

Annual report on drinking water quality in Victoria

1 July 2008–30 June 2009



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Introduction

Water is necessary for life. Ensuring the community has access to safe drinking water is essential for maintaining public health and, in Victoria, is protected by legislation that recognises its importance to our ongoing social and economic wellbeing.

Our drinking water regulatory framework is detailed in the *Safe Drinking Water Act 2003* and the *Safe Drinking Water Regulations 2005*. The Act and Regulations provide a comprehensive framework based on a catchment-to-tap approach that actively safeguards the quality of drinking water across Victoria.

The main objectives of this regulatory framework are to ensure:

- 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.

Section 32 of the Act requires the Secretary to the Department of Health to provide the Minister for Health with an annual report on the quality of Victoria's drinking water, which is then presented to each house of Parliament.

This annual report is the fifth produced under the Act. It provides an overview of the operations and implementation of the Act and the performance of water businesses in Victoria in relation to the quality of drinking water supplied during 2008–09 (1 July 2008 to 30 June 2009). It also includes more detailed information on water treatment, fluoridation and the location of non-drinking water supplies around Victoria.

The report explains Victoria's drinking water quality regulatory framework and highlights a number of activities the department undertook during 2008–09 to help ensure the ongoing quality of drinking water in Victoria. These activities include administering the auditor certification scheme, commencing work on a competency framework for water treatment operators, contributing to a national review of the *Australian drinking water guidelines* and conducting a survey about the effectiveness of the department's communication with its water stakeholders.

The report shows that the high quality of Victoria's drinking water was maintained in 2008–09. Of the potential threats to water quality reported to the department, the majority were minor and transient in nature, and did not compromise public health.

The February 2009 bushfires had a devastating affect on many Victorian communities and consequently affected a number of drinking water supplies. These effects were mainly due to damaged water reticulation systems or restricted access to treatment plants making it impossible to test water quality. Some of Melbourne's water supply catchment areas were also damaged. Like many other sectors, the fires highlighted a need to reassess emergency response plans among the water industry. Some of the lessons learnt are highlighted in this year's report.

Consistent with previous reports, most customer complaints about the quality of Victoria's drinking water during 2008–09 related to discolouration or taste/odour issues. Overall, the number of complaints remained low.

We hope this annual report sufficiently recognises the good work of Victoria's water businesses and, by highlighting areas for improvement, encourages industry stakeholders to continue to work together to ensure Victorians have ongoing access to quality drinking water, no matter where they live.

We present this report to all drinking water consumers in Victoria.

Section 1: Victoria's drinking water quality regulatory framework and activities of the department under the Act



Section 1: Victoria's drinking water quality regulatory framework and activities of the department under the Act

Victoria's drinking water quality regulatory framework

The regulatory framework for safe drinking water in Victoria consists of the *Safe Drinking Water Act 2003* (the Act), the *Safe Drinking Water Regulations 2005* (the Regulations) and, for fluoridation of drinking water, the *Health (Fluoridation) Act 1973*.

Victoria's Department of Health is responsible for administering the legislation. This task is overseen by the Drinking Water Regulatory Section, located in the department's Environmental Health Unit.

The Act defines two types of water business: water suppliers and water storage managers.

A water supplier is a water business that supplies drinking water or regulated water¹ to the public. The role of a water supplier is to manage risk in relation to the supply of drinking water or regulated water to the public and to ensure the drinking water they supply is safe and complies with the quality standards specified in the legislation.

Water storage managers supply water to water suppliers and manage risk in relation to that supply. Water storage managers either treat this water to a drinking standard or supply it as untreated water, which is then treated by the water supplier.

Water suppliers include 16 water businesses, five alpine resort management boards and Parks Victoria. Water storage managers include Southern Rural Water, Goulburn-Murray Rural Water (both of which supply untreated water to water suppliers) and Melbourne Water (which supplies drinking water to water suppliers). Grampians Wimmera Mallee Water is both a water supplier and a water storage manager.

The regulatory framework also provides for the Secretary to the Department of Health to approve water analysts and risk management plan auditors.

Water suppliers and water storage managers are listed in Appendix 1, with contact details in Appendix 3. Appendix 2 provides an overview of the Act and Regulations and details the functions of the Secretary under the Act.

Fluoridation

The Health (Fluoridation) Act regulates the way fluoride is safely and effectively added to Victorian drinking water.

It is clear that drinking fluoridated water significantly reduces the risk of dental decay. Water fluoridation is the most effective and socially equitable way to give everybody access to the caries-preventive effects of fluoride regardless of age, income or education level.

Most Victorians already have access to fluoridated drinking water. In 2004 about 74 per cent of our population had a ready supply, with most of these people residing in Melbourne, Drouin, Shepparton, Bendigo, Kyneton or adjacent areas. Since then, the department has introduced fluoridation to a number of regional Victorian towns, so that close to 90 per cent of Victorians will have a fluoridated drinking water supply by mid 2010. The Victorian Government is committed to extending this important public health initiative to those regional communities currently without it.

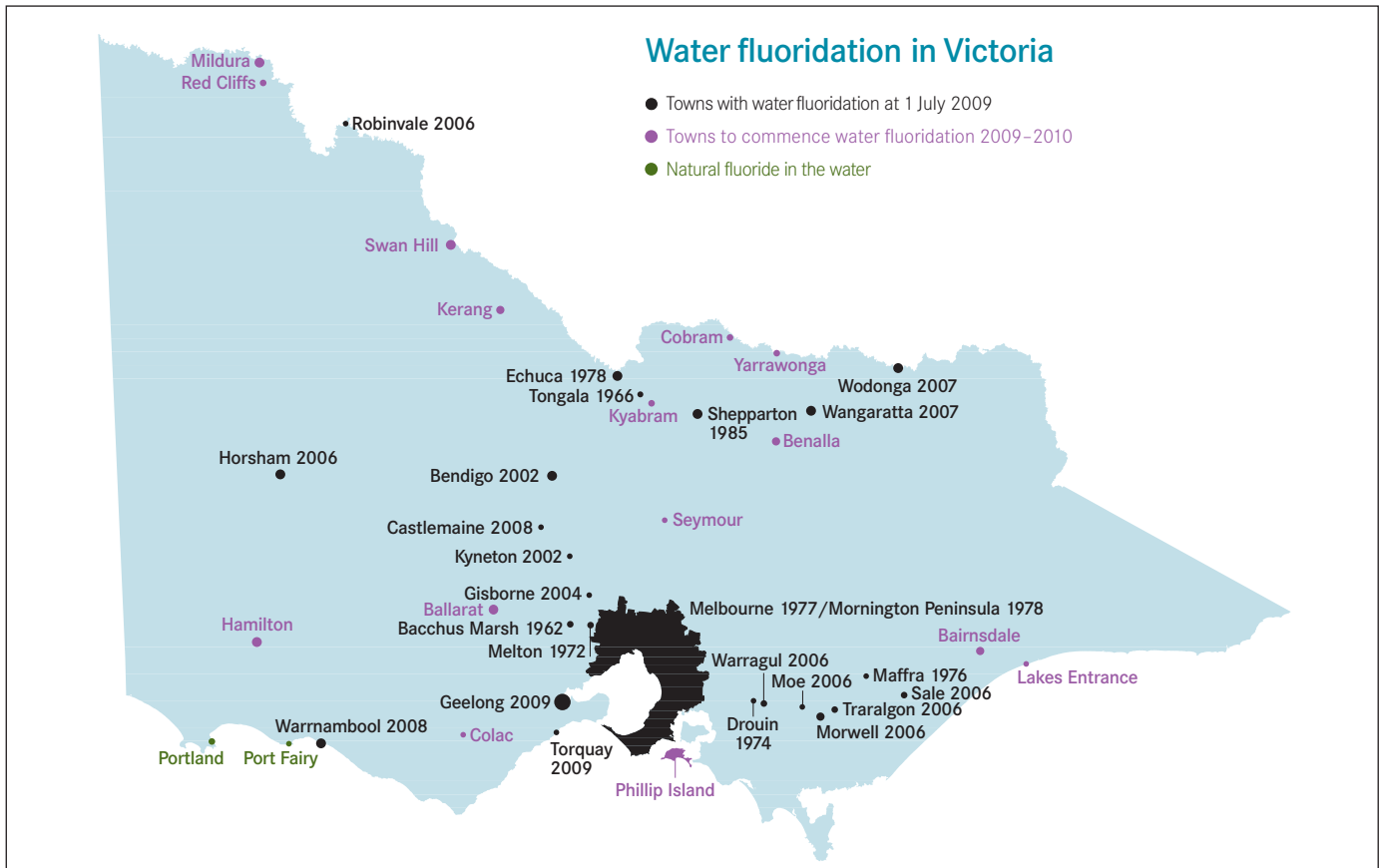
During 2008–09, fluoridation was extended to Warrnambool, Allansford and Koroit (in September 2008), Chiltern (March 2009), Barnawartha (June 2009) and to Geelong, Torquay and Bellarine peninsula towns (in June 2009). Chiltern and Barnawartha were supplied from the existing Wodonga fluoridation plant.

Figure 1 shows the water fluoridation status of Victorian towns as at 1 July 2009, including the year of introduction. Towns scheduled to receive fluoridated water in 2009–10 are also identified. A number of smaller towns near those identified in the figure also receive fluoridated water – refer to Appendix 7 for specific details.

The ground water supplies to Portland and Port Fairy contain naturally occurring fluoride at levels comparable to a fluoridated supply.

1 Regulated water is water that is not intended for drinking but may be supplied to the public in circumstances in which it may be mistaken for drinking water.

Figure 1: Water fluoridation in Victoria



The close collaboration between the department and the water industry has been an important factor behind the success of the water fluoridation program. This close collaboration will improve the dental health of Victorians in the years ahead.

The water industry also provided valuable advice in early 2009 when the department updated the *Code of practice for fluoridation of drinking water supplies*. This code supports the Health (Fluoridation) Act, by specifying requirements for water fluoridation plants and incorporates advances in technology and the risk management framework underpinning the Safe Drinking Water Act.

Drinking water quality management system auditor certification scheme

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 to undertake regulatory audits under the Act.

The scheme is administered independently of the department by RABQSA International, an international personnel certification body that provides competency-based certification. The department chairs a scheme committee that oversees the development and policy attributes of the scheme.

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

By the end of the reporting period 18 individual auditors had been certified under the scheme, an increase of nine from 2007–08. The names and contact details of currently approved auditors can be obtained from the RABQSA website at <www.rabqsa.com>.

One of the most significant components of the scheme is the exam that is administered by RMIT. The exam is marketed as a stand-alone short course module. It has the dual benefit of assessing candidate auditors' knowledge competency for the scheme as well as providing a challenging forum in which people working in the water industry Australia-wide can test their understanding of the concepts involved. To date 70 candidates across Australia have sat the exam.

Significant and exciting growth opportunities are also likely to lie in the future, to meet the need for certified auditors of risk management plans for:

- validating recycled water and/or drinking water treatment processes, prior to commissioning
- auditing recycled water schemes that supply water for non-potable purposes, either to residential, agricultural, municipal or industrial uses.

The current scheme has the potential to provide a structure within which skill sets for these new scopes can be assessed and, ultimately, certified. The scheme committee is already examining these challenges.

Competency framework for water treatment operators

During the reporting period, the department commenced a project to develop a minimum competency framework for water treatment operators.

At present, no minimum requirements exist that specify the qualifications, experience or refresher training that operators need to acquire or maintain to operate a water treatment plant. Victoria's water businesses have well-trained and skilled water treatment operators. Nevertheless, all parties recognise that an ageing workforce, a possible skills shortage and a lack of national guidance on the minimum requirements for staff operating water treatment plants create risks with regard to producing safe drinking water.

The competency framework, which may be formulated as a code of practice or a best practice guideline, will be based on an assessment of the level of microbial risk at individual water treatment plants. The assessment process will grade or classify water treatment plants, with plants that are assessed as having higher microbial risk requiring operators with higher qualifications, skills and training.

This project was established in collaboration with Victoria's water businesses through their representative body, the Victorian Water Industry Association (VicWater), and the Water Industry Operators Association of Australia. Two committees formed under the auspices of VicWater have

also assisted the department. One committee consists of operational staff from various water businesses, the other, human resources managers.

By the end of the reporting period, the draft framework document had been through several revisions. The framework is scheduled to be finalised in 2010 and may be adopted nationally if implemented successfully in Victoria.

Approving analysts

Another of the department's roles in ensuring a safe drinking water supply for all Victorians is approving personnel to analyse samples of drinking water collected by water suppliers. The department has determined that 'analyse' can encompass supervising the analysis, provided all final analytical reports to water businesses that contain the results of samples collected under the Regulations are signed off by an approved analyst.

During 2008–09, as in previous years, the department received and processed a number of applications from water analysts. All approved analysts are listed on the department's drinking water website.² There are now approximately 60 approved water analysts.

Undertakings

Where the department or water businesses identify non-compliance with the requirements of 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.

2 Refer to <www.health.vic.gov.au/environment/water/drinking>.

An undertaking may deal with more than one contravention, regardless of whether or not the contraventions are of the same nature.

During 2008–09, the department accepted nine new undertakings from water businesses. Eight were for non-compliant findings from the 2008 round of audits, as described in section 2. The other was for a water treatment plant to rectify microbiological non-compliances for the Mount Beauty water supply.

Eighteen undertakings from previous years were finalised during the reporting period, mainly relating to contraventions for disinfection by-products such as trihalomethanes. Most of the completed undertakings involved either optimising treatment processes, constructing a new treatment plant or supplying water from a better quality source. The other seven undertakings that were finalised in 2008–09 were for the audit findings.

The status of undertakings at the end of the 2008–09 reporting period is summarised in Table 1.

In this table, ‘completed by end date’ means that the contravention was remedied on time and the works were completed on time, with the end date within the 2008–09 reporting period. ‘Completed after end date’ means that the contravention was remedied on time (and thus the drinking water complied) but some of the works were completed after that date.

‘Undertaking breached’ means that the contravention continued beyond the end date and the works were not completed on time.

Table 1: Status of undertakings from water businesses, 2008–09

Status	Number
Total scheduled for completion by 30 June 2009	25
Completed by end date	14
Completed after end date	5
Undertaking breached	6
Total scheduled for completion after 1 July 2009	9
Scheduled for completion in 2009–10	8
Scheduled for completion in 2012–13	1

The six undertakings that were breached were for water supplied by Grampians Wimmera Mallee Water to Manangatang, Lalbert and Ultima (for turbidity) and for Beulah, Nullawil and Rupanyup (for trihalomethanes and turbidity). While these undertakings were not completed on time, drinking water for Beulah, Nullawil and Rupanyup now complies with the standards. The department is working with Grampians Wimmera Mallee Water to resolve the ongoing turbidity issues for the supplies for Manangatang, Lalbert and Ultima.

Eight undertakings continue into 2009–10. These will be reported in detail in the next annual report. One undertaking, for Marysville and Buxton, continues until July 2012.

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

Undertakings are listed in Appendix 6. More details on individual undertakings can be found in the individual sections on each water business in Section 3 of this report.

Water sampling localities

The Regulations allow for the specification of water sampling localities, to assist in managing water quality and risk. Essentially, water sampling localities are areas of similar water quality that are usually defined by water treatment process or system hydraulics. At the end of the reporting period there were 483 water sampling localities in Victoria, with approximately 90 of these forming the Melbourne metropolitan water supply system. In regional Victoria, most water sampling localities typically equate to the water supply for an individual town.

The boundary or number of water sampling localities may change over time, due to population growth or supply upgrades. During 2008–09, the following changes were approved and published in the *Victoria Government Gazette*:

- Grampians Wimmera Mallee Water – a new water sampling locality was created for Underbool, following the introduction of drinking water for this town (decision gazetted on 19 September 2008 and effective from 20 September 2008)

- Wannon Water – the water sampling locality of Henty was omitted, as the department agreed to this supply reverting to a non-drinking supply (decision gazetted on 29 May 2009 and effective from 1 July 2009).

The Government Gazettes in which the water sampling localities were published are listed in Appendix 4. The specific towns and suburbs that are supplied are listed in Appendix 9.

Variations to sampling frequency

In June 2009 the department gazetted a variation to sampling frequency for South Gippsland Water for the Wonthaggi, Inverloch, Korumburra, Leongatha, Toora and Port Franklin water sampling localities. The variation was made under regulation 11 for *Escherichia coli* and turbidity for these localities. The sampling frequency increased for the period 1 July 2009 to 1 July 2012 to cater for the increased population of these localities.

The variation was gazetted on 26 June 2009.

Regulated water and other non-drinking 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 as 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 are

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.

During 2008–09 regulated water declarations were made for:

- non-drinking water supplied by Grampians Wimmera Mallee 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 and the Mount Zero pipeline (gazetted and effective from 23 February 2009)
- non-drinking water supplied by Lower Murray Water to the township of Mystic Park (gazetted and effective from 19 May 2009).

The full list of regulated water declarations is detailed in Appendix 5.

Appendix 10 lists small towns or supplies in Victoria that do not have a drinking water supply managed by a water supplier. These towns either have no reticulated water supply or have a non-drinking water supply. Residents and businesses in these towns usually rely on rainwater tanks or other sources for drinking water.

Industry and research organisation membership

During 2008–09 the department continued its associate membership of the Water Services Association of Australia, the peak body of the Australian urban water industry, and its industry membership of Water Quality Research Australia (WQRA).

Water Quality Research Australia Limited (WQRA) is the national research centre that succeeded the Co-operative Research Centre for Water Quality and Treatment from 30 June 2008. WQRA undertakes national collaborative research on drinking water quality, recycled water and relevant areas of wastewater management. The department is represented 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 providing a means by which drinking water regulatory issues can be highlighted at a national level.

During the reporting period, WQRA commenced its first round of research project approvals, the majority of which address water quality issues that are relevant to Victorian drinking water supplies.

Review of the *Australian drinking water guidelines*

During 2008–09 a number of staff from the department were involved in the most recent review of the *Australian drinking water guidelines* being undertaken by the National Health and Medical Research Council. This included a senior staff member

serving on the council's Water Quality Advisory Committee.

The *Australian drinking water guidelines* provides an authoritative reference on what defines safe, good quality drinking water and how it can be achieved and assured. The current review is the first since 2004.

The review primarily involves examining chapters dealing with water quality monitoring, the production of new microbiological fact sheets and the review of numerous other chemical fact sheets. The review will produce approximately 140 new fact sheets on pesticides, resulting in a fact sheet for every pesticide that can be legally used in Australia.

The updated draft material was released for public consultation in late November 2009. It is anticipated that the updated version of the *Australian drinking water guidelines* will be released later in 2010.

Stakeholder survey

During May and June 2009 the department's Drinking Water Regulatory Section undertook a stakeholder survey. The survey assessed the effectiveness of the section's engagement with the state's water businesses, other government agencies involved in the water sector and representative water industry organisations.

The survey was undertaken by UltraFeedback Pty Ltd. The survey was almost exclusively conducted through face-to-face interviews, using a semi-structured set of questions developed by UltraFeedback in consultation with the department.

Overall, the survey found that the section was engaging effectively with its stakeholders, but also identified some areas for improvement. Some of these areas for improvement included:

- preparing and disseminating a three-to five-year strategic plan for the department, which will provide water businesses with some certainty and clarity with respect to the regulatory priorities for the department
- improving the useability of the forms used for submitting reports to the department
- more clearly articulating the purpose and intended audience of the department's annual drinking water quality report.

During the next reporting period the section will work through the identified issues and provide feedback to stakeholders.

Expenditure under the Act

The department set the administrative levy for the 2008–09 financial year, payable under section 51 of the Act, and estimated receipts were \$1,012,325. Actual receipts of

\$1,010,806 were paid into consolidated revenue, as required under the Act. The variance is due to the late payment of a levy from a water supplier, which will be received in 2009–10.

To cover the administration of the Act for the reporting period, equivalent funds were appropriated to the department. Table 2 shows how these funds were used (in the table, 'Variance' represents the difference between the assessed expenditure for 2007–08 and 2008–09).

The department administers but does not control certain resources on behalf of the Victorian Government. It is accountable for the transactions involving those administered resources, but does not have the discretion to use the resources for achieving other departmental objectives.

Transactions and balances relating to these administered resources are not recognised as departmental revenues, expenses, assets or liabilities, but are disclosed in the applicable output schedules of the department's annual report.

Table 2: Expenditure under the Safe Drinking Water Act, 2006–07 to 2008–09

	Expenditure (\$)			
	2008–09	2007–08	Variance	2006–07
Salaries, allowances and salary-related oncosts	437,925	411,916	26,009	383,008
Indirect costs	42,613	39,480	3,133	89,425
Operating costs	111,338	104,603	6,735	85,639
Communication and education	75,489	21,747	53,742	153,273
Research and development	323,781	354,738	(30,957)	107,904
IT development	0	0	0	20,887
Total expenses	991,146	932,484	58,662	840,136

Increased expenditure this reporting period is mainly attributed to contributions to the communication and education expenditure item, principally from the stakeholder engagement survey.

Contributions to research organisations, such as Water Quality Research Australia, that provide high quality research outputs that address industry-wide water quality issues, formed the bulk of the expenditure under the *Research and development* expenditure item.

The expenditure includes any costs associated with the department providing a 24-hour emergency pager service for environmental health matters.

Disclosure of information

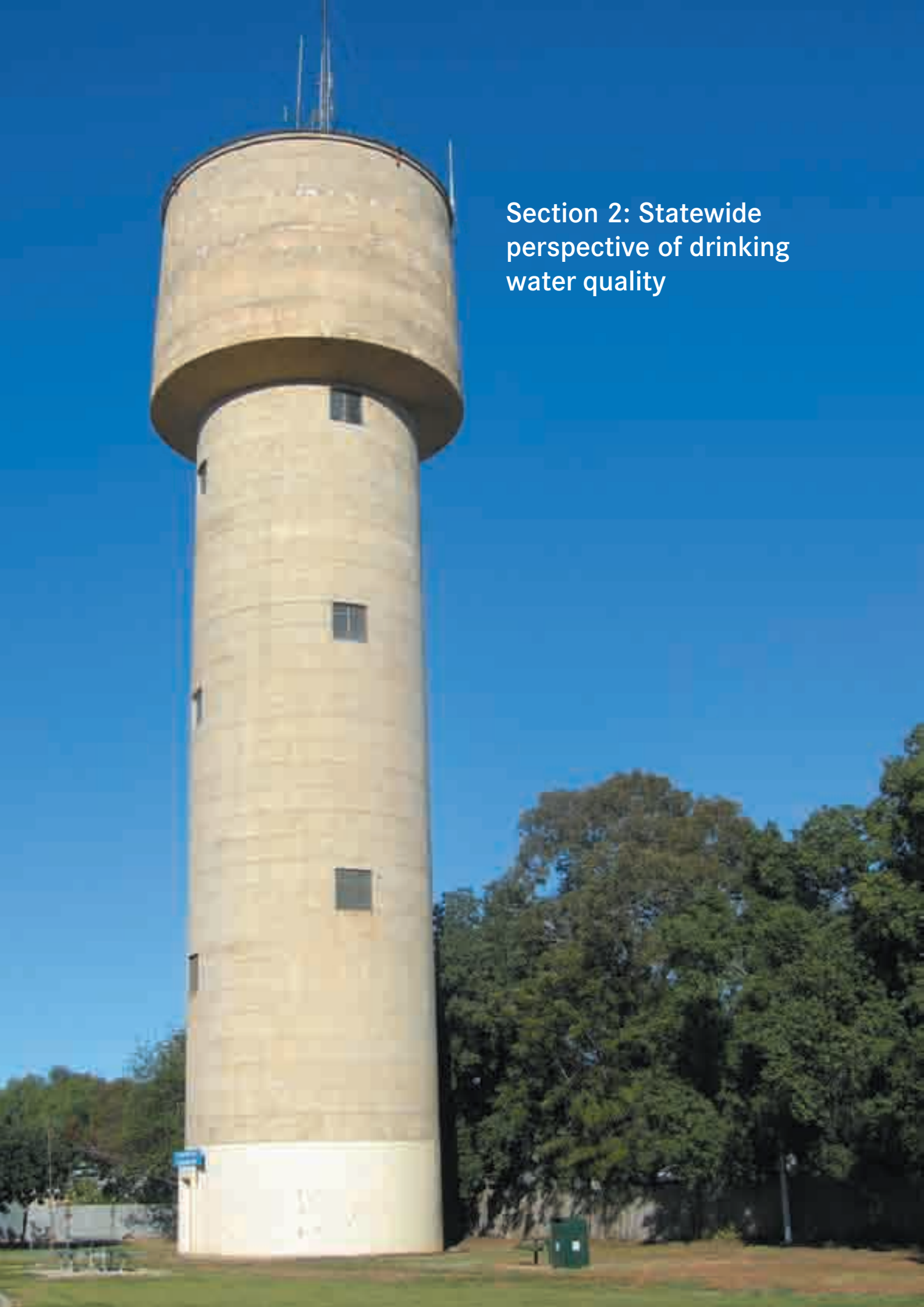
The Act requires water suppliers and water storage managers to provide the following information to the department:

- notifications of known or suspected contamination, under section 22 of the Act
- notifications of breaches of the water quality standards, under section 18 of the Act
- an annual water quality report, under section 26 of the Act, that discusses the matters required by the Regulations.

The annual water quality reports submitted to the department are public documents and may be obtained by contacting the appropriate water supplier or water storage manager.

Each water supplier must also make the results of any water quality monitoring program that it conducts on any drinking water supplied by it publicly available, as per section 23 of the Act.

The contact details for water suppliers are provided in Appendix 3.



**Section 2: Statewide
perspective of drinking
water quality**

Section 2: Statewide perspective of drinking water quality

Drinking water supplies in Victoria

Twenty-one water suppliers provided drinking water to a total of 483 water sampling localities across Victoria during 2008–09.³ 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 small towns that supply water to fewer than 200 people, to localities in the Melbourne and Geelong metropolitan areas that supply many thousands of people (see appendices 7 and 9 for more detail). Overall, water suppliers supply drinking water to approximately 98 per cent of Victoria's population. As listed in Appendix 10, some small communities and rural populations do not receive a reticulated drinking water supply from a water supplier. These communities rely on private rainwater, ground water or carted water supplies.

All drinking water supplies in Victoria are disinfected. The majority of localities in Victoria, especially those with larger populations, either receive filtered and disinfected water, or enjoy water from Melbourne's protected water supply catchments or from protected ground water sources that do not require filtration. The remaining 53 localities, accounting for just 1.3 per cent of the population supplied statewide, receive disinfected water from surface water sources that are not filtered.

Table 3: Localities with filtered and unfiltered water, 2008–09

Source	Localities with disinfected and unfiltered water	Localities with disinfected and filtered water
Ground water (only)	14 (0.4%)	11 (0.3%)
Surface water*	53 (1.3%)	312 (24.3%)
Protected catchments (metropolitan supply)**		93 (73.7%)
Total		483 (100%)

Notes:

includes ground water and surface water blended

filtered metropolitan localities are included under 'surface water'

Protected catchments supply City West Water, South East Water, Western Water and Yarra Valley Water, and may sometimes be blended with filtered surface water. 'Filtered' has the same meaning as used in Appendix 7.

The number of water sampling localities in each category, as well as the proportion of total population supplied with drinking water, is shown in Table 3 and in Appendix 7.

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* bacteria, turbidity, aluminium, trihalomethanes, chloroacetic acid, dichloroacetic acid, trichloroacetic acid, bromate and formaldehyde. The latter chemicals are by-products of the types of disinfection or water treatment commonly used in Victoria. Turbidity is a measure of the cloudiness of the water.

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 2004 edition of the *Australian drinking water guidelines*, published by the National Health and Medical Research Council.⁴ Fluoridated supplies in Victoria must also comply with the requirements of the Health (Fluoridation) Act.

Water quality data for 2008–09 for each water sampling locality is shown in Appendix 7. More detailed discussion of the results for individual water businesses can be found in Section 3 of this report, the notifications section overleaf and in the annual water quality reports of the businesses.

The more significant results are discussed overleaf.

³ There was a net reduction of one locality this year, compared with the 484 in 2007–08.

⁴ Available via <www.health.vic.gov.au/environment/water/drinking.htm>.

Water quality data for 2008–09

The vast majority of drinking water supplied across Victoria in 2008–09 met the required standards. Results are shown in Table 4 and Figure 2, including a comparison with data for previous years.

For individual standards, 99 per cent of localities satisfied the standard for *Escherichia coli*, whereas 94 per cent of localities satisfied the standards for trihalomethanes and aluminium. Overall, 416 localities of 483 complied with all standards, representing drinking water supplied to over 98 per cent of the total supplied population. Non-complying results were, in general, spread across a number of smaller supplies in Victoria, with

most larger supplies compliant. This is a significant improvement from the comparable figure for 2007–08, which was 399 localities complying with all standards, representing drinking water supplied to 96 per cent of the total supplied population.

All drinking water supplied by Barwon Water, City West Water, East Gippsland Water, Lower Murray Water, South East Water, Western Water, Westernport Water, Falls Creek and Mount Baw Baw alpine resorts in 2008–09 complied with all standards. Almost all drinking water supplied by Coliban Water, Gippsland Water, North East Water, South Gippsland Water, Yarra Valley Water, Mount Hotham and Mount Buller alpine resorts in 2008–09 likewise complied with the standards. All fluoridated supplies complied

with the requirements of the Health (Fluoridation) Act.

In every respect, both in terms of overall result and results for individual standards, this result was equal or better than results from previous years and is a testament to the great investment made in supplying good quality drinking water in Victoria in recent years, often against an adverse climate of ongoing drought.

Non-compliant results

Most non-compliant results were caused by one-off, short-term or sporadic problems with the water supply. All of these were rectified rapidly and appropriately by the water supplier concerned but nevertheless are reflected in the annual statistics.

The response to more significant microbiological detections of *Escherichia coli* in Willaura, Beaufort and Myrtleford are described under the notifications section overleaf. The only other results that required a strategic response were those for aluminium and the disinfection by-product trihalomethanes.

Most water sampling localities that did not meet the standards throughout the year failed because they experienced high results for aluminium or trihalomethanes. This was especially significant for Goulburn Valley Water, Wannon Water (for aluminium) and Central Highlands Water and Grampians Wimmera Mallee Water (for trihalomethanes), each of which experienced persistent problems with these parameters in a number of water sampling localities through the year, including for a number of larger regional towns (Hamilton, Warrnambool and Maryborough).

Figure 2: Localities complying with water quality standards, 2006–07 to 2008–09

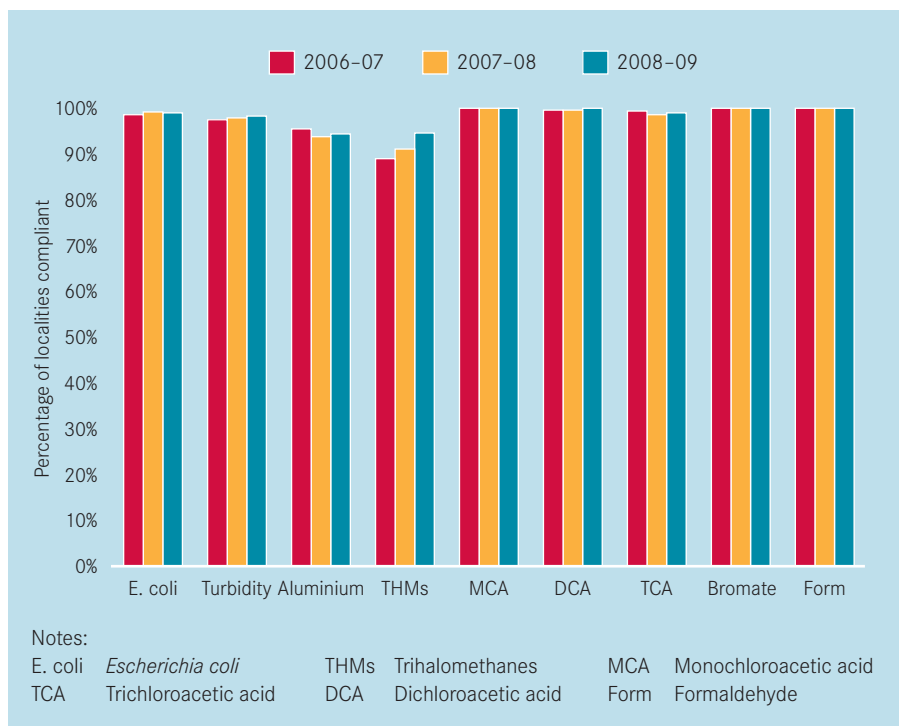


Table 4: Number of localities where drinking water did not comply in 2008-09

Water supplier	Number of localities where drinking water did not comply in 2008-09													
	Number of localities	Population supplied	<i>E. coli</i>	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Form	Fluoride	Total non-compliant	Population
Barwon Water	32	276,720	—	—	—	—	—	—	—	—	—	—	0	0
Central Highlands Water	37	119,510	1	—	—	9	—	—	—	—	—	—	10	12,040
City West Water	15	695,210	—	—	—	—	—	—	—	—	—	—	0	0
Coliban Water	44	145,890	—	—	2	2	—	—	—	—	—	—	4	1,890
East Gippsland Water	19	50,760	—	—	—	—	—	—	—	—	—	—	0	0
Gippsland Water	35	109,540	—	—	1	—	—	—	—	—	—	—	1	280
Goulburn Valley Water	48	124,090	—	—	5	1	—	3	—	—	—	—	9	14,840
Grampians Wimmera Mallee Water*	35	46,240	1	6	2	13	—	1	—	—	—	—	20	10,810
Lower Murray Water	14	54,430	—	—	—	—	—	—	—	—	—	—	0	0
North East Water	41	102,500	—	—	2	—	—	—	—	—	—	—	2	400
Parks Victoria*	5	—	2	1	1	—	—	—	—	—	—	—	3	—
South East Water	39	1,429,190	—	—	—	—	—	—	—	—	—	—	0	0
South Gippsland Water	19	25,640	—	—	1	—	—	—	—	—	—	—	1	430
Wannon Water	34	71,395	—	—	13	1	—	—	—	—	—	—	14	49,455
Western Water	18	139,730	—	—	—	—	—	—	—	—	—	—	0	0
Westport Water	9	13,180	—	—	—	—	—	—	—	—	—	—	0	0
Yarra Valley Water	32	1,558,720	—	1	—	—	—	—	—	—	—	—	1	830
Falls Creek ARMB	1	—	—	—	—	—	—	—	—	—	—	—	0	—
Mount Baw Baw ARMB	1	—	—	—	—	—	—	—	—	—	—	—	0	—
Mount Hotham ARMB	1	—	1	—	—	—	—	—	—	—	—	—	1	—
Mount Buller & Mount Stirling ARMB	4	—	—	—	—	—	—	1	—	—	—	—	1	—
STATEWIDE TOTALS*	483	4,962,745	5	8	27	26	0	5	0	0	0	0	67	90,975
(% of localities compliant for 2008-09)			99.0%	98.3%	94.4%	94.6%	100.0%	99.0%	100.0%	100.0%	100.0%	100.0%	86.1%	98.2%
... Comparison with previous years														
STATEWIDE TOTALS*	484	4,892,685	4	10	30	43	0	2	7	0	0	0	85	203,180
(% of localities compliant for 2007-08)			99.2%	97.9%	93.8%	91.1%	100.0%	99.6%	98.6%	100.0%	100.0%	100.0%	82.4%	95.8%
STATEWIDE TOTALS*	484	4,684,390	7	12	22	53	0	2	3	0	0	0	85	94,375
(% of localities compliant for 2006-07)			98.6%	97.5%	95.5%	89.0%	100.0%	99.6%	99.4%	100.0%	100.0%	100.0%	82.4%	98.0%
ARMB	Alpine Resort Management Board													
MCA	Monochloroacetic acid													
DCA	Dichloroacetic acid													
TCA	Trichloroacetic acid													
THMs	Trihalomethanes													
<i>E. coli</i> Form #	<i>Escherichia coli</i> 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.														

In most cases the elevated trihalomethanes results were caused by natural organic matter in the source water reacting with disinfection chemical to produce trihalomethanes at levels above the required standard. This especially affected some unfiltered surface water supplies in northern and central Victoria, but it affected some filtered supplies also. Significant high results for aluminium for Wannon Water usually related to process control problems at a number of their water treatment plants.

Nevertheless, the department has worked with each of these businesses to establish a long-term solution to the problems – details are provided in Section 3 of this report. The trend shows that these problems are being eliminated. While drinking water in 26 water sampling localities did not comply with the trihalomethanes standard this year, this has significantly reduced from the 53 localities recorded two years earlier.

In particular, in the case of Grampians Wimmera Mallee Water, the persistent problems with trihalomethanes that have occurred across this region for a number of years are expected to be eliminated once the Wimmera Mallee pipeline project is finalised and provides a better quality of source water for the affected towns. The very significant benefits of this project have already flowed through in recent data for 2009, which has eliminated the problem in all towns already supplied from the new pipeline project.

In no cases did non-compliant results compromise public health.

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 and requires water storage managers to do likewise for their supply of water to water suppliers. The Act and Regulations, taken together, set out the mandatory content of risk management plans.

The Act also requires that a water supplier or water storage manager have their risk management plan audited. The auditors must be approved by the department.

This is one of the most important philosophical aspects of this 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.

2008 round of audits

The 2008 round of audits ran from April to October 2008. Eight auditors were approved to audit the 25 water businesses during 2008. The audit

period for the 2008 audits was from 1 January 2006 to 31 December 2007.

The results of the 11 audits prior to 1 July 2008 were described in detail in the department's annual report for 2007–08. Of the 14 audits conducted during the current reporting period, nine were found to be compliant and five were non-compliant. The overall result statewide for 2008 was 15 compliant audits out of 25 audits conducted.

The audits were pitched at a level that matched industry best practice and identified some realistic yet challenging stretch targets for water suppliers.

The audit process will help promote water quality improvements and drive culture change towards the proactive approach to risk management embodied in the *Australian drinking water guidelines*.

The results for the 14 audits in 2008–09 are summarised in Box 1.

A non-compliant audit result indicates that the risk management processes used to support the safety of water being supplied requires improvement. It does not mean that drinking water itself was unsafe during the audit period.

Box 1: Water quality audit results, 2008–09

Risk management plan audits completed during 2008–09	
Compliant audits	Non-compliant audits
East Gippsland Water	Central Highlands Water
Barwon Water	North East Water
South Gippsland Water	Lake Mountain alpine resort
Coliban Water	Mount Hotham alpine resort
Melbourne Water	Mount Baw Baw alpine resort
Lower Murray Water	
City West Water	
Falls Creek alpine resort	
Mount Buller & Mount Stirling alpine resort	

Where a water business was found to be non-compliant, departmental officers met with senior staff from the affected businesses in order to discuss the audit findings and agree upon the actions to address the findings. Depending on the issues involved, the most common outcome was that the affected water business submitted a written undertaking to the department, under section 30 of the Act. The undertaking sets out the specific actions that the water business commits to taking, including the proposed timetable by which the actions will be completed.

In 2008–09 the department accepted undertakings pertaining to non-compliant audit findings from Central Highlands Water, North East Water, Lake Mountain alpine resort, Mount Hotham alpine resort and, for the pre-July 2008 audits, Goulburn-Murray Water, Parks Victoria, Westernport Water and Grampians Wimmera Mallee Water.

Compliant water businesses provided details of the actions they took to address any identified continuous improvement opportunities, including the timeframe over which any proposed actions would be implemented.

More detail on the specific audit findings and audit undertakings for 2008 for each water business can be found in Section 3 of this report and in Appendix 6.

The department's second round of audits was conducted from July to December 2009. The results from these audits will be reported in detail in the next annual report.

Notifications under section 22 of the Act

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 also obliged to report the detection of pathogens in food or water supplies to the department, under the Health (Infectious Diseases) Regulations 2001.⁵

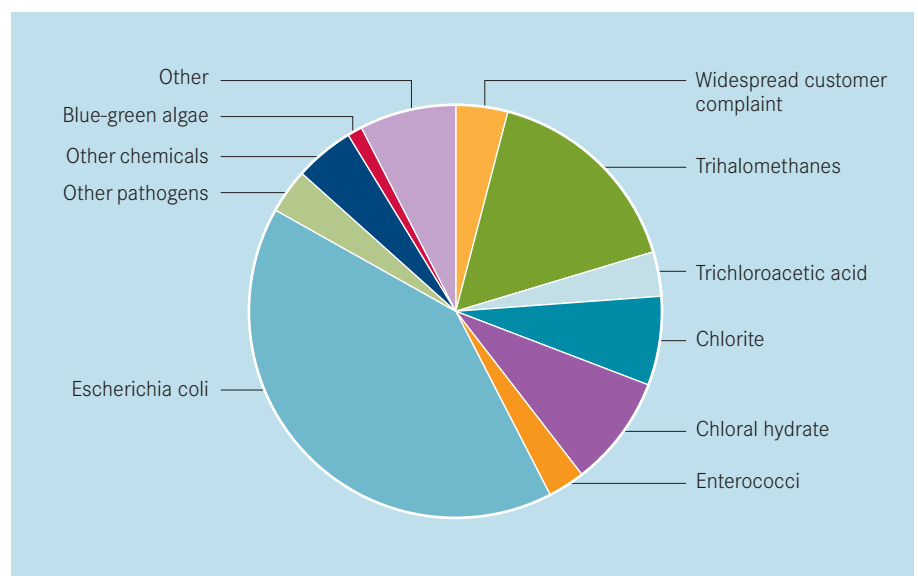
In conjunction with the water supplier(s) concerned, the department assesses all water quality notifications reported to it to determine whether any public health response is necessary, such as initiating a temporary boil water notice, providing an alternative supply, providing health-based

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 to 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 related to longer term events or problems.

Notifications reported to the department during 2008–09 are listed in Appendix 8 and summarised in Figure 3 below. Individual notifications are described in more detail in the sections under the relevant water business. Notifications pertaining to an ongoing problem were consolidated to assist understanding of the underlying water quality issues.

Figure 3: Section 22 notifications, 2008–09



⁵ After the reporting period these were replaced by the Public Health and Wellbeing Regulations 2009.

Overall, 172 notifications were made to the department during 2008–09. The majority of these related to detecting *Escherichia coli* in drinking water (70 notifications), followed by disinfection by-product chemicals, namely trihalomethanes (28 notifications), trichloroacetic acid (six notifications), chlorite (12 notifications) or chloral hydrate (15 notifications) at levels exceeding the permitted standard. Seven episodes related to widespread customer complaint were also recorded. By way of comparison, 195 notifications were reported to the department in 2007–08 and in 2006–07.

Disinfection by-products were predominantly notified by Goulburn Valley Water, North East Water, Central Highlands Water and Grampians Wimmera Mallee Water and usually related to the level of natural organic matter in unfiltered water supplies. *Escherichia coli* was detected sporadically by most water suppliers across Victoria. 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.

