Operational Phase Environmental Management Plan (oEMP) for the Northern Area Bulk Water Augmentation Scheme: Muldersvlei Bulk Water Treatment Facility, Reservoir and Associated Infrastructure

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Operational Phase Environmental Management Plan (oEMP) for the Northern Area Bulk Water Augmentation Scheme: Muldersvlei Bulk Water Treatment Facility, Reservoir and Associated Infrastructure

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Abbreviations and Definitions

cEMP	Construction Phase Environmental Management Plan
CoCT	City of Cape Town
Construction Phase	This is the phase during which physical construction activities take place. It is preceded by the detailed design phase and succeeded by the operational phase.
DEADP	Western Cape Provincial Department of Environmental Affairs and Development Planning
Design Phase	This is the phase during which the detailed design of the WTP and pipelines takes place. It includes detailed landscape and architectural designing as well as layout and routing of the pipelines. It starts before the construction phase but may continue even after construction activities have commenced. For the purposes of this document they are regarded as discrete and separate phases.
EA	Environmental Authorisation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Second Revised Draft Environmental Impact Report compiled by Chand Environmental Consultants November 2011
EMP	Environmental Management Plan
MS	Method Statement
NABWAS	Northern Area Bulk Water Augmentation Scheme
NEMA	National Environmental Management Act (No 107 of 1998)
oEMP	Operational Phase Environmental Management Plan
Operational Phase	The operational phase succeeds the construction phase and commences when water treatment at the WTP starts or when potable water is stored in the bulk reservoir. There may still be some construction taking place around the facility which will still be covered by the construction phase so the oEMP may commence before the cEMP has been completely phased out.
WTP	Water Treatment Plant

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1. Introduction

1.1 Background to this management plan

This document details the Operational Phase Environmental Management Plan (oEMP) and accompanies the application for Environmental Authorisation for the development of the Northern Area Bulk Water Augmentation Scheme: Muldersvlei Bulk Water Treatment Facility, Reservoir and Associated Infrastructure. It is based on the assumption that the preferred alternative and associated mitigation measures as detailed in the Environmental Impact Assessment Report (EIR) would be approved *in toto* by the Western Cape Provincial Department of Environmental Affairs and Development Planning (D:EA&DP). It also made use of standard clauses found in other Environmental Authorisations (EA) for the delineation of roles and responsibilities under the assumption that they too will form an explicit part of the Authorisation.

Since it is entirely possible that additional conditions may be required of the applicant by D:EA&DP, and that some recommended mitigation measures may be deemed unnecessary, the first task in the implementation of this oEMP will be to update section 3 (below) to accurately reflect the conditions of approval. However, this document details the manner in which the conditions of authorisation and environmental best practice will be applied to this development by the City of Cape Town. Since it is unlikely that anything contained in the Environmental Authorisation will change the contents of sections 1 and 2, these two sections shall not be changed or amended unless specifically required by D:EA&DP as part of the Authorisation process. Specifications for the amendment of the specifications in section 3 are detailed in that section.

This document has been compiled by Errol Cerff on instructions from, and using information supplied by Chand Environmental Consulting. It has been amended to incorporate responses to stakeholder comments and queries and an adjustment to the preferred option made in June 2012. Errol Cerff has more than 15 years experience in environmental management, environmental auditing and systems design. He has audited operations as diverse as mining concerns to sweet factories. This has resulted in the development of a keen sense of the components of practical and implementable management plans. His recent experience in a auditing a number of large construction activities has resulted in the development of an approach to environmental management plans which focus more on who performs the tasks and with what desired outcome than on providing details on how the tasks much be achieved. Furthermore, this experience has resulted in a focus on recognising existing organisational structures and using them for environmental management rather than inventing new ones which would necessarily be add-ons. His skills and experience are therefore well suited to the drafting of this oEMP. His curriculum vitae is available on request.

1.2 Structure and function of this Environmental Management Plan

This oEMP primarily focuses on specifying desired outcomes of environmental management activities and the organisational structures and procedures to produce and check such outcomes during the operational phase of the water treatment plant (WTP) and associated pipelines. Since this facility will be managed and administered in the same manner as existing, similar facilities using established internal management systems, the practical details of how such outcomes are achieved are left to the operational staff of the facility. They will

however, be required to report on the outcomes of whatever measures they employ to ensure environmental compliance.

The document is organised in three discrete sections:

- **Section One:** details the background to the draft oEMP, the anticipated activities that will take place and an indication of how these activities could affect the surrounding environment based upon a synthesis of specialist investigations detailed in the EIR compiled by Chand Environmental Consultants.
- **Section Two:** details the organisational structures and responsibilities for implementing, checking and rectifying the activities required to mitigate any negative impacts resulting from operations.
- **Section Three:** details environmental protection specifications for the most likely operational activities. This list is NOT exhaustive and provision is made for staff member responsible for environmental protection or the external auditor call for further specifications as required.

Compliance with the provisions of this oEMP is mandatory for all parties involved in the management of the WTP and associated infrastructure including the pipelines.

1.3 Scope

This oEMP provides environmental specifications for the implementation of mitigation measures specified in the EIR for the operation of the WTP, bulk reservoir, associated facilities and the pipelines as approved. Environmental specifications for the Construction Phase are contained in a separate volume. The mandate for the development and limits of these environmental specifications are derived from the Environmental Authorisation issued in terms of the National Environmental Management Act (No 107 of 1998) (NEMA) and other environmental legislation. As such, the mandate of the draft oEMP does not extend beyond environmental management. While there is some overlap with Health and Safety management, this oEMP is not intended to provide health and safety specifications. The management of the overlap between the two disciplines is detailed in section 2.2.

1.3.1 Description of Activities

The activities which may affect the environment and are the subject of this oEMP are involved in the operation of the Muldersvlei facility comprises a WTP, a reservoir and a system of pipelines carrying raw water to and treated water from the WTP. Final details of orientation and location of the various components will result from the detailed design phase.

The WTP/reservoir complex will be between 25 and 32 ha in extent, the exact boundaries of which will be finalised during the detail design phase. Agricultural activities will be able to continue directly beyond the boundaries of the site. It will have a capacity of 500 Mℓ/day, with a storage capacity of 300 Mℓ in the reservoir. This reservoir will be a rectangular excavation and embankment-type which is concrete lined and is fully enclosed.

The major components of the WTP/ reservoir complex include the following:

- Lime silos (each 11.5 m high (approximately 7 m above ground level and the tallest structures on the site);
- Sludge tanks (approximately 8.7 m high and 30 m diameter, projecting above ground, approximately 1 500 m^2 in extent);
- The inlet building (approximately 8.6 m high above ground level);
- Double-storeyed administration buildings (approximately 8 m high and 900 m^2 in extent);
- Workshop buildings (approximately 6 m high);
- The reservoir (approximately 31 500 m^2 in extent and largely set into the hillside slope);
- Filter buildings (approximately 4 m high and 1 000 m^2 in extent);

- Flammable store;
- Disinfection building comprising on-site sodium hypochlorite generation units and storage tanks;
- Filter beds (approximately 4000 m^2 in extent); and
- Settling tanks (approximately 14 800 m^2 in extent).

External areas would either be covered in grass or asphalt hardstanding.

Ancillary services for the combined WTP and reservoir site will include:

- internal access roads,
- domestic water supply,
- domestic waste removal,
- sewage treatment and effluent disposal,
- stormwater drainage,
- telecommunications,
- electricity supply and
- lighting.

On-site generation of sodium hypochlorite is proposed, for use in disinfection. This will eliminate the need for chlorine gas to be stored on site. This also negates the facility being declared a major hazardous installation. This process involves using electrolysis to convert ordinary salt dissolved in water, to produce sodium hypochlorite. The sodium hypochlorite solution is dosed directly into the product water stream, where the free chlorine produced acts as a disinfectant. Hydrogen gas produced in the process is safely vented into the atmosphere.

Electricity will be supplied by on-site turbines with some top-up supply from Eskom, with a backup diesel generator for emergencies.

Sewage will be treated with a commercial sewage treatment package plant to specifications of the General Authorisation provided for under the National Water Act, 1998 (Act No. 36 of 1998). The maximum capacity of the plant will be approximately 5 m^3/day. The treated effluent will be irrigated onto landscaped areas located around the WTP facility in summer, but in winter is likely to be discharged to the nearest watercourse, located to the south west of the facility. The treated effluent will be treated to the general effluent standards as determined by the Department of Water Affairs (as prescribed within GG No 26187 GN 399 of 26 March 2004) and should therefore not pose a problem in terms of odour and groundwater contamination. In addition, the quality of the effluent discharged will be regularly monitored by the City of Cape Town to ensure compliance

Potable water supply will be obtained on site from the WTP.

Domestic waste will be disposed of at an appropriately licensed landfill.

Tarred access roads will be constructed from existing farm roads (where practically possible) which will have a 20 m wide road reserve with a 9.5 m wide paved surface. Where the road is located on a private property, the land required for the 20 m reserve will be purchased by the CoCT from the relevant landowner.

The premises will have access control at the entrance and 24 hour patrols inside the perimeter security fence.

Approximately 60 staff will be appointed for the operation and maintenance of the treatment works. There would be 10 people suitably trained to work within the chlorine storage and handling facility. During chlorine drum delivery and off-loading, there would be additional

supplier trained personnel on-site. This process is estimated to occur once a week and involve operators trained to do so.

The total length of the pipeline from the Dasbos Pump Station at the Berg River Dam, to the Dasbos outlet and on to the transfer reservoir at Spes Bona, just north of Durbanville, is approximately 40 km.

1.3.2 Site description

The location of the preferred site (Site A1) is depicted in Figure 1 overleaf. Only this site is described in detail since it is for this site that approval is being sought. Should another site be approved instead this section will be amended in the final oEMP .

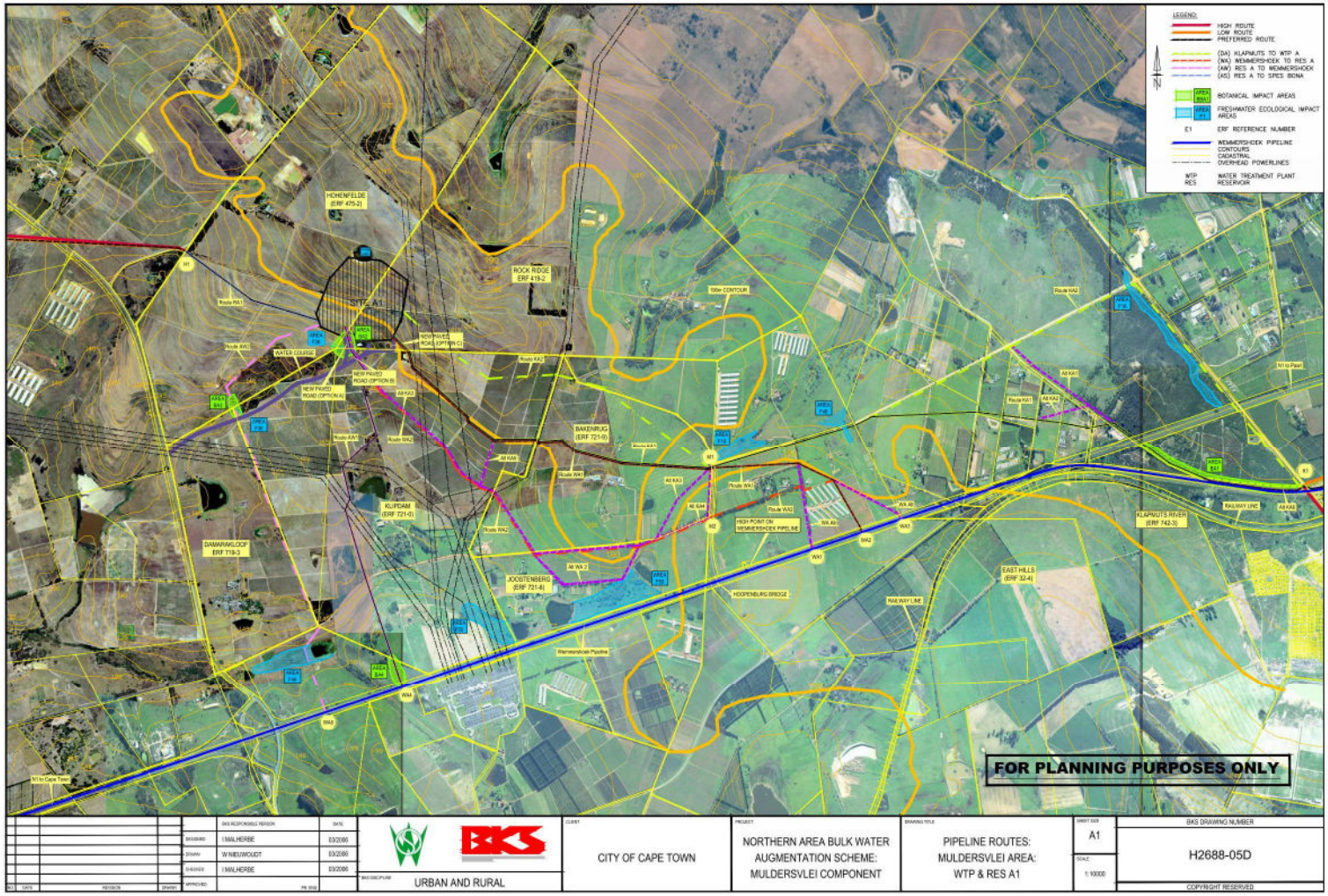


Figure 1: Preferred location of the WTP (Site A1)

Site A1 straddles the boundary between the Farms Hohenfelde and Rock Ridge in the Muldersvlei area, approximately 2 km north of the N1 and 1 km east of the Regional Road 304. The boundary between the two farms is also the municipal boundary between the CoCT to the west and the Drakenstein Municipality to the east.

Approximately 12.53 ha of the site footprint is located on the Farm Hohenfelde, and approximately 9.72 ha on the Farm Rock Ridge.

The portion of the site on Farm Hohenfelde is currently utilised for growing wheat and that on Farm Rock Ridge is currently utilised for animal grazing.

The site is located in a principally agricultural area, on land currently used for wine farming. Land-uses immediately surrounding the site are as follows:

- **North**: Agricultural land, predominantly vineyards, extends for more than 2 km this direction.;
- **South**: Agricultural land, predominantly vineyards, surrounds the proposed location. The N1 National Route runs in a south-west to north-east direction, approximately 2.5 km away;
- **East**: Agricultural land, predominantly vineyards, extends for more than 2 km in this direction;
- **West**: The farm residence of Hohenfelde is situated to the east with the R300 Secondary Road a further 1.8 km in this direction.

Figure 2: Location of adjacent stream

It is situated on a small rise at a topographic height of approximately 210 m above mean sea level (amsl) and is about 40 km inland (east) of the Atlantic Ocean coastline, and approximately 16 km north-west of Stellenbosch. The agricultural area of Weltevreden slopes approximately 2 km down gradient from the site in a south-westerly direction. Towards the south-west is a small stream and wetland (Figure 2). The closest permanent surface water course is Zand Dam, 2 km to the north-east.

1.3.3 Affected environment

The table below summarises the potential impacts of activities which must be addressed during operations. The specialist reports in the EIR provided more detail but this table provides context to the specifications which follow in this draft oEMP. (Impacts associated with the construction phase are dealt with in a separate volume).

