Uralla Shire Council

Drought Management Plan

Revision 2 March 2019

Report Details

Report Title	Uralla Shire Council: Drought Management Plan
Status	of Revised Plan
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Document History and Status

Revision	Report Status	Prepared by	Reviewed by	Approved by	Issue Date
1	Final Draft	Stephanie McCaffrey	Terry Seymour	Terry Seymour	June 2018
2	Update	Stephanie McCaffrey	Terry Seymour	Terry Seymour	March 2019

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1 DROUGHT MANAGEMENT PLAN

The Drought Management Plan outlines the various demand and supply side drought response actions that should be employed at various stages during an extended drought period. The Plan outlines Council's restriction policy and documents backup supply sources and emergency supply options. Implementing a Drought Management Plan ensures that a structured and transparent approach is taken for ongoing management of drought impacts on the Uralla and Bundarra town water supplies operated by Uralla Shire Council (USC)

The fundamental objectives of preparing and adopting a Drought Management Plan are to minimise the risk of the community running out of water, and ensure there is always sufficient water available to satisfy the basic community needs in Bundarra and Uralla.

The Uralla Shire Council Drought Management Plan was originally adopted by Council in 2015. It has been updated to coincide with the development of the Demand Management Plan. The update includes Bureau of Meteorology data, the revision of trigger levels and revision of the actions associated with the Drought Action Plan. The extent, application and practicality of Permanent Water Conservation Measures (PWCMs) as compulsory long-term water restrictions has been reviewed.

The objectives of this Drought Management Plan are complemented by the Demand Management Plan and its program. Both plans are applicable to Uralla and Bundarra customers connected to the reticulated town water supply systems operated by Uralla Shire Council.

Drought Management planning is an essential component of the NSW Government's *Best Practice Management of Water Supply and Sewerage Guidelines - 2007*. The guidelines were prepared in response to urban water reform commitments made by the NSW Government as part of the National Water Initiative (NWI).

Another essential component of the *Best Practice Management Guidelines* is the preparation of an Integrated Water Cycle Management (IWCM) Strategy. Council has prepared an IWCM Strategy, which outlines a plan for the integrated management of the water supply, sewerage and storm water services within a whole of catchment strategic framework.

Drought management will be a key component of the IWCM Strategy and therefore, this Drought Management Plan is consistent with the principles of the IWCM Strategy.

This Plan contains the following sections:

Section 2: Contains a description of the Bundarra and Uralla water supply systems; with a brief review of previous drought experience.

Section 3: Provides an outline of the operating environment for this plan; including consideration of climatic conditions and water resources.

Section 4: A brief summary of the key activities and strategies that should be in place prior to a drought period.

Section 5: Outlines the actions to be taken during each drought response level.

Section 6: Outlines the post-drought actions that should be taken in preparedness for future drought periods.

2 WATER SUPPLY SYSTEMS

This plan is applicable to the urban water supply systems of Bundarra and Uralla. Details of these water supply systems are included in Table 1.

While there is a need to have some level of uniformity across the region for some drought response actions (e. g. the rules associated with water restrictions), there is also a need to have tailored drought management strategies that are related to the individual water supply system and the greater environment that it operates within (e.g., the triggers for activating water restrictions).

Water Supply System	Population Served[1]	Average Demand (kL/day)	Raw Water Source	Current Problems	Past Drought Experience
Uralla	2421	800	Kentucky Creek Dam 500ML capacity	Small catchment in upper reaches of Gwydir River. Storage susceptible to algae growth in summer. Impact of siltation on storage volume is unknown.	The 2015 Secure Yield Assessment indicates that storage would not meet demand during a dry year by 2044. Water restrictions have only been applied infrequently in the past. Last restrictions were applied in 2016.
Bundarra	394	123	Gwydir River 90-120 ML sourced directly from Taylors Pond	System is not robust and is vulnerable to periods of low flow in Gwydir River. Upstream irrigators can place stress on town water supply.	Water restrictions (including those on irrigators) are triggered by water levels in Taylors Pond. Severe restrictions were applied in 1994 and 2016. Past restrictions have been applied inconsistently. Taylors Pond capacity was restored by excavating the river bed in 1994. Carting of potable water from Gilgai was considered in 1994.

Table 1: Summary of Uralla Shire Council Water Supply Systems

[1] 2016 Census data

2.1 Water Supply characteristics: Uralla

Water supply for Uralla township is sourced from Kentucky Creek Dam with a total storage of 500 ML, of which 75 ML is assumed to be dead storage, leaving an effective storage of 425 ML. Current extraction of raw water for Uralla varies between 230 and 350 ML per annum. Uralla Shire Council is licensed to extract up to 621 ML per annum to meet urban demand from the Kentucky Creek catchment.

The Uralla Water Treatment Plant (WTP) is a conventional water treatment plant. Raw water is pumped from the storage dam on Kentucky Creek located approximately 5 km south west of Uralla through 85m of pipeline to the inlet of the water treatment works. There are three water reservoirs in Uralla with a combined storage capacity of 5 ML.

2.2 Water Supply characteristics: Bundarra

Bundarra is serviced by Taylors Pond on the Gwydir River which has a total storage capacity of around 83 ML of which 8 ML is dead storage, leaving an effective storage of 75 ML. Uralla Shire Council is licensed to extract up to 93 ML per annum from the Gwydir River for the urban supply at Bundarra. Records indicate that demand varies between 38 and 56 ML per annum with the average demand being 47 ML per annum.

There are currently 216 water assessments in Bundarra supplied from a conventional sedimentation and sand filtration water treatment plant similar in operation to the Uralla plant.

The plant has a design capacity of 0.8 ML per day plus a 20% hydraulic loading. Water is sourced from a pump well adjacent to Taylors Pond and following treatment, is pumped to two service reservoirs located on the northern and western extremities of the village. The two water reservoirs in Bundarra have a combined storage capacity of 1 ML.

2.3 Secure Yield Study 2015

In 2013, Council commissioned NSW Public Works/SMEC to carry out a secure yield study on the catchments for both water supplies. The study projected that the modelled unrestricted dry year demand for the two supplies will increase from a current 381 ML to 433 ML in 2044 for Uralla and from a current 62 ML to 71 ML in 2044 for Bundarra.

