



Tamworth Emergency Water Supply Plan (Executive Summary)

Tamworth Regional Council

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Executive Summary

Overview

The Tamworth Emergency Water Supply Plan has been prepared by Hunter H2O in association with Tamworth Regional Council (TRC) to assist Council with the ongoing management of limited water supplies in the severe drought conditions that are being experienced in the Peel Valley. Tamworth's primary water security storage, Chaffey Dam, has fallen to critical levels and Level 5 emergency water restrictions have been in place since September 2019. While Council's Drought Management Plan has been the guiding policy document since water restrictions were first implemented in January 2019, an Emergency Water Supply Plan is now needed to further guide Council through this most critical stage of the drought and to help plan for the potential worst-case scenario of Chaffey Dam reaching zero storage. The Plan outlines a staged action plan, for both demand and supply based measures, to extend existing supplies and avoid running out of water.

Background

The Namoi Region experienced unprecedented drought conditions in 2018 and 2019, with record low rainfall and streamflows. This led to town water supply systems facing severe stress and having to implement severe water restrictions, as well as major dams in the region dropping to record low storage levels. With Chaffey Dam now below 15% and Level 5 water restrictions in place, the Tamworth water supply is under severe stress and works have been recently undertaken to minimise water losses between Chaffey Dam and Tamworth in order to extend the remaining supplies as long as possible. With a temporary block-bank weir on the Peel River at Dungowan installed in December 2019 and the Chaffey Dam to Dungowan pipeline completed in May 2020, water losses between the dam and Tamworth are now mostly eliminated.

Without these drought contingency works, it was estimated that Chaffey Dam could have reached day zero by around August 2020 (assuming a continuation of the 2019 drought conditions). With these works now in place and taking into consideration the more favourable climatic conditions since the start of 2020, the remaining storage in Chaffey Dam now likely exceeds 18 months of supply. However, with Chaffey Dam storage levels still critical, Council needs to start considering further drought contingency and emergency supply measures to ensure Tamworth and Moonbi / Kootingal don't run out of water. It is important that TRC starts planning for emergency supply measures now, to ensure there is sufficient time to implement these measures.

Demands

Existing town water demands are around 16.8 megalitres per day (ML/d), which comprises:

- 7.3 ML/d residential demand, or just over 150 litres per person per day (L/p/d)
- 7.5 ML/d non-residential demand
- 2.0 ML/d estimated water losses

As shown in Figure 1, evaporative coolers make up a significant proportion of average residential usage (0.7 ML/d, or around 10% of residential demand) and this increases to around 1.4 ML/d (17.5%) on average during the warmer months between October and March and peaks as high as 4 – 5 ML/d on very hot summer days. TRC has estimated that there are around 8,000 evaporative cooler units installed in Tamworth (including Moonbi/Kootingal), with the typical water usage of each unit being between 10 and 40 litres per hour (L/hr). It is estimated that older, poorly maintained units could use up to 70 L/hr on very hot days.

In early 2020, TRC introduced further water efficiency rebates to help reduce the impact of evaporative coolers on town water usage. The rebates include 50% (up to \$50 each) of the cost of ceiling fans permanently installed in an indoor room that has an evaporative cooler / duct and 50% (up to \$200) of the cost of servicing and/or replacing filters in evaporative cooler units. Further water saving measures / rebates related to evaporative coolers that could be considered include: a rebate towards the cost of replacing an old and/or inefficient evaporative cooling unit with a new, efficient evaporative cooling unit or reverse cycle air conditioning; the installation of smart water meters to provide real-time access to water consumption data; and restrictions on the hours of use of evaporative coolers (if the water supply situation becomes critical) with special exemptions for vulnerable people.

Despite the impact of evaporative coolers on the residential water usage, it is estimated the current residential usage is just over 150 L/p/d, which is in line with the current residential usage target. This target was established by the Water Restrictions Communication and Engagement Plan (CEP), endorsed by Council in mid-2019. The CEP assists TRC with the development and implementation of an expanded community awareness campaign. The CEP has also set a future residential usage target of 100 L/p/d, which will be applied if supplies become more critical.