The majority of notifications reported to the department were minor and transient in nature, 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 to the detections and coordinated their responses with the department. Operational responses ranged from an immediate and interim

response to address the problem, to investment in capital works to provide a long-term solution.

The more significant incidents, which generated a public health response or community interest, are discussed below.

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.

In nearly all cases *Escherichia coli* was absent from subsequent drinking water 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 disinfection residual
- contamination of storage tanks or reservoirs (for example, by animals or birds)
- inappropriate sampling location, such that the water sample did not represent the general drinking water supply in that area at that time.

In May 2009 a single *Giardia* cyst was detected in a sample taken in the Moonee Ponds locality. Follow-up monitoring showed no evidence of faecal contamination of the distribution system or further cyst presence. The test methodology (fluorescent staining

microscopy) did not indicate that the isolate was either viable or pathogenic.

Cryptosporidium was detected by North East Water in the Tawonga and Corryong supplies. These detections were investigated by North East Water in conjunction with the department. None of these notifications were associated with waterborne illness or increased risk to health.

Boil water notices

In times of a potential threat to water quality, communities are issued a notice to boil their water before drinking it. Over the reporting period a number of *Escherichia coli* detections (or *Enterococci* or *Cryptosporidium* detections in some cases) resulted in advisory boil water notices being issued. In most cases, these notices were implemented when *Escherichia coli* was detected in systems where there was no residual disinfection within the distribution system, or when undisinfecting water was inadvertently supplied, or when it was suspected that the quality of the water had been compromised.

The boil water notices issued in 2008–09 are listed in Table 5.

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

Table 5: Boil water notices, 2008–09

Supply	Cause	Duration	Water supplier
Beaufort	<i>Escherichia coli</i> in drinking water	(entire year)	Central Highlands Water
Mount Macedon	Raw water supply due to pump failure	13–16 August 2008 (4 days)	Western Water
Willaura	<i>Escherichia coli</i> in drinking water	November 2008	Grampians Wimmera Mallee Water
Whitfield	Dirty water	21 November 2008 to 12 January 2009	North East Water
Myrtleford	<i>Cryptosporidium</i> or <i>Enterococci</i> or <i>Escherichia coli</i> in drinking water	1 November 2008 to 30 April 2009	North East Water
Boolarra	Response to bushfires	January 2009	Gippsland Water
Marysville and Buxton	Response to bushfires	February 2009	Goulburn Valley Water
Mount Baw Baw	Response to bushfires	February to May 2009	Mount Baw Baw alpine resort

Chlorination has recently been introduced to the Beaufort drinking water supply. The water treatment plant at Myrtleford is being upgraded to improve water quality. This is due for completion by 2011. Boil water notices relating to bushfires are discussed below.

Bushfires

The devastating Victorian bushfires of January and February 2009 had a tragic impact on many communities. The fires also severely affected some of the state's drinking water supplies and catchments. These impacts are summarised below.

Gippsland Water

The main fire-related impacts for Gippsland Water were around the township of Boolarra. The fires made it impossible for Gippsland Water to access or remotely communicate with the water treatment plant at Boolarra. As a precaution, Gippsland Water issued a boil water notice for the township, until such time as maintenance staff could inspect the plant and take samples to verify the

drinking water being supplied was safe to drink.

Goulburn Valley Water

The bushfires significantly affected the water supplies for the townships of Marysville and Buxton.

Marysville and Buxton are supplied from the same water supply system. Due to the severity of the fires in this area, power and remote communications with the Marysville water treatment plant were lost. After the fires, access to the area remained restricted. Goulburn Valley Water staff repaired leaking mains, but because it could not be verified that the water treatment plant was still functioning correctly, or that the water in the distribution system was still safe, a precautionary boil water notice was implemented.

Prior to the fires, the water supply of Marysville and Buxton required minimal treatment, as the catchment area for the supply was largely pristine forest. Given the extent of fire damage to the catchment area, additional treatment may be required.

Lake Mountain alpine resort

The February 2009 bushfires severely affected infrastructure and the water reticulation system that supplied water to buildings and retail and food outlets at the resort. A number of the resort's buildings that were a part of the water reticulation system were destroyed. Similarly to Marysville and Buxton, the catchment area for the supply was largely pristine forest. Temporary portable buildings were brought in to replace those destroyed in the fires for the 2009 snow season. Works are scheduled for 2010 to complete restoration works of the system.

Melbourne Water

The fires also affected some of Melbourne's water supply catchment areas. Melbourne Water has estimated the fires caused \$5 million damage to its natural and built assets. About one-third of Melbourne's catchment areas were burnt, including all of Armstrong and Wallaby Creek catchments and most of O'Shannassy and Maroondah catchments.

The severity and intensity of the fires varied from catchment to catchment and sometimes within a catchment. Melbourne Water initiated a bushfire recovery coordination team to manage short-term recovery issues associated with the water supply system and waterways. The team initiated a rapid assessment project of fire-damaged assets to help prioritise recovery works and developed the overall strategy to guide recovery operations across all of the Melbourne Water business. The assessment work undertaken by the end of the reporting period showed minimal fire-related impacts on raw water quality.

Lessons learnt

One of the common themes that emerged from the bushfires is that during a severe bushfire there is a high probability that access to and remote communication with water treatment plants, and other water-related infrastructure, will be lost, especially when electrical supplies are interrupted.

This suggests the need to consider having remote communication capacity that is independent of the traditional electrical supply system. While this technology may not always avoid the need for interventions such as boil water notices, it would allow water businesses to remain up to date with what is occurring at the water treatment plant.

The other common theme that emerged was the value of treating and storing as much drinking water as possible ahead of severe weather days to ensure that even if the water treatment plant is damaged there

still should be several days of treated water available for use. The state's water businesses proactively adopted this approach over the 2008–09 fire season.

Private water supplies

Many of the areas that were fire-affected, such as Flowerdale, Kinglake, Kinglake West, Narbethong and Steels Creek, were not serviced by reticulated water supplies. Residents were managing their own drinking water supplies through collecting rainwater or groundwater, extracting from local creeks or through water being supplied by a water carter.

The severity and extent of the fires meant that after the fires the normal processes that residents use to manage their own water supplies stopped functioning or were no longer suitable or safe. In response to this, the Department of Sustainability and Environment, in conjunction with the state's water businesses and local government, established a mutual aid arrangement that ensured that fire-affected residents who were not on town drinking water supply received deliveries of drinking water.

This experience highlighted the need for introducing whole-of-government arrangements for providing drinking water when a natural disaster severely disrupts normal supply arrangements or when existing emergency recovery arrangements fail. Formalising these arrangements for those individuals or communities serviced only by private drinking water supplies is being co-ordinated by the Department of Sustainability and Environment.

To assist in identifying such communities, Appendix 10 lists all small towns or supplies in Victoria that, as far as the department is able to ascertain, do not have a drinking water supply managed by a water supplier under the Act. These towns either have no reticulated water supply at all, or have a non-drinking water supply. Residents and businesses in these towns usually rely on rainwater tanks or other sources for drinking water.

This list has been provided to stakeholders such as regional and outer metropolitan councils and other Victorian government agencies and will be maintained and updated. It will assist local government environmental health practitioners when working with food or prescribed accommodation businesses to help them meet their regulatory obligations.

Blue-green algae

Water storage managers and water suppliers advise the department of any blue-green algae blooms that potentially affect public health, either via drinking water or recreation. This is in addition to the *Blue-green algae statewide co-ordination plan* managed by the Department of Sustainability and Environment.

The most significant blue-green algae bloom during 2008–09 was the extensive bloom that affected the Murray River from March to May 2009. At its peak the bloom stretched for approximately 800 km, from Hume Dam east of Albury, to Robinvale.

The overall response to the blue-green algal bloom was coordinated by the Murray River Algal Coordinating Committee, which is chaired from New South Wales. Victorian water businesses are active members of this cross-border committee. Goulburn-Murray Rural Water coordinated the Victorian response to the Murray River blue-green algal bloom.

To ensure the continued safety of drinking water, North East Water, Goulburn Valley Water, Coliban Water and Lower Murray Water all incorporated activated carbon dosing to the existing water treatment plants that source their water from the Murray River. While the bloom significantly affected recreational activity and the quality of water in the river itself, drinking water supplies sourced from the Murray River remained safe.

The bloom reinforced the need for a conservative management approach to ensure public health is protected. The efficacy of some treatment processes to remove algal toxins from water still need to be confirmed and the extensive time involved to conduct toxin testing on algal blooms needs reviewing.

Customer complaints

Customer complaints relating to the quality of drinking water are reportable under the Act if the drinking water is believed to cause widespread public complaint. Customer complaints are also reported in each water supplier's annual report against five 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. Overall, the number of complaints remained low and comparable to previous years.

With the widespread introduction of water restrictions and permanent water saving rules during the reporting period, a number of water suppliers have reduced their water mains air scouring and flushing programs. In some cases this has led to a small increase in customer complaints relating to discoloured water. In other cases water suppliers have experienced a reduced complaint rate during the period of water restrictions.

Nevertheless, a number of incidents during the year generated a significant number of customer complaints. These were for:

- Preston and Reservoir in June 2009 (Yarra Valley Water), caused by air in the distribution system when a bypass valve was opened on a large water main.
- Broadford in January 2009 (Goulburn Valley Water), when a new water source was suspected of displacing iron and manganese particles in the town's reticulated pipe work.
- Cohuna (Coliban Water), due to a build-up of manganese sediments in the reticulation mains. Sediment had built up in the pipes because the usual flushing and scouring program had been reduced over recent years due to the drought.
- Melton West in January 2009 (Western Water), due to a burst large water main.

- Hamilton in August 2008 (Wannon Water), due to operational problems with the performance of the Hamilton water treatment plant.
- Horsham in December 2008 (Grampians Wimmera Mallee Water), when dirty water entered the system after large-scale mains work had been carried out.
- Maryborough in October 2008 (Central Highlands Water), due to high levels of manganese causing dirty water, and in November 2008, when changing disinfection from chlorination to chloramination generated widespread customer complaints relating to taste and odour.

The details of these incidents can be found in Section 3 of this report under the relevant water supplier. In all cases water suppliers responded appropriately and public health was not compromised.

A clear glass filled with water, set against a solid blue background. The glass is positioned centrally and is partially filled with water, with the water level visible. The lighting creates highlights on the rim and the surface of the water.

Section 3: Summaries of performance of individual water businesses

Alpine resort management boards

Five alpine resort management boards, as designated in the *Alpine Resorts (Management) Act 1997*, have responsibility for managing all aspects 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 year-round permanent populations. During the ski season, the populations at each resort rise significantly, and the number of visitors ranges from 7,000 (Mount Stirling) to 245,000 (Mount Buller)¹. In recent years, winter visitors to all resorts have numbered between 460,000 and 830,000. All resorts except Lake Mountain and Mount Stirling have residential accommodation, varying from 750 to 7,800 beds. The demand for drinking water is therefore highly seasonal.

1 2003 Figures, Alpine Resorts 2020 Strategy, DSE, 2004.



Map prepared by, and used with the permission of, Department of Sustainability and Environment

Falls Creek alpine resort

Drinking water is supplied to a single water sampling locality, Falls Creek, comprising the resort village and the immediate surrounding area. The water is disinfected with ultra-violet irradiation.

Population supplied with drinking water: The estimated overnight visitor population is 5,000 in winter, with a further 2,000 day visitors during the ski season.

Performance against water quality standards

Drinking water supplied to Falls Creek during 2008–09 complied with the water quality standards.

Other 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-related guideline values set out in the 2004 *Australian drinking water guidelines* during the reporting period.

In recent years Falls Creek alpine resort has experienced sporadic elevated levels of iron in the water supply, in late summer to early autumn then 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 do not affect the safety of the supply. Falls Creek resort management has advised that interim connection to the snowmaking system, which is filtered, has seen a marked improvement in the iron levels in summer.

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 Falls Creek alpine resort's annual drinking water quality report for 2008–09.

Risk management plan audit

Falls Creek ARMB's risk management plan audit was completed in August 2008.

Falls Creek ARMB was found to have complied with the obligations imposed by the Act, with the auditor identifying a number of improvement opportunities.

These improvement opportunities, along with Falls Creek's response, are set out in the following table.

Improvement opportunities	Proposed action
As the risk management plan is updated, explicitly set out the critical control points, control point and target criteria and critical limits for system operations.	Review and update of risk management plan carried out in 2008–09
Make attempt to find the dose supplied by the ultra-violet unit with a lamp operating at its design lamp age and flow rates.	Carried out as part of risk management plan review and update in 2008–09
Seek some kind of supplier warranty with deliveries that the correct lamps have been supplied and record sighting of that warranty when lamps are received. Check power settings when lamps are installed to detect any unusual settings.	Immediate implementation.
To provide some verification evidence in relation to the functioning of the ultra-violet sensor and related alert system, make a note when maintenance is performed to confirm that the ultra-violet sensor reading does indeed drop during period of lamp off or lamp warm up and that the alarm flashes or is transmitted via telemetry at these times.	Immediate implementation.
Clarify the ultra-violet intensity sensor checking and calibration requirements with the supplier or with WEDECO directly, to ensure the unit is within normal operational range.	Immediate implementation.
Determine the maximum flow rate through the system that can be permitted before pressure loss starts to occur from the high level system and use this to manage fire system tests and other high flow events.	Included in 2008–09 program.
Implement an internal auditing process for the risk management plan.	Immediate implementation.
When updating the risk management plan, complete the verification section. Either cross reference the verification section of the risk management plan to the sampling contractor and/or summarise the verification testing in the risk management plan.	Carried out as part of risk management plan review and update in 2008–09.
Seek formal assurances from AGL Hydro relating to their understanding of the drinking water supply risks relevant to the Rocky Valley Reservoir source.	Review of Memorandum of Understanding with AGL Hydro
Seek advice from the department as to whether or not Southern Hydro is required to become a water storage manager under the Act.	Resolve and include in updated risk management plan.
In updating its general site emergency management plan it is recommended that Falls Creek alpine resort develop water quality incident contingency plans for the general case of possible water quality contamination incidents and a small number of reasonably foreseeable specific cases.	Develop specific water supply emergency management plan sub plan during next emergency management plan review.
Include consideration of radionuclides when updating the risk assessment.	Carried out as part of risk management plan review and update in 2008–09

The audit certificate is included in Falls Creek alpine resort's annual drinking water quality report for 2008–09.

Water quality notifications

During 2008–09 no notifications were made to the department under section 22 of the Act.

Customer complaints related to water quality

No customer complaints related to water quality were recorded during 2008–09.

Lake Mountain alpine resort

Population supplied with drinking water: Nil. There is no permanent residential population. Annual visitation is approximately 200,000 people.

Other 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 have implemented a program to ensure that staff, stakeholders and visitors to the resort are aware that the water supplied is not drinking water.

Risk management plan audit

Lake Mountain ARMB's risk management plan audit was completed in September 2008. The audit found that Lake Mountain ARMB did not comply with the obligations imposed by the Act.

The department accepted an undertaking from Lake Mountain resort management in October 2008 in relation to the most significant audit findings, as set out in the table below. Due to the destruction of infrastructure at Lake Mountain resulting from the February 2009 bushfires, the department accepted a delay in finalising the undertaking. The undertaking was finalised after July 2009.

Reasons for major non-compliance	Proposed action
All statutory requirements have not been addressed.	Consultants have been engaged to review the water risk management plan and address the non-compliance outcomes from the audit.
Risks listed in Regulation 6(2) have not been specifically addressed.	A risk identification matrix has been inserted into the risk management plan which addresses the non-compliance issues.
The risk management plan does not identify the names and contact details of, and the positions held by, the persons responsible for managing hazards and risks to the quality of the water identified in the risk management plan a required by Regulation 6(1)(a).	The water risk management plan identifies the names and contact details for the persons responsible for managing water quality at Lake Mountain alpine resort.
The risk management plan does not explicitly link risk management plan emergency management to the Lake Mountain emergency management plan.	The risk management plan now links with the emergency management plan.
The risk assessment has not explicitly addressed the hazards identified in Regulations 6(2)(a).	A risk assessment matrix has been inserted into the risk management plan which addresses the non-compliance issues.
The risk assessment has not addressed the incidents, events or the transfer of the hazards listed in Regulations 6(2)(b) and (c).	A risk assessment matrix has been inserted into the risk management plan which addresses the non-compliance issues.

The audit certificate is included in Lake Mountain alpine resort's annual water quality report for 2008–09.

Water quality notifications

The February 2009 bushfires severely affected infrastructure and the water reticulation system that supplied water to buildings and retail and food outlets at the resort. A number of the resort's buildings that were a part of the water reticulation system were destroyed. Temporary portable buildings were brought in to replace those destroyed in the fires for the 2009 snow season. Works are scheduled for 2010 to complete restoration works of the system.

Mount Baw Baw alpine resort

Drinking water is supplied to a single water sampling locality, Mount Baw Baw, comprising the resort village and the immediate surrounding area. The water is disinfected with ultra-violet irradiation and chlorine.

Population supplied with drinking water: The resort has a 750-bed capacity. The resort attracts an average visitation of 50,000 visitors for the period June–September and approximately 25,000 visitors for the period October–May.

Performance against water quality standards

Drinking water supplied to Mount Baw Baw during 2008–09 complied with the water quality standards.

Other water quality issues of potential health significance

Whilst the manual chlorine dosing system currently in place has been effective, Mount Baw Baw resort management has advised that the system is labour intensive. Technical expertise has been sought in relation to possible installation of equipment suitable for flow paced chlorine dosing. This would enable the delivery of more efficient chlorine dosing and would provide improved biological protection in addition to the existing ultraviolet treatment process currently in place.

For detailed water quality data, including data about other aesthetic characteristics of the water, refer to Mount Baw Baw alpine resort's annual drinking water quality report for 2008–09.

Risk management plan audit

Mount Baw Baw ARMB's risk management plan audit was completed in September 2008.

The audit found that Mount Baw Baw alpine resort did not comply with the obligations imposed by the Act. The audit findings and corrective actions in response to these findings, are detailed in the table below. The majority of the corrective actions in response to the major non-compliances below were completed shortly after the audit. An undertaking was not deemed to be necessary.

Reasons for major non-compliance	Proposed action
The names and contact details of, and the positions held by, the persons responsible for managing hazards and risks to the quality of the water identified in the risk management plan are not identified in the risk management plan as required by Regulation 6(1)(a).	The risk management plan was revised to ensure it includes the names and contact details of, and the positions held by, the persons responsible for managing hazards and risks to the quality of the water identified in the risk management plan as required by Regulation 6(1)(a).
The risk management plan's Incident Management Plan does not list the names and contact details of, and the positions held by, the persons responsible for dealing with an incident, event or emergency as required by Regulation 6(1)(f).	(a) Updated the risk management plan's Incident Management Plan to list the names and contact details of, and the positions held by, the persons responsible for dealing with such an incident, event or emergency as required by Regulation 6(1)(f). ** (b) Explicitly link the safe drinking water risk management plan emergency arrangements to the emergency management plan which is currently under review.
The Risk Management Plan does not address the requirements of Regulation 6(1)(a), 6(f)(i) and 7	The risk management plan is currently being reviewed, rewritten and finalised. A fully updated and improved risk management plan will to be implemented in advance of the 2009 audit.
No training or competency manuals have been prepared as required by Regulation 7(c). No training records exist for potable water training.	Developed a training and competency manual, and implemented training for relevant staff.

** This corrective action was a result of an opportunity for improvement. Mount Baw Baw resort management advised that the documents are currently being reviewed, rewritten and finalised and that an updated and improved emergency management plan will be implemented in 2009–10.

The auditor also identified several improvement opportunities, all of which have been completed. For further details, including the audit certificate, refer to Mount Baw Baw alpine resort's annual drinking water quality report for 2008–09.

Water quality notifications

In February 2009 Mount Baw Baw alpine resort experienced significant ash fall as a result of the “Black Saturday” bushfires. This ash fall contaminated the water supply catchment. Measures were undertaken by resort staff to ensure the remaining drinking water supply was isolated from this external threat both during and after this major event. The department was notified of these events under section 22 of the Act.

Mount Baw Baw resort management implemented a **boil water notice** on 9 February 2009 as part of their risk management policy in response to possible contamination of the water supply. This notice was removed on 1 June 2009 when all areas of the supply infrastructure experiencing contamination were cleaned and repaired and testing indicated that the quality of the water supplied was satisfactory.

During the **boil water notice** period drinking water was supplied by a water cartage contractor from the Erica/Rawson water treatment plant, which is managed by Gippsland Water. This process ensured a secure treated supply to the resort and enabled the resort to fully function over the summer and autumn period with water restrictions imposed on all guests and stakeholders.

For further information, refer to Mount Baw Baw alpine resort’s annual drinking water quality report for 2008–09.

Customer complaints related to water quality

No customer complaints related to water quality were recorded during 2008–09.

Mount Buller and Mount Stirling alpine resort

Drinking water is supplied to four water sampling localities, comprising the resort village, the immediate surrounding area and the small settlement at Mount Stirling. The four localities are Mt Buller High Level Reticulation, Mt Buller Alpine Village – Low Level Reticulation, Mirimbah and Mt Stirling – Telephone Box Junction.

The water is disinfected with ultra-violet irradiation and chlorine, for the Mount Buller localities, or chlorine only, for Mirimbah and Mt Stirling – Telephone Box Junction.

Population supplied with drinking water: The resort has a 7,800-bed capacity, with a population that increases to approximately 1,600 during the ski season. The resort has an annual visitation of 500,000 visitor days (number of days each visitor stays) with an estimated maximum of 17,000 people in the resort on any one day. There is no permanent population at Mirimbah or Mount Stirling, although ski patrol members from Mount Stirling have a residence in the Mirimbah locality.

Performance against water quality standards

Drinking water supplied by Mount Buller alpine resort during 2008–09 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standard
Trichloroacetic acid	Mt Stirling – Telephone Box Junction

Elevated levels of trichloroacetic acid were detected in the Mt Stirling – Telephone Box Junction locality on five occasions during the reporting period. Mount Buller resort management advised that the high results were caused by a faulty dosing pump. The faulty pump was sent away for repairs and reinstalled. Resort management also purchased a digital chlorine residual meter for the Mount Stirling staff, to enable the chlorine levels to be monitored more closely and accurately.

Due to a data handling error, Mount Buller resort management did not report the high results to the department within the time frames required by the Act. As the site has no permanent population and few regular visitors, no further action was taken by the department.

Other water quality issues of potential health significance

There were no other issues to report. The resort also provides water at two huts within the Mount Stirling ski field via rainwater. This water is not intended for drinking and relevant signs are placed to advise people of this.

For detailed water quality data refer to Mount Buller and Mount Stirling alpine resort's annual drinking water quality report for 2008–09.

Risk management plan audit

Mount Buller and Mount Stirling ARMB's risk management plan audit was completed in October 2008.

Mount Buller and Mount Stirling ARMB was found to have complied with the obligations imposed by the Act, with the auditor identifying a number of improvement opportunities. These improvement opportunities, along with Mount Buller and Mount Stirling's response, are set out in the table below.

Improvement opportunities	Proposed action
It is necessary to mention radionuclides in the risk assessments as these appear in the Act, even though the risks are low.	Mentioned in safe drinking water risk management plan.
It is recommended that although a low inherent risk, when updating the plans, note the risks from fire-fighting foams and retardants.	Updated in the safe drinking water risk management plan.
It is necessary to work out how to calibrate the ultra-violet units or some other suitably competent party needs to support these units.	UV unit calibrated and serviced.
It is worth considering sending the critical limit monitoring signals (ultra-violet intensity and free chlorine residual) to a continuous alarm system that can alert duty persons immediately in the event of a process failure.	UV unit and chlorine residual alarmed.
It is necessary to record the ultra-violet intensity readings on the ultra-violet units either via telemetry or manually.	Recorded via telemetry.
It would be worth gathering a body of data on disinfected water pH, free chlorine and total chlorine e.g. weekly monitoring, then review	Data is now collected.
It is necessary to describe, either in the risk management plan or the emergency management plan how to notify potential water consumers in the event of suspected or actual contamination.	A procedure is part of the risk management plan.
The risk management plan or emergency management plan deal with the setting up a response to bushfires to prepare for and deal with the possible severe water quality impacts during follow up storms.	A procedure is part of the risk management plan.
It is necessary to develop some standard operating procedures or protocols for a small number of quality – critical tasks performed by Mount Buller staff.	Standard operating procedure's have been developed and continue to be developed.

The audit certificate is included in Mount Buller and Mount Stirling alpine resort's annual drinking water quality report for 2008–09.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department.

Date	Supply	Issue	Action(s)
January 2009	Mirimbah	Detection of <i>Escherichia coli</i> in drinking water	Mains flushed and inspected, additional chlorine added to the system. Repeat sample free of <i>Escherichia coli</i> .
September 2008	Mt Stirling - Telephone Box Junction	Elevated trichloroacetic acid in drinking water	Refer to text under the heading “Performance against water quality standards”

For further information on the water quality notifications listed above, refer to Mount Buller and Mount Stirling alpine resort’s annual drinking water quality report for 2008–09.

Customer complaints related to water quality

No customer complaints related to water quality were recorded during 2008–09.

Mount Hotham alpine resort

Drinking water is supplied to a single water sampling locality, Mount Hotham, comprising the resort village and the immediate surrounding area. The water is disinfected with ultra-violet irradiation.

Population supplied with drinking water: The resort has a 4,700-bed capacity, with a population that increases to an estimated maximum of 5,000 people on any one day in peak winter periods.

Performance against water quality standards

Drinking water supplied by Mount Hotham alpine resort during 2008–09 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>	Mount Hotham

Escherichia coli was detected in the drinking water supply system on two occasions, in July 2008 and February 2009. Mount Hotham resort management investigated each incident but was unable to determine the cause of the detections. At the time of notification the ultra-violet disinfection unit was checked and found to be operating correctly. Repeat samples were found to be clear of *Escherichia coli*.

Other water quality issues of potential health significance

There were no other issues to report. Mount Hotham alpine resort monitors for turbidity and *Escherichia coli* only.

Risk management plan audit

Mount Hotham ARMB's risk management plan audit was completed in September 2008.

The audit found that Mount Hotham ARMB did not comply with the obligations imposed by the Act. This was predominately due to having only a draft risk management plan prepared that had not been effectively implemented, reviewed or updated; a lack of information that identifies that all risks have been considered; and no documentary evidence that risk mitigation measures have been addressed.

The department accepted a formal undertaking from Mount Hotham resort management in relation to the most significant audit findings. The major non-compliances, along with Mount Hotham's response, are set out in the following tables. The undertaking was finalised in July 2009.

Reasons for major non-compliance	Proposed action
A draft risk management plan (dated July 2005) has been prepared. It has not been finalised or updated. All statutory requirements have not been addressed.	Final version of Risk management plan completed February 2009. Employed a consultant to prepare risk management plan.
The risks to be considered under Regulation 6(2) have not been explicitly considered.	Risks addressed and considered in risk management plan 2009.
There is no documentary evidence that the risk mitigation measures identified in the risk assessment have been directly addressed as required by Regulation 9(1)(d).	Installation of inline turbidity meter on raw water feed to pump station. Back up diesel generator for ultra-violet facility 2. Upgrade of SCADA system. Bird proofing water storage facility.
No evidence was sighted to confirm that the risk management plan has been implemented as required by Section 7(1)(b) of the Act.	Ongoing review and implementation of risk management plan recommendations as evidenced in preceding paragraphs.
There is no evidence that the plan has been regularly reviewed and updated as required by Section 7(1)(c) of the Act.	Risk management plan reviewed and updated Feb 2009 following risk management workshop on 25 November 2008.
There is no evidence that the plan has been regularly revised as required by Section 7(1)(d) of the Act.	Risk management plan reviewed and updated Feb 2009 following risk management workshop on 25 November 2008.
The names and contact details of, and the positions held by, the persons responsible for managing hazards and risks to the quality of the water identified in the risk management plan are not identified in the risk management plan as required by Regulation 6(1)(a).	Name of responsible officer identified in risk management plan 2009.
Relevant emergency positions have been identified but contact details have not been included as required by Regulation 6(1)(f).	List of contacts in relation to emergency incidents currently being compiled by resort management staff. List will be located within emergency response protocol folder. Emergency response folder will be accessible to all resort staff.

Reasons for major non-compliance	Proposed action
The hazards identified in Regulation 6(2)(a) have not been specifically addressed.	Risk management plan 2009 has identified all hazards in Regulation 6(2)(a).
Hazards identified in Regulations 6(2)(b) and (c) are not specifically addressed in the risk management plan risk assessment.	Risk management plan 2009 has identified all hazards in Regulation 6(2)(b) and (c).
No training or competency manuals have been prepared as required by Regulation 7(c). No training records exist for potable water training.	Standard operating procedures compiled for sampling and analysis of potable water. Instructions stored on Resort management board hard drive and printed standard operating procedures. Training of staff member in UV disinfection.

The audit certificate is included in Mount Hotham alpine resort's annual drinking water quality report for 2008–09.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department.

Date	Supply	Issue	Action(s)
July 2008	Mount Hotham	Detection of <i>Escherichia coli</i> in drinking water	Sampling procedures were reviewed, ultra-violet disinfection was checked. Resamples were found to be free of <i>Escherichia coli</i> .
February 2009	Mount Hotham	Detection of <i>Escherichia coli</i> in drinking water	Sampling procedures were reviewed, ultra-violet disinfection was checked. Resamples were found to be free of <i>Escherichia coli</i> .

For further information on the water quality notifications listed above, refer to Mount Hotham alpine resort's annual drinking water quality report for 2008–09.

Customer complaints related to water quality

No customer complaints related to water quality were recorded during 2008–09.

Barwon Water

Head office: Geelong

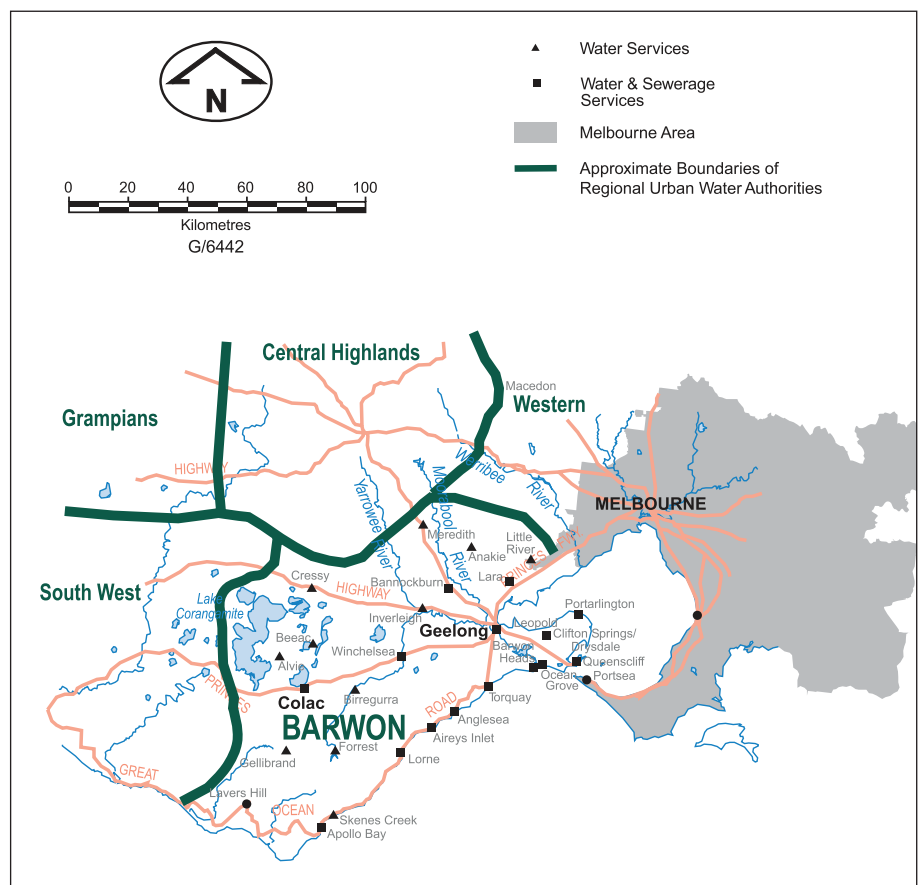
Localities supplied with drinking water: Aireys Inlet, Anakie, Anglesea, Apollo Bay, Bannockburn, Batesford, Bellarine, Birregurra, Clifton Springs, Colac, Cressy, Forrest, Gellibrand, Highton, Highton High Level, Leopold, Lethbridge, Little River West, Lorne, Lovely Banks, Lovely Banks – Carrs Rd, Meredith, Montpellier, Moriac, Ocean Acres, Ocean Grove, Pettavel, Portarlington, Queenscliff, Teesdale, Torquay and Winchelsea (refer to Appendix 9 for a list of all individual towns and suburbs supplied).

All supplies are filtered. The greater Geelong area (extending to Anglesea, Anakie, Bannockburn, Batesford, Lethbridge, Torquay, Winchelsea and Bellarine Peninsula towns) has received fluoridated water since late June 2009.

Population supplied with drinking water: approximately 276,720

Performance against water quality standards

Drinking water supplied in all localities by Barwon Water during 2008–09 complied with the water quality standards.



Other water quality issues of potential health significance

All other parameters measured by Barwon Water as part of its drinking water quality monitoring program complied with the relevant health-related guideline values set out in the 2004 *Australian drinking water guidelines* during the reporting period.

For detailed water quality data, including data about aesthetic characteristics of the water, refer to Barwon Water's annual drinking water quality report for 2008–09.

Risk management plan audit

Barwon Water's risk management plan audit was completed in July 2008.

Barwon Water was found to have complied with the obligations imposed by the Act, with several opportunities for improvement highlighted. These improvement opportunities, along with Barwon Water's response, are detailed below.

Improvement opportunity	Proposed actions
Identification of water pressure as a critical control point	The audit found that Barwon Water adequately managed water pressure as it relates to water quality; however, it was recommended that water pressure be considered a critical control point. Water pressure does not fit Barwon Water's definition of a critical control point, as it cannot be continually monitored and sufficiently controlled across the system. However, it was agreed that there is merit in recognising water pressure in the drinking water risk management plan as an important control measure.
Having a procedure to respond to simultaneous water and sewer bursts	An emergency response procedure has been developed to capture the appropriate response, recovery and notification protocol for field staff, in the rare event of a simultaneous water and sewer burst.
Recording of inherent risk for other than catchments	The inherent risks mentioned in the audit refer to those that are not currently listed on the operational risk register. These inherent risks are mentioned in the detailed risk management plan, however they are not covered in the more frequently used operational risk register. Barwon Water agreed that inherent risks should be included on the operational risk register and will make alterations accordingly, in order to quantify the importance of the control measure.
Improved guidance for flushing requirements after a mains burst.	More detailed guidance has been developed and issued to field staff.
Water temperature in above ground hoses for temporary supply	Hoses provided for temporary supply by field crews are food grade and are disinfected and flushed prior to connection. Given that temperature is an aesthetic parameter and appropriate disinfection of hoses is conducted, Barwon Water does not consider that it presents a health risk. However, it is agreed that temperature is an important aesthetic quality of the water supplied. Consequently, customers that receive temporary supplies by field crews will be provided correspondence advising of the following: <ul style="list-style-type: none"> • the water is safe to drink • temperature fluctuations may be observed; and • flushing of taps before consumption will help resolve temperature variation
Checking of chemical certificates of compliance	A certificate of compliance for a single delivery of lime reported a physical parameter (available lime content) slightly exceeding specification. This exceedance was missed during the checking of the certificate. In order to reduce the likelihood of future oversights, the following has been implemented: <ul style="list-style-type: none"> • The importance of checking the certificates of compliance was discussed with operators • The chemical supplier has been asked to provide a statement and/or automated system of notification with each delivery that guarantees that the product meets specification. Hence any deviation from specification will be reported prior to product acceptance.
Ensuring that current proforma templates are being used at disinfection sites	An outdated proforma was being used at a single disinfection plant. Discussions have been held with area coordinators and operators about the importance of using current proformas. A review of all sites has been conducted to ensure consistency and that current forms are used.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department.

Date	Supply	Issue	Action(s)
November 2008	Birregurra	Detection of <i>Escherichia coli</i> in high level tank	<p>Raw water is treated and disinfected at Birregurra water treatment plant prior to entering the reticulation system. A water pumping station feeds two high level tanks that float on the system and provide pressure to the high level areas of the reticulation network. The high level tank was immediately isolated and dosed with chlorine. Samples taken from the high level tank at the same time were free of <i>Escherichia coli</i>.</p> <p>The water treatment plant, which is the last point of treatment, had no disinfection failures or treatment faults either prior to or after the detection. A review by Barwon Water of recent monitoring results for the system did not show any abnormalities. There had been negligible flows from the high level tanks; and as such, it was very unlikely that water from the tank had been directly supplying customers. As a precaution, the supply main from the high level tanks to the reticulation system was scoured. Follow up sampling of the reticulation system and both high level tanks did not detect any further <i>Escherichia coli</i>. Inspection of the high level tanks provided no evidence of contamination, i.e. from bird life etc. A direct cause of the detection could not be identified.</p>
December 2008	Anakie	Detection of <i>Escherichia coli</i> in tank	<p>Samples taken from the Anakie water supply tank recorded a low level <i>Escherichia coli</i> detection and a chlorine residual of 0.34 mg/L. The Anakie system is classified by Barwon Water as a closed system. There is a disinfection plant on the outlet of the tank, hence customers were not supplied with this water without prior disinfection.</p> <p>There were no faults or issues with the operation or performance of the disinfection process prior to or after the detection. Follow up sampling and tank inspections failed to determine a direct cause. The result appeared to be spurious.</p>
January 2009	Portarlinton	Detection of <i>Escherichia coli</i> in high level tank	<p>On 29 January 2009, routine sampling of the Portarlinton high level tank detected the presence of <i>Escherichia coli</i>. The tank is filled twice per day with 5kL of fresh water dosed at 2.2 mg/L of chlorine. The tank is manually checked for chlorine residual twice per week by Barwon Water operational staff and records indicate sufficient residual (0.56mg/L) within the tank prior to the detection. Barwon Water's contract laboratory was immediately engaged to conduct follow up sampling.</p> <p>Inspection of the tank failed to identify any signs of potential contamination. There were no faults or failures with the operation of the Portarlinton disinfection plant prior to or post detection. Follow up samples were free of <i>Escherichia coli</i> and contained a chlorine residual of 0.85 mg/L. The source of the suspected contamination could not be determined.</p>
February 2009	Portarlinton	Detection of <i>Escherichia coli</i> in high level tank	<p>A month after the previous detection, another sample returned a positive result for <i>Escherichia coli</i>. Follow up tests and investigations failed to detect further <i>Escherichia coli</i> or a cause for the detection. Since these two detections, Barwon Water has increased routine monitoring of the tank. The increased monitoring has failed to identify any issues.</p>

For further information on the water quality notifications listed above, refer to Barwon Water's annual drinking water quality report for 2008–09.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by Barwon Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	111	0.040
Taste/odour	101	0.037
Blue water	1	< 0.001
Air in water	45	0.016
Suspected illness	3	0.001
Other	17	0.006

The vast majority of complaints for 2008–09 related to discoloured water, followed closely by taste and odour issues. Overall, there were approximately 40 fewer complaints this year, compared to the previous year.

For the second year in a row, the largest reduction in complaints was observed in the discolouration call type, with 53 fewer complaints being recorded. The reduction in discoloured water complaints appears to be the result of targeted mains cleaning programs and reduced number of water main bursts.

Milky water (air in water) complaints increased during the 2008–09 reporting period. The increase was a result of operational works undertaken by Barwon Water on their Highton feeder main. Air became trapped in the main during recharge works and as a consequence aerated water was supplied to customers in the reticulation system. A debrief of the event was held and procedures were reviewed in order to reduce the likelihood of the event reoccurring.

There were fewer “Other” complaint types reported by Barwon Water. This was mainly due to the mitigating control measures that they implemented after the emergence of *Plumatella* (tobacco weed) in Portarlinton. It appears that the corrective actions have proven to be successful in disrupting the nuisance invertebrate’s life cycle. Barwon Water will continue to closely monitor the Portarlinton system.

Central Highlands Water

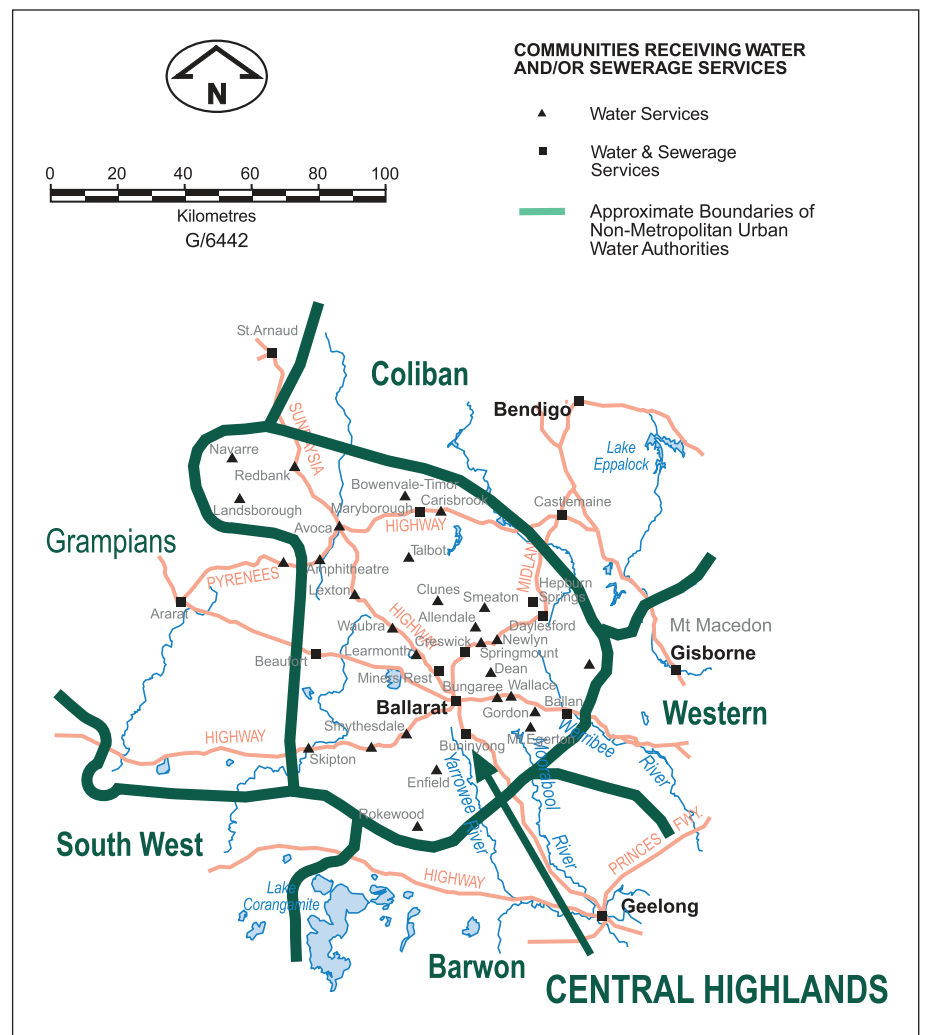
Head office: Ballarat

Localities supplied with drinking water: Alma, Avoca, Ballan, Ballarat Central, Ballarat North/Nerrina, Beaufort, Bet Bet, Blackwood/Barrys Reef, Bungaree/Wallace, Buninyong/Mount Helen, Cardigan Village, Carisbrook, Clunes, Creswick, Daisy Hill, Daylesford High Level, Daylesford Low Level/Hepburn, Dean, Enfield, Forest Hill, Fiskville/Glenmore, Gordon/Mount Egerton, Haddon, Lal Lal, Learmonth, Lexton, Linton, Majorca, Maryborough, Napoleons, Sebastopol, Skipton, Smythesdale, Talbot, Timor, Waubra and Wendouree.

