



Healthy Hunter Rivers (HHR – formerly No Tillegra Dam Group)
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Submission - Draft NSW Water Strategy - The Lower Hunter Region

Healthy Hunter Rivers Group has a particular emphasis on a sustainable approach to water supply. For this submission, we will focus on the general principles of the *Draft NSW Water Strategy* within the context of the Lower Hunter region as it pertains to how *Hunter Water Corporation* manages its water supply. We have taken this approach because we believe *Hunter Water* need to take a more diverse, integrated, sustainable and flexible approach to water supply/security, whilst following current research/technology and best practice.

We need to do things differently – the climate is changing

With climate change and its consequent severe weather events, evidence shows diversity of source options to be the key. *Infrastructure Australia* has recently supported this view.

In climate change warnings recently released by the CSIRO and BoM, there is an expected increase in extended dry periods and droughts becoming longer and more severe, a predicted reduction in rainfall frequency and streamflow runoff, fewer East Coast Lows and increased evaporation from water storages.

The report goes on to say, *"It is important to recognise that climate change is not only about potential changes in average rainfall. It is also expected to involve greater volatility and duration in rainfall patterns. This may potentially result in a greater chance of being at relatively low storage levels necessitating a greater reliance on water restrictions."*

"Climate change is also about a higher level of uncertainty regarding future supply. That is, there is no information about the probability of the extreme events occurring. In situations of increased uncertainty water supply strategies that offer greater flexibility in responding to new situations are likely to be more 'valuable' compared with those more traditional approaches."

These predictions are re-enforced in the **2021 NSW Draft Water Strategy** which states the following:

"The recent drought highlighted many vulnerabilities in metropolitan and regional water services in NSW. These vulnerabilities indicate that we need much better long-term strategic planning and to fundamentally rethink and improve how we use and manage water."

"We must plan and prepare for a future where we may need to deal with more extreme and more frequent droughts and floods than we have experienced in the past. This means that we need to reduce our reliance on traditional climate dependent water sources to supply our towns, cities and industry, while protecting the communities and natural environments sustained by our waterways."

"Our water supplies in NSW could be less secure than we thought. This is because we now understand that droughts longer than those of the last 130 years are likely at some point, and that we could also see higher temperatures and less rainfall. Projected changes in

rainfall patterns, warmer conditions and increased evaporation will impact future water availability. The frequency, intensity and duration of droughts are also predicted to increase, which may affect water quality and the ecology of our rivers.”

The NSW Productivity Commission Green Paper (2020) also highlights many of the key challenges facing the water sector. It notes:

- “the risk that traditional rainfall-dependent water supply will become less reliable as demand pressures grow, and that the combination of population growth, changing climate and ageing infrastructure will test the water sector’s ability to meet the evolving water needs of NSW.”
- “The overall message from new modelling is that our water supplies in NSW could be less secure than we thought. This is because we have now factored in that droughts longer than those of the last 130 years are likely at some point and potentially to reduced river flows and more frequent low flow periods, decreased inflows into dams and water storages, and lower water storage levels.”
- “Climate change means that NSW will confront more frequent and more severe droughts, temperature and storm events. Over the next two decades, towns and cities should aim to transition to more secure water storage options, diversify water sources and increase the proportion of non-rainfall dependent sources. At the same time, we should invest in more efficient and valued uses of water by households and industry. We will also need to better integrate the way that we capture, provide and manage urban water through land use planning and urban design.”
- “Use diverse water sources for greater water security
- “Many regional towns are dependent on a single source of water for town water supply. This makes them particularly vulnerable to drought, as well as other incidents that could compromise the availability or safety of water supplies. Diversification of water sources—which may be across surface water and groundwater, recycling and desalination—and the use of other standards of water for non-drinking water purposes can significantly improve water security.
- “Stormwater and recycled water remain largely underused water sources with significant potential to improve water security for towns and communities. Options may include purified recycled water for drinking. Recycled water also provides options for supplying fit-for-purpose water for industry and agriculture, and for maintaining ‘green’ spaces—reducing reliance on drinking water supplies and relieving the pressures on the wastewater system.”
- “The Government will support water utilities to diversify sources of water including The outstanding highlight of this NSW Draft Water Strategy is clearly the need to diversify water sources and increase the proportion of rainfall independent sources.”

Hunter Water stated in their December community engagement meeting that: “the challenge is drought”, and that “storages fall 1% per week in severe drought”.

Total storage levels fell from 88.5% to 52.6% in the 15 months from October 2018 to February 2020.

Hunter Water total storage has never been at 100% capacity in the last 40 years.

Net evaporative losses from Hunter Water storages is in the order of 60,000 ML/year (around 90% of average supply). Add this to the real water losses (leaks) of about 6,000 ML from the supply system each year and the system is losing approximately as much water as it supplies each year - a very inefficient and wasteful water supply system, particularly when they are paying to pump the water which is subsequently lost from the supply system

During the recent drought, because of either lack of water or water quality issues in Seaham Weir.