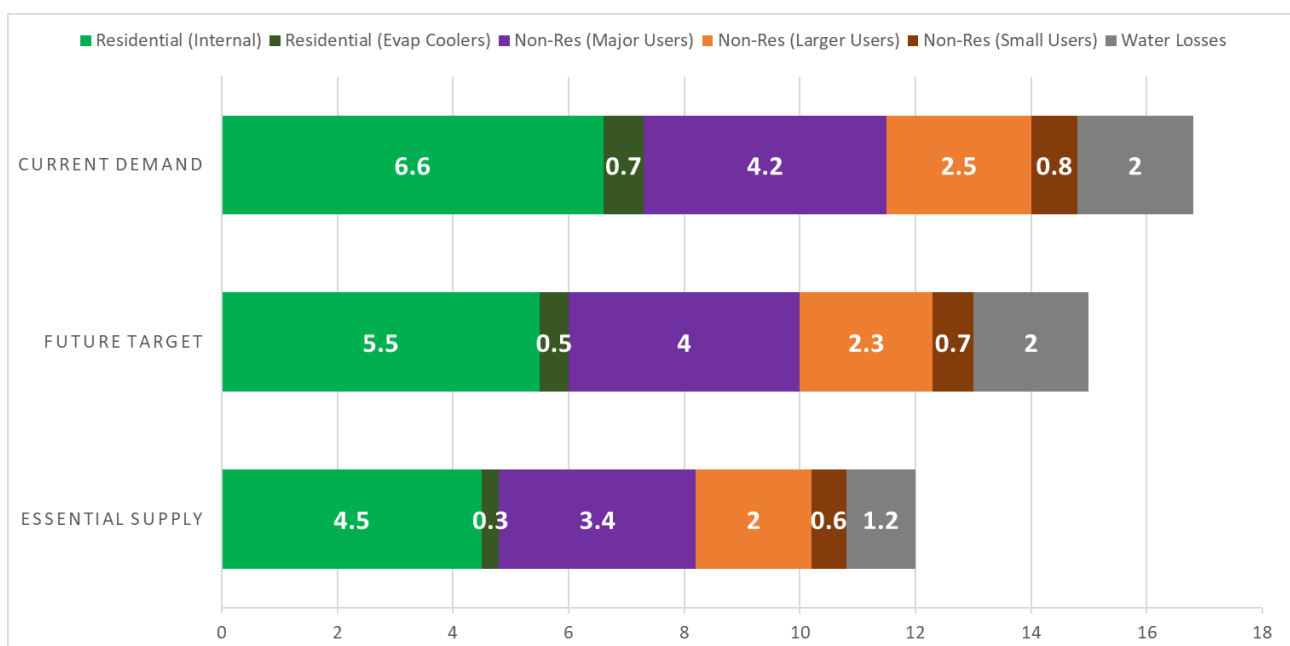


Figure 1 Current Demands and Future Demand Targets (by Category)

As shown on Figure 1, 4.2 ML/d of the estimated 7.5 ML/d of current non-residential water usage can be attributed to the top four major users (all related to the meat processing industry). Due to the nature of these businesses and the previous establishment of water efficient processes, the major users have been unable to further significantly reduce their water usage to-date. The remaining water users – categorised as either large users (top 150) or small users, depending on their water usage – currently use around 3.3 ML/d and have significantly reduced their water usage over the last 12 months (around 35% reduction compared to 2018/19).

Current water losses are assumed to be 2 ML/d, based on the difference between water production and metered usage. Further analysis is needed to better understand the true extent of existing water losses.

Further reductions in non-residential water usage will need to be achieved as the water supply situation deteriorates, as shown on Figure 1. A non-residential usage target of 7.0 ML/d is proposed once Chaffey Dam falls to 10%, with the total town water consumption target reducing to 15 ML/d. If the water supply situation becomes more critical, town water demands may need to be reduced to minimum essential supply requirements, which is estimated to be around 12 ML/d, including 6 ML/d for non-residential usage and 4.8 ML/d for residential usage (based on 100 L/p/d).

Emergency Supply Options

A range of emergency water supply options have been considered and include local and regional surface water options, local and regional groundwater options and local reclaimed effluent options. The key emergency supply options considered in the Plan are summarised in Table 1.