All drinking water supplies are filtered, except bore water supplies to Dean, Learmonth and Waubra.

Towns supplied with regulated (non-drinking) water: Amphitheatre, Landsborough, Navarre, Raglan and Redbank.

Population supplied with drinking water: approximately 119,510



Performance against drinking water standards (drinking water supplies only)

Drinking water supplied in all localities by Central Highlands Water during 2008–09 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>	Beaufort
Trihalomethanes	Enfield, Lexton, Alma, Bet Bet, Carisbrook, Daisy Hill, Majorca, Maryborough and Timor

Drinking water supplied to Beaufort did not comply with the standard for *Escherichia coli* due to incidents in December 2008, January 2009 and March 2009. In response, Central Highlands Water began adding chlorine to the water supply 13 March 2009. Prior to March 2009, this supply was disinfected with ultra-violet light rather than chlorine-based disinfectants. Beaufort remained on a **boil water notice** during 2008–09.

For the locality of Beaufort, customer communications included issuing a “*Reminder Water Quality Notice*” in December 2008 and in January, March and May 2009. A water mains cleaning process was undertaken during July and October 2008 as well as January and March 2009. A water quality update letter was issued to Beaufort customers in April 2009. A public notice regarding water quality was also published in the local newspaper, the Pyrenees Advocate, on 20 March 2009.

The localities of Alma, Bet Bet, Carisbrook, Daisy Hill, Majorca and Timor receive water from the Maryborough water supply system. The disinfection process for this system was changed from chlorination to chloramination in November 2008, in response to the high levels of trihalomethanes experienced in these supply systems in recent years. The disinfection process for Avoca was also changed to chloramination, in September 2008. These systems have since complied.

Central Highlands Water has advised that ammonia dosing equipment failures and possible lower concentration of ammonia in the Lexton water supply system caused elevated levels of trihalomethanes, in August 2008. Central Highlands Water have increased monitoring and equipment maintenance programs. The high trihalomethane results in Rokewood in 2008 were also investigated and were found to be of no significance to public health.

Other water quality issues of potential health significance

Drought conditions continued across Central Highland Water's area of operation during 2008–09. This created challenges to maintaining water quality with low reservoir levels, emergency supplies and limited resource for mains cleaning programs.

Elevated levels of lead were detected in Gordon, in October and December 2008. Central Highlands Water advised that both lead results were investigated and that the resamples were compliant.

Apart from the lead detections in Gordon, all other parameters measured by Central Highlands Water as part of its drinking water quality monitoring program satisfied the relevant health-related guideline values set out in the 2004 *Australian drinking water guidelines* during the reporting period.

Central Highlands Water also manages a number of non-potable (non-drinking) water supplies in its region. Central Highlands Water 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 drinking water, refer to Central Highlands Water's annual drinking water quality report for 2008–09.

Risk management plan audit

Central Highlands Water's risk management plan audit was completed in August 2008.

The auditor found that Central Highlands Water had not complied with the obligations of the Act, with three major and four minor non-compliances highlighted. In October 2008 Central Highlands Water sought an undertaking with the department to address their response to the audit findings. The period of the undertaking concluded in June 2009.

The following tables set out the actions in response to the non-compliances.

Reason for minor non-compliance	Proposed actions
1. Although reference to radiological hazards is mentioned in the risk management plan and testing is carried out annually, there has been no formal risk assessment conducted for any water supply system across Central Highlands Water.	– Central Highlands Water will include an assessment of the radiological risks for each water supply system as part of the review of catchment to tap risk assessments.
2. a. Some unapproved chemicals were sighted at Lexton water treatment plant.	– Chemicals left over from a water treatment trial were removed after the audit. Chemicals and Material Safety Data Sheets to be reviewed quarterly, or as required.
b. Delivery dockets for chemicals were not always signed at Maryborough water treatment plant	– Delivery checklists developed for all chemicals delivered to water treatment plants
c. Records were not available to show that specific gravity testing of alum deliveries was carried out at the Maryborough water treatment plant.	– For alum deliveries the specific gravity checked and recorded on the delivery checklists
d. Licences for pest control operators were not available at the Maryborough water treatment plant	– Operator licences held at Central Highlands Water’s main office in Ballarat. Central Highlands Water’s operators engaging pest control contractors will check licences as part of signing into visitors log-book.
e. An expired buffer solution (Sept 2007) was noted in the Avoca water treatment plant.	– Monitoring of chemical reagents will be monitored as part of regular site visits and internal audits
3. No formal review of the emergency management plan has been undertaken in relation to a water quality incident exercise.	– Central Highlands Water will test emergency response – either within the <i>Terrorism (Community Protection) Act 2003</i> exercise if there is a ‘water quality’ focus or as a separate water quality exercise at least once annually. The testing of emergency procedures to be added to Central Highlands Water’s risk management plan.
4. Some uncontrolled forms (ie. forms which were not incorporated into the risk management system) were sighted at the Avoca treatment plant.	– In the short-term the forms required for the Avoca water treatment plant to be printed from Maryborough water treatment plant where access is available to the intranet and the most up-to-date forms, and then transported to Avoca. In the longer-term Central Highlands Water are investigating the use of mobile computing with direct access to the intranet.

Reason for major non-compliance	Proposed actions
<p>1. The monitoring requirements for critical control points outlined in the Drinking Water Quality Management System manual Hazard Analysis and Critical Control Point plans have not been followed for the Daylesford water treatment plant as follows:</p> <p>a. Critical Control Point (CCP) 1, a manganese result of 0.115 mg/L was recorded on 31 January 2007 vs the critical limit of < 0.1 mg/L with no corrective actions recorded.</p> <p>b. Supervisory Control and Data Acquisition (SCADA) monitoring results were not available for 2006.</p> <p>c. CCP 9, Prevention of sabotage weekly security inspections were not conducted and no records were available</p>	<ul style="list-style-type: none"> - CCPs previously developed for the Daylesford HACCP plan in 2003 will not be used, but will be updated as part of the review for the catchment to tap risk assessments. Notification reports developed. - The limitation of the current SCADA system for accessing historical data has previously been identified and is part of the Water Plan capital expenditure budget. Until this project has been completed, parameters required for audits will be reviewed prior to each audit to ensure required parameters can be viewed by the Auditor for the entire audit period - This CCP previously developed for Daylesford HACCP Plan in 2003 will not be used, but a roster has been developed to ensure at water treatment plant operator is onsite at least twice weekly and are noted in plant diaries.
<p>2. There are no formal records to demonstrate that any residual chlorine testing is carried out following a burst mains repair across all water systems audited as indicated in CCP 8</p>	<ul style="list-style-type: none"> - Central Highlands Water will purchase chlorine analysers, provide training, update procedures and update 'work order' records to provide record chlorine residuals. Residual chlorine testing will be carried out after burst main has been repaired in the distribution system.
<p>3. Records were not available to demonstrate that any verification or validation had been undertaken for each of the CCPs outlined in the HACCP plan for Daylesford</p>	<ul style="list-style-type: none"> - CCPs previously developed for Daylesford HACCP plan in 2003 will not be used, but with the updated risk management plan validation and verification of CCPs has been reviewed and completed. Internal audits will ensure these continue to be monitored.

Central Highlands Water did not complete a number of the actions they specified in the undertaking by the due date but implemented a number of alternative actions to those specified in the undertaking. These issues were considered as breaches of the undertaking. However, the department took into account Central Highlands Water's compliant audit result for 2009 and considers that adequate measures have been taken to address the purpose of the undertaking. As a result, the department considers that Central Highlands Water has completed the undertaking.

The audit certificate is included in Central Highlands Water's annual drinking water quality report for 2008-09.

Water quality notifications

During 2008–09, the following water quality notifications were made to the department.

Date	Supply	Issue	Action(s)
July 2008	Dean	Detection of <i>Escherichia coli</i> at tank	Inspection of tank and resampling. No <i>Escherichia coli</i> detected in resample.
July 2008	Maryborough system (including Alma, Timor, Carisbrook, Daisy Hill)	Elevated trihalomethanes in drinking water	Commissioning of Maryborough chloramination plant in November 2008 for water quality improvements.
August 2008	Lexton	Elevated trihalomethanes in drinking water	More rigorous maintenance schedule developed.
October 2008	Alma	Elevated trihalomethanes in drinking water	Commissioning of Maryborough chloramination plant in November 2008 for water quality improvements.
October 2008	Maryborough system (including Timor, Bet Bet, Carisbrook, Daisy Hill, Majorca)	Elevated trihalomethanes in drinking water	Commissioning of Maryborough chloramination plant in November 2008 for water quality improvements.
October 2008	Gordon	Elevated lead in drinking water	Site investigated, resample collected with no lead elevation.
October 2008	Rokewood	Elevated trihalomethanes in drinking water	Site investigated and resample collected with no trihalomethane elevation.
October 2008	Maryborough supply (Maryborough water treatment plant)	Widespread customer complaint due to high levels of manganese causing dirty water	Filter taken offline at water treatment plant. Additional sampling at customer taps and treatment plant continued until dirty water disappeared. Customers notified through media releases.
November 2008	Rokewood	Elevated trihalomethanes in drinking water	Additional sampling, plus dose rates and dosing equipment investigated.
November 2008	Buninyong	Detection of <i>Escherichia coli</i> at tank	Tank dosed with chlorine and resampled. Resample results revealed positive <i>Escherichia coli</i> detection before tank dosed. No <i>Escherichia coli</i> detected in second set of resamples.
November 2008	Maryborough system (including Timor, Majorca, Daisy Hill)	Elevated trihalomethanes in drinking water	Commissioning of Maryborough chloramination plant in November 2008 for water quality improvements.
November 2008	Maryborough system	Widespread customer complaint due to taste and odours created by changing disinfection from chlorination to chloramination	Central Highlands Water tankered water from the ends of the reticulation system to pull fresh water through the town. Customers were advised in newspapers, on radio and in a newsletter inserted into customer bills.
December 2008	Gordon	Elevated lead in drinking water	Further resampling and site investigation. Lead levels satisfied health-related guideline value in resamples.
December 2008	Creswick	Detection of <i>Escherichia coli</i> in basin	Inspection of tank and resampled. No <i>Escherichia coli</i> detected in resample.

Date	Supply	Issue	Action(s)
December 2008	Beaufort	Detection of <i>Escherichia coli</i> in drinking water	Beaufort on Boil Water Notice . A number of resamples were collected; at first these returned with detection of <i>Escherichia coli</i> , but later returned clear.
December 2008	Beaufort	Detection of <i>Escherichia coli</i> in drinking water	Notice sent to customers to remind of the need to boil water . Mains spot dosed with chlorine. No <i>Escherichia coli</i> detected in resample.
January 2009	Beaufort	Detection of <i>Escherichia coli</i> in drinking water	Beaufort on Boil Water Notice . Resamples collected. Mains spot dosed with chlorine as part of mains cleaning program. Fax sent to businesses, hospitals and schools via emergency communications database. No <i>Escherichia coli</i> detected in second resample.
February 2009	Talbot	Detection of <i>Escherichia coli</i> in tank	Break pressure tank dosed with chlorine and resampled. No <i>Escherichia coli</i> detected in resample.
March 2009	Beaufort	Detection of <i>Escherichia coli</i> in drinking water	Resamples collected from all four sites: Two returned with detection of <i>Escherichia coli</i> . Mains flushed and decision made to chlorinate entire town. Following resample identified one site with <i>Escherichia coli</i> . Community advised of contamination, reminder to boil water and advised chlorine would be added to the system. No <i>Escherichia coli</i> detected in following samples.
March 2009	Cardigan Village	Detection of <i>Escherichia coli</i> in tank	Tanks disinfected using chlorine and resampled. No <i>Escherichia coli</i> detected in resamples.

For further information on the water quality notifications listed above, refer to Central Highlands Water's annual drinking water quality report for 2008–09.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by Central Highlands Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	590	0.99
Taste/odour	97	0.16
Blue water	0	0
Air in water	100	0.16
Suspected illness	22	0.03
Other	15	0.02

The number of complaints in the discoloured water category was higher than the previous year, when 354 complaints were recorded. Central Highlands Water advised that this increase was primarily due to a single incident in Maryborough, where 336 discoloured water complaints were received in thirteen days. This provided the largest contribution to the increase in complaints.

Central Highlands Water advised that the implementation of chloramination disinfection at Maryborough and Avoca also contributed to an increase of taste and odour complaints, up from 74 in 2007–08. Central Highlands Water advised that treatment plant upgrades and new operational procedures have been implemented to reduce future complaints of this nature.

In addition, mains cleaning programs led to a significant increase in reported complaints relating to air in the pipes (100, compared to three complaints in 2007–08).

City West Water

Head office: Sunshine

Localities supplied with drinking water: Altona, Caroline Springs, Deer Park, East Keilor, Little River, Maribyrnong, Moonee Ponds, Parkville, Richmond, Strathmore, Taylors Lakes, Tullamarine, Werribee, Werribee South, Williamstown and adjacent suburbs (refer to Appendix 9 for a list of all individual suburbs supplied).

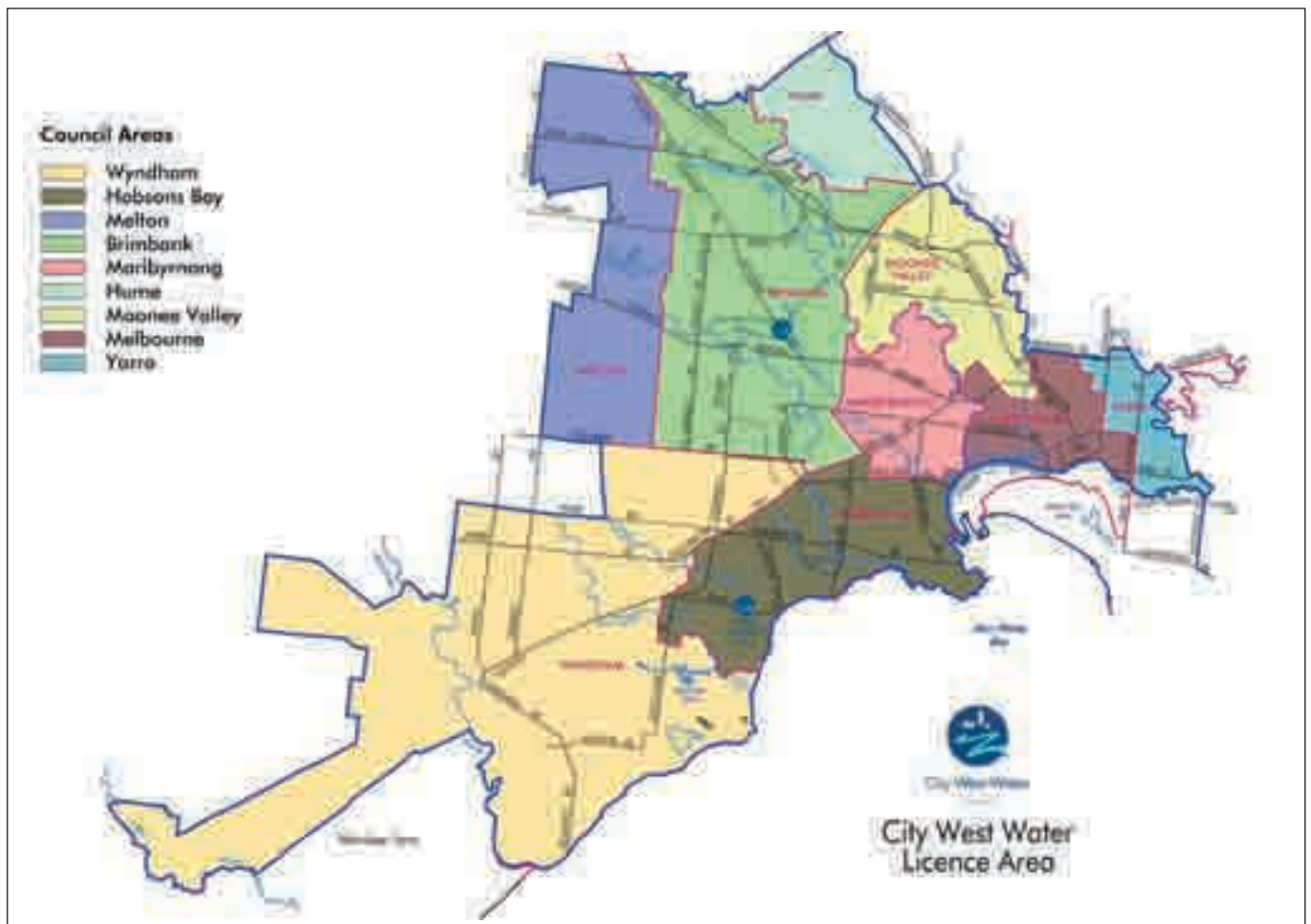
Water is sourced from Melbourne's protected forested catchments without requiring further filtration, or is blended with filtered water from Winneke water treatment plant. All localities receive fluoridated water.

Population supplied with drinking water: approximately 695,210

Performance against water quality standards

Drinking water supplied in all localities by City West Water during 2008-09 complied with the water quality standards.

Map prepared by, and used with the permission of, City West Water



Other water quality issues of potential health significance

In May 2009 a Giardia cyst was detected in a sample from the Moonee Ponds locality. Please refer to the “*Water quality notifications*” section.

All other parameters measured by City West Water as part of its drinking water quality monitoring program satisfied the relevant health-related guideline values set out in the 2004 *Australian drinking water guidelines* during the reporting period.

For detailed water quality data, including data about other aesthetic characteristics of the water, refer to City West Water’s annual drinking water quality report for 2008–09.

Risk management plan audit

City West Water’s risk management plan audit was completed in September 2008.

The auditor found that City West Water complied with the obligations of the Act, with several opportunities for improvement highlighted. These improvement opportunities, along with City West Water’s response, are detailed below.

Improvement opportunity	Proposed action
Update existing policy to reflect current managing director and developments in managing drinking water safety.	The policy has been updated to include (a) reference to the <i>Safe Drinking Water Act</i> 2003 and (b) endorsement by the current Managing Director and Board of Management.
Construct flow diagrams of water supply system for individual localities.	Flow diagrams have been completed.
Evaluate uncertainty associated with each hazard and consider actions to reduce uncertainty.	Uncertainty evaluations, together with response actions have been included in Element 2.3 of the risk management plan.
Relate City West Water’s improvement programs and works to water quality improvements.	City West Water agreed that at this stage its long term (capital) improvement programs are not associated with water quality improvements. This is because City West Water, after careful ongoing consideration, does not consider that there is currently a demonstrated need for (capital) improvement works related to water quality. However, City West Water remains vigilant in this regard and will target improvement programs or works to improve water quality when required.
Estimate residual risks for each significant hazard or hazardous event.	Estimates of residual risks have been included in Element 3.1 of the risk management plan.
Identify alternative or additional preventative measures.	Alternative or additional preventative measures have been included in Element 3.1 of the risk management plan.
Develop monitoring protocols for operational performance.	Operational monitoring protocols have been developed and included in Element 4.2 of the risk management plan.
Develop and improve skills of operational staff to deal with new systems and processes.	Operational staff skills and training have been developed and included in Element 7.2 of the risk management plan.
Ensure that the ‘Bulk Water Supply Agreement’ with Melbourne Water is enforced fully to control short and long term risks to City West Water’s water supply.	An assessment of Melbourne Water’s obligations and performance has been updated in Element 9.2 of the risk management plan.

The audit certificate is included in City West Water’s annual drinking water quality report for 2008–09.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department:

Date	Supply	Issue	Action(s)
April 2009	Werribee (Manor Lakes High level tank, supplies Wyndham Vale).	Detection of <i>Escherichia coli</i> at tank	Re-sampling conducted. No detection of <i>Escherichia coli</i> in resample results. Inspection of tank revealed small gaps at some joints due to deteriorated silicone sealant. Fresh application of sealant was applied.
May 2009	Moonee Ponds	Detection of <i>Giardia cyst</i> in drinking water	Associated and follow-up monitoring showed no evidence of faecal contamination of the distribution system or further cyst presence. The test methodology (fluorescent staining microscopy) did not indicate that the isolate was either viable or pathogenic.

For further information on the water quality notifications listed above, refer to City West Water's annual drinking water quality report for 2008–09.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by City West Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers supplied*
Discoloured water	167	0.048
Taste/odour	53	0.015
Blue water	3	< 0.001
Air in water	65	0.019
Suspected illness	0	0
Other	3	< 0.001

* Based on number of properties serviced.

A higher number of complaints was recorded for the 'Air in water' (white water) category when compared with 2007–08, which had 37 complaints. City West Water advised that this increase resulted from the failure of, and subsequent repairs to, a large Melbourne Water distribution main in Northcote in January 2009. City West Water advised that with the introduction of water restrictions, greater emphasis is placed on better explaining the phenomenon of white water and obtaining customers' agreement to not flush water mains.

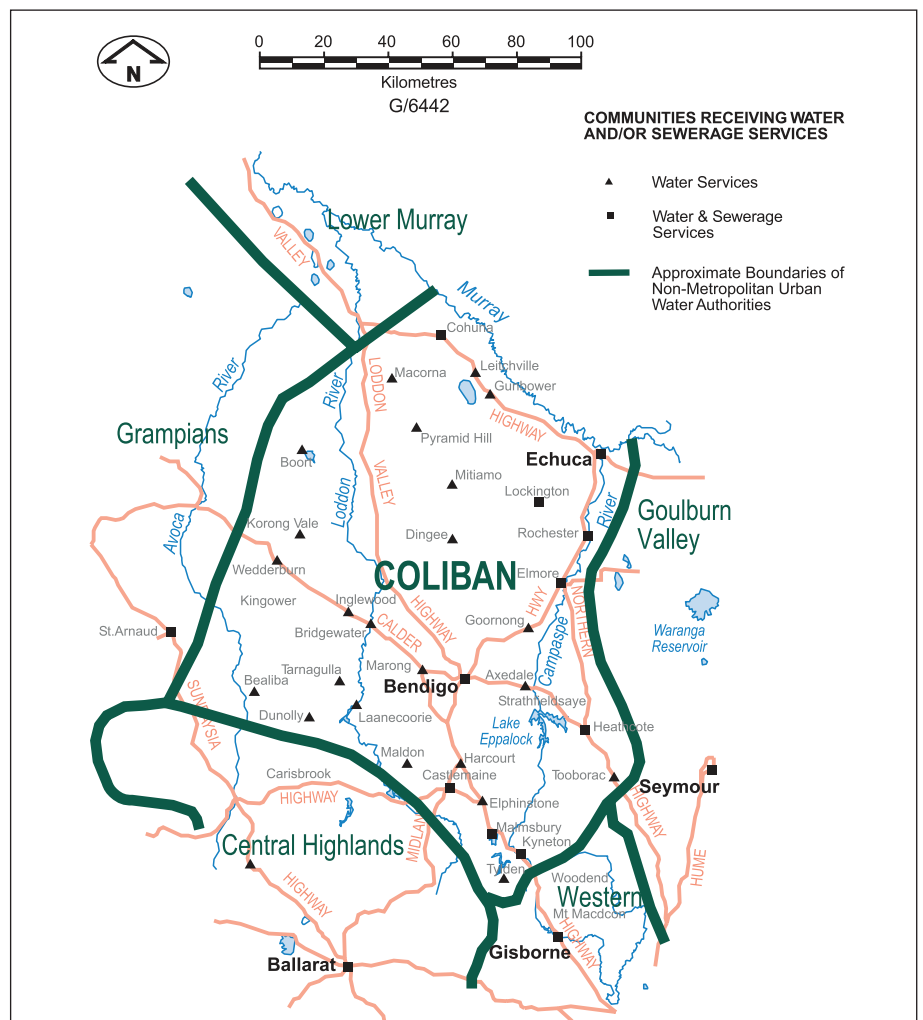
Coliban Water

Head office: Bendigo

Localities supplied with drinking water: Axedale, Bealiba, Bendigo Northern, Bendigo Southern, Bendigo – Spring Gully, Big Hill, Boort, Bridgewater, Castlemaine, Cohuna (Rural), Cohuna (Urban), Dunolly, Echuca, Elmore, Epsom – Huntly, Fryerstown, Goornong, Guildford, Gunbower, Harcourt, Heathcote, Inglewood, Junortoun, Korong Vale, Kyneton, Laanecoorie, Leitchville (Rural), Leitchville (Urban), Lockington, Maiden Gully – Marong, Maldon, Malmsbury, Newstead, Pyramid Hill, Raywood, Rochester, Serpentine, Strathfieldsaye, Taradale – Elphinstone, Tarnagulla, Tooborac, Trentham, Tylden and Wedderburn.

All drinking water supplies are filtered, except the bore water supply to Elmore.

Echuca, Kyneton, Tylden, Malmsbury, Castlemaine, Harcourt, Newstead, Taradale, Maldon and greater Bendigo (including Axedale, Spring Gully, Epsom, Huntly, Junortoun, Big Hill, Marong, Maiden Gully and Strathfieldsaye) receive fluoridated water. Supplies to Raywood and Serpentine were supplemented with fluoridated water from Bendigo for part of 2008–09.



Map prepared by, and used with the permission of, Department of Sustainability and Environment

Towns supplied with regulated (non-drinking) water: Borung, Dingee, Jarklin, Macorna, Mitiamo, Mysia, Sebastian and Wychitella.

Population supplied with drinking water: approximately 145,890

Performance against water quality standards (drinking water supplies only)

Drinking water supplied in all localities by Coliban Water during 2008–09 complied with the water quality standards, except as noted in the table below.

Parameter	Localities not complying with water quality standard
Aluminium	Bridgewater, Inglewood
Trihalomethanes	Bealiba, Serpentine

The elevated aluminium results at Bridgewater and Inglewood were caused by operational problems at the Bridgewater water treatment plant in October 2008 and April 2009. Coliban Water notified the department of these results under section 18 of the Act. Coliban Water has since advised that they have upgraded the backwash facilities and replaced the filter media at the Bridgewater water treatment plant. The chemical dosing systems have also been upgraded to improve feed water quality for the reverse osmosis facility being installed to control salinity. This system was commissioned in October 2009. These results did not pose a risk to public health.

Coliban Water advised that the isolated elevated trihalomethanes result for Serpentine in January 2009 was a result of a short term increase in raw water salinity levels and management of water carting for this supply. This result did not pose a risk to public health.

The water supplied to Bealiba is chloraminated at the Laanecoorie water treatment plant and then booster chlorinated at the Bealiba booster chlorinator. Coliban Water has advised that the high level of salinity in the raw water from the Loddon River combined with the booster chlorination has made control of the trihalomethanes levels challenging. This result likewise did not pose a risk to public health.

During the reporting period undertakings were also in place for previous water quality issues in Axedale and Gunbower, for aluminium and trichloroacetic acid respectively. Nevertheless, drinking water for both supplies complied with all standards in 2008–09.

The undertaking for Axedale involved the construction of a pipeline to provide treated water from Bendigo by 31 December 2008. Although the pipeline was not completed until May 2009, the department concluded the undertaking in February 2009 as drinking water had been trucked to Axedale from Bendigo since July 2007 and the water supplied to Axedale complied with the standard.

The undertaking for the Gunbower supply continues into 2009–10.

Other water quality issues of potential health significance

All other parameters measured by Coliban Water as part of its drinking water quality monitoring program satisfied the relevant health-related guideline values set out in the 2004 *Australian drinking water guidelines* during the reporting period.

Coliban Water also manages a number of regulated (non-drinking) water supplies in its region. Coliban Water has developed a program of public signage and customer consultation that is designed 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 drinking water, raw water monitoring and details of Coliban Water's undertakings, refer to Coliban Water's annual drinking water quality report for 2008–09.

Risk management plan audit

Coliban Water's risk management plan audit was completed in September 2008.

The auditor found that Coliban Water complied with the obligations of the Act, with several opportunities for improvement highlighted. These improvement opportunities, along with Coliban Water's response, are detailed below.

Improvement opportunity	Proposed action
Develop a formal risk assessment for radiological hazards for all water supply systems across Coliban Water.	Radiological risk assessments were conducted for each catchment area and included in the risk registers by the end of March 2009.
Whilst testing for residual chlorine is undertaken by contractor staff following any bursts or repairs, there are no formal records to demonstrate this testing is completed.	A review of the mains disinfection process (for both new mains and repairs) was conducted by the end of March 2009. Changes were made so that all residual chlorine results are reported satisfactorily.
A clarified water turbidity reading by the operator at Echuca water treatment plant was recorded with no corrective action recorded on the Event log.	The critical control point in question is to be reviewed (along with all other critical control points) to include removing the manual sampling as critical monitoring and instead rely on continuous Supervisory Control and Data Acquisition (SCADA) monitoring. The reporting of the SCADA monitoring is in the process of being upgraded so that all critical control point exceedences are to be automatically reported each day. This reporting upgrade was completed by end of September 2009.
Records were not available to demonstrate that the annual audits of the critical control point plans in the risk management plan were conducted in 2006.	The risk management plan was created through extensive workshops in 2005. An extensive review was conducted in mid 2007 to review implications of new water sources.

Improvement opportunity	Proposed action
<p>In relation to chemical quality assurance systems:</p> <ul style="list-style-type: none"> Some unapproved chemicals were sighted in the treatment plant at Castlemaine e.g sodium bentonite. Expired buffer solutions and test chemicals were sighted at Trentham water treatment plant. An unlabelled 20 litre drum containing green liquid was sighted in the Echuca water treatment plant. 4) A spray unit containing an unidentified liquid and a bag of construction grout were sighted in the chemical feed area at Echuca. 	<p>The procedure for the storage of chemicals at all water treatment facilities have been amended to include:</p> <ul style="list-style-type: none"> All chemicals stored within the water treatment facilities are to be approved for safety and listed on the Material Safety Data Sheets (MSDS) register at each site. Also all chemicals which are used in the water treatment process are to be specified as appropriate for use in water treatment by the manufacturer/supplier. This specification for each product is to be located in the Product Specification register at each site. All chemicals stored within the water treatment facilities are to be adequately labelled. All chemicals stored within the water treatment facilities and used in the water treatment process are to be replaced once the expiry date has been reached.

The audit certificate is included in Coliban Water's annual drinking water quality report for 2008–09.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department.

Date	Supply	Issue	Action(s)
Oct–Dec 2008	Bealiba	Elevated trihalomethanes in drinking water	Refer to text under the heading “ <i>Performance against water quality standards</i> ”
December 2008	Raywood	Elevated chlorine in drinking water (10 mg/L)	Older chlorinator initially upgraded and then made redundant as a new chlorinator at Raywood water treatment plant was used instead.
January 2009	Serpentine	Elevated trihalomethanes in drinking water	Refer to text under the heading “ <i>Performance against water quality standards</i> ”
February 2009	Inglewood	Detection of <i>Escherichia coli</i> at tank outlet	Bridgewater water treatment plant operating satisfactorily however residual chlorine low and elevated plate count. The tank was spot dosed with sodium hypochlorite and inspected for contamination. Resample was clear of <i>Escherichia coli</i> .
April 2009	Gunbower	Elevated blue green algae in raw water supply	The Gunbower micro-filtration plant performed adequately with the elevated blue green algae levels.
May 2009	Maldon	Detection of <i>Escherichia coli</i> at tank outlet	Castlemaine water treatment plant operating satisfactorily. The tank was spot dosed with sodium hypochlorite and inspected for contamination. Resample was clear of <i>Escherichia coli</i> .

Date	Supply	Issue	Action(s)
May 2009	Malmsbury	Detection of <i>Escherichia coli</i> in drinking water	Kyneton water treatment plant operating satisfactorily. The Malmsbury tank was spot dosed with sodium hypochlorite and inspected for contamination. Resample was clear of <i>Escherichia coli</i> .
June 2009	Boort	Detection of <i>Escherichia coli</i> in drinking water	No known cause. Boort water treatment plant was operating normally. Resample was clear of <i>Escherichia coli</i> .

The extensive blue green algae outbreak in the Murray river system in March to May 2009 did not result in an increase in water quality complaints from Echuca, Cohuna, Leitchville and Gunbower. Powdered-activated carbon dosing was initiated at Echuca, Cohuna and Leitchville. The Gunbower microfiltration plant performed satisfactorily.

Algal blooms affected the raw water basin at Wychitella, a non-drinking supply, necessitating a brief period of carting water from Bendigo.

For further information on the water quality notifications listed above, refer to Coliban Water's annual drinking water quality report for 2008–09.

Customer complaints relating to water quality

A summary of the customer complaints related to water quality that were recorded by Coliban Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	145	0.25
Taste/odour	65	0.11
Blue water	0	0
Air in water	0	0
Suspected illness	0	0
Other	0	0

Across the business, the numbers of customer complaints relating to discoloured water decreased compared with the previous year, from 312 to 145. The number of taste and odour complaints remained much the same as the previous year.

A large proportion of the complaints related to the Cohuna system. Coliban Water advised that these complaints related to a build up of manganese sediments in the reticulation mains. Due to the drought, the flushing/scouring program had been reduced over recent years and this had allowed a build-up of sediment in the pipes.

Coliban Water advised that flushing and scouring recommenced in 2008–09 and together with an additional treatment process has improved quality, but that further actions are required to avoid elevated levels of manganese entering the system.

After consideration and consultation with the community during 2008–09, Coliban Water has installed a reverse osmosis facility at Bridgewater water treatment plant. This facility was commissioned after the end of 2008–09 (in October 2009) and will reduce salinity and improve the palatability and aesthetics of the Bridgewater and Inglewood drinking water supplies.

East Gippsland Water

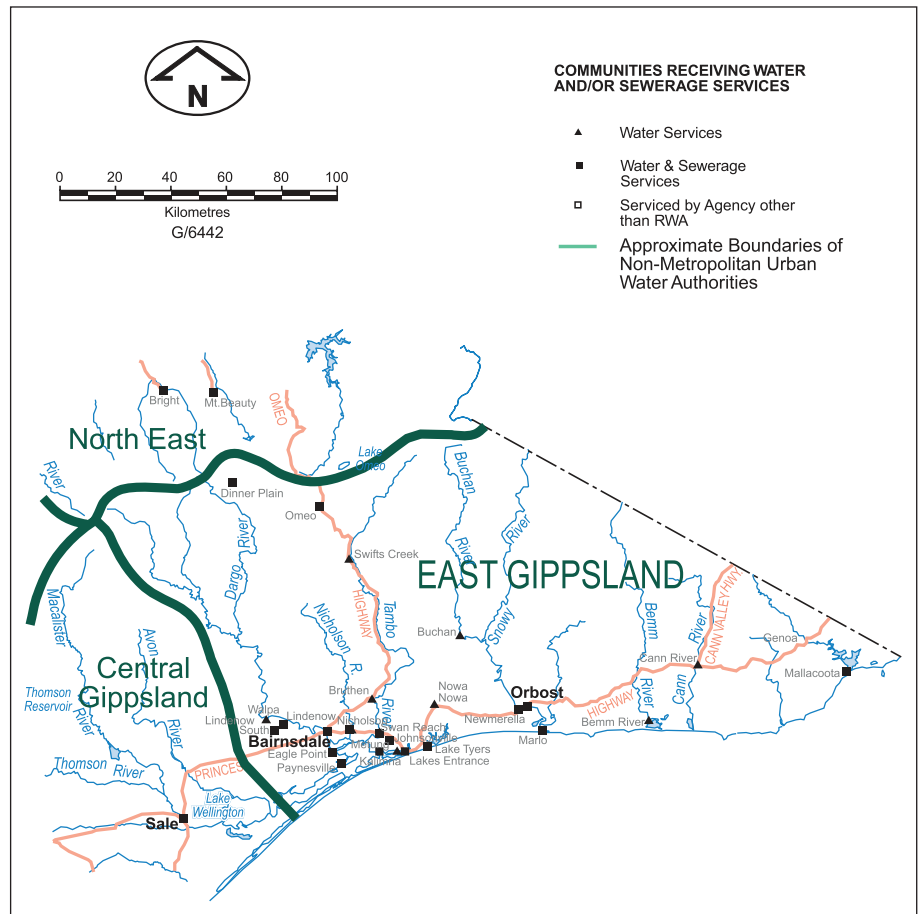
Head office: Bairnsdale

Localities supplied with drinking water: Bairnsdale, Bemm River, Buchan, Cann River, Dinner Plain, Eagle Point – Paynesville, Kalimna, Lindenow, Lindenow South, Mallacoota, Merrangbaur, Metung, Nicholson – Swan Reach, Nowa Nowa, Omeo, Orbost, Sarsfield – Bruthen, Sunlakes – Toorloo and Swifts Creek.

Other communities within these localities that are provided with drinking water include Newlands Arm, Raymond Island, Johnsonville, Lakes Entrance, Lake Tyers Beach, Lake Tyers Aboriginal Trust, Marlo and Newmerella.

Supplies to Bemm River, Buchan, Cann River, Mallacoota, Omeo, Orbost and Swifts Creek are filtered (during 2008–09). Dinner Plain is supplied with ground water.

Population supplied with drinking water: approximately 50,760



Performance against water quality standards

Drinking water supplied in all localities by East Gippsland Water during 2008–09 complied with the water quality standards.

Other water quality issues of potential health significance

All parameters measured by East Gippsland Water as part of its drinking water quality monitoring program satisfied the relevant health-related guideline values set out in the 2004 *Australian drinking water guidelines* during the reporting period.

For detailed water quality data, including data about other aesthetic characteristics of the drinking water, refer to East Gippsland Water's annual drinking water quality report for 2008–09.

Risk management plan audit

East Gippsland Water's risk management plan audit was completed in July 2008.

The auditor found that East Gippsland Water complied with the obligations of the Act, with several minor non-conformances (equivalent to improvement opportunities) being noted. A summary of actions taken in response to these issues is detailed below.

Minor non-conformance	Proposed action
Whilst testing for residual chlorine and colour is undertaken by East Gippsland Water staff following any bursts or repairs, there are no formal records to demonstrate this testing is completed.	The form used by field staff has been amended to ensure consistency in recording residual levels.
Hazard Analysis and Critical Control Point (HACCP) plans have not been updated annually in 2007, as required by Section 4.3.2 of the drinking water quality management system.	Implementing a procedure to ensure that the drinking water quality management system will be reviewed on a regular basis.
Faecal matter from grazing cattle was sighted in close proximity to the river bank opposite the inlet pipe to Buchan treatment plant. In flood conditions this material could wash into the river.	Working with stakeholders to manage stock in potable water catchments (ongoing).

The audit certificate is included in East Gippsland Water's annual drinking water quality report for 2008–09.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department:

Date	Supply	Issue	Action(s)
February 2009	Buchan	Detection of <i>Escherichia coli</i> in drinking water	Investigation carried out. Original samples re-analysed and all returned with no detection of <i>Escherichia coli</i> . Resamples taken from original sample site and two other reticulation sites, returned with no detection of <i>Escherichia coli</i> .

East Gippsland Water also advised the department of an incident at Eagle Point in December 2008, where the detection of *Escherichia coli* found that the sample tap had been connected to a private rainwater tank instead of to the mains supply.

East Gippsland Water advised that adequate backflow prevention was in place to prevent contamination of the reticulation system. Through consultation with the department, this incident was not reportable under section 22 of the Act. East Gippsland Water have relocated this sample site to another point and the landowners were notified of the identification of bacteria in their tank.

For further information on the water quality notifications listed above, refer to East Gippsland Water's annual drinking water quality report for 2008–09.

Customer complaints relating to water quality

A summary of the customer complaints related to water quality that were recorded by East Gippsland Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers*
Discoloured water	4	0.02
Taste/odour	15	0.07
Dirty water	6	0.03
Air in water	0	0
Suspected illness	0	0
Other	1	<0.001

* Based on number of water supply connections

The number of water quality complaints remained low.

East Gippsland Water advised that there were two causes for taste and odour complaints:

- chlorine: variability in customer tolerance to levels of chlorine in drinking water and seasonal fluctuations due to higher usage/flows during holiday periods.
- not chlorine (e.g. earthy, musty etc): main cause was the presence of algae in the source water supply (storage basin) for unfiltered supplies. There were some instances of chemical reaction between pipe material and internal plumbing and appliances with disinfectant that caused a 'medicinal' taste.

Gippsland Water

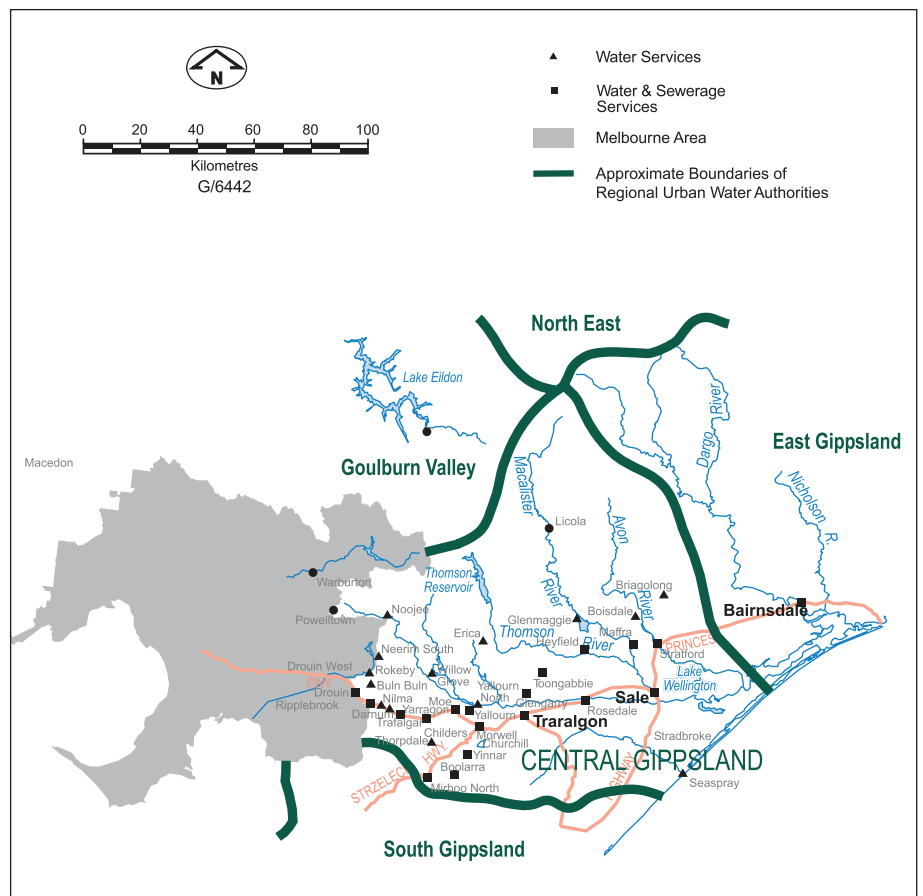
Head office: Traralgon

Localities supplied with drinking water: Boisdale, Boolarra, Briagolong, Churchill, Coongulla/Glenmaggie, Cowwarr, Drouin, Erica, Heyfield, Jumbuk, Maffra, Mirboo North, Moe, Morwell, Neerim South, Newborough, Noojee, Rawson, Rokeby/Buln Buln, Rosedale, Sale/Wurruk, Seaspray, Stratford, Thorpdale, Toongabbie, Trafalgar, Traralgon, Traralgon South and Hazelwood North, Tyers/Glengarry, Warragul*, Warragul South, Willow Grove, Yallourn North, Yarragon and Yinnar.

