# ENVIRONMENTAL MANAGEMENT PLAN
# FOR
# CENTRAL NORTH WATER SUPPLY AREA: ZONE 8

Document Type: **Updated Environmental Management Plan**

Document Version: **Final for Submission**

ECC Application No: **240906004670**


| | |
|---|---|
| Author: **Fillemon Aupokolo**<br>Company: **Namibia Water Corporation Ltd**<br>Telephone: **+264 813253 301 / +264 61 712095**<br>Postal Address: **Private Bag 13389, Windhoek, Namibia**<br>Email : **AupokoloF@namwater.com.na** | Proponent: **Namibia Water Corporation Ltd**<br>Contact Person: **Jolanda Kamburona**<br>Telephone: **+264 81 144 1528 / +264 61 712105**<br>Postal Address: **Private Bag 13389, Windhoek, Namibia**<br>Email : **KamburonaJ@namwater.com.na** |


**EAP Signature** **Proponent**

**July 2024**

Table of Contents

## LIST OF ABBREVIATIONS

| | |
|---|---|
| **AIDS** | Acquired Immune Deficiency Syndrome |
| **CoC** | Code of Conduct |
| **DEA** | Directorate of Environmental Affairs |
| **EMA** | Environmental Management Act |
| **EMP** | Environmental Management Plan |
| **HIV** | Human Immunodeficiency Virus |
| **I&AP** | Interested and Affected Parties |
| **MEFT** | Ministry of Environment Forest and Tourism |
| **NEM** | NamWater Environmental Manager |
| **MSDS** | Material Safety Data Sheet |
| **NWQG** | Namibian Water Quality Guidelines |
| **NWQS** | Namibian Water Quality Standards |
| **STI's** | Sexually Transmitted Infections |
| **WTW** | Water Treatment Works |

## 1. PURPOSE OF THE EMP

This Environmental Management Plan (EMP) has been compiled for the management of potential environmental impacts during the operation, and decommissioning phases of the proposed Central North Water Supply Area (CNWSA): Zone 8 Water Supply Scheme. Best practice is proposed for the generic issues of construction management and supervision as well as the on-going management and operation of the pipeline.

In terms of the Environmental Assessment Policy of 1994 and the Environmental Management (Act No 7 of 2007) (EMA), the activities required for the construction of the proposed project requires authorization from the Directorate of Environmental Affairs at the Ministry of Environmental, Forestry and Tourism (MEFT: DEA).

An Environmental Clearance Certificate (ECC) was originally issued in 2021 and this EMP serves as an application for the renewal of the ECC.

## 2. INTRODUCTION

The CNWSA is located in the North Central area of Namibia, and covers areas of the Oshikoto, Omusati, Oshana and Ohangwena Regions. CNWSA infrastructure components have been divided into 8 separate zones.

CNWSA Zone 8 infrastructure consists of the following pump stations: Ondangwa, Oshitayi, Oshigambo, Onandjokwe, Oshali, Onayena, Okatope and Onembenge, Omuthiya. The Oshivelo – Omutsegwonime–Okankolo Rural Water Supply Scheme also forms part of the infrastructure of Zone 8.

Reservoirs are located at all of the abovementioned pump stations with the exception of Onembenge Pump Station. The urban centres of Ondangwa, Omuthiya, Onayena, Onethindi, Oniipa and Oshigambo are located in CNWSA Zone 8.

The location of Water Supply Zone 8 is depicted in **Figure 1.**
The EMP is for an existing Water Supply Zone 8 and it is therefore only for the operation and maintenance of the Zone.

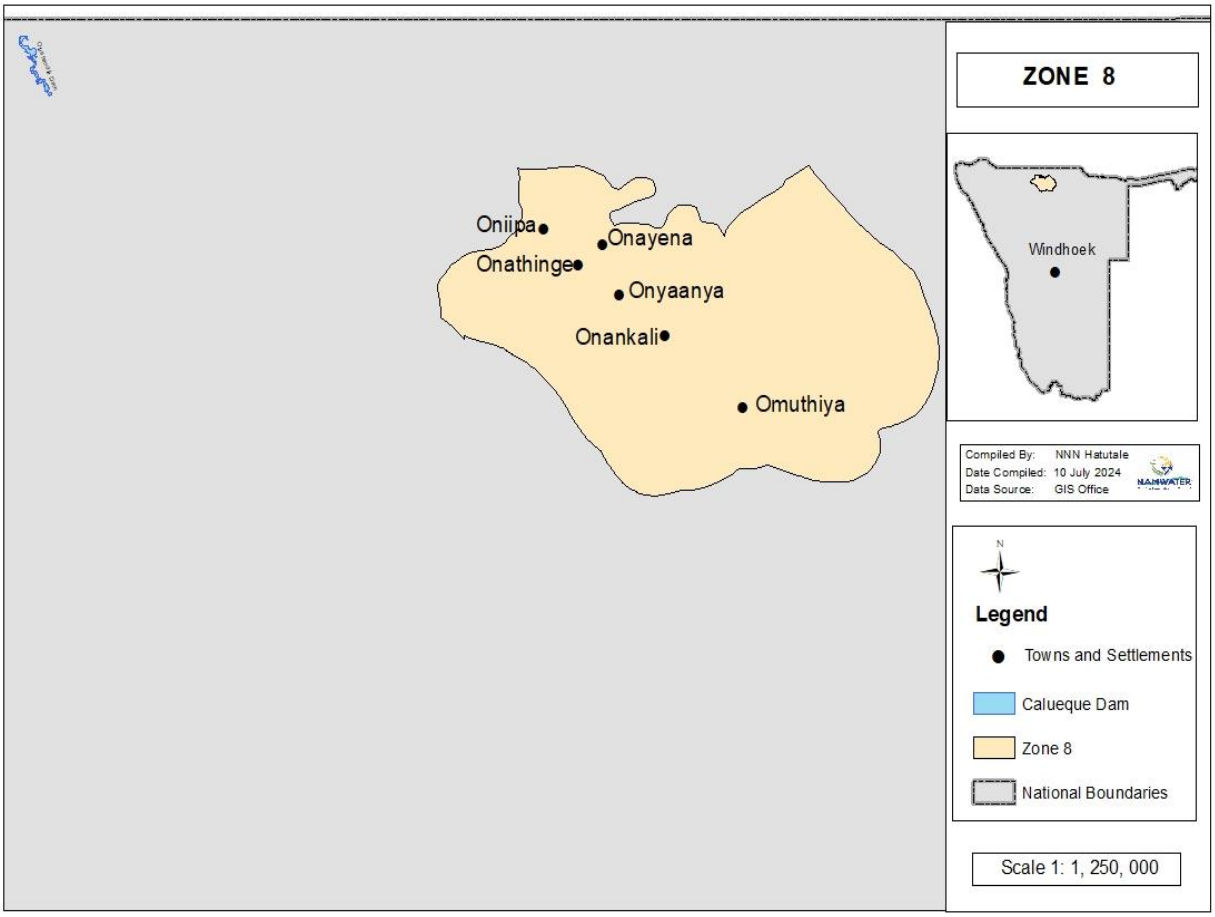


**Figure 1: Water Supply Zone 8 Location Map**

# 3. EXISTING CNWSA: ZONE 8 WATER SUPPLY INFRASTRUCTURE

## 3.1. Water Source

### 3.1.1 Oshakati Purification Plant

Ondangwa Pump Station is the source of water supply for Zone 8, from where water is pumped northwards to Iindangungu and hence to Oshitayi and Oshigambo and in a south easterly direction to supply numerous schemes between Ondangwa and Omutsegwonime.

Water is supplied to Ondangwa from Oshakati, via either the new or old pipelines. The new pipeline delivers water into a 5 000 $m^3$ concrete ground level reservoir. The old pipeline supplies water either to the 63 000 $m^3$ dam or a 9 000 $m^3$ concrete ground level reservoir.

A schematic layout of the existing infrastructure is indicated in **Figure 2** below

## 3.2. Water Quality and Disinfection

The quality of water supplied to the pump station was evaluated for compliance with the Namibian Water Quality Guidelines (NWQG) and the Namibian Water Quality Standards (NWQS).

According to the NWQG the water can be classified in group A and B.

## 3.3. Pipework

### 3.3.1 Ondangwa-Iindangungu Pipeline

This pipeline is approximately 10.6 km long which runs from the Namwater pump station in Ondangwa in a northerly direction to the eastern side of the B1 road between Ondangwa and Oshikango, to terminate at the NamWater Pump Station in Iindangungu. Water meter installations on this route include Directorate of Rural Water Supply (DRWS) water points and private water meter installations.