The outcomes of the secure yield modelling gave an estimated secure yield of between 196 and 228 ML per annum (up to 2015) for the Uralla supply and between 41 and 61 ML per annum for Bundarra, depending on the security of supply rule that Council adopts.

The study concluded that: "*The modelling indicates that the Uralla water supply system would need to be augmented to provide a secure yield which matches the dry year demand... and that the Bundarra system would need to be augmented to provide a secure yield meeting the average current demand in climate change conditions applying the 5/10/10 rule.*"

The 5/10/10 rule requires:

- Duration of restriction does not exceed 5% of the time.
- Frequency of restriction is not more than 10% of the time (1 in 10 years).
- Severity does not exceed 10% of annual demand, i.e. annual demand is not less than 90% of normal.

Consequently, Council will need to upgrade the Uralla water supply system and, should any growth in water supply demand in Bundarra, or predicted climate change conditions occur, additional storage will be required to maintain security of that supply.

3 OPERATING ENVIRONMENT

3.1 Location and Climate

The New England Region experiences a dry sub–humid temperate climate. Summers are relatively short and mild and winters are long and cold. Mean monthly maximum temperatures vary from 25.7 degrees Celsius in February to 11.8 degrees Celsius in July. Mean monthly minimum temperatures vary from 12.7 degrees Celsius in February to minus 0.4 degrees in July.

Median rainfall is approximately 766 mm per annum in Uralla and 763 mm per annum in Bundarra with approximately 60% falling in summer and 40% in winter. Average annual evaporation is 1400mm/a. Figure 2 below graphs average monthly rainfall and temperatures.

Bureau of Meteorology charts showing historical annual rainfall for Uralla and Bundarra are included below in Figure 3 and Figure 4.

