they are usually of light colour and have no structure. As a consequence, solonchaks only develop under salt-tolerant vegetation; they are characterised by poor drainage and seepage from the sea. South of Walvis Bay, in the domain of the Namib Sand Sea, soil formation is extremely limited to littoral sands representing arenosols. They have a low water-retaining capacity and are extremely sensitive to wind erosion.

## **2.5 Water resources**

### **2.5.1 Surface water**

In terms of hydrology, area of Walvis Bay and surroundings is overrun by the ephemeral Kuiseb River that is dry for most of the years. According to topographic map interpretation, the direction of groundwater in the vicinity of the project is inferred to flow toward the west (seaward). Run-off is generated predominantly in the upper part of the catchment. Only if enough volume of run-off is generated, flow reaches the Lower Kuiseb area. The flash floods are relatively short and highly variable in magnitude, duration and frequency. Between 1837 and 1984, the Kuiseb flow reached the Atlantic Sea only 15 times, which comes to an average once every 10 years (GCS Water & Environmental Consultants, 2018 after SLR Namibia, 2014a).

The only visible surface water is the semi purified effluent water which is being discharged about 150 m eastern side of the cemetery.

The Walvis Bay Birds Paradise is a prominent feature which is immediately east of town at the municipal sewage-purification works, which consists of a series of shallow artificial pools, fringed by reeds. It lies 500m east of town, off the C14 towards Rooikop airport. As with both other local wetlands, the Birds Paradise is used for nature walks and bird watching.

### **2.5.2 Ground water**

The groundwater gradient is fairly flat, and it is generally in a north-north-westerly direction away from the fresh water portion of the aquifer, and following the direction of the old Kuiseb River course. Treated sewage effluent from liquid waste disposal wetlands, however, contributes to recharge and produce a north westerly groundwater flow beneath the site. Any

contamination from the cemetery would therefore move away from the aquifer towards the sea.

Possible future abstraction from the Dorop North aquifer could reverse the ground water gradient towards the aquifer, although it is believed that the saline wedge would reach the abstraction wells before any contamination from the waste site. However, it would appear that abstraction of groundwater from the Dorop North aquifer is extremely unlikely on account of its poor water quality and since recharging of the aquifer appears to be inhibited due to the contaminants from the Rooibank flood protection wall in the Kuiseb River.

In the unlikely event that contamination of groundwater from the facility should occur as a result of liner failure, poor operation and etc., the effects of such contamination is not considered to be of extreme significance because of poor quality of the regional groundwater and its gradient away from the Dorop North aquifer towards the sea and the small volume of water involved due to the minimal rainfall in the area.

## **2.6 Socio economic factors**

Cemeteries bring families together and are known to have the following importance for the community:

- **A connection between families:** Cemeteries can hold deep significance for families with loved ones buried in the area. Local cemeteries help offer a space that brings comfort to families as they struggle with their grief while remembering loved ones. It can provide a serene environment in which to place flowers on important occasions and to spend time speaking on a spiritual level with the person that has passed.
- **A location of memorial for the deceased:** Beyond their functional value as an area in which to place people after they've passed, cemeteries can act as a place of memorial. They can become the host of ritual events for families and post-funeral events, allowing the family to give their loved one a respectful and dignified burial process at the end of their life. A cemetery therefore holds great significance to communities and their values.



## **3 CURRENT OPERATIONS AT THE WALVIS BAY CEMETERY**

### **3.1 Site facilities**

The Walvis Bay Cemetery currently has a wall of remembrance, burial ground and an ablution block. The ablution block is connected to a local septic tank. There is no electrical connection. There are no other service lines except one freshwater pipeline that is running across. The site is accessed from Rikumbi Kandanga Road through an entrance gate.

The burial ground is demarcated into two sections. One is for the Bahai Faith and the other one is for the general Christian community.

### **3.2 Reservation of grave spaces**

Grave space can be reserved upon purchase of the exclusive grave space. According to the Municipal Cemetery Regulations, these exclusive rights should be renewed after every 10 years upon payment of the prescribed fees.

### **3.3 Preparation of graves and burial**

The graves are prepared on client request upon payment of a fee. Digging and closing of graves is done by the municipal team consisting of five staff members.

