

UMZIMKULU BULK WATER AUGMENTATION SCHEME

1. PROJECT NAME

Umzimkulu Bulk Water Augmentation Scheme: Construction of a 27Mℓ/d Extension to the Bhubhoji Water Treatment Works

2. BACKGROUND

Water demand in the uMzimkhulu water supply catchment has outstripped the existing treatment capacity at Bhubhoji waterworks due to the expansion of the water supply network to the sprawling rural community with water supply backlogs and increasing demand from the coastal urban strip of the lower south coast. The coastal urban strip is the economic hub of the lower south coast region.

The Bhubhoji Waterworks has a current design capacity of 54 Mℓ/day. The treatment capacity has been exceeded and is being increased by 27Mℓ/d to 81Mℓ/day. Tenders for the extension works closed in 2012 and construction commenced in 2014

3. PROJECT DESCRIPTION AND LOCATION

3.1 Project Description

The capacity of Bhubhoji Water Treatment works is to be augmented as follows:

- Construction of a new inlet division box complete with lime and polyelectrolyte dosing facilities. The inlet division box will house a sleeve valve to enable on site control of the rate of flow of raw water under gravity from the off-channel storage dam to the treatment works.
- Supply and Installation of bulk chemical storage tanks.
- Construction of a new clariflocculator with a rated capacity of 36Mℓ/day.
- Demolition of the existing rectangular clarifier (rated capacity of 7,6 Mℓ/day) and the construction four new rapid gravity filters with a combined capacity of 27 Mℓ/day on the site presently occupied by the rectangular clarifier.
- Construction of a new chlorine house to house three one tonne chlorine cylinders including a loading gantry, cylinder trolleys, and rails.
- Construction of a new treated water pump station which will draw treated water from the existing circular reservoir and deliver it to the existing header tank on the roof of the Chemical House.
- Construction of a new backwash water recovery pump station to enable all backwash wastewater to be collected and transferred to a sludge treatment facility which is to be constructed in the future.
- Supplying and laying of all interconnecting pipework required for the new water treatment facilities.

- Construction of a building to house a standby generator set.
- Upgrading of first floor of the Chemical House to a Control Room.
- Conversion of part of the Main Building into Change Rooms and Ablutions for Staff.

Construction is undertaken by two separate Contracts, Contract Ugu-07-1127-2012; Construction of a 27Ml/day Extension to the Bhoibhoyi Water Treatment Works for the civil engineering works and contract UGU-07-1129-2012, Supply and Installation of the Mechanical and Electrical Plant and Equipment for the 27Ml/d Extension to the Bhoibhoyi Water Treatment works.

When all of the above work has been completed, the Bhoibhoyi Water Treatment Works will have a rated capacity of 81 Ml/d.

3.2 Project Location

The project area is located at the Bhoibhoyi Township within the Ward 20 of the Hibiscus Coast Local Municipality. Bhoibhoyi township is some 9 km inland of Port Shepstone, along the N2 Freeway to Harding, on the KwaZulu-Natal Lower South Coast.

4. PROJECT DURATION

CONTRACT DATES:

Commencement Date: 17 June 2014

Completion Date: 17 November 2017

5. PROJECT FUNDING AND COSTING

R 98 151 970,45 (incl VAT)

6. CONSTRUCTION ROLE PLAYERS

- | | |
|---|-----------------------------------|
| • Implementing Agent: | Ugu District Municipality |
| • Consulting Engineer: | Royal HaskoningDHV |
| • ISD Consultant | Nkeshezi Construction |
| • Environmental Control | Afzelia Environmental Consultants |
| • Civil Works Contractor: | Pilcon Projects |
| • Mechanical & Electrical Works Contractor: | PCISA |

7. CONSTRUCTION STATUS

The fabrication of the mechanical and electrical plant and equipment is complete. The equipment is currently stored off site awaiting the completion of the civil works for installation. The overall construction progress is at 67%. The progress on the construction of the civil works is as indicated below:

Description	Civil Works
Bulk Chemical Storage Area	100
Operations Control Room	100
Inlet Division Box	20
Clariflocculator No 4	99
Treated Water Pumpstation suction and delivery pipework	60
Treated water pump station	100
Backwash water recovery pump station	80
Genset Building	100
Diesel Bund	85
Chlorine House	15
Rapid Gravity Filters	0
Roads and Site works	0

8. BREAKDOWN PROJECT COSTING

Description	Cost
Contract Ugu-07-1127-2012: Civil Engineering Works	R 47 109 116.37
Contract Ugu-07-1129-2012: Mechanical & Electrical Contract	R 19 700 050.40
Engineering and Construction management and Site Supervision Costs	R 19 289 052.92
Subtotal	R 86 098 219.69
VAT	R 12 053 750.76
TOTAL	R 98 151 970.45

9. **JOB OPPORTUNITIES**

The project employed 35 people from the local community. Additional labourers are employed as an when required on the project

10. **INJURIES / ACCIDENTS**

No major injuries have been reported on site.

11. **CHALLENGES EXPERIENCED**

- Extension of the waterworks Boundary

The existing WW boundary was extended and registered with the Surveyor General's office during the design phase. During the implementation phase, a home owner who resides adjacent to the WW requested that the family be re-located at the Client's cost. The family was concerned about their risk exposure in the event of failure of the water-retaining structures.

The water-retaining structure (Clariflocculator) was relocated away from that homestead, within the existing boundary, and construction proceeded without relocating the family. As a result, a delay of 3 months occurred.

- Water Demand

The treatment capacity of 54Ml/day has already been exceeded due to the increased demand from the community. Plant shutdowns to make connections to the existing pipework are a challenge as the system cannot cope with extended shutdown times. The construction team is working closely with the operations team to reduce the impact on the community.

12. **CONCLUSION**

Notwithstanding the challenges highlighted above, the project is being implemented successful. The local community is benefiting from the work opportunities arising out of the construction project. On completion, Ugu District Municipality will be able to extend the water supply network to areas that previously had no clean water and hence further reduce the water supply backlog.

13. **PHOTOGRAPHS**

Waterworks
Structure

Photograph

Chemical
Storage Tanks



Genset Building



Clarifloculator

**36M³/day
Clarifloculator**



Clarifloculator

**36M³/day
Clarifloculator**



Treated Water
pumpstation





Treated Water Pumpstation MCC