Table 1: Summary of impacts in affected environments

Receiving Environment	Risk/ Potential Impacts
Freshwater rivers and streams, wetlands and riparian vegetation	• Disruption of freshwater and riparian ecology through alteration of normal functioning of the systems resulting may have taken place during construction and rehabilitated. These rehabilitation measures will need to be monitored. • Removal of or damage to riparian vegetation making stream banks vulnerable to erosion and any subsequent erosion of stream beds and banks may have resulted from constructions activities. The rehabilitated riparian vegetation and stream banks will need to be monitored. • Contamination of the stream water with out-of-spec sewage effluent and other chemicals must be prevented during operations. • Activities which could affect the environment are: o Spillage or leakage of liquid chemicals, fuels and greases into water courses; o Transport of solid chemicals and wastes to the stream through rain water; o Leakage or spillage of waste products into water courses; o Discharge of inadequately treated effluent from the sewage treatment plant into watercourses; o Burst water pipelines near to a water course causing erosion; o Maintenance of the roads disrupting water courses and stream banks; and, o Upgrading or repair of the pipelines disrupting water courses and stream banks.
Ground water systems	• No contamination of the ground water system should have occurred during construction. Contamination of the ground water with lime, chlorine, fuels and greases and other liquids must be prevented during operations. • Activities which could affect the environment are: o Spillage or leakage of liquid chemicals, fuels and greases onto unprotected soil; o Transport of solid chemicals and wastes onto unprotected soil through rain water; o Leakage or spillage of waste products onto unprotected soil; and, o Discharge of inadequately treated effluent from the sewage treatment plant onto unprotected soil.
Endangered terrestrial vegetation	• Terrestrial ecosystem will have been disrupted during construction and rehabilitated. The rehabilitation completed during the construction phase will need to be monitored and maintained during operations. • Activities which could affect the environment are: o Neglect of rehabilitation programs o Expansion of the WTP; o Repair or upgrading of the pipelines; o Spillage or leakage of liquid chemicals, fuels and greases onto unprotected soil; o Transport of solid chemicals and wastes onto unprotected soil through rain water; o Leakage or spillage of waste products onto unprotected soil; and, o Discharge of inadequately treated effluent from the sewage treatment plant onto unprotected soil.
Agricultural land and potential	• Agricultural land will have been disrupted during construction. The rehabilitation of the land completed in the construction phase will need to be monitored during operations. • Further disruption could be caused by: o Dust from maintenance or repair work; o Dust caused through inconsiderate driving on unpaved roads; o Fires; and o Release of chlorine gas.
Surrounding human communities	• Disruptions to surrounding communicates should have ended with the completion of the construction phase. However further disruptions could occur through: o Inconsiderate driving; o Expansions of the facilities; o Repair and maintenance to pipe lines; and o Operation of WTP after normal working hours (it is to be operational 24 hrs per day).
Visual landscape (including heritage landscape)	• Disruption of visual landscapes and potentially the heritage of the area were mitigated during the design and construction phases. In order to limit further impact the following activities need to be managed: o Building maintenance and repair; o Rehabilitation area maintenance; and, o Landscape maintenance.
Archaeological environment	• Disruption of archaeological artefacts during construction as a result of placement of infrastructure

Receiving Environment	Risk/ Potential Impacts
General	• General operational activities which will need to be managed to limit environmental impacts are as follows: o Energy usage; o Water usage; o Waste management and transportation o Maintenance and repair or machinery and plant; o Maintenance of rehabilitated areas; o General housekeeping; o Materials handling and storage; o Use of contractors; o Incident management (spillage); and, o Emergency planning and response (MHI); • Additional activities required for good environmental management and compliance with the EA include: o Maintenance of the Community Liaison Forum; o Training and awareness; o Monitoring and reporting; o Record keeping; and, o Auditing.

A summary of the mitigation measures recommended in the Second Revised Draft EIR to be implemented by this oEMP and already implemented in the cEMP, is contained in Annexure 1.

1.3.4 Applicable legislation

The impacts detailed in the previous sub-section are governed by legislation which is used to set performance criteria in the specifications which follow.

Table 2: Summary of legislation applicable to the operational phase

Impact	Applicable legislation
General threat to environmental quality	• National Environmental Management Act (No 107 of 1998) (s28(1) • CoCT By-law: Environmental Health
Protection of water resources including prevention of pollution of water and diversion of flows	• National Water Act (No 36 of 1998) (s19), (s3(3)) • CoCT By-law: Storm water management
Management of waste including discharge to a natural watercourse	• National Environmental Management Act (No 108 of 1998) s28 • National Environmental Management: Waste Act (No 59 of 2008) (chapter 4) • National Water Act (No 36 of 41998) (GA 3.7) • CoCT By-law: Integrated Waste Management • CoCT By-law: Waste Water
Noise generation	• Environment Conservation Act (No 73 of 1989) (Regulation 25) • CoCT By-law: Relating to Streets, Public Places and the Prevention of Noise Nuisances
Pollution prevention and safe handling of hazardous and flammable substances and equipment	• Occupational Health and Safety Act (No 85 of 1993) (s 9(1) • Hazardous Substances Act (No 15 of 1973(• Hazardous Substances Regulations (August 1995) • CoCT By-law: Community Fire Safety
Dust and smoke	• National Environmental Management: Air Quality Act (No 39 of 2004) (s 27, 32, 34, 35) • CoCT By-law: Air Pollution Control
Protection of heritage resources	• National Heritage Resources Act (No 25 of 1999) (s44(1))
Endorsement of this cEMP	• National Environmental Management Act (No 107 of 1998) (s24(e))
Prevention of veld fires	• National Veld and Forest Act (No 101 of 1998 as amended)
Control of invasive alien plant species	• Conservation of Agricultural Resources Act (No 43 of 1983)

1.3.5 Legal Status

This oEMP is an intrinsic part of the suite of conditions of approval of the WTP and associated infrastructure. As such, compliance with the specifications is mandatory by the operational staff of the WTP and reservoir complex. It is understood that responsibility for maintenance of the pipelines may fall on a number of depots or sections within the Bulk Water Branch of the CoCT. Each of these sections and depots will be obliged to adhere to the suite of specifications attendant on the pipe line management under their jurisdiction and in particular, the maintenance of any rehabilitated areas in the pipeline servitudes.

Upon finalisation of the draft oEMP, changes to the specifications may only take place with the express, written consent of the competent authority: the Western Cape Provincial Department of Environmental Affairs and Development Planning (DEADP).

The varying responsibilities in this regard are detailed in the following section.

2 Implementation of the EMP

2.1 Organisational structure

The sub-sections that follow outline the responsibilities and lines of reporting for the key role-players in the operational phase of NABWAS. As a result of a meeting held with staff of the Bulk Water Branch on 5th October 2011, it is understood that the Muldersvlei WTP will be operated similarly to the Faure WTP. However responsibility for maintenance and management of various portions of the pipelines may be devolved to other WTPs or depots.. This draft oEMP is based upon that understanding but will need to be amended and finalised during the construction phase prior to handing over to more accurately reflect the organisational context at the time.

2.1.1 Structure and Responsibility

Box 1 provides an overview of the responsibilities of the Applicant (in this case CoCT) as expressed in most Environmental Authorisations.

Box 1: Excerpts from various Environmental Authorisations (EAs) on the roles of the ECO and Applicant

- Authorisation of the activity is subject to the conditions contained in this authorisation, which form part of the environmental authorisation and are binding on the holder of the authorisation.
- The holder of the authorisation shall be responsible for ensuring compliance with the conditions contained in this environmental authorisation. This includes any person acting on the holder's behalf, including but not limited to, an agent, servant, contractor, sub-contractor, consultant or person rendering a service to the holder of the authorisation.

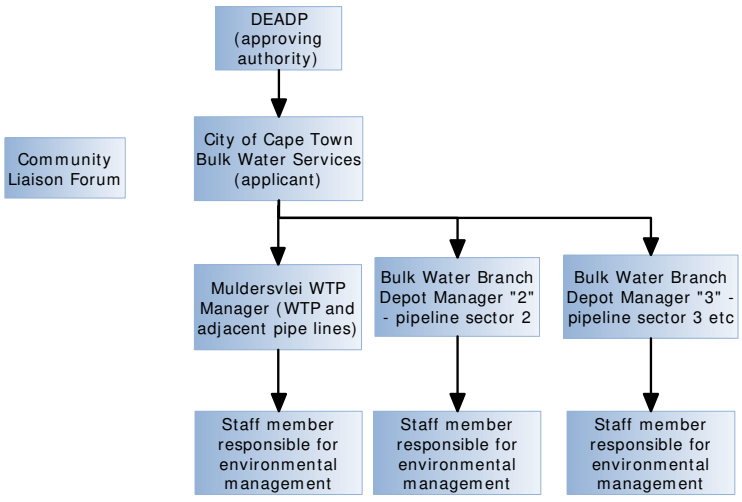


Figure 3: Lines of responsibility for the implementation of this oEMP

From the excerpt in Box 1 it is clear that ultimately full responsibility for compliance with the conditions of authorisation (implementation of this draft oEMP being one of them) rests with CoCT. This responsibility is imposed upon CoCT by DEADP (Figure 3). In practical terms this responsibility then rests initially with the Manager: Bulk Water and Sanitation but is then devolved down to the Manager of the Muldersvlei facility. It is understood that the Manager of the Muldersvlei facility will not be responsible for the entire length of pipeline feeding and receiving water to the Muldersvlei WTP, but that responsibility for management is to be assumed by the management of water treatment facilities or reservoirs closest to the pipeline. At this stage it is uncertain how many, and the identity of these other facilities. For the purposes of this explanation they are termed Manager "2" and Manager "3". These other managers will be responsible for implementing sections of this draft oEMP which deal with the maintenance of rehabilitated areas in the servitudes of the pipelines. In each case a single staff member is to be delegated as responsible for the functional implementation of the draft oEMP specifications in the operational phase. Tasks assigned in Table 3 below and contained in Environmental

Specification 4 (section 3) detail the duties and responsibilities of this staff member in the implementation of this draft oEMP and therefore in complying with the conditions of authorisation.

In response to recommendations in the Second Revised Draft EIR, the establishment of a voluntary Community Liaison Forum for the construction phase is likely to be required as a condition of authorisation. This has been adopted in the draft cEMP. Since this Forum has no decision-making function and does not itself undertake any construction activities, there is no direct line of responsibility in Figure 3. However, it was further recommended that the Community Liaison Forum continue to function into the operational phase to perform a similar monitoring and liaison function over the implementation of the draft oEMP. These functions are detailed in Table 3 below and Environmental Specification 7 (section 3).

Details of the responsibilities and actions required of each of these role-players are presented in section 3 below. However, an overview of the range of responsibilities and how they will link with those which will already have taken place in the design and construction phases have summarised in Table 3 below. For the sake of brevity, the title of the WTP staff member tasked with environmental management is termed the "environmental responsible staff member".

Table 3: Summary of responsibilities for the implementation of environmental conditions

Phase of development	Design			Construction			Operational
	Start	Mid	End	Start	Mid	End	Start
City of Cape Town							
Appoint Engineer(s)	x						
Appoint ECO	x						
Participate in detailed design	x	x	x				
Commission traffic management plan			x				
Commission landscape architect			x				
Notify DEADP of commencement			x				
Finalise and approve penalty system for the cEMP			x				
Submit version 1 of the cEMP to DEADP			x				
Establish Community Liaison Forum			x				
Manage Community Liaison Forum				X	X	x	
Manage Engineer and ECO contracts	x	x	x	x	x	x	
Take any actions required to ensure compliance	x	x	x	x	x	x	x
Appoint operational staff						x	
Accept handover from Engineer (contractors) and ECO						x	
Commission WTP and pipelines							x
Approve version 1 of oEMP							x
Take responsibility for ongoing management and compliance							x
Consulting Engineer							
Accept appointment	x						
Finalise detailed design	x	x	x				
Appoint contractor(s)			x				
Approve the Contractor(s) Waste Management Plan prior to the commencement of construction activities			x				
Approve site establishment and maintenance MS prior to establishment			x				

Phase of development	Design			Construction			Operational
	Start	Mid	End	Start	Mid	End	Start
Approve construction activities MS prior to commencement of construction activities			x				
Manage compliance by contractors				x	x	x	
Hand over to City of Cape Town operational staff						x	
Environmental Control Officer (ECO)							
Accept appointment	x						
Provide input to detailed design	x	x					
Provide input to structure and siting of construction camp(s)			x				
Revise draft cEMP to incorporate conditions of approval			x				
Provide input to traffic management plan			x				
Provide input to landscape plan			x				
Provide input to Contract(s) Waste Manage Plans			x				
Provide input to site establishment and maintenance MS			x				
Provide input to construction activities MS			x	x	x	x	
Conduct induction training				x	x	x	
Review MS developed by the Contractor(s)				x	x	x	
Monitor construction compliance with cEMP				x	x	x	
Report to CoCT and the Engineer on compliance during construction				x	x	x	
Design of Rules of Engagement for Community Liaison Forum		x	x				
Receive and respond to community and stakeholder inputs/ feedback				x	x	x	
Compile and submit closure inspection and compliance report						x	
Finalise and customise draft oEMP into version 1.							x
Obtain approval for version 1 of oEMP							x
Notify DEADP of changes to oEMP							x
Handover Community Liaison Forum to operational staff						x	
Transfer documentation to operational staff						x	
Transfer environmental management to operational staff						x	
Community Liaison Forum							
Establishment			x				
Inception				x			
Engage in information sharing with ECO and construction team				x	x	x	
Act as a conduit for stakeholder and community feedback				X	X	X	x
Monitor construction activities				x	x	x	
Monitor operational activities							x
Environmental Responsible Staff Member							
Accept appointment							x
Assume functions of environmental management							x
Assume management of Community Liaison Forum							x
Ensure that contents of oEMP are included in Event Management System and Risk Register as appropriate							x
Implement the requirements of the oEMP							x

21.2 Communication and Reporting Structures

The lines of reporting compliance are depicted in Figure 4. Each facility has a staff member responsible for the implementation of this draft oEMP at a functional level and these staff members report on compliance (or non-compliance) to their individual facility managers. There is no need for a consolidation reporting function at this point. The Manager: Bulk Water Branch will then receive compliance reports from the individual facility managers and respond accordingly.

Compliance with this draft oEMP and the conditions of authorisation has already been noted as a responsibility of the Manager: Bulk Water Branch. Non-compliance attracts certain consequences as dictated by DEA&DP. The corporate function: Integrated Risk Management serves a facilitation role to all City departments to identify, manage and report on risks such as this risk of non-compliance. Thus, once non-compliance with the oEMP and conditions of approval is formally identified as a risk of the Bulk Water and Sanitation Department, reporting on the management of this risk to the Integrated Risk Management Department becomes routine. Internal auditing of the actions detailed in the risk register to manage this risk is performed on a scheduled basis by Internal Auditors. There is, therefore, an established internal mechanism to not only adopt and implement the specifications of this draft oEMP and conditions of approval, but to check and monitor compliance. There is, therefore, no need to specify the implementation of a separate and discrete management system to ensure compliance, rather the specification ensures incorporation of the specifications in this draft oEMP into the existing system (see Environmental Specification 1 in section 3).

In order to satisfy the requirement for external verification however, the appointment of an independent external auditor is necessary. It is the role of this external auditor to assess compliance with the specifications of this draft oEMP and the conditions of authorisation and report to the Manager: Bulk Water Branch and indirectly to DEADP. Specifications for the external auditor's responsibilities are detailed in specification Environmental Specification 6.

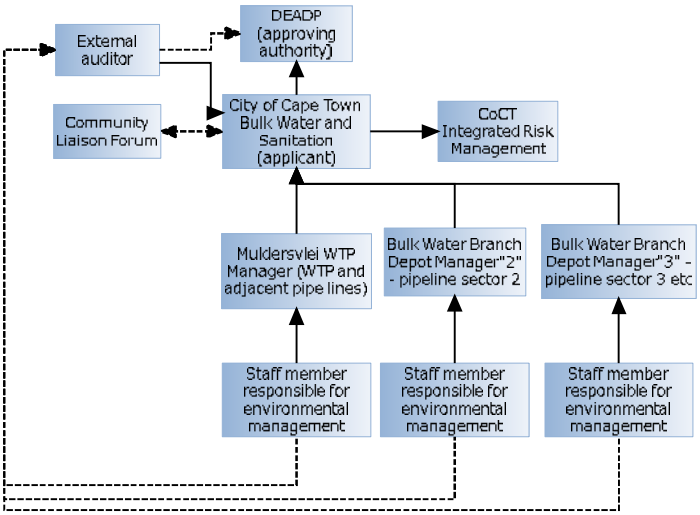


Figure 4: Lines of reporting for this oEMP

The Manager: Bulk Water Branch has a duty to report any non-compliance as well as to submit compliance reports as specified in the environmental authorisation to DEADP. The external auditor's report would form part of this reporting.

