

BERG AUKAS-ELANDSPAN WATER SUPPLY SCHEME

ENVIRONMENTAL MANAGEMENT PLAN

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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
MET	Ministry of Environment 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

1. PURPOSE OF THE EMP

This Environmental Management Plan (EMP) has been compiled and updated for the management of potential environmental impacts during the operation, and decommissioning phases of the existing Berg Aukas – Elandspan 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 water supply scheme.

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 and Tourism (MET: DEA).

An Environmental Clearance Certificate (ECC) was originally issued in 2017 and this EMP serves as an application for the renewal of the ECC. The EMP is for an existing scheme and it is therefore only for the operation and maintenance of the scheme.

2. INTRODUCTION

Berg Aukas – Elandspan is a groundwater scheme comprising two boreholes near the Berg Aukas Mine and a pipeline network, which supplies potable water to the Berg Aukas Mine settlement and to the Otjituuu and Elandspan communities, situated in the communal part of the eastern Otjozondjupa Region. In 2009/10, 514 183 m³ of water were sold from this scheme.

This scheme was planned in the 1970s to supply 250 L/s from the proposed ENWC eastwards into what was then referred to as Hereroland West. This scheme was designed to transfer water under pressure from Otjituuu southwards to Elandspan and thence to Central Reservoir and eventually to Okakarara, to supply the intervening communities and Okamatapati via the seven branchlines, which branch off the Otjituuu – Central Reservoir Pipeline. The location of Berg Aukas is depicted in **Figure 1**.

