

# Modular solutions



Working in partnership with a range of clients covering utilities, municipal, resources and industry. We use the latest technology to design, build, install and operate modular water and wastewater treatment solutions. We specifically tailor packages to meet our clients' various water treatment challenges.

Delivery of modular water and wastewater treatment solutions for potable water, process water, wastewater and water reuse. Solutions are fabricated, assembled and tested off-site to minimise on-site installation.



## Your water treatment challenges

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We specifically tailor modular packages to meet our clients' various water treatment challenges. Our modular solutions cover potable water, process water, wastewater and water reuse.

Solutions must be safe, compliant, reliable, delivered on-time and optimise operating costs. The benefit of using a modular water treatment solution, which is fabricated and assembled off-site, is that minimised on-site installation is required.

We advocate the use of modular solutions to ensure:

- Installation time on-site is minimised resulting in less on-site workforce management and reduced exposure to safety hazards
- Relative ease of expansion or turn down of modular facilities as needs change
- Quality control is enhanced due to controlled assembly and testing in warehouse conditions
- Reduced schedule risk due to off-site testing and minimised need for civil and structural construction on-site
- TRILITY can offer these solutions through a variety of delivery models including Build Own Operate (BOO), Design Build Operate (DBO), Engineer Procure and Construct (EPC) or "supply and install" formats

## About TRILITY

TRILITY is an established industry leader, dedicated in the delivery of water, wastewater, reuse and biosolids solutions across Australia and New Zealand's municipal and industrial sectors. This leadership draws on more than 30 years' experience of providing high-quality environmentally sustainable solutions for our public and private sector clients. Services include; financing, design and construction, operations and maintenance, asset management, utility services and bespoke modular solutions.

An Australian and New Zealand company with the support of its shareholders Beijing Enterprises Water Group (BEWG), TRILITY has a growing footprint across Australia and New Zealand. As such, our capabilities span the full life cycle of water and related services, which our dedicated team of industry specialists deliver to millions every day.

## Expertise

TRILITY brings the following expertise:

- Design using latest technologies to conserve water, maximise recovery and reduce operating costs
- System integration of different process streams and peripheral equipment and control systems
- Full site construction, project management and installation services
- Commissioning and operator training
- Operations and / or planned and reactive maintenance partnerships customised to clients requirements and creating potential for reduction of life cycle costs
- Assistance with membrane cleaning regimes and troubleshooting advice
- Refurbishment and upgrading of existing facilities
- Customer support for technical enquiries and spare parts by highly experienced service technicians



Modular water treatment plant in Tasmania

Managing the supply chain

Relationships and distribution arrangements with various manufacturers and suppliers allow us to leverage maximum value, resulting in cost effective solutions.

**TRILITY**

Our supplier relationships span over 30 years. Our staff work closely with our suppliers to achieve the best overall outcomes for our clients and we have intimate knowledge and experience with our supplier's products. We visit our supplier's facilities regularly and receive product training and up-to-date design tools.

**Suppliers**

Our suppliers retain the highest quality, safety and environmental standards. Product knowledge and service is paramount to TRILITY and our customers.

- Solutions**
- Process knowledge and experience
  - Full solution design including site requirements
  - Full solution procurement
  - Product integration and solution assembly
  - Site construction and installation
  - Full testing, commissioning, training and handover
  - Operations, maintenance, servicing, troubleshooting and spare parts



Some of our key supplier relationships used to compile solutions are:

Key components	Key supplier relationship
Chemical dosing	<ul style="list-style-type: none"> <li>• Evoqua Water Technologies</li> <li>• Grundfos</li> <li>• Hydramet</li> <li>• Koflo</li> </ul>
Components	<ul style="list-style-type: none"> <li>• GF Piping Systems</li> <li>• Primary Fluid Systems</li> </ul>
Electrochlorination	<ul style="list-style-type: none"> <li>• Evoqua Water Technologies</li> <li>• Grundfos</li> </ul>
Filtration	<ul style="list-style-type: none"> <li>• Baldwin</li> </ul>
Gas chlorination	<ul style="list-style-type: none"> <li>• Evoqua Water Technologies</li> <li>• Forceflow</li> <li>• Hydramet</li> </ul>
Instrumentation	<ul style="list-style-type: none"> <li>• Analytical Technologies Inc</li> <li>• Evoqua Water Technologies</li> <li>• Hydramet</li> </ul>



TRILITY has built an impressive track record of building reliable, modular water and wastewater treatment solutions across Australia and New Zealand. We are committed to providing the high standards of service and quality workmanship for which we are renowned.

## Australia

### Western Australia



**1. 58 Mile tank chloramination facility**  
TRILITY manufactured chlorine and ammonia dosing modules, as well as completing the civil site works, installation, commissioning, and project management to upgrade the 58 Mile tank facility.



**2. Allanooka chlorination reconfiguration**  
TRILITY was contracted to reconfigure a chlorination system with automatic generator power in the event of a power failure. Safe, withdrawable injection quills and chemical barrier protection enhance operator safety.