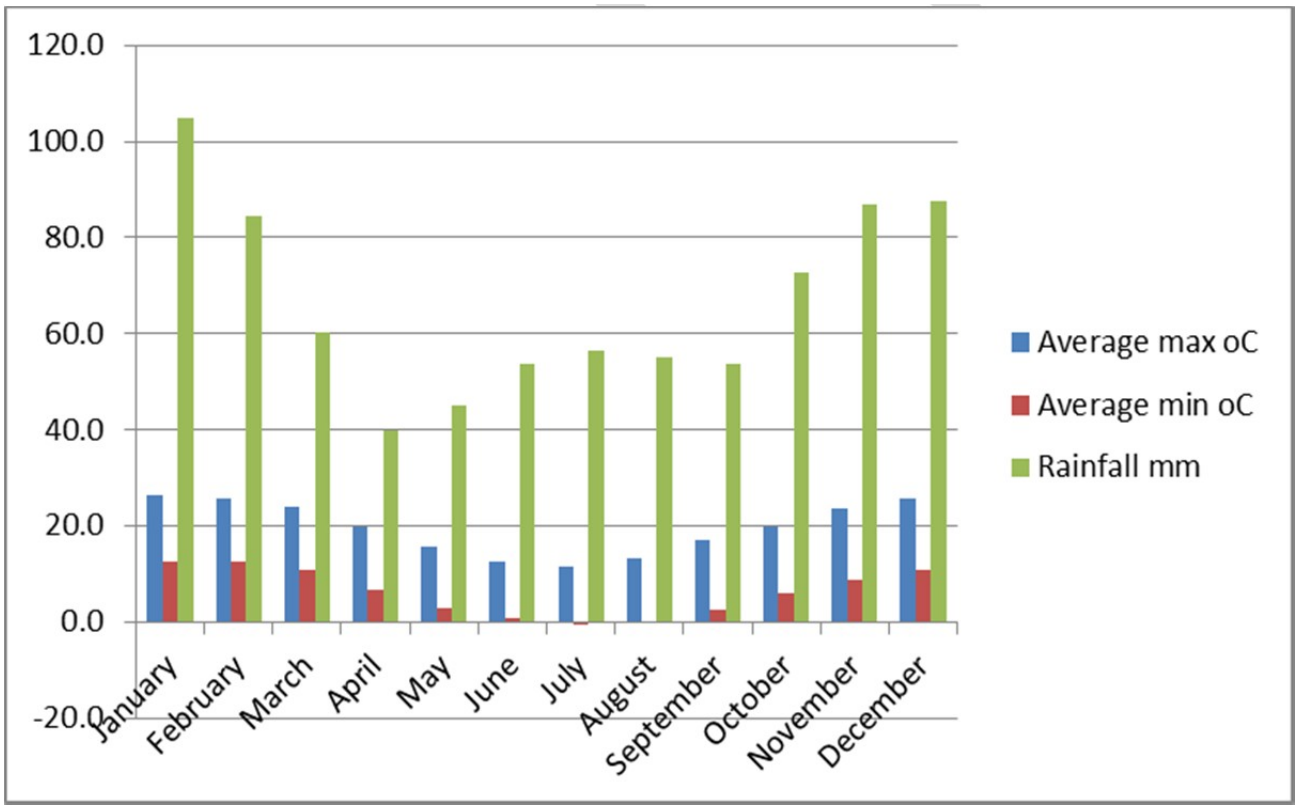

Figure 1: Average monthly rainfall and temperature

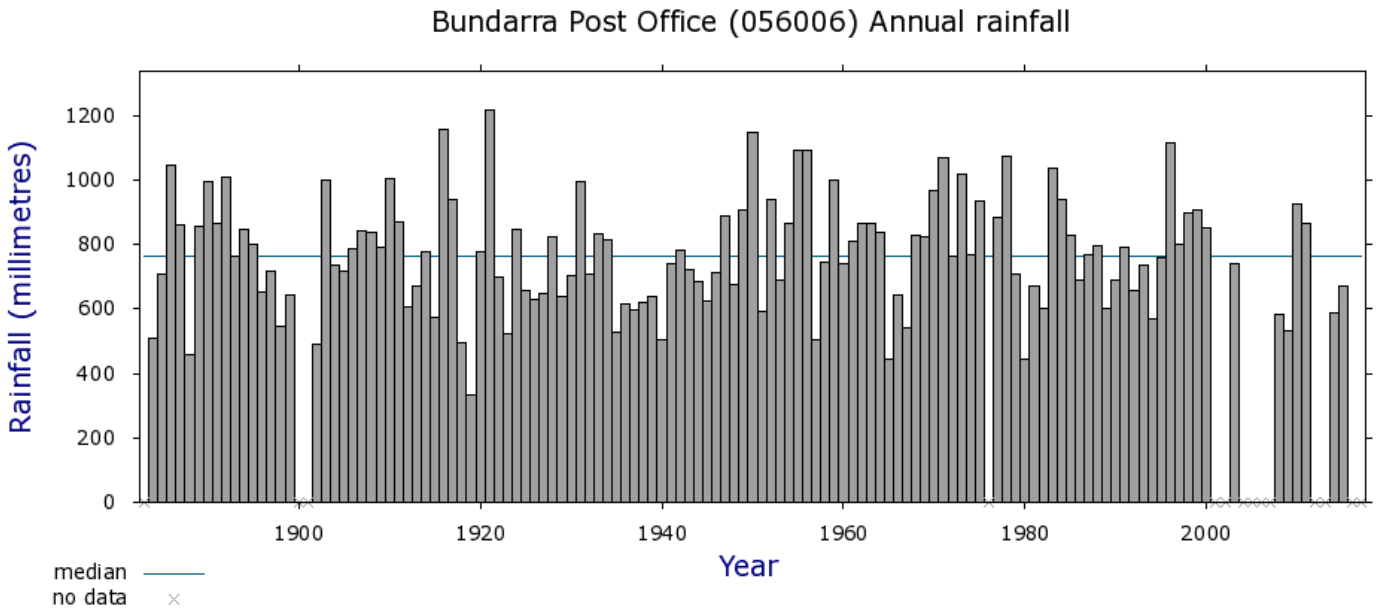

Figure 2: BOM Annual Rainfall Data Bundarra Post Office, 1883 - 2017[2]

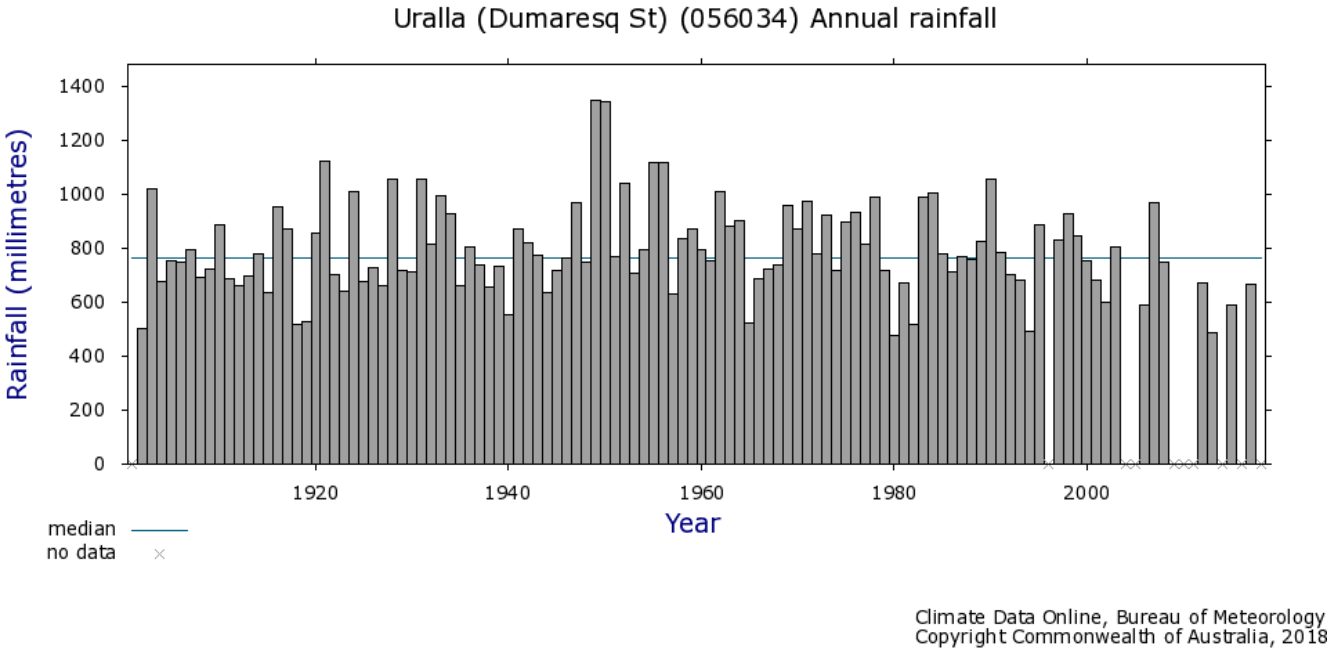

Figure 3: BOM Annual Rainfall Data Uralla Dumaresq Street, 1901 - 2018[3]

[2] The Bundarra Post Office records ceased in 2017. Only data for August 2017 was recorded that year.

[3] Gaps occur in the table where there are missing valid daily observations within the month. This is frequently associated with the observer being unavailable (where observations are undertaken manually), a failure in the observing equipment, movement to automatic recording equipment, or when an event has produced suspect data.

