

Wagga Wagga Case Study

Exploring sewage recycling in a regional inland city

This case study illustrates the trials, tribulations and successes of an inland regional council establishing water recycling. The council has implemented various small-scale experiments over the last 3 decades, but in the recent past has struggled to meet the tighter compliance requirements which now apply.

After many years of ineffective communication, Council now has an improved relationship with regulators and is aiming to develop a strategic plan to maximise future opportunities for recycling in the region.

WAGGA WAGGA	
 <p>The Wagga Wagga water recycling scheme is located in NSW, in Australia's 5th largest inland city.</p>	
NARRUNG ST.	
CAPACITY (ADWF)	CLASS OF WATER
17.5 ML/d	A
TYPE Continuous Extended Aeration & Sequential Batch Reactor	
USAGE Sports ground	
KOORINGAL	
CAPACITY (ADWF)	CLASS OF WATER
4.5 ML/d	A
TYPE Sequential batch Reactor	
USAGE Sports ground and lawn cemetery	
FOREST HILL	
CAPACITY (ADWF)	CLASS OF WATER
1.26 ML/d	B
TYPE Intermittent Extended Aeration & Aerated Lagoons	
USAGE Agricultural – non-food crop via centre pivot	

ABOUT THE AUTHORS

The Institute for Sustainable Futures (ISF) is a flagship research institute at the University of Technology, Sydney. ISF's mission is to create change toward sustainable futures through independent, project-based research with government, industry and community. For further information visit www.isf.uts.edu.au

Research team: Professor Cynthia Mitchell, Joanne Chong, Andrea Turner, Monique Retamal, Naomi Carrard, and Janina Murta, assisted by Dr Pierre Mukheibir and Candice Moy.

Contact details: Cynthia.Mitchell@uts.edu.au, +61 (0)2 9514 4950

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ABOUT THE PROJECT

This national collaborative research project entitled "Building industry capability to make recycled water investment decisions" sought to fill significant gaps in the Australian water sector's knowledge by investigating and reporting on actual costs, benefits and risks of water recycling **as they are experienced in practice.**

This project was undertaken with the support of the Australian Water Recycling Centre of Excellence by the Institute for Sustainable Futures (ISF) at the University of Technology Sydney (UTS), in collaboration with 12 partner organisations representing diverse interests, roles and responsibilities in water recycling. ISF is grateful for the generous cash and in-kind support from these partners: UTS, Sydney Water Corporation, Yarra Valley Water, Ku-ring-gai Council, NSW Office of Water, Lend Lease, Independent Pricing and Regulatory Tribunal (IPART), QLD Department Environment & Resource Management, Siemens, WJP Solutions, Sydney Coastal Councils Group, and Water Services Association of Australia (WSAA).

ISF also wishes to acknowledge the generous contributions of the project's research participants – approximately 80 key informants from our 12 project partners and 30 other participating organisations.

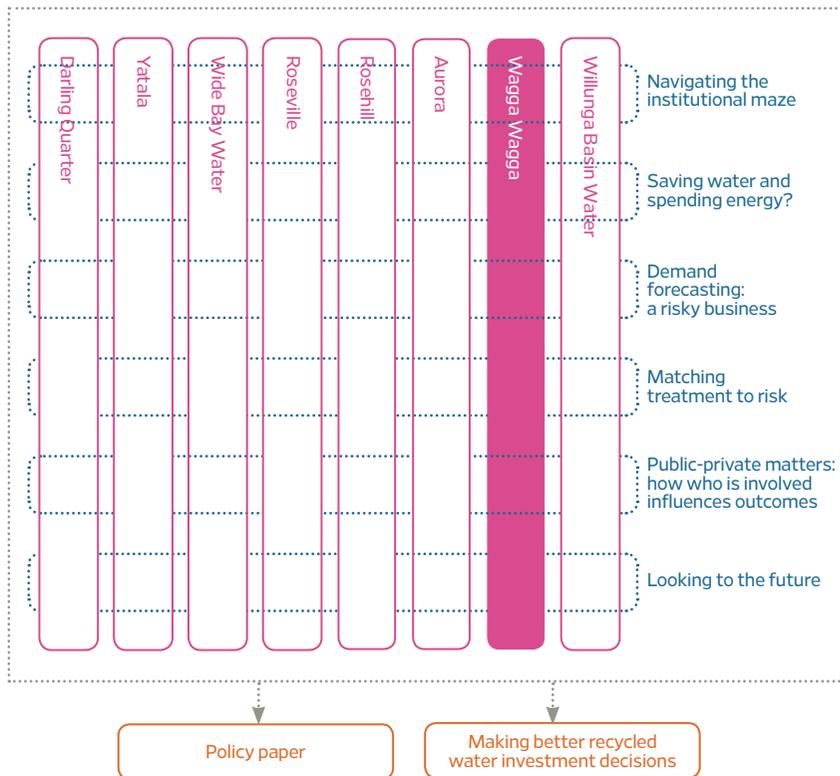
Eight diverse water recycling schemes from across Australia were selected for detailed investigation via a participatory process with project partners. The depth of the case studies is complemented by six papers exploring cross-cutting themes that emerged from the detailed case studies, complemented by insights from outside the water sector.