Boisdale, Churchill, Drouin, Jumbuk, Maffra, Moe, Morwell, Newborough, Rokeby/Buln Buln, Sale/Wurruk, Stratford, Trafalgar, Traralgon, Traralgon South, Hazelwood North, Warragul*, Warragul South, Yallourn North, Yarragon and Yinnar receive fluoridated water. All supplies are filtered.

* The Warragul locality also includes supplies to Darnum, Nilma and Drouin East.

Population supplied with drinking water: approximately 109,540



Map prepared by, and used with the permission of, Department of Sustainability and Environment

Performance against water quality standards

Drinking water supplied in all localities by Gippsland Water during 2008–09 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standard
Aluminium	Rawson

In April 2009, one sample of elevated aluminium was recorded in Rawson. Gippsland Water investigated the high result but could not identify a cause. All follow-up monitoring samples complied with the aluminium standard. The department was notified under section 18 of the Act.

Other 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 guideline values set out in the 2004 *Australian drinking water guidelines* during the reporting period.

For detailed water quality data, including data about other aesthetic characteristics of the water, refer to Gippsland Water's annual water quality report for 2008–09 or, for data on pesticides and protozoan organisms, contact Gippsland Water.

Risk management plan audit

No risk management plan audit was scheduled for this reporting period. Gippsland Water's previous risk management plan audit result was described in detail in the department's annual report for 2007–08.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department:

Date	Supply	Issue	Action(s)
January 2009	Boolarra	Self imposed Boil water notice during bushfire period (see text below)	System was monitored during and after event, until the water treatment plant resumed operation.
March 2009	Traralgon	Detection of <i>Escherichia coli</i> at water entry point	All reticulation monitoring on the day of the incident and subsequent follow up monitoring of the Traralgon system was compliant.

As a result of the January 2009 Delburn complex bushfires in the Boolarra region, the Boolarra water treatment plant lost power and exhausted its water storages. This resulted in Gippsland Water being unable to produce drinking water for Boolarra. The subsequent low pressure in the reticulation system meant that microbiological contamination may have entered the reticulation when the water supply system was returned to service and the mains recharged to operational levels. Gippsland Water arranged for alternative treated drinking water supplies to be provided by water tankers to the township of Boolarra during this time.

In addition, Gippsland Water advised that the Mirboo, Warragul, Rawson and Neerim South water treatment plants were placed at risk due to bushfires in January and February 2009. Six water supply catchments were impacted at varying degrees (Tarago, Little Morwell River, O'Gradys Creek, Merrimans Creek, Thomson River, and Tyers River). The quality of drinking water supplies was not compromised.

Gippsland Water also advised the department of an event when fluoride was not dosed at Moe treatment plant between 27 March and 1 April 2009. This occurred due to incorrect fluoride product being supplied to Gippsland Water. The product supplied was mislabelled at the suppliers packaging warehouse. Gippsland Water's chemical delivery protocols were followed and the product supplied was not used. The product supplier has since modified its packaging and handling procedures to minimise the potential for re-occurrence.

For further information on the water quality notifications listed above refer to Gippsland Water's annual drinking water quality report for 2008–09.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by Gippsland Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	87	0.145
Taste/odour	50	0.084
Blue water	0	0
Air in water	21	0.035
Suspected illness	4	0.007
Other	0	0

Gippsland Water experienced an increase in discoloured water complaints during the reporting period, up from 69 in 2007–08. Gippsland Water advised that this was a result of operational activities (planned and unplanned) and a reduced air scouring and flushing program due to the implementation of the permanent water saving rules.

Goulburn-Murray Water

Head office: Tatura

Goulburn-Murray Water is a water storage manager under the Act and supplies untreated water in bulk to Central Highlands Water, Coliban Water, Goulburn Valley Water, Lower Murray Water, Grampians Wimmera Mallee Water and North East Water. This water can either be supplied directly from storages operated by Goulburn-Murray Water, or from rivers supplied from the storages, or from channel systems managed by Goulburn-Murray Water. The water suppliers then treat the water they receive to drinking standard and distribute the treated water to their customers.

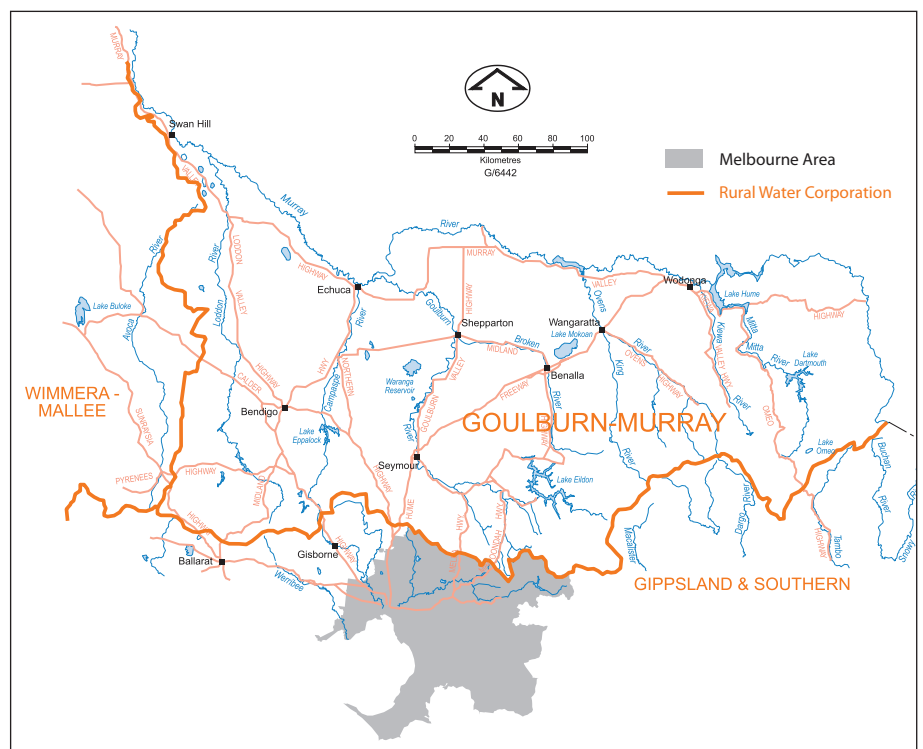
Goulburn-Murray Water does not supply drinking water to any customers but does supply water for irrigation and other rural and stock purposes.

Risk management plan audit

No risk management plan audit was scheduled for this reporting period.

Goulburn-Murray Water's previous risk management plan audit result was described in detail in the department's annual report for 2007-08.

In October 2008, Goulburn-Murray Water sought an undertaking with the department to address their response to the non-compliant audit findings relating to pathogen risks. The undertaking specified how Goulburn-Murray Water will work together with the urban water suppliers to manage risks from pathogens in water supplied to the urban water suppliers, with details to be incorporated into their risk management plan. The undertaking was satisfactorily completed in February 2009.



Map prepared by, and used with the permission of, Department of Sustainability and Environment

Water quality notifications

Goulburn-Murray Water classifies incidents into four categories based on the potential or actual environmental consequence of the incident. During 2008–09 Goulburn-Murray Water recorded 128 environmental incidents, of which 69 occurred in locations that had the potential to affect water supplied for drinking or potentially posed a risk to human health.

None of these incidents were classed as emergencies. The most commonly reported incidents were dead animals in channels and waterways (both terrestrial and aquatic animals), vehicle or boat accidents and poor water quality observed.

Goulburn-Murray Water advises the department of any blue-green algae blooms that potentially affect public health, either via drinking water or recreation. The most significant bloom affected extensive reaches of the Murray River, from Lake Hume near Albury to Robinvale (Euston Weir), in March and April 2009. The bloom included potentially toxic species of algae and persisted until early May 2009.

The overall response to the bloom was coordinated by the Murray Regional Algal Coordinating Committee. There was a high level of cooperation between all agencies involved at the operational level, in both Victoria and New South Wales. The committee issued media releases weekly regarding the status of the bloom, with additional information available via websites and telephone information services in both Victoria and New South Wales. Goulburn-Murray Water coordinated the Victorian response. Warning signs were erected at access points to public lands along the river. No reports of adverse health affects due to the bloom were received and no drinking water supplies in Victoria were affected.

Goulburn-Murray Water also advised Coliban Water and Parks Victoria of other significant blooms in 2008–09. These were in Gunbower Creek and Lake Moodemere respectively. These blooms were managed without affecting drinking water supplies. Notification to the department under section 22 of the Act was therefore not required.

Goulburn-Murray Water has also, with the assistance of the department, developed a management strategy to ensure that their customers and members of the public are aware that all water supplied or managed by Goulburn-Murray Water is untreated and is not suitable for drinking or food preparation.

For further information on the management strategy for non-potable supplies, blue-green algae blooms or environmental incidents, refer to Goulburn-Murray Water's annual water quality report for 2008–09.

Performance against water quality standards (drinking water supplies only)

Drinking water supplied in all localities by Goulburn Valley Water during 2008–09 complied with the water quality standards, except as noted in the table below.

Parameter	Localities not complying with water quality standard
Trihalomethanes	Pyalong
Trichloroacetic acid	Buxton, Thornton, Upper Delatite
Aluminium	Avenel, Broadford, Katandra West, Seymour Low Level, Tongala

High trihalomethanes results in Pyalong in February and March 2009 were due to a short-term process control problem, resulting in an elevated level of chlorine leaving the water treatment plant. Follow-up samples complied with the standard.

The elevated levels of trichloroacetic acid at Upper Delatite, Thornton and Buxton were caused by high levels of organic matter in the raw water which could not be removed by the existing treatment process. Investigations showed that the trichloroacetic acid levels fluctuated over time, with only one sample out of twelve exceeding the standard for Upper Delatite and Buxton, and four out of twelve for Thornton.

A new water treatment plant for Upper Delatite commenced operating in July 2009. An undertaking is currently in place for Thornton, under which a pipeline to supply Thornton with treated water from Alexandra is being constructed. These facilities will help eliminate issues with high organic matter. The undertaking will conclude in 2010.

During 2008–09, non-compliant aluminium results were recorded for Tongala, Avenel, Seymour Low Level, Broadford and Katandra West. Goulburn Valley Water advised that all were isolated, single events due to short term process control issues at the water treatment plants. All were reported to the department under section 18 of the Act.

These results did not pose a risk to public health.

Other water quality issues of potential health significance

Chlorine dioxide is used as a disinfectant in the water supply system for Marysville and Buxton. 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 2008–09 some samples exceeded the 2004 *Australian drinking water guidelines* health-related guideline value for chlorite (0.3 mg/L). There is no health-related guideline values established for chlorate.

Goulburn Valley Water has an undertaking in place for the Buxton and Marysville supplies to address these issues. As a result, Goulburn Valley Water advised that they will develop options of alternative disinfection for these supplies and engage the community in the process. At present the solution to the problem has not yet been determined.

Due to the bushfires in February 2009, the chlorine dioxide generator at Marysville was off-line for three weeks and a **boil water notice** was in place during this time. Samples were not collected from Marysville, Buxton and Woods Point during this period due to the area being deemed unsafe. The fires also caused significant damage to the main water supply pipeline for Marysville.

Chloral hydrate is a disinfection by-product arising from chlorination of water containing naturally occurring organic material. Chloral hydrate was detected in supplies to Thornton, Longwood, Upper Delatite, Broadford, Eildon and Violet Town. These were isolated events and not deemed to be a public health risk.

All other parameters measured by Goulburn Valley Water as part of its drinking water quality monitoring program satisfied the relevant health-related guideline values set out in the *Australian drinking water guidelines* during the reporting period.

Goulburn Valley Water also manages a number of non-potable (non-drinking) water supplies in its region. Goulburn Valley Water 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 drinking water, raw water monitoring and undertakings, refer to Goulburn Valley Water's annual drinking water quality report for 2008–09.

Risk management plan audit

Goulburn Valley Water's risk management plan audit was completed in July 2008.

Goulburn Valley Water was found to have complied with the obligations imposed by the Act. The audit result was described in detail in the annual report for 2007–08.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department.

Date	Supply	Issue	Action(s)
July 2008	Marysville	Elevated chlorite in drinking water	Ongoing monitoring and chlorine dioxide system serviced.
July 2008	Buxton	Elevated chlorite in drinking water	Ongoing monitoring and chlorine dioxide system serviced.
July 2008	Thornton	Elevated chloral hydrate in drinking water	Additional samples taken. New pipeline being constructed from Alexandra to Eildon via Thornton with treated drinking water.
August 2008	Marysville	Elevated chlorite in drinking water	Ongoing monitoring and optimisation of chlorine dioxide treatment processes. Provision has been made in capital works program to change disinfection.
September 2008	Thornton	Elevated chloral hydrate in drinking water	Resampling conducted. New pipeline being constructed from Alexandra to Eildon via Thornton with treated drinking water.
October 2008	Marysville	Elevated chlorite in drinking water	Ongoing monitoring and optimisation of chlorine dioxide treatment processes. Provision has been made in capital works program to change disinfection.
October 2008	Longwood	Elevated chloral hydrate in drinking water	Resampling conducted.
November 2008	Upper Delatite	Elevated chloral hydrate in drinking water	Resampling conducted. New treatment plant being constructed.
November 2008	Thornton	Elevated chloral hydrate in drinking water	Resampling conducted. New pipeline being constructed from Alexandra to Eildon via Thornton with treated drinking water.
November 2008	Upper Delatite	Elevated trichloroacetic acid in drinking water	Refer to text under the heading <i>“Performance against water quality standards”</i>
December 2008	Broadford	Elevated chloral hydrate in drinking water	Resampling conducted.
December 2008	Eildon	Elevated chloral hydrate in drinking water	Resampling conducted. New pipeline being constructed from Alexandra to Eildon to provide treated drinking water.
December 2008	Kyabram	Detection of <i>Escherichia coli</i> at water tower	Water tower inspection hatch was found to be left open with birds inside the tower. <i>Escherichia coli</i> was not detected in the reticulation. The hatch was locked, birds removed and chlorination increased. Samples taken the following day found no <i>Escherichia coli</i> present.
December 2008	Violet Town	Elevated chloral hydrate in drinking water	Resampling conducted.
January 2009	Broadford	Widespread complaint – dirty water	Media release issued in relation to taste and dirty water issues. Suspected source is a new water source displacing particulates of iron and manganese in reticulation pipe work at Broadford.
January 2009	Eildon	Elevated chloral hydrate in drinking water	Resampling conducted. New pipeline being constructed from Alexandra to Eildon to provide treated drinking water.
February–March 2009	Marysville and Buxton	Boil water notice	Due to the bushfires the power supply to Marysville and Buxton was cut off. The loss of power at Marysville prevented disinfection and the assurance that the water was safe to drink.

Date	Supply	Issue	Action(s)
February 2009	Thornton	Loss of power to disinfection plant	Due to the bushfires power was cut off to Thornton. There were concerns about disinfection process and assurance water was safe to drink. Power was restored and boil water notice was not required to be issued.
February and March 2009	Pyalong	Elevated trihalomethanes in drinking water	Refer to text under the heading <i>“Performance against water quality standards”</i>
February 2009	Upper Delatite	Elevated chloral hydrate in drinking water	Resampling conducted. New treatment plant being constructed.
March 2009	Thornton	Elevated chloral hydrate in drinking water	Resampling conducted. New pipeline being constructed from Alexandra to Eildon via Thornton with treated drinking water.
March 2009	Buxton	Elevated trichloroacetic acid in drinking water	Refer to text under the heading <i>“Performance against water quality standards”</i>
March 2009	Thornton	Elevated trichloroacetic acid in drinking water	Refer to text under the heading <i>“Performance against water quality standards”</i>
April 2009	Eildon	Elevated chloral hydrate in drinking water	Resampling conducted. New pipeline being constructed from Alexandra to Eildon to provide treated drinking water.
April 2009	Upper Delatite	Elevated chloral hydrate in drinking water	Resampling conducted. New treatment plant being constructed.
May 2009	Longwood	Elevated chloral hydrate in drinking water	Resampling conducted.
May 2009	Marysville	Detection of <i>Escherichia coli</i> in drinking water	Sampling point located at house vacated after the bushfires. Resampling conducted and system checked to confirm operating correctly. Provision has been made in capital works program to change disinfection.
May to June 2009	Thornton	Elevated trichloroacetic acid in drinking water	Refer to text under the heading <i>“Performance against water quality standards”</i>
June 2009	Marysville	Elevated chlorite in drinking water	Ongoing monitoring and optimisation of chlorine dioxide treatment processes. Provision has been made in capital works program to change disinfection.
June 2009	Longwood	Elevated chloral hydrate in drinking water	Resampling conducted.
June 2009	Trawool	Elevated turbidity	A burst pipe resulted in higher flows, disturbing the lining of the old cast iron pipe leading to higher turbidity. Burst repaired and main flushed.

To address the toxic blue-green algae bloom present in the Murray River earlier in 2009, Goulburn Valley Water incorporated powered activated carbon dosing to the existing treatment at Cobram water treatment plant, which supplies Cobram, Yarroweyah and Strathmerton, and at Barmah water treatment plant. Regular monitoring and testing for blue-green algae continued during this event.

For further information on the water quality notifications listed above, as well as details on the effect of the February 2009 bushfires on Goulburn Valley Water assets, refer to Goulburn Valley Water’s annual drinking water quality report for 2008–09.

Customer complaints relating to water quality

A summary of the customer complaints related to water quality that were recorded by Goulburn Valley Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 population
Discoloured water	171	0.325
Taste/odour	35	0.067
Blue water	0	0
Air in water	4	0.008
Alleged illness	2	0.004
Other	2	0.004

Goulburn Valley Water advised that a large number of discoloured water complaints were received from Broadford in January 2009, due to the changing of the raw water source from Sunday Creek to the Goulburn River. The remaining complaints were isolated in nature and were generally resolved by mains flushing in the local area.

Taste and odour complaints were related to chlorine or were unspecified. The number of taste and odour complaints is down from 64 recorded in 2007–08.

Culgoa, Dooen, Elmhurst, Glenorchy, Goroke, Harrow, Jeparit, Kaniva, Kiata, Lascelles, Lillimur, Marnoo, Miram, Moyston, Murrayville, Nandaly, Natimuk, Nhill, Noradjuha, Patchewollock, Pimpinio, Serviceton, Speed, Streatham, Tarranyurk, Tempy, Waitchie, Watchem, Westmere, Wickliffe, Yaapeet and a number of rural pipelines and private diversion schemes in the region.

Grampians Wimmera Mallee Water also functions as a water storage manager under the Act, as it supplies untreated water to Coliban Water and Wannon Water.

Population supplied with drinking water: approximately 46,240.

Performance against water quality standards (drinking water supplies only)

Drinking water supplied in all localities by Grampians Wimmera Mallee Water during 2008–09 complied with the water quality standards, except as noted in the table below.

Parameter	Localities not complying with water quality standards [#]
<i>Escherichia coli</i>	• Willaura
Aluminium	• Filtered supplies to Murtoa and Underbool
Turbidity	• Disinfected-only supplies to Brim, Lalbert, Manangatang, Nullawil, Ultima and Woomelang
Trihalomethanes	• Disinfected-only supplies to Beulah, Donald, Jung, Minyip, Quambatook, Rupanyup, Woomelang and Wycheproof • Filtered supplies to Charlton, Hopetoun, Murtoa, Rainbow and Warracknabeal
Trichloroacetic acid	• Rupanyup

[#] Towns and areas supplied with non-potable (non-drinking) water are excluded from this table.

Escherichia coli

Grampians Wimmera Mallee Water investigated and reported all detections of *Escherichia coli* in drinking water. In general, these were caused by isolated instances where the disinfection system failed or was unable to cope with an adverse change in the quality of raw water. A more sustained period of detections in November 2008 at Willaura was caused by a structural fault that allowed birds to enter the storage and contaminate the supply. Responses included a short-term **boil water notice** being issued for Willaura from 21 to 27 November 2008.

Aluminium

The non-compliances for aluminium were isolated single events in October 2008. Each high result was reported to the department, as required by section 18 of the Act. The elevated result at Murtoa was due to a change in the pH of raw water. The elevated result at Underbool was due to a fault with a dosing pump.

Turbidity

The highest turbidity results were experienced in the northern Mallee towns of Lalbert, Manangatang and Ultima. Water for these towns is sourced from the Murray River then via the Northern Mallee pipeline. It reacts with the clay lining of the local water storages, substantially increasing the turbidity of each town's water supply. The undertakings for these towns will alleviate this problem, by replacing the existing storages. The undertakings were scheduled for completion by the end of June 2009.

Grampians Wimmera Mallee Water did not meet the deadline for the completion of the works at these three towns. Grampians Wimmera Mallee Water has advised that this deadline was not met because they changed the specification of the new storages from lined earthen storages to tank storage, and because there were problems in constructing the lining of the tanks. Both of these delayed the project delivery time to September 2009. The department and Grampians Wimmera Mallee Water are in discussions on how to ensure that the turbidity of these supplies complies with the standard for 2010.

The high turbidity results in late 2008 for Brim were due to the Brim storage being very low, due to the ongoing drought and the imminent connection to the Wimmera Mallee pipeline. This caused sediments in the storage to be mobilised due to wind action on the storage surface. Grampians Wimmera Mallee Water has flushed the reticulation system. Due to the poor quality of the raw water and there being no filtration at the town, the problem persisted until the new Wimmera Mallee pipeline supply was delivered.

An undertaking for the Nullawil supply was scheduled for completion by March 2008, to address very high turbidity from the Murray River source water. The reticulation system was flushed in April 2009. Grampians Wimmera Mallee Water has advised that unusually high turbidities were encountered in the Murray River over the 2008–09 summer, leading to a build up in the distribution system. A further program of air scouring to remove excess sediment was organised for the Nullawil supply. The Nullawil undertaking was not completed satisfactorily, as this supply experienced high turbidity for several months after March 2008 and Grampians Wimmera Mallee Water did not carry out its obligations relating to community consultation and information disclosure.

Trihalomethanes

As in the previous reporting period, filtered water supplies for Rainbow, Warracknabeal and Murtoa failed to satisfy the trihalomethane standard in 2008. These problems were rectified once these supplies were linked to the Wimmera Mallee pipeline. Rainbow and Warracknabeal were connected in October 2008, via new raw water storages, in line with the undertakings for these supplies. Murtoa was connected by November 2008, first via a temporary cross connection then, since June 2009, via new raw water storages.

Isolated or anomalous high results for trihalomethanes occurred in the filtered supplies for Charlton and Hopetoun. The raw water supply to these towns was investigated at the time. All other results have complied with the standard.

Drinking water for the other disinfected-only supplies listed in the table above frequently did not meet the standard for trihalomethanes and/or turbidity, due to limited control over disinfection by-products and turbidity in water supplies with no coagulation or filtration. These supplies predominantly obtained their source water from the Wimmera-Mallee channel system. The dissolved organic carbon and other natural organic matter combined with the chlorine used to disinfect the water and created disinfection by-products.

These problems were rectified during the reporting period for Jung, Beulah, Minyip and Woomelang, once these supplies were linked to the Wimmera Mallee pipeline and new raw water storages were constructed. In the case of Rupanyup, the drinking water complies with the required standards but the raw water storage works were not finalised during the reporting period.

The undertakings for water supplied to Rainbow, Warracknabeal, Jung and Woomelang were completed on time. The works associated with the undertaking for Murtoa were not completed on time but the drinking water complied from the required date. Grampians Wimmera Mallee Water did not comply with the undertakings for Minyip, Beulah and Rupanyup, as the works were completed several months behind the schedule and the drinking water did not comply with the standards until the works were completed.

The undertakings for Donald and Wycheproof were concluded after the end of the reporting period. Grampians Wimmera Mallee Water has not yet determined the most appropriate ongoing solution for the elevated trihalomethanes results for Quambatook.

An isolated high result for trichloroacetic acid was also recorded for Rupanyup in October 2008. Samples for haloacetic acids were not collected in June 2009 for Sea Lake due to a sampling error.

It is anticipated that most of these supplies should comply for 2009–10.

Other water quality issues of potential health significance

During the reporting period, drinking water supplied to Willaura and Lake Bolac was disinfected with chlorine dioxide and consequently tested for chlorite, a by-product of this type of disinfection. The health-related guideline value for this parameter is 0.3 mg/L.

Chlorite levels in the filtered Willaura and Lake Bolac supplies always exceeded 0.3 mg/L during 2008–09. Grampians Wimmera Mallee Water has advised that they changed the form of disinfection to chloramination in late June 2009 and that, consequently, drinking water supplied to Willaura and Lake Bolac will comply with all water quality standards since that date.

Other than the matters identified above relating to disinfection by-products, all other parameters measured by Grampians Wimmera Mallee Water as part of its drinking water quality monitoring program satisfied the relevant health-related guideline values set out in the 2004 *Australian drinking water guidelines* during the reporting period.

For detailed water quality data, including data about other aesthetic characteristics of the water, details of undertakings and details of its water storage manager role, refer to Grampians Wimmera Mallee Water's annual drinking water quality report for 2008–09.

Management of non-drinking supplies

Grampians Wimmera Mallee Water also manages 40 non-potable (non-drinking) water supplies in its region, including supplies to the towns of Kaniva, Jeparit, Nhill and Natimuk. Non-drinking water supplies are harvested from a range of sources including surface water and groundwater. The water is not treated and is not fit for drinking or food preparation.

Grampians Wimmera Mallee Water has developed a program of community consultation that is designed to ensure that such non-drinking supplies are not consumed or confused with a drinking water supply and improvements are made where there is local community support for such improvements. Communication includes notices on customer invoices, regular newsletters and delivery of the *Living with an untreated water supply* pamphlet.

Whilst most of the non-drinking supplies are for very small towns, the towns of Nhill, Kaniva and Jeparit are regionally significant, supporting residential aged care facilities and campuses of essential community health services. There remains significant potential for ongoing health risks and ongoing social inequality arising from the current non-potable supplies to these towns, compared with other towns that enjoy good quality supplies of drinking water.

Grampians Wimmera Mallee Water also supplies non-drinking water to customers on rural pipelines. The risk management and risk communication issues for rural customers receiving this non-drinking water are similar to those for regulated water supplies, many of which are supplied from the same pipelines. As a result, non-drinking water supplied 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 and the Mount Zero pipeline was declared by the Minister for Health as regulated water, on 23 February 2009.

For further details and data about the quality of non-drinking (regulated) water supplies, refer to Grampians Wimmera Mallee Water's annual drinking water quality report for 2008–09.

Risk management plan audit

Grampians Wimmera Mallee Water's risk management plan audit was completed in July 2008. As the originally scheduled date for the completion of the audit was prior to 30 June 2008, the audit results were included in the 2007–08 annual report.

The audit found that Grampians Wimmera Mallee Water did not comply with the obligations imposed by the Act, with seven major non-compliances and 21 minor non-compliances being identified.

In October 2008, the department accepted an undertaking from Grampians Wimmera Mallee Water in relation to the most significant audit findings. The undertaking was scheduled for completion in June 2009, but was not completed until August 2009.

Water quality notifications

During 2008–09, the following water quality notifications were made to the department:

Date	Supply	Issue	Action(s)
July 2008	Beulah	Elevated trihalomethanes in drinking water	Refer to text under the heading "Performance against water quality standards"
July 2008	Rainbow	Elevated trihalomethanes in drinking water	Refer to text under the heading "Performance against water quality standards"
August 2008	Woomelang	Loss of disinfection	A field service staff member was sent to the site and immediately turned the chlorinator back on. The staff member took a water sample from the reticulation system which was sent to the laboratory for microbiological testing. Water was then flushed through the reticulation system to restore the chlorine residual.
July–October 2008	Jung	Elevated trihalomethanes in drinking water	Refer to text under the heading "Performance against water quality standards"
July–October 2008	Murtoa	Elevated trihalomethanes in drinking water	Refer to text under the heading "Performance against water quality standards"
July–October 2008	Warracknabeal	Elevated trihalomethanes in drinking water	Refer to text under the heading "Performance against water quality standards"
October 2008	Rainbow	Elevated trihalomethanes in drinking water	Refer to text under the heading "Performance against water quality standards"
October 2008	Rupanyup	Elevated trichloroacetic acid in drinking water	Isolated result – refer actions for trihalomethanes.
November 2008	Charlton	Elevated trihalomethanes in drinking water	As a result of a channel refill the sediment in the earthen storage was suspended and subsequently treated in the water treatment plant. High turbidity and high organic matter combined with chlorination to produce these high THM results. Since filling, Charlton's raw water storage is slowly clarified.
November 2008	Willaura	Detection of <i>Escherichia coli</i> in drinking water (multiple occasions)	The clear water storage was cleaned and super chlorinated. A boil water notice was issued to Willaura residents for 21/11/08 to 27/11/08. Multiple resamples confirmed the end of the incident.

Date	Supply	Issue	Action(s)
December 2008	Horsham	Widespread public complaint	Dirty water was allowed into the system after large scale mains work has been carried out. System flushed and investigated. Operation of the Morson Pump station was reviewed and operating procedures changed. These include manually operating some valves rather than automatic and changing the functionality of the control boards.
February 2009	Hopetoun	Elevated trihalomethanes in drinking water	Storage was drawn down, resample was satisfactory.
March 2009	Horsham	Detection of <i>Escherichia coli</i> in drinking water	Sampling point was contaminated. Resample test confirmed no <i>Escherichia coli</i> .
April 2009	Charlton	Elevated trihalomethanes in drinking water	Changed to second town storage, which had a lower dissolved organic carbon level.
April 2009	Quambatook	Detection of <i>Escherichia coli</i> in drinking water	Reticulation system was flushed. Resample test confirmed no <i>Escherichia coli</i> .
Oct 2008– January 2009	Beulah	Elevated trihalomethanes in drinking water	Refer to text under the heading “Performance against water quality standards”
July 2008– June 2009	Donald	Elevated trihalomethanes in drinking water	Refer to text under the heading “Performance against water quality standards”
July 2008– April 2009	Minyip	Elevated trihalomethanes in drinking water	Refer to text under the heading “Performance against water quality standards”
July 2008– May 2009	Rupanyup	Elevated trihalomethanes in drinking water	Refer to text under the heading “Performance against water quality standards”
July 2008– March 2009	Woomelang	Elevated trihalomethanes in drinking water	Refer to text under the heading “Performance against water quality standards”
August 2008– May 2009	Wycheproof	Elevated trihalomethanes in drinking water	Refer to text under the heading “Performance against water quality standards”
July 2008– June 2009	Willaura	Elevated chlorite levels in drinking water	Disinfection changed from chlorine dioxide to chloramination – refer to text in section above.
July 2008– June 2009	Lake Bolac	Elevated chlorite levels in drinking water	Disinfection changed from chlorine dioxide to chloramination – refer to text in section above.
October 2008– January 2009	Quambatook	Elevated trihalomethanes in drinking water	Chlorination dose levels have been slowly rising over the past month to retain a town residual. The storage has been allowed to drain down so works can be done to move the offtake. The raw water storage offtake was moved from the bottom of the dam to the surface water to keep the storage full. Both these actions will minimise the poor quality water from being chlorinated.
February– March 2009	Quambatook	Elevated trihalomethanes in drinking water	Refer to text under the heading “Performance against water quality standards”

For further information on the water quality notifications listed above, refer to Grampians Wimmera Mallee Water’s annual drinking water quality report for 2008–09.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by Grampians Wimmera Mallee Water during 2008–09 is provided in the table below. Data for towns supplied with non-potable (non-drinking) water is excluded from this table but is disclosed in Grampians Wimmera Mallee Water's annual drinking water quality report.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	27	0.061
Taste/odour	14	0.032
Blue water	0	0
Air in water	0	0
Suspected illness	0	0
Other	17	0.038

As in the previous year, the number of water quality complaints recorded is very low. Grampians Wimmera Mallee Water has advised that this number is well below the threshold for triggering a strategic response to the issue.

An incident in the Horsham supply in December 2008 caused a number of complaints to be registered. The complaints arose due to dirty water being allowed into the system after large-scale mains work had been carried out. Grampians Wimmera Mallee Water acted quickly to rectify the problem and notified the department under section 22 of the Act.

Lower Murray Water

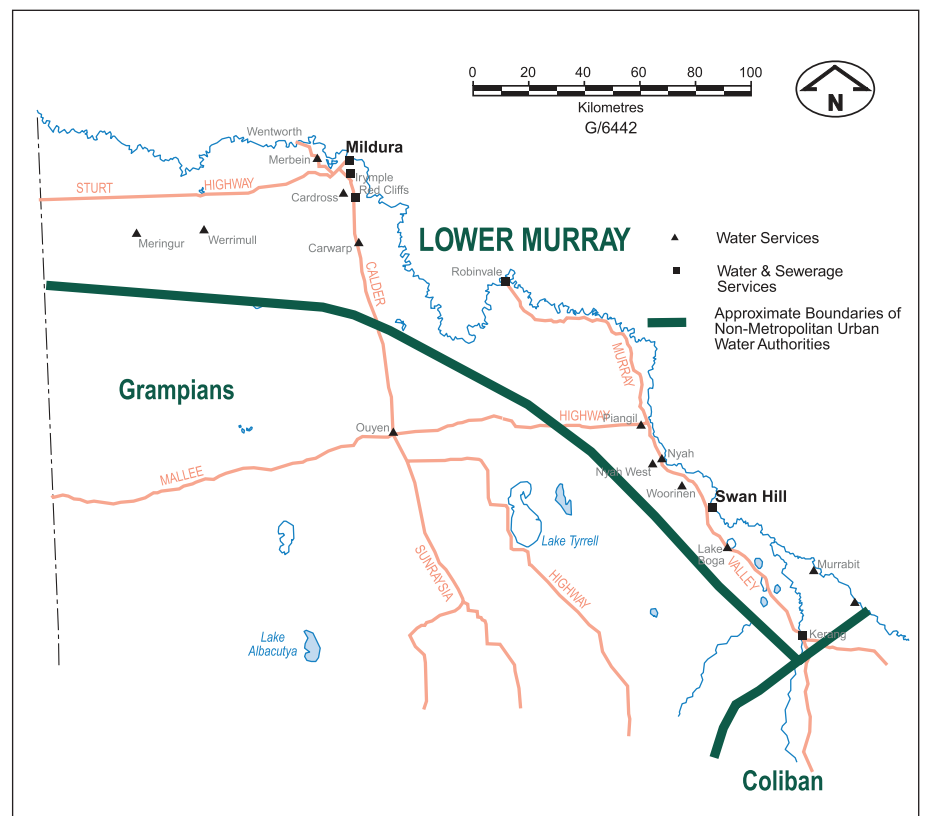
Head office: Mildura

Localities supplied with drinking water: Irymple, Kerang, Koondrook, Lake Boga, Merbein, Mildura, Murrabit, Nyah, Nyah West, Piangil, Red Cliffs, Robinvale, Swan Hill and Woorinen South.

All drinking water supplies are filtered. Drinking water for Robinvale is fluoridated.

Towns and areas supplied with non-potable (non-drinking) water: Werrimull, Meringur and Cullulleraine (the Millewa system), Mystic Park, irrigation schemes in the Sunraysia region and near Robinvale and private diverters from Nyah to the South Australia border.

Population supplied with drinking water: approximately 54,430



Map prepared by, and used with the permission of, Department of Sustainability and Environment

Performance against water quality standards (drinking water supplies only)

Drinking water supplied in all localities by Lower Murray Water during 2008–09 complied with the water quality standards.

Other 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-related guideline values set out in the 2004 *Australian drinking water guidelines* during the reporting period.

Lower Murray Water also manages a number of non-potable (non-drinking) water supplies in its region. Of these, water supplied to Mystic Park was declared as regulated water in May 2009. Lower Murray Water has developed a program of public signage and customer consultation that is designed 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 drinking water, information about non-drinking supplies and data about monitoring of organochlorine pesticides in raw (untreated) water from the Murray river, refer to Lower Murray Water's annual drinking water quality report for 2008–09.

Risk management plan audit

Lower Murray Water's risk management plan audit was completed in September 2008.

Lower Murray Water was found to have complied with the obligations imposed by the Act. The auditor identified four improvement opportunities. These improvement opportunities, along with Lower Murray Water's response, are detailed below.

Improvement opportunity	Proposed action
Closer monitoring and communication with Goulburn–Murray Water is essential to minimise risks to drinking water supplies.	Regular meetings between Lower Murray Water, Goulburn–Murray Water and other water businesses have been arranged.
Improve use of electronic tools to assess water quality data.	Investigating scanning of 'back end' water quality data. When implemented this additional monitoring of each plant's performance will be listed as an additional control for identified hazards in the risk register for each plant.
Update and amend the drinking water quality management plans to cover uncertainty of hazards, prioritisation of capital works projects and alternative preventative measures.	Relevant sections of the risk management plans have been amended.
Laboratory to notify two managers instead of one when high analytical results are detected.	Notification arrangements amended to ensure that both the Manger Environmental Services and the Process Control Engineer are notified of high results.

The audit certificate is included in Lower Murray Water's annual drinking water quality report for 2008–09.

Water quality notifications

During 2008–09 no notifications were made to the department under section 22 of the Act.

An extensive blue-green algal bloom in the Murray River in March to May 2009 stretched, at its peak, from the Hume weir to Euston. During this period, elevated blue green algae cell counts were detected at the intakes to the Koondrook, Kerang, Swan Hill and Piangil treatment plants. Powdered activated carbon was dosed into the raw water supply of each plant. At the height of the bloom the water was tested for algae toxins, at Koondrook. Both the raw and treated water samples were clear. The bloom did not adversely affect the quality of any drinking water supplies.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by Lower Murray Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	13	0.04
Taste/odour	9	0.03
Blue water	0	0
Air in water	0	0
Suspected illness	0	0
Other	1	< 0.01

The number of complaints for the reporting period decreased compared with 2007–08. This was mainly due to a large decrease in taste and odour complaints.

The discoloured water complaints were generally due to instances when there had been burst mains or other works being carried out in the reticulation. These were addressed by flushing mains in the areas concerned. Lower Murray Water advised that this problem has been exacerbated by the current water restrictions.

Melbourne Water

Head office: East Melbourne

Water suppliers serviced: City West Water, South East Water, Yarra Valley Water and Western Water (supplied with treated drinking water), and Gippsland Water (supplied with untreated water from Tarago reservoir).

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 standard and then distributes this treated water to City West Water, South East Water, Yarra Valley Water and Western Water. Melbourne Water, therefore, provides water treatment services to approximately 80 per cent of Victoria's population. With the exception of water supplied to Healesville, Yarra Glen, Seville, Emerald and Upper Yarra townships, all supplies receive fluoridated water.

Additionally, the complexity of the metropolitan system creates a number of operational challenges with regard to the management of water quality. Melbourne Water, and the water suppliers that it supplies with drinking water, have an effective working relationship, whereby water quality incidents are managed through a multi-business approach. The effectiveness of this relationship is demonstrated by the fact that all but one of the water sampling localities across the metropolitan area complied with the water quality standards during the reporting period.



Map prepared by, and used with the permission of, Melbourne Water

Risk management plan audit

Melbourne Water's risk management plan audit was completed in September 2008.

The auditor found that Melbourne Water complied with the obligations of the Act, with several opportunities for improvement highlighted. These improvement opportunities, along with Melbourne Water's response, are detailed below.

Improvement opportunity	Proposed action
Formulate a drinking water quality policy, endorsed by senior executives, to be implemented throughout the organisation.	Melbourne Water's drinking water quality aspects will remain within the public health policy. The policy will be reviewed for consistency with the <i>Australian drinking water guidelines</i> .
Review requirements periodically to reflect any changes.	The public health policy is reviewed every two years, at a minimum. At the time of audit, the review due in August 2008 had been postponed as Melbourne Water's strategic framework was being reviewed and the policy supports this framework.
Regularly update the list of relevant agencies.	Melbourne Water's General Emergency Management System manual lists relevant agencies and is updated at least six monthly. The Water Availability Roster is developed weekly and also includes a detailed list of stakeholders. A list of relevant agencies will be added to the Drinking Water Quality and Risk Management Plan.
Evaluate the major sources of uncertainty associated with each hazard and hazardous event and consider actions to reduce uncertainty.	The links to Melbourne Water's water research and investigative programs will be formalised within the Risk Management Plan. A process will be established for incorporating outcomes of Melbourne Water's annual State of the Assets review (asset reliability assessments) into the Risk Management Plan risk assessment and improvement plan.
Determine significant risk and document priorities for risk management.	An operational improvement plan for drinking water quality will be prepared.
Identify existing preventive measures from catchment to interface points for each significant hazard or hazardous event and estimate the residual risk.	Melbourne Water has recently undertaken scenario analysis of combinations of various events associated with higher risk events that could affect the systems, for example, bushfires and algal blooms.