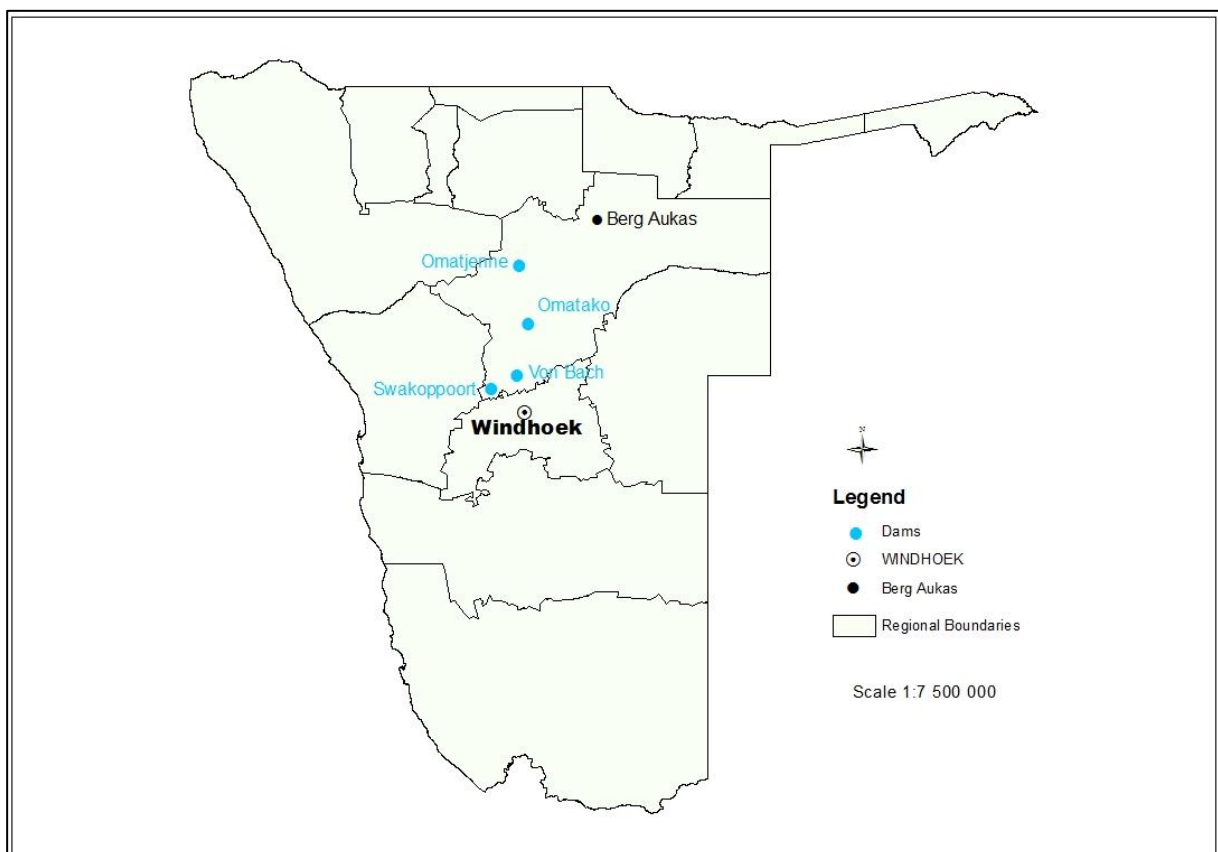


Figure 1: Berg Aukas Location Map

3. EXISTING OMATAKO DAM - VON BACH WATER PIPELINE INFRASTRUCTURE

3.1 Water Source

Water is abstracted from two boreholes near Berg Aukas and pumped to a concrete ground level collector reservoir, which is situated to the north of the disused Berg Aukas Mine (Alexander and Becker, 2003). From this collector reservoir, water gravitates south eastwards to the Otjituuo Reservoir through a 39 km pipeline of CID pipes of varying diameters and pressure classes.

Two production boreholes, WW2153 and WW24857, which are located on the farm Bly-'n-Biekie, a few kilometres north-west of the Berg Aukas Mine, are used by NamWater to draw water from the so-called Karst Area II aquifer.

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 Berg Aukas was evaluated for compliance with the NWQS and the NWQG. The Berg Aukas water meets the Group B limits for conductivity and total dissolved salts, as well as for all inorganic determinants (Appendix).

3.3 Pipe Work

A base pump station is located at the Otjituuo Reservoir, which pumps water southwards into the 112 km long Otjituuo – Central Reservoir Pipeline. This pipeline is not completely straight, as it follows the watershed between Otjituuo and Central Reservoir, which is much the same alignment followed by District Road D3805. The first 50 km of this pipeline, to Elandspan, consists of 350 mm diameter CID pipes of varying pressure classes. A reservoir and booster pump station is located at Elandspan.

The collector pipeline between the Berg Aukas Boreholes and the Collector Reservoir consists of Class 12 (60 m) CID asbestos-cement pipes. For the 2.450 km between the two boreholes, the pipeline is of 200 mm diameter, after which it becomes 250 mm diameter for the 2.610 km from the second borehole to the Collector Reservoir.

Berg Aukas Collector Reservoir – Otjituuo Reservoir Pipeline a large diameter gravity pipeline, 39.092 km long, consisting of CID asbestos-cement pipes of varying diameters and pressure classes, through which water gravitates from the Berg Aukas Collector Reservoir to the Otjituuo Reservoir. The first 8.811 km consist of 450 mm diameter Class 12 (60 m) AC pipes, the next 6.730 km of 450 mm diameter Class 18 (90 m) AC pipes and the next 4.684 km to chainage point 20.225 km, of 450 mm diameter Class 24 (120 m) AC pipes.

Downstream of this point, the next 4.25 km are of 700 mm diameter Class 6 (30 m) AC pipes, which at the time of their installation, were surplus pipes from another scheme. The next 7.909 km are of 600 mm diameter Class 12 (60 m) AC pipes, whilst the last 6.709 km to chainage 39.093 km at Otjituuo Reservoir are of 500 mm diameter Class 12 AC pipes.

