

## Draft NSW Water Strategy submission form

The NSW Water Strategy will be the first 20-year water strategy for all of NSW. It will provide a blueprint to help us tackle the key challenges and opportunities for water management across the state.

For more information about the strategy or to download a copy of the strategy, please visit [dpie.nsw.gov.au/nswwaterstrategy](https://dpie.nsw.gov.au/nswwaterstrategy).

## Your voice is important

We would like to hear your views on the draft strategy, including whether you think it identifies the right priorities, challenges, opportunities and actions.

Please provide your feedback in the submission form below and email your completed submission to [nsw.waterstrategy@dpie.nsw.gov.au](mailto:nsw.waterstrategy@dpie.nsw.gov.au) or post to NSW Water Strategy, Department of Planning, Industry and Environment, Locked Bag 5022, Parramatta NSW 2124 by **28 March, 2021**.

The form will take approximately 15 minutes to complete and your response can remain anonymous if you wish (see question 1).

Questions marked with an asterisk (\*) require an answer.

If you have any questions about making a submission, please email: [nsw.waterstrategy@dpie.nsw.gov.au](mailto:nsw.waterstrategy@dpie.nsw.gov.au)

## Making your submission public

We collect information about you, which may include personal information, to assess submissions in response to the department's dealings and activities, and to perform other functions required to complete the project. This information must be supplied. If you choose not to provide the requested information we may not be able to assess your submission.

To promote transparency and open government, we intend to make all submissions publicly available on our website, or in reports. Your name or your organisation's name may appear in these reports with your feedback attributed, unless you have chosen to remain anonymous.

**If you would like your submission and/or feedback to be kept confidential, please let us know when making your submission.** You will be asked for your confidentiality preference at question 1.

If you request that your submission be kept confidential, it will not be published on our website or included in any relevant reports. However, it will still be subject to the *Government Information Public Access Act 2009*.

Your submission will be stored securely consistent with the department's Records Management Policy and you have the right to request access to, and correction of, your personal information held by the department.

Further details can be found in our privacy statement available on our website: [industry.nsw.gov.au/privacy](https://industry.nsw.gov.au/privacy)

## 1. Information on confidentiality and privacy\*

I give permission for my submission to be made publicly available on the NSW Department of Planning, Industry and Environment website.

- Yes  
 No

I would like my personal details to be kept confidential.

- Yes  
 No

## 2. Your details

Name\* [REDACTED]

Contact phone number\* [REDACTED]

Postcode\* [REDACTED]

Email address\* [REDACTED]

Do you identify as an Aboriginal person?

- Yes  
 No

Are you an individual or representing an organisation?\*

- Individual  
 Organisation

## 3. Organisation or business details

### Who do you represent?

- Government Please specify
- Peak representative organisation Please specify
- Local Water Utility
- Other (please specify) BAYVIEW GOLF CLUB LIMITED

### Which aspects of water management are most important to you?

The most important aspects of water management are Priority 1, 3, 4 & 7: build sustainable water resources for thriving people, places and ecosystems, both now and for future generations.

Inna Water demonstrating a successful WASTEWATER RECYCLING plant at Bayview Golf Club want to demonstrate the benefit of recycled water for turf management. Northern Beaches Council plans to increase the population of the local government area by up to 36,000 by 2036 so the benefit of the recycling plant will be less treated sewer going to the Warriewood Treatment Plant and Turimetta Point ocean outfall. To supply water to a growing Australian population it is critical that recycled wastewater becomes the backbone of water supplies. The patented core technology used at 1770 (an ecotourist development in QLD see attachment) is the Inna Water Sonic Disinfection Unit (SDU) developed by Australian Inventor Mr. Tony Dickson and is the result of many years of research. The innovative solution would have enormous benefit in Regional Australia and Indigenous communities (Priority 2), as well as developing countries, for the provision of Class A water from wastewater. Benefits of the wastewater recycling model are:

