

Recycled Water Master Plan

File Reference	West Ballina STP Ultimate Upgrade
Sustainability Plan	A built environment contributing to health and wellbeing
Management Plan	Sewer Services
Objective	To seek Council's endorsement of a modified proposal for the planned Lennox Head Recycled Water Reservoir.

Background

Recycled Water Master Plan

The Ballina Lennox Head Recycled Water Master Plan, as adopted by Council in September 2007, includes a commitment to provide urban dual reticulation (UDR) to all new major subdivisions in Ballina and Lennox Head. The Master Plan targets 80% dry weather re-use of treated wastewater from the Ballina and Lennox Head Waste Water Treatment Plants by the year 2026. This will be achieved by providing UDR to an estimated some 7242 new lots. The recycled water, subject to final approval, will be used for garden watering, toilet flushing, car washing and the cold tap of washing machines.

To meet this target, in addition to the UDR, Urban Open Space (UOS) irrigation will be expanded to some 173 ha including playing fields, parks/gardens and the Ballina Golf Club and 160 hectares of Vegetation Regeneration (VR) is proposed.

The 2026 dry season water balance in the Master Plan 2026 is as follows:

Urban Dual Reticulation (UDR)	24%
Urban Open Space (UOS)	29%
Vegetation Regeneration (VR)	27%
Discharge to ocean	9%
Discharge to estuary	11%

Within the Lennox Head/East Ballina areas, the following recent or currently approved subdivisions are developed to facilitate dual reticulation, with the supply of recycled water to commence following the construction of treatment and distribution infrastructure.

• 'Elevation' subdivision	113 properties
• 'Aspects' subdivision	33 properties
• "Angels Beach" subdivision	63 properties
• 'Meadows' subdivision	24 properties
Total:	233 properties

A total of some 2,258 properties are expected to be ultimately connected to the dual reticulation system in the Lennox Head to East Ballina areas. In

addition to the land above, dual reticulation is planned for the remainder of the Pacific Pines and neighbouring land, as well as for planned land releases at Skennars Head and north of Lennox Head.

UDR re-use is considered the highest value of the three streams nominated in the Master Plan. The reason for this is that the water avoids the use of the potable water supply. The size of the Council's proposal contributes to the potential to defer or reduce the required provision of new water sources, such as the potential Dunoon Dam currently being considered by Rous Water.

Environmental Impact Statement

To implement the Master Plan, a significant infrastructure development program is required. To obtain development consent it was necessary for Council to prepare an Environmental Impact Statement.

The assessment of the EIS is being managed by Council's Regulatory Services Group. Prior to and during the exhibition of the EIS, submissions were received from residents concerned about the impacts of a reservoir proposed for Kings Court Reserve.

In response to those concerns, further investigations have been undertaken and details of the findings are set out below.

Key Issues

- To consider the various technical, financial, ecological and social issues related to the range of options available to provide the required recycled water pressure to the Lennox Head/East Ballina dual reticulation areas.

Information

The use of a service reservoir (with a capacity of about 1 peak days demand) to supply pressure and increase security of supply is normal water supply practise in Australia. To meet those demand requirements for the proposed 2,258 properties and planned open space irrigation in the Lennox Head to East Ballina areas a 3.4 ML is required.

By placing reservoirs on the sites of the highest elevation mean that the any required high level zone pressure system is reduced in size. That is, the maximum number of homes can be serviced directly from the available reservoir pressure, with no mechanical or electrical cost or risks. A minimum water pressure equal to 25 m vertical head is normally required in order to avoid customer complaints.

Two potential reservoir sites were nominated in the Recycled Water Master Plan EIS. The site at Kings Court Reserve provided the highest elevation in the area. The alternative, lower site was nominated in part of Mr Pidcock's land to the north of Fieldcrest Place. As indicated above Council has received considerable representations and submissions opposing the reservoir from the local communities near these 2 sites.

During consultation processes, a third site has been suggested by Mr Pidcock, on his land adjacent to 'Warrawee' estate. Whilst considerable consultation has occurred with residents impacted by the Kings Court and

Pidcock's sites, no consultation has yet occurred with residents near to this third site, as further alternatives have since emerged.

