

Client Name: Paardeberg Prison

Project Value: R750 000-00 (incl. VAT)

Project Duration: June 2020 – October 2021

Location: Paardeberg, South Africa

Project Description: Re-Solve was tasked with optimising the Paardeberg Prison's water infrastructure and identifying and developing alternative water supply systems. Re-Solve identified the potential of developing the facility's groundwater resources through the drilling and treatment of boreholes at the facility.

1. Pre-Intervention State

Paardeberg Prison's water infrastructure is very old and in need of urgent management and optimisation by Re-Solve to assist them in solving for their excessive municipal water bill. The facility had existing boreholes that needed further development to enable potable water augmentation. In summary:

- The municipal water bills indicated average consumption of 264.9kl/day or 7 947 kl/month calculated over a three-year period.
- The municipal water bills charged an average cost of R200 582.28 per month of R2 406 987.36 per year using the 2016 tariff structure.
- An existing borehole was identified to be developed further and treated to supplement municipal water use.

2. Proposed Solution

- **Construction and Civil Works** – the construction and development of the borehole location, 200mm concrete slab to house the skid mounted Water Treatment Works, 1km of new 50mm diameter HDPE pipelines, including all pipeline appurtenances, such as air valves, etc.
- **Package Water Treatment Plant** – the installation of a skid mounted water treatment plant containing micro filtration, activated carbon filter, pH dosing, chlorinator, one 10 000

litre tanks and all associated piping and plumbing.

- **Mechanical and Electrical** – the installation of pumps, valves, float switches, electrical wiring, and an electrical board to aid in the automation of the system.
- **Drafting plans and procedures** provided the facility with a comprehensive operations and maintenance manual including troubleshooting scenarios. The maintenance personnel were also provided training for emergency conditions.
- **Plant Operation** – Re-Solve appointed and managed treatment specialists to operate and maintain the treatment works ensuring compliance with regulatory and legislative requirements of being a Water Service Provider

3. Post-Intervention State

The proposed solutions have been implemented, and Paardeberg Prison has a skid mounted water treatment plant that they are using for potable drinking purposes. The water from the plant is pumped into the existing elevated reservoir which feeds the facility via a gravitational watermain. The prison has reduced their reliance on municipal water, with an independent water supply.



Excavation for the raw water pipeline from the borehole to the Water Treatment Works (WTW)



Excavation and reinforcement for the 200mm concrete slab to house the WTW



WTW installed



Supporting housing structure constructed for WTW

4. Savings Achieved

The savings achieved can be summarised as follows:

- The prison's water consumption from the package water treatment plant has been measured to be 35 kl/day or 1 050kl/month.
- The billing of municipal water should reduce to an average of 100kl/month.
- The **estimated current saving** of water on the municipal water bill will be **R200 000-00 per month** or R1 400 000-00 per annum.