MAGARENG LOCAL MUNICIPALITY

UPGRADE AND EXTENSION OF THE WARRENTON WATER TREATMENT WORKS

Q1 PROGRESS REPORT
JULY - SEPTEMBER 2024

Project Details

Client	: MAGARENG LOCAL MUNICIPALITY
Funder	: RBIG
Engineers	: SMEC CONSULTING ENGINEERS
Civil Contractor	: **BICS Engineering & Supply JV Musundwa Mahani (Pty) Ltd**
Electrical Contractor	: **PFP Projects (Pty) Ltd**
Mechanical Contractor	: **Lebotebo Projects**
Total Households to benefit	: 5 932

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1. PROJECT DESCRIPTION

The Warrenton WTW is abstracting raw water directly from the Vaalharts irrigation canals and the Vaal river, thereafter the raw water is treated through the various purification processes at the facility. The various processing units at the Warrenton WTW was operating under extreme difficulties to an extent that the final treated water did not meet the SANS 241 water quality standards for a prolonged period. Therefore, the need to upgrade the current WTW by adding new processing units and extending the capacity from 9Ml/day to 12Ml/day.

The project scope cuts across civil, electrical and mechanical services and consists of the following as the main work packages:

- Decommissioning of the existing flocculation tank
- New 2 X 6Ml/d primary flocculation channels
- New 2 X 6Ml/d sedimentation tanks
- New 1 X 2.5Ml/d filter block and refurbishment of old filter block
- New raw water pipeline from the river pumpstation and new pumps
- New clearwater reservoir
- Conversion of existing lamella settler into a dissolved air flotation unit
- Current filters will be changed to dual lateral underdrain filtration systems

2. EXTENT OF THE WORKS

The existing Warrenton potable water treatment facility, as operated and maintained by the Magareng Local Municipality, comprises a number of unit processes able to receiving and treat raw water from the Vaal River and the irrigation canal.

The upgrade of the current plant by adding new unit processes and extending the capacity to 12.2 Mℓ/d shall meet the Client's initial objective. The treatment facility, initially designed and constructed, included for a diminishing mechanical flocculation unit, followed by a high rate lamella equipped settling system and completed by 3 sand filtration units of the Moore type. The current filtration unit is in a poor state and all the existing filter floors will be replaced by new filter systems. This document contains all associated civil, mechanical and electrical work for this works.

The Contract shall comprise the construction of a new inlet box, two new flocculation channels, two new clarifiers and an additional sand filter. Additional storage capacity will also be included below the new filter. The contract shall also include all mechanical and electrical

equipment associated with the new and current process trains.

Some work has already been done during 2018, which includes excavation, backfill and compaction (preparation of foundations for new structures), procurement of some mechanical and electrical equipment and minimal civil structural works. The contractor should make themselves familiar with the extent of work already completed. The scope for the Remainder Portion of the Works is:

Civil Work

- Establishment on site;
- Site clearance (limited - where required in addition to work already carried out);
- Searching and exposing of existing services;
- Excavation of pipe trenches for new 500mm raw water pipeline;
- Increasing the current 1 Ml clear water storage capacity to 1.5Ml;
- Preparation of pipe bedding;
- Construction of flocculation channels, clarifiers and an additional sand filters;
- Construction of DAF and secondary flocculation structures inside existing settling tank;
- Demolition and reconstruction of current Moore filters to the new specified filters;
- Construction of support structures in the clear water tank;
- Installation of pipe specials, including a variety of valves;
- Construction of chambers;
- Finishing-off and site clearance, and
- De-establishment of site on completion of the works.

Mechanical Work

The mechanical upgrading of the Warrenton Water Treatment Plant will compromise the procurement, delivery, installation, commissioning, testing and maintaining for the defects liability period of the following equipment and not limited to:

Inlet Pump Station

- Supply, deliver, install, test and commission of Raw Water pumping sets (these pumps will be free issued to the contractor as they have already been procured);
- Manufacture, deliver, install, test and commission of suction and delivery pipework;
- Supply, deliver, install test and commission actuated valves of varying diameter 250 – 350mm; and
- Supply, deliver, install test and commission manually operated valves of varying

diameter 250 – 350mm.