- According to Hunter Water, just over 3% (2,449 ML) of their average annual allowance (78,500 ML) of water was able to be transferred from Seaham Weir to Grahamstown dam in 2019.
- In the last six years to November 2020 an average of only 53% of the average annual allowance of water was transferred.
- Over those six years, 222,000 ML of the allowance was unable to be sourced from the Williams River.
- To put that in perspective, Hunter Water customers consumed just over 66,000 ML last year.
- So that is more than 3 years supply, that either wasn't available, or wasn't safe enough to be pumped from Seaham Weir to Grahamstown Dam.
- Hunter Water are investigating a new 160,000 ML dam to be built on Limeburners Creek which would be filled by water pumped from Seaham Weir on the Williams River, in exactly the same way as the water sourced for Grahamstown Dam.
- This is a HUGE RISK when Hunter Water can't even fill Grahamstown Dam because of water supply issues.
- Because the Limeburners Creek dam would have a much smaller (29 sq km) natural catchment area than Grahamstown Dam (100 sq km), it would be majority sourced from the Williams River, whereas Grahamstown Dam only sources on average about 37% of it's water from the Williams River - and there still isn't enough water in the Williams River to fill it.

Water toxicity and poor catchment management by Hunter Water are a huge threat to the Lower Hunter's water supply. Water quality with respect to dams is already limiting the ability of the water utility to extract the allowable, licensed allocation. This threat will not be alleviated by building more dams and will become an even greater threat as climate uncertainty affects streamflow and evaporation levels.

Limeburners Creek Dam if built would be classified as part of the Grahamstown Scheme.

Statements made by Hunter Water :

Grahamstown Dam upgrade ("Why Tillegra Now" Hunter Water 2010)

"Further investment in Grahamstown Dam would result in an increased reliance on the Grahamstown Scheme and reduced source diversity, essentially 'putting all our eggs in one basket'. This would significantly reduce Hunter Water's capabilities in contingency planning for extreme water quality events."

KEY RISK "Increased reliance on the Grahamstown Scheme." 2019 MERI

"A number of supply side risks exist which did not impact upon yield in 2018-19, although these could be an issue in the future. These issues will be monitored and considered in the calculation of yield for the next LHWP, including reduced inflow to Grahamstown Dam due to water quality risks."

Reliability can only be achieved through a diverse range and rainfall independent water supply options – The Lower Hunter has too much reliance on dams and one catchment

Reliability can only be achieved through climate independent strategies such as recycling, desal, aquifer recharge.

The Williams River Catchment is obviously not a reliable enough supply on which to base the long-term water security of the Lower Hunter particularly during extended drought

Why is Hunter Water ignoring their own statements and going against the principles of the NSW Draft Water Strategy and the Productivity Commission by continuing to investigate the use of unreliable dams when alternative, untapped, climate independent sources are available?

After the axing of Tillegra Dam in 2010, Hunter Water were directed to diversify its options. **This is because over 94% of all water supplied by HWC comes from the Williams River Catchment**, so there is already an over-reliance on this catchment and rainfall dependent systems.

Independent government reports have all emphasised the need for HWC to change its practices and diversify its water planning for the Lower Hunter.

Dams are well known to cause major environmental impacts. But, again, Hunter Water is considering dams. Any new dam in the Williams, Chichester catchments will have adverse implications for the whole of the Hunter River systems, its ecology and the Ramsar listed *Kooragang Wetlands*. Reports during the Tillegra Dam debacle reinforced this view.

The Limeburner's Creek option would have similar impacts, potentially reducing Karuah River flows into Port Stephens covered by the *Port Stephens Great Lakes Marine Park* and impacting on the *Habitat Protection Zone*. Both options are likely to threaten seafood industries reliant on these systems. With present concerns regarding our environment after the recent bushfires, we believe that a new dam in these areas would be strongly opposed.

The building of Dams is old technology – there are enough dams in the Lower Hunter

Dams are contrary to all current research and best practice with regards to water security. A unique 2014 report on the trends and insights of water sector professionals about their own industry (*State of the Water Sector Report, 2014*, Australian Water Association and Deloitte) indicated the three most important things that could be done to meet water supply requirements are:

- using innovative sources such as recycling and storm water (recycling/reuse is used successfully as a significant water source throughout Europe, Singapore, the US and now Perth)
- lowering the demand for water through education
- adjusting the price of water to reflect its scarcity.

