

ISC Case Study



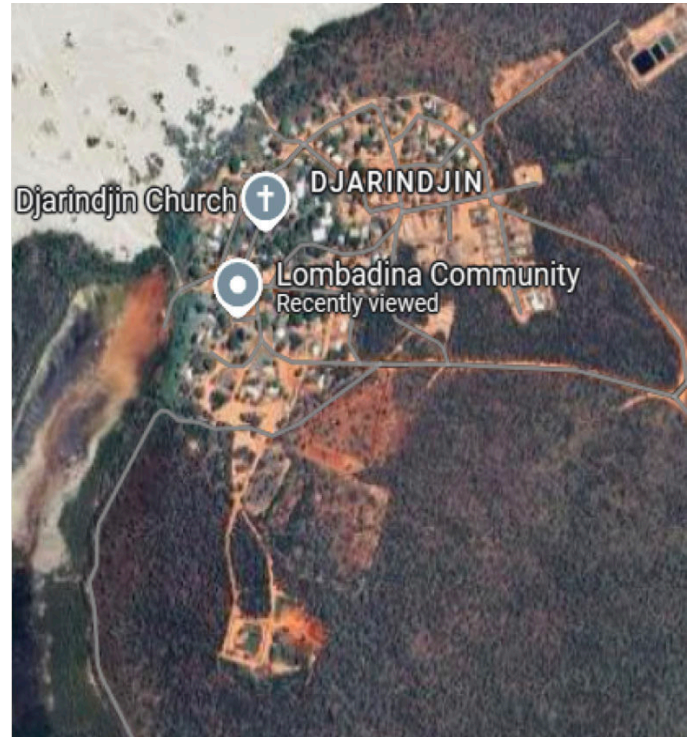
Djarindjin–Lombadina Water Treatment Plant Upgrade: Sustainable Infrastructure for Healthy Country

The Djarindjin and Lombadina communities on Western Australia's Dampier Peninsula have long faced challenges in accessing safe, reliable drinking water. Previously reliant on a diesel-powered system, both communities will benefit from a planned upgrade that combines essential infrastructure with cultural respect, community development, and environmental responsibility.

As the first pilot of the **IS Essentials** rating on a remote water asset, the Djarindjin–Lombadina Water Treatment Plant Upgrade has demonstrated that sustainability is achievable at any scale. Led by Water Corporation WA, this project demonstrates how small-scale regional infrastructure can deliver lasting outcomes for people and Country.

Project at a Glance

- **Name:** Djarindjin–Lombadina Water Treatment Upgrade
- **Owner:** Water Corporation WA
- **Delivery Partners:** GHD (Design), Kimberley Regional Service Providers (Operations)
- **Scope:** 3 new bores, raw water transfer main, solar-powered water treatment plant, 1.26 ML storage tank and gravity main to existing town infrastructure
- **Timeline:** Start 2022, est. completion 2026
- **IS Rating:** IS Essentials Design – Bronze
- **Population Served:** ≈ 390 residents



Why an IS Essential Rating Was Pursued

Water Corporation chose the IS Essentials Design & As Built pathway to:

- Drive and be able to quantify sustainability benefits often overlooked in smaller remote projects.
- Build in-house capability for delivery of IS Ratings using a hybrid delivery model: Water Corporation led delivery of the governance, economic and legacy IS Rating credits while GHD focused on the water use, resource efficiency and energy credits.
- Contribute feedback to help refine and shape the final version of the IS Essentials Rating Scheme from a water industry perspective

"The IS Essentials rating scheme has enabled us to systematically benchmark sustainability performance across key impact areas. It has facilitated data-driven decision making, highlighted priority areas for targeted improvement, and supported the integration of sustainability principles into project design and delivery."

Anita Kilibarda

Specialist – Sustainable Infrastructure
Water Corporation

Energy and Carbon

A standout feature will be the deployment of a solar PV and battery microgrid that will power the treatment plant nearly entirely via renewables, contributing to **Ene-1: Energy Efficiency and Carbon Reductions** and **Ene-2: Renewable Energy credit outcomes**. A backup diesel generator exists for contingency use only.

