

Department of Health

health

Annual report on drinking  
water quality in Victoria  
2010–2011



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2010–2011

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## Foreword

I am pleased to present the Department of Health's *Annual Report on drinking water quality in Victoria 2010–2011*. This annual report is the seventh produced under the *Safe Drinking Water Act 2003*.

The Annual Report has been prepared in accordance with Section 32 of the Act, which requires the Secretary of the Department of Health to provide the Minister for Health with an annual report on the quality of Victoria's drinking water, and then to be presented to each house of Parliament.

The regulatory framework for Victoria's drinking water is detailed in the *Safe Drinking Water Act 2003* and the *Safe Drinking Water Regulations 2005*. The framework provides a comprehensive catchment-to-tap approach to actively safeguard the quality of drinking water throughout Victoria.

The department recognises that the provision of safe drinking water to Victoria's urban and rural communities is essential for maintaining public health and wellbeing, as well as for the state's ongoing social and economic security.

The main objectives of drinking water regulatory framework are to ensure that:

- where water is supplied as drinking water, it is safe to drink
- any water not intended to be drinking water cannot be mistaken for drinking water
- water quality information is disclosed to consumers and is open to public accountability.

It also examines the operations and performance of water businesses, water treatment and fluoridation activities, and some of the initiatives that the state's water businesses undertook to improve or enhance drinking water quality across Victoria during the period.

The report shows that despite the challenges of severe weather events across the state; the safety of Victoria's drinking water was maintained during the year.

It also shows that 97.6 per cent of all Victorians with access to drinking water received water that complied with the Act's water quality standards. Of the potential threats to water quality reported to the department, some of which were flood-related, the majority were minor and transient in nature and did not compromise public health.

Consistent with previous reports, most customer complaints about the quality of Victoria's drinking water during 2010–11 related to quality rather than safety issues, such as discolouration, taste and odour. The number of complaints remained relatively low.

Most importantly, Victorians have continued to access, and enjoy the benefits of, safe drinking water. This report highlights how this has been achieved. First, Victoria's water businesses have continued to face the challenges and work diligently to deliver safe drinking water. Second, the collaborative relationship between the department and water businesses that underpins the regulatory framework has continued to drive improvements to the quality of the state's drinking water.



**Lance Wallace**  
Acting Secretary, Department of Health

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# At a glance

## What we do

Victoria's drinking water regulatory framework is administered by the Department of Health (the department) which oversees all aspects of the supply of drinking water to Victorians in order to:

- protect public health in relation to the supply of drinking water
- monitor and enforce compliance with the *Safe Drinking Water Act 2003* and its associated regulations
- investigate and report on any aspect of drinking water quality in Victoria
- report on the performance of water businesses
- make recommendations to the Minister for Health on any matter relating to drinking water
- promote industry and public awareness and understanding of drinking water quality.

The department achieves this by monitoring Victoria's water businesses compliance with the *Safe Drinking Water Act 2003*.

During 2010–11, 97.6 per cent of the population who had access to reticulated drinking water received water that complied with drinking water quality standards. While this was a two per cent decrease on the 2009–10 reporting period the trend over the last five years is one of improvement.

Victoria's water businesses made significant investments to improve water quality during 2010–11 including the:

- commencement of the supply of drinking water to the township of Natimuk
- completion of a 10 megalitre (ML) raw water storage at Omeo, increasing the towns storage capacity to 15 ML
- commencement of the reverse osmosis treatment process at Avoca to reduce the saltiness of the drinking water
- commencement of the new multi-barrier water treatment plant and treated water storage tank at Mount Beauty
- completion of a new pipeline from Alexandra to Thornton and Eildon
- construction of a 4 ML treated water storage tank at Toora.

## Highlights of 2010–11

Highlights for Victoria's drinking water supply in 2010–11 included:

- the continued increase in the percentage of Victorians with access to safe drinking water
- the upgrade of Natimuk's water supply from a regulated supply to drinking water quality
- an additional 82,000 Victorians having access to a fluoridated water supply
- the publication of *A guide to completing a water supply management plan – For schools using private drinking water supplies*, which was developed in partnership with the Department of Education and Early Childhood Development to assist rural and regional schools to manage the risks associated with non-reticulated drinking water supplies.

## Challenges

In 2010–11 severe rainfall and flooding again presented the biggest challenges.

These challenges included:

- floods in the Broken Creek and Murray River catchments increased levels of natural contaminants and decreased levels of dissolved oxygen
- damaged infrastructure, loss of power and an inability of staff to access water treatment infrastructure as a result of record flooding throughout the North West of the state

A number of severe weather events resulted in a number of issues with water quality standards.

These events contributed to the increase in non-compliance from the 2009–10 reporting year.

The water businesses were able to continue to provide safe drinking water to most flood-affected townships without additional treatment. Where water businesses were unable to provide safe drinking water, in consultation with the department, boil water advisories were issued to the affected communities in accordance with the *Safe Drinking Water Act 2003*.

Most notifications related to detections of *Escherichia coli*, which, in nearly all cases, was absent from subsequent samples from the same location. None of the *Escherichia coli* notifications received during 2010–11 were associated with known outbreaks of illness.

Only one notification during the period was known to be associated with illness. In May 2011 an excess amount of chlorine was dosed into the drinking water system that supplies the township of Tooborac. At least three young children, including an 11-week old baby, displayed health effects associated with consuming the affected water. A health impact assessment identified that there is unlikely to be any lasting adverse health effects. Coliban Water provided the department with a report describing the root causes of the incident and what actions they would be undertaking to prevent a similar occurrence.





## Part 1

Regulatory arrangements,  
structure of the Victorian  
water industry and activities  
of the department under  
the Act



# The drinking water regulatory framework

## Overview

The regulatory framework for drinking quality water in Victoria consists of the *Safe Drinking Water Act 2003* (the Act) and the *Safe Drinking Water Regulations 2005* (the regulations). The fluoridation of drinking water is regulated under the *Health (Fluoridation) Act 1973*.

The regulatory framework is administered by the Department of Health.

The Act defines two types of water business:

- water suppliers, which provide drinking water or regulated water to the public
- water storage managers, which provide water to water suppliers.

The role of water suppliers is to manage risk in relation to the supply of drinking water to the public. The role of water storage managers is to manage risk in relation to the supply of untreated water to water suppliers.

Victoria's water suppliers include 16 water businesses, five alpine resort management boards and Parks Victoria.

Victoria's water storage managers include Goulburn Murray Rural Water and Southern Rural Water (both supply untreated water to water suppliers), Melbourne Water (which primarily supplies treated drinking water to water suppliers) and Grampians Wimmera Mallee Water (which is both a water supplier and a water storage manager because it supplies raw water to several water suppliers).

At 30 June 2011 there were 25 water businesses regulated by the department under the regulatory framework. These businesses are listed in Appendix 1 of this report (see page 90).

## Objectives and functions

The Department of Health's Drinking Water Regulatory Section administers the Act and regulations on behalf of the department's Secretary (the Secretary). The specific functions of the Secretary, as prescribed in section 27 of the Act, are to:

- protect public health in relation to the supply of drinking water
- monitor and enforce compliance with the Act and the regulations
- report on the performance of water suppliers and water storage managers in relation to the requirements imposed on them under the Act
- investigate and report on any aspect of drinking water quality in Victoria
- make recommendations to the Minister for Health on any matter relating to drinking water or regulated water
- promote industry and public awareness and understanding of drinking water quality issues.

In carrying out these functions, the department liaises closely with Victoria's water businesses, other Victorian water-related regulatory agencies (primarily the Office of Water in the Department of Sustainability and Environment (DSE) and the Essential Services Commission), water industry representative bodies (Victorian Water Industry Association and Water Services Association of Australia) and equivalent interstate regulatory agencies.

## Activities

The day-to-day activities of the Drinking Water Regulatory Section include:

- reviewing and assessing the health significance of notifications made to the department under section 22 of the Act
- providing advice to water businesses on drinking water quality issues
- working with water businesses that are found to be non-compliant with the Act or regulations to assist them to achieve compliance
- preparing and disseminating guidance material on aspects of the regulatory framework
- keeping abreast of current research and emerging drinking water quality issues
- providing input into national guidelines and policy discussion.

The sections below provide more detail on regulatory activities undertaken by the department during 2010–11.

### 1 Fluoridation

Since 2004 the department has progressively extended water fluoridation throughout rural and regional Victoria. The expansion of water fluoridation has increased the proportion of Victorians receiving optimally fluoridated drinking water from 74 per cent to 90 per cent – an additional 700,000 Victorians (see Figure 1). This increase to 90 per cent coverage brings Victoria into line with other jurisdictions in Australia.

The extension of water fluoridation helps to address the disparity in oral health that exists between towns with a fluoridated water supply and those without. It is also widely recognised as a good investment in preventive health programs. *The Victorian Public Health and Wellbeing Plan 2011–2015* has a key strategic direction to build prevention infrastructure to support evidence-based policy and practice. Extension of water fluoridation supports this and is listed in the plan as an opportunity for progress. This also aligns with priorities in the *Victorian Health Priorities Framework 2012–2022*.

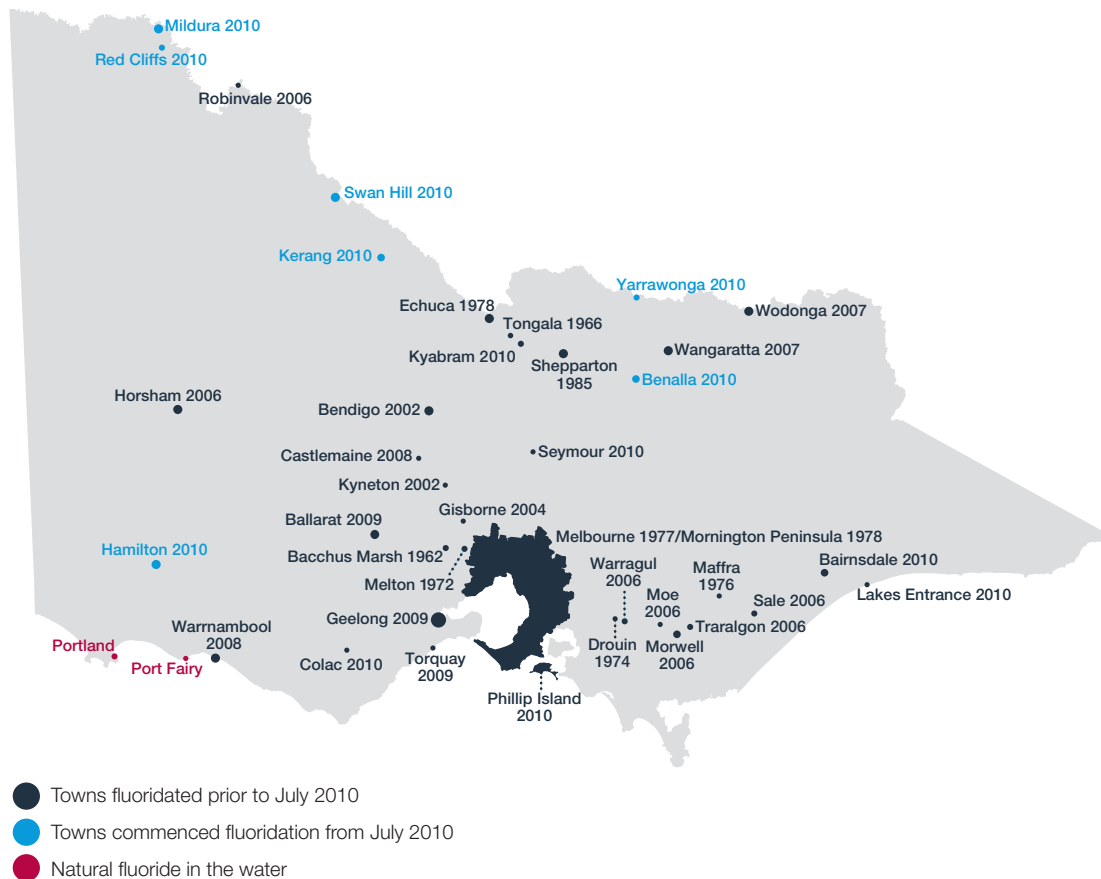
Water fluoridation helps protect against dental decay, and is the most effective way of allowing everybody access to the benefits of fluoride. Scientific studies have shown that water fluoridation is a safe and effective way to reduce tooth decay. There is no similar cost-effective population health alternative to water fluoridation and, as such, it represents significant value for money. In Australia, children living in optimally fluoridated areas experience considerably less tooth decay than those in areas without optimal fluoridation.



Water fluoridation has been practised in Australia since 1953. In some areas of Victoria, fluoride occurs naturally at optimal levels. However, for the majority of community drinking water sources, this is not the case. Water fluoridation commenced in Bacchus Marsh in 1962, followed by a small number of other rural locations, and Melbourne in 1977.

During 2010–11 a number of new plants in rural Victoria completed their commissioning programs and commenced operation. Plants located in Benalla, Hamilton, Kerang, Mildura, Swan Hill, and Yarrowonga were finalised and therefore an additional 82,000 people will benefit from access to a fluoridated water supply. This outcome consolidates the achievement of 90 per cent water fluoridation coverage across Victoria.

**Figure 1: Water fluoridation in Victoria**



## 2 Auditors and auditor certification

Under the Act, at the direction of the Secretary, water businesses are required to conduct an audit of their risk management plans by an approved auditor. Audits determine whether water businesses are complying with their obligations under the Act.

The auditor certification scheme for drinking water quality management systems was established by the department in 2007, in collaboration with the Water Services Association of Australia and the Victorian Water Industry Association. Auditors certified under this scheme are eligible for approval by the department to undertake regulatory risk management plan audits under the Act.

The scheme is administered independently of the department by RABQSA International, an international personnel certification organisation. The department chairs the committee overseeing the development and policy attributes of the scheme.

The scheme is recognised as a national benchmark for certifying drinking water quality management system auditors; it is also referenced in drinking water quality regulatory frameworks in Queensland and New South Wales. The scheme provides essential training to professionals servicing the water industry.

By the end of the 2010–11 reporting period, 17 individual auditors had been certified under the scheme. The names and contact details of certified auditors can be obtained from the RABQSA website at [www.rabqsa.com](http://www.rabqsa.com).

A significant component of the scheme is the Australian Drinking Water Guidelines-based exam, which is administered by RMIT. The exam is marketed as a stand-alone short course but forms an integral part of the auditor certification process. It has the dual benefit of assessing candidate auditors' knowledge competency for the auditor scheme, as well as providing a challenging forum in which people working in the Australian water industry can test their understanding of the risk management concepts contained within the *Australian Drinking Water Guidelines 2004*.

## 3 Approving water analysts

Under the regulations, the department approves water analysts to analyse samples of drinking water collected by water suppliers. Analysts have to meet certain requirements under the regulations to be approved by the department. The department has determined that 'analyse' can include an approved analyst supervising people conducting the analysis work, provided that results in the final reports to water suppliers of samples collected under the regulations are signed by an approved analyst as being correct.

During 2010–11 the department continued to receive and process applications from analysts seeking approval as water analysts under the regulations. All approved analysts are listed on the department's drinking water website at [www.health.vic.gov.au/environment/water/drinking](http://www.health.vic.gov.au/environment/water/drinking). At the time of publication, there were approximately 90 approved water analysts.

## 4 Overseeing undertakings

Where the department or water businesses identify non-compliance with the Act or regulations, the Secretary may accept a written undertaking from the business to rectify the non-compliance within a set period of time. An undertaking may deal with more than one contravention, regardless of whether or not the contraventions are of the same nature.

During 2010–11, no new undertakings were submitted to the department by water businesses.

There were six undertakings from previous years, and five of these were due for completion by the end of this reporting period. The undertakings related to contraventions of the water quality standards for *Escherichia coli*, turbidity and disinfection by-products.

The actions to resolve the undertakings involved optimising treatment processes, constructing a new treatment plant, or supplying water from a better-quality source. One of the finalised undertakings was related to 2008 audit findings.

Three of the five undertakings which were due for completion during 2010–11 did not meet the agreed completion date. For two of these undertakings the drinking water being supplied complied with the water quality standards, but the agreed actions under the undertaking had not been completed. These undertakings were closed out because the drinking water was found to be compliant.

In the case of the other undertaking, non-compliant aluminium results were still being recorded after the end of the undertaking, which were the result of delays in finalising the activities that would stop the contravention. Compliance with the aluminium water quality standard was finally achieved after the end of the reporting period.

The timelines were not met because of delays in completing the construction of new water treatment facilities or delays in the upgrading of existing facilities.

One undertaking, for Marysville and Buxton, is due for completion in July 2012, and will be reported in detail in the 2011–12 annual report.

The need for undertakings in Victoria in the future is expected to diminish as undertakings for existing water quality problems conclude, improvements are made and audit findings remain compliant.

A full list of undertakings for 2010–11 is provided in Appendix 6 (see pages 97–98).

## 5 Specification of water sampling localities

The regulations allow for specific areas, called water sampling localities, to be established. Water sampling localities assist water suppliers to manage water quality and risk.

Water sampling localities are a designated area that has common water quality characteristics and is representative of the drinking water supplied to customers. They are usually defined by water treatment processes or system hydraulics.

Each water sampling locality has designated water sampling points that represent all parts of the locality. The water supplier samples water from these points to monitor the quality and safety of the drinking water.

At the end of 2010–11 there were 486 water sampling localities in Victoria, with approximately 90 of these forming the Melbourne metropolitan water supply system. In regional Victoria, most water sampling localities equate to the water supply for an individual town.

The boundaries or number of water sampling localities may change over time due to population growth or supply upgrades. During 2010–11 one new sampling locality was approved and published in the *Victoria Government Gazette*:

- **Grampians Wimmera Mallee Water** – A new water sampling locality was created for Natimuk following the introduction of drinking water for this town (gazetted on 21 June 2010 and effective from 1 July 2010)

The Government Gazettes in which specific water sampling localities were published are listed in Appendix 4 (see page 94).

The specific towns and suburbs that are supplied with drinking water are listed in Appendix 9 (see page 148–163).

## 6 Overseeing regulated water supplies

Some water businesses supply a number of their customers with water that is not intended for human consumption. If it is considered that this water could be mistaken for drinking water the Minister for Health may, under section 6 of the Act, declare the water to be regulated water.

A water business supplying regulated water must prepare a risk management plan for the water, take all reasonable steps to ensure the community is made aware of the nature of the water and advise of any health risks that may arise from the consumption of the water. The process for considering whether a particular supply is declared as regulated water incorporates a significant degree of consultation between the water supplier and the local community.

In addition to protecting public health, regulated water declarations are a mechanism to include these non-drinking water supplies within the state's regulatory framework.

There were no new regulated water declarations during the 2010–11 reporting period. At 30 June 2011 regulated water was being supplied to 67 townships across Victoria.

One regulated supply, Natimuk, became a drinking water supply in 2010–11.

The full list of regulated water declarations is detailed in Appendix 5 (see page 95).

## 7 Competency framework for water treatment operators

During 2010–11, the department commenced implementation of the *Victorian framework for water treatment operator competencies – Best practice guidelines* (the guidelines).

As detailed in the 2009–10 annual report, prior to the completion of the guidelines, there were no minimum requirements (specifying qualifications, experience or refresher training) for operators of water treatment plants in Victoria.

The development of the guidelines was a collaborative project undertaken with Victoria's water businesses through their representative body, the Victorian Water Industry Association (VicWater) and the Water Industry Operators Association of Australia (WIOA).

Nevertheless, the businesses recognise that an ageing workforce, the prospect of skills shortages and a lack of national guidance on minimum requirements for staff operating water treatment plants creates risks with regard to producing safe drinking water. Therefore, they have been supportive of the guidelines.

The guidelines were released in September 2010, and implementation commenced shortly afterwards. In keeping with the collaborative nature of the guidelines an implementation committee was formed, which consisted of the Department of Health, eight representatives from Victorian water corporations (who represent the general VicWater membership), WIOA and the Water Industry Training Centre. The implementation committee met twice during 2010–11 to resolve a range of implementation issues.

Initial data submissions under the guidelines were received by the department in March and April 2011. Preliminary assessment of the submitted data showed that the vast majority of water treatment operators in Victoria met the minimum experience requirements of the guidelines, but many operators needed to undertake additional training to meet the minimum qualification requirements. Based on this information, water businesses began prioritising the additional training needs of their water treatment operators.

The guidelines establish the need for operators in charge of high-risk water treatment facilities to be certified under an independent certification scheme. During the 2010–11 reporting period WIOA submitted their certification scheme to the department for approval. It was approved by the end of 2010–11.

Also during the 2010–11 the National Water Commission commenced a project to develop a national certification scheme for water treatment operators. The Victorian guidelines are the reference scheme for the project. There is a Department of Health representative on the steering committee for this project.

More information on Victoria's best practice guidelines can be found at [www.health.vic.gov.au/environment/water/operator](http://www.health.vic.gov.au/environment/water/operator).

## **8 Victorian flood response**

In September 2010 and again in the months January to March 2011, Victoria experienced heavy rainfall which resulted in separate and widespread flood events. Particularly affected were the western and northern regions of the state where record levels of rainfall were recorded. Victoria's major rivers received significant inflows from storm water, many of which are directly or indirectly the source of drinking water to regional townships and metropolitan Melbourne.

The arrival of the heavy and sustained rainfall presented significant challenges to Victorian water suppliers and water storage managers. Advanced warning provided opportunity for water businesses to undertake a range of precautionary actions to minimise the effect of the storms. Still, many experienced loss of infrastructure, loss of power and access problems. Coliban Water and Parks Victoria were unable to undertake scheduled water quality sampling because of access problems due to flooding in February and March 2011.

There was rapid and large-scale deterioration of the raw water quality at the offtakes to many drinking water supplies. Water businesses experienced strong inflows into their storages after a period of sustained drought. Poor raw water quality (particularly high colour and turbidity) resulting from flooding and rain events presented challenges at numerous water treatment plants.

Of note were the 'black water' events on the Murray River and Broken Creek, which had a significant effect on the operations of a number of water treatment plants operated by Goulburn Valley Water and Lower Murray Water. Black water is a result of leaves and twigs being swept into waterways during floods where they decay; lowering the oxygen levels and turning the water black. Both Goulburn Valley Water and Lower Murray Water faced significant treatment challenges with the large amount of naturally occurring organic matter, iron, manganese and sudden decrease in dissolved oxygen levels. To manage the event required water businesses to increase chemical usage, change treatment chemicals, monitor water treatment plant performance closely and increase staff attendance.

Some water businesses were affected by more than one flood event during 2010–11. Grampians Wimmera Mallee Water in particular had widespread flooding in all regions and received multiple insults. The floods impacted significantly on the operation of drinking water systems without multiple treatment barriers. In collaboration with the department, Coliban Water, Goulburn Valley Water, Grampians Wimmera Mallee Water and North East Water issued boil water advisories on their vulnerable drinking water supplies to protect public health and provided alternate supplies. Some of these boil water advisories remained in place for the entire 2010–11 reporting period and beyond.

Higher levels of colour and turbidity during the floods gave rise to taste and odour challenges for businesses, resulting in increased numbers of customer complaints. In addition the changes to water quality and increased chemical usage have impacted on compliance, with some water businesses struggling to meet the drinking water quality standards during the 2010–11 reporting period.

The department worked closely with water corporations and other government agencies to ensure flood-affected people had access to safe drinking water. Members of the community who use private water supplies were provided with a community factsheet, *Flood hazards – protecting your health and safety* (January 2011), which provides advice on preventing waterborne illness, including instructions for boiling and disinfecting water for drinking.

Further information on how each individual water business was affected by the floods and their responses and actions are discussed in section 3 (see pages 32–87).

## **9 Plague locusts**

A locust plague occurred in Victoria and other Australian states in late 2010 and early 2011.

Historically during locust plagues, large amounts of chemicals are used to control and reduce the number of plague locusts.

Due to the large area predicted to be covered by plague locusts and the large quantity of insecticide expected to be used, there was a strong possibility that insecticides could enter waterways and impact drinking water.

The Department of Health, Department of Primary Industries (DPI) and water businesses in the areas predicted to be affected by plague locusts met to discuss possible impacts and preventative measures that could be undertaken. Water businesses conducted risk assessments on the possible insecticide contamination of raw water supplies and the possible impact on drinking water. When spraying occurred in areas that could affect waterways and potentially impact on drinking water, water businesses monitored the raw water for insecticides. Coliban Water, Goulburn Valley Water and Grampians Wimmera Mallee Water all monitored raw water within their areas during periods of spraying. Results of raw water monitoring revealed that insecticides were either below detection level or were well below the health-based guideline values for pesticides in the *Australian Drinking Water Guidelines 2004*.

The Department of Health provided advice for the public on the likely health impacts from being exposed to the insecticides used to control the plague locusts. This advice included how to manage private drinking water supplies to reduce possible contamination with insecticides.

## 10 Catchment management

Good catchment management practices are an important factor in managing the risks to drinking water quality. Ensuring good quality source water means that water treatment is likely to be more effective; thus it is an important component of ensuring safe drinking water.

During 2010–11 the department worked collaboratively with relevant stakeholders to continually improve and raise awareness of catchment issues.

In November 2010, the department released the booklet *Protect our waters – protect our health: A guide for landholders on managing land in drinking water catchments*. The booklet was developed by the Department of Health in consultation with DSE, DPI, the Environment Protection Authority (EPA), and several water businesses and catchment management authorities. It details the important actions that should be taken when managing land in a drinking water catchment.

The booklet was developed as a stakeholder engagement tool for use by the water industry and other stakeholders to raise awareness among landholders about the importance of managing land for the protection of water quality in Victoria's drinking water catchments.

The booklet was distributed widely to water businesses and catchment management authorities, as well as VicWater, DSE, DPI, EPA and local councils via the Department of Health regional offices.

Feedback on the usefulness of the document as an engagement tool has been very positive.

The electronic version of the booklet can be downloaded from [www.health.vic.gov.au/environment/water/protecting\\_d-water](http://www.health.vic.gov.au/environment/water/protecting_d-water).

## 11 Water supply management plan for schools using private drinking water supplies

There are many schools in rural and regional Victoria that are not serviced by water businesses and rely on other private sources of water, such as rainwater or bore water.

The guidance document, *A guide to completing a water supply management plan – For schools using private drinking water supplies*, has been developed in partnership with the Department of Education and Early Childhood Development. The document is designed to assist rural and regional schools to understand the risk management expectations, and to effectively manage the risks, associated with their private drinking water supplies.

Managing risks associated with private drinking water supplies requires a long-term commitment from school management. It is the responsibility of schools to exercise a duty of care and ensure that drinking water supplies are protective of human health. This can be achieved by adopting the preventive risk-based approach described in the guidance document.

The recommendation is to develop a water supply management plan to ensure the delivery of water that is fit for the intended end use. A water supply management plan consists of five steps:

1. Nominate a person to be responsible for the school's water supply system.
2. Provide a detailed description of the water supply system.
3. Identify hazards and ways to manage risks to the water supply system.
4. Document operational, monitoring and maintenance procedures for the water supply system.
5. Have an emergency management plan in place.

The guide was launched by the Minister of Health in July 2011. Hard copies were sent out to Victorian schools using private drinking water supplies, local councils, the Plumbing Industry Commission and regional Department of Health and Department of Education and Early Childhood Development offices. The document is available online via the department's Environmental Health website at [www.docs.health.vic.gov.au/docs/doc/A-guide-to-completing-a-water-supply-management-plan---for-schools-using-private-drinking-water-supplies](http://www.docs.health.vic.gov.au/docs/doc/A-guide-to-completing-a-water-supply-management-plan---for-schools-using-private-drinking-water-supplies).

## 12 Participation in industry organisations and research

During 2010–11, the department continued its industry membership of Water Quality Research Australia (WQRA) and its associate membership of the Water Services Association of Australia, the peak body of the Australian urban water industry.

WQRA is the national research centre that succeeded the Co-operative Research Centre for Water Quality and Treatment from 30 June 2008. It undertakes national collaborative research on drinking water quality, recycled water and relevant areas of wastewater management. During the early part of 2010–11 the department had representation on the board of WQRA.

Membership of both organisations provides the department with valuable access to the leading water quality research in Australia, as well as a means for highlighting drinking water regulatory issues at a national level.



## Drinking water safety expenditure

The department set the administrative levy for the 2010–11 financial year, payable under section 51 of the Safe Drinking Water Act. Receipts of \$1,063,573.66 were paid into consolidated revenue, as required under the Act.

To cover the administration of the Act for 2010–11, equivalent funds were appropriated to the department. The application of these funds is shown in Table 1. The variance column shows the difference between the assessed expenditure for 2008–09 and 2009–10.

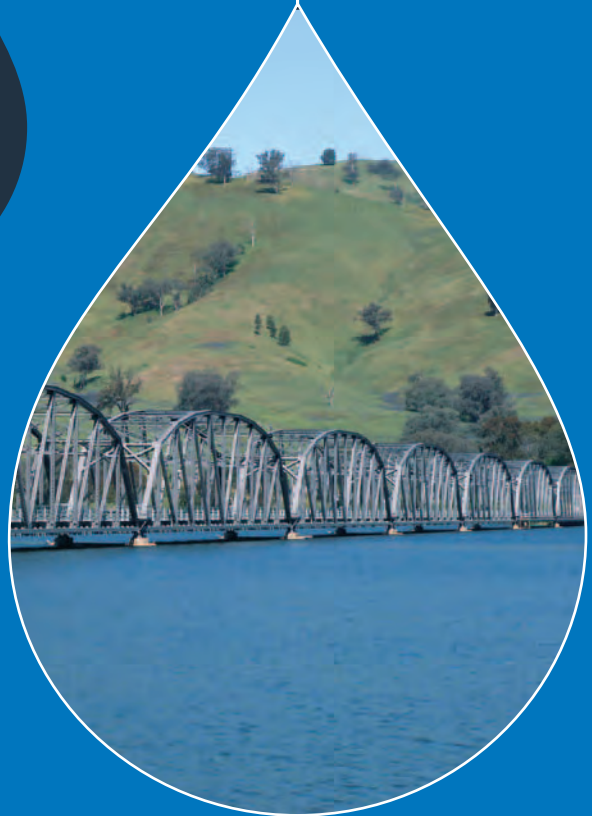
The expenditure in the 2010–11 reporting period is higher than in 2009–10 because of a number of factors, including the need to undertake pre-commissioning audits for a number of new fluoridation plants, extensive redevelopment of the database that holds water quality data collected under the Safe Drinking Water Regulations and the secondment of external staff to support administration activities.

**Table 1: Expenditure under the Safe Drinking Water Act, 2008–09 to 2010–11**

	Expenditure (\$)			
	2008–09	2009–10	2010–11	Variance
Salaries, allowances and salary-related oncosts	437,925	462,840	393,102	(-69,738)
Indirect costs	42,613	44,258	33,527	(-10,731)
Operating costs	111,338	90,229	156,155	65,926
Communication and education	75,489	36,632	71,241	34,609
Research and development	323,781	291,782	354,097	62,315
IT development	0	9,232	42,023	32,791
<b>Total expenses</b>	<b>991,146</b>	<b>934,973</b>	<b>1,050,145</b>	<b>115,172</b>

## Part 2

# Statewide perspective on drinking water quality



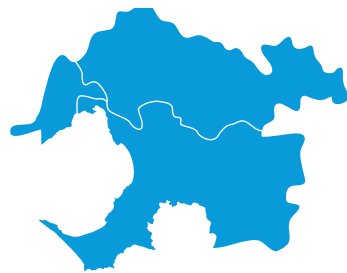
# Drinking water supplies in Victoria

Water suppliers provide drinking water to approximately 98 per cent of Victoria’s population. All drinking water supplies in Victoria are disinfected.

Twenty-two water suppliers provided drinking water or regulated water to a total of 486 water sampling localities across Victoria<sup>1</sup> (see Figures 2 and 3 below). The Lake Mountain Alpine Resort Management Board is unique in that it is the only water supplier that supplies regulated water (non-drinking water) only.

Water sampling localities vary considerably in size – from individual towns supplying water to fewer than 200 people, to localities in the Melbourne and Geelong metropolitan areas that supply many thousands of people (see Appendix 7 and Appendix 9 for more details).

**Figure 2: Melbourne metropolitan water industry (Melbourne Water is the water storage manager supplying to three water suppliers – City West Water, South East Water, Yarra Valley Water).**



In Victoria there are 13 regional water corporations managing rural and regional drinking water supplies across the state. Figure 3 shows these suppliers, with the dark area representing the Melbourne metropolitan suppliers, detailed in Figure 2. The five Alpine Resort Management Boards and the sites where Parks Victoria provide drinking water are not shown on these maps.

**Figure 3: Victoria’s 13 regional water suppliers**



Maps provided by the Victorian Water Industry Association.

Section 17 of the Act and regulations 10 and 11 require water businesses to comply with water quality standards and to carry out regular water sampling. The regulations also specify the required sampling frequency.

The Act also requires water businesses to prepare, implement and review risk management plans, which are subject to audits by an auditor approved by the department.

<sup>1</sup> There was a net increase of one locality during 2010–11 (Natimuk).

# Standards for drinking water quality in Victoria

Section 17 of the Act requires drinking water supplied by a water supplier to comply with the nine water quality standards set out in Schedule 2 of the regulations. These include:

- *Escherichia coli*
- turbidity
- aluminium
- trihalomethanes
- chloroacetic acid
- dichloroacetic acid
- trichloroacetic acid
- bromate
- formaldehyde.

The bacterium *Escherichia coli* is used as a specific indicator of faecal contamination. Turbidity is a measure of the cloudiness of the water. Aluminium-based chemicals are used as a coagulant in the water treatment process.

The other six chemicals listed are by-products of the types of disinfection or water treatment commonly used in Victoria.

Water suppliers must also ensure the drinking water they supply does not contain any algal toxin, pathogen, substance or chemical at levels that may pose a risk to human health. This means that drinking water supplied by water suppliers must also comply with the health-related guideline values set out in the *Australian Drinking Water Guidelines 2004*, published by the National Health and Medical Research Council<sup>2</sup>. Fluoridated supplies in Victoria must also comply with the requirements of the Health (Fluoridation) Act.

Water quality data for 2010–11 for each water sampling locality is shown in Appendix 7 (see pages 99–120). More detailed discussion of the results for individual water businesses can be found in Part 3 of this report (pages 32–87), the notifications section and in the annual water quality reports of the individual businesses.

Significant results are discussed on the following page.

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<sup>2</sup> Available at [www.nhmrc.gov.au/publications/synopses/eh19syn.htm](http://www.nhmrc.gov.au/publications/synopses/eh19syn.htm)

# Water quality data for 2010–11

The vast majority of drinking water supplied across Victoria in 2010–11 met the required standards. Results are shown in Table 2 and Figure 4, including a comparison with data for previous years.

**Table 2: Number of localities where drinking water did not comply with the water quality standards 2010–11**

Water supplier	Number of locations where drinking water did not comply in 2009–2010											Total non-compliant	Population affected
	Total number of localities	<i>E. coli</i>	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Form	Fluoride		
Barwon Water	32	---	---	---	---	---	---	---	---	---	---	0	---
Central Highlands Water	37	1	---	---	---	---	---	1	---	---	---	2	3,920
City West Water	15	---	---	---	---	---	---	---	---	---	---	0	---
Colliban Water	45	1	---	---	6	1	3	---	---	---	---	8	5,260
East Gippsland Water	19	---	---	1	---	---	---	---	---	---	---	1	250
Gippsland Water	35	---	---	---	---	---	---	---	---	---	---	0	---
Goulburn Valley Water	48	---	---	8	1	1	4	---	---	---	---	10	62,450
Grampians Wimmera Mallee Water #	36	---	12	4	18	3	12	---	---	---	---	23	26,010
Lower Murray Water	14	---	---	---	1	---	---	---	---	---	---	1	2,800
North East Water	42	---	---	6	---	---	---	---	---	---	---	6	5,510
Parks Victoria #	5	2	---	---	---	---	---	---	---	---	---	2	---
South East Water	39	---	---	---	---	---	---	---	---	---	---	0	---
South Gippsland Water	19	---	---	1	---	---	---	---	---	---	---	1	430
Wannon Water	33	---	---	5	1	1	1	---	---	---	---	5	10,220
Western Water	19	---	---	---	---	---	---	---	---	---	---	0	---
Westernport Water	9	---	---	2	1	---	---	---	---	---	---	3	5,670
Yarra Valley Water	32	---	---	---	---	---	---	---	---	---	---	0	---
Falls Creek ARMB	1	---	---	---	---	---	---	---	---	---	---	0	---
Mount Baw Baw ARMB	1	---	---	---	---	---	---	---	---	---	---	0	---
Mount Hotham ARMB	1	---	---	---	---	---	---	---	---	---	---	0	---
Mount Buller & Mount Stirling ARMB	4	---	---	---	---	---	---	---	---	---	---	0	---
<b>Statewide totals #</b> % of localities compliant for 2010–11	<b>486</b>	<b>4</b> 99.2%	<b>12</b> 97.5%	<b>27</b> 94.4%	<b>28</b> 94.2%	<b>0</b> 100.0%	<b>6</b> 98.8%	<b>20</b> 95.9%	<b>1</b> 99.8%	<b>0</b> 100.0%	<b>0</b> 100.0%	<b>62</b> 87.2%	<b>122,520</b> 97.6%

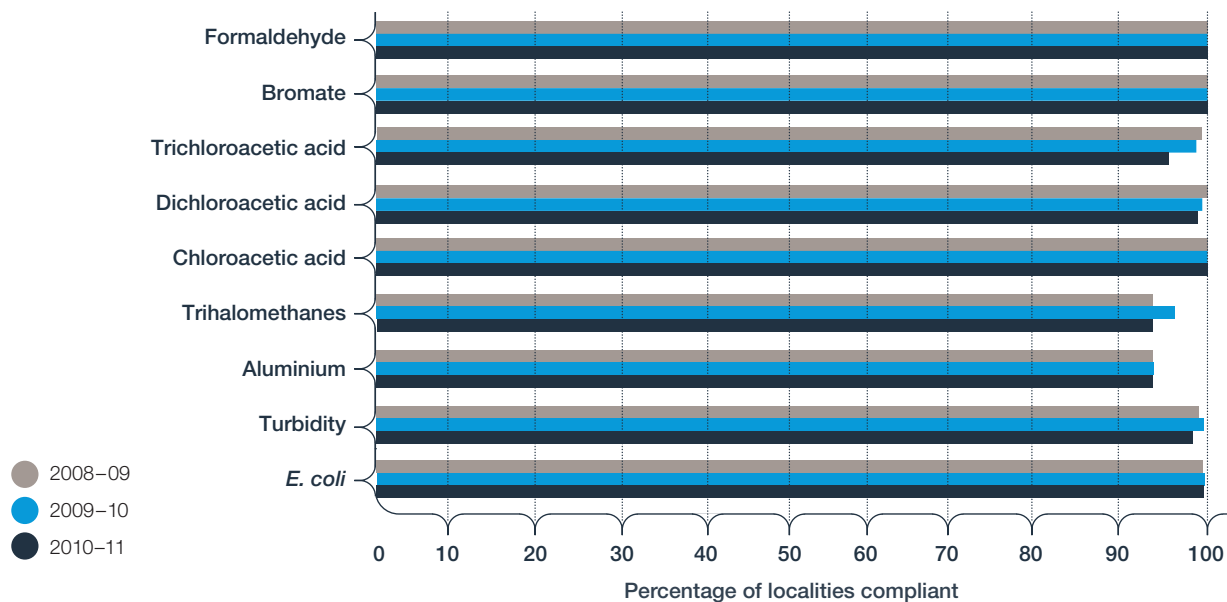
## Comparison with previous years

<b>Statewide totals #</b> % of localities compliant for 2009–10	<b>485</b>	<b>2</b> 99.6%	<b>4</b> 99.2%	<b>26</b> 94.6%	<b>15</b> 96.9%	<b>0</b> 100.0%	<b>1</b> 99.8%	<b>9</b> 98.1%	<b>0</b> 100.0%	<b>0</b> 100.0%	<b>0</b> 100.0%	<b>50</b> 89.7%	<b>162,679</b> 96.8%
<b>Statewide totals #</b> % of localities compliant for 2008–09	<b>483</b>	<b>5</b> 99.0%	<b>8</b> 98.3%	<b>27</b> 94.4%	<b>26</b> 94.6%	<b>0</b> 100.0%	<b>0</b> 100.0%	<b>5</b> 99.0%	<b>0</b> 100.0%	<b>0</b> 100.0%	<b>0</b> 100.0%	<b>67</b> 86.1%	<b>90,975</b> 98.2%

### Abbreviations

ARMB Alpine Resort Management Board  
MCA Chloroacetic acid  
DCA Dichloroacetic acid  
TCA Trichloroacetic acid  
THMs Trihalomethanes  
*E. coli* Form  
*Escherichia coli*  
Formaldehyde  
# Localities which did not comply on more than one standard are only counted once in the Total column  
Water supplies that are non-potable (i.e. not intended for drinking) are excluded from the above table.  
Fluoride data included since 2008-09 only.

Figure 4: Performance against water quality standards 2008–09 to 2010–11



In 2010–11:

- 99.2 per cent of localities satisfied the standard for *Escherichia coli*
- 97.5 per cent of localities satisfied the standard for turbidity
- 94.4 per cent of localities satisfied the standard for acid-soluble aluminium
- 94.2 per cent of localities satisfied the standard for trihalomethanes
- 98.8 per cent of localities satisfied the standard for dichloroacetic acid
- 95.9 per cent of localities satisfied the standard for trichloroacetic acid
- 99.8 per cent of localities satisfied the standard for bromate
- 100 per cent of localities satisfied the standard for chloroacetic acid and formaldehyde.

Of all localities, 87.2 per cent complied with all standards, representing drinking water supplied to 97.6 per cent of the total supplied population. This is an increase in the percentage of the total population supplied with compliant water from 2009–10.

The 2010–11 results for the individual water quality standards decreased from 2009–10.

Non-complying results were, generally, spread across a number of smaller supplies in rural Victoria. The results reflect the difficult conditions experienced by Victoria's water businesses during 2010–11. The large rainfall events and extensive flooding across the state produced very poor water quality, that presented challenges to water businesses to produce safe drinking water. The number of complying results decreased from the figures for 2009–10, when 89.7 per cent of localities complied with the standards.

All drinking water supplied by Barwon Water, City West Water, Gippsland Water, South East Water, Western Water and Yarra Valley Water, as well as Mount Baw Baw, Mount Buller and Mount Stirling, Falls Creek and Mount Hotham alpine resorts complied with all standards in 2010–11.

Almost all drinking water supplied by East Gippsland Water, Lower Murray Water and South Gippsland Water complied with standards in 2010–11 – each had only one non-compliant locality.

All fluoridated supplies complied with the requirements of the Health (Fluoridation) Act.

## Non-compliant results

There was an increase in the number of non-compliant water sampling localities in 2010–11, as compared to 2009–10. When non-compliant results were received, the affected water suppliers undertook appropriate investigations and remedial actions.

The impacts on raw water quality that followed the rainfall events and extensive flooding that occurred across the state during the 2010–11 reporting period were the cause for the increased number of non-compliant localities. Most of the non-compliant localities were in rural or regional areas.

Some of the issues that lead to non-compliant results are ongoing and are being managed by the water supplier concerned. An example of an ongoing issue are those water supplies that do not have filtration as part of their normal water treatment process, and due to poor raw water quality as a result of the floods, exceeded the turbidity standard.

In all cases of non-compliance, the department assessed the non-compliant results and determined that the results did not compromise public health.

All microbiological detections of *Escherichia coli* are reported to the department and the significance of each detection is assessed. When *Escherichia coli* is detected, water businesses will resample, and in nearly all cases *Escherichia coli* was absent in the follow-up samples. The responses taken by water businesses to individual *Escherichia coli* detections are described in Appendix 8 (page 121–147).