Table 1 Tamworth Emergency Water Supply Options

Surface Water	Groundwater	Reclaimed Effluent
<p>Local</p> <ul style="list-style-type: none"> Optimising storage in Chaffey and Dungowan Dams Temporary block-bank (and pump station) on Peel River near Paradise Weir <p>Regional</p> <ul style="list-style-type: none"> Pipeline from Keepit Dam Pipeline from Split Rock Dam Pipeline from Copeton Dam 	<p>Local</p> <ul style="list-style-type: none"> Maximise use of existing Paradise Drift Wells Expand the Paradise wellfield New wellfield in Peel Alluvium (around Appleby) New wellfield in Peel Fractured Rock source <p>Regional</p> <ul style="list-style-type: none"> New wellfield in Upper Namoi Alluvium (around Carroll) 	<p>Local</p> <ul style="list-style-type: none"> Temporary industrial reuse (potable substitution) to large users around Westdale STP Temporary direct potable reuse (DPR) via Calala WTP

Train-based water carting is not considered to be a viable option due to the uncertainties and complexities associated with carting water to Tamworth from the Hunter Valley via rail. However, truck-based water carting is considered technically feasible, with Keepit Dam and/or Copeton Dam being the most likely supply sources. Full water carting for Tamworth is not considered to be viable and would, at best, only contribute 25% to 33% of the minimum essential supply requirement – i.e. potentially 3 – 4 ML/d via truck-based carting from two different sources, compared to 12 ML/d minimum essential supply requirements.

Emergency Water Supply Action Plan

It is estimated that there may only be 19 months of remaining storage in Chaffey Dam, assuming the dam is used as the sole source for Tamworth and assuming a return to zero inflows (as experienced across most of 2018 and 2019). The months to failure estimates could increase by a further 3 months if TRC is able to maximise the use of the Paradise Drift Wells and a further 2 months if the likely remaining storage in Dungowan Dam is taken into account.

Therefore, for the purposes of this Plan, it is estimated that there is around 24 months to the potential failure of the combined water supplies, assuming zero inflows to Chaffey Dam.

With the return to more typical rainfall conditions across the first half of 2020 – resulting in Chaffey Dam storage levels maintaining at around 14% for the past 6 months – and a forecast wetter than average winter, it is important that a staged approach be adopted for the actions proposed in this Plan. A key outcome of this approach will be delaying any decisions on major infrastructure options for at least 6 months (if possible) and only proceeding with these options if the Chaffey Dam storage volume starts falling again and/or the months to failure estimate (for the combined water supplies) reduces to around 18 months. After this point, implementation of a major emergency water supply source option/s will need to commence and proceed quickly to ensure completion within the remaining 18-month timeframe and to avoid the possibility of Tamworth and Moonbi / Kootingal running out of water.

A two-phased approach to demand-side and supply-side actions is outlined in Table 2.

Table 2 Emergency Water Supply Action Plan

ACTIONS	DETAILS
<p>Phase 1: Immediate Actions</p> <ul style="list-style-type: none"> Phase 1 commences immediately and continues until remaining storage reduces to 18 months Supply-side focus is on short-term water efficiency gains and incremental improvements to existing supply sources (to avoid or at least further delay Phase 2) Demand-side focus is on actions to support future water savings (under Phase 2) Emergency supply options will require the necessary approvals from DPIE and other NSW government agencies and their assistance to help preserve water for critical human needs 	
<p>1. Maximise the use of the existing Paradise Drift Wells</p>	<ul style="list-style-type: none"> Requires DPIE/NRAR to provide a temporary increase in LWU entitlements to better utilise a critical backup supply source May require reducing or pulsing flows from Chaffey Dam
<p>2. Limit environmental flows from Chaffey Dam and Dungowan Dam</p>	<ul style="list-style-type: none"> TRC needs to work with DPIE and WaterNSW to preserve water in both dams for critical human needs, as much as possible May require a temporary suspension of the Water Sharing Plan
<p>3. Consider options to install a temporary block-bank on the Peel River near Paradise Weir</p>	<ul style="list-style-type: none"> The block-bank weir (and associated pumping system) will facilitate the harvesting of more flows from the Peel River May require a temporary suspension of the Water Sharing Plan
<p>4. Consider options to expand the Paradise wellfield</p>	<ul style="list-style-type: none"> Increase local groundwater extractions by negotiating with and compensating existing licence owners to allow Council to access and utilise their bores (either temporarily or permanently)
<p>5. Consider whether fractured rock groundwater is worth pursuing</p>	<ul style="list-style-type: none"> The risks associated with utilising fractured rock groundwater are significantly higher than other groundwater sources, but further investigation may be warranted before dismissing entirely.
<p>6. Further investigation and preliminary planning for a major emergency water supply source</p>	<ul style="list-style-type: none"> Preferred option must be able to supply 15 – 17 ML/d (for up to 24 months) and must be delivered within 12 – 18 months Preferred options include: a pipeline from Keepit Dam; a new groundwater wellfield in Lower Peel alluvium; or a new groundwater wellfield in Upper Namoi alluvium. Need to assess planning approval requirements and the ability to fast-track approvals, as allowed under the <i>Water Supply (Critical Needs) Act 2019</i>
<p>7. Fast-track implementation of Automated Meter Reading (AMR)</p>	<ul style="list-style-type: none"> Smart meters could be installed in Tamworth in 6 months and would assist with achieving residential usage targets, driving further large user reductions and assist water loss management
<p>8. Review non-residential large user water efficiency measures</p>	<ul style="list-style-type: none"> Investigate the potential costs and timing to implement up to 1.75 ML/d of previously identified water efficiency measures
<p>9. Investigate viability of non-residential potable substitution with reclaimed effluent</p>	<ul style="list-style-type: none"> Consultation with major and large users to assess the viability of using reclaimed effluent to substitute potable water requirements Need to consider likely planning approval requirements, timing and cost effectiveness
<p>10. Maintain average town water consumption below 17 ML/d</p>	<ul style="list-style-type: none"> Maintain current residential usage target of 150 L/p/d and non-residential usage target of 25% reduction