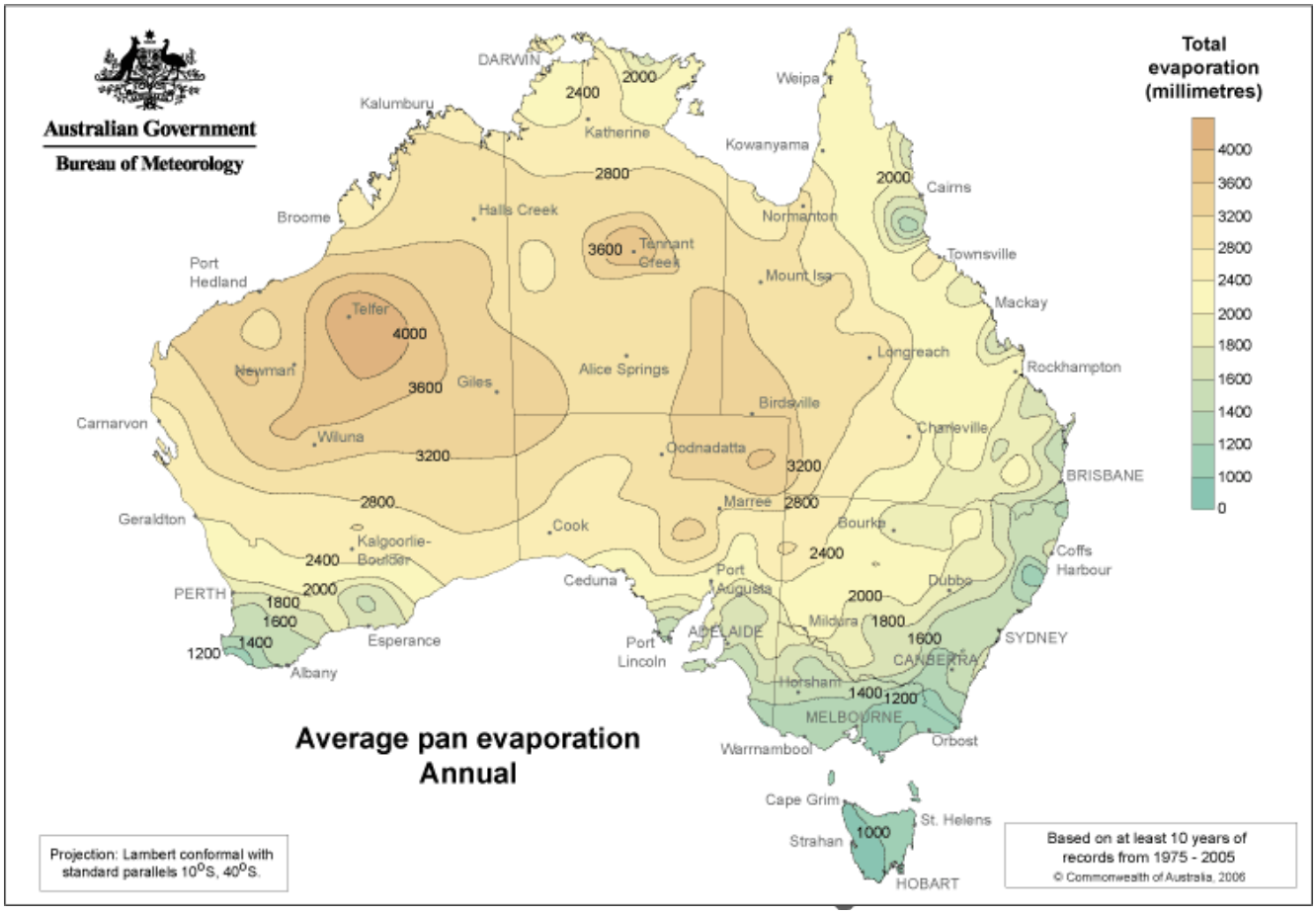

Figure 4: Average Annual pan evaporation, BOM 14 May 2018

3.2 Water Resources

Both Uralla and Bundarra water resources are drawn from the Gwydir Catchment. Uralla is served by Kentucky Creek, a tributary to the Gwydir River, while Bundarra is serviced by the Gwydir via Taylors Pond.

The Gwydir River originates in the New England Tablelands near Uralla and stretches 670 km to the Barwon River near Collarenebri. The catchment is separated from the Border Rivers catchment to the north by the Mastermans Range, and from the Namoi catchment to the south by the Nadewar Range. The river catchment is a total of 26,600 km^2. The Gwydir catchment at Bundarra is 3,990km^2.

Gwydir River resources are shared by multiple communities, councils and water utilities. However it is agriculture that dominates land use across the catchment, with livestock grazing dominant along Kentucky Creek and a mix of livestock grazing and cropping dominant around Bundarra.

Copeton Dam was completed in 1976 and is the only regulated water storage on the system. The Gwydir Wetlands lie below Moree in Northern NSW. The wetlands form part of the traditional country of the Gamilaroi people and are a major site for water bird breeding.

Uralla and Bundarra extract water from the unregulated portion of the Gwydir. That is, the river upstream of Copeton Dam. Unregulated rivers are dependent on rainfall and natural flows rather than water released from dams.

To balance the water needs of the Gwydir communities the Water Sharing Plan for the Gwydir Unregulated and Alluvial Water Sources commenced on 2 August 2012. The plan provides for the sharing of water between the environment, town water supplies, basic landholder rights and commercial use of water. The volume of water available to meet all competing environmental and extractive needs varies on a yearly and daily basis, depending on the weather, river flow and aquifer conditions.

The Office of Water maintains a river gauging station at Bundarra. Flow data has been recorded here from 1937. The long term average annual flow at Bundarra is 336,300 ML, the mean daily flow is 926 ML (for the period 1937 – 2010).

The driest year on record was in 1994 when 3,400 ML was recorded at Bundarra. Extended drought periods occurred in 1937 – 1949 and 1999 – 2009 when the annual flow was below the long-term average.[4]

3.3 Climate Scenarios: NARCLiM

It is widely accepted that future climate changes could impact on water supply systems through changes to the frequency and duration of rainfall, as well as an increase in evaporation.

A specific analysis of the impact of changing hydrological conditions under these scenarios for the Gwydir River is not available.

In generally, across the region (i.e. for the New England North West) NARCLiM Climate Scenarios predict increasing autumn rainfall, while winter and summer rainfall will decrease in the near future (to 2030). Current levels in variability of rainfall are predicted to continue into the future, though the pattern of rainfall is likely to be dominated by more intense storms. Increases in all temperature variables are expected in the near and longer term (i.e. by 2070) with fewer cold nights and more hot days. NARCLiM models suggest that there will be an extra 7 hot days a year by 2030 and 24 a year by 2070 on average across the region.

