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JANUARY 2024



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WaterWorks welcomes the submission of articles relating to any operations area associated with the water industry. Articles can include brief accounts of one-off experiences or longer articles describing detailed studies or events. Submissions may be emailed to: info@wioa.org.au

NEW BEGINNINGS

George Wall

After being on the WIOA Incorporated Committee for more than 30 years and the WIOA CEO/Managing Director for the last 18 years, the time is right for me to move on to the next chapter in my professional life.

I have thoroughly enjoyed my role working with, and for, what I consider to be the engine room of the water sector, the operators. It is a source of great inspiration for myself and everyone connected with WIOA, to do whatever we can to support our members as they undertake their vital role in maintaining the health and wellbeing of our communities.

I have been fortunate and privileged to meet and work with so many passionate and committed people over the years. Whether it is someone participating on one of the many WIOA Committees, a presenter or volunteer at an interest day or conference, someone contributing an article for one of our publications, or one of our fantastic staff members, WIOA cannot function without all your valuable input.

In reflecting on WIOA's journey over the last 30 years, I am filled with great pride when thinking about the enormous number of achievements we have made as a team. Some of the more notable outcomes include moving from a totally volunteer run organisation to one that now employs seven staff; growing the membership from 80 in 1994 to more

than 4,500 in 2023; expanding the annual conference program into four States; the establishment of the Operator Certification (now Registration) Scheme; and the growth in the water taste test competition to name just a few. These and the many other outcomes took a huge amount of time, effort and the support of a lot of people, and I would like to express my sincere gratitude to everyone who has contributed along the way.

In looking to the future, WIOA has employed a new and very capable staff team to take the organisation to the next phase of its evolution. I look forward to seeing the organisation continue to prosper and grow in the coming months and years.

I am pleased that I will also be able to continue my connection with WIOA and the water industry in 2024, through my new role as National Manager Water Sector Industry Engagement with BuildSkills Australia, the newly formed Jobs and Skills Council for our sector. As part of the new job, I am excited that I will be able to continue to meet and engage with lots of people from the water industry, as we seek to find solutions to the substantial skills and training issues facing our industry at present.

In closing my work chapter with WIOA, I would like to thank everyone who has encouraged, supported and offered me their friendship along the way. It is greatly appreciated.

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OUR COVER

Tom Jones inspecting the aeration tower at the Hope Vale water treatment plant.

LUGGAGE POINT RESOURCE RECOVERY CENTRE ODOUR MANAGEMENT

Winner of the Best Operations Paper at the 2023 WIOA Queensland Operations Conference

Kathryn Turner

Urban Utilities (UU) operates the Luggage Point Resource Recovery Centre (RRC), located on Main Beach Road, Pinkenba immediately adjacent to the mouth of the Brisbane River. Daily inflows average 140ML/day, around 60% of Brisbane's sewage flows.

Historically, the Luggage Point RRC has not been a source of odour nuisance to nearby receptors as these were predominantly industrial sites. However, recent developments have included the establishment of the Brisbane International Cruise Ship Terminal (BICT), the extension of the Brisbane Airport runway, along with many commercial entities establishing their premises closer to the plant.

In line with the Urban Utilities business position of maximising resource recovery, the decision to commence biosolids drying on the drying beds has also increased the odour release potential from the plant. The

odour contours from the various process streams at luggage point are shown in Figure 1.

Odour Monitoring

It is critical that UU understands the odour generation at each source area on the Luggage Point RRC. UU installed equipment provided by Envirosuite at various locations based on odour studies and sensitive receptors around the plant. Two odour modelling studies were used – 2018 and 2022.

In reviewing the data, two areas stood out as potential odour sources - the Inlet works area and Primary Sedimentation Tanks (PSTs) and the biosolids drying operations.

Inlet Works Odour Management

In 2019, following the commencement of planning for the construction of

the BICT adjacent to Luggage Point, in collaboration with Brisbane Port Authority, Urban Utilities installed an odour control unit (Figure 2) which only covered the inlet works, supported by strategic dosing capability for ferrous chloride (FeCl_2) into the incoming rising main. This was considered adequate treatment for the known odour impacts at that time. However, the opening of the BICT was delayed by COVID-19.

In November 2021, operational changes to the management of biosolids commenced with all biosolids produced on the 26 resource recovery centres operated by Urban Utilities being transported to Luggage Point RRC for further processing on the drying beds. Although not used since 2003, these beds were assessed as having sufficient capacity to process all of the biosolids, reducing the total volume by weight by up to 50%.

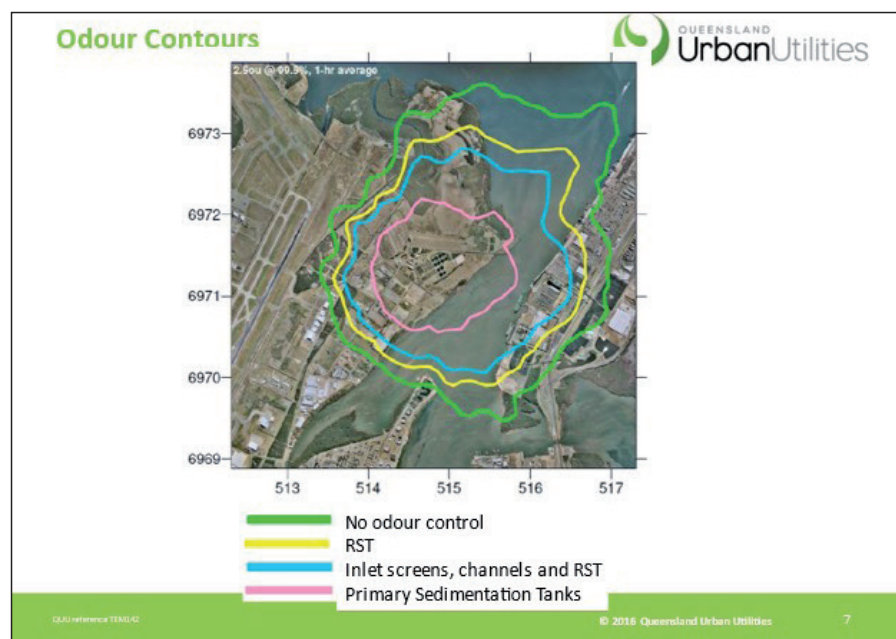


Figure 1. Odour Contours from Luggage Point.



Figure 2. Inlet works odour control.