Construction cost overruns of dams

The World Commission on Dams found that dams, generally, have an overrun cost of 50%. For the 40 dams constructed in Australia and over a wide historical period (built between 1888 and 2012), estimated cost immediately prior to commencement of construction and final cost were available. For these dams the median cost overrun is 49% with the exceedance range being 20% and 131% respectively. The overall range varies from –48% to 825%. The mean cost overrun of all 40 dams is 120%.

Population Growth shouldn't be used to justify the building of dams

Increasingly water utilities are using population growth to justify the building of new dams. According to the NSW Weir Policy, this should not be the case:

- *“An increase in town water supply for the purposes of meeting projected population demand cannot be used as a justification to approve a proposal to build a new, or expand an existing weir, if environmentally friendlier alternatives to meeting that demand exist, which are also economically feasible. “*
- *“A proposal to build a new weir or enlarge an existing weir should not be approved unless it can be demonstrated that the primary component of the proposal is necessary to maintaining the essential social and economic needs of the affected community.”*

Independent Government reports during the Tillegra Dam debacle in the Lower Hunter demonstrated that there would be no socio-economic benefit to the people of the Hunter if the dam had been constructed.

Water efficiency needs to improve – particularly in the Lower Hunter

Water efficiency makes our supplies go further. It also slows the need for large-scale infrastructure supply options and is a cheaper alternative for the community.

A *Parliamentary Call for Papers* by Independent Justin Field, on 26 August 2020, has uncovered a detailed report which demonstrates Hunter Water’s poor record when it comes to water efficiency.

The report, *Water Efficiency and Demand Management*, *Institute for Sustainable Futures* (ISF), University of Technology, Sydney, January 2018, was commissioned by Hunter Water with the goal of delaying the need for a **decision** on supply augmentation for 10 years.

Hunter Water’s 2017+3 Strategic Plan Water Resilience states:

“Each year we defer a major augmentation saves our customers \$20 million in avoided investment costs. Keeping our options open would add an additional \$9 million in avoided costs, in excess of the direct deferral benefit, due to the ability to take advantage of shocks and shifts to the yield-demand balance (e.g. technological change) that further defer the need for a source augmentation.”

The ISF Report was also intended to set a new direction for Hunter Water in relation to water efficiency and demand management.

The report also shows Hunter Water’s poor water efficiency record in comparison with other major Australian water utilities and its need to improve on its performance.

Despite this report, which clearly points out what Hunter Water needs to do over the next 10 years before even considering a new supply option, the water utility has pushed ahead with portfolio surveying of the public - which includes the construction of dams.

Some of what the ISF report Says:

- Although there has been a number of demand management and water efficiency programs run by Hunter Water, the data collection and evaluation processes have been limited. This data scarcity creates challenges for developing and justifying future programs
- Many HWC residential programs have not achieved the same participation rates as other jurisdictions
- A lack of regulatory and environmental drivers and associated lack of funding and incentive mechanisms by HWC have limited the uptake of programs and the implementation of savings
- Considering the participation rates and the population size of the Hunter, there still appears to be water conservation potential in both the residential and non-residential sectors

- There needs to be detailed market segmentation of customers to better understand how to develop more sophisticated tailored demand management programs
- There were gaps identified in the suite of demand management/water efficiency programs run in the Lower Hunter region compared to other jurisdictions, most notably in the limited targeting of high users and multi-dwellings; limited rebates for efficient appliances; and the absence of garden programs (except for water wise rules and trigger nozzle giveaways)
- HWC have generally not reached the depth of adoption or covered the breadth of customer groups for non-residential programs of other utilities with mandatory programs imposed in the Millennium drought
- Given the high amount of rainwater tanks in the region (around 40,000) HWC have not capitalised on programs associated with these to support water efficiency
- HWC have not followed through with programs for high-end water users (the top 30 non-residential customers with average demand over 50ML/yr account for 50% of non-residential use)
- Incentivisation programs for medium water users is limited (the top 200 non-residential customers in the Hunter have a demand 10-50ML/yr accounting for 20% of non-residential use)
- A failure to take advantage of ‘best practice’ demand management programs
- Gaps in the suite of demand management and water efficiency programs run in the Lower Hunter region compared to other jurisdictions, most notably in the limited targeting of high-end users and multi-dwellings, limited rebates for efficient appliances and the absence of garden programs (except for water wise rules and nozzle giveaways)

Very few water efficiency gains have been made by Hunter Water in the last ten years.

In 2010 real losses totalled 7% of supply

In 2020 real losses totalled 9% of supply.

More water was recycled in 2009-10 than in 2009-20

Water consumption gains of 11% made in 2019-20 could be partly attributed to water restrictions applied during the recent drought.

Respect for the Environment

Dams, through disruption of physiochemical and biological processes, have water and associated environmental impacts that have far reaching social and economic consequences. The construction of a dam results in “discontinuities” in the river continuum (Ward & Stanford, 1995). Post impoundment phenomena directly and indirectly influence a myriad of factors that affect natural processes and so, ultimately, alter the ecological structure of ecosystems, sometimes tens or even hundreds of kilometres downstream. Dams also alter the downstream flow regime and produce large amounts of greenhouse gases.