### 3.3.2 Iindangungu-Oshigambo Pipeline

The pipeline is 11 km in length this pipeline starts at the NamWater pump station in Iindangungu, and runs eastwards to terminate at the NamWater pump station in Oshigambo. There is only one DRWS water point connected to this pipeline, while there are numerous private water meter connections.

### 3.3.3 Oshitayi-Okamanya Pipeline

This pipeline is approximately 5.6 km long. This pipeline branches off the Ondangwa–Iindangungu Pipeline and follows an easterly direction to the NamWater pump station at Oshitayi,

from where it turns in a northerly direction to terminate in the vicinity of the village of Okamanya. The pipeline primarily supplies private water meter installations.

### 3.3.4 Onethindi-Onandjokwe Pipeline

The pipeline is approximately 3.1 km in length. This pipeline branches off the Ondangwa–Omutsegwonime Pipeline at the village of Onethindi, and terminates at the NamWater pump station in Onandjokwe. There are only private water meter installations on this pipeline.

### 3.3.5 Ondangwa - Omutsegwonime Pipeline

This pipeline is roughly 108 km in length. This pipeline runs parallel to the B1 road from Ondangwa to Oshivelo. Starting at NamWater's Ondangwa Pump Station, it follows a route through Ondangwa Town, through Oluno, south eastwards up to the village of Omutsegwonime. There are a few branch lines and several DRWS water points connected directly to the pipeline.

### 3.3.6 Onethinge-Onayena Pipeline

The pipeline is 9.3 km long, this pipeline branches off the Ondangwa – Omutsegwonime Pipeline at the village of Onethinge, and terminates at the NamWater pump station in Onayena. Some DRWS water points are connected to this pipeline, but in most cases clusters of private water meter installations were identified.

### 3.3.7 Onayena-Okankolo Pipeline

This line is approximately 24.4 km long. This pipeline runs south of the gravel road between Onayena and Okankolo. There are several DRWS pipelines branching off this pipeline, a few DRWS water points, and numerous private water meters.

### 3.3.8 Okatope-Okankolo Pipeline

The pipeline is about 22.3 km in length, this pipeline branches off the Ondangwa – Omutsegwonime Pipeline downstream of the Okatope Pump Station, and follows a north–easterly route, terminating at Okankolo. There are a few DRWS water points and livestock water points connected to this pipeline.

### 3.3.9 Onayena- Iikokola Pipeline

This pipeline is 13.3 km long, starting at the NamWater pump station in Onayena, this pipeline runs in a north-easterly direction to Iikokola. There are several DRWS branch lines connected to the line, as well as numerous private water meters.

### 3.3.10 Ondangwa-Omuntele Pipeline

The pipeline is approximately 48 km long, The Ondangwa – Omuntele Pipeline commences at the NamWater pump station in Ondangwa and follows a southerly direction, turning southwest to end at a connection manhole near Omuntele. This pipeline has several DRWS branch lines connected to it, as well as a number of DRWS water points

### 3.3.11 Okatope-Omuntele Pipeline

This pipeline is 14.2 km long, this pipeline branches off the Ondangwa – Omutsegwonime Pipeline downstream of the Okatope Pump Station. The pipeline runs in a south-westerly direction to end at a connection manhole near Omuntele. There are a few DRWS water points drawing water from this pipeline, but the majority of water meter installations are for private users.

### 3.3.12 Omuthiya-Ambende Pipeline

The pipeline is approximately 17.4 km long; this pipeline is fed by the NamWater pump station in Omuthiya. From Omuthiya, the pipeline runs in a westerly direction up to Ambende village. There are numerous DRWS branch lines off this pipeline, as well as several private water meter installations.

### 3.3.13 Ambende-Omuntele Pipeline

This portion of the pipeline is about 12.5 km in length Ambende – Omuntele Pipeline is connected to the Omuthiya – Ambende Pipeline. Several branch lines are connected to this pipeline, as well as a number of DRWS water points. In addition, there are also numerous private water meter installations along the pipeline.

## 3.4. Reservoirs

| Reservoir Name or Location | Reservoir Type and Configuration | Nominal Capacity ($m^3$) |
|---|---|---|
| **Okatope** | Reinforced concrete GLR | 2 250 |
| **Akazulu** | Pressed steel ER | 100 |
| **Omutsegwonime** | Pressed steel ER | 40 |
| **Omuthiya** | Reinforced concrete GLR | 3 000 |
| **Omuthiya** | Pressed steel ER | 100 |
| **Onankali** | Pressed steel ER | 60 |
| **Onandjokwe** | Pressed steel GLR | 1 000 |
| **Onandjokwe** | 4 x 10$m^3$ Plastic tanks, ER | 40 |
| **Onayena** | Pressed steel GLR | 420 |
| **Onayena** | Pressed steel ER | 55 |

| | | |
|---|---|---|
| **Ondangwa** | Reinforced concrete GLR | 4 850 |
| **Ondangwa** | Reinforced concrete GLR | 5 000 |
| **Ondangwa** | Pressed steel ER | 200 |
| **Ondangwa** | Pressed steel ER | 180 |
| **Onembenge** | Pressed steel ER | 100 |
| **Onyuulaye** | Pressed steel ER | 50 |
| **Oshali** | Reinforced concrete GLR | 2 250 |
| **Oshigambo** | Pressed steel GLR | 330 |
| **Oshigambo** | Pressed steel ER | 104 |
| **Oshitayi** | Pressed steel GLR | 124 |
| **Oshitayi** | Pressed steel ER | 55 |

### 3.5. Power Supply and Control Systems

#### 3.5.1 Ondangwa Premises

Water is supplied to Ondangwa from Oshakati, via either the new or old pipelines. The new pipeline delivers water into a 5 000 $m^3$ concrete ground level reservoir. The old pipeline supplies water either to the 63 000 $m^3$ dam or a 9 000 $m^3$ concrete ground level reservoir.

These two pump stations, via various connecting pipelines, supply water to Omuntele, the Ondangwa – Omutsegwonime Pipeline, Oluno, Onandjokwe, and Ondangwa Town and to Iindangungu.

The main power supply to the premises is via a 1 250 kVA circuit breaker situated in a new 11 000/400 V, 1 MVA mini substation.

#### 3.5.2 Omuntele Pump Station (Supply to Omuntele and Iindangungu)

The station consists of five pumps. The pump sets are variable speed driven and are controlled via pressure sensors, an electro-magnetic flow meter and by measuring the reservoir levels at Ondangwa and Iindangungu. The speed of the pumps increases with increasing flow and loss of pressure in the pipeline.

These five pumps consist of three KSB ETA 80-315 units and two KSB ETA 125-400 units. The former are driven by three 18.5 kW, 380 V, WEG, TEFC-type electrical motors, whilst the latter are driven by two 37 kW, 380 V, WEG, and TEFC-type electrical motors.

The main power supply to the pump station is via the new 1 MVA mini substation that supplies power to the Ondangwa premises. A 250 A TP main isolator is installed in the control panel of the pump station.

### 3.5.3 South East Pump Station- (supply to Iindangungu, Ondangwa Town, Onandjokwe, Oluno and the Ondangwa – Omustegwonime Pipeline)

The south east pump station is equipped with three pumps, the pumps are KSB Omega 150-460 units, driven by 90 kW, 400 V, Alstom TEFC-type electrical motors running up to 1 480 rpm. The pump sets are variable speed driven and are controlled via pressure sensors, an electro-magnetic flow meter and by measuring the reservoir levels at the elevated reservoirs in Ondangwa, Oshali and Iindangungu. The speed of the pumps increases with the increasing flow and loss of pressure in the pipeline

The main power supply to the pump station is via the new 1 MVA mini substation that supplies power to the Ondangwa premises. A telemetry system is installed at the pump station and allows all measurements to be recorded on the SCADA system.

### 3.5.4 Oshitayi Pump Station

The Oshitayi Pump Station is supplied with water from Ondangwa, via a branch pipeline from the Ondangwa – Iindangungu Pipeline. The station uses two pumps; the pumps are Rapid Allweiler, model NE 40-250 units. Both pumps are quit old but seem to be in good condition. At the time of the assessment, the electric motor of one pump set was removed for repairs. The other motor is a 3 kW, 380 V, WEG TEFC-type unit, running at 1 410 rpm.

The main power supply to the pump station is via a 50 A TP circuit breaker located in a distribution board underneath an 11 000/400 V, 25 kVA pole mounted transformer.
A telemetry system is installed at the pump station and allows all measurements to be recorded on the SCADA system.

