WHO’S TAKING CARE OF OUR WATER?

INTRODUCING THE NEXT EVOLUTION
OF WATER TECHNOLOGIES
EVOQUA WATER TECHNOLOGIES IN AUSTRALIA AND NEW ZEALAND

We offer an extensive range of solutions, specifically designed to meet the pressing needs of the water and wastewater industries. Our innovative technologies encompass a comprehensive range of solutions for water re-use, purification and wastewater treatment including membrane technologies, biological treatment, clarification, biosolids management, odour control, chemical feed, disinfection and filtration. Supported by our dynamic global research and development program, Evoqua is leading the way in the water and wastewater industry by providing reliable and sustainable choices for water purification and wastewater treatment.

RELY ON OUR SUPERIOR WATER TECHNOLOGIES

In Australia and New Zealand and around the world, industries and municipalities rely on Evoqua Water Technologies for total water management solutions. We deliver cost-effective systems designed to optimise plant operations and lower life-cycle costs. Our commitment to sustainable water management fuels our determination to ensure the availability of safe and reliable water supply for future generations. Evoqua understands your site-specific needs and treatment objectives, and helps you effectively manage capital costs, life-cycle costs and regulatory requirements. With market-advancing technologies, we offer the industry’s largest portfolio of water and wastewater solutions, backed by an unparalleled commitment to service.

LOCAL R&D AND MEMBRANE MANUFACTURING FOR THE WORLD

Our factory in Windsor, New South Wales is the only Australian based manufacturer of UF & MF membranes modules and units for high quality water treatment. The fibre is produced at site while other components are mainly locally sourced for final assembly as packaged and skid mounted designs. MEMCOR® products have been supplied across the globe to be used in municipal and industrial treatment plants. We are proud of our heritage and contribution as innovation and continuous improvement are part of our research and development principles.
WASTEWATER TREATMENT

In wastewater treatment, biological nutrient reduction (BNR) is the science by which bacteria and other micro-organisms break down complex materials into simple, more stable substances.

So, how does Evoqua fit in? We appreciate how integral this science is to improve the wastewater treatment process and we have created stand alone technologies and integrated systems to do just that.

Are you looking to upgrade your existing mechanical plant to a BNR System whilst maximising the utilisation of your existing infrastructure? Or perhaps consider designing a new BNR system? The Orbal® multichannel oxidation system is the best selection for you. The typical Orbal basin has three basins that allow for operation at high mixed liquor suspended solids (MLSS) concentrations. In addition to conventional activated sludge or advanced secondary sludge treatment, it provides a simultaneous nitrification-denitrification environment that results in an overall denitrification performance rate of 80% without internal recycle. In addition, most plants can achieve effluent phosphorus levels of 1 mg/L or lower without chemical addition.

Storm flow rates five times the average flow can go through the Orbal system with plant recovery and BNR stabilisation within hours of the event.

SECONDARY CLARIFIERS

Looking for more flow through existing secondary clarifiers or designing new systems requiring greater capacity with smaller footprint? For greater capacity, higher overflow rates, optimum hydraulic stability, full surface and feed channel skimming, maximum design versatility and lower construction costs, Rim-Flo® clarifiers are the answer. These peripheral feed and takeoff clarifiers originated by Evoqua, have a proven record of performance in wastewater plants worldwide. Because of its greater hydraulic efficiency (50 to 80% more than centre feed clarifiers), Rim-Flo clarifiers can be smaller than a centre feed unit and provide the extra capacity needed to relieve overload situations or a conservative factor when designing treatment plants.

To increase solids removal by up to 200%, Tow-Bro® Unitube system offers the ultimate in fast, uniform sludge removal. A gentle suction action removes biological and light sludge in one pass of the header arm leaving sludge fresher with less chance of septicity. The Tow-Bro Unitube system provides maximum concentration of solids with minimum sludge agitation. Due to flat tank floors, excavation and forming are simpler and scraping or plowing is eliminated, reducing torque requirements and development costs. Better sludge means less aeration and solids handling volume – another energy saver.

Perfect for clarifier upgrades, where increased solids capacity is required, traditional scraper or organ pipe sludge removal devices can be retro-fitted with Tow-Bro Uniblue system headers, often doubling the solids handling capacity of the existing clarifiers.

CASE STUDY

EVOQUA’S MBR SYSTEM HELPS RECYCLE WATER

The recycled water plant at Sydney Water’s North Head Sewerage Treatment Plant has saved up to 550 ML per year of drinking water since its 2005 commissioning. Evoqua’s MBR system, installed in this facility, treats water used for cooling, spray water, seal water, washdown water, polyelectrolyte batching and odour scrubber makeup water.
If you want to produce high-quality effluent suitable for indirect reuse applications, Evoqua’s membrane bioreactor (MBR) is ideal. Evoqua combines one of its many biological treatment processes with its world-renowned membrane operating system resulting in the most energy efficient and fully automated integrated MBR system. This process provides municipalities with recycled and treated wastewater which reduces the cost of clean water in the face of decreasing water availability.