High results for turbidity, aluminium, trihalomethanes or trichloroacetic acid accounted for most of the non-compliant results. This was especially significant for Coliban Water, Goulburn Valley Water, Grampians Wimmera Mallee Water, North East Water and Wannon Water. Each of these businesses had water treatment plants in areas affected by flooding, which significantly impacted on the raw water quality and therefore water treatment processes.

Drinking water in 28 water sampling localities did not comply with the trihalomethanes standard in the 2010–11 reporting period, which is a significant increase from the 15 non-compliant localities recorded in the previous year. Four of the 28 non-compliant localities (Donald, Quambatook, Rupanyup and Wycheproof) were also non-compliant in both 2008–09 and 2009–10. The water treatment plants for these four localities do not have the treatment processes required to remove the precursors that lead to the production of disinfection by-products.

Drinking water in 20 water sampling localities did not comply with the trichloroacetic acid standard in the 2010–11 reporting period, which is also a significant increase from the nine non-compliant localities recorded in 2009–10.

Elevated levels of trihalomethanes and trichloroacetic acid are caused by natural organic matter in the source water reacting with the chemicals used for disinfection. Both filtered and non-filtered supplies were affected.

Grampians Wimmera Mallee Water had 12 water sampling localities that were non-compliant with the turbidity standard. All of these localities are non-filtered supplies. Nine of the non-compliant localities (Beulah, Brim, Donald, Jung, Minyip, Rupanyup, Sea Lake, Woomelang and Wycheproof) were a direct result of the January 2011 floods. The poor raw water quality continued post floods and as a result has continued to produce non-compliant water until the end of the 2010–11 reporting period. In January 2011 a boil water advisory was issued for these nine localities. The boil water advisory was still in place at the end of the 2010–11 reporting period. Lalbert, Manangatang and Ultima all had turbidity results above 5 NTU for the entire 2010–11 period as a result of poor water quality from the October 2010 floods. These three localities have had a boil water advisory in place since October 2010.

Drinking water in 26 water sampling localities did not comply with the aluminium water quality standard. The majority of these were one-off sporadic issues managed by the supplier concerned. However, some localities (Beechworth Low Level, Bonnie Doon, Cavendish and Hamilton) had ongoing elevated aluminium results that were related to issues with raw water quality and process-related difficulties at the relevant water treatment plants.



## Risk management plan audits

The Act requires water suppliers to prepare, implement and review risk management plans for their supplies of drinking water and regulated water. It requires water storage managers to do the same for their supply of water to water suppliers. The Act and regulations, taken together, set out the mandatory content to be included in risk management plans.

The Act also requires that water suppliers and water storage managers must have their risk management plan audited. The auditors must be approved by the department.

This is one of the most important aspects of the regulatory framework, as it directly assesses, under audit, the risk management activities and capabilities of the water business, rather than the day-to-day quality of the drinking water supplied. Under the regulatory framework, risk management is the primary tool for protecting public health.

### 2010–11 audits

Only one risk management plan audit was undertaken during the 2010–11 reporting period.

Parks Victoria was requested to undertake an audit in response to its non-compliant audit result in 2009. The audit was undertaken in September 2010 and Parks Victoria was found to be compliant with regard to its risk management obligations under the Act.

## Notifications

Under section 22 of the Act, officers of water suppliers and water storage managers must notify the department where drinking water that is supplied poses or may pose a risk to human health or may cause widespread public complaint.

Analytical laboratories are obliged to report the detection of pathogens in food or water supplies to the department under the Public Health and Wellbeing Regulations 2009.

In conjunction with the affected water supplier(s), the department assesses all reported water quality notifications to determine whether any public health response is necessary, such as initiating an advisory boil water notice, providing an alternative supply, providing health-based assessments or coordinating a wider incident response.

Notifications typically relate to the detection of microorganisms or chemicals in drinking water, suspected sabotage or vandalism, compromises to barriers, contamination, failure of disinfection or water treatment plants or any suspected illnesses. Some notifications relate to events that last only for a day or so, while others relate to longer term problems.

Notifications reported to the department during 2010–11 are listed in Appendix 8 (see pages 121–147) and summarised below.

Overall, 200 notifications were made to the department during 2010–11, including:

- *Escherichia coli* detected in drinking water: 77 notifications
- levels of disinfection by-product chemicals above the permitted standard or guideline:
  - chloral hydrate: 25 notifications
  - trihalomethanes: two notifications
  - trichloroacetic acid: one notification
  - bromate: one notification
  - monochloramine: two notifications
  - chlorite: eight notifications
- widespread customer complaints: 10 notifications.

In comparison, 156 notifications were reported to the department in 2009–10. The increase in notifications reflects the difficult conditions experienced by the water suppliers during 2010–11.

Disinfection by-products and *Escherichia coli* are intensively monitored in all drinking water supplies in Victoria, so their predominance in the list of notifications is expected.

Notification of disinfection by-products were predominantly made by Coliban Water, Goulburn Valley Water, Grampians Wimmera Mallee Water and Wannon Water. These were usually caused by a raised level of natural organic matter in raw water supplies. High rainfall events and widespread flooding experienced across the state during 2010–11 contributed to significantly higher levels of natural organic material in the raw water than normally experienced.

With the exception of the impact that the floods had on drinking water supplies, the other notifications made to the department were minor in nature and transient, did not compromise public health and did not require a public health response from the department. In all cases, water suppliers initiated suitable operational responses and coordinated their responses with the department. Operational responses ranged from immediate interim responses to investment in capital works to provide long-term solutions.

The incidents that generated a public health response or community interest are discussed on the following page.

## Microbiological detections

Under the established reporting criteria, all *Escherichia coli* detections in drinking water are reportable to the department. This ensures that all potential incidents involving the entry of microorganisms into drinking water supplies are assessed. It also provides a better understanding of the risk management regimes and responses employed by water businesses in Victoria.

*Escherichia coli* was detected sporadically by most water suppliers across Victoria. In nearly all cases *Escherichia coli* was absent from subsequent samples taken from the same locations. Causes included:

- inadequate disinfection – either by an interruption to the disinfection process or by the lack of an adequate post-treatment residual disinfection within the distribution system
- contamination of storage tanks or reservoirs (for example, by animals or birds).

The department did not receive any notifications of illness associated with detections of *Escherichia coli* or any other microorganism in any drinking water supply during the 2010–11 reporting period.

The details of these incidents can be found in Appendix 8 (pages 121–147).

## Boil water advisories

Communities are issued with a notice to boil their water before drinking it when potentially unacceptable drinking water is being supplied. During the 2010–11 reporting period 30 boil water advisories were issued due to impacts of heavy rainfall events and widespread flooding. Another four boil water advisories were implemented when *Escherichia coli* was detected in systems where there was no or very little residual disinfectant within the distribution system, or when there had been disinfection failure and it was suspected that the quality of the water had been compromised.

The boil water advisories issued in 2010–11 are listed in Table 3.

In all circumstances, boil water advisories remained in place until corrective measures had been implemented and evidence indicated that the system was free of microbiological contamination.

**Table 3: Boil water advisories issued in 2010–11**

Supply	Cause	Duration	Water supplier
Bright, Wandiligong, Porepunkah	Flood-related water quality issue	5 September 2010 to 16 September 2010	North East Water
Myrtleford	Flood-related water quality issue	5 September 2010 to 17 September 2010	North East Water
Harrietville	Flood-related water quality issue	7 September 2010 to 16 September 2010	North East Water
Lalbert, Manangatang, Ultima	Flood-related water quality issue	7 October 2010 and is still in place	Grampians Wimmera Mallee Water
Myrtleford #	<i>Enterococci</i> or <i>Escherichia coli</i> in drinking water	1 November 2010 to 30 April 2011	North East Water
Rochester	Flood-related water quality issue	30 November 2010 to 2 December 2010	Coliban Water

Supply	Cause	Duration	Water supplier
Nagambie	<i>Escherichia coli</i> in drinking water	10 December 2010 to 12 December 2010	Goulburn Valley Water
Warracknabeal	Infiltration of storm water to clear water storage from heavy rainfall events.	17 December 2010 to 29 December 2010	Grampians Wimmera Mallee Water
Serpentine	Flood-related water quality issue	14 January 2011 to 22 February 2011	Coliban Water
Boort	Flood-related water quality issue	14 January 2011 to 27 January 2011	Coliban Water
Pyramid Hill	Flood-related water quality issue	14 January 2011 to 8 February 2011	Coliban Water
Tarrangulla	Flood-related water quality issue	14 January 2011 to 17 February 2011	Coliban Water
Bridgewater, Rochester	Flood-related water quality issue	14 January 2011 to 28 January 2011	Coliban Water
Quambatook	Flood-related loss of power to the disinfection system	15 January 2011 to 14 February 2011	Grampians Wimmera Mallee Water
Birchip, Charlton, St Arnaud	Flood-related loss of power to the water treatment plant and disinfection system	15 January 2011 to 28 January 2011	Grampians Wimmera Mallee Water
Halls Gap, Pomonal	Flood-related water quality issue	15 January 2011 to 31 January 2011	Grampians Wimmera Mallee Water
Donald, Wycheproof	Flood-related water quality issue and loss of power to the disinfection system	15 January 2011 and is still in place	Grampians Wimmera Mallee Water
Riddles Creek	Disinfection failure	8 January 2011	Western Water
Minyip, Rupanyup	Flood-related water quality issue	3 February and is still in place	Grampians Wimmera Mallee Water
Jung	Flood-related water quality issue	7 February 2011 and is still in place	Grampians Wimmera Mallee Water
Tylden	<i>Escherichia coli</i> in drinking water	13 February 2011 to 22 February 2011	Coliban Water
Beulah, Woomelang	Flood-related water quality issue	18 February 2011 and is still in place	Grampians Wimmera Mallee Water
Eildon	<i>Escherichia coli</i> in storage tank	2 March 2011 to 3 March 2011	Goulburn Valley Water

# The water treatment plant at Myrtleford is being upgraded to improve water quality and is due for completion July 2011

## Elevated chlorine

In May 2011 an excess amount of chlorine was dosed into the drinking water system that supplies the township of Tooborac. At least three young children, including an 11-week old baby, displayed health effects associated with consuming the affected water. In response, the parents of the affected children were provided with health advice. The health impact assessment identified that there is unlikely to be any lasting adverse health effects.

The Tooborac drinking water supply system is managed by Coliban Water. Once the issue was identified, Coliban Water undertook a range of remedial actions, including:

- decommissioning the chlorine dosing system that failed
- implementing an interim action plan that ensured that chlorine residuals were maintained within the Tooborac water supply system
- initiated a capital works program to replace aging infrastructure and increase confidence that there would be no further problems with the Tooborac supply
- convened a public meeting to discuss the issue with the community.

By the end of the 2010–11 reporting period Coliban Water had supplied the department with a draft report on the incident, which included their improvement plan for the Tooborac system.

## Customer complaints

Customer complaints relating to the quality of drinking water are reportable under the Act if the drinking water is believed to cause, or may cause, widespread public complaint. Customer complaints are also reported in each water supplier's annual report against six general categories: discoloured water; taste and odour; air in water; blue water; suspected illness; and other.

Consistent with previous reporting periods, most complaints related to discoloured water, followed by taste and odour issues. The number of complaint incidents remained relatively low but were slightly higher in number compared with previous years.

The following incidents generated a significant number of customer complaints during 2010–11:

- Bacchus Marsh, August 2010 (Western Water) – Dirty water was supplied to some customers after there was a rapid change in flow within a major water main. Mains were flushed and parameters returned to normal.
- Toora, November 2010 (South Gippsland Water) – Dirty water was supplied to some customers after a scouring event occurred in the clear water storage. Affected parts of the reticulation system were flushed to remove the dirty water.
- Caulfield, November 2010 (South East Water) – A burst water main resulted in some customers receiving dirty water. The water main was repaired. The affected area of the reticulation was flushed to remove the dirty water.
- Hallam, December 2010 (South East Water) – A burst water main resulted in some customers receiving dirty water. The water main was repaired. The affected area of the reticulation system was flushed to remove the dirty water.

- Lance Creek, December 2010 (South Gippsland Water) – A blue-green algae bloom in the reservoir caused taste and odour problems associated with elevated levels of geosmin, methylisoborneol (MIB) and algal metabolites in the raw water. The water was dosed with powdered activated carbon to remove the taste and odour compounds. The reticulation was flushed to remove any residual taste and odour compounds.
- Leongatha, January 2011 (South Gippsland Water) – Following the treatment of algae in reservoirs, difficulties arose in optimising treatment for manganese removal. Adjustment of chemical dosing was undertaken to remove manganese. The mains were flushed and scoured to remove discoloured water from the reticulation.
- Mornington, February 2011 (South East Water) – Damage to a fire plug located on a water main stirred up sediment in the mains. Affected parts of the reticulation system were flushed to remove the dirty water.
- Cardinia, February 2011 (South East Water) – A change of water supply through the chlorinator caused the chlorine to decrease to a lower than normal level resulting in customer complaints. Chlorine levels in the system were increased.
- Tallangatta, February 2011 (North East Water) – A combination of algal growth and decaying vegetation in the raw water source caused taste and odour problems in the drinking water. The water was dosed with powdered activated carbon to remove the taste and odour compounds. The reticulation was flushed to remove any residual taste and odour compounds.
- Korumburra, May 2011 (South East Water) – Dirty water was caused by high levels of manganese in the raw water. The water treatment plant was optimised for manganese removal. The reticulation was flushed to remove the dirty water.

Details of these incidents can be found in Part 3 of this report under the relevant water supplier (pages 32–87). In all cases water suppliers responded appropriately and public health was not compromised.



## Part 3

# Summaries of performance of individual water businesses





## Alpine resort management boards

Five alpine resort management boards have responsibility for all aspects of management of the commercial alpine resorts in Victoria. The current boards and the resorts they provide drinking water to are:

- Falls Creek Alpine Resort Management Board
- Lake Mountain Alpine Resort Management Board (non-drinking water only)
- Mount Baw Baw Alpine Resort Management Board
- Mount Buller and Mount Stirling Alpine Resort Management Board
- Mount Hotham Alpine Resort Management Board.

The resorts have no significant permanent populations. During the ski season, the populations at each resort rise significantly. The demand for drinking water is therefore highly seasonal.

**Figure 5: Map of Victoria showing the location of the six alpine resorts**



Source: Map supplied by Department of Sustainability and Environment.

## Falls Creek Alpine Resort

### Performance against water quality standards

Drinking water supplied to Falls Creek Alpine Resort during 2010–11 complied with the water quality standards.

### Water quality issues of potential health significance

All other parameters measured by Falls Creek Alpine Resort as part of its drinking water quality monitoring program satisfied the relevant health-based guideline values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period.

In recent years, Falls Creek Alpine Resort has experienced sporadic elevated levels of iron in the water supply occurring in late summer to early autumn and again in late winter to early spring. This has been found to relate to stratification of raw water in Rocky Valley Reservoir. Elevated iron levels may discolour the water, but they do not affect the safety of the supply. Falls Creek Resort Management has advised that when the reservoir has stratified, the interim connection of the drinking water supply to the snowmaking system, which is filtered, has seen a marked improvement in the iron levels in summer. In January 2011, a new off-take from the Frying Pan aqueduct was installed. This source water was used when the reservoir stratified and proved to be more effective than the previous snow making source.

For detailed water quality data, including data about other aesthetic characteristics of the drinking water and raw water quality in Rocky Valley reservoir, refer to the *Falls Creek Alpine Resort Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.fallscreek.com.au/Assets/6684/1/AnnualReport2010-11.pdf](http://www.fallscreek.com.au/Assets/6684/1/AnnualReport2010-11.pdf).

### Risk management plan audit

The department did not require Falls Creek Alpine Resort to undertake an audit on its Risk Management Plan during 2010–11.

### Water quality notifications

There were no notifications made to the department during 2010–11 under section 22 of the Act.

### Customer complaints related to water quality

No customer complaints relating to water quality were recorded during 2010–11.

#### 2010–11 Highlights

- Falls Creek locality complied with the water quality standards during 2010–11.
- A new water off-take from the Frying Pan aqueduct has been installed. The new water source is used when Rocky Valley reservoir stratifies and produces poor raw water quality.
- To further enhance the water treatment system security, online remote sensing equipment with a dial-out alarm function has been installed

## Lake Mountain Alpine Resort

### Water quality issues of potential health significance

Lake Mountain resort management provides untreated water to the Lake Mountain Resort Day Visitor Centre, which contains resort management offices, retail and food outlets and public space for visitors to shelter. This water is not intended for drinking. This supply was declared as regulated water under section 6 of the Act in October 2005. Resort management has implemented a program to ensure staff, stakeholders and visitors to the resort are aware the water supplied is not for drinking. For more information about Lake Mountain Alpine Resorts water supply refer to the *Lake Mountain Alpine Resort Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.lakemountainresort.com.au/wp-content/uploads/2010/12/Water-Supply-Annual-Report-2010-2011.pdf](http://www.lakemountainresort.com.au/wp-content/uploads/2010/12/Water-Supply-Annual-Report-2010-2011.pdf).

### Risk management plan audit

The department did not require Lake Mountain Alpine Resort to undertake an audit on its Risk Management Plan during 2010–11.

### Water quality notifications

There were no notifications made to the department during 2010–11 under section 22 of the Act.

## Mount Baw Baw Alpine Resort

### Performance against water quality standards

Drinking water supplied to Mount Baw Baw Alpine Resort during 2010–11 complied with the water quality standards.

### Water quality issues of potential health significance

All other parameters measured by Mount Baw Baw Alpine Resort as part of its drinking water quality monitoring program satisfied the relevant health-based guideline values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period.

For detailed water quality data, including data about other aesthetic characteristics of the water, refer to the *Mount Baw Baw Alpine Resort Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.mountbawbaw.com.au/summercorporate/summerdownloads/download.html?path=Mt+Baw+Baw\\_Potable+Water\\_Annual+Report\\_2010\\_11\\_Final.pdf](http://www.mountbawbaw.com.au/summercorporate/summerdownloads/download.html?path=Mt+Baw+Baw_Potable+Water_Annual+Report_2010_11_Final.pdf).

### Risk management plan audit

The department did not require Mount Baw Baw Alpine Resort to undertake an audit on its Risk Management Plan during 2010–11.

## Water quality notifications

There were no notifications made to the department during 2010–11 under section 22 of the Act.

## Customer complaints related to water quality

No customer complaints relating to water quality were recorded during 2010–11.

### 2010–11 Highlights

Mount Baw Baw Alpine Resort Management Board achieved 100 per cent compliance for the *Escherichia coli* water quality standard in 2010–11 and each of the previous three reporting periods

## Mount Buller and Mount Stirling Alpine Resort

### Performance against water quality standards

Drinking water supplied by Mount Buller and Mount Stirling Alpine Resort during 2010–11 complied with the water quality standards.

### Water quality issues of potential health significance

There were no other water quality issues to report. For detailed water quality data, refer to the *Mount Buller and Mount Stirling Alpine Resort Drinking Water Quality Annual Report* for 2010–11, which can be found at [www.mtbuller.com.au/uploads/file/Water\\_Quality\\_Annual\\_Report\\_10-11.pdf](http://www.mtbuller.com.au/uploads/file/Water_Quality_Annual_Report_10-11.pdf).

The resort provides water at two huts in the Mount Stirling ski field via rainwater. This water is not intended for drinking and signs are placed to advise people of this.

### Risk management plan audit

The department did not require Mount Buller and Mount Stirling Alpine Resort to undertake an audit on its Risk Management Plan during 2010–11.

## Water quality notifications

There were two notifications made to the department during 2010–11 under section 22 of the Act. For further details of the notification, refer to Appendix 8 and *Mount Buller and Mount Stirling Alpine Resort Drinking Water Quality Annual Report* for 2010–11.

## Customer complaints related to water quality

No customer complaints relating to water quality were recorded during 2010–11.

### 2010–11 Highlights

#### Distribution water quality improvements

- Increased flushing.
- Increased monitoring for free and total chlorine, pH and turbidity.
- Increased frequency of storage cleaning.
- Improvements in telemetry systems

## Mount Hotham Alpine Resort

### Performance against water quality standards

Drinking water supplied by Mount Hotham Alpine Resort during 2010–11 complied with the water quality standards.

### Water quality issues of potential health significance

All other parameters measured by Mount Hotham Alpine Resort as part of its drinking water quality monitoring program satisfied the relevant health-based guideline values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period. Refer to the *Mount Hotham Alpine Resort Drinking Water Quality Annual Report* for 2010–11, which can be found at [www.mthotham.com.au/resort/about/corporate/publications/20111014970226.asp](http://www.mthotham.com.au/resort/about/corporate/publications/20111014970226.asp).

### Risk management plan audit

The department did not require Mount Hotham Alpine Resort to undertake an audit on its Risk Management Plan during 2010–11.

### Water quality notifications

There were four notification made to the department during 2010–11 under section 22 of the Act. For further details of the notifications, refer to Appendix 8 and *Mount Hotham Alpine Resort Drinking Water Quality Annual Report* for 2010–11.

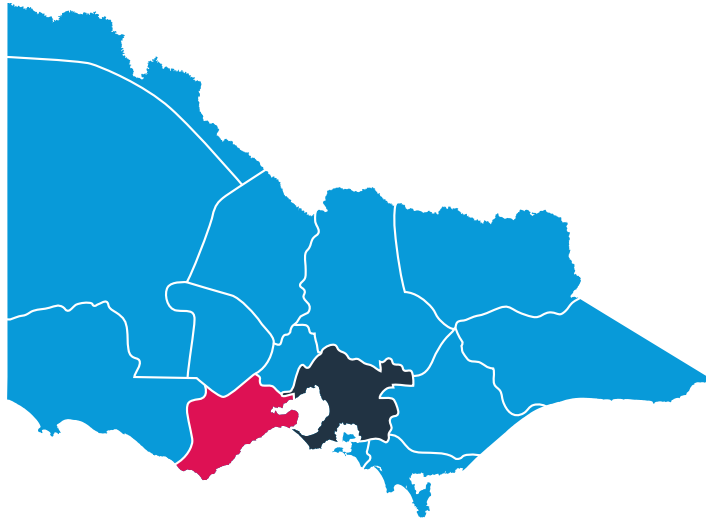
### Customer complaints related to water quality

No customer complaints relating to water quality were recorded during 2010–11.

#### 2010–11 Highlights

- A Supervisory Control Data Acquisition (SCADA) system was fully commissioned for the drinking water system.
- A turbidity meter at the pumping station was incorporated into the SCADA monitoring system allowing continuous monitoring and recording of turbidity levels in raw water.
- An uninterruptable power supply (UPS) was installed on the disinfection equipment. The UPS allows immediate start-up of the chlorine dosing pump during any mains-to-generator changeovers, helping to avoid the current 20 minute delay required before the UV reactor lamps restart. Once the lamp restart time has passed, the SCADA system then restarts the UV lamps and turns off the chlorine dosing.
- The raw water reservoir, Swindlers Weir, was de-silted.

# Barwon Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against water quality standards

Drinking water supplied in all localities by Barwon Water during 2010–11 complied with the water quality standards.

## Water quality issues of potential health significance

All other parameters measured by Barwon Water as part of its drinking water quality monitoring program satisfied the relevant health-based guideline values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period.

For detailed water quality data, including data about the aesthetic characteristics of the water, refer to *Barwon Water's Drinking Water Quality Annual Report* for 2010–11, which can be found at [www.barwonwater.vic.gov.au/about/publications/drinking-water-report](http://www.barwonwater.vic.gov.au/about/publications/drinking-water-report).

## Risk management plan audit

The department did not require Barwon Water to undertake an audit on its Risk Management Plan during 2010–11.

## Water quality notifications

There were 10 notifications made to the department during 2010–11 under section 22 of the Act. For further details of the notifications, refer to Appendix 8 and *Barwon Water's Drinking Water Quality Annual Report* for 2010–11.

## Customer complaints related to water quality

A summary of the customer complaints

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	111	0.081
Taste/odour	121	0.088
Blue water	0	0.000
Air in water	19	0.014
Suspected illness	0	0.000
Other	24	0.017

There was a reduction in the number of discoloured water and air in water complaints in comparison to 2009–10. The air in water complaints were related to air entrapment, and were generally isolated issues as a result of bursts or mains cleaning. There were also less 'other' complaint types reported in 2010–11. The nature of other complaints received incorporated concerns over water causing staining of baths and showers, water incompatibility with applications and scale build-up on kettles.

### 2010–11 Highlights

#### Source water improvements

- Forrest raw water storage was covered to prevent blue-green algae growth that has previously created treatment difficulties and aesthetic issues.
- An aeration device was installed at Marengo raw water basin to prevent stratification and reduce iron and manganese levels in the raw water and reduce the likelihood of algae blooms.

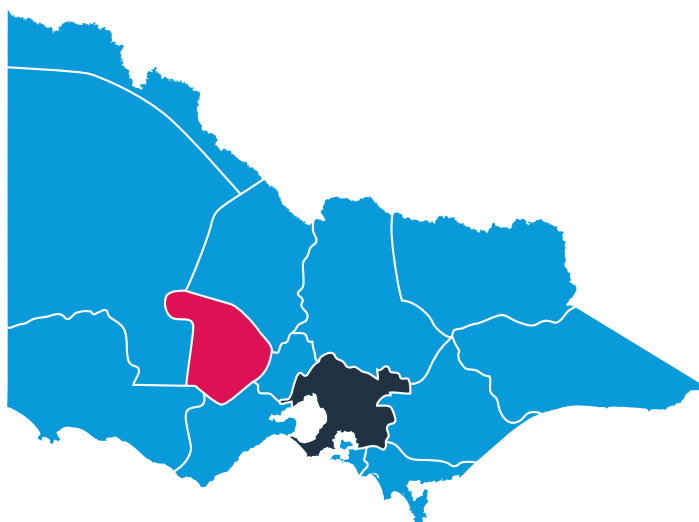
#### Water treatment plant improvements

- Ultraviolet disinfection was added to Forrest and Gellibrand water treatment plants, providing a second treatment barrier to the existing treatment process.

#### Water quality improvement projects

- Lining and covering of three service basins at Lovely Banks commenced.
- Design works to completely close the Bellarine and Portarlinton systems progressed.
- A new pipeline to carry treated water from Geelong to Meredith was completed, ensuring security of supply and improved water quality for residents of Meredith. Previously, Meredith's drinking water was sourced from the drought-affected Moorabool River where low flows had lead to poor water quality, particularly salinity.

# Central Highlands Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against drinking water standards (drinking water supplies only)

Drinking water supplied in all localities by Central Highlands Water during 2010–11 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standard
<i>Escherichia coli</i>	Ballan
Bromate	Clunes

The non-compliant results at Clunes for bromate occurred in July and August 2010 and were investigated by Central Highlands Water. The source for the elevated bromate levels is unknown. Treatment processes were optimised, flow rates were adjusted and changing to a different groundwater source was trialled. Ongoing investigations and monitoring have been implemented.

The two *Escherichia coli* detections in the Ballan locality that resulted in non-compliance with the standard were unrelated events.

## Water quality issues of potential health significance

In September 2010, the Minister for Health declared that the Landsborough / Navarre water supply was no longer considered a regulated water supply, on the expectation that the new Landsborough / Navarre water treatment plant would be commissioned shortly afterwards. Landsborough / Navarre's new water treatment plant is currently still being commissioned. In the period since September 2010 the water being supplied to Landsborough/Navarre has been regarded as being non-potable and not suitable for drinking.

Reportable levels of blue-green algae were detected in the Lal Lal Reservoir, Centenary Reservoir and Evansford Reservoir. Evansford Reservoir was off-line at the time and not being used for drinking water. Water from the Lal Lal Reservoir was dosed with powdered activated carbon at the water treatment plant to remove any potential algal toxins and taste and odour compounds. The Centenary Reservoir was isolated from supply, spot dosed with algicide and toxin testing undertaken. Powdered activated carbon dosing was initiated at the water treatment plant.



Apart from a detection of elevated lead in the Fiskville / Glenmore drinking water supply in November 2010 and elevated manganese in the Carisbrook drinking water in March 2011, all other parameters satisfied the relevant health-based guideline values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period. Elevated lead was not detected from the locality prior to or after the detection. Elevated manganese was detected at the customer tap and targeted flushing and scouring was undertaken in affected areas.

The heavy rainfall events during the 2010–11 reporting period dramatically increased storage levels which presented water quality challenges at numerous water treatment plants. Central Highlands Water effectively managed these challenges and continued to provide safe water during and after these rainfall and storm events.

The Victorian locust plague resulted in widespread targeted use of specific insecticides for locust control. The use of these chemicals had the potential to pose a risk to drinking water supplies. Central Highlands Water undertook an analysis of this potential risk and concluded that it presented a low risk to their drinking water supplies. During the plague, Central Highlands Water closely monitored spraying activities within their catchments via the Department of Primary Industries website.

Central Highlands Water manages a number of non-potable (non-drinking) water supplies in its region. Central Highlands Water has continued its customer communications to ensure non-drinking supplies are not consumed or confused with a drinking water supply.

For detailed water quality data, including data about other aesthetic characteristics of the drinking water and information about non-drinking supplies, refer to *Central Highlands Water's Drinking Water Quality Annual Report* for 2010–11, which can be found at [http://www.chw.net.au/CHW/index.php?option=com\\_content&task=view&id=67&Itemid=215](http://www.chw.net.au/CHW/index.php?option=com_content&task=view&id=67&Itemid=215).

### Risk management plan audit

The department did not require Central Highlands Water to undertake an audit on its Risk Management Plan during 2010–11.

### Water quality notifications

There were 18 notifications made to the department during 2010–11 under section 22 of the Act. For further details of the notifications, refer to Appendix 8 and *Central Highlands Water's Drinking Water Quality Annual Report* for 2010–11.

### Customer complaints related to water quality

A summary of the customer complaints relating to water quality recorded by Central Highlands Water during 2010–11 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	197	0.320
Taste/odour	17	0.030
Blue water	0	0.000
Air in water	13	0.020
Suspected illness	10	0.020
Other	20	0.030

There was a 44 per cent reduction of water quality complaints in comparison to 2009–10. Easing of drought conditions throughout the region, coupled by two major rain events in September 2010 and January 2011 filling local surface water storages were the major drivers behind the improvement.

Groundwater was not used to supplement the Ballarat water supply during 2010–11. This improved the aesthetic characteristics of the water and significantly decreased the number of discoloured water and taste and odour complaints in comparison to 2009–10.

### 2010–11 Highlights

#### Mains renewal

- During 2010–11, approximately 4,000 metres of water main were replaced, aimed to improve water quality and reduce leaks and or burst mains.

#### Water treatment plant improvements

- The Avoca water treatment plant upgrade was completed. The plant upgrade included a new chemical storage area, installation of a new clarifier and installation of reverse osmosis treatment to reduce salt levels in treated water.
- Telemetry access has been upgraded for faster and more reliable access at Ballarat, Beaufort, Blackwood, Clunes and Forest Hill water treatment plants.

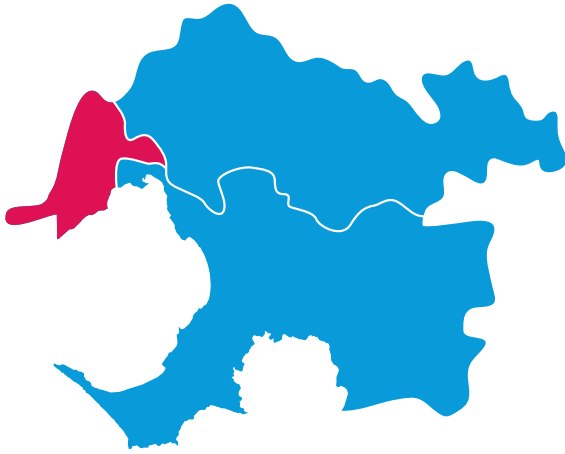
#### Catchment risk management

- Central Highlands Water continued to engage with Catchment Management Authorities with regard to the corporation's assets and their association with regional natural resources. This was underpinned by the reinforcement of drinking water quality standards and the impact of broader catchment land use. Furthermore, staff from Central Highlands Water continued to participate in the stakeholder reference committee for the Victorian Strategy for Healthy Rivers, Estuaries and Wetlands.
- To protect water quality from inappropriate development in catchments, Central Highlands Water is actively involved in planning by providing input and recommendations during the development of government guidelines relating to planning permits and residential developments in water supply catchments. Central Highlands Water assisted in protecting local water catchments by reviewing and processing approximately 52 planning permit applications for proposed development within special water supply catchments during 2010–11.

To further reduce risks to water quality within its water supply catchments Central Highlands Water:

- established an agreed standard for fire protection and fuel reduction measures across their 6,000 hectare land estate
- upgraded the clay lining in a number of Ballarat's off-stream dams
- installed culverts, erosion control earth works, stock-crossings within fenced stream areas and erected fencing to exclude stock access
- evaluated and responded to the impact of the September 2010 and January 2011 storm events on catchment assets.

# City West Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against water quality standards

Drinking water supplied in all localities by City West Water during 2010–11 complied with the water quality standards.

## Water quality issues of potential health significance

All other relevant health-based parameters measured by City West Water as part of its drinking water quality monitoring program satisfied the values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period.

For detailed water quality data, including data about other aesthetic characteristics of the water, refer to *City West Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.citywestwater.com.au/documents/water\\_quality\\_report\\_2011.pdf](http://www.citywestwater.com.au/documents/water_quality_report_2011.pdf).

## Risk management plan audit

The department did not require City West Water to undertake an audit on its Risk Management Plan during 2010–11.

## Water quality notifications

There were three notifications made to the department during 2010–11 under section 22 of the Act. For further details of the notifications, refer to Appendix 8 and *City West Water's Drinking Water Quality Annual Report for 2010–11*.

## Customer complaints related to water quality

A summary of the customer complaints relating to water quality recorded by City West Water during 2010–11 is provided in the table on the following page.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	155	0.042
Taste/odour	51	0.014
Blue water	3	0.001
Air in water	7	0.002
Suspected illness	2	<0.001
Other	2	<0.001

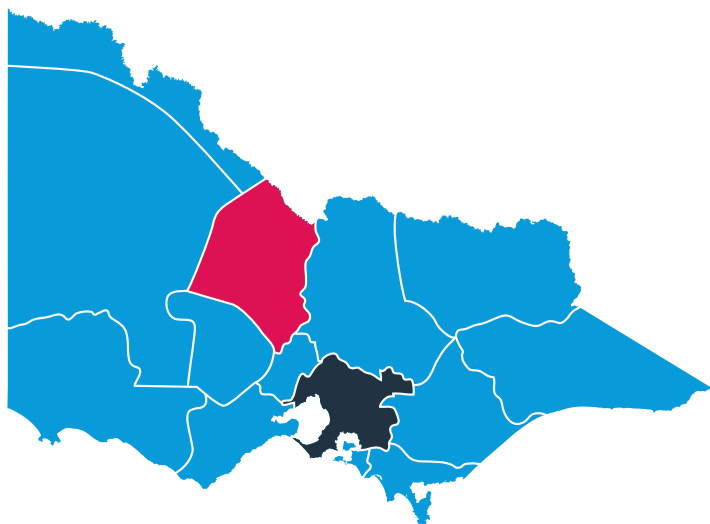
The total number of complaints for 2010–11 is 220 and is the lowest result for the previous four reporting periods.

#### 2010–11 Highlights

##### Ongoing compliance with water quality standards

- City West Water has achieved 100 per cent compliance for water quality standards in all water sampling localities for 2010–11 and each of the three previous reporting periods.

# Coliban Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against water quality standards

Drinking water supplied in all localities by Coliban Water during 2010–11 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standard
<i>Escherichia coli</i>	Maldon
Dichloroacetic acid	Gunbower
Trichloroacetic acid	Cohuna (Rural), Gunbower, Tooborac
Trihalomethanes	Boort, Cohuna (Rural), Cohuna (Urban), Goornong, Gunbower, Serpentine

High rainfall and flooding across much of western Victoria during 2010–11 caused a number of water quality issues for Coliban Water, resulting in a higher than average number of positive *Escherichia coli* detections. Compliance was achieved for all water sampling localities for *Escherichia coli* except at Maldon, where two detections in March 2011 produced a result less than the standard.

As a result of flooding, increased levels of naturally occurring organic material at the above mentioned localities resulted in occasional elevated levels of disinfection by-products in the treated water. A number of steps have been taken to further reduce the formation of disinfection by-products, including:

- at Cohuna – chlorinating only after clarification, as pre-chlorination had previously aided the formation of disinfection by-products
- at Gunbower – upgrading this water treatment plant with MIEX ion exchange, clarification and membrane filtration capacity (due for completion in December 2011) to control high organics in raw water
- at Tooborac – installation of a new chlorination tank to reduce the ingress of potential contaminants into the water storage, thereby reducing the demand for booster chlorination that had previously led to a reaction with organics and consequent elevated disinfection by-products.

## Water quality issues of potential health significance

All other relevant health-based parameters measured by Coliban Water as part of its drinking water quality monitoring program satisfied the values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period.

Coliban Water manages a number of non-potable (non-drinking) water supplies in its region and has continued its customer communications to ensure that such non-drinking supplies are not consumed or confused with a drinking water supply.

For detailed water quality data, including data about other aesthetic characteristics of the water, plus information about non-drinking water supplies, refer to *Coliban Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.coliban.com.au/operations/documents/Coliban\\_Water\\_SDWA\\_Annual\\_Report\\_2010\\_11\\_FINAL.pdf](http://www.coliban.com.au/operations/documents/Coliban_Water_SDWA_Annual_Report_2010_11_FINAL.pdf).

## Risk management plan audit

The department did not require Coliban Water to undertake an audit on its Risk Management Plan during 2010–11.

## Water quality notifications

There were 22 notifications made to the department during 2010–11 under section 22 of the Act. There were also two boil water advisories issued for a number of towns simultaneously by Coliban Water during 2010–11. These advisories covered the water supplies to the towns of Rochester and Boort, Bridgewater, Pyramid Hill, Rochester, Serpentine, Tarnagulla and Tylden. For further details of the notifications, refer to Appendix 8 and *Coliban Water's Drinking Water Quality Annual Report for 2010–11*.

In May 2011 an excess amount of chlorine was dosed into the drinking water system that supplies the township of Tooborac. At least three young children, including an 11-week old baby, displayed health effects associated with consuming the affected water. In response, the parents of the affected children were provided with health advice. The health impact assessment identified that there is unlikely to be any lasting adverse health effects.

## Customer complaints related to water quality

A summary of the customer complaints relating to water quality recorded by Coliban Water during 2010–11 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	319	0.500
Taste/odour	104	0.160
Air in water	0	0.000
Blue water	0	0.000
Suspected illness	0	0.000
Other	0	0.000

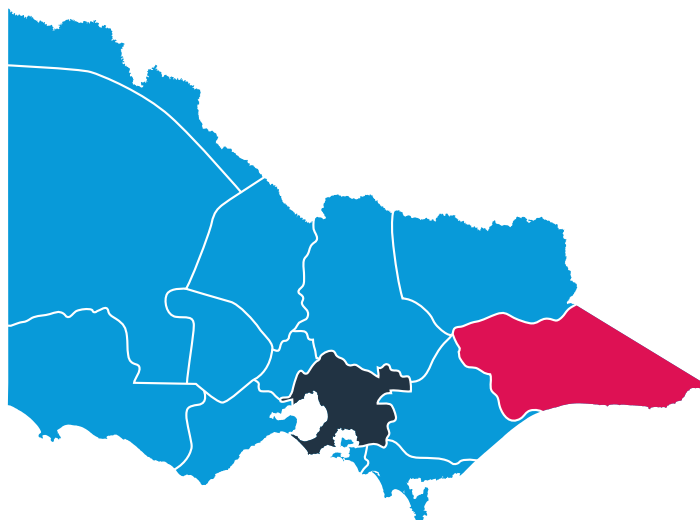
A higher than usual number of complaints was reported in the Echuca system during 2010–11. These complaints mainly related to colour after the floods when an elevated level of manganese precipitated out and discoloured the treated water. A number of odour complaints were recorded at Tooborac due to elevated chlorine.

## 2010–11 Highlights

### Water treatment improvement projects

- A new booster disinfection system was installed at Inglewood Basin to better maintain residual chlorine for both the Bridgewater and Inglewood reticulation systems.
- Two new sealed tanks with a new booster chlorination system were installed at the Tooborac Basin to improve disinfection control and reduce the likelihood of external contamination and chlorination malfunction.
- The existing basin at Harcourt has been identified for future replacement with a smaller tank. Similar to improvements at Tooborac, the new sealed tank should reduce the likelihood of external contamination.
- Membrane upgrades were undertaken at Bendigo and Kyneton water treatment plants to maintain water treatment capacity and to enable future process enhancements, and enhance security of supply for Coliban Water's customers.
- A Water Quality Improvement Project, which commenced in March 2006, has continued to upgrade disinfection, filtration and process monitoring at Axedale, Boort, Bridgewater/ Inglewood, Cohuna, Echuca, Elmore, Goornong, Gunbower, Heathcote, Korong Vale, Laanecoorie, Leitchville, Lockington, Pyramid Hill, Raywood, Rochester, Serpentine and Trentham. In addition to this, a project to upgrade the chemical dosing systems at most of these plants commenced in June 2010 and is in progress.

# East Gippsland Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against water quality standards

Drinking water supplied in all localities by East Gippsland Water during 2010–11 complied with the water quality standards, except as noted in the table below

Parameter	Locality not complying with water quality standard
Aluminium	Omeo

In November 2010 and again in March 2011, elevated aluminium results were detected in a distal and low point of the Omeo water sampling locality. Both detections were believed to have occurred as a result of a preventative maintenance program, where flushing activities (and air-scouring in March 2011) resulted in the re-suspension of aluminium deposits. Extensive monitoring of water treatment plant performance and the reticulation system indicated that this issue was not system-wide. The aluminium result of 4.3 mg/L in March 2011 may also have been influenced by the use of a fire-plug water sampling point. In response to these incidents, extensive cleaning of the Omeo system storage tanks and air-scouring of the reticulation network was undertaken.

## Water quality issues of potential health significance

All other parameters measured by East Gippsland Water as part of its drinking water quality monitoring program satisfied the relevant health-based guideline values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period.

For detailed water quality data, including data about other aesthetic characteristics of the drinking water, refer to *East Gippsland Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.egwater.vic.gov.au/Water/WaterQuality/tabid/101/Default.aspx](http://www.egwater.vic.gov.au/Water/WaterQuality/tabid/101/Default.aspx).

## Risk management plan audit

The department did not require East Gippsland Water to undertake an audit on its Risk Management Plan during 2010–11.



## Water quality notifications

During 2010–11, there were no section 22 notifications; however, two section 18 notifications were notified to the department, both relating to the abovementioned elevated acid soluble aluminium levels in the Omeo water sampling locality.

Following plant maintenance a brief high fluoride event occurred in February 2011 at the Woodglen water treatment plant. The concentration upstream of the plant's clear water storage (CWS) tank reached a high of 1.55mg/L. Due to the large 1.4 ML CWS tank downstream of the fluoride dosing, adequate dilution occurred and, as such, the event did not affect the quality of water delivered to consumers.

For further details of the notifications, refer to Appendix 8 and *East Gippsland Water's Drinking Water Quality Annual Report for 2010–11*.

## Customer complaints relating to water quality

A summary of the customer complaints relating to water quality recorded by East Gippsland Water during 2010–11 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers*
Discoloured water	14	0.070
Taste/odour	32	0.150
Dirty water	18	0.080
Air in water	34	0.160
Suspected illness	0	0.000
Other	2	0.010

The number of water quality complaints per 100 customers was low, but slightly higher than 2009–10. Discoloured water complaints significantly decreased in 2010–11, with only 14 compared with 43 last year.