### 3.5.5 Oshigambo Pump Station

The oshigambo pump station is equipped with two pumps, the pumps are Salweir, model VEG 65-7535 units, driven by 5.5 kW, 380 V, Eberle, TEFC-type electrical motors running at 1 465 rpm.

The main power supply to the pump station is via a 100 A TP circuit breaker located in a distribution board underneath an 11 000/400 V, 50 kVA pole mounted transformer. The transformer is the property of NORED Electricity. A telemetry system is installed at the pump station and allows all measurements to be recorded on the SCADA system. An old radio communication system is still in operation in the pump station.

### 3.5.6 Onandjokwe Pump Station

The Onandjokwe Pump Station is supplied with water from the Ondangwa–Omutsegwonime Pipeline, which water is delivered into a 1 080 $m^3$ reservoir.

The Two pumps draw water from the 1 080 $m^3$ reservoir and deliver into the 70 $m^3$ elevated reservoir, from where water gravitates to the hospital, Onandjokwe Town, Oniipa and Olukonda. The two pumps are KSB, model ETA NEW 80-315 units, driven by 18.5 kW, 380 V, Siemens, TEFC-type electrical motors running at 1 460 and 1 455 rpm.

The main power supply to the pump station is via a 40 A TP circuit breaker supplied via an overhead line from Oniipa Village from an 11 000/400 V, 100 kVA transformer. A telemetry system is installed at the pump station and allows all measurements to be recorded on the SCADA system for future use.

### 3.5.7 Oshali Pump Station

The Oshali Pump Station serves as a booster pump station to the Ondangwa – Omutsegwonime Pipeline. the station consists of three pumps, the pumps are APE, model HSC-200-150-460 units, driven by 90 kW, 400 V, Alstom, TEFC-type electrical motors running up to 1 490 rpm.

The main power supply to the pump station is via an 800 A TP circuit breaker from an 11 000/400 V, 500 kVA pole mounted transformer. The transformer is the property of NORED Electricity. A telemetry system is installed at the pump station and allows all measurements to be recorded on the SCADA system for future use.

### 3.5.8 Onayena Pump Station

The Onayena Pump Station is supplied with water from the Ondangwa – Omutsegwonime Pipeline, and from a pipeline from Onethinge, which pipelines join and deliver water into a 400 $m^3$ ground level reservoir. The pump station has a total of 5 pumps.

**Onayena Town Pumps**

These two pumps are KSB ETA 50-315 units, driven by 7.5 kW, 380 V, WEG, TEFC-type electrical motors running at 1 460 rpm.

**Onayena–Iikokola/Okankolo Pumps**

These three pumps are KSB ETA 80-400 units, driven by 30 kW, 380 V, WEG, TEFC-type electrical motors running at 1 470 rpm.

A telemetry system is installed at the pump station and allows all measurements to be recorded on the SCADA system for future use. The main power supply to the pump station is supplied via a 400 A TP circuit breaker from a kiosk adjacent to a 315 kVA floor-standing transformer located in the school yard adjacent to the pump station. A 250 A TP main isolator, set to 200 A TP, is installed in the pump station control panel.

### 3.5.9 Okatope Pump Station

The Okatope Pump Station functions as a booster pump station to the Ondangwa – Omutsegwonime Pipeline. The station has two pumps which are APE, model HSC 200-150-365 units, driven by 75 kW, 400 V, Alstom, TEFC-type electrical motors running at 1 475 rpm. The pump sets are variable speed driven and are controlled via pressure sensors, an electro-magnetic flow meter and by measuring the reservoir level.

The main power supply to the pump station is via a 300 A TP circuit breaker in a kiosk located underneath an 11 000/400 V, 250 kVA pole mounted transformer. A telemetry system is installed at the pump station and allows all measurements to be recorded on the SCADA system for future use.

### 3.5.10 Onembenge Pump Station

The four pumps of the Onembenge Pump Station draw water from the Ondangwa–Omutsegwonime Pipeline and deliver this into the Bulk Feeder North Pipeline, which in turn supplies portions of the Oshivelo–Omutsegwonime–Okankolo Rural Water Supply Scheme. The four pumps are Grundfos CRE32-4 units, driven by 7.5 kW, 380 V, Grundfos, TEFC-type electrical motors, running up to 2 880 rpm.

The main power supply to the pump station is supplied via a 40 A TP circuit breaker located in a distribution board underneath an 11 000/400 V, 25 kVA pole mounted transformer. The transformer is the property of NORED Electricity.

No telemetry system is installed at the pump station.

### 3.5.11 Omuthiya Pump Station

The Omuthiya Pump Station serves as both a booster pump station to the Ondangwa – Omutsegwonime and Ambende Pipelines and a supply to the Bulk Feeder South Pipeline.
This station has 6 pumps which feed into three different pipelines which are:

**The Ambende Scheme Pumps**

These two pumps are Grundfos CR90-3 units, driven by 22 kW, 380 V, Siemens, TEFC-type electrical motors, running up to 2 945 rpm.

**The Ondangwa–Omutsegwonime Pipeline Pumps**

These two pumps are Grundfos CR64-3 units, driven by 18.5 kW, 380 V, Siemens, TEFC-type electrical motors, running up to 2 940 rpm.

**The Supply to the Bulk Feeder South Pipeline Pumps**

These two pumps are Grundfos CR90-5 units, driven by 37 kW, 400 V, Siemens, TEFC-type, model electrical motors, running up to 2 950 rpm.

The main power supply to the pump station is via a 315 A TP circuit breaker from an 11 000/400 V, 200 kVA pole mounted transformer. The transformer is the property of NORED.
A telemetry system is installed at the pump station and allows all measurements to be recorded on the SCADA system for future use.

### 3.6. Scheme Processes/Operation

Most these pumps are automatically controlled by means of pressure switches and float switches thus no operator is required.

### 3.7. Maintenance

Maintenance is done by a permanent NamWater team.

#### 3.7.1 Pumps

All motors bearings should be lubricated with a high-temperature lithium-based grease after 3000 hours.
If a pump/s were out of operation for six months, lubrication is required before service commence on all motor bearings.

#### 3.7.2 Air Valves

The valves must be opened monthly to be descaled and cleaned to ensure effective operation. The service intervals will depend on the severity of the conditions.

#### 3.7.3 Pressure Gauges and Transducers

The gauge cocks must be turned monthly to bleed-off air and ensure accurate readings. Turning prevents scale accumulation which prevents the gauge cock from functioning. The operational or service intervals will depend on the severity of the conditions.

### 3.7.4 Reservoirs

The reservoirs should be checked for leaks and other damages on a monthly basis. If leaks are detected, it should be fixed immediately.

### 3.7.5 Pipe Breaks/leaks

Monthly monitor of pipes should be done to avoid wastage of water in an event a major pipe break. The pipeline corridor for maintenance work is 10 m by 5 m.