1. the model is replicable across all golf courses, parks and sporting fields
2. the processing unit footprint is 50 sq meters (Biological STP are around 800 sq meters)
3. the plant can be switched on and off at will. (Biological STP must remain working even in wet conditions)
4. the power consumption of the unit can take advantage of renewable power, especially solar and power consumption is 30% of a Biological STP.
5. Inna Water's plant uses no hazardous chemicals.
6. the plant produces no odours and is nonintrusive, able to be soundproofed.
7. the cost is more competitive than a Biological STP.
8. the plant will not produce an activated sludge and will only return pre-existing BOD and food related solids to Warriewood STP thus reducing hydraulic loading.
9. the plant will completely destroy all known viruses, bacteria and pathogens and reduce phosphorous and ammonia and other nutrients further reduced by the dam aeration system.

It is possible to extract from the Sydney Water wastewater system 1ML of water per day. This removes the need for Sydney Water to augment its overloaded sewer treatment system. Water extractions can be conducted during peak flows through the day stabilising and diminishing flow, with the ability to turn on and off as required, something existing treatment systems cannot do. The process does not return sludge to the sewer system and leaves the bacterial food intact so that Sydney Water processes can continue unhindered.

After designing the mixing equipment for Sydney's drinking water at Prospect Water Authority NSW, Anthony set out to find a better way of disinfecting water. After many years of research he has finally been able to disinfect water without chemicals. Now Inna Water has the opportunity to deliver safe water for irrigation, enabling one of the Premier's Priorities of quality green open spaces. The operation of the Inna Water Treatment Plant (IWTP) is completely non-biological so does not require constant operation. (Biological plants such as Membrane Bio-Reactors (MBR) must remain operative to keep the working bacteria alive) (MBR produce massive amounts of sludge, requiring complex risk based sludge management regimes and procedures.)

Priority 7: Enabling a future focused, capable and innovative water sector is a valuable strategy if regulators can get behind and promote innovation because existing technologies are not suitable for all applications and there is resistance to innovation in the water industry. Bayview Golf Club wants to do more with less by employment of innovation and new technologies to reuse the wastewater that otherwise would go to the ocean. There is an opportunity for the NSW State Government to Pilot the technology with the complete support of Sydney Water at Bayview Golf Club where there is a large rising main that flows to the Warriewood STP. This plant is already at maximum capacity and with the predicted increase of up to 36,000 people in the Northern Beaches over the next 10 years, Warriewood treatment plant would require significant capacity expansion to cope with the increase in sewage. A pilot demonstration of this technology costing \$500,000 and a Water Management Plan conducted by Royal Haskoning DHV for \$50,000 could benefit both Aboriginal and Regional communities who may adopt it. (Priority 7 & 2) As open green space, the secure supply of water enables the ecological and drainage connectivity of the wildlife corridor and floodplain, supporting the flora and fauna of the wetland and Pittwater estuary with clean water flows. (Priority 3)

## Which objectives are most important to you?

The ranking is as follows:

- 1) Water sources, floodplains and ecosystems protected
- 2) Protecting public health and safety
- 3) Liveable and vibrant towns and cities
- 4) Contribute to a strong economy
- 5) Orderly, fair and equitable sharing of water
- 6) Cultural values respected and protected

For Australia to really grow and have competitive and liveable cities, Australians need to embrace potable water reuse as one of its sources going forward. In Sydney, when Warragamba Dam is full, the city claims four years available water supply. Bayview Golf Club, like most commercial entities, is extracting more water year-on-year, despite awareness of decreased water supply. In the current environment there is an increasing need to recycle wastewater for irrigation in real time and deliver a system to turn on treatment as required. For this criteria, Mechanical Non-Biological Treatment (MNBT) is best suited. Inna Water's patented Sonic Disinfection Unit (SDU), Ozone Dosing and Activated Glass filtration will deliver a quality of water with the required disinfection to meet national and local recycled water guidelines. Inna Water proposes to tap into the sewerage pumping station well situated adjacent on the Bayview Golf Club land, extracting 20,000 L/hr and treat this wastewater to a level which can be used for irrigation of the golf course. During a typical dry spell, Bayview Golf Club consumes up to 0.5 ML per day of quality drinking water for irrigation purposes. The secure supply of Class A water will protect the ecosystems and floodplains of the wetland as a wildlife corridor between Katandra Bushland and Pittwater estuary. Bayview Golf Club Water Security group whose members include Sydney Water representatives will complete a Hazard & Operability Study by April 2021.

