Mr David Gibson MP
Chair, State Development, Infrastructure and Industry Committee
Queensland Parliament
Cnr George and Alice Streets
Brisbane, Qld 4000

Submission No. 018
11.1.12
30 October 2013

via email: sdiic@parliament.qld.gov.au

Dear Mr Gibson

The Australian Water Association (AWA), the Water Services Association of Australia (WSAA) and the Australian Water Recycling Centre of Excellence (AWRCE) welcome the opportunity to make a combined submission to the State Development, Infrastructure and Industry Committee in regard to its enquiry into the issues contained in *the Queensland Audit Office Report to Parliament 14 for 2012-13: Maintenance of water infrastructure assets*.

This represents a combined submission from these three national water industry associations and research and development brokers. Our submission is focused on the Western Corridor Recycled Water Scheme (WCRW Scheme) within the context enunciated in the Enquiry's Terms of Reference.

The National Organisations

AWA is Australia's leading membership association for water professionals and organisations. It plays an essential role in supporting the Australian water sector in the delivery of effective and sustainable water management practices. Its mission is to foster knowledge, understanding and advancement in sustainable water management – its science, practice and policy – through advocacy, collaboration and professional development. AWA operates across all Australian States and Territories as well as maintaining extensive international links, including with the International Water Association (IWA).

WSAA is the industry body that supports the Australian Urban Water Industry. Its members and associate members provide water and wastewater services to approximately 16 million Australians and to many of Australia's largest industrial and commercial enterprises. The Association facilitates collaboration, knowledge sharing, networking and cooperation within the urban water industry. It is proud of the collegiate attitude of its members which has led to industry-wide approaches to national water issues.

The Australian Water Recycling Centre of Excellence is enhancing the management and use of water recycling nationally and internationally through industry, research and government partnerships. Through its investment in a portfolio of industry-relevant research projects across the full water recycling spectrum, the Centre develops practical solutions to secure Australia's future water supply and, at the same time, builds awareness and understanding in the community about this precious resource.

Our Submission

Summary of key points

Recognising the complexity of the WCRW Scheme, its operational environment and the issues of cost, affordability and community acceptance, this submission argues the future of the scheme is most usefully evaluated in context of the following four inter-related considerations:

a. Maintaining a diversified portfolio of least-cost, water supply assets in South East Queensland is essential for future water supply affordability and regional economic development. Recycled water needs to be viewed as a core component of the region's diversified portfolio.
b. Development and implementation of new, innovative operating configurations for the WCRW Scheme is now required. With advances in technology since the scheme was first conceived and designed nearly a decade ago, the design of recycled water schemes has progressed nationally and internationally. More direct and less costly reuse operations are now becoming more common. With some augmentation, the WCRW Scheme could be readily converted to a more flexible, multiple-use, less costly and scalable operation. This fresh approach stands in stark contrast to the original design and intended operation of the scheme.
c. Creating the conditions to maximise return on the existing investment and facilitating private sector investment in the WCRW Scheme is essential. This will support scheme augmentation and help realise the potential for innovative and scalable operations.
d. Community engagement regarding future water supply options involving recycled water is necessary. Innovative national and international programs, currently being developed and implemented by our three organisations and others, provide an opportunity for engaging the South East Queensland community and positioning the incremental use of recycled water in a wider national and international context. Incremental and staged approaches need to replace blanket policy bans.

Recommendations:

That the Queensland Government:

1. further explore specific asset ownership and operating options to use the current WCRW Scheme infrastructure to boost regional water supply capacity, and in doing so, support rural production and affordable urban development by providing increased access to regional water supplies;
2. plans for affordable water, integral to the prosperity of future generations in South East Queensland, through new, innovative and more cost-effective solutions such as forms of potable reuse; and
3. takes advantage of current national and international initiatives to develop long-term community education and engagement strategies in relation to infrastructure investment planning that includes use of recycled water in future supply options.

The following discussion provides further background to each of these recommendations.

Discussion and Background to the Recommendations

1. The benefit of a diverse water supply portfolio to address affordability, uncertainty and productivity

Recommendation #1:

That the Queensland Government further explore specific asset ownership and operating options to use the current WCRW Scheme infrastructure to boost regional water supply capacity, and in doing so, support rural production and affordable urban development by providing increased access to regional water supplies.