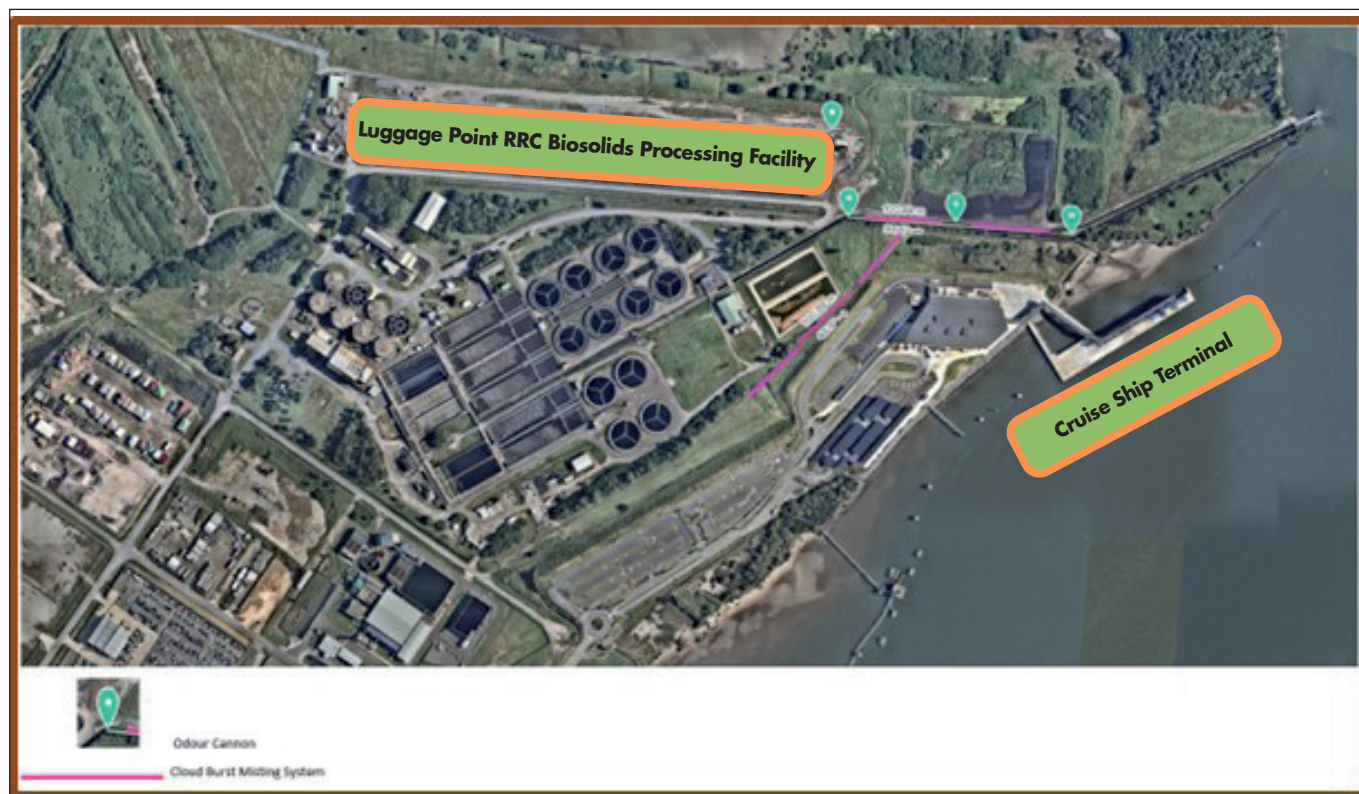


Figure 3: Location of the biosolids processing facility and the cruise ship terminal.

This presented a substantial reduction in transport costs for UU and provided the opportunity for up to 12 months storage. Given the emerging contaminants issues storing the biosolids on site was essential to provide time for planning activities to be undertaken.

This activity increased the odour control requirements on site, as the recently installed system only treated odour at the inlet works. The location of the BICT in relation to the drying beds is shown in Figure 3.

In addition, the original operating licence had a new paragraph added confirming that UU was responsible for the operation and maintenance planning of the odour management equipment with consultation and forecasting with PBPL (Port of Brisbane) to remove all odour impacts on the adjacent Cruise Ship Terminal.

Odour Management Options Implemented

In April 2022, UU was notified that the BICT would commence cruise ship operations on 2 June 2022. This did not

allow sufficient time for a full detailed study, planning and project scoping. Fortunately, UU staff had been exposed to potential options at recent industry events including WIOA conferences, and quickly installed an odour monitoring option and an odour misting system option.

The resultant additional odour management equipment was installed in a rapid 6 week project and provides a 3 facet platform to address the release of

unacceptable odours generated in the operational processing of biosolids on and around the drying beds at Luggage Point RRC.

The works included a fence mounted misting system (Cloudburst) (Figure 4) with 600 metres of pipework with 40 spray heads each 100 metres, 20 meter spray cannons and odour monitoring, (Envirosuite).



Figure 4: Cloudburst misting system in operation.

Misting System

The Cloudburst misting system initially provided a continuous mist via 6 x 100 metre long pipelines that utilises an odourising product, potable water and a low pressure pump to push the liquid through 40 misting tees on each run. Water pressure required for the system was 600 to 120 PSI.

The odourising product uses a bubble gum scent and masks sulphur and ammonia compounds in the atmospheric plumes. The system has successfully contained odours between the plant and the BICT and following complaints received to the southwest of the plant, a further 600 metres has been installed on that boundary.

Cannon Sprays

Initially 2 cannons have been installed with spares available for additional coverage if needed.

The cannons (Figure 5) use a similar mixture as the misting system but using pressure spray the mist into the air with a 20 meter projection. The cannons are noisy and create a wet trail where they project. They are mobile and can be aimed at sensitive receptors or focus on the odour generation point. They are only used if required.

The misting systems are in operation 12 hours prior to a cruise ship arriving at the terminal, or if the monitoring systems identify unacceptable odours are present and the wind direction is considered to be moving the odour in the direction of the terminal. This direction will usually be from the north and west. The system remains operational until the ship leaves port. The system on the southwest boundary operates continuously at this point.

In the initial roll out, the operation of the system is manual. The Odour Dosing Forecast System that operates the odour control for the influent does determine when the ferrous chloride dosing at Luggage Point needs to be turned on or off.



Figure 5: Canon misting system.

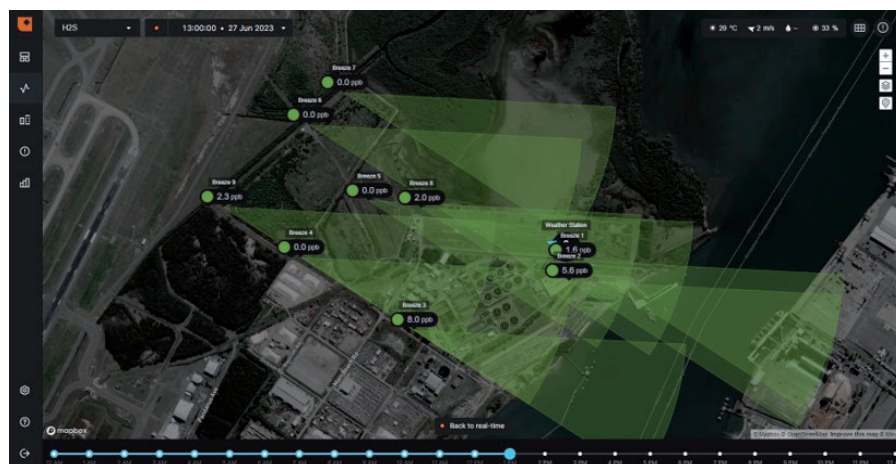


Figure 6: Outputs from the odour monitoring system.



Figure 7: One of the odour monitoring stations.

The PBPL application generates a schedule that is sent to UU to control pumps. In return, UU send PBPL information to confirm (a) if the dosing is on or off (b) how much chemical was consumed. The integration of the misting systems to this control will be assessed but could not impact the rapid deployment and operation of the misting systems.

The future BICT vessel call schedule is automatically extracted from the Maritime Safety Queensland (MSQ) QSHIPS database. The QSHIPS database is interrogated to filter for all planned shipping movements to and from the BICT up to 30 days in advance. If late bookings occur these are managed via the Unplanned and Unforeseen Events process.

Utilising Odour Monitoring Data

Using the odour study information and identifying the impacts of wind direction and the location of the sensitive receptors (BICT, Brisbane Airport) the odour monitors are installed as shown in Figure 6.

The green dots are the monitor locations with the monitoring station shown in Figure 7, the green cone shapes are the wind direction and speed, and indicate the readings are within acceptable parameters for odour intensity at this time on this day. The system also measures H₂S, NH₃, and VOC.

The system enables reporting on an hourly basis both real time and historic with data trend reports available as shown in Figure 8. This has proved highly beneficial both in preventing complaints and responding with facts when received.

This monitoring has provided data that has assisted our decision making on where UU needs odour control and what system best suits the situation.

Odour at Luggage Point is currently being controlled with the 3 facet platform we have established and we are achieving a better control on odours impacting sensitive receptors.