For each case study and theme, data collection included semi-structured interviews with representatives of all key parties (e.g., regulators, owners/investors, operators, customers, etc) and document review. These inputs were analysed and documented in a case study narrative. In accordance with UTS ethics processes, research participants agreed to participate, and provided feedback on drafts and permission to release outputs. The specific details of the case studies and themes were then integrated into two synthesis documents targeting two distinct groups: policy makers and investors/planners.

The outcomes of the project include this paper and are documented in a suite of practical, accessible resources:

- 8 Case Studies
- 6 Cross-cutting Themes
- Policy Paper, and
- Investment Guide.

For more information about the project, and to access the other resources visit www.waterrecyclinginvestment.com



Summary

This case study is an example of an inland council that has been using recycled water on a small scale for over 30 years. The primary purpose for recycling in Wagga has been to irrigate local parks and ovals, lowering potable water costs payable to the supplier, Riverina Water County Council, and to a lesser extent, sewage to the Murrumbidgee River and associated discharge costs. The long history of recycling in the region illustrates the diversity of applications that have been trialled over the years and Wagga Wagga City Council's (Council) interest in experimenting with potential uses for recycled water.

In more recent times, Wagga's experience illustrates how the drivers for regional councils to implement water recycling schemes have changed over time with the introduction of more stringent sewage effluent discharge and recycling water quality requirements together with environmental and social considerations associated with triple bottom line reporting.

In the process of achieving compliance, Wagga's recycling scheme is undergoing a complete technical, managerial and cultural transformation with principles of accountability and risk management now guiding Council's approach to recycled water. But like many local governments going through the approvals process, Council has struggled with the regulatory requirements due, from their perspective, to a lack of guidance on how to achieve compliance, coupled with internal resource constraints.

Overcoming a legacy of poor communications with regulatory bodies has been one of the necessary changes embraced by Council in working towards Section 60 approval for both their sewage treatment plants and water recycling system. This has been replaced with open and transparent communication with the assistance of external technical and facilitation expertise. Currently working through the final stages of the approvals process and on the brink of compliance, Council is now looking for opportunities to use the high quality recycled effluent available and expand recycling to additional end users.

Wagga Wagga and the recycling scheme: facts and figures

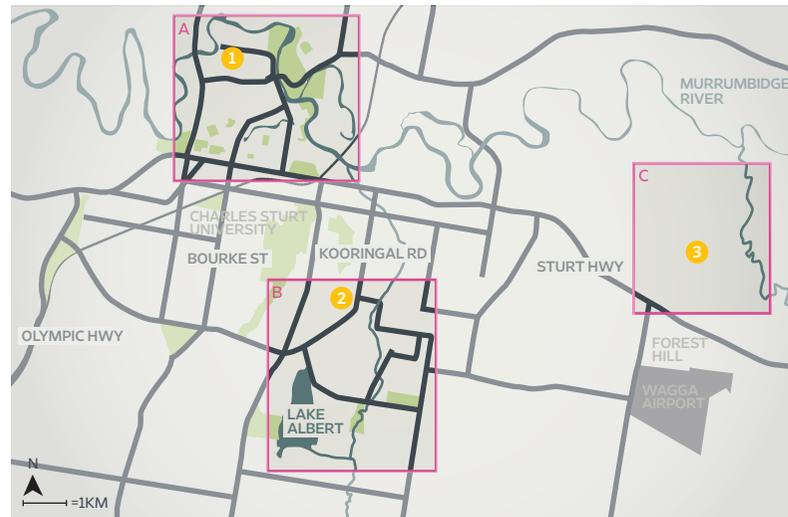
- Wagga Wagga is Australia's fifth-largest inland city, with a population of over 63,500.
- Riverina Water County Council (RWCC) provide potable water to Wagga from borefields interconnected with the regulated Murrumbidgee River that runs through the city. Wagga Wagga City Council (the Council) provides stormwater, wastewater and wastewater recycling services to the city.
- Wastewater services are provided to the 23,500 residential and 1,500 non-residential customers through three main licensed sewage treatment plants (STPs): Narrung 2 km to the north of the CBD; Koorinal 8 km to the south east; and Forest Hill about 7 km east. Treated wastewater is currently discharged to river, evaporation/storage ponds or is recycled.
- In 2010/11 the Council treated 6,357 ML of effluent in both licensed and unlicensed STPs. Around 8% of this (about 500 ML/a) was recycled during this period. This volume changes from year to year depending on rainfall and evaporation patterns, and it is often not needed for around three months of the year.
- Recycling has changed over the years in Wagga but at its core it consists of a recycling network constructed over 30 years ago, which is predominantly used to irrigate Council parks and ovals due to their significant demand with respect to Council's usage.
- Over the last 30 years, Wagga has instigated three distinct trials, none of which are in operation now, but all of which provided Council with insights into the costs, benefits and risks of recycled water:
 - From 2002 to 2007 a Rouse Hill-inspired trial involved 90 households being given access to recycled water for outdoor watering through a Veolia installed and council operated membrane plant. The trial was closed down due to reduced demand after pricing was introduced and escalating costs associated with new regulatory requirements.