New Primary Flocculation and Clarifier

- Manufacture, supply, deliver, install test and commission manual channel gates;
- Manufacture, supply, deliver, install test and commission of pipework from inlet pump station to new inlet structure;
- Manufacture, supply, deliver, install, test and commission all pipework from inlet structure emergency overflow to Secondary Flocculation inlet channel;
- Manufacture, supply, deliver, install, test and commission all sludge withdrawal pipework inside

Clarifiers

- Manufacture, supply, deliver, install, test and commission all sludge transport pipework from Clarifier to sludge facility on site;
- Supply, deliver, install test and commission manually operated valves of varying diameter 250 – 350mm; and
- Manufacture, supply, deliver, install test of all pipe supports.

Secondary Flocculation and DAF Units

- Manufacture, supply, deliver, install test and commission of Saturator for DAF units (this unit will be free issued as it has already been procured);
- Manufacture, supply, deliver, install, test and commission pipework from Recycle pumps to Saturator unit (these pumps will be free issued as they have already been procured);
- Supply, deliver, install, test and commission air compressor with associated pipework to feed the Saturator unit (this unit will be free issued as it has already been procured);
- Manufacture, supply, deliver, install, test and commission all Saturator delivery pipework including nozzles in reaction zones (the pipework and nozzles will be free issued as they have already been procured);
- Manufacture, supply, deliver, install, test and commission all DAF clean water draw off pipework;
- Manufacture, supply, deliver, install, test and commission all DAF sludge withdrawal pipework;
- Manufacture, supply, deliver, install, test and commission all DAF Scum withdrawal pipework;

- Supply, deliver, install test and commission actuated valves of varying diameter 150 – 350mm; and
- Supply, deliver, install, test and commission manual valves of varying diameter 150 – 350mm.

Filters (New and Refurbished)

- Manufacture, supply, deliver, install test and commission three refurbished filter floors, complete with dual lateral underdrains (or false floor alternative);
- Manufacture, supply, deliver, install, test and commission one new filter floor, complete with dual lateral underdrains (or false floor alternative);
- Procure filter media, deliver, install, and test for all four filters;
- Supply, deliver, install, test and commission actuated valves of varying diameter 250 – 450mm;
- Design, supply, deliver, install, test and commission all filter outlet pipework;
- Design, supply, deliver, install, test and commission all filter backwash pipework;
- Design, supply, deliver, install, test and commission all filter air scour pipework; and
- Supply, deliver, install, test and commission filter inlet isolation (size to confirm).

New Pump Station

- Supply, deliver, install, test and commission of New Recycle pump-set for Saturator unit (pumps to be free issued as they have already been procured);
- Supply, deliver, install, test and commission of New Backwash Pumping-sets for all filters (pumps to be free issued as they have already been procured);
- Supply, deliver, install, test and commission of air scour blowers sets for all the filters (blowers will be free issued as they have already been procured);
- Supply, deliver, install, test and commission manually operated valves of varying diameter 100 - 450mm;
- Supply, deliver, install, test and commission of Backwash suction pipework;
- Supply, deliver, install, test and commission of Recycle water suction pipework;
- Supply, deliver, install, test and commission of Air Scour pipework within pump station
- Supply, deliver, install, test and commission of plenum void access including scour pipework within lower gallery (if required);
- Supply, deliver, install, test and commission of filter waste outlet pipework within backwash water collection gallery;
- Supply, deliver, install, test and commission of extension contact tank access manhole pipework within backwash water collection gallery;

- Supply, deliver, install, test and commission connection pipework between old and new filter buildings;
- Supply, deliver, install, test and commission bypass pipework from new filter building to plant outlet;
- Manufacture, supply, deliver, install test of all pipe supports;
- Manufacture, supply, deliver, install test and commission electrically operated mono rail gantry cranes;
- Manufacture, supply, deliver, install test and commission crawl cranes;
- Reliability run of the new filter bank; and
- Finishing-off and site clearance.