Improvement opportunity	Proposed action
Evaluate alternative or additional preventive measures where improvement is required.	<p>Long term improvements for drinking water quality include an assessment of options within the drinking water quality strategic framework.</p> <p>Alternative short-term preventive measures will be documented in the operational improvement plan where improvement is required.</p>
Develop monitoring protocols for operational performance of the water supply system, including the selection of operational parameters and criteria and routine analysis of results.	Site-specific HACCP plans are being developed that require operators to assess and report operational monitoring, at action limits less than critical limits. This reporting will contribute to improved management reporting.
Establish documented procedures for evaluating chemicals, materials and suppliers.	<p>Chemical contracts exist for the majority of chemicals and specify quality requirements, including product testing.</p> <p>Melbourne Water's Standard Operating Procedure for Quality Control of Chemical Supplies details the incoming quality checks required for chemicals used for potable water treatment. There are also delivery procedures for key chemicals which require operator presence at each delivery.</p>
Define communication protocols with the involvement of relevant agencies and prepare a contact list of key people, agencies and businesses.	<p>Melbourne Water's general emergency management system manual lists relevant agencies and is updated at least six monthly.</p> <p>The water availability roster is developed weekly and also includes a detailed list of stakeholders.</p>
Train employees and regularly test emergency response plans.	<p>All water supply operators are currently being assessed for Certificate III of the National Water Training Package.</p> <p>Melbourne Water's skills matrix system is being revised to link to the National Water Package.</p>
Validate processes and procedures to ensure that they are effective at controlling hazards.	The current validation and research to support Melbourne Water's drinking water quality processes and procedures is considered to be sufficiently thorough and documented.

The audit certificate is included in Melbourne Water's annual drinking water quality report for 2008–09.

Water quality notifications

Under the reporting protocol that exists between Melbourne Water and City West Water, South East Water and Yarra Valley Water, and agreed to by the department, Melbourne Water reports to the department failures of, or incidents with, its assets or infrastructure. The water suppliers report instances of customer complaints or failures of any infrastructure that they manage.

During 2008–09 the following water quality notifications were made to the department.

Date	Location	Issue	Action(s)
November 2008	Outlet of Winneke water treatment plant clear water storage	Detection of <i>Escherichia coli</i> (24 orgs/100 mL)	<p>A resample was taken at the outlet of the treatment plant and further sampling of a site downstream was carried out when notification of the <i>Escherichia coli</i> detection was received. All resamples taken had no <i>Escherichia coli</i> or coliforms detected. The sampling technique and laboratory quality control were checked and found to be in order.</p> <p>There was no obvious cause or contributing factor to the <i>Escherichia coli</i> detection. The plant operation was checked and chlorine dosing was normal and there would have been at least 12 hours detention on the clear water storage. The area of the tank was inspected and found to be secure. There was very little rainfall on this day and the preceding days which would eliminate infiltration into the tank. As a precaution, tanks supplied from the Winneke source were spot dosed with hypochlorite.</p> <p>Consumer notification was not required.</p>
November 2008	Somers/Bittern offtake from Bittern main	Detection of <i>Escherichia coli</i> in main	<p>A retest of the original sample was carried out with the result being positive for <i>Escherichia coli</i>. The site was resampled along with other sites in the area. South East Water also conducted testing in their zones downstream from the sample site.</p> <p>All resamples and additional samples taken by both Melbourne Water and South East Water had no coliforms or <i>Escherichia coli</i> detected in them. The sampling technique and laboratory quality control were checked and found to be in order.</p> <p>There was no obvious cause or contributing factor to the <i>Escherichia coli</i> detection. The sample point air valves along the main were inspected and found to be in good order. Tyabb reservoir was also inspected. Contamination of the sample could possibly have occurred due to the dust or flies in the vicinity of the sample tap. Therefore, as a precaution, sample taps are to be fitted with a cap to prevent any contamination entering the tap.</p> <p>Consumer notification was not required.</p>

Impact of February 2009 bushfires

The bushfires of February 2009 caused \$5 million damage to Melbourne Water's natural and built assets. Approximately one-third of Melbourne's catchment areas, which are managed by Melbourne Water, were burnt. This included all of the Armstrong Creek and Wallaby Creek catchments and most of the O'Shannassy and Maroondah catchments.

Fire-affected assets included four bridges, 12 buildings, 80 kilometres of roads, 42 kilometres of fencing, 30 gates, one weir, two water tanks, seven hydrographic sites, a bulldozer and numerous signs. The Department of Sustainability and Environment has provided Melbourne Water with a grant of \$3.9 million to assist in bushfire recovery. Recovery works are due to be completed by June 2011.

Melbourne Water established its Bushfire Recovery Coordination Team to manage short-term and long-term recovery issues associated with the water supply system and its waterways. The team initiated a rapid assessment project of fire damaged assets to help prioritise recovery works and developed the overall strategy to guide recovery operations across all of the Melbourne Water business.

To safeguard Melbourne Water's supplies from the risk of the fires spreading to the Upper Yarra and Thomson catchments, Melbourne Water transferred one billion litres of drinking water from Upper Yarra Reservoir to Cardinia Reservoir on 9 February 2009. Melbourne Water continued to transfer this amount of water to Cardinia Reservoir for a further 20 days as a precautionary measure.

Even before the fires were contained in the catchments, Melbourne Water began putting in place rehabilitation works to protect short-term water quality. These works included road drainage improvements and installing silt curtains to prevent debris, soot and ash being washed into the water storages during subsequent rain events.

As a result of these rehabilitation works, the water quality impacts appear to be manageable but fire-related impacts can take months to appear. Melbourne Water is monitoring several parameters, including turbidity and nutrients, within some of the major waterways in the burnt catchments and downstream of the catchments. Melbourne Water has also installed event-based automatic samplers. These will provide an indication of future water quality in Melbourne Water storages.

The table below summarises the impact of the bushfires on Melbourne's water catchments.

Catchment	Fire affected	Area burnt estimate	Share of total reservoir inflow
Reservoirs with catchment			
Thomson	No	None	36%
Upper Yarra	Yes	About 2% burnt	19%
Maroondah	Yes	About 75% burnt	12%
O'Shannassy	Yes	About 93% burnt	12%
Yan Yean	No	None	2% (not in supply)
Tarago	Yes	About 50% burnt	Nil (not used for Melbourne's water supply at the time of bushfires)
Reservoirs with no catchment			
Cardinia	No	N/A (no catchment)	Nil
Sugarloaf	No	N/A (no catchment)	12%*
Greenvale	No	N/A (no catchment)	Nil
Silvan	No	N/A (no catchment)	7%**
Small catchments			
Graceburn Creek	Yes	About 100% burnt	Run-off to Maroondah Reservoir
Wallaby Creek	Yes	About 100% burnt	Run-off to Yan Yean Reservoir
Armstrong Creek	Yes	About 100% burnt	Run-off to Silvan Reservoir
Coranderk Creek	Yes	Less than 2% burnt	Run-off to Silvan Reservoir
McMahons Creek	No	None	Run-off to Silvan Reservoir
Starvation Creek	No	None	Run-off to Silvan Reservoir

Percentages are calculated from the annual average inflow (run-off) into reservoirs from 1997 to 2008.

* Sugarloaf inflow is from the Maroondah aqueduct and Yarra River.

** Silvan inflow is from small catchments (see above), accounting for 7% of total reservoir inflow.

For further information on the events listed above, refer to Melbourne Water's annual drinking water quality report for 2008–09.

North East Water

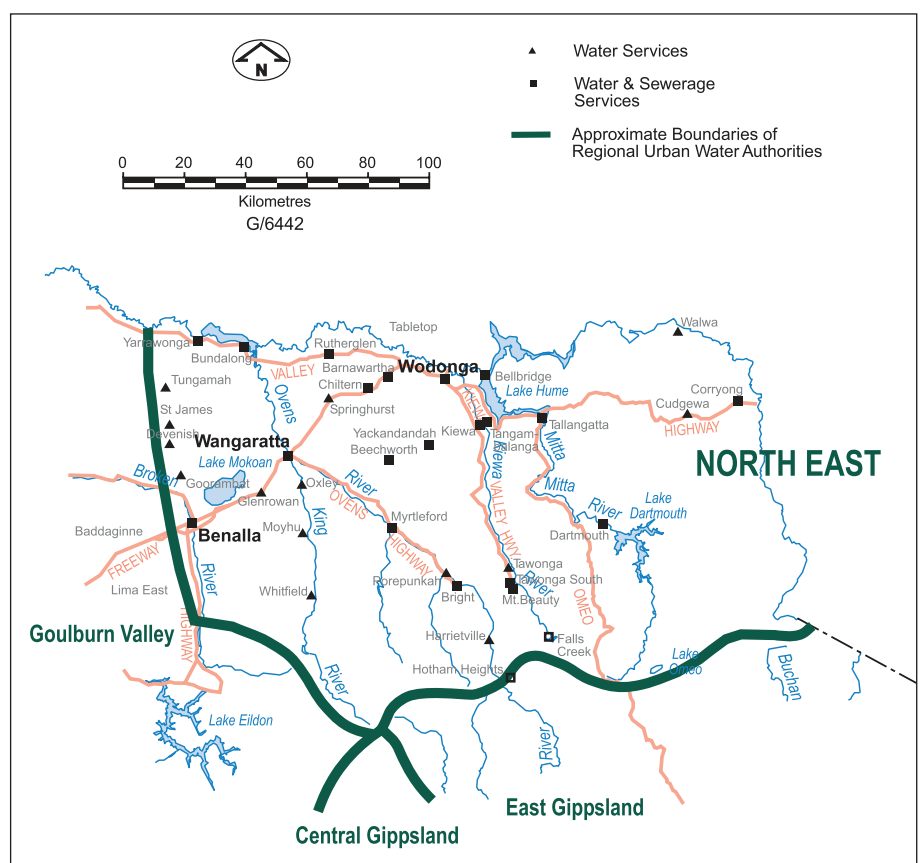
Head office: Wodonga

Localities supplied with drinking water: Barnawartha, Beechworth High Level, Beechworth Low Level, Bellbridge, Benalla, Bright, Bundalong, Chiltern, Corryong High Level, Corryong Low Level, Cudgewa, Dartmouth, Devenish, Ebden/Baranduda Low Level, Glenrowan, Gooramab, Harrietville, Kiewa, Moyhu, Mount Beauty, Myrtleford, Oxley, Porepunkah, Rutherglen, Springhurst, St James, Tallangatta, Tangambalanga, Tawonga, Tungamah, Wahgunyah, Walwa, Wandiligong, Wangaratta, Whitfield, Wodonga Baranduda High Level, Wodonga High Level, Wodonga Logic Centre, Wodonga Low Level, Yackandandah and Yarrowonga.

All supplies are filtered, except supplies to Corryong, Cudgewa, Harrietville, Myrtleford, Mount Beauty, Tawonga, Whitfield and the bore supply to Gooramab.

Wangaratta, Wodonga, Tangambalanga, Kiewa and Ebden/Baranduda received fluoridated water throughout 2008–09. Chiltern and Barnawartha were connected to the Wodonga system and have received fluoridation water since March and June 2009 respectively. Prior to June 2009, Barnawartha received an unfiltered ground water supply with naturally occurring fluoride at levels comparable to a fluoridated supply.

Population supplied with drinking water: approximately 102,500



Performance against water quality standards

Drinking water supplied in all localities by North East Water during 2008–09 complied with the water quality standards except as noted in the table below.

Parameter	Localities not complying with water quality standard
Aluminium	Dartmouth, Springhurst

In the case of Springhurst, the non-compliance for aluminium resulted from a single result above the standard in December 2008. In the case of Dartmouth three results were above the standard. In response to the non-compliances, North East Water optimised their water treatment processes to reduce the amount of acid-soluble aluminium that was being carried over into the treated water. All non-compliances were reported to the department under section 18 of the Act. These results did not pose a risk to public health.

Other water quality issues of potential health significance

Chlorite levels exceeded the health related guideline value set out in the 2004 *Australian drinking water guidelines* on five occasions within the Whitfield supply. The guideline value for chlorite is 0.3 mg/L and a maximum value of 0.5 mg/L was recorded.

North East Water have made efforts to improve effectiveness of the Whitfield treatment plant, including implementation of a coarse screen filter, dosing of algicide, investigation into ground water availability and optimisation of chlorine dioxide dosing. Investigations into future treatment options are now underway, including the raw water source for improved water quality and water supply security.

The health-related guideline value for manganese (0.5 mg/L) was exceeded on one occasion in Bright, at 0.56 mg/L. A filtration plant was being commissioned at the time of this detection. Levels of manganese have reduced significantly since the filtration plant has been brought on line.

The health-related guideline value for chlorine of 5 mg/L was exceeded on one occasion at Walwa due to a power failure. The dose rate was lowered and the reticulation was flushed.

Four positive *cryptosporidium* results were detected in the reticulation in Corryong High Level, Corryong Low Level, Myrtleford and Tawonga. Each of these localities has an unfiltered supply. Investigations into these detections did not reveal the source and the viability and infectivity of the *cryptosporidium* could not be determined.

The localities of Myrtleford, Tawonga and Mount Beauty utilise methods of disinfection that do not provide a residual disinfectant in the reticulation system. The Myrtleford water supply system is disinfected with ultraviolet light and the Tawonga and Mount Beauty water supply system is disinfected with ozone, at the request of the resident communities.

There were a number of *enterococci* detections in Myrtleford, Tawonga and Mount Beauty. Mount Beauty was chlorinated for a period while the Mount Beauty basin

was drained, repaired and refilled. Multiple barrier upgrades to the water treatment plants are currently underway in Mount Beauty and Myrtleford to improve water quality. These are due for completion in 2010 and 2011 respectively.

At the direction of the department, a seasonal **boil water notice** was implemented for Myrtleford from 1 November 2008 to 30 April 2009.

For detailed water quality data, including data about other aesthetic characteristics of the drinking water and raw water monitoring, refer to North East Water's annual drinking water quality report for 2008–09.

Risk management plan audit

North East Water's risk management plan audit was completed in July 2008.

The audit found that North East Water did not comply with the obligations imposed by the Act. This was predominately due to:

- some of the supply systems not meeting the multiple barrier principles set out in the 2004 *Australian drinking water guidelines*;
- not developing a comprehensive water quality improvement plan;
- not developing a comprehensive schedule for ongoing review of risk management plans; and
- some of the critical limits set for some of the water supplies not being consistent with the requirements of the *Guidelines*.

The department accepted an undertaking from North East Water in relation to the most significant audit findings. The undertaking will be finalised after the current reporting period and will be discussed in more detail in the annual report for 2009–10 reporting period. The most significant audit findings and the proposed actions are set out in the table below.

Reason for major non-compliance	Proposed action
Some of the supply systems do not include pre-treatment prior to disinfection and do not meet the requirements of multiple barrier principles outlined in the 2004 <i>Australian drinking water guidelines</i> .	System upgrades incorporating multiple barriers are planned. All systems have been discussed with the department and undertakings submitted for high risk systems.
Although implementation of works to address higher water quality risk issues is occurring, the approach is not well documented and it is not clear that it is comprehensive in dealing with higher risk issues.	A comprehensive water quality improvement plan has been drafted.
There has been a program of on-going review and revision of the risk management plans, but this has not been comprehensive and has not been adequate to demonstrate that the plans remain relevant to the system and allow progress to be measured against the risk management plan.	A schedule is in place for comprehensive update of the risk management plans. Revision of the risk management plans is on track with the schedule.
The critical limits set for some of the supplies are not consistent with the requirements of the <i>Australian drinking water guidelines</i> for turbidity and disinfection, and this does not meet the requirements for validation of control measures. While North East Water does have a summary listing of improvements that forms the basis for a water quality improvement plan, further development of this is required to make this comprehensive and link it with the complete listing of risks in each risk management plan.	A comprehensive water quality improvement plan has been drafted which includes validation of critical limits.

The audit certificate is included in North East Water's annual drinking water quality report for 2008–09.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department.

Date	Supply	Issue	Action(s)
July 2008	Bright	Elevated manganese in drinking water	Coincided with commissioning of new filtration plant and air scouring of the reticulation system. Subsequent results were significantly lower.
August 2008	Corryong High Level	<i>Cryptosporidium</i> detection	Disinfection systems checked and no faults found. Nothing detected in the resample tests.
August 2008	Whitfield	Elevated chlorite in drinking water	Due to the treatment of an algal bloom in the raw water reservoir the supply was changed to the Musk Gully creek. This creek is subject to high turbidity during rainfall. As Whitfield is an unfiltered site the turbidity and high organics can affect the chlorine dioxide dosing. Investigations into raw water source and additional barriers were commenced.
October 2008	Chiltern	Detection of <i>Escherichia coli</i> in drinking water (390 orgs/100 mL)	Repair chlorinator, town tank hypochlorinated to increase chlorine residual level. Retest of initial sample to check high <i>Escherichia coli</i> reading as source water level of <i>Escherichia coli</i> was low. Suspected sample was not reticulated water. Installed a dedicated sample tap to avoid any confusion with water tank supply. Resample was clear.
October 2008	Goorambat	Detection of <i>Escherichia coli</i> at tank outlet	Detection at outlet of town tank. Checked chlorine dosing system and chlorine residuals in town. Resample was clear.
October 2008	Tawonga	Detection of <i>Escherichia coli</i> at tank outlet	Ranch road tank chlorinated and resample was clear.
November 2008	Corryong Low Level	<i>Cryptosporidium</i> detection	Disinfection systems checked and no faults found. Nothing detected in the resample tests.
November 2008	Mount Beauty	<i>Enterococci</i> detection	An unfiltered and non residual locality. Multiple barrier upgrade due for completion by end of 2010. Sodium hypochlorite added from 19/12/08 to 20/01/09 while basin was drained and repaired.
December 2008	Mount Beauty	<i>Enterococci</i> detections (on two occasions)	An unfiltered and non residual locality. Multiple barrier upgrade due for completion by end of 2010. Sodium hypochlorite added from 19/12/08 to 20/01/09 while basin was drained and repaired.
November 2008	Tawonga	<i>Cryptosporidium</i> detection	An unfiltered and non residual locality. Multiple barrier upgrade due for completion by end of 2010.
November 2008	Myrtleford	<i>Cryptosporidium</i> detection	A boil water notice effective from 1/11/08 to 30/04/09. Multiple barrier upgrade due for completion by end of 2010.
November 2008 to March 2009	Myrtleford	<i>Enterococci</i> detections (on 12 occasions) in drinking water	A boil water notice effective from 1/11/08 to 30/04/09. Multiple barrier upgrade due for completion by end of 2010.
November 2008–January 2009	Whitfield	Boil Water Notice	Due to the treatment of an algal bloom in the raw water reservoir the supply was changed to the Musk Gully creek. This creek is subject to high turbidity during rainfall. As Whitfield is an unfiltered site the turbidity and high organics can affect the chlorine dioxide dosing. The UV was operational and a Boil Water Notice was put in place 21/11/08 to 12/01/09.

Date	Supply	Issue	Action(s)
December 2008	Whitfield	Elevated chlorite in drinking water	Whitfield is an unfiltered site the turbidity and high organics can affect the chlorine dioxide dosing.
December 2008	Walwa	Elevated chlorine residual in drinking water	Power failure resulted in loss of signal to pump to shut off dosing. Dose rate was lowered and reticulation flushed.
December 2008	Corryong Low Level and High Level	Loss of disinfection	Disinfection restored early evening on same day.
December 2008	Tawonga	<i>Enterococci</i> detection in drinking water	Ranch road tank dosed with sodium hypochlorite. Resample was clear.
January 2009	Tawonga	<i>Enterococci</i> detection in drinking water	Resample was clear.
January 2009	Whitfield	Elevated chlorite in drinking water	Whitfield is an unfiltered site the turbidity and high organics can affect the chlorine dioxide dosing.
January 2009	Dartmouth	Detection of <i>Escherichia coli</i> in drinking water	Loss of chlorine disinfection due to blocked dosing pump. Equipment cleaned and tank hypochlorinated. Resample was clear.
February 2009	Whitfield	Elevated chlorite in drinking water	Whitfield is an unfiltered site the turbidity and high organics can affect the chlorine dioxide dosing.
February 2009	Myrtleford	Detection of <i>Escherichia coli</i> in drinking water	A boil water notice was active from 1/11/08 to 30/04/09. A community newsletter was sent to remind all residents to boil their water. Multiple barrier upgrade due for completion by end of 2010.
February 2009	Tawonga	Detection of <i>Escherichia coli</i> at plant outlet	No <i>Escherichia coli</i> detected in reticulation system. Resample was clear.
February 2009	Mount Beauty and Tawonga	Loss of ozonation	A computer default followed a loss of power.
April 2009	Whitfield	Elevated chlorite in drinking water	Investigations still ongoing as to optimal long-term solution for chlorite issue.
June 2009	Yackandandah	Detection of <i>Escherichia coli</i> in drinking water	Unknown source, chlorine residual was 0.59 mg/L. Resample was clear
June 2009	Corryong High Level	Detection of <i>Escherichia coli</i> in drinking water	Unknown source. Resample was clear.

The other major water quality incident for 2008–09 was a significant blue green algae bloom along the Murray River. North East Water incorporated powder activated carbon dosing to the existing water treatment plants along the Murray River, to remove the algae and associated taste and odour to continue to provide safe drinking water to their customers.

For further information on the water quality notifications listed above, refer to North East Water's annual drinking water quality report for 2008–09.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by North East Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers supplied
Discoloured water	47	0.11
Taste/odour	54	0.12
Blue water	0	0
Air in water	1	0.002
Suspected illness	2	0.004
Other	15	0.03

The most common type of complaint received by North East Water was regarding taste and odour. Significant levels of algae were present in the Murray River system and other towns with raw water storages. Approximately half of the taste and odour complaints received were related to algae and the other half were related to chlorine where two towns changed their disinfection method. Taste and odour removal can occur at the water treatment plant with the use of powdered activated carbon.

The complaint category of dirty/discoloured water was the second most common type of complaint in 2008–09. North East Water advised that their maintenance staff responded to these complaints and service requests by visiting the site and investigating. Causes of discolouration include bio-film sloughing off the mains resulting in sediment at customer taps, the presence of some types of algae, or iron and manganese in the water.

The third most common complaint category is “other”. This category included complaints about or objection to the addition of chlorine, household water filter blockages and grit in water, staining of basins, tubs and pipe fittings and clothes washing stains.

Parks Victoria

Head office: Melbourne

Parks Victoria provides water to approximately 260 sites within the areas it manages across Victoria. During 2008–09 Parks Victoria provided drinking water to five of these 260 sites, which have been declared water sampling localities under the Safe Drinking Water Regulations. The five localities are Gabo Island Lightstation, Lakeside/Candlebark Campgrounds (Lake Eildon National Park), Twelve Apostles Visitor Facility, Tidal River and Wilsons Promontory Lightstation.

Performance against water quality standards (drinking water supplies only)

Drinking water supplied by Parks Victoria during 2008–09 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, Wilsons Promontory Lightstation
Aluminium	Tidal River Campground
Turbidity	Wilsons Promontory Lightstation

With regard to Gabo Island Lightstation, two *Escherichia coli* detections were recorded during the reporting period. In the case of the Wilsons Promontory Lightstation locality, a single detection was recorded. Because of the modified sampling frequency that is used at Wilsons Promontory Lightstation, a single *Escherichia coli* detection is sufficient to make it non-compliant with the standard.

After each *Escherichia coli* detection Parks Victoria undertook appropriate 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*.

Two non-compliant aluminium results were recorded in Tidal River, in January and May 2009. As with previous years, aluminium non-compliance remains a sporadic, ongoing issue for this locality. Parks Victoria advised that the non-compliant results were a result of residual aluminium levels from the chemical dosing regime. The monitoring equipment in the water treatment plant is now being re-calibrated every six months to ensure a more accurate dosing regime in an attempt to eliminate future non-compliant occurrences.

The method being used to conduct onsite testing for aluminium residual is also being reviewed as it has been identified that it may not be recording acid soluble aluminium, according to the requirements of the Regulations. Parks Victoria will endeavour to resolve this issue during the next reporting period.

The non-compliance with the turbidity standard at Wilsons Promontory Lightstation was largely caused by the effect of the reduced sampling frequency on the statistical nature of the calculation for this standard. Turbidity samples are only collected quarterly at this site. One of the collected samples recorded a turbidity value of 7.1 NTU, and as the standard is based on the 95th percentile upper confidence limit of the mean, one high result is enough to result in non-compliance

with the standard. In response to the elevated result, the drinking water tank was disconnected from the building roof suspected of contributing the elevated turbidity result.

Other water quality issues of potential health significance

Water quality testing as required by the Regulations could not be undertaken at Lakeside/Candlebark Campgrounds, in Lake Eildon National Park, during February 2009 because the park was closed due to bushfires. Testing was undertaken before the park re-opened in early March 2009.

Risk management plan audit

Parks Victoria's first risk management plan audit under the Act was completed on 17 July 2008, but as the originally agreed date for the completion of the audit was 30 June 2008, the audit results were reported in the 2007–08 report.

Parks Victoria was found to be non-compliant with the requirements of the Act. The reasons for the non-compliance are detailed below. In response to the audit, Parks Victoria submitted an undertaking to the department.

The actions detailed in the undertaking have been completed as follows:

- The Twelve Apostles Centre risk management plan has been reviewed and updated to ensure that it contains adequate procedures and forms for inspections and maintenance of the potable water supply system, in particular ultra-violet lamps, storage tanks and water cartage procedures.
- Staff at Port Campbell office, who look after the Twelve Apostles Centre have been trained to ensure that they understand the procedures and keep proper records.
- All risk management plans have been reviewed and updated to ensure that they contain adequate procedures and forms to ensure maintenance is carried out and documented.
- Parks Victoria has developed a purchasing procedure for chemicals and equipment to ensure that they are suitable for potable water delivery systems.
- Parks Victoria received written assurances from water cartage contractors for the Twelve Apostles Centre and Lakeside/Candlebark Campground localities that they understand and adhere to the water cartage guidelines.
- A Safe Drinking Water training framework has been developed that identifies the key areas of the program and risk management plans. Staff at drinking water sites have been trained to ensure that they understand the Safe Drinking Water program, the risk management plan procedures and keep proper records.
- A Safe Drinking Water Procedure has been developed to manage Parks Victoria's Safe Drinking Water Program. This procedure identifies all activities that need to be completed to ensure compliance and the accountability for completion. The procedure also identifies the commitment to hold annual onsite meetings with staff responsible for delivery of the Program at the five drinking water localities.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department.

Date	Supply	Issue	Action(s)
December 2008	Gabo Island Lightstation	Detection of <i>Escherichia coli</i> in drinking water	The tanks were treated with sodium hypochlorite. “Do Not Drink” signs were installed and visitors provided with bottled water. A resample was taken and <i>Escherichia coli</i> levels returned to below the detection limit.
December 2008	Wilsons Promontory Lightstation	Detection of <i>Escherichia coli</i> in drinking water	The tanks were treated with sodium hypochlorite. A resample was taken and <i>Escherichia coli</i> levels returned to below the detection limit.
June 2009	Gabo Island Lightstation	Detection of <i>Escherichia coli</i> in drinking water	The tanks were closed and treated with sodium hypochlorite. A resample was taken and <i>Escherichia coli</i> levels returned to below the detection limit.

For further information on the water quality notifications listed above, refer to Parks Victoria’s annual drinking water quality report for 2008–09.

Customer complaints relating to water quality

There were no customer complaints related to drinking water quality lodged with Parks Victoria in 2008–09.

Non-drinking water sites

Parks Victoria manages a large number of sites where the water supply is not intended for drinking. These include:

- camp sites with a single tank
- kiosks managed by a lessee
- accommodation premises managed by lessees
- taps in car parks and picnic areas

Parks Victoria has developed a set of risk management strategies to prevent the inadvertent consumption of water not intended for drinking. These include:

- installing appropriate signage at all sites where the water is not intended for drinking.
- establishing lease agreements with the lessees managing food and accommodation premises to ensure they are aware of the intended purpose of the water they receive, and of their obligations under other legislation such as the *Food Act* 1984 and the *Health Act* 1958 (accommodation).
- ensuring obligations to staff under occupational health and safety legislation are met in relation to drinking water at remote offices.

- forming the Safe Drinking Water Working Group, with representation from each of the five Parks Victoria regions and the Commercial Services Division.
- developing a Parks Victoria Park Note “Water – Make it Safe to Drink” in collaboration with the Department of Human Services. The note is available from Parks Victoria offices, on the Parks Victoria website and the department’s Better Health Channel web site.

Mineral springs

Parks Victoria also manages a number of mineral springs in Central Victoria, chiefly in the 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 2008–09, 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 also closed until retesting demonstrated that the contamination had been removed.

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

Date	Mineral spring where <i>Escherichia coli</i> was detected
July 2008	Tipperary Pipe Pit
July 2008	Sailors Falls Pipe
July 2008	Tipperary Pipe Pit
September 2008	Sailors Falls Pump
November 2008	Argyle
December 2008	Sailors Falls Pump

Parks Victoria took appropriate action after each detection, signposting and closing the affected springs and undertaking re-sampling. Given the lack of treatment barriers, it was considered inappropriate to proceed with declaring the springs as water sampling localities.

Parks Victoria also collected a range of water quality data, which the department will use to conduct a health risk assessment on the consumption of spring water, with the intended outcome being that any future management arrangements will be based on this assessment.

South East Water

Head office: Heatherton

Localities supplied with drinking water: Balnarring, Bayswater, Beaumaris, Belgrave, Berwick, Bittern, Brighton/Heatherton, Bunyip, Carrum Downs, Caulfield, Chelsea, Cora Lynn, Cranbourne, Dandenong, Dandenong North, Devon Meadows, Dromana, Ferntree Gully, Frankston, Frankston South, Garfield, Hallam, Hastings, Karingal, Koo Wee Rup, Lang Lang, Moorooduc, Mordialloc, Mornington, Mount Martha, Pakenham, Rowville, Rye, Shoreham, Somerville, South Melbourne, Tynong, Upper Beaconsfield, Wantirna and adjacent suburbs (refer to Appendix 9 for a list of all individual suburbs supplied).

Water is sourced from Melbourne's protected forested catchments without requiring further filtration, or is blended with filtered water from Winneke water treatment plant. All localities receive fluoridated water.

Population supplied with drinking water: approximately 1,429,190

Towns and areas supplied with non-potable (non-drinking) water: A small number of customers receive non-potable (non-drinking) water from an open channel system supplied from the Bunyip and Tarago rivers. This water is untreated and used for stock and domestic purposes.



Map prepared by, and used
with the permission of,
South East Water

Performance against water quality standards

Drinking water supplied in all localities by South East Water during 2008–09 complied with the water quality standards.

Other 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-related guideline values set out in the 2004 *Australian drinking water guidelines* during the reporting period.

A small number of customers receive untreated, non-potable water from an open channel system supplied from the Bunyip and Tarago rivers. South East Water has advised that each customer receiving such water has an individual supply agreement with South East Water to provide them with water and that the agreement specifically states that the water supplied is not fit for human consumption. This water has not been declared as regulated water.

For detailed water quality data, including data about other aesthetic characteristics of the water, refer to South East Water's annual drinking water quality report for 2008–09.

Risk management plan audit

No risk management plan audit was scheduled for this reporting period. South East Water's previous risk management plan audit result was described in detail in the department's annual report for 2007–08.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department.

Date	Supply	Issue	Action(s)
October 2008	Ferntree Gully	Detection of <i>Escherichia coli</i> at hydrant	Detection occurred in a non-routine sample taken from a hydrant for a new main sampling program. All system checks were clear and a resample from the original location and another sample tap nearby, taken on the following day, were clear of <i>Escherichia coli</i> .
December 2008	Frankston South	Detection of <i>Escherichia coli</i> at tank outlet	Detection occurred in a sample collected from a tap located at the Armagh Road basin outlet. At the time of sampling free chlorine residual was 0.01 mg/L. Resamples were taken from Armagh Road basin and the reticulation system. Two of these samples were positive for <i>Escherichia coli</i> , the first at Armagh Road basin and the other within the reticulation system. The Armagh Road basin was taken offline. The most likely source of the <i>Escherichia coli</i> was a small hole in the floating cover of Armagh Road basin. Following operational changes, resamples taken within the reticulation system were clear of <i>Escherichia coli</i> . Armagh Road basin remained offline for a number of weeks. During this time the basin was drained and the cover repaired. Prior to returning Armagh Road basin to operation, the basin was sampled and found to be clear of <i>Escherichia coli</i> .

Date	Supply	Issue	Action(s)
December 2008	Koo Wee Rup	Detection of <i>Escherichia coli</i> in drinking water	Detection occurred in a routine sample taken at Koo Wee Rup low level tank. At time of sampling the free chlorine residual was 0.01 mg/L. The tank was isolated and cleaned before being retested and put back online. The resample was clear of <i>Escherichia coli</i> .
February 2009	Balnarring	Detection of <i>Escherichia coli</i> at tank outlet	Detection occurred in a routine sample taken at Somers Tank, in the Balnarring locality. At the time of sampling the free chlorine residual was 0.2 mg/L. The tank was immediately isolated, inspected and dosed to a free chlorine residual of 0.5mg/L. Samples taken at three nearby taps within the reticulation system and on the Somers-Flinders Pipeline, on the following day, were all clear of <i>Escherichia coli</i> .
February 2009	Brighton/ Heatherton	Detection of <i>Escherichia coli</i> in drinking water	The free chlorine residual at time of sampling was 0.07 mg/L. All system checks were clear and the resample at the same tap and three other nearby sample points taken on the following day were clear of <i>Escherichia coli</i> .
April 2009	Berwick	Detection of <i>Escherichia coli</i> at hydrant	Detection occurred in a non-routine sample taken from a hydrant for a new main sampling program in Thomas Street, Beaconsfield, in the Berwick locality. At the time of sampling the free chlorine residual was 0.09 mg/L. All system checks were clear and the resample at the hydrant and another nearby tap, taken the following day, were clear of <i>Escherichia coli</i> .
April 2009	Cranbourne	Detection of <i>Escherichia coli</i> at tank outlet	Detection occurred in a routine sample taken at the Centreville tank, in the Cranbourne locality. The free chlorine residual at time of sampling was 0.01 mg/L. The tank was immediately isolated, inspected and dosed to a free chlorine residual of 0.5mg/L. All system checks were clear and the resample was clear of <i>Escherichia coli</i> . The detection was thought to be due to windblown contamination. This tank has since been fully sealed.
April 2009	Balnarring	Detection of <i>Escherichia coli</i> at tank outlet	Detection occurred in a routine sample taken at Balnarring tank, in the Balnarring locality. The free chlorine residual at time of sampling was 0.2 mg/L. The tank was immediately isolated, inspected and dosed to a free chlorine residual of 0.5 mg/L. Samples taken at three nearby taps within the reticulation system, taken on the following day, were clear of <i>Escherichia coli</i> . The detection was possibly due to windblown contamination entering the tank through partially-open eave ventilation. The tank has since been fully sealed.
April 2009	Somerville	Detection of <i>Escherichia coli</i> in drinking water	The free chlorine residual at time of sampling was 0.01 mg/L. All system checks were clear, the tank was dosed to 0.5mg/L and the resamples at the same tap, one other sample point within the distribution zone and also from the Somerville tank, all taken on the following day, were clear of <i>Escherichia coli</i> .

For further information on the water quality notifications listed above refer to South East Water's annual drinking water quality report for 2008-09.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by South East Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	561	0.088
Taste/odour	162	0.025
Blue water	14	0.002
Air in water	24	0.004
Suspected illness	13	0.002
Other	35	0.005

South East Water received 809 water quality complaints during the reporting period, which was down from 1,112 (0.18 per 100 properties) during the last reporting period. Even though the drought has created low demands and the continued suspension of South East Water's routine mains cleaning program, this reporting period's total number of complaints were the lowest on record for the business.

South East Water attributed this to a number of reasons, such as better management of planned shutdowns, closer working relationship with Melbourne Water and their outages/works, closely monitoring South East Water and Melbourne Water SCADA systems and continued use of secondary disinfection plants.

South Gippsland Water

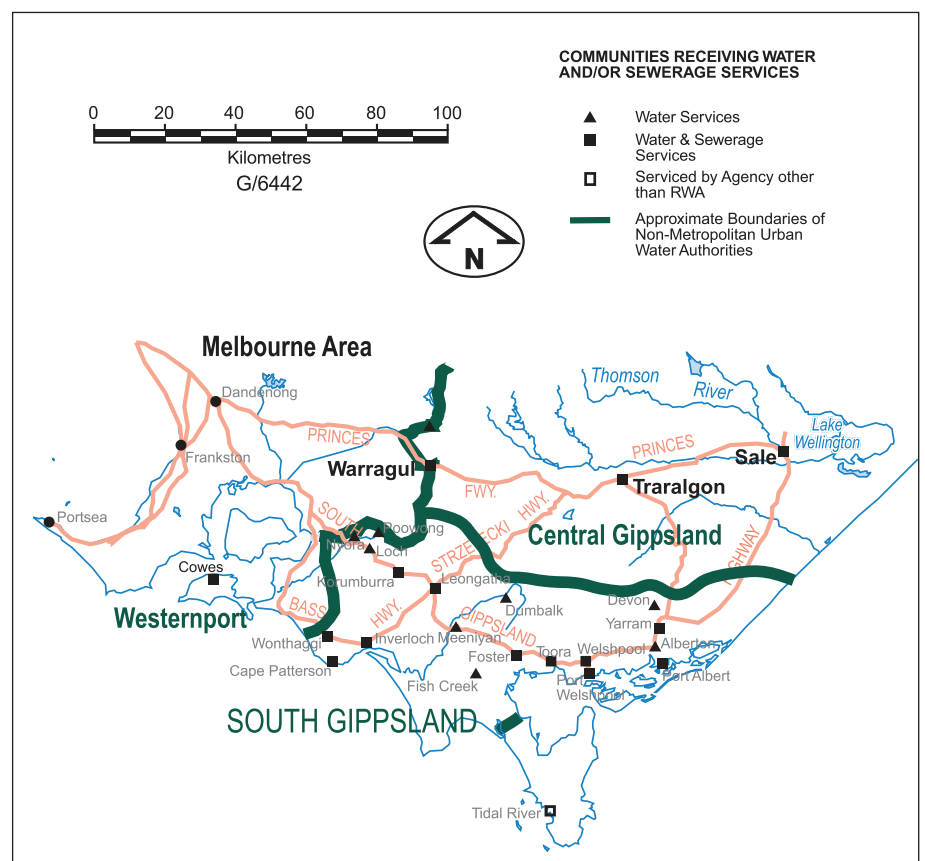
Head office: Foster

Localities supplied with drinking water: Alberton, Cape Paterson, Dumbalk, Fish Creek, Foster, Inverloch, Koonwarra, Korumburra, Leongatha, Lance Creek, Loch, Meeniyan, Nyora, Poowong, Port Franklin, Port Welshpool, Toora, Wonthaggi and Yarram.

The Yarram locality includes Devon North, the Alberton locality includes Port Albert and the Port Welshpool locality includes Welshpool.

South Gippsland Water also functions as a water storage manager under the Act when it supplies water from Lance Creek Reservoir to Westernport Water at Candowie Reservoir. This supply is untreated.

Population supplied with drinking water: approximately 25,640



Performance against water quality standards

Drinking water supplied in all localities by South Gippsland Water during 2008–09 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standards
Aluminium	Meeniyian

On two separate occasions, in August 2008 and May 2009, elevated aluminium results were detected in Meeniyian. Both results related to difficulties in optimising coagulation and flocculation processes at the water treatment plant. South Gippsland Water's corrective actions included adjusting dosing protocols, experimenting with alternative treatment regimes, inspecting the clear water storage and filters at the treatment plant, air scouring and flushing the mains, increasing monitoring and engaging a consultant to assist with plant optimisation. These high results were reported to the department under section 18 of the Act and did not pose a risk to health.

In June 2009 the department closed two undertakings from South Gippsland Water. The first specified the replacement of chlorination with chloramination disinfection at the Lance Creek water treatment plant. As a result of the introduction of chloramination into the Lance Creek system (including the localities of Lance Creek, Wonthaggi, Inverloch and Cape Paterson), trihalomethane levels dropped significantly.

The second undertaking also related to trihalomethane levels, in Dumbalk. Although the installation of a raw water tank/basin (the primary action specified in the undertaking) was not completed, the department accepted that trihalomethane levels were reduced following the installation of a volatile organics removal system and the use of potassium permanganate.

Other 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-related guideline values set out in the 2004 *Australian drinking water guidelines* during the reporting period.

For detailed water quality data, including data about other aesthetic characteristics of the water and details on South Gippsland Water's undertakings and raw water monitoring program, refer to South Gippsland Water's annual drinking water quality report for 2008–09.

Risk management plan audit

South Gippsland Water's risk management plan audit was completed in August 2008. The auditor found that South Gippsland Water complied with the obligations of the Act.

A number of improvement opportunities were identified, as shown below.

- The Water Safety Plan document, Risk Assessment Plan – Catchment-Reservoir, be combined with the Catchment system description documents to provide a detailed catchment description;
- The Drinking Water Management System responsibility matrix be reviewed frequently to ensure correctness of named responsible persons;
- References to the procedures for equipment maintenance and calibration be made in the Equipment Capability and Maintenance section of the Water Safety Plan;
- The Chemical Weed Control Planning procedures include the requirement for a South Gippsland Water staff member to be responsible for reviewing weed control activities by external operators.
- Revision dates be stated clearly for all documents on the Drinking Water Management System.
- Documents referenced by the Water Safety Plan be uniquely numbered to aid in identification purpose.
- A map showing the location of all water supply systems be included in the Water Safety Plan to give an overview of the geographic extent of South Gippsland Water's entire drinking water supply system.
- In the Risk Assessment Plan document, Catchment, explain the risk assessment approaches used in its preparation; it currently refers to just one of the approaches.
- While both of the risk assessment approaches used by South Gippsland Water are valid, efficiencies could be gained from standardisation such that the same approach for catchment/storage is used as that for storage to customer tap.
- The result of the risk assessment for radiological parameters be mentioned in the Water Safety Plan.

South Gippsland Water advised that each improvement opportunity had been addressed by making the changes as recommended by the auditor. The opportunities for improvement mainly related to the robustness, management and accessibility of documents on the South Gippsland Water Drinking Water Management System intranet site.

The audit certificate is included in South Gippsland Water's annual drinking water quality report for 2008–09.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department:

Date	Supply	Issue	Action(s)
March 2009	Toora	Detection of <i>Escherichia coli</i> in drinking water	System inspected and flushed, follow-up samples collected were clear of <i>Escherichia coli</i> . Fault detected (and corrected) in chlorine dosing injector at treatment plant
March 2009	Leongatha	Detection of <i>Escherichia coli</i> in drinking water	System inspected and flushed, follow-up samples collected were both clear of <i>Escherichia coli</i> .
April 2009	Leongatha	Detection of <i>Escherichia coli</i> in drinking water	System inspected and flushed, follow-up samples collected were both clear of <i>Escherichia coli</i> .

For further information on the water quality notifications listed above, refer to South Gippsland Water's annual drinking water quality report for 2008–09.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by South Gippsland Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers supplied
Discoloured water	76	0.41
Taste/odour	20	0.10
Blue water	0	0
Air in water	0	0
Suspected illness	0	0
Other	9	0.05

Discoloured water complaints primarily resulted from:

- high manganese levels that exist naturally in the soils around south gippsland that are washed down to surface water reservoirs and rivers;
- accumulation of sediment; or
- scouring of mains following high flows or recharging of the system.