Finally, the Community Liaison Forum to be established in the construction phase will continue to function but in a different form as specified in Environmental Specification 7 as contained in section 3. The dashed line of reporting to this body from the Manager: Bulk Water and Sanitation indicates that there will be reporting on compliance and information transfer as and when required to this Forum as detailed in Environmental Specification 7 (section 3)

More details on these lines of reporting and the nature of the reporting are contained in section 3.

2.1.3 Community Engagement

Engagement with stakeholders and especially the surrounding community is essential. There is also a need for a portal to accept and process feedback from stakeholders. To this end the Community Liaison Forum is to have been established in the construction phase. The draft rules of engagement and responsibilities for the operational phase are detailed in section 3.

2.1.4 Review and Maintenance of the EMP

This draft oEMP is a living document and as such will require modification or amendment to suit changing circumstances. The procedure for making amendments or changes while ensuring that the integrity of the oEMP is maintained is detailed in section 3.

2.2 Links to other management plans

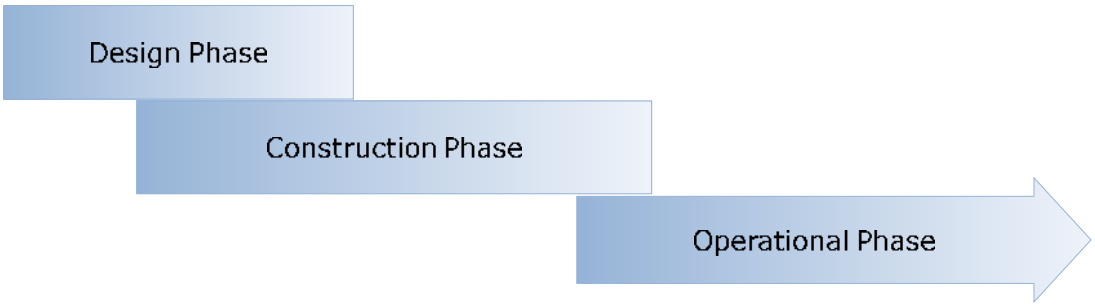
This draft oEMP is designed to provide specifications for the management of the environmental consequences of activities taking place during the operation of the WTP and reservoir complex. However, it does not stand in isolation and will not be implemented as self-sufficient entity. It necessarily links with other management plans as the actual management activities will be performed under these, existing management plans.

It also follows on from and will be informed by the construction phase environmental management plan. For the purposes of this draft oEMP the following definitions of the three phases of development are used.

Table 4: Definitions of the three phases of development for the purposes of this draft oEMP

Design Phase	This is the phase during which the detailed design of the WTP and pipelines takes place. It includes detailed engineering, landscape and architectural designing as well as layout and routing of the pipelines. It starts before the construction phase but may continue even after construction activities have commenced. There may thus be a functional overlap in schedule between the two phases. However, for the purposes of this document they are regarded as discrete and separate phases. Since there is no conflict between the activities and responsibilities during the two phases, this overlap is not considered to be an impediment to effective implementation.
Construction Phase	This is the phase during which physical construction activities take place. It is preceded by the detailed design phase and succeeded by the operational phase. However, as noted above ,some detailed design may continue into the construction phase. Furthermore, some construction may continue after the WTP, reservoir and associated pipelines has become operational resulting in some overlap between this phase and the operational phase. Since implementation of the operational phase is the responsibility of the CoCT and not the Engineer or ECO, there is no conflict as result of the two phases running concurrently.
Operational Phase	The operational phase succeeds the construction phase and commences when water treatment at the WTP starts, or when potable water starts being stored in the bulk reservoir. There may still be some construction taking place around the facility which will still be covered by the construction phase so the oEMP may commence before the cEMP has been completely phased out.

The possible overlap between the phases is depicted in the schematic overleaf. The Scheme will be implemented in components, so the phases in Table 4 will be implemented for each component. The implementation of the components will overlap.



Details of the linkages with other management plans are presented in Table 5 below.

Table 5: Description of linkages with other management plans

Name of Management Plan	Nature of linkage with this oEMP
Construction Phase Environmental Management Plan	The cEMP will have ensured that specifications for environmental mitigation required during the construction phase have been implemented. The cEMP then prepares for the assumption of responsibility for environmental management by facility staff once the WTP, reservoir and pipelines become operational.
ISO 9002	It is understood that the entire Bulk Water and Sanitation department is preparing for re-registration as an ISO 9002 certified facility. This system has an environmental management component and deals with incident management and scheduled maintenance since this affects quality of service delivery. The specifications of this draft oEMP and environmental authorisation will be included in documented procedures and work instructions to ensure effective implementation and monitoring. It is the role of the external auditor to ensure that this incorporation takes place.
Event management system	The Event Management System is an online incident management and reporting system for all facets of the WTP reservoir and pipeline operation. The staff member responsible for environmental compliance will ensure that the definitions of incidents which require investigation and reporting are included into this system.
Health & Safety	All facilities in the Bulk Water and Sanitation department have entrenched health and safety management systems. Where appropriate (such as with the management of the chlorine plant) the specifications of this draft oEMP and conditions of authorisation will be incorporated into that system.

Details of the specifications follow. Each individual specification will need to be checked and amended before implementation to reflect the contents of the EA and how they will be implemented as appropriate. The draft specifications that follow contain the minimum requirements for the specifications. They do not however detail every aspect of environmental best practice. Those specifications will be the responsibility of operational staff to include once the details of the facilities have been finalised. Compliance requires that at least the details presented below are complied with but this does not prevent additional elements being added. A standard format has been used for all specifications.

3. Environmental Management Specifications

This section provides specifications for the following:

1. Actions to be taken before the operational phase commences
2. Responsibilities and function of the Manager Bulk Water Branch
3. Responsibilities and function of the WTP Manager(s)
4. Responsibilities and function of the staff member responsible for environmental management
5. Responsibilities of the Integrated Risk Management department of CoCT
6. Responsibilities and function of the external auditor
7. Functions of the Community Liaison Forum
8. Complaints register
9. oEMP amendment and change
10. Storm water management
11. Waste management
12. Materials handling
13. Incident management
14. Emergency preparedness and response
15. Training and induction
16. Monitoring, checking and auditing
17. Records and record keeping
18. Reporting

Environmental Specification 1: Actions to be taken before the operational phase commences

Version No.	draft	Date of Approval	

1. Background

The assessment of possible impacts and recommendation of mitigation measures conducted during the EIA dealt with numerous permutations of design. These were incorporated into the construction phase environmental management plan. However as a result of design changes and unexpected local conditions, some specifications for the operational phase may have changed.

The conditions of authorisation may require the inclusion of additional specifications such as the incorporation of energy or water saving measures and actions to be taken during maintenance and upgrade activities. These will need to be included in the amended oEMP before implementation.

It is also important that before taking over responsibility for the draft oEMP, the final completion of the duties of the ECO for the construction phase have been signed-off.

In addition the specifications for the operational phase need to be incorporated into various existing systems to ensure implementation.

This specification provides a checklist of actions required for commissioning to ensure compliance with the conditions of authorisation.

2. Objectives

- To ensure that the responsibilities of the construction phase ECO have been fulfilled and closed off and that hand-over is facilitated.
- To ensure that all specifications detailed in this draft oEMP and any that may have been developed during the construction phase are effectively incorporated into the existing management systems at Muldersvlei WTP and other Bulk Water Branch Depots responsible for pipeline management.

3. Specifications

The following actions shall be completed before operations may commence:

- A single staff member at each facility shall be assigned responsibility for implementing and monitoring the specifications in this draft oEMP.
- The staff member in each facility shall ensure that the specifications contained in this draft oEMP and in the conditions of authorisation are included in the existing management systems (including but not limited to those from the EIR detailed in the cell below).
- The staff member responsible for environmental management at NABWAS has received the documentation regarding construction phase environmental management from the ECO. (Note: handover may take a number of months and take place piecemeal since the ECO will hand over various aspects of the construction phase as they are completed (see cEMP for details).
- The definition of events as defined in specification Environmental Specification 13 shall be included in the Event Management Systems.
- The risks of non-compliance shall be incorporated in the each facility risk register and the overall departmental risk register.
- Management of the Community Liaison Forum shall be handed over to the Manager: Bulk Water Branch.

Summary of recommended mitigation measures from the Second Revised Draft Environmental Impact Report compiled by Chand Environmental Consultants November 2011

- The Operational Management Plan shall highlight regular intervals during which inspections should be undertaken to monitor invasive

alien plant establishment. Further to that a removal plan should be compiled.

- The Community Liaison Forum shall change function and become a liaison forum for the operational phase. The Forum shall:
  - Be an information sharing portal
  - Serve as a monitoring organisation
  - Serve as a portal for stakeholder feedback and response.
- The freshwater ecology shall be preserved by:
  - Conducting regular effluent quality testing.
  - Discharging treated effluent only when it meets requirements of the DWA General Authorisation 399 (March 2004).
  - Conducting annual monitoring of affected freshwater ecosystems – this should include testing for nutrient levels (at least orthophosphates and nitrates, and chlorophyll-a (as algal biomass).
  - Irrigating effluent away from sensitive environments, especially watercourses and wetlands.
  - Implementing a scheduled maintenance program for the treatment package plant..

4. Performance Criteria

- A single staff member in each facility responsible for the management of the Muldersvlei WTP and pipelines has been appointed to implement the environmental specifications.
- Each appointed staff member has incorporated every specification in this draft oEMP into the appropriate existing management system.

5. Responsibilities

- The Manager: Bulk Water Branch shall be responsible for ensuring that the necessary appointments take place and that the appointees fulfil the functions specified in this draft oEMP.
- The individual staff members at each facility responsible for environmental management shall ensure that all specifications of this draft oEMP and condition of authorisation as applicable to their area of work have been incorporated into the existing systems.
- The external auditor is responsible for verifying that the above actions have taken place and for overall compliance with the draft oEMP and conditions of authorisation and reporting any breaches as required.
- DEA&DP is responsible for taking any action required in the event of non-compliance by CoCT with this specification. Report of such a breach can arise from the external auditor or any other third party such as a member of the Community Liaison Forum.

6. Monitoring and reporting

- The individual staff member of each facility shall compile a report detailed how each of the above specifications were addressed and this report filed for inspection by the external auditor. This report shall be available for the first external audit.
- The external auditor shall verify the actions of the ECO during the hand-over of responsibilities and report accordingly.
- This report shall be reviewed by the external auditor and submitted to DEA&DP by the Manager: Bulk Water Branch as evidence of compliance.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 1 to
- Environmental Specification 18 inclusive

Environmental Specification 2: Responsibilities and functions of the Manager: Bulk Water Branch

Version No.	draft	Date of Approval	

1. Background

Responsibility for compliance with this draft oEMP and the conditions of authorisation ultimately rests with the Manager: Bulk Water and Sanitation even though functional responsibility is delegated to other levels in the organisation.

2. Objectives

- To ensure that all functions required of the Manager: Bulk Water and Sanitation are executed in accordance with the EA.

3. Specifications

The functions of the Manager: Bulk Water Branch during the operation or the Muldersvlei WTP and associated pipelines are:

- Formally assign specific WTP or other facilities responsibility for specific sections of the pipelines carrying water to and from the Muldersvlei WTP.
- Ensure that a single staff member is formally assigned responsibility for implementing this draft oEMP and the conditions of authorisation at the NABWAS WTP and for each length of the new pipelines.
- Ensure that there is adequate budget for the implementation of the specifications contained in this draft oEMP and the conditions of authorisation.
- Ensure that all facilities involved in the ongoing management of the Muldersvlei WTP reservoir and pipeline complex comply with this draft oEMP and the conditions of authorisation.
- Receive reports on compliance and non-compliance from the respective staff members and respond to any non-compliance as appropriate.
- Appoint a representative of the department to attend and manage the Community Liaison Forum.
- Appoint an external auditor at the frequency detailed in this draft oEMP or as dictated by DEA&DP. Receive the auditor's report and respond as appropriate.
- Report on the management of the risk of non-compliance to Integrated Risk Management.
- Approve the amended oEMP for submission to DEADP;
- Ensure compliance with the EA and oEMP; and,
- Take actions required in the event of non-compliance.

4. Performance Criteria

- Compliance with this environmental specification will require each of the above requirements to be addressed.

5. Responsibilities

- CoCT is responsible for fulfilling the items in this specification and for ensuring that the details are implemented at facility level.
- The external auditor is responsible for reporting on the implementation of this specification by CoCT and reporting any non-compliance initially to CoCT but in the event of no action resulting; to DEA&DP for action.
- DEA&DP is responsible for ensuring that CoCT complies with this specification and taking any action required in the event of non-compliance.

6. Monitoring and reporting

- The individual staff members responsible for implementation of this draft oEMP and conditions of authorisation monitor compliance with this environmental specification and report any non-compliances to their immediate facility manager for attention.
- The action of Manager: Bulk Water Branch and individual staff members responsible for implementation of this draft oEMP shall be reviewed by the external auditor.

- The external auditor shall report any non-conformances to the Manager: Bulk Water Branch for action. If this is not resolved the non-compliance shall be reported to D:EA&DP.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 1 to
- Environmental Specification 18 inclusive

Environmental Specification 3: Responsibilities and functions of the Respective WTP and Reservoir Managers

Version No.	draft	Date of Approval	

1. Background

The staff members responsible for ensuring and monitoring compliance with this draft oEMP and the conditions of approval at operational level are the responsibility of and report directly to the manager of the facility concerned. The bulk of the responsibilities will be assumed by the staff of the Muldersvlei WTP but other responsibilities will be assumed for various lengths of pipeline by other WTP or reservoir facilities.

2. Objectives

- To provide a checklist of responsibilities and functions of the managers of the various WTP facilities involved in the implementation of this draft oEMP.

3. Specifications

The Manager of each facility shall:

- Ensure that the WTP for reservoir facility has sufficient allocated budget for the implementation of this draft oEMP and conditions of authorisation. This may include maintenance of rehabilitated areas etc.
- Ensure that in the event of any maintenance of the pipelines, the biosecurity area of the County Fair Farms is upheld.
- Ensure that all risks of non-compliance are entered into the risk register for the facility.
- Ensure that an appropriated trained person is responsible for the implementation of this draft oEMP as it applies to the area of jurisdiction formally assigned by the Manager: Bulk Water Branch.
- Ensure that the appointee is sufficiently and appropriately trained to fulfil the functions detailed in this draft oEMP.
- Ensure that the appointee has sufficient organisational authority to ensure implementation of the draft oEMP.
- Ensure that the appointee performs the allocated functions and reports any non-conformances.
- Ensure that all staff members comply with this draft oEMP as required and that any non-conformances are responded to without undue delay.
- Ensure that any recommendations from the external auditor are responded to.
- Plan for emergencies as appropriate to the facilities under his/her management.

4. Performance Criteria

- Compliance with this specification shall be the execution of the above listed functions.

5. Responsibilities

- CoCT is responsible for fulfilling the items in this specification and for ensuring that the details are implemented at facility level.
- The external auditor is responsible for reporting on the implementation of this specification by CoCT and reporting any non-compliance initially to CoCT but in the event of no action resulting; to DEA&DP for action.

6. Monitoring and reporting

- The individual staff members responsible for implementation of this draft oEMP and conditions of authorisation monitor compliance with this environmental specification and report any non-compliances to their immediate facility manager for attention.
- The action of Manager: Bulk Water Branch and individual staff members responsible for implementation of this draft oEMP shall be reviewed by the external auditor.
- The external auditor shall report any non-conformances to the Manager: Bulk Water and Sanitation for action. If this is not resolved the non-compliance shall be

reported to DEA&DP.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 3
- Environmental Specification 4
- Environmental Specification 5
- Environmental Specification 8
- Environmental Specification 9
- Environmental Specification 10
- Environmental Specification 11
- Environmental Specification 12
- Environmental Specification 13
- Environmental Specification 14
- Environmental Specification 15
- Environmental Specification 16
- Environmental Specification 17
- Environmental Specification 18

Environmental Specification 4: Responsibilities and functions of the staff member responsible for implementing this oEMP

Version No.	draft	Date of Approval	

1. Background

The staff member assigned responsibility for the facilitation and monitoring of the implementation of this oEMP (in addition to any other responsibilities for the operation of the facility) and the conditions of authorisation will have a number of responsibilities specifically related to environmental management in addition to any other organisational responsibilities already assigned. In addition, the responsibilities of the staff member at the Muldersvlei WTP will be different from those at the facilities responsible for managing pipelines alone. This specification provides details of the suite of responsibilities for the staff member.