## Which principles are most important to you?

The ranking is as follows:

- 1) Water is a limited (although recyclable) resource
- 2) Forward thinking to build preparedness and resilience
- 3) Healthy environments sustain social and economic outcomes
- 4) Systems thinking to optimise outcomes
- 5) Data-enabled planning and decision-making
- 6) Transparency and accountability to engender community trust
- 7) Giving effect to Aboriginal rights and access to water

Bayview Golf Club and Inna Water were inspired to:

- 1) Mitigate the effects of climate change on golf course turf management;
- 2) Assist in removing negative environmental effects due to the degradation of water bodies and ecosystems where inadequately treated wastewater is discharged from the Warriewood WWTP;
- 3) Align with NSW Govt. Greater Sydney Region Plan to increase water recycling in Sydney, which aims to increase water recycling in Sydney to 70 billion litres per year; contributing to save 145 billion litres of water per year through water conservation and improving the environmental health of wetlands and catchments through actively managing water for the environment. The UN reported that the world is not on track to meet its Sustainable Development Goal 6. In summary, the most important principles to Bayview Golf Club are water recycling to create resilience and environmental health and demonstrate that this project could be rolled out across regional NSW to augment available water across the nation.

Do you have any comments on the seven strategic priorities which are:

1. Build community confidence and capacity through engagement, transparency and accountability
2. Recognise Aboriginal rights and values, and increase access to and ownership of water for cultural and economic purposes
3. Improve river, floodplain and aquifer ecosystem health, and system connectivity
4. Increase resilience to changes in water availability (variability and climate change)
5. Support economic growth and resilient industries within a capped system
6. Support resilient, prosperous and liveable cities and towns
7. Enable a future focused, capable and innovative water sector

**Comment:**

Capping the use of available water resources should be supplemented with increasing the supply of water by recycling. This should be the number one action to improve water management. Bayview Golf Club's new technology pilot would demonstrate how communities could recycle water supporting all the strategic priorities above.

**Do you have any comments on the 41 actions to improve water management across the state?**

**Priority 3**

**Actions:**

- 3.1 Implement NSW Long Term Water Plans to protect and enhance ecological systems
- 3.2 Take landscape scale action to improve river and catchment health
- 3.3 Take action to address threats to native fish

**Priority 4**

**Actions:**

- 4.3 Improve drought planning, preparation and resilience
- 4.4 Better integrate land use planning, development approvals and water management

**Priority 5**

**Actions:**

- 5.1 Provide greater certainty to regional businesses that rely on secure access to water
- 5.2 Invest in R&D and new technologies to lift water productivity in NSW industries
- 5.3 Improve the operation and transparency of water trade in NSW
- 5.4 Identify infrastructure and operational options for each region of NSW

**Priority 6**

**Actions:**

- 6.1 Increase resilience to changes in climate and water availability in Greater Sydney
- 6.2 Work collaboratively with local water utilities to reduce risks to town water supplies
- 6.3 A new Town Water Risk Reduction Program
- 6.4 Continue to deliver the Safe and Secure Water Program
- 6.5 A new state-wide Water Efficiency Framework and Program
- 6.6 Proactive support for water utilities to diversify sources of water
- 6.7 Investigate and enable managed aquifer recharge
- 6.8 Promote and improve Integrated Water Cycle Management
- 6.9 Enable private sector involvement in the NSW water sector
- 6.10 Foster the circular economy in our cities and towns

**Priority 7**

**Actions:**

- 7.1 Pilot new technologies to increase our water options
- 7.2 Collaborate to harness new research, innovation and technology
- 7.3 Invest in water sector workforce and capability

**Comment:**

Priority 7 Actions can be supported by Bayview Golf Club's new pilot model. This is a local solution to support the local workforce and capability with implications for the whole State. Local solutions managed at a local level for the communities they serve rather than through large bureaucratic centralised organisations.