The Author

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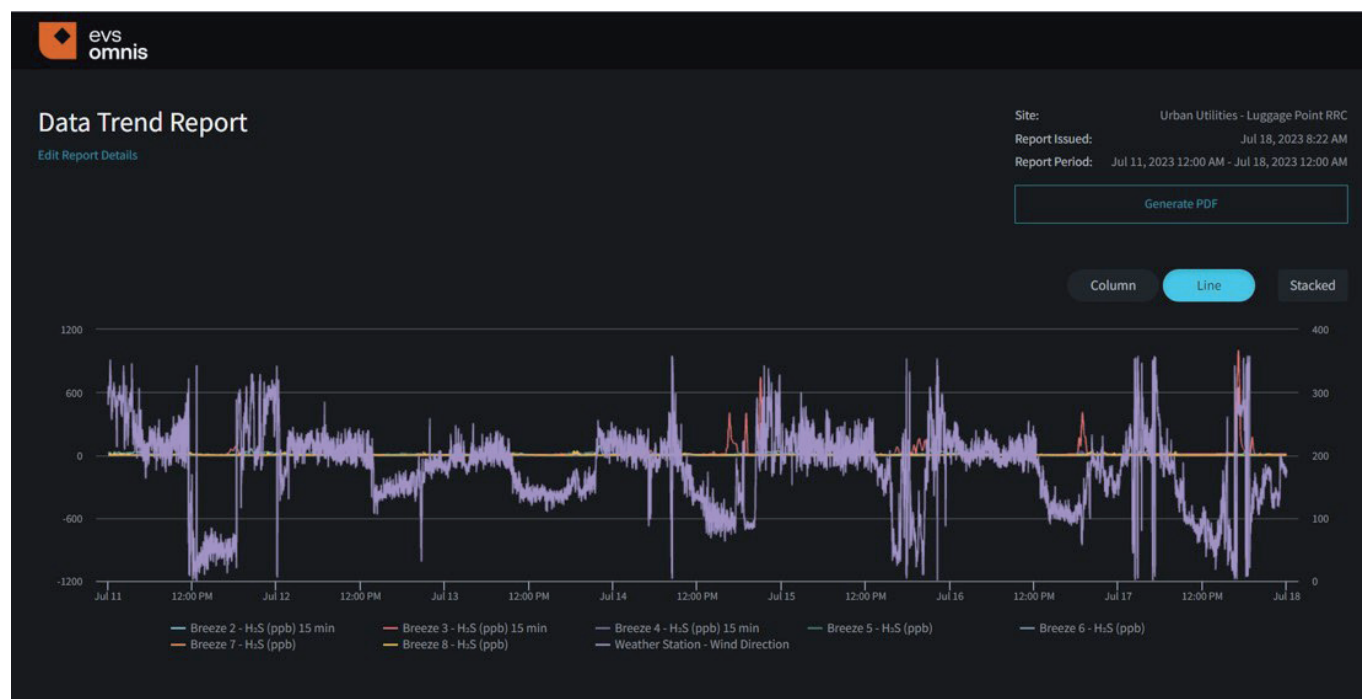


Figure 8: Monitoring data.

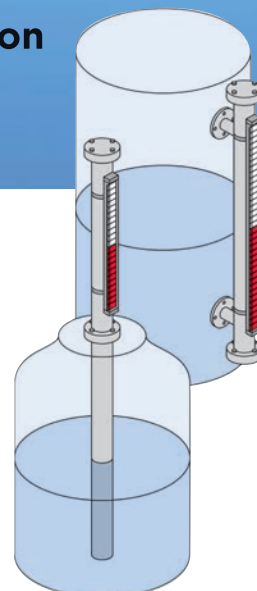


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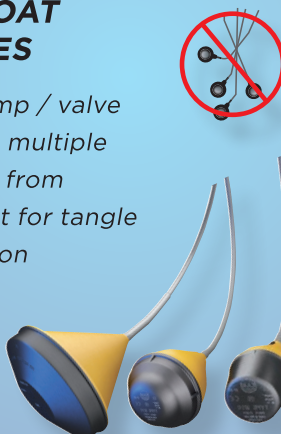
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WATER USE ACCURATELY ASSESSES THE QUALITY OF THE AFL GRAND FINALS

David White

The AFL Grand Final, one of the most highly anticipated sporting events in Australia, has always been a significant occasion for Melburnians. Beyond the excitement on the field, Melbourne Water has identified interesting changes in water use behaviour during and after the game.

Large spikes in water use at the end of each quarter and at the end of the game can be attributed to delayed water use as people remain glued to their televisions. The size of the spikes, known as the Flush Factor, can be correlated with the 'quality' of the game.

Melbourne Water operates hundreds of water flow meters. Whilst not all of these flow meters are suitable to measure residential usage due to tank fills, transfer requirements or the distribution zone including large components of industrial use, some flow meters supply areas largely composed of residential customers.

These flow meters measure the instantaneous flow to customers, so as soon as customers use the water in sufficient volumes it's recorded at these flow meters. This can be confirmed by

observing a typical daily flow profile, as shown in Figure 1, where we can see low flow over night and a morning and afternoon peak typical of residential usage.

During the AFL Grand Final there are a number of changes to the typical pattern. As shown in Figure 2 which depicts Melbourne's water use during the 2020 AFL Grand Final, we can see the following changes;

- A reduction in overall flow when the TV telecast commences.
- Spikes in flow at the quarter time, half time, three quarter time breaks, final siren and after the presentations.
- A return to normal flow after the telecast has finished.

The Flush Factor is defined as the percentage change in flow at that particular time as illustrated in Figure 2

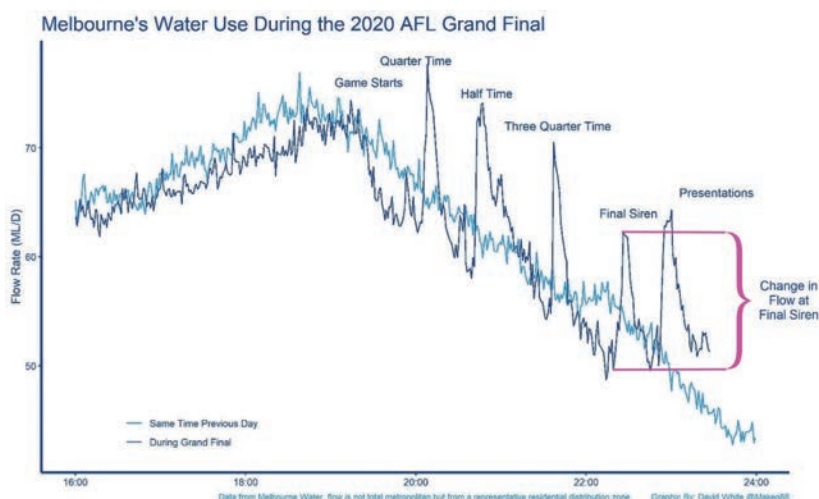


Figure 2: Melbourne's Water Use During the 2020 AFL Grand Final.

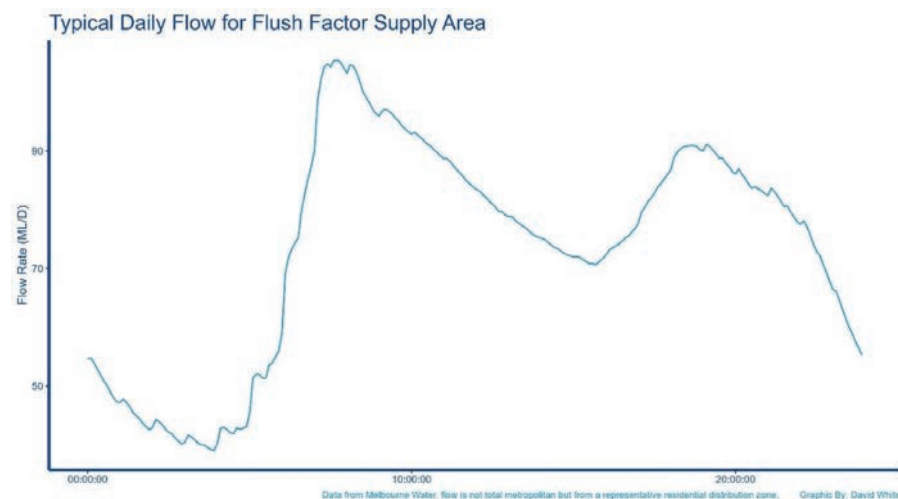


Figure 1: Typical Daily Flow for Flush Factor Supply Area.