It is emphasised that this staff member does not personally have to implement the specifications; merely that he/she is responsible for ensuring that they are implemented.

2. Objectives

- To ensure that the various environmental appointees have a clear understanding of their responsibilities. .

3. Specifications

The environmental staff member at the Muldersvlei WTP shall:

- Sign acceptance of and receive the documentation and closed out construction activities from the ECO.
- Store the documentation received from the ECO for five years or as directed by internal document control procedures.
- Provide access to the above documentation for the external auditor or any other third party on request.
- Ensure that specifications relating to the WTP including maintenance of the landscaped areas and access roads are incorporated into the existing management systems of the facility.
- Ensure that effluent from the waste water treatment plant is tested weekly to ensure that it complies with specifications.
- Conduct annual monitoring of the stream to the south to ensure that the discharge of treated effluent is not having a detrimental effect on the ecology of the stream.

All environmental staff members shall:

- Compile a brief report detailing how the specifications of this draft oEMP have been incorporated into existing systems or addressed in another appropriate manner for the scrutiny of the external auditor.
- Maintain all documentation required to demonstrate compliance with this draft oEMP and conditions of authorisation relevant to their area of jurisdiction.
- Ensure that specifications relating to the management of the pipelines and the rehabilitated areas in the associated servitudes are incorporated into existing management systems.
- Conduct annual monitoring of the rehabilitated areas.
- Monitor and report on compliance and report any non-compliance to the facility manager.
- Co-operate with the external auditor as required.
- Maintain a complaints register.
- Participate in all assessment and investigation of incidents (events) that result from deviations from specifications in this draft oEMP and especially where any environmental medium is affected.
- Conduct training and awareness programs as detailed in specification Environmental Specification 15.

4. Performance Criteria

- Compliance with this specification shall be the execution of the above listed functions.

5. Responsibilities

- Each facility manager is responsible for ensuring that the staff member assigned the responsibilities above fulfils these functions adequately.
- Each facility manager is responsible for ensuring that all other staff members co-operate with the staff member assigned environmental responsibility to ensure that compliance is achieved.
- Each facility manager is responsible for ensuring compliance with this draft oEMP and conditions of authorisation.
- The external auditor is responsible for reporting on the implementation of this specification by CoCT and reporting any non-compliance initially to CoCT but in the event of no action resulting, to D:EA&DP for action.

6. Monitoring and reporting

- The individual staff members responsible for implementation of this draft oEMP and conditions of authorisation monitor compliance with this environmental specification and report any non-compliance to their immediate facility manager for attention.
- The action of Manager: Bulk Water Branch and individual staff members responsible for implementation of this draft oEMP shall be reviewed by the external auditor.
- The external auditor shall report any non-conformances to the Manager: Bulk Water Branch for action. If this is not resolved the non-compliance shall be reported to DEA&DP.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 1 to
- Environmental Specification 18 inclusive

Environmental Specification 5: Responsibilities and functions of the Integrated Risk Management Department

Version No.	draft	Date of Approval	

1. Background

Non-compliance with this draft oEMP and condition so authorisation can result in environmental damage and censure from DEA&DP and other government departments. This is risk that must be managed. It is therefore the role of the Integrated Risk Management (IRM) department to assist in the management of this risk and to comment when risk management efforts require improvement. The department is therefore an integral part of the successful implementation of this draft oEMP.

2. Objectives

- To provide a checklist of responsibilities and functions for the IRM department of the CoCT.

3. Specifications

The IRM shall:

- Be provided with details of risks inherent in the operation of the Muldersvlei WTP and associated pipeline and action plans to manage the risks.
- Participate in improving management of the risk over time and commenting on the compliance with action plans for their management.

4. Performance Criteria

- Compliance with this specification shall be the execution of the above listed functions.

5. Responsibilities

- Each facility manager is responsible for ensuring that the risks posed by the operations under his management are adequately managed and that action plans associated with those risks are implemented as planned.
- The Manager: Bulk Water Branch is responsible for ensuring that the facility managers fulfil these functions and aggregating the risks into the departmental risk register.
- The IRM department is responsible for commenting on and assisting in improving management of the risks identified in the Bulk Water Risk Register.
- The external auditor is responsible for reporting on the implementation of this specification by CoCT and reporting any non-compliance initially to CoCT but in the event of no action resulting; to D:EA&DP for action.

6. Monitoring and reporting

- The facility managers are responsible for monitoring and reporting on the action plans detailed for the management of the identified risks.
- The external auditor shall report any non-conformances to the Manager: Bulk Water Branch for action. If this is not resolved the non-compliance shall be reported to DEA&DP.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 1

Environmental Specification 6: Responsibilities and functions of the external auditor

Version No.	draft	Date of Approval	

1. Background

The EA usually specifies the need for external audits and the frequency thereof. In anticipation of this requirement the following specification is issued.

2. Objectives

- To provide a checklist of responsibilities for the external auditor.

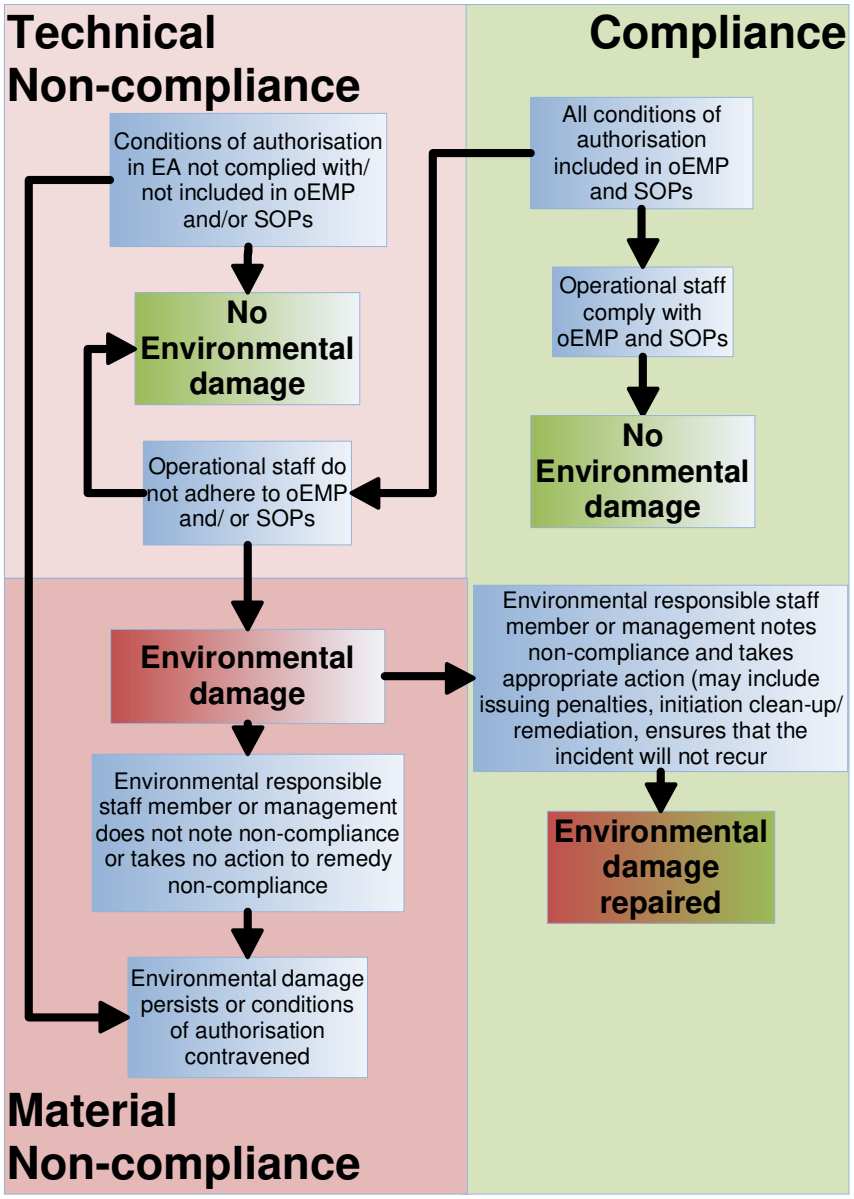
3. Specifications

- An external auditor shall be appointed to conduct an audit of compliance against this draft oEMP and the conditions of approval every year for the first three years of operation and thereafter every three years or as specified by the conditions of authorisation in the EA.
- The external auditor shall audit each facility involved in the implementation of this draft oEMP and conditions of authorisation.
- The first audit shall, in addition to the duties listed below, examine the report by each facility on the incorporation of the specifications of this draft oEMP and conditions of authorisation into existing systems and:
  - Comment on compliance with all specifications;
  - Comment on the effectiveness/ appropriateness of the mechanism of incorporation; and,
  - Make recommendations for changes or improvement as appropriate.
- The external auditor shall, in all audits:
  - Review all documentation and records held by the environmental staff member and any other staff member who has responsibilities in respect of this draft oEMP.
  - Conduct physical site inspections.
  - Compile a report detailing:
    - Documentation reviewed;
    - Details of compliance and non-compliance using the definitions of compliance detailed below;
    - An assessment of the efficiency and or effectiveness of the individual staff member responsible for implementing this draft oEMP;
    - An assessment of the monitoring programs (both chemical and biological as appropriate);
    - An assessment of the record and document keeping;
    - An assessment of the effectiveness of the draft oEMP;
    - Any recommendations for improvement; and,
    - An overall statement of compliance.
  - Submit the audit report to the Manager: Bulk Water Branch which will then be copied to DEA&DP.

When auditing compliance, it is useful to distinguish between difference types of non-compliance as this will inform the degree of severity/ materiality of the finding. The figure below illustrates two types of non-compliance.

In discussing the figure, it is useful to first discuss the nature of **compliance**. Clearly, if the conditions of the Environmental Authorisation are fully incorporated into the EMPs and Standard Operating Procedures (SOPs or their equivalents) and no environmental damage results, a finding of **compliance** is the logical outcome.

However, if all the conditions of the EA are fully incorporated into the EMPs but the manager of the facility of associated staff fails to implement them BUT the environmental responsible staff member notes the failure to comply and takes remedial action and no environmental damage results, the finding is also of **compliance**. In this instance, whilst the facility staff was non-compliant, the environmental responsible staff member was fully compliant in taking remedial action so the end result complied



with the intent of the Environmental Authorisation from an audit perspective.

In considering **non-compliance** then; if not all of the conditions of the Environmental Authorisation are incorporated into the EMP a finding of **non-compliance** is obvious. However, as already noted, this has far less significance than if there had been environmental damage, so there needs to be a way of distinguishing between the two types of non-compliance.

For this reason it is convenient, for the purposes of this audit report, to distinguish between **Technical non-compliance** and **Material non-compliance**. The former deals with non-compliances which **do not** result in environmental damage and are largely administrative in nature and the latter deals with non-compliances that **do** result in environmental damage and are therefore of much greater significance. The latter, which result in environmental damage and therefore contravene environmental legislation require immediate attention.

4. Performance Criteria

- Compliance with this specification shall be external audits covering the above details at frequency specified above or by the EA.

5. Responsibilities

- The Manager: Bulk Water Branch shall appoint the external auditor at the frequency specified in the above or in the EA.
- The external auditor shall review all documentation and conduct all activities specified above.
- The individual facility staff members co-operate with the external auditor, provide a guided site tour and supply all documentation required.

6. Monitoring and reporting

- The external auditor shall review compliance with this specification and report to the Manager: Bulk Water Branch.
- The Manager: Bulk Water Branch and facility managers shall respond to any recommendations by the external auditor.
- The Manager: Bulk Water Branch shall ensure that appropriate action is taken by facility managers to any non-compliances reported by the external auditor.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 1 to
- Environmental Specification 18 inclusive

Environmental Specification 7: Functions of the Community Liaison Forum

Version No.	draft	Date of Approval	

1. Background

During the construction phase the Community Liaison Forum had a more active role as an informal monitoring body. It also acted as a conduit for information from the construction teams about road closures etc and for feedback from communities on nuisances etc. With the cessation of construction these functions will now change.

2. Objectives

- To provide a checklist of responsibilities and functions of the Community Liaison Forum during the operational phase of the WTP and pipelines.

3. Specifications

Responsibility for the management of the Community Liaison Forum shall be transferred to the Manager: Bulk Water Branch who shall appoint a staff member to take this function and supply secretariat and logistic functions for the Forum.

The Community Liaison Forum shall:

- Meeting quarterly or as decided during the construction phase.
- Define its role in the operational phase and define reasons for, and procedures for dissolution if this becomes necessary or its function becomes redundant;
- Report any non-compliances or complaints to the representative of the Bulk Water Branch.
- Receive feedback from the representative of the Bulk Water Branch on compliance and any additional investigations such as the scheduled external audits.
- Comprise of representatives of stakeholder or community groups only- individuals may not be members;
- Have no decision-making or veto powers;
- Be attended by the representative of the Bulk Water Branch;
- Elect its own chairperson;
- Adopt its rules of engagement;
- Keep accurate minutes of the meetings; and,
- Perform a monitoring function on behalf of the community during the operational phase.

4. Performance Criteria

- Compliance with this specification shall be the continued meeting of the Community Liaison Forum.

5. Responsibilities

- The Manager: Bulk Water Branch is responsible for ensuring that the Community Liaison Forum continues functioning or is dissolved in accordance with the specifications above.

6. Monitoring and reporting

- The external auditor shall review compliance with this specification and report to the Manager: Bulk Water Branch.
- The Manager: Bulk Water Branch and facility managers shall respond to any recommendations by the external auditor.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 7
- Environmental Specification 8

Environmental Specification 8: Complaints Management System

Version No.	draft	Date of Approval	

1. Background

The operation and maintenance of the Muldersvlei WTP, reservoir and associated pipelines may result in inconvenience to surrounding communities. The surrounding communities may also detect failures and provide an early warning system. For this reason a complaints management system is critical.

2. Objectives

- To provide a checklist of the components of a complaints management system in the operational phase.

3. Specifications

The staff member responsible for implementing this draft oEMP at each facility shall:

- Assign a cell phone and landline number for complaints receipt;
- Publicise the numbers at the Community Liaison Forum;
- Maintain a register of all complaints received detailing:
  - Date and time of complaint;
  - Name of complainant;
  - Name of recipient of complaint;
  - Nature of complaint;
  - Name of the responsible person to whom the complaint was referred;
  - Date of referral;
  - Details of resulting action;
  - Date of resulting action; and,
  - Date of feedback to complainant.
- Ensure that all complaints received are processed and responded to within 24 hours. Where remedial action will take longer than 24 hrs the complainant shall be notified of the time anticipated before final resolution and then notified once the remedial action is completed.
- Report on complaints and complaint trends to the staff member responsible or management of the Community Liaison Forum to be reported at the next meeting..

4. Performance Criteria

- Compliance with this specification shall be the execution of the above listed functions.
- Compliance shall constitute responses to all complaints with 24 hrs of receipt.

5. Responsibilities

- Each facility manager is responsible for ensuring that a complaints register is developed and maintained.
- The Manager: Bulk Water Branch is responsible for ensuring that the Community Liaison Forum continues functioning or is dissolved in accordance with the specifications above.

6. Monitoring and reporting

- The external auditor shall review the functioning of the complaints register and the performance of the facility staff in the management of complaints.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 7
- Environmental Specification 8
- Environmental Specification 10
- Environmental Specification 12
- Environmental Specification 14
- Environmental Specification 16
- Environmental Specification 17

Environmental Specification 9: Maintenance and amendment of the oEMP

Version No.	draft	Date of Approval	

1. Background

The oEMP is a living document and even once version 1 has been approved by DEA&DP it can still change to suit changing local conditions in order to be effective.