An increase in complaints in the air in water and taste and odour categories for 2010–11 occurred in:

- *air in Water*, mostly due to air entrapment during maintenance/repair works, with a noticeable increase on the previous reporting period (34, up from 2 in 2009–10). This was primarily due to East Gippsland Water undertaking a significant preventative maintenance program of air-scouring with more than 140 kilometres of water mains scoured in 2010–11; and
- *taste and odour*, from 16 in 2009–10 to 32 in 2010–11, most of which related to:
  - chlorine – with seasonal fluctuations in usage / flows during holiday periods, and a greater retention of chlorine during distribution in the Mitchell system due to a new closed tank system
  - metallic – the main cause of which was determined to be pipe corrosion on the customers' property.

## 2010–11 Highlights

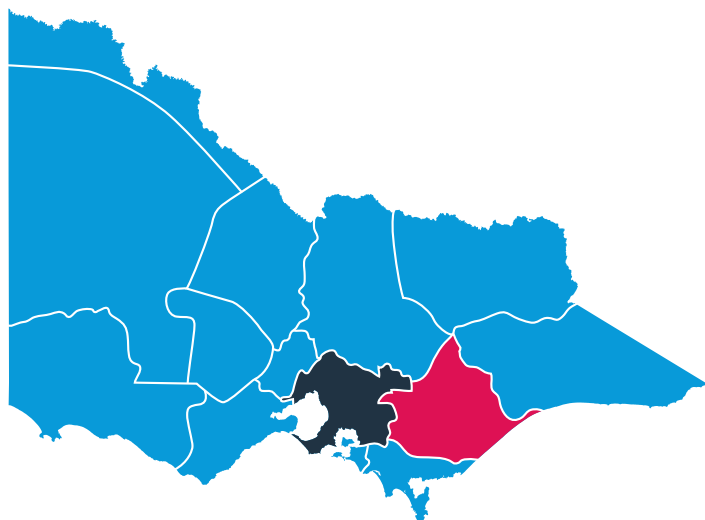
### Water quality improvement projects

- In January 2011, East Gippsland Water undertook an extensive four-week fluoride tracer study to help determine the water age through the Mitchell River supply system and to ensure the microbiological integrity of the Wy Yung and Sunlakes-Toorloo clear water storage basins, and demonstrated that efficient hydraulic mixing was occurring in both storages, confirming that no short-circuiting was occurring. The study also demonstrated that *Pseudomonas aeruginosa* was not of concern at these storages.
- The Sarsfield 160 ML open clear water storage basin was replaced with a 6 ML closed clear water storage tank (November 2011), which will eliminate contamination from dust, algae and airborne contaminants, thereby ensuring the continued future supply of high-quality drinking water to East Gippsland Water's customers.
- East Gippsland Water is required to complete regular and detailed checks of its water storages as part of its Dam Safety Management System. Water quality checks are now recorded as part of a Dam Safety Surveillance Program to assist in the identification of risks to water quality at those sites. Site fences, evidence of animal life, integrity of storage covers and algal blooms are some of the aspects checked off during dam surveillance.
- Two water filters were installed in June 2011 at the Orbost clear water basin site to improve water quality supplied during the summer months. During summer, water demand from the Orbost township is, at times, too high for the treatment plant to keep up with and treated water from an open CWS is used to supplement supply. The filters will treat water from this basin which is susceptible to algal blooms and turbidity spikes.

### Capital works projects

- East Gippsland Water finished construction of a new 10 ML raw water storage basin for the community of Omeo. This increases the town's drinking water storage capacity to 15 ML, enabling enough water to be harvested and stored during sizeable water flow events to protect the community against prolonged periods of dry weather.
- A capital works program for the town of Mallacoota delivered the construction of a new shade cloth for the raw water storage. The cover is designed to improve water quality in the 41 ML raw water storage by greatly reducing the risk of soil, algal or airborne contamination. It also reduces evaporation by some 90 per cent.

# Gippsland Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against water quality standards

Drinking water supplied in all localities by Gippsland Water during 2010–11 complied with the water quality standards.

## Water quality issues of potential health significance

All other parameters measured by Gippsland Water as part of its drinking water quality monitoring program satisfied the relevant health-based guideline values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period.

Although compliant for 2010–11, Gippsland Water has commenced works to decrease levels of trihalomethanes at the Seaspray water treatment plant and will include installation of activated carbon treatment and refurbishment of the filter. To ensure continuation of supply for Seaspray during these works, water will be carted from Sale to the Seaspray reticulation.

The fluoride dosing system at Moe water treatment plant was turned off during 2010–11 between 2 to 19 November 2010 and 10 to 18 March 2011 due to issues with the delivery system, with both events promptly notified to the department. During this period, non-fluoridated water was supplied to the localities serviced by the Moe water treatment plant.

For detailed water quality data, including data about other aesthetic characteristics of the water, refer to *Gippsland Water's Water Quality Annual Report* for 2010–11, which can be found at [www.gippswater.com.au/ProjectsServices/DrinkingWaterTreatmentQuality.aspx](http://www.gippswater.com.au/ProjectsServices/DrinkingWaterTreatmentQuality.aspx).

## Risk management plan audit

The department did not require Gippsland Water to undertake an audit on its Risk Management Plan during 2010–11.

## Water quality notifications

In March 2011, in accordance with section 22 of the Act, two detections of *Escherichia coli* were reported at Traralgon during the same sampling event (one at a customer tap and the other at the water treatment plant). However, compliance was still achieved here as overall at least 98 per cent of all samples collected in the 12-month period contained no *Escherichia coli*. Investigation of the positive results revealed the cause as being either sample contamination at the sampling collection point, or inadequate disinfection of the sampling equipment. Additional sampling training was provided to the water quality samplers and the techniques audited against established procedures for compliance. No *Escherichia coli* was present in repeat samples taken immediately after the positive results were reported.

For further details of notifications, refer to Appendix 8 and *Gippsland Water's Drinking Water Quality Annual Report for 2010–11*.

## Customer complaints related to water quality

A summary of the customer complaints relating to water quality recorded by Gippsland Water during 2010–11 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	59	0.148
Taste/odour	97	0.090
Blue water	0	0.000
Air in water	21	0.032
Suspected illness	3	0.005
Other	0	0.000

Gippsland Water experienced an increase in taste and odour and suspected illness complaints during 2010–11 compared with 2009–10. There has been a decrease in discoloured water, blue water and air in water complaints for the same period of time.

### 2010–11 Highlights

#### Capital works and improvements

- ongoing water treatment plant filter upgrades and a refurbishment program
- an upgrade of remote disinfection sites and replacement of chlorine gas with sodium hypochlorite
- raw water storage basin coverage to reduce algal growth and water quality issues associated with treatment of taste and odour
- refurbishment of water treatment clarifiers at a number of sites to ensure greater operational control and enhance security of supply
- an upgrade of raw water pump stations for ongoing security of supply.

# Goulburn-Murray Water



Source: Map supplied by Victorian Water Industry Association.

## Overview

Goulburn-Murray Water does not supply treated drinking water to any customers. It supplies water for irrigation and other rural and stock purposes and to other water suppliers for treatment to a drinking water standard.

## Risk management plan audit

The department did not require Goulburn-Murray Water to undertake an audit on its Risk Management Plan during 2010–11.

## Water quality issues of potential health significance

During the 2010–11 reporting period, Goulburn-Murray Water recorded 46 incidents that were regarded as potentially having the ability to affect the quality of water supplied to regional water corporations or potentially posing a risk to human health. None of these incidents were classed as emergencies by Goulburn-Murray Water. Each incident was handled using Goulburn-Murray Water's incident response procedures, which includes formal processes for communicating, responding to and reviewing incidents.

Goulburn-Murray Water advises the department of any blue-green algal blooms that could potentially affect public health, either via drinking water or recreational water use. The most significant blooms reported to the department during 2010–11 affected Lake Eildon and Lake Eppalock from January 2011. The levels of blue-green algae in Lake Eppalock decreased to levels that permitted warnings for the lake to be lifted prior to the end of the 2010–11 reporting period. The blue-green algae warnings for Lake Eildon continued until the end of June 2011. Lake Eildon does not have a history of high blue-green algae levels and the long duration of the warning is unprecedented for the Goulburn catchment.

Goulburn-Murray Water staff conducted increased monitoring, erected warning signs at major recreational areas, sent letters to affected customers, informed the public by regular media releases, and updated phone and website information services. Goulburn-Murray Water also created a series of fact sheets on blue-green algae to better inform the public of the risks and to enable people to make informed decisions.

A number of other blue-green algal blooms occurred during 2010–11 within Goulburn-Murray Water's area of responsibility that had the potential to impact on drinking water supplies (including Little Lake Charm, Kangaroo Lake, Kow Swamp, the Torrumbarry Irrigation area, excluding the Gunbower Creek system, Loddon River and Torgannah lagoon). Overall the number of blue-green algae warnings has remained the same as the 2009–10 reporting period. All these blooms were managed well by Goulburn-Murray Water and no drinking water supplies were adversely impacted.

All Goulburn-Murray Water customers are advised through an information statement that the water supplied by Goulburn-Murray Water is untreated and is not suitable for drinking or food preparation. This includes any customers that provide a water supply to residential schemes, syndicates or cooperatives. This information is also included on Goulburn-Murray Water accounts, detailed on the website and when relevant in media releases.

During late 2010 and early 2011 significant rain fell across Victoria. Most of Goulburn-Murray Water's dams were full by the end of 2010. Goulburn-Murray Water was unable to control the impacts of the floods on water quality. It did liaise with water suppliers, communities, customers and other stakeholders (including catchment management authorities and local governments) to raise awareness of the potential and actual impacts of the poor water quality. Goulburn-Murray Water continued to reinforce that raw water should not be used for human consumption without appropriate treatment.

Goulburn-Murray Water participated in state- and agency-run forums to gather information to inform their planning in response to the Victorian locust plagues. Risks to waterways from targeted pesticide spraying were communicated directly to water suppliers. Goulburn-Murray Water developed a website and fact sheets to provide customers with relevant information and highlighted the importance of appropriate chemical use around sensitive areas.

For further information on the management strategy for non-potable supplies, blue-green algal blooms or environmental incidents, refer to *Goulburn-Murray Water's Water Quality Annual Report for 2010–11*, which can be found at [www.g-mwater.com.au/downloads/Safe\\_Drinking\\_Water\\_Acts/SAFE\\_DRINKING\\_WATER\\_ACT\\_-\\_2010-11\\_ANNUAL\\_REPORT\\_-\\_WATER\\_QUALITY\\_-\\_2011.pdf](http://www.g-mwater.com.au/downloads/Safe_Drinking_Water_Acts/SAFE_DRINKING_WATER_ACT_-_2010-11_ANNUAL_REPORT_-_WATER_QUALITY_-_2011.pdf).

### **Water quality notifications**

There were no notifications made to the department during 2010–11 under section 22 of the Act.

## 2010–11 Highlights

### Research projects

- Goulburn-Murray Water continued several research programs in collaboration with the CSIRO, universities, state government agencies, catchment management authorities and other water businesses. One of the research programs was developing effective monitoring tools for heavy metals, pesticides and herbicides. The monitoring tools will enable Goulburn-Murray Water to improve its understanding of the quality of water that is being delivered to customers and able to update the risk management plans to reflect the results.

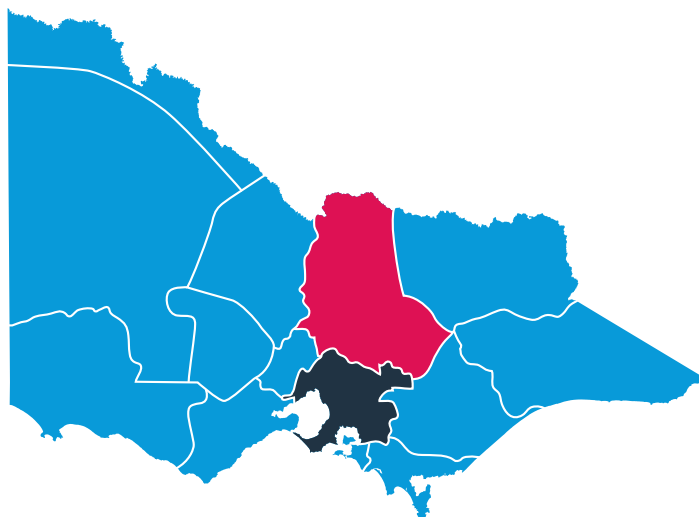
### Land and On-Water Management Plans

- Goulburn-Murray Water is developing individual land and on-water management plans for its 16 water storages. Land and on-water management is about managing the community, recreational and environmental aspects of dams and surrounding lands. The aim is to protect and enhance water quality, improve the ecological health of the waterway and provide safe sustainable public access. Goulburn-Murray Water storages are easily accessible by the general public, providing highly valued recreational opportunities for tourists and local communities.

### Local Government Planning

- Goulburn-Murray Water assesses planning applications to meet a range of objectives, including the requirements of the Act, to minimise risks to water quality within catchments. Planning controls were identified as a key risk management control during the risk management plan development process. Goulburn-Murray Water assesses a large number of development applications to ensure potential impacts on water quality are addressed by proponents. During 2010–11, more than 1,300 applications were referred and assessed.

# Goulburn Valley Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against water quality standards

Drinking water supplied in all localities by Goulburn Valley Water during 2010–11 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standard
Aluminium	Barmah, Bonnie Doon, Katamatite, Mooroopna, Nagambie, Numurkah, Shepparton, Wandong/Heathcote Junction
Trichloroacetic acid	Barmah, Nagambie, Pyalong, Thornton
Dichloroacetic acid	Nagambie
Trihalomethanes	Nagambie

The elevated levels of trichloroacetic acid at Thornton were caused by high levels of organic matter in the raw water, which could not be removed by the existing treatment process during the 2010–11 reporting period. An undertaking was in place for Thornton, under which a pipeline to supply Thornton with treated water from Alexandra has been constructed and is being commissioned. The elevated levels of trichloroacetic acid at Barmah and Pyalong were isolated events and did not pose a risk to public health.

During 2010–11, non-compliant aluminium results were recorded for Barmah, Bonnie Doon, Katamatite, Mooroopna, Nagambie, Numurkah, Shepparton and Wandong / Heathcote Junction. Bonnie Doon’s new dissolved air flotation filtration water treatment plant experienced process related issues that resulted in five elevated aluminium results; investigations continue to identify and resolve these issues. Goulburn Valley Water advised that all the other non-compliant aluminium results were isolated, single events due to short-term process control issues at various water treatment plants. These results did not pose a risk to public health.

Heavy rainfall events in January 2011 impacted on the quality of the raw water source for Nagambie. The poor raw water quality created treatment challenges for Goulburn Valley Water. Disinfection by-products occurred from chlorinating water containing naturally occurring organic material.



Nagambie's water treatment process was unable to remove the high levels of organic materials in the raw water, and as a result elevated levels of dichloroacetic acid, trichloroacetic acid and trihalomethanes were reported. To prevent future non-compliance Goulburn Valley Water is installing chemical dosing prior to the membrane filtration system and investigating other options such as a granular activated carbon filter to remove the precursors to forming disinfection by-products.

Raw water quality was impacted by the heavy rainfall events in October 2010. The existing treatment process at Pyalong could not remove all of the precursors to the formation of disinfection by-products. These rainfall events also contributed to a black water event in the Broken Creek and Murray River. The black water event had a major effect on the water treatment plants at Barmah and Numurkah and contributed to the elevated levels of aluminium and trichloroacetic acid.

### Water quality issues of potential health significance

Chlorine dioxide is used as a disinfectant in the water supply system for Buxton and Marysville. The levels of naturally occurring organic matter and iron in the raw water regularly result in elevated levels of chlorite and chlorate in these localities. During 2010–11, 10 samples exceeded the health-based guideline value for chlorite (0.3 mg/L) in the *Australian Drinking Water Guidelines 2004*. There is no health-based guideline value established for chlorate. Goulburn Valley Water has an undertaking in place for the Buxton and Marysville supplies to address these issues. As part of the undertaking, Goulburn Valley Water commenced a community engagement project and options for disinfection and treatment are currently being considered. A solution to the problem has not yet been determined.

Storm damage to the Nagambie water tower is believed to have contributed to contamination of the system with bird faeces. This resulted in a boil water advisory being issued for Nagambie. The tower was isolated from the system and the reticulation was disinfected and flushed.

*Escherichia coli* detected in the Eildon reticulation system resulted in a boil water advisory being issued for the Ti Tree Drive area of the reticulation.

Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. It was detected in the supplies of Alexandra, Barmah, Girgarre, Nagambie, Numurkah, Pyalong, Stanhope, Tallarook, Thornton and Trawool. The health significance of chloral hydrate is currently being reviewed in consultation with the department.

The heavy rainfall and flooding events during the 2010–11 reporting period dramatically impacted raw water quality and presented challenges at numerous water treatment plants. Goulburn Valley Water effectively managed these challenges and continued to provide safe water during and after these rainfall and flood events.

Powdered activated carbon was used at Barmah and Cobram water treatment plants during 2010–11 due to blue-green algae being detected in the Murray River. It was also used at Nagambie water treatment plant for a short period of time to reduce taste and odour compounds detected in the raw water source.

Potassium permanganate was used in the treatment process at Barmah and Nathalia to reduce the levels of manganese in the water during the black water event in the Murray River.

High levels of manganese were also detected in Broadford's raw water. Sodium hypochlorite was used in the treatment process to reduce the manganese levels.

The Victorian locust plague resulted in widespread targeted use of specific insecticides for locust control. It was determined that the use of these chemicals could present a risk to some drinking water supplies. Goulburn Valley Water monitored and tested for specific pesticides used to control locusts. Monitoring was conducted over a five-month period, with no detection of these chemicals being reported.

Goulburn Valley Water manages a number of non-potable (non-drinking) water supplies in its region, and has continued its customer communications to ensure such non-drinking supplies are not consumed or confused as drinking water supplies.

For detailed water quality data, including data about other aesthetic characteristics of the drinking water, raw water monitoring, plus information about non-drinking water supplies and undertakings, refer to *Goulburn Valley Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.gvwater.vic.gov.au/communications/publications/images/Annual\\_Report\\_Water\\_Quality\\_2010-11.pdf](http://www.gvwater.vic.gov.au/communications/publications/images/Annual_Report_Water_Quality_2010-11.pdf).

### Risk management plan audit

The department did not require Goulburn Valley Water to undertake an audit on its Risk Management Plan during 2010–11.

### Water quality notifications

There were 38 notifications made to the department during 2010–11 under section 22 of the Act. For further details of the notifications, refer to Appendix 8 and *Goulburn Valley Water's Drinking Water Quality Annual Report for 2010–11*.

### Customer complaints related to water quality

A summary of the customer complaints relating to water quality recorded by Goulburn Valley Water during 2010–11 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	291	0.541
Taste/odour	52	0.097
Blue water	0	0.000
Air in water	2	0.004
Suspected illness	8	0.015
Other	2	0.004

Goulburn Valley Water advised that 343 of the complaints received related to taste and odour and discoloured water. The majority of these complaints related to unusually wet weather, heavy rainfall and the black water event. Water supplied to Murchison and Shepparton had an earthy and musty taste and odour for a short period of time and it is believed that it was related to a heavy rainfall event. Goulburn Valley Water increased the chemical dosing in the treatment process and undertook additional flushing within its reticulation networks.

Barmah and Nathalia had high colour in their drinking water for several weeks due to the black water event and associated elevated manganese levels in the raw water. Goulburn Valley introduced potassium permanganate into the treatment process to reduce the colour in the treated drinking water.

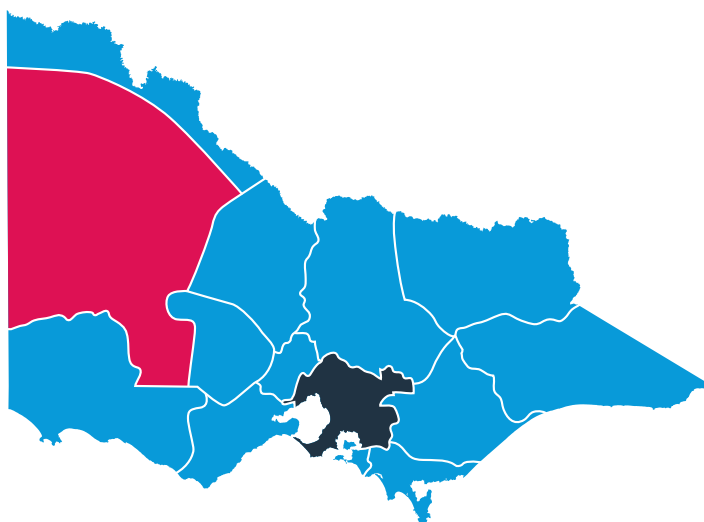
Numurkah also had high colour and taste and odour issues associated with the black water. To manage these issues Goulburn Valley Water introduced powder activated carbon dosing into the treatment process.

## 2010–11 Highlights

### Capital works and improvements

- Completion of the construction of a new pipeline that will deliver treated water between the Alexandra water treatment plant and the townships of Eildon and Thornton.
- Reconstruction of Kilmore water treatment plant commenced, which was damaged in the Black Saturday bushfires.
- Completion of an additional on-site clear water storage and sludge handling (geo-bag) facility at Kilmore.
- Commencement of the construction of new water treatment plants using membrane filtration at Colbinabbin, Dookie, Katamatite, Katandra West and Stanhope.
- Completion and commissioning of new 3 ML clear water storages at the Numurkah and Tatura water treatment plants.
- Completion and initial commissioning of the Bonnie Doon water treatment plant.

# Grampians Wimmera Mallee Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against water quality standards

Drinking water supplied in all localities by Grampians Wimmera Mallee Water during 2010–11 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standard
Dichloroacetic acid	Lalbert, Manangatang, Ultima
Trichloroacetic acid	Beulah, Great Western, Jung, Lalbert, Manangatang, Minyip, Nullawil, Ouyen, Rupanyup, Ultima, Woomelang, Wycheproof
Trihalomethanes	Beulah, Dimboola, Donald, Horsham, Jung, Lalbert, Manangatang, Minyip, Natimuk, Nullawil, Ouyen, Quambatook, Rupanyup, Ultima, Walpeup, Warracknabeal, Woomelang, Wycheproof
Turbidity	Beulah, Brim, Donald, Jung, Lalbert, Manangatang, Minyip, Rupanyup, Sea Lake, Ultima, Woomelang, Wycheproof
Aluminium	Charlton, Horsham, Natimuk, Underbool

The floods of November 2010 and January 2011 contributed to most of the water quality standard non-compliances.

The increased number of non-compliant results can be directly attributed to the changed raw water characteristics after the flood events. To illustrate this, there were 23 non-compliant results recorded prior to the floods and 91 recorded afterwards.

Elevated disinfection by-products persisted for many months after the floods in locations that receive an unfiltered water supply – including Beulah, Donald, Jung, Lalbert, Manangatang, Minyip, Nullawil, Quambatook, Rupanyup, Ultima, Walpeup, Woomelang and Wycheproof.

With regard to turbidity, Grampians Wimmera Mallee Water has limited control over this in water supplies with no coagulation and filtration facilities. As a result of the multiple flood events in Grampians Wimmera Mallee Water's catchments all towns without filtration facilities experienced elevated turbidity levels in their supplies.

As with the elevated disinfection by-product results, the majority of non-compliant turbidity results were recorded after the floods; there were 18 elevated results prior to the floods and 64 after the floods.

Similarly for aluminium, non-compliances correlated with changes in raw water quality due to the floods, and at Horsham and Natimuk were influenced by changes in pH during treatment. At Charlton flood waters had entered the raw water storage and caused an immediate change to the chemical make up of the water which led to the non-compliance.

At Underbool water treatment plant, difficulties with the flocculation and filtration stages of the treatment process led to acid soluble aluminium making its way into the treated water, resulting in non-compliance. Grampians Wimmera Mallee Water has since installed extra flocculation chambers, which will allow for better flocculation and will help to reduce the level of aluminium in the treated water.

### Water quality issues of potential health significance

Whilst *Escherichia coli* results were compliant in all of Grampians Wimmera Mallee Water's supply areas, there were five positive *Escherichia coli* results during the 2010–11 reporting period occurring at five separate towns. The positive results were detected at Horsham, Jung, Lake Bolac, Murtoa and Sea Lake.

Re-sampling of all supplies took place, and all repeat samples returned negative results. An investigation of Grampians Wimmera Mallee Water sampling procedure indicated problems in the sampling methodology and there were difficulties in obtaining samples from some sample points due to overgrown weeds.

Three blue-green algae blooms, none of which involved toxin-producing species, were reported for:

- Taylors Lake in January 2011
- Dimboola raw water storage in June 2011
- Warracknabeal raw water storage in June 2011.

For Taylors Lake, the decision was made to maintain supplying the Wimmera Mallee Pipeline from the lake given that the species was non-toxin-producing and that the alternate water supply in Lake Bellfield at the time was of poor quality.

As for the raw water storages, these were immediately isolated with water being supplied to the towns directly from the Wimmera Mallee Pipeline and, as a precaution, powdered activated carbon dosing was initiated at Warracknabeal.

Grampians Wimmera Mallee Water manages a number of non-potable (non-drinking) water supplies and has continued its customer communications to ensure that such non-drinking supplies are not consumed or confused as drinking water supplies. The provision of a pamphlet to new customers, providing signage at public and business taps advising not to drink the water, and including reminders in the normal billing cycle is conducted to minimise the likelihood of the water being mistaken as drinking water.

For detailed water quality data, including data about other aesthetic characteristics of the water and information about non-drinking water supplies, refer to *Grampians Wimmera Mallee Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.gwmwater.org.au/information/publications/cat\\_view/116-reports-and-policies/80-annual-and-sustainability-reports](http://www.gwmwater.org.au/information/publications/cat_view/116-reports-and-policies/80-annual-and-sustainability-reports).

### **Risk management plan audit**

The department did not require Grampians Wimmera Mallee Water to undertake an audit on its Risk Management Plan during 2010–11.

### **Water quality notifications**

There were eight notifications made to the department during 2010–11 under section 22 of the Act.

During 2010–11 Grampians Wimmera Mallee Water experienced a number of extreme weather events and subsequent flooding that led to the issuing of the following boil water advisories:

- 7 October 2010 at Lalbert, Manangatang and Ultima, due to increased turbidity and colour concentrations in raw water. Since this event Grampians Wimmera Mallee Water has constructed a trial filtration system at Manangatang which allowed for the boil water advisory to be lifted; the advisories for Lalbert and Ultima remain in place.
- 15 January 2011 at Birchip, Charlton, Donald, St Arnaud, Wycheproof and Quambatook, due to loss of power resulting in uncertainty about drinking water quality. As at the publication date of *Grampians Wimmera Mallee Water's Drinking Water Quality Annual Report for 2010–11*, boil water advisories remained in place at Donald and Wycheproof.
- 15 January 2011 at Halls Gap and Pomonal, due to significant erosion causing wash-out and the severing of a proximally located trunk main and a larger sewer main that supplied these localities. At the time Grampians Wimmera Mallee Water could not be certain that stormwater and wastewater had entered the trunk main as a result of this event; however, these boil water advisories have since been lifted.
- Land slides in the Grampians in January 2011 resulted in a deterioration of the water quality in Lake Bellfield, which provides a number of water supply systems via the Wimmera Mallee Pipeline. Boil water advisories were issued, initially at Donald and Wycheproof, and later at Beulah, Minyip, Rupanyup and Woomelang. As at the publication date of *Grampians Wimmera Mallee Water's Drinking Water Quality Annual Report for 2010–11*, boil water advisories remained in place in all of these towns.

At the end of the 2010–11 reporting period, 10 boil water advisories were still in place. Eight of the boil water advisories, for the townships of Beulah, Brim, Donald, Jung, Minyip, Rupanyup, Woomelang and Wycheproof, were associated with the flooding that occurred in January 2011; the other two, for the townships of Lalbert and Ultima, were associated with the flooding that occurred in September 2010.

For further details of the notifications, refer to Appendix 8 and *Grampians Wimmera Mallee Water's Drinking Water Quality Annual Report for 2010–11*.

## Customer complaints related to water quality

A summary of the customer complaints relating to water quality recorded by Grampians Wimmera Mallee Water during 2010–11 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	154	0.587
Taste/odour	25	0.010
Blue water	0	0.000
Air in water	4	0.015
Suspected illness	0	0.000
Other	13	0.050

Grampians Wimmera Mallee Water experienced an increase in complaints for 2010–11 compared with the previous reporting period. The increased complaints can be directly attributed to elevated levels of colour and turbidity in raw water from flood events.

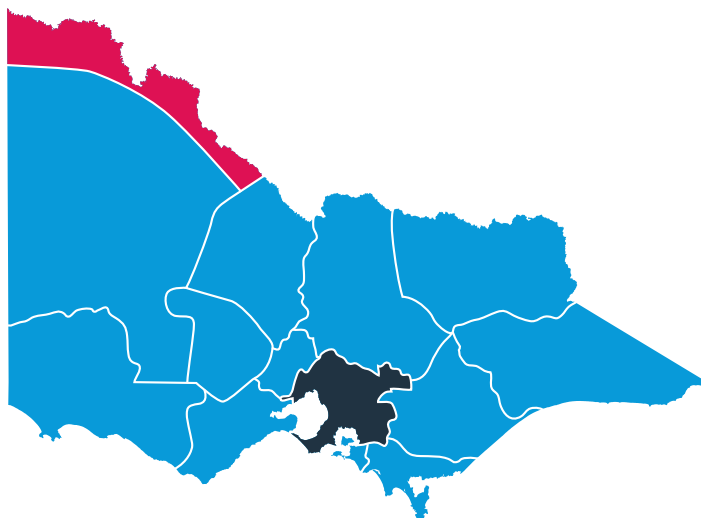
### 2010–11 Highlights

#### Capital investment projects

With many turbidity and filtration issues, Grampians Wimmera Mallee Water has responded with following capital investments:

- A trial filtration device has been installed at Manangatang to improve the town's water supply. The filtration device was chosen as an innovative, cost-effective way of improving water quality in towns that have elevated turbidity and colour. The other aspect of the filtration system is that it could be delivered in a much shorter time frame than other conventional filtration systems. Grampians Wimmera Mallee Water will continue to monitor the performance of the filtration system to ascertain whether it is a viable long-term method for improving water quality.
- Grampians Wimmera Mallee Water undertook smaller-scale options to improve the water quality in towns that had boil water advisories in place. These water quality improvement strategies are aimed to give customers short-term relief from the impacts of poor quality water. These options involve installing coagulation devices in various towns to reduce the turbidity and colour in their supplies. The towns where these devices have been installed are: Beulah, Brim, Donald, Jung, Lalbert, Minyip, Nullawil, Rupanyup, Ultima, Woomelang and Wycheproof. These devices have proved effective in reducing the turbidity and colour in these supplies. Grampians Wimmera Mallee Water will continue installing the coagulation devices during 2011–12.

## Lower Murray Water



Source: Map supplied by Victorian Water Industry Association.

### Performance against water quality standards

Drinking water supplied in all localities by Lower Murray Water during 2010–11 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standard
Trihalomethanes	Red Cliffs

This non-compliance was a result of disinfecting water with high levels of naturally occurring organic material. At the time of this non-compliance there was a black water event and severe flooding in the Murray River and the source water was of a very poor quality.

### Water quality issues of potential health significance

All other parameters measured by Lower Murray Water as part of its drinking water quality monitoring program satisfied the relevant health-based guideline values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period.

Fluoridation facilities constructed at Kerang, Mildura, Mildura West and Swan Hill water treatment plants completed commissioning and commenced operation, supplying fluoridated water to Irymple, Kerang, Lake Boga, Merbein, Mildura, Nyah, Nyah West, Red Cliffs, Swan Hill and Woorinen South drinking water localities.

Lower Murray Water manages a number of non-potable (non-drinking) water supplies. Lower Murray Water has developed a public awareness program to reduce the risk of people confusing the non-potable supply as a drinking water supply. The program includes a number of measures including a mail out of pamphlets to new customers, providing signage at public and business taps advising not to drink the water, biennial audit of signage and the re-issue of pamphlets.

For detailed water quality data about other aesthetic characteristics of the drinking water and information about non-drinking supplies, refer to *Lower Murray Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.lmw.vic.gov.au/documents/Final\\_000.pdf](http://www.lmw.vic.gov.au/documents/Final_000.pdf).



## Risk management plan audit

The department did not require Lower Murray Water to undertake an audit on its Risk Management Plan during 2010–11.

## Water quality notifications

There were three notifications made to the department during 2010–11 under section 22 of the Safe Drinking Water Act. For further details of the notifications, refer to Appendix 8 and *Lower Murray Water's Drinking Water Quality Annual Report for 2010–11*.

## Customer complaints related to water quality

A summary of the customer complaints relating to water quality recorded by Lower Murray Water during 2010–11 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	65	0.207
Taste/odour	54	0.172
Blue water	0	0.00
Air in water	0	0.00
Suspected illness	0	0.00
Other	4	0.013

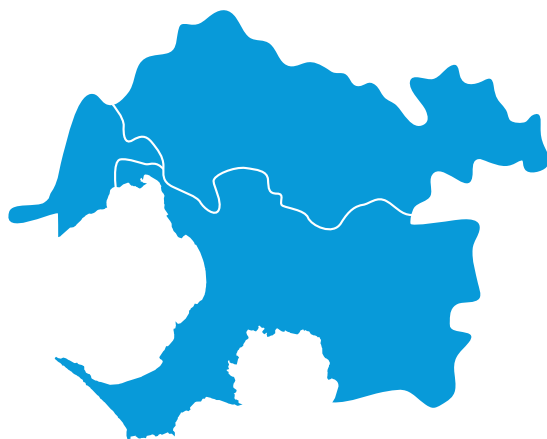
The number of discoloured water complaints for 2010–11 increased significantly compared with 2009–10, where 15 complaints were recorded. This was due to the very poor water quality in the Murray River caused by flooding and the black water event. The taste and odour complaints decreased significantly from 2009–10 due to the absence of blue-green algae in the Murray River.

Lower Murray Water is planning to air-scour all of the potable water supply systems mains, which will significantly assist in the reduction of future dirty water complaints

### 2010–11 Highlights

Fluoridation plants were commissioned at the Kerang, Mildura, Red Cliffs and Swan Hill water treatment plants.

# Melbourne Water



Source: Map supplied by Victorian Water Industry Association.

## Overview

Melbourne Water is unique among water storage managers in that it not only stores and manages water that will eventually be used for drinking water, but it also treats this water to a drinking water standard and then distributes this treated water to the metropolitan water businesses of City West Water, South East Water, Western Water and Yarra Valley Water.

## Water quality issues of potential health significance

In February 2011 the high rainfall event produced stormwater flows that exceeded the capacity of the Cardinia Reservoir catchdrain system. This resulted in stormwater overtopping the catchdrain into the reservoir. The catchdrain water drains from a rural-residential area on the south side of Emerald. The quality of the catchdrain water was not up to the standard required for water supplied from Cardinia Reservoir to customers, which is chlorinated but unfiltered. The reservoir was bypassed until monitoring confirmed that the spill water had diluted and dissipated safely away from the reservoir outlet. A number of improvement actions were initiated following the incident, such as improved alarm systems at the catchdrain pump station; an improved monitoring plan for contamination events at Cardinia; and a better system to manage chlorine residuals to avoid customer complaints when changing source waters.

The management actions undertaken by Melbourne Water ensured there were no public health issues associated with water that was supplied to customers.

## Risk management plan audit

The department did not require Melbourne Water to undertake an audit on its Risk Management Plan during 2010–11.

## Water quality notifications

There were three incidents reported by Melbourne Water to the Department of Health, in accordance with section 22 of the Act. For further details of the notifications, refer to Appendix 8 and *Melbourne Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.melbournewater.com.au/content/publications/reports/annual\\_report\\_to\\_department\\_of\\_health.asp?bhcp=1](http://www.melbournewater.com.au/content/publications/reports/annual_report_to_department_of_health.asp?bhcp=1).

## 2009–10 Highlights

### **New and upgraded infrastructure**

- Commenced the renewal of the North Essendon–Footscray main, which will continue into 2011–12 and will improve the level of reliability to customers.
- The Warburton and Woori Yallock hypochlorite plants were renewed to maintain levels of service for drinking water quality and safety.
- The Monbulk fluoride plant converted from using a sodium fluorosilicate solution to sodium fluoride. The fluoride plant was upgraded to meet the *Code of Practice for Fluoridation*.

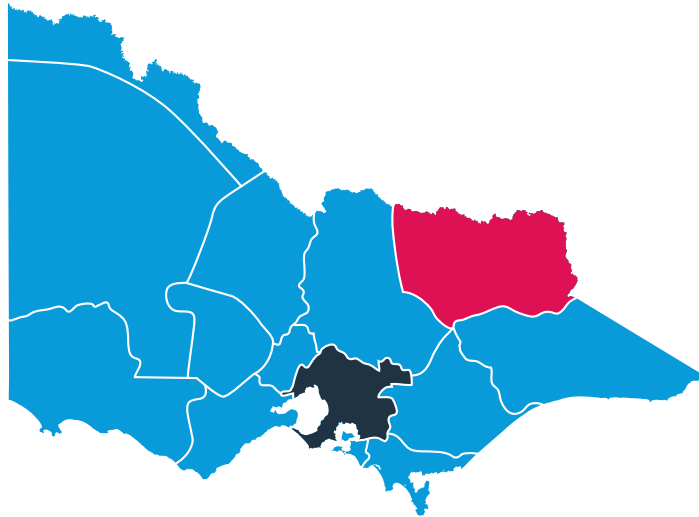
### **Preparing for desalination**

To receive and distribute water from the new desalination plant being built at Wonthaggi, significant works within Melbourne Water's supply network was required. Works undertaken include:

- upgrading existing water mains
- a new inlet water main and chute to enable desalinated water to be delivered to Cardinia Reservoir (for subsequent redistribution to Melbourne's southern suburbs, Mornington Peninsula and Pakenham areas)
- Construction of a new pump station at Cardinia Reservoir, which will improve flexibility and security in transferring water throughout Melbourne's water supply network.

The desalination project will enable Barwon Water, South Gippsland Water and Westernport Water to increase the security of their supply by accessing the Melbourne system when required.

# North East Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against water quality standards

Drinking water supplied in all localities by North East Water during 2010–11 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standard
Aluminium	Beechworth High and Low Level, Dartmouth, Glenrowan, Mt Beauty, Walwa

North East Water has identified non-compliance with the aluminium water quality standard as an area of concern and introduced improvement programs to address the issue.

The non-compliance with the aluminium water quality standard in Beechworth (High and Low Levels) occurred in February 2011. Beechworth Lower Level water sampling locality recorded two other non-compliant results in September 2010 and March 2011. The raw water source for Beechworth provides treatment challenges as it contains a relatively high level of organic material and fluctuating pH.

The non-compliance recorded at Mt Beauty and Glenrowan for aluminium resulted from a single result in each locality above the standard. Variable raw water conditions contributed to Dartmouth and Walwa recording two non-compliances each with the aluminium water quality standard. Each of the non-compliances was an isolated event.

Non-compliances for aluminium indicate a number of contributing factors, including characteristics of the raw water, changes in operations, weather impacts and the type of coagulant used in the treatment process. In response to the non-compliances, North East Water optimised their water treatment processes to reduce the amount of aluminium that was being carried over into the treated water. All non-compliances were reported to the department under section 18 of the Act.

None of these issues posed a risk to public health.

## Water quality issues of potential health significance

There were a number of *Escherichia coli* and *Enterococci* detections in Myrtleford, which were detected through extra monitoring of the system. The Myrtleford water supply system is currently disinfected using ultraviolet light. This method does not provide any residual disinfection within the reticulation system. Multiple treatment barrier upgrades to the Myrtleford water treatment plant to improve drinking water quality to this township are to be completed in the latter half of 2011.

At the direction of the department, a seasonal boil water advisory was implemented for the Myrtleford water supply system from 1 November 2010 to 30 April 2011.

Major flooding occurred in September 2010, which affected the ability to adequately treat drinking water in some of the towns that North East Water services. Boil water advisories were put in place for:

- Myrtleford, due to sections of the network being flooded and the absence of residual disinfection
- Bright, Wandiligong and Porepunkah (which are supplied from the Bright water treatment plant), due to significant levels of turbidity in the source water and available treatment processes being unable to guarantee the production of safe drinking water
- Harrietville, due to increased levels of turbidity in the source water and the available treatment processes being unable to guarantee the production of safe drinking water.

In response to the blue-green algal bloom in the Mitta Mitta arm of Lake Hume, North East Water incorporated powdered activated carbon dosing at Tallangatta water treatment plant, to remove the algae and associated taste and odour.

Fluoridation facilities constructed at Benalla and Yarrawonga water treatment plants completed commissioning and commenced operation supplying fluoridated water to Benalla, Devenish, St James, Tungamah and Yarrawonga localities.

For detailed water quality data, including data about other aesthetic characteristics of the drinking water, raw water quality monitoring and undertakings, refer to *North East Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.newater.com.au/communications/publications/images/NEW\\_DWQ%20Annual%20Report%202010-11.pdf](http://www.newater.com.au/communications/publications/images/NEW_DWQ%20Annual%20Report%202010-11.pdf).

## Risk management plan audit

The department did not require North East Water to undertake an audit on its Risk Management Plan during 2010–11.

## Water quality notifications

There were 21 notifications made to the department during 2010–11 under section 22 of the Act. For further details of the notifications, refer to Appendix 8 and *North East Water's Drinking Water Quality Annual Report for 2010–11*.

## Customer complaints related to water quality

A summary of the customer complaints relating to water quality recorded by North East Water during 2010–11 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	10	0.022
Taste/odour	55	0.121
Blue water	0	0.000
Air in water	0	0.002
Suspected illness	3	0.006
Other	9	0.019

The most common type of complaint by North East Water was taste and odour. Significant levels of algae were again present in the Murray River system. Approximately 40 per cent of the taste and odour complaints received were from Tallangatta and associated with the high levels of blue-green algae in the Mitta Mitta arm of Lake Hume.

Other taste and odour complaints related to chlorine. Many of these were received from Mt Beauty, Tawonga and Tawonga South after the upgrade of the water treatment plant and the introduction of chlorine disinfection. The community strongly opposed the use of chlorine in the treatment process and many of the complaints were direct objections to the introduction of chlorine.

The second most commonly received complaint type was discoloured water. North East Water maintenance staff responded to these complaints and service requests by visiting the site and investigating the complaint. Causes of discoloration include biofilm sloughing off the mains resulting in sediment at customer taps, the presence of some types of algae or iron and manganese in water.

The “other” category was the third most common type of complaint received by North East Water in 2010–11 and included complaints about or objection to the addition of chlorine to the drinking water supply; household water filter blockages; and grit in the water causing stains on clothing and the staining on basins, baths and pipe fittings.

## 2010–11 Highlights

### Water quality improvement project

- To address non-compliance with water quality standards at Mt Beauty, Tawonga and Tawonga South, North East Water has worked with the Mt Beauty community and the department since 2006. The Mt Beauty community were strongly opposed to introducing chemicals to their drinking water supply. A formal community reference group was established to consult with the community while working through the issues and solutions to resolve the non-compliance. North East Water was challenged by the reference group throughout the consultation process to achieve the best possible outcome for the community while maintaining regulatory compliance. A new multiple barrier water treatment plant was constructed and commissioned in September 2010.

### New water source

- Glenrowan received a new drinking water source via a new pipeline delivering treated water from the Wangaratta water treatment plant.

# Parks Victoria

## Overview

Parks Victoria provides water to approximately 260 sites within the areas it manages across Victoria. During 2010–11 Parks Victoria provided drinking water to five of these 260 sites, which have been declared water sampling localities under the Safe Drinking Water Regulations 2005. The five localities are Gabo Island Lightstation, Lakeside / Candlebark / Devil Cove Campgrounds (Lake Eildon National Park), Tidal River (Wilson's Promontory National Park), Twelve Apostles Centre (Port Campbell National Park) and Wilson's Promontory Lightstation.