An animated version of the 2023 Grand Final data can be viewed at <https://tinyurl.com/3fucpumv>

By comparing the size of the Flush Factor, we can identify the games for which Melbourne's AFL supporters are more willing to hold on before going to the toilet or making a cup of tea and therefore, determine the interest in the game. For example compare the Flush Factors for the 2015 and 2016 Grand Finals, shown in Figure 3 and Figure 4.

During the Western Bulldogs epic victory over Sydney in 2016, the city gritted its collective teeth and stayed on the couch.

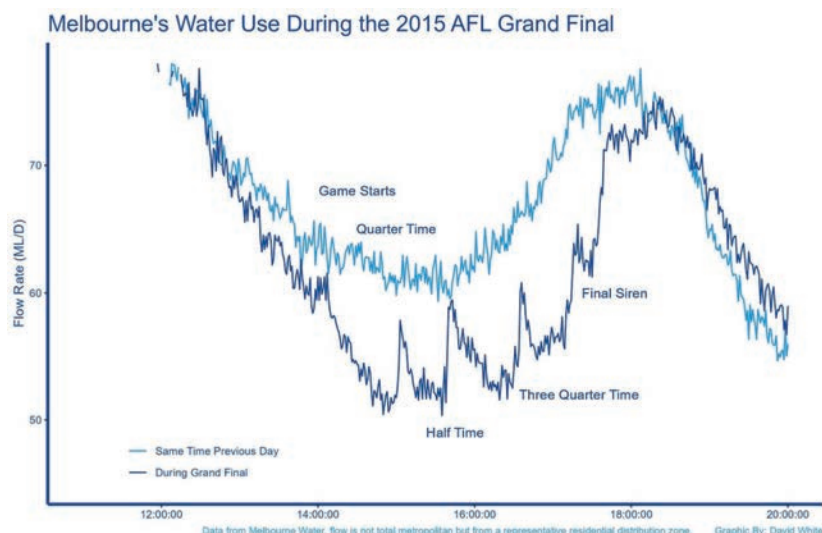


Figure 3: Melbourne's Water Use During the 2015 AFL Grand Final.

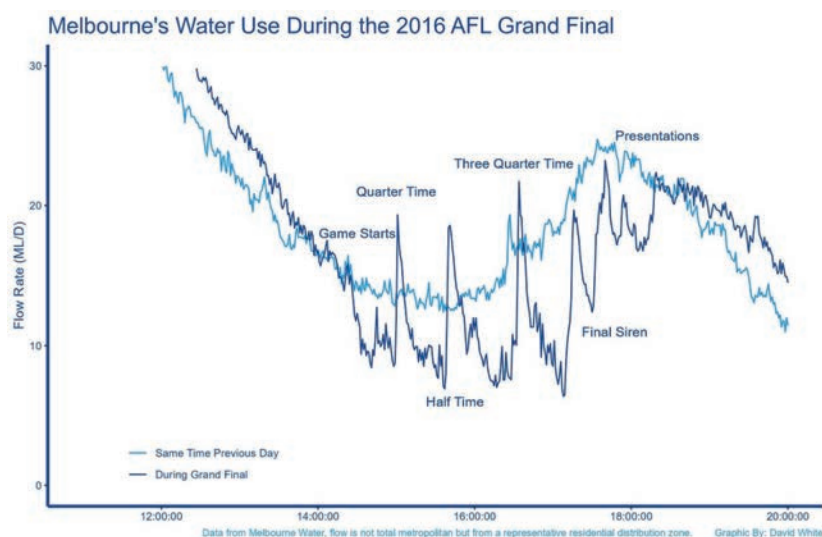


Figure 4: Melbourne's Water Use During the 2016 AFL Grand Final.

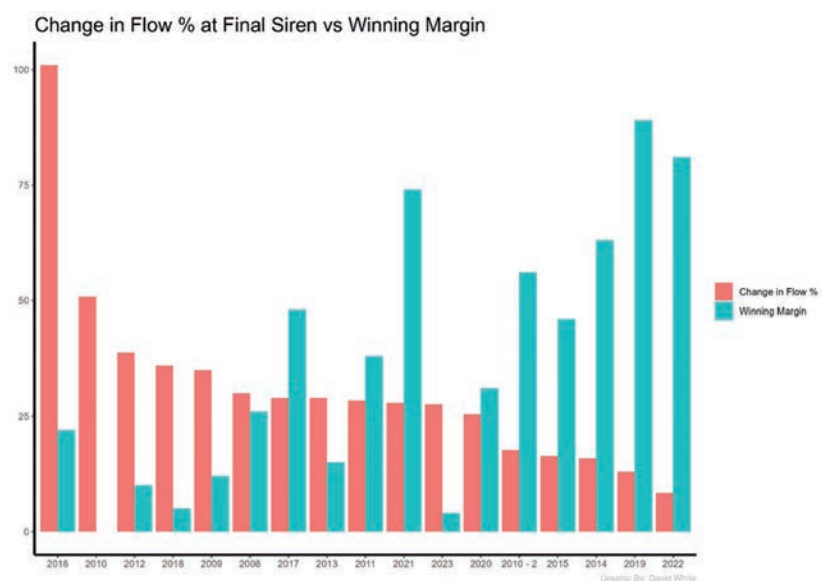


Figure 5: Change in Flow % at Final Siren vs Winning Margin.

By comparison, during Hawthorn's easy win over the Eagles in 2015, fans were more than happy to miss a few minutes whenever the urge arose. The Flush Factor in 2016 is the highest ever recorded at 101% where as in 2015, it was only 16%.

Historically, there has been a clear relationship between the Flush Factor and the final point differential between the teams. As the point differential for each game increases, the change in flow decreases as illustrated in Figure 5. It is interesting (or frustrating) to note that the 2023 grand final is an outlier. It was a very close game, but the flush factor was not as high as it should have been.

Using the Flush Factor, we can rank the grand finals of the last 17 years as shown in the table below. The 2016 game between the Western Bulldogs and Sydney comes out on top, with the 2022 final between Geelong and Sydney coming in at the bottom of the table.

| Rank | Teams | Year | Change in Flow % at Final Siren |
|------|--------------------------------|----------|---------------------------------|
| 1 | Western Bulldogs def Sydney | 2016 | 101.0 |
| 2 | Collingwood St Kilda Draw | 2010 | 50.8 |
| 3 | Sydney def Hawthorn | 2012 | 38.8 |
| 4 | West Coast def Collingwood | 2018 | 36.0 |
| 5 | Geelong def St Kilda | 2009 | 35.0 |
| 6 | Hawthorn def Geelong | 2008 | 30.0 |
| 7 | Richmond def Adelaide | 2017 | 29.0 |
| 8 | Hawthorn def Fremantle | 2013 | 29.0 |
| 9 | Geelong def Collingwood | 2011 | 28.4 |
| 10 | Melbourne def Western Bulldogs | 2021 | 27.9 |
| 11 | Collingwood def Brisbane | 2023 | 27.6 |
| 12 | Richmond def Geelong | 2020 | 25.5 |
| 13 | Collingwood def St Kilda | 2010 - 2 | 17.7 |
| 14 | Hawthorn def West Coast | 2015 | 16.4 |
| 15 | Hawthorn def Sydney | 2014 | 15.9 |
| 16 | Richmond def GWS | 2019 | 13.0 |
| 17 | Geelong def Sydney | 2022 | 8.4 |

The AFL grand final is not the only event that leads to this phenomenon. It was also observed during this year's Matilda's world cup campaign and during significant TV events such as the Master Chef finale of 2010.

The Author

David White (David.White3@melbournewater.com.au) is Water Operations Centre Lead at Melbourne Water.



