Lower Molonglo Water Quality Control Centre

Australia's foremost wastewater processing plant

The Lower Molonglo Water Quality Control Centre is recognised by Engineers Australia with an Engineering Heritage National Marker.

Aerial view of the LMWQCC with the Murrumbidgee River in the background

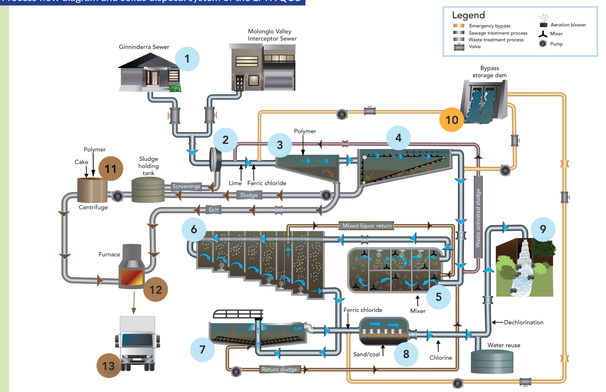
Biological nitrification

Cake incineration

Waste shredders

The plant passes incoming sewage through a complex multi-stage process, which removes solids, phosphorus, nitrogen and ammonia, and incinerates sludge to produce Agri-ash, which is sold as farm fertiliser. The resulting clear liquid is then disinfected with chlorine and used in the treatment process equipment for irrigation or discharged into the river system.

Process flow diagram and solids disposal system of the LMWQCC



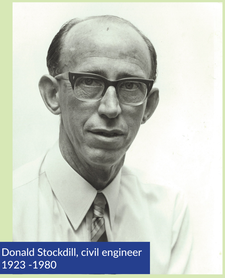
1. Sewage or wastewater enters LMWQCC from homes and businesses across the ACT via two sewer mains.
2. Sewage first passes through fine screens to remove all objects greater than 3 mm (millimetres) in diameter which are then macerated, or softened.
3. The screened sewage then moves to the flocculation and grit removal tanks.
4. Sewage then moves to the primary sedimentations tanks where sludge, oils and grease are collected and removed.
5. The sewage moves to the anoxic (meaning without oxygen) biological reactor tanks where micro-organisms naturally remove nitrate, releasing it into the atmosphere as nitrogen gas.
6. Sewage then moves to the biological reactor tanks.
7. The next step in the process is secondary clarification. This separation process removes solids, including the microorganisms in the sludge. A portion of these micro-organisms are returned back to Step 5 to be reused. The excess activated sludge is returned to the start of Step 3 to be removed with the sewage sludge.
8. The sewage is then filtered through one metre of finely crushed coal and half a metre of sand. This filtering process removes solids that remain in the sewage, leaving a clear effluent (or liquid waste).
9. Chlorine disinfection then kills any remaining microbiological pathogens. The effluent is then dechlorinated as too much chlorine can be harmful to a river's ecosystem. The effluent is then discharged into the river.
10. Screened sewage can be moved to the bypass storage dam.
11. Solids that have been removed through the treatment process are dewatered to form a thick, muddy substance called cake.
12. The cake is sent to the furnace where it is incinerated along with the grit at 750–1000°C to produce an ash.
13. Ash is collected by a contractor who distributes it to farmers for agricultural use.

The facility was designed and constructed to meet sewage treatment standards higher than any previously specified for a facility in Australia. This was necessary as the plant discharges into the Murrumbidgee River system from which downstream communities such as Gundagai, Wagga Wagga, Narrandera, Hay and Balranald draw their water. At the time of its completion in 1978, the LMWQCC was one of the highest standard sewage treatment facilities in the world and continues to be regarded as an example and icon of excellence in the treatment of the wastewater of inland cities.

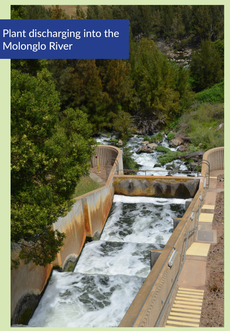
After World War II, Canberra experienced rapid growth and the existing sewage treatment facility at Weston Creek was expanded. Additional sewage treatment works were also established at Fyshwick, Belconnen and in the Tuggeranong Valley. However, by the 1960s the need to further increase the capacity and quality of sewage treatment had become obvious.

The National Capital Development Commission (NCDC) engaged American consultants Camp, Dresser and McGee who produced a report which, together with reports from overseas studies by NCDC and Commonwealth Department of Works engineers, led to a decision to phase out the individual sewage treatment works and replace them with one large processing plant working to the highest standards.

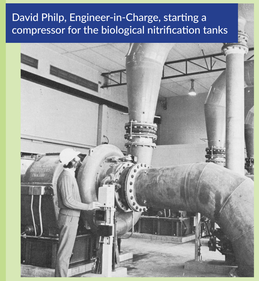
Design and construction of the new facility were managed by the Department of Works on behalf of the NCDC, and American engineer David Caldwell was engaged. At the time, Caldwell was involved in the provision of high quality treatment works in inland California. He associated his company with the large Australian engineering firm John Connell and Partners. The project was led by Department of Works engineer Donald Stockdill, whose 20-year involvement in the planning, design and construction of the plant led to the road leading to the facility being named after him.



Donald Stockdill, civil engineer 1923 -1980



Plant discharging into the Molonglo River



David Philp, Engineer-in-Charge, starting a compressor for the biological nitrification tanks

This panel was unveiled by

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and
Nick Clarke
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on ***15 August 2017***

For more info:

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