Electrical and Control & Instrumentation

- Supply, deliver and install medium voltage (MV) switchgear, medium voltage (MV) cables and mini substations;
- Supply, deliver and install emergency generator sets;
- Supply, deliver and install new, Chemical House/Raw water Pump station MCC, Sand Filter MCC (Main MCC);
- Supply, deliver, install and terminate low voltage (LV) power/control cable racking including supports and fixtures;
- Supply, deliver, install and terminate low voltage (LV) power and control cables for all the new equipment;
- Supply, deliver and install start/stop/isolator stations for all the motors;
- Supply, deliver and install industrial welding plugs/sockets;
- Supply, deliver and install area lighting;
- Supply, deliver and install buildings accessories;
- Supply, deliver and install small power & lighting for all the new buildings;
- Supply, deliver and install earthing and earth continuity bonding of all the new electrical systems, buildings and structures;
- Supply, deliver and install lightning protection of all the buildings and structures;
- Testing and commissioning of the complete electrical systems; and
- Supply, deliver, install, test and commission various analytical equipment.

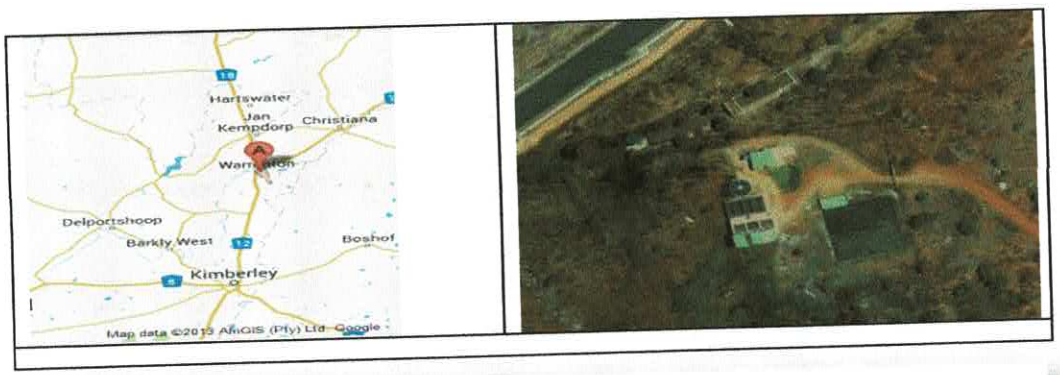
3. LOCATION OF SITE

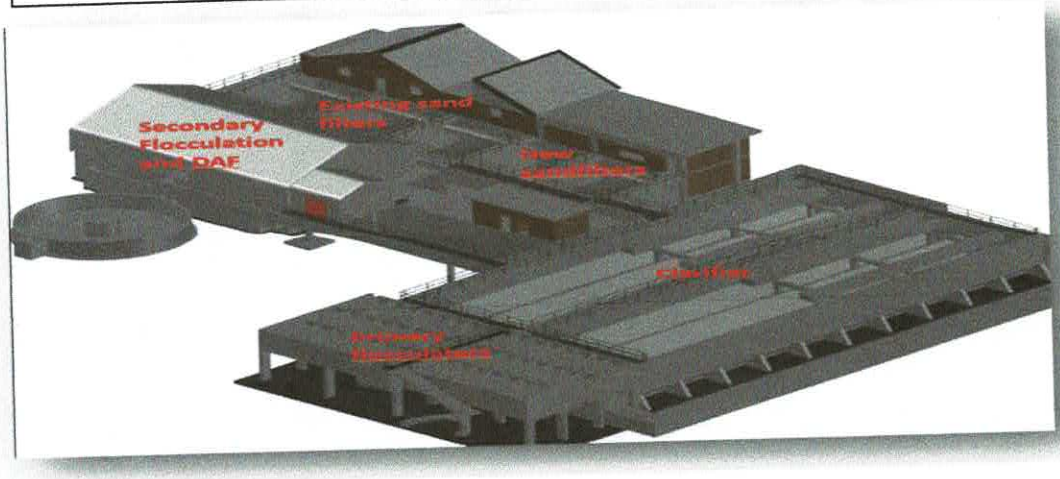
The location of the site is at the Warrenton water Treatment Plant situated approximately 2 km to the north-west of the town of Warrenton. The coordinates of the plant are as follows:

- 28° 6'0.05"S / 24°50'25.33"E

The Elevation is approximately 1190 m above sea level.