3.4 Downstream Impacts

It is important that Council liaise with relevant government agencies and other large users (e.g. local irrigators) during drought periods to ensure that water resources are effectively managed at a whole of catchment level.

Drawdown of the Kentucky Creek Dam and Taylors Pond under drought conditions is not expected to have any additional negative impact on either Kentucky Creek or the Gwydir River *per se*. There are no environmental water allocations from either storage.

[4] Source – NSW Office of Water, May 2011: Water resources and management overview – Gwydir River

4 PRE-DROUGHT PLANNING

While the Drought Management Plan focuses primarily on the response actions to be undertaken during a drought, the extent of the various impacts of drought (including economic, social and environmental impacts) will be largely driven by the effectiveness of a range of pre- drought planning and management activities, as discussed below.

4.1 Demand Management Plan

A Demand Management Plan has been prepared and released for Community Consultation in tandem with this Drought Management Plan. The Demand Management Plan includes the following key measures:

- Community Awareness Program.
- Best Practice Water Pricing.
- Permanent Water Conservation Measures.
- Non-Residential Large User Audits during Level 3 restrictions.
- Regulation and Planning Controls, including supporting current government initiatives like BASIX, WELS and Smart Approved WaterMark.
- Water Loss Management, including the metering of all properties.

4.2 Operating Rules

Efficient operation of water supply systems, particularly systems with either surface or groundwater storages, is an important pre-emptive strategy for managing droughts. Due to the difficulty in predicting future drought conditions, it is important that system storages are not drawn down excessively during non-drought periods as a result of inefficient operation of the system, as this would reduce the security of a supply system in the event of a drought and consequently worsen the impacts of drought.

Council should also liaise with the NSW Office of Water (Department of Primary Industries Water) during the water year to ensure that allocation of General Security water is managed in a way that sufficient storages are provided to meet future High Security town water supply requirements.

4.3 System Monitoring

Regular and accurate system monitoring of river flows, groundwater levels, dam levels, extractions and consumptions will be important inputs into future reviews of the Drought Management Plan.

4.4 Long Term Supply Strategies

All water supply systems should be designed to cope with at least a repeat of the worst drought on record. Larger systems (>1,000 people) should be designed to cope with more severe drought conditions than the worst on record, on the basis that it is reasonably expected that our communities could face a more severe drought than the worst on record.

While the Uralla water supply system currently has fairly high supply security, Bundarra has a relatively low level of supply security. Previous studies for both of these systems have identified a range of alternative long term supply strategies. However, to date long term supply strategies for these systems have not been adopted or implemented.

In accordance with IWCM principles, Council should prepare and adopt long term supply strategies for each system. Where required and/or available, part funding for the construction of works associated with the long term supply strategies should be sought from higher levels of government.

4.5 Resource and Funding Strategy

The costs associated with managing drought can have a significant impact on Council's finances, due to a variety of factors, including:

- Reduced revenue due to water consumption reductions associated with enforcing restrictions, particularly in the mid to late stages of the drought.
- Additional costs associated with Council activities, including running an ongoing community awareness campaign, increased frequency of supply and demand monitoring, liaison with government agencies and other stakeholders and policing of restrictions.
- Increased capital and operating expenditure associated with investigation, procurement, implementation and running of backup and emergency supply options.

When preparing budgets for the year ahead, Council will need to ensure that if drought conditions are expected and/or existent, sufficient funds are set aside for drought management activities. In addition, all costs associated with managing the drought should be tracked and be available to report to Council, government regulators, Department of Primary Industries Water and the community (if required). These costs can then be used as a justification for further investment in long term supply strategies and other drought management planning initiatives.

Drought emergency funding may be available through Department of Primary Industries Water to manage depleted supplies, investigate and implement emergency capital works or to cart water.

5 DROUGHT MANAGEMENT ACTION PLAN

Drought Management Action Plan (DMAP) set out the actions to be taken during each phase (i.e. drought response level) of the drought. There are five drought response levels; from Level 1 (Low) to Level 5 (Emergency), with each level having a set of suggested actions to be undertaken during that phase of the drought, including an associated set of water conservation measures / restrictions. Please refer to Table 2. The specific water conservation measures associated with each Level are listed in Table 5.

Specific DMAPs have been prepared for Uralla and Bundarra (see Tables 3 and 4) with additional specific actions to be undertaken in that system. These are generally related to the investigation and implementation of backup and emergency supply options. Secondary (or supplementary) supply sources for each of the drought response levels are listed.

5.1 Triggers & Water Consumption Targets

The DMAPs for each water supply system include primary triggers for initiating each drought response level, as well as total system water consumption targets for those levels. In general, triggers for small town water supply systems had previously been based on the operator's experience and were generally not directly related to a fixed flow or water level. Trigger Levels have been adopted and it is anticipated that over time more refined triggers will be developed and that they will be based more on the risk (based on historical flow records) of having a shortfall in supply.

Water consumption targets are average annual consumptions and should be adjusted for seasonal patterns (where appropriate). Note that once outdoor usage is banned (Levels 4 & 5), consumption targets become fixed daily targets due to the lack of influence from seasonal factors.

The decision to implement water restrictions is subject to an assessment of factors including, but not limited to, remaining storage, weather and climate forecasts and the impact the restrictions may have in relation to maintaining compliance with the Australian Drinking Water Guideline 2011 and Public Health Act (NSW) 2010.

In considering the easing of water restrictions Council will take into consideration water supply demand, projected demand, level and security of bulk water sources, catchment parameters, seasonal conditions, and seasonal outlook.

5.2 Compliance with Water Restrictions

Periods of water restrictions and use of appliances in accordance with water restrictions in place may be policed by Council officers.

Under the Local Government Act 1993 the maximum penalty that may be applied for a breach of imposed water restrictions is $2,200 for corporations and $220 for individuals.

5.3 Easing Restrictions

Easing water restrictions will generally not be implemented where it is likely that the revised restrictions will not be sustained for more than three weeks before tighter restrictions have to be re-imposed. Table 6 outlines the levels at which restrictions will be eased in each system.