**ADVANCED TREATMENT**

Evoqua also has a wide range of sludge management solutions from dewatering and drying technology to complete biosolids reduction processes. Evoqua provides:

- Thermal dryers
- Thickeners
- Belt presses
- Composting systems

The **BioMag® System** — maximum performance and up to triple the capacity. Simple, reliable and proven, the innovative BioMag® System from Evoqua uses magnetite to ballast conventional biological floc, enhancing settling rates and increasing the performance of wastewater and water treatment facilities, while substantially reducing life-cycle costs. Primarily used to improve secondary wastewater treatment, the BioMag System easily integrates with planned or existing facilities, making it easier than ever to solve today’s operational and environmental challenges.

Key benefits of the BioMag System:

- Simplicity and reliability – Ballasting biological floc with magnetite increases secondary settling rates while providing reliable control over the depth of secondary sludge blankets to minimise the risk of upsets.
- Up to 300% increase in capacity – Rapid and reliable settling enables a 2 – 3x increase in mixed liquor suspended solids (MLSS) concentrations and an equivalent increase in treatment capacity all within existing bioreactors and clarifiers.
- Enhanced nutrient removal (ENR) at lower costs – Increased capacity and superior solids removal enable existing activated sludge systems to free up reactor capacity for multi-stage treatment processes, thereby enabling the removal of nitrogen to ≤ 3.0 mg/L.

The enhanced settling capabilities of the BioMag System have been proven at municipal and industrial facilities to deliver the following results:

- $\text{BOD}_5 < 5.0 \text{ mg/L}$
- $\text{TSS} < 10 \text{ mg/L}$
- $\text{NH}_3-N < 0.2 \text{ mg/L}$
- $\text{TP} < 0.2 \text{ mg/L}$
- $\text{TN} < 3.0 \text{ mg/L}$
- $\text{SVI} < 70 \text{ mL/gram}$
- Clarifier SLR up to 100 lb/day-ft²
- Clarifier SOR up to 2,500 gpd/ft²
- MLSS up to 10,000 mg/L
- MLVSS up to 8,000 mg/L

**CLARIFICATION WITH MINIMAL FUSS AND MAXIMUM RELIABILITY**

The Christchurch Wastewater Treatment Plant (New Zealand) operates four 50m dia Tow-Bro® Unitube sludge headers. The Tow-Bro system have maintained significantly lower sludge bed levels in the clarifiers than traditional systems, which allow greater peace of mind in achieving effluent water quality from the clarifiers. The plant currently treats an estimate flow equivalent to 700,000EP (which includes approximately one third of the flow from industrial sources). The Tow-Bro system have required no service since installation other than periodical lubrications.
The CoMag® System — enhanced clarification that easily integrates with your process. Simple and reliable, the CoMag® system from Evoqua uses magnetite to ballast conventional chemical floc, enhancing settling rates and increasing the performance of wastewater and water treatment facilities, while substantially reducing life-cycle costs. Primarily used to improve primary and/or tertiary treatment, the CoMag system easily integrates with planned or existing facilities, making it easier than ever to solve today’s operational and environmental challenges.

Key benefits of the CoMag system:

• Superior contaminant removal – total suspended solids (TSS), total phosphorus (TP), turbidity, colour, pathogens and metals can be reduced to levels far below conventional treatment.

• Low costs – High-rate, ballasted clarification allows for smaller reaction and solids separation tanks, minimal power consumption and moderate chemical use.

• Improved productivity – The CoMag system minimises the risk of upsets and handles a wide range of flows and loads — including peak flow events — with no backwashing, plugging or fouling, no media filters required and almost no effect on contaminant removal performance or operational stability.

• Ultraviolet enabling – The high transmissivity of the CoMag system effluent reduces energy and operating costs of final purification.

The enhanced settling capabilities of the CoMag system have been proven at municipal and industrial facilities to deliver the following results:

- SOR up to 10x
- SLR up to 20x
- Turbidity < 1 NTU
- TP < 0.05 mg/L
- TSS < 2.0 mg/L
- Colour 2 Pt-Co Units
- Faecal Coliform < 200 Col/100 mL
- Copper < 8 μg/L
- Aluminum < 80 μg/L
- Arsenic < 5 μg/L
- UV Transmittance > 75%

PRACTICAL USES FOR THE COMAG™ SYSTEM

The CoMag system competes effectively with all forms of media and membrane filtration and conventional clarification, and is proven to be effective for:

- Primary treatment (chemically enhanced primary treatment)
- Tertiary treatment for polishing secondary effluent
- Stormwater / CSO (combined sewer overflow) / wet weather control
- Recycle-reuse applications
- RO pre-treatment
- Drinking water

THE COMAG™ SYSTEM AS PART OF A TRADITIONAL TERTIARY TREATMENT CONFIGURATION
ODOUR CONTROL

EFFECTIVE ODOUR CONTROL FOR MUNICIPALITIES AND INDUSTRY

In the modern world of wastewater treatment, control of odours has moved from an after thought to a primary design consideration for most collection and treatment facilities. As communities and other development increases in the areas surrounding these facilities, the need for odour control systems becomes even more important.