- From the 1980s to 2007 recycled water was disposed of onto a 16.8 ha tree plantation at the Kooringal STP. Council initially planned to sell the firewood but due to its subsequent smoke reduction policy this never eventuated. Irrigation ceased in 2008.
- From 1991 to 1997 the Council and a local landowner at Forest Hill conducted collaborative research with CSIRO on the growth rates of plantation trees with different levels of treated effluent. Wagga was chosen due to their policy, at that time, of working towards zero discharge to rivers. The research won awards, was assessed as having a highly positive cost:benefit ratio and led to the development of industry guidelines. Irrigation ceased in 2008 when some tree species started dying.
- More recent additions to the scheme have included expansion of the recycling network to include the Duke of Kent Oval, where a spur and tank were built in 2011 for irrigation due to public requests to restore the quality of the oval after the existing bore failed for 2 years after 8 years of drought.
- Another new private agricultural end user (who irrigates lucerne) has recently come on board at Forest Hill, replacing the former CSIRO tree plot disposal research and other crop irrigation in the land adjacent to the Forest Hill STP. A 10-year management plan has been set up between the farmer and Council due to the significant benefits to both parties including delaying the Forest Hill STP augmentation (\$6-7 million).
- Due to more stringent STP effluent discharge regulations being imposed on Council as part of the EPA Pollution Reduction Program (PRP), Council has recently invested \$44 million on upgrades at the Narrung and Kooringal STPs. This has significantly improved the quality of STP effluent and of the water being used in the recycling scheme.
- During 2013/14 the Council intends to develop a strategic plan after discussions on the recycling scheme upgrade requirements with regulators are finalised.

