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## Lockheed Martin UF/RO Water Treatment Plants Bore Water to Process & Potable Water, Australia

## Background

Lockheed Martin operates two remote Commonwealth Government facilities in central Queensland, Australia. The facilities are located 150 km apart from each other. The only water supply on each site is saline water from deep bore wells. Each site requires a water treatment plant to desalinate the bore water for use within the facility processes and for drinking water purposes. Amiad Australia was contracted to replace the existing water treatment plants, which were expensive to maintain and operate, with new skid mounted plants.

## The Challenge

The product flow rate for the plants is low at 0.45 kL/hr however the treatment process is complex given that the bore water contains many elements that are detrimental to the reverse osmosis desalination process such as hydrogen sulfide, organics, silica, iron, manganese, aluminium, and high turbidity. The plants also include a recirculation/chlorination system and distribution pump system to supply water to the facility. The existing plants had to be removed and the new plants installed with minimal down time of water supply. Given the remoteness of the facilities any errors in equipment supply / installation / commissioning would result in significant disruption to the facility operations.

Target	Raw Water (Max.)	Parameter
Australian Drinking Water Guidelines	5 – 29 mg/L	TSS
	19 – 77 NTU	NTU
	2400 – 2900 mg/L	TDS (Total Dissolved Solids)
	230 – 250 mg/L	TOC (Total Organic Carbon)
	46 – 69 mg/L	Silica
	0.16 – 4.6 mg/L	Iron
	0.01 – 0.06 mg/L	Manganese
	1.1 – 5.7 mg/L	Aluminium



## The Solution

Amiad Australia supplied 2 x water treatment plants with each plant comprising two skids. The previous plants were removed and the new plants installed and operational within 2 week while the downtime for the distribution pump supplies to the site was minimized to approximately 3 hours. Amiad Plant (new one that replaces existing plant) incorporates the following treatment processes:

1. Arkal Disc Filtration (70 micron) for screening larger particulate matter
2. pH correction with hydrochloric acid dosing to prevent particular salts precipitating on RO membranes
3. Ultrafiltration plant (with air scouring, backwashing, acid/alkaline chemical enhanced backwash & CIP systems) for suspended solids and colloidal material removal, and organics reduction
4. Granular activated carbon system for organics reduction
5. Anti-scalant dosing to prevent sparing soluble salts precipitating on RO membranes
6. Reverse osmosis plant (with CIP system) for water desalination
7. Calcite filter for RO permeate stabilization
8. Recirculation/chlorination system for water disinfection
9. Distribution pump supply system to supply product water to the facility



An HMI is utilized to operate and monitor the systems, and the individual HMI pages can be viewed on the facility computer network. Flows, pressures, pH, chlorine, conductivity and turbidity are measured at different points in the process and are trended / logged and fed back to the computer network.



## The Results

The water treatment plants supplied by Amiad Australia are producing quality potable water for the facility processes and site amenities. The new plants are more efficient than the previous plants in reducing the waste water discharge. Operation and maintenance costs have been significantly reduced and plant operators are now able to undertake routine maintenance that was previously undertaken by external contractors.



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