

Case study – Tenterfield Shire Council

Managing coinciding events to maintain water quality

Customers expect councils to plan for and provide them with access to adequate supplies of drinking water. Often environmental influences such as drought can change water access especially when water restrictions are applied, and the need to supply water for fighting bushfires can further reduce water supplies quickly.

Dealing with only one of these issues is difficult enough, dealing with these plus a sudden wet weather event, creating a water quality risk because of all the contaminants washed into waterways, is extremely challenging.

This case study describes how supplying town water under drought conditions was exacerbated by fire-fighting requirements, followed by ensuing water quality impacts from large post bushfire inflows, into Tenterfield Dam.

This case study is a resource for regional and county council decision-makers, including Councillors and operations staff of council-owned local water utilities.

About the Tenterfield Shire Council

- Tenterfield Shire Council is responsible for the town of Tenterfield and villages including Drake, Jennings, Liston, Legume, Bolivia, Sandy Flat, Stannum, Torrington, Urbenville and Mingoola in the New England region of NSW.
- The local government area is home to around 6,628 residents across 7,332 square kilometres.
- Council manages around \$600 million in community assets, including three drinking water supply systems totalling \$90 million.



Figure 1. Map showing the location of Tenterfield Shire local government areas in northern NSW.

System context

Tenterfield Shire Council (Council) owns and manages 3 drinking water supply systems:

- Tenterfield is the largest and supplies around 1,925 connections
- Urbenville supplies supply around 161 connections
- Jennings supplies around 90 connections.

Both Tenterfield and Urbenville have water filtration plants owned and run by the Council whereas Jennings receives treated water from the Southern Downs Regional Council, over the border, with Council being responsible for distributing that water to their customers, making sure it remains in a fit for purpose state. Each of these systems have their own dam and water treatment.

Council is responsible for planning and managing assets, to ensure statutory obligations and community levels of service are met. Levels of service are determined through community consultation and include compliance with national guidelines, acceptability of the taste and odour of the water, supply continuity and minimisation of drought restrictions.

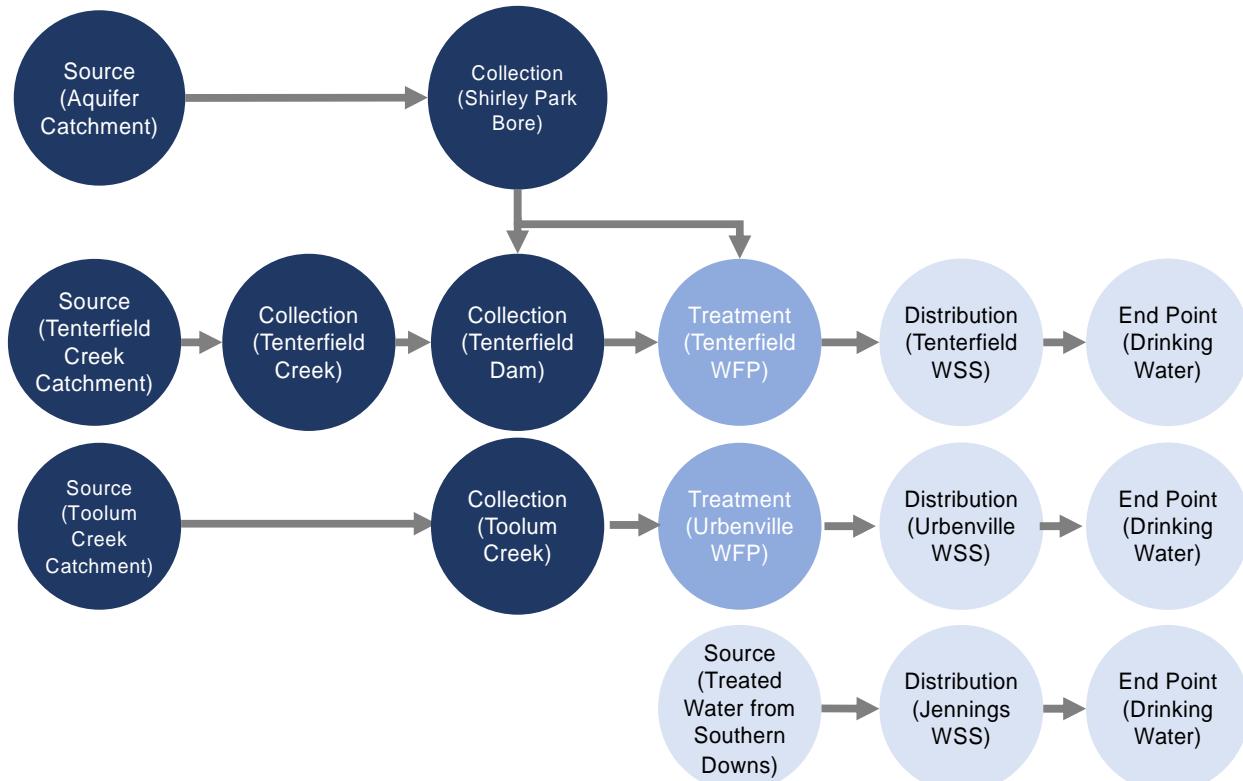


Figure 2. Taralga water supply system showing the sources of water that feed the dam, the treatment plant and the distribution to customers and sporting fields.