By ensuring South East Queensland has a diverse portfolio of water sources, the Queensland Government will have increased water security, with resultant community and economic benefits. National and international best practice now suggests that a diversified and resilient water supply portfolio should logically comprise 'fit-for-purpose' waters of varying quality, cost and security; with these being managed to achieve the greatest social, economic and environmental benefit for urban, regional and rural communities.

Further, recycling water is a resilient form of supply that represents an effective insurance against extreme weather events (droughts and floods), both of which have caused significant impact to the economy and social well-being of South East Queensland over the past decade. This contribution to system security and resilience is currently being demonstrated by the comprehensive diversification strategies being implemented in Australian capital cities (eg. Perth, with the state government's new managed aquifer recharge scheme using recycled water for potable use; Melbourne and Adelaide with stormwater harvesting and use) and elsewhere internationally (eg. recycled water schemes for potable use in the United States: California, Texas, Virginia, Arizona, Georgia; and also Singapore; South Africa; Namibia; and Belgium).

With the long term decline in secure yields from traditional surface storages, recycled water in particular has financial and economic benefits relative to the higher cost and energy intensity associated with some other alternate sources, including sea water desalination. Mid and long-term trends and projections in the water industry nationally and internationally point towards an increase in water reuse and further integration of alternative water sources within the existing drinking water network.

Significant capital investment has already been incurred with the construction of the WCRW Scheme. In respect to ensuring 'least-cost' solutions are fully investigated for the sake of community affordability, decisions relating to the future value of this infrastructure must take into account the forecast population growth of South-East Queensland and the subsequent increase in demand for water in the next decade and beyond. By maintaining the capacity of the WCRW Scheme as part of an integrated regional water supply portfolio, future potential investments in capital intensive and higher energy intensive infrastructure such as dams or desalination plants could be deferred. This will have a future net benefit to the community regarding affordability of water supply.

We recognise that ongoing operating and maintenance costs associated with these assets is not an insubstantial consideration for the Queensland Government. We therefore acknowledge it is both necessary and critical to explore additional infrastructure investment and revenue return opportunities which align with the Queensland Government's long-term economic objectives. Here we briefly identify two possible scenarios:

- Private sector investment in all or part of the WCRW Scheme's ownership and operation; and
- Investment in scheme augmentation to enable it to more cost-effectively support regional economic development in South East Queensland (some possible options for this are discussed below).

2. The importance of adopting a longer term perspective to economic development and infrastructure planning

Recommendation #2

That the Queensland Government plans for affordable water, integral to the prosperity of future generations in South East Queensland, through new, innovative and more cost-effective solutions such as forms of potable reuse, including specific investment options by the private sector.

The urban water industry has undergone significant transformation in recent years, particularly the initiatives to increase economic efficiency. As part of this, the focus for water recycling in Australia has shifted from primarily being a response to temporary drought conditions to addressing broader objectives of community affordability, regional system resilience, efficiency, cost and sustainability. Assessing current opportunities in relation to the WCRW Scheme now requires a fresh consideration of these trends and opportunities, the contribution of private and public sectors and recent national and international developments. We briefly highlight some of these in this submission.

Multiple options and approaches to staging the introduction of potable reuse

The WCRW Scheme was designed in 2005 as an Indirect Potable Reuse (IPR) scheme to be operated by a state-government owned bulk water utility, relying on long-distance, energy-intensive pumping of large volumes of purified recycled water to an existing drinking water storage (Lake Wivenhoe). At that time, this design was premised on the desirability of incorporating an environmental "buffer", Lake Wivenhoe. Under the *Australian Guidelines for Water Recycling* this was considered an additional stage of treatment. However, there have been significant developments in the industry over the last decade reflecting progress in technology, policy and regulatory practices.