Rather than taking a "one size fits all" approach, Evoqua’s treatment recommendations are based on data collected at your site and may include one or more odour control products to achieve the desired results in a cost effective manner. With a complete selection of odour control systems, Evoqua can customise the right solution for your specific odour control problem.

Our systems comprise of:

• Liquid phase odour control systems
• Activated carbon odour control
• Biological odour control systems
• Chemical odour control - multi-stage chemical odour control systems
• LO/PRO® chemical scrubber technology

The main features are:

• BIOXIDE® Solution for liquid phase odour control: A liquid phase odour control systems for municipal wastewater collection systems.
• Modular activated carbon odour control units: Activated carbon odour control system designed for installation at sewage pump stations and wastewater treatment plants, optional polishing stage available.
• Activated carbon odour control media: Pelletised activated carbon for odour control in municipal and industrial wastewater treatment.
• Biological odour control ZABOCS® BTF Biotricking filter odour control system suitable for small to large sewage treatment plants. Offered with the option of in series activated carbon system.
• Biological odour control ZABOCS Series P (pump stations): BTF odour control system suitable for sewage pump stations and small sewage treatment plants. Offered with the option of integral activated carbon system.

Generating benefits for our customers through:

• A uniquely designed offerings range, with varying levels of sophistication
• Simplicity of operation and installation
• Wide range of odour control technologies (vapour phase and liquid phase)
• Systems custom designed or pre-engineered worldwide
• Installation base - unparalleled support network

CASE STUDY

TREATMENT PLANT ELIMINATES ODOUR WITH LO/PRO CHEMICAL SCRUBBER

In order to control odour at a biosolids handling facility, a South Australian wastewater treatment plant selected the LO/PRO chemical scrubber system from Evoqua. The patented multi-stage LO/PRO system enables the efficient, cost-effective removal of a wide range of odours associated with biosolids handling. The versatility of the LO/PRO system design makes it an excellent choice for locations where odour levels are unpredictable and subject to wide variation in concentration and composition.
CHEMICAL FEED AND DISINFECTION

Technological innovation and superior quality products have been part of the Wallace & Tiernan® family of products for over a century. Whether you’re dealing with gases, liquids or solids, Evoqua has a solution for your process. Our product range, ground breaking technology and experience allow us to offer the right solution for all areas of water treatment and disinfection applications. We place great emphasis on quality and providing unparalleled commitment to service.

GAS FEED AND MONITORING SYSTEMS

The Wallace & Tiernan product line includes an extensive range of gas monitoring and gas feed systems that include vacuum type solution feed chlorinators for treating/disinfecting municipal, process or industrial water/wastewater supplies. Configurations include: cylinder, drum or wall, floor mounted models, with or without automatic feed control. Gas feed systems are also available for ammonia, sulphur dioxide and carbon dioxide.

LIQUID FEED SYSTEMS

Evoqua offers an extensive range of positive displacement pumps which includes: solenoid operated, motor driven, non-loss motion Encore 700 diaphragm pumps, tubular diaphragm, peristaltic tube and hose pumps. These pumps are capable of safely and accurately metering small to large volumes of liquids, slurries or corrosive/toxic chemicals. Each variant can be configured to meet the latest process control requirements.

DRY CHEMICAL FEED SYSTEMS

Dry chemical feed systems are used to meter dry, powdered and granulated substances typically used in water treatment and industrial applications. We offer an extensive range of screw type volumetric dry chemical feeders and belt drive gravimetric/volumetric feeders. Wallace & Tiernan lime slakers are very compact in design and utilise the efficient paste method to prepare concentrated lime slurry from quicklime on site. The lime slurry produced using this method is highly reactive to achieve optimum performance.

POLYMER SYSTEMS

Evoqua’s polymer systems, include all of the components needed for storage, dry feeding, wetting, dissolving and aging of polyelectrolyte. Our systems are compact units designed for the preparation of polymer solutions from either powdered or liquid based polymers.

CASE STUDY

SEQ WATER – FLUORIDATION FROM EVOQUA WATER TECHNOLOGIES

To ensure timely compliance with the Water Fluoridation Act 2008, SEQ Water and their partners turned to Evoqua to provide a solution for the safe introduction of fluoride into Queensland’s public water supply. It includes the design and construction of 14 prefabricated sodium fluoride saturator plants as well as the design and supply of 6 large sodium silicofluoride plants incorporating ‘bulk bag’ handling systems. Evoqua designed, constructed and commissioned the complete systems incorporating flow and level instruments, automation, control and distribution equipment as well as Wallace & Tiernan® fluoride dosing pumps and feeders all housed in purpose built prefabricated structures. The 14 buildings and 6 bulk handling sites were successfully installed on a fast-track, 20 week programme and commissioned on schedule.
Evoqua offers customised engineered chemical feed systems for products such as fluoride, lime, alum, sodium hypochlorite, ferric chloride, powdered activated carbon, potassium permanganate systems. Packages include: storage hoppers, powder handling systems, storage tanks, powder/liquid mixing, dosing skids and integrated control systems.