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RETIRED WATER ASSETS IN YORTA YORTA AND TAUNGURUNG COUNTRY COME BACK TO LIFE

Winner of the 2023 Kwatye Award for the Duniyak Moira Project

Steven Nash



Projects by Goulburn Valley Water (GVW) to convert retired water supply assets in Northern Victoria to community assets through a partnership approach, has delivered long term benefits to Traditional Owners and all involved.

The partnership approach ensured collaboration, resulting in funding and support from local businesses and neighbours, and acceptance of the projects as community assets.

The positive outcome challenges the notion that such projects are not core business. Councils and water agencies can review their retired asset list with an eye for innovation and community benefit, while stimulating their own business. These projects provide a model for review and future planning for other similar assets with local Traditional Owners, communities, and businesses.

Project Inception

Through the Victorian Government's strategic water plan, Water for Victoria 2016, water agencies are encouraged to implement

projects that generate environmental, community, recreational and cultural benefits and opportunities as part of broader water planning and use.

With variable access to water for recreational use across the region, GVW identified three projects at different sites that could deliver benefits to Traditional Owners and local communities. These include the Duniyak Moira (Fishing Lake) in Merrigum, the Guwarn Baring (Echidna Track) at Trawool, and the Polly McQuinn's storage where access was provided for recreational fishing in the Strathbogie/Euroa region.

The projects gained support and engagement across all of GVW, with operators taking the lead in the field. Many other staff were excited to be involved, visited the site during the development and were invested in project completion.

The three projects were presented at the 2019 GVW annual Customer Forum to gauge interest, comment and support from a representative customer group. There was support for all three projects, with Seymour/

Trawool-based customers recognising and valuing the Trawool Reservoir and camp ground. The broader customer group also supported the project and fishing platforms, and requested inclusion of a toilet at the camp site.

GVW progressed two projects, Duniyak Moira and Gawarn Baring, concurrently implementing partnerships with respective Traditional Owner groups, local community and businesses. Flow on benefits have occurred beyond what was originally envisaged and influenced improvements in local land-use.

Project 1: DUNYAK MOIRA – Merrigum

Duniyak Moira (Fishing Lake) was created in Yorta Yorta country at the Merrigum Water Treatment Plant (WTP), which was downscaled in 2020 when a trunk main connected Merrigum to the Kyabram water supply system. This created open space and redundant assets including two raw water storages of 12.5ML and 50ML. The site layout and concept plan is shown in Figure 1.

The Yorta Yorta Nation Aboriginal Corporation referred this project to the Burnanga Indigenous Fishing Club (BIFC) with their club president, Corey Walker, becoming an inaugural member of the project team. He visited the site as the project was initiated with the GVW team, and also presented the project to GVW's Executive Team for endorsement in October 2020.

From project initiation onwards, Corey and BIFC had key access to the site, and along with the adjoining neighbour, were kept informed and consulted on the project vision and program of works. BIFC participated in all stages of design, construction, public consultation and launch.

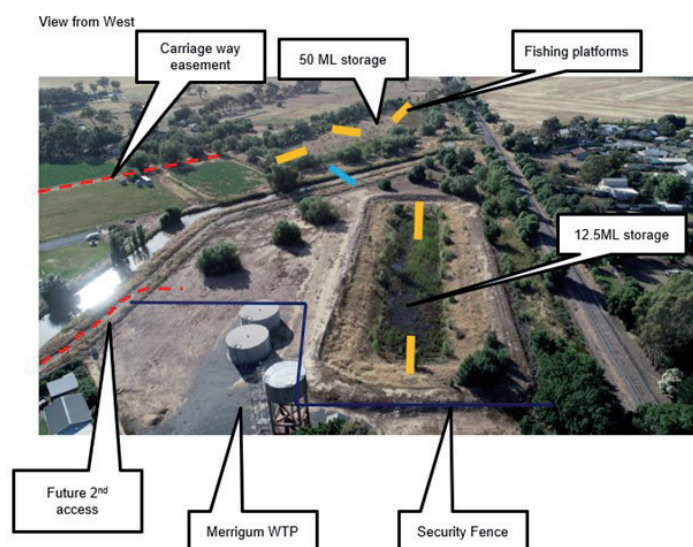


Figure 1: Concept plan overlaid on the existing Merrigum WTP site.

Contributions include enhancing design, leading public consultation and promotion, particularly to Victorian Fisheries Authority (VFA) and Bush Fire Recovery Victoria (BRV). Direct results include installation of massive tree root balls for fish habitat, stocking with 'trophy' size native fish and development of community-supported operating rules and committee of management representation.

This project has also been supported with in-kind investigation, design and materials from local consultants, contractors, Goulburn Murray Water and GVW staff. Ricky Bertolli, a water treatment plant operator, became the site project manager, and with the support of his team and others in GVW, was hands on in the design, construction and community consultation. His team covered for him while he was on site, with the wastewater management team assisting with pumping and construction. Plenty of other staff offered to catch fish after hours to check their health. This open invitation attitude with BIFC and GVW staff ensured both owned and invested into the project.

An issue that Ricky confronted was the sudden impact of a virus transferred from the channel into the ponds while refilling. There was good news and bad news – unfortunately, it killed some fingerlings, but it was proof that the Murray cod in the pond were successfully breeding. His chemical dosing skills came in handy and there is now a dosing station ready to go for future filling.

He also put his own stamp on the project, installing duck and bird breeding boxes (Figure 2), which have been very successful with over 300 ducklings hatched in 18 months. The engagement with the local Field and Game Australia group has enabled variations on the breeding boxes to be experimented with, due to the ease of access and success of attracting breeding birds to this site.

The inclusion of around 100 mature fish also caused issues with providing enough food in these freshly filled ponds. BIFC and GVW staff and families assisted with catching yabbies to supplement the food supply for the fish in the ponds. The inclusion of the timber root balls and timber posts, have created a great habitat for aquatic



Figure 2: Gangupka Moira (12.5ML), nesting boxes and WTP at the launch.



Figure 3: One of the very large Murray Cod caught and released in October 2023.

snails, and also for dragon flies, with mud eyes prevalent. BIFC members and GVW staff continued to catch fish and the photos provided showed they remained very healthy and growing during the development of the site (Figure 3). There has been no evidence of any fish deaths apart from fingerlings on either pond. A revegetation contract with Sandy Creek Trees was instigated to revegetate and soft scape the water's edge and surrounding areas, to enhance insect and aquatic life in and around the dams and improve water quality. Over 15,000 plants have been added to this site and will grow into significant parkland and native vegetation settings on the edge of Merrigum. Other innovations included:

- Solar pumps and interconnecting pipes were installed to provide aeration, mixing and dosing of the water.

- Pipework was also installed on the interconnecting bridge to enable easy connection of pumps to refill the 50ML dam from the channel as and when required.
- Fishing platforms were retrofitted from barges previously used to install a new floating cover on Shepparton's high rate anaerobic lagoon.
- All timber (poles and back chip) was harvested from GVW's irrigated tree plantation at the Shepparton wastewater management facility
- Application of bio-solids from the Shepparton wastewater management facility for establishing lawn areas

The project has evolved from an initial project budget of \$600,000 to being launched on 11 October 2023 and open to the public at a current cost of \$720,000.

The results of the project include three distinct areas:

Gangupka Moira – Park land setting around the 12.5ML pond, wetland and bird habitat

Burnanga Moira – Revegetation setting around 50ML storage connected by a 17m span bridge shown in Figure 4.

Merrigum WTP isolated securely from remainder of public access site

Dunyak Moira now provides two freshwater ponds as home to 100 advanced native fish for catch and release, and recreational space including revegetation gardens, carpark, walking track and bridge.

The project team has grown from the original partnership of GVW and BIFC to include adjoining landowners and Merrigum community leaders, with a team of Merrigum locals on a roster opening the site at dawn and closing at dusk, Friday to Sunday each week. A committee of management is now being formed with members of BIFC, local community, neighbours, to be chaired by GVW.