In addition to these three site alternatives, the consultation process asked Council to seek out other options. Investigations were undertaken regarding the feasibility of a pressure system. Two pressure options were developed. One option is a full pressure system with no reservoir. The second option was a hybrid option being a pressure system with a 107kL header tank. Finally a sixth option is reported, being the impacts associated with a do nothing option.

The pressure system option is unique and as such there are no readily applicable engineering standards. Therefore there is limited information available for the Council to consider service risks. The service risk relates to the mechanical or electrical failure of the pressure system. Households will be supplied with potable water from a different supply. Therefore the risks to service from a lack of supply of recycled water are not as critical, although toilet flushing needs should be considered.

The tank in the hybrid option would provide an emergency storage of several hours under power outage/pump failure conditions and also the ability to allow a potable top-up of this header tank from the existing drinking water system. That is a tank of this size would allow uninterrupted supply for the more typical times required to make the repairs from the outage.

The pressure system requires additional pumping when compared to the service reservoir options. It was important therefore to assess the whole of life costs and green house gas emissions associated with these options.

Attachment One to this report is a table setting out the findings of the investigation. The analysis indicates that the Hybrid System is preferred for the following reasons.

- Acceptable level of service risk
- Risk advantages when compared to full pressure system
- Avoids many of the social impacts of the service reservoir options
- Lowest NPV
- The additional GHG emissions are relatively minor in the context of the total energy of Council's water and sewer operations.

Kings Court Reserve Embellishment

The preferred site on a technical basis for a tank within the hybrid pressure system is still Kings Court. The reasons described above in regard to the high level zone for the service reservoir apply in the same manner for the small tank.

Consideration has also been given to locating the tank on the Council reserve on the western side of North Creek road, opposite Castle Drive (adjacent to Mr Pidcock's property). Advice is that the tank cannot be located in this area due to the close proximity to heritage listed trees, which are part of an 'Endangered Ecological Community'.

The other sites are not owned by Council would need to be acquired.

The 107 kL tank would be approximately 6 by 4 metres. It was therefore decided that there may be opportunities to use the tank as a structure that as well as meeting the Master Plan needs, embellish the reserve and contribute to its amenity.

Consulting architects, Archimages were engaged to prepare concept sketches for shade structure that incorporated the tank, playground and ball play areas, bbqs, tables and chairs.

Attachment Two to this report provides the outcomes of that work including sketches and photo montages.

The proposal is to utilise the sloping land and the southern end of the reserve. The slope reduces the use of this area, it is located away from residents, and provides excellent views. The concept design takes into account sight lines from the houses adjacent and the structure can be designed so as not to impede the views of those houses.

As well as being a social meeting place, it would be possible to utilise the tank structure for interesting artwork, indigenous story telling or water demand management education.

The additional capital cost for the embellishment proposal still results in this option having the lowest Net Present Value.

In addition, consideration has been given to completely burying the 107 kL reservoir. There are several reasons why this is not feasible, including operational/maintenance difficulties (access is required for pipe work at the base of the storage, additional costs (likelihood of highly expensive basalt excavation), and loss of head.

The embellishment proposal has been discussed with representatives of the Kings Court Action Group and the Lennox Head Residents Association. Their response is discussed in the consultation section of this report.

Sustainability Considerations

- **Environment**

The Master Plan was developed to reduce the discharge of treated effluent to aquatic environments and to reduce the demand on the potable water supply. Greenhouse gas production arising from the operation of the system has been considered in the assessment.

- **Social**

The options have been considered for their social impacts. The recommended option offers the embellishment of a reserve and avoids the social impacts associated with the other options.

- **Economic**

The supply of cost effective infrastructure supports economic development.

Legal / Resource / Financial Implications

The recommendation to this report seeks Council's approval to amend its EIS proposal. Therefore there are no legal implications directly associated with this report.

The Council is not making a financial commitment through the recommendation to this report, other than to continue to the next phase of this project. It is however noted that the recommendation is supporting the least expensive option on a capital and net present value basis. The current project estimates are consistent with those previously used in Council's financial planning, however those plans will need to be reconfirmed prior to Council accepting a tender for the reservoir works and making the commitment to expend the required funds.