South Gippsland Water has advised that scheduled air scouring and flushing programs were progressively implemented within all distribution systems to remove manganese and accumulated sediment. Potassium permanganate dosing systems have been introduced at all water treatment plants to oxidise and remove soluble manganese from source waters.

Other complaints generally involved sediment in water. Corrective actions include flushing and supply to the customer with a commercial product to remove discolouration marks from laundry items.

Southern Rural Water

Head office: Maffra

Southern Rural Water is a water storage manager under the Act and supplies untreated water in bulk to Western Water, from Pykes Creek, Merrimu and Rosslynne reservoirs, and to Gippsland Water, from Glenmaggie and Blue Rock reservoirs. Western Water and Gippsland Water then treat the water that they receive to drinking standard and distribute the treated water to their customers.

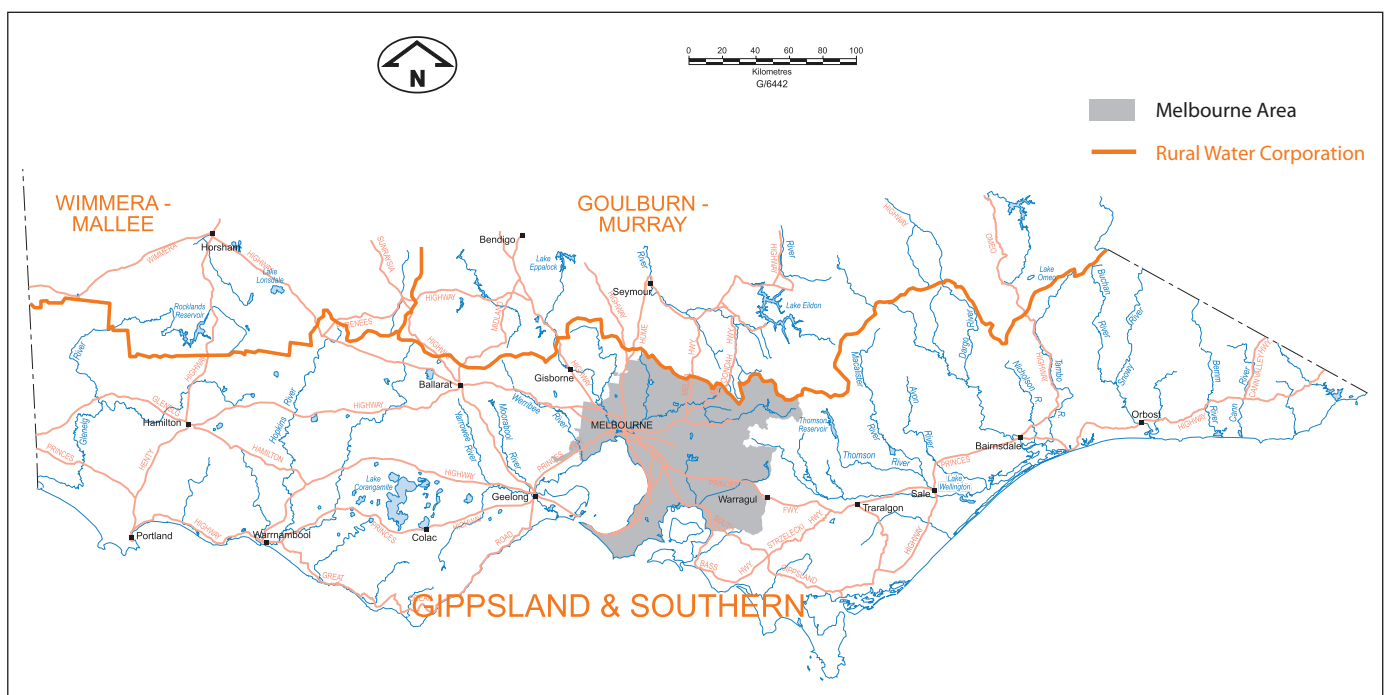
Southern Rural Water does not supply drinking water to any customers but does supply water for irrigation and rural purposes and to industry, including power generation in the Latrobe Valley.

Risk management plan audit

Southern Rural Water's risk management plan audit was completed in July 2008. The audit found that Southern Rural Water had some areas of non-compliance with the obligations imposed by the Act. The audit result was described in detail in the annual report for 2007-08.

Southern Rural Water has completed the actions arising from the audit and updated the risk management plans.

Map prepared by, and used with the permission of, Department of Sustainability and Environment



Water quality notifications

Southern Rural Water advises the department of any blue-green algae blooms that potentially affect public health, either via drinking water or recreation. There were no significant blue-green algae blooms on their storages during 2008–09. Notification to the department under section 22 of the Act was therefore not required. In addition, Southern Rural Water and Western Water have negotiated agreed values for notifying turbidity and *Escherichia coli* levels in Pykes Creek Reservoir and Merrimu Reservoir.

Southern Rural Water has also developed a communication strategy to ensure that their customers and members of the public are aware that water supplied or managed by Southern Rural Water is untreated and is not suitable for drinking or food preparation. The strategy was developed in consultation with the department.

For further information on the communication strategy for non-potable water, blue-green algae blooms or environmental management, refer to Southern Rural Water's annual water quality report for 2008–09.

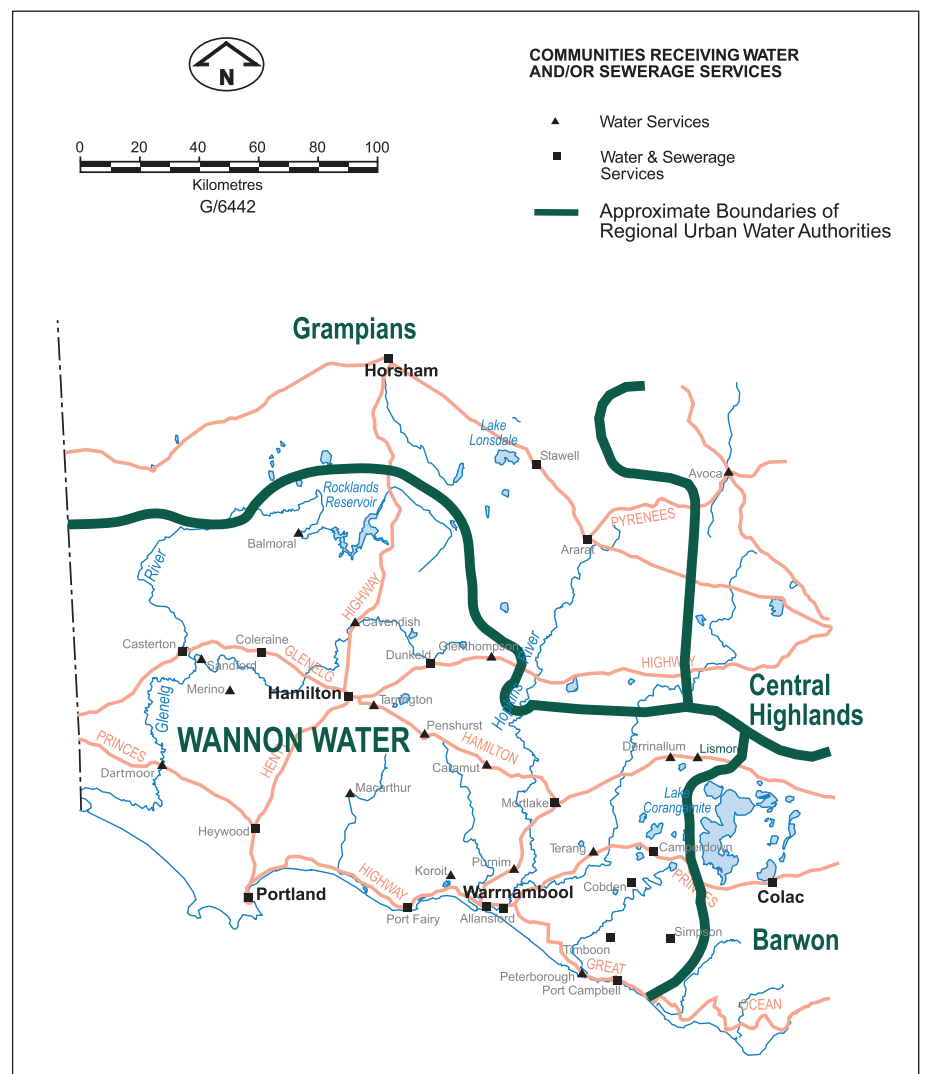
Wannon Water

Head office: Warrnambool

Localities supplied with drinking water: Allansford, Balmoral, Camperdown (Rural), Camperdown (Urban), Caramut, Casterton, Cavendish, Cobden, Coleraine, Dartmoor, Derrinallum, Dunkeld, Glenthompson, Hamilton, Henty, Heywood, Koroit, Lismore, Merino, Mortlake, Noorat/Glenormiston, Paaratte, Penshurst, Peterborough, Port Campbell, Port Fairy, Portland, Purnim, Sandford, Simpson, Tarrington, Terang, Timboon and Warrnambool.

All drinking water supplies are filtered, except supplies to Cavendish, Coleraine, Purnim and bore supplies to Caramut, Dartmoor, Heywood, Penshurst, Port Fairy and Portland.

Allansford, Koroit and Warrnambool have received fluoridated water since October 2008. The ground water supplies to Portland and Port Fairy contain naturally occurring fluoride at levels comparable to a fluoridated supply.



Towns supplied with regulated (non-drinking) water: Darlington, Macarthur and supplies from the North Otway Pipeline (including supplies to Cudjee, Garvoc and Carlisle River).

Population supplied with drinking water: approximately 71,395

Performance against water quality standards (drinking water supplies only)

All water sampling localities complied with the drinking water quality standards during 2008–09 reporting period, except as noted in the table below.

Parameter	Localities not complying with water quality standard
Trihalomethanes	Coleraine
Aluminium	Allansford, Balmoral, Camperdown (Rural), Camperdown (Urban), Cavendish, Cobden, Derrinallum, Dunkeld, Glenthompson, Hamilton, Koroit, Tarrington, Warrnambool

Trihalomethanes

With regard to the non-compliances with the trihalomethanes standard in Coleraine, Wannon Water had an undertaking in place with the department to address this issue. The Coleraine undertaking expired on 30 June 2009. The undertaking involved constructing a pipeline from Casterton water treatment plant to Coleraine. The pipeline was completed and commissioned prior to the expiry date.

In preparation for the water supply arriving via the pipeline, the water level in the basin was drawn down as low as possible, to ensure maximum dilution of the water from the local reservoir. Additionally, the Coleraine reticulation system was flushed. As the actions were not completed until June 2009, 11 of the 12 monthly results for the year exceeded the standard. Piping water from Casterton should resolve the trihalomethanes issue in Coleraine.

Aluminium

The other significant water quality issue for Wannon Water during 2008–09 was non-compliance with the aluminium standard in thirteen localities. Because individual water treatment plants provide water to multiple water sampling localities, a problem at a particular water treatment plant, or raw water source, may result in non-compliance issues being experienced in several localities.

The Warrnambool water treatment plant supplies drinking water to Allansford, Koroit and Warrnambool. Two non-compliant results were recorded in Allansford and Koroit and three were recorded in Warrnambool during 2008–09.

The non-compliance in Warrnambool in August 2008 was the result of the Warrnambool water treatment plant filters being overloaded due to ineffective flocculation of the raw water. Filter breakthrough occurred and, as a result, aluminium carry over was experienced. Investigations by Wannon Water identified that ineffective flocculation may have been due to change over of the alum dosing

pumps. Additional checks have been put in place to ensure both dosing pumps are set at the same dose rate.

The non-compliances recorded in January and June 2009 were isolated to individual reticulation sampling sites. The turbidity at these sites was also elevated, suggesting that aluminium had accumulated as a post treatment floc at these two sites. The reticulation in the vicinity of these sites was flushed.

With regard to Allansford, the reticulation was flushed to remove the high aluminium that was also associated with higher than typical turbidity, iron and manganese.

At Koroit, the aluminium non-compliance in July 2008 was caused by issues at the Warrnambool water treatment plant. In June 2008 a valve failure on the aluminium sulphate storage tank resulted in aluminium sulphate siphoning from the tank back into the raw water line at the treatment plant whilst the plant was being supplied under gravity from raw water storages. Wannon Water installed valves to prevent a recurrence of this incident. Operating procedures for operating under gravity supply were also developed by Wannon Water.

The non-compliance in March 2009 is thought to be the result of aluminium accumulating at the end of the main. This sample site is regularly flushed to prevent the build up of sediment.

With regard to Balmoral, Wannon Water completed and commissioned the new Balmoral water treatment plant in January 2008. The majority of the high aluminium results for this system relate to pH control of chemically dosed water.

Soda ash is used to increase pH, however the soda ash lines have been freezing during cold weather conditions. The soda ash dosing lines were insulated by Wannon Water in September 2008 however this did not prevent the freezing. Wannon Water is investigating options to eliminate freezing in the future and or changing the coagulant to a product that is less pH dependent.

The high acid soluble aluminium concentrations recorded in Balmoral in November 2008 was unusual and isolated.

The localities of Camperdown (Rural), Camperdown (Urban) and Derrinallum are supplied from Camperdown water treatment plant. Long-term monitoring by Wannon Water indicated that acid soluble aluminium levels increase each year around the months of August to October. During this period the Camperdown water treatment plant sources its water from the Arkins Creek Catchment. The water extracted from the Arkins Creek has very low alkalinity, resulting in difficulties in controlling pH through the water treatment process.

Low pH at the time of coagulation results in dissolution of aluminium and carryover through the filtration process.

As a result, from 16 July 2008 to 22 October 2008 high levels of acid soluble aluminium were experienced in the Camperdown rural and urban reticulation systems. On 19 November 2009 this carryover process resulted in increased acid soluble aluminium levels being detected in the Derrinallum reticulation.

During 2007–08 Wannon Water started work on a pH stabilisation project to improve pH stability of the final product water.

The modified plant was commissioned in October 2008, however due to incorrect valve sizing no improvement was evident during the remainder of the reporting period. Wannon Water plan to replace the valve in 2009–10, and this is expected to improve pH stability.

On 3 December 2009 and 22 April 2009 samples collected from the Derrinallum locality were found to be non-compliant with the aluminium water quality standard. Both these samples were collected from the same sampling tap, which is located close to the end of a dead-end main; the samples were also associated with high turbidity. This sample site is flushed on a regular basis as part of Wannon Water's routine flushing program.

In November–December 2008 the Cavendish raw water service basin experienced elevated turbidity. To reduce the turbidity, Wannon Water dosed the Cavendish raw water service basin with aluminium chlorohydrate on 17 December 2008, with the aim of settling out the suspended material and therefore reducing turbidity.

In-house aluminium residuals taken from the inlet to the clear water storage indicated compliance with acid-soluble aluminium water quality standard.

However, subsequent results received from Wannon Water's consultant, NATA-accredited laboratory indicated non-compliance with the water quality standard. Sampling for acid-soluble aluminium was increased to twice per week.

Three weeks after dosing the basin with aluminium chlorohydrate, acid soluble aluminium levels declined to less than the standard. An increase in acid soluble aluminium concentrations at the end of June 2009 is attributable to an increase in the natural aluminium concentration in the raw water. Other than detention time in the raw water service basin, the Cavendish disinfection plant is not designed to remove aluminium.

Similar to Camperdown, the acid soluble aluminium concentrations in Cobden increase each year between August and October. During late winter and early spring, the source water for Cobden water treatment plant (North Otway Pipeline – Arkins Creek) typically has very low alkalinity. This results in difficulty in controlling pH through the water treatment process. As discussed above, low pH at coagulation results in dissolution of aluminium and carryover through the filtration process.

During the reporting period, acid soluble aluminium concentrations peaked on 28 October 2008. This peak coincided with trials Wannon Water was conducting to optimise plant performance, using a combination of aluminium sulphate and aluminium chlorohydrate at varying dose rates. These trials did not prove to be successful. Following cessation of the trials, along with increased alkalinity levels, the aluminium concentrations reduced.

Wannon Water is continuing with a step-by-step trial process with the aim of improving plant coagulation. Plans for 2009–10 include dosing pH corrective agent into the raw water storage to increase alkalinity, reducing plant flow rates, and reducing the percentage of backwash water returned to the head of the plant.

Hamilton water treatment plant supplies drinking water to Dunkeld, Hamilton and Tarrington. The plant utilises coagulation, flocculation, clarification and filtration to remove naturally-occurring particles from the water prior to disinfection. Aluminium sulphate is used within this process to achieve coagulation.

The raw water for this system is high in dissolved organic material and requires higher doses of aluminium sulphate to achieve particulate and colour removal. To sustain water reserves, Wannon Water's water harvesting strategy from the catchment area for Hamilton has focussed on capturing as much water as possible. As a result, the quality of the raw water entering the water treatment plant has deteriorated to the point where it is outside the design specifications of the plant. Design issues with the plant have also hindered optimum performance. Due to these deficiencies, significant aluminium non-compliances were recorded for the Hamilton, Dunkeld and Tarrington localities.

Wannon Water entered into an undertaking with the department to address this issue. The undertaking was due to expire on 31 December 2009 but has since been extended to 30 August 2010.

During the reporting period a review of the current design and operation of the Hamilton water treatment plant was completed and an action program developed.

During 2009–10 Wannon Water will continue with the upgrade works, including upgrading the capacity of the Dissolved Air Flotation process, installation of new saturators and installation of a new lime dosing system for improved pH control.

Non-compliance with the acid-soluble aluminium water quality standard was recorded in the Glenthompson locality during October 2008, in January 2009 and during March 2009.

The high results in October 2008 were the result of unoptimised coagulant dosing at the Glenthompson water treatment plant. The turbidity and colour of the raw water at the treatment plant is variable, making it difficult to optimise coagulant dosing. This has resulted in poor control of coagulant dosing and acid-soluble aluminium carryover.

The non-compliances in March 2009 were again the result of poor coagulation control. The reticulation system was flushed to remove the high aluminium concentrations.

The non-compliance in January 2009 appeared to be caused by aluminium accumulating as a post treatment floc at the sample site. This sample was also associated with higher than usual turbidity, iron and manganese. The sample site was flushed.

Other water quality issues of potential health significance

During the reporting period, as part of its broader water quality monitoring program, Wannon Water detected free chlorine and manganese results above the relevant health-related guideline values in the 2004 *Australian drinking water guidelines*.

The detections, in Dunkeld in January and February 2009 and in Casterton in March 2009, are listed in the table overleaf.

Wannon Water also manages a number of regulated (non-drinking) water supplies in its region, as well as non-drinking supplies to a number of 'supply-by-agreement' customers. Wannon Water has developed a program of public signage and customer consultation that is designed to ensure that such non-drinking supplies are not consumed or confused with a drinking water supply.

As a result of a detection of *Escherichia coli* in the Henty water sampling locality, Wannon Water applied to the department to delist Henty as a drinking water locality. Wannon Water advised that the five customers supplied in the locality have historically been told the water they receive is non-drinking water and would therefore not be affected by the reclassification. Henty was omitted as a water sampling locality by a notice published in Victorian Government Gazette No. S 155 on 29 May 2009, effective from 1 July 2009.

For detailed water quality data, including data about other aesthetic characteristics of the drinking water, raw water monitoring and details of Wannon Water's undertakings, refer to Wannon Water's annual drinking water quality report for 2008-09.

Risk management plan audit

No risk management plan audit was scheduled for this reporting period. Wannon Water's previous risk management plan audit result was described in detail in the department's annual report for 2007-08.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department.

Date	Supply	Issue	Action(s)
August 2008	Hamilton	Widespread customer complaint and elevated turbidity	<p>Customer complaints were received in response to poor treatment performance at the Hamilton water treatment plant.</p> <p>The raw water quality at this time was highly turbid and coloured, exceeding the treatment plant design criteria. In addition, there were issues with the plant filter performance and optimisation of coagulant dosing. The result was high turbidity water in the reticulation and the clear water storage.</p> <p>Wannon Water conducted a risk assessment in conjunction with the department, based on available literature and concluded that at a turbidity greater than 5 NTU in the clear water storage there was a possibility of ineffective disinfection. As a precaution, a boil water notice was issued. All samples collected for microbiological analysis during this period of high turbidity were found to be free of <i>Escherichia coli</i>.</p> <p>The reticulation mains were air scoured to remove the turbid water. Wannon Water is continuing to work with consultants to upgrade and optimise the performance of the Hamilton water treatment plant.</p>
October 2008	Glenthompson	Elevated aluminium	Refer to text under the heading “ <i>Performance against water quality standards</i> ”
November 2008	Cavendish	Elevated turbidity	<p>In November 2008 the turbidity levels in the Cavendish raw water storage basin increased to 11 NTU. The elevated turbidity in the Cavendish basin was due to increase algal growth and also elevated iron concentrations. Over this time, Cavendish was sourcing its water from the drought relief bores in the Grampians National Park.</p> <p>Wannon Water was concerned that the elevated turbidity may shield bacteria during disinfection and that customer dissatisfaction would be an issue at turbidities above 5 NTU. In response, Wannon Water initially increased disinfection dose rates and <i>Escherichia coli</i> sampling to twice a week in the reticulation. All samples were free of <i>Escherichia coli</i>.</p> <p>When turbidity levels continued to climb, Wannon Water made the decision to stop using the Cavendish raw water basin and truck water from Peshurst until the turbidity levels decreased. To assist in reducing the turbidity in the raw water basin, aluminium chlorohydrate was dosed into the basin with the aim of settling out the suspended material.</p> <p>Wannon Water conducted jar tests to determine the optimum dose rate and the basin was left to settle for a period of 24–48 hours, following dosing.</p>

Date	Supply	Issue	Action(s)
December 2008	Cavendish	Detection of <i>Escherichia coli</i> at clear water storage outlet	<p>At the time of the detection water was being transported from Peshurst to Cavendish due to elevated turbidity in the Cavendish service basin.</p> <p>The water was chlorinated at Peshurst and then re-chlorinated at Cavendish into the clear water storage. Rechlorination at Cavendish did not occur from Sunday 30 November 2008 until 1pm on Tuesday 2 December 2008. This resulted in a low chlorine residual in the clear water storage at the time of the <i>Escherichia coli</i> detection.</p> <p>Samples taken in the Cavendish reticulation on the same day were found to be free of <i>Escherichia coli</i>.</p> <p>Upon identifying the low chlorine residual in the clear water storage the storage was dosed with sodium hypochlorite and procedures were put in place for sodium hypochlorite to be manually dosed with each delivery. Microbiological tests were increased to twice weekly during the cartage period.</p>
January 2009	Derrinallum	Detection of <i>Escherichia coli</i> in drinking water (200 orgs/100 mL)	<p>13 January 2009 was a total fire ban day so the sample tap was not flamed, and alcohol swabs were used instead to sterilise the tap prior to the sample being taken.</p> <p>As there was a high total chlorine residual at the time of sampling (1.2 mg/L), Wannon Water suspected that the <i>Escherichia coli</i> was transferred from the tap into the sample bottle at the time of sampling. The site was flushed as a precaution and resamples collected, which were found to be free of <i>Escherichia coli</i>.</p>
January 2009	Dunkeld	Elevated chlorine	A high concentration of chlorine in the Dunkeld reticulation (above 5 mg/L) was recorded in January 2009. Plant dosing was reduced and the high chlorine flushed from the system.
February 2009	Dunkeld	Elevated chlorine	As occurred in January 2009, a high concentration of chlorine in the Dunkeld reticulation (above 5 mg/L) was recorded in February 2009. Wannon Water investigated these instances, reviewing the Dunkeld Disinfection Plant operation.
February 2009	Coleraine	Blue-green algae	<p>On 3 February 2009 Wannon Water received water quality results indicating that the blue green algae genus <i>Anabaena</i> was at 4500 cell/mL in a sample collected on 8 January 2009.</p> <p>Wannon Water contacted the laboratory and requested the species to be identified and also put an urgent request on the analysis of the latest water sample for Coleraine raw water storage to be conducted.</p> <p>The laboratory identified the species as <i>Anabaena bergii</i> var.</p> <p>Analysis of the most recent water quality samples revealed that <i>Anabaena</i> levels had significantly declined between 8 January and 29 January 2009 to 450 cell/mL.</p>
February 2009	Portland	Detection of <i>Escherichia coli</i> at clear water storage outlet	<p>Upon detection of low chlorine residuals the clear water storage was isolated from the system. Reticulation samples taken on the same day were found to be free of <i>Escherichia coli</i>.</p> <p>Investigations revealed that a pipe that drained rainwater off the roof of the tank had cracked and allow rain water to wash into the clear water storage. The pipe work was repaired and the integrity of the tank roof and entire stormwater diversion system was checked.</p>

Date	Supply	Issue	Action(s)
March 2009	Casterton	Elevated manganese	<p>The sample also contained elevated levels of iron. As there were no customer complaints in Casterton for March, Wannon Water was of the view that there was an isolated pocket of dirty water that lasted for one day. The non-compliant result was the result of sub-optimal treatment at Casterton water treatment plant.</p> <p>Corrective action involved flushing of the mains to remove the manganese build up. Wannon Water is also in the process of upgrading the Casterton water treatment plant</p>
March 2009	Henty	Detection of <i>Escherichia coli</i> in drinking water	<p>The sample site is located approximately 25 km downstream of disinfection, on a dead-end main that has very low water usage. The chlorine residual was low. There had been no reports of breaks in the closed system, and Wannon Water could not identify the source of <i>Escherichia coli</i>.</p> <p>The site was flushed, however Wannon Water have difficulty maintaining a chlorine residual in the locality without major capital works.</p>
May 2009	Coleraine	Detection of <i>Escherichia coli</i> in drinking water	<p>The sample site was at an extremity of the reticulation system. The source of contamination is suspected to have occurred on the 24 April 2009, as on that day there was an unusually high demand in the reticulation system.</p> <p>On receiving the non-compliant <i>Escherichia coli</i> result, the sample site was flushed and resampled for <i>Escherichia coli</i>, total coliforms and heterotrophic plate counts. Resamples were also collected at two other dead end locations within the locality.</p>
May 2009	Coleraine	Detection of <i>Escherichia coli</i> in drinking water and disinfection failure	<p>Undisinfected water was supplied to Coleraine for up to five hours on 17 May 2009.</p> <p>Upon identifying that the disinfection plant was offline the plant was immediately turned back on and the reticulation sampled for the presence of <i>Escherichia coli</i>.</p> <p>The reticulation was then flushed to ensure that all undisinfected water was expelled and a chlorine residual of 1 mg/L was achieved.</p> <p>The cause of undisinfected water entering the reticulation was a result of a contractor turning the power off to the plant to do works. A root cause analysis identified that procedures were not followed and communication within Wannon Water had broken down.</p> <p>Actions were put in place to prevent a repeat of this incident at any site. Changes to the configuration of Coleraine disinfection plant in September 2009 should ensure that undisinfected water can no longer gravity feed to customers.</p>
June 2009	Cavendish	Detection of <i>Escherichia coli</i> in drinking water	<p>The reticulation was immediately flushed and additional samples collected. Investigations into the source of the <i>Escherichia coli</i> were inconclusive. Both the clear water storage and entry point samples collected on the same day were free of <i>Escherichia coli</i> and total coliforms.</p>
July 2008 to June 2009	Coleraine	Elevated trihalomethanes in drinking water	<p>Refer to text under the heading “Performance against water quality standards”.</p>

For further information on the water quality notifications listed above, refer to Wannon Water’s annual drinking water quality report for 2008–09.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by Wannon Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers supplied
Discoloured water	244	0.34
Taste/odour	72	0.10
Air in water	2	0.003
Blue water	0	0
Illness	2	0.003
Other	13	0.02

As with most water businesses, the highest number of complaints received related to discoloured water. The localities with the most customer complaints during 2008–09 were Hamilton (134), Warrnambool (45), Portland (39) and Casterton (34). The more significant incidents are described in the table of notifications above.

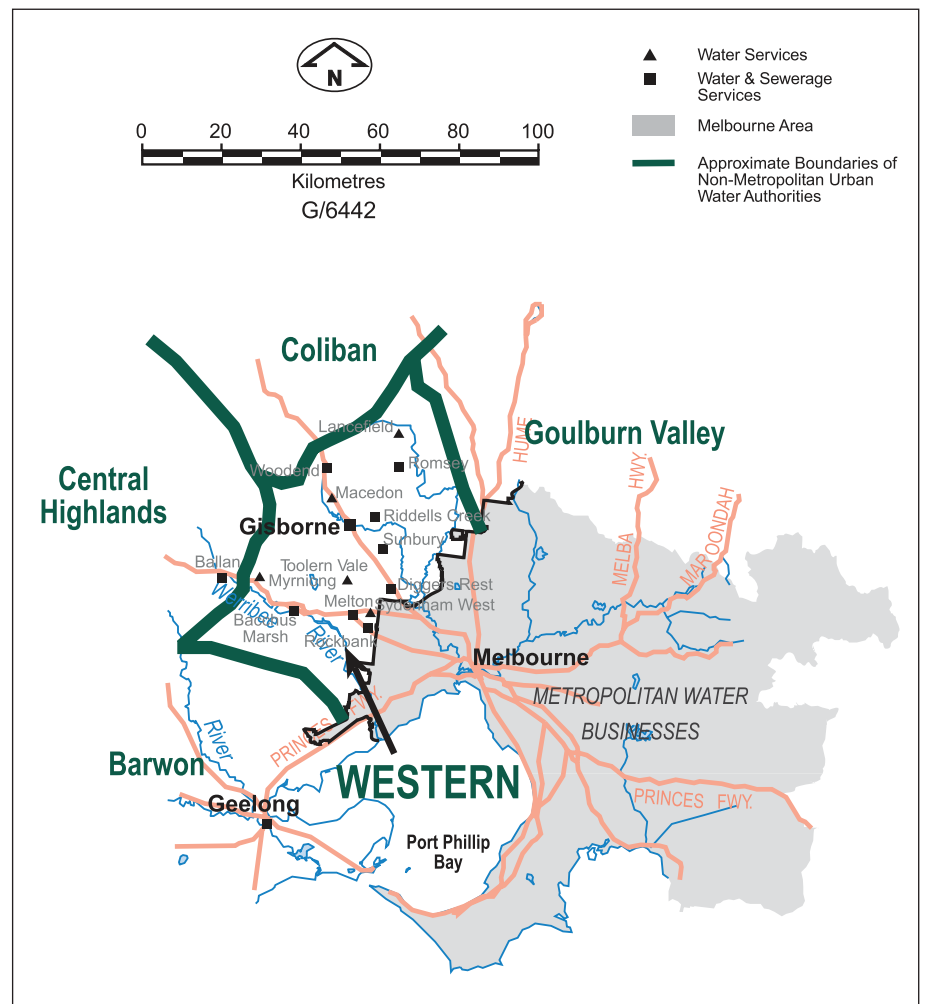
Western Water

Head office: Sunbury

Localities supplied with drinking water: Bulla, Darley, Diggers Rest, Gisborne, Lancefield, Lerderderg, Macedon, Maddingley, Melton South, Merrimu, Mount Macedon, Myrning, Riddells Creek, Rockbank, Romsey, Sunbury, Toolern Vale and Woodend.

All drinking water supplies except those for Woodend, Romsey, Myrning and Lancefield receive fluoridated water from the Melbourne metropolitan supply system. The Woodend and Romsey supplies were supplemented with fluoridated water from Melbourne from time to time in 2008–09. Supplies to Woodend, Romsey, Myrning and Lancefield are filtered.

Population supplied with drinking water: approximately 139,780



Performance against water quality standards

Drinking water supplied in all localities by Western Water during 2008–09 complied with the water quality standards.

Other 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-related guideline values set out in the 2004 *Australian drinking water guidelines* during the reporting period.

Western Water manages a small number of non-drinking supplies to individual customers. These customers are usually connected to Western Water's supply system upstream of the water treatment plant. Western Water advises these customers that this water is not suitable for drinking or food preparation.

For detailed water quality data, including data about other aesthetic characteristics of the water and data about source water quality, refer to Western Water's annual drinking water quality report for 2008–09.

Risk management plan audit

No risk management plan audit was scheduled for this reporting period. Western Water's previous risk management plan audit result was described in detail in the department's annual report for 2007–08.

Water quality notifications

During 2008–09 the following notifications were made to the department:

Date	Supply	Issue	Action(s)
August 2008	Mount Macedon	Undisinfected water supply due to pump failure	The pump station was repaired and a boil water notice issued for 13 to 16 August. The main was flushed until a satisfactory chlorine residual was detected by on-site monitoring. A suspected illness complaint was also investigated but this was found to be unrelated to the drinking water. Western Water also reviewed a number of internal protocols in response to the incident debrief.
December 2008	Sunbury	Detection of <i>Escherichia coli</i> in tank	After partial drainage of the Shepherds Lane tank, evidence of bird entry was found and bird nests were detected inside the tank. The tank was drained, inspected, cleaned and spot dosed with sodium hypochlorite and the roof was repaired.

Date	Supply	Issue	Action(s)
January 2009	Melton West and Kurunjang	Widespread customers complaint due to burst water main	Western Water flushed the water mains in the affected area. The local supply was supplemented by filtered water from Merrimu filtration plant during the incident. Turbidity and chlorine residuals were tested to assess water quality. All affected customers received a letter addressing the cause of the incident and the actions being taken by Western Water as a result. Western Water also issued a media release on the incident.
February 2009	Woodend	Detection of <i>Escherichia coli</i> in drinking water	Disinfection systems were confirmed to be operating normally, with no outages during the suspected period of contamination. The local area was flushed until satisfactory chlorine residuals were detected in the water mains and resamples taken. The contamination is suspected to have been caused by a localised low pressure event coinciding with a nearby water main burst.
March 2009	Myrning	Detection of <i>Escherichia coli</i> in tank	Browns Hill tank was isolated, spot dosed and inspected for evidence of vermin or bird entry. The Myrning distribution system was also checked and resamples taken. Western Water identified replacing the roof on Brown Hill Tank as a high priority in their 2009/10 capital works program.

For further information on the water quality notifications listed above, refer to Western Water's annual drinking water quality report for 2008–09.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by Western Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	164	0.299
Taste/odour	35	0.064
Blue water	0	0
Air in water	5	0.009
Suspected illness	0	0
Other	11	0.020

Most water quality complaints were in relation to discoloured water and taste/ odour. Western Water advised that this was largely due to the cessation of proactive mains flushing programs, due to general customer concern about flushing programs wasting water during the drought.

There were fewer discoloured water complaints in 2008–09 compared with the prior year. This result is consistent with the lower turbidity levels observed through the monitoring program at many of the water localities.

The highest number of complaints per 100 customers were recorded in Mount Macedon and Melton West, corresponding to the incidents described above in August 2008 and January 2009 respectively.

The number of taste and odour complaints increased during 2008–09 to 35, compared with twenty the year before. However, the total was similar to that recorded in 2006–07. These additional complaints are mainly attributable to chlorine taste and odour.

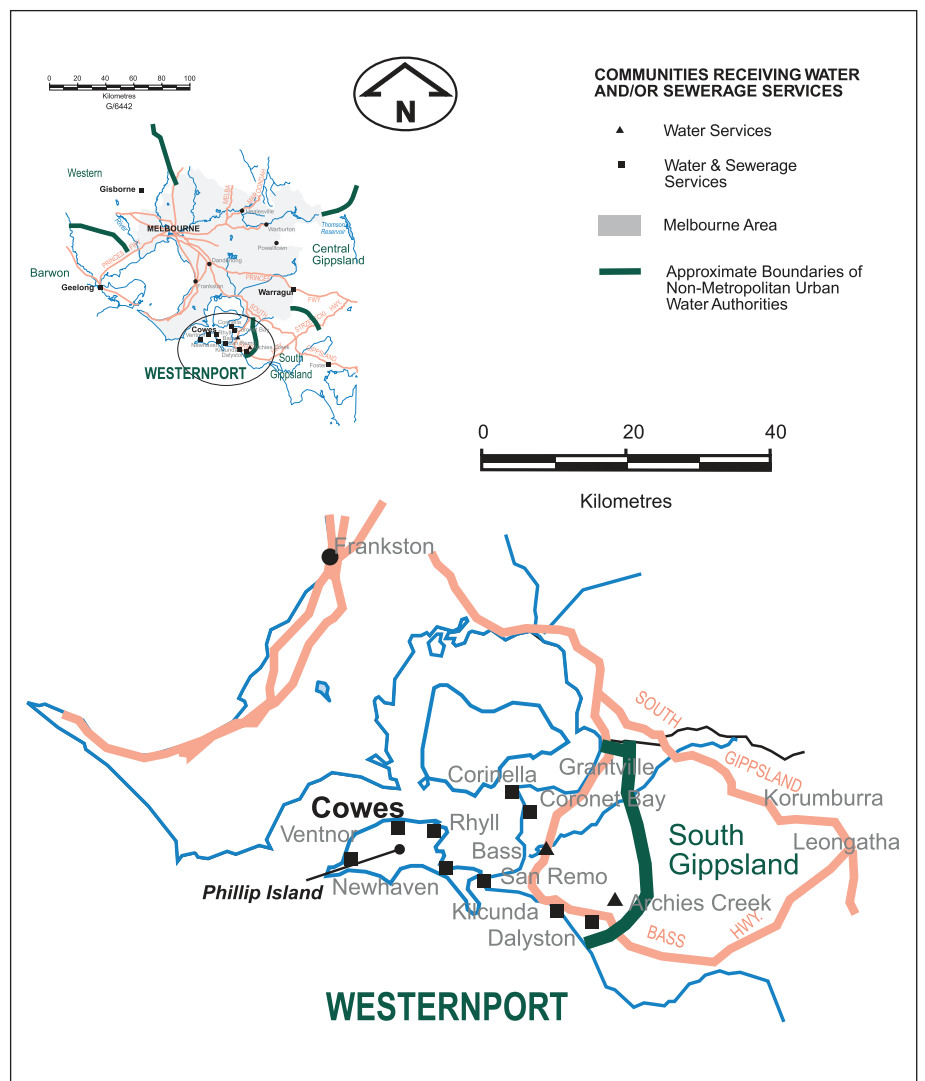
Westernport Water

Head office: Newhaven

Localities supplied with drinking water: Bass, Cape Woolamai, Corinella, Cowes, Grantville, Kilcunda, Rhyll, San Remo and Ventnor.

All supplies are filtered.

Population supplied with drinking water: approximately 13,180, rising to 34,240 in peak holiday periods.



Map prepared by, and used with the permission of, Department of Sustainability and Environment

Performance against water quality standards

Drinking water supplied in all localities by Westernport Water during 2008–09 complied with the water quality standards.

Turbidity was not measured on a number of occasions in Ventnor. This was due to the incorrect specification of tests submitted to the laboratory.

Other water quality issues of potential health significance

Bromodichloromethane (a component of total trihalomethanes) slightly exceeded the World Health Organization guideline limit in five localities. However, 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 *2004 Australian drinking water guidelines*. As the total trihalomethane levels did not exceed the regulated standard, or pose a risk to public health, no action was taken.

With the exception of an isolated high lead result in Corinella in February 2009, all other parameters measured by Westernport Water as part of its drinking water quality monitoring program satisfied the relevant health-related guideline values set out in the *2004 Australian drinking water guidelines* during the reporting period. The lead result is discussed under the heading “Water quality notifications” overleaf and did not pose a risk to public health.

For detailed water quality data, including data about aesthetic characteristics of the water and the raw water monitoring program, refer to Westernport Water’s annual drinking water quality report for 2008–09.

Risk management plan audit

No risk management plan audit was scheduled for this reporting period.

Westernport Water’s previous risk management plan audit result was described in detail in the department’s annual report for 2007–08.

In July 2008, Westernport Water sought an undertaking with the department to address their response to the most significant non-compliant audit findings, namely the identification of pathogen and radiological risks to water and a procedure for consulting with South Gippsland Water. The undertaking was satisfactorily completed in January 2009.

In addition to the undertaking, Westernport Water also provided the department with details on the actions they had taken with regard to further improvement opportunities and recommendations by the auditor. All actions had been completed by the end of the reporting period.

Water quality notifications

During 2008–09, the following water quality notifications were made to the department:

Date	Supply	Issue	Action(s)
July 2008	Wimbledon Heights	Detection of <i>Escherichia coli</i> in drinking water	The tap was resampled on the day of the notification. This subsequent sample recorded zero <i>Escherichia coli</i> . On speaking with the owner of the property, the water supply was coming from a private tank and pressurised via a pump. The owner was made aware of the positive <i>Escherichia coli</i> reading and the risks involved in consuming the water as well as the risk of <i>Escherichia coli</i> flowing back into the mains. Westernport Water arranged for the installation of a dual backflow device on the property's water meter for back up to avoid contamination of the distribution system.
December 2008	Grantville	High heterotrophic plate count	The distribution main was flushed until the chlorine residual and turbidity levels were acceptable. The site was retested with a zero result.
February 2009	Grantville	Elevated turbidity in drinking water (17 NTU)	Sampling error occurred which was reinforced by the fact that no other sample results indicated elevated turbidity. Resample turbidity results at subject property were very low.
March 2009	Grantville (Stanley Road Tank)	Detection of <i>Escherichia coli</i> in tank	Liquid chlorine added to the tank. Resample collected, no <i>Escherichia coli</i> detected.
March 2009	Ian Bartlett treatment plant	Detection of <i>Escherichia coli</i> at contact point	Resample collected, no <i>Escherichia coli</i> detected. A weekly chlorination check list for samplers was introduced to identify issues and to highlight desired chlorine residuals at various locations.

A high lead result in Tenby Point (in Corinella) in February 2009 required a section 22 notification to be forwarded to the department. However, Westernport Water advised that this did not occur, partially due to a time delay in receiving the sample result. The cause of the high lead result was difficult to determine. After receiving notification of this lead reading, the main was flushed and no further actions taken. Westernport Water and their laboratory services provider have reviewed the reporting protocol for high results to minimise the chance of a similar reoccurrence.

A separate elevated turbidity reading of 13 NTU, at Rhyll in October 2008, was not reported to the department as the sample was taken at the same time as air scouring was being done. The main was flushed and another turbidity sample was taken, which returned a satisfactory reading of 0.3 NTU.

For further information on the water quality notifications listed above, refer to Westernport Water's annual drinking water quality report for 2008–09.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by Westernport Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers
Discoloured water	16	0.12
Taste/odour	14	0.11
Blue water	1	0.01
Air in water	0	0
Suspected illness	9	0.07
Other	40	0.30

The number of complaints reported during the 2008–09 reporting period decreased significantly from the previous reporting period.

Overall, most of the complaints were about dirty water and a strong taste of chlorine. Westernport Water advised that, in general, complaints were resolved through call-backs, site visits to discuss issues and maintenance (mains flushing).