Compared to a traditional diesel use base case, this solution achieves an estimated 99% reduction in operational GHG emissions associated with powering the plant, equating to around 1,244 tonnes of CO₂ over 50 years.

In addition, the project made operational adjustments to reduce travel-based emissions. By increasing the size of calcite dosing hoppers, the frequency of operator visits dropped from fortnightly to monthly saving an estimated 101 t CO₂, or 50 % reduction vs base case, in vehicle emissions over 50 years, whilst also improving safety by reducing travel frequencies on remote roads.

These opportunities will result in a 65% water saving compared to standard construction practice—avoiding over 7,600kL of water along the corridor.



Materials Usage

A life-cycle assessment undertaken as part of **Rso-6: Material Life Cycle Impact Measurement and Management** revealed high embodied carbon impacts from concrete to be used for hard stand areas and reinforced concrete used for the water storage tank. The project pursued the fabrication of a galvanised steel potable water storage tank instead of a traditionally used reinforced concrete tank. This opportunity reduced precast concrete by 33 m³ and reinforcement steel by 2.5 m³. Resulting in a reduction of 9.2 t of CO₂-e.

Water

To manage construction water use sustainably and meet **Wat-1: Avoiding Water Use credit requirements**, the project team identified an opportunity for dust suppression using chemical stabilisers and staged land clearing in three discrete segments along the 4.3 km distribution route.

Economic Analysis and Trade-Offs

From the outset, Water Corporation undertook a holistic options assessment as part of **Ecn-1: Options Assessment and Significant Decisions**, incorporating cultural, social and environmental outcomes—not just capital cost.

The renewable energy microgrid and larger hopper system were selected based on life-cycle cost and benefit criteria. This analysis not only improved project value but demonstrated that low-carbon and culturally responsive solutions can be economically justified.

Community Outcomes and Stakeholder Engagement

The project's community outcomes were shaped directly by engagement with Traditional Owners and local residents. Walking the proposed bore field route with the project team, the Traditional Owners identified sacred trees on the proposed access track route, prompting a realignment of the track—an act that deepened trust and reinforced local knowledge-sharing.

These conversations also surfaced broader community concerns, including high rates of diabetes and limited access to fresh produce. In response, the project supported the upgrade of a community-run greenhouse nursery. Co-designed with local stakeholders, the facility produces fruit and vegetables sold through a social enterprise, with profits reinvested into seeds, tools and training. Since opening in 2023, it has improved diet diversity, created employment pathways, and supported local health initiatives—delivering social value well beyond the core water infrastructure.

“Working closely with Traditional Owners reshaped our approach — showing that sustainable design starts with deep listening and respect. Our aim was a low-maintenance, resilient plant that serves the community long-term. Partnering with Water Corporation to apply the IS Essentials rating tool helped us build smarter, more inclusive, and culturally sensitive infrastructure with lasting impact.”

Mei Yau
Project Manager
GHD

Governance and Collaboration

A joint sustainability steering group was established with members from Water Corporation and GHD. Meeting monthly, the group tracked credit delivery, risk, and sustainability opportunities. Lessons-learned will now inform future IS rated Water Corporation projects.

A Blueprint for Regional Reform

The Djarindjin–Lombadina Water Treatment Upgrade is more than an infrastructure project, it is a prototype for sustainable reform across WA's remote communities. With over 137 Aboriginal communities part of the program for water service upgrades, this project offers a scalable, culturally sensitive and environmentally responsible model for future works.

The Bronze IS Essentials rating demonstrates that meaningful sustainability outcomes are possible even for small-scale assets—particularly when community partnership and local knowledge are central to the design process.

Contacts

Anita Kilibarda
Specialist – Sustainable Infrastructure,
Water Corporation WA
anita.kilibarda@watercorporation.com.au

Monique Isenheim
Head of Market Development,
Infrastructure Sustainability Council
monique.isenheim@iscouncil.org