2. Objectives

- To provide a procedure to guide the amendment and modification of the draft oEMP without resulting in loss of integrity or having different versions in circulation.

3. Specifications

The ECO before ceasing activities in the construction phase:

- Revise the draft oEMP to include all conditions detailed in the EA and change all version numbers to version 1 and date the specifications accordingly;
- Separate each environmental specification into individual files which reflect the name of the environmental specification and version number to facilitate amendment of individual specifications;
- Issue version 1 to the each facility for implementation.

At each facility, the staff member responsible for implementing this draft oEMP shall:

- Maintain a register of all Environmental Specifications and their version number;
- Amend individual environmental specifications as required by:
  - Collaborating with the Health & Safety management staff;
  - Amending the environmental specification and changing the version number and date accordingly;
  - Submitting the amended version to the facility manager and Manager: Bulk Water Branch for approval;
  - Registering the amended version in the register;
  - Request that the old version be destroy by all holders of the version; and,
  - Notify D:EA&DP of the amendment.

4. Performance Criteria

Compliance with this specification shall be:

- the execution of the above listed functions
- removal of old versions of the environmental specifications and replacement with the new versions
- the maintenance of a register which reflects the removal and replacement with an amended version.

5. Responsibilities

- The individual staff member responsible for implementation of this draft oEMP shall be responsible for compliance with this specification.
- The facility manager is responsible for ensuring compliance with the amended specifications.
- The Manager: Bulk Water Branch is responsible for ensuring that any amendments comply with the draft oEMP and do not conflict with the conditions of authorisation.

6. Monitoring and reporting

- External auditor shall review the performance of each facility and report on compliance to the Manager: Bulk Water Branch.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 1

Environmental Specification 10: Storm water management			
Version No.	**draft**	**Date of Approval**	

1. Background

This specification is only applicable to the Muldersvlei WTP and reservoir and provides specifications for the protection of storm water from contamination. This is especially important due to the proximity of a natural water course to the south of the facility.

2. Objectives

- To provide specifications for the protection of storm water.
- To ensure compliance with legislative requirements for the protection of storm water and natural watercourses.

3. Specifications

The staff member responsible for implementing this oEMP shall ensure that:

- All storm water drains and covers are maintained in a working condition;
- All storm water drains are kept free of debris and litter;
- No chemicals, contaminated water or sediment are permitted to enter the storm water drains. Any chemical spills are to be isolated and cleaned up according to incident management specifications; and,
- Any contamination of the storm water system is reported to the regional Department of Water Affairs.

4. Performance Criteria

Compliance with this specification shall be:

- Maintenance of all storm water drains in a workable condition; and,
- All drains are free of any contaminant.

5. Responsibilities

- The individual staff member responsible for implementation of this draft oEMP shall be responsible for ensuring that storm water is not contaminated by any substance (liquid or solid).
- The facility manager is responsible for ensuring compliance with this specification.

6. Monitoring and reporting

- External auditor shall review the performance of each facility and report on compliance to the Manager: Bulk Water Branch.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 11
- Environmental Specification 12
- Environmental Specification 13

Environmental Specification 11: Waste management			
Version No.	**draft**	**Date of Approval**	

- **Background**

This specification is only applicable to the Muldersvlei WTP and reservoir and provides specifications for the management of general and hazardous waste.

The National Environmental Management: Waste Act (No 59 of 2008) and the CoCT By-law: Integrated Waste Managementrequire that waste is approached in a hierarchical manner starting with waste minimisation through re-use, recycling and only as a final resort disposal. This environmental specification provides guidance on how that will be achieved in this project.

Examples of waste are:

- Packaging
- Food containers
- Food waste
- Human waste
- Cleaning waste
- Paper and spent stationery and office consumables such as toners cartridges
- Electrical and electronic waste
- Chemical waste
- Waste water
- Spent paint tins and paint residues
- Oils and greases from workshops
- etc

- **Objectives**
  - To minimise the amount of water produced
  - Comply with waste management legislation in all facets of waste management
  - To manage waste is such a manner as to prevent:
    - Spillage onto and contamination of soil, surface or ground water;
    - Dispersal by wind or animals;
    - Generation of nuisances such as odour or vermin;
    - Cross contamination preventing potentially e-usable or recyclable materials from being re-used or recycled;
    - Formation of leachates through the accumulations of rainwater in containers; and,
    - Misidentification through incorrect or inadequate labelling.

- **Specifications**

The Muldersvlei facility manager shall in collaboration with the staff member tasked with implementing this draft oEMP, compile a Waste Management Plan which details:

- What wastes are anticipated to be generated;
- How waste generation will be minimised through planning and preferential procurement;
- How waste will be classified, labelled and stored;
- How many skips/ and or bins will be provided and in which locations on site;
- How waste will be collected and stored to ensure that:
  - cross-contamination;
  - wind or rain dispersal;
  - ingress of rain water;
  - pollution of soil, ground water or any streams or watercourse is prevented.
- Which waste will be re-used or recycled and the avenues for such actions;

- What hazardous waste will be produced and how this will be labelled, stored and disposed of;
- Which waste will be disposed of and to which landfill using which mechanisms;
- How waste production and disposal will be monitored; and,
- The establishment and maintenance of the waste register.

The manager of the sewage plant shall detail:

- Effluent quality specifications required for discharge of effluent water; and,
- Quantities and qualities of effluent discharged to land and natural water course

Note: The treatment residue is hazardous and must be collected from the centrifuges into a vehicle and removed from site as soon as the vehicle's hopper is full. The maximum volume of residue permitted on site at any one time is 35 m^3.

Minimum Requirements (Courtesy of Ecosense CC)

Waste shall be managed in the following order (as is required by the NEM Waste Act):

1. **Waste Elimination**: Eliminate waste generation through efficient procurement, reduction in wasteful corrections due to poorly supervised work etc.
2. **Waste Reduction**: Good storage and management of materials to avoid unnecessary breakage/contamination
3. **Waste Re-use on site**: Reclaiming of materials otherwise considered as waste
4. **Waste Recycling/Recovery off-site** (records required for verification).
5. **Waste Disposal** to a **licensed** landfill site (records required for verification) after separation into general versus hazardous waste categories.

The Waste Management Plan entails the following:

1. The manager shall complete a **Waste Register** which details each waste anticipated to be produced during the project, anticipated quantities, the waste's classification (hazardous and SABS class or non hazardous), the disposal method and any special precautions or legislative requirements for each waste type. This shall be reviewed a minimum of every 6 months to remain up to date.
2. Specific details as to the destination of each waste type including contact details.
3. Details of the system of sorting employed on site including separating hazardous from non hazardous wastes, separating recyclable from no recyclable wastes and sorting out re-useable materials, and providing labelled bins for these different waste types.
4. Sets up a **Waste Manifest** system which details the weight of all wastes leaving the facility, the date on which they left, the date on which they were received by the disposal/recycling/recovery facility and proof of correct disposal by the facility (safe disposal certificate for hazardous waste and receipts for other waste types).

- The manager is to keep all working areas and the site in general in a neat and tidy condition at all times, including neat and safe stacking and storage of materials and equipment, and management of waste materials at appropriate intervals. The separation and recovery of recyclable materials is required and shall be detailed in the Manager's Waste Management plan. The manager shall provide sufficient bins to store the waste produced on a daily basis. Bins shall not be allowed to become overfull. The waste may be temporarily stored in a central fenced waste area e.g. with ready fence panels or a waste skip with a shade cloth/netting roof cover where there is a risk of wind dispersal of litter across the site, and which the environmental responsible staff member has approved. All waste storage areas shall be maintained to prevent these from becoming a breeding ground for pests or otherwise posing a health nuisance. The refuse removed at least once a week. Refuse must be disposed of at a licensed landfill site or reputable recycling depot. The manager shall ensure that waste litter is not deposited by employees anywhere on the site except in refuse bins.
- Petroleum, chemical, harmful and hazardous waste is to be temporarily stored in a sealed drum/s in a specifically designated area in the facility. This waste shall be disposed of at a licensed hazardous waste disposal site. Storage and disposal etc is also controlled through other relevant legislation, which must be complied with e.g. Hazardous Substances Act (No. 15 of 1973) and Occupational Health & Safety Act.
- Wherever possible and practical, waste materials generated by construction shall be recycled for example:
  - Paper / cardboard (e.g. significant quantities are generated during the fit-out phase)
  - Metals
  - Glass
  - Plastic (specific types only)
  - Salvageable trees and other plant material transplanted elsewhere.
  - Organic waste (e.g. cleared vegetation) to a green waste depot that produces compost
  - Whole bricks and crushed rubble for base course (from rubble stockpile)
- Labelled containers for recyclable materials must be provided separate to general waste bins in the site camp and taken to the relevant depot when full. This aspect must be detailed in the Contractor's Waste Management Plan and explained to the site staff during environmental awareness training sessions.
-

- **Performance Criteria**

Compliance with specification comprises:

- Accurate registers as specified above;
- No litter in WTP site;
- Correct labelling and storage of all waste;
- No contamination of any environmental medium;
- No leachates;
- No vermin or other nuisances;
- Proof of recycling or re-use;
- Compliance with legislation regarding transportation and disposal of waste.

Note: Storage of in excess of 35m^3 treatment residue at any one time constitutes a risk of prosecution under the National Environmental Waste Management: Waste Act.

- **Responsibilities**
  - The facility manager is responsible for compiling and ensuring compliance with the waste management plan and this specification.
- **Monitoring and reporting**
  - The external auditor shall review and report on the compliance with the waste management plan.
- **Related documents**

The following documents relate to this environmental specification:

- Environmental Specification 10
- Environmental Specification 12
- Environmental Specification 13

Environmental Specification 12: Materials handling

Version No.	draft	Date of Approval	

1. Background

This specification provides specifications for the handling of chemicals and potentially polluting materials primarily to ensure the protection of storm water from contamination since operational area is to be under handstanding. This is especially important due to the proximity of a natural water course to the south of the facility.

This includes the management of the chlorine plant as recommended in the EIR.

2. Objectives

- To ensure that:
  - All materials used on site are handled and stored according to legal requirements and specifications provided by their manufacturers.
  - The environment, staff and surrounding communities are protected from hazards resulting from the handling, storage or transport of materials and substances.

3. Specifications

The facility manager shall ensure that:

- All chemical substances are stored in accordance with the requirements on their MSDS and as specified in relevant legislation (including flammable substances and hazardous substances regulations).
- All chemical substances are handled and stored in such a way as to minimise the risk of spillage to an environmental medium or in a manner that would affect staff or surrounding communities. The recommendations of the management of the chlorine plant as detailed in the EIR are detailed below for implementation.
- Any spilled substances are isolated and cleaned up in accordance with the incident specification (Environmental Specification 13).
- All plant and or machinery involved in the storage, handing and use of chemicals shall be subject to scheduled maintenance. This maintenance is intended to minimise the risk of failure resulting in environmental damage and/ or exposure of staff or surrounding communities to chemical hazards.

Minimum Requirements (Courtesy of Ecosense CC)

- All fuels/flammable substances are to be stored within a demarcated area in the facility. The storage area and perimeter must be well away from stored combustible materials. The manager shall ensure that all liquid fuels (petrol and diesel) and other flammable substances are stored in containers with lids, which are kept firmly shut. All containers must be in such a condition as to be reasonably safe from damage and to prevent leakage there from. The rated capacity of a tank/container must be able to accommodate expansion of the product contained therein due to the rise in temperature during storage. Only empty and externally clean containers may be stored on the bare ground. Containers containing fuels as well as all empty and externally dirty containers shall be situated on a smooth and level impermeable surface (e.g. concrete floor) and must be contained within a bund wall. The impermeable lining shall extend to the crest of the bund and the volume inside the bund shall be equal to 110% multiplied (x) by the total capacity of all the storage containers/tanks. The floor of the bund must be sloped towards an oil trap or sump to enable any spilled fuel to be removed. A hydrocarbon absorption / remediation product approved by the manager may be installed in the bund to reduce the risk of pollution. The requirements for fuel storage and management as detailed in SANS 10089 part 1 and SANS 10131 must be implemented. All safety requirements for flammables stores including signage shall be implemented by the facility's Health and Safety Officer. Sufficient fire-fighting equipment/extinguishers must be provided in an easily accessible position and in close proximity to all areas used for the storage and / or handling of fuel and other flammable substances. The above statements and requirements must further incorporate the regulations and specifications of any laws including the By-law relating to Community Fire Safety Chapter 8 - download at

http://web1.capetown.gov.za/websearch/search/search.aspx?lib=acm/comsup/Weblib&docName=Bylaw

- All vehicles and equipment must be maintained in a good condition in order to minimise the risk of leakage and possible contamination of the soil or natural drainage system by fuels, oils and hydraulic fluids. All vehicles / plant requiring servicing, or which are parked on site overnight and found to leak oils, as well as any static plant e.g. generators and concrete mixers leaking fuels and oils, are to make use of a drip tray placed strategically to avoid incidental spillage of oils and fuels onto the ground. Drip trays shall be inspected at least weekly (daily, if affected by rainwater) and appropriate mop up products used to remove spillages. In particular, drip trays shall be closely monitored during rain events to ensure that they do not overflow.
- A suitable leak proof container for the storage of oiled equipment (filters, drip tray contents and soiled mop-up products, oil changes, etc.) must be established.

- All fuel, oil or hydraulic fluid spills are to be reported to the manager immediately and be treated according
- The manager shall prevent discharge of any waste water containing pollutants, such as cements, lime, chemicals and oils and fuels into any water sources e.g. into the natural drainage system, or onto any adjacent land. Wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas are not polluted.
- The pollution of surface or ground water shall be prevented. Such pollution could result from the release, accidental or otherwise, of chemicals, oils, fuels, sewage, water from excavations, construction water, water carrying soil particles or waste products etc.
- Fuel and oil spills anywhere on site are to be treated immediately with an appropriate mop-up or bio-remedial products as directed by manufacturers to prevent contamination of runoff.
- All hazardous substances, as scheduled by the Hazardous Substances Act (No. 15 of 1973), shall be strictly handled, stored and disposed of as per the manufacturer's specifications. Material Safety Data Sheets (MSDS) for all hazardous materials used on site shall be available on the environmental responsible staff member's environmental file for reference e.g. in first aid cases, to guide personal protective equipment use, to guide spill clean-ups etc. No hazardous substances may be disposed of on the site, to general landfill or into a sewer or natural drainage system. These shall be directed to a hazardous waste disposal site e.g. Vissershok and the contractor shall obtain safe disposal receipts as proof of safe disposal. No paint products and chemical additives and cleaners such as thinners and turpentine may be disposed of on Site or into a sewer or natural drainage system.

4. Performance Criteria

Compliance with this specification shall be:

- Implementation of the recommendations from the EIR;
- Storage and handling of chemical substances managed to the satisfaction of the external auditor.
- No instances of environmental contamination.

5. Responsibilities

- The facility manager is responsible for ensuring compliance with this specification.
- The Manager: Bulk Water Branch is responsible for ensuring the management of the risks imposed by chemical handling at this facility meets requirements of the IRM and statutory provisions.

6. Monitoring and reporting

- External auditor shall review the performance of each facility and report on compliance to the Manager: Bulk Water Branch.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 9
- Environmental Specification 10
- Environmental Specification 11
- Environmental Specification 12
- Environmental Specification 13
- Environmental Specification 14
- Environmental Specification 16

Environmental Specification 13: Incident management			
Version No.	**draft**	**Date of Approval**	

1. Background

Even with the best planning in the world mistakes or unexpected events can occur. An incident management procedure ensures that any such event is responded to appropriately and quickly but more importantly that the event is analysed to determine its root causes so that procedures can be changed to reduce the likelihood of recurrence.

This specification is for the Muldersvlei WTP facility only. The Muldersvlei WTP facility will have the Event Management System implemented in the same way as all other facilities under the control of the Bulk Water Branch. This specification is provided to ensure that a minimum level of incident management is implemented.

2. Objectives

- To identify and investigate significant incidents in sufficient time to prevent persistent or cumulative environmental damage and through reviewing and improving existing management instructions ensure that the incident does not recur.