Consultation

The information presented in this report has been provided to the Lennox Head Residents Association, the Lennox Head Chamber of Commerce and the Kings Court Action Group.

Attachment Three to this report is an email response from the resident's association which is in effect in support of the recommendation to this report.

At the time of writing this report the formal response from the Action Group is yet to be received. It is understood from conversation with the President of the Group that some members would still prefer for the reserve to maintain its current status, however the majority of residents support the proposal. Should a formal response be received prior to the meeting, it will be distributed to Councillors.

Should the Council accept the recommendation to this report, the Regulatory Services Group will notify adjoining residents and those that made submissions to the EIS of the amended proposal and seek any new or additional comments.

The design is at concept level only for EIS purposes. Should the project be approved, further consultation can be undertaken regarding the detail of the design.

Options

1. Kings Court Reserve - 3.4 ML reservoir
2. Pidcock Land West 3.4 ML reservoir
3. Pidcock Land North Ck Rd: 3.4 ML reservoir
4. Do nothing (no UDR in this area)
5. Full Pressure system (2.5 ML storage & pump station at Lennox WWTP)
6. Hybrid Pressure System (as for 5 with a 107kL tank at Kings Court Reserve)
7. Hybrid Pressure System (as for 5 with a 107kL tank at the sites for 2 and 3).

If the do nothing option is selected 2,258 future or existing properties will not be part of the recycled water scheme. This will significantly impact on the Council's ability to meet its current reuse targets and remove a major portion

of the reuse type considered to be the most important given it reduces the demand for potable water.

As detailed in the report the hybrid option is preferred as it avoids social impact issues and is the lowest cost. Option 6 (Kings Court) is preferred when compared to Option 7 for the following reasons.

- Elevation provides high level zone operational benefits
- Social impacts of a small tank can still apply
- Land is owned by Council
- Opportunity to embellish the reserve.

As described in the above report, the only disadvantage of Option Six compared to the service reservoir options is that there is a greater risk of service interruption in the event of mechanical or electrical problems. However, it is considered that the proposed concept provides enough redundancy to manage typical faults without impacting on service level. It was noted that given the unique nature of this project, no specific engineering standard applies. In addition to the proposed redundancy, the service risks are considered acceptable given the non critical types of use for the water.

RECOMMENDATIONS

That Council endorses a proposal to amend its Recycled Water Master Plan EIS by replacing the proposed Kings Court Reservoir with a pressure system inclusive of a feeder tank that can be incorporated into a structure that provides embellishment to the amenity and function of the Kings Court Reserve.

Attachment(s)

1. Comparison of Social, Technical, Financial and Ecological Aspects of Options
2. Architect sketches of Option 6 Hybrid system 107 kL tank with community facilities inbuilt.
3. Correspondence from the Lennox Head Residents Association

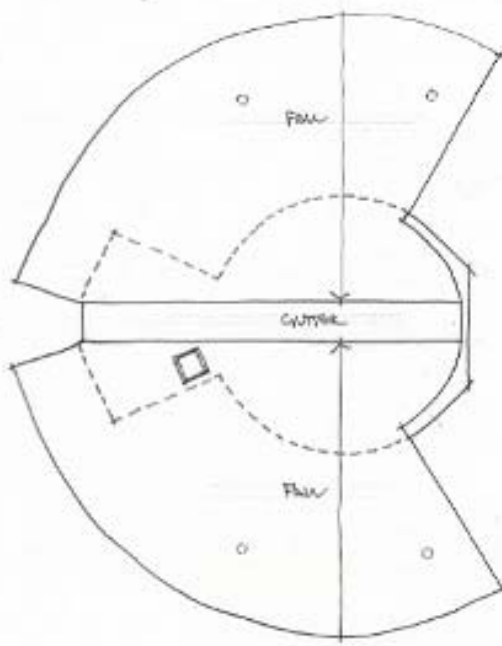
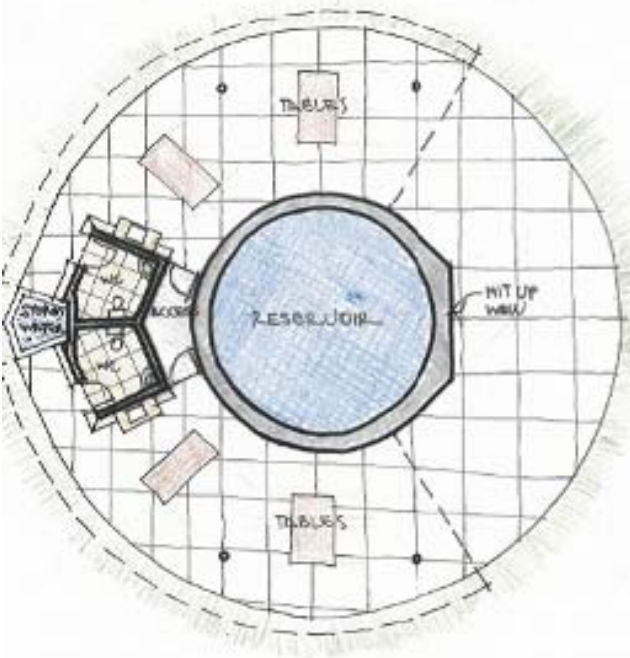
Appendix – Lennox Head Recycled Water Reservoir
Comparison of Social, Technical, Financial and Ecological Aspects of Options