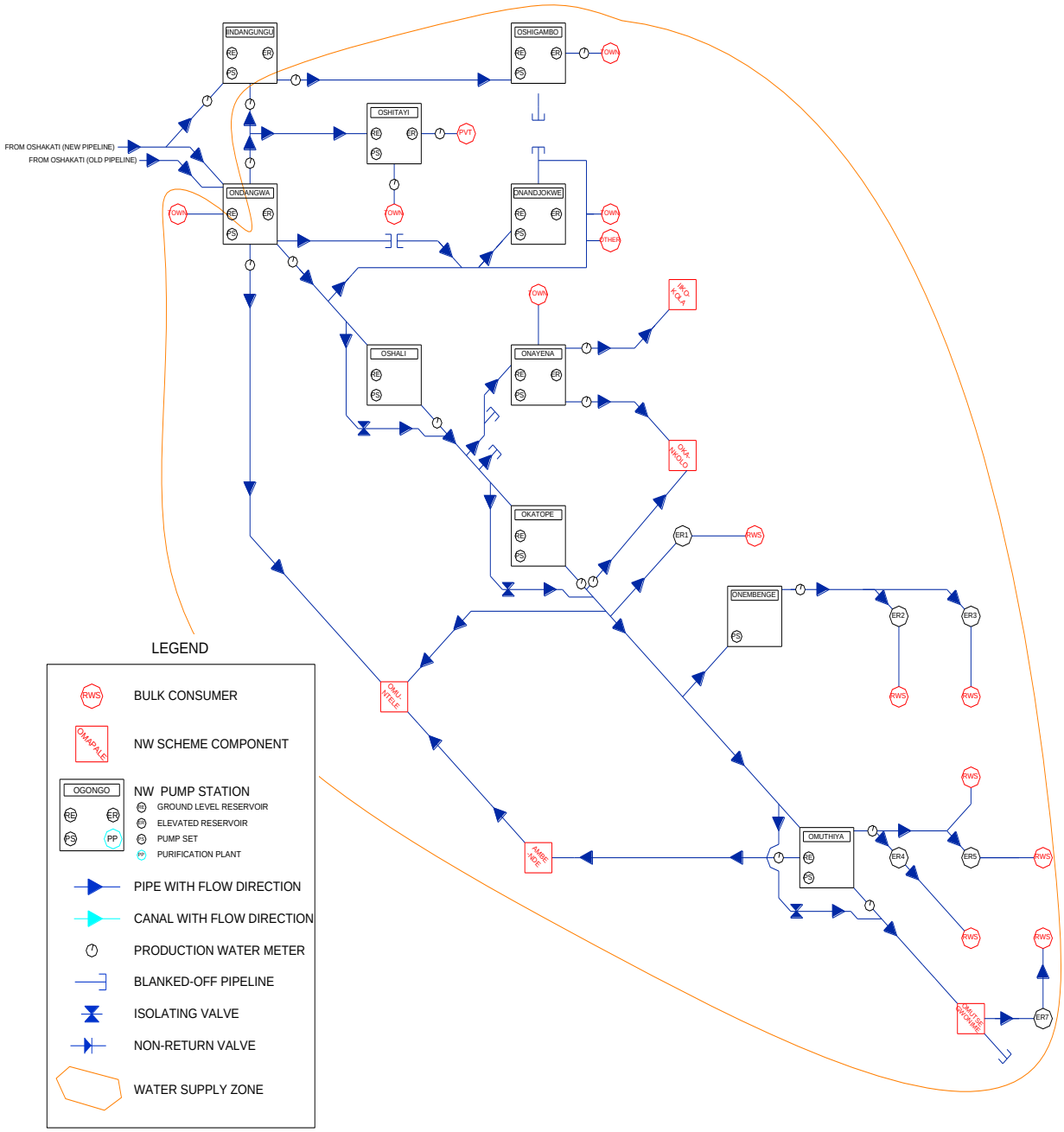


**Figure 2: CNWSA: Zone 8 Schematic Layout**

## 4. BRIEF DESCRIPTION OF THE RECEIVING ENVIRONMENT

The baseline description provided below focuses on the receiving environment:

### 4.1 Climate

The CNWSA: Zone 8 area is characterised by a semi-arid climate (Mendelsohn *et al.,* 2002).

#### 4.1.1 Precipitation

The area receives about 400-450 mm of precipitation annually. Driest precipitation period occurs from June to October. Whilst the wettest period occurs from October to mid may (Mendelsohn, et al., 2002).

#### 4.1.2 Temperature

The average annual temperature for CNWSA: Zone 8 is 22 °C. The average minimum temperatures falls between 6°C and 8°C, the highest average temperatures falls between 34°C and 36°C *(*Mendelsohn *et al.,* 2002*).*

### 4.2 Geology

The CNWSA: Zone 8 area is located in the Cuvelai basin. The area comprises of Kalahari sequence, it is entirely of continental, aeolian to fluvial origin. The Aeolian material consists of fine-grained, well-sorted sand, while the material deposited in a fluvial environment ranges from gravel to clay and often represents braided stream conditions, resulting in very variable lithologies both vertically and horizontally. This basin includes a large part of the Kalahari basin. The basin surface contains very thick sequence of rocks of numerous ages.

Groundwater, recharged in the fractured dolomites of the Otavi Mountain Land, flows northwards and feeds the aquifer system of the Karoo and Kalahari, and discharges south-east of Namutoni through numerous springs along the southern margin of the Etosha Pan and through the bottom of the pan from where it rapidly evaporates (Christelis *et al*., 2011).

### 4.3 Natural Fauna and Flora

The area has pocket-sized wildlife mixture. The little wildlife found in this area mostly consists of small wildlife animals such as the Zorilla (*Ictonyx striatus*) Helmeted Guinea fowl (*Numida meleagris*), and the Bush rabbit (*Bunolagus monticularis*) (Mendelsohn *et. al*., 2009).

CNWSA: Zone 8 is found within the Angolan Mopane Woodlands ecoregion, located in both Namibia and Angola. In the west of the ecoregion, the ephemeral wetlands of the Oshanas support an open landscape with palm (*Hyphaene petersiana*) and marula trees (Sclerocarya birrea), while the eastern parts comprise woodlands. Mopane (*Colophospermum mopane*) dominates the vegetation of this ecoregion (Vetter, n.d.).

Purple-pod terminalia (*Terminalia prunioides*) *Acacia erioloba*, leadwood (*Combretum imberbe*) red bushwillow (*Combretum apiculatum* subsp. apiculatum), Lonchocarpus nelsii and tamboti (*Spirostachys Africana*) (White, 1983; Berry, 1991).

Much of the CNWSA: Zone 8 region is covered in mopane shrub, with a woodland vegetation structure. These woodlands support trees such as the trumpet thorn (*catophractes alexandri*), bushwillow *(Burkea combretum*), bird plum (*berchemia discolor*), Black thorn *(Acacia mellifera*), leadwood (*Combretum imberbe*), Purple-pod termenilia (*Termenelia Pruinioides*). Grass cover in the area consists of bushaman grass (*Schmidtia kalahariensis*), love grass (*Eragrostis porosa*), sixweeks threeawn (*Aristida adscensionis*), silkybushgrass (*stipagrostis uniplumis*) (Mendelsohn *et. al*., 2002).

During the dry season, most of the oshanas are covered by grass, while on the higher ground in between, saline Kalahari sands support Mopane scrub and various larger trees. These raised areas also support much of the crop production and grazing areas – various saline grasses dominate the vegetation (Mendelsohn *et. al*., 2000).

## 5. THE LEGAL ENVIRONMENT

A legal review was done and the key laws of concern include those which protect the ecological integrity of the CNWSA: Zone 8 ecosystem and its water resource, including the Water Act of 1954 and the Water Resources Management Act of 2004, and applicable international treaties such as the Convention on Biological Diversity. These laws and conventions place Namibia under an obligation to conserve the ecological integrity of the CNWSA: Zone 8 ecosystem for the sustainable use by Namibians.

### 5.1 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 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. The formulation of these general principles resulted in the Namibia's Environmental Assessment Policy of 1994. To give statutory effect to this Policy, the Environmental Management Act was approved in 2007, and gazetted as the Environmental Management Act (Act No. 7 of 2007) (herein referred to as the EMA. As the organ of state responsible for management and protection of its natural resources, MEFT: DEA is committed to pursuing the 13 principles of environmental management that is set out by Part 2 of the Act.

To summarise, Articles 91(c) and 95(l) 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.

### 5.2 Environmental Assessment Policy (1995)

Cabinet endorsed Namibia's Environmental Assessment Policy in 1995 as the first formal effort in Namibia to regulate the application of environmental impact assessments and environmental management. Amongst others, the Policy provides a procedure for conducting EIA's which sets out to:

- Better inform decision makers and to promote accountability of decisions taken;
- Strive for a high degree of public participation and involvement of all sectors of the Namibian community during the execution of the EIA;
- Take into account the environmental costs and benefits of projects and programmes;
- Promote sustainable development in Namibia;

- Ensure that anticipated adverse impacts are minimized and that positive impacts are maximized.

### 5.3 Environmental Management Act (No 7 of 2007) (EMA)

The Environmental Management Act (EMA) was promulgated in 2007 by Parliament and gives effect to the Environmental Assessment Policy. The Act specifies the environmental assessment procedures to be followed as well as the listed activities (activities that require an EIA).

Of relevance to this project are the following listed activities, as provided in Section 27 of this Act, which include:

- Water use and disposal;
- Transportation

### 5.4 EIA Regulations Government Notice No. 30, promulgated on 6 February 2012

The regulations, promulgated in terms of the EMA, were promulgated on 6 February 2012 and indicated certain activities that require an Environmental Clearance from MEFT: DEA prior to commencing.

### 5.5 Water Act 54 of 1956 and Water Resources Management Act 11 of 2013

The Water Resources Management Act 11 of 2013 is presently without regulations; therefore the Water Act 54 is still in force. The Act provides for the management and protection of surface and groundwater resources in terms of utilisation and pollution.

## 6. RESPONSIBLE PARTIES

NamWater's Environmental Manager is primarily responsible for the implementation of the EMP during the operational and maintenance phases.