**3. Electrochlorination supply of facilities**  
TRILITY was awarded a contract to build, install, test and commission electrochlorination facilities to disinfect both potable and process water supplies at a mine site. The facilities were manufactured and tested off-site, then transported to site as complete buildings, where they were installed and commissioned.



**4. Mine site water treatment**  
TRILITY was commissioned by one of the largest mineral resource companies in Australia to design, manufacture and commission a multi-stage water treatment system. The system was specifically designed to provide their sites with water that complied with the Australian Drinking Water Guidelines. The water treatment plant was centrally located to distribute the treated water to several remote sites throughout the client's network. Technologies included multimedia and nano filtration, disinfection, chemical dosing and ultraviolet treatment.

### Victoria



**5. Ararat Water Treatment Plant**  
Design and construction of an upgraded fluoride dosing system to comply with the updated Code of Practice for the fluoridation of drinking water supplies.



**6. Mount Zero powdered activated carbon (PAC) dosing system**  
Improving water taste and odour using powdered activated carbon dosing prior to treatment at Mount Zero Water Treatment Plant.



**7. Soluble iron removal**  
TRILITY designed and manufactured a water treatment solution to remove soluble iron within a nursery's raw bore water. The chemical dosing station used pH correction to oxidise the iron out of solution. The on-site testing measured the dissolved iron in the raw bore water to be 55mg/L. After pH correction the levels of dissolved iron decreased to less than 0.03mg/L

### Tasmania



**8. Adventure Bay Water Treatment Plant Interim Upgrade Project**  
TRILITY was engaged to design, supply, fabricate, install, test and commission a new disinfection and mixing system to improve monitoring and control of the existing water supply.



**9. TasWater Regional Towns Water Supply Program**  
TRILITY was selected by TasWater to design and construct Work Package One of the TasWater Regional Towns Water Supply Program. Work Package One was the design and construction of water treatment plants and the subsequent operational support for a period of one year for eight of sixteen townships around Tasmania.



**10. TasWater Scamander network**  
TRILITY was engaged to provide a top up chlorination solution in the Scamander reticulation system and assist with maintaining chlorine residual levels across the network.



**11. Wayatinah remote reservoir chlorine control**  
Rechlorination at the Wayatinah reservoir was required as part of the Regional Towns Water Supply Program. TRILITY designed a purpose-built sodium hypochlorite modular solution which was used in conjunction with the Hydra-Mix, an in-tank mixing and monitoring device to control the chlorine levels in the reservoir.

### Queensland



**12. Airport Water Quality Improvement Project**  
An Australian airport engaged TRILITY to maintain constant disinfection residual throughout their water supply network. A building was designed to house chloramine and caustic soda dosing equipment, including chemical storage tanks, bunds, chemical dosing skids, analytical equipment and switchboards in two separate chemical rooms.



**13. Agnes Water Desalination Plant Upgrade - Groundwater Ultrafiltration System**  
TRILITY was contracted to design, construct, install and commission a new ultrafiltration system to treat 0.5ML/d from existing groundwater bores. Gladstone Regional Council wanted to increase the capacity of the Agnes Water water treatment plant to ensure the supply of water continues to meet the demand of the local communities in the long term.



**14. Alligator Creek chlorine dosing system**  
TRILITY designed, supplied and installed a pre-fabricated, dual room chlorine dosing system complete with internal electrical and plumbing fit out including commissioning, testing, proving and operator training.



**New Zealand**  
North Island



**Hawke's Bay District Health Board Main Water Supply and Treatment System**  
TRILITY was engaged to design, build, install and commission a bespoke modular water treatment plant at the Fallen Soldiers' Memorial Hospital in Hastings that is capable of providing 1.3 ML/d of compliant drinking water.



**Rotorua wastewater treatment plant poly dosing system**  
TRILITY designed and built a poly dosing system as part of an upgrade to a sludge dewatering building at a wastewater treatment plant. The solution has helped the operators of the plant achieve reduced sludge handling costs with less operator effort.

**Key**

-  Water treatment
-  Preventative maintenance
-  Wastewater treatment



## Electrochlorination facilities to disinfect potable and process water supplies

TRILITY was awarded a contract to build, install, test and commission electrochlorination facilities to disinfect both potable and process water supplies at a mine site in Western Australia.

Electrochlorination produces a low-strength sodium hypochlorite solution on-demand for disinfection purposes. Disinfection is a critical component of the client's water quality management plans and is vital to ensuring the safe operation of the drinking water and raw water supplies.

The sodium hypochlorite is produced on-site and requires only salt, water and electrical power. The facilities consist of four electrochlorination (EC) buildings, two brine buildings and four pump skids which were manufactured and factory acceptance tested at the TRILITY workshop, prior to being transported to site. This approach enhances quality control due to the controlled assembly and testing, resulting in less on-site workforce management and reduced exposure to safety hazards.

The electrochlorination process starts with feed water passing through a Granulated Activated Carbon (GAC) filter for de-chlorination purposes. Dechlorinated water then passes through a water softening system and softened water is fed into a brine tank where the salt is dissolved to form a saturated brine solution. Next, the brine solution passes through a chiller unit to meet the electrochlorinator's water quality requirements.