## **Are there any additional opportunities, risks and challenges that should be in the draft strategy?**

For Australia to really grow and to have competitive cities and liveable cities, we have to embrace potable reuse as one of our supplies going forward. There are inland towns which came very close to having to build recycled water plants at the end of the millennium drought. That's really going to be the next viable option (for those towns) ... they will have very few choices and they will be pushing to be able to develop potable water recycling schemes in order to sustain their communities and cities. The compass direction changes, but the trend is the same for all coastal capital cities: population growth is moving away from the coast and away from desalination plants so that is not an option. The only real option is Bayview Golf Club's recycled wastewater plant to increase the supply of water. Ignoring this solution and focussing on water allocation alone ignores the opportunity to increase supply and meet the demand from industry, agriculture, regional and aboriginal communities, and the green spaces of urban cities

## **What actions should be prioritised for immediate implementation and how should they be implemented?**

The further we pump desalinated water inland, the more we're working in a direction that is opposite to the way our water supply systems are designed and operate. Bayview GC believes we should establish local wastewater recycling instead of large centralised water supplies that require large capital and energy inputs to pump and circulate water. NSW Government ought invest in Bayview Golf Club's pilot wastewater recycling plant to exhibit to the State a viable solution to increase supply.

## **Do you have any other comments on the draft NSW Water Strategy?**

Desalinated water costs roughly twice as much to supply as recycled water and that's before you add the costs of a pipeline. It would be much easier and cheaper to recycle water from a wastewater treatment plant close to where water is being used and to make use of existing infrastructure.

The following is an example of test results from a Townsville test plant similar to the one proposed:

## **TOWNSVILLE SEWER MINING PILOT TEST PLANT AND RESULTS 2-3rd April 2017**

Inna Water conducted a pilot test in Townsville

The sewer effluent was high in Grease and Oil so it was a good sight to do the tests.

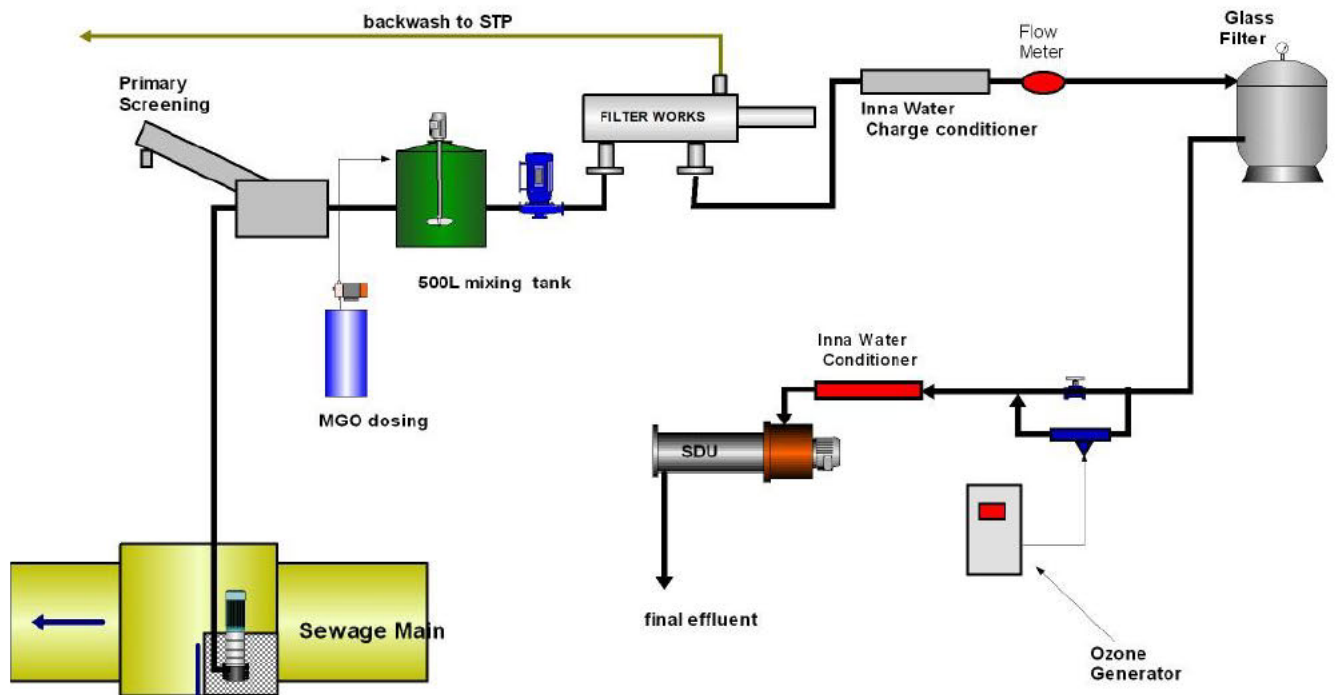
Below is a photo of the modified test unit.