Drought Response Level	Action	Corresponding Water Restrictions
1 Low	• Activation of Drought Management Plan • Implement Level 1 Water Restrictions and associated communications plan • Establish a drought budget to track ongoing drought management costs • Review alternative / backup supply options and emergency response /supply options outlined in Drought Management Plan • Initiate regular (weekly) liaison with key government agencies (Department of Primary Industries Water) • Undertake weekly review of river flows, dam levels (where applicable), water extractions, WTP production, and monitoring of actual water consumption compared to target	This is the first temporary level of WCM and would involve a restriction on the use of watering during the heat of the day. The introduction of this level of restrictions would raise community awareness of drought conditions, however only minor reductions in water consumptions would be achieved.
2 Moderate	• Implement Level 2 Water Restrictions • Consider the need to issue warnings and fines for violation of restrictions • Continue regular (weekly) liaison with Department of Primary Industries Water • Undertake weekly review of river flows, dam levels (where applicable), water extractions, WTP production, and monitoring of actual water consumption compared to target	This level of WCM and would involve a restriction on watering to 2 hours per day in order to reduce water consumption to just below average consumption levels. Council begins to cease watering parks, gardens etc. Implementation of this level of restrictions would create some level of inconvenience for the community; however most lawns and gardens would not be significantly impacted.
3 High	• Implement Level 3 Water Restrictions • Begin to implement issue of warnings and fines for violation of restrictions • Step-up community awareness campaign & meet with large non-residential users to discuss options for water reduction • Twice-weekly review of river flows, dam levels (where applicable), water extractions, WTP production, and monitoring of actual water consumption compared to target • Monthly liaison with key government agencies and local irrigators (where appropriate) • Begin planning for Emergency Response/supply options • Notify Department of Primary Industries Water of intention to investigate and/or implement backup or emergency supply options and seek drought assistance	This level of WCM would involve a ban on sprinklers and watering new turf. Buckets could still be used and hand held hoses with a trigger nozzle would be allowed for 15 minutes by the elderly. Council ceases all watering of parks, gardens, lawns with an exception for sports facilities when in use. Washing hard surfaces, vehicles and the supply of water for stock is not allowed. Swimming pools may not be filled or topped up. Implementation of this level of restrictions would create a major level of inconvenience for the community. Some losses of lawns and gardens and an impact on public amenity would be expected at this stage.
4 Very High	• Implement Level 4 Water Restrictions • Step-up the issuing of warnings and fines for violation of restrictions • Step-up community awareness campaign • Daily review of river flows, dam levels (where applicable), water extractions, WTP production, and monitoring of actual water consumption compared to target • Regular (weekly) liaison with key government agencies and local irrigators (where appropriate)	This severe level of WCM would involve a ban on all outdoor and non-essential usage in order to reduce water consumption to around winter consumption levels. Impacts would include the severe stress, and in many cases dying off, of lawns and gardens.
5 Emergency	• Implement Level 5 Water Restrictions • Continue to issue warnings and fines for violation of restrictions • All-out community water reduction appeal – minimum essential usage only (residential use 150L/person/day) • Regular (fortnightly) meetings with large water users to discuss ongoing water reduction options • Consider temporary closure of non-essential, high water dependent services • Daily review of river flows, dam levels (where applicable), water extractions, WTP production, and monitoring of actual water consumption compared to target • Regular (weekly) liaison with key government agencies and local irrigators (where appropriate) • Implementation of emergency response / supply options	This extreme level of WCM would involve an all-out campaign to reduce water consumption to absolute minimum levels (<100 L/person/day). This level of restrictions would involve a major disruption to normal lifestyles, including reduced shower times, reduced number of washing machine loads and a ban on the use of residential evaporative coolers (except where exemptions apply). Non-residential customers would be requested to restrict the use of water for only essential services, with the possible temporary shutting down of non-essential, water dependent services.

Table 2: Drought Management Action Plan (Bundarra and Uralla)

Drought Response Level	Primary Trigger[5]	Usage Target (kL/day)[6]	Additional Actions
1 Low	Kentucky Creek Dam level falls to 74%	1020 (95% average)	
2 Moderate	Kentucky Creek Dam level falls to 62%	960 (90% average)	Implement Parks and Gardens water management plan and target 30% reduction in water usage.
3 High	Kentucky Creek Dam level falls to 54%	910 (85% average)	Target 50% reduction in Parks and Gardens water usage.
4 Very High	Kentucky Creek Dam level falls to 42%	800 (75% average)	Target 25% non-residential usage reduction. Investigate availability of tankers to transport potable water from Armidale.
5 Emergency	Kentucky Creek Dam level falls to 35%	540 (50% average)	Target 50% non-residential usage reduction Implement transport of potable water from Armidale to supplement supply.

Table 3: Uralla Drought Management Plan

Drought Response Level	Primary Trigger	Usage Target (kL/day)	Additional Actions
1 Low	Taylors Pond level falls to 74%	164 (95% average)	Irrigation by adjoining rural landholders ceases.
2 Moderate	Taylors Pond level falls to 62%	156 (90% average)	Target 20% reduction in Parks and Gardens water usage.
3 High	Taylors Pond level falls to 54%	147 (85% average)	Target 50% reduction in Parks and Gardens water usage. Prepare to draw on Warrabinda Pond.
4 Very High	Taylors Pond level falls to 42%	130 (75% average)	Draw on Warrabinda Pond (if supply available). Investigate availability of tankers to transport potable water from Gilgai.
5 Emergency	Taylors Pond level falls to 32%	87 (50% average)	Target 50% non-residential usage reduction Implement transport of potable water from Gilgai to supplement supply.