## Performance against water quality standards

Drinking water supplied in all localities by Parks Victoria during 2010–11 complied with the water quality standards, except as noted in the table below.

Parameter	Localities not complying with water quality standard
<i>Escherichia coli</i>	Gabo Island Lightstation, Lakeside/Candlebark/ Devil Cove Campgrounds (Lake Eildon National Park)

*Escherichia coli* detections were recorded at the Gabo Island Lightstation, Lakeside / Candlebark / Devil Cove Campgrounds and Tidal River (Wilson's Promontory National Park) localities during the 2010–11 reporting period. In both the Gabo Island Lightstation and the Lakeside / Candlebark / Devil Cove Campgrounds localities, multiple detections were recorded causing non-compliance with the standard. After each *Escherichia coli* detection Parks Victoria undertook remedial actions, primarily consisting of dosing the storage tanks with sodium hypochlorite and collecting a resample. All resamples were found to be free of *Escherichia coli*.

## Water quality issues of potential health significance

In March 2011 a one-in-300-year flood event occurred at Wilson's Promontory National Park causing extensive damage, including part of a bridge washing away and multiple landslips. The Tidal River water treatment plant itself was not affected, but damage to other essential service equipment caused the treatment plant to be shutdown. Due to the lack of access and the water treatment plant being shut down, a number of water quality samples were not collected for 2010–11.

## Risk management plan audit

An audit of Parks Victoria's risk management plan was conducted in October 2009. The auditor found that Parks Victoria had not complied with the obligations of the Act. The two audit findings that led to the non-compliant audit result were:

- maintenance schedules not being completed at the documented frequency for inspections of the water supply storage and distribution tanks and pipes at the Twelve Apostles Visitor Facility and the Gabo Island Lightstation
- the revised risk management plans and procedures and staff training put in place during 2009 (following the previous audit in 2008) not being fully implemented at the time of the 2009 audit.

Parks Victoria completed an additional voluntary audit in September 2010. The auditor found that Parks Victoria complied with the obligations of the Act and the minor non-compliances raised in the previous audit (listed above) had been successfully addressed. The audit certificate is included in *Parks Victoria's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.parkweb.vic.gov.au/\\_\\_data/assets/pdf\\_file/0003/514236/Parks-Victoria-SDW-Annual-Report-2010-11.pdf](http://www.parkweb.vic.gov.au/__data/assets/pdf_file/0003/514236/Parks-Victoria-SDW-Annual-Report-2010-11.pdf).

## Water quality notifications

There were six notifications made to the department during 2010–11 under section 22 of the Act. For further details of the notifications refer to Appendix 8 and *Parks Victoria's Drinking Water Quality Annual Report for 2010–11*.

## Customer complaints relating to water quality

No customer complaints relating to water quality were recorded during 2010–11.

## Mineral springs

Parks Victoria also manages a number of mineral springs in Central Victoria, chiefly in Hepburn Regional Park and Castlemaine Diggings National Heritage Park. At several of these springs, facilities and infrastructure encourage visitors to drink spring water for the health benefits that it is believed to provide.

During 2010–11, monitoring of mineral water quality, including testing for microbiological contamination, was carried out for Parks Victoria under an informal arrangement with the Victorian Mineral Water Committee. Any failure to comply with required standards was reported to the department by Parks Victoria as if these locations were declared water sampling localities. Contaminated mineral springs were closed until re-testing demonstrated that the contamination had been removed.

Under this arrangement, the following *Escherichia coli* detections were reported to the department during the 2010–11 reporting period.

Date	Mineral spring where <i>Escherichia coli</i> was detected
September 2010	Sailors Falls Pump
October 2010	Tipperary Pipe Pit
December 2010	Sailors Falls Pump
January 2011	Sailors Falls Pump / Pit
January 2011	Jim Paull
March 2011	Sailors Falls Pump
March 2011	Sailors Falls Pump / Pit

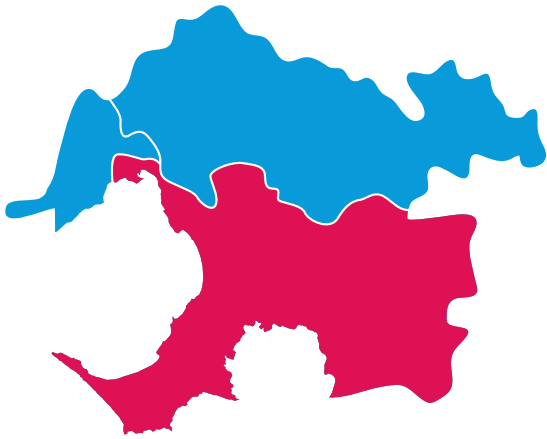
Parks Victoria took appropriate action after each detection, signposting and closing the affected springs and undertaking resampling. The spring was not reopened until the repeat sample was shown to be free of *Escherichia coli*.

## 2010–11 Highlights

Parks Victoria was found to be compliant in its most recent risk management plan audit



# South East Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against water quality standards

Drinking water supplied in all localities by South East Water during 2010–11 complied with the water quality standards.

## Water quality issues of potential health significance

All other parameters measured by South East Water as part of its drinking water quality monitoring program satisfied the relevant health-based guideline values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period.

For detailed water quality data, including data about other aesthetic characteristics of the drinking water and raw water quality monitoring, refer to *South East Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.sewl.com.au/SiteCollectionDocuments/About\\_Us/Corporate\\_Reports/Water\\_Quality\\_Report\\_2010-11.pdf](http://www.sewl.com.au/SiteCollectionDocuments/About_Us/Corporate_Reports/Water_Quality_Report_2010-11.pdf).

## Risk management plan audit

The department did not require South East Water to undertake an audit on its Risk Management Plan during 2010–11.

## Water quality notifications

There were nine notifications made to the department during 2010–11 under section 22 of the Act. For further details of the notifications, refer to Appendix 8 and *South East Water's Drinking Water Quality Annual Report for 2010–11*.

## Customer complaints related to water quality

A summary of the customer complaints relating to water quality recorded by South East Water during 2010–11 is provided in the table on the following page.

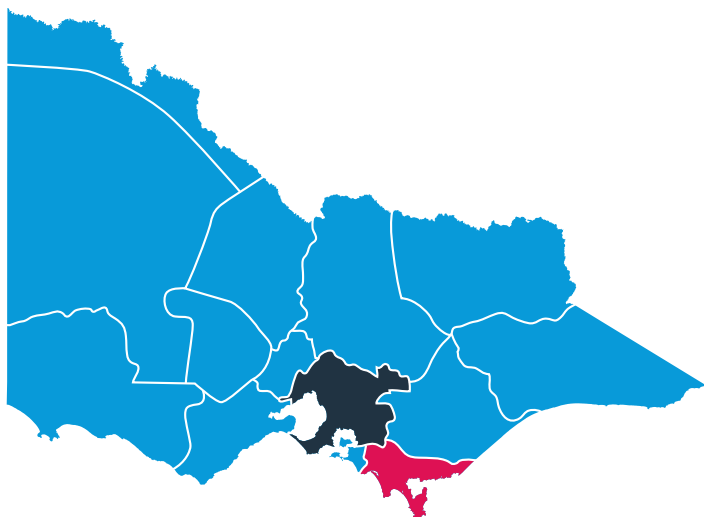
Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	959	0.146
Taste / odour	199	0.030
Blue water	11	0.002
Air in water	54	0.008
Suspected illness	11	0.002
Other	60	0.009

The number of complaints received by South East Water was higher than the previous reporting period. Discoloured water complaints increased from 547 in 2009–10 to 959 in 2010–11. These complaints are attributed to an increase in the flow of water through the mains or a reversal of the direction within the main that stirs up the fine sediment in the mains. There was a slight increase in taste and odour complaints, which are usually related to chlorine, and varies with seasonal water demands and the location of the customer's property in relation to the disinfection plant.

#### 2010–11 Highlights

- A new online water quality monitoring system was installed at Cremorne, which enables South East Water to monitor the quality of the water being transferred from the northern suburbs.
- A new chlorinator was added to a recently installed water tank in Carrum Downs, providing secondary disinfection to assist maintaining a chlorine residual for longer, ensuring the water supplied is protected and the distribution system is kept clean.

# South Gippsland Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against water quality standards

Drinking water supplied in all localities by South Gippsland Water during 2010–11 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standard
Aluminium	Alberton

As reported to the Department of Health under section 18 of the *Safe Drinking Water Act 2003*, the non-compliance at Alberton for the aluminium water quality standard was due to a change in source water quality and subsequent attempts to optimise treatment leading to an over-dose of aluminium at the treatment plant. Water was temporarily sourced directly from the Tarra River and additional monitoring was carried out.

## Water quality issues of potential health significance

All other parameters measured by South Gippsland Water as part of its drinking water quality monitoring program satisfied the relevant health-based guideline values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period.

With the exception of aluminium, all of South Gippsland Water localities complied with the health-based water quality standards, the department was notified of one missing *Escherichia coli* and turbidity result for Inverloch and two missing *Escherichia coli* and turbidity results for Wonthaggi in July 2010.

No algal blooms were reported to the department in 2010–11, as cell counts did not pose a risk to human health; however, notifications were made to the Department of Sustainability and Environment in accordance with protocols. Algae present in the Lance Creek Reservoir led to taste and odour issues for water supplied to the Cape Paterson, Inverloch, Lance Creek and Wonthaggi localities.

For detailed water quality data, including data about other aesthetic characteristics of the drinking water, refer to *South Gippsland Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.sgwater.com.au/About\\_Water/PDF/11Report.pdf](http://www.sgwater.com.au/About_Water/PDF/11Report.pdf).

### Risk management plan audit

The department did not require South Gippsland Water to undertake an audit on its Risk Management Plan during 2010–11.

### Water quality notifications

During 2010–11 there were nine notifications made to the department under section 22 the Act. For further details of the notifications, refer to Appendix 8 and *South Gippsland Water's Drinking Water Quality Annual Report for 2010–11*.

### Customer complaints related to water quality

A summary of the customer complaints relating to water quality recorded by South Gippsland Water during 2010–11 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	194	1.02
Taste / odour	64	0.34
Blue water	0	0
Air in water	2	0.01
Suspected illness	2	0.01
Other	3	0.02

An increase in discoloured water complaints for 2010–11 compared with the previous two years was attributed to two separate incidents of high manganese in source waters. In January 2011 at Leongatha, difficulties with optimising the treatment for manganese removal following application of algicide to the Leongatha reservoirs led to 40 complaints being received within a 48-hour period. Likewise in May 2011 at Korumburra, high levels of manganese in the raw water led to the formation of solid, brownish-black manganese precipitating in the distribution system; 35 calls were received in one week.

A similar trend was the increase in taste and odour complaints, which was related to the growth of algae in the Lance Creek Reservoir causing levels of geosmin in the supplied drinking water above the taste-threshold level.

All other complaints were comparable with, or lower than, those in the two previous years. Of the two suspected illness reported there was no evidence that the illnesses related to the quality of drinking water.

## 2010–11 Highlights

### Water quality during extreme weather

- In the 2010–11 reporting period South Gippsland Water, as with other water suppliers, continued to meet customer demands during the extreme wet weather and flooding events experienced in the early half of 2011. Despite highly turbid source waters, the careful management of raw water uptake and treatment plant operation resulted in an uninterrupted supply of drinking water that was uncompromised with respect to safety and quality.

### Capital works and improvements

- The most significant capital work commenced by South Gippsland Water in the 2010–11 period was the construction of a 4 ML clear water storage tank at the Toora water treatment plant, allowing for the decommissioning of the uncovered Toora 30 ML Basin and secure the continued supply of high quality drinking water to Toora, Port Franklin, Port Welshpool, Welshpool and surrounding districts.
- Other actions undertaken during 2010–11 to improve water treatment and minimise the risk of contamination of drinking water supplies included installation of double valve systems and implementation of monitoring practices to prevent cross-contamination from raw water plant bypass lines (the bypass lines are necessary as part of fire contingency plans but represent a potential risk if not completely isolated from drinking water supply lines). Furthermore, more rigorous procedures for both hygienic mains break repair and optimal filter management were implemented, with advanced relevant training for staff being provided.
- South Gippsland Water has also become a registered member of the Water Services Association of Australia (WSSA) Water Treatment Alliance, which aims to reduce the risk of waterborne disease through the optimisation of water treatment plant operation, and to encourage plant operators to share information and identify opportunities to reduce risk. In participating in the program, improvements in filter and clarifier performance at the Foster water treatment plant have led to lower turbidity levels in the final treated water product. Similar improvements in operation are expected as the focus of the program is moved to other South Gippsland water treatment plants.

# Southern Rural Water



Source: Map supplied by Victorian Water Industry Association.

## Overview

Southern Rural Water is a water storage manager under the *Safe Drinking Water Act 2003* and is responsible for the harvest and storage of water and delivery to customers in accordance with the provisions of bulk entitlement orders, and also manages the recreational facilities at most of these storages. Southern Rural Water does not supply drinking water but rather stores untreated water for water suppliers (Western Water and Gippsland Water), power-generating companies in the Latrobe Valley, industry, irrigation and rural purposes.

## Water quality issues of potential health significance

Two events during 2010–11 that were not reportable under section 22 of the Act, but had the potential to impact on the quality of drinking water, relate to *Escherichia coli* levels in untreated water. Southern Rural Water has negotiated agreed notification values with Western Water and Gippsland Water for *Escherichia coli* levels above which the respective supplier is notified. Both of these events followed heavy rains, the first at Blue Rock Reservoir in November 2010 and a second at Rosslynne Reservoir in January 2011.

There were eight incidents for blue-green algae blooms in Southern Rural Water's western storages during the period November 2010 to April 2011.

These incidents did not require Southern Rural Water to notify the department, but did require notification to stakeholders, including Western Water. Further details are provided in *Southern Rural Water's Water Quality Annual Report for 2010–11*, which can be found at [www.srw.com.au/Files/Annual\\_reports/Safe\\_Drinking\\_Water\\_Annual\\_report\\_2010\\_11\\_\\_Final\\_Rev\\_4\\_.pdf](http://www.srw.com.au/Files/Annual_reports/Safe_Drinking_Water_Annual_report_2010_11__Final_Rev_4_.pdf).

## Risk management plan audit

The department did not require Southern Rural Water to undertake an audit on its Risk Management Plans during 2010–11.

## Water quality notifications

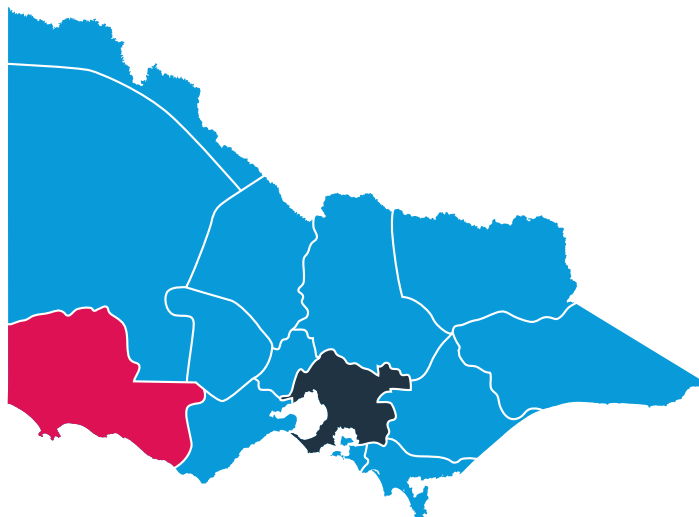
There were no notifications made to the department during 2010–11 under section 22 of the Act.

### 2010–11 Highlights

#### Reviews

- Southern Rural Water recently completed an internal review of their blue-green algae incident management plan, which has helped clarify their responsibilities as a local water manager and ensured accurate and appropriate information was available in the event of a blue-green algae bloom.
- Southern Rural Water commenced an internal review of their safe drinking water risk management plans, the first stage of which involved a risk identification and review process, incorporating workshops with stakeholders. The results of the review process will be incorporated in revised risk management plans.

## Wannon Water



Source: Map supplied by Victorian Water Industry Association.

### Performance against water quality standards (drinking water supplies only)

Drinking water supplied in all localities by Wannon Water during 2010–11 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standard
Trihalomethanes	Glenthompson
Dichloroacetic acid	Glenthompson
Trichloroacetic acid	Glenthompson
Aluminium	Balmoral, Cavendish, Dunkeld, Glenthompson, Hamilton

Elevated aluminium results were the result of a number of issues, including: naturally high aluminium in source waters; sampling during the commissioning phase of water treatment plant upgrades; and reservoir stratification leading to increases in raw water colour and turbidity for which optimal coagulate dosing was made difficult.

### Water quality issues of potential health significance

The aesthetic guideline value of 0.1 mg/L for manganese was exceeded at Casterton, Cobden, Dunkeld and Port Fairy and the health guideline value of 0.5 mg/L for manganese was exceeded in Glenthompson during 2010–11.

The treatment process at Glenthompson was temporarily altered in an effort to eliminate elevated manganese, resulting in the creation of disinfection by-products. Removal of manganese was optimised by the installation of an inline mixer to provide rapid mixing and the addition of a coagulant, Calgon.



An incorrect chlorine-to-ammonia dosing ratio at Cavendish resulted in a single elevated chloral hydrate result. A chloramines optimiser software package was created for this site and other locations to manage this risk. Purnim also experienced levels of chloral hydrate above the Australian Drinking Water Guidelines 2004 health-based guideline value. The health significance of chloral hydrate is currently being reviewed in consultation with the department.

Blue-green algae above reportable limits was detected within a number of raw water storages in the 2010–11 reporting period, instigating a number of actions including isolation of basins, increased algal monitoring and utilising dissolved air flotation treatment.

Wannon Water manages a number of non-potable (non-drinking) water supplies in its region, and has continued its customer communications to ensure that such non-drinking supplies are not consumed or confused as drinking water supplies.

For detailed water quality data about other aesthetic characteristics of the drinking water and information about non-drinking water supplies and undertakings, refer to *Wannon Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.wannonwater.com.au/images/pdf/AboutWater/waterqualityannualreport2010-11-final.pdf](http://www.wannonwater.com.au/images/pdf/AboutWater/waterqualityannualreport2010-11-final.pdf).

### Risk management plan audit

The department did not require Wannon Water to undertake an audit on its Risk Management Plan during 2010–11.

### Water quality notifications

There were 29 notifications made to the department during 2010–11 under section 22 of the Act. For further details of this notification, refer to Appendix 8 and *Wannon Water's Drinking Water Quality Annual Report for 2010–11*.

### Customer complaints relating to water quality

A summary of the customer complaints relating to water quality recorded by Wannon Water during 2010–11 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	68	0.17
Taste / odour	23	0.06
Blue water	0	0
Air in water	7	0.02
Suspected illness	4	0.01
Other	5	0.01

During 2010–11, complaint numbers reduced significantly compared with previous years. A large number of discoloured water complaints were received from the Casterton system in previous years due to high levels of manganese. Wannon Water improved the treatment process at Casterton to include pre-chlorination and conducted additional on-site testing of manganese to allow for water treatment plant optimisation. These works have eliminated customer complaints for discoloured water at Casterton. During 2010–11 there were no incidences where more than five water quality complaints were received within any 24-hour period.

### 2010–11 Highlights

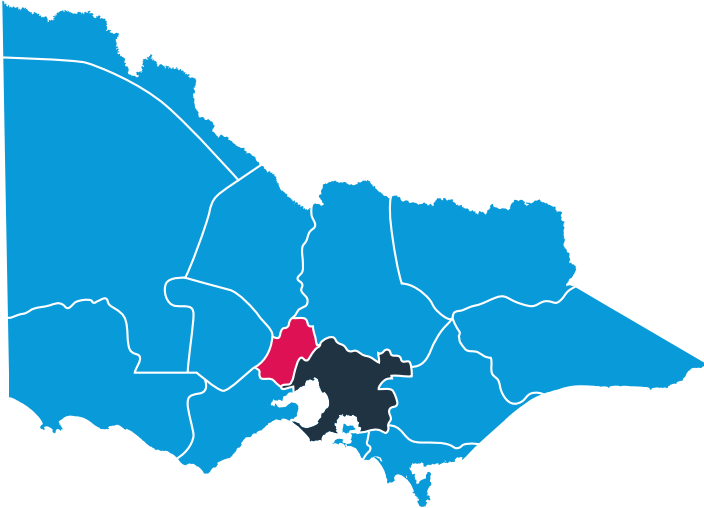
#### **New water sources**

- Hamilton is now able to receive an additional 2,000 ML of water if required, from the Hamilton–Grampians pipeline commissioned in July 2010.
- The Warrnambool Roof Water Harvesting Project commenced. Rainfall harvested from city roofs is mixed with raw water before being treated at the Warrnambool water treatment plant and supplied to the city's reticulation system.

#### **Water treatment plant improvement programs**

- Fluoride dosing facilities were commissioned in 2010–11 at the Hamilton water treatment plant.
- The Hamilton water treatment plant upgrade works were completed in 2010–11, increasing the capacity and performance of the plant to meet future growth in water demands. The completion of upgrade works also finalised the existing undertaking for Hamilton, put in place for ongoing elevated aluminium levels detected in the reticulation system.

# Western Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against water quality standards

Drinking water supplied in all localities by Western Water during 2010–11 complied with the water quality standards.

## Water quality issues of potential health significance

All other parameters measured by Western Water as part of its drinking water quality monitoring program satisfied the relevant health-based guideline values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period.

For detailed water quality data, including data about aesthetic characteristics of the water and the raw water monitoring program, refer to *Western Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.westernwater.com.au/SiteCollectionDocuments/Reports/Water%20Quality%20Reports/WQ%20Report%202011.pdf](http://www.westernwater.com.au/SiteCollectionDocuments/Reports/Water%20Quality%20Reports/WQ%20Report%202011.pdf).

## Risk management plan audit

The department did not require Western Water to undertake an audit on its Risk Management Plan during 2010–11.

## Water quality notifications

There were seven notifications made to the department during 2010–11 under section 22 of the Act. For further details of this notification, refer to Appendix 8 and *Western Water's Drinking Water Quality Annual Report for 2010–11*.

## Customer complaints related to water quality

A summary of the customer complaints relating to water quality recorded by Western Water during 2010–11 is provided in the table on the following page.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	133	0.068
Taste / odour	38	0.240
Blue water	0	0.000
Air in water	9	0.016
Suspected illness	4	0.007
Other	9	0.016

During 2010–11, there were a significantly higher number of dirty water complaints compared with 2009–10. This was caused by disturbances in the mains, such as mains breaks and flushing, which re-suspended sediment that had built up over the long period of drought when systematic mains flushing was discontinued to conserve water. The increased number of taste and odour complaints was brought about by a change in the water supply. Local water storages filled rapidly during the months of December 2010 and January 2011. Customers noticed a difference in taste when the water supply for Bacchus Marsh and Melton was changed from water supplied by Melbourne Water to water supplied from the Merrimu Reservoir.

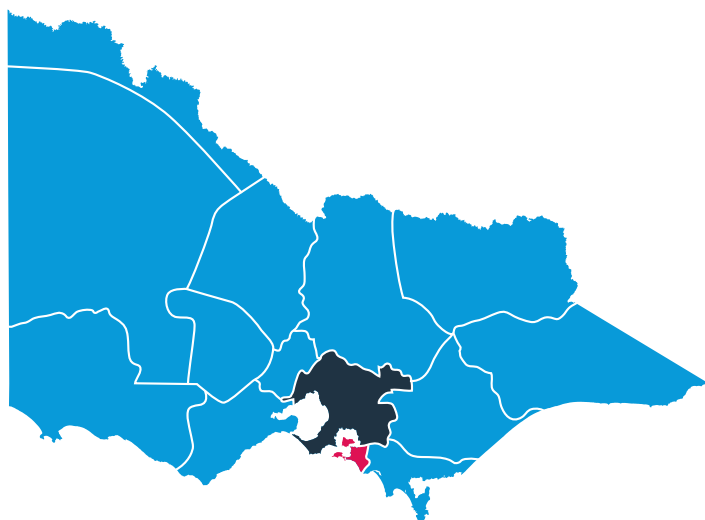
#### 2010–11 Highlights

- Local water storages filled after many years of drought and were able to be utilised to provide drinking water.

#### Water treatment plant improvement projects

- Significant upgrades to Rosslynne and Merrimu water filtration plants.
- Recommissioning of both Rosslynne and Merrimu water filtration plants.
- Construction of 10 ML drinking water storage tanks at Rosslynne and Merrimu water filtration plants.

# Westernport Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against water quality standards

Drinking water supplied in all localities by Westernport Water during 2010–11 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standard
Trihalomethanes	Cowes
Aluminium	Bass, Kilcunda

A trihalomethane reduction program introduced during the 2008–09 reporting period has continued to reduce the naturally occurring organic material levels in the treated water. These are the precursors to disinfection by-products. One high trihalomethane result was recorded in Cowes during April 2011.

During 2010–11 non-compliant aluminium results were recorded for Bass in January 2011 and at Kilcunda in January and March 2011. Westernport Water advised that samples for both Bass and Kilcunda were taken on the same day in January and believed to be due to works being undertaken on the supply main.

## Water quality issues of potential health significance

All other parameters measured by Westernport Water as part of its drinking water quality monitoring program satisfied the relevant health-based guideline values set out in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period.

A significant increase in potentially toxic blue-green algae occurred in February 2011 at Candowie Reservoir. The reservoir was treated with algicide and subsequent sampling confirmed that the treatment was successful.

Bromodichloromethane (a component of total trihalomethanes) slightly exceeded the World Health Organisation guideline limit in five localities. A mandated standard does not exist in the Safe Drinking Water Regulations 2005, nor does a health-related guideline value exist for this parameter in the *Australian Drinking Water Guidelines 2004*. As only one trihalomethane result exceeded the regulated standard, which did not pose a risk to public health, no action was taken.

For detailed water quality data, including data about aesthetic characteristics of the water and the raw water monitoring program, refer to *Westernport Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.westernportwater.com.au/WebFiles/Services/Water%20quality/WPW%20Annual%20Drinking%20Water%20Quality%20Report%202010-11%20Final%20V1.pdf](http://www.westernportwater.com.au/WebFiles/Services/Water%20quality/WPW%20Annual%20Drinking%20Water%20Quality%20Report%202010-11%20Final%20V1.pdf).

### Risk management plan audit

The department did not require Westernport Water to undertake an audit on its Risk Management Plan during 2010–11.

### Water quality notifications

There were no notifications made to the department during 2010–11 under section 22 of the Act.

### Customer complaints related to water quality

A summary of the customer complaints relating to water quality recorded by Westernport Water during 2010–11 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	13	0.090
Taste / odour	8	0.060
Blue water	0	0.000
Air in water	0	0.000
Suspected illness	0	0.000
Other	4	0.030

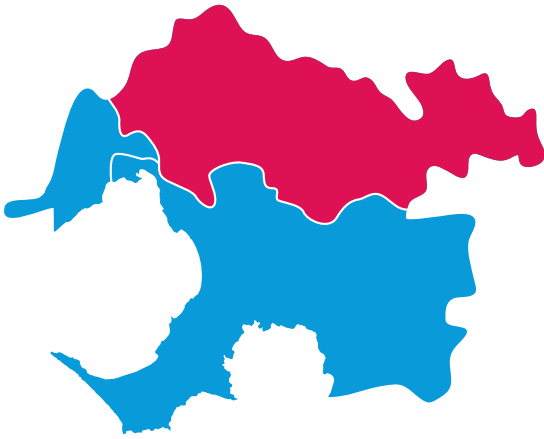
The majority of complaints for Westernport Water were related to discoloured water. The number of discoloured water complaints decreased from 17 in 2009–10 to 13 in 2010–11. The number of taste and odour complaints more than halved from 19 in 2009–10 to eight in 2010–11. Works undertaken during 2010–11 resulted in improved water quality and reducing the number of complaints compared with previous reporting periods.

### 2010–11 Highlights

#### Water treatment plant improvement projects

- San Remo holding basin was inspected and vacuumed to improve water quality leaving the basin.
- Maintenance was carried out on all flocculators. This included servicing chains and cogs, tanks and walls were cleaned, floors painted and paddles were repaired or replaced.
- The reliability of each filter was improved by each inlet valve being replaced at every individual filter.

# Yarra Valley Water



Source: Map supplied by Victorian Water Industry Association.

## Performance against water quality standards

Drinking water supplied in all localities by Yarra Valley Water during 2010–11 complied with the water quality standards.

## Water quality issues of potential health significance

All other parameters measured by Yarra Valley Water as part of its drinking water quality monitoring program satisfied the relevant health-based guideline values detailed in the *Australian Drinking Water Guidelines 2004* during the 2010–11 reporting period.

For detailed water quality data, including data about aesthetic characteristics of the water and the raw water monitoring program, refer to *Yarra Valley Water's Drinking Water Quality Annual Report for 2010–11*, which can be found at [www.yvw.com.au/yvw/groups/public/documents/document/yvw1002794.pdf](http://www.yvw.com.au/yvw/groups/public/documents/document/yvw1002794.pdf).

## Risk management plan audit

The department did not require Yarra Valley Water to undertake an audit on its Risk Management Plan during 2010–11.

## Water quality notifications

There were 15 notifications made to the department during 2010–11 under section 22 of the Act. For further details of the notifications, refer to Appendix 8 and *Yarra Valley Water's Drinking Water Quality Annual Report for 2010–11*.

## Customer complaints related to water quality

A summary of the customer complaints relating to water quality recorded by Yarra Valley Water during 2010–11 is provided in the table on the following page.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	1868	0.270
Taste / odour	283	0.040
Blue water	27	0.003
Air in water	83	0.010
Suspected illness	0	0.000
Other	71	0.010

Yarra Valley Water recorded its lowest level of water quality complaints in history. The reduction can be attributed to an increased amount of filtered water supplied from Sugarloaf Reservoir, plus lower flows in water mains due to lower demands over the summer period.

### 2010–11 Highlights

#### Water quality improvement projects

- A project to identify water mains with a high build-up of sediments commenced in 2010–11 in response to the cessation of a routine mains cleaning program. Hydraulic and gravitation sediment settling models were used to accurately predict which areas of Yarra Valley Water's network are subject to high and low sediment build-up. Should a mains cleaning program recommence, the model can be used to target areas with high sediment load.
- An investigation into chlorine residuals in Yarra Valley Water's water sampling localities identified the need for a new secondary chlorinator at Yarrambat Reservoir to improve aesthetic water quality, scheduled for installation in 2011–12.





# Appendices



# Appendix 1: Water storage managers and water suppliers 2010–11

## Water storage managers

Goulburn-Murray Water  
Grampians Wimmera Mallee Water#  
Melbourne Water  
Southern Rural Water

## Water suppliers

Barwon Water  
Central Highlands Water  
City West Water  
Coliban Water  
East Gippsland Water  
Falls Creek Alpine Resort Management Board  
Gippsland Water  
Goulburn Valley Water  
Grampians Wimmera Mallee Water#  
Lake Mountain Alpine Resort Management Board  
Lower Murray Water  
Mount Baw Baw Alpine Resort Management Board  
Mount Buller & Mount Stirling Alpine Resort Management Board  
Mount Hotham Alpine Resort Management Board  
North East Water  
Parks Victoria  
South East Water  
South Gippsland Water  
Wannon Water  
Western Water  
Westernport Water  
Yarra Valley Water

# For the purposes of the Act, Grampians Wimmera Mallee Water is both a water supplier and a water storage manager.

# Appendix 2: Overview of the *Safe Drinking Water Act 2003*, *Safe Drinking Water Regulations 2005* and Functions of the Secretary

## *Safe Drinking Water Act 2003*

The Safe Drinking Water Act:

- requires water suppliers and water storage managers to prepare and implement plans to manage risks in relation to drinking water and some types of non-potable water
- provides for the auditing of those plans by approved auditors
- requires water suppliers to ensure that the drinking water they supply meets quality standards specified by the Regulations
- requires water suppliers to disclose to the public information concerning the quality of drinking water
- provides for the variation, after community consultation, of water quality standards that relate only to aesthetic factors
- requires the reporting of known or suspected contamination of drinking water to the department
- empowers the Secretary to enforce the Act.

## *Safe Drinking Water Regulations 2005*

The Safe Drinking Water Regulations:

- set out the further matters to be addressed in risk management plans and the risks to be specified in risk management plans
- describe the documents that are to be available for inspection in a risk management plan audit
- prescribe the form of audit certificates to be given to the person who has commissioned a risk management plan audit at the completion of the audit
- set out the risk management plan auditor approval criteria
- set out drinking water quality standards
- set out requirements relating to the frequency of collection of samples of water for analysis
- empower the Secretary to
  - divide areas supplied by water suppliers into water sampling localities
  - specify locations within a water sampling locality at which samples of water are to be collected
  - vary the frequency of collection for samples of water in certain circumstances
  - approve persons to be approved water analysts
- require all water samples to be analysed by an approved water analyst and a summary of the results of the analyses to be given to the department
- specify the issues relating to the quality of drinking water and regulated water in an annual report every financial year
- set out details to be included in an annual report to the Secretary.

## Functions of the Secretary

The functions of the Secretary to the Department of Health set out in the Act are to:

- protect public health in relation to the supply of drinking water
- monitor and enforce compliance with the Act and the Regulations
- report on the performance of water suppliers and water storage managers in relation to the requirements imposed on them under the Act
- investigate and report on any aspect of drinking water quality in Victoria
- make recommendations to the Minister for Health on any matter relating to drinking water or regulated water
- promote industry and public awareness and understanding of drinking water quality issues.

These functions are prescribed in section 27 of the Act.

Please note that for 2008–09 the Secretary was the Secretary to the Department of Human Services. Since 12 August 2009 the Secretary is the Secretary to the Department of Health.

## Matters not covered by the Act

The Act does not apply to:

- water not intended for drinking and which cannot be mistaken for drinking water
- the supply of water for irrigation purposes
- the supply of water by a proprietor of prescribed accommodation within the meaning of Division 2 of Part 6 of the *Public Health and Wellbeing Act 2008* to such accommodation
- the supply of packaged drinking water.

More detailed information about the legislation can be found at:

[www.health.vic.gov.au/environment/water/drinking](http://www.health.vic.gov.au/environment/water/drinking).

## Appendix 3: Contact details for water businesses

Business	Postal Address	Telephone	Website
Barwon Water	PO Box 659 Geelong VIC 3220	1300 656 007	<a href="http://www.barwonwater.vic.gov.au">www.barwonwater.vic.gov.au</a>
Central Highlands Water	PO Box 152 Ballarat VIC 3353	(03) 5320 3100	<a href="http://www.chw.net.au">www.chw.net.au</a>
City West Water	Locked Bag 350 Sunshine VIC 3020	131 691	<a href="http://www.citywestwater.com.au">www.citywestwater.com.au</a>
Coliban Water	Box 2770 Bendigo Delivery Centre VIC 3554	1300 363 200	<a href="http://www.coliban.com.au">www.coliban.com.au</a>
East Gippsland Water	PO Box 52 Bairnsdale VIC 3875	1300 720 700	<a href="http://www.egwater.vic.gov.au">www.egwater.vic.gov.au</a>
Falls Creek ARMB	PO Box 50 Falls Creek VIC 3699	(03) 5758 1200	<a href="http://www.fallscreek.com.au">www.fallscreek.com.au</a>
Gippsland Water	PO Box 348 Traralgon VIC 3844	1800 066 401	<a href="http://www.gippswater.com.au">www.gippswater.com.au</a>
Goulburn Murray Water	PO Box 165 Tatura VIC 3616	(03) 5833 5500	<a href="http://www.g-mwater.com.au">www.g-mwater.com.au</a>
Goulburn Valley Water	PO Box 185 Shepparton VIC 3632	(03) 5832 0400	<a href="http://www.gvwater.vic.gov.au">www.gvwater.vic.gov.au</a>
Grampians Wimmera Mallee Water	PO Box 481 Horsham VIC 3402	1300 659 961	<a href="http://www.gwmwater.org.au">www.gwmwater.org.au</a>
Lake Mountain ARMB	PO Box 40 Marysville VIC 3779	(03) 5957 7222	<a href="http://www.lakemountainresort.com.au">www.lakemountainresort.com.au</a>
Lower Murray Water	PO Box 1438 Mildura VIC 3502	(03) 5051 3400	<a href="http://www.lmw.vic.gov.au">www.lmw.vic.gov.au</a>
Melbourne Water	PO Box 4342 Melbourne VIC 3001	131 722	<a href="http://www.melbournewater.com.au">www.melbournewater.com.au</a>
Mount Baw Baw ARMB	PO Box 117 Rawson VIC 3825	(03) 5165 1136	<a href="http://www.mountbawbaw.com.au">www.mountbawbaw.com.au</a>
Mount Buller and Mount Stirling ARMB	C/- Post Office Mount Buller VIC 3723	(03) 5777 6077	<a href="http://www.mtbuller.com.au">www.mtbuller.com.au</a>
Mount Hotham ARMB	PO Box 188 Bright VIC 3741	(03) 5759 3550	<a href="http://www.mthotham.com.au">www.mthotham.com.au</a>
North East Water	PO Box 863 Wodonga VIC 3689	1300 361 622	<a href="http://www.nerwa.vic.gov.au">www.nerwa.vic.gov.au</a>
Parks Victoria	Level 10 / 535 Bourke Street Melbourne VIC 3000	(03) 8627 4699	<a href="http://www.parkweb.vic.gov.au">www.parkweb.vic.gov.au</a>
South East Water	Locked Bag 1 Moorabbin VIC 3189	131 694	<a href="http://www.southeastwater.com.au">www.southeastwater.com.au</a>
South Gippsland Water	PO Box 102 Foster VIC 3960	(03) 5682 0444	<a href="http://www.sgwater.com.au">www.sgwater.com.au</a>
Southern Rural Water	PO Box 153 Maffra VIC 3860	1300 139 510	<a href="http://www.srw.com.au">www.srw.com.au</a>
Wannon Water	PO Box 1158 Warrnambool VIC 3280	1300 926 666	<a href="http://www.wannonwater.com.au">www.wannonwater.com.au</a>
Western Water	PO Box 2371 Sunbury DC 3429	1300 650 422	<a href="http://www.westernwater.com.au">www.westernwater.com.au</a>
Westernport Water	2 Boys Home Road Newhaven VIC 3925	1300 720 711	<a href="http://www.westernportwater.com.au">www.westernportwater.com.au</a>
Yarra Valley Water	Private Bag 1 Mitcham VIC 3132	131 721	<a href="http://www.yvw.com.au">www.yvw.com.au</a>

ARMB = Alpine Resort Management Board

## Appendix 4: Gazettal dates for new water sampling localities 2010–11

Additions or modifications to localities		
Water supplier	Government gazette	Publication date
2010 - 11 Reporting period		
Grampians Wimmera Mallee Water (add Natimuk from 1 July 2010)	Special Gazette s229	21 June 2010

## Appendix 5: Regulated water declarations

Water supplier	Water supply area	Date declared as regulated water	Government gazette	Publication date in gazette
<b>2010–11 Reporting period</b>				
<b>None declared for 2010–11 reporting period</b>				
<b>Current declarations for regulated water supply</b>				
Central Highlands Water	Landsborough / Navarre <sup>#</sup>	26 June 2006	Gazette G27	6 July 2006
Central Highlands Water	Raglan	25 July 2006	Gazette G31	3 August 2006
Central Highlands Water	Amphitheatre, Redbank	18 August 2006	Gazette G35	31 August 2006
Coliban Water	Borong, Dinglee, Jarlin, Macorna, Mitiama, Mysia, Sebastian and Wychitella	2 January 2006	Gazette G3	19 January 2006
Coliban Water	omit Sebastian from January 2006 declaration (gazetted as a drinking water supply from July 2009)	-	Special Gazette s241	13 July 2009
Goulburn Valley Water	Corop, Goulburn Weir, Kirwans Bridge, Molesworth, Strathbogie, Woods Point	8 January 2008	Special Gazette s3	8 January 2008
Grampians Wimmera Mallee Water	Antwerp, Apsley, Berrillock, Buangor, Chillingollah, Chinkapook, Clear Lake, Cowangie, Culgoa, Dooen, Elmhurst, Glenorchy, Goroke, Harrow, Jeparit, Kaniva, Kiata, Lascelles, Lillimur, Marnoo, Moyston, Nandaly, Natimuk, Nhili, Noradjuha, Patchewollock, Pimpinio, Serviceton, Speed, Streatham, Tarranyurk, Tempy, Underbool, Waitchie, Westmere, Wickliffe, Yaapeet.	29 June 2007	Special Gazette s143	29 June 2007
Grampians Wimmera Mallee Water	Murrayville	28 May 2007	Special Gazette s117	28 May 2007
Grampians Wimmera Mallee Water	omit Natimuk from June 2007 declaration (gazetted as a drinking water supply from July 2010)	-	Special Gazette s229	21 June 2010
Grampians Wimmera Mallee Water	Non-drinking water from the Northern Mallee pipeline, St Arnaud pipeline, Mount Cole pipeline, Ararat-Lake Fyans pipeline, Stawell supply main, Moyston pipeline, Willaura pipeline, Wickliffe pipeline, Willaura-Lake Bolac pipeline, Mount Zero pipeline (refer to gazette notice for detailed description).	23 February 2009	Special Gazette s236	23 February 2009
Grampians Wimmera Mallee Water	omit Underbool from June 2007 declaration (gazetted as a drinking water supply in September 2008)	-	Special Gazette s254	17 September 2008



Water supplier	Water supply area	Date declared as regulated water	Government gazette	Publication date in gazette
<b>2010–11 Reporting period</b>				
<b>None declared for 2010–11 reporting period</b>				
<b>Current declarations for regulated water supply</b>				
Grampians Wimmera Mallee Water	Watchem	14 March 2008	Special Gazette s64	14 March 2008
Lake Mountain Alpine Resort Management Board	Lake Mountain Alpine Resort	23 October 2005	Gazette G47	24 November 2005
Lower Murray Water	Millewa water supply system (including Cullulleraine, Meringur and Werriimull)	15 February 2007	Special Gazette s28	15 February 2007
Lower Murray Water	Mystic Park	19 May 2009	Special Gazette s135	19 May 2009
Wannon Water	Darlington, Macarthur##	22 August 2006	Gazette G36	6 September 2006
Wannon Water	Non-drinking water from the North Otway Pipeline System (refer to gazette notice for detailed description).	26 June 2008	Special Gazette s168	26 June 2008

**Notes**

# Government Gazette declared this locality is no longer declared as regulated water in September 2010

## Government Gazette declared this locality is no longer declared as regulated water in May 2011

## Appendix 6: Undertakings for 2010–11

Includes all undertakings commencing, concluding or active during any part of 2010–11. Excludes undertakings commencing after or satisfactorily concluding before 2010–11.