By way of example, the release of a new, independent report by the Australian Academy of Technological Sciences and Engineering (ATSE) has strongly endorsed an emerging option in global water supply with potential relevance to South East Queensland. As described in the ATSE Report *Drinking Water through Recycling* (released October 2013 http://www.atse.org.au), where it involves long-distance pumping, IPR is now being challenged in a number of jurisdictions around the world as being overly energy intensive (pumping to elevated storages), inefficient and economically unsustainable, particularly if used only for emergency or contingent circumstances. In short, new technical approaches and funding models are required to facilitate and deliver the economically efficient use of recycled water.

In this context, the ATSE Report highlights that various forms of Direct Potable Reuse (DPR), where purified recycled water is added to the drinking water treatment process (generally upstream of a conventional water treatment plant), are now being implemented in a number of jurisdictions (including in Southern Africa and several states in the USA). Based on decades of positive public health data generated in existing potable recycling schemes, and acknowledging recent advancements in treatment and monitoring technologies, ATSE have found that various forms of DPR are now considered a safe and reliable option to supplement integrated drinking water networks operating with a diversified portfolio of sources.

Benefits and possible options

As highlighted in the ATSE Report, some of the specific benefits of DPR include:

- continuous demand allowing greater economic efficiency and sustainability;
- generally lower energy demand and operating costs than equivalent scale seawater desalination facilities; and
- ongoing environmental benefits by continuous reduction in treated wastewater discharge to natural watercourses.

The ATSE report found significant operating cost advantages in coastal urban communities of DPR compared to IPR and desalination. Consideration of this comparison is specifically relevant given the longer term water supply security planning for South East Queensland. Technically, the WCRW Scheme could readily be converted (in whole or in part) from a relatively higher cost IPR scheme to either (i) a lower cost IPR scheme or (ii) a DPR scheme. This would require (at a relatively modest cost) connecting the WCRW Scheme pipeline to the Mount Crosby Water Treatment Plant (~7km new pipeline).

> (i) If a cheaper form of IPR was preferred, the purified recycled water could then be blended with an environmental buffer (ie. water from the Brisbane River at Mt Crosby Weir) before it undergoes further conventional treatment at the Mt Crosby water treatment plant.
>
> (ii) Alternatively, if DPR was to be implemented, purified recycled water can be blended into the network at the Mt Crosby water treatment plant.

In addition to reducing operating (pumping) costs and enhancing affordability, subject to further investigations, amending the WCRW Scheme in this manner could also bring two *additional* regional economic and social benefits:

- The use of the WCRW Scheme pipeline from Lake Wivenhoe to Mount Crosby water treatment plant (reverse flow) to transport raw water during extreme flood events such as those experienced in 2011 and 2013, thereby avoiding contamination contaminating by highly turbid water in the Brisbane River (downstream of the Lockyer Valley) with highly turbid water. This would build substantial additional resilience into the system, thereby avoiding multiple interruptions of essential drinking water supplies; and
- The potential for rural producers to access additional water from the overall increase in system capacity, specifically during periods of higher dam levels. (It is noted that, in order to realise this potential, amendments to existing statutory water resource plans may be required as well as the introduction of innovative pricing models that recognise both water availability and risks of water scarcity for rural producers).

Further investigations of each would, of course, be required. However, connecting the WCRW Scheme to the Mount Crosby water treatment plant (as suggested above) would not only offer increased resilience by flood-proofing the drinking water system, but importantly, would also allow for a staged implementation and evaluation of potable reuse. For example, initial trials could be conducted with relatively small volumes only involving the Bundamba Advanced Water Treatment Plant, and not the entire capacity of the whole WCRW Scheme.

Private sector participation

Seeking opportunities for maximising the return on existing water supply assets is highly relevant to long-term infrastructure planning in Queensland, across Australia and internationally. As regional water supply

portfolio options develop, new business models for funding and operating all or parts of such a scheme become more viable. New and innovative forms of investment involving the private sector, and evaluation of compartmentalised and/or staged potable reuse options (as suggested above) should be fully investigated. It does not need to happen immediately and it most certainly should not happen without the engagement of the broader community. However, in order for these financial options and future returns on investment to be viable to potential investors, maintaining the existing WCRW Scheme assets and capacity is essential.

