

# Case Study

## Media Filtration followed by Reverse Osmosis

### Background

A long-term agriculture client needed to add additional capacity to their existing water treatment plant that comprised of two smaller reverse osmosis plants. The existing plants were 20 plus years of age and there was a need for installing a more reliable plant. The existing water source was from a deep bore licence situated within the Great Artesian Basin (GAB).

### Solution

A 500m<sup>3</sup> per/day brackish water reverse osmosis plant was offered to increase the capacity of production water required for the ongoing development of the abattoir. As the site infrastructure was already in place to support the smaller reverse osmosis plants, the new plant was designed to be built onsite by expanding the footprint of the existing layout. This expansion was undertaken in consultation with the client.

The GAB water source temperature was in excess of 45 degrees and required cooling prior to pre-treatment and reverse osmosis. The site was equipped with an existing cooling tower which had the capacity to cool the feed water required for the new plant design. The control system implement for the cooling tower was upgraded so that fan speeds were controlled by output temperature. The control change allowed for a constant feed water temperature to the reverse osmosis system.

Glass Media Filtration was adopted for pre-treatment of the GAB water source to filter out suspended and colloidal particles. Feed water contained a small amount of iron and direct feed was adopted without aeration. The plant was designed to have the ability to be feed from two GAB water sources from the site infrastructure. Several media filters were installed to allow for future expansion. This design returned an SDI of < SDI 1.8 with the initial feed water being SDI 5.6.



### Results

A two-stage design was employed for the reverse osmosis plant with a second stage boost pump. The membranes selected were high rejection (99.7%) brackish water membranes with a system recovery of 70% for initial start-up.

The plant was fully automated with instrumentation for pressures, flows, analysers and level control. A HMI was implemented for operator interface for maintenance and operational purposes. The plant control system was integrated into the plant SCADA system, alarms are SMS and remote dial in access via VPN for maintenance, fault diagnosis and managing water storage and production.

Browns Aqua Systems and Brown Electrical were able to offer a complete turnkey solution within a 6-month period.

#### Reverse Osmosis Permeate Use

- Cooling Towers
- Boiler Feed Water
- Washdown Water
- Service Water