Water business	Water supply	Nature of contravention	Proposed actions to be taken to rectify contravention	Start date	Date undertaking accepted by department	End date	Status as at 30 June 2011
Goulburn Valley Water	Thornton	Non-compliance with the turbidity, trihalomethanes, dichloroacetic acid and trichloroacetic acid water quality standards	Construction of a pipeline from Alexandra water treatment plant, combined with optimisation of current water treatment process until pipeline is completed.	1 April 2007	4 October 2007	30 June 2010 (end date extended to 30 June 2011)	Undertaking not completed by end date (closed out in August 2011)
Goulburn Valley Water	Marysville and Buxton	Non-compliance with regulation 10 (b) of Safe Drinking Water Regulations 2005 - chlorite levels exceeding health related guideline value in the <i>Australian Drinking Water Guidelines 2004</i> .	Develop options for alternative disinfection that will reduce the risk of elevated chlorite levels. This will involve community engagement on the preferred solution, and construction of the new disinfection facilities.	1 January 2008	20 June 2008	30 July 2012	End date after 30 June 2011
North East Water	Audit finding	Non-compliance arose from findings of 2008 risk management plan audit	Undertake a range of corrective actions to address finding from risk management plan audit.	31 October 2008	25 October 2008	30 June 2010 (end date extended to 31 December 2010)	Undertaking completed by end date
North East Water	Mount Beauty	Non-compliance with the <i>Escherichia coli</i> water quality standard	Construct a new water treatment plant and introduce residual chlorine disinfection to the distribution system.	31 October 2008	6 January 2009	30 June 2010 (end date extended to 30 September 2010)	Undertaking completed by end date

Water business	Water supply	Nature of contravention	Proposed actions to be taken to rectify contravention	Start date	Date undertaking accepted by department	End date	Status as at 30 June 2011
North East Water	Myrtleford	Non-compliance with the <i>Escherichia coli</i> water quality standard	Construct a new water treatment plant and introduce residual chlorine disinfection to the distribution system.	1 July 2009	30 June 2011	30 June 2011	Undertaking not completed by end date (closed out in August 2011)
Wannon Water	Hamilton, Dunkeld, Tarrington	Non-compliance with aluminium water quality standard	An external review of the design and operation of the Hamilton water treatment plant will be undertaken. Based on the recommendations of the review, capital works and process design alterations will be undertaken to rectify the aluminium and turbidity issues.	1 January 2008	9 May 2008	30 December 2009 (end date extended to 30 August 2010)	Undertaking not completed by end date (closed out in May 2011)

Undertaking completed by end date means that the contravention was remedied on time, or earlier, and the works were completed on time (or were not required).  
 Undertaking not completed by end date means that the contravention was remedied on time, or earlier, but the works were not completed on time.

# Appendix 7: Water quality and treatment data for 2010–11

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	<i>E. coli</i> % of samples with zero <i>E. coli</i> / 100 mL	Turbidity 95% UCL of the mean (NTU)	Aluminium Maximum [mg/L]	THMs Maximum [mg/L]	MCA Maximum [mg/L]	DCA Maximum [mg/L]	TCA Maximum [mg/L]	Bromate Maximum [mg/L]	Formaldehyde Maximum [mg/L]	Fluoride Maximum [mg/L]	Fluoride Mean [mg/L]
Barwon Water	Aireys Inlet	1,340	CL	Fit	98.1	0.5	0.21	0.160	<0.005	0.009	0.023	--	--	--	0.81
Barwon Water	Anakie	770	CL	Fit	100	0.6	0.04	0.051	<0.005	<0.005	<0.005	<0.01	<0.1	0.92	0.87
Barwon Water	Anglesea	2,560	CL	Fit	100	0.1	0.02	0.080	<0.005	<0.005	<0.005	--	--	1.00	--
Barwon Water	Apollo Bay	2,480	CL	Fit	100	0.1	0.03	0.069	<0.005	<0.005	<0.005	--	--	--	--
Barwon Water	Bannockburn	4,520	CL	Fit	100	0.4	0.04	0.034	<0.005	<0.005	<0.005	<0.01	<0.1	0.91	0.76
Barwon Water	Batesford	830	CL	Fit	100	0.7	0.02	0.092	<0.005	<0.005	<0.005	<0.01	<0.1	0.95	0.82
Barwon Water	Bellarine	220	CL	Fit	100	0.1	0.02	0.097	<0.005	<0.005	<0.005	--	--	1.00	0.88
Barwon Water	Birregurra	690	CL	Fit	100	0.2	0.05	0.110	<0.005	0.008	<0.005	--	--	--	--
Barwon Water	Clifton Springs	12,750	CL	Fit	100	0.1	0.03	0.120	<0.005	0.007	0.008	--	--	1.00	0.87
Barwon Water	Colac	14,510	CL	Fit	100	0.1	0.04	0.055	<0.005	0.010	0.008	--	--	0.87	0.66
Barwon Water	Cressy	510	CL	Fit	100	0.2	0.04	0.120	<0.005	0.008	0.011	--	--	0.88	0.68
Barwon Water	Forrest	240	CL	Fit	100	0.2	0.15	0.073	<0.005	0.012	0.011	--	--	--	--
Barwon Water	Gellibrand	300	CL	Fit	100	0.1	0.06	0.084	<0.005	0.010	0.009	--	--	--	--
Barwon Water	Highton	37,510	CL	Fit	98.6	0.1	0.04	0.092	<0.005	<0.005	0.005	--	--	0.94	0.86
Barwon Water	Highton High Level	2,490	CL	Fit	100	0.1	0.03	0.091	<0.005	0.005	<0.005	--	--	0.91	0.87
Barwon Water	Leopold	13,050	CL	Fit	100	0.1	0.05	0.094	<0.005	<0.005	0.005	--	--	0.94	0.85
Barwon Water	Lethbridge	840	CL	Fit	100	0.2	0.10	0.130	<0.005	<0.005	<0.005	<0.01	<0.1	0.71	0.31
Barwon Water	Little River West	380	CL	Fit	100	0.8	0.03	0.120	<0.005	<0.005	0.008	<0.01	<0.1	0.89	0.81
Barwon Water	Lorne	1,790	CL	Fit	98.6	0.2	0.03	0.049	<0.005	0.010	0.010	--	--	--	--
Barwon Water	Lovely Banks	55,960	CL	Fit	100	0.6	0.03	0.065	<0.005	<0.005	<0.005	<0.01	<0.1	0.89	0.81
Barwon Water	Lovely Banks - Carrs Rd	120	CL	Fit	100	1.0	0.02	0.058	<0.005	<0.005	0.007	<0.01	<0.1	0.96	0.82
Barwon Water	Meredith	580	Clam	Fit	100	0.1	0.16	0.140	<0.005	0.013	0.009	--	--	0.80	0.17
Barwon Water	Montpellier	58,860	CL	Fit	100	0.1	0.04	0.100	<0.005	0.008	0.005	<0.01	<0.1	0.91	0.80
Barwon Water	Moriac	800	CL	Fit	100	0.1	0.07	0.062	<0.005	0.006	<0.005	--	--	0.96	0.87
Barwon Water	Ocean Acres	150	CL	Fit	100	0.1	0.03	0.076	<0.005	0.012	0.007	--	--	0.92	0.87
Barwon Water	Ocean Grove	17,720	CL	Fit	100	0.1	0.02	0.097	<0.005	<0.005	<0.005	--	--	0.92	0.86
Barwon Water	Pettavel	22,400	CL	Fit	100	0.1	0.03	0.083	<0.005	<0.005	<0.005	--	--	0.91	0.86
Barwon Water	Portarlington	6,980	CL	Fit	97.6	1.3	0.02	0.047	<0.005	<0.005	<0.005	--	--	0.81	0.74
Barwon Water	Queenscliff	4,510	CL	Fit	100	0.3	0.03	0.140	<0.005	0.006	0.007	--	--	0.94	0.87
Barwon Water	Teesdale	2,840	CL	Fit	100	0.3	0.03	0.024	<0.005	<0.005	<0.005	<0.01	<0.1	0.91	0.76
Barwon Water	Torquay	14,630	CL	Fit	100	0.1	0.03	0.110	<0.005	0.008	0.006	--	--	0.92	0.87
Barwon Water	Winchelsea	2,080	CL	Fit	100	0.1	0.05	0.091	<0.005	<0.005	<0.005	--	--	0.92	0.87
<b>Localities and population</b>	<b>32</b>	<b>285,410</b>													

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	E. coli		MCA	DCA	TCA	Bromate	Formaldehyde	Fluoride	
					% of samples with zero E. coli / 100 mL	Turbidity 95% UCL of the mean (NTU)						Maximum [mg/L]	Maximum [mg/L]
Central Highlands Water	Alma	410	Clam	Filt	100	0.3	<0.005	0.008	<0.005	--	--	--	--
Central Highlands Water	Avoca	1,550	Clam	Filt	100	0.4	<0.005	0.008	<0.005	--	--	--	--
Central Highlands Water	Bailan	2,270	Clam	Filt	96.2	0.2	<0.005	0.007	<0.005	--	--	0.94	0.82
Central Highlands Water	Ballarat Central	33,250	Clam	Filt	99.2	0.2	<0.005	0.009	<0.005	--	--	0.97	0.86
Central Highlands Water	Ballarat North/Nerrina	4,350	Clam	Filt	100	0.3	<0.005	0.008	<0.005	--	--	1.00	0.89
Central Highlands Water	Beaufort	1,350	UV / CL	Filt	100	0.2	<0.005	0.043	0.069	--	--	--	--
Central Highlands Water	Bet Bet	320	Clam	Filt	100	0.3	<0.005	<0.005	<0.005	--	--	--	--
Central Highlands Water	Blackwood/Barrys Reef	430	UV	Filt	100	1.6	--	--	--	--	--	--	--
Central Highlands Water	Bungaree/Wallace	370	Clam	Filt	100	0.3	<0.005	0.010	<0.005	--	--	0.96	0.80
Central Highlands Water	Buninyong/Mount Helen	7,980	Clam	Filt	100	0.2	<0.005	0.012	<0.005	--	--	0.97	0.83
Central Highlands Water	Cardigan Village	780	Clam	Filt	100	0.1	<0.005	0.007	<0.005	--	--	0.98	0.88
Central Highlands Water	Carisbrook	1,000	Clam	Filt	100	0.7	<0.005	0.006	<0.005	--	--	--	--
Central Highlands Water	Clunes	1,650	Oz / CL	B	100	0.2	<0.005	<0.005	<0.005	0.03	<0.1	--	--
Central Highlands Water	Creswick	2,700	Clam	Filt	100	0.7	<0.005	0.009	<0.005	--	--	0.99	0.88
Central Highlands Water	Daisy Hill	430	Clam	Filt	100	0.4	<0.005	0.015	<0.005	--	--	--	--
Central Highlands Water	Daylesford High Level	1,630	CL	Filt	100	0.2	<0.005	0.047	0.032	--	--	--	--
Central Highlands Water	Daylesford Low Level/Hepburn	2,290	CL	Filt	100	0.5	0.009	0.069	0.027	--	--	--	--
Central Highlands Water	Dean	40	CL	B	98.1	0.9	<0.005	<0.005	<0.005	--	--	--	--
Central Highlands Water	Enfield	360	Clam	Filt	100	0.2	<0.005	0.013	0.008	--	--	0.93	0.80

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	<i>E. coli</i> % of samples with zero <i>E. coli</i> / 100 mL	Turbidity 95% UCL of the mean (NTU)	Aluminium Maximum [mg/L]	THMs Maximum [mg/L]	MCA Maximum [mg/L]	DCA Maximum [mg/L]	TCA Maximum [mg/L]	Bromate Maximum [mg/L]	Formaldehyde Maximum [mg/L]	Fluoride Maximum [mg/L]	Fluoride Mean [mg/L]
Central Highlands Water	Fiskville/Glenmore	50	Clam	Filt	100	0.4	0.03	0.005	<0.005	0.011	<0.005	--	--	0.97	0.83
Central Highlands Water	Forest Hill	950	CL	B	98.1	0.8	--	0.013	<0.005	<0.005	<0.005	--	--	--	--
Central Highlands Water	Gordon/ Mount Egerton	940	Clam	Filt	100	0.2	0.03	0.004	<0.005	0.013	<0.005	--	--	0.95	0.83
Central Highlands Water	Haddon	4,000	Clam	Filt	100	0.3	0.04	0.004	<0.005	0.009	<0.005	--	--	0.97	0.87
Central Highlands Water	Lal Lal	160	Clam	Filt	100	0.2	0.03	0.003	<0.005	0.011	<0.005	--	--	1.00	0.82
Central Highlands Water	Learmonth	300	CL	B	100	0.2	--	0.026	<0.005	<0.005	<0.005	--	--	--	--
Central Highlands Water	Lexton	200	Clam	Filt	100	0.2	--	0.054	0.005	0.038	0.011	--	--	--	--
Central Highlands Water	Linton	480	Clam	Filt	100	0.3	0.03	0.004	<0.005	0.009	<0.005	--	--	0.98	0.87
Central Highlands Water	Majorca	200	Clam	Filt	100	0.3	0.03	0.022	<0.005	0.009	<0.005	--	--	--	--
Central Highlands Water	Maryborough	7,330	Clam	Filt	100	0.5	0.03	0.025	<0.005	0.013	<0.005	--	--	--	--
Central Highlands Water	Napoleons	850	Clam	Filt	100	0.2	0.03	0.071	<0.005	0.013	<0.005	--	--	0.95	0.82
Central Highlands Water	Sebastopol	9,160	Clam	Filt	100	0.2	0.04	0.008	<0.005	0.011	<0.005	--	--	1.00	0.83
Central Highlands Water	Skipton	490	Clam	Filt	100	0.3	0.08	0.084	<0.005	0.010	<0.005	--	--	0.97	0.87
Central Highlands Water	Smythesdale	850	Clam	Filt	100	0.3	0.03	0.045	<0.005	0.008	<0.005	--	--	0.98	0.86
Central Highlands Water	Talbot	450	Clam	Filt	100	0.3	0.05	0.025	<0.005	0.009	<0.005	--	--	--	--
Central Highlands Water	Timor	180	Clam	Filt	98.1	0.4	0.03	0.023	<0.005	<0.005	<0.005	--	--	--	--
Central Highlands Water	Waubra	260	CL	B	100	0.4	--	0.004	<0.005	<0.005	<0.005	--	--	--	--
Central Highlands Water	Wendouree	32,300	Clam	Filt	99.2	0.4	0.03	0.003	<0.005	0.008	<0.005	--	--	0.99	0.88
<b>Localities and population</b>	<b>37</b>	<b>122,310</b>													

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	E. coli		Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde	Fluoride	Fluoride
					% of samples with zero E. coli / 100 mL	95% UCL of the mean (NTU)									
City West Water	Altona	56,950	CL	--	100	0.3	0.02	0.056	<0.005	<0.005	0.010	<0.01	<0.1	1.00	0.90
City West Water	Caroline Springs	87,920	CL	--	100	0.9	0.04	0.093	<0.005	0.006	0.036	<0.01	<0.1	1.10	0.89
City West Water	Deer Park	37,510	CL	--	100	0.6	0.03	0.053	<0.005	0.005	0.014	<0.01	<0.1	1.00	0.90
City West Water	East Keilor	36,330	CL	--	100	0.3	0.02	0.056	<0.005	<0.005	0.010	<0.01	<0.1	1.00	0.92
City West Water	Little River	870	CL	--	100	0.4	0.03	0.084	<0.005	<0.005	0.012	<0.01	<0.1	1.00	0.90
City West Water	Maribymong	97,420	CL	--	100	0.4	0.02	0.049	<0.005	<0.005	0.007	<0.01	<0.1	0.99	0.90
City West Water	Moonee Ponds	61,870	CL	--	99.5	0.4	0.02	0.052	<0.005	<0.005	0.010	<0.01	<0.1	1.10	0.92
City West Water	Parkville	99,420	CL	--	100	0.6	0.02	0.055	<0.005	<0.005	0.009	<0.01	<0.1	1.00	0.90
City West Water	Richmond	19,490	CL	--	100	0.7	0.05	0.092	<0.005	<0.005	0.030	<0.01	<0.1	1.00	0.87
City West Water	Strathmore	7,560	CL	--	100	0.4	0.04	0.056	<0.005	<0.005	0.010	<0.01	<0.1	0.98	0.91
City West Water	Taylors Lakes	47,170	CL	--	100	0.9	0.04	0.086	<0.005	0.010	0.040	<0.01	<0.1	1.10	0.90
City West Water	Tullamarine	9,470	CL	--	100	0.9	0.04	0.050	<0.005	<0.005	0.016	<0.01	<0.1	1.00	0.92
City West Water	Werribee	91,960	CL	--	100	0.4	0.03	0.061	<0.005	<0.005	0.011	<0.01	<0.1	1.00	0.90
City West Water	Werribee South	1,650	CL	--	100	0.3	0.02	0.065	<0.005	<0.005	0.010	<0.01	<0.1	1.00	0.91
City West Water	Williamstown	39,630	CL	--	100	0.3	0.02	0.055	<0.005	0.005	0.010	<0.01	<0.1	1.00	0.90
<b>Localities and population</b>	<b>15</b>	<b>695,220</b>													
Coliban Water	Axeedale	230	Clam / Oz	Fit	100	0.3	0.02	0.110	0.005	0.042	0.025	<0.01	<0.1	0.96	0.88
Coliban Water	Bealiba	120	Clam	Fit	100	0.3	0.03	0.240	0.002	0.015	0.006	--	--	--	--
Coliban Water	Bendigo (Northern)	27,410	Clam / Oz	Fit	100	0.4	0.03	0.013	0.009	0.021	0.002	<0.01	<0.1	0.95	0.89
Coliban Water	Bendigo (Southern)	33,690	Clam / Oz	Fit	99.2	0.3	0.03	0.012	0.006	0.012	0.002	<0.01	<0.1	0.96	0.90
Coliban Water	Bendigo (Spring Gully)	11,620	Clam / Oz	Fit	100	0.3	0.04	0.012	0.040	0.017	<0.005	<0.01	<0.1	1.00	0.89
Coliban Water	Big Hill	340	Clam / Oz	Fit	100	0.4	0.04	0.011	0.009	0.022	0.002	<0.01	<0.1	0.98	0.91
Coliban Water	Boort	720	CL	Fit	100	0.5	0.05	<b>0.280</b>	0.003	0.015	0.021	--	--	--	--
Coliban Water	Bridgewater	420	Clam	Fit	100	0.3	0.10	0.130	0.004	0.026	0.007	--	--	--	--
Coliban Water	Castlemaine	9,780	Clam / Oz	Fit	98.5	0.4	0.03	0.016	0.007	0.015	0.003	<0.01	<0.1	0.95	0.88
Coliban Water	Cohuna (Rural)	50	CL	Fit	100	0.5	0.23	<b>0.320</b>	0.010	0.090	<b>0.220</b>	--	--	--	--
Coliban Water	Cohuna (Urban)	1,960	CL	Fit	100	0.8	0.13	<b>0.310</b>	0.014	0.130	0.140	--	--	--	--
Coliban Water	Dunolly	700	Clam	Fit	98.1	0.5	0.13	0.061	<0.005	0.005	0.003	--	--	--	--
Coliban Water	Echuca	13,130	CL	Fit	100	0.4	0.09	0.130	0.004	0.032	0.043	--	--	0.95	0.88
Coliban Water	Elmore	640	UV	B	100	0.3	--	--	--	--	--	--	--	--	--
Coliban Water	Epsom - Huntly	3,370	Clam / Oz	Fit	100	0.3	0.03	0.014	0.008	0.016	0.002	<0.01	<0.1	0.94	0.89
Coliban Water	Fryerstown	170	Clam / Oz	Fit	100	0.4	0.03	0.020	<0.005	0.012	<0.005	<0.01	<0.1	0.97	0.92
Coliban Water	Goornong	240	CL	Fit	98.1	0.4	0.09	<b>0.260</b>	0.008	0.040	0.024	--	--	--	--

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	<i>E. coli</i>	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde	Fluoride	Fluoride
					% of samples with zero <i>E. coli</i> / 100 mL	95% UCL of the mean (NTU)	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Mean [mg/L]
Coliban Water	Guildford	220	Clam / Oz	Filt	100	0.4	0.015	0.002	0.007	<0.005	<0.005	<0.01	<0.1	0.96	0.89
Coliban Water	Gunbower	360	CL	Filt	100	0.5	0.380	0.017	0.180	0.310	0.002	--	--	--	--
Coliban Water	Harcourt	730	Clam / Oz	Filt	100	0.3	0.014	<0.005	0.002	<0.005	<0.005	<0.01	<0.1	0.99	0.92
Coliban Water	Heathcote	1,850	Clam	Filt	100	0.6	0.180	0.013	0.073	0.056	0.005	--	--	--	--
Coliban Water	Inglewood	710	Clam	Filt	100	0.4	0.140	0.005	0.025	0.018	0.005	--	--	--	--
Coliban Water	Junortoun	1,480	Clam / Oz	Filt	100	0.3	0.013	0.004	0.008	<0.005	<0.005	<0.01	<0.1	0.98	0.91
Coliban Water	Korong Vale	190	Clam	Filt	100	0.6	0.041	0.003	0.012	0.002	0.002	--	--	--	--
Coliban Water	Kyneton	4,950	Clam / Oz	Filt	100	0.3	0.012	0.007	0.022	0.002	0.002	<0.01	<0.1	1.10	0.88
Coliban Water	Laanecoorie	60	Clam	Filt	100	0.4	0.050	0.002	0.013	0.002	0.002	--	--	--	--
Coliban Water	Leitchville (Rural)	10	CL	Filt	100	0.5	0.140	0.015	0.056	0.012	0.012	--	--	--	--
Coliban Water	Leitchville (Urban)	190	CL	Filt	100	0.4	0.120	0.007	0.140	0.013	0.013	--	--	--	--
Coliban Water	Lockington	250	CL	Filt	100	0.4	0.120	0.004	0.025	0.021	0.021	--	--	--	--
Coliban Water	Maiden Gully - Marong	2,920	Clam / Oz	Filt	100	0.4	0.015	0.006	0.022	0.002	0.002	<0.01	<0.1	0.99	0.90
Coliban Water	Maldon	1,750	Clam / Oz	Filt	96.2	0.4	0.011	<0.005	0.002	<0.005	<0.005	<0.01	<0.1	0.94	0.90
Coliban Water	Maldon	600	Clam / Oz	Filt	100	0.3	0.013	0.002	0.005	0.002	0.002	<0.01	<0.1	1.00	0.89
Coliban Water	Newstead	630	Clam / Oz	Filt	98.1	0.4	0.022	0.002	0.004	0.002	0.002	<0.01	<0.1	0.94	0.90
Coliban Water	Pyramid Hill	450	CL	Filt	98.1	0.4	0.110	0.003	0.020	0.017	0.017	--	--	--	--
Coliban Water	Raywood	110	Clam / Oz	Filt	100	0.5	0.100	0.009	0.037	0.027	0.027	<0.01	<0.1	0.97	0.88
Coliban Water	Rochester	2,690	CL	Filt	100	0.4	0.120	0.004	0.037	0.033	0.033	--	--	--	--
Coliban Water	Sebastian	120	Clam / Oz	Filt	100	0.4	0.120	0.002	0.010	0.014	0.014	<0.01	<0.1	0.94	0.88
Coliban Water	Serpentine	120	Clam	Filt	100	0.9	0.360	0.002	0.009	0.006	0.006	--	--	--	--
Coliban Water	Strathfieldsaye	2,900	Clam / Oz	Filt	100	0.3	0.013	0.007	0.016	<0.005	<0.005	<0.01	<0.1	0.96	0.89
Coliban Water	Taradale	540	Clam / Oz	Filt	100	0.4	0.010	0.004	0.016	0.002	0.002	<0.01	<0.1	0.97	0.88
Coliban Water	- Elphinstone	150	Clam	Filt	98.1	0.4	0.150	<0.005	0.008	0.011	0.011	--	--	--	--
Coliban Water	Tarnagulla	60	Clam	Filt	98.1	0.7	0.210	0.017	0.120	0.150	0.150	--	--	--	--
Coliban Water	Tooborac	670	Clam / Oz	Filt	100	0.3	0.005	0.002	0.006	<0.005	<0.005	<0.01	<0.1	1.00	0.88
Coliban Water	Trentham	330	Clam / Oz	Filt	98.1	0.3	0.030	0.004	0.012	0.002	0.002	<0.01	<0.1	1.00	0.88
Coliban Water	Tylden	650	Clam	Filt	100	0.4	0.012	<0.005	0.002	0.002	0.002	--	--	--	--
Coliban Water	Wedderburn		Clam	Filt											
<b>Localities and population</b>	<b>45</b>	<b>130,280</b>													





Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	<i>E. coli</i>	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde	Fluoride	Fluoride	
					% of samples with zero <i>E. coli</i> / 100 mL	95% UCL of the mean (NTU)	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Mean [mg/L]
Gippsland Water	Boisdale	90	CL	Fit	100	0.2	0.02	0.046	<0.005	0.008	0.017	--	--	0.88	0.76	
Gippsland Water	Boolarra	710	CL	Fit	100	0.2	0.02	0.091	<0.005	0.011	0.009	--	--	--	--	
Gippsland Water	Briagolong	930	CL	Fit B	100	0.1	0.04	0.009	<0.005	<0.005	<0.005	--	--	--	--	
Gippsland Water	Churchill	5,420	CL	Fit	100	0.2	0.03	0.130	<0.005	0.006	0.027	--	--	1.00	0.85	
Gippsland Water	Coongulla / Glenmaggie	310	CL	Fit	100	0.3	0.03	0.053	<0.005	0.007	0.017	--	--	--	--	
Gippsland Water	Cowwarr	370	CL	Fit	100	0.2	0.05	0.110	<0.005	0.013	0.035	--	--	--	--	
Gippsland Water	Drouin	11,000	CL	Fit	100	0.2	0.05	0.081	<0.005	0.029	0.023	--	--	1.10	0.95	
Gippsland Water	Erica	230	CL	Fit	100	0.2	0.06	0.044	<0.005	0.008	0.012	--	--	--	--	
Gippsland Water	Heyfield	2,130	CL	Fit	100	0.2	<0.01	0.043	<0.005	<0.005	0.007	--	--	--	--	
Gippsland Water	Jumbuk	380	CL	Fit	100	0.2	0.04	0.130	<0.005	0.007	0.028	--	--	1.00	0.85	
Gippsland Water	Maffra	5,390	CL	Fit	100	0.2	0.02	0.052	<0.005	0.006	0.012	--	--	0.90	0.73	
Gippsland Water	Mirboo North	1,980	CL	Fit	100	0.3	0.02	0.072	<0.005	<0.005	<0.005	--	--	--	--	
Gippsland Water	Moe	11,510	CL	Fit	100	0.2	0.08	0.068	<0.005	0.008	0.007	--	--	0.95	0.71	
Gippsland Water	Morwell	16,540	CL	Fit	100	0.2	0.04	0.057	<0.005	0.008	0.019	--	--	1.00	0.84	
Gippsland Water	Neerim South	1,460	CL	Fit	100	0.2	<0.01	0.053	<0.005	0.010	0.010	--	--	--	--	
Gippsland Water	Newborough	7,250	CL	Fit	100	0.2	0.05	0.066	<0.005	<0.005	0.007	--	--	0.94	0.71	
Gippsland Water	Noojee	350	Clam	Fit	100	0.2	<0.01	0.029	<0.005	0.011	0.008	--	--	--	--	
Gippsland Water	Rawson	350	CL	Fit	100	0.2	0.06	0.033	<0.005	0.011	0.011	--	--	--	--	
Gippsland Water	Rokeby/Buln Buln	490	CL	Fit	100	0.1	0.05	0.081	<0.005	0.008	0.018	--	--	1.10	0.95	
Gippsland Water	Rosedale	1,850	CL	Fit	100	0.4	0.04	0.110	<0.005	0.007	0.026	--	--	--	--	
Gippsland Water	Sale/Wurruk	17,080	CL	Fit B	100	0.1	0.01	0.027	<0.005	<0.005	<0.005	--	--	0.96	0.85	
Gippsland Water	Seaspray	240	CL	Fit	100	0.4	0.03	0.140	0.006	0.013	0.018	--	--	--	--	
Gippsland Water	Stratford	2,130	CL	Fit	100	0.2	0.01	0.052	<0.005	<0.005	0.014	--	--	0.86	0.73	
Gippsland Water	Thorpdale	240	CL	Fit	100	0.3	0.04	0.074	<0.005	0.008	<0.005	--	--	--	--	
Gippsland Water	Toongabbie	960	CL	Fit	100	0.2	0.04	0.100	<0.005	0.013	0.033	--	--	--	--	
Gippsland Water	Trafalgar	3,700	CL	Fit	100	0.2	0.07	0.079	<0.005	0.009	0.009	--	--	0.94	0.71	
Gippsland Water	Traralgon	29,490	CL	Fit	99.1	0.1	0.05	0.041	<0.005	0.007	0.013	--	--	1.10	0.83	
Gippsland Water	Traralgon South/ Hazelwood North	2,370	CL	Fit	100	0.1	0.07	0.064	<0.005	<0.005	0.022	--	--	1.00	0.86	
Gippsland Water	Tyers/Glengarry	2,290	CL	Fit	100	0.1	0.05	0.081	<0.005	0.013	0.025	--	--	--	--	
Gippsland Water	Warragul	16,210	CL	Fit	100	0.1	0.07	0.093	<0.005	0.013	0.020	--	--	1.10	0.94	
Gippsland Water	Warragul South	820	CL	Fit	100	0.2	0.06	0.084	<0.005	0.005	0.025	--	--	1.00	0.95	
Gippsland Water	Willow Grove	360	Clam	Fit	100	0.2	0.05	0.005	<0.005	0.005	<0.005	--	--	--	--	
Gippsland Water	Yallourn North	1,590	CL	Fit	100	0.2	0.03	0.075	<0.005	0.005	0.010	--	--	0.93	0.70	

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	E. coli		Aluminium Maximum [mg/L]	THMs Maximum [mg/L]	MCA Maximum [mg/L]	DCA Maximum [mg/L]	TCA Maximum [mg/L]	Bromate Maximum [mg/L]	Formaldehyde Maximum [mg/L]	Fluoride Maximum [mg/L]	Fluoride Mean [mg/L]
					% of samples with zero E. coli / 100 mL	95% UCL of the mean (NTU)									
Gippsland Water	Yarragon	1,450	CL	Fit	100	0.2	0.05	0.110	<0.005	0.009	0.011	--	--	1.00	0.69
Gippsland Water	Yinnar	1,100	CL	Fit	100	0.2	0.05	0.140	<0.005	<0.005	0.030	--	--	0.97	0.86
<b>Localities and population</b>	<b>35</b>	<b>148,770</b>													
Goulburn Valley Water	Alexandra	2,950	CL	Fit	100	0.3	0.03	0.077	<0.010	0.020	0.054	--	--	--	--
Goulburn Valley Water	Avenel	970	CL	Fit	100	0.4	0.12	0.090	<0.010	0.022	0.048	--	--	1.10	0.38
Goulburn Valley Water	Barmah	310	CL	Fit	98.1	1.2	0.42	0.160	<0.010	0.110	0.150	--	--	--	--
Goulburn Valley Water	Bonnie Doon	520	CL	Fit	100	0.5	0.86	0.079	<0.010	0.035	0.026	--	--	--	--
Goulburn Valley Water	Broadford	4,450	CL	Fit	100	0.3	0.19	0.084	<0.010	0.023	0.022	--	--	--	--
Goulburn Valley Water	Buxton	560	CL02 / CL	--	100	0.4	--	0.082	<0.010	0.030	0.045	--	--	--	--
Goulburn Valley Water	Cobram	5,840	CL	Fit	100	0.2	0.08	0.071	<0.010	0.031	0.025	--	--	--	--
Goulburn Valley Water	Colbinabbin	170	CL	Fit	100	1.4	0.22	0.084	<0.010	0.025	0.010	--	--	--	--
Goulburn Valley Water	Dookie	380	CL	Fit	100	1.4	0.10	0.087	<0.010	0.060	0.064	--	--	--	--
Goulburn Valley Water	Eildon	1,530	CL	--	98.1	3.5	--	0.094	<0.010	0.045	0.057	--	--	--	--
Goulburn Valley Water	Euroa	3,630	CL	Fit	100	0.1	0.04	0.110	<0.010	0.042	0.052	--	--	--	--
Goulburn Valley Water	Girgarre	320	CL	Fit	100	0.3	0.03	0.160	<0.010	0.043	0.061	--	--	--	--
Goulburn Valley Water	Katamatite	290	CL	Fit	100	3.8	0.25	0.072	<0.010	0.035	0.065	--	--	--	--
Goulburn Valley Water	Katandra West	280	CL	Fit	100	1.4	0.16	0.097	<0.010	0.029	0.014	--	--	--	--
Goulburn Valley Water	Katunga	230	CL	B	100	0.1	--	0.009	<0.010	<0.005	0.011	--	--	--	--
Goulburn Valley Water	Kilmore	7,240	CL	Fit	100	0.2	0.05	0.095	<0.010	0.057	0.023	--	--	--	--
Goulburn Valley Water	Kyabram	7,050	CL	Fit	100	0.3	0.09	0.082	<0.010	0.028	0.022	--	--	1.10	0.93

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	E. coli		Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde	Fluoride	Fluoride	
					% of samples with zero E. coli / 100 mL	95% UCL of the mean (NTU)										Maximum [mg/L]
Goulburn Valley Water	Longwood	260	CL	Filt	100	0.2	0.09	0.150	<0.010	0.058	0.083	--	--	--	--	--
Goulburn Valley Water	Mansfield	4,280	CL	Filt	100	0.2	0.04	0.045	<0.010	0.023	0.019	--	--	--	--	--
Goulburn Valley Water	Marysville	600	CLO2 / CL	--	100	0.9	--	0.057	<0.010	0.029	0.019	--	--	--	--	--
Goulburn Valley Water	Merrigum	590	CL	Filt	100	0.3	0.09	0.086	<0.010	0.010	0.027	--	--	1.10	0.90	0.90
Goulburn Valley Water	Mooroopna	8,820	CL	Filt	100	0.3	0.27	0.110	<0.010	0.025	0.029	--	--	1.20	0.91	0.91
Goulburn Valley Water	Murchison	1,100	CL	Filt	100	0.5	0.23	0.150	<0.010	0.032	0.061	--	--	--	--	--
Goulburn Valley Water	Nagambie	1,840	CL	Filt	98.1	0.5	0.33	0.350	0.011	0.210	0.310	--	--	--	--	--
Goulburn Valley Water	Nathalia	1,720	CL	Filt	100	0.3	0.05	0.180	<0.010	0.056	0.066	--	--	--	--	--
Goulburn Valley Water	Numurkah	4,760	CL	Filt	98.1	0.6	0.36	0.210	<0.010	0.069	0.140	--	--	--	--	--
Goulburn Valley Water	Picola	160	CL	Filt	100	0.6	0.12	0.078	<0.010	0.034	0.043	--	--	--	--	--
Goulburn Valley Water	Pyalong	390	CL	SF	100	0.7	--	0.230	<0.010	0.120	0.160	--	--	--	--	--
Goulburn Valley Water	Rushworth	1,370	CL	Filt	100	0.5	0.15	0.089	<0.010	0.035	0.033	--	--	--	--	--
Goulburn Valley Water	Seymour High Level	1,780	CL	Filt	100	0.4	0.13	0.068	<0.010	0.024	0.036	--	--	1.20	0.40	0.40
Goulburn Valley Water	Seymour Low Level	5,830	CL	Filt	100	0.5	0.17	0.071	<0.010	0.025	0.025	--	--	1.00	0.30	0.30
Goulburn Valley Water	Shepparton	43,260	CL	Filt	100	0.3	0.39	0.160	<0.010	0.064	0.069	--	--	1.20	0.89	0.89
Goulburn Valley Water	Stanhope	620	CL	Filt	100	1.3	0.09	0.120	<0.010	0.045	0.045	--	--	--	--	--
Goulburn Valley Water	Strathmerton	560	CL	Filt	100	0.2	0.06	0.094	<0.010	0.026	0.045	--	--	--	--	--
Goulburn Valley Water	Tallarook	290	CL	Filt	100	0.5	0.08	0.093	<0.010	0.041	0.045	--	--	0.90	0.34	0.34
Goulburn Valley Water	Tallygaropna	320	CL	Filt	100	0.3	0.08	0.150	<0.010	0.011	<0.005	--	--	1.10	0.87	0.87
Goulburn Valley Water	Tatura	4,590	CL	Filt	100	0.5	0.18	0.076	<0.010	0.026	0.020	--	--	--	--	--

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	E. coli		Aluminium Maximum [mg/L]	THMs Maximum [mg/L]	MCA Maximum [mg/L]	DCA Maximum [mg/L]	TCA Maximum [mg/L]	Bromate Maximum [mg/L]	Formaldehyde Maximum [mg/L]	Fluoride Maximum [mg/L]	Fluoride Mean [mg/L]
					% of samples with zero E. coli / 100 mL	95% UCL of the mean (NTU)									
Goulburn Valley Water	Thornton	260	CL	--	100	1.2	--	0.190	<0.010	0.098	0.200	--	--	--	--
Goulburn Valley Water	Tongala	1,490	CL	Flit	100	0.2	0.03	0.083	0.015	0.020	0.019	--	--	1.00	0.76
Goulburn Valley Water	Toolamba	340	CL	Flit	100	0.4	0.20	0.180	<0.010	0.018	0.029	--	--	1.10	0.91
Goulburn Valley Water	Trawool	140	CL	Flit	100	1.6	0.05	0.088	<0.010	0.008	0.032	--	--	0.90	0.30
Goulburn Valley Water	Upper Delatite	1,140	CL	--	100	0.2	0.03	0.053	<0.010	0.036	0.041	--	--	--	--
Goulburn Valley Water	Violet Town	910	CL	Flit	100	0.2	0.03	0.140	<0.010	0.016	0.033	--	--	--	--
Goulburn Valley Water	Wandong - Heathcote Junction	2,000	CL	Flit	100	0.3	0.25	0.084	<0.010	0.027	0.021	--	--	--	--
Goulburn Valley Water	Waterford Park	320	CL	Flit	100	0.6	0.08	0.087	<0.010	0.024	0.024	--	--	--	--
Goulburn Valley Water	Wunghnu	360	CL	Flit	98.1	0.6	0.12	0.190	<0.010	0.016	0.030	--	--	--	--
Goulburn Valley Water	Yarroweyah	140	CL	Flit	100	0.2	0.07	0.068	<0.010	0.030	0.031	--	--	--	--
Goulburn Valley Water	Yea	1,580	CL	Flit	100	0.3	0.10	0.097	<0.010	0.042	0.033	--	--	--	--
<b>Localities and population</b>	<b>48</b>	<b>128,540</b>													
GWM Water	Ararat	7,200	CL	Flit	100	0.3	0.07	0.120	0.005	0.030	0.035	--	--	--	--
GWM Water	Beulah	230	CL	--	100	18.2	--	0.420	0.009	0.110	0.240	--	--	--	--
GWM Water	Birchip	800	CL	Flit	100	1.6	0.09	0.130	0.005	0.020	0.031	--	--	--	--
GWM Water	Brim	100	Clam	--	100	23.5	--	0.028	0.005	0.027	0.006	--	--	--	--
GWM Water	Charlton	1,100	CL	Flit	100	0.7	0.31	0.200	0.005	0.028	0.045	--	--	--	--
GWM Water	Dimboola	1,560	CL	Flit	100	0.4	0.05	0.260	0.005	0.026	0.022	--	--	--	--
GWM Water	Donald	1,380	CL	--	100	15.2	--	0.270	0.005	0.068	0.130	--	--	--	--
GWM Water	Edenhope	780	CL	B Flit	100	1.0	--	0.013	0.005	0.005	0.005	--	--	--	--
GWM Water	Great Western	150	CL	Flit	100	0.2	0.05	0.230	0.010	0.120	0.180	--	--	--	--
GWM Water	Halls Gap	260	CL	Flit	100	0.5	0.06	0.160	0.005	0.041	0.048	--	--	--	--
GWM Water	Haven	--	CL	Flit	100	0.6	0.11	0.210	0.005	0.060	0.091	--	--	0.98	0.60

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	E. coli		Aluminium Maximum [mg/L]	THMs Maximum [mg/L]	MCA Maximum [mg/L]	DCA Maximum [mg/L]	TCA Maximum [mg/L]	Bromate Maximum [mg/L]	Formaldehyde Maximum [mg/L]	Fluoride Maximum [mg/L]	Fluoride Mean [mg/L]
					% of samples with zero E. coli / 100 mL	95% UCL of the mean (NTU)									
GWM Water	Hopetoun	670	CL	Filt	100	0.3	0.17	0.120	0.005	0.023	0.016	--	--	--	--
GWM Water	Horsham	13,290	CL	Filt	99.1	0.4	1.10	0.300	0.005	0.074	0.094	--	--	0.96	0.61
GWM Water	Jung	90	CL	--	98.1	26.0	--	0.490	0.006	0.097	0.190	--	--	--	--
GWM Water	Lake Bolac	240	Clam	Filt	98.1	0.4	0.09	0.007	0.005	0.023	0.005	--	--	--	--
GWM Water	Lalbert	100	CL	--	100	17.3	--	0.610	0.018	0.330	0.560	--	--	--	--
GWM Water	Manangatang	310	CL	--	100	14.2	0.07	0.850	0.013	0.330	0.860	--	--	--	--
GWM Water	Minyip	480	CL	--	100	32.1	--	0.390	0.005	0.080	0.190	--	--	--	--
GWM Water	Murtoa	840	CL	Filt	98.1	1.4	0.24	0.200	0.005	0.037	0.027	--	--	--	--
GWM Water	Natimuk	480	CL	Filt	100	0.4	0.45	0.270	0.005	0.037	0.099	--	--	0.73	0.62
GWM Water	Nullawil	100	CL	--	100	4.6	--	0.260	0.005	0.120	0.230	--	--	--	--
GWM Water	Ouyen	1,250	CL	Filt	100	0.4	0.02	0.400	0.008	0.110	0.300	--	--	--	--
GWM Water	Pomonal	150	CL	Filt	100	0.4	0.07	0.130	0.005	0.033	0.038	--	--	--	--
GWM Water	Quambatook	280	CL	--	100	4.7	--	0.290	0.006	0.051	0.079	--	--	--	--
GWM Water	Rainbow	560	CL	Filt	100	2.9	0.18	0.200	0.005	0.028	0.027	--	--	--	--
GWM Water	Rupanyup	410	CL	--	100	31.4	--	0.400	0.005	0.100	0.170	--	--	--	--
GWM Water	Sea Lake	690	CL	--	98.1	6.4	--	0.190	0.005	0.048	0.064	--	--	--	--
GWM Water	St Arnaud	2,640	CL	Filt	100	0.5	0.13	0.120	0.005	0.017	0.009	--	--	--	--
GWM Water	Stawell	6,270	CL	Filt	100	0.3	0.19	0.079	0.005	0.023	0.027	--	--	--	--
GWM Water	Ultima	190	CL	--	100	15.9	--	0.550	0.015	0.280	0.540	--	--	--	--
GWM Water	Underbool	230	CL	Filt	100	3.6	1.80	0.120	0.005	0.037	0.053	--	--	--	--
GWM Water	Walpeup	150	CL	--	100	2.3	--	0.270	0.019	0.049	0.065	--	--	--	--
GWM Water	Warracknabeal	2,490	CL	Filt	100	1.1	0.14	0.270	0.006	0.041	0.033	--	--	--	--
GWM Water	Willaura	300	Clam	Filt	100	0.3	0.06	0.006	0.005	0.019	0.005	--	--	--	--
GWM Water	Woomelang	220	CL	--	100	21.0	--	0.430	0.008	0.097	0.220	--	--	--	--
GWM Water	Wycheproof	730	CL	--	100	18.9	--	0.480	0.010	0.081	0.170	--	--	--	--
<b>Localities and population</b>	<b>36</b>	<b>46,720</b>													
Lower Murray Water	Irymple	1,100	CL	Filt	100	0.5	0.06	0.200	<0.005	0.014	0.032	--	--	0.77	0.62
Lower Murray Water	Kerang	4,000	CL	Filt	100	0.8	0.20	0.240	<0.005	0.047	0.055	--	--	0.82	0.54
Lower Murray Water	Koondrook	850	CL	Filt	100	0.4	0.17	0.230	0.007	0.075	0.086	--	--	--	--
Lower Murray Water	Lake Boga	600	CL	Filt	100	0.4	0.04	0.220	0.005	0.067	0.061	--	--	0.78	0.54
Lower Murray Water	Merbein	1,800	CL	Filt	100	0.4	0.05	0.180	<0.005	0.025	0.038	--	--	0.75	0.58