This is a home for Burnanga Indigenous Fishing Club (BIFC) who launched at the site on Sunday 25 November 2023. The cultural value of Burnanga (commonly known as Murray Cod) is highly significant for the Yorta Yorta people, as it is an important species of fish they use for dietary needs and serves an important role in environment and culture. Dunyak Moira will support the health and wellbeing of the local community and surrounding areas where various events and activities can take place.

For Dunyak Moira to be the preferred launch event site and home to a club information sign reflects the success of the project in the eyes of the BIFC members. Also, to have ten locals happy to open and close the gates over every weekend, and public holiday, and provide updates keeps the project growing and shows ownership by the local community as well.

Project 2: GAWARN BARING - Trawool

Gawarn Baring (Echidna Track), in Taungurung lands, is a 2.7km steep hiking track linking the Great Victorian Rail trail at Trawool along Falls Creek to the abandoned 100ML granite stone walled Trawool Reservoir and associated infrastructure.



Figure 4: View above Burnanga Moira (50ML) back to WTP.

The Taungurung people have a strong physical, cultural and spiritual connection to the Tallarook forest and Trawool area as both are a significant part of their Country, oral history and contemporary culture.

The Falls Creek catchment and granite rock formation in 1890 was also utilised for a granite quarry to construct a reservoir and headworks, with a pipeline that initially provided water to the railway line between Tallarook and Yea but also for supply to Seymour from 1895.

The granite block wall reservoir and initial section of pipeline became redundant around 1940 and continues to be owned by GVW with the assets and Falls Creek downstream located within Victorian Government-owned land (Figure 5). Previously, the reservoir and camp site could only be accessed by four-wheel drive and motorbikes through tracks managed by

Parks Victoria.

GVW applied for and received funding from the Department of Energy, Environment and Climate Action's Recreational Values Program, towards a co-funded project to construct and maintain a walking track linking the Great Victorian Rail Trail at Trawool to the Trawool Reservoir including Falls Creek. Grant funding of \$250,000 was provided towards the project's total estimated budget of \$355,000, with GVW contributing the balance, including in-kind contributions.

The Gawarn Baring project is 2.5km track starting from the Goulburn Valley Highway, travelling along the banks of Falls Creek, and then through bushland, rising a total of 278m to the retired 100ML Trawool Reservoir (Figures 6 & 7). At the reservoir, two fishing platforms and a toilet block are being installed.



Figure 5: The Trawool Reservoir Wall after clearing 20m frontage

It is a partnership project with Taungurung Lands and Waters Council (TLaWC) with construction and vegetation management delivered by BiiK Cultural Land Management, a TLaWC subsidiary entity who delivers the cultural land management: Healing, Reading and Caring for Country, with local contractors and stakeholders providing project team support. In Taungurung language Gawarn Baring means Echidna Track, selected as echidnas have been spotted along the track, with the platforms also named Wirrap (Fish) and Wirrang (Duck).

This project has also been supported with in-kind investigation, design and materials from consultants and GVV staff. Construction contractors, including Kelly (platform walkway and entrance), Fast Track (platforms) and CB & PS (timber poles) all provided input to the project. GHD donated in-kind design for the pedestrian crossing of the GV Highway linking track to the rail trail and undertook the CHMP investigation.

Daniel Reid, a senior operator with the GVV South West Operations team based at Seymour has been the field project manager. He instigated the siphon installation to lower the reservoir by 50ML to enable the investigation and installation of the fishing platform timber poles, again sourced from Shepparton's irrigated tree plantation. He has also overseen the construction of the walkways to the platform partnering with a local excavation company (Figure 8).

Daniel has also taken on the installation of the front entrance off the GV Highway which will be a combination of old pump and pipe fittings, to represent the history of water transfer and supply in the local region.

TLaWC have been embedded within the project team throughout and undertaken cultural assessments alongside GHD. The removal and management of the blackberry infestation along Falls Creek has encouraged downstream farmers to also manage their blackberry issues - this brings a holistic approach to land management to heal Country.

The construction has provided BiiK staff with the opportunity to work on Country and resulted in the identification of artefacts throughout the project.



Figure 6: Gawarn Baring – Project team trekking the walking track.



Figure 7: Gawarn Baring – BiiK team clearing the walking trail.

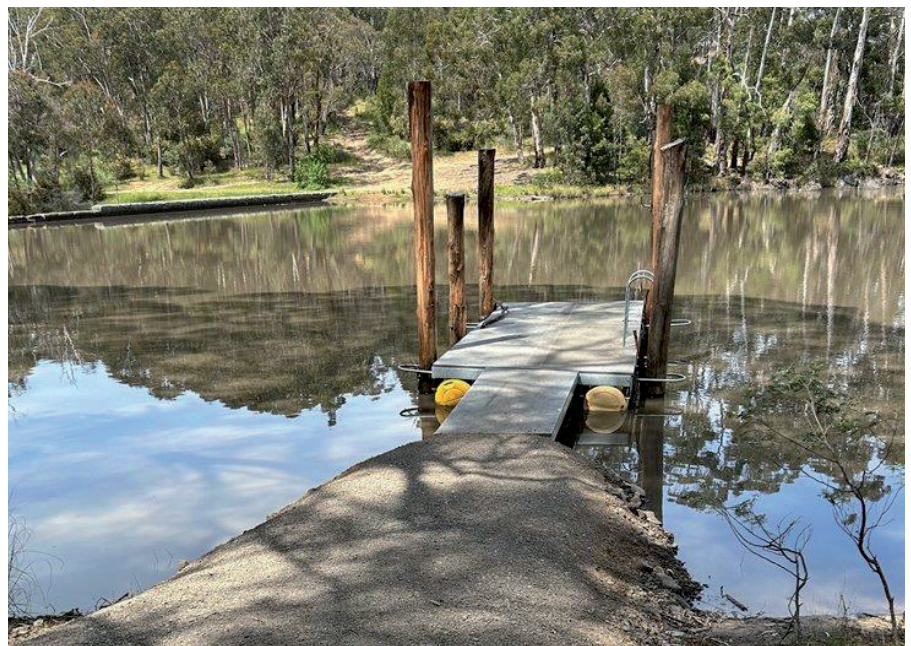


Figure 8: Fishing platform with reservoir wall in background.

This was from the first site visit and culminating in the CHMP 1m test pit for the toilet block, where a large number of unique and exquisite artefacts were discovered.

This project has also attracted in-kind donations of professional services, reused surplus materials, and included recycled water irrigated plantation timber. The same platforms and timber poles used at Duniak Moira were installed at Trawool, creating two new fishing platforms.

Flowing on from this project, the following benefits have also occurred:

- Numerous valuable artefacts have been discovered and logged
- GVW are engaging BiiK for an annual maintenance program of the track and reservoir wall frontage
- Parks Victoria has upgraded the access roads to and around the camp site
- Victorian Fisheries Authority has committed to including the Trawool Reservoir on the annual fish stocking program and will be providing 20,000 fingerlings of native fish per annum

- Neighbouring properties have been sold and new owners considering new opportunities for 'glamping' and weekend accommodation in line with the walking track's tourism potential.

The opportunity has also been taken to recognise some valued GVW staff with the naming of walking track and two abandoned pipe headwalls in honour of current and past employees. This has been appreciated by the individuals and their families.

The camp site is now open, and visitors are commenting on the improvement of the roads and addition of the fishing platforms. Over the coming months the signage, road crossing and toilet will be installed. The track is being used now, and provides a defined and safe passageway outside of private property between the rail trail and the reservoir.

Conclusion

These projects have been undertaken by GVW while still delivering core business water and sewer services, and have provided opportunities for variety in work, with the whole business embracing the projects.

Both BIFC and TLaWC, have been fully invested in the projects, and partnering with both from inception has been the key. The renaming of both assets to reflect both Yorta Yorta and Taungurung languages, and using this in the references as frequently as possible, has been effective and valuable. It has helped the acceptance of these sites as recreational rather than operational.