### 6.1 NamWater

NamWater, as the implementing agency, is responsible for:

- Ensuring that the objects of the EMP are being obtained;
- Ensuring that all environmental impacts are managed according to the environmental principles of avoiding, minimizing, mitigating and rehabilitation. This will be achieved by successful implementation of the EMP;
- Ensuring that appropriate monitoring and compliance auditing are executed;
- Ensuring that the environment is rehabilitated to its natural state as far as possible.

NamWater shall ensure that all employees attend an Environmental, Awareness Training Course. This course shall be structured to ensure that attendees:

- Become familiar with the environmental controls contained in the EMP;
- Are made aware of the need to conserve water and minimise waste;
- Are made aware of NamWater's Code of Conduct;
- Are aware that a copy of the EMP is readily available at the plant and that all staff are aware of the location and have access to the document;
- 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.

### 6.2 Contractor

The Contractor shall conduct his/her activities so as to cause the least possible disturbance to the existing amenities, whether natural or man-made, in accordance with all 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 NamWater/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 to NamWater, the Contractor and any relevant environmental authority.
- Identifying environmental non-conformances and initiating measures to remedy such issues, including the institution of fines against the Contractor.

The Contractor shall ensure that all employees attend an Environmental Awareness Training Course. This course shall be structured to ensure that attendees:

- Become familiar with the environmental controls contained in the EMP.
- Are made aware of the need to conserve water and minimise waste.
- Are made aware of NamWater's Code of Conduct.
- Are aware that a copy of the EMP is readily available at the plant and that all staff are aware of the location and have access to the document.
- 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 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.

## 7. ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plans (EMP) is an important tool focusing on the management actions that are required to ensure environmental compliance of a particular project.

EMP implementation is a cyclical process that converts mitigation measures into actions and through cyclical monitoring, auditing, review and corrective action, ensures conformance with stated EMP aims and objectives. Monitoring and auditing, feedback for continual improvement ensures that environmental performance has been provided and corrective action is taken for an effective EMP.

The main aim of this EMP is to ensure that the project complies with the goals of the Namibian Environmental Management Act (No. 7 of 2007); and, more specifically, to provide a framework for implementing the management actions as described in the EMP for the operational and maintenance phases of the scheme. Best practice is proposed for the operation of the scheme.

There are some environmental impacts that cannot be avoided. These environmental impacts require mitigation, and in order to mitigate against these impacts an EMP is required. The EMP aims to ensure best practises are implemented and environmental degradation is avoided through appropriate environmental protection, adherence to legal requirements and maintaining good community relationships.

MEFT indicated that EMP's for existing operations are sufficient.

The project activities are grouped according to the different operational processes and stages. Most of the impacts can be reduced through good housekeeping.

# 8. MANAGEMENT ACTIONS

## 8.1 Operation and Maintenance phase of the CNWSA: Zone 8 Water Supply Scheme

### 8.1.1 Introduction

The Operational Phase Section relates to the management and mitigation measures required to ensure that the continuation of the bulk water supply network and the maintenance of the infrastructure is operated in a manner that demonstrates responsible, precautionary environmental management.

The EMP will address specific areas of concern in terms of the long-term environmental management of the affected environment and is intended to serve as a guide to the on-going management of the water supply scheme site as well as the affected environment. The EMP will therefore aim to provide NamWater with the necessary tools to ensure that the potential impacts on the natural environment of the site during the operation of the water supply scheme are minimised. Moreover, it will aim to ensure that the infrastructure is operated and maintained according to Best Practice, in an environmentally sensitive and sustainable manner, and that the operation of the infrastructure does not result in reasonably avoidable environmental impacts.

### 8.1.2 Maintenance Procedures

The optimal operation and effective maintenance of all the scheme components is important in protecting the environment and ensuring that resources are not wasted and environmental incidents arising out of equipment or infrastructure failures, are avoided. Operation and Maintenance Manuals are available for the CNWSA: Zone 8 Scheme. The manuals provide a detailed guidance on the operation of all machinery and associated systems as well as related maintenance procedures, including maintenance schedules. Implementation of this manuals by NamWater will facilitate the proactive management of potential risks and thus result in impacts on the receiving environment being averted.

The maintenance procedures set out in the manuals, provides specific guidance in terms of the monitoring and maintenance of the scheme components. These procedures will specify the equipment item and specific component of each piece of equipment requiring checking, the scope and nature of the check that is to be carried out including detailed instructions related to the specific check, and the programme for conducting each check.

**Table 1: Operation and Maintenance Phase Management Table**

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| a. Minimize the loss of rare/endangered fauna and flora species. | Loss of rare / endangered fauna or flora species. | • Avoid small mammal / reptile and bird nesting where possible. Do not hurt, kill or unnecessarily disturb birds or animals. | Ensure scheme operations and maintenance is limited to the area next to the pipeline and reservoir corridors.<br>Visual checks to ensure that no disturbance occur outside the pipeline corridor.<br>Frequency: Monthly.<br>Responsible Person: Scheme Supervisor. |
| b. Prevent unnecessary removal of trees/plants of importance. | Unnecessary removal of trees/plants of importance. | • Do not remove any vegetation unless it is absolutely necessary. Make sure that operation and maintenance team is well informed.<br>• Do not disturb, deface, destroy or remove plants or natural features, whether fenced or not. | Visual inspection/checks to prevent, as well as to ensure the unnecessary removal of trees/plants.<br>Frequency: Monthly.<br>Responsible Person: Scheme Supervisor. |

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| c. Minimize the loss of rare/endangered fauna and flora species. | Loss of rare / endangered fauna or flora species. | • Avoid small mammal / reptile and bird nesting where possible. Do not hurt, kill or unnecessarily disturb birds or animals. | Ensure scheme operations and maintenance is limited to the area next to the pipeline and reservoir corridors.<br>Visual checks to ensure that no unnecessary disturbance occur outside the pipeline and reservoir corridors.<br>Frequency: Monthly.<br>Responsible Person: Scheme Supervisor. |
| d. Prevent the poaching of flora and fauna. | Poaching of fauna and flora. | • Employees who poach fauna and/or flora will be handed to the authorities for prosecution.<br>• Regular checks of the surrounding environment must be undertaken to ensure no traps or snares have been set. Any snares or traps found on or adjacent to the site must be disposed of. | Visual inspection.<br>Frequency: Weekly visual checks.<br>Responsible Person: Scheme Supervisor |
| e. Minimise the creation and use of | Creation of tracks outside existing roads. | • Use existing roads.<br>• Traffic shall be controlled to ensure minimal disruption to other road users. | Visual checks to ensure that no off-road driving exists.<br>Frequency: Weekly. |

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| tracks outside existing roads. | | • Do not construct new roads when the quality of existing roads deteriorates. Where possible, repair or upgrade existing roads.<br>• Ensure that adequate vehicle turning areas are allowed for.<br>• Enforce speed limits at all times. Unless otherwise specified, the speed limit on access roads is 50km/h.<br>• Runoff from roads must be managed to avoid erosion and pollution problems.<br>• Roads not required for further use shall be rehabilitated immediately.<br>• Use 3-point turns and not U-turns. Confine turning to the road.<br>• Prevent shortcuts between roads. | Responsible Person: Scheme Supervisor. |
| f. Minimise the damage and destruction of important palaeontological | Disturbance to sites of palaeontological and archaeological importance. | • Do not disrupt any archaeological or palaeontological sites. Inform NEM (J Kamburona at cell no 081 144 1528) who will take the necessary action.<br>• All workers will be educated about the importance of preserving archaeological sites. | Monitoring can and should involve field induction of key scheme personnel so that they will be able to recognize the important palaeontological and |

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| and archaeological sites. | | • Educate specific workers about tell-tale signs of archaeological sites and the action to be taken if one is identified | archaeological sites themselves.<br>Frequency: Monthly.<br>Person Responsible: Scheme Supervisor. |
| g. Minimise the number of heavy vehicles on the road. | Increased number of heavy vehicles on the road. | • Heavy vehicles should be limited to numbers necessary. | Checks to ensure that there is minimal heavy vehicle on the road.<br>Frequency: Weekly.<br>Responsible Person: Scheme Supervisor. |
| h. Minimise and if possible prevent the activities that accelerate erosion during operation or maintenance. | Erosion. | • Runoff on steep inclines should be diverted to prevent the formation of erosion gullies.<br>• Vegetative cover is the most efficient and economical means of controlling soil erosion.<br>• Berms should be constructed at selected intervals on long sloping areas to prevent erosion. Diversion berms should be reshaped as necessary to divert runoff. | Visual inspection to ensure that activities that accelerate soil erosion are minimised and if possible prevented at all cost.<br>Frequency: Weekly.<br>Responsible Person: Scheme Supervisor. |