**ENGINEERED PACKAGED CHEMICAL FEED SYSTEMS**

Evoqua offers customised engineered chemical feed systems for products such as fluoride, lime, alum, sodium hypochlorite, ferric chloride, powdered activated carbon, potassium permanganate systems. Packages include: storage hoppers, powder handling systems, storage tanks, powder/liquid mixing, dosing skids and integrated control systems.

**ALTERNATIVE DISINFECTION SYSTEMS**

Barrier® M ultraviolet disinfection systems offer a broad range of lamp technologies for cost effective operation of closed vessel configuration and are available with DVGW certification, for drinking water applications. Other applications include wastewater, wastewater reuse and industrial water treatment.

The OSEC® system produces sodium hypochlorite on demand through the electrolysis of brine solution. Electrolysers are available in standard capacities from 6 to 907 Kg of equivalent chlorine per day. System capacities can be increased by the installation of additional modular electrolysers. The sodium hypochlorite produced by the OSEC system can be used for treating/disinfecting municipal, process, or industrial water/wastewater supplies. Evoqua has over one thousand installations globally including installations locally in Australia and New Zealand.

Evoqua offers a chlorine dioxide generation system that provides advance oxidation for specialist applications, such as paper bleaching, water and wastewater treatment. Generators are available as two chemical (using chlorine and sodium chlorite) and three chemical systems (sodium chlorite, hydrochloric acid and sodium hypochlorite).

**ANALYSERS AND CONTROL SYSTEMS**

Our analysers comprise of either the SFC (single function controllers) for the measurement and control of single parameters, while our MFC (multi function controllers) handle up to four parameters offering a broad combination of water analysis and disinfection/chemical control in a single unit. Control functions of these analysers include; flow proportional, residual, compound loop and set point trim. Measurable parameters include; pH, ORP, combined/total/free chlorine, conductivity, temperature, fluoride, sulphur dioxide, chlorine dioxide and turbidity. Evoqua also offers its Advantage Series of analyser/control panels for quick and convenient installation.

**GAS MONITORING**

For gas monitoring we offer our GMS plus system for gases such as chlorine, chlorine dioxide or ozone. This reliable dual channel measuring system for two gas sensors (maybe identical or different) allows gas concentration and temperature to be monitored in up to two rooms.

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**CELEBRATING 100 YEARS OF CHLORINATION**

**100 YEARS OF INDUSTRY EXPERIENCE**

In 1913, Mr Wallace and Mr Tiernan - two young engineers invented a device for disinfecting water supplies by use of chlorine gas. Named the “Chlorinator”, this device has been credited with the elimination of waterborne diseases all too common in the early 1900’s. Recognising this success, LIFE Magazine in 1997 declared water chlorination and filtration “Probably the most significant public health advancement of the millennium”.
MEMCOR® membranes were one of the first low pressure membrane systems introduced to treat drinking water in 1987. Evoqua offers these world leading membranes which offer more flexibility for customised solutions.

Using Evoqua, your system designs will remain compatible with future technological advancements. Pre-engineered systems are used in variety of industrial and municipal applications. We are able to supply both pressurised and submerged membrane systems – the two most convenient and efficient microfiltration and ultrafiltration systems for treating large flow capacities – Evoqua can offer tailored solutions for any requirements. Our products are Australian made and supported by our world class research and development facility located in Windsor, New South Wales.

**SUBMERGED SYSTEMS**

Flexible MEMCOR CS systems are composed of module racks housed in open cells accessible by the optional MemSAP® (service access platform). Unlike our competitors, our platform moves quietly across the tanks like a travelling bridge to position the operator directly above the membranes. Modules are then safely lifted through an opening in the floor of the platform. Another unique feature is that our membrane fibres are cleaned in-place with a combined low pressure air scour and filtered water backwash.

**PRESSURISED MEMBRANE SYSTEMS**

The MEMCOR CP II system is a pressurised, pre-engineered membrane system with a modular building-block configuration and ultra-compact footprint. Building on 25 years of experience in supplying membranes and membrane systems, the MEMCOR CPII system is the next evolution of the MEMCOR product family. The system utilises the latest enhanced PVDF UF membrane technology, and features design enhancements which reduce installation costs, improve system performance, and simplify operations. The MEMCOR CPII system is ideal for new installations and upgrades of existing facilities. By combining durable materials and reusable housings with easy module access, it reduces maintenance requirements and delivers exceptional value over the entire system lifecycle.