Table 4: Bundarra Drought Management Plan

[5] *Secondary triggers may include failure to achieve consumption targets or major water quality incidents*

[6] *Usage targets are average annual consumptions and should be adjusted for seasonal variations*

Category	Activity	Level 1: Low		Level 2: Moderate		Level 3: High		Level 4: Very High		Level 5: Emergency	
General watering lawns and gardens	Buckets/cans	ok		R	Not during heat of the day	R	Not during heat of the day	X		X	
General watering lawns and gardens	Hand held hoses with trigger nozzle	R	Not during heat of the day.	R	Max 2 hours and not during the heat of the day.	R	Max 1 hour only and not during the heat of the day.	X		X	
	Water efficient drip irrigation	R	Not during heat of the day	R	Max 2 hours and not during the heat of the day	R	Aged and disabled only: 15 mins on Sun and Wed	X		X	
	Sprinklers and fixed hoses	R	Not during heat of the day	R	Max 2 hours and not during the heat of the day	X		X		X	
	Watering of new turf	R	Not during heat of the day	R	Max 2 hours and not during the heat of the day	X		X		X	
Council watering of public parks, gardens, blisters, sports fields	Irrigation	R	Not during heat of the day	R	Council reduces lawn watering; continues garden bed watering for maximum of 2 hours and not during heat of the day. Reduced watering of sports fields.	R	Limited to sports fields	X		X	
Vehicle washing including machinery	Buckets	ok		ok		R	Clean windows only	R	Clean windows only	R	Clean windows only
	Hand held hoses with trigger nozzle	ok		ok	Use of water for washing vehicle permitted for less than 30 minutes.	X		X		X	
Washing down hard surfaces	Hand held hoses with trigger nozzle	X		X		X		X		X	
	High pressure cleaner, assume 9L/min	ok		ok		X		X		X	
Private swimming pools	Topping up	R	With Council permission for >5kL	R	With Council permission for >3kL	X		X		X	
	Filling	X		X		X		X		X	
Motel swimming pools	Topping up	R	With Council permission for >5kL	R	With Council permission for >5kL	X		X		X	
	Filling	X		X		X		X		X	
Council swimming pool	Topping up	ok		ok		R	With Council permission for >5kL	X		X	
	Lawns and surrounds	R	Not during the heat of the day.	R	Max 2 hours and not during the heat of the day	X		X		X	
Evaporative coolers	Use of water for cooling	ok		ok		ok		ok		ok	
Water cartage	Treated water for stock and domestic	ok		ok		R	Domestic, hospital, aged care, school use only; no stock watering	R	Domestic, hospital, aged care, school use only; no stock watering	R	Domestic, hospital, aged care, school use only; no stock watering
	All other uses	R	By application	R	By application	X		X		X	
Commercial, educational and industrial	Landscaping (incl. lawns and garden)	R	Not during heat of the day	R	Max 2 hours, not during heat of the day	R	Target 30% reduction in usage.	R	Target 40% reduction in usage.	R	Target 50% reduction in usage.
	Irrigation of sports fields (Schools)	R	Not during heat of the day	R	Max 2 hours, not during heat of the day	X		X		X	

ok = Allowed at all times	Restriction apply to the use of Uralla and Bundarra town water.
X = Banned at all times	Greywater and rainwater can be used at any time provided that rainwater tanks are not topped up from town supplies.
R = Restricted use only	Not during the heat of the day means not between 9.00am and 5.00 pm during daylight saving and 10.00 am and 3.00pm at other times.
The decision to implement water restrictions is subject to an assessment of factors including, but not limited to, remaining storage, weather and climate forecasts and the impact the restrictions may have in relation to maintaining compliance with the Australian Drinking Water Guideline 2011 and Public Health Act (NSW) 2010.	

Table 5: Specific Water Restriction Measures

Drought Response Level	Kentucky Creek Dam	Taylors Pond
Permanent Water Conservation Measures		
1 Low	64%	70%
2 Low	52%	60%
3 High	44%	50%
4 Very High	32%	40%
5 Extreme	25%	30%

Table 6: Trigger points for easing restrictions Uralla and Bundarra

5.4 Communication

A key aspect in ensuring the successful implementation of the Drought Management Plan is the communication strategy. A community awareness campaign is vital for ensuring the community is made aware of actions that directly impact them, such as water conservation measures / restrictions and any associated fines and exemptions, and the activation of backup or emergency supply sources and any associated changes in water quality.

The community also needs to be given advice on how to minimise the impact of various water conservation measures (including options for household recycling of water) and advice on saving water around the home in general. It is important that the community is kept up-to-date with the status of water supply sources (including river flows and dam storage volumes) and is given some idea of the consequences of not achieving target reductions in water consumption.

An understanding of how to comply with water restrictions, and the applicable fines, is also required.

Liaison with key government agencies is another important component of the communication strategy. Key agencies include Department of Primary Industries Water, Department of Environment & Climate Change & Water (DECCW), NSW Health, the Gwydir-Border Rivers Catchment Management Authority

(CMA) and State Water. It is particularly important that the relevant agencies be informed when significant impacts on the community, the environment or other stakeholders are expected as a result of actions arising from implementation of the plan.

For the Bundarra system, liaison with local irrigators is also important, to ensure they are aware of any impacts they may be having on the town water supplies and conversely, to make sure they are aware of the potential impacts that Council's actions, arising from the implementation of the plan, may have on them.

5.5 Backup / Emergency Supply Options

After each of the water supply system DMAPs, backup and emergency supply sources (referred to in the action plan) are listed in order of preference.

1. Transporting potable water from Armidale to Uralla by tanker. A temporary connection to the new Armidale Regional Airport main would allow the closest point for the transfer of water to a tanker. Approval from Armidale Regional Council will be required.
2. Transporting potable water from Gilgai to Bundarra by tanker: Tankers would need to fill using standpipe attached to the main in the village. Approval of Inverell Shire Council would be required.

5.6 Permanent Water Conservation Measures

As part of Councils overall Demand Management strategy in conserving water at all times (during drought and non-drought periods), permanent water conservation measures (PWCMs) will be adopted and promoted to residents to take up on a voluntary basis. The following measures comprise PWCMs:

1. Minimise watering during the heat of the day
2. Use a trigger nozzle on hand held hoses
3. Wash down hard/paved surfaces with a high-pressure hose only

5.7 Emergency Response Strategies

In the event of severe water shortage it is assumed that external residential water use would be stopped altogether by way of restrictions, and that indoor water use could also be reduced through persuasive advertising and community education campaigns.

