

# Cedar Grove Environmental Centre

## Project Facts – March 2021

### THE SITE

#### Location

- 441 Cedar Grove Road, Cedar Grove, on the Logan River.

#### Total area

- 204ha.

#### Site master plan

- 95% community and environmental use – wetlands, planted areas (offset planting), Cedar Grove Landcare nursery, walking trails, picnic shelters, public amenities.
- 5% hard structures – wastewater treatment plant (WWTP) infrastructure.

#### Work completed to date

- Stage 1 completed in August 2020.
- Future stages in planning.



### INNOVATIONS

- Queensland's first WWTP to benefit the environment through membrane technology and constructed wetlands to achieve record low nutrient levels, and offsetting remaining nutrients through catchment restoration.
- Logan's longest ever horizontal directional drill (HDD) of 1.3km to reduce vegetation clearing around waterways and protect koala habitat. HDD was also used to drill 24m beneath the bed of the Logan River.
- Australia's first use of a magnetics walkover locating system to enable verification of pipe locations up to 54m deep.
- Australia's first use of high-stress, crack-resistant polyethylene pipe for a wastewater application. This pipe contains a resin which reduces the risk of damage during HDD installation and can last 100 years.

- Precision blasting using explosive gel to excavate a pipe trench in hard rock up to 8m deep.
- Added a dust extractor, normally used in tunnelling, to a pipeline trenching machine to reduce dust impacts on neighbours.
- Where dispersive soils were evident, lime was mixed into spoil before backfilling excavations to mitigate future erosion risks.



### COMMUNITY AND ENVIRONMENTAL FEATURES AT CEDAR GROVE

#### Recreation

- 2.5km walking trail along the Logan River.
- 4 picnic shelters and tables.
- Public toilets.
- Public carpark.
- Future environmental education centre.

#### Environmental features

- Around 120,000 native trees and shrubs planted to date including 34,000 planted on 37ha of the site to offset approved vegetation removal by developers across Logan; 80,000 in the wetlands; 2,000 by community members; 4,000 for site landscaping; and about 500 by Belong trainees.
- More than 20 species of birds recorded at the wetlands to date.
- Four historic Queensland Blue Gum trees (also known as Forest Red Gum) dated at up to 317 years old being protected.
- Integrated the reclaimed water outfall pipeline in a fish ladder on Seqwater's weir on the Logan River to replace water released to maintain environmental flows, therefore preserving 3.3ML of water per day in the weir pool which is a future drinking water resource.

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- Planning underway for the future reuse of reclaimed water from the WWTP for recycling to agricultural irrigation.
- Griffith University environmental research projects on site.

### Community support

- Cedar Grove Community Reference Group formed to provide input into project development, including creation of the site master plan.
- About 500 job opportunities created during the project.
- About 80 trainees from Belong conducted planting, weeding and maintenance activities and gained conservation and land management qualifications.
- More than \$500,000 spent in Jimboomba and Cedar Grove (immediate local area) on construction materials and services.
- Logan Village Men's Shed involved in making picnic tables for the community from dead gum trees on site.



### TECHNICAL SPECIFICATIONS – WWTP

#### Stage 1 capital cost

- \$53.7m.

#### Stage 1 capacity

- 20,000 people (EP).

#### Ultimate capacity (future stages)

- 189,000 people (EP).

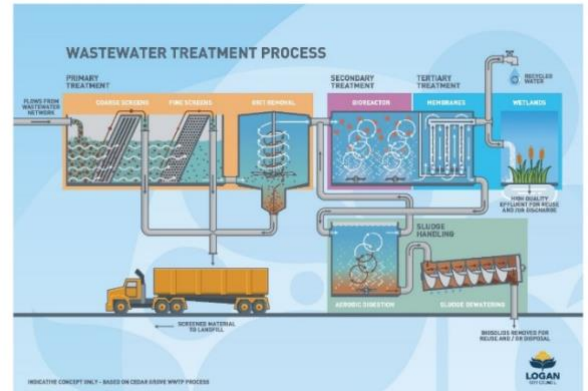
#### Environmental license requirements

- Strictest environmental license in Queensland.
- Total nitrogen release: Less than 1mg per litre.
- Total phosphorous release: Less than 0.5mg per litre.

- Must achieve a net environmental benefit for the catchment. Nutrient reductions must be 1.5 times greater than nutrients discharged in reclaimed water.

### Wastewater treatment process

- Screening and degritting of incoming wastewater via an inlet works, which includes coarse and fine screens, grit separation and cleaning, dewatering and removal of screened and degritted materials.
- Biological treatment via two bioreactor trains which utilise a bioselector, anaerobic, anoxic and aerobic zones.
- Membrane filtration using four membrane tanks and associated membrane feed pumps, blowers and permeate pumps.
- Chemical dosing systems to assist with Nitrogen and Phosphorus reduction, pH correction, membrane cleaning and local disinfection.
- Further treatment and polishing of effluent water in constructed wetlands.
- Biosolids (sludge) stabilised using an aerobic digester before being dewatered through a decanter centrifuge and conveyed into sealed storage bins for removal from site.