3.4 Reservoirs

The Berg Aukas Collector Reservoir is a circular reinforced concrete ground level reservoir with a diameter of 20.3 m, a height of 3.78 m and a nominal capacity of 1 000 m³, which as the name suggests, serves as a collector reservoir for the water pumped from the two boreholes.

3.5 Power Supply and Control System

A submersible pump is installed and is manually operated at each borehole (WW24857 and WW24853). The pumps provide borehole water to the Berg Aukas Collector Reservoir. Both pumps operate in parallel with each other.

The main power supply to the pump installations is via a dedicated 11 000/400 V, 100 kVA pole mounted transformer situated inside the pump installation yards. The pump installations are supplied via a 100 A TP circuit breaker.

3.6 Scheme Processes/Operation

There is a fulltime NamWater scheme operator, who does checks on a daily basis whether all the systems are functional. The scheme has been electrified and automated with timer switches.

3.7 Maintenance

Maintenance is done by a permanent NamWater team.

3.8 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.

3.9 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.

3.10 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.

3.11 Reservoirs

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

3.12 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.

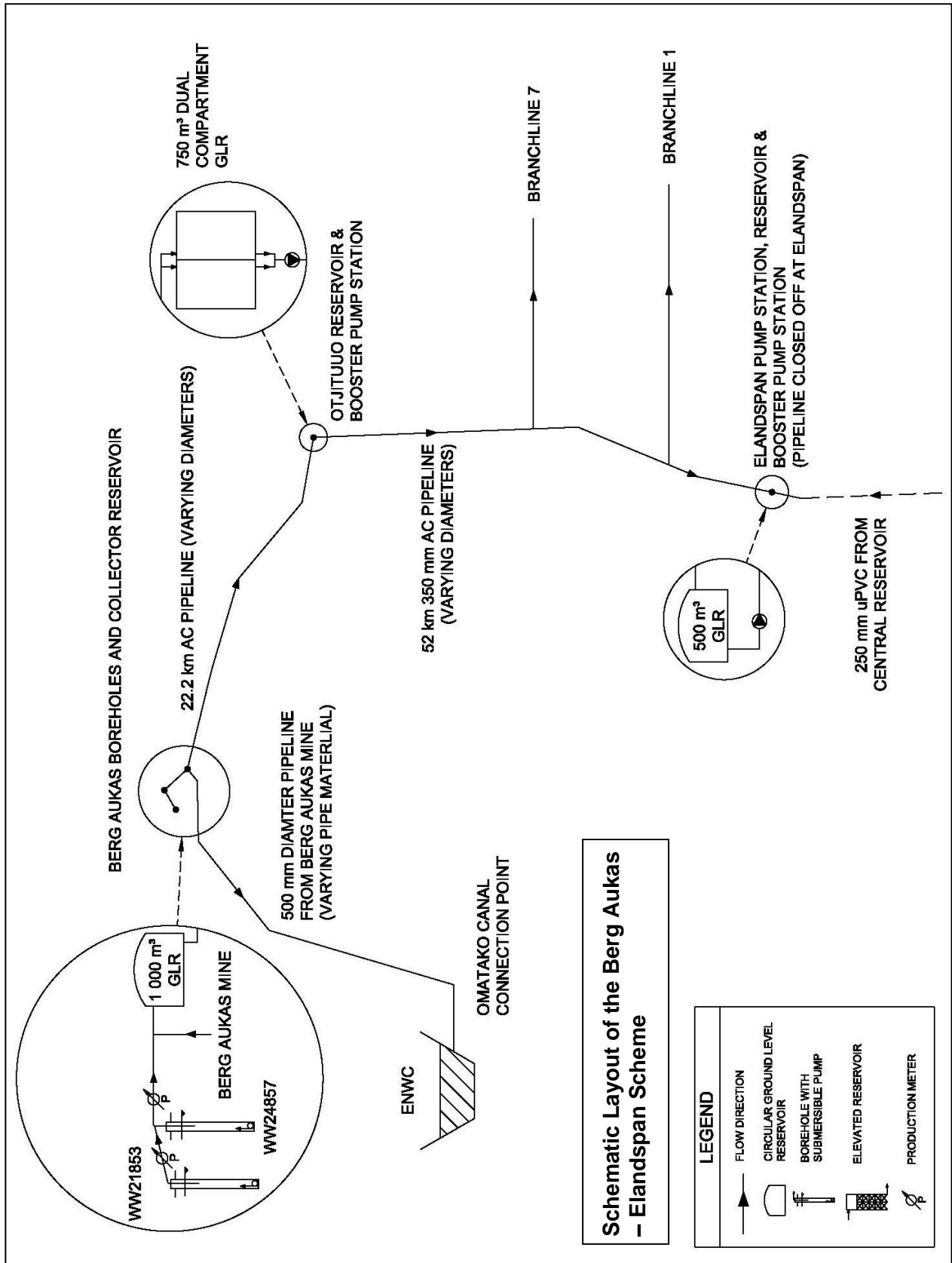


Figure 2: Berg Aukas Scheme Schematic

4. BRIEF DESCRIPTION OF THE RECEIVING ENVIRONMENT

The baseline description provided below focuses on the receiving environment:

4.1 Climate

Most of the rain in the area falls as thundershowers in the summer months, from October to March. There is great variation between years, with the driest years having the least predictable rainfall. Berg Aukas has an extreme climate most times of the year with high temperatures especially during the rainy season and low temperature during the dry winter season.

4.1.1 Precipitation