**MEMBRANE SOLUTIONS FOR PRE-ENGINEERED SYSTEMS**

- MEMCOR XP-E pressurised
- MEMCOR XP pressurised
- MEMCOR XS submerged
- Xpress™ MBR membrane bioreactor

**MEMBRANE SOLUTIONS FOR LARGE CAPACITY SYSTEMS**

- MEMCOR CPII pressurised
- MEMCOR CS submerged
- MEMCOR CP pressurised
- MemPulse® MBR membrane bioreactor

**CASE STUDY**

**MEMCOR® CP SYSTEMS SELECTED FOR WESTERN CORRIDOR PROJECT**

The Western Corridor Project in South East Queensland is one the most strategic reuse projects in Australia. The short lead time requirements and demanding construction milestones meant that pressurised UF membranes were an obvious candidate. The project has confirmed the indirect benefits of shorter construction duration and smaller footprint offered by MEMCOR CP systems. Low energy consumption and high system recovery means that downstream RO systems can run more efficiently. MEMCOR CP system is modular, expandable and compact.
WATER RECLAMATION AND DESALINATION PRE-TREATMENT

Australia’s new emphasis on water cycle management has resulted in closer evaluation of water reuse and desalination alternatives. All water reclamation and seawater desalination projects require upstream protection of reverse osmosis systems.

MEMCOR® system are the pioneers in pre-treatment systems for reverse osmosis. MEMCOR XP and XS systems have been applied for small community-based water reuse systems. The larger capacity CS and CP system are clearly proven platforms on major Australian reference projects, such as the Western Corridor Project. As the need for wastewater and recycling grows, our MBR systems are increasingly specified for modular compact options. Tertiary polishing of effluent using our existing platforms is complimented by additional capability for either commercially or municipal MBR solutions. Our membrane operating systems (MOS) are an important technology offering for many water reclamation projects. Evoqua’s MBR systems are specified and supplied for many of the six-star commercial projects where world class, environmental practices are required.

Major municipal recycling projects such as the Gippsland Water Factory in Victoria, that process complex industrial and municipal effluent, use Evoqua’s MBR systems. To achieve success, water reuse projects must use technologies that offer safe, high quality water, reduced use of chemicals, long-term reliability, small footprint, low operating costs, scalable and constructible options as well as high yield and maximum recovery. Proven worldwide, MEMCOR systems meets these criteria, enabling wastewater to be reclaimed and reused for both potable and non-potable use, safely and reliably.

CASE STUDY

LEADING EDGE CREDENTIALS FOR SEAWATER PRE-TREATMENT

Seawater desalination projects around Australia have highlighted the impressive benefits of membrane technology over other conventional, chemically-intensive solutions. Through environmental auditing, dual membrane seawater systems have been identified as preferred alternatives.

Evoqua has manufactured and supplied the Southern Seawater Joint Venture (SSJV) 20 MEMCOR, SeaBlock® CP membrane filtration units, each consisting of up to 912 hollow fibre membrane modules for membrane pre-treatment at Water Corporation’s desalination plant in Binningup, south of Perth, Western Australia. Pre-treatment capacity is 720 MLD per day making this one of the largest applications of this type in the world.

This innovative technology is growing in application as pre-treatment for reverse osmosis in water desalination. In addition, Evoqua has manufactured and supplied our SeaCell® submerged seawater UF systems for the pre-treatment of seawater at the Adelaide desalination plant providing the plant with a capacity of 626 MLD over the two stage project.

Manufactured in our facility in Windsor, New South Wales, this membrane technology was chosen for its reduced footprint, simplicity of operation, ability to treat feed without coagulant addition, lower energy costs and improved feed water quality for the downstream reverse osmosis system when compared to conventional technology. Compact and modular in design, the system can be easily expanded to meet future capacity demands without increasing footprint. The result is a more efficient, easily designed and installed membrane system that significantly reduces both greenhouse emissions and the overall cost of operation.
INDUSTRIAL WATER TREATMENT

With increasing pressure and strain on fresh water resources, industries are now facing the challenge of finding alternate sources of water and improve water management to remain profitable.

Evoqua offers ways to protect your capital investment while keeping your operating budget in line. By choosing the best technologies and innovative solutions for every application and integrating them into complete systems to meet your objectives, Evoqua is more than just a technology supplier of water and wastewater treatment, we are a trusted partner.

Our process guarantee ensures that your treatment systems provide years of reliable operation, backed by our local sales and service network.

Our technology offerings include:
- Vantage® series filtration systems
- Vantage series ion exchange systems (cation, anion, mixed bed and WWV selective heavy metal removal)
- Vantage series membrane system (MF/UF/NF/RO)
- Vantage series continuous deionisation system (CEDI)
- Condensate polishing systems
- Packaged skid mounted and Containerised Water Treatment plants (DESAL in a BOX)
- Packaged high purity systems (PURITAS® VRx system, EPV)
- Chloropac® Electrocatalytic systems
- SeaCURE® ballast water treatment systems
- J-Press® and mining concentrate filter press (MCP)
- Vanox® Advanced oxidation systems (AOP)
- Remote Monitoring

MINING

With increasing water scarcity and stricter environmental regulations for wastewater discharge – efficient processing of process water and reducing the use of fresh water is now critical for any mining operations sustainability. Evoqua offers proven solutions for water treatment to address these key challenges.