Emergency response strategies should only be considered when all other options have been exhausted, and should be applied in conjunction with the application of level 5 water conservation measures.

Water Carting

It is anticipated that water carting to Bundarra could be achieved using a single truck, however Uralla may require several large trucks or semi-trailers. In order to reduce transportation times and costs, Bundarra could be supplied from Gilgai (if possible) and Uralla could be supplied from Armidale.

Technical and financial assistance towards the cost of water cartage is available from the NSW Minister for Water but is subject to quantities and cartage arrangements being agreed with Department of

Primary Industries Water. Further details regarding water carting are provided in the Department of Primary Industries Water document titled “Drought Relief for Country Towns”.

Rationing

In association with Level 5 water conservation measures, voluntary rationing of indoor water use will be strongly encouraged through persuasive advertising and community education. Council has adopted a Level 5 residential water allowance (or target) of 100 L/person/day. Feedback on how much water each household is using compared to the allowance will be provided through the billing cycle. This puts the onus on each household to decide what internal restrictions or water savings devices they will employ in order to achieve the Level 5 residential water allowance.

Once Level 5 Restrictions are introduced Council may implement some, or all of the following measures;

- Introduce investigation of properties claiming the use of recycled or alternate sources of supply and, if the claims are valid, provide a Council approved sign at no cost to the property owner verifying the inspection and alternate use;
- Commence monitoring water consumption at residential properties on a quarterly basis and formally approach property owners where savings in treated water consumption are not shown or other unusual consumption is indicated requesting an explanation;
- Mail out to all residential properties connected in the affected area one or two shower timers to be used to encourage residents to reduce the period of time spent showering.
- Write to all businesses (including motels, schools and other institutions) in the affected area to support them with water audits.

6 POST-DROUGHT ACTIONS

6.1 Post-Drought Evaluation & Revision

Once the drought has broken and water supply systems return to normal operating conditions, a review needs to be undertaken of the effectiveness of the Drought Management Plan. The post-drought evaluation should include:

- A review of both supply side and demand side actions, including their effectiveness and timing, should be undertaken for each system and documented.
- An assessment should be made of the impact of drought management actions (including water conservation measures) on various stakeholders, including the community.
- An assessment of the impact of drought management actions on Council should also be undertaken.
- Community response to the imposition of various restrictions should be sought, including feedback on the effectiveness of the Community Awareness Campaign, how they managed the impacts of drought and any suggested changes / modifications to the water conservation measures.
- Feedback should also be sought from various government agencies and other stakeholders, including local irrigators.

Based on this review of the previous drought and any feedback received, the Drought Management Plan will need to be revised to include issues that were not previously considered and potentially modified to improve the future management of droughts.

6.2 Regular Review & Update of the Plan

In addition to evaluation and revision after each period of drought, regular reviews of the Drought Management Plan should be undertaken initially at least every 3 years. Plans should be updated with the latest information on water supply systems, including any augmentations that have occurred, changes to operating rules and up-to-date water consumption data and flow / level monitoring data for water sources. Plans should also be updated after any major changes / augmentations to water supply systems. Future revisions of the plans should consider climate change projections developed by the CSIRO.

6.3 Supporting actions

It is recommended that the following actions and initiatives be undertaken to improve the effectiveness of the Drought Management Plan and overall supply security.

- Discuss proposed emergency sources with adjoining Councils.
- Advertise this Drought Management Plan and invite public comment.

Appendix 1

Definitions

Aged and Disabled Watering Exemption under Level 3 water restrictions is an exemption granted to aged and disabled persons at an approved site for watering with a hand held hoses for 15 minutes only on Sundays and Wednesdays between the hours of 4.00pm and 8.00pm during daylight saving time and 4.00pm to 6.00pm during Eastern Standard Time. A Council approved sign supplied by Council is to be displayed at the site (visible form the street) while watering is in operation. The person authorised under the exemption or any other persons at the site are not permitted to use a bucket or watering can while the exemption is in place at the site.

Alternate Water Source means water from a bore, dam, stream, rainwater tank that is not connected to the Council reticulated water supply, or recycled water.

Approved Alternate Water Source means an approved alternate water source approved by Council.

Domestic Purposes means for internal household use.

Drought: "Drought is a prolonged, abnormally dry period when the amount of available water is insufficient to meet our normal use. Drought is not simply low rainfall. Meteorologists monitor the extent and severity of drought in terms of rainfall deficiencies.

It is generally difficult to compare one drought to another, since each drought differs in the seasonality, location, spatial extent and duration of the associated rainfall deficiencies. Additionally, each drought is accompanied by varying temperatures and soil moisture deficits." Bureau of Meteorology, 2018.

Hand held hose means a hose fitted with a trigger nozzle that is only held by hand.

Fixed Sprinkler means sprinklers, micros rays, or misters fitted to a hose or pipe.

Drip irrigation system means an irrigation system that complies with the following requirements;

- Drippers must have a manufacturer's discharge rating of not greater than 8L/hour at a water pressure of 100kPa;
- The maximum rate of the complete irrigation system per property is 5 L/minute;
- The following devices must be those approved by Council and fitted at the appropriate locations in a drip irrigation system; Backflow prevention device; Automatic timer; and 100kPa pressure reduction valve.

Use of Bucket or Can (when permitted under water restrictions). A bucket or can is to be of no more than 20L capacity, is to be filled directly from a tap (or a length of hose of not exceeding one meter in length connected directly to a tap) during the allocated watering time. The bucket or can must only be decanted by way of tipping directly onto the garden, lawn, pool or motor vehicle, and must not be decanted into another vessel or storage vessel prior to use. A limit of only one bucket or can may be used during the allocated hours of watering at each property or tenement (unit, villa or strata unit).

Water Restrictions means regulations introduced by Council to enforce restrictions of water consumption to ensure that water supply can be maintained at levels consistent with good management practices, considering volume.

Water Management Plan means a plan approved by Council for the approved hours and method of on-site water use. The approved plan relates to a specific property and a sign provide by Council must be displayed at the site for the duration of the plan.

Council Approved Sign means a sign approved and supplied by Council.