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| | | • Berms should be constructed with compacted soil, have a minimum top width of 60 cm and a minimum height of 30 cm, and should allow for 10% settlement. It should have side slopes with a gradient of at least 2:1.<br>• Runoff should be guided to a point where it will not cause damage. Scour by the discharge of runoff should be prevented. | |
| i. Minimise and if possible prevent the collection and removal of firewood during operation and maintenance. | Collection of firewood. | • No vegetative matter may be removed for firewood.<br>• The collection and removal of firewood is not allowed. | Checks to ensure that there's no removal and collection of firewood by the employees.<br>Frequency: Weekly.<br>Responsible Person: Scheme Supervisor. |
| j. Noise | Generation of noise | • Install and maintain silencers on trucks and machinery.<br>• Repair faulty brakes.<br>• Operators should not use hooters for the purposes of general communication. | Visual inspection to ensure that activities that generate noise are minimised and if possible prevented.<br>Frequency: Daily.<br>Responsible Person: Scheme Supervisor. |

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| k. Driving | Increased risk for accidents | • No operator will operate any equipment when he is under the influence of alcohol.<br>• Adhere to safety rules.<br>• Always keep your headlights on.<br>• Drivers must have the correct licence for the vehicle they are driving. | Visual inspection to ensure that activities that generate noise are minimised and if possible prevented.<br>Frequency: Weekly.<br>Responsible Person: Scheme Supervisor. |
| l. To avoid potential chemical /hazardous substance pollution | Pollution | • Designated areas for the storage of potentially hazardous material will be lined with concrete and secured. The bunded area will be of adequate capacity to contain 1.5 times the volume of the hazardous material to be stored in the bunded area. | Visual checks to ensure chemical/hazardous substances are stored appropriately.<br>Frequency: Monthly.<br>Responsible Person: Scheme Supervisor. |
| m. To ensure correct procedures are in place to avoid environmental impacts associated with maintenance | Environmental Degradation | • Establish regular reporting procedures on maintenance<br>• Undertake regular inspection and maintenance of all infrastructure to ensure in working order and to assess damaged / deficient equipment, as per the Operations and Maintenance Manual.<br>• Review, and if necessary, revise maintenance manual. | A review of the Operations and Maintenance Manual.<br>Frequency: Bi-annual |

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| activities as well as proactive intervention to avoid, and if required, to respond to emergencies | | • Establish emergency procedures guidelines for the blockage/failure, flooding, contaminant removal and disinfection, power failure and fire of the scheme.<br>• Implement the response procedures when emergency incident occurs.<br>• Complete the incident report checklist in the case of emergency and keep with monitoring records for submission.<br>• Undertake annual education course for all operational staff.<br>• Review, and if necessary revise emergency manual. | Responsible Person: NamWater Maintenance Team |

**Table 2: Waste Management Table**

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| a. To prevent the improper disposal of waste | Pollution | • Enforce a waste management programme.<br>• All waste will be removed to an appropriate waste dump.<br>• No waste should be buried.<br>• General Waste: Includes waste paper, plastic, cardboard, harmless organic (e.g. vegetables) and domestic waste.<br>• Hazardous Substances include: sewerage, fuels, lubrication oils, hydraulic and brake fluid, solvents, paints, anticorrosives, insecticides and pesticides, chemicals, acids etc. It should be disposed of at designated hazardous disposal sites.<br>• Contaminated soil should be stored in drums and taken to the nearest appropriate waste dumpsite.<br>• Do not change oil on uncovered ground. Drip trays will be used to catch oil when vehicles are repaired in the field. | Visual check to ensure wastes is managed according to the waste management plan<br>Frequency: Weekly.<br>Person Responsible: Scheme Supervisor. |

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| | | • Used oil and hydraulic fluids will not be discarded on the soil or buried. It will be removed from site and taken back to an appropriate dump.<br>• In the event of a hazardous spill:<br>• Immediately implement actions to stop or reduce the spill.<br>• Contain the spill.<br>• Arrange implementation of the necessary clean-up procedures.<br>• Collect contaminated soil, water and other materials and dispose it at an appropriate waste dumpsite.<br>• Used solvents and grease should be stored in drums or other suitable containers. It should be sealed and recycled or disposed at an appropriate disposal site.<br>• Hazardous waste should not be burnt.<br>• Bunding, concrete slabs and/or other protective measures should be installed where hazardous materials are handled.<br>• Ensure that the staff are informed and have information pertaining to the management of spills or ingestion. | |

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| b. Prevent diesel and oil spills during operation and maintenance and ensure adequate clean up. | Concrete, diesel and oil spills and inadequate clean up. | • Clean up concrete, fuel and oil spills immediately.<br>• Clean small oil or fuel spills with an approved/appropriate absorbent material.<br>• Contain oil or fuel spills in water using an approved oil absorbent fibre.<br>• In cases where oil spills cannot be cleaned up immediately, monitor seepage into deeper soils and groundwater.<br>• Do not bury polluted soil, but rather dispose it at an appropriate dump site.<br>• Provide bunding at fuel storage and transfer sites. The bunding should be big enough to contain 110% of the volume of the tank. Where a bund wall encloses a group of tanks, the bund wall must be able to contain 110% of the volume of the largest tank in the group. Tanks must stand on a concrete slab, or otherwise have a sealed, base in order to prevent the leakage of contaminants into the soil. | Checks to prevent and minimise oil and diesel spills and to ensure adequate clean up should spills occur.<br>Frequency: Daily throughout the operation period.<br>Responsible Person: Scheme Supervisor. |

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| c. Waste Management | Littering (Litter such as paper, plastic etc. can be blown away into the surrounding environment). | • No littering will be allowed. The operation and maintenance areas will be kept free of waste at all times. All maintenance sites will be cleaned on a daily basis before leaving the site.<br>• Provide sufficient waste bins at worksites. Make sure that all waste is removed from the worksites.<br>• Bins should be placed in pairs to ensure that one is always present while the other is being emptied.<br>• Areas likely to generate higher quantities of waste shall be equipped with additional bins.<br>• Refuse bins must be stable, i.e. cannot be tipped by animals, and have scavenger and baboon proof lids.<br>• Make sure that the bins are covered so that plastic bags, paper etc. are not blown away.<br>• Make sure that the bins are regularly emptied and the waste taken to an appropriate waste dumpsite.<br>• The central waste storage vessel shall be emptied weekly or as necessary. | Checks to ensure that litter is disposed of correctly in bins provided.<br>Frequency: Daily, at the end of the work day.<br>Responsible Person: Scheme Supervisor. |

**Table 3: Workshops, Vehicle and Equipment Management Table**

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| a. Appropriate storage of machinery, vehicles, and materials. | Inappropriate storage of machinery, vehicles and materials may result in the possible damage/disturbance of nearby undisturbed environments. | • Store machinery, vehicles and materials only in demarcated areas.<br>• Do not leave machinery and equipment standing around if not in use.<br>• Do not store machinery, vehicles, or materials in undisturbed or rehabilitating areas | Regular inspection to ensure that machinery, vehicles, and equipment are stored in designated areas.<br>Frequency: Daily.<br>Responsible Person: Scheme Supervisor. |
| b. Minimize the leakage of fuels and lubricants from vehicles and equipment. | The use of vehicles and equipment that may leak fuel and lubricants. | • Only service machinery and vehicles in designated areas.<br>• Regularly check your vehicle for fuel and oil leaks.<br>• Maintain vehicles and equipment in good conditions through regular and thorough servicing.<br>• Inform the Foreman of leaking vehicles and machinery so that he can schedule repairs.<br>• Only refuel on the bund created for that purpose.<br>• Immediately clean any accidental fuel and oil spills – do not hose spills into the natural environment.<br>• Dispose of contaminated soil as hazardous waste in the correct location on site. | Visual inspection to ensure that vehicles and equipment are in excellent condition and also to ensure that there is no leakage of fuels and lubricants.<br>Frequency: Daily.<br>Responsible Person: Scheme Supervisor. |

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| | | • If a mobile fuel bowser is used, then all refuelling shall occur with appropriate measures in place to prevent spillages (drip trays, funnels, non-dripping dispensing nozzles etc.)<br>• All mobile fuel browsers shall carry a spill kit that is adequately sized to contain at least a 200 litre spill.<br>• Train staff in the correct procedure/technique to transfer fuels.<br>• Make sure all vehicles are roadworthy. Repair faulty brakes, exhausts etc. immediately.<br>• Fire extinguishers shall be present whenever undertaking any form of hot work, i.e. welding, gas cutting, angle grinding, etc. | |