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	<i>E. coli</i>	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde	Fluoride	Fluoride
Lower Murray Water	Mildura	29,000	CL	Filt	100	0.5	0.05	0.180	<0.005	0.026	0.035	--	--	0.75	0.53
Lower Murray Water	Murrabit	90	CL	Filt	100	0.6	0.22	0.100	<0.005	0.026	0.026	--	--	--	--
Lower Murray Water	Nyah	350	CL	Filt	100	0.3	0.03	0.230	0.006	0.071	0.065	--	--	0.65	0.44
Lower Murray Water	Nyah West	550	CL	Filt	100	0.3	0.03	0.220	0.006	0.069	0.063	--	--	0.76	0.52
Lower Murray Water	Piangil	190	CL	Filt	100	0.4	0.10	0.220	0.006	0.067	0.067	--	--	--	--
Lower Murray Water	Red Cliffs	2,800	CL	Filt	100	0.6	0.05	0.280	0.006	0.053	0.068	--	--	0.76	0.67
Lower Murray Water	Robinvale	2,250	CL	Filt	100	0.4	0.06	0.250	<0.005	0.043	0.068	--	--	0.88	0.79
Lower Murray Water	Swan Hill	10,500	CL	Filt	100	0.3	0.04	0.180	<0.005	0.062	0.059	--	--	0.76	0.58
Lower Murray Water	Woorinen South	350	CL	Filt	100	0.3	0.03	0.220	0.005	0.067	0.061	--	--	0.62	0.48
<b>Localities and population</b>	<b>14</b>	<b>54,430</b>													
North East Water	Barnawartha	660	Clam/CL	Filt	100	0.2	0.06	0.150	<0.005	0.039	0.052	--	--	0.82	0.74
North East Water	Beechworth High Level	2,300	Clam	Filt	100	0.4	0.25	0.005	<0.005	0.008	<0.005	--	--	--	--
North East Water	Beechworth Low Level	1,170	Clam	Filt	100	0.3	0.70	0.003	<0.005	0.006	<0.005	--	--	--	--
North East Water	Bellbridge	440	CL	Filt	100	0.2	0.03	0.088	<0.005	0.060	0.092	--	--	--	--
North East Water	Benalla	11,750	Clam	Filt	100	0.4	0.18	0.068	<0.005	0.030	0.031	--	--	0.84	0.72
North East Water	Bright	3,140	CL	Filt	100	0.8	0.13	0.016	<0.005	0.016	0.009	--	--	--	--
North East Water	Bundalong	150	CL	Filt	100	0.2	0.05	0.084	<0.005	0.032	0.031	--	--	--	--
North East Water	Chiltern	1,250	Clam/CL	Filt	100	0.2	0.08	0.120	<0.005	0.036	0.041	--	--	0.79	0.74
North East Water	Corryong High Level	170	UV/CL	--	98.1	3.7	--	0.078	0.008	0.068	0.074	--	--	--	--
North East Water	Corryong Low Level	1,340	UV/CL	--	100	3.1	--	0.072	0.005	0.046	0.051	--	--	--	--
North East Water	Cudgewa	140	UV/CL	--	100	3.7	--	0.110	0.006	0.060	0.110	--	--	--	--
North East Water	Dartmouth	200	CL	Filt	100	0.7	0.29	0.160	0.007	0.079	0.082	--	--	--	--
North East Water	Devenish	120	CL	Filt	98.1	0.3	0.03	0.092	<0.005	0.053	0.052	--	--	0.89	0.76
North East Water	Ebden/Baranduda Low Level	1,670	Clam	Filt	100	0.3	0.08	0.076	<0.005	0.036	0.040	--	--	0.78	0.75
North East Water	Eskdale	120	CL	Filt	100	0.5	0.14	0.035	<0.005	0.018	0.022	--	--	--	--
North East Water	Glenrowan	350	CL	Filt	100	0.3	0.37	0.097	0.009	0.041	0.043	--	--	--	--
North East Water	Goorambat	150	CL	B	100	0.2	--	0.048	<0.005	0.017	0.014	--	--	--	--

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	E. coli		Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde	Fluoride	Fluoride
					% of samples with zero E. coli / 100 mL	95% UCL of the mean (NTU)									
North East Water	Harrierville	400	CL	--	100	1.7	--	0.071	<0.005	0.034	0.040	--	--	--	--
North East Water	Kiewa	400	Clam	Filt	100	0.3	0.09	0.086	0.006	0.061	0.058	--	--	0.81	0.75
North East Water	Moyhu	250	CL	Filt	100	0.4	0.05	0.049	<0.005	0.022	0.019	--	--	--	--
North East Water	Mount Beauty	1,380	CL	Filt	100	0.5	0.28	0.030	<0.005	0.013	0.015	--	--	--	--
North East Water	Myrtleford	3,540	UV	--	100	1.5	--	--	--	--	--	--	--	--	--
North East Water	Oxley	360	CL	Filt	100	0.4	0.02	0.050	<0.005	0.020	0.023	--	--	--	--
North East Water	Porepunkah	800	CL	Filt	100	0.8	0.08	0.054	<0.005	0.023	0.018	--	--	--	--
North East Water	Rutherglen	2,650	CL	Filt	100	0.2	0.04	0.130	0.007	0.079	0.053	--	--	--	--
North East Water	Springhurst	200	CL	Filt	98.1	0.7	0.21	0.190	0.007	0.063	0.087	--	--	--	--
North East Water	St James	100	CL	Filt	100	0.4	0.04	0.130	0.005	0.061	0.063	--	--	0.82	0.72
North East Water	Tallangatta	1,110	CL	Filt	100	0.6	0.10	0.073	<0.005	0.040	0.049	--	--	--	--
North East Water	Tangambalanga	520	Clam	Filt	100	0.2	0.07	0.072	0.005	0.063	0.064	--	--	0.79	0.75
North East Water	Tawonga	1,300	CL	Filt	100	0.5	0.11	0.030	<0.005	0.013	0.014	--	--	--	--
North East Water	Tungamah	410	CL	Filt	100	0.3	0.05	0.150	0.006	0.074	0.058	--	--	0.93	0.70
North East Water	Wahgunyah	1,030	CL	Filt	100	0.3	0.03	0.082	<0.005	0.025	0.027	--	--	--	--
North East Water	Walwa	110	CL	Filt	100	1.0	0.56	0.110	<0.005	0.056	0.074	--	--	--	--
North East Water	Wandiligong	440	CL	Filt	100	0.4	0.04	0.017	<0.005	0.011	0.012	--	--	--	--
North East Water	Wangaratta	19,650	CL	Filt	100	0.5	0.02	0.088	<0.005	0.018	0.024	--	--	0.94	0.77
North East Water	Whitfield	120	CL02/UV	--	100	1.9	--	<0.001	<0.005	0.004	<0.005	--	--	--	--
North East Water	Wodonga / Baranduda High Level	580	Clam	Filt	100	0.2	0.07	0.100	0.006	0.074	0.052	--	--	0.78	0.78
North East Water	Wodonga High Level	14,840	Clam	Filt	100	0.3	0.06	0.053	<0.005	0.023	0.028	--	--	0.84	0.74
North East Water	Wodonga Logic Centre	10	Clam/CL	Filt	100	0.2	0.07	0.130	0.005	0.053	0.052	--	--	0.78	0.75
North East Water	Wodonga Low Level	31,130	Clam	Filt	100	1.0	0.06	0.051	<0.005	0.029	0.029	--	--	0.95	0.78
North East Water	Yackandandah	960	CL	Filt	100	0.2	0.05	0.027	0.008	0.007	0.011	--	--	--	--
North East Water	Yarrowonga	8,640	CL	Filt	100	0.3	0.08	0.071	<0.005	0.033	0.030	--	--	0.93	0.79
<b>Localities and population</b>	<b>42</b>	<b>116,050</b>													



Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	E. coli		Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde	Fluoride	Fluoride
					% of samples with zero E. coli / 100 mL	95% UCL of the mean (NTU)										
Parks Victoria	Gabo Island Lightstation Reserve	Seasonal population	PV	PV	75	0.3	--	--	--	--	--	--	--	--	--	--
Parks Victoria	Lake Eildon National Park: Lakeside/ Candlebark	Seasonal population	PV	PV	94.4	0.3	--	--	--	--	--	--	--	--	--	--
Parks Victoria	Tidal River	Seasonal population	CL	Filt	97.9	0.6	0.11	0.090	0.050	0.022	0.023	--	--	--	--	--
Parks Victoria	Twelve Apostles Visitor Facility	Seasonal population	PV	PV	100	0.4	--	--	--	--	--	--	--	--	--	--
Parks Victoria	Wilsons Promontory Lightstation	Seasonal population	UV	PV	100	2.3	--	--	--	--	--	--	--	--	--	--
<b>Localities and population</b>	<b>5</b>	<b>--</b>														
South East Water	Bairraring	6,000	CL	Filt	100	0.6	0.02	0.091	<0.005	0.007	0.035	0.035	--	--	0.93	0.85
South East Water	Bayswater	61,580	CL	CL	100	1.0	--	0.120	<0.005	0.018	0.061	0.061	--	--	1.00	0.91
South East Water	Beaumaris	25,870	CL	CL	100	1.0	0.02	0.071	<0.005	0.008	0.028	0.028	--	--	0.89	0.84
South East Water	Belgrave	15,540	CL	CL	100	1.1	--	0.110	<0.005	0.010	0.040	0.040	--	--	1.00	0.95
South East Water	Berwick	65,300	CL	CL	100	1.0	--	0.065	<0.005	0.024	0.031	0.031	--	--	0.96	0.87
South East Water	Bittern	6,150	CL	Filt	100	0.6	0.02	0.100	<0.005	0.005	0.021	0.021	--	--	0.92	0.86
South East Water	Brighton/ Heatherton	192,680	CL	CL	99.8	1.0	0.04	0.080	<0.005	0.012	0.047	0.047	--	--	1.00	0.86
South East Water	Bunyip	3,650	CL	Filt	100	0.3	0.03	0.073	<0.005	0.006	0.012	0.012	--	--	1.10	0.93
South East Water	Carrum Downs	25,910	CL	CL	100	1.2	--	0.071	<0.005	0.016	0.033	0.033	--	--	1.00	0.83
South East Water	Caulfield	161,270	CL	Filt	100	0.9	0.07	0.100	<0.005	0.011	0.073	0.073	--	--	0.98	0.90
South East Water	Chelsea	46,910	CL	CL	100	1.0	--	0.085	<0.005	0.010	0.037	0.037	--	--	0.91	0.85
South East Water	Cora Lynn	100	CL	Filt	100	0.4	0.05	0.056	<0.005	<0.005	0.006	0.006	--	--	1.10	0.91
South East Water	Cranbourne	50,830	CL	Filt	100	1.0	0.02	0.068	<0.005	0.019	0.034	0.034	--	--	0.95	0.84
South East Water	Dandenong	112,580	CL	CL	99.7	1.0	--	0.070	<0.005	0.011	0.035	0.035	--	--	1.00	0.91
South East Water	Dandenong North	24,100	CL	CL	100	1.0	--	0.095	<0.005	0.018	0.058	0.058	--	--	0.92	0.86
South East Water	Devon Meadows	5,780	CL	Filt	100	0.8	0.02	0.072	<0.005	0.010	0.035	0.035	--	--	0.92	0.86
South East Water	Dromana	22,230	CL	Filt	100	0.3	0.02	0.150	<0.005	0.008	0.039	0.039	--	--	0.95	0.89
South East Water	Ferntree Gully	20,780	CL	CL	100	1.1	--	0.092	<0.005	0.015	0.049	0.049	--	--	1.10	0.94
South East Water	Frankston	86,760	CL	Filt	100	1.2	0.02	0.094	<0.005	0.013	0.062	0.062	--	--	1.00	0.87
South East Water	Frankston South	15,200	CL	Filt	100	0.8	0.03	0.110	<0.005	0.007	0.028	0.028	--	--	0.91	0.73
South East Water	Garfield	1,170	CL	Filt	100	0.3	0.04	0.069	<0.005	0.009	0.012	0.012	--	--	0.95	0.90
South East Water	Hallam	92,430	CL	CL	100	1.0	--	0.068	<0.005	0.016	0.038	0.038	--	--	0.96	0.87

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	E. coli		Aluminium Maximum [mg/L]	THMs Maximum [mg/L]	MCA Maximum [mg/L]	DCA Maximum [mg/L]	TCA Maximum [mg/L]	Bromate Maximum [mg/L]	Formaldehyde Maximum [mg/L]	Fluoride	
					% of samples with zero E. coli / 100 mL	95% UCL of the mean (NTU)								Maximum [mg/L]	Mean [mg/L]
South East Water	Hastings	10,760	CL	Filt	99	0.5	0.04	0.120	<0.005	0.015	0.020	--	--	0.950,89	0.950,89
South East Water	Kairingal	10,450	CL	Filt	100	0.8	0.02	0.077	<0.005	0.008	0.030	--	--	0.920,84	0.920,84
South East Water	Koo Wee Rup	2,400	CL	Filt	100	0.2	0.03	0.066	<0.005	0.005	<0.005	--	--	0.980,91	0.980,91
South East Water	Lang Lang	1,430	CL	Filt	100	0.3	0.02	0.100	<0.005	0.005	0.012	--	--	0.970,88	0.970,88
South East Water	Moorooduc	500	CL	Filt	100	0.5	0.03	0.100	<0.005	0.021	0.031	--	--	0.940,88	0.940,88
South East Water	Mordialloc	30,280	CL	--	100	1.0	0.02	0.079	<0.005	0.005	0.014	--	--	0.940,86	0.940,86
South East Water	Mornington	42,700	CL	Filt	100	0.4	0.02	0.110	<0.005	0.007	0.035	--	--	0.960,88	0.960,88
South East Water	Mount Martha	8,170	CL	Filt	100	0.5	0.05	0.130	<0.005	0.007	0.028	--	--	1.000,89	1.000,89
South East Water	Pakenham	37,350	CL	--	100	1.1	--	0.088	<0.005	0.017	0.041	--	--	0.930,82	0.930,82
South East Water	Rowville	30,010	CL	--	100	1.0	--	0.094	<0.005	0.017	0.031	--	--	0.920,86	0.920,86
South East Water	Rye	76,980	CL	Filt	100	0.3	0.02	0.170	<0.005	0.012	0.041	--	--	0.970,89	0.970,89
South East Water	Shoreham	3,240	CL	Filt	100	0.6	0.02	0.093	<0.005	0.008	0.041	--	--	0.970,87	0.970,87
South East Water	Somerville	15,340	CL	Filt	100	0.9	0.02	0.072	<0.005	0.013	0.036	--	--	0.980,86	0.980,86
South East Water	South Melbourne	179,420	CL	Filt	99.7	1.0	0.05	0.099	<0.005	0.012	0.059	--	--	0.990,91	0.990,91
South East Water	Tynong	1,000	CL	Filt	100	0.3	0.04	0.073	<0.005	0.007	0.009	--	--	1.100,91	1.100,91
South East Water	Upper Beaconsfield	2,890	CL	Filt	100	0.9	--	0.098	<0.005	0.012	0.034	--	--	0.900,85	0.900,85
South East Water	Wantirna	22,170	CL	--	100	1.0	--	0.110	<0.005	0.029	0.059	--	--	1.000,92	1.000,92
<b>Localities and population</b>	<b>39</b>	<b>1,517,910</b>													
South Gippsland Water	Alberton	430	Clam	Filt	100	0.3	0.44	0.003	<0.005	0.006	<0.005	--	--	--	--
South Gippsland Water	Cape Paterson	760	Clam	Filt	98.1	0.4	0.14	0.017	<0.005	0.009	<0.005	--	--	--	--
South Gippsland Water	Dumbalk	170	CL	Filt	100	0.4	0.02	0.160	<0.005	0.011	0.009	--	--	--	--
South Gippsland Water	Fish Creek	180	CL	Filt	100	0.4	0.06	0.240	<0.005	0.020	0.044	--	--	--	--
South Gippsland Water	Foster	1,090	CL	Filt	100	0.5	0.05	0.150	<0.005	0.008	0.011	--	--	--	--
South Gippsland Water	Inverloch	4,650	Clam	Filt	100	0.3	0.08	0.021	<0.005	0.009	<0.005	--	--	--	--
South Gippsland Water	Koonwarra	150	CL	Filt	100	0.3	0.05	0.150	<0.005	<0.005	<0.005	--	--	--	--
South Gippsland Water	Korumburra	3,300	CL	Filt	100	0.5	0.14	0.180	<0.005	0.026	0.022	--	--	--	--

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	E. coli		MCA	DCA	TCA	Bromate	Formaldehyde	Fluoride	
					% of samples with zero E. coli / 100 mL	95% UCL of the mean (NTU)						Maximum [mg/L]	Maximum [mg/L]
South Gippsland Water	Lance Creek	50	Clam	Filt	100	0.5	< 0.005	0.011	< 0.005	--	--	--	--
South Gippsland Water	Leongatha	4,700	CL	Filt	100	0.5	< 0.005	0.012	0.017	--	--	--	--
South Gippsland Water	Loch	200	Clam	Filt	100	0.3	< 0.005	0.022	< 0.005	--	--	--	--
South Gippsland Water	Meenyan	450	CL	Filt	100	0.3	< 0.005	0.026	0.032	--	--	--	--
South Gippsland Water	Nyora	570	Clam	Filt	100	0.3	< 0.005	0.019	< 0.005	--	--	--	--
South Gippsland Water	Poowong	300	Clam	Filt	100	0.3	< 0.005	0.017	< 0.005	--	--	--	--
South Gippsland Water	Port Franklin	1,300	CL	Filt	100	0.3	< 0.005	0.044	0.043	--	--	--	--
South Gippsland Water	Port Welshpool	470	CL	Filt	100	0.4	< 0.005	0.026	0.032	--	--	--	--
South Gippsland Water	Toora	710	CL	Filt	100	0.6	< 0.005	0.045	0.048	--	--	--	--
South Gippsland Water	Wonthaggi	7,270	Clam	Filt	99.5	0.3	< 0.005	0.012	< 0.005	--	--	--	--
South Gippsland Water	Yarram	1,800	Clam	Filt	100	0.3	< 0.005	< 0.005	< 0.005	--	--	--	--
<b>Localities and population</b>	<b>19</b>	<b>28,550</b>											
Wannon Water	Allansford	530	Clam/CL	Filt	100	1.0	0.005	0.016	0.014	--	--	1.10	0.73
Wannon Water	Balmoral	200	Clam	Filt	100	0.8	0.012	0.050	0.005	--	--	--	--
Wannon Water	Camperdown (Rural)	400	Clam	Filt	100	0.5	0.005	0.011	0.005	--	--	--	--
Wannon Water	Camperdown (Urban)	3,130	Clam	Filt	100	0.2	0.005	0.007	0.005	--	--	--	--
Wannon Water	Caramut	100	CL	B	100	0.2	0.005	0.005	0.005	--	--	--	--
Wannon Water	Casterton	1,640	CL	B Filt	100	0.3	0.005	0.011	0.007	--	--	--	--
Wannon Water	Cavendish	120	Clam	--	100	1.4	0.021	0.140	0.039	--	--	--	--
Wannon Water	Cobden	1,420	CL	Filt	100	0.3	0.005	0.025	0.026	--	--	--	--
Wannon Water	Coleraine	980	CL	B Filt	100	0.3	0.005	0.018	0.011	--	--	--	--
Wannon Water	Dartmoor	250	CL	B	100	0.1	0.005	0.005	0.005	--	--	--	--
Wannon Water	Derrinallum	265	Clam/CL	Filt	100	0.3	0.005	0.045	0.017	--	--	--	--

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	E. coli % of samples with zero E. coli / 100 mL	Turbidity 95% UCL of the mean (NTU)	Aluminium Maximum [mg/L]	THMs Maximum [mg/L]	MCA Maximum [mg/L]	DCA Maximum [mg/L]	TCA Maximum [mg/L]	Bromate Maximum [mg/L]	Formaldehyde Maximum [mg/L]	Fluoride Maximum [mg/L]	Fluoride Mean [mg/L]
Wannon Water	Dunkeld	400	Clam/CL	Filt	98.1	0.9	1.20	0.250	0.010	0.070	0.022	--	--	0.39	0.13
Wannon Water	Glenthompson	130	Clam	Filt	100	1.2	0.25	0.480	0.022	0.180	0.250	--	--	--	--
Wannon Water	Hamilton	9,370	Clam	Filt	100	0.4	1.60	0.020	0.005	0.022	0.005	--	--	0.60	0.18
Wannon Water	Heywood	1,280	CL	B	100	0.5	--	0.015	0.005	0.005	0.005	--	--	--	--
Wannon Water	Koroit	1,380	Clam	Filt	100	0.6	0.21	0.024	0.005	0.009	0.005	--	--	0.97	0.72
Wannon Water	Lismore	265	Clam/CL	Filt	100	0.2	0.08	0.110	0.005	0.030	0.012	--	--	--	--
Wannon Water	Merino	200	CL	B Filt	100	1.3	--	0.170	0.005	0.019	0.009	--	--	--	--
Wannon Water	Mortlake	940	Clam	Filt	100	0.4	0.05	0.082	0.005	0.017	0.024	--	--	--	--
Wannon Water	Noorat/														
Wannon Water	Glenormiston	350	Clam	Filt	100	0.1	0.07	0.160	0.008	0.030	0.058	--	--	--	--
Wannon Water	Paaratte	30	CL	B Filt	100	0.4	0.05	0.011	0.005	0.005	0.005	--	--	--	--
Wannon Water	Penshurst	500	CL	B	100	0.3	--	0.067	0.005	0.005	0.005	--	--	--	--
Wannon Water	Peterborough	150	CL	B Filt	100	0.2	--	0.018	0.005	0.005	0.005	--	--	--	--
Wannon Water	Port Campbell	460	CL	B Filt	100	0.2	--	0.019	0.005	0.005	0.005	--	--	--	--
Wannon Water	Port Fairy	2,710	CL	B	100	0.2	--	0.001	0.005	0.005	0.005	--	--	--	--
Wannon Water	Portland	10,130	Clam	B	100	0.3	--	0.001	0.005	0.005	0.005	--	--	--	--
Wannon Water	Purnim	70	CL	--	100	1.6	--	0.120	0.005	0.025	0.047	--	--	--	--
Wannon Water	Sandford	90	CL	B Filt	100	0.2	--	0.190	0.005	0.014	0.008	--	--	--	--
Wannon Water	Simpson	130	CL	Filt	100	0.2	0.07	0.057	0.005	0.019	0.013	--	--	--	--
Wannon Water	Tarrington	110	Clam	Filt	100	0.6	0.23	0.015	0.005	0.018	0.005	--	--	0.58	0.17
Wannon Water	Terang	1,860	Clam	Filt	100	0.1	0.07	0.140	0.007	0.028	0.057	--	--	--	--
Wannon Water	Timboon	780	CL	B Filt	100	0.3	0.07	0.072	0.005	0.005	0.005	--	--	--	--
Wannon Water	Warrnambool	31,020	Clam	Filt	100	0.2	0.10	0.028	0.005	0.017	0.007	--	--	1.10	0.73
<b>Localities and population</b>	<b>33</b>	<b>71,390</b>													
Western Water	Bulla	780	CL / Clam	--	100	0.8	0.19	0.110	<0.005	0.006	0.031	--	--	1.10	0.87
Western Water	Darley	3,640	CL	Filt	100	0.5	0.14	0.190	0.005	0.010	0.025	--	--	0.90	0.49
Western Water	Diggers Rest	2,750	CL / Clam	--	100	1.0	0.20	0.110	0.005	0.007	0.034	--	--	1.00	0.85
Western Water	Eynesbury	450	CL	Filt	100	0.6	0.14	0.180	0.005	0.010	<0.005	--	--	0.96	0.83
Western Water	Gisborne	9,850	CL / Clam	Filt	100	0.8	0.19	0.120	<0.005	0.010	0.024	--	--	1.00	0.87
Western Water	Lancefield	2,100	CL	Filt	98.1	0.2	0.11	0.150	<0.005	0.023	0.018	--	--	--	--
Western Water	Lerdererg	11,980	CL	Filt	100	0.5	0.13	0.150	<0.005	0.009	0.020	--	--	0.90	0.49
Western Water	Macedon	2,550	CL / Clam	Filt	100	0.8	0.18	0.170	<0.005	0.016	0.018	--	--	1.00	0.88
Western Water	Maddingley	4,550	CL	Filt	100	0.5	0.14	0.210	<0.005	0.008	0.029	--	--	0.89	0.49
Western Water	Melton South	45,550	CL	Filt	100	0.7	0.20	0.140	<0.005	0.009	0.019	--	--	0.93	0.69

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	E. coli		Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde	Fluoride	Fluoride
					% of samples with zero E. coli / 100 mL	95% UCL of the mean (NTU)										
Western Water	Merrimu	8,950	CL	Fit	100	0.6	0.17	0.190	<0.005	0.012	0.020	0.020	--	--	1.00	0.60
Western Water	Mount Macedon	900	CL / Clam	Fit	100	0.8	0.17	0.160	<0.005	0.016	0.018	0.018	--	--	1.10	0.89
Western Water	Myrning	300	CL	Fit	100	0.3	0.11	0.160	<0.005	0.021	0.021	0.021	--	--	--	--
Western Water	Riddells Creek	3,660	CL / Clam	Fit	100	1.1	0.19	0.130	<0.005	0.025	0.026	0.026	--	--	1.00	0.88
Western Water	Rockbank	2,270	CL	Fit	100	0.7	0.19	0.150	<0.005	0.010	0.052	0.052	--	--	0.98	0.74
Western Water	Romsey	4,600	Clam	Fit	100	0.2	0.04	0.016	<0.005	0.012	<0.005	<0.005	--	--	--	--
Western Water	Sunbury	39,710	CL / Clam	--	100	1.0	0.19	0.078	<0.005	0.010	0.037	0.037	--	--	0.99	0.87
Western Water	Toolern Vale	630	CL	Fit	100	0.6	0.15	0.210	<0.005	0.011	0.024	0.024	--	--	0.91	0.48
Western Water	Woodend	5,440	Clam	Fit	100	0.3	0.12	0.091	<0.005	0.120	0.011	0.011	--	--	--	--
<b>Localities and population</b>		<b>150,660</b>														
Westernport Water	Bass	1,260	CL	Fit	100	0.7	0.37	0.140	<0.005	0.007	0.009	0.009	--	--	0.94	0.74
Westernport Water	Cape Woolamai	2,680	CL	Fit	100	0.3	0.07	0.240	<0.005	0.006	0.014	0.014	--	--	0.87	0.67
Westernport Water	Corinella	1,400	Clam	Fit	100	0.4	0.15	0.160	<0.005	0.016	0.014	0.014	--	--	0.96	0.72
Westernport Water	Cowes	3,870	CL	Fit	100	0.2	0.11	0.260	<0.005	0.007	0.015	0.015	--	--	0.86	0.64
Westernport Water	Grantville	830	CL	Fit	100	0.3	0.13	0.200	0.005	0.074	0.040	0.040	--	--	0.86	0.68
Westernport Water	Kilcunda	540	Clam	Fit	100	0.3	0.64	0.160	<0.005	0.016	0.019	0.019	--	--	0.90	0.70
Westernport Water	Rhyll	500	CL	Fit	100	0.4	0.12	0.250	<0.005	0.009	0.014	0.014	--	--	0.86	0.66
Westernport Water	San Remo	1,440	CL	Fit	100	0.4	0.17	0.220	<0.005	0.008	0.015	0.015	--	--	0.88	0.68
Westernport Water	Ventnor	660	UV / CL	Fit	100	0.2	0.04	0.250	<0.005	0.009	0.015	0.015	--	--	0.84	0.62
<b>Localities and population</b>		<b>13,180</b>														
Yarra Valley Water	Brahams Road	140	UV / CL	--	100	1.4	--	0.004	0.002	0.002	0.002	0.002	--	--	--	--
Yarra Valley Water	Bundoora	118,210	CL	Fit	100	0.6	0.04	0.057	0.002	0.007	0.030	0.030	--	--	1.00	0.90
Yarra Valley Water	Croydon	129,630	CL	Fit	100	0.9	0.04	0.070	0.002	0.010	0.031	0.031	--	--	1.10	0.87
Yarra Valley Water	Doncaster	87,340	CL	Fit	100	0.9	0.04	0.075	0.002	0.006	0.029	0.029	--	--	1.00	0.90
Yarra Valley Water	Eltham	22,000	CL	Fit	100	0.3	0.02	0.057	0.002	0.002	0.007	0.007	--	--	1.00	0.91
Yarra Valley Water	Emerald	16,180	Clam	--	99	1.2	--	0.160	0.002	0.008	0.036	0.036	--	--	--	--
Yarra Valley Water	Epping	59,700	CL	Fit	100	0.4	0.03	0.055	0.002	0.005	0.017	0.017	--	--	1.00	0.91
Yarra Valley Water	Glen Waverley	126,120	CL	--	100	1.3	--	0.092	0.002	0.015	0.047	0.047	--	--	1.20	0.97
Yarra Valley Water	Glenroy	94,100	CL	Fit	100	0.9	0.01	0.037	0.002	0.002	0.013	0.013	--	--	1.00	0.92
Yarra Valley Water	Healesville	9,760	CL	Fit	100	0.4	0.03	0.037	0.002	0.011	0.009	0.009	--	--	--	--
Yarra Valley Water	Ivanhoe	22,010	CL	Fit	100	0.6	0.04	0.089	0.002	0.002	0.011	0.011	--	--	1.10	0.90
Yarra Valley Water	Kew	149,110	CL	Fit	98.1	0.9	0.04	0.087	0.002	0.002	0.017	0.017	--	--	1.00	0.86
Yarra Valley Water	Lilydale	39,940	CL	Fit	99.7	0.9	0.04	0.087	0.002	0.002	0.017	0.017	--	--	1.00	0.86
Yarra Valley Water				Fit	100	1.1	0.05	0.082	0.002	0.010	0.038	0.038	--	--	1.20	0.88

Water supplier	Water sampling locality	Estimated population	Type of disinfection	Filtered supply	<i>E. coli</i>	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde	Fluoride	Fluoride
					% of samples with zero <i>E. coli</i> / 100 mL	95% UCL of the mean (NTU)	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]
Yarra Valley Water	Lower Plenty	16,790	CL	Fit	98.1	0.8	0.04	0.086	0.002	0.019	0.044	--	--	1.00	0.85
Yarra Valley Water	Lyrebird Avenue	830	UV	--	100	2.9	--	0.017	0.002	0.002	0.002	--	--	--	--
Yarra Valley Water	Malvern	83,410	CL	Fit	100	1.0	0.04	0.088	0.002	0.005	0.038	--	--	1.00	0.90
Yarra Valley Water	Mernda/ Hurstbridge	19,830	CL	Fit	99	0.5	0.03	0.067	0.002	0.002	0.008	--	--	1.00	0.91
Yarra Valley Water	Mitcham	112,090	CL	Fit	99.7	0.9	0.04	0.095	0.002	0.002	0.021	--	--	1.00	0.87
Yarra Valley Water	Montrose	15,700	CL	--	100	1.1	--	0.099	0.002	0.018	0.045	--	--	1.20	0.93
Yarra Valley Water	Northcote	98,300	CL	Fit	100	0.4	0.02	0.040	0.002	0.006	0.010	--	--	0.98	0.91
Yarra Valley Water	Plenty	34,060	CL	Fit	99.2	0.3	0.02	0.052	0.002	0.002	0.002	--	--	1.00	0.92
Yarra Valley Water	Preston	126,510	CL	Fit	100	0.5	0.03	0.044	0.002	0.002	0.005	--	--	0.98	0.91
Yarra Valley Water	Ridge/ Monbulk	14,670	Clam	--	100	1.1	--	0.095	0.002	0.025	0.054	--	--	0.91	0.37
Yarra Valley Water	Seville	5,490	Clam	--	100	1.1	--	0.110	0.002	0.010	0.051	--	--	1.00	0.94
Yarra Valley Water	Somerton	77,990	CL	Fit	100	0.7	0.04	0.082	0.002	0.002	0.008	--	--	1.00	0.85
Yarra Valley Water	Wallan	6,470	CL	Fit	99	0.7	0.04	0.120	0.002	0.002	0.009	--	--	1.10	0.90
Yarra Valley Water	Warburton	3,790	UV/CL	--	100	1.4	--	0.038	0.002	0.013	0.020	--	--	--	--
Yarra Valley Water	Warranwood	50,180	CL	--	100	0.8	0.04	0.094	0.002	0.002	0.017	--	--	1.00	0.89
Yarra Valley Water	Whittlesea	5,240	CL	Fit	99	0.4	0.07	0.096	0.002	0.002	0.011	--	--	1.10	0.92
Yarra Valley Water	Woori Yallock	6,840	UV/CL	--	99	1.6	--	0.051	0.002	0.014	0.022	--	--	--	--
Yarra Valley Water	Yarra Glen	2,710	CL	Fit	100	0.4	0.03	0.110	0.002	0.021	0.045	--	--	--	--
Yarra Valley Water	Yarra Junction	3,580	UV/CL	--	100	1.6	--	0.083	0.002	0.011	0.011	--	--	--	--
<b>Localities and population</b>	<b>32</b>	<b>1,558,720</b>													
Falls Creek ARMB	Falls Creek	Seasonal population	UV	--	100	1.6	--	--	--	--	--	--	--	--	--
<b>Localities and population</b>	<b>1</b>	<b>--</b>													
Mount Baw Baw ARMB	Mount Baw Baw	Seasonal population	UV/CL	--	100	0.7	--	0.068	<0.005	<0.005	0.056	--	--	--	--
<b>Localities and population</b>	<b>1</b>	<b>--</b>													
Mount Hotham ARMB	Mount Hotham	Seasonal population	UV	--	98	0.2	--	--	--	--	--	--	--	--	--
<b>Localities and population</b>	<b>1</b>	<b>--</b>													



## Notes

MCA	Monochloroacetic acid
FL	Fluoridated supply for 2010–11
TCA	Trichloroacetic acid
NF	Naturally occurring fluoride in ground water at levels comparable to a fluoridated supply.
THMs	Trihalomethanes
Filt	Filtered supply (involving coagulation, clarification, flocculation, membrane filtration, nanofiltration or similar applied processes)
<i>E. coli</i> /100 mL	<i>Escherichia coli</i> per 100 millilitres  For the purposes of this table “filtered” does not refer to natural settling, aeration, sand filtration or treatment for algae, weed, pH, iron or manganese control only.
ARMB	Alpine Resort Management Board
SF	Slow sand filtered (with no further filtration processes)
[mg/L]	concentration in milligrams per litre
B	Ground water bore source (without blending with surface raw water sources or surface raw water storage)
95% UCL	95 percent upper confidence limit
UV	Ultra-violet light irradiation
NTU	Nephelometric Turbidity Unit
Oz	Ozonation
--	Locality not sampled during 2010–11
CL	Chlorination (gaseous chlorine or hypochlorite)
GWM Water	Trading name for Grampians Wimmera Mallee Water
Clam	Chloramination
PV	Refer Parks Victoria for details of local arrangements
CLO2	Chlorine dioxide
/	both listed types of disinfection were used during 2010–11 (either simultaneously or periodically)



The benchmark standards were:

- at least 98 per cent of samples with zero *E. coli*/ 100 mL.
- 95 per cent UCL of the mean should not exceed 5.0 NTU.
- Aluminium: 0.2 mg/L.
- THMs: 0.25 mg/L.
- MCA: 0.15 mg/L.
- DCA: 0.1 mg/L.
- TCA: 0.1 mg/L.
- Bromate: 0.02 mg/L.
- Formaldehyde: 0.5 mg/L.
- Fluoride: 1.5 mg/L (all supplies).
- Fluoride: mean not to exceed 1.0 mg/L (fluoridated supplies).

Refer Appendix 4 for gazettal dates for water sampling localities.

Highlighting indicates where drinking water did not satisfy the benchmark standard for 2010–11.

Population data is based on estimated permanent population.

East Gippsland Water has used the number of connections rather than the estimated population for each water sampling locality.

The water quality data in the above table is derived from data submitted to the Department of Health by the relevant water businesses for 2010–11.

Data is based on sampling of drinking water that represents supplies to consumers for the localities shown.

Some data that notionally and slightly exceeds the listed standard for aluminium, DCA and TCA is deemed to be compliant, in accordance with data rounding conventions.

For details of water treatment or added chemicals please refer to annual reports for individual water businesses.

Water supplies that are non-potable (that is, not intended for drinking) are excluded from the table.

## Appendix 8: Notifications for 2010–11

Date	Issue location	Type	Incident description	Reported by organisation
November 2010	Leopold	Detection of <i>Escherichia coli</i> in drinking water	No faults or failures with treatment plant performance or chlorine contact time were identified. The main was flushed by field crews. Cause of the detection is unknown. Resample results were clear of <i>Escherichia coli</i> .	Barwon Water
December 2010	Aireys Inlet	Detection of <i>Escherichia coli</i> in drinking water	No faults or failures were detected at the water treatment plant. The affected area of the reticulation was flushed. Resample results were clear of <i>Escherichia coli</i> .	Barwon Water
December 2010	Highton	Detection of <i>Escherichia coli</i> in drinking water	No faults or failures with treatment plant performance or chlorine contact time were identified. The main was flushed by field crews. Resample results were clear of <i>Escherichia coli</i> .	Barwon Water
January 2011	Moolap	Detection of <i>Escherichia coli</i> in drinking water	There were no known issues with the water supply and the adjacent system was inspected. Resample results were clear of <i>Escherichia coli</i> .	Barwon Water
January 2011	Teesdale	Detection of <i>Escherichia coli</i> in drinking water	No faults or failures were identified at the water treatment plant. Resample results were clear of <i>Escherichia coli</i> .	Barwon Water
January 2011	Torquay	Detection of <i>Escherichia coli</i> at entry point	No faults or failures were identified at the water treatment plant. Resample results were clear of <i>Escherichia coli</i> .	Barwon Water
January 2011	Portarlinton	Detection of <i>Escherichia coli</i> in drinking water	Sample was taken during the commissioning of a newly constructed feeder main. The pipeline was flushed. Resample results were clear of <i>Escherichia coli</i> .	Barwon Water
February 2011	Portarlinton Tank	Detection of <i>Escherichia coli</i> in high level storage tank	Visual inspection for contamination was undertaken and no cause identified. Storage tank was filled with chlorinated water. Resample results were clear of <i>Escherichia coli</i> .	Barwon Water
March 2011	Lorne	Detection of <i>Escherichia coli</i> in drinking water	No faults or failures were identified at the water treatment plant. Resample results were clear of <i>Escherichia coli</i> .	Barwon Water
March 2011	Portarlinton	Detection of <i>Escherichia coli</i> in drinking water	<i>Escherichia coli</i> was detected in two locations on the same day. Flushing was immediately conducted and a mobile disinfection unit deployed providing booster disinfection. Resample results were clear of <i>Escherichia coli</i> .	Barwon Water
July 2010	Clunes	Elevated bromate in drinking water	Investigative resampling was undertaken. Trialled changing the source ground water, optimised ozone dosing and increased flow rate through the plant to reduce contact time. Verification testing conducted on ozone destructor and trials were completed to determine any contributing factors.	Central Highlands Water
October 2010	Timor	Detection of <i>Escherichia coli</i> in drinking water	Site investigation conducted and resamples collected. Disinfectant levels confirmed. Resample results were clear of <i>Escherichia coli</i> .	Central Highlands Water

Date	Issue location	Type	Incident description	Reported by organisation
November 2010	Ballan	Detection of <i>Escherichia coli</i> in drinking water	Site investigation conducted and resamples collected. Confirmed disinfectant levels and carried out flushing of the reticulation in the affected area. Sample point maintenance conducted and sampling methodology reviewed. Resample results were clear of <i>Escherichia coli</i> .	Central Highlands Water
November 2010	Fiskville/ Glenmore	Elevated lead in drinking water	Samples taken from the locality prior to and after the elevated result were compliant. Investigation of possible source was undertaken and unable to identify source.	Central Highlands Water
December 2010	Buninyong	Detection of <i>Escherichia coli</i> in storage tank	Site investigation undertaken and resamples collected. Confirmed disinfectant levels were low. The basin was spot dosed with chlorine. Resample results were clear of <i>Escherichia coli</i> .	Central Highlands Water
January 2011	Gordon	Detection of <i>Escherichia coli</i> in storage basin	The tank was off line at the time of sampling. Site investigation undertaken and tank inspection completed. Confirmed disinfectant levels. Resamples collected and tank upgrades initiated. Resample results were clear of <i>Escherichia coli</i> .	Central Highlands Water
January 2011	Ballan	Detection of <i>Escherichia coli</i> in drinking water	Initial sample taken to represent Steiglitz Basin. Site investigation conducted and locality resamples collected. Disinfectant levels confirmed. Resample results were clear of <i>Escherichia coli</i> .	Central Highlands Water
January 2011	Ballarat Central	Blue Green Algae	Initial sample taken from surface of reservoir. Increased monitoring regime in accordance with blue-green algae management plan, including confirming algae levels at offtake (22 meters below surface). It is not expected that the algal bloom would extend to that depth. Powdered Activated Carbon dosing (PAC) implemented at treatment plant.	Central Highlands Water
January 2011	Creswick	Detection of <i>Escherichia coli</i> in treated storage basin	Site investigation conducted and resamples collected. Disinfectant levels confirmed. Basin was dosed with sodium hypochlorite. Resample results were clear of <i>Escherichia coli</i> .	Central Highlands Water
February 2011	Forest Hill	Detection of <i>Escherichia coli</i> in drinking water	Inspection of site conducted and resamples collected. Confirmed disinfectant levels and correct operation of plant. Maintenance records were checked to confirm no mains bursts in reticulation system. Resample results were clear of <i>Escherichia coli</i> .	Central Highlands Water
February 2011	Dean	Detection of <i>Escherichia coli</i> in drinking water	Site investigation conducted and disinfectant levels checked at entry point and in the reticulation. On line trends were also checked. Resample results were clear of <i>Escherichia coli</i> . Sample point is to be relocated to a more representative location.	Central Highlands Water

Date	Issue location	Type	Incident description	Reported by organisation
February 2011	Maryborough	Blue Green Algae	Increased monitoring regime in accordance with the blue-green algae management plan. Reservoir isolated from supply and powdered activated carbon dosing (PAC) implemented at treatment plant. Reservoir dosed with algicide and toxicity and residual copper testing undertaken.	Central Highlands Water
March 2011	Carisbrook	Elevated manganese in drinking water	Affected areas of the reticulation were flushed and scoured to remove manganese from the system. Treated water storages at the entry to the system were inspected and cleaned.	Central Highlands Water
April 2011	Ballarat Central	Detection of <i>Escherichia coli</i> in drinking water	Site investigation carried out and resample collected. Disinfectant levels confirmed. Decided to relocate the sample point to a more appropriate location to minimise interferences during sampling processes. Resample results were clear of <i>Escherichia coli</i> .	Central Highlands Water
April 2011	Smythesdale	Detection of <i>Escherichia coli</i> in treated storage basin	Site investigation carried out and resample collected. Basin was spot dosed with chlorine. Resample results were clear of <i>Escherichia coli</i> .	Central Highlands Water
April 2011	Maryborough	Blue Green Algae	Reservoir was already isolated due to pipeline renewal works. Increased monitoring regime in accordance with blue-green algae management plan. The "Supply by Agreement" customers were notified of blue-green algae.	Central Highlands Water
May 2011	Smeaton	Detection of <i>Escherichia coli</i> in storage tank	An inspection of the system was conducted and disinfectant levels were confirmed. Resample results were clear of <i>Escherichia coli</i> .	Central Highlands Water
June 2011	Ballarat Central	Detection of <i>Escherichia coli</i> in drinking water	Site investigation conducted. Resampled from the same site with further samples taken from properties either side. One <i>Escherichia coli</i> was detected again at the original sample site, but not detected in adjoining properties. Disinfectant levels were confirmed and flushing of the main at the sample location was carried out. Checked for burst mains and assessed operation of meter backflow device. Sample point maintenance conducted and sampling methodology reviewed. A decision to relocate sample point to a more appropriate location to minimise interferences during sampling processes. Further resamples were taken and results were clear of <i>Escherichia coli</i> .	Central Highlands Water

Date	Issue location	Type	Incident description	Reported by organisation
December 2010	Moonee Ponds	Detection of <i>Escherichia coli</i> in drinking water	<i>Escherichia coli</i> detected in a sample from the Moonee Ponds from locality in December 2010. At the time of the detection a cause could not be determined. No other samples, whether upstream or downstream, including repeat sampling, showed the presence of <i>Escherichia coli</i> . Follow-up investigations by City West Water indicated that there may have been issues with the integrity of the sample. Discussions were held with City West Water's contract laboratory who changed their sampling practices to improve sample integrity.	City West Water
December 2010	Werribee	Detection of <i>Escherichia coli</i> in storage tank	Initial investigations indicated a restriction to roof drainage on a small section of roof resulting in potential rain water ingress into tank. There were no upstream signs of contamination. Chlorine spot dosing of the tank was undertaken. Resample results were clear of <i>Escherichia coli</i> .	City West Water
January 2011	Werribee	Detection of <i>Escherichia coli</i> in high level storage tank	Chlorine spot dosing of the tank was undertaken. Resample results were clear of <i>Escherichia coli</i> .	City West Water
November 2010	Pyramid Hill	Detection of <i>Escherichia coli</i> in drinking water	Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
November 2010	Bendigo Southern	Detection of <i>Escherichia coli</i> in drinking water	There were no obvious problems with the system and no cause could be identified. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
December 2010	Rochester	Flood-related water quality issue	Due to a severe rainfall event and as a result the Rochester water treatment plant (WTP) was flooded. The clear water storages (CWS) at the water treatment plant were partly buried in the ground and there was concern that floodwater may have entered at least one of the clear water storages, potentially contaminating the drinking water supply. In response to the flooding a <b>boil water advisory</b> was issued. Various media releases were issued, notifications were sent to mobile and fixed phones in the area, letters were hand delivered to each customer, signs were placed around the town and a public meeting was held.	Coliban Water
December 2010	Harcourt	Detection of <i>Escherichia coli</i> in storage tank	Storage tank was spot dosed with sodium hypochlorite. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
December 2010	Inglewood	Detection of <i>Escherichia coli</i> in storage tank	Sodium hypochlorite been added to the tank to achieve a rate of 2 mg/L. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water

Incidents associated with a **boil water notice** are highlighted in white type.