Wagga Wagga recycled water scheme distribution

WAGGA WAGGA CITY AND SURROUNDINGS

- 1 NARRUNG STP 2 KOORINGAL STP 3 FOREST HILL STP



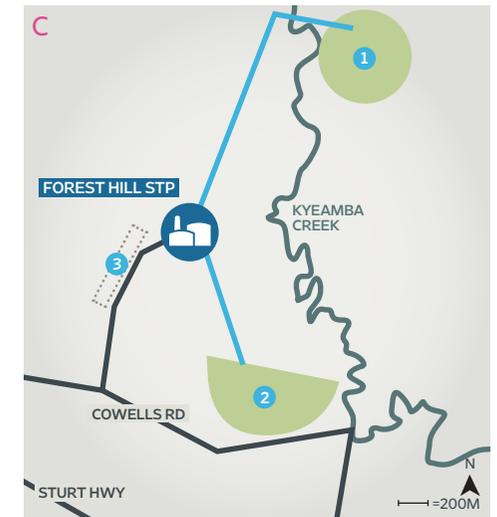
INSET A DETAIL

- 1 MCPHERSON OVAL 2 BOLTON PARK 3 ROBERTSON OVAL
4 DUKE OF KENT OVAL 5 WIRADJURI DOG RUN



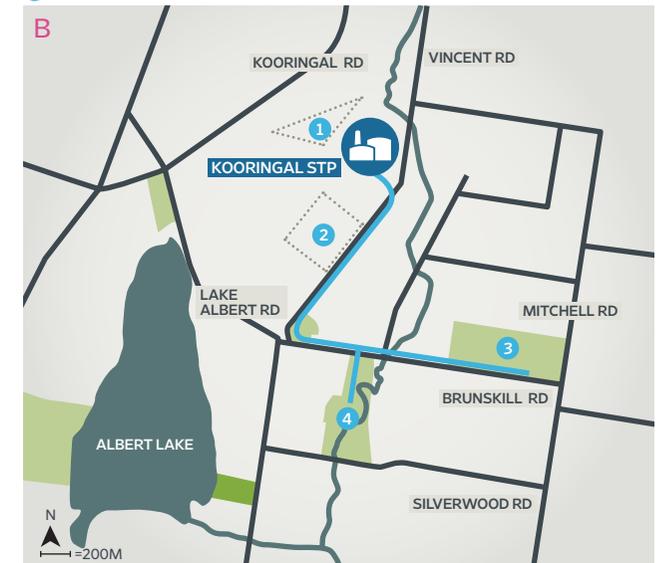
INSET C DETAIL

- 1 IRRIGATION SITE 1 2 IRRIGATION SITE 2 3 OLD CSIRO



INSET B DETAIL

- 1 TREE LOT 2 OLD URBAN REUSE AREA 3 LAWN CEMETERY
4 RAWLINGS PARK



A long history of water recycling

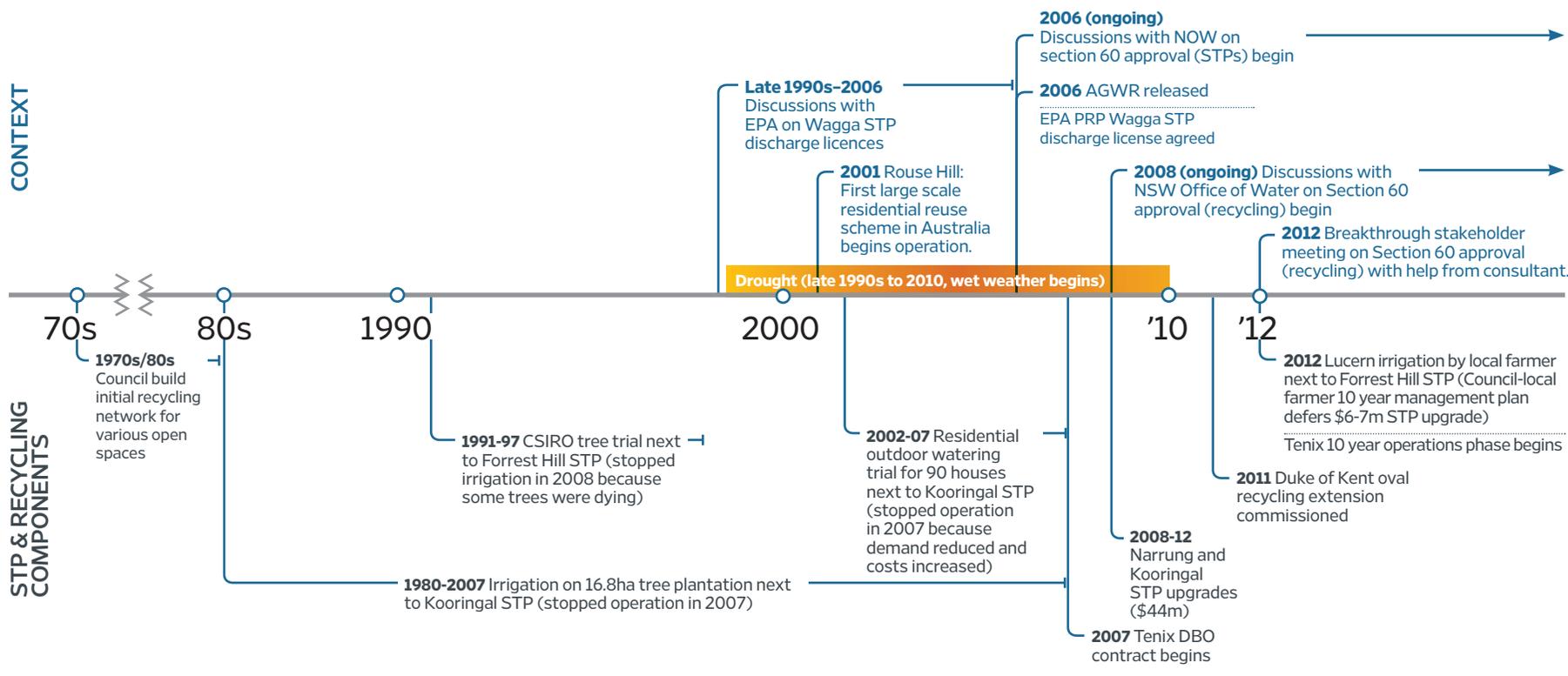
Whilst the drivers for the original water recycling scheme are now unclear, there is an unwavering belief within Council that recycled water is worthwhile.

Wagga’s water recycling scheme began over 30 years ago, so there is no remaining documentation and there are no staff members to provide insight or commentary on the factors influencing its implementation. While the scheme has been operating for a long time, and a variety of end use applications have been trialled, there was no overarching strategy guiding water recycling. It appears that successive champions who had envisioned how water recycling could

benefit Wagga initiated the original scheme and subsequent trials, doing the best with what limited resources and capacity the Council had. Using recycled water to maintain the health and usability of public parks and ovals in a dry climate appears to have been a way to both reduce the potable water charges to RWCC, and meet community facility lifestyle expectations. A bonus was a reduction in effluent discharge fees and associated nutrient levels, but as less than 10% of effluent is reused, the cost savings appear to be secondary.

The absence of strategic planning and lack of risk management around the original scheme reflects the regulatory standards governing water recycling at the time, as well as the perceived risks to health and public safety,

Timeline



and Council's responsibilities in this area. On the other hand, having a go and implementing a system in a time when recycling was not commonplace shows a willingness to apply a water initiative that makes sense in Wagga's geographical dry inland river context. While not a perfect system, Wagga's early innovation has meant that working with recycled water has become a normal part of operations in the region, which arguably gives them a strong footing to maximise its application in the future.

"I think the reuse is a sensible thing."

"we get reminded pretty regularly down here that it's good to have reuse because it's damn dry out there."

Like many local government schemes Wagga's approach did not always put risk at the top of the agenda.

