



Creating Water Solutions for the **Power Industry**



Solutions & Technologies



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Water is a key element for the Power industry.

Veolia Water Solutions & Technologies specialises in water and wastewater treatment solutions for various types of power plants: conventional power stations, fossil fuel or nuclear plants.

We can provide you with **tailor made** water management systems focusing on **technical performance, compliance** with process and environmental requirements and **long-term cost effectiveness**, in order to fulfill the most demanding reliability and quality requirements essential to the Power industry.

Our strong technology and expertise can help you to achieve the following objectives:

- > **secure a drought proof water supply:** the Power industry needs a reliable water supply, which may be jeopardised because of water restrictions linked to the drought conditions. Therefore, the Power customers have to look for alternative water sources, as they are competing with domestic use for fresh water.
- > ensure the **security and safety of the water process at Power Stations:**
 - > Preventing **Health & Safety** risks through smart engineering and systems that are easy to operate and maintain.
 - > Incorporating your **Quality** requirements and ensuring the availability of your water treatment units.
 - > Implementing clean technologies and policies of continuous improvement and sustainable development to protect the **environment**.

We can provide:

- > Boiler feed water production for steam generators, including treatment of condensate and blowdown water
- > Cooling water production
- > Effluent treatment and reuse, including sludge treatment and disposal.
- > Zero liquid discharge technologies (ZLD)
- > Services, focusing on decontamination and cleaning of cooling systems against Legionella and other contaminants
- > Optimisation of water chemical conditioning

> Actiflo®

- > A compact, high-rate water and wastewater **clarification** process combining micro-sand enhanced flocculation and settling.
- > An ideal solution to treat raw water or recycle valuable process water to provide boiler feed, process water or cooling tower make-up.



> Ion Exchange

- > Ideally suited for **ultra pure water** for boiler feed
- > Packaged or tailored engineered systems.
- > Countercurrent or packed bed designs available.



> Condensate Polishing

- > Conventional **mixed bed polishing** for hydrogen cycle operations.
- > Tripol® **condensate polishing** for hydrogen & ammonia cycle operations.



> Microfiltration

- > Can be used as a pre-treatment for reverse osmosis or as a standalone process for producing high quality water.
- > **Membrane filtration** range includes microfiltration pressurised, submerged, ultrafiltration and nanofiltration.



> Reverse Osmosis

- > A **membrane** process used extensively for removing salt and contaminants from seawater, brackish water or surface water.
- > Robust proven technology, easy to operate.



> Aquamove®

- > Containerised mobile Reverse Osmosis units for use as water demineralisation, desalination and clarification units.
- > Provides a quick response to emergency or temporary water needs.
- > Cost effective short-term water treatment solution. Units can be purchased or leased from 1 month up to 10 years .



> Evaporation & Crystallisation

- > Systems provided through VWS company HPD offering complete wastewater treatment solutions, including waste reduction, product recovery, and high purity water for reuse (including **Zero Liquid Discharge** technologies).



Stanwell Raw Water Pre-Treatment Plant for Stanwell Corporation Ltd – QLD



- > Turnkey design, engineering & supply of plant and equipment for a Raw Water Pre-Treatment Plant, taking water from a dam.
- > Capacity: 80 Megalitres/day.
- > Process: 3 **Actiflo**® units ACP 750 for clarification.
- > Application: provides **cooling tower make up** water with total suspended solids of less than 8 mg/l to Stanwell Power Station.



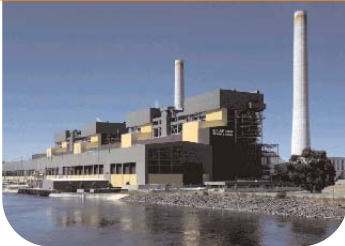
Robe River Cape Lambert Power Station Rio Tinto - WA



- > **Reverse Osmosis / Continuous Deionisation Water** treatment plant treating potable water to produce high purity boiler demineralised water for power station use.
- > Multi-year performance with remote monitoring, with multi-year performance guarantee.
- > Capacity: 120 kilolitres/day.
- > Process: **2-pass reverse osmosis, gas transfer membranes** and **continuous deionisation**.

Eraring Water Reclamation Plant for Eraring Power Station - NSW

AWWA 1996 National Cleaner Production Award

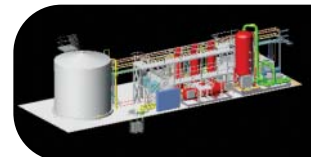


- > Design & Build of the 1st Wastewater Plant in the world, treating secondary sewage to provide a high quality water for **reuse**.
- > Capacity: 3.8 Megalitres/day of reclaimed water.
- > Process: using dual **microfiltration, Reverse Osmosis** and **Zero Liquid Discharge (ZLD)** technologies to remove suspended solids, bacteria, viruses and dissolved salts.
- > Application: high quality water to be reused for boiler feed, cooling water, dust suppression and fly ash handling.
- > Providing a drought proof water supply, while reducing the freshwater supply to the power station.

