

ROCKINGHAM DESALINATION RESEARCH FACILITY

The National Centre of Excellence in Desalination Australia boasts a world-class pilot-scale desalination testing and research facility in Rockingham, Western Australia. The Rockingham Desalination Research Facility offers feed water, chemical dosing, waste collection, instrumentation, and control system infrastructure to researchers and industry seeking plug-and-play performance testing or certification.

Water supply

The water supply system consists of two variable speed drive bore pumps each capable of pumping up to 12.5 m³/h. One is a seawater bore at a depth of 80 m and the other a freshwater bore at 40 m. Alternative supplies can be utilised by carting water from a selected source and transferring it directly to the feedwater tank system.

Feed water storage

The feed water system consists of three feed water tanks, each 36 m³. A fourth tank of 9 m³ capacity for service water is fed from a potable water supply (mains water). Tanks are equipped with level transmitters to provide control feedback.



Feed water distribution

There are several distribution systems operating in the facility, related to each storage tank. Each system has a variable speed drive feed pump with capacity of 12.5 m³/h. These are controlled to maintain an operator adjustable pressure in the distribution mains. This mains pressure is measured and recorded using a pressure transmitter on the discharge of each feed pump. A recirculation loop allows the feed pump to run continuously. Feed water can be made up to suit requirements from seawater to fresh water and any desired specification in between. Also, service water is distributed throughout the facility and used for chemical cleans, general wash downs and other maintenance activities.



Tie in points

There are 6 internal and 3 external tie in points, used to connect to equipment through isolation valves and provide feedwater, service water, collection for the product, brine and waste streams and also a selection of single phase and three-phase power outlets. Several bays can be used concurrently.





Brine, product and waste collection

Brine and product water generated by the researchers' experiments is collected in a brine sump and a product water sump each holding 1.4 m³. From the two collection sumps, each pumps to the managed aquifer recharge (MAR) system under normal operation, or can be diverted to the sanitary sewer. Waste generated in experiments is collected in the neutralisation system.



Managed aquifer recharge system

At a depth of 112 metres the managed aquifer recharge (MAR) system is used to dispose of the surplus brine and product water generated as part of the facility's activities. The MAR system is monitored by the Seimens PCS7 SCADA control system, which records the flow, conductivity, temperature and level in the re-injection bore.

Chemical dosing systems

Three chemical dosing systems consist of 200 L storage tanks and chemical dose pumps with capacity up to 13.7 L/h. Hydrochloric Acid is dosed to reduce pH, Sodium Hydroxide is dosed to raise pH, and Sodium Metabisulphite is dosed to de-chlorinate the waste.

Neutralisation system

The neutralisation system consists of a 5 m³ storage tank fitted with a submersible pump that either circulates the waste through a return pipe system or disposes of the waste down the sanitary sewer after treatment. The pH and ORP are monitored during the neutralisation process and once acceptable levels are achieved the waste is then pumped to the sanitary sewer.

Instrumentation skid

The instrumentation skid provides researchers with a flexible and customisable level of instrumentation for their research activities. The skid will interface with the researcher's equipment and provide specific monitoring of the feed water, product water, brine and waste water. The skid will be equipped with additional flow meters, pH probes, pressure sensors and conductivity/temperature probes. The data collected by these instruments is relayed to the SCADA system for recording.

For more information

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