**Plant operation.** Sewage is pumped from the sewer main to the primary screening system. (This system is designed to remove large solid matter and rags). A portion of the influent is sent to the 500 Litre holding and mixing tank. A small amount of MGO is dosed and mixed with the influent and then pumped to the flow works filter where secondary filtration occurs removing small to medium size suspended solids. The automatic back wash from the Flow Works filter was returned to the existing Sewage Treatment Plant (STP).

The influent is then put through the Inna Water charge conditioner that is designed to assist in coagulating the fine suspended solids by creating charged particles that attract each other, making them larger so the glass filter can collect the suspended solids.

## TOWNSVILLE SEWER MINING TEST PLANT



Glass was chosen due to its superior ability in trapping suspended solids and the ability to release solids when backwashing. *Activated glass is far more effective, unfortunately we were unable to acquire the product before testing.* Ion Exchange media such as Zeolite was not considered as it can get coated with the O&G and will need to be backwashed with a high pH solution such as caustic (NaOH). This will take up the sodium and when used as a filter will exchange the Ammonia for the sodium which will be in the final effluent. Sodium is unsatisfactory for the grasses. The effluent is then dosed with Ozone prior to going through the Inna Water conditioner. The conditioner is designed to assist creating micro and Nano bubbles when put through the SDU. The final effluent was then returned to the existing STP.

### Testing

Date 2 April 2107

All test samples were carried out by ALS laboratories.

The influent flowed through to the 500 L mixing tank where it was filled to max then mixed to ensure consistency in the sample being taken.

This is sample 1 marked "Raw Effluent" (ET1700556001)

#### Results

Turbidity	280 NTU
O&G	129 mg/l
BOD	200mg/l
Faecal coliforms	2,500,000
E.coli	1,700,000

O&G in this sample is quite high and could be due to the time of day due to cooking and discharge from restaurants.

The influent then passed through the Flow works filter and through the glass filter and through the SDU. The SDU and the Ozone was turned off as I wanted to determine the efficiency of just the filtration process.

This is Sample 2 marked "Final Effluent Pre SDU" (ET1700556002)

#### Results

Turbidity	140 NTU
BOD	128 mg/l
Faecal coliforms	370
E.coli	100

The result showed that the Glass Filtration was very effective in reducing the faecal coliforms and E.coli without disinfection and reducing BOD. This is good as it increases security for the final disinfection process. Giving a log 4 reduction

The SDU, and Ozone was then turned on. A sample was taken post SDU.

