GOVERNMENT OF WESTERN AUSTRALIA

Infrastructure Western Australia

Major Infrastructure Proposal Assessment

New Water Sources for Integrated Water Supply Scheme

Summary Assessment Report

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Acknowledgment of Country

Infrastructure WA acknowledges the Traditional Custodians of Western Australia and their continuing connection to the land, waters and community. We pay our respects to all members of the Aboriginal communities and their cultures; and to Elders both past and present.

Major Infrastructure Proposal Assessment Summary Report

Purpose

This summary assessment report has been prepared in carrying out Infrastructure WA's (IWA) legislative function to assess and report to the Premier on major infrastructure proposals. The assessment is of the Water Corporation's (WC) New Water Sources for Integrated Supply Scheme (the proposal) business case (version dated August 2023), plus additional supporting information received, and consultation undertaken by IWA.

An investment decision for the proposal is considered to have already been made with a number of Government actions and decisions informing this position. These have influenced the development of the proposal with a focus placed on delivering the recommended option, the Alkimos Seawater Desalination Plant (ASDP) Stage 1 co-developed with the Eglinton Groundwater Scheme (EGS).

IWA has not revisited prior decisions, and therefore our assessment of the proposal has focused on its strategic alignment with Government policies, compliance with the Department of Treasury's Strategic Asset Management Framework (SAMF) Business Case Guidelines (BCG) and any significant risks for Government consideration as part of proceeding with the proposal.

1. IWA observations

The proposal is to develop ASDP Stage 1, along with EGS on WC's existing Alkimos Water Precinct site, north of Graceful Boulevard in Alkimos. Stage 1 will produce approximately 55 gigalitres of potable drinking water per year (GL/year) and is expected to commence operations in 2028.

WC's master planning indicates multiple new climate independent water sources will be required to secure supplies into Perth's Integrated Water Supply Scheme (IWSS) through to 2050, as a result of several supply and demand factors, including population growth, climate change and reduced reliance on groundwater.

IWA considers that the proposal and supporting information contains sufficient information and is of a suitable standard to inform a Government decision to proceed with implementing the proposal. However, the business case contains several limitations which are noted below.

The primary deliverability risks associated with the proposal include the early status of planning to deliver on Government's commitment that the ASDP be powered by 100 per cent renewable energy and market capacity to deliver within the required timeframe.

2. Context

2.1 Project background

Gnangara groundwater supplies almost half of all the water used across Perth[1] including water for the IWSS and water directly extracted by farmers, local governments, schools, industry, and household bores. To ensure ongoing climate and environmentally responsible management of this key water resource the WA Government released the 2022 Gnangara Groundwater Allocation Plan[2] (GGAP) in June 2022, resulting in reduced annual water entitlements for licensees from 1 July 2028.

Under the GGAP, WC is required to reduce its abstraction by 27 percent (30 GL/year). Other industry sectors are also required to reduce their draw by 10 percent (10.2 GL/year), and domestic garden bore users now have water use restrictions aligned to scheme users.

[1] Home - Gnangara (dwer.wa.gov.au)

[2] Gnangara groundwater allocation plan (www.wa.gov.au)

In addition to reduced community reliance on groundwater, WC is also anticipating additional overall demand for water, largely resulting from climate change and population growth. This forecast additional demand means that WC must plan for an initial 50 GL/pa replacement source to be operational by 2028, with further expansion in supply over time.

Perth and south-western coast water security[3] was added to Infrastructure Australia's Infrastructure Priority List (IPL) in 2020 as an early-stage, near term (0-5 years) proposal listing.

WC has been adapting to climate change since the early 2000's by adopting a portfolio approach of reducing water use and increasing recycling opportunities. In 2006, WC commissioned the Perth Seawater Desalination Plant (PSDP)[4], Australia's first large-scale desalination plant (45 GL/year). The Southern Seawater Desalination Plant (SSDP)[5] (100 GL/year) was developed in 2012 and, in 2017, the corporation introduced Australia's first Groundwater Replenishment Scheme (28 GL/year)[6].

3. Strategic merit

3.1 Alignment

The proposal has strong strategic merit and alignment with WA Government plans, policies and strategies to facilitate development of new water sources that service a large proportion of the Western Australian population. The proposal addresses the State Water Plan, WA's Climate Change Policy and the Kep Katitjin Gabi Kaadadjan Waterwise Perth Action Plan 2, by not imposing untenable water restrictions on residents.

The proposal directly aligns with the State Infrastructure Strategy *Foundations for a Stronger Tomorrow* (Recommendation 51), which recommends long-term water security through timely planning and delivery of climate-independent sources that provide fit-for-purpose and sustainable water services to the community.

By developing this proposal, WC is meeting its obligations under the *Water Corporation Act 1995*[7], and delivering on its Corporate Plan - Thrive 2035. WC's 2022-23 Strategic Asset Plan (SAP) identifies development of the ASDP as one of its key priorities for development.

3.2 Problems and opportunities

Climate change has had a noticeable impact in the south-west of WA since the 1970s. A combination of reduced rainfall, longer, hotter summers and drier winters have significantly reduced the availability of water from existing surface and groundwater sources.

WC has a requirement to reduce its draw on Gnangara ground water, and at the same time is anticipating increased demand due to climate change, population growth and likely substitution to scheme water to accommodate reductions from domestic garden bore users.