Definitions

A significant environmental incident is any inadvertent occurrence (including sabotage):

1. In which the performance criteria specified in any environmental specification has been inadvertently contravened, or
2. Any environmental facet (air, water, soil) has been endangered or degraded through a spill or similar event.

This will include but is not limited to:

- Spills of any liquid or solid onto the exposed soil, into the storm water drain or sewer or any natural watercourse
- An accidental release of any gaseous substance to atmosphere

Note: This definition is different from the definition of a significant incident defined in terms of section 30(1)(a) of NEMA as an unexpected sudden occurrence, including a major emission, fire or explosion leading to **serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed.** The incidents dealt with by this procedure are localised and do not require the intervention of the Department of Water and the Environment. If the incident is deemed significant in terms of this legislation the procedure is overruled and the procedure legislated by the Department shall be assumed.

3. Specifications

1. The facility manager shall ensure that the definitions of an incident in this specification are included in the Event Management System and that the details of this specification are implemented as a minimum.
2. Any incident occurring in any working area of the Muldersvlei WTP and reservoir development will be reported to the facility manager immediately.
3. Upon receiving a report of an incident, the facility manager or designate shall take any action required to prevent the impact of the incident from spreading.
4. Once the incident area has been stabilised, the staff member reporting the incident shall complete the incident investigation form in Annexure 2 or its equivalent in the Event Management System. This shall include a full investigation into the causes of the incident and how a recurrence can be avoided.
5. Once the form has been completed it shall be submitted to the facility manager for review within one day of the incident.

Note: In the event of a significant incident which is defined in terms of section 30(1)(a) of NEMA as an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed, the incident shall be reported to the National Departments of Water and Environmental Affairs and an appropriate incident form completed and submitted to the regional

office or as instructed by the competent official.

6. The facility manager shall sign- off that the incident has been investigated and signed off to his/her satisfaction.

4. Performance Criteria

- All incidents are fully documented and reviewed.
- Management instructions have been amended in response to incident investigation.
- The incident is not repeated.

5. Responsibilities

- The facility manager is responsible for ensuring compliance with this specification.
- The Manager: Bulk Water Branch is responsible for ensuring the management of the risks imposed by chemical handling at this facility meets requirements of the IRM and statutory provisions.

6. Monitoring and reporting

- The external auditor shall review and comment on the functioning and implementation of the incident management environmental specification.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 10
- Environmental Specification 11
- Environmental Specification 12
- Environmental Specification 13
- Environmental Specification 17

Environmental Specification 14: Emergency preparedness and response

Version No.	draft	Date of Approval	

1. Background

This specification applies to the Mulersvlei WTP and reservoir only. Emergency preparedness and response differs from incident management in the magnitude of the incident and the risk to the environment and human lives. This environmental specification draws attention to environmentally related aspects of such response but does not attempt to prescribe the contents of the comprehensive emergency response plan required by the OHSAct.

2. Objectives

- To provide a checklist of environmental aspects to be considered in the development of a comprehensive emergency response plan.

3. Specifications

- The facility manager shall develop an emergency response plans for (amongst others):
  - Failure of the sewage treatment plant; and,
  - Rupture of a pipeline.
- The staff member responsible for implementing this draft oEMP shall:
  - ensure that environmental consequences (such as pollution of any environmental medium) of emergency response are adequately addressed in the emergency plan;
  - ensure that emergency response to risks from environmental media are considered where appropriate (i.e. flooding of a river washing hazardous chemicals downstream); and,
  - ensure that the nature of operations and the position of equipment and chemicals reflects the provisions made in the plan – e.g. hazardous chemicals stored above the flood line.

4. Performance Criteria

- Compliance with this specification shall be the execution of the above listed functions.

5. Responsibilities

- The Manager: Bulk Water Branch shall review the emergency preparedness and response plan and report to the facility manager.
- The IRM shall review the emergency preparedness and response plan and report to the facility manager.
- The external auditor shall verify that this function was performed.

6. Monitoring and reporting

- The external auditor shall review and comment on the inclusion of this specification in emergency response plans.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 10
- Environmental Specification 11

Environmental Specification 15: Induction and Training			
Version No.	**draft**	**Date of Approval**	

1. Background

Implementation of the draft oEMP can only be effective if all personnel are appropriately trained.

2. Objectives

- To provide a checklist of training and induction requirements.

3. Specifications

The staff member responsible for implementing this draft oEMP shall:

- Develop a training and induction program which covers aspects of general environmental management and best practice as well as the specifics of the draft oEMP;
- Ensure that no personnel are permitted to work on site without having first completed the induction training;
- Maintain a register of personnel trained; and,
- Provide refresher training on an annual basis

4. Performance Criteria

- All personnel, visitors and consultants working on site have attended an induction and training course; and,
- The training register is up-to-date and accurate.

5. Responsibilities

- The facility manager shall provide the training and maintain the training register.

6. Monitoring and reporting

- The staff member responsible for implementing this draft oEMP shall monitor the activities on site to determine whether the induction training is adequate. If not, the program is to be revised and all personnel retrained.The external auditor shall review the register and conduct random checks of personnel on site to ensure that all have received induction training.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 2 to
- Environmental Specification 18

Environmental Specification 16: Monitoring checking and auditing			
Version No.	**draft**	**Date of Approval**	

1. Background

The effectiveness of planned environmental protection measures can only be determined through implementation and an analysis of the outcomes of the implementation. For this reason monitoring, checking and auditing of the results if the implementation of these specifications and the draft oEMP as a whole are a critical part of the draft oEMP.

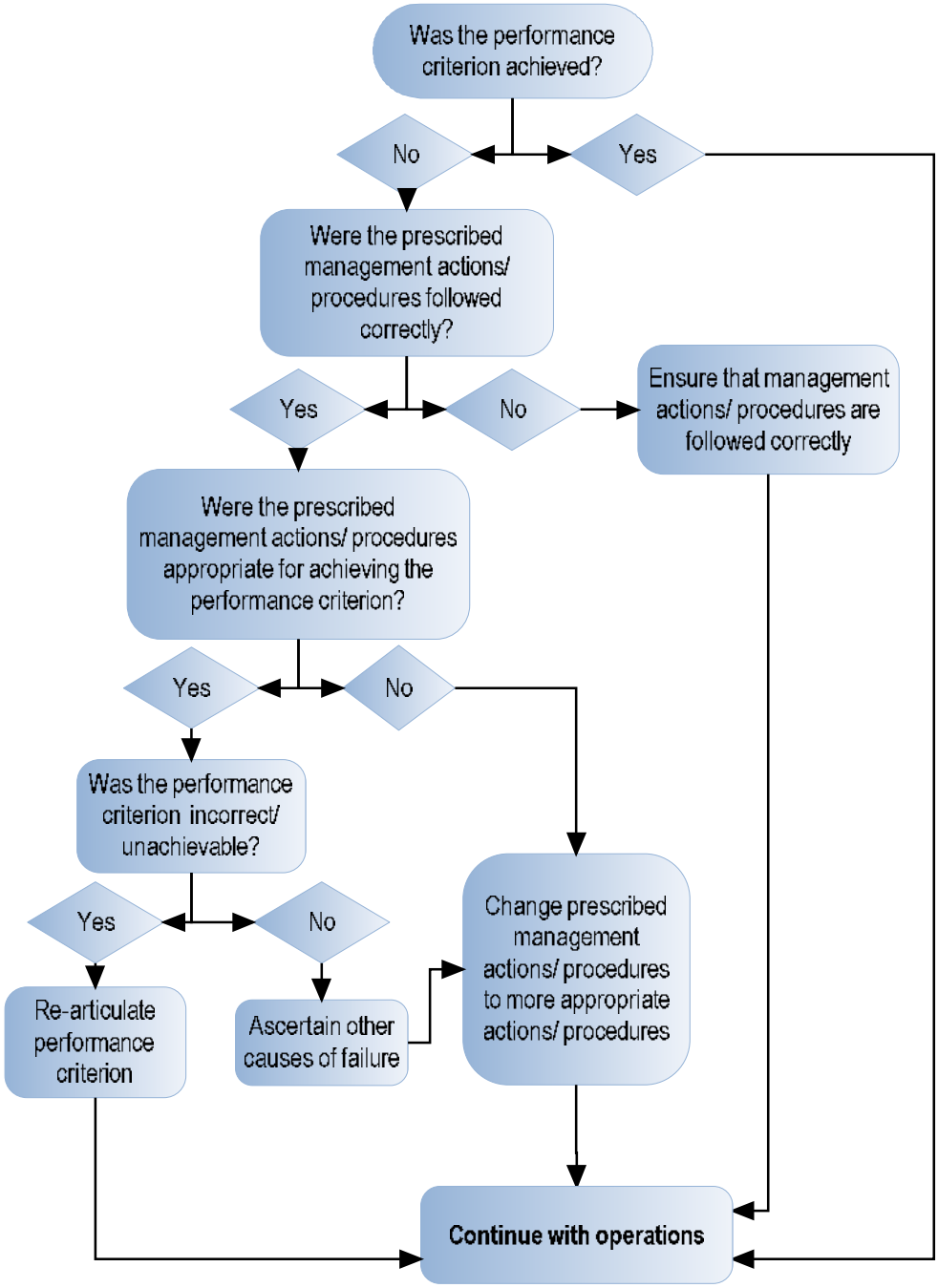
2. Objectives

- To provide for the monitoring, checking and auditing of the implementation of the environmental specifications; and,
- To provide for improvement of environmental specifications.

3. Specifications

The staff member responsible for implementing this draft oEMP shall:

- monitor all operations on a weekly basis, or as often as is practical to determine if the prescribed environmental protection is achieved;
- review audit reports to identify deficiencies in environmental management during operations;
- employ the decision tree overleaf if performance does not meet specifications;
- amend environmental specifications if required as a result of the analysis; and,
- report any such action to the facility manager.



4. Performance Criteria

- Environmental compliance is monitored weekly (or as often as is practical) by the environmental staff member.
- Any discrepancies are analysed for root cases.
- Any required changes to specifications or method statement are implemented.

5. Responsibilities

- The staff member assigned the function of implementing this draft oEMPis responsible for conducting all monitoring and analyses.

6. Monitoring and reporting

- The external auditor shall check that such checking has been conducted and that any discrepancies have been adequately analysed.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 2 to

- Environmental Specification 18

Environmental Specification 17: Records and record-keeping			
Version No.	**draft**	**Date of Approval**	

1. Background

The staff member responsible for implementing this draft oEMP is the facilitator and monitor of environmental compliance. This record of compliance has to be available to any third party and especially to the external auditor. A coherent filing system is essential especially as this development involves public funds and all aspects of it may be subject to scrutiny.

2. Objectives

- To provide a comprehensive and coherent procedure for record keeping by the assigned staff member.

3. Specifications

- The staff member shall file and index the following (note this list is not limited to the items below):
  - All documentation from the construction phase received from the ECO;
  - Reports detailing the mechanisms of implementation of the specifications in the operational phase; Environmental Authorisation;
  - The most recent draft oEMP;
  - Register of updates to the oEMP specifications;
  - Rehabilitation plan;
  - Landscape plan;
  - Weekly compliance monitoring checklists;
  - External audit reports;
  - Training records;
  - Complaints register; and,
  - Any other correspondence.
- The records must be kept for five years for audit purposes.

4. Performance Criteria

- All the above documents are in place, in order and current.

5. Responsibilities

- The staff member assigned the function of implementing this draft oEMP is responsible for the establishment and maintenance of the filing system.

6. Monitoring and reporting

- The external auditor shall report on the filing system and report any noncompliance

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 2 to
- Environmental Specification 18

Environmental Specification 18: Reporting			
Version No.	**draft**	**Date of Approval**	

1. Background

The facility management and the Manager: Bulk Water Branch both have reporting responsibilities in terms of the EA and this draft oEMP.It is important that the reporting schedule and content is maintained to demonstrate compliance.

2. Objectives

- To provide a checklist of reporting requirements.

3. Specifications

The facility manager shall report t the Manager: Bulk Water Branch:

- Any non-compliances;
- Any major incidents; and,
- Any changes to the specifications in this draft oEMP;

The Manager: Bulk Water Branch shall:

- Submit compliance reports to DEA&DP at the frequency specified in the EA;
- Submit external audit reports to DEA&DP at the frequency specified in the EA; and,
- Submit reports to IRM on risk management as specified by that department.

The external auditor shall compile audit reports at the frequency specified in the EA.

4. Performance Criteria

- Compliance with this specification shall be the execution of the above listed functions.

5. Responsibilities

- As above

6. Monitoring and reporting

- The external auditor shall monitor the execution of the above specifications and report any noncompliance.

7. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 1 to
- Environmental Specification 18

Environmental Specification 19: Operational Phase Maintenance			
Version No.	**draft**	**Date of Approval**	

8. Background

This specification is only applicable to the maintenance activities of the Muldersvlei access road, pipelines, WTP and reservoir and provides specifications for the protection of wetlands, watercourses, fauna, and terrestrial vegetation. This is especially important due to the proximity of a natural water course to the south of the facility.

9. Objectives

- To provide specifications for the protection of wetlands, watercourses fauna, and terrestrial vegetation.
- To ensure compliance with legislative requirements for the protection of wetlands, watercourses fauna, and terrestrial vegetation.

10. Specifications

The staff member responsible for implementing this oEMP shall ensure that:

2022 Freshwater Assessment Mitigations

- For crossings of road and pipeline over wetlands and watercourses
  - The potential interception and transfer of subsurface water by the drainage- and bedding material under and around inclined pipes should be inhibited with cut-off barriers perpendicular to the longitudinal profile of the trench (for example, 0.3m thick bentonite). The barriers should be spaced at 24m intervals and extend a minimum of 0.5m past the sides of the trench profile, and up to rock level or a minimum of 0.5m deeper than the trench bottom (whichever comes first).
  - At all road crossings over aquatic ecosystem 3, the natural surface flow of water should be accommodated in several pipes or wide culverts, in order ensure that flow is not concentrated downstream of the crossings.
  - The impacted footprint of the pipeline and road should be kept to a minimum in close (< 30m) proximity to all wetlands and watercourses, e.g. by reducing the depth to which the pipes are laid, where possible.
  - Mowing or clearing of the pipeline or road servitudes of vegetation must be kept to a minimum.
- For the access road crossing through wetlands and watercourses
  - The geomorphological characteristics (shape, gradient, slopes) of the impacted ecosystems must be re-instated after construction – this will reduce the likelihood of increased erosion or sedimentation.
  - If it is necessary to stabilise the watercourse or wetland bed or banks with gabions or rip rap, these should be kept to a minimum, and should be done in an ecologically sensitive manner. For example, gabions could be top-soiled to allow for the establishment of vegetation, which would also serve the purpose of reducing erosion.
- For vegetation clearance along the pipeline and access road servitudes:
  - Mowing should not be more frequently than annually.
  - Vegetation within the pipeline servitudes should be allowed to recover (in some cases, re-planted), within the constraints of ongoing maintenance of the pipeline.
  - Ongoing monitoring of the pipeline and WTP site and associated infrastructure should be implemented (part of the ongoing EMP) in order to ensure that exotic plant species are not introduced or become established due to the disturbance.

2023 Biodiversity Assessment Requirements:

- The applicant (CoCT Bulk Water) must provide all necessary funding for all the required mitigation (including ongoing site management) and must transfer management responsibility and al necessary funding for the 5.5ha conservation area (See Figure 5) to the CoCT Environmental Management Branch, within three

months of any project approval.

- The 1ha of currently cultivated or fallow area north of the road that has been expropriated must be rehabilitated to local indigenous Renosterveld vegetation as soon as possible, and should form part of the main drainage line conservation area.