### Wetlands

- 7.27ha of wetlands in Stage 1 comprising three trains (train 1 having 2 sub-cells and trains 2 and 3 having 3 sub-cells) with each train stepping down a sloping terrain.
- 80,000 seedlings and 100 million seeds planted
- Eight wetlands plant species.
- Water depth between 100mm in dry weather and 700mm in wet weather.
- Wetlands can contain 6.5 times the average dry weather wastewater flows entering the WWTP plus rainfall.

### Control and communications

- Control system with SCADA.

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- Telemetry for mobile monitoring of WWTP operations and 4G cellular network link between pump stations and the WWTP.
- Security fencing, cameras and monitoring.

### Odour control

- Odour capture and treatment of the inlet works and front zone of the bioreactor using a bio-trickling filter and activated carbon.

### Energy supply

- 150kW solar farm on site to provide baseload power.
- Access to mains power as needed.
- Emergency generator.

### Nutrient offset site

- Rehabilitation of an 800m long, 20m high section of the Logan River banks at Veresdale using 9,000t of rock armour and almost 1,000 native plants.
- Rehabilitated site prevents 5,775t of sediment from entering the Logan River each year.

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## TECHNICAL SPECIFICATIONS – CONNECTING TRUNK PIPELINES AND PUMP STATIONS

### Capital cost

- \$63m.

### Trunk pipelines

- 20km pipelines from Greenbank to Cedar Grove.
- Diameters ranging from 450mm to 1,200mm.
- HDD used to lay pipes up to 24 metres deep under the Logan River bed.
- 101 nesting boxes installed in Logan Parks to offset vegetation removal for the pipelines.

### Pump stations

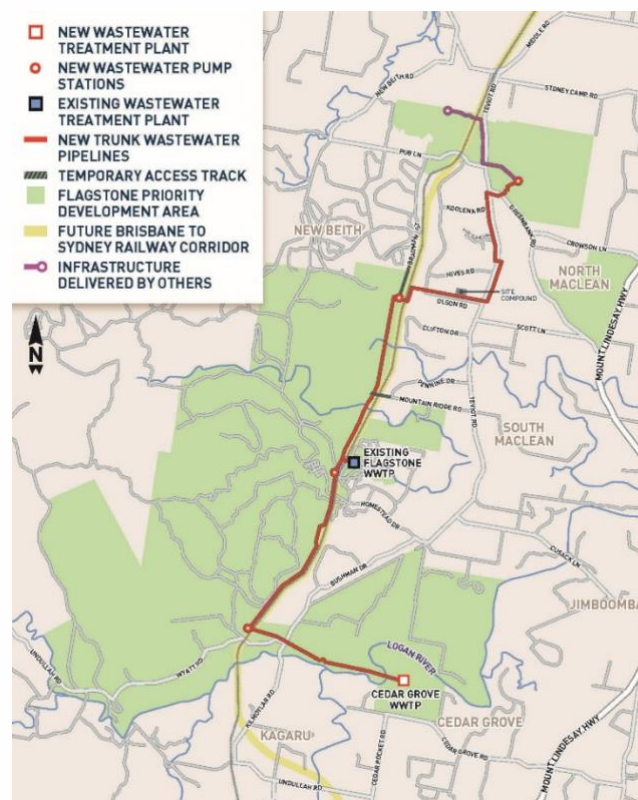
- Four pump stations.
- Deepest wet well 11m and largest diameter well 6m.

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## CONSTRUCTION PHASE STATISTICS

- 438,000 working hours during the project with no Lost Time Injuries.
- Construction duration: 18 months.

- 250,000m<sup>3</sup> of earth was moved to create foundations for the WWTP, solar array and wetlands.
- 2,000m<sup>3</sup> of concrete used for WWTP structures.
- 320t of reinforcing steel used for WWTP structures.
- 32,000m<sup>3</sup> of soil imported for wetlands.



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## AWARDS

- 2020 Australian Water Awards (AWA) – Queensland Excellence Awards – Infrastructure Project Innovation (Metro).
- 2020 Institution of Public Works Engineering Australasia Qld (IPWEA) – Excellence Awards – Award for Excellence – Innovation and Sustainability.
- 2020 Australian Engineering Excellence Awards QLD – Engineering Excellence Award (Qld Division).

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### For more information:

Phone 3412 3412

Visit [www.logan.qld.gov.au](http://www.logan.qld.gov.au)

Email

[WaterCustomerExperienceAndEngagement@logan.qld.gov.au](mailto:WaterCustomerExperienceAndEngagement@logan.qld.gov.au)