The prospect of a compartmentalised and/or staged implementation for purified recycled water from the WCRW Scheme is likely to increase the private sector's interest in the WCRW Scheme assets. As a parallel example, the Sydney Desalination Plant was acquired by private equity operators based on future operating revenues and returns. Staged implementation of a form of potable reuse, by creating future demand opportunities for part or all of the WCRW Scheme, would therefore provide an opportunity for the government to consider alternative debt management and risk transfer strategies with the private sector. The significant investment by the private sector in developing DPR as an option for California is further demonstration of the private sector's view of the long-term potential of this water supply option. Further information on this development can be supplied if required.

3. Customer and community perceptions

Recommendation #3

That the Queensland Government takes advantage of current national and international initiatives to develop long-term community education and engagement materials in relation to infrastructure investment planning that includes the future use of recycled water in regional water supply options.

We recognise that while IPR and DPR trials and schemes are technically viable, safe and cost effective options for the supplementation of regional drinking water supplies, the key challenges for governments relate to community appreciation of longer term needs, as well as relative benefits and risks associated with all water supply options. As national industry associations and R&D organisations actively involved with the industry both internationally and in all Australian jurisdictions, we recognise the critical significance to governments of gaining community acceptance. We stand willing to assist in this regard.

Uncertainties associated with climate variability and rapid population growth present challenges to all state and territory governments, all of whom have been responding by developing long-term water supply strategies. These strategies share a dual focus on affordability and sustainability, and a growing recognition of the need for community understanding and engagement to achieve long-term objectives. Australian communities have great interest in water and rightfully expect to be consulted and provide input into the wide range of options that will maximise the return on their investment, both now and the future.

As highlighted above, we emphasise that the evaluation of the WCRW Scheme being operated in-whole or in-part as a lower-cost IPR or a DPR operation should include comprehensive consultation and engagement with the community. The Centre of Excellence, WSAA and AWA are currently part way through a national collaboration program that is designing and developing practical and appropriate communication and engagement tools to assist governments, water utilities, urban communities and the media to engage in discussions about the use of purified recycling water to augment traditional drinking water supplies.

Led by the Centre of Excellence, this National Demonstration Education and Engagement Program (NDEEP), is designing and testing the necessary communication and engagement tools required to develop understanding and support for water recycling as an acceptable drinking water supply option within the mix of mid-t-long term water supply security options. Specifically, we extend the offer to the Queensland Government to take advantage of, and engage with, this NDEEP Program and to use and adopt material for its future use in South East Queensland.

Summary

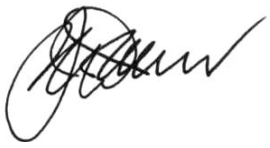
The Centre of Excellence, AWA and WSAA support the initiative by all state governments, the private sector and water utilities to invest in the diversification of water supplies for the future, and strongly support the consideration of climate resilient water sources such as recycling and desalination as options in future water supply portfolios.

In evaluating the options available to meet the terms of reference of the review, the Government may be interested to know that the Centre of Excellence, AWA and WSAA's programs and current research and development investment is already supporting programs which:

- develop closer linkages and productive association between researchers, public water utilities and the private sector in regard to bringing technological innovations to market;
- engage with urban water utilities both in Australia and internationally, private enterprise and research sectors to better understand community attitudes to the blending of water from schemes such as the WCRW Scheme with traditional drinking water supplies;
- work with Australian state government water quality regulators, urban water utilities and the equipment manufacturing sectors to develop more efficient and consistent national and international approaches to the effective validation and safety of water recycling technologies; and
- identify economic assessment practices and tools to more appropriately value and evaluate water recycling schemes in state government economic regulatory practices.

The Australian Water Recycling Centre of Excellence, AWA and WSAA thank the Queensland Government for the opportunity to comment, and would be pleased to discuss our input further. Individually and collectively, we are currently conducting projects and programs relevant to all three recommendations, and would welcome the opportunity to discuss refinement and implementation of these recommendations with Queensland Government representatives. In the first instance, please direct enquiries to Greg Oliver at the Australian Water Recycling Centre of Excellence (greg.oliver@australianwaterrecycling.com.au or 07 30355543)

Yours sincerely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