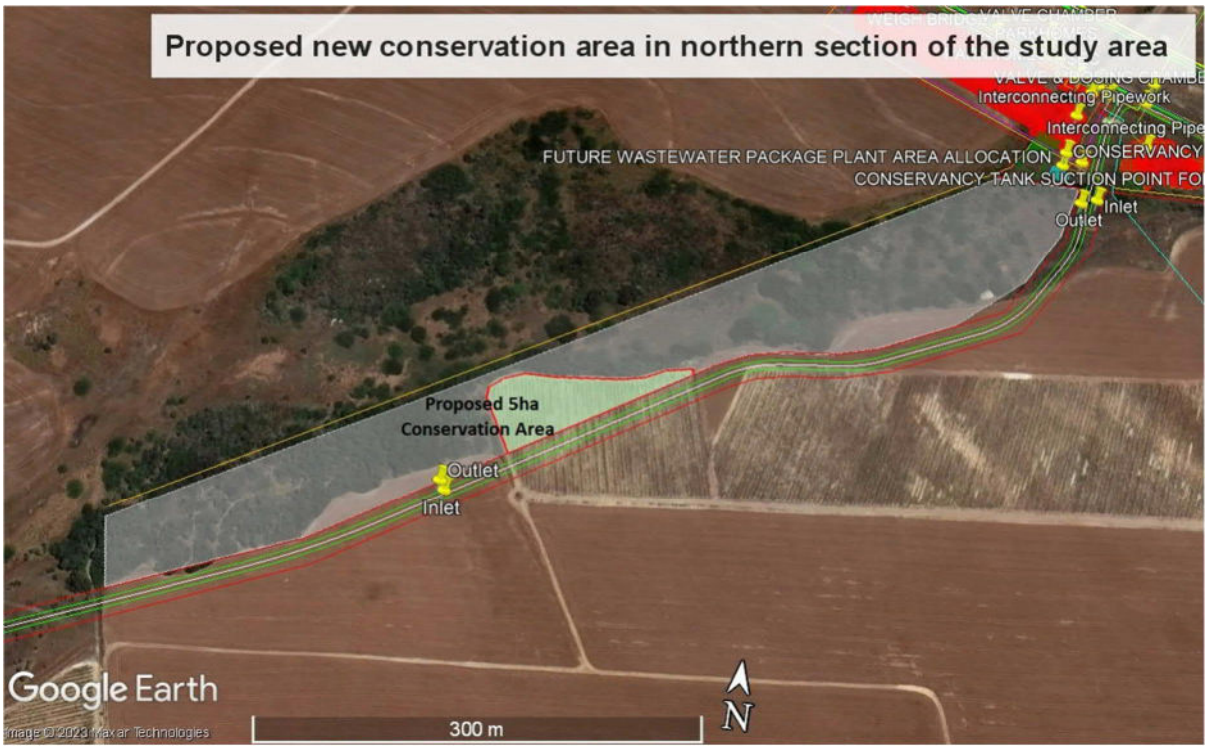


Figure 5: Map showing the proposed 5ha conservation area (grey and green shading) north of the proposed road that should be transferred to the CoCT Environmental Management Department (has already been expropriated by CoCT Bulk Water), courtesy (Nick Helme, 2023)

11. Performance Criteria

Compliance with this specification shall be:

- Ensuring maintenance activities do not adversely affect the wetlands and watercourses, i.e. the following:
  - There is no loss of surface flow connectivity at pipeline and road crossings and no erosion within impacted ecosystems.
  - There is no loss or deterioration of aquatic habitat through ongoing erosion and sedimentation.
  - There is no deterioration in wetland and riverine habitat through loss of indigenous vegetation.

12. Responsibilities

- The individual staff member responsible for implementation of this oEMP shall be responsible for ensuring that maintenance activities do not adversely affect the wetlands and watercourses.
- The facility manager is responsible for ensuring compliance with this specification.

13. Monitoring and reporting

- External auditor shall review the performance of each facility and report on compliance to the Manager: Bulk Water Branch.

14. Related documents

The following documents relate to this environmental specification:

- Environmental Specification 10
- Environmental Specification 11
- Environmental Specification 12

- Environmental Specification 13

Annexure 1: Summary of mitigation measures from the EIR copied verbatim from the EIR for reference

Please note that some of the recommendations recorded below are not possible or are not legally permitted and have not been included in the oEMP above.

Summary of mitigations and recommendations for pipelines and access road

Discipline	Design Phase	Construction Phase	Operational Phase

Stakeholder engagement and facilitation	• A Community Liaison Forum shall be established prior to construction commencing.
	  • A single Community Liaison Forum shall provide an information sharing function for both the pipeline construction and the construction of the WTP and associated infrastructure.
	  • The Terms of Engagement and responsibilities shall be documented and approved by the applicant.
	  • The Terms of Engagement shall cover two phases and the different activities attendant on the two phases: the construction phase and the operational phase.
		• The Community Liaison Forum will negotiate the construction roll-out with affected landowners prior to construction commencing.
		• Road closures, movement of abnormal load vehicles, land acquisitions and other activities that would affect general public will be communicated via the Community Liaison Forum and local newspapers.
		• The Forum shall:
		  • Be an information-sharing portal
		  • Serve as a monitoring organisation
		  • Serve as a portal for stakeholder feedback and response.
			• The Community Liaison Forum shall cease construction phase activities once construction and rehabilitation has been completed along the length of the pipeline.

Biophysical (terrestrial and freshwater ecology) impact management	• The pipeline design shall be:
	  • Designed to minimise vertical and horizontal footprint (as shallow and narrow as possible).
	  • Aligned to avoid wetlands and rivers - especially for sites listed to be of moderate to high conservation importance. Where this is impossible artificial stabilisation using structures such as gabions to be kept to a minimum.
	  • Aligned to avoid crossing roads or railway lines or make use of existing crossings.
		• Construction shall:
		  • Be planned in collaboration with a restoration ecologist to ensure that activities do not occur during construction which will limit post-construction rehabilitation.
		  • Take place in the dry season to minimise impacts of blasting and bulk earth moving.
		  • Limit stream flow disruption. Temporary diversions to be designed to flush sediment accumulations. Crossings to occur in late summer or when the streams are dry. Bank erosion must be prevented. All diversions to be removed once construction has been completed. Post-construction rehabilitation to be signed-off by the restoration ecologist.
		• Soil disturbance shall be kept to a minimum.
		  • Removal of vegetation shall be kept to a minimum
		  • Exposed soil shall be protected from erosion.
		  • Construction areas shall be restored to the natural slope and geomorphology through rehabilitation.
		  • Exposed soil shall be revegetated as soon as construction has ceased.
			• The Operational Management Plan should highlight regular intervals during which inspections should be undertaken to monitor invasive alien plant establishment. Further to that a removal plan should be compiled.
			2022 Freshwater Assessment Mitigations
			• The potential interception and transfer of subsurface water by the drainage- and bedding material under and around inclined pipes should be inhibited with cut-off barriers perpendicular to the longitudinal profile of the trench (for example, 0.3m thick bentonite). The barriers should be spaced at 24m intervals and extend a minimum of 0.5m

Discipline	Design Phase	Construction Phase	Operational Phase
	• Ensure that the bedding medium does not form a preferential drainage line. • Commented upon by the freshwater ecologist prior to finalisation. • A post construction rehabilitation plan shall be developed in collaboration with a restoration ecologist and approved prior to the commencement of construction. This plan must highlight and minimise t any construction activities which could limit rehabilitation success. Such activities must be avoided where possible.	• Post-construction rehabilitation to be signed-off by the restoration ecologist. • Rare and endangered plants are to be fostered. • Ecologically sensitive areas shall be demarcated and maintained as no-go zones. • All invasive aliens to be removed within 100 m either side of the pipeline where indigenous vegetation or riparian areas are affected . • A restoration ecologist shall be contracted to conduct a search and rescue of rare or endangered plants along the route of the pipeline in late winter/ spring. • A nursery is to be established to care for the rescued plants. • The rescued plants shall be replanted under the supervision of a restoration ecologist once construction has been completed. • Post-construction rehabilitation to be signed-off by the restoration ecologist. • Topsoil to be removed and stockpiled for replacement during post-construction rehabilitation. • Topsoil stockpiles to be protected against wind and rain dispersal. • Any topsoil run-off to be trapped and re-stockpiled. • No stockpile run-off may be permitted to enter any watercourse. • Watercourses shall be protected from contamination. • All building materials should be stored away (at least 50 m) from aquatic ecosystems and the areas bunded appropriately such that there will be no runoff to watercourses. • If construction areas are to be pumped of water (e.g. after rains), this water shall be routed via a settlement area and not directly to a watercourse. • Vehicle and plant washing shall take place at least 50 m from watercourses and any effluent water contained and treated prior to discharge to the watercourse. • No run-off from construction areas may be permitted to enter any watercourses unchecked. Any chemical or fuel spills shall be contained and cleaned immediately to prevent contamination of water courses. • 2022 Freshwater Assessment Mitigations • Where the pipe comes close to (< 30m) a wetland or watercourse, the specifications for the pipe trenches should aim to minimise the footprint of construction (e.g. the shallower the pipe, the narrower the disturbed area). • Sensitive ecosystems must be demarcated prior to any construction activities, so that these can be avoided, unless construction is taking place within the boundaries of a wetland or watercourse. • Removal of indigenous vegetation should be kept to a minimum, and refilled trenches must be rehabilitated after construction. Refer to Section 8.9 for rehabilitation plan and guidelines (Note: Areas under cultivation where the Wynland pipeline is removed can be returned to cultivation). • Where the access road will be re-aligned through the valley-bottom wetland in lower Aquatic Ecosystem 3, the old road footprint (current access road to County Fair) must be rehabilitated, to the guidelines provided. A total of 1636m2 of wetland and 700m2 of riparian habitat will be lost, and 1119m2 gained. Additional rehabilitation of	past the sides of the trench profile, and up to rock level or a minimum of 0.5m deeper than the trench bottom (whichever comes first). • At all road crossings over aquatic ecosystem 3, the natural surface flow of water should be accommodated in several pipes or wide culverts, in order ensure that flow is not concentrated downstream of the crossings. • The impacted footprint of the pipeline and road should be kept to a minimum in close (< 30m) proximity to all wetlands and watercourses, e.g. by reducing the depth to which the pipes are laid, where possible. • Mowing or clearing of the pipeline or road servitudes of vegetation must be kept to a minimum. 2023 Biodiversity Assessment Requirements: • The applicant (CoCT Bulk Water) must provide all necessary funding for all the required mitigation (including ongoing site management) and must transfer management responsibility and al necessary funding for the 5.5ha conservation area (See Figure 5) to the CoCT Environmental Management Branch, within three months of any project approval. • The 1ha of currently cultivated or fallow area north of the road that has been expropriated must be rehabilitated to local indigenous Renosterveld vegetation as soon as possible, and should form part of the main drainage line conservation area.

Discipline	Design Phase	Construction Phase	Operational Phase
		the wetland (such as shaping of the erosion gullies in the wetland) and watercourse (such as stabilising erosion and re-planting with indigenous plant species) will achieve the balance required, such that there will be no residual loss. • The specifications for the relocated pipe trenches should aim to minimise the footprint of construction (e.g. the shallower the pipe, the narrower the disturbed area) where the pipe comes close to (< 30m) a wetland or watercourse, and sensitive ecosystems should be demarcated prior to any construction activities, so that these can be avoided, wherever possible. • Special care should be taken around storm and heavy rain events. The construction sites should be inspected for erosion damage at these times. • Consideration should be given at the design phase to remedial shaping of banks to their near-natural slope, geomorphological and bed characteristics and re-vegetated after clean-up. • Banks and slopes should be re-vegetated after construction is completed. A detailed planting plan should be developed, in consultation with a landscaper and ecologist. • If construction areas are to be pumped of water (e.g. after rains), this water must first be pumped into a settlement area, and not directly into a natural aquatic ecosystem. • • Disruption of flow should be kept to a minimum, but where necessary, temporary diversion measures should allow flushing of the system to prevent build-up of material. • Diversion techniques should take measures to limit erosion from temporary channels into watercourses or wetlands. • No obstructions to flow shall remain in the watercourses or wetlands after construction is completed. • Temporary diversion channels must be rehabilitated. • All building materials must be stored away (at least 15m) from all aquatic ecosystems and the areas bunded appropriately such that there will be no runoff from these areas towards aquatic systems. All building materials should be removed after construction. • Materials should be stored in piles that do not exceed 1.5m in height and should be protected from the wind, to prevent spread of fine materials across the site. • Sensitive areas that are impacted by the dumping or storage of materials must be ripped and re-planted after construction is complete. • The pipeline contractor should work the relocated Wynland pipeline route in sections, backfilling as they go, which will reduce the width of disturbed area – i.e. it is not as necessary to spread the spoil wide, if it can spread along a greater length. • Washing of vehicles and machinery should take place well away (50m) from aquatic ecosystems. • Machinery prone to oil or fuel leakage must be located at least 50m away from any aquatic ecosystem, and the area adequately bunded in order to contain leakages. • Water pumps and cement mixers shall have drip trays to contain oil and fuel leaks – these must be cleaned regularly.	

Discipline	Design Phase	Construction Phase	Operational Phase
		• Concrete batching must be done well away from (50m minimum) from all sensitive environments. • All machinery should be regularly checked for leaks. • Suitable toilet and wash facilities must be provided to avoid the use of sensitive areas for these activities. These service areas must be maintained, and toilets emptied on at least a weekly basis. • If construction areas are to be pumped of water (e.g. after rains), this water must first be pumped into a settlement area, and not directly into a natural ecosystem. • Pathways and temporary access roads must be routed around the wetlands and should cross drainage channels as seldom as possible. • Sensitive areas must clearly be demarcated and fenced off (using temporary fencing and danger tape) before any construction work or site preparation begins. These are no-go areas during the construction process. • Affected areas must be ripped and re-planted after construction, according to the specifications set out in the CEMPr, and to the satisfaction of the ECO. • The construction sites and pathways must avoid sensitive areas. If lights are used, these must be directed away from all sensitive areas. • The sensitive areas (i.e. the edges of the buffers around the wetlands, watercourses) not affected by construction must clearly be demarcated and fenced off (using temporary fencing and danger tape) before any construction work or site preparation begins. These are no-go areas during the construction process, except where work is occurring. • In situ soils must preferably be used for rehabilitation of construction sites. • Where in situ soils are insufficient, top soils used after construction must be bought from reliable sources, and must be free of alien seeds or grass runners. • Constant monitoring of the construction sites by the Site Engineer and ECO must occur, and all alien plant species removed from or destroyed on the site. • 2023 Biodiversity Assessment Requirements: • Relocation of the Endangered plant species recorded in the Very High sensitivity is not the first choice, as the adult plants are very unlikely to survive, but an attempt should be made to take seed (in April/May) and cuttings (April/May), and an effort must be to translocate all the live plants (April/May) of Athanasia capitata from within the approved development footprint to nearby similar but secure habitat. As the Medium and Very High sensitivity habitat may support various other plant Species of Conservation Concern (SoCC) the city of Cape Town (CoCT) Environmental Management Branch staff should undertake Search and Rescue in the approved development footprints on at least two occasions in the appropriate seasons (July – late September) prior to any earthmoving on site. • During construction an ECO must ensure that no animals are trapped in the construction and pipeline trenches, and remove any that are. These should be checked every morning before work starts. Trenches should be infilled as soon as possible.	

Discipline	Design Phase	Construction Phase	Operational Phase
		•	
Agricultural impact management	• Compensation for expropriated land and lost production shall be finalised prior to construction.	• Measures to reduce dust production and dispersal shall be included in a method statement submitted by the contractor. Use of potable water for dust suppression is not permitted.	
Heritage	• The pipeline route should: • Be above the valley floor . • Be separated from public scenic road edges by vineyards or other relevant planted agricultural land. • Avoid running alongside scenic drive edges. • Avoid crossing tree-lined main approach avenues. • Be set back a minimum 5 m from tree canopy drip lines where running parallel with, and adjacent to, belts of trees. • Be separated from private roads by planted tree. • Be set back a minimum 10 m from the edge of a river or watercourse • Be laid below watercourse and stream beds. • Run close to and preferably on the southern side of the (disused) railway embankment running along the valley. • Follow existing vineyard and other agricultural boundaries wherever possible, particularly where farm service roads are already in existence. • Avoid bisecting or encroaching on vineyards. • Avoid the use of obtrusive service structures.		
Archaeological		• The burial/cemetery site on the Farm Simonsvlei alongside the Klapmuts Road is a no-go area and shall be demarcated as such. • Should any unmarked human remains be disturbed, exposed or uncovered during excavations and earthworks for the proposed project, these shall be reported to the South	

Discipline	Design Phase	Construction Phase	Operational Phase
		African Heritage Resources Agency and not be disturbed or removed without official approval.	