Huntly Power Station Condensate Polishing Plant for Genesis Energy, New Zealand



- > Design, supply, install, and construct a new **Condensate Polishing Plant** for the Huntly Power Station (e3p, Huntly Energy Efficiency Enhancement Project).
- > Flowrate: 360 m³/hour.
- > Process: Tripol® **condensate polishing system** with 3 regenerator vessels, to remove impurities from condensed steam from the power plant steam turbine.
- > Application: **high pressure boiler**.
- > Provides an external regeneration system to avoid condensate contamination with regenerant chemicals (i.e. acid, caustic).



Redbank Water Treatment Plant for Redbank Power Station - NSW

2001 Environmental Engineering Excellence Award



- > Design & Build of a Water Treatment Plant treating raw water from the Hunter River
- > Capacity: 465 m³/hour.
- > Process: using lime soda softening, **reverse osmosis, mixed bed exchangers, gravity mixed media filtration**.

Harquahala Generating Station for Pacific Gas & Electric Company, Arizona, USA



- > Design & Build of a turnkey **Zero Liquid Discharge (ZLD)** process system for a 1000 MW Combined Cycle Power Facility.
- > Using a sidestream softener, **reverse osmosis, evaporators** and **crystallisers** to produce a dry cake out of the waste.

Drinking Water Applications

- > set up or upgrade **potable water systems**, especially when the Power sites are in remote locations.
- > provide a **temporary or emergency supply of water**, when there is a breakdown, emergency maintenance or planned maintenance.

Wastewater Applications

- > treat **wastewater & sludge** to minimise waste, up to the point of Zero Liquid Discharge (ZLD).
- > treat wastewater for **reuse** or for discharge into sensitive environments.

Process Water Applications

- > **reduce water consumption** and **save time and money**.
- > produce **purified demineralised water** for boilers by removing dissolved solids from make up water.
- > **prevent build up of solids** in cooling system equipment.
- > provide a **temporary or emergency supply of water**, when there is a breakdown, emergency maintenance or planned maintenance.



- > Remove suspended solids, colloids, organics, iron and manganese from water (surface water, recycled waste stream...)

RAW WATER PRE-TREATMENT

- > **Actiflo®**
- > **Microfiltration**
- > Solids contact clarifier
- > Pressure & gravity type filters

- > Produce high quality demineralised water to the boiler

BOILER FEED MAKE-UP WATER

- > Electro Deionisation (EDI)
- > **Conventional and packed-bed ion exchange**
- > **Single and double-pass Reverse Osmosis**
- > Vacuum and forced draft degassifiers

- > Reduce the losses or damages caused by corrosion or deposits from condensate streams
- > Reduce start-up times
- > Minimise routine cleaning

CONDENSATE TREATMENT

- > **Mixed bed condensate polishers**
- > Deaerating feedwater heaters
- > **Separate beds condensate polishers**

- > Treat a side stream to increase the cycles of concentration by reducing suspended solids hardness, silica
- > Treat cooling tower blowdown to minimise waste or assist in a ZLD facility

COOLING TOWER WATER

- > **Actiflo®**
- > **Reverse osmosis**
- > Solids contact clarifiers / softeners
- > **Microfiltration**
- > Pressure & gravity filters
- > **HPD evaporation / crystallisation (inc. ZLD)**

- > Minimise wastewater sludge or concentrate it to a solid waste (dry cake)

WASTEWATER TREATMENT

- > **Actiflo®**
- > Filtration
- > Biological treatment (e.g. MBR)
- > Sludge thickener
- > Filter presses
- > **HPD evaporation / crystallisation (inc. ZLD)**
- > Lime soda softening
- > **Reverse osmosis**

Veolia Water Solutions & Technologies Australia and New Zealand

Creating Water Solutions

Present in Australia and New Zealand for over 70 years, **Veolia Water Solutions & Technologies** is a world leader in Design & Build of water and wastewater treatment plants. Our unique portfolio of differentiating technologies includes drinking water, industrial process water, and wastewater.

We provide Design & Build capabilities, Engineered Systems, Equipment Supply, Leasing of Mobile Plants and Services, focusing on reuse and desalination.

Our approach for delivering innovative water solutions makes us the partner of choice for municipal and industrial customers.

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