In response to the changing regulatory environment Council has completely changed its approach to sewage treatment, disposal, and recycled water application since the original scheme was constructed. The Council acknowledges that risk minimisation did not always govern water recycling decision-making in the past, primarily due to the less stringent practices of that era.

"It always worried me we might have a famous footballer come to town... he's skinned his knee and got an infection. The headlines – famous footballer gets disease from Wagga's recycled water!"

The pragmatic approach historically taken by Council began to change when the culture of compliance began to shift. This shift created a tension for Council, between a sense of confidence from having operated a water recycling scheme for 30 years and an emerging concern that liability might be a real issue for future operations.

"there was a fear that we didn't have approval but a historical knowledge that, hang on these schemes have been going for 30-35 years, what's the big deal?"

As water recycling gained momentum in other areas of the country in the early 2000s, so did the rhetoric of risk and compliance. The potential to use recycled water for a wider range of uses had influenced the Council to trial different recycling ventures including: a tree lot, a research collaboration with CSIRO on nutrient removal by trees and a residential outdoor water recycling scheme for 90 households similar to that at Rouse Hill in Sydney. Reduced demand due to the introduction of water recycling charges (two thirds of the potable water price), combined with increased costs associated with recycled water quality testing requirements, and the realisation by Council that public exposure to recycled water provided unacceptable levels of risk, led the Council to shut the household trial and associated Veolia recycling plant down in 2007.

"it was the change in attention by the regulator to quality that meant we had to have... proof of good quality at all times. So that just changed the ball game"

“It was all right when water was free but when they actually had to pay for it then they started switching us off at the tap so the economies of scale reduced...it was just a nice trial but in the end a waste of money.”

Transitioning to a new era of water recycling

Upgrades to the STPs provided an opportunity to gain Section 60 approval for both the STPs and recycling scheme

During the early 2000s staff in Council had protracted discussions with the EPA about the tightening STP discharge license requirements on the horizon and the quality of discharge from the existing Wagga STPs. During this time Council and regulator relations became somewhat strained. However, in 2006 the EPA developed a Pollution Reduction Program (PRP) mandating an improved standard for the treated effluent released to the Murrumbidgee River. For the Council, this EPA directive resulted in a \$44 million upgrade to the Narrung and Koorringal STPs. The upgrades were essential if discharge to the river was to continue. The PRP triggered a transition for the Council, prompting a shift from pragmatism to an acceptance that the standards, procedures and risk management culture must change if new licensing requirements were to be met.

In 2007 Council decided to go to tender with a performance-based design-build-operate (DBO) contract for upgrading of the STPs and commenced discussion with the regulator (the NSW Office of Water) about the associated Section 60 approval. However, debate between the regulator and the DBO contractor on the design of the treatment process resulted in the Section 60 approval for the STP upgrades being withheld until the regulator could be of the STPs' compliance post-construction operating results.

In 2008 during treatment design reviews with the DBO contractor the Council was buoyed by the anticipated quality of the STPs' treated effluent and thought that this would align well with the AGWR, which although released in 2006 were only just beginning to gain traction. Despite the absence of Section 60 approval for the STPs the Council decided to pursue advice on Section 60 approval for their recycling scheme using the limited guidance material available. However, when Council approached the NSW Office of Water in 2009 with draft documentation, the regulator rejected the application (which was a common occurrence throughout country NSW at that time). Council sought further clarification from the regulator on exactly what was required for a formal application but found that the type of guidance the Council was seeking was not readily available.

“the bar was also raised by the regulators with the AGWR 2006 and the rolling out by NSW Office of Water and local inspectors of their expectation that you had to have basically potable water going out to your parks and gardens.”

Due to the urgency of the PRP, lack of clear direction on how to move forward on Section 60 approval for the recycling scheme and limited Council resources, Council felt they had no choice but to concentrate on the STP upgrades. This meant putting the upgrade of the recycling components of the STPs and Section 60 approvals on the back burner on the understanding that they would be dealt with retrospectively.

Working backwards is not straightforward

For Council, with its limited time and resources, deciphering exactly what was required for the Section 60 approval remained a difficult task. While the AGWR were published in 2006, clear documentation was still absent and this continued to slow down the process from the Council's point of view. To obtain Section 60 approval ongoing negotiations with regulators were necessary to ensure the

critical control points aligned with the risk management standards of the NSW Office of Water. These negotiations have not been a simple process and they have brought to the foreground the current difficulties both councils and regulators are experiencing in the approvals process.

Council has expressed frustration and confusion about the mixed messages they have received from different regulatory bodies and from individual regulators within the same organisation, as well as the lack of clear guidance material. Regulators are aware of the difficulties experienced by councils, but maintain that risk management is not a 'tick-box' system, but a process that councils need to go through.

"Every single reuse scheme is unique."

Despite the reasoning behind the lack of clear guidance from regulatory bodies, Wagga and many other councils in a similar position are left without the technical and policy knowledge to negotiate complex risk management strategies. This lack of knowledge translates to a significant language gap, which can make negotiations slow, and for the most part unproductive.