Rainfall occurs in summer, with a mean annual precipitation between 300 mm and 500 mm and is extremely variable both spatially and in time. An indication of the variability in this rainfall is that 90 % of the time rainfall between 255 mm and 710 mm is expected, with a minimum of 120 mm and a maximum of 932 mm (Alexander and Becker, 2003). The annual mean rainfall deviates on average between 30 % and 60 % from the long-term mean (SPC, 2005). Rainfall is generally higher in the north, near Grootfontein, and decreases to the south and west. Rainfall is highly seasonal, occurring in the wetter summer months, with no rainfall of any significance falling in the cooler, winter months, typically between May and September (SPC, 2005).

4.1.2 Temperature

The area receives between 150 and 250 mm of rain per annum. Potential evaporation is as high as 3 800 mm in the south-eastern part of the basin, and in normal years little or no local runoff is generated (Weismiller, *et al.*, 2012).

4.2 Geology

The hydrology of the area comprises mainly sediments (Aeolian sand) of the Kalahari Sequence, with underlying sediments of the Damara Sequence. The shallow topsoil consists of grey sands, formed by the weathering of the Kalahari layers (Alexander and Becker, 2003). These unconsolidated sediments generally have a low aquifer potential.

Most of the Project Area overlies the Kavango-Epukiro Groundwater Basin, which forms the southwest margin of the greater Kalahari Basin, which extends eastwards into Botswana and northwards into Zambia and Angola. Ground water flow direction and hydro-chemical evidence suggest that recharge takes place from the Otavi Mountains in the Kombat-Grootfontein-Abenab area towards the Omuramba Omatako Basin in the Waterberg Area (SPC, 2005). The thick layer of unconsolidated and semi-consolidated Aeolian sand, approximately 50 m thick, which covers this area, however, makes it difficult to locate groundwater aquifers beneath the Kalahari layers and the presence of ground water in the underlying Damara sediment is limited, with the result that apart from the areas around Goblenz and in the vicinity of omiramba, no potential aquifers are found in the WWSA (after Alexander and Becker, 2003 and SPC, 2005). Where boreholes have been located, these yields are not suitable for the large scale supply of bulk water (CAJVC, 2004).

The ground water areas in and around the WWSA were not declared as groundwater control regions in terms of the previous Water Act (Act 54 of 1956).