**Table 4: Health and Safety Management Table**

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| a. Minimise the risk of HIV infection and the increase of STI's. | Risk of HIV infection. | • Provide an AIDS awareness programme to all the staff. | Verify that an awareness and education programme on the risks of HIV/AIDS and recommended preventative measures has been conducted.<br>Frequency: Monthly<br>Responsible Person: Scheme Supervisor. |
| b. Minimise the occurrence of injuries. | Injuries. | • Make sure that all staff are equipped and know how to use safety and protective gear. This includes hard hats, goggles, hearing protectors, dusk masks, steel-toed shoes etc.<br>• Keep a comprehensive first aid kit at the scheme offices and at maintenance sites.<br>• Establish an emergency rescue system for evacuation of serious injured people.<br>• Emergency procedures for accidents should be communicated to all employees. | Checks to ensure that correct procedures are followed and that protective clothing are worn at all times during scheme operations and maintenance.<br>Frequency: Check weekly.<br>Responsible Person: Scheme Supervisor. |

| Objectives | Potential Impact | Management Action | |
|---|---|---|---|
| | | • Dangerous areas must be clearly marked and access to these areas controlled or restricted.<br>• Good driving and adherence to safety rules will result in a minimum number of road and workplace accidents.<br>• Fire extinguishers must be available at all refuelling sites. Staff should be trained to handle such equipment.<br>• Nobody is allowed to dispose a burning or smouldering object in an area where it may cause the ignition of a fire.<br>• Hazardous substances must be kept in adequately protected areas to avoid soil, air or water pollution.<br>• Work areas, such as these for the maintenance of equipment, must be on concrete slabs.<br>• Explosives should be stored according to the prescribed regulations. | |

## 9. SITE CLOSURE AND REHABILITATION

Rehabilitation is the process of returning the land in a given area that has been disturbed by operation and maintenance to its original state, or an otherwise determined state. Many projects, if not all, will result in the land becoming degraded to some extent. However, with proper rehabilitation most impacts associated with the operation and maintenance of the scheme and pipelines, could be mitigated and restored to an acceptable level. Poorly rehabilitated areas provide a difficult legacy issue for governments, communities and companies, and ultimately tarnish the reputation of companies as a whole.

Objectives of proper site closure and rehabilitation include the following:

- Reduction or elimination of the need for a long-term management program to control and minimise the long-term environmental impacts;
- Clean-up, treatment or restoration of contaminated areas (e.g., soils contaminated by oil or fuel spills, concrete spills, etc.). Excavation of contaminated material and disposal thereof in an acceptable manner.

Rehabilitation measures to implement:

a. A site inspection will be held quarterly by the scheme supervisor after every maintenance work during operation of the scheme. Rehabilitation will be done to the satisfaction of the ENV section and MEFT.

b. Frequent inspections of the scheme and effective follow-up procedures, to prevent minor defects from becoming major repair jobs.

c. Make sure all soil polluted during maintenance work is properly stored in drums and removed to an appropriate waste dump.

d. Make sure all windblown litter is removed once maintenance has seized.

e. Make sure that all potential hazards (i.e., the sewerage pit) are properly closed and left in a safe and neat position.

Rehabilitation will be completed when the above have been achieved.

## 10. NAMWATER ENVIRONMENTAL CODE OF CONDUCT

### What is an Environmental Code of Conduct?

It is a set of rules that everybody has to follow in order to minimise damage to the environment.

### What is the ENVIRONMENT?

The ENVIRONMENT means the surroundings within which people live. The ENVIRONMENT is made up of the **soil, water, plants,** and **animals** and those characteristics of the soil, water, air, and plant and animal life that influence **human health and well-being**. **People** and **all human activities** are also part of the environment and have to be considered during the operation of the Scheme.

### Do these ENVIRONMENTAL RULES apply to me?

YES, The Environmental Rules apply to EVERYBODY. This includes all permanent, contract, or temporary workers as well as any other person who visits the Scheme. Every person will be required to adhere to the Environmental Code of Conduct.

### ALL PERSONNEL must study and keep to the Environmental Code of Conduct

The SCHEME SUPERVISOR will issue warnings and will discipline ANY PERSON who breaks any of the Environmental Rules. Repeated and continued breaking of the Rules will result in a disciplinary enquiry and which may result in that person being asked to leave the Scheme permanently.

### What if I do not understand the ENVIRONMENTAL RULES?

ASK FOR ADVICE, if any member of the WORKFORCE does not understand, or does not know how to keep any of the Environmental Rules, that person must seek advice from the SCHEME SUPERVISOR. The PERSON that does not understand must keep asking until he/she is able to keep to all the Environmental Rules.

### Safety and Security

1. Only enter and exit roadways and construction areas at demarcated entrances.
2. Wear protective clothing and equipment as per signboards at the Scheme and according to instructions from your SCHEME SUPERVISOR.
3. Report to your SCHEME SUPERVISOR if you see a stranger or unauthorised person in the construction area.

4. Never enter any area that is out of bounds or that is demarcated as dangerous without permission of your SCHEME SUPERVISOR.
5. Never climb over any fence or enter private property without permission of the landowner or your SCHEME SUPERVISOR.
6. Do not remove any vehicle, machinery, equipment, or any other object from the maintenance site without the permission of your SCHEME SUPERVISOR.
7. Keep clear of blasting sites. Follow the instructions of your SCHEME SUPERVISOR.
8. Never enter or work in the Scheme while under the influence of alcohol or other intoxicating substances.
9. All staff should know the emergency procedures in case of accidents.

**Waste Disposal**

10. Learn the difference between different types of waste, namely:
    - general waste, and
    - hazardous waste.

Containers will be provided for different types of wastes.

**<u>General Waste</u> includes waste paper, plastic, cardboard, harmless organic (e.g., Vegetables) and domestic waste**

**<u>Hazardous Waste</u> includes objects, liquids or gases that are potentially dangerous or harmful to any person or the environment. Sewage, fuel, tyres, diesel, oils, hydraulic and brake fluid, paints, solvents, acids, soaps and detergents, resins, old batteries, etc. are all potentially hazardous.**

11. Learn how to identify the containers for the different types of wastes. Only throw general waste into containers, bins or drums provided for general waste.
12. Recycle drums, pallets and other containers.
13. Never bury or burn any waste on site, all waste is to be disposed in allocated refuse disposal containers, bins or bags.
14. Never overfill any waste container. Inform your SCHEME SUPERVISOR if you notice a container that is nearly full.
15. Do not litter.
16. Do not bury litter or rubbish in the backfill trench.

## Plants and Animals

17. **Do not ever pick any plants, or catch any animal.** People caught with plants or animals in their possession will be handed to the authorities for prosecution.
18. Never feed, tease, play with, or set devices to trap any animal or livestock. Wild animals are not to be domesticated.
19. Keep off the rock outcrops unless given specific permission by the SCHEME SUPERVISOR to be there.
20. Never cut down any tree or branches for firewood.
21. Never leave rubbish or food scraps or bones where it will attract animals, birds, or insects.
22. Rubbish must be thrown into allocated waste disposal bins/bags.
23. Always close the gates behind you.

## Preventing Pollution

24. Only work with hazardous materials in bunded areas.
25. Never discard any hazardous substances such as fuel, oil, paint, solvent, etc. into stream channels or onto the ground. Never allow any hazardous substances to soak into the soil.
26. Clean up spills immediately.
27. Immediately report to your SCHEME SUPERVISOR when you spill, or notice any hazardous substance overflow, leak or drip or spill on site, into the streambeds or along the road.
28. Immediately report to your SCHEME SUPERVISOR when you notice any container, which holds hazardous substances overflow, leak or drip. Spillage must be prevented.
29. Only wash vehicles, equipment and machinery, containers and other surfaces at work site areas designated by your SCHEME SUPERVISOR.
30. Do not change oil on uncovered surfaces.
31. If you are not sure how to transport, store, use, or get rid of any hazardous substances ask your SCHEME SUPERVISOR for advice.

## Health

32. Drink lots of clean water every day.
33. Use toilets that have been provided.
34. Take the necessary precautions to avoid contracting HIV / AIDS. Condoms are available at most Clinics.
35. Inform your SCHEME SUPERVISOR when you are sick.
36. Do not work with any machinery when you are sick.
37. If you are working in malaria areas, you must take the necessary precautions.

### Dust Control

38. Do not make any new roads or clear any vegetation unless instructed to do so by your SCHEME SUPERVISOR.
39. Keep to established tracks and pathways.
40. Keep within demarcated work areas.