Positive and productive stakeholder relations are fundamental in furthering recycled water schemes.

A history of sometimes strained communications with some regulatory bodies about the quality of STP discharge and recycled water being used combined with Council's frustration in not being able to move forward on Section 60 approvals, had created tension with the regulatory bodies. This led Council to view authorities as being 'against' Wagga, and thus Council minimised regulatory engagement.

"the EPA in the past has been very nervous when they think that Council's not informing them of things. Then we sort of built on that fear I suppose."

Now working closely with regulators to gain Section 60 approval, Council recognises that the previous mode of communication did very little to further local initiatives or stakeholder relationships. To move forward and overcome this barrier to compliance, the Council knew it needed to change its approach and demonstrate a commitment to reforming operations and relationships. While Council recognised this was the first step in progressing recycled water in Wagga, it was a difficult process as it meant complete transparency with regulatory bodies.

"there's a risk in opening yourself up to the regulators and stakeholders. You know you're doing the right thing but... then you are a bit exposed in terms of any deficiencies in the scheme."

A primary concern of regulatory bodies is to ensure operations are conducted with the health and safety of both the community and the environment in mind. While a tension had previously existed, regulators were supportive of Wagga's transition to more open communications.

"the regulators need trust in the relationship. When they don't have trust it is very difficult."

With multiple stakeholders and perspectives involved, seeking outside help and getting everyone around the table has made transitioning possible

To fill the knowledge and expertise gaps and to deal with the ongoing limitations of capacity constraints, Council have sought assistance on two fronts. The first was to contract an expert to deal with the design and ongoing operation and maintenance of the STPs and water recycling schemes. The second was to employ an expert consultant to guide the Council through the Section 60 approvals process after many years of internal attempts.

Maintaining compliance with the licensing standards for their STPs under the new PRP licensing requirements

is a key concern for Council. In the past this has proven to be difficult due to time and capacity constraints. When faced with the PRP and STP augmentation, Council decided to engage a design-build-and-operate (DBO) contractor to ensure quality standards were continually upheld. This \$44 million contract ensured the augmented STPs would meet the new licensing standards and continually operate to those standards. This agreement shifts the financial consequences of failing to meet the revised licensing requirements to a third party but as the licence holder, the liability and ultimate responsibility remains with Council.

“The design-build-operate concept worked well for us.”

After nearly 5 years of attempting to work through the Section 60 approvals process, in 2012 Council sought the support of an expert consultant to bridge the technical and regulatory language gap between the regulators and Council. As requested by Council, the consultant coordinated and facilitated a meeting of stakeholders and regulatory bodies to enable them to voice any concerns and potential conflicting perspectives.

For Council this was an invaluable exercise as it offered an opportunity to highlight the discrepancies in perspectives both between and within regulatory organisations (as well as Council) and enabled all involved to be on the same page. Various stakeholders involved openly acknowledged the benefits of such a forum.

“If they flag something, we want to deal with it and have everyone know. We can all have input and come up with a way of fixing it. There’s a certain amount of comfort in the fact that everyone is up to speed.”

The decentralised nature of Council management and operations alone can result in communication breakdown between departments. As the Council’s Parks and Gardens are the primary water users, it was vital that these staff

members were involved in the stakeholder discussions to ensure the logic behind the on-the-ground applications was understood and risk measures were sufficiently managed.

From the Council’s perspective, bringing in an expert advisor with technical and regulatory expertise as well as nuanced facilitator skills has been key to moving towards achieving compliance.

Part of Council’s transition has been a shift towards a risk management paradigm, but also a change in attitude towards engagement with regulators and stakeholders. Council staff recognised that the positive communications brought to recent regulatory discussions have been fundamental in progressing the compliance process. Despite this shift in approach and attitude, the complexity of the water recycling compliance processes remains the primary challenge for councils to manage amidst ongoing knowledge, time and capacity constraints. The current process makes it difficult for councils to obtain approval, and they often require external help from a handful of professionals who possess the range of knowledge required.

“There are only a handful of [people] that understand the full conversation.”

The NSW Office of Water is aware of the difficulties experienced by councils in navigating the approvals process and as a result is currently in the midst of providing additional information, materials and training to aid this process. Despite the current difficulties in transitioning to a new risk management culture, regulators believe that the risk-based approach they use leads to better knowledge outcomes for councils.

“[Councils] tend to find [the process] tedious, but at the end of the day worthwhile... I don’t know that we have been very good at explaining there is a good reason to do it.”

Opportunities for regional growth

While approval for the recycled water scheme is yet to be achieved Council remains optimistic

Now in the final stages of the approvals process, Council is optimistic about the possibilities provided by the high quality recycled water they can produce. Due to the difficulties and time-consuming nature of negotiating compliance with regulators, Council has been hesitant to look to the future until it is certain that a compliant system is in place.

