



## O&M

### Consulting Services

**Client**  
Gippsland Water

**Location**  
Traralgon, Victoria, Australia

*The Gippsland Water Factory will treat 8 million litres per day to extra high standards to sell to the nearby Australian Paper mill. This will free up nearly 3 billion litres of fresh water annually to use for environmental flows in rivers, for drinking water, or for further regional growth.*

## Gippsland Water Factory Victoria

The first of its kind in Australia, Gippsland Water Factory is an innovative wastewater treatment and recycling system that will improve regional waterways, increase the amount of fresh water in the local ecosystem, and significantly reduce odour emitted from the open channel section of the regional outfall sewer. It will also produce 20 percent of its required operating energy through internal energy recovery processes.

CH2M HILL is a member of the Gippsland Water Factory Project Alliance. Charged with designing, constructing, commissioning, and performing initial operations of the 35-million litres per day (17.43 million gallons per day) wastewater treatment plant, the Alliance will create a facility to treat domestic and industrial wastewater from more than 15,000 households and businesses in nine townships. The facility design includes advanced wastewater treatment and membrane bioreactor processes.

CH2M HILL O&M associates are responsible for process optimisation and operational expenditure (OPEX) analysis. They are part of the engineer/procure/construct team that is optimising OPEX and O&M process performance. They also are overseeing operations, conducting operator training, and are responsible for knowledge transfer during the initial 2 years of plant commercial operations.

Staff designed and built a pilot plant featuring membrane bioreactor and pretreatment technologies. By testing different membrane technologies for quality and durability, personnel can select the best membrane solution to yield efficiency and cost savings. They also tested recycled water quality and consistency.



## O&M Consulting Services

**Client**  
Western Corridor Recycled Water  
Pty Ltd

**Location**  
Myrtletown, Brisbane, Australia

*CH2M HILL's technology solution and design-build capability is meeting the public's demand for higher-quality effluent, to help supply sustainable water resources, while providing best overall value to the Queensland Government.*

## Luggage Point Queensland

As part of the Luggage Point Alliance, CH2M HILL is providing design, construction, commissioning, and process proving services for the Luggage Point Advanced Water Treatment Plant. The 66-million litres per day (17.43-million gallons per day) plant is a key component of the Western Corridor Recycled Water Project to secure a sustainable water source for the fast growing South East Queensland region. The plant uses tertiary treatment processes including chemical clarification to reduce phosphorus, microfiltration, reverse osmosis (RO), and ultraviolet oxidation to treat effluent from the Waste Water Treatment Plant at Luggage Point. The Advanced Water Treatment Plant will produce purified recycled water for distribution to power stations, industry, agriculture, and the Wivenhoe Dam.

CH2M HILL associates are providing O&M consulting during the project. They serve on the engineer/procure/construct team tasked with ensuring the plant is designed and constructed to optimise plant operating expenditures and O&M process performance. Staff also fulfil the important O&M representative for the design and change management process. They ensure operability, fit for purpose, and optimise project lifecycle performance.

The Alliance built a pilot plant to simulate operation and water quality of the full-scale plant. Staff tested different membrane technologies for quality and durability to select the best membrane solution. They also tested recycled water quality and consistency. The team constructed a pilot wetlands next to the plant to test the natural system's ability to remove nutrients and metals created during the RO process. They are testing surface flow wetlands and bio-bed wetlands to see which one produces the most favourable results as an option to treat RO concentrate.



## Operations & Maintenance

**Client**  
Hutt City Council

**Location**  
Hutt Valley, New Zealand

**Project Start Date**  
March 2000

**Population Served**  
98,000

## Hutt Valley, New Zealand

CH2M HILL, with a New Zealand joint venture partner, performed a design/build/operate contract involving upgrade of an existing 45-million litres per day (mld) [12 mgd] wastewater treatment plant with primary and secondary treatment facilities followed by ultraviolet disinfection prior to discharge to the ocean. New 55-mld [15 mgd] primary and secondary treatment facilities were constructed at the site. CH2M HILL is responsible for startup and commissioning of the improvements, and for operation and maintenance, together with a collection system, for 15 years.

The team resolved several site constraints and selected contact stabilisation for the treatment process upgrade. Sludge is dewatered and then dried and pelletised onsite. The biosolids pelletising facilities are the first of their kind in this part of the world.

### Accomplishments

- Developed startup, commissioning, and treatment-process optimisation plan
- Maintained operations during construction of facility upgrades



## Operations & Maintenance

### Client

City of Manukau

### Location

Manukau, Auckland,  
New Zealand

### Project Start Date

April 2000

### Population Served

950,000

*CH2M HILL associates provided technical assistance during design and construction and treatment plant startup and commissioning for one of the largest environmental restoration efforts in the Southern Hemisphere.*

## Manukau, New Zealand

Project Manukau is one of the largest environmental restoration and wastewater treatment plant construction contracts in the Southern Hemisphere. It will provide greatly improved water quality to a population base of 950,000, and will reclaim 8 kilometres of shoreline for recreational pursuits. As part of a design-build consortium, CH2M BECA (a New Zealand engineering company owned by CH2M HILL and BECA Carter, Hollings & Ferner) is involved in the design, construction, startup, and commissioning of the project. Our services include technical assistance during design and construction to ensure operability, and treatment plant startup and commissioning. CH2M HILL will participate in the

3-year operations period and our role constitutes 25-percent interest in the joint venture, as well as joint and several parent guarantees for the entire amount.

The works comprise new treatment facilities and removal and restoration of approximately 500 hectares of oxidation ponds—reputedly the largest in the world when the plant opened in 1960—and other works. The existing Mangere Wastewater Treatment Plant will be upgraded to advanced treatment standards, including biological nutrient removal for nitrogen removal, and will continue to operate during construction. In developing the new facilities, the objective was to maximise cost-effective use of the existing works. A key condition that affected the design of new facilities was the unconsolidated soils in the area.

The plant design flow is an average of 350 mld [93 mgd] with a peak of 14 cubic meters per second. The nitrogen removal stage is based on the Step Feed Process incorporated into circular reactors located around the associated clarifiers. Nine of these reactors are to be constructed with each reactor 18,600 cubic meters in volume (liquor depth 7.5 meters) and each clarifier is 52 meters in diameter. The diameter of each structure is 89 meters.