4.3 Natural Flora

Berg Aukas is found within the Namibian Savannah Woodland ecoregion, an area characterized by a great variety of species, many of which are endemic. Typical of the area is *Euphorbia guerichiana*, *Cyphostemma* spp. with succulent stems, *Adenolobus* spp., *Moringa ovalifolia*. Two

species of *Acacia* are confined to this vegetation type; these are the Brandberg acacia (*Acacia montis-ustii*) and *A. robynsiana*. *Acacia senegal* and *A. tortilis* are also found, mainly in the alluvial sands and silts along ephemeral rivers in the ecoregion. High diversity of the genus *Commiphora* is particularly characteristic of both the mopane savanna to the north and the semi-desert and savanna transition zone (Spriggs, 2017).

4.4 Fauna

Berg Aukas is found within the Namibian Savanna Woodland ecoregion, which is a centre of high faunal endemism and species richness. The ecoregion hosts a variety of large to small fauna, ranging from Kudu (*Tragelaphus strepsiceros*), springbok (*Antidorcas marsupialis*), gemsbok (*Oryx gazella*), Damara dik-diks (*Madoqua kirkii*), and black-faced impala (*Aepyceros melampus petersi*), leopard (*Panthera pardus*), cheetah (*Acinonyx jubatus*), bat-eared fox (*Otocyon megalotis*) and Cape fox (*Vulpes chama*). Seven reptiles are strictly endemic to the ecoregion such as Albert's burrowing skink (*Sepsina alberti*), Husaben sand lizard (*Pedioplanis husabensis*), Namaqua spinytail lizard (*Cordylus namaquensis*), Campbell's spinytail lizard (*Cordylus campbelli*), Herero girdled lizard (*Cordylus pustulatus*), Brandberg thick-toed gecko (*Pachydactylus gaiasensis*) and Nama padloper (*Homopus solus*) (Spriggs, 2017). Only two amphibians are considered endemic to the ecoregion, the Okahandja toad (*Bufo hoeschi*) and the Mossamedes toad (*B. grandisonae*). Five birds are endemic or near-endemic to this ecoregion: including the Karoo chat (*Cercomela schlegelii*), tractrac chat (*Cercomela tractrac*), greybacked cisticola (*Cisticola subruficapillus*), and the Herero chat (*Namibornis herero*) (Simmons et al., 1998).

5. RESPONSIBLE PARTIES

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

5.1 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. 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.

MET 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.

7. MANAGEMENT ACTIONS

7.1 Operation and Maintenance phase of the Berg Aukas Elandspan Water Pipeline 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.

Table 2: Operation and Maintenance Phase Management Table

Issue	Objective	Strategy	Actions	Time frame
Maintenance and emergency procedures	To ensure correct procedures are in place to avoid environmental impacts associated with maintenance activities as well as proactive intervention to avoid, and if required, to respond to emergencies	<ul style="list-style-type: none"> • Establish environmentally sensitive and technically sound maintenance procedures as well as reporting structures. • Compile a staff competency assessment and training programme. • Establish emergency procedures to ensure appropriate response and minimise potential risk to the biophysical and social environment. 	<ol style="list-style-type: none"> 1. Establish regular reporting procedures on maintenance 2. Undertake regular inspection and maintenance of all infrastructure to ensure in working order and to assess damaged / deficient equipment, as per the O&M Manual. 3. Review, and if necessary, revise maintenance manual. 4. Establish emergency procedures guidelines for the blockage/failure, flooding, contaminant removal and disinfection, power failure and fire of the scheme. 5. Implement the response procedures when emergency incident occurs. 6. Complete the incident report checklist in the case of emergency and keep with monitoring records for submission. 7. Undertake annual education course for all operational staff. 8. Review, and if necessary revise emergency manual. 	<p>Bi-monthly for the lifespan of infrastructure as per the maintenance manual.</p> <p>Bi-annually for lifespan of works.</p> <p>When emergency incident occurs.</p> <p>Emergency incident</p> <p>Annually for lifespan of operation.</p> <p>Annually for lifespan of operation</p> <p>Annually for lifespan of operation</p>

7.2 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 Omatako Dam - Von Bach water pipeline. 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.