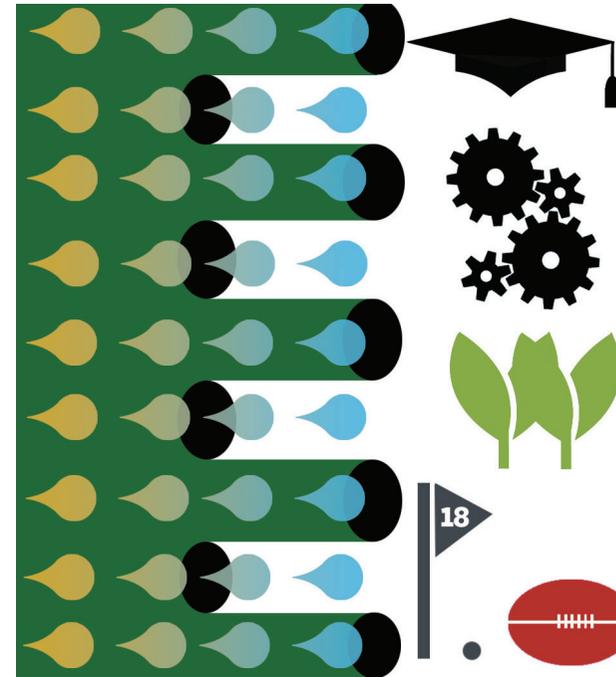
After a long process, Council now has a clearer idea of what is required by regulators before they grant Section 60 approval, but are faced with the decision as to whether the recommended actions are financially viable. The measures that are required to comply with public health and safety regulations will require large investment (potentially a \$1.3M UV plant). While the Council remains committed to finding a way to achieve compliant operations, the technical approach is yet to be finalised. Once this approach has been decided upon and approved strategies to maximise the recycled water will require planning to ensure the remaining hurdles are tackled and overcome. It is anticipated that this strategic planning will be developed in the near future and will identify how recycled water can be used in Wagga over the next 30 years and the associated costs and benefits.

While compliance is yet to be finalised, innovative project planning is in the wings. A project recently on display as part of the community consultation process aims to turn the decommissioned STP lagoons at Narrung STP into an environmental benefit by restoring the area into a natural wetland. This initiative - driven by champions within Council - will channel recycled water into the decommissioned area, rehabilitating it to its natural state. The social and environmental benefits have driven support for this restoration and shows how recycling can be used to enhance the community by contributing to the less quantifiable benefits that don't traditionally measure success.

"we've got really good quality water discharged into the river already but we're hoping that some of the nutrients that are in that water will be used by the aquatic plants and life that are going to be in that wetland."

There are many potential opportunities identified that may benefit from the high quality recycled water the Council is soon to provide. Such prospects include:

- research partnerships with Charles Sturt University for application on vineyards and farming areas;
- a soon-to-be-developed Intermodal Freight Hub, which will provide reuse opportunities for industrial purposes;
- irrigation of a local golf course;
- further private partnerships with agricultural users; and
- irrigation expansion of parks and ovals.



There are also opportunities that the Council have tapped into that have not required such high quality recycled water. Council were facing significant costs associated with the required upgrade of the Forest Hill STP to bring it in line with current EPA water discharge license requirements. In 2012, Council managed to secure an arrangement with a local private agricultural end user to transport all available discharge from the Forest Hill STP via a new pipeline and use it to irrigate lucerne. The 10-year management plan set up between the farmer and Council is highly beneficial to the farmer (guaranteeing approximately 250 ML/a of treated effluent from the STP formerly used on the CSIRO research project) and the Council (delaying a \$6 - \$7 million STP upgrade by at least 10 years).

Further cost savings being explored by Council that may assist in further developing the recycling scheme centre around the potential to install a cogeneration plant similar to one recently commissioned at the local swimming complex. This cogeneration plant could potentially assist in reducing power costs at the STPs (currently \$800k/a), bringing bioreactor temperatures up and enabling the boiling of the recycled water to achieve disinfection (instead of investing \$1.3m on a UV plant). Boiling the recycled water may not be considered adequate by the NSW Office of Water but the concept demonstrates the Council's willingness to try new ideas.

A few barriers remain to optimising water recycling

Once compliance for the Narrung and Koorngal STP components of the recycling scheme have been achieved and these opportunities begin to be developed, there are a few final barriers that will require consideration if growth in the production and use of recycled water is to be maximised. The first centres around the capital investment which may be required to expand the network for new end users and the arrangements/business models for sharing these costs.

The second entails ensuring recycled water pricing goes some way to being reflective of the costs incurred by Council yet competitive given the low price of potable water. At less than a dollar per kilolitre, the cost of potable water is low, reducing the financial incentive to use recycled water (current Council policy is to charge two-thirds of

the price of potable water). Securing demand and creating a business model that appeals to prospective users will require substantial effort from Council. This workload is currently spread across existing staff struggling to manage the additional work on top of their core responsibilities.

“[To maximise business opportunities for reuse] there needs to be a separate business unit to be proactive in overseeing those things. There's just not the time in the day for me to do that.”