Our solutions include treatment of fresh surface waters (rivers, lake, sea) and ground waters for camp sites, townships potable applications, dust suppression and process filtration. Our packaged engineered systems include both Vantage® series skid mounted and containerised water treatment plants (DESAL in a BOX) offering superior benefits to our customers including:
- Modular construction with factory acceptance testing (FAT) prior to shipment
- Ease of installation and commissioning
- Better serviceability of plant
- Remote monitoring capability

CASE STUDY

CONTAINERISED POTABLE WATER TREATMENT PLANT FOR MINING TOWNSHIP AND CAMP SITE

When a world class mining company decided to install permanent potable water treatment plants for their expansion project in the Pilbara region, Western Australia, they decided to work with Evoqua after evaluating competitive bids from other reputable Australian suppliers.

Evoqua’s thorough understanding of the pre-treatment plant requirement and reverse osmosis design including post treatment gave the customer confidence that the plant designed would withstand the harsh operating conditions and handle varying feed water quality. The potable water treatment plant (PWTP) is fully containerised and automated requiring minimal operator interference. The PWTP is fully integrated with the client’s main SCADA system enabling them to acquire operating information online. Evoqua will be providing regular maintenance services for the PWTP.
The coal beds that are formed are saturated with water at high pressures which keeps the methane adsorbed onto the matrix of the coal.

Coal Seam Gas (CSG) projects extract this water at great quantities in order to decrease the pressure and consequently desorb the gas from the coal. Producers must manage these considerable volumes of water generated during the dewatering process. Evoqua offers highly reliable and proven technologies for treatment of CSG produced waters which include:

- MEMCOR® CP membrane based UF pre-treatment
- Ion exchange based softening systems (WAC, SAC)
- Reverse Osmosis systems
- Chemical dosing systems including SAR dosing

Evoqua offerings also include processing of Tailings Dam and Acid Mine Drainage waters for discharge and reuse.

Evoqua have developed specific antiscalant which enables processing high Sulphate bearing waters. Some of the benefits to our customer includes:

- Removal of heavy metals to ppb concentration levels
- Achieve higher RO recovery rates and less brine generation
- Reduced CAPEX and OPEX

Evoqua also offers concentrate filter presses for mining dewatering, tailings recovery and resource recovery processes. Our Mining Filter Press (MFP) and J-Press® systems have gained the reputation of:

- Most simple and low maintenance cost machines available in the market
- Rugged construction
- Higher machine availability compared to other similar competing machines

POWER

Today’s power producers are also under tremendous pressure to reduce costs and increase efficiency. As the power industry becomes more competitive and environmental regulations becomes more stringent, power generators need smart solutions that meet specific water quality requirements to ensure consistent processes and production, while also improving efficiency and reducing waste.

Evoqua offers solutions to assist the power industry to meet its challenging business demand include:

- Demineralisation System
- Condensate Polishing System
- Cooling Water Treatment and Reuse
- Potable Water Treatment and Disinfection
- Flue Gas Desulphurisation Scrubber Wastewater Treatment
- Anaerobic high rate digesters
- Gas collection and treatment systems

CASE STUDY

EVOQUA DELIVERS COMPLETE WATER MANAGEMENT SOLUTION FOR A MINING CAPTIVE POWER PLANT PROJECT IN QUEENSLAND

When a leading Australian EPC company having established a reputation of delivering timely industrial power projects decided to install a Demineralisation Plant to produce boiler make-up water for high pressure boilers, cooling water filtration system, PWTP and disinfection, they selected Evoqua based on our experience in the power industry and proven technologies to enable them to meet the project deadline. Evoqua designed a packaged engineered skid mounted system which included Vantage® PTI series filtration systems, Vantage® RO and CEDI systems underwent rigorous factory acceptance testing prior to delivery enabling reduced installation and start-up time for the customer.
The 2Mi and 3Mi solutions are an innovative, membrane treatment approach to achieving consistent and cost-effective boiler feed water. The 3Mi solution consists of three main components – MEMCOR® ultra-filtration system, Vantage® reverse osmosis system and Vantage continuous deionisation system (CEDI). In combination, these systems provide a superior solution to produce ultrapure water for your power generation application.

Condensate polishing can help improve your bottom line by reducing the losses or damages caused by corrosion and deposits and can significantly reduce start-up times and the frequency of routine cleanings. Our breadth of technology, systems and services, combined with years of experience in designing, installing and operating make us your trusted partner in:

- Deep-Bed Condensate Polishing
- Powdered Resin Condensate Polishing

**MARINE**

To help meet ballast water treatment management standards as outlined in the 2004 IMO Convention for the Control and Management of Ships’ Ballast Water and Sediments, Evoqua has developed the SeaCURE® ballast water treatment system which provides a reliable, environmentally sound solution that is designed to protect against the proliferation of aquatic invasive species. The patent pending SeaCURE ballast water management system uses a combination of physical separation and a proprietary, on-demand treatment with biocides, produced in-situ from seawater, without the addition of chemicals.

