Case Study: Parkes integrated water infrastructure renewal project

Overview
The project augments infrastructure to draw on diversified water sources including two dams, the Lachlan River, and groundwater sources. By replacing aged infrastructure and planning for more effective and extensive use of recycled water, the project will decrease demand on scarce water resources.

Background
The project was undertaken to achieve the following broad objectives:

1. Provide water security for the Parkes Shire into the future
2. Reduce localised impacts on individual water sources to protect water assets in a changing climate
3. Provide improved quality of treated water for discharge to the environment.
4. Direct recycled effluent to irrigate open spaces reducing reliance on naturally occurring water sources and enhance opportunities for recreation and cultural activities
5. Maintain and improve Council assets and infrastructure.

Implementation
Implementation of the project followed three broad stages:

Assessment and consultation
The concept design for each sub-project was fully assessed through a comprehensive Review of Environmental Factors (REF), supported by relevant specialist reports, including investigations into hydrology, hydrogeology and aquatic ecology.

Finding the 'right' contractor and Detailed Design
To maximise value for its community, Council applied an Early Contractor Involvement process. Once Council had selected its successful tenderer, the Detailed Design phase commenced. This involved round-table discussions between the contractor, relevant council staff, Council's panel of experts, and agency project partners, in order to push for best-practice water-management outcomes.

Construction and Commissioning
Throughout construction, regular environmental inspections were undertaken. The ongoing consultation with water regulators and other project partners helped ensure construction activities had reduced environmental impacts. Both the sewer treatment plant (STP) and the water treatment plant (WTP) will soon enter the commissioning and proving phase. This will ensure optimum performance and operability prior to being handed over to Council.
Outcomes

The works will achieve significant outcomes for water savings and integrated water cycle management for the Parkes Shire. The WTP and high level reservoir will provide a safe, secure and reliable water supply and ensures that the towns can continue to grow and attract new business and residents.

The STP and Advanced Water Recycling Facility (AWRF) produce high-quality effluent, suitable for a range of reuse applications and discharge to the environment. The AWRF is projected to result in water savings of up to 200ML and $20,000 per annum.

The Recycled Water Ring Main is an innovation developed by Council to transport treated effluent from the AWRF, in combination with raw bore water, across the shire, effectively creating a new local water source that is expected to meet 87% of future demand for non-potable water.

The urban water mains augmentation and dam mains refurbishment has enabled significant water savings through replacing sections of pipework damaged over time, that were potentially creating huge system losses and overly taxing the naturally occurring water sources.

The Lachlan River pump station and Bore 8 refurbishment have substantially improved the capacity for water extraction. This will enable spreading of water extraction across a number of sources, and reducing the impacts on individual water bodies.

Key Learnings

- Early contact with authorities is beneficial to ensure timely approvals
- Open, clear, and direct lines of communication should be implemented to ensure that work interfaces are understood and agreed by all parties
- It is advised to include ‘hold points’ in contract documentation for environmental and sustainability outcomes, to prevent incidents from occurring
- Contractor and client monitoring to be synchronised
- Create and use a central database for all monitoring data.

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This project was the 2017 winner of the Water Management Award at the LGNSW Excellence in the Environment Awards