Access to the site is by means of tarred public roads. No restriction on access to the site shall be placed on persons involved with the construction of the Works, but personnel must comply with the security and safety requirements of the Magareng LM. Access on the site is by means of gravel roads which are in a good condition. Movement on the Site must be limited to construction areas to prevent unnecessary damage to the environment or existing services. The making good of any damage caused by non- observance of such restrictions will be for the Contractor's account.





4. 2024/25 FINANCIAL YEAR ALLOCATION

The Financial year allocation for Warrenton WTW is **R 30 281 000.00** and the expenditure to date for quarter 1 of the 2024/25 Financial year is **R 7 569 630.34**

5. QUARTERLY PHYSICAL PROGRESS (NARRATIVE)

Name of project	Project location (DM, LM, Village name and GPS coordinates)	Targeted Scope of work for the quarter (please focus on KEY infrastructure / deliverables)	Actual progress on site against targeted scope for the quarter (please focus on KEY infrastructure / deliverables)	Reason for non-achievement	Recovery plan	Completion date (Expected / Actual)	Jobs created for the quarter	Villages or settlements served for the quarter (Names or Ward Numbers)	Number of households served for the quarter	Comments (issues to be escalated)
Warrenton WTW	Francis Baard DM; Magareng LM; Warrenton; GPS coordinates: 28° 6'0.05"S / 24°50'25.33"E	**Civil Works**: Raw water Pipeline (10% of overall project)	Target: Actual: 92%	The backfilling of the pipeline is outstanding and suitable backfill material is available.	Pressure test will indicate the way forward. Intervention may be required due to slow to no progress.	New estimated date will be finalised once an approved program is in place.	5	Ikutseng Warrenvale	5	New MoU was entered into between Magareng LM and DWS. The payment issue was resolved. A permit need be submitted to the department of labour due to the construction period more than 12 months extended.
		New Sand filters (20% of overall project)	Target: Actual:98%	Slow to no progress of civil contractor pending the approval of the permit.	Watertightness needs to be tested before handover to mechanical.					
		Flocculation Channels (15% of overall project)	Target: Actual:97%	Slow to no progress of civil contractor pending the approval of the permit.	Durability treatment on floor slab before screed. Concrete finishing to be completed and watertightness test outstanding.					

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		Clarifiers (25% of overall project)	Target: Actual:98%	Slow to no progress of civil contractor pending the approval of the permit.	Openings for sludge withdrawal pipes broken through walls. Watertightness testing outstanding					
		Existing plant refurbish (15% of overall project)	Target: Actual:0%	Not started yet.	New works to be commissioned before decommissioning existing plant.					
		Clearwater Reservoir (15% of overall project)	Target: Actual:92%	Slow progress of civil contractor pending payment. Structure completed and subsoil drainage in process.	Stone to roof, catladders, inlet and outlet, backfilling and surface drainage outstanding. Water tightness test outstanding					
		Junction Chambers	Target: Actual: 15%	Excavations complete.	Concrete casting will follow once according to new programme once payment issues are complete.					
		Mechanical Contract	Actual: 26% (New contractor)	1. QCP's & method statements approved. 2. Mobile Gantry crane and Crawl Beams are on site. 1 of 2 Crawl beams installed at Filter Building 3. Dosing equipment was delivered and is in	Work is proceeding but slower than programme.		4			Free Issue items inventoried and any discrepancies to be reported.

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				process of being installed 4. Weirs were installed on draw-off channels in Clarifier but appear to have problems with levels. 5. Backwash pipes are being installed 6. Inlet pipework are being installed						
		Electrical Contract	Actual: 75%	Awaits mechanical installation.	All Mcc's & instrument panels delivered to Site.					Awaits mechanical equipment installation for electrical installation, Instrumentation to follow thereafter.