Sample 3A Marked "Final Effluent Ozone Only" ( ET1700556003)

#### Results

Faecal Coliforms	less than 10 counts in 100mls and no target organisms found.
E.coli	less than 10 counts in 100mls and no target organisms found.
Redox reading	160mv

#### Results

O&G	<5mg/l
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Two testing times were completed this day. One in the morning at 9AM and one at midday.

The tests in the morning began with collecting samples of the raw influent in the 500 L mixing tank and the same procedure as previous.

Sample no is 5 and is marked "Incoming sewage" (ET1700557003)

## Results

Suspended solids.	346mg/l
O&G	37 mg/l
BOD	130mg/l
Faecal coliforms	88,000
E. coli	1,600

Sample 7A marked "Final effluent" (ET1700557002)

## Results

Faecal coliforms	<10
E. coli	<10
Redox	150mv

Sample 8 marked "Incoming Sewage" (ET1700557006) prior to treatment

## Results

Suspended solids.	366mg/l
Turbidity	237ntu
O&G	243mg/l
BOD	133
Faecal coliforms	170,000
E. coli	145,000

Sample 9 marked "final influent" (ET1700557007) after treatment

This sample was with the ozone and CLO2

## Results

Suspended solids.	20mg/l
Turbidity	31.1
O&G	9mg/l
Faecal coliforms	<10
E. coli	<10
Redox	310mv

Sample 9A marked "Final Effluent ozone only" (ET1700557008)

## Results

Faecal coliforms	<10
E. coli	<10
Redox	170mv

## Conclusion

The test results show that the process will reduce O&G Suspended solids Faecal Coliforms and E.coli to acceptable limits to meet the required licence parameters. It has also demonstrated that ozone and the SDU are effective in disinfecting. (Previous Tests with the SDU at sunrise at 1770 shows a log 7 reduction in Viruses)

With more sophisticated mixing systems and more suitable filtration. Using deep bed activated glass filters the results will improve significantly in suspended solids, O&G and BOD. And reduction in faecal coliforms and E-coli. Although the test filtration process shows a log 4 reduction. The guide lines will only accept a maximum of log 4. In Sample 2, it showed a reduction in BOD from 200mg/l to 128mg/l. This is a reasonable reduction and hypothetically you will get the same reduction with good filtration, such as activated glass and much larger filters. (Well documented by other filter companies) This will bring the amounts to as low as 40, Which is more than adequate for irrigation, detention time in an aerated pond will get the BOD down to 20. However where there are open ponds there is bird life such as ducks and this will greatly reduce the quality of the water in the pond and naturally increase BOD.

# BAYVIEW GOLF CLUB - SUPPORT FOR NEW TECHNOLOGY PILOT TO INCREASE WATER THROUGH THE NSW GOVERNMENT WATER STRATEGY.

VAN RYS, DEREK <derek.vanrys@sydneywater.com.au>

To: [REDACTED], [REDACTED], [REDACTED], [REDACTED], Bayview Golf Club GM  
<gm@bayviewgolfclub.com.au>

Hi [REDACTED]

Sydney Water fully supports the recycled water initiative that Bayview Golf Club is undertaking. The use of recycled water to irrigate the course is strongly supported by our corporate strategy. Sydney Water is moving towards a "circular economy" approach to delivering services for our customers. The recovery of water resources and nutrients from the nearby wastewater assets is a good example of this business direction we are following. There are a couple of similar schemes already running in Sydney.

The technology offered by Inna Water as the treatment process is also of great interest to Sydney Water. The process may have some technological advantages over some of the more traditional recycled water processes. The process does not rely on biological processes to achieve water quality goals, this makes the process potentially more resilient to variable operating conditions that will arise over the life of a recycled water scheme. Sydney Water is keen to see how this technology performs as it may open up new recycled water projects within our area of operations.

I have attached Sydney Water's current 10 year Strategy. The two focus areas that support this project are:

- Embracing a circular economy
- New products, services & markets

Regards,

Derek van Rys  
Senior Project Manager  
Business Development