7.3 Facility Management and Operations

NamWater shall ensure that sufficient budget allocations and provisions are made available to ensure that the infrastructure can be adequately operated and maintained. NamWater must also attend to damage to the scheme components resulting in water loss as a matter of high priority.

7.4 Routine Maintenance and Repairs

The condition of the infrastructure shall be inspected routinely and a maintenance list compiled. Identified, preventative maintenance issues shall be undertaken as soon as possible. Any wastes arising from the repair and maintenance work must be removed and disposed-off at a designated waste deposal site as part of the operation.

7.5 Environmental Awareness

Instilling a sense of environmental awareness and consideration in all employees, but especially those involved with the scheme operations is vital to the overall success of any environmental management plan. It is therefore recommended that a general environmental awareness course for the Scheme Staff Members, who may be required to carry out duties on the scheme, be undertaken.

7.6 Waste and Pollution Management

7.6.1 Waste and Pollution Prevention

To prevent the improper disposal of waste and to prevent pollution, the following management actions shall be enforced:

- All waste will be removed to an appropriate waste dump.
- No waste should be buried.
- General Waste: Includes waste paper, plastic, cardboard, harmless organic (e.g. vegetables) and domestic waste.
- No littering will be allowed. The plant area will be kept free of waste at all times.
- Provide sufficient waste bins at worksites. Make sure that all waste is removed from the worksites.

- 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.
- Contaminated soil should be stored in drums and taken to the nearest appropriate waste dumpsite.
- Do not change oil on uncovered ground. Drip trays will be used to catch oil when vehicles are repaired in the field.
- 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.
- In the event of a hazardous spill:
 - ✓ Immediately implement actions to stop or reduce the spill.
 - ✓ Contain the spill.
 - ✓ Arrange implementation of the necessary clean-up procedures.
 - ✓ Collect contaminated soil, water and other materials and dispose it at an appropriate waste dumpsite.
- 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.
- Hazardous waste should not be burnt.
- Bunding, concrete slabs and/or other protective measures should be installed where hazardous materials are handled.
- Ensure that the staff are informed and have information pertaining to the management of spills or ingestion.

7.6.2 Hazardous Materials

Where hazardous materials are required for repair and maintenance work (including fuels and oils), care will be taken to ensure that a competent individual is appointed to enforce the responsible use of such materials. The operational staff or maintenance teams shall carry a copy of the relevant Material Safety Data Sheet (MSDS) whenever using such materials. The Scheme Supervisor shall ensure that persons working with hazardous materials have been trained in the handling of such substances, as well as in emergency procedures to be followed in the event of an accidental spillage or medical emergency. Maintenance teams shall also carry a spill kit containing the appropriate neutralizing chemicals, absorbent materials and other relevant equipment required to undertake a clean-up of any spill that may occur.

7.6.3 Noise Management

During maintenance operations, all silencing mechanisms on all equipment must be in a good state of repair. Except for in emergency situations, no amplified sound may be broadcast. All routine maintenance shall be restricted to daylight hours.

7.7 Health and Safety

To minimise the risk of HIV infection and the increase of STI's and the occurrence injuries the following management actions shall be enforced:

- Provide an AIDS awareness programme to all the staff.

- 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.
- Keep a comprehensive first aid kit at Scheme.
- Establish an emergency rescue system for evacuation of serious injured people.
- Emergency procedures for accidents should be communicated to all employees.
- Dangerous areas must be clearly marked and access to these areas controlled or restricted.
- Good driving and adherence to safety rules will result in a minimum number of road and workplace accidents.
- Fire extinguishers must be available at all refuelling sites. Staff should be trained to handle such equipment.
- Nobody is allowed to dispose a burning or smouldering object in an area where it may cause the ignition of a fire.
- Hazardous substances must be kept in adequately protected areas to avoid soil, air or water pollution.
- Work areas, such as these for the maintenance of equipment, must be on concrete slabs.
- Explosives should be stored according to the prescribed regulations.