Performance against water quality standards

Drinking water supplied in all localities by Yarra Valley Water during 2008–09 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standard
Turbidity	Lyrebird Avenue

Drinking water supplied at Lyrebird Avenue (in Warburton East) did not satisfy the standard for turbidity, due to the effect of a significant dirty water incident in this area in June 2009. The incident was reported to the department under sections 18 and 22 of the Act and is described in more detail below. Although the drinking water supplied in this locality before and after this incident remains satisfactory, the statistical nature of the calculation for this standard means that this locality will not comply with the standard until well into the 2009–10 reporting period.

The department also gazetted a variation to water sampling frequency for Yarra Valley Water. The gazette notice was published on 24 July 2008 and applied from 1 August 2008. The variation consisted of sampling once every three months instead of monthly for trihalomethanes, monochloroacetic acid, dichloroacetic acid and trichloroacetic acid for all water sampling localities except Healesville and Yarra Glen. The variation was based on an analysis of water quality data from previous years.

Other 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 guideline values detailed in the 2004 *Australian drinking water guidelines* during the reporting period.

Yarra Valley Water has advised that approximately 600 customers in the Yarra Valley area north east of Melbourne receive untreated water from Melbourne Water aqueducts and pipelines. As part of the management plan, Yarra Valley Water sends out letters annually to emphasise that this water is not suitable for drinking and food preparation.

For detailed water quality data, including data about other aesthetic characteristics of the water, refer to Yarra Valley Water's drinking water quality annual report for 2008–09.

Risk management plan audit

No risk management plan audit was scheduled for this reporting period. Yarra Valley Water's previous risk management plan audit result was described in detail in the department's annual report for 2007–08.

Water quality notifications

During 2008–09 the following water quality notifications were made to the department.

Date	Supply	Issue	Action(s)
December 2008	Wallan	Unauthorised access to tank	The hatch on Pretty Sally Reservoir in Wallan was found to be open during routine inspections. The reservoir was isolated and extensive water quality testing was performed throughout Wallan and the two reservoirs. The reservoir was drained, inspected and the hatch was repaired. All samples were subsequently found to be free of contamination.
March 2009	Wallan	Detection of <i>Escherichia coli</i> in drinking water	Yarra Valley Water flushed the water mains in the area and resampled the supply. Chlorine levels were also checked at Pretty Sally high level tank in Wallan. Resamples were clear of <i>Escherichia coli</i> .
May 2009	Warburton	Detection of <i>Escherichia coli</i> in tank	Four Mile Creek tank was inspected and spot dosed and chlorine levels were checked. Further samples were taken from customer sample taps in the area. Resamples were clear of <i>Escherichia coli</i> .
June 2009	Thomastown (Bundoora locality)	Detection of <i>Escherichia coli</i> in drinking water	Yarra Valley Water flushed the water mains in the affected area and resampled the water. Resamples were clear of <i>Escherichia coli</i>
June 2009	Lyrebird Avenue (Warburton East)	Detection of <i>Escherichia coli</i> in drinking water and high turbidity	This <i>Escherichia coli</i> detection and high turbidity result of 120 NTU were attributed to construction works occurring in the area. The water mains in the affected area were flushed and chlorine was introduced, as the area is normally disinfected with ultra-violet irradiation. Subsequent samples indicated turbidity was below 5 NTU. Resamples were clear of <i>Escherichia coli</i> .
June 2009	Chum Creek	Detection of <i>Escherichia coli</i> in tank	Yarra Valley Water inspected and spot dosed the Chum Creek tank, checked chlorine levels and resampled the local area. The tank roof was repaired. Resamples were clear of <i>Escherichia coli</i> .
June 2009	Preston and Reservoir	Widespread public complaint	Yarra Valley Water received 62 water quality complaints for discoloured water and white water in the Preston and Reservoir areas, caused by air in the distribution system when Melbourne Water opened a bypass valve on a large water main. The area was extensively flushed and the valve was re-shut, which eventually cleared up the problem.

For further information on the water quality notifications listed above, refer to Yarra Valley Water's annual drinking water quality report for 2008–09.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by Yarra Valley Water during 2008–09 is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers*
Discoloured water	1969	0.29
Taste/odour	280	0.04
Blue water	14	< 0.01
Air in water	192	0.03
Suspected illness	0	0
Other (including customer pipes)	94	0.01

* based on customer connections

The total number of complaints was 2549, a decrease from the previous year's result of 3746.

Yarra Valley Water attributed the lower number of water quality complaints recorded in 2008–09 to the lower source water turbidity and reduced flow rates in water mains. The lower turbidity in the unfiltered water source reduces the amount of naturally occurring particles settling in water mains. The lower flow rates in water mains during water restriction periods also minimises the re-suspension of naturally occurring particles in water mains, which causes discoloured (dirty) water.

Appendices



Appendix 1: Water storage managers and water suppliers 2008–09

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* and *Safe Drinking Water Regulations 2005* and Functions of the Secretary

Safe Drinking Water Act 2003

- 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 this Act

Safe Drinking Water Regulations 2005

- 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

- protect public health in relation to the supply of drinking water
- monitor and enforce compliance with this Act and the Regulations
- report on the performance of water suppliers and water storage managers in relation to the requirements imposed on them under this 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 Part XII of the *Health Act 1958* 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.htm

Appendix 3: Contact details for water businesses

Business	Postal Address	Telephone	Website
Barwon Water	PO Box 659 Geelong VIC 3220	1300 656 007	www.barwonwater.vic.gov.au
Central Highlands Water	PO Box 152 Ballarat VIC 3353	(03) 5320 3100	www.chw.net.au
City West Water	Locked Bag 350 Sunshine VIC 3020	131 691	www.citywestwater.com.au
Coliban Water	Box 2770 Bendigo Delivery Centre VIC 3554	1300 363 200	www.coliban.com.au
East Gippsland Water	PO Box 52 Bairnsdale VIC 3875	1300 720 700	www.egwater.vic.gov.au
Falls Creek ARMB	PO Box 50 Falls Creek VIC 3699	(03) 5758 1200	www.falls creek.com.au
Gippsland Water	PO Box 348 Traralgon VIC 3844	1800 066 401	www.gippswater.com.au
Goulburn – Murray Rural Water	PO Box 165 Tatura VIC 3616	(03) 5833 5500	www.g-mwater.com.au
Goulburn Valley Water	PO Box 185 Shepparton VIC 3632	(03) 5832 0400	www.gvwater.vic.gov.au
Grampians Wimmera Mallee Water	PO Box 481 Horsham VIC 3402	1300 659 961	www.gwmwater.org.au
Lake Mountain ARMB	PO Box 40 Marysville VIC 3779	(03) 5957 7222	www.lakemountainresort.com.au
Lower Murray Water	PO Box 1438 Mildura VIC 3502	(03) 5051 3400	www.lmw.vic.gov.au
Melbourne Water	PO Box 4342 Melbourne VIC 3001	131 722	www.melbournewater.com.au
Mount Baw Baw ARMB	Private Bag via Noojee VIC 3833	(03) 5165 1136	www.mountbawbaw.com.au
Mount Buller & Mount Stirling ARMB	C/- Post Office Mount Buller VIC 3723	(03) 5777 6077	www.mtbuller.com.au
Mount Hotham ARMB	PO Box 188 Bright VIC 3741	(03) 5759 3550	www.mthotham.com.au
North East Water	PO Box 863 Wodonga VIC 3689	1300 361 622	www.nerwa.vic.gov.au
Parks Victoria	Level 10/535 Bourke Street Melbourne VIC 3000	(03) 8627 4699	www.parkweb.vic.gov.au
South East Water	Locked Bag 1 Heatherton VIC 3202	131 694	www.southeastwater.com.au
South Gippsland Water	PO Box 102 Foster VIC 3960	(03) 5682 0444	www.sgwater.com.au
Southern Rural Water	PO Box 153 Maffra VIC 3860	1300 139 510	www.srw.com.au
Wannon Water	PO Box 1158 Warrnambool VIC 3280	1300 926 666	www.wannonwater.com.au
Western Water	PO Box 2371 Sunbury DC 3429	1300 650 422	www.westernwater.vic.gov.au
Westernport Water	2 Boys Home Road Newhaven VIC 3925	1300 720 711	www.westernportwater.com.au
Yarra Valley Water	Private Bag 1 Mitcham VIC 3132	131 721	www.yvw.com.au

ARMB = Alpine Resort Management Board

Appendix 4: Gazettal dates for water sampling localities

Additions or modifications to localities		
Water Supplier	Government Gazette	Publication Date
2008–09 Reporting Period		
Wannon Water (omit Henty from 1 July 2009)	Special Gazette s155	29 May 2009
Grampians Wimmera Mallee Water (add Underbool)	Special Gazette s260	19 September 2008
2007–08 Reporting Period		
Yarra Valley Water (omit Bayswater North, amend some boundaries)	Special Gazette s179	30 June 2008
Barwon Water (amend Batesford, Lethbridge, Meredith)	Special Gazette s131	9 May 2008
City West Water (omit Footscray, add Maribyrnong, Williamstown)	Special Gazette s335	14 December 2007

Original water sampling localities		
Water Supplier	Government Gazette	Publication Date
South East Water	Special Gazette s228	20 September 2007
Goulburn Valley Water	Special Gazette s142	29 June 2007
Wannon Water	Special Gazette s71	30 March 2007
Grampians Wimmera Mallee Water	Special Gazette s46	8 March 2007
Western Water	Special Gazette s14	25 January 2007
Yarra Valley Water	Special Gazette s8 & s9	18 January 2007
Westernport Water	Special Gazette s6	16 January 2007
Gippsland Water	Special Gazette s202	10 August 2006
Coliban Water	Special Gazette s201	9 August 2006
Central Highlands Water	Special Gazette s197	4 August 2006
South Gippsland Water	Special Gazette s193	3 August 2006
North East Water	Special Gazette s183	27 July 2006
City West Water	Special Gazette s177	19 July 2006
Lower Murray Water	Special Gazette s176	19 July 2006
East Gippsland Water	Special Gazette s160	22 June 2006
Parks Victoria	Special Gazette s161	22 June 2006
Barwon Water	Special Gazette s157	16 June 2006
Falls Creek	Special Gazette s158	16 June 2006
Mount Baw Baw	Special Gazette s158	16 June 2006
Mount Buller & Mount Stirling	Special Gazette s158	16 June 2006
Mount Hotham	Special Gazette s158	16 June 2006

Appendix 5: Regulated water declarations

Water supplier	Water supply area	Date declared as regulated water	Government Gazette	Publication date in Gazette
2008–09 Reporting Period				
Lower Murray Water	Mystic Park	19 May 2009	Special Gazette s135	19 May 2009
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 and the 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 (refer Appendix 4 – gazetted as a drinking water supply in September 2008)	17 September 2008	Special Gazette s260	17 September 2008
Previous reporting periods				
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
Grampians Wimmera Mallee Water	Watchem	14 March 2008	Special Gazette s64	14 March 2008
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, Berriwillock, Buangor, Chillingollah, Chinkapook, Clear Lake, Cowangie, Culgoa, Doon, Elmhurst, Glenorchy, Goroce, Harrow, Jeparit, Kaniva, Kiata, Lascelles, Lillimur, Marnoo, Miram, Moyston, Nandaly, Natimuk, Nhill, Noradjuha, Patchewollock, Pimpinio, Serviceton, Speed, Streatham, Tarranyurk, Tempy, Underbool, Waitchie, Westmere, Wickliffe and Yaapeet.	29 June 2007	Special Gazette s143	29 June 2007
Grampians Wimmera Mallee Water	Murrayville	28 May 2007	Special Gazette s117	28 May 2007
Lower Murray Water	Millewa water supply system (including Cullulleraine, Meringur and Werrimull)	15 February 2007	Special Gazette s28	15 February 2007
Wannon Water	Darlington and Macarthur	22 August 2006	Gazette G36	6 September 2006
Central Highlands Water	Redbank and Amphitheatre	18 August 2006	Gazette G35	31 August 2006
Central Highlands Water	Raglan	25 July 2006	Gazette G31	3 August 2006
Central Highlands Water	Landsborough and Navarre	26 June 2006	Gazette G27	6 July 2006
Coliban Water	Borong, Dingee, Jarklin, Macorna, Mitiamo, Mysia, Sebastian [#] and Wychitella	2 January 2006	Gazette G3	19 January 2006
Lake Mountain Alpine Resort Management Board	Lake Mountain Alpine Resort	23 October 2005	Gazette G47	24 November 2005

Notes ## Drinking water supplied to Sebastian from July 2009.

Appendix 6: Undertakings for 2008–09

Includes all undertakings commencing, concluding or active during any part of 2008–09.

Excludes undertakings commencing after or satisfactorily concluding before 2008–09.

Water Business	Water Supply	Nature of Contravention	Proposed Actions to be Taken to Rectify Contravention	Date Undertaking Accepted by Department		Status as at 30 June 2009	
				Start Date	End Date		
Central Highlands Water	Avoca	Non-compliance with the trihalomethanes water quality standard	Upgrade disinfection process from chlorination to chloramination. This will involve active community consultation, construction, proof of performance testing, commissioning and performance evaluation. In addition, an alternative groundwater source is currently being investigated that may provide improved water quality as a relief supply.	23/1/06	7/4/06	30/6/07	Chloramination plants were constructed by end date but did not commence operation until September 2008.
Central Highlands Water	Maryborough and adjacent localities	Non-compliance with the trihalomethanes water quality standard	Upgrade disinfection process from chlorination to chloramination. This will involve active community consultation, construction, proof of performance testing, commissioning and performance evaluation. In addition, an alternative groundwater source is currently being investigated that may provide improved water quality as a relief supply.	23/1/06	7/4/06	30/6/07	Chloramination plants were constructed by end date but did not commence operation until November 2008.
Central Highlands 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.	14/8/08	20/10/08	30/6/09	Undertaking not completed by end date (completed in September 2009)
Coliban Water	Axedale	Non-compliance with the aluminium and trihalomethanes water quality standards	Decommissioning of the water treatment plant at Axedale and the construction of a 12 km pipeline from the Bendigo water reticulation system at Junortoun.	1/7/05	Original undertaking: 04/10/2005 Amended undertaking: 15/11/2007	31/12/2006 (extended to 31/12/2008)	Undertaking not completed by end date (contravention remedied on time, pipeline completed in May 2009)
Coliban Water	Gunbower	Non-compliance with the trichloroacetic acid water quality standard	Decommission Gunbower water treatment plant. An upgraded water treatment facility is expected to be constructed at Leitchville within the next 3 years and a new pipeline will supply water to the Gunbower township from the Leitchville plant following the upgrade. In the shorter term, Coliban Water will undertake minor works at the Gunbower treatment facility to improve treated water quality.	1/11/06	1/11/06	31/12/09	End date after 30 June 2009
Goulburn Valley Water	Nagambie	Elevated 2008 risk of non-compliance to the trihalomethanes and trichloroacetic acid water quality standards	Develop options to optimise disinfection process and reduce disinfection by-product levels.	1/7/05	24/2/06	1/12/08	Undertaking completed by end date
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.	1/4/07	4/10/07	30/6/10	End date after 30 June 2009

Water Business	Water Supply	Nature of Contravention	Proposed Actions to be Taken to Rectify Contravention	Date Undertaking Accepted by		End Date	Status as at 30 June 2009
				Start Date	Department		
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 2004 Australian Drinking Water Guidelines.	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	1/1/08	20/6/08	30/7/12	End date after 30 June 2009
GWM Water	Lalbert	Non-compliance with the turbidity water quality standard	Replace the raw water storages at Lalbert and satisfy community consultation and interim risk management requirements.	1/7/06	26/2/07	30/6/09	Undertaking breached (contravention not remedied on time, new storages completed in September 2009)
GWM Water	Manangatang	Non-compliance with the turbidity water quality standard	Replace the raw water storage at Manangatang with new tanks and satisfy community consultation and interim risk management requirements.	1/7/06	26/2/07	30/6/09	Undertaking breached (contravention not remedied on time, new storages completed in September 2009)
GWM Water	Ultima	Non-compliance with the turbidity water quality standard	Replace the raw water storages at Ultima and satisfy community consultation and interim risk management requirements.	1/7/06	26/2/07	30/6/09	Undertaking breached (contravention not remedied on time, new storages completed in September 2009)
GWM Water	Nullawil	Non-compliance with the trihalomethanes and turbidity water quality standards	Connect to the Wimmera Mallee Pipeline, construct new raw water storages for Nullawil and satisfy community consultation and interim risk management requirements.	1/11/07	2/1/08	31/3/08	Undertaking breached (contravention not remedied until July 2008, works completed on time but interim communication actions not done)
GWM Water	Beulah	Non-compliance with the trihalomethanes water quality standard	Connect to the Wimmera Mallee Pipeline, construct new raw water storages for Beulah and satisfy community consultation and interim risk management requirements.	1/11/07	2/1/08	31/10/08	Undertaking breached (contravention not remedied and new storages not completed until January 2009)
GWM Water	Rupanyup	Non-compliance with the trihalomethanes and turbidity water quality standards	Connect to the Wimmera Mallee Pipeline, construct new raw water storages for Rupanyup and satisfy community consultation and interim risk management requirements.	1/11/07	2/1/08	31/3/09	Undertaking breached (contravention not remedied until July 2009, works completed in December 2009)

Water Business	Water Supply	Nature of Contravention	Proposed Actions to be Taken to Rectify Contravention	Date Undertaking Accepted by Department			Status as at 30 June 2009
				Start Date	End Date	End Date	
GWM Water	Minyip	Non-compliance with the trihalomethanes and turbidity water quality standards	Connect to the Wimmera Mallee Pipeline, construct new raw water storages for Minyip and satisfy community consultation and interim risk management requirements.	1/11/07	2/1/08	31/3/09	Undertaking not completed by end date (works completed in April 2009)
GWM Water	Rainbow	Non-compliance with the trihalomethanes water quality standards	Connect to the Wimmera Mallee Pipeline, construct new raw water storages for Rainbow and satisfy community consultation and interim risk management requirements.	1/2/08	18/3/08	31/10/08	Undertaking completed by end date
GWM Water	Warracknabeal	Non-compliance with the trihalomethanes water quality standards	Connect to the Wimmera Mallee Pipeline, construct new raw water storages for Warracknabeal and satisfy community consultation and interim risk management requirements.	1/2/08	18/3/08	31/10/08	Undertaking completed by end date
GWM Water	Murtoa	Non-compliance with the trihalomethanes water quality standards	Connect to the Wimmera Mallee Pipeline, construct new raw water storages for Murtoa and satisfy community consultation and interim risk management requirements.	1/2/08	18/3/08	31/10/08	Undertaking not completed by end date (contravention remedied on time, new storage completed in March 2009)
GWM Water	Jung	Non-compliance with the trihalomethanes and turbidity water quality standards	Connect to the Wimmera Mallee Pipeline, construct new raw water storages for Jung and satisfy community consultation and interim risk management requirements.	1/5/08	11/6/08	30/11/08	Undertaking completed by end date
GWM Water	Donald	Non-compliance with the trihalomethanes and turbidity water quality standards	Connect to the Wimmera Mallee Pipeline, construct new raw water storages for Donald and satisfy community consultation and interim risk management requirements.	1/5/08	11/6/08	31/10/09	End date after 30 June 2009
GWM Water	Woomelang	Non-compliance with the trihalomethanes and turbidity water quality standards	Connect to the Wimmera Mallee Pipeline, construct new raw water storages for Woomelang and satisfy community consultation and interim risk management requirements.	1/5/08	11/6/08	31/10/09	End date after 30 June 2009
GWM Water	Wycheproof	Non-compliance with the trihalomethanes water quality standards	Connect to the Wimmera Mallee Pipeline, construct new raw water storages for Wycheproof and satisfy community consultation and interim risk management requirements.	1/5/08	11/6/08	31/10/09	End date after 30 June 2009
GWM 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.	31/10/08	18/12/08	30/6/09	Undertaking not completed by end date (actions completed in August 2009)
Goulburn-Murray 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.	1/10/08	1/10/08	31/1/09	Undertaking completed by end date
Parks Victoria	[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.	1/12/08	23/12/08	30/6/09	Undertaking completed by end date

Water Business	Water Supply	Nature of Contravention	Proposed Actions to be Taken to Rectify Contravention	Date Undertaking Accepted by		End Date	Status as at 30 June 2009
				Start Date	Department		
Lake Mountain ARMB	[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.	21/10/08	28/10/08	30/4/09	Undertaking completed by end of reporting period (time extension was granted due to bushfires)
Mount Hotham ARMB	[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.	28/11/08	1/11/08	28/5/09	Undertaking completed by end date
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.	31/10/08	25/10/08	30/6/10	End date after 30 June 2009
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	31/10/08	6/1/09	30/6/10	End date after 30 June 2009
South Gippsland Water	Dumbalk	Non-compliance with the trihalomethanes water quality standard	Install a new raw water basin. If this fails to fully resolve the issue, chloramination will be introduced.	1/4/07	21/5/07	1/4/09	Undertaking completed by end date (some works were not required)
South Gippsland Water	Lance Creek, Wonthaggi, Inverloch, Cape Patterson	Non-compliance with the trihalomethanes water quality standard	Install a chloramination dosing system.	1/4/07	21/5/07	1/4/09	Undertaking completed by end date
Wannon Water	Coleraine	Non-compliance with the aluminium, trihalomethanes and turbidity water quality standards	Construction of a pipeline from an alternative source, the Casterton water treatment plant.	1/7/05	Original undertaking: 24/02/2006 Amended undertaking: 16/08/2007	30/06/2008 (extended to 30 June 2009)	Undertaking completed by end date
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.	1/1/08	9/5/08	30/12/09	End date after 30 June 2009
Westernport 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.	1/7/08	4/9/08	30/12/08	Undertaking completed by end date

ARMB means Alpine Resort Management Board

Undertaking completed by end date 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.

Undertaking breached means that the contravention was not remedied on time and the works were not completed on time.

Appendix 7: Water quality and treatment data for 2008–09

(Abbreviations, symbols and derivation are explained at end of table)

Water supplier	Water sampling locality	Estimated Population	Type of disinfection	Filtered supply	E. coli/100 mL	Turbidity	Aluminium	THMs	MCA		DCA		TCA		Bromate		Formaldehyde		Fluoride		Fluoride dated supply	
									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]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]		Maximum [mg/L]
Barwon Water	Aireys Inlet	1,330	CL	Filt	100	0.3	0.09	0.141	<0.005	<0.005	<0.018	0.022	—	—	—	—	—	—	—	—	0.07	**
Barwon Water	Anakie	770	CL/Clam	Filt	100	0.5	0.04	0.053	<0.005	<0.013	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.08	**
Barwon Water	Anglesea	2,530	CL/Clam	Filt	100	0.1	0.07	0.086	<0.005	<0.005	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Apollo Bay	2,400	CL	Filt	100	0.1	0.05	0.071	<0.005	0.012	0.009	0.009	—	—	—	—	—	—	—	—	0.09	**
Barwon Water	Bannockburn	3,910	CL/Clam	Filt	100	0.2	0.09	0.035	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.15	**
Barwon Water	Batesford	770	CL/Clam	Filt	100	0.1	0.07	0.083	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.15	**
Barwon Water	Bellarine	220	CL	Filt	100	0.1	0.05	0.101	<0.005	<0.005	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Birregurra	680	CL	Filt	100	0.3	0.06	0.121	<0.005	0.009	—	<0.005	—	—	—	—	—	—	—	—	0.09	**
Barwon Water	Clifton Springs	12,540	CL/Clam	Filt	100	0.1	0.05	0.097	<0.005	0.007	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Colac	14,220	CL	Filt	100	0.1	0.05	0.075	<0.005	0.017	0.017	0.017	—	—	—	—	—	—	—	—	0.06	**
Barwon Water	Cressy	490	CL	Filt	100	0.2	0.06	0.092	<0.005	0.007	0.017	0.017	—	—	—	—	—	—	—	—	0.06	**
Barwon Water	Forrest	230	CL	Filt	100	0.2	0.07	0.121	<0.005	0.025	0.025	0.025	—	—	—	—	—	—	—	—	0.10	**
Barwon Water	Gellibrand	300	CL	Filt	100	0.3	0.06	0.092	<0.005	0.017	0.014	0.014	—	—	—	—	—	—	—	—	0.07	**
Barwon Water	Highton	37,000	CL	Filt	100	0.1	0.05	0.088	<0.005	<0.005	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Highton High Level	2,200	CL	Filt	100	0.1	0.05	0.090	<0.005	<0.005	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Leopold	11,630	CL	Filt	100	0.1	0.05	0.096	<0.005	<0.005	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Lethbridge	820	CL	Filt	100	0.2	0.11	0.180	<0.005	0.007	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.15	**
Barwon Water	Little River West	820	CL/Clam	Filt	100	0.3	0.07	0.121	<0.005	<0.005	<0.005	0.007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.08	**
Barwon Water	Lorne	1,780	CL	Filt	100	0.5	0.09	0.095	<0.005	0.016	0.026	0.026	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Lovely Banks	54,030	CL/Clam	Filt	100	0.3	0.05	0.150	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.08	**
Barwon Water	Lovely Banks - Carrs Rd	130	CL/Clam	Filt	100	0.8	0.05	0.045	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.15	**
Barwon Water	Meredith	580	Clam	Filt	100	0.2	0.09	0.171	<0.005	0.012	0.007	0.007	—	—	—	—	—	—	—	—	—	**
Barwon Water	Montpellier	57,480	CL/Clam	Filt	100	0.1	0.06	0.085	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.15	**
Barwon Water	Moriac	780	CL	Filt	100	0.1	0.06	0.059	<0.005	<0.005	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Ocean Acres	140	CL	Filt	100	0.1	0.07	0.074	<0.005	0.012	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Ocean Grove	17,100	CL/Clam	Filt	100	0.1	0.06	0.082	<0.005	<0.005	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Pettavel	21,720	CL	Filt	100	0.1	0.06	0.083	<0.005	<0.005	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Portarlington	6,900	CL/Clam	Filt	100	1.3	0.04	0.035	<0.005	0.007	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Queenscliff	4,480	CL/Clam	Filt	100	1.7	0.05	0.021	<0.005	<0.005	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Teesdale	2,700	CL/Clam	Filt	100	0.2	0.09	0.059	<0.005	0.007	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.15	**
Barwon Water	Torquay	13,990	CL	Filt	100	0.1	0.07	0.121	<0.005	<0.005	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Barwon Water	Winchelsea	2,050	CL	Filt	100	0.1	0.05	0.088	<0.005	<0.005	<0.005	<0.005	—	—	—	—	—	—	—	—	0.08	**
Localities and population																						32
276,720																						

Water supplier	Water sampling locality	Estimated Population	Type of disinfection	Filtered supply	E. coli/100 mL	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde		Fluoride		Fluoride-dated supply
													Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Mean [mg/L]	
Central Highlands Water	Alma	340	CL/Clam	Filt	100	0.9	0.06	0.490	<0.005	<0.005	<0.005	—	—	—	—	—	—
Central Highlands Water	Avoca	1,550	CL/Clam	Filt	100	0.4	0.05	0.223	<0.005	<0.005	<0.005	—	—	0.14	—	—	—
Central Highlands Water	Ballan	2,580	Clam	Filt	100	0.2	0.08	0.015	<0.005	0.009	<0.005	—	—	—	—	—	—
Central Highlands Water	Ballaarat Central	29,800	Clam	Filt	100	0.4	0.05	0.029	<0.005	0.008	<0.005	—	—	—	0.09	—	—
Central Highlands Water	Ballaarat North/Nerrina	3,100	Clam	Filt	100	0.2	0.07	0.002	<0.005	0.007	<0.005	—	—	—	—	—	—
Central Highlands Water	Beaufort	1,240	UV/CL	Filt	96.2	0.3	0.10	0.160	<0.005	0.041	0.035	—	—	—	<0.05	—	—
Central Highlands Water	Bet Bet	260	CL/Clam	Filt	100	0.6	0.05	0.440	<0.005	<0.005	<0.005	—	—	—	—	—	—
Central Highlands Water	Blackwood/Barrys Reef	880	UV	Filt	100	0.7	0.05	—	—	—	—	—	—	—	<0.05	—	—
Central Highlands Water	Bungaree/Wallace	210	Clam	Filt	100	0.4	0.10	0.013	<0.005	0.010	<0.005	—	—	—	—	—	—
Central Highlands Water	Buninyong/Mount Helen	14,500	Clam	Filt	100	0.2	0.06	0.017	<0.005	0.009	<0.005	—	—	—	—	—	—
Central Highlands Water	Cardigan Village	270	Clam	Filt	100	0.6	0.03	0.049	<0.005	<0.005	<0.005	—	—	—	—	—	—
Central Highlands Water	Carisbrook	1,240	CL/Clam	Filt	100	1.0	0.05	0.420	<0.005	<0.005	<0.005	—	—	—	—	—	—
Central Highlands Water	Clunes	2,060	Oz/CL	B Filt	100	0.3	—	0.180	<0.005	<0.005	<0.005	<0.01	<0.1	0.32	—	—	—
Central Highlands Water	Creswick	3,100	Clam	Filt	100	0.3	0.06	0.003	<0.005	0.007	<0.005	—	—	—	—	—	—
Central Highlands Water	Daisy Hill	520	CL/Clam	Filt	100	0.9	0.05	0.440	<0.005	0.066	0.092	—	—	—	—	—	—
Central Highlands Water	Daylesford High Level	2,060	CL	Filt	100	0.2	0.04	0.064	<0.005	0.015	0.018	—	—	—	<0.05	—	—
Central Highlands Water	Daylesford Low Level/Hepburn	3,100	CL	Filt	100	0.4	0.07	0.065	<0.005	0.014	0.015	—	—	—	<0.05	—	—
Central Highlands Water	Dean	50	CL	B	100	1.3	—	0.030	<0.005	<0.005	<0.005	—	—	—	<0.05	—	—
Central Highlands Water	Enfield	410	Clam	Filt	100	0.5	0.02	0.280	<0.005	0.007	<0.005	—	—	—	—	—	—
Central Highlands Water	Fiskville/Glenmore	210	Clam	Filt	100	0.5	0.09	0.013	<0.005	0.012	<0.005	—	—	—	—	—	—
Central Highlands Water	Forest Hill	1,200	CL	B Filt	100	0.3	—	0.013	<0.005	<0.005	<0.005	—	—	—	0.05	—	—
Central Highlands Water	Gordon/Mount Egerton	520	Clam	Filt	100	0.3	0.10	0.014	<0.005	0.009	<0.005	—	—	—	—	—	—
Central Highlands Water	Haddon	2,700	Clam	Filt	100	0.3	0.02	0.050	<0.005	<0.005	<0.005	—	—	—	—	—	—
Central Highlands Water	Lal Lal	100	Clam	Filt	100	0.2	0.06	0.017	<0.005	0.006	<0.005	—	—	—	—	—	—
Central Highlands Water	Learmonth	380	CL	B	100	0.4	—	0.011	<0.005	<0.005	<0.005	—	—	—	0.07	—	—
Central Highlands Water	Lexton	260	Clam	Filt	100	0.5	—	0.670	<0.005	0.036	0.034	—	—	—	0.24	—	—
Central Highlands Water	Linton	460	Clam	Filt	100	0.4	0.03	0.042	<0.005	<0.005	<0.005	—	—	—	—	—	—
Central Highlands Water	Majorca	210	CL/Clam	Filt	100	0.4	0.05	0.500	<0.005	<0.005	<0.005	—	—	—	—	—	—
Central Highlands Water	Maryborough	7,330	CL/Clam	Filt	100	0.8	0.06	0.480	<0.005	<0.005	<0.005	—	—	—	0.41	—	—
Central Highlands Water	Napoleons	360	Clam	Filt	100	0.4	0.03	0.056	<0.005	<0.005	<0.005	—	—	—	—	—	—
Central Highlands Water	Sebastopol	8,250	Clam	Filt	100	0.3	0.03	0.041	<0.005	0.006	<0.005	—	—	—	—	—	—
Central Highlands Water	Skipton	670	Clam	Filt	100	0.6	0.02	0.098	<0.005	<0.005	<0.005	—	—	—	—	—	—
Central Highlands Water	Smythesdale	830	Clam	Filt	100	0.4	0.02	0.042	<0.005	<0.005	<0.005	—	—	—	—	—	—
Central Highlands Water	Talbot	720	CL/Clam	Filt	100	0.4	0.04	0.100	<0.005	<0.005	<0.005	—	—	—	—	—	—
Central Highlands Water	Timor	230	CL/Clam	Filt	100	0.7	0.05	0.470	<0.005	<0.005	<0.005	—	—	—	—	—	—
Central Highlands Water	Waubra	260	CL	B	100	0.3	—	0.006	<0.005	<0.005	<0.005	—	—	—	0.12	—	—
Central Highlands Water	Wendouree	27,550	Clam	Filt	100	0.2	0.05	0.013	<0.005	0.007	<0.005	—	—	—	—	—	—
Localities and population 37																	
119,510																	

Water supplier	Water sampling locality	Estimated Population	Type of disinfection	Filtered supply	% of samples with zero <i>E. coli</i> /100 mL	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde	Fluoride	Fluoride	Fluoride
						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]	Fluoride dated supply
City West Water	Altona	56,950	CL	Filt	100	0.4	0.03	0.061	<0.005	<0.005	0.017	<0.01	<0.1	1.0	0.90	FL
City West Water	Caroline Springs	87,920	CL	Filt	100	1.1	0.04	0.103	<0.005	0.014	0.038	<0.01	<0.1	1.0	0.96	FL
City West Water	Deer Park	37,510	CL	Filt	100	0.8	0.03	0.067	<0.005	<0.005	0.021	<0.01	<0.1	1.1	0.93	FL
City West Water	East Keilor	36,330	CL	Filt	100	1.0	0.05	0.050	<0.005	0.010	0.020	<0.01	<0.1	1.1	0.93	FL
City West Water	Little River	870	CL	Filt	100	0.6	0.04	0.088	<0.005	0.006	0.025	<0.01	<0.1	1.1	0.91	FL
City West Water	Maribyrnong	97,420	CL	Filt	100	0.5	0.03	0.060	<0.005	<0.005	0.016	<0.01	<0.1	1.0	0.89	FL
City West Water	Moonee Ponds	61,870	CL	Filt	100	0.6	0.11	0.070	<0.005	<0.005	0.020	<0.01	<0.1	0.98	0.89	FL
City West Water	Parkville	99,420	CL	Filt	100	0.5	0.03	0.067	<0.005	<0.005	0.022	<0.01	<0.1	1.0	0.89	FL
City West Water	Richmond	19,500	CL	Filt	100	0.9	0.04	0.101	<0.005	<0.005	0.027	<0.01	<0.1	1.1	0.93	FL
City West Water	Strathmore	7,550	CL	Filt	100	0.7	0.04	0.080	<0.005	<0.005	0.025	<0.01	<0.1	1.0	0.89	FL
City West Water	Taylor's Lakes	47,170	CL	Filt	100	1.2	0.03	0.099	<0.005	0.021	0.047	<0.01	<0.1	1.1	0.97	FL
City West Water	Tullamarine	9,470	CL	Filt	100	0.9	0.04	0.092	<0.005	0.009	0.032	<0.01	<0.1	1.1	0.90	FL
City West Water	Werribee	91,960	CL	Filt	100	0.6	0.03	0.074	<0.005	<0.005	0.021	<0.01	<0.1	1.0	0.91	FL
City West Water	Werribee South	1,650	CL	Filt	100	0.6	0.03	0.076	<0.005	<0.005	0.019	<0.01	<0.1	1.0	0.92	FL
City West Water	Williamstown	39,620	CL	Filt	100	0.5	0.03	0.057	<0.005	<0.005	0.019	<0.01	<0.1	1.0	0.89	FL
Localities and population 15																
Coliban Water	Axeedale	260	Clam/Oz	Filt	100	0.4	0.06	0.035	<0.005	0.010	<0.005	<0.01	<0.1	1.10	0.88	FL
Coliban Water	Bealiba	210	Clam	Filt	100	0.5	0.04	0.330	<0.005	<0.005	<0.005	—	—	—	—	FL
Coliban Water	Bendigo (Northern)	30,180	Clam/Oz	Filt	100	0.3	0.03	0.003	<0.005	<0.005	<0.005	<0.01	<0.1	0.93	0.87	FL
Coliban Water	Bendigo (Southern)	31,630	Clam/Oz	Filt	100	0.4	0.04	0.003	<0.005	<0.005	<0.005	<0.01	<0.1	0.97	0.87	FL
Coliban Water	Bendigo (Spring Gully)	14,670	Clam/Oz	Filt	100	0.4	0.03	0.001	<0.005	<0.005	<0.005	<0.01	<0.1	0.97	0.87	FL
Coliban Water	Big Hill	220	Clam/Oz	Filt	100	0.5	0.03	0.002	<0.005	<0.005	<0.005	<0.01	<0.1	0.96	0.86	FL
Coliban Water	Boort	990	CL	Filt	98.1	0.7	0.07	0.095	<0.005	0.012	0.011	—	—	—	—	FL
Coliban Water	Bridgewater	480	Clam	Filt	100	0.8	0.55	0.120	<0.005	<0.005	<0.005	—	—	—	—	FL
Coliban Water	Castlemaine	11,700	Clam/Oz	Filt	100	0.4	0.04	0.008	<0.005	<0.005	<0.005	<0.01	<0.1	1.00	0.90	FL
Coliban Water	Cohuna (Urban)	260	CL	Filt	100	0.5	0.07	0.150	<0.005	0.049	0.080	—	—	—	—	FL
Coliban Water	Cohuna (Rural)	2,360	CL	Filt	100	0.6	0.12	0.140	<0.005	0.050	0.057	—	—	—	—	FL
Coliban Water	Dunolly	960	Clam	Filt	100	0.6	0.05	0.093	<0.005	<0.005	<0.005	—	—	—	—	FL
Coliban Water	Echuca	14,270	CL	Filt	100	0.5	0.05	0.030	<0.005	0.009	0.007	—	—	1.10	0.92	FL
Coliban Water	Elmore	930	UV	B	100	0.6	—	—	—	—	—	—	—	—	—	FL
Coliban Water	Epsom - Huntly	5,080	Clam/Oz	Filt	100	0.4	0.03	0.003	<0.005	<0.005	<0.005	<0.01	<0.1	0.95	0.85	FL
Coliban Water	Fryerstown	230	Clam/Oz	Filt	100	0.5	0.03	0.005	<0.005	<0.005	<0.005	<0.01	<0.1	1.00	0.88	FL
Coliban Water	Goornong	370	CL	Filt	100	0.6	0.06	0.190	<0.005	0.007	0.007	—	—	—	—	FL
Coliban Water	Guildford	320	Clam/Oz	Filt	100	0.5	0.03	0.007	<0.005	<0.005	<0.005	<0.01	<0.1	1.00	0.88	FL
Coliban Water	Gunbower	340	CL	Filt	100	0.4	—	0.092	<0.005	0.031	0.046	—	—	—	—	FL
Coliban Water	Harcourt	600	Clam/Oz	Filt	100	0.4	0.03	0.006	<0.005	<0.005	<0.005	<0.01	<0.1	0.98	0.86	FL
Coliban Water	Heathcote	2,620	Clam	Filt	100	0.5	0.12	0.065	<0.005	0.023	0.017	—	—	—	—	FL
Coliban Water	Inglewood	1,020	Clam	Filt	98.1	0.6	0.26	0.130	<0.005	<0.005	<0.005	—	—	—	—	FL
Coliban Water	Junortoun	1,390	Clam/Oz	Filt	100	0.4	0.03	0.003	<0.005	<0.005	<0.005	<0.01	<0.1	0.99	0.86	FL
Coliban Water	Korong Vale	310	Clam	Filt	100	0.8	0.07	0.063	<0.005	0.011	<0.005	—	—	—	—	FL
Coliban Water	Kyneton	5,640	Clam/Oz	Filt	100	0.4	0.04	0.013	<0.005	0.006	<0.005	<0.01	<0.1	0.98	0.90	FL
Coliban Water	Laanecoorie	90	Clam	Filt	100	0.6	0.04	0.091	<0.005	<0.005	<0.005	—	—	—	—	FL