The benefits of the SeaCURE ballast water management system includes:

- Safe, reliable, secure solution to ballast water management
- Produces biocide in-situ and on-demand, minimising corrosion and DBP potential
- Dual-action system provides ballast water treatment and biofouling control
- Low operating cost
- No on-board storage of chemicals required
- Low maintenance
- System design is based on a proven 30+ year record and over 2,500 shipboard installations of Evoqua’ well-known Chloropac® system biofouling control system.

**OIL AND GAS**

For seawater-based processes, the cost of fouling can be substantial. Macro-fouling from mussels, clams, oysters, sea anemones and barnacles, combined with micro-fouling from bacteria, slime and algae, greatly restricts the flow of cooling water to heat exchanger surfaces, accelerates localised corrosion by restricting oxygen diffusion, and causes...

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**CASE STUDY**

**EVOQUA HELPS A POWER PLANT CUSTOMER ACHIEVE 100% WATER RE-USE OF COOLING TOWER BLOW DOWN**

A West Australian energy company was facing excess cooling tower (CT) blowdown and increasing CT operating expense issues due to the deterioration of make-up ground water quality at one of their power plants.

Evoqua designed the water re-use Vantage® RO desalination plant and helped the customer to stabilise the existing wastewater treatment plant enabling the customer to recover up to 75% of cooling tower blowdown water as make-up. The reject 25% from the Vantage RO plant is being now used for dust suppression at their ash handling facility. This has enabled the customer to achieve 100% zero liquid discharge and savings in cooling water chemicals due to improvement in make-up water quality. Evoqua supplied a micro-filtration unit (MEMCOR CMF), a demineralisation plant (RO based) and seawater hypochlorite generation Chloropac systems at various power generating locations in Western Australia. These systems have been in operation for over 15 years.
destructive turbulence at inlets. This can severely shorten the life of affected equipment.

With more than 3,000 Chloropac® systems installations around the world, Evoqua is a leading provider of hypochlorination and electro-chemical equipment designed to control biological fouling and corrosion wherever seawater is used as cooling or process water – e.g. land-based power, LNG and petrochemical facilities, sea-water desalination and treatment facilities, ships, and offshore facilities.

The patented Circular Tubular Electrode (CTE) technology use in Chloropac systems provide many benefits to our customers including:

• Self cleaning cells (no calciferous deposits)
• Long term reliability of cells through our 5 year guarantee
• High electrical energy efficiency
• Modular construction including FAT prior to shipment
• All components are fully certified including cells and power supplies

FOOD AND BEVERAGE

Water is a critical ingredient in the food and beverage industry. Our partnership with the industry has resulted in continued innovation to meet increasingly strict water and wastewater requirements, while conserving valuable water resources.

All projects are designed for quality, safety and compliance. Our extensive operational experience is unmatched with responsibility for over 1,000 installations. Our offerings for the food and beverage industry include a wide range of systems such as:

WATER

• Membrane pre-treatment systems (MEMCOR® CMF, XP systems)
• Ionpure® continuous electrodionisation systems (Hot Water and Chemical Sanitisable)
• Membrane vacuum degasification units
• OSEC® systems (hypochlorite generators)
• UV disinfection units

WASTEWATER

• Aerobic biological treatment systems (MBR, SBR, MBBR)
• Anaerobic high rate digesters
• Gas collection and treatment systems

CASE STUDY

CHLOROPAC® SYSTEM HELPING AUSTRALIAN ENERGY CUSTOMERS MAINTAIN CLEANER HEAT EXCHANGERS AND ACHIEVE ENERGY SAVINGS

Three leading Australian energy companies are using seawater for cooling purpose. The biological fouling in the cooling water supply line and heat exchangers is controlled by dosing hypochlorite. Chlorination is well-known as the best solution for treating biologically fouled seawater systems however, the manual use and bulk storage of chlorine is generally an unacceptable safety hazard on land, offshore platforms or onboard ships. For the same reasons, the handling of large volumes of liquid sodium hypochlorite is also impracticable.

So when these customers decided to install seawater hypochlorite generation systems they chose Evoqua as recognised leaders in the field of the electro-chlorination. The electrocatalytic Chloropac system was the obvious choice based on its proven technology, lower cost of plant ownership and high safety standards.

Evoqua has supplied numerous Chloropac systems to oil and gas, power, LNG tankers, freight and ship building customers in Australia.
INTEGRATED PROCESS SOLUTIONS

Evoqua offers an integrated treatment process solution that includes the most innovative scope of water and wastewater technologies backed by our 100% end-to-end process guarantee.

Involving Evoqua’s experts at the project design phase optimises your plant’s performance and lowers installation and lifecycle costs. Working with Evoqua for your total water management solution means full accountability and a complete understanding of your treatment process needs.

BioFlowsheet™ solutions is Evoqua’s new biological process optimisation program that integrates several key wastewater treatment plant processes including biological treatment, solids separation, solids treatment, automation and control. The program evaluates effluent requirements, land availability and specific cost factors such as energy use, labour and disposal.

Our experienced professionals have been involved in hundreds of local and global projects and will deliver the necessary skills and expertise to guarantee end-to-end process for your wastewater treatment plant.