The enthusiasm of GVW's Board and Executive Team for Duniak Moira at its launch also reflects that the benefits and pride in these projects is fully owned by all at GVW.

I am sure that similar opportunities and projects exist across Australia and the benefits for the water agency, Traditional Owners, local businesses and the community are long term and very worthwhile.

The Author

Steven Nash (StevenN@gvwater.vic.gov.au) is Manager of Operations at Goulburn Valley Water in Victoria.

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ONE SIZE DOES NOT FIT ALL: A CASE FOR DIFFERENT LEARNING PROGRAMS

Winner of the Best Paper Overall at the 2023 WIOA Queensland Operations Conference

Janice Wilson, Reagan Whitehouse, King Intrapabo

Unitywater provides safe, high-quality and reliable water and sewerage services to the Moreton Bay, Sunshine Coast and Noosa communities. There are 17 Sewage Treatment Plants (STP) across these regions and until 2022, Unitywater staff operated and maintained 15 of the 17 plants. The Noosa STP was operated by Suez and the Redcliffe STP by TRILITY, for Unitywater under design-build-operate-maintain (DBOM) contracts. These contracts had a common expiry date for their initial terms of 30 November 2022.

The decision to bring the operations and maintenance of the Noosa and Redcliffe STP's in-house, reflects a recognition by the Unitywater Board that sewage treatment is something that the organisation excels at, and forms part of Unitywater's core business.

A Transition Project was established with an aim of delivering a smooth and seamless transition of operations and maintenance back to Unitywater.

The goals of the Transition Project were to:

1. Ensure a smooth and seamless transition of operations and maintenance to Unitywater.
2. Identify risks to compliance with the Environmental Authority and assist stakeholders to scope, plan and execute activities to identify these key risks, including upgrades, replacements and renewals.
3. Engage in a fair contractual process between all parties, and
4. Maintain positive relationships with the contractors.

The management of change throughout this entire process across the multiple stakeholders was a critical success factor for the project, along with developing and delivering a fit-for-



Figure 1: Aerial photo of the Redcliffe STP.

purpose training program for Unitywater operations and maintenance teams in the lead-up to handback.

This article focuses primarily on the transition of operations and maintenance to Unitywater, specifically with the knowledge transfer from the contractor teams to the Unitywater teams.

One of the critical success factors of the project was implementing a training program for the operations and maintenance teams, tailored for different learning styles. Key to this was being considerate about the impact of changes to the Unitywater teams inheriting unfamiliar plants. There was also the impact of changes to Contractor staff, noting that some had served on the plants for 25 years and it was a significant shift for them professionally and personally to demobilise from the plants. Knowledge transfer from the contractor operator to the Unitywater operator was critically essential and some contractors transitioned to work with Unitywater after handback.

Unitywater identified that structural

changes to their operations teams were needed to accommodate the two additional treatment plants. This was required to ensure that the balance of process complexity and work requirements were comparable between all cells (groups of operational staff, responsible for geographically grouped STPs) across the entire region. Operators were encouraged to voice concerns about the changes during regular engagement sessions with the cells impacted by the Transition Project. Internal staff (Process Engineer, Maintenance Planner) were seconded to the project to facilitate maintaining corporate knowledge of the treatment plants.

Learning as an Adult

Unitywater provided leadership and direction with the development of operations and maintenance training programs.

In developing the training program for the Transition Project, it was important to understand the learning and development journey for an adult.

Adult learning theory is based on five assumptions, shown in Figure 2. These include that adults are self-directed; they have experiences they can apply to their learning journey; they have a level of readiness and want to learn things that are relevant to their context; they are engaged in learning that is problem-centred and practical; and they are motivated by various drivers including job satisfaction, self-esteem, personal and professional growth and development.

Training Development

With the support and feedback of the operators, the program was structured to consist of theoretical training, on-site training, followed by a comprehensive shadowing period for three months prior to handback. Maintenance training which included collaborative engagement with the existing Contractors was targeted to focus on equipment unique to the plants, with shadowing occurring for specific maintenance activities such as screens inspection and pump de-ragging. This included the use of wearable technology (Hindsite) by our Operators.

The training program started at both sites with a tour of each plant with the Contractor and operations leadership (Figure 3).

This was followed either by online training using videos, visuals, drawings and comprehension tests, or by virtual workshops facilitated by the Contractor plant manager and Contractor process engineer. The online training courses allowed operators to conduct training at their own pace, and the virtual workshops facilitated real-time questions, although recordings of these workshops were available for review after.

On-site operations training started with hands-off shadowing, where a Unitywater operator would follow a Contractor operator for the day. Once suitably familiar with the rhythm and routine, the Unitywater operators were assigned tasks done under supervision, and eventually tasks done independently with Contractor operators available for assistance, if needed.

Training intensified as the Transition Project shifted in the Organisational/Operational Readiness phase (3 months to handback) with a checklist of tasks created at each site (Figure 4). Throughout the course of this training

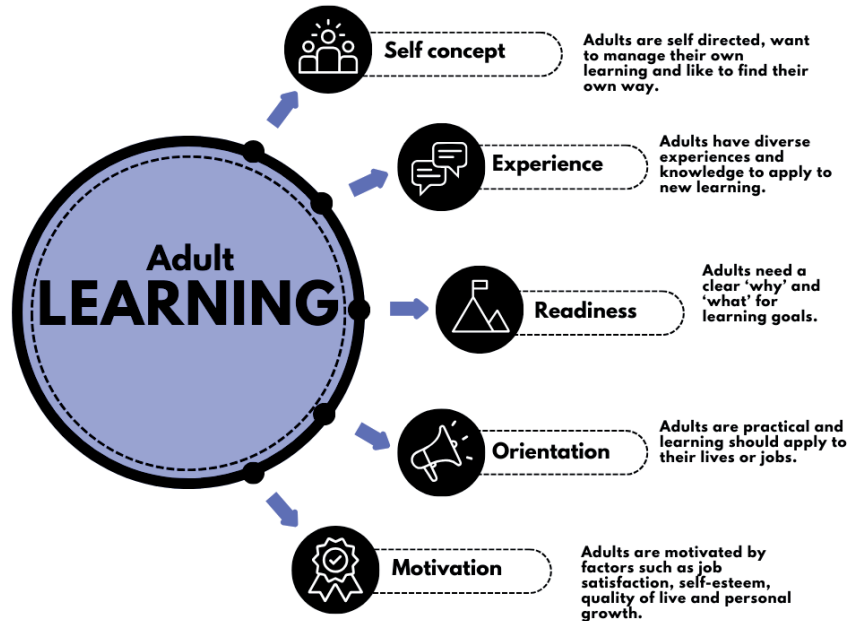


Figure 2: Adult Learning: The Art and Science. Adapted from The Instructional Design Australia (2023) and M. Knowledges (1984).



Figure 3: Tour of Redcliffe STP with Unitywater and Contractor staff.

program, it was identified that one size does not fit all operators, with multiple approaches and tweaks needed for our learning journey.

Hindsite and the Use of Wearable Technology

The use of wearable technology for recording and capturing routine and non-routine operational and maintenance activities was trialled as part of the Transition Project as a response to more stringent COVID restrictions in August 2022. During the shadowing phase, operators and maintainers had

the ability to wear either a hands-free, voice-activated headset video recorder, or use their mobile device to capture critical information required to operate each STP. This helped to manage the workplace health and safety of our critically essential operations staff while ensuring continuous operation of the STPs.

All content was directly uploaded to the Hindsite web-based portal where it was named with a brief description, geographically tagged, and stored in appropriate digital workplaces.

This content could be recalled both back in the field and from any personal computer or mobile device, which could be used for training and support material in the early operations phase after handback.