Another task facing Council once the water recycling scheme is approved is to devise formalised management plans with each end user. As part of the risk management approach, these management plans ensure soil tests, water quality tests, corrective actions and critical control points are clearly identified.

Ongoing management and the application of these site-specific sampling requirements are needed at every discharge point. The management needs are likely to vary greatly depending on the purpose of the application. Devising appropriate plans and ensuring the end user both understands, and is willing to accept the responsibility to maintain the risk measures will require significant resources from Council.

To simplify the process, and make it more manageable from the Council's perspective, industry standard fit-for-purpose templates are needed that outline the risk measures that need to be in place for different types of application. Council is of the view that state regulators should develop such templates, because they would be sector-based, and would therefore apply across regional jurisdictions. This lack of standardised templates for typical end uses has been an on-going frustration for Council.

Council is concerned that not only are the water quality standards and risk measures complicated, but that these may result in perverse outcomes. For example, having such high water quality now coming from the upgraded STPs passing to the soon-to-be upgraded recycling components

for all water recycling applications strips many of the nutrients that are effective fertilisers.

“regulators haven’t been able to say, here’s [a] freely available management plan for open space irrigation at a council level. How much simpler could that be?”

These fertilisers are highly beneficial, both for grass growth in the public parks and ovals and for agricultural crops. Council acknowledge nutrient and pathogen removal is needed from both an environmental and a public health perspective, but consider a more nuanced fit-for-purpose approach to recycled water use would be beneficial. Council would find it useful to have greater guidance from regulators as to how both public health and nutrient levels can be managed depending on the particular end use and degree of human exposure.

“now you’re treating it to such a high level that you’re not going to be able to fertilise – you’ll have to water in artificial fertilisers.”

While regulators acknowledge the need for a more manageable system that councils are equipped to navigate, regulators are resistant to the idea of producing a standard template due to the context-specific nature of risk management. While improved guidance materials and training can help to simplify the current process, a compromise about the level of information provided will need to be reached between regulators and local governments. To avoid a paternalistic approach, regulators aim to provide councils with enough information to ensure they can navigate their way through the process themselves. Despite the difficulties currently being experienced, regulators are optimistic that as councils transition into a new culture of risk management, these processes will become normalised as knowledge in this new management paradigm increases.

Another practical barrier to growth is around the impending cost of technological upgrades. The current irrigation systems used on the Wagga public parks and ovals are outdated and inefficient, as they do not maximise the possible reach during irrigation periods, and nor do they enable sufficient watering within the allocated watering times to minimise exposure to the public. Meeting the demand for larger volumes of recycled water in the warmer months will require a significant upgrade. The projected financial investments that will be needed to maximise recycled water applications may be helped significantly by Council demonstrating best practice management in accordance with the NSW Office of Water Best Practice Management of Water Supply and Sewerage Management Guidelines. Being included in such benchmarking reports and demonstrating best practice puts Council in a strong position to tap into state recycled water funding if and when available in the future.

Key learnings and reflections

The historical and recent experiences with recycled water in Wagga provide some key learnings and reflections that may be useful to councils in a similar position.

Wagga is a dry inland city and Council acknowledge that water security is an obvious benefit. However, despite the initial drivers being unclear it does not appear to be the strongest driver for the original recycling scheme. Although the benefits of water recycling in Wagga have not been clearly quantified the reasons for implementation appear to be: avoiding potable water charges for irrigation of Council parks and ovals, reduced treated effluent discharge costs associated with the EPA license, the need to reduce nutrient loads on the river, and the view that recycling is sensible.

Drivers, costs and benefits will vary in different jurisdictions. For inland regional centres, having them more clearly articulated upfront is likely to assist in more transparent decision-making and effective investment. This will help recycled water play a more significant role and enable it to be adopted where it makes most sense locally.

A more recent learning emerging from Wagga is that for councils to implement and manage a compliant scheme, support from regulators and advisors is essential. The technical and regulatory knowledge required to implement a compliant water recycling scheme is currently more than what most councils have available. For schemes such as the ones described here to have a chance of succeeding, clear guidance is needed in the early stages of the process to avoid time and money being wasted. The current complexities make it unrealistic to expect councils to be able to independently navigate the process. Guidance, support and improvement of the available supporting documents is essential.

Through extended dialogue with regulators in working towards Section 60 approval, Wagga has realised the importance of fostering positive relationships and open communication with stakeholders. Making efforts to collaborate and work together is a key ingredient not only for water recycling, but for progressing any initiative with multiple stakeholders and perspectives.

Creating a forum for open dialogue meant Wagga needed to reveal aspects of the schemes that may not have been

compliant. This up-front communication was needed for Wagga to be able to move forward and improve operations and water quality. Somewhat of a cleansing process, the positive outcomes for Wagga are knowing that all parties are on the same page, that the beginnings of a trusting working relationship have been established and most importantly, high quality water is available that can maximise the future of water recycling in the area.

“...it’s like we’ve turned the corner on all things reuse in Wagga just recently.”

“...it makes me sleep at night knowing that our quality of water is going to be good enough.”