Option	Social	Technical Reliability	Financial Capital NPV (\$m) See (3)	Ecological equivalent number of average homes/ GHG emissions offset cost at \$50/t - over 25 yrs	Ownership/BSC parkland
1	3.4 ML Kings Ct Reserve (East)	Highest site in area - smallest HLZ see (1)	7.27-7.36	5.1 - \$89,000	26 m dia uses 1/5 of current park site area
2	3.4 ML Pidcocks West	9 m lower than option 1 - larger HLZ	7.75-7.83	4.5 - \$79,000	NIL - private land but unwilling vendor
3	3.4 ML Pidcocks – adjacent North Ck Road	16 m lower than option 1 – much larger HLZ	7.82-7.89	4.1 - \$72,000	NIL – private land, possible willing vendor
4	Do nothing – abandon UDR in Lennox-East Ballina. Limit UDR to only Ballina Heights and North Ballina areas	NA see (2)		Greater discharge of recycled water to environment and earlier construction of new water sources	NA
5	Full Pressure system with no elevated reservoir	Even with standby generator, potential reliability issues especially with lightning strikes on PS.	5.79-5.92	7.0 - \$123,000	NIL
6	Hybrid System: Full pressure system with 107 kL header tank in Kings Ct reserve (western side)	Reliability ensured by potable top-up from Basalt Ct reservoir. Air gap prevents backflow.	6.51-6.84 see (4)	7.0 - \$123,000	Very small footprint on parkland - which is offset by the added community facilities

Legend/Notes:

- (1) HLZ = High level zone for pumped pressure (ie vertical height less than 25 m from home to reservoir water level)
- (2) NA = not applicable
- (3) NPV = Net Present Value & this also includes cost of offsetting GHG emissions at \$50/tonne & includes cost of land acquisition, where required.
- (4) Capital cost and NPV adjusted to include \$300,000 additional cost for BBQ, toilet, playground and landscaping over and above 107kL reservoir

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Lennox Head Residents Association Inc.

8 November 2009

Mr John Truman
Group Manager
Civil Services
Ballina Shire Council
BALLINA

Dear John,

Re: Recycled Water Masterplan - Kings Court Reserve Reservoir Proposal

I refer to our meeting held 24 November and your subsequent letter enclosing the concept plans for the potential use and amenity of the King's Court Reserve Area incorporating a small tank capable of storing around 100kl of water. Thank you for the opportunity to consider this proposal and to discuss it with the members of the Association at its meeting last night.

Reaction to the proposal and to the concept plans was favourable. It was resolved: that provided the intention to improve the amenity of the Reserve as shown in the sketches, ie to incorporate facilities including playground equipment, toilets and covered seating BBQ etc, is adopted the Association approves of the proposed location of the Smaller tank.

Discussion revolved around the need to improve the amenity to avoid the spoiling effect of the presence of the tank. However, the meeting wished me to compliment you for the effort that has gone into reaching this solution to the problem and for your cooperation with the representatives of the objectors to the original proposal.

Please don' hesitate to contact me if I can help any further.

Yours sincerely

Fred Goodman
President