There are different types of graves namely with different dimension of a kerb or bordering of a grave space. According to the municipal regulations, the dimension for different graves spaces shall be as follows:

- (a) Adult grave: 2.20m x 1.10 m
- (b) Child grave: 1.50m x 0.75 m

The dimensions of the aperture (opening hole) for any grave or niche shall be as follows (Municipality of Walvis Bay Cemetery Regulations, 2001)

- a) Graves:
  - i) For adults –  
Length: 2.10 m  
Width : 0.90 m  
Depth; 1.80 m
  - ii) For children –

Length: 1.50 m

Width: 0.60 m

Depth: 1.50 m

b) Niches:-

Height: 0.50 m

Width: 0.30 m

Depth: 0.50 m

### **3.4 Waste management**

There are different kinds of waste generated at the cemeteries, building rubble from construction of graves, garden refuse and general litter. The cemetery has two refuse bins for general wastes. Waste collection is done by the municipal Lorry Crew on a daily basis.

### **3.5 Maintenance**

General maintenance is done by the municipal team and it includes the following:

- Planting and pruning of trees
- Watering the plants
- Trimming of grass

## **4 MANAGEMENT AND REMEDIAL MEASURES**

### **4.1 Introduction**

The potential environmental impacts associated with the continuous development and operation of this cemetery were identified through years of operation experiences. This entire Cemetery Environmental Management Plan (CEMP) was thus developed based on operational experiences and confirmed through a top desk environmental assessment. The Municipality thus considered the environmental impacts and required mitigation measures for upgrading and development of the existing site into an environmentally acceptable cemetery. The objectives of this site-specific CEMP are therefore to:

- Summarise the negative impacts that were identified
- List the associated management actions necessary to minimize negative impacts
- Identify responsible person/ party for implementing the required actions, in this case being the Parks and Cemetery Section of the Municipality of Walvis Bay.
- Identify monitoring requirements to ensure the management actions are implemented.

This entire Draft CEMP also fulfils the minimum requirements in terms of clause 8(j) of the national Environmental Impact Assessment Regulations.

### **4.2 Overriding Management Recommendations**

Several environmental considerations and potential impacts that will be dealt with by way of ongoing management actions which are listed below.

#### **4.2.1 Concerning adherence to the cemetery regulations**

The Municipality of Walvis Bay need to adhere to its own regulations as attached in Annexure1.

#### **4.2.2 Concerning grave space**

Demarcation for grave spaces needs to be improved. Currently demarcation is being done manually one by one and on the day when it is required. This process is not accurate and results into wastage of space. The whole cemetery need to be surveyed and demarcated with pins at dimensions as prescribed in the regulations. This will lead to optimization of space available.

Demarcation of roads also need to be improved. Currently the road is unnecessarily wide and taking up space. Roads can be demarcated during the land surveying exercise.

### **4.2.3 Concerning access to the cemetery**

Although the municipal cemetery regulations prescribe that the hours of admission to a cemetery is from 07:00 until 19:00 and no person may at any time between the hours 19:00 and 07:00 enter a cemetery or linger there unless with the written consent of an authorized person. These regulations are currently not being enforced. The cemetery has two lockable gates which are however open 24/7, members of the public still enter at any given time and this leads to vandalism.

In order to avoid vandalism and unwanted entry, the gates should be locked and there is a need for a security guard during the night.

Well defined, single access roads shall be established, maintained and used throughout the life of the site

### **4.2.4 Concerning grave register**

An up to date register for all the graves should be kept.

### **4.2.5 Concerning waste management**

Uncontrolled access leads to littering. In order to avoid vandalism and unwanted entry, the gates should be locked and there is a need for a security guard during the night.

### **4.2.6 Concerning geohydrological conditions**

Continue with proper stabilization of ground as prescribed in the regulations.

### **4.2.7 Maintenance of cemetery after closure**

Cemeteries do not necessarily require decommissioning, but rather closure when they reach full capacity. Therefore, when the Walvis Bay Cemetery reaches capacity in future, the Municipality will have to close it and look for a new site.

In case of closure, the following should be done:

- Arrangements for a new cemetery should be done well in time before this cemetery reaches full capacity.
- Maintenance (cleaning) should continue even after closure.
- Budget for an EIA for a new cemetery well in advance.
- Appoint a suitable EAP to conduct the EIA.

## 5 REFERENCES

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