8. SITE CLOSURE AND REHABILITATION

Rehabilitation is the process of returning the land in a given area that has been disturbed by construction and earthworks to some degree of its former 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 reservoir construction project, could be mitigated and restored to an acceptable level. Poorly rehabilitated construction areas provide a difficult legacy issue for governments, communities and companies, and ultimately tarnish the reputation of operators 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 MET.
- 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 be achieved.

9. 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 construction 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.

General Waste includes waste paper, plastic, cardboard, harmless organic (e.g. Vegetables) and domestic waste

Hazardous Waste 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

21. **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.
22. Never feed, tease, play with, or set devices to trap any animal or livestock. Wild animals are not to be domesticated.
23. Keep off the rock outcrops unless given specific permission by the SCHEME SUPERVISOR to be there.
24. Never cut down any tree or branches for firewood.
25. Never leave rubbish or food scraps or bones where it will attract animals, birds, or insects.
26. Rubbish must be thrown into allocated waste disposal bins/bags.
27. Always close the gates behind you.

Preventing Pollution

28. Only work with hazardous materials in bunded areas.
29. 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.
30. Clean up spills immediately.
31. 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.
32. Immediately report to your SCHEME SUPERVISOR when you notice any container, which holds hazardous substances overflow, leak or drip. Spillage must be prevented.
33. Only wash vehicles, equipment and machinery, containers and other surfaces at work site areas designated by your SCHEME SUPERVISOR.
34. Do not change oil on uncovered surfaces.
35. If you are not sure how to transport, store, use, or get rid of any hazardous substances ask your SCHEME SUPERVISOR for advice.

Health

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

Dust Control

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

Saving Water

47. Always use as little water as possible. Reduce, re-use and recycle water.
48. Never leave taps or hose pipes running. Close all taps after use.

49. Report any dripping or leaking taps and pipes to your SCHEME SUPERVISOR.

Working Hours

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

Archaeological and Cultural Objects

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

Cultural and Historical Objects include old buildings, graves or burial sites, milestones, old coins, beads, pottery and military objects.

Pre-Historical objects include fossils and old bones, old human skeletal remains, pieces of pottery and old tools and implements.

Sensible Driving

54. Tracks and roads should be kept to a minimum. Where possible follow existing roads.
55. No off-road driving is allowed.
56. Never drive any vehicle without a valid licence for that vehicle class and do not drive any vehicle that is not road-worthy.
57. Never drive any vehicle when under the influence of alcohol.
58. **Always** keep your headlights on when driving on dusty roads.
59. Keep to the roads as specified by your SCHEME SUPERVISOR. Vehicles may only be driven on demarcated construction roads. Drivers should always use three point turns, “u-turns” are not allowed. Do not cut corners.
60. Do not drive on rocky outcrops.

Noise

61. Keep noise levels as low as possible.
62. Do not operate noisy equipment outside normal working hours.

Fire Control

63. Do not make open fires, use a drum or tin and do not collect any vegetation to burn.
64. 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.
65. Cigarette butts should always be thrown in allocated refuse bins. Make sure that the cigarette butt is out before throwing it into the bin.
66. Immediately notify your SCHEME SUPERVISOR if you see an unsupervised fire at the campsite or construction site.

Dealing with Environmental Complaints

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

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

NP du Plessis
Tell: 061-71 2093
Cell: 081 127 9040

OR

Jolanda Murangi
Tell: 061-71 2105
Cell: 081 144 1528

10. REFERENCES

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ANNEXURE 1: GRIEVANCE PROCEDURE AND REGISTRATION FORM