ACTIONS	DETAILS
<p>Phase 2: 18 Months to Day Zero</p> <ul style="list-style-type: none"> Phase 2 should commence once remaining storage reduces to 18 months Supply-side focus is on the implementation of a major emergency water supply source Demand-side focus is on achieving further water savings, including implementing some measures that may only have a short-term benefit Emergency supply options will require the necessary approvals from DPIE and other NSW government agencies and ongoing assistance to help preserve water for critical human needs 	
<p>11. Implement major emergency water supply source</p>	<ul style="list-style-type: none"> Subject to the outcomes of Action 6, the implementation of the major emergency supply source would be undertaken in two stages: <ul style="list-style-type: none"> <u>Stage 1</u> would involve detailed design and planning approvals for the major emergency supply source and would take around 6 months (with fast-track approvals) <u>Stage 2</u> would involve construction of the major emergency supply source (within 12 months) and would only proceed if the remaining storage reduced to around 12 months
<p>12. Use of Reclaimed Effluent to substitute up to 2.5 ML/d of non-residential water usage</p>	<ul style="list-style-type: none"> Subject to the outcomes of Action 9, implement a temporary reclaimed effluent scheme to support non-residential customers achieving usage reduction targets
<p>13. Maximise use of the expanded Drift Wells and/or extractions from the block-bank at Paradise Weir</p>	<ul style="list-style-type: none"> Need to continue maximising the use of local surface water and groundwater resources (subject to ongoing availability) to maximise the time available to design and then construct the major emergency supply source (or potentially avoid construction)
<p>14. Reduce average town water consumption to 15 ML/d or less</p>	<ul style="list-style-type: none"> Further reduction in residential demand target (from 150 to 100 L/p/d) and non-residential demand target (from 25% reduction to 30% reduction) The use of AMR will allow real-time usage data to be provided to customers to help drive revised water targets
<p>15. Implement non-residential large user water efficiency measures</p>	<ul style="list-style-type: none"> Council to work in collaboration with non-residential customers to implement measures, where cost effective, including considering the co-funding of some measures (subject to a business case)
<p>16. Ramp-up water loss management (utilising AMR data)</p>	<ul style="list-style-type: none"> AMR data will allow water losses to be more easily detected (both customer-side losses and network losses) Assisted by night-time flow analysis and active leak detection
<p>17. Consider shutting down non-essential businesses and limiting the use of evaporative coolers</p>	<ul style="list-style-type: none"> WILL ONLY BE CONSIDERED IF DEMAND TARGETS CANNOT BE ACHIEVED AND SUPPLIES ARE CRITICAL
<p>18. If supplies become critical, commence carting up to 2 ML/d from Keepit Dam and/or 2 ML/d from Copeton Dam</p>	<ul style="list-style-type: none"> CARTING WILL ONLY BE REQUIRED IF LOCAL WATER SUPPLIES START TO FAIL BEFORE THE MAJOR EMERGENCY SUPPLY SOURCE IS COMPLETED Emergency works will be required at the dams and the WTP / Drift Wells to enable carting of up to 2 ML/d from each source (4 ML/d in total)