One of the challenges of the Transition Project was the operation team responsible for operating the STPs on handback (seven Operators and one Treatment Plant Coordinator), also had to operate the three other STPs in their “Cell” while the Transition Project was underway. This meant that not all operators had the ability to spend much time onsite during the shadowing phase. As there were only between six and three months to transfer over as much information as possible, Hindsite was an efficient way to capture this information, facilitate familiarisation with the routine and rhythm of day-to-day operations and make it available to the operators that could not be onsite on the day of the training event.

In hindsight (no pun intended), a longer lead-in and operator engagement period should have been undertaken to facilitate uptake of this learning opportunity. A significant amount of change was already taking place and the uptake of a brand new product and technology during the Transition Project was limited. For future integration with operations learning and development, due consideration should be given to the diversity of demographics and openness to new technologies. Uptake was reasonably high for those who were used to trialling new technology and incorporating that in their learning and development.

CONCLUSION

What worked well during this learning and development program included:

- The hands-on shadowing phase was the most effective learning phase based on operations and maintenance feedback.
- Dedicated resources to manage this project and ensure quality outcomes helped facilitate the learning journey. This was specifically true for having a process engineer dedicated to the project who was able to assist and complement the learning material whilst learning it themselves.
- All stakeholders involved from



Figure 4: Checklist at Redcliffe STP for handback.

Unitywater and both Contractors were genuinely motivated for a successful outcome.

- Transferring employment of some of the contractor staff over to Unitywater after handback and keeping a subject matter expert on for a period post transition as a “dial a friend” option assisted with the seamless transition.

Some challenges included:

- Change management fatigue for the operations team: the operations team underwent a significant amount of change in a short period of time, from a structural change to learning a new process while maintaining business as usual with their other STPs.
- The change in business model from an operator/maintainer-run plant back to separate operations and maintenance business model required a significant amount of effort to unpack and then ensure all risks were addressed in the transition.
- Transferring all the STP knowledge over to operations and maintenance in a compressed period of time (approximately six months, realistically three months). There are a lot of idiosyncrasies within STPs which can take years to learn. A lot of these were picked up in the Transition Project, but not all of them. There continues to be learning

opportunities post handback, which is reflective of the general water industry experience operating and maintaining STPs.

It is important to note that a variety of learning options suit a diverse range of adult learners. Providing opportunities for operations and maintenance staff to “self-serve” along their learning journey so they can manage their own learning is important. It’s also essential to be able to apply the practical learning content as soon as possible, which is essential for learning hands-on tasks such as formic acid cleans on diffusers.

Throughout the course of this training program, we found that one size does not fit all operators, with multiple approaches and tweaks needed for our learning journey. The feedback for the online training modules was overwhelmingly positive due to the quality, specificity and amount of detail and accompanying resources (standard operator procedures, unit process guidelines, online training modules). The hands-on operator shadowing was also well received but was highly dependent on the motivation, knowledge and communication skills of the Contractor operator and the experience, curiosity and willingness to learn of the Unitywater operator.

Acknowledgements

We would like to sincerely thank every operator and trade who participated in this program, from Suez, TRILITY and Unitywater. We appreciate the trust they placed in us to develop and roll out a program that was essential to the successful delivery of their duties as front-line stewards of public health, safety and environment. Without the unreserved support for learning and development from the management and Executive team at Unitywater, undertaking a program of this type would not have been possible.

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WATERABLE – A NETWORK IMPROVING DISABILITY INCLUSION

Llewellyn Prain

Increasingly, organisations are embracing the benefits of workplace diversity and inclusion.

Launched in 2020 with the help of the Victorian Water Industry Association (VicWater), WaterAble is a network for people with disability and their allies in the water industry. This year, WaterAble has changed its structure and is now open to partnering with organisations in the water industry from across Australia.

The network has two very clear aims

- to improve disability inclusion in the water industry, and
- to support people with disability to grow their careers in water.

WaterAble Chair and Goulburn-Murray Water Corporate Risk Coordinator Donald Hughan is committed to ensuring the network is all about raising awareness of disability and its diversity of forms, whether it's a physical or an invisible disability.

Organisations are encouraged to look at what they can do to improve their workplace disability inclusion, including workplace access and recruitment programs.

WaterAble partners with water corporations and service providers and currently has around 50 members who are employees in the water industry.

It has been really exciting to see some of the WaterAble members participate in advocacy and connect in our industry. There are still huge barriers for people with disability gaining employment and pursuing their careers, and we want to reduce those barriers as much as possible.

While WaterAble launched in 2020, Llewellyn's decision to found the network was inspired by my own lived experience with disability. There was also



Figure 1: Llewellyn Prain WaterAble founder and National Coordinator, Donald Hughan WaterAble Chair, Jo Lim VicWater Chief Executive, Matt Iversen WaterAble Deputy Chair (L to R)

an appetite for change that had been developing within the Victorian water community.

I lost most of my vision in 2014, and entered the water sector in 2015, when I was appointed to the Board of a Victorian Water Corporation. I wanted to work to improve equity for people with disability, particularly in terms of workforce participation.

WaterAble is really grateful to VicWater, and its Chief Executive Jo Lim, for their longstanding commitment to improving diversity and inclusion outcomes and now working more formally to support the new national WaterAble structure.

WaterAble has also been really fortunate to have people such as Donald Hughan on board to help drive the whole thing.

While it is great to have allies, it is important to have people with lived experience guiding what the organisation does.

WaterAble has now held two Day of Action workshops, which have been attended by people working in water from across Australia. The aim is to co-design three or four disability inclusion actions to be implemented by 3 December each year – International Day of People With a Disability.

The actions aim to be low effort and high impact in terms of improving disability inclusion across the industry. The workshops also enable the industry to share best practice and progress.

WaterAble has supported participating organisations by providing simple toolkits to help people implement these actions. It is fantastic to see the results with most participating organisations fully implementing the WaterAble actions.

The inaugural leadership development program for people in the WaterAble community has been staged in 2023. Llewellyn noted that she loved delivering this program, which is all about exploring leadership frameworks, clarifying our participants' goals and helping them to focus on how to maximise their impact.

Other activities WaterAble runs each year include:

- A fully accessible event to celebrate the International Day of People with Disability – 3 December
- Specific programs for members, including peer mentoring with leaders in the water industry, leadership development programs and opportunities
- Forums and information sessions to improve disability awareness.

This movement is about amplifying the voices of people with disability and making sure we are included and valued in our workplaces, and making sure

people are genuinely enabled to pursue meaningful careers in water.

It's also really great for our partner organisations, as it helps them to understand the communities they serve. We cater to customers with a disability every day, but the network helps water companies understand what disability really is, in all its diversity.

If anyone is interested in learning more about or partnering with WaterAble, please visit the website at www.waterable.com.au

The Author

Llewellyn Prain (praininclusion@gmail.com) is WaterAble Founder and Greater Western Water Deputy Board Chair.



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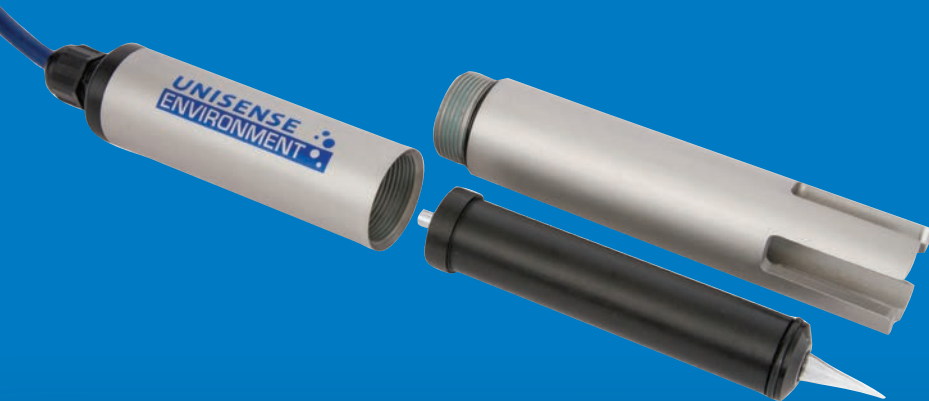
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