Furthermore, our non-exclusive recommendation of products will mean that the best value for money is obtained from the market.

CASE STUDY

EVOQUA CHOSEN AS TRUSTED PARTNER FOR APLNG COAL SEAM GAS PROJECT

Evoqua will supply the ultra filtration (UF) CP membrane filters, chemical dosing and chemical transfer, and chloramination which will be used to filtrate and treat water that is released as part of the coal seam gas extraction process.

Total supply will include 20 UF membrane filtration skids. Each will house 156 modules, manifolds, associated valves and equipment, instrumentation and connection panels. The skids are modular for easy transportation and are approximately 10 metres long x 2 metres wide x 2.5 metres high.

Additionally, Evoqua will manufacture 26 chemical dosing and chemical transfer skids, including chemicals such as Chlorine, Acids, Biocides and Antiscalants. The chloramination disinfection system, a combination of Chlorine and Ammonia, will incorporate our Wallace & Tiernan® gas feed systems. All systems were manufactured and witness tested at our facility in Windsor, New South Wales before being shipped to site.
SERVICE

EVOQUA OFFERS THE BROADEST LINE OF PROCESS TECHNOLOGIES, PRODUCTS AND SERVICES TO MEET THE NEEDS OF OUR MUNICIPAL AND INDUSTRIAL CUSTOMERS, WHETHER THEY INVOLVE POTABLE WATER, WASTEWATER TREATMENT OR ADVANCED TREATMENT FOR RE-USE PURPOSES.

A comprehensive service support capability is provided to our customers from specialist program maintenance services for our product lines to emergency response services and on site commissioning.

With a highly skilled and trained workforce and accredited service providers, our coverage across Australia and New Zealand enables us to provide the local level of service required for our customers’ plants to run at optimum levels increasing plant availability, reducing operating costs and ensuring safe and compliant operations.

General support services from Evoqua;

• Multidisciplined contracting on a performance basis with KPIs linked to business objectives and outcomes
• Programmed maintenance services for MEMCOR® membrane systems, Wallace & Tiernan® dosing systems, gas chlorination, analytics and UV disinfection systems
• Specialist services in gas chlorination overhaul and calibration, calibration of Wallace & Tiernan water quality analysers
• MEMCOR membrane care program, performance audits and mobile pilot plants
• Plant audits
• Upgrade, rehabilitation and retrofit services
• On-site commissioning and installation supervision
• Spare parts and repair
• Operator and maintenance training services on all products and processes
• Service and maintenance contracts geared to customer requirements
• National sales and service support 1300 661 809
OVERVIEW OF EVOQUA WATER TECHNOLOGIES OFFERINGS

**Wastewater treatment**
- CoMag® systems
- BioMag® systems
- Internalift high rate lift pumps
- Orbal® oxidation process
- Rim-Flo® clarifiers
- Envirex® chain and scraper sludge collector system
- Tow-Bro® unitube sludge removers
- Trans-Flo® secondary clarifiers
- Verticel® loop reactors
- OMNI FLO® SBR process
- Forty-X® tertiary disc filters
- Dystor® gas holder
- JetMix™ high solids and sludge treatment systems

**Odour control**
- ZABOC® biological systems
- Midas® OCM activated carbon
- Bioxide® biological systems
- LO/PRO® chemical scrubbers
Industrial water and wastewater treatment systems
- Vantage® series filtration systems
- Vantage series ion exchange systems (cation, anion, mixed bed and WW selective heavy metal removal)
- Vantage series membrane system (MF/UF/NF/RO)
- Vantage series continuous deionisation system (CEDI)
- Condensate polishing systems
- Packaged skid mounted and containerised water Treatment Plants (DESAL in a BOX)
- Packaged high purity systems (Puritas® VRx system, EPV)
- Electro catalytic Chloropac® systems
- SeaCURE® Ballast water treatment systems
- Sludge dewatering systems (filter press/belt press/centrifuges/dryers)

Integrated process solutions
- BioFlowsheet™ solutions

Chemical feed and disinfection
- Wallace & Tiernan® analysers, controllers and gas monitoring
- Wallace & Tiernan® gas chlorination/dechlorination
- Dry chemical – handling/feeding/mixing
- Engineered products – fluoridation packages/lime slakers/chemical dosing skids/polymer systems
- Liquid feed – positive displacement pumps
- Multi-barrier disinfection technologies including: UV – Ultra Violet / ClO2 – Chlorine Dioxide/OSEC® hypochlorite generator

Membrane solutions
- SeaCell® submerged seawater pre-treatment membrane systems
- SeaBlock® low pressure seawater pre-treatment membrane systems
- MEMCOR® CPII pressurised membrane systems
- MEMCOR CS submerged membrane systems
- MEMCOR CP pressurised membrane systems
- MEMCOR XP pressurised pre-engineered systems
- MEMCOR XP-E economy model pressurised pre-engineered systems
- MEMCOR XS submerged pre-engineered systems
- Xpress™ MBR (membrane bioreactor)
- MemPulse® MBR
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