The EC building is designed to generate sodium hypochlorite to a maximum of 16 hours a day at a rate of 5kg/hr to batch fill the sodium hypochlorite tanks. The operation of each EC train will alternate after the complete generation and fill of each train's sodium hypochlorite storage tank.

Overall, the scope of works included the structural, architectural, mechanical, electrical, instrumentation control and communication works. All works were completed to the client's company standards, Australian Standards and the Australian Drinking Water Guidelines.

### Snapshot

#### Client

Large mining company

#### Type of contract

Build, install, test and commission

#### Facilities

Four electrochlorination buildings, two brine buildings and four pump skids

#### Technology

Electrochlorination and GAC filtration

#### Design capacity

5kg/hr sodium hypochlorite production



## Upgrading a water tank facility with a tailored, automated chloramination unit

The Water Corporation determined that an extension to their network required a re-chloramination system to top-up the monochloramine disinfectant levels at points where the residuals had decayed below requirements. The tank also required Calgon dosing to deal with the scaling effects induced by dosing ammonia.

In addition to designing, installing and commissioning a complete chloramination system, for which we are renowned, TRILITY also excavated the 742 hectare site and completed the civil works.

TRILITY highly skilled technicians conducted a site-wide integration into the client's SCADA system including upgrading the communications, pump stations and remote water quality monitoring.

The site supplies water to a local town, so there was no room for error. The team worked to critical time lines to ensure continuity of the water supply to the local community.

The project included:

- Site clearance
- Access road construction
- Building slabs and trenchwork
- Pipework and manifold installation
- Chloramination dosing facility manufacture
- Sodium hypochlorite dosing facility
- Chlorine dosing system
- Calgon dosing skid
- Dosing building installation
- Testing and commissioning

This tailored modular solution was designed to meet the client's requirements and was pre-tested in a factory environment to ensure quick and easy installation on-site.

### Snapshot

#### Client

The Water Corporation

#### Type of contract

Civil works, design and construct, install and commission

#### Facilities

Water tank disinfection chloramination unit

#### Technology

Liquefied chlorine gas, ammonia, Calgon and sodium hypochlorite dosing

#### Design capacity

100L/s



## Design and construction of water treatment plants for rural townships

TasWater made a commitment to accelerate its program to address water quality issues and to systematically remove public health alerts as quickly as possible across a number regional towns and communities.

TRILITY was selected to build modular water treatment plants to ensure safe, clean and reliable water supply to eight regional communities.

The scope of works included the planning, design, construction and commissioning of the water treatment plants to supply treated drinking water to the reticulation system for each of the townships. TRILITY designed and manufactured the purpose-built, modular plants to suit the specific needs of each of the eight townships.

The key process areas in each treatment plant consisted of:

- Raw water supply and storage
- Pre-screening of the raw water to remove larger particles
- Ultrafiltration (UF)
- Granular Activated Carbon (GAC) filters
- Calcite for pH adjustment
- Ultraviolet treatment of the clean water where it is needed
- Treated water storage and supply

### Snapshot

#### Client

TasWater

#### Type of contract

Design and construct, fabricate, install and commission

#### Facilities

Modular/purpose-built packaged water treatment facilities

#### Technology

Ultrafiltration, granular activated carbon filtration, pH balancing and ultraviolet treatment

#### Design capacity

64kL/d across 8 townships



## Reducing reliance on the desalination process by upgrading to ultrafiltration

Gladstone Regional Council produces drinking water for the townships of Agnes Water and Seventeen Seventy at the Agnes Water Desalination Plant (AWDP).

The region is a rapidly growing hotspot, home to 62,000 people, and boasts national parks, state forests, beaches, islands and is the doorway to the Great Barrier Reef.

AWDP treats seawater using an ultrafiltration and reverse osmosis process and blends the treated seawater with groundwater treated by a media filtration process (MMF).

Gladstone Regional Council wanted to increase the capacity of the Agnes Water water treatment plant to ensure the supply of water continues to meet the demand of the local communities in the long term.

TRILITY was contracted to design, construct, install and commission a new ultrafiltration system to treat 0.5ML/d from existing groundwater bores.

The upgrade replaced the MMF process with a new ultrafiltration system for treating groundwater which was integrated into the existing treatment plant at AWDP.

The ultrafiltration process enables:

- the utilisation of the existing groundwater source to augment the existing seawater process
- the management of water quality risks
- an increased production capacity of AWDP

The new system was designed to minimise the energy requirements for pumping, climate control and other loads. It also provides automatic operation of the plant by utilising the appropriate instrumentation, automation and controls.

### Snapshot

#### Client

Gladstone Regional Council

#### Type of contract

Design and construct, install and commission

#### Facilities

Water treatment facility

#### Technology

Ultrafiltration treatment plant including coagulant dosing and a biologically activated carbon system

#### Design capacity

0.5ML/d

# What is expected from TRILITY today?

It is to provide an excellent service provision to our clients now and in the future in a safe, sustainable and environmentally responsible way. It is to continuously strengthen our commitment to being the 'provider of choice' when it comes to water and wastewater modular solutions.



[www.trility.com.au](http://www.trility.com.au)  
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