6. CHALLENGES

CHALLENGES	• The Civil Contractor's progress was negligible but has improved after weekly interventions. • The replacement of the main water line supplying the town is being investigated to identify the least risky method.
FRUSTRATIONS	• Some incorrect long-lead items were delivered to site, but measures have been put in place to bridge the period until the correct items arrive.
DELAYS	• Shortages of material on the civil contract.

7. CERTIFICATION OF PROGRESS REPORT: UPGRADE OF THE WARRENTON WATER TREATMENT WORKS

COMPILED BY

Seleke

ANGIE SELEKE

TECHNICIAN: TECHNICAL SERVICES DEPARTMENT

APPROVED BY

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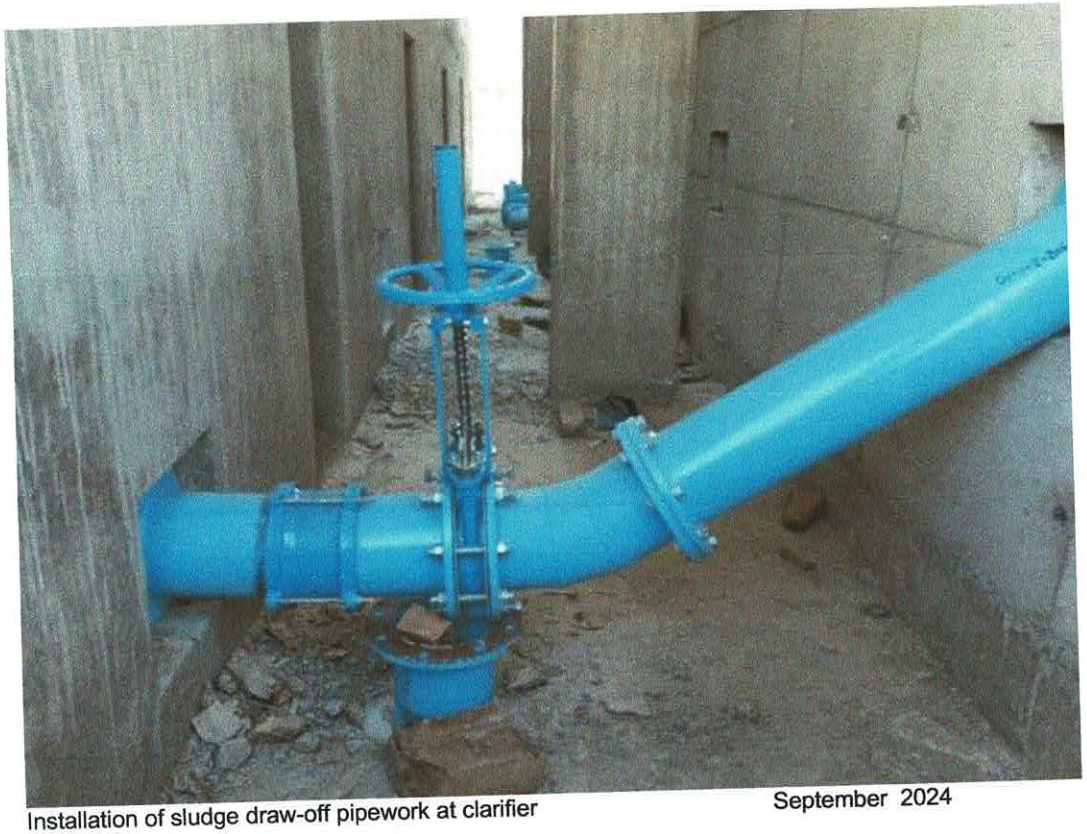
ACTING MUNICIPAL MANAGER

PHOTO MONTAGE

Installation of Backwash Delivery Pipework September 2024



Installation of sludge draw-off pipework at clarifier September 2024

Installation of Pipework in Raw Water Inlet Chamber September 2024

Installation of Thrust Block on Raw Water Pipeline September 2024

Installation of Pipework at Primary Flocculation

September 2024

Clear water reservoir: 19mm gravel placement on roof

September 2024

River Chambers: Screen and duck foot alignment

September 2024