4. Options assessment

WC assessed supply and demand side options separately in order to meet the source shortfall. The inventory of longlist options considered includes:

- Water recycling (including groundwater replenishment);
- Seawater desalination (multiple sites considered);
- New groundwater sources;

[3] Perth and south-western coast water security | Infrastructure Australia
[4] Perth Seawater Desalination Plant (watercorporation.com.au)
[5] Southern Seawater Desalination Plant (watercorporation.com.au)
[6] Groundwater replenishment (watercorporation.com.au)
[7] Water Corporations Act 1995 (legislation.wa.gov.au)

- Residential and commercial water efficiency programs; and
- Water loss reduction.

The list of options was reduced to a shortlist based on the results of multi-criteria analysis and cost-effectiveness analysis. Practical considerations such as source deliverability and estimated "earliest time to first water" were factored into the shortlisting process. The proposal provides a clear rationale regarding demand and supply side shortlisting.

The proposal would have benefited from the provision of information regarding the proposed benefits to be delivered and identification of risks associated with not achieving the project benefits for each of the shortlisted options.

5. Societal impacts

5.1 Financial and economic assessment

The capital cost estimate for the proposal is $2.8 billion. This comprises costs relating to 34 key project scope elements and allowances for other program costs and risks. Capital cost estimates of other shortlisted options are also presented in the business case.

Annual operating costs for the recommended option are estimated at $51.9 million, presented on the basis of an operating unit cost estimate of $1.00/kL. Operating cost estimates have been undertaken at a high level, benchmarking costs against WC's existing operations. Operating and maintenance cost estimates do not include major asset renewals and membrane replacement costs which may understate whole of lifecycle costs.

IWA notes that while a key part of WC's strategy for securing climate independent water sources, manufactured water through desalination is both capital cost intensive and has substantially higher operating costs relative to historical sources, resulting in increasing ongoing operating costs to Government.

A base case option (do nothing or minimal intervention) has not been developed by WC and the proposal is not able to provide quantitative economic analysis that would enable direct comparison of shortlist options. The establishment of a 'Do Minimum' base case is a requirement under SAMF, enabling shortlist options to be comparatively assessed based on incremental benefits and costs.

5.2 Social assessment

IWA commends WC for the high level of consideration of Aboriginal engagement and participation from an early stage of project development.

The proposal demonstrates best practice in several areas and considers holistic Aboriginal participation outcomes including cultural recognition, cultural design, procurement, employment, heritage, and governance.

The proposal's Aboriginal participation is also strengthened by WC's broader organisational Aboriginal participation commitments including its Stretch RAP and Yesterday, Today, Tomorrow Aboriginal engagement strategy. Proposal governance is reflected through reporting commitments, in particular the value of embedded accountability.

More broadly, societal outcomes have been considered by WC in the development of the proposal. Principles of water security, reduction in GHG emissions and waste and productivity have been relevant to achieving proposal objectives. Community feedback has generally been supportive and WC note the location of the ASDP presents an opportunity to engage effectively with the community relating to water education, understanding the water cycle and water efficiency measures.

5.3 Environmental assessment

An Environmental Review Document was prepared in 2019 for ASDP Stage 1 and PSDP Stage 2 with the quantification and qualification of impacts and mitigation measures published on the EPA's website www.epa.wa.gov.au.

The proposal identifies sustainability issues that align with key state government ESG objectives and WC's public commitments. Key relevant factors are energy consumption, decarbonisation and the circular economy. The proposal demonstrates that sustainability issues have been considered explicitly in the options assessment, although the depth of analysis is not uniform across options.

The proposal demonstrates transparency and credibility through commitment to external sustainability accreditation through the Infrastructure Sustainability Council (ISC).

IWA also notes that WC have referred to a sustainability management plan in the proposal. Contract requirements to obtain an ISC Design and As-built rating provides assurance that consideration of the impacts and benefits of the recommended option will continue through the project life.

6. Recommended option and project definition

ASDP Stage 1 includes a 50GL/year seawater desalination plant located on WC owned land within the Alkimos Water Precinct and co-developed with a 4.9GL/year Eglinton groundwater source, with water integrated into the network via Wanneroo Reservoir. Some components of the scope (earthworks, marine tunnels and structures, treated water storage tanks, trunk main connections, and power) are sized for ultimate plant capacity (100 GL/year), future-proofing this future expansion.

The scope of work will broadly include construction of the seawater desalination and groundwater treatment plants, seawater inlet/outfall tunnels and pumping stations, bulk earthworks, power supply, trunk main connection, pipeline construction and conveyancing works.

7. Deliverability

At this time the proposal does not include scope to deliver on Government's commitment that the ASDP will be powered by renewable energy. WC has advised IWA that a Power Purchase Agreement (PPA) has been assumed for project planning purposes and the actual approach to procure renewable energy will be progressed by WC's Energy Procurement Plan. Given the energy solution for the proposal is still in the early planning stages it represents a key risk to manage as a priority.

WC also acknowledges that local market capacity to resource a project of this nature within the required timeframe will be a challenge and represents another key risk.

WC have selected a competitive alliance model as the preferred procurement strategy. The alliance proponents have completed design and procurement optioneering for equipment supply and prepared schedules based on supplier responses for long lead items and known typical construction timeframes, enabling resources to be calculated and costed. Further detail on scope, timeframes and costings will be available following submission of the alliance proponents' final proposals in September 2023 to help further inform a Government decision to proceed with the project.