### Saving Water

41. Always use as little water as possible. Reduce, re-use and recycle water.
42. Never leave taps or hose pipes running. Close all taps after use.
43. Report any dripping or leaking taps and pipes to your SCHEME SUPERVISOR.

### Working Hours

44. You may only work on weekends and after hours with the consent of the SCHEME SUPERVISOR.

### Archaeological and Cultural Objects

45. If you find any archaeological, cultural, historical or pre-historical object on the maintenance site you must immediately notify your SCHEME SUPERVISOR.
46. Never remove, destroy, or disturb any cultural, historical, or pre- historical object on site.

**<u>Cultural and Historical</u> Objects include old buildings, graves or burial sites, milestones, old coins, beads, pottery and military objects.**

**<u>Pre-Historical objects</u> include fossils and old bones, old human skeletal remains, pieces of pottery and old tools and implements.**

### Sensible Driving

47. Tracks and roads should be kept to a minimum. Where possible follow existing roads.
48. No off-road driving is allowed.
49. Never drive any vehicle without a valid licence for that vehicle class and do not drive any vehicle that is not road-worthy.
50. Never drive any vehicle when under the influence of alcohol.
51. **Always** keep your headlights on when driving on dusty roads.

52. Keep to the roads as specified by your SCHEME SUPERVISOR. Vehicles may only be driven on demarcated construction roads. Drivers should always use three points turns, “u-turns” are not allowed. Do not cut corners.

53. Do not drive on rocky outcrops.

**Noise**

54. Keep noise levels as low as possible.

55. Do not operate noisy equipment outside normal working hours.

**Fire Control**

56. Do not make open fires, use a drum or tin and do not collect any vegetation to burn.

57. Do not smoke or make fires near refuelling depots or any other area where fuel, oil, solvents, or paints are used or stored. Fireplaces should be at a safe distance from fuel and explosive storage sites as well as vehicle parking sites.

58. Cigarette butts should always be thrown in allocated refuse bins. Make sure that the cigarette butt is out before throwing it into the bin.

59. Immediately notify your SCHEME SUPERVISOR if you see an unsupervised fire at the campsite or maintenance site.

**Dealing with Environmental Complaints**

60. If you have any complaint about dangerous working conditions or potential pollution to the environment, talk to your SCHEME SUPERVISOR.

61. If any person complains to you about noise, lights, littering, pollution, or any harmful or dangerous condition, immediately report this to your SCHEME SUPERVISOR.

| | | |
|---|---|---|
| **Jolanda Kamburona** | | **Fillemon Aupokolo** |
| **Tell: 061-71 2105** | **or** | **Tell: 061-71 2095** |
| **Cell: 081 144 1528** | | **Cell: 081 325 3301** |

## 11. REFERENCES


1. Christelis, G., and Struckmeier, W. (Eds.). 2011. Groundwater in Namibia an explanation to the Hydrogeological Map. Windhoek

2. Department of Water Affairs and Forestry. 2005. Environmental Best Practice Specifications: Construction. Pretoria.

3. Department of Water Affairs and Forestry. 2005. Environmental Best Practice Specifications: Site Management and Rehabilitation. Pretoria.

4. Kangombe, FN 2010, The vegetation of Omusati and Oshana regions, central-northern Namibia, MSc dissertation, University of Pretoria, Pretoria, viewed 06/04/18 < https://repository.up.ac.za/handle/2263/26656

5. Mendelsohn, J., Jarvis, A., Roberts, C. & Robertson, T. 2002. Atlas of Namibia: a portrait of the land and its people. Ministry of Environment & Tourism / David Philip: Cape Town.

6. Mendelsohn, J., Jarvis, A., Roberts, C., & Robertson, T. 2009. Atlas of Namibia: A portrait of the land and its people. Cape Town, South Africa: Sunbird Publishers (PTY) LTD.

## GRIEVANCE PROCEDURE

All grievances should be submitted through the completion of the grievance registration form as presented below and submitted to the Scheme Supervisor during the construction phase and to the Scheme Superintended during the operation and maintenance phase.

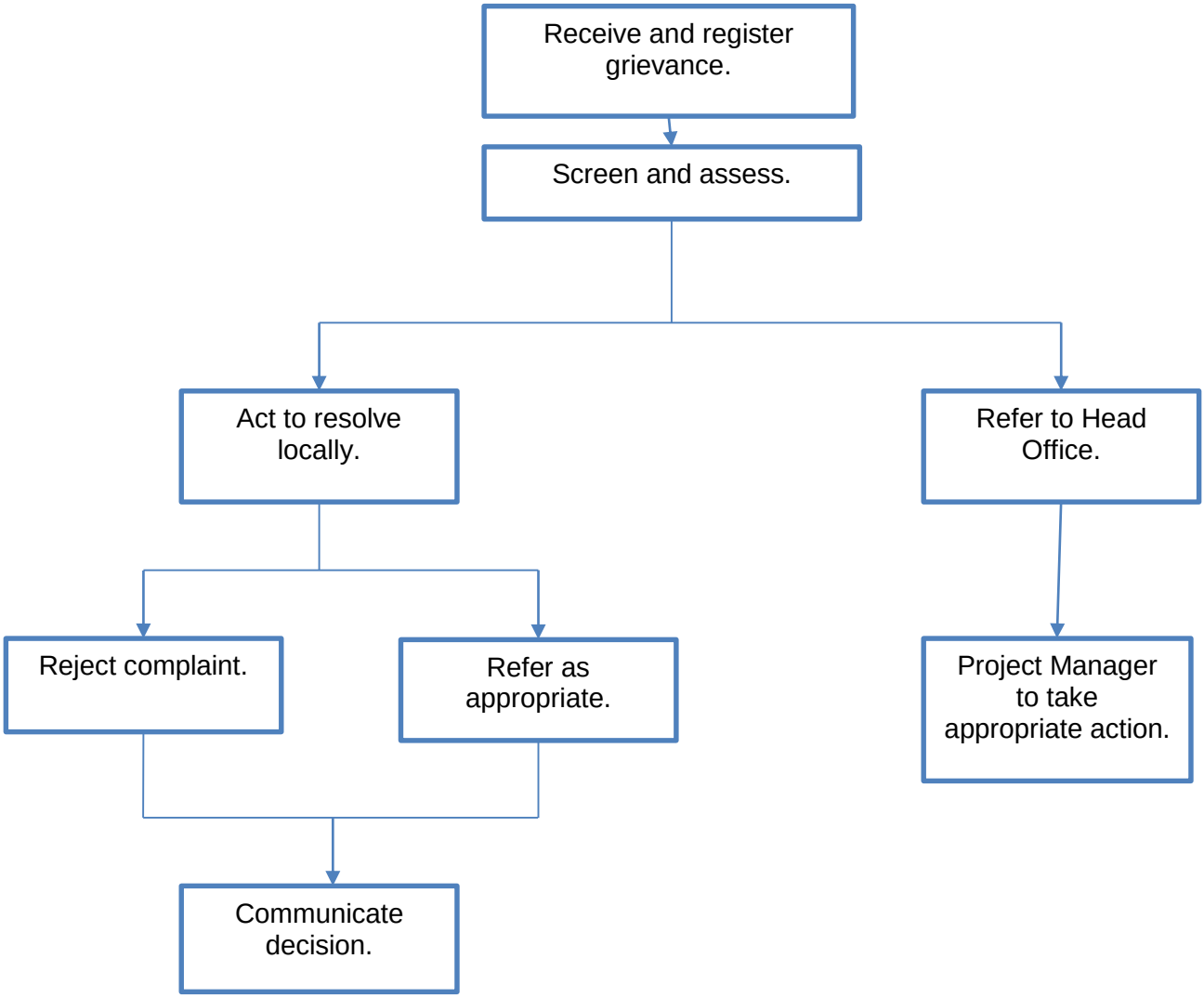


**Figure 3: Grievance response procedure**

Upon receipt of the registered grievance forms, the Scheme Supervisor shall screen and asses to either act to solve the grievance locally or refer it to head office. If the grievance is referred to the head office, the line manager should decide. If the grievance is to be solved locally, it should either be rejected or handled appropriately of which the decision should be communicated to the aggrieved person.

## GRIEVANCE REGISTRATION

| Grievance Registration | |
|---|---|
| Case No: | Date: |
| Name of complainant: | Cell no: |
| | Email address: |
| Details of grievance: (Date, location, persons involved, frequency of occurrence, effects of ensuing situation, etc) | |
| Name of person recording grievance: | Cell number: |
| Proposed date of response: | |
| Signature of recording person: | Signature of complainant: |
| Date of redress: | |