Date	Issue location	Type	Incident description	Reported by organisation
December 2010	Tooborac	Detection of <i>Escherichia coli</i> in storage tank	Sodium hypochlorite been added to the tank to achieve a rate of 2 mg/L. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
December 2010	Malmsbury	Detection of <i>Escherichia coli</i> in storage tank	Storage tank was spot dosed with sodium hypochlorite. Some water from the tank was drained and refilled with new water. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
December 2010	Dunolly	Detection of <i>Escherichia coli</i> in drinking water	Spot dosing with sodium hypochlorite of all the tanks supplied from the Laanecoorie water treatment plant. All tanks and water sampling localities supplied from the Laanecoorie water treatment plant were resampled. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
January 2011	Boort, Bridgewater, Pyramid Hill, Rochester, Serpentine, Tarangulla, Tylden	Flood-related water quality issue	In response to severe flooding, <b>boil water advisories</b> were issued for the drinking water supplies of Boort, Bridgewater, Pyramid Hill, Rochester, Serpentine, Tarangulla and Tylden. A range of actions were taken to ensure that customers were kept advised on the status of their drinking water supplies for these towns. Boil water advisories were not lifted until safe to do so.	Coliban Water
January 2011	Tooborac	Detection of <i>Escherichia coli</i> in storage tank	Parts of the reticulation were flushed. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
January 2011	Goornong	Detection of <i>Escherichia coli</i> in drinking water	The water supply system was inspected. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
January 2011	Trentham	Detection of <i>Escherichia coli</i> in storage tank	The water supply system was inspected. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
February 2011	Tylden	Detection of <i>Escherichia coli</i> in drinking water	Spot dosing of the ground level tanks and flushing the chlorine through the reticulation system was undertaken. Plant processes were checked and were performing normally. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
March 2011	Tarnagulla	Detection of <i>Escherichia coli</i> in drinking water	Tank has previously been inspected with no items requiring attention. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
March 2011	Maldon	Detection of <i>Escherichia coli</i> in drinking water	An inspection of the system was conducted. Flushing was performed on the local reticulation network. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
March 2011	Tooborac	Detection of <i>Escherichia coli</i> in drinking water	An inspection of the system was conducted. Flushing was performed on the local reticulation network. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water

Incidents associated with a **boil water notice** are highlighted in white type.

Date	Issue location	Type	Incident description	Reported by organisation
March 2011	Maldon	Detection of <i>Escherichia coli</i> in drinking water	An inspection of the system was conducted. Flushing was performed on the local reticulation network. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
March 2011	Harcourt	Detection of <i>Escherichia coli</i> in storage tank	An inspection of the system was conducted. Tank was spot dosed with sodium hypochlorite. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
March 2011	Castlemaine	Detection of <i>Escherichia coli</i> in drinking water and storage tank	Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
April 2011	Newstead	Detection of <i>Escherichia coli</i> in drinking water	Spot dosing of the tank was undertaken and the mains were flushed. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
May 2011	Tooborac	Disinfection/ Treatment failure	The chlorinator that services the drinking water supply of Tooborac failed and overdosed chlorine into the drinking water supply. The system was flushed to lower the chlorine residuals and storage tank de-chlorinated with sodium metabisulphate and the water disposed of. The tank was refilled from Heathcote and the town network was flushed. A media release was issued via local radio station and a box of bottled water was hand-delivered to every household in Tooborac.	Coliban Water
June 2011	Harcourt	Detection of <i>Escherichia coli</i> in storage tank	Spot dosing of the tank was undertaken and the mains were flushed. Resample results were clear of <i>Escherichia coli</i> .	Coliban Water
March 2011	Traralgon	Detection of <i>Escherichia coli</i> in drinking water	Extensive flushing of the reticulation was undertaken. Additional monitoring of water quality parameters undertaken. Resample results were clear of <i>Escherichia coli</i> .	Gippsland Water
July 2010	Marysville	Elevated chlorite in drinking water	Chlorite is a disinfection by-product arising from the disinfection of water containing naturally occurring organic material with chlorine dioxide. An undertaking is currently in place for Marysville/Buxton to address elevated levels of chlorite and chlorate. Goulburn Valley Water will develop options of alternative disinfection. The solution has not yet been determined.	Goulburn Valley Water
August 2010	Marysville	Elevated chlorite in drinking water	Chlorite is a disinfection by-product arising from the disinfection of water containing naturally occurring organic material with chlorine dioxide. An undertaking is currently in place for Marysville/Buxton to address elevated levels of chlorite and chlorate. Goulburn Valley Water will develop options of alternative disinfection. The solution has not yet been determined.	Goulburn Valley Water

Date	Issue location	Type	Incident description	Reported by organisation
August 2010	Thornton	Elevated chloral hydrate in drinking water	There is currently an undertaking in place for Thornton. Thornton is to receive a new drinking water source via a pipeline from Alexandra water treatment plant. Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
September 2010	Marysville	Elevated chlorite in drinking water	Chlorite is a disinfection by-product arising from the disinfection of water containing naturally occurring organic material with chlorine dioxide. An undertaking is currently in place for Marysville/Buxton to address elevated levels of chlorite and chlorate. Goulburn Valley Water will develop options of alternative disinfection. The solution has not yet been determined.	Goulburn Valley Water
September 2010	Numurkah	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
October 2010	Barmah	Detection of <i>Escherichia coli</i> in drinking water	No recent mains breaks or repairs and no evidence of loss of disinfection at water treatment plant were identified. Investigative sampling for <i>Escherichia coli</i> , coliforms and total plate counts were conducted at five reticulation sampling sites, the clear water storage and the storage tower. Another <i>Escherichia coli</i> was detected at another sampling point so all sample points were again resampled. Chlorine levels were checked at all reticulation sites and flushing carried out as required. A small gap was discovered between hatch and roof of the new clear water storage was to be sealed by contractor. Resample results were then clear of <i>Escherichia coli</i> .	Goulburn Valley Water
October 2010	Marysville	Elevated chlorite in drinking water	Chlorite is a disinfection by-product arising from the disinfection of water containing naturally occurring organic material with chlorine dioxide. An undertaking is currently in place for Marysville/Buxton to address elevated levels of chlorite and chlorate. Goulburn Valley Water will develop options of alternative disinfection. The solution has not yet been determined.	Goulburn Valley Water
October 2010	Pyalong	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water



Date	Issue location	Type	Incident description	Reported by organisation
October 2010	Thornton	Elevated chloral hydrate in drinking water	There is currently an undertaking in place for Thornton. Thornton is to receive a new drinking water source via a pipeline from Alexandra water treatment plant. Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
October 2010	Numurkah	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
November 2010	Thornton	Elevated chloral hydrate in drinking water	There is currently an undertaking in place for Thornton. Thornton is to receive a new drinking water source via a pipeline from Alexandra water treatment plant. Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
November 2010	Barmah	Elevated manganese in drinking water	Recent heavy rainfall and localised flooding affected the quality of the water in the Murray River which resulted in a severe black water event. A number of complaints were received related to the colour of the treated water at Barmah. Goulburn Valley Water advised that the water remained safe to drink. Ongoing monitoring of the system was carried out due to the "colour" in the treated water. A potassium permanganate dosing system was installed to remove manganese and reduce the colour. Resampling and priority testing for manganese was undertaken to confirm that the permanganate dosing was operating correctly and to check the accuracy of internal testing for manganese. A letter was mailed to all customers with an explanation of the water quality issues in the Murray River including information of Goulburn Valley Water's response.	Goulburn Valley Water
November 2010	Longwood	Detection of <i>Escherichia coli</i> in storage tank	Investigation of the system was undertaken and resamples collected. There were no known breaks in treatment or any evidence of loss of disinfection at the treatment plant. There was no evidence of microbial ingress in the clear water storages. Resample results were clear of <i>Escherichia coli</i> .	Goulburn Valley Water

Date	Issue location	Type	Incident description	Reported by organisation
November 2010	Barmah	Elevated chloral hydrate in drinking water	A severe black water event was occurring in the Murray River at the time of sampling which would have contained large amounts of organic materials. The black water event contributed to the elevated chloral hydrate result. Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
November 2010	Marysville	Elevated chlorite in drinking water	Chlorite is a disinfection by-product arising from the disinfection of water containing naturally occurring organic material with chlorine dioxide. An undertaking is currently in place for Marysville/Buxton to address elevated levels of chlorite and chlorate. Goulburn Valley Water will develop options of alternative disinfection. The solution has not yet been determined.	Goulburn Valley Water
December 2010	Nagambie	Detection of <i>Escherichia coli</i> in drinking water	Possible contamination sources were investigated. No mains breaks reported or other potential recontamination sites identified. Resamples were collected and the results detected <i>Escherichia coli</i> . Every reticulation sample point was resampled. The storage tower was identified as the source of the contamination. A <b>boil water advisory</b> was issued and the water storage tower was taken off line and rechlorinated. Resample results were then clear of <i>Escherichia coli</i> and the boil water advisory was lifted.	Goulburn Valley Water
December 2010	Numurkah/Wunghnu	Detection of <i>Escherichia coli</i> in storage tank	Confirmed that the treatment plant was operating correctly and there was no loss in disinfection via SCADA. The chlorine levels were checked. Resampling of all sampling points designated to the Numurkah and Wunghnu localities was undertaken. Flushing of Numurkah and Wunghnu reticulation systems was undertaken. Storages were inspected for ingress. No apparent cause identified. Resample results were then clear of <i>Escherichia coli</i> .	Goulburn Valley Water
December 2010	Tallarook	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water

Incidents associated with a **boil water notice** are highlighted in white type.

Date	Issue location	Type	Incident description	Reported by organisation
December 2010	Numurkah	Elevated chloral hydrate in drinking water	A significant black water event occurred in the raw water source as a result of the floods in early December 2010. The black water contained large amounts of organic material. Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
December 2010	Alexandra	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
January 2011	Kilmore	Detection of <i>Escherichia coli</i> at storage tank outlet	Disinfection levels were checked and found to be normal but were increased in response to the detection. Source could not be identified. Resample results were clear of <i>Escherichia coli</i> .	Goulburn Valley Water
January 2011	Toolamba	Detection of <i>Escherichia coli</i> in storage tank	It was raining at the time of sampling and the sampling point is located where it is subjected to rain runoff from the tower. The sampling point location appropriateness has been reviewed and is to be relocated. There was no cause identified for the <i>Escherichia coli</i> detection. Resample results were clear of <i>Escherichia coli</i> .	Goulburn Valley Water
January 2011	Trawool	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
January 2011	Nagambie	Elevated chloral hydrate in drinking water	Heavy rainfall has resulted in Lake Nagambie having very poor water quality. The water contained a lot of organic material which was being monitored. Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
January 2011	Marysville	Elevated chlorite in drinking water	Chlorite is a disinfection by-product arising from the disinfection of water containing naturally occurring organic material with chlorine dioxide. An undertaking is currently in place for Marysville/Buxton to address elevated levels of chlorite and chlorate. Goulburn Valley Water will develop options of alternative disinfection. The solution has not yet been determined.	Goulburn Valley Water

Date	Issue location	Type	Incident description	Reported by organisation
February 2011	Nagambie	Elevated chloral hydrate in drinking water	Heavy rainfall has resulted in Lake Nagambie having very poor water quality. The water contained a lot of organic material which was being monitored. Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
February 2011	Pyalong	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
February 2011	Marysville	Elevated chlorite in drinking water	Chlorite is a disinfection by-product arising from the disinfection of water containing naturally occurring organic material with chlorine dioxide. An undertaking is currently in place for Marysville/Buxton to address elevated levels of chlorite and chlorate. Goulburn Valley Water will develop options of alternative disinfection. The solution has not yet been determined.	Goulburn Valley Water
March 2011	Violet Town	Detection of <i>Escherichia coli</i> in storage tanks	Inspection of the clear water storage was undertaken. No source could be identified. Resamples were collected and results were clear of <i>Escherichia coli</i> .	Goulburn Valley Water
March 2011	Eildon	Detection of <i>Escherichia coli</i> in high level storage tank	Initiated a <b>boil water advisory</b> to the affected customers in the Ti Tree Drive system. This part of the reticulation was flushed and dosed with hypochlorite. Resamples collected throughout the whole of the Eildon reticulation system. The water treatment plant performance was investigated and no issues were identified. Resample results were clear of <i>Escherichia coli</i> .	Goulburn Valley Water
March 2011	Girgarre	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
March 2011	Marysville	Elevated chlorite in drinking water	Chlorite is a disinfection by-product arising from the disinfection of water containing naturally occurring organic material with chlorine dioxide. An undertaking is currently in place for Marysville/Buxton to address elevated levels of chlorite and chlorate. Goulburn Valley Water will develop options of alternative disinfection. The solution has not yet been determined.	Goulburn Valley Water

Incidents associated with a **boil water notice** are highlighted in white type.

Date	Issue location	Type	Incident description	Reported by organisation
March 2011	Numurkah	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
April 2011	Marysville	Elevated chlorite in drinking water	Chlorite is a disinfection by-product arising from the disinfection of water containing naturally occurring organic material with chlorine dioxide. An undertaking is currently in place for Marysville/Buxton to address elevated levels of chlorite and chlorate. Goulburn Valley Water will develop options of alternative disinfection. The solution has not yet been determined.	Goulburn Valley Water
April 2011	Thornton	Elevated chloral hydrate in drinking water	There is currently an undertaking in place for Thornton. Thornton is to receive a new drinking water source via a pipeline from Alexandra water treatment plant. Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
April 2011	Stanhope	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
April 2011	Pyalong	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
May 2011	Thornton	Elevated chloral hydrate in drinking water	There is currently an undertaking in place for Thornton. Thornton is to receive a new drinking water source via a pipeline from Alexandra water treatment plant. Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
May 2011	Pyalong	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
May 2011	Girgarre	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water

Date	Issue location	Type	Incident description	Reported by organisation
June 2011	Pyalong	Elevated chloral hydrate in drinking water	Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Goulburn Valley Water
June 2011	Marysville	Elevated chlorite in drinking water	Chlorite is a disinfection by-product arising from the disinfection of water containing naturally occurring organic material with chlorine dioxide. An undertaking is currently in place for Marysville/Buxton to address elevated levels of chlorite and chlorate. Goulburn Valley Water will develop options of alternative disinfection. The solution has not yet been determined.	Goulburn Valley Water
July 2010	Lake Bolac	Detection of <i>Escherichia coli</i> in drinking water	The reticulation system and water treatment plant logs were reviewed and did not indicate that there has been any failure of the disinfection system. Resample results were clear of <i>Escherichia coli</i> .	Grampians Wimmera Mallee (GWM) Water
October 2010	Murtoa	Detection of <i>Escherichia coli</i> in drinking water	The reticulation system and water treatment plant logs were reviewed and did not indicate that there has been any failure of the disinfection system. Resample results were clear of <i>Escherichia coli</i> .	Grampians Wimmera Mallee (GWM) Water
October 2010	Jung	Detection of <i>Escherichia coli</i> in drinking water	The reticulation system and water treatment plant logs were reviewed and did not indicate that there has been any failure of the disinfection system. Resample results were clear of <i>Escherichia coli</i> .	Grampians Wimmera Mallee (GWM) Water
December 2010	Horsham	Detection of <i>Escherichia coli</i> in drinking water	The reticulation system and water treatment plant logs were reviewed and did not indicate that there has been any failure of the disinfection system. Resample results were clear of <i>Escherichia coli</i> .	Grampians Wimmera Mallee (GWM) Water
January 2011	Sea Lake	Detection of <i>Escherichia coli</i> in drinking water	The system was inspected. Resample results were clear of <i>Escherichia coli</i> .	Grampians Wimmera Mallee (GWM) Water
April 2011	Ouyen	Elevated trihalomethanes in drinking water	Significant rain events in the Murray River catchments have washed humic and fulvic acids into the Murray River leading to increase in disinfection by products. Monitoring of the supply continued with poor water quality contributing to an increase in trihalomethane levels.	Grampians Wimmera Mallee (GWM) Water
June 2011	Warracknabeal	Blue Green Algae	Blue-green algal bloom on the raw water storage for the Warracknabeal water supply. Powdered activated carbon (PAC) dosing commenced at the Warracknabeal water treatment plant. The raw water storages were bypassed and the town supplied directly from the Wimmera Mallee Pipeline. The storages were dosed with algicide. Normal supply arrangements resumed in July 2011.	Grampians Wimmera Mallee (GWM) Water

Date	Issue location	Type	Incident description	Reported by organisation
June 2011	Dimboola	Blue Green Algae	Blue-green algal bloom on the raw water storage for the Dimboola water supply system. Raw water storage for the town was by-passed and was supplied directly from the Wimmera Mallee Pipeline. The storages were dosed with an algicide. Normal supply arrangements resumed in July 2011.	Grampians Wimmera Mallee (GWM) Water
October 2010	Mildura	Disinfection/ Treatment failure	During the treatment process sludge/ flocculation carried over from a sedimentation tank, causing a rapid increase in the turbidity of filtered water. As a result the turbidity of the treated water entering the reticulation system also increased. There was no compromise to disinfection with chlorine levels being good at all times. After discussions with the department, a targeted flushing program across Mildura was undertaken to remove the turbid water. Water quality samples were collected to assess the quality of the water. Resample results were clear of <i>Escherichia coli</i> . As a result of this incident all Lower Murray Water water treatment plants now shut down and raise an alarm if the filtered water exceeds 1.0 NTU for greater than five minutes.	Lower Murray Water
March 2011	Mildura	Detection of <i>Escherichia coli</i> in drinking water	At the time of the detection the raw water quality was extremely poor due to the black water event in the Murray River and flooding. Lower Murray Water inspected and flushed the distribution system in the vicinity where the detection occurred. Resample results were clear of <i>Escherichia coli</i> .	Lower Murray Water
September 2010	Yan Yean	Detection of <i>Escherichia coli</i> in treated water storage	The storage tank was spot dosed with chlorine as a precautionary measure. Inspections and investigation could not determine the source. Resample results were clear of <i>Escherichia coli</i> .	Melbourne Water
November 2010	Yan Yean	Detection of <i>Escherichia coli</i> in treated water storage	Additional monitoring was undertaken and the storage tank was spot dosed with chlorine as a precautionary measure. During investigations it was discovered that a tank bypass valve that linked untreated water from Yan Yean reservoir and the tank outlet could have been leaking a small amount of untreated water. The water system flow was reversed to prevent untreated water coming from the reservoir. The tank was cleaned and spot dosed with chlorine. Maintenance on the valve has been carried out and the valve is now fully closed. Resample results were clear of <i>Escherichia coli</i> .	Melbourne Water

Date	Issue location	Type	Incident description	Reported by organisation
December 2010	Silvan	Incident relating to fluoride dosing	The Silvan-Waverley fluoride plant had a high fluoride residual following a blockage in the dosing system. This resulted in an excess of fluoride being dosed for 32 minutes in the water mains downstream of the Silvan treatment plant. The fluoride residual went above 1.5mg/L at 10:58am and did not return to below 1.5mg/L until 11:30am. The control system did not activate as expected to immediately stop dosing when the fluoride residual reached 1.2mg/L. The fluoride plant initiated a high fluoride residual alarm at 10:58am, but the plant did not shutdown until 11:21am. Due to the mixing of water in the water supply system, high fluoride results were not detected in water samples taken downstream of the plant. Following the incident, improvement actions have been undertaken. These actions include the implementation of a maintenance task to remove and check lines for blockages, and a review and update of the fluoride alarms and associated procedures. A project to upgrade the Silvan fluoride plants is scheduled to commence in 2011, and is to be completed in 2012.	Melbourne Water
September 2010	Mount Hotham	Detection of <i>Escherichia coli</i> in drinking water	The UV lamps were checked to ensure operating correctly, the raw water turbidity was low and sampling procedures were reviewed. The source could not be identified. Chlorine dosing was implemented for the peak use period as a precautionary measure. Resample results were clear of <i>Escherichia coli</i> .	Mount Hotham ARMB
November 2010	Mount Hotham	Loss of disinfection	There was a power outage and the backup generator for the UV lamps did not turn on. The UV lamps were not operating for approximately 17hrs until they were physically switched back on by the operator. UV is the only treatment process for the drinking water. Untreated water would have entered the drinking water reticulation system during the time the UV lamps were not operating. There would have been only approximately 10 people up at Mt Hotham during the period that the UV lamps were not operating. The back up generator has been programmed to ensure it automatically turns on during a power outage.	Mount Hotham ARMB



Date	Issue location	Type	Incident description	Reported by organisation
February 2011	Mount Hotham	Detection of <i>Escherichia coli</i> post UV treatment plant	Ultra Violet lamps were checked to ensure operating correctly. The raw water storage tank was chlorinated as a precaution. Resample results were clear of <i>Escherichia coli</i> .	Mount Hotham ARMB
June 2011	Mount Hotham	Detection of <i>Escherichia coli</i> post UV treatment plant	UV lamps were checked and both of the UV lamps were on and operational. The flow of water was slowed to enable maximum irradiation of the water. The automatic chlorine dosing was implemented over the weekend following the detection as a precaution. Resample results were clear of <i>Escherichia coli</i> .	Mount Hotham ARMB
March 2011	TBJ - Mt Stirling	Detection of <i>Escherichia coli</i> in drinking water	The chlorine dosing system ran out of chlorine. The chlorine was replenished and the system was flushed. This drinking water supply is generally only utilised during the snow season and not during the summer period which is when the detection occurred. Resample results were clear of <i>Escherichia coli</i> .	Mount Buller and Mount Stirling ARMB
June 2011	Mirrimbah	Detection of <i>Escherichia coli</i> in drinking water	The chlorine dosing line had a hole in it reducing the amount of chlorine disinfecting the drinking water. The hole in chlorine dosing line had been caused by rodents. The hole was repaired and the system was dosed with chlorine to achieve a good residual and then flushed. A pest control program has been implemented at this site to prevent this from reoccurring. Resample results were clear of <i>Escherichia coli</i> .	Mount Buller and Mount Stirling ARMB
September 2010	Myrtleford	Detection of <i>Escherichia coli</i> in drinking water	Increased monitoring of the reticulation allowed additional vigilance and response flushing of localised areas of the reticulation. UV lamps are cleaned and flushed weekly at the water treatment plant, all valves are open to reduce the possibility of any dead end accumulation zones. Resample results were clear of <i>Escherichia coli</i> .	North East Water
September 2010	Myrtleford	Detection of <i>Escherichia coli</i> in drinking water	Detection occurred post the flooding event. The UV lamps are cleaned and flushed weekly at the treatment plant. Localised flushing of the mains was undertaken in the area of the detection. All other sampling sites around this one were clear for <i>Escherichia coli</i> . Resample results were clear of <i>Escherichia coli</i> .	North East Water

Date	Issue location	Type	Incident description	Reported by organisation
September 2010	Myrtleford	Detection of <i>Escherichia coli</i> in drinking water	The detection occurred whilst a precautionary boil water advisory was in place from 5 September 2010 due to flooding inundating some areas of the reticulation. All other sampling sites around this one were clear of <i>Escherichia coli</i> . The resample results were clear of <i>Escherichia coli</i> . The <b>boil water advisory</b> was lifted 17 September 2010.	North East Water
September 2010	Whitfield	Detection of <i>Escherichia coli</i> post UV treatment plant	A power surge caused damage to the chlorine dioxide disinfection system. Repairs were conducted promptly with the UV barrier reinstated within 30 seconds of the outage via a back up generator. Additional electrical barriers were installed to protect the disinfection equipment from the power surges. When the chlorine dioxide was reinstated, disinfected water was flushed through the reticulation system. All disinfection equipment is alarmed to notify of equipment failures. Resample results were clear of <i>Escherichia coli</i> .	North East Water
September 2010	Harrietville	Flood-related - Boil Water Advisory	Heavy rainfall resulted in increased turbidity at both of the source waters for Harrietville. The water at this site is not filtered prior to treatment. A precautionary <b>boil water advisory</b> was issued for the township of Harrietville. The boil water advisory stayed in place until such time as the safety of the drinking water supply can be guaranteed.	North East Water
September 2010	Bright, Wandiligong, Porepunkah	Flood-related - Boil Water Advisory	Due to heavy rainfall and deteriorating raw water quality a precautionary boil water advisory was issued for the townships of Bright, Wandiligong and Porepunkah. The <b>boil water advisory</b> stayed in place until such time as the safety of the drinking water supply could be guaranteed.	North East Water
September 2010	Myrtleford	Flood-related - Boil Water Advisory	Due to heavy rainfall, deteriorating raw water quality, lack of any residual disinfection within the distribution system and areas of the drinking water reticulation under flood water, a precautionary <b>boil water advisory</b> was issued for the township of Myrtleford. The boil water advisory stayed in place until such time as the safety of the drinking water supply can be guaranteed.	North East Water

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Date	Issue location	Type	Incident description	Reported by organisation
October 2010	Tallangatta	Loss of disinfection	Heavy rainfall resulted in an increased turbidity in Lake Hume at Tallangatta. A high spike in the turbidity of the source water shut down the water treatment plant. A slug of turbid water passed through the filters and entered the clear water storage before the plant shut down. The turbid water was not identified by operational staff until it entered the reticulation system. Once identified the bulk of the turbid water was flushed from the reticulation system. Additional monitoring was undertaken. Resample results were clear of <i>Escherichia coli</i> . An internal debrief was held in regard to this incident.	North East Water
October 2010	Wodonga	Loss of disinfection	The raw water storage basin was offline for maintenance. As a result of a high rainfall event turbidity increased in the raw water supply. The water treatment plant had difficulty filtering the turbid water which resulted in the filters becoming blocked, and, as a result elevated turbidity in the drinking water. Pump stations were shut down isolating the turbid water to localised sections of the reticulation. The affected parts of the reticulation was scoured and flushed. Extensive monitoring was undertaken. No customer complaints were received. North East Water believed that the general water supply remained safe throughout this period. Resample results were clear of <i>Escherichia coli</i> . A internal debrief was held in regard to this incident, resulting in changes being made to internal processes, protocols and infrastructure.	North East Water
November 2010	Wangaratta	Detection of <i>Escherichia coli</i> in storage tank	The systems and records were checked and no issues were identified at the treatment plant. There were no main breaks within the reticulation. There was a low chlorine residual in the clear water tank at the time of sampling. The clear water storage tank was inspected with no obvious issues observed. Chlorine residuals were increased. Investigations could not identify the source. Resample results were clear of <i>Escherichia coli</i> .	North East Water
November 2010	Corryong	Loss of disinfection	During the night a large storm caused a power flicker which started the power generator at the water treatment plant. The generator operated until it ran out of fuel, which set off alarms because there was no power to the UV lamp or the chlorinator. The contractor attended the plant in response to the alarms and physically turned the power back on to the water treatment plant. It is estimated that the plant did not disinfect for approximately 7-8 minutes. An electrician attended the site the next day. Samples were taken from the reticulation and results were clear of <i>Escherichia coli</i> .	North East Water

Date	Issue location	Type	Incident description	Reported by organisation
November 2010	Corryong	Loss of disinfection	During the night a large storm caused a power flicker which started the power generator at the water treatment plant. The generator operated until it ran out of fuel, which set off alarms because there was no power to the UV lamp or the chlorinator. The contractor attended the plant in response to the alarms and physically turned the power back on to the water treatment plant. It is estimated that the plant did not disinfect for approximately 7-8 minutes. An electrician attended the site the next day. Samples were taken from the reticulation and results were clear of <i>Escherichia coli</i> .	North East Water
December 2010	Springhurst	Detection of <i>Escherichia coli</i> in drinking water	The water treatment plant was inspected with no obvious source identified. No mains breaks had been reported. Resample results were clear of <i>Escherichia coli</i> .	North East Water
January 2011	Myrtleford	Detection of <i>Enterococci</i> in drinking water	A seasonal <b>boil water advisory</b> is in place for Myrtleford (1/11/10 - 30/4/11). The UV lamps are cleaned and flushed weekly. The distribution system was been checked and reticulation flushed in localised areas. A press release was issued to the Myrtleford community and visitors to remind them to boil water before consumption.	North East Water
January 2011	Devenish	Detection of <i>Escherichia coli</i> in drinking water	The water supply system was inspected with no obvious source identified. Resample results were clear of <i>Escherichia coli</i> .	North East Water
February 2011	Myrtleford	Detection of <i>Escherichia coli</i> in drinking water	A seasonal <b>boil water advisory</b> is in place for Myrtleford (1/11/10 - 30/4/11). The UV lamps are cleaned and flushed weekly.	North East Water
February 2011	Myrtleford	Detection of <i>Escherichia coli</i> in drinking water	A seasonal <b>boil water advisory</b> is in place for Myrtleford (1/11/10 - 30/4/11). Weekly checking and flushing of UV lamps are carried out. A media release to remind the community and tourists to boil water was issued during the previous week.	North East Water

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Date	Issue location	Type	Incident description	Reported by organisation
February 2011	Bright/ Wandiligong/ Porepunkah	Loss of disinfection	Due to a large rainfall event, the ground level clear water storage was inundated with stormwater as the diversion drainage capacity was exceeded. The clear water storage was isolated, drained and cleaned with enough water being stored in high level clear water storage to supply the towns. The chlorinator was turned off during this process and not reinstated when the water treatment plant was brought back on line. Once identified, the operator drained the clear water storage and reinstated chlorine dosing. Additional sampling of all three localities affected (Bright, Wandiligong and Porepunkah) was conducted and results were free of microbial contamination. A staff debrief of the incident was held. A project has been initiated to reduce the likelihood of ingress/inundation of the clear water storage.	North East Water
February 2011	Tallangatta	Widespread complaint - taste and odour	Due to a combination of algal growth and decaying vegetation with the rise of the water level in Lake Hume it has resulted in taste and odour compounds to be present in the drinking water. These compounds caused widespread public complaint. Powdered activated carbon dosing commenced at the water treatment plant, however it took time to optimise. Further monitoring and improved operations at the treatment plant reduced the levels of taste and odour compounds. Flushing of reticulation was carried out to draw the improved water through the town.	North East Water
March 2011	Myrtleford	Detection of <i>Escherichia coli</i> in drinking water	A seasonal <b>boil water advisory</b> is in place for Myrtleford (1/11/10 - 30/4/11). The UV lamps are cleaned and flushed weekly.	North East Water
March 2011	Wangaratta	Detection of <i>Escherichia coli</i> in storage tank	Initial inspection of the tank could not identify the source. When resample returned positive <i>Escherichia coli</i> a series of actions to mitigate further contamination risks were undertaken. Actions included cleaning of the tank, relocation of the sample tap, repair flashing around the roof of the tank. Resample results were clear of <i>Escherichia coli</i> .	North East Water
March 2011	Corryong	Detection of <i>Escherichia coli</i> in drinking water	The chlorine residual was increased. The high level reticulation was flushed to increase chlorine residuals through the reticulation system. Further investigation is to be carried out to identify improved methods/operation to maintain chlorine levels during times of low demand/usage. Resample results were clear of <i>Escherichia coli</i> .	North East Water

Incidents associated with a **boil water notice** are highlighted in white type.

Date	Issue location	Type	Incident description	Reported by organisation
March 2011	Beechworth	Detection of <i>Escherichia coli</i> in storage tank	The clear water storage tank was inspected and no operational issues were identified at the water treatment plant. All operations were closely monitored. Investigations could not determine the source. Resample results were clear of <i>Escherichia coli</i> .	North East Water
March 2011	Wangaratta	Detection of <i>Escherichia coli</i> in storage tank	The storage tanks were been inspected and found to be in good order with no sign of any damage or contamination. Resample results were clear of <i>Escherichia coli</i> .	North East Water
April 2011	Myrtleford	Detection of <i>Enterococci</i> in drinking water	A seasonal <b>boil water advisory</b> is in place for Myrtleford (1/11/10 - 30/4/11). The UV lamps are cleaned and flushed weekly. The distribution system was checked and flushed in localised areas of the reticulation. A community newsletter was sent to Myrtleford residents advising to continue boiling water over the Easter period and that the <b>boil water advisory</b> will be lifted on 1 May 2011. The North East Water website was updated to include this message.	North East Water
September 2010	Gabo Island Lightstation	Detection of <i>Escherichia coli</i> in drinking water	The tanks were treated with sodium hypochlorite and the lines to the tap were flushed. Resample results were clear of <i>Escherichia coli</i> .	Parks Victoria
December 2010	Lake Eildon	Detection of <i>Escherichia coli</i> in drinking water	The tanks were manually dosed with sodium hypochlorite. The lines were flushed to clear contaminated water. All taps accessing water from the tank were closed off and "Do Not Drink" signs were installed. Resample results were clear of <i>Escherichia coli</i> .	Parks Victoria
December 2010	Gabo Island Lightstation	Detection of <i>Escherichia coli</i> in drinking water	The tanks were treated with sodium hypochlorite and the lines to the tap were flushed. Resample results were clear of <i>Escherichia coli</i> .	Parks Victoria
February 2011	Tidal River	Detection of <i>Escherichia coli</i> in drinking water	The non-compliant result was not reported to Parks Victoria by the testing laboratory until after subsequent tests had shown <i>Escherichia coli</i> levels were zero. The laboratory was immediately contacted to confirm the result and to ensure that the correct notification procedures for non-compliant results are in place.	Parks Victoria
April 2011	Lake Eildon	Detection of <i>Escherichia coli</i> in drinking water	The storage tank at Devil Cove Campground was closed and treated with sodium hypochlorite. The lines were flushed to clear contaminated water. All taps accessing water from the tank were closed off and "Do Not Drink" signs installed. Resample results were clear of <i>Escherichia coli</i> .	Parks Victoria
June 2011	Gabo Island Lightstation	Detection of <i>Escherichia coli</i> in drinking water	The tanks were treated with sodium hypochlorite and the lines to the tap were flushed. Resample results were clear of <i>Escherichia coli</i> .	Parks Victoria

Incidents associated with a **boil water notice** are highlighted in white type.

Date	Issue location	Type	Incident description	Reported by organisation
November 2010	Caulfield	Widespread complaint - dirty water	Dirty water complaints were the result of a water main shut down. The burst water main was repaired. The affected area of the reticulation was flushed.	South East Water
December 2010	Hallam	Widespread complaint - dirty water	The burst water main was repaired. Flushing of the reticulation was carried out to ensure safe water was supplied to customers.	South East Water
January 2011	Hastings	Detection of <i>Escherichia coli</i> in drinking water	Water supply system was inspected and the area was flushed. Resample results were clear of <i>Escherichia coli</i> .	South East Water
January 2011	Dandenong	Detection of <i>Escherichia coli</i> in drinking water	Water supply system was inspected and the area was flushed. Resample results were clear of <i>Escherichia coli</i> .	South East Water
February 2011	Brighton-Heatherton	Detection of <i>Escherichia coli</i> in drinking water	Water supply system was inspected and the area was flushed. Resample results were clear of <i>Escherichia coli</i> .	South East Water
February 2011	Cardinia	Widespread complaint - taste and odour	A number of customer complaints were received as a result of a change of water supply through the chlorinator at Cardinia Reservoir causing the chlorine residual to decrease to a lower than usual level. Chlorine levels in the system were increased to rectify the issue.	South East Water
February 2011	Mornington	Widespread complaint - dirty water	Damage to a fire plug located on a water main stirred up sediment within the main. Strategic flushing was undertaken in the area complaints were received. Affected customers were advised of the reason for the dirty water and that crews were on site flushing. Crews remained onsite until the water had cleared.	South East Water
April 2011	South Melbourne	Detection of <i>Escherichia coli</i> in drinking water	The water supply system was inspected and the area was flushed. Resample results were clear of <i>Escherichia coli</i> .	South East Water
November 2010	Toora	Widespread complaint - dirty water	A slug of sediment material passed into the trunk main following a scouring event at the clear water storage. Flushing of the affected parts of the reticulation was carried out. A de-brief meeting was held to discuss why radio communications seemed to have failed and what additional back-up systems can be put in place.	South Gippsland Water
December 2010	Lance Creek	Widespread complaint - taste and odour	Blue-green algae in the reservoir was treated with algicide. Water was dosed with powdered activated carbon to remove taste and odour compounds. Additional monitoring for algae and algal compounds was conducted. The reticulation was flushed to remove any residual taste and odour compounds.	South Gippsland Water
January 2011	Toora	Detection of <i>Escherichia coli</i> in storage tank	The water supply system was inspected and treatment plant was functioning normally. Resample results were clear of <i>Escherichia coli</i> .	South Gippsland Water

Date	Issue location	Type	Incident description	Reported by organisation
January 2011	Korumburra	Detection of <i>Escherichia coli</i> in drinking water	The water supply system was inspected. The reticulation was flushed to improve the chlorine residual levels. Resample results were clear of <i>Escherichia coli</i> .	South Gippsland Water
January 2011	Leongatha	Widespread complaint - dirty water	Difficulties arose to optimise treatment for manganese removal, following the treatment of algae in Leongatha reservoirs. Adjustment of chemical dosing to optimise the treatment plant was undertaken. The mains were flushed and scoured.	South Gippsland Water
April 2011	Wonthaggi	Detection of <i>Escherichia coli</i> in drinking water	The reticulation where detection occurred was flushed. Resample results were clear of <i>Escherichia coli</i> .	South Gippsland Water
April 2011	Cape Paterson	Detection of <i>Escherichia coli</i> in drinking water	The reticulation where detection occurred was flushed. Resample results were clear of <i>Escherichia coli</i> .	South Gippsland Water
May 2011	Korumburra	Widespread complaint - dirty water	The water treatment plant has been optimised for manganese removal. Extensive flushing to remove dirty water from the system was carried out. Air scouring program is to commence September 2011.	South Gippsland Water
June 2011	Dumbalk	Detection of <i>Escherichia coli</i> in drinking water	No mains breaks were recorded in the area. The affected reticulation was flushed. Samples were taken pre and post flushing. Resample results were clear of <i>Escherichia coli</i> .	South Gippsland Water
August 2010	Glenthompson	Elevated aluminium in drinking water	The reticulation system was flushed.	Wannon Water
August - October 2010	Purnim	Elevated chloral hydrate in drinking water	Alterations to the treatment process were investigated. Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Wannon Water
September 2010 - June 2011	Cavendish	Elevated aluminium in drinking water	Temporary dissolved air flotation was set up in an attempt to removed elevated aluminium from the source water. The raw water basin was dosed with aluminium chlorohydrate (a coagulant) in November 2010.	Wannon Water
October 2010	Hamilton	Elevated aluminium in drinking water	The water treatment plant was in the commissioning phase of an upgrade when the elevated levels of aluminium occurred. The plant was optimised by May 2011.	Wannon Water



Date	Issue location	Type	Incident description	Reported by organisation
November 2010	Cavendish	Elevated chloral hydrate in drinking water	Dissolved air flotation was installed to remove organics and the chlorine to ammonia ratio was altered. Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. The health significance of chloral hydrate is currently being reviewed in consultation with the department.	Wannon Water
November 2010	Cavendish	Elevated monochloramine in drinking water	Dissolved air flotation plant was shut down and the main was flushed.	Wannon Water
January 2011	Dunkeld	Detection of <i>Escherichia coli</i> in drinking water	There were no known issues with the water supply system at the time of sampling. The water mains in the affected area were flushed. Resample results were clear of <i>Escherichia coli</i> .	Wannon Water
January 2011	Portland	Detection of <i>Escherichia coli</i> in storage tank	The system was inspected and no known problems with the water supply system were identified. Resample results were clear of <i>Escherichia coli</i> .	Wannon Water
January 2011	Hamilton	Elevated aluminium in drinking water	The water treatment plant was in the commissioning phase of an upgrade when the elevated levels of aluminium occurred. The plant was optimised by May 2011.	Wannon Water
January 2011	Cavendish	Elevated monochloramine in drinking water	The chlorine dose rates were reduced and the clear water storage was diluted via recycling the water through the storage back into the raw water basin. The control of the chlorine dosing was simplified.	Wannon Water
January 2011	Glenthompson	Elevated manganese in drinking water	The system and treatment processes were inspected. Pre-chlorine dosing commenced to oxidise manganese. Weekly flushing of the reticulation occurred until the issue was resolved.	Wannon Water
February 2011	Glenthompson	Elevated trichloroacetic acid in drinking water	This is an ongoing incident and several treatment processes to remove the manganese were tried, with pre-chlorination resulting in exceedence of the disinfection by product trichloroacetic acid. Introduced the use of calgon and ceased pre-chlorine dosing. Additional samples collected.	Wannon Water
February – April 2011	Glenthompson	Elevated trihalomethanes in drinking water	This is an ongoing incident and several treatment processes to remove the manganese were tried, with pre-chlorination resulting in exceedence of the disinfection by product trichloroacetic acid. Introduced the use of calgon and ceased pre-chlorine dosing. Additional samples collected.	Wannon Water
March 2011	Dunkeld	Elevated aluminium in drinking water	The result was associated with sediment in the mains rather than poor plant performance. The main was flushed and a regular mains flushing program implemented.	Wannon Water

Date	Issue location	Type	Incident description	Reported by organisation
April 2011	Warrnambool	Blue Green Algae	The raw water basin was isolated due to blue-green algae bloom. Sampling frequency was increased and dissolved air flotation was implemented at the water treatment plant resolving taste and odour issues.	Wannon Water
June 2011	Balmoral	Elevated aluminium in drinking water	This is related to plant performance. The water treatment plant was optimised. The reticulation system was flushed and the frequency of routine flushing was increased.	Wannon Water
November 2010	Lancefield	Detection of <i>Escherichia coli</i> in drinking water	The system was inspected and there were no obvious signs of treatment failure or contamination. Resample results were clear of <i>Escherichia coli</i> .	Western Water
November 2010	Melton South	Potential to cause widespread complaint - dirty water	A slug of turbid water came through the pump station (off-take from Melbourne Water) resulting from works being conducted at the reservoir. The water treatment plant shut down. Approximately 0.5 ML of turbid water entered the reticulation. No complaints were received. Additional monitoring was undertaken during the event. Sample results were free of <i>Escherichia coli</i> .	Western Water
January 2011	Riddells Creek	Disinfection/ Treatment failure	Due to the failure of the zone's water pump, raw water entered the reticulation system. Flushing of the reticulation was undertaken, along with spot dosing the affected area with chlorine and letter dropping all affected customers. Letters and bottled water were hand-delivered to affected customers. The letters advised customers of what had happened, that they should seek medical advice if they were feeling unwell, and that they should consider <b>either drinking bottled water, or boiling drinking water taken from the tap, as a precaution.</b>	Western Water
February 2011	Darley	Detection of <i>Escherichia coli</i> in storage tank	The tank was spot dosed with chlorine. Resample results were clear of <i>Escherichia coli</i> .	Western Water
February 2011	Woodend	Detection of <i>Escherichia coli</i> in drinking water	Investigations revealed a snake in the storage tank and a small crack in the internal rainwater downpipe which enters the tank. There had also been recent intense rainstorm events. The tank was spot dosed and taken off-line. Flushing of the system was undertaken to draw the chlorine through the reticulation system. Resample results were clear of <i>Escherichia coli</i> .	Western Water
April 2011	Lancefield	Detection of Faecal Streptococci in drinking water	Localised flushing of the reticulation was undertaken. Inspection of the sample tap was carried out and identified potential issues with the condition of the tap which may have been a contributing factor. Resample results were clear of <i>Escherichia coli</i> and faecal streptococci.	Western Water

Date	Issue location	Type	Incident description	Reported by organisation
August 2010	Bacchus Marsh	Widespread complaint - dirty water	A slug of dirty water was caused by a rapid change in flow in a major water main. The water remained safe and was purely an aesthetic issue. The system was flushed and affected properties were advised of the issue via a letter drop.	Western Water
July 2010	Thornbury	Detection of <i>Escherichia coli</i> in drinking water	The mains in the immediate area were flushed. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water
July 2010	Yan Yean	Detection of <i>Escherichia coli</i> in storage reservoir	The sample tap was checked and the main line flushed. Hairline cracks identified in the Red Hill supply tank will be reassessed. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water
November 2010	Blackburn	Detection of <i>Escherichia coli</i> in drinking water	The sample tap was checked and the water mains in the immediate area was flushed. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water
December 2010	Hawthorn East	Detection of <i>Escherichia coli</i> in drinking water	Low chlorine residual was recorded. The sample tap was inspected and the reticulation in immediate area was flushed. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water
January 2011	Rosanna	Detection of <i>Escherichia coli</i> in drinking water	The system was inspected and the cause could not be identified. The sample tap was inspected and the water mains in the immediate area were flushed. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water
January 2011	Chum Creek	Detection of <i>Escherichia coli</i> in storage tank	A likely explanation is that some contamination has come in through the roof of the tank. The tank was spot dosed with chlorine. An in-tank inspection of the roof was conducted. The roof is budgeted for replacement/upgrade in 2012. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water
January 2011	Ivanhoe	Detection of <i>Escherichia coli</i> in drinking water	The system was inspected and there were no obvious problems with the supply system. The sample tap was checked and the water mains in the immediate area were flushed. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water
January 2011	Montmorency	Detection of <i>Escherichia coli</i> in drinking water	There are no known problems with the water supply system in this area. The system was inspected and flushing was undertaken. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water
February 2011	Woori Yallock	Detection of <i>Escherichia coli</i> in drinking water	The affected sampling tap was inspected and the water mains in the affected area were flushed. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water
March 2011	Wattle Glen	Detection of <i>Escherichia coli</i> in drinking water	There were no known issues with the water supply system at the time of sampling. The water mains in the affected area were flushed. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water

Date	Issue location	Type	Incident description	Reported by organisation
March 2011	Avonsleigh	Detection of <i>Escherichia coli</i> in drinking water	The sample tap was been inspected and the water mains in the immediate area was flushed. Resample from same sample tap detected more <i>Escherichia coli</i> . The whole distribution zone was then flushed to clear the system. Chlorine levels were increased at each flushing location and more resamples collected. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water
April 2011	Greensborough	Detection of <i>Escherichia coli</i> in drinking water	Mains in the immediate area were flushed. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water
April 2011	Eltham	Detection of <i>Escherichia coli</i> in drinking water	Mains in the immediate area were flushed. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water
April 2011	Wallan	Detection of <i>Escherichia coli</i> in drinking water	The mains in the immediate area were flushed. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water
May 2011	Craigieburn	Detection of <i>Escherichia coli</i> in treated storage reservoir	The sample tap was inspected. The reservoir was spot dosed with chlorine and the roof of the tank was inspected. Resample results were clear of <i>Escherichia coli</i> .	Yarra Valley Water

### Notes

ARMB Alpine Resort Management Board

WTP Water treatment plant

# Melbourne Water is a water storage manager.

Notifications for aluminium and turbidity made under section 18 are not shown in this table.