Summary of mitigations and recommendations for the reservoir and WTP

Discipline	Design Phase	Construction Phase	Operational Phase

Stakeholder engagement and facilitation	• A Community Liaison Forum shall be established prior to construction commencing.
	  • A single Community Liaison Forum shall provide an information sharing function for both the pipeline construction and the construction of the WTP and associated infrastructure.
	  • The Terms of Engagement and responsibilities shall be documented and approved by the applicant.
	  • The Terms of Engagement shall cover two phases and the different activities attendant on the two phases: the construction phase and the operational phase.
		• The Community Liaison Forum will negotiate the construction roll-out with affected landowners prior to construction commencing.
		• Road closures, movement of abnormal load vehicles, land acquisitions and other activities that would affect general public will be communicated via the Community Liaison Forum and local newspapers.
		• The Forum shall:
		  • Be an information-sharing portal
		  • Serve as a monitoring organisation
		• Serve as a portal for stakeholder feedback and response.
			• The Community Liaison Forum shall change function and become a liaison forum for the operational phase. The Forum shall:
			  • Be an information sharing portal
			  • Serve as a monitoring organisation
			  • Serve as a portal for stakeholder feedback and response.

Biophysical (terrestrial and freshwater ecology)	• The WTP and associated infrastructure design shall:
	  • Minimise the footprint.
	  • Move the proposed access road 30m to the east to avoid the Renosterveld remnant.
		• Construction shall:
		  • Be planned in collaboration with a restoration ecologist to ensure that activities do not occur during construction which will limit post-construction rehabilitation.
		  • Take place in the dry season to minimise impacts of blasting and bulk earth moving.
		  • Limit stream flow disruption. Temporary diversions to be designed to flush sediment accumulations. Crossings to occur in late summer or when the streams are dry. Bank erosion must be prevented. All diversions to be removed once construction has been completed. Post-construction rehabilitation to be signed-off by the restoration ecologist.
		• Soil disturbance shall be kept to a minimum.
		  • Removal of vegetation shall be kept to a minimum.
		  • Exposed soil shall be protected from erosion.
		  • Construction areas shall be restored to the natural slope and geomorphology through rehabilitation.
		  • Exposed soil shall be revegetated as soon as construction has ceased.
		  • Post-construction rehabilitation to be signed-off by the restoration ecologist.
			• The freshwater ecology shall be preserved by:
			  • Conducting continuous effluent quality testing.
			  • Discharging treated effluent only when it meets requirements of the DWA General Authorisation 399 (March 2004).
			  • Conducting annual monitoring of affected freshwater ecosystems – this should include testing for nutrient levels (at least orthophosphates and nitrates, and chlorophyll-a (as algal biomass).
			  • Irrigating effluent away from sensitive environments, especially watercourses and wetlands.
			  • Implementing a scheduled maintenance program for the treatment package plant.
			2022 Freshwater Assessment Mitigations
			  • The geomorphological characteristics (shape, gradient, slopes) of the impacted ecosystems must be re-instated after construction – this will reduce the likelihood of increased erosion or sedimentation.
			  • If it is necessary to stabilise the watercourse or wetland bed or banks with gabions or rip rap, these should be kept to a minimum, and should be done in

Discipline	Design Phase	Construction Phase	Operational Phase

		• Rare and endangered plants are to be fostered.
		  • Ecologically sensitive areas shall be demarcated and maintained as no-go zones.
		  • All invasive aliens to be removed within 100 m either side of the pipeline where indigenous vegetation or riparian areas are affected .
		  • A restoration ecologist shall be contracted to conduct a search and rescue of rare or endangered plants along the route of the pipeline in late winter/ spring (at least twenty plants of the rare Athanasiacapitata associated with Area BA4 would have to be relocated).
		  • A nursery is to be established to care for the rescued plants.
		  • The rescued plants shall be replanted under the supervision of a restoration ecologist once construction has been completed.
		  • Post-construction rehabilitation to be signed-off by the restoration ecologist.
		• Topsoil to be removed and stockpiled for replacement during post-construction rehabilitation.
		  • Topsoil stockpiles to be protected against wind and rain dispersal.
		  • Any topsoil run-off to be trapped and re-stockpiled.
		  • No stockpile run-off may be permitted to enter any watercourse.
		• Watercourses shall be protected from contamination:
		  • All building materials should be stored away (at least 50 m) from aquatic ecosystems and the areas bunded appropriately such that there will be no runoff to watercourses.
		  • If construction areas are to be pumped of water (e.g. after rains), this water shall be routed via a settlement area and not directly to a watercourse.
		  • Vehicle and plant washing shall take place at least 50 m from watercourses and any effluent water contained and treated prior to discharge to the watercourse.
		  • No run-off from construction areas may be permitted to enter any watercourses unchecked. Any chemical or fuel spills shall be contained and cleaned immediately to prevent contamination of water courses.
		• 2022 Freshwater Assessment Mitigations
		  • Disruption of flow should be kept to a minimum, but where necessary, temporary diversion measures should allow flushing of the system to prevent build-up of material.
		  • Diversion techniques should take measures to limit erosion from
			an ecologically sensitive manner. For example, gabions could be top-soiled to allow for the establishment of vegetation, which would also serve the purpose of reducing erosion.
			• Mowing should not be more frequently than annually.
			• Vegetation within the pipeline servitudes should be allowed to recover (in some cases, re-planted), within the constraints of ongoing maintenance of the pipeline.
			• Ongoing monitoring of the pipeline and WTP site and associated infrastructure should be implemented (part of the ongoing EMP) in order to ensure that exotic plant species are not introduced or become established due to the disturbance.

Discipline	Design Phase	Construction Phase	Operational Phase
		temporary channels into watercourses or wetlands. • No obstructions to flow shall remain in the watercourses or wetlands after construction is completed. • Temporary diversion channels must be rehabilitated. • All building materials must be stored away (at least 15m) from all aquatic ecosystems and the areas bunded appropriately such that there will be no runoff from these areas towards aquatic systems. All building materials should be removed after construction. • Materials should be stored in piles that do not exceed 1.5m in height and should be protected from the wind, to prevent spread of fine materials across the site. • Sensitive areas that are impacted by the dumping or storage of materials must be ripped and re-planted after construction is complete. • Washing of vehicles and machinery should take place well away (50m) from aquatic ecosystems. • Machinery prone to oil or fuel leakage must be located at least 50m away from any aquatic ecosystem, and the area adequately bunded in order to contain leakages. • Water pumps and cement mixers shall have drip trays to contain oil and fuel leaks – these must be cleaned regularly. • Concrete batching must be done well away from (50m minimum) from all sensitive environments. • All machinery should be regularly checked for leaks. • Suitable toilet and wash facilities must be provided to avoid the use of sensitive areas for these activities. These service areas must be maintained, and toilets emptied on at least a weekly basis. • If construction areas are to be pumped of water (e.g. after rains), this water must first be pumped into a settlement area, and not directly into a natural ecosystem. • Pathways and temporary access roads must be routed around the wetlands and should cross drainage channels as seldom as possible. • Sensitive areas must clearly be demarcated and fenced off (using temporary fencing and danger tape) before any construction work or site preparation begins. These are no-go areas during the construction process. • Affected areas must be ripped and re-planted after construction, according to the specifications set out in the CEMPr, and to the satisfaction of the ECO.	

Discipline	Design Phase	Construction Phase	Operational Phase
		• The construction sites and pathways must avoid sensitive areas. If lights are used, these must be directed away from all sensitive areas. • The sensitive areas (i.e. the edges of the buffers around the wetlands, watercourses) not affected by construction must clearly be demarcated and fenced off (using temporary fencing and danger tape) before any construction work or site preparation begins. These are no-go areas during the construction process, except where work is occurring. • In situ soils must preferably be used for rehabilitation of construction sites. • Where in situ soils are insufficient, top soils used after construction must be bought from reliable sources, and must be free of alien seeds or grass runners. • Constant monitoring of the construction sites by the Site Engineer and ECO must occur, and all alien plant species removed from or destroyed on the site.	
Agricultural impact management	• Compensation for expropriated land and lost production shall be finalised prior to construction.	• Measures to reduce dust production and dispersal shall be included in a method statement submitted by the contractor. Use of potable water for dust suppression is not permitted.	

Visual	• The visual impact of the WTP infrastructure shall be mitigated by:
	  • Blending and varying colours and textures to fit in with the existing environment.
	  • Grading earth embankments to the proposed reservoir into the natural contours.
	  • Landscaping the WTP premises to blend with the surrounding environment.
	  • Ensuring that only essential security lighting is used and that it faces away from the perimeter.
	  • Employing sustainable design elements such as:
	  • Using renewableand natural materials and elements where possible, as well as recycled and reconstituted materials.		

Discipline	Design Phase	Construction Phase	Operational Phase
	• Using locally produced, as opposed to imported materials. • Planning construction and finishing to limit repainting/re-finishing intervals; and replacement and repair costs.		
Heritage		• Local labour to be used wherever practical.	
Archaeological		• The burial/cemetery site on the Farm Simonsvlei alongside the Klapmuts Road is a no-go area and shall be demarcated as such. • Should any unmarked human remains be disturbed, exposed or uncovered during excavations and earthworks for the proposed project, these shall be reported to the South African Heritage Resources Agency and not be disturbed or removed without official approval.	

Additional mitigation measures to be implemented copied verbatim from the EIR

Operational Phase Impacts

Local Employment Opportunities

Based on employment figures at the CCT's Faure WTP, approximately 85 people would work on the site once it is operational, working in three shifts of 8 hours each, in order to ensure 24 hour operation. Approximately 25 employees would be skilled, 32 semi-skilled and 28 unskilled. Impacts for the local area would be of a **moderate positive** significance during operations with mitigation, regardless of which site is chosen.

Mitigation

Ensure jobs for low skilled workers are assigned to local residents.

Increased Traffic to and from the WTP/Reservoir Complex

The traffic volumes on the access roads to and from the proposed WTP and reservoir during the operational phase are estimated to be as follows:

Trucks (up to 10 tons) :	5 to 10 return trips per day
Other vehicles (e.g. staff transport) :	5 to 10 return trips per day

The traffic to and from the WTP and reservoir is not expected to significantly increase the traffic volumes on the access roads to the site.

Noise

The only significant noise related impacts are related to the turbines of the WTP and the daily traffic associated with the transport of materials and personnel to and from the WTP and reservoir site.

The maximum noise output from the WTP and associated infrastructure would have to comply with the requirements of the relevant SANS standards.

Stormwater Runoff

The hardened surfaces on the WTP and reservoir site would result in an increased peak and volume of stormwater runoff when it rains, which could impact negatively on downstream areas by resulting erosion and flooding. A stormwater management system will need to be implemented on the site which could include detention ponds to detain runoff to pre-development runoff levels as well as measures to deal with stormwater operating.

Pollution of Freshwater Resources and Soils Associated with Chemical Spills on Site and During Delivery

The oEMP will include standard operating measures in this regard to manage this impact. Procedures for the correct handling and securing of chemicals during transport will be adhered to according to legal requirements which will be outlined in the EMP.

Impact associated with the disposal/irrigation of treated sewage effluent

Treated sewage effluent will be irrigated onto landscaped areas surrounding the WTP. During the winter months there may be a need to discharge some of the effluent to a nearby watercourse in the case of Sites A and A1 and a low point in the landscape in the case of Site B located in the south eastern corner of this site. This treated effluent will meet the General Effluent Limits for irrigation and discharging of effluent to a watercourse contained in the General Authorisation to be applied for and obtained from DWA during the detailed design phase. The quality and quantity of effluent to be produced is not anticipated to have a significant impact on the environment (refer to section 7.2.2.3 of the EIR). Adequate storage capacity and back-up systems provided on site, should an

operational failure be experienced, will ensure that the environment is not negatively impacted by the release of treated effluent. With the implementation of mitigation measures, as provided in Table 7.4, or the EIR the impact of this aspect on the environment is expected to be negligible.

Staff Capacity Problems/Efficient Running of the Plant

The management of the existing Faure WTP have highlighted the problem that they experience loss of experienced staff at the facility, which does impact on the efficient operations of the facility. This is not a unique problem and is experienced by many government departments. The CCT should consider the formulation of a succession planning policy to limit the loss of experienced staff as a malfunctioning WTP would have a high negative impact on the residents of Cape Town.

Impact Associated with Filtration residue Disposal

30-40 tons of residue will be trucked to landfill daily. This residue has elevated concentrations of mobile Manganese and is therefore hazardous and will be disposed of to a landfill capable of accepting such waste.. The residue will be discharged directly from the filtration plant to skips which will leave the site when full. In this way the threshold of 35 m^3 of waste onsite will not be exceeded thus obviating the need for a waste licence.

Construction and Operational Phase Impacts

Compromised Safety and Security on Farms

Safety and security concerns, associated with the presence of construction and operational phase workers, have been expressed by a number of the affected property owners. The EMP would make specific provision regarding the demarcation of construction, office and storage areas before construction commences and it is envisaged that specific measures would have to be put in place to ensure that the existing levels of security on individual properties are maintained throughout the construction period and that trespassing onto private property does not occur.

Fire Risks

Property owners have raised the concern that increased people presence associated with the construction and operational phases of the project could create potential fire risks to the surrounding farmlands. The establishment of firebreaks around the facility will form part of the EMP. This issue will also be included in the Emergency Response Plan to be developed for the facility.

Impact on Tourism

In order to assess tourism impacts, the Economic Impact Assessment (Van Zyl, 2010) took into consideration the findings of the visual and heritage specialist studies as well as discussions with tourism planning authorities. The intensity of tourism impacts are difficult to predict as they are primarily reliant on the perceptions of passing tourists, some of whom may find that the WTP and reservoir would detract from their experience and others who may not. Confidence in assessment is thus medium. It is predicted that the tourism impacts associated with the placement of the proposed infrastructure at Sites A, A1 and B would be of a low significance (after mitigation).

Mitigation

Design and construction

Impacts on tourism are dependent on how the site is developed and managed to minimise negative biophysical and social impacts. The measures recommended in other specialist reports to minimise biophysical and social impacts (primarily the minimisation of visual impacts and sound management of risks) would thus also minimise tourism impacts. Particular attention needs to be paid to visual mitigation measures in this regard.

Annexure 2: Specimen incident report form

A2. Incident Report Form

Version 1: October 2009

Note: In the event of a significant incident which is defined in terms of section 30(1)(a) of NEMA as an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed, the incident shall be reported to the National Department of Water and the Environment and an appropriate incident form completed and submitted to the regional office or as instructed by the competent official.

Section One: To be completed by the person reporting the incident

Name		**Designation**	
Contact number		**Physical location of incident**	

Describe the incident

Was there damage/ contamination of any of the following? (Tick the appropriate box)

Potable water supply		**Storm water**		**Ground water**	
Air		**Soil**		**Roadways**	

What remediation has been undertaken? (Describe)

Has the damage/ contamination been completely remediated?	
If not, what residual damage remains (detail the residual damage).	
If residual damage remains- what is the reason and what is planned with respect to the environmental damage. CoCT must counter sign this form in this event before it can be closed. (see below)	
Upon investigation, what was found to be the cause of the incident? (Detail)	
Is this a repeat of a similar incident?	
What is the reason that planned changes did not prevent a recurrence of the incident?	

What is to be changed to ensure that the incident will not be repeated? (Detail)

Section Two: To be completed by the ECO

Does the incident comprise a contravention of legislation?	
What action has been taken?	
In the opinion of the ECO is the remediation action sufficient?	
If not, what further actions must be taken? (detail)	
Have all the required and appropriate actions been taken to the satisfaction of the ECO?	
Have all parties signed the incident form?	

_____	_____
Date	Contractor
_____	_____
Date	ECO
_____	_____
Date	CoCT (if required)