



WATERCARE MINING

## Case Study: Replacing Municipal Drinking Water with Watercare Mining-Treated Waste Mine Water

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A gold mine in the Free State faced the risk of water outages, as the local water board was not properly managed and faced bankruptcy. The mine was pumping approximately 4ML of excess water per day from under the ground to surface dams for storage, and ultimately, dumping. The mine realised that converting excess mine water to potable water would decrease their reliance on municipal reticulated water, and that they could save on water usage costs. The mine approached Watercare Mining to design, build, operate and maintain a water treatment plant to deliver 2 ML/day of SANS241:2015 potable water for use in the mine shaft and hostel.

Watercare Mining uses a range of unique technologies and expert engineering to produce potable water from complex waters associated with mining activity. The core competencies of Watercare Mining that enabled the company to successfully execute this project include:

- Our knowledge, expertise, experience and commitment
- Our understanding of our client's environment, water systems and SANS potable water requirements
- Our appreciation of the services required for the successful operation of a water treatment plant
- Our technical capabilities that support routine monitoring, problem solving, and new development

FIGURE 1: NYALA WATER PLANT



The design specification of the plant was required to handle high conductivity, chlorides, sodium and uranium –elements detected in the feedwater that were at levels not compliant with the SANS 241:2015 limits. The main scaling compounds in the feed water were Barium Sulphate, Strontium Sulphate, Calcium Sulphate and Calcium Carbonate. The water

FIGURE 2: NYALA WATER PLANT



treatment plant needed to be sufficiently robust to treat variations in feedwater quality.

Watercare Mining designed, built and commissioned a water plant to treat 2 900 ML/day of mine return water to produce SANS 241:2015 potable water at a recovery of 70% (volume based). The water treatment plant comprises sand filtration, ultrafiltration, reverse osmosis (RO), disinfection and remineralisation. The backwash water and RO brine is diverted to the mine's tailing system.

The project also required Watercare Mining to operate and maintain the water treatment plant. A competent engineering and operational team, together with our in-house IT platform, WaterBizz, and centralised control room, produce SANS241:2015 potable water that has better clarity and less colour than municipal water.

The municipality supplied water to the mine at a rate of R13,48/m<sup>3</sup>, while Watercare Mining-treated water cost R7,39/m<sup>3</sup>, 45% less. The ROI on the capital expenditure of the plant has been 30 months.

The mine, in partnership with Watercare Mining, has invested in its sustainability by producing its own potable water from mine water that would have gone to waste. In so doing, the mine has saved on costs. It has also improved its environmental sustainability by re-using water that would ultimately have been dumped.



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Watercare Mining (Pty) Ltd  
Telephone: 010 140 0870 | Fax: 086 572 7603 | [sales@watercaremining.co.za](mailto:sales@watercaremining.co.za) | [www.watercaremining.co.za](http://www.watercaremining.co.za)  
PO Box 421, Randfontein, 1760 | 22 Flat Str, Aureus, Randfontein, Gauteng