## Appendix 9: Localities and towns

Water sampling locality	Water supplier	Suburb/Town supplied
Aireys Inlet	Barwon Water	Aireys Inlet, Fairhaven
Anakie	Barwon Water	Anakie, Staughtonvale
Anglesea	Barwon Water	Anglesea
Apollo Bay	Barwon Water	Apollo Bay, Marengo, Skenes Creek
Bannockburn	Barwon Water	Bannockburn, Gheringhap
Batesford	Barwon Water	Batesford
Bellarine	Barwon Water	Bellarine, Mannerim
Birregurra	Barwon Water	Birregurra
Clifton Springs	Barwon Water	Clifton Springs, Drysdale, Swan Bay, Wallington
Colac	Barwon Water	Alvie, Beeac, Colac, Coragulac, Cororooke, Elliminyt
Cressy	Barwon Water	Cressy
Forrest	Barwon Water	Forrest
Gellibrand	Barwon Water	Gellibrand
Highton	Barwon Water	Breakwater, East Geelong, Geelong, Geelong West, Highton, Moolap, Newcomb, Newtown, Rippleside, South Geelong, Thomson, Whittington
Highton High Level	Barwon Water	Ceres, Wandana Heights
Leopold	Barwon Water	Curlewis, Leopold
Lethbridge	Barwon Water	Lethbridge, She Oaks
Little River West	Barwon Water	Little River West
Lorne	Barwon Water	Lorne
Lovely Banks	Barwon Water	Bell Park, Corio, Geelong North, Hamlyn Heights, Lara, Norlane, North Shore,
Lovely Banks - Carrs Rd	Barwon Water	Lovely Banks, Moorabool
Meredith	Barwon Water	Meredith
Montpellier	Barwon Water	Bell Post Hill, Belmont, Fyansford, Geelong West, Hamlyn Heights, Hern Hill, Highton, Montpellier, Newtown
Moriac	Barwon Water	Moriac
Ocean Acres	Barwon Water	Ocean Acres (near Torquay)
Ocean Grove	Barwon Water	Barwon Heads, Marcus Hill, Ocean Grove
Pettavel	Barwon Water	Breamlea, Connewarre, Fresh Water Creek, Grovedale, Marshall, Mount Duneed, Pettavel, Waurm Ponds
Portarlington	Barwon Water	Indented Heads, Portarlington, St Leonards
Queenscliff	Barwon Water	Point Lonsdale, Queenscliff
Teesdale	Barwon Water	Inverleigh, Shelford, Teesdale
Torquay	Barwon Water	Jan Juc, Torquay
Winchelsea	Barwon Water	Winchelsea

Water sampling locality	Water supplier	Suburb/Town supplied
Alma	Central Highlands Water	Adelaide Lead, Alma, Moonlight
Avoca	Central Highlands Water	Avoca
Ballan	Central Highlands Water	Ballan
Ballarat Central	Central Highlands Water	Alfredton, Ballarat, Ballarat East, Canadian, Delacombe, Golden Point, Mount Pleasant, Redan, Woodmans Hill
Ballarat North / Nerrina	Central Highlands Water	Ballarat North, Nerrina
Beaufort	Central Highlands Water	Beaufort
Bet Bet	Central Highlands Water	Bet Bet, Betley, Havelock, Simson
Blackwood / Barrys Reef	Central Highlands Water	Barrys Reef, Blackwood
Bungaree / Wallace	Central Highlands Water	Bungaree, Wallace
Buninyong / Mount Helen	Central Highlands Water	Buninyong, Mount Clear, Mount Helen, Mount Pleasant
Cardigan Village	Central Highlands Water	Alfredton, Cardigan, Cardigan Village
Carisbrook	Central Highlands Water	Carisbrook, Flagstaff
Clunes	Central Highlands Water	Clunes
Creswick	Central Highlands Water	Creswick
Daisy Hill	Central Highlands Water	Daisy Hill
Daylesford High Level	Central Highlands Water	Daylesford (high level area)
Daylesford Low Level / Hepburn	Central Highlands Water	Daylesford (low level area), Hepburn Springs
Dean	Central Highlands Water	Dean
Enfield	Central Highlands Water	Corindhap, Dereel, Enfield, Rokewood
Fiskville / Glenmore	Central Highlands Water	Fiskville, Glenmore, Rowsley
Forest Hill	Central Highlands Water	Allendale, Broomfield, Kingston, Newlyn, Smeaton, Springmount
Gordon / Mount Egerton	Central Highlands Water	Gordon, Mount Egerton
Haddon	Central Highlands Water	Carngham, Delacombe, Haddon, Smythes Creek, Snake Valley
Lal Lal	Central Highlands Water	Bungal, Lal Lal, Navigators, Yendon
Learmonth	Central Highlands Water	Learmonth
Lexton	Central Highlands Water	Lexton
Linton	Central Highlands Water	Linton, Pittong
Majorca	Central Highlands Water	Craigie, Golden Point, Majorca
Maryborough	Central Highlands Water	Maryborough
Napoleons	Central Highlands Water	Enfield, Napoleons, Woodlands
Sebastopol	Central Highlands Water	Delacombe, Magpie, Sebastopol
Skipton	Central Highlands Water	Pittong, Skipton
Smythesdale	Central Highlands Water	Newtown, Scarsdale, Smythesdale
Talbot	Central Highlands Water	Talbot
Timor	Central Highlands Water	Bowenvale, Timor
Waubra	Central Highlands Water	Waubra

Water sampling locality	Water supplier	Suburb/Town supplied
Wendouree	Central Highlands Water	Ballarat East, Ballarat North, Black Hill, Brown Hill, Invermay, Wendouree, Lake Gardens, Miners Rest, Mitchell Park, Mount Rowan, Warrenheip
Altona	City West Water	Altona, Altona North, Laverton, Point Cook, Truganina
Caroline Springs	City West Water	Caroline Springs, Kealba, Keilor, Kings Park, St Albans
Deer Park	City West Water	Cairnlea, Deer Park, Derrimut, St Albans, Sunshine North
East Keilor	City West Water	Avondale Heights, Essendon, Keilor Park, Keilor East, Niddrie
Little River	City West Water	Little River
Maribyrnong	City West Water	Braybrook, Brooklyn, Footscray, Maidstone, Maribyrnong, Sunshine, Tottenham, Yarraville
Moonee Ponds	City West Water	Ascot Vale, Essendon, Flemington, Kensington, Moonee Ponds
Parkville	City West Water	Abbotsford, Carlton, Clifton Hill, Collingwood, East Melbourne, Fitzroy, Melbourne, North Melbourne, Parkville, Docklands
Richmond	City West Water	Burnley, Richmond
Strathmore	City West Water	Strathmore
Taylors Lakes	City West Water	Hillside, Sydenham, Taylors Lakes
Tullamarine	City West Water	Airport West, Melbourne Airport, Strathmore Heights, Tullamarine
Werribee	City West Water	Hoppers Crossing, Tarneit, Werribee, Wyndham Vale
Werribee South	City West Water	Werribee South
Williamstown	City West Water	Altona North, Newport, Spotswood, Williamstown
Axedale	Coliban Water	Axedale
Bealiba	Coliban Water	Bealiba
Bendigo (Northern)	Coliban Water	Bendigo, Bendigo East, Bendigo North, California Gully, Eaglehawk, Jackass Flat, Myers Flat, Long Gully, Sailors Gully, White Hills
Bendigo (Southern)	Coliban Water	Bendigo West, California Gully, Flora Hill, Golden Square, Kangaroo Flat, Kennington, Long Gully, Quarry Hill,
Bendigo (Spring Gully)	Coliban Water	Flora Hill, Kennington, Spring Gully, Strathdale
Big Hill	Coliban Water	Belvoir Park, Big Hill
Boort	Coliban Water	Boort
Bridgewater	Coliban Water	Bridgewater
Castlemaine	Coliban Water	Campbells Creek, Castlemaine, Chewton, Golden Point

Water sampling locality	Water supplier	Suburb/Town supplied
Cohuna (Rural)	Coliban Water	Cohuna (rural area)
Cohuna (Urban)	Coliban Water	Cohuna (urban area)
Dunolly	Coliban Water	Dunolly
Echuca	Coliban Water	Echuca
Elmore	Coliban Water	Elmore
Epsom - Huntly	Coliban Water	Epsom, Huntly
Fryerstown	Coliban Water	Fryerstown
Goornong	Coliban Water	Goornong
Guildford	Coliban Water	Guildford
Gunbower	Coliban Water	Gunbower (urban and rural areas)
Harcourt	Coliban Water	Castlemaine North, Harcourt
Heathcote	Coliban Water	Heathcote
Inglewood	Coliban Water	Inglewood
Junortoun	Coliban Water	Junortoun
Korong Vale	Coliban Water	Korong Vale
Kyneton	Coliban Water	Kyneton
Laanecoorie	Coliban Water	Laanecoorie
Leitchville (Rural)	Coliban Water	Leitchville (Rural area)
Leitchville (Urban)	Coliban Water	Leitchville (Urban area)
Lockington	Coliban Water	Lockington
Maiden Gully - Marong	Coliban Water	Maiden Gully, Marong
Maldon	Coliban Water	Maldon
Malmsbury	Coliban Water	Malmsbury
Newstead	Coliban Water	Newstead
Pyramid Hill	Coliban Water	Pyramid Hill
Raywood	Coliban Water	Raywood
Rochester	Coliban Water	Rochester
Sebastian	Coliban Water	Sebastian
Serpentine	Coliban Water	Serpentine
Strathfieldsaye	Coliban Water	Strathfieldsaye
Taradale - Elphinstone	Coliban Water	Elphinstone, Taradale
Tarnagulla	Coliban Water	Tarnagulla
Tooborac	Coliban Water	Tooborac
Trentham	Coliban Water	Trentham
Tylden	Coliban Water	Tylden
Wedderburn	Coliban Water	Wedderburn
Bairnsdale	East Gippsland Water	Bairnsdale, Bairnsdale East, Eastwood, Granite Rock, Lucknow, Wy Yung
Bemm River	East Gippsland Water	Bemm River
Buchan	East Gippsland Water	Buchan
Cann River	East Gippsland Water	Cann River
Dinner Plain	East Gippsland Water	Dinner Plain



Water sampling locality	Water supplier	Suburb/Town supplied
Eagle Point - Paynesville	East Gippsland Water	Banksia Peninsula, Eagle Point, Newlands Arm, Paynesville, Raymond Island
Kalimna	East Gippsland Water	Kalimna
Lindenow	East Gippsland Water	Lindenow
Lindenow South	East Gippsland Water	Lindenow South
Mallacoota	East Gippsland Water	Karbethong, Mallacoota, Mirrabooka
Merrangbaur	East Gippsland Water	Lake Bunga, Lake Tyers, Merrangbaur
Metung	East Gippsland Water	Metung
Nicholson - Swan Reach	East Gippsland Water	Johnsonville, Metung, Nicholson, Swan Reach, Tambo Upper
Nowa Nowa	East Gippsland Water	Nowa Nowa
Omeo	East Gippsland Water	Omeo
Orbost	East Gippsland Water	Orbost, Marlo, Newmerella
Sarsfield - Bruthen	East Gippsland Water	Bruthen, Mossiface, Sarsfield, Wiseleigh
Sunlakes - Toorloo	East Gippsland Water	Lake Bunga, Lakes Entrance, Lake Tyers
Swifts Creek	East Gippsland Water	Swifts Creek
Boisdale	Gippsland Water	Boisdale
Boolarra	Gippsland Water	Boolarra
Briagolong	Gippsland Water	Briagolong
Churchill	Gippsland Water	Churchill
Coongulla / Glenmaggie	Gippsland Water	Coongulla, Glenmaggie
Cowwarr	Gippsland Water	Cowwarr
Drouin	Gippsland Water	Drouin, Robin Hood
Erica	Gippsland Water	Erica
Heyfield	Gippsland Water	Heyfield
Jumbuk	Gippsland Water	Jeeralang Junction, Jumbuk
Maffra	Gippsland Water	Maffra
Mirboo North	Gippsland Water	Mirboo North
Moe	Gippsland Water	Moe, Newborough
Morwell	Gippsland Water	Morwell
Neerim South	Gippsland Water	Neerim South
Newborough	Gippsland Water	Newborough
Noojee	Gippsland Water	Noojee
Rawson	Gippsland Water	Rawson
Rokeby / Buln Buln	Gippsland Water	Buln Buln, Rokeby
Rosedale	Gippsland Water	Rosedale
Sale / Wurruk	Gippsland Water	Sale, Wurruk
Seaspray	Gippsland Water	Seaspray
Stratford	Gippsland Water	Stratford
Thorpdale	Gippsland Water	Thorpdale
Toongabbie	Gippsland Water	Toongabbie
Trafalgar	Gippsland Water	Trafalgar
Traralgon	Gippsland Water	Traralgon

Water sampling locality	Water supplier	Suburb/Town supplied
Traralgon South / Hazelwood North	Gippsland Water	Hazelwood North, Traralgon South
Tyers / Glengarry	Gippsland Water	Glengarry, Tyers
Warragul	Gippsland Water	Darnum, Drouin East, Nilma, Warragul
Warragul South	Gippsland Water	Warragul South
Willow Grove	Gippsland Water	Willow Grove
Yallourn North	Gippsland Water	Yallourn North
Yarragon	Gippsland Water	Yarragon
Yinnar	Gippsland Water	Yinnar
Alexandra	Goulburn Valley Water	Alexandra
Avenel	Goulburn Valley Water	Avenel
Barmah	Goulburn Valley Water	Barmah
Bonnie Doon	Goulburn Valley Water	Bonnie Doon
Broadford	Goulburn Valley Water	Broadford
Buxton	Goulburn Valley Water	Buxton
Cobram	Goulburn Valley Water	Cobram
Colbinabbin	Goulburn Valley Water	Colbinabbin
Dookie	Goulburn Valley Water	Dookie
Eildon	Goulburn Valley Water	Eildon
Euroa	Goulburn Valley Water	Euroa
Girgarre	Goulburn Valley Water	Girgarre
Katamatite	Goulburn Valley Water	Katamatite
Katandra West	Goulburn Valley Water	Katandra West
Katunga	Goulburn Valley Water	Katunga
Kilmore	Goulburn Valley Water	Kilmore
Kyabram	Goulburn Valley Water	Kyabram
Longwood	Goulburn Valley Water	Longwood
Mansfield	Goulburn Valley Water	Mansfield
Marysville	Goulburn Valley Water	Marysville
Merrigum	Goulburn Valley Water	Merrigum
Mooroopna	Goulburn Valley Water	Mooroopna
Murchison	Goulburn Valley Water	Murchison
Nagambie	Goulburn Valley Water	Nagambie
Nathalia	Goulburn Valley Water	Nathalia
Numurkah	Goulburn Valley Water	Numurkah
Picola	Goulburn Valley Water	Picola
Pyalong	Goulburn Valley Water	Pyalong
Rushworth	Goulburn Valley Water	Rushworth
Seymour High Level	Goulburn Valley Water	Seymour (high level area)
Seymour Low Level	Goulburn Valley Water	Mangalore, Seymour (low level area)
Shepparton	Goulburn Valley Water	Shepparton, Congupna
Stanhope	Goulburn Valley Water	Stanhope
Strathmerton	Goulburn Valley Water	Strathmerton

Water sampling locality	Water supplier	Suburb/Town supplied
Tallarook	Goulburn Valley Water	Tallarook
Tallygaroopna	Goulburn Valley Water	Tallygaroopna
Tatura	Goulburn Valley Water	Tatura
Thornton	Goulburn Valley Water	Thornton
Tongala	Goulburn Valley Water	Tongala
Toolamba	Goulburn Valley Water	Toolamba
Trawool	Goulburn Valley Water	Trawool
Upper Delatite	Goulburn Valley Water	Merrijig, Sawmill Settlement
Violet Town	Goulburn Valley Water	Violet Town
Wandong / Heathcote Junction	Goulburn Valley Water	Heathcote Junction, Wandong
Waterford Park	Goulburn Valley Water	Waterford Park
Wunghnu	Goulburn Valley Water	Wunghnu
Yarroweyah	Goulburn Valley Water	Yarroweyah
Yea	Goulburn Valley Water	Yea
Ararat	Grampians Wimmera Mallee Water	Ararat
Beulah	Grampians Wimmera Mallee Water	Beulah
Birchip	Grampians Wimmera Mallee Water	Birchip
Brim	Grampians Wimmera Mallee Water	Brim
Charlton	Grampians Wimmera Mallee Water	Charlton
Dimboola	Grampians Wimmera Mallee Water	Dimboola
Donald	Grampians Wimmera Mallee Water	Donald
Edenhope	Grampians Wimmera Mallee Water	Edenhope
Great Western	Grampians Wimmera Mallee Water	Great Western
Halls Gap	Grampians Wimmera Mallee Water	Bellfield, Halls Gap
Haven	Grampians Wimmera Mallee Water	Haven
Hopetoun	Grampians Wimmera Mallee Water	Hopetoun
Horsham	Grampians Wimmera Mallee Water	Horsham
Jung	Grampians Wimmera Mallee Water	Jung
Lake Bolac	Grampians Wimmera Mallee Water	Lake Bolac
Lalbert	Grampians Wimmera Mallee Water	Lalbert
Manangatang	Grampians Wimmera Mallee Water	Manangatang
Minyip	Grampians Wimmera Mallee Water	Minyip
Murtoa	Grampians Wimmera Mallee Water	Murtoa
Natimuk	Grampians Wimmera Mallee Water	Natimuk
Nullawil	Grampians Wimmera Mallee Water	Nullawil
Ouyen	Grampians Wimmera Mallee Water	Ouyen
Pomonal	Grampians Wimmera Mallee Water	Pomonal
Quambatook	Grampians Wimmera Mallee Water	Quambatook
Rainbow	Grampians Wimmera Mallee Water	Rainbow
Rupanyup	Grampians Wimmera Mallee Water	Rupanyup
Sea Lake	Grampians Wimmera Mallee Water	Sea Lake
St Arnaud	Grampians Wimmera Mallee Water	St Arnaud
Stawell	Grampians Wimmera Mallee Water	Stawell

Water sampling locality	Water supplier	Suburb/Town supplied
Ultima	Grampians Wimmera Mallee Water	Ultima
Underbool	Grampians Wimmera Mallee Water	Underbool
Walpeup	Grampians Wimmera Mallee Water	Walpeup
Warracknabeal	Grampians Wimmera Mallee Water	Warracknabeal
Willaura	Grampians Wimmera Mallee Water	Willaura
Woomelang	Grampians Wimmera Mallee Water	Woomelang
Wycheproof	Grampians Wimmera Mallee Water	Wycheproof
Irymple	Lower Murray Water	Cardross, Irymple
Kerang	Lower Murray Water	Kerang
Koondrook	Lower Murray Water	Koondrook
Lake Boga	Lower Murray Water	Lake Boga
Merbein	Lower Murray Water	Merbein
Mildura	Lower Murray Water	Birdwoodton, Cabarita, Kings Billabong, Mildura, Nichols Point
Murrabit	Lower Murray Water	Murrabit
Nyah	Lower Murray Water	Nyah
Nyah West	Lower Murray Water	Nyah West
Piangil	Lower Murray Water	Piangil
Red Cliffs	Lower Murray Water	Red Cliffs
Robinvale	Lower Murray Water	Robinvale
Swan Hill	Lower Murray Water	Swan Hill
Woorinen South	Lower Murray Water	Woorinen South
Barnawartha	North East Water	Barnawartha
Beechworth High Level	North East Water	Beechworth (high level area)
Beechworth Low Level	North East Water	Beechworth (low level area)
Bellbridge	North East Water	Bellbridge
Benalla	North East Water	Benalla
Bright	North East Water	Bright
Bundalong	North East Water	Bundalong
Chiltern	North East Water	Chiltern
Corryong High Level	North East Water	Corryong (high level area)
Corryong Low Level	North East Water	Corryong (low level area)
Cudgewa	North East Water	Cudgewa
Dartmouth	North East Water	Dartmouth
Devenish	North East Water	Devenish
Ebden / Baranduda Low Level	North East Water	Baranduda, Ebden
Eskdale	North East Water	Eskdale
Glenrowan	North East Water	Glenrowan
Goorambat	North East Water	Goorambat
Harrietville	North East Water	Harrietville
Kiewa	North East Water	Kiewa
Moyhu	North East Water	Moyhu

Water sampling locality	Water supplier	Suburb/Town supplied
Mt. Beauty	North East Water	Mount Beauty
Myrtleford	North East Water	Myrtleford
Oxley	North East Water	Oxley
Porepunkah	North East Water	Porepunkah
Rutherglen	North East Water	Rutherglen
Springhurst	North East Water	Springhurst
St James	North East Water	St James
Tallangatta	North East Water	Tallangatta
Tangambalanga	North East Water	Tangambalanga
Tawonga	North East Water	Tawonga, Tawonga South
Tungamah	North East Water	Tungamah
Wahgunyah	North East Water	Wahgunyah
Walwa	North East Water	Walwa
Wandiligong	North East Water	Wandiligong
Wangaratta	North East Water	Wangaratta
Whitfield	North East Water	Whitfield
Wodonga / Baranduda High Level	North East Water	Baranduda, Killara
Wodonga High Level	North East Water	Wodonga
Wodonga Logic Centre	North East Water	Wodonga Logic Centre
Wodonga Low Level	North East Water	Wodonga
Yackandandah	North East Water	Yackandandah
Yarrawonga	North East Water	Yarrawonga
Gabo Island Light Station Reserve	Parks Victoria	Gabo Island Light Station Reserve
Lake Eildon National Park: Lakeside / Candlebark	Parks Victoria	Lake Eildon National Park: Lakeside Candlebark
Tidal River	Parks Victoria	Tidal River (Wilsons Promontory National Park)
Twelve Apostles Visitor Facility	Parks Victoria	Twelve Apostles Visitor Facility (Port Campbell National Park)
Wilsons Promontory Lightstation	Parks Victoria	Wilsons Promontory Lightstation (Wilsons Promontory National Park)
Balnarring	South East Water	Balnarring, Bittern, Merricks, Merricks Beach, Somers
Bayswater	South East Water	Bayswater, Boronia, Ferntree Gully, Knoxfield, The Basin, Upper Ferntree Gully, Wantirna, Wantirna South
Beaumaris	South East Water	Beaumaris, Black Rock, Cheltenham
Belgrave	South East Water	Belgrave, Belgrave Heights, Belgrave South, Selby, Tecoma, Upper Ferntree Gully, Upwey
Berwick	South East Water	Berwick, Beaconsfield, Nar Nar Goon, Narre Warren, Narre Warren North, Narre Warren South, Officer, Pakenham
Bittern	South East Water	Bittern, Crib Point, HMAS Cerberus

Water sampling locality	Water supplier	Suburb/Town supplied
Brighton / Heatherton	South East Water	Bentleigh, Bentleigh East, Brighton, Brighton East, Caulfield South, Cheltenham, Clarinda, Clayton South, Hampton, Heatherton, Highett, McKinnon, Mentone, Moorabbin, Oakleigh South, Ormond, Sandringham
Bunyip	South East Water	Bunyip, Longwarry
Carrum Downs	South East Water	Carrum Downs, Skye
Caulfield	South East Water	Armadale, Carnegie, Caulfield, Caulfield North, Caulfield South, Clayton, Elsternwick, Elwood, Hughesdale, Huntingdale, Murrumbeena, Oakleigh, Oakleigh South, Ormond, Prahran, Ripponlea, South Yarra, Springvale, St Kilda East, Toorak, Windsor
Chelsea	South East Water	Aspendale, Aspendale Gardens, Bonbeach, Carrum, Chelsea, Chelsea Heights, Edithvale, Patterson Lakes
Cora Lynn	South East Water	Bunyip, Koo Wee Rup, Nar Nar Goon, Tooradin
Cranbourne	South East Water	Centreville, Cranbourne, Cranbourne East, Cranbourne North, Cranbourne South, Cranbourne West, Langwarrin, Pearcedale
Dandenong	South East Water	Bangholme, Dandenong, Dandenong South, Dingley Village, Doveton, Keysborough, Noble Park, Springvale South
Dandenong North	South East Water	Clayton, Dandenong North, Noble Park North, Springvale
Devon Meadows	South East Water	Blind Bight, Cannons Creek, Clyde, Cranbourne, Five Ways, Tooradin, Warneet
Dromana	South East Water	Dromana, McCrae, Mount Martha, Safety Beach
Ferntree Gully	South East Water	Boronia, Ferntree Gully, The Basin, Upper Ferntree Gully
Frankston	South East Water	Baxter, Carrum Downs, Cranbourne, Frankston, Frankston North, Langwarrin, Pearcedale, Seaford
Frankston South	South East Water	Baxter, Frankston, Frankston South, Mount Eliza
Garfield	South East Water	Garfield, Garfield North
Hallam	South East Water	Dandenong South, Doveton, Endeavour Hills, Eumemmerring, Hallam, Hampton Park, Lynbrook, Lyndhurst, Narre Warren North
Hastings	South East Water	Bittern, Hastings
Karingal	South East Water	Frankston
Koo Wee Rup	South East Water	Koo Wee Rup
Lang Lang	South East Water	Lang Lang
Moorooduc	South East Water	Dromana, Moorooduc, Tuerong
Mordialloc	South East Water	Braeside, Dingley Village, Mentone, Mordialloc, Parkdale, Waterways

Water sampling locality	Water supplier	Suburb/Town supplied
Mornington	South East Water	Mornington, Mount Eliza, Mount Martha, Osborne
Mount Martha	South East Water	Mount Martha
Pakenham	South East Water	Pakenham
Rowville	South East Water	Lysterfield, Rowville
Rye	South East Water	Blairgowrie, Cape Schank, Fingal, McCrae, Portsea, Rosebud, Rosebud South, Rosebud West, Rye, St Andrews Beach, Sorrento, Tootgarook
Shoreham	South East Water	Flinders, Point Leo, Shoreham
Somerville	South East Water	Pearcedale, Somerville, Tyabb
South Melbourne	South East Water	Albert Park, Balaclava, Middle Park, Port Melbourne, Prahran, South Melbourne, South Yarra, Southbank, St Kilda, St Kilda East, St Kilda West, Toorak, Windsor
Tynong	South East Water	Nar Nar Goon, Nar Nar Goon North, Tynong
Upper Beaconsfield	South East Water	Beaconsfield, Guys Hill, Upper Beaconsfield
Wantirna	South East Water	Knoxfield, Scoresby, Wantirna, Wantirna South
Alberton	South Gippsland Water	Alberton, Port Albert
Cape Paterson	South Gippsland Water	Cape Paterson
Dumbalk	South Gippsland Water	Dumbalk
Fish Creek	South Gippsland Water	Fish Creek
Foster	South Gippsland Water	Foster
Inverloch	South Gippsland Water	Inverloch
Koonwarra	South Gippsland Water	Koonwarra
Korumburra	South Gippsland Water	Korumburra
Lance Creek	South Gippsland Water	Lance Creek, Wattlebank
Leongatha	South Gippsland Water	Leongatha
Loch	South Gippsland Water	Loch
Meeniyan	South Gippsland Water	Meeniyan
Nyora	South Gippsland Water	Nyora
Poowong	South Gippsland Water	Poowong
Port Franklin	South Gippsland Water	Bennison, Port Franklin
Port Welshpool	South Gippsland Water	Hedley, Port Welshpool, Welshpool
Toora	South Gippsland Water	Agnes, Barry Beach, Toora
Wonthaggi	South Gippsland Water	Wonthaggi
Yarram	South Gippsland Water	Devon, North Yarram
Allansford	Wannon Water	Allansford
Balmoral	Wannon Water	Balmoral
Camperdown (Rural)	Wannon Water	Camperdown (rural area)
Camperdown (Urban)	Wannon Water	Camperdown (urban area)
Caramut	Wannon Water	Caramut
Casterton	Wannon Water	Casterton

Water sampling locality	Water supplier	Suburb/Town supplied
Cavendish	Wannon Water	Cavendish
Cobden	Wannon Water	Cobden
Coleraine	Wannon Water	Coleraine
Dartmoor	Wannon Water	Dartmoor
Derrinallum	Wannon Water	Derrinallum
Dunkeld	Wannon Water	Dunkeld
Glenthompson	Wannon Water	Glenthompson
Hamilton	Wannon Water	Hamilton
Heywood	Wannon Water	Heywood
Koroit	Wannon Water	Koroit
Lismore	Wannon Water	Lismore
Merino	Wannon Water	Merino
Mortlake	Wannon Water	Mortlake
Noorat / Glenormiston	Wannon Water	Glenormiston, Noorat
Paaratte	Wannon Water	Paaratte
Penshurst	Wannon Water	Penshurst
Peterborough	Wannon Water	Peterborough
Port Campbell	Wannon Water	Port Campbell
Port Fairy	Wannon Water	Port Fairy
Portland	Wannon Water	Portland
Purnim	Wannon Water	Purnim
Sandford	Wannon Water	Sandford
Simpson	Wannon Water	Simpson
Tarrington	Wannon Water	Tarrington
Terang	Wannon Water	Terang
Timboon	Wannon Water	Timboon
Warrnambool	Wannon Water	Warrnambool
Bulla	Western Water	Bulla, Oaklands Junction
Darley	Western Water	Darley, Pentland Hills
Diggers Rest	Western Water	Diggers Rest
Eynesbury	Western Water	Eynesbury
Gisborne	Western Water	Bullengarook, Gisborne, Gisborne South, New Gisborne
Lancefield	Western Water	Lancefield
Lerderderg	Western Water	Bacchus Marsh, Coimadai, Merrimu
Macedon	Western Water	Macedon
Maddingley	Western Water	Balliang, Balliang East, Maddingley, Parwan, Rowsley
Melton South	Western Water	Brookfield, Hopetoun Park, Melton, Melton South
Merrimu	Western Water	Kurunjang, Long Forest, Melton West
Mount Macedon	Western Water	Mount Macedon
Myrniong	Western Water	Myrniong



Water sampling locality	Water supplier	Suburb/Town supplied
Riddells Creek	Western Water	Riddells Creek
Rockbank	Western Water	Rockbank
Romsey	Western Water	Kerrie, Monegeetta, Romsey
Sunbury	Western Water	Clarkefield, Goonawarra, Jacksons Hill, Sunbury
Toolern Vale	Western Water	Toolern Vale
Woodend	Western Water	Woodend
Bass	Westernport Water	Bass, Woolamai
Cape Woolamai	Westernport Water	Cape Woolamai, Smiths Beach, Sunderland Bay, Sunset Strip, Wimbledon Heights
Corinella	Westernport Water	Corinella, Coronet Bay, Tenby Point
Cowes	Westernport Water	Cowes, Silverleaves
Grantville	Westernport Water	Grantville, Pioneer Bay
Kilcunda	Westernport Water	Archies Creek, Dalyston, Kilcunda
Rhyll	Westernport Water	Rhyll
San Remo	Westernport Water	Newhaven, San Remo
Ventnor	Westernport Water	Summerlands, Ventnor
Brahams Road	Yarra Valley Water	Millgrove, Warburton, Wesburn
Bundoora	Yarra Valley Water	Briar Hill, Bundoora, Campbellfield, Coburg, Fawkner, Greensborough, Keon Park, Kingsbury, Lalor, Macleod, Mill Park, Reservoir, Thomastown, Watsonia, Yallambie
Croydon	Yarra Valley Water	Bayswater, Blackburn, Chirside Park, Croydon, Donvale, Forrest Hill, Heatherdale, Heathmont, Kilsyth, Lilydale, Mitcham, Montrose, Mooroolbark, Mt Evelyn, Nunawading, Park Orchards, Ringwood, Ringwood East, Ringwood North, Vermont, Warranwood, Wonga Park
Doncaster	Yarra Valley Water	Doncaster, Doncaster East, Donvale, Forrest Hill, Nunawading, Templestowe, Templestowe Lower, Warrandyte
Eltham	Yarra Valley Water	Diamond Creek, Eltham, Kangaroo Ground, Research, Wattle Glen, Yarrambat
Emerald	Yarra Valley Water	Avonsleigh, Belgrave, Clematis, Cockatoo, Emerald, Gembrook, Kallista, Macclesfield, Menzies Creek, Monbulk, Pakenham, The Patch
Epping	Yarra Valley Water	Epping, Lalor, Mill Park, Morang South
Glen Waverley	Yarra Valley Water	Burwood East, Clayton, Forrest Hill, Glen Waverley, Hughesdale, Huntingdale, Mt Waverley, Mulgrave, Notting Hill, Nunawading, Oakleigh, Syndal, Wheelers Hill
Glenroy	Yarra Valley Water	Attwood, Broadmeadows, Campbellfield, Coburg, Coolaroo, Dallas, Fawkner, Gladstone Park, Glenroy, Greenvale, Meadow Heights, Oak Park, Oaklands Junction, Pascoe Vale, Tullamarine, Westmeadows

Water sampling locality	Water supplier	Suburb/Town supplied
Healesville	Yarra Valley Water	Badger Creek, Chum Creek, Healesville
Ivanhoe	Yarra Valley Water	Banyule, Eaglemont, Heidelberg, Ivanhoe, Rosanna, View Bank
Kew	Yarra Valley Water	Balwyn, Balwyn East, Balwyn North, Box Hill North, Bulleen, Burwood, Camberwell, Canterbury, Deepdene, Doncaster, Glen Iris, Greythorn, Hawthorn, Hawthorn East, Kew, Kew East, Kooyong, Malvern, Mont Albert, Surrey Hills, Templestowe Lower
Lilydale	Yarra Valley Water	Chirnside Park, Coldstream, Don Valley, Gruyere, Launching Place, Lilydale, Montrose, Mooroolbark, Mt Evelyn, Olinda, Seville, Steels Creek, Wandin, Woori Yallock, Yarra Glen, Yellingbo, Yering
Lower Plenty	Yarra Valley Water	Banyule, Briar Hill, Eaglemont, Eltham, Greensborough, Heidelberg, Lower Plenty, Macleod, Montmorency, Research, Rosanna, View Bank, Yallambie
Lyrebird Avenue	Yarra Valley Water	Millgrove, Warburton, Wesburn
Malvern	Yarra Valley Water	Armadale, Ashburton, Ashwood, Burwood, Caulfield East, Chadstone, Glen Iris, Hawksburn, Hawthorn, Hughesdale, Huntingdale, Kooyong, Malvern, Malvern East, Notting Hill, Oakleigh, Toorak
Mernda / Hurstbridge	Yarra Valley Water	Arthurs Creek, Diamond Creek, Doreen, Eltham, Hurstbridge, Kangaroo Ground, Mernda, Nutfield, Panton Hill, Plenty, Research, Smiths Gully, South Morang, Wattle Glen, Yarrambat
Mitcham	Yarra Valley Water	Balwyn, Balwyn East, Balwyn North, Blackburn, Box Hill North, Burwood, Burwood East, Deepdene, Forrest Hill, Greythorn, Mont Albert, Mt Waverley, Nunawading, Surrey Hills, Syndal, Vermont
Montrose	Yarra Valley Water	Bayswater, Kalorama, Kilsyth, Montrose, Mooroolbark
Northcote	Yarra Valley Water	Alphington, Brunswick, Brunswick East, Brunswick West, Coburg, Croxton, Fairfield, Kew, Northcote, Pascoe Vale, Preston, Thornbury
Plenty	Yarra Valley Water	Briar Hill, Diamond Creek, Eltham, Greensborough, Montmorency, Plenty, Research
Preston	Yarra Valley Water	Banyule, Bundoora, Coburg, Eaglemont, Heidelberg, Heidelberg Heights, Heidelberg West, Kingsbury, Macleod, Pascoe Vale, Preston, Rosanna, Thornbury, View bank, Yallambie

Water sampling locality	Water supplier	Suburb/Town supplied
Ridge / Monbulk	Yarra Valley Water	Burleigh, Ferny Creek, Kallista, Kalorama, Menzies Creek, Monbulk, Mt Evelyn, Mount Dandenong, Olinda, Sassafras, Seville, Sherbrooke, Silvan, The Patch, Tremont, Upwey, Wandin, Woori Yallock, Yellingbo
Seville	Yarra Valley Water	Burleigh, Coldstream, Gruyere, Seville, Silvan, Wandin, Woori Yallock, Yellingbo, Yering
Somerton	Yarra Valley Water	Attwood, Beveridge, Broadmeadows, Campbellfield, Coolaroo, Craigieburn, Dallas, Greenvale, Meadow Heights, Mickleham, Oaklands Junction, Roxburgh Park, Somerton, Westmeadows, Woodstock
Wallan	Yarra Valley Water	Wallan
Warburton	Yarra Valley Water	Don Valley, Launching Place, Millgrove, Warburton, Wesburn
Warranwood	Yarra Valley Water	Croydon, Donvale, Eltham, Kangaroo Ground, Park Orchards, Research, Ringwood, Ringwood North, Warrandyte, Warranwood, Wonga Park
Whittlesea	Yarra Valley Water	Doreen, Mernda, Whittlesea, Wollert, Woodstock
Woori Yallock	Yarra Valley Water	Don Valley, Launching Place, Millgrove, Seville, Wandin, Warburton, Wesburn, Woori Yallock, Yellingbo
Yarra Glen	Yarra Valley Water	Steels Creek, Yarra Glen
Yarra Junction	Yarra Valley Water	Millgrove, Warburton, Wesburn, Yarra Junction
Falls Creek	Falls Creek ARMB	Falls Creek
Mount Baw Baw	Mount Baw Baw ARMB	Mount Baw Baw
Mount Hotham	Mount Hotham ARMB	Mount Hotham
Mirimbah	Mount Buller and Mount Stirling ARMB	Mirimbah
Mt Buller Alpine Village - Low Level Reticulation	Mount Buller and Mount Stirling ARMB	Mount Buller (low level area)
Mt Buller High Level Reticulation	Mount Buller and Mount Stirling ARMB	Mount Buller (high level area)
Mt Stirling - Telephone Box Junction	Mount Buller and Mount Stirling ARMB	Mount Stirling - Telephone Box Junction

## Notes

ARMB means Alpine Resort Management Board

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This appendix lists drinking water supplies for 2010–11.

Natimuk (Grampians Wimmera Mallee Water) became a drinking water supply on 1 July 2010.

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For queries relating to water supplied to any specific property or local area please enquire with the relevant water supplier.

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