In the case of Tillegra Dam in the Lower Hunter region, the environmental impacts of building a dam have already been proven to be disastrous in the Williams River catchment., with the Decision media release stating that a dam in the Lower Hunter placed: *‘An unacceptable level of uncertainty about potential impacts on the environment, particularly the Hunter Estuary and its internationally-recognised wetlands’*

In a bid to diversify options for water security, water utilities should be required to consider rainfall independent options (especially where there are already a number of dams) in order to protect the environment and its threatened terrestrial and aquatic biodiversity

Stormwater harvesting

Currently Hunter Water operate and maintain about 92 km of storm water drains in the Lower Hunter which is all discharged into waterways or the ocean. None is currently collected, treated and added to the supply storage network.

The local community continually advocates to have this precious source of water added to the supply network, but to date, nothing has been done.

Aquifer recharge/re-use & recycling

Perth is treating wastewater to drinking water standards, with its groundwater replenishment scheme adding around 28 GL per year of recycled water to the city's aquifers with upgrades expected to deliver 115 GL per year by 2060.

Potable water reuse offers a potentially significant, relatively drought- proof source of water. The degree of significance is, to a large extent, a consequence of the 'multiplier effect' that comes with reclaiming water which, once reused and returned to municipal sewers, becomes available to reclaim a second and subsequent times.

In the case of water recycling, an injection of 'new' water into a municipal system is made to meet new and growing demand. Some of that water (such as that used on gardens and other outdoor uses) will be lost from the system, but in a highly urbanised scenario, much of it will be returned to the sewage collection system and become available for re-treatment and re-injection back into the system. A city, which is able to capture and recycle 50% of the drinking water it supplies, will capture 50% again (thus a total of 75%) on the second time around. Capturing 50% on the third time around gives a total of 88%. This practice of 50% capture and recycle will ultimately lead to a doubling (an extra 100%) of the city's available potable water supply. The impact of the multiplier effect becomes exponentially more effective as the percentage of water recapture and reuse increases

Aquifer/storage recharge and re-use must become a priority for the NSW Water Strategy as the uncertainty of reliability of traditional supplies increases with climate variabilities.

Unfortunately, most public perception of recycled water use is using non-potable recycled water systems for outdoor irrigation of gardens, parks and sporting facilities. There is a major education program required to broaden this perception to include all uses of treated, recycled water for industrial use and for potable water.

Transparency and the planning process

If Water utilities are not transparent with reports and information - and secretive in relation to planning water supply options, then community engagement breaks down. Trust in Hunter Water faltered during the Tillegra Dam debacle and it has again come to the fore during community consultation of the Lower Hunter Water Security Plan. *Healthy Hunter Rivers Group* were compelled to work with Justin Field, NSW Independent MP, to carry out a *Call for Papers* in order to determine whether Hunter Water were, again, planning new dams for the Hunter.

A lengthy consultation process conducted by the Metropolitan Water Directorate from 2012-2014 and HWC's review in 2019 showed that dams are not popular with the Hunter community. The first consultation process, which culminated in the 2014 Lower Hunter Water Plan (LHWP), resulted in new dams being omitted from any water security measures - concentrating instead on water efficiency methods, recycled water, rainwater and stormwater use, and temporary desalination as a drought response.

In the 2018/2019 review of the LHWP, HWC reintroduced dams to the list of options but they were ranked fifth out of the seven options provided. Again, the community preferred HWC to be prioritising recycled water, conservation of water, water sharing and stormwater harvesting.

On 21 March 2021 results were released from a 7 Portfolio Survey of options for water security in the Lower Hunter region. Portfolio 3 (deliver choices for water conservation, recycled water, storm water harvesting; increase interregional transfers, community engagement for purified recycled water for drinking) was the top performing Portfolio with a score of 73%. 805 participants supported this option out of the 1,167 responses.

Comments made by Hunter Water in summarising the survey results were: *“the community is quite open to us considering all options”* and *“strong relative support for all options meant none should be ruled out”*, are clearly a rebuke of what the community had said in the somewhat limited survey.

Summary

If the NSW Water Strategy is to be effective, then an integrated ‘whole of government approach’, driven from the ‘top’ is essential.

This must be a regulatory document and should not just be an aspirational document able to be ignored by state, municipal or privately owned water utilities.

Specific state-wide goals with time frames (particularly for SOC’s), need to be set and achieved for all aspects of water supply/demand

Where available, climate independent sources of water must be prioritised for securing a utility’s supply.

Pricing of water must be adjusted and incentivized to reflect the scarcity of this valuable and precious resource.

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