The event

In April 2018 Tenterfield Dam reached 70% capacity and Level 1 water restrictions for Tenterfield town and the extended rural community started. In February 2019 as the drought worsened the dam fell to 50% capacity and water restrictions increased to Level 4.7, banning watering with hand held hoses.

In February 2019, fires started in the village of Drake, continuing throughout the shire and in September 2019 fires affected Tenterfield town until November 2019.

Drought conditions affected the ability for the NSW Rural Fire Service to obtain water, most dams were dry except for Tenterfield. Ash, smoke and dust covered the town for months and impacted water quality and safety in the dam and surrounding water ways.

In October 2019, the dam levels dropped to around 18%. On October 4, Council began advising residents to boil water, with this lasting until 23 December 2019.

In late November 2019, a storm brought hail and heavy rain creating a frozen sludge which washed a large amount of ash, organics and debris into catchment waterways. As well as these water quality hazards, concern also existed about the potential impacts from fire retardants that turned the water orange.

The combined effect of the drought, bushfires and flooding resulted in economic hardship for the town due to serious water restrictions and the extended boil water alert.

Council governance

Tenterfield Shire Council is a general-purpose Council under the *Local Government Act 1993* (NSW) and is subject to a range of obligations under that act including drinking water provision, supplying drinking water to the towns of Tenterfield, Urbenville and Jennings.

As part of its drinking water obligations, Council is required to meet *Public Health Act 2010* (NSW) requirements as well as meet levels of service agreed with the community.

Under the *Public Health Act 2010* (NSW) and the *Public Health Regulation 2012* (NSW), Council must:

- meet the requirements of the *Public Health Act* and levels of service agreed with the community
- carry out and uphold a quality assurance program, often known as a Drinking Water Management System (DWMS)
- manage a DWMS that is consistent with the Framework for Management of Drinking Water Quality in the Australian Drinking Water Guidelines (ADWG; NHMRC/NRMMC, 2011).

Two of the Australian Drinking Water Guidelines (ADWG) guiding principles cover the importance of understanding and managing the source water, including being aware of significant change:

- principle 2: the drinking water system must have, and continuously maintain, robust multiple barriers appropriate to the level of potential contamination facing the raw water supply

- principle 3: any sudden or extreme change in water quality, flow or environmental conditions like extreme rainfall should arouse suspicion that drinking water might become contaminated.

In risk management there is also something called the ‘Swiss Cheese Model’, which aligns with the ADWG concept of multiple barriers. The idea is that if you line up all your slices of swiss cheese, a failure in one slice (the hole), will be masked by another slice – unless a situation exists where there are not enough slices or the slices that do exist, are also very holey – in which case, an incident, or water quality hazard, can shoot right through to the customer.

In April 2018, Tenterfield found itself at the start of its own Swiss Cheese event, where the combined incidence of drought, fires and heavy rain resulted in undrinkable water for the community.

Overview of risks

Tenterfield Shire Council was exposed to a number of risks from the event, some of which are summarised in table 1:

Risk	Consequence to Council	Impacts
Increased operational disruption in responding and rectifying the impacts.	<ul style="list-style-type: none"> • Increased costs due to unplanned nature and duration of the impacts. • Resource fatigue of staff. • Exposure to potential non-conformance on other system obligations and levels of service. 	<ul style="list-style-type: none"> • Financial • Reputation • Public health • Work health and safety • Compliance
Lack of ability to address customer queries and concerns across multiple channels	<ul style="list-style-type: none"> • Reputational impacts for Council, councillors, executive staff • Loss of confidence in Council. 	<ul style="list-style-type: none"> • Reputation • Political • Wellbeing • Financial
Lack of preparation for a multi-faceted emergency scenario	<ul style="list-style-type: none"> • Reputational impacts for Council, councillors and executive staff. 	<ul style="list-style-type: none"> • Reputation • Political • Wellbeing
Reduced reputation of town because of boiled water alert and water restrictions	<ul style="list-style-type: none"> • Potential reduction in tourism. • Impact on regional economy. • Political fallout. 	<ul style="list-style-type: none"> • Financial • Political

Table 1. Overview of risks Council were exposed to from the dam safety event.

Insights gained

Some of the key insights gained from this event were:

Risk management

- Monitor catchments for changes in water quality like for algal blooms.
- Monitor potential contaminants in raw water like increases in metals, drop of pH, increases in turbidity.

Incident management

- Start event investigation testing earlier.
- Placement of additional (more robust) organic traps.
- Use of booms and floating silt fence to capture organics.

Considerations

- Did you know that councils who are drinking water suppliers, have a *Public Health Act 2010* (NSW) obligation to have a Drinking Water Management System in place?
- Do you know what your responsibilities are in an emergency situation?
- Do you know what impacts to drinking water quality there might be in your drinking water catchments?
- Do you have a bushfire management plan in place?
- Has your drinking water emergency management plan been developed in consultation with NSW Health?

References

<https://www.tenterfield.nsw.gov.au/your-council/about-council>