Water supplier	Water sampling locality	Estimated Population	Type of disinfection	Filtered supply	E. coli/100 mL	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde		Fluoride		Fluoride dated supply
													Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	
Coliban Water	Leitchville (Urban)	40	CL	Filt	100	0.3	0.03	0.054	<0.005	0.014	0.011	—	—	—	—	—	—
Coliban Water	Leitchville (Rural)	340	CL	Filt	100	0.4	0.02	0.041	<0.005	0.012	0.011	—	—	—	—	—	—
Coliban Water	Lockington	510	CL	Filt	100	0.5	0.07	0.057	<0.005	0.013	0.008	—	—	—	—	—	—
Coliban Water	Maiden Gully - Marong	3,210	Clam/Oz	Filt	100	0.4	0.03	0.054	<0.005	<0.005	<0.01	<0.1	<0.1	0.94	0.86	FL	FL
Coliban Water	Maldon	2,150	Clam/Oz	Filt	100	0.7	0.03	0.068	<0.005	0.007	<0.005	<0.01	<0.1	1.00	0.84	FL	FL
Coliban Water	Malmesbury	650	Clam/Oz	Filt	98.1	0.3	0.04	0.016	<0.005	0.006	<0.005	<0.01	<0.1	0.99	0.90	FL	FL
Coliban Water	Newstead	750	Clam/Oz	Filt	100	0.5	0.03	0.007	<0.005	<0.005	<0.005	<0.1	<0.1	0.99	0.89	FL	FL
Coliban Water	Pyramid Hill	660	CL	Filt	100	0.4	0.14	0.084	<0.005	0.011	0.008	—	—	—	—	—	—
Coliban Water	Raywood	200	CL	Filt	100	0.5	0.05	0.130	<0.005	0.024	0.020	<0.01	<0.1	—	—	—	FL
Coliban Water	Rochester	3,320	CL	Filt	100	0.4	0.09	0.044	<0.005	0.009	0.007	—	—	—	—	—	—
Coliban Water	Serpentine	180	Clam	Filt	100	0.9	0.14	0.310	<0.005	<0.005	<0.005	—	—	—	—	—	—
Coliban Water	Strathfieldsaye	3,320	Clam/Oz	Filt	100	0.4	0.03	0.002	<0.005	<0.005	<0.005	<0.01	<0.1	0.95	0.85	FL	FL
Coliban Water	Taradale - Elphinstone	560	Clam/Oz	Filt	100	0.3	0.03	0.007	<0.005	<0.005	<0.005	<0.01	<0.1	0.96	0.88	FL	FL
Coliban Water	Tarnagulla	300	Clam	Filt	100	0.6	0.03	0.083	<0.005	<0.005	<0.005	—	—	—	—	—	—
Coliban Water	Toobrac	130	Clam	Filt	100	0.6	0.11	0.100	<0.005	0.027	0.025	—	—	—	—	—	—
Coliban Water	Trentham	1,040	Clam/Oz	Filt	100	0.4	—	0.043	<0.005	0.008	0.013	<0.01	<0.1	—	—	—	—
Coliban Water	Tylden	260	Clam/Oz	Filt	100	0.5	0.03	0.011	<0.005	<0.005	<0.005	<0.01	<0.1	0.98	0.90	FL	FL
Coliban Water	Wedderburn	1,140	Clam	Filt	100	0.5	0.08	0.052	<0.005	<0.005	<0.005	—	—	—	—	—	—
Localities and population 44																	
145,890																	
East Gippsland Water	Bairnsdale	14,570	CL	CL	100	0.7	—	0.120	0.005	0.024	0.044	—	—	—	—	—	—
East Gippsland Water	Bemm River	200	CL	Filt	100	0.8	0.04	0.034	0.005	0.005	0.005	—	—	—	—	—	—
East Gippsland Water	Buchan	230	CL	Filt	98.1	0.2	0.05	0.078	0.005	0.007	0.011	—	—	—	—	—	—
East Gippsland Water	Cann River	440	CL	Filt	100	0.8	0.11	0.044	0.005	0.005	0.005	—	—	—	—	—	—
East Gippsland Water	Dinner Plain	1,060	UV	B	100	0.3	—	—	—	—	—	—	—	—	—	—	—
East Gippsland Water	Eagle Point - Paynesville	7,500	CL	CL	100	0.8	—	0.120	0.005	0.013	0.049	—	—	—	—	—	—
East Gippsland Water	Kalimna	1,480	CL	CL	100	0.7	—	0.077	0.005	0.012	0.028	—	—	—	—	—	—
East Gippsland Water	Lindenow	450	CL	CL	100	1.2	—	0.098	0.005	0.026	0.030	—	—	—	—	—	—
East Gippsland Water	Lindenow South	310	CL	CL	100	1.1	—	0.069	0.005	0.024	0.032	—	—	—	—	—	—
East Gippsland Water	Mallacoota	2,040	CL	Filt	100	1.1	0.02	0.170	0.005	0.031	0.033	—	—	—	—	—	—
East Gippsland Water	Merrangbaur	1,480	CL	CL	100	0.9	—	0.130	0.005	0.031	0.042	—	—	—	—	—	—
East Gippsland Water	Metung	2,440	CL	CL	100	0.6	—	0.068	0.005	0.010	0.010	—	—	—	—	—	—
East Gippsland Water	Nicholson - Swan Reach	3,850	CL	CL	100	0.8	—	0.058	0.005	0.014	0.021	—	—	—	—	—	—
East Gippsland Water	Nowa Nowa	210	CL	CL	100	0.6	—	0.180	0.005	0.022	0.056	—	—	—	—	—	—
East Gippsland Water	Omeo	570	CL	Filt	100	0.4	0.15	0.050	0.005	0.012	0.028	—	—	—	—	—	—
East Gippsland Water	Orbost	4,440	CL	Filt	100	0.3	0.19	0.077	0.005	0.006	0.013	—	—	—	—	—	—
East Gippsland Water	Sarsfield - Bruthen	1,130	CL	CL	100	0.8	—	0.098	0.005	0.024	0.046	—	—	—	—	—	—
East Gippsland Water	Sunlakes - Toorlo	8,100	CL	CL	100	1.5	—	0.120	0.005	0.032	0.043	—	—	—	—	—	—
East Gippsland Water	Swifts Creek	260	CL	Filt	100	0.5	0.03	0.026	0.005	0.007	0.005	—	—	—	—	—	—
Localities and population 19																	
50,760																	

Water supplier	Water sampling locality	Estimated Population	Type of disinfection	Filtered supply	% of samples with zero <i>E. coli</i> /100 mL	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde		Fluoride		Fluoride dated supply
													Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	
Gippsland Water	Boisdale	70	CL	Filt	100	0.1	0.03	0.075	<0.05	<0.02	<0.02	--	--	--	--	FL	
Gippsland Water	Boolarra	480	CL	Filt	100	0.3	0.15	0.120	<0.05	<0.02	<0.02	--	--	--	--	--	
Gippsland Water	Briarolong	470	CL	B Filt	100	0.2	0.02	0.021	<0.05	<0.02	<0.02	--	--	--	--	--	
Gippsland Water	Churchill	4,900	CL	Filt	100	0.2	0.03	0.077	<0.05	<0.02	0.038	--	--	--	--	FL	
Gippsland Water	Coongulla/Glenmaggie	180	CL	Filt	100	0.2	0.02	0.027	<0.05	<0.02	<0.02	--	--	--	--	--	
Gippsland Water	Cowwarr	230	CL	Filt	100	0.4	0.07	0.077	<0.05	<0.02	0.026	--	--	--	--	--	
Gippsland Water	Drouin	5,820	CL	Filt	100	1.5	0.08	0.078	<0.05	<0.02	0.029	--	--	1.4	0.86	FL	
Gippsland Water	Erica	190	CL	Filt	100	0.6	0.09	0.060	<0.05	<0.02	0.026	--	--	--	--	--	
Gippsland Water	Heyfield	1,440	CL	Filt	100	0.2	0.02	0.048	<0.05	<0.02	<0.02	--	--	--	--	--	
Gippsland Water	Jumbuk	180	CL	Filt	100	0.2	0.03	0.110	<0.05	<0.02	0.032	--	--	--	--	FL	
Gippsland Water	Maffra	3,920	CL	Filt	100	0.5	0.03	0.061	<0.05	<0.02	<0.02	--	--	1.4	0.85	FL	
Gippsland Water	Mirboo North	1,380	CL	Filt	100	0.2	0.02	0.066	<0.05	<0.02	<0.02	--	--	--	--	--	
Gippsland Water	Moe	15,770	CL	Filt	100	0.9	0.05	0.077	<0.05	<0.02	<0.02	--	--	1.3	0.82	FL	
Gippsland Water	Morwell	12,280	CL	Filt	100	0.3	0.04	0.058	<0.05	<0.02	0.020	--	--	1.4	0.86	FL	
Gippsland Water	Neerim South	540	CL	Filt	100	0.2	0.02	0.053	<0.05	<0.02	<0.02	--	--	--	--	--	
Gippsland Water	Newborough	4,010	CL	Filt	100	0.2	0.02	0.065	<0.05	<0.02	<0.02	--	--	--	--	FL	
Gippsland Water	Noojee	120	Clam	Filt	100	0.8	0.02	0.051	<0.05	<0.02	<0.02	--	--	--	--	--	
Gippsland Water	Rawson	280	CL	Filt	100	0.2	0.30	0.068	<0.05	0.024	0.023	--	--	--	--	--	
Gippsland Water	Rokeby/Bulin Buln	360	CL	Filt	100	0.2	0.07	0.074	<0.05	<0.02	0.023	--	--	--	--	FL	
Gippsland Water	Rosedale	1,040	CL	Filt	100	0.3	0.07	0.077	<0.05	<0.02	0.024	--	--	--	--	--	
Gippsland Water	Sale/Wurruk	12,860	C	B Filt	100	0.2	0.02	0.064	<0.05	0.047	0.050	--	--	1.0	0.79	FL	
Gippsland Water	Seaspray	210	C	Filt	100	0.3	0.04	0.190	<0.05	<0.02	<0.02	--	--	--	--	FL	
Gippsland Water	Stratford	1,330	CL	Filt	100	0.3	0.02	0.066	<0.05	<0.02	<0.02	--	--	1.4	0.85	FL	
Gippsland Water	Thorpdale	160	C	Filt	100	0.6	0.06	0.082	<0.05	<0.02	<0.02	--	--	--	--	--	
Gippsland Water	Toongabbie	460	CL	Filt	100	0.2	0.07	0.081	<0.05	<0.02	0.023	--	--	--	--	--	
Gippsland Water	Trafalgar	2,280	CL	Filt	100	0.4	0.04	0.095	<0.05	<0.02	<0.02	--	--	--	--	FL	
Gippsland Water	Traragon	19,610	CL	Filt	99.0	0.2	0.05	0.054	<0.05	<0.02	<0.02	--	--	1.4	0.79	FL	
Gippsland Water	Traragon South/Hazelwood North	1,050	CL	Filt	100	0.4	0.04	0.071	<0.05	<0.02	0.035	--	--	--	--	FL	
Gippsland Water	Tyers/Glengarry	910	CL	Filt	100	0.3	0.08	0.055	<0.05	<0.02	<0.02	--	--	--	--	--	
Gippsland Water	Warragul	14,040	CL	Filt	100	0.2	0.08	0.095	<0.05	<0.02	0.025	--	--	1.4	0.87	FL	
Gippsland Water	Warragul South	330	CL	Filt	100	0.2	0.06	0.110	<0.05	0.021	0.029	--	--	--	--	FL	
Gippsland Water	Willow Grove	190	Clam	Filt	100	0.3	0.04	<0.002	<0.05	<0.02	<0.02	--	--	--	--	--	
Gippsland Water	Yallourn North	1,190	CL	Filt	100	0.1	0.03	0.095	<0.05	<0.02	<0.02	--	--	--	--	FL	
Gippsland Water	Yarragon	710	CL	Filt	100	0.5	0.20	0.092	<0.05	<0.02	<0.02	--	--	--	--	FL	
Gippsland Water	Yinnar	550	CL	Filt	100	0.3	0.03	0.084	<0.05	<0.02	0.034	--	--	--	--	FL	
Localities and population 35																	
109,540																	

Water supplier	Water sampling locality	Estimated Population	Type of disinfection	Filtered supply	E. coli/100 mL	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate		Formaldehyde		Fluoride		Fluoride dated supply
												Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	
Goulburn Valley Water	Alexandra	2,870	CL	Filt	100	0.2	0.09	0.045	<0.010	0.020	0.026	—	—	<0.1	0.05			
Goulburn Valley Water	Avenel	920	CL	Filt	100	0.3	0.32	0.065	<0.010	0.022	0.016	—	—	<0.1	0.05			
Goulburn Valley Water	Barmah	300	CL	Filt	100	0.2	0.10	0.035	<0.010	0.016	0.011	—	—	<0.1	0.05			
Goulburn Valley Water	Bonnie Doon	510	CL	Filt	100	4.5	0.10	0.170	<0.010	0.045	0.130	—	—	0.3	0.14			
Goulburn Valley Water	Broadford	4,110	CL	Filt	100	0.3	0.44	0.140	<0.010	0.052	0.064	—	—	<0.1	0.05			
Goulburn Valley Water	Buxton	590	CLO2/CL		100	0.5	0.11	0.220	<0.010	0.120	0.180	—	—	<0.1	0.05			
Goulburn Valley Water	Cobram	5,650	CL	Filt	100	0.1	0.03	0.044	<0.010	0.016	0.012	—	—	<0.1	0.05			
Goulburn Valley Water	Colinababin	160	CL	Filt	100	2.3	0.14	0.063	<0.010	0.024	0.018	—	—	<0.1	0.05			
Goulburn Valley Water	Dookie	380	CL	Filt	100	1.7	0.12	0.055	<0.010	0.034	0.031	—	—	<0.1	0.05			
Goulburn Valley Water	Elidon	1,510	CL		100	2.0	<0.02	0.080	<0.010	0.045	0.056	—	—	<0.1	0.05			
Goulburn Valley Water	Euroa	3,540	CL	Filt	100	0.3	0.17	0.120	<0.010	0.032	0.043	—	—	0.1	0.06			
Goulburn Valley Water	Girgarre	310	CL	Filt	100	1.8	0.08	0.070	<0.010	0.024	0.018	—	—	0.1	0.06			
Goulburn Valley Water	Katamatite	280	CL	Filt	100	3.0	0.15	0.092	<0.010	0.041	0.046	—	—	0.1	0.09			
Goulburn Valley Water	Katandra West	270	CL	Filt	100	1.2	0.30	0.061	<0.010	0.022	0.014	—	—	<0.1	0.05			
Goulburn Valley Water	Katunga	220	CL	B	100	0.2	<0.02	0.010	<0.010	<0.005	0.014	—	—	0.7	0.39			
Goulburn Valley Water	Kilmore	6,430	CL	Filt	100	0.4	0.11	0.140	<0.010	0.025	0.056	—	—	0.7	0.300			
Goulburn Valley Water	Kyabram	6,940	CL	Filt	100	0.2	0.06	0.057	<0.010	0.020	0.013	—	—	<0.1	0.05			
Goulburn Valley Water	Longwood	260	CL	Filt	100	0.4	0.24	0.230	<0.010	0.072	0.085	—	—	0.1	0.09			
Goulburn Valley Water	Mansfield	4,120	CL	Filt	100	0.2	0.03	0.037	<0.010	0.015	0.017	—	—	<0.1	0.05			
Goulburn Valley Water	Marysville	1,000	CLO2/CL		98.0	0.7	0.11	0.075	<0.010	0.051	0.038	—	—	<0.1	0.05			
Goulburn Valley Water	Merrigum	580	CL	Filt	100	0.4	0.06	0.060	<0.010	0.021	0.018	—	—	<0.1	0.05			
Goulburn Valley Water	Mooroopna	8,680	CL	Filt	100	0.3	0.07	0.094	<0.010	0.027	0.024	—	—	0.93	0.69	FL		
Goulburn Valley Water	Murchison	1,090	CL	Filt	100	0.2	0.12	0.072	<0.010	0.019	0.014	—	—	<0.1	0.05			
Goulburn Valley Water	Nagambie	1,730	CL	Filt	100	0.1	0.05	0.140	<0.010	0.067	0.100	—	—	<0.1	0.05			
Goulburn Valley Water	Nathalia	1,700	CL	Filt	100	0.1	<0.02	0.059	<0.010	0.024	0.020	—	—	0.1	0.06			
Goulburn Valley Water	Numurkah	4,680	CL	Filt	100	0.2	0.05	0.130	<0.010	0.025	0.023	—	—	<0.1	0.05			
Goulburn Valley Water	Picola	160	CL	Filt	100	0.4	0.07	0.059	<0.010	0.026	0.021	—	—	0.1	0.06			
Goulburn Valley Water	Pyalong	380	CL	SF	100	0.2	<0.02	0.380	<0.010	0.036	0.014	—	—	0.4	0.40			
Goulburn Valley Water	Rushworth	1,350	CL	Filt	100	0.4	0.08	0.057	<0.010	0.015	0.009	—	—	<0.1	0.05			
Goulburn Valley Water	Seymour High Level	1,770	CL	Filt	100	0.3	0.11	0.052	<0.010	0.019	0.016	—	—	<0.1	0.05			
Goulburn Valley Water	Seymour Low Level	5,720	CL	Filt	100	0.2	0.31	0.051	<0.010	0.017	0.015	—	—	<0.1	0.05			
Goulburn Valley Water	Shepparton	41,130	CL	Filt	100	0.3	0.10	0.085	<0.010	0.019	0.016	—	—	1.0	0.71	FL		
Goulburn Valley Water	Stanhope	620	CL	Filt	100	0.9	0.06	0.076	<0.010	0.035	0.023	—	—	0.2	0.09			
Goulburn Valley Water	Strathmerton	550	CL	Filt	100	0.1	0.05	0.052	<0.010	0.016	0.013	—	—	<0.1	0.05			
Goulburn Valley Water	Tallaroak	290	CL	Filt	100	0.1	0.11	0.056	<0.010	0.021	0.018	—	—	<0.1	0.05			
Goulburn Valley Water	Tallygaropna	320	CL	Filt	100	0.2	0.13	0.079	<0.010	0.008	0.024	—	—	0.9	0.70	FL		
Goulburn Valley Water	Tatura	4,450	CL	Filt	100	0.3	0.11	0.061	<0.010	0.019	0.012	—	—	<0.1	0.05			
Goulburn Valley Water	Thornton	260	CL		100	1.5	0.12	0.200	<0.010	0.140	0.250	—	—	<0.1	0.05			
Goulburn Valley Water	Tongala	1,480	CL	Filt	100	0.6	0.40	0.048	<0.010	0.014	0.006	—	—	0.93	0.57	FL		
Goulburn Valley Water	Toolamba	320	CL	Filt	100	0.2	0.05	0.110	<0.010	0.028	0.028	—	—	1.00	0.69	FL		
Goulburn Valley Water	Trawool	140	CL	Filt	100	2.2	0.06	0.063	<0.010	0.011	0.012	—	—	<0.1	0.05			
Goulburn Valley Water	Upper Delatite	1,110	CL		100	0.8	0.06	0.160	<0.010	0.095	0.150	—	—	<0.1	0.05			
Goulburn Valley Water	Violet Town	890	CL	Filt	100	0.3	0.13	0.180	<0.010	0.019	0.061	—	—	<0.1	0.05			

Water supplier	Water sampling locality	Estimated Population	Type of disinfection	Filtered supply	E. coli/100 mL	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde		Fluoride	Fluoride	Fluori-dated supply
													Maximum [mg/L]	Maximum [mg/L]			
Goulburn Valley Water	Wandong - Heathcote Junction	1,950	CL	Filt	100	0.4	0.12	0.130	<0.010	0.026	0.063	—	—	—	0.8	0.46	
Goulburn Valley Water	Waterford Park	360	CL	Filt	100	0.5	0.12	0.120	<0.010	0.017	0.069	—	—	—	<0.1	0.05	
Goulburn Valley Water	Wungah	360	CL	Filt	100	0.3	0.07	0.120	<0.010	0.015	0.018	—	—	—	<0.1	0.05	
Goulburn Valley Water	Yarroweiah	140	CL	Filt	100	0.1	0.03	0.045	<0.010	0.011	0.015	—	—	—	<0.1	0.05	
Goulburn Valley Water	Yea	1,510	CL	Filt	100	0.2	0.06	0.120	<0.010	0.043	0.045	—	—	—	<0.1	0.05	
Localities and population 48																	
GWM Water	Ararat	7,200	CL	Filt	100	0.4	0.06	0.140	0.005	0.020	0.020	—	—	—	0.05	0.05	
GWM Water	Beulah	230	CL	Filt	100	3.0	—	0.560	0.007	0.055	0.099	—	—	—	0.05	0.05	
GWM Water	Birchip	800	CL	Filt	100	0.6	0.02	0.250	0.005	0.017	0.012	—	—	—	0.24	0.24	
GWM Water	Brim	100	Clam	Filt	100	6.4	—	0.130	0.005	0.018	0.031	—	—	—	0.05	0.05	
GWM Water	Charlton	1,100	CL	Filt	100	0.4	0.13	0.260	0.005	0.025	0.028	—	—	—	0.27	0.27	
GWM Water	Dimboola	1,560	CL	Filt	100	0.3	0.19	0.180	0.005	0.021	0.019	—	—	—	0.05	0.05	
GWM Water	Donald	1,380	CL	Filt	100	1.5	—	0.530	0.005	0.007	0.006	—	—	—	0.23	0.23	
GWM Water	Edenhope	780	CL	B Filt	100	1.3	—	0.044	0.005	0.005	0.005	—	—	—	0.05	0.05	
GWM Water	Great Western	150	CL	Filt	100	0.3	0.07	0.250	0.005	0.081	0.090	—	—	—	0.07	0.07	
GWM Water	Halls Gap	260	CL	Filt	100	0.4	0.05	0.120	0.005	0.022	0.023	—	—	—	0.05	0.05	
GWM Water	Haven	290	CL	Filt	100	0.7	0.06	0.200	0.005	0.022	0.014	—	—	—	0.99	0.74	FL
GWM Water	Hopetoun	670	CL	Filt	100	0.7	0.08	0.300	0.005	0.022	0.020	—	—	—	0.05	0.05	
GWM Water	Horsham	13,000	CL	Filt	99.0	0.5	0.07	0.230	0.005	0.022	0.021	—	—	—	1.00	0.74	FL
GWM Water	Jung	90	CL	Filt	100	3.9	—	0.750	0.005	0.042	0.073	—	—	—	0.05	0.05	
GWM Water	Lake Bolac	240	CL02/CL	Filt	100	0.4	0.09	—	—	—	—	—	—	—	0.05	0.05	
GWM Water	Lalbert	100	CL	Filt	100	6.5	—	0.130	0.005	0.022	0.022	—	—	—	0.31	0.31	
GWM Water	Manangatang	310	CL	Filt	100	22.6	—	0.140	0.005	0.023	0.028	—	—	—	0.19	0.19	
GWM Water	Minyip	480	CL	Filt	100	3.2	—	0.660	0.005	0.025	0.046	—	—	—	0.09	0.09	
GWM Water	Murtoa	840	CL	Filt	100	1.6	0.62	0.520	0.005	0.018	0.026	—	—	—	0.05	0.05	
GWM Water	Nullawil	100	CL	Filt	100	6.5	—	0.100	0.005	0.032	0.034	—	—	—	0.08	0.08	
GWM Water	Ouyen	1,250	CL	Filt	100	0.5	0.02	0.110	0.005	0.024	0.027	—	—	—	0.12	0.12	
GWM Water	Pomonal	150	CL	Filt	100	0.5	0.15	0.097	0.005	0.032	0.030	—	—	—	0.05	0.05	
GWM Water	Quambatook	280	CL	Filt	98.1	4.0	—	0.430	0.007	0.055	0.059	—	—	—	0.24	0.24	
GWM Water	Rainbow	560	CL	Filt	100	0.8	0.17	0.360	0.005	0.019	0.013	—	—	—	0.05	0.05	
GWM Water	Rupanyup	410	CL	Filt	100	4.7	—	0.500	0.007	0.088	0.150	—	—	—	0.11	0.11	
GWM Water	Sea Lake	690	CL	Filt	100	3.8	—	0.120	0.005	0.030	0.036	—	—	—	0.13	0.13	
GWM Water	St Arnaud	2,640	CL	Filt	100	0.7	0.18	0.220	0.005	0.025	0.015	—	—	—	0.06	0.06	
GWM Water	Stawell	6,270	CL	Filt	100	0.3	0.19	0.100	0.005	0.024	0.026	—	—	—	0.05	0.05	
GWM Water	Ultima	190	CL	Filt	100	31.1	—	0.097	0.005	0.026	0.025	—	—	—	0.10	0.10	
GWM Water	Underbool	230	CL	Filt	100	2.2	0.27	0.075	0.005	0.011	0.008	—	—	—	0.25	0.25	
GWM Water	Walpeup	150	CL	Filt	100	2.8	—	0.140	0.005	0.025	0.025	—	—	—	0.18	0.18	
GWM Water	Warracknabeal	2,490	CL	Filt	100	0.5	0.16	0.510	0.005	0.021	0.017	—	—	—	0.05	0.05	
GWM Water	Willaura	300	CL02/CL	Filt	91.2	0.9	0.09	—	—	—	—	—	—	—	0.05	0.05	
GWM Water	Woomelang	220	CL	Filt	100	5.4	—	0.760	0.005	0.068	0.079	—	—	—	0.05	0.05	
GWM Water	Wycheproof	730	CL	Filt	100	3.1	—	0.440	0.005	0.022	0.016	—	—	—	0.27	0.27	
Localities and population 35																	

Water supplier	Water sampling locality	Estimated Population	Type of disinfection	Filtered supply	E. coli/100 mL	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate		Formaldehyde		Fluoride		Fluoride-dated supply	
												Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]		Mean [mg/L]
Lower Murray Water	Irymple	1,100	CL	Filt	100	0.2	0.03	0.050	<0.005	<0.005	<0.005	—	—	—	—	—	—	—	
Lower Murray Water	Kerang	4,000	CL	Filt	100	0.6	0.13	0.034	<0.005	0.013	0.012	<0.01	<0.1	0.06	0.06	0.06	0.06	—	
Lower Murray Water	Koondrook	850	CL	Filt	100	0.3	0.09	0.047	<0.005	0.011	0.013	<0.01	<0.1	<0.05	0.03	0.03	0.03	—	
Lower Murray Water	Lake Boga	600	CL	Filt	100	0.2	0.05	0.053	<0.005	0.017	0.015	—	—	—	—	—	—	—	
Lower Murray Water	Merbein	1,800	CL	Filt	100	0.2	0.03	0.058	<0.005	0.008	0.006	—	—	—	—	—	—	—	
Lower Murray Water	Mildura	29,000	CL	Filt	100	0.3	0.03	0.038	<0.005	<0.005	<0.005	<0.01	<0.1	0.05	0.03	0.03	0.03	—	
Lower Murray Water	Murrabit	90	CL	Filt	100	0.5	0.10	0.073	<0.005	0.024	0.030	<0.01	<0.1	0.08	0.05	0.05	0.05	—	
Lower Murray Water	Nyah	350	CL	Filt	100	0.2	0.02	0.052	<0.005	0.008	0.014	—	—	—	—	—	—	—	
Lower Murray Water	Nyah West	550	CL	Filt	100	0.2	0.02	0.054	<0.005	0.008	0.015	—	—	—	—	—	—	—	
Lower Murray Water	Piangli	190	CL	Filt	100	0.3	0.01	0.033	<0.005	0.012	0.011	<0.01	<0.1	<0.05	0.03	0.03	0.03	—	
Lower Murray Water	Red Cliffs	2,800	CL	Filt	100	0.2	0.06	0.054	<0.005	0.010	0.006	<0.01	<0.1	<0.05	0.03	0.03	0.03	FL	
Lower Murray Water	Robinvale	2,250	CL	Filt	100	0.3	0.03	0.050	<0.005	0.011	0.050	<0.01	<0.1	0.93	0.75	0.75	0.75	FL	
Lower Murray Water	Swan Hill	10,500	CL	Filt	100	0.3	0.03	0.034	0.012	0.006	0.000	<0.01	<0.1	0.07	0.06	0.06	0.06	—	
Lower Murray Water	Wooninen South	350	CL	Filt	100	0.2	0.02	0.040	<0.005	0.008	0.011	—	—	—	—	—	—	—	
Localities and population 14																			
North East Water	Barnawartha	590	CL	B	100	0.2	0.01	<0.001	<0.005	<0.005	<0.005	<0.01	<0.1	0.85	0.80	0.80	0.80	NF then FL	
North East Water	Beechworth High Level	2,330	Clam	Filt	100	0.3	0.10	0.005	<0.005	<0.005	<0.005	<0.01	<0.1	0.06	0.06	0.06	0.06	—	
North East Water	Beechworth Low Level	1,180	Clam	Filt	100	0.3	0.09	0.004	<0.005	<0.005	<0.005	<0.01	<0.1	0.05	0.05	0.05	0.05	—	
North East Water	Bellbridge	430	CL	Filt	100	0.3	0.03	0.068	<0.005	0.021	0.040	<0.01	<0.1	0.07	0.07	0.07	0.07	—	
North East Water	Benalla	11,280	Clam	Filt	100	0.5	0.08	0.060	<0.005	0.014	0.021	<0.01	<0.1	0.06	0.06	0.06	0.06	—	
North East Water	Bright	3,200	CL	Filt	100	0.4	0.05	0.041	<0.005	0.013	0.022	<0.01	<0.1	0.06	0.06	0.06	0.06	—	
North East Water	Bundalong	140	CL	Filt	100	0.2	0.06	0.059	<0.005	0.017	0.014	<0.01	<0.1	0.05	0.05	0.05	0.05	—	
North East Water	Chiltern	1,330	Clam/CL	Filt	98.0	0.2	0.11	0.067	<0.005	0.017	0.017	<0.01	<0.1	1.50	1.00	1.00	1.00	FL	
North East Water	Corryong High Level	170	UV/CL	Filt	98.1	2.9	0.02	0.100	<0.005	0.036	0.077	<0.01	<0.1	0.06	0.06	0.06	0.06	—	
North East Water	Corryong Low Level	1,380	UV/CL	Filt	100	3.1	0.01	0.072	<0.005	0.024	0.037	<0.01	<0.1	0.07	0.07	0.07	0.07	—	
North East Water	Cudgewa	150	UV/CL	Filt	100	1.8	0.01	0.110	<0.005	0.041	0.079	<0.01	<0.1	0.07	0.07	0.07	0.07	—	
North East Water	Dartmouth	210	CL	Filt	98.1	1.9	0.84	0.150	<0.005	0.046	0.066	<0.01	<0.1	0.08	0.08	0.08	0.08	—	
North East Water	Devenish	120	CL	Filt	100	0.3	0.05	0.066	<0.005	0.034	0.027	<0.01	<0.1	0.08	0.07	0.07	0.07	FL	
North East Water	Ebden/Baranduda Low Level	1,210	Clam	Filt	100	0.2	0.11	0.049	<0.005	0.012	0.010	<0.01	<0.1	0.84	0.57	0.57	0.57	FL	
North East Water	Glenrowan	360	CL	Filt	100	0.3	0.11	0.071	0.009	0.015	0.013	<0.01	<0.1	0.16	0.16	0.16	0.16	—	
North East Water	Goorambat	150	CL	B	100	0.2	0.01	0.030	<0.005	<0.005	<0.005	<0.01	<0.1	0.40	0.40	0.40	0.40	—	
North East Water	Harrieville	470	CL	Filt	100	0.8	0.01	0.061	<0.005	0.023	0.041	<0.01	<0.1	0.08	0.07	0.07	0.07	—	
North East Water	Kiewa	350	Clam	Filt	100	0.2	0.10	0.043	0.010	0.017	0.015	<0.01	<0.1	0.86	0.55	0.55	0.55	FL	
North East Water	Moyhu	270	CL	Filt	100	0.4	0.03	0.057	<0.005	0.019	0.021	<0.01	<0.1	0.06	0.06	0.06	0.06	—	
North East Water	Mount Beauty	1,620	Oz	Filt	100	0.3	0.03	—	—	—	—	<0.01	<0.1	0.07	0.06	0.06	0.06	—	
North East Water	Myrtleford	3,600	UV	Filt	100	1.0	0.04	—	—	—	—	<0.01	<0.1	0.05	0.05	0.05	0.05	—	
North East Water	Oxley	330	CL	Filt	100	0.4	0.03	0.034	<0.005	0.016	0.019	<0.01	<0.1	0.07	0.07	0.07	0.07	—	
North East Water	Porepunkah	800	CL	Filt	100	0.3	0.12	0.045	<0.005	0.017	0.017	<0.01	<0.1	0.05	0.05	0.05	0.05	—	
North East Water	Rutherglen	2,580	CL	Filt	100	0.2	0.12	0.081	<0.005	0.025	0.019	<0.01	<0.1	0.05	0.05	0.05	0.05	—	
North East Water	Springhurst	190	CL	Filt	100	0.5	0.25	0.160	<0.005	0.034	0.045	<0.01	<0.1	0.43	0.21	0.21	0.21	—	

Water supplier	Water sampling locality	Estimated Population	Type of disinfection	Filtered supply	% of samples with zero <i>E. coli</i> /100 mL	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde	Fluoride		Fluoride-dated supply
														Maximum [mg/L]	Mean [mg/L]	
North East Water	St James	100	CL	Filt	100	0.2	0.03	0.085	<0.005	0.036	0.025	<0.01	<0.1	0.06	0.06	
North East Water	Tallangatta	1,160	CL	Filt	100	0.3	0.05	0.043	<0.005	0.018	0.018	<0.01	<0.1	0.05	0.05	
North East Water	Tangambalanga	460	Clam	Filt	100	0.2	0.10	0.055	<0.005	0.024	0.017	<0.01	<0.1	0.82	0.62	FL
North East Water	Tawonga	1,520	Oz		100	0.3	0.08	--	--	--	--	<0.01	<0.1	0.05	0.05	
North East Water	Tungamah	450	CL	Filt	100	0.3	0.22	0.076	<0.005	0.030	0.023	<0.01	<0.1	0.05	0.05	
North East Water	Wahgunyah	1,000	CL	Filt	100	0.2	0.07	0.053	<0.005	0.012	0.009	<0.01	<0.1	0.06	0.06	
North East Water	Walwa	130	CL	Filt	100	0.3	0.20	0.069	<0.005	0.027	0.031	<0.01	<0.1	0.05	0.05	
North East Water	Wandiligong	460	CL	Filt	100	0.3	0.04	0.039	<0.005	0.016	0.026	<0.01	<0.1	0.05	0.05	
North East Water	Wangaratta	19,760	CL	Filt	100	0.3	0.02	0.022	<0.005	0.012	0.013	<0.01	<0.1	0.93	0.79	FL
North East Water	Whitfield	130	CL02/UV		100	2.7	0.03	--	--	--	--	<0.01	<0.1	0.06	0.06	
North East Water	Wodonga/Baranduda High Level	420	Clam	Filt	100	0.2	0.14	0.053	<0.005	0.018	0.015	<0.01	<0.1	0.86	0.62	FL
North East Water	Wodonga High Level	10,700	Clam	Filt	100	0.2	0.06	0.027	<0.005	0.009	0.009	<0.01	<0.1	0.81	0.53	FL
North East Water	Wodonga Logic Centre	10	Clam/CL	Filt	100	0.2	0.07	0.110	<0.005	0.022	0.013	<0.01	<0.1	0.83	0.62	FL
North East Water	Wodonga Low Level	22,450	Clam	Filt	100	0.3	0.07	0.028	<0.005	0.009	0.008	<0.01	<0.1	0.87	0.62	FL
North East Water	Yackandandah	880	CL	Filt	98.2	0.3	0.22	0.024	<0.005	0.007	0.011	<0.01	<0.1	0.06	0.06	
North East Water	Yarrowonga	8,430	CL	Filt	100	0.4	0.06	0.050	<0.005	0.016	0.015	<0.01	<0.1	0.06	0.06	
Localities and population 41																
Parks Victoria	Gabo Island Lightstation Reserve	Seasonal population	PV	PV	67	1.5	--	--	--	--	--	--	--	--	--	--
Parks Victoria	Lake Eildon National Park: Lakeside/Candlebark	Seasonal population	PV	PV	100	0.3	--	--	--	--	--	--	--	--	--	--
Parks Victoria	Tidal River	Seasonal population	CL	Filt	100	0.5	0.45	0.100	0.050	0.020	0.020	--	--	--	--	--
Parks Victoria	Twelve Apostles Visitor Facility	Seasonal population	PV	PV	100	0.3	--	--	--	--	--	--	--	--	--	--
Parks Victoria	Wilson's Promontory Lightstation	Seasonal population	UV	PV	75	5.6	--	--	--	--	--	--	--	--	--	--
Localities and population 5																
South East Water	Balnarring	5,830	CL	CL	100	0.9	0.02	0.083	<0.005	0.005	0.029	--	--	0.91	0.42	FL #
South East Water	Bayswater	59,300	CL	CL	100	0.9	--	0.099	<0.005	0.014	0.049	--	--	0.96	0.90	FL
South East Water	Beaumaris	24,980	CL	CL	100	1.2	--	0.061	<0.005	<0.005	0.019	--	--	0.88	0.34	FL #
South East Water	Belgrave	15,200	CL	CL	100	0.9	--	0.110	<0.005	0.009	0.039	--	--	0.94	0.88	FL
South East Water	Berwick	86,090	CL	CL	100	1.0	--	0.056	<0.005	0.008	0.016	--	--	0.91	0.60	FL #
South East Water	Bittern	5,820	CL	CL	100	0.9	0.02	0.090	<0.005	<0.005	0.018	--	--	0.93	0.62	FL #
South East Water	Brighton/Heatherton	184,430	CL	CL	99.8	1.2	--	0.074	<0.005	<0.005	0.018	--	--	0.84	0.33	FL #
South East Water	Bunyip	2,990	CL	CL	100	0.7	0.02	0.095	<0.005	<0.005	0.008	--	--	0.84	0.45	FL #
South East Water	Carrum Downs	23,380	CL	CL	100	1.1	--	0.058	<0.005	0.006	0.015	--	--	0.92	0.49	FL #
South East Water	Caulfield	155,000	CL	CL	100	1.0	--	0.100	<0.005	0.006	0.033	--	--	0.98	0.90	FL
South East Water	Chelsea	45,220	CL	CL	100	1.0	--	0.054	<0.005	0.006	0.018	--	--	0.94	0.63	FL #
South East Water	Cora Lynn	1,240	CL	CL	100	3.0	0.01	0.064	<0.005	0.006	0.014	--	--	0.95	0.61	FL #
South East Water	Cranbourne	39,820	CL	CL	100	1.0	0.02	0.052	<0.005	0.009	0.015	--	--	0.92	0.34	FL #

Water supplier	Water sampling locality	Estimated Population	Type of disinfection	Filtered supply	E. coli/100 mL	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde		Fluoride		Fluoride dated supply
													Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	
South East Water	Dandenong	98,630	CL	100	1.0	—	0.053	<0.005	0.007	0.015	—	—	0.93	0.72	FL #		
South East Water	Dandenong North	23,420	CL	100	1.2	—	0.110	<0.005	0.008	0.047	—	—	1.00	0.66	FL #		
South East Water	Devon Meadows	5,630	CL	100	1.4	0.01	0.060	<0.005	0.008	0.018	—	—	0.88	0.61	FL #		
South East Water	Dromana	21,520	CL	100	0.9	0.01	0.100	<0.005	0.014	0.042	—	—	0.86	0.48	FL #		
South East Water	Ferntree Gully	21,120	CL	100	1.9	—	0.087	<0.005	0.011	0.036	—	—	1.10	0.91	FL		
South East Water	Frankston	83,500	CL	100	0.9	0.01	0.087	<0.005	0.008	0.022	—	—	0.95	0.60	FL #		
South East Water	Frankston South	14,770	CL	100	1.0	0.01	0.081	<0.005	<0.005	0.026	—	—	0.85	0.53	FL #		
South East Water	Garfield	1,120	CL	100	0.7	0.02	0.076	<0.005	<0.005	0.014	—	—	0.92	0.55	FL #		
South East Water	Hallam	65,710	CL	100	1.0	—	0.063	<0.005	0.007	0.016	—	—	0.93	0.48	FL #		
South East Water	Hastings	10,270	CL	100	1.0	0.01	0.100	<0.005	0.015	0.036	—	—	1.00	0.63	FL #		
South East Water	Karingal	10,190	CL	100	1.1	0.02	0.063	<0.005	0.009	0.020	—	—	0.36	0.16	FL #		
South East Water	Koo Wee Rup	2,250	CL	100	0.8	0.01	0.071	<0.005	<0.005	<0.005	—	—	0.98	0.49	FL #		
South East Water	Lang Lang	1,320	CL	100	0.9	0.01	0.077	<0.005	<0.005	0.008	—	—	0.83	0.26	FL #		
South East Water	Moorooduc	500	CL	100	1.1	0.02	0.079	<0.005	0.016	0.036	—	—	0.92	0.58	FL #		
South East Water	Mordialloc	28,970	CL	100	1.0	—	0.051	<0.005	<0.005	0.008	—	—	0.90	0.58	FL #		
South East Water	Mornington	40,720	CL	100	1.0	0.02	0.091	<0.005	0.016	0.036	—	—	0.89	0.55	FL #		
South East Water	Mount Martha	7,970	CL	100	0.9	0.02	0.110	<0.005	0.008	0.038	—	—	1.00	0.60	FL #		
South East Water	Pakenham	30,550	CL	100	1.0	—	0.093	<0.005	0.006	0.023	—	—	0.85	0.84	FL #		
South East Water	Rowville	28,900	CL	100	1.2	—	0.055	<0.005	0.008	0.014	—	—	0.88	0.58	FL #		
South East Water	Rye	74,670	CL	100	0.9	0.01	0.100	<0.005	0.019	0.044	—	—	1.00	0.50	FL #		
South East Water	Shoreham	3,110	CL	100	0.9	0.02	0.094	<0.005	0.006	0.031	—	—	0.93	0.58	FL #		
South East Water	Somerville	14,680	CL	99.0	1.0	0.01	0.056	<0.005	<0.005	0.018	—	—	0.92	0.49	FL #		
South East Water	South Melbourne	165,860	CL	100	1.0	0.05	0.075	<0.005	<0.005	0.023	—	—	0.96	0.91	FL		
South East Water	Tynong	600	CL	100	0.7	0.01	0.073	<0.005	<0.005	0.012	—	—	0.87	0.49	FL #		
South East Water	Upper Beaconsfield	2,820	CL	100	1.0	—	0.089	<0.005	<0.005	0.017	—	—	0.88	0.52	FL #		
South East Water	Wanima	21,090	CL	100	1.0	—	0.110	<0.005	<0.005	0.044	—	—	1.00	0.95	FL		
Localities and population 39																	
1,429,190																	
South Gippsland Water	Alberton	150	Clam	Filt	100	0.4	0.02	0.009	<0.005	<0.005	—	—	0.06	0.06			
South Gippsland Water	Cape Paterson	710	Clam	Filt	100	0.4	0.10	0.250	0.013	0.009	—	—	0.10	0.10			
South Gippsland Water	Dumbalk	170	CL	Filt	100	0.5	0.05	0.140	0.007	0.008	—	—	0.14	0.14			
South Gippsland Water	Fish Creek	180	CL	Filt	100	0.4	0.09	0.200	0.010	0.010	—	—	<0.03	<0.03			
South Gippsland Water	Foster	1,060	CL	Filt	100	0.5	0.06	0.140	<0.005	<0.005	—	—	<0.03	<0.03			
South Gippsland Water	Inverloch	4,330	Clam	Filt	100	0.4	0.18	0.200	0.013	0.007	—	—	0.10	0.10			
South Gippsland Water	Koonwarra	150	CL	Filt	100	0.2	0.03	0.160	<0.005	<0.005	—	—	0.06	0.06			
South Gippsland Water	Korumburra	3,200	CL	Filt	100	0.4	0.02	0.140	<0.005	0.023	0.019	—	0.08	0.08			
South Gippsland Water	Lance Creek	50	Clam	Filt	100	0.6	0.05	0.170	<0.005	0.012	<0.005	—	0.10	0.10			
South Gippsland Water	Leongatha	4,550	CL	Filt	98.7	0.4	0.07	0.160	<0.005	0.015	0.011	—	0.06	0.06			
South Gippsland Water	Loch	190	Clam	Filt	100	0.3	0.07	0.009	<0.005	0.016	<0.005	—	0.11	0.11			
South Gippsland Water	Meenyan	430	CL	Filt	100	0.4	0.29	0.160	<0.005	0.018	0.031	—	0.10	0.10			
South Gippsland Water	Nyora	550	Clam	Filt	100	0.3	0.06	0.012	<0.005	0.010	<0.005	—	0.11	0.11			
South Gippsland Water	Poowong	290	Clam	Filt	100	0.3	0.06	0.011	<0.005	0.014	<0.005	—	0.11	0.11			
South Gippsland Water	Port Franklin	120	CL	Filt	100	0.8	0.07	0.130	<0.005	0.024	0.027	—	0.07	0.07			

Water supplier	Water sampling locality	Estimated Population	Type of disinfection	Filtered supply	% 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]	Fluoride-dated supply
South Gippsland Water	Port Welshpool	200	CL	Filt	100	0.4	0.06	0.140	<0.005	0.015	0.027	–	–	0.07	0.07	
South Gippsland Water	Toora	690	CL	Filt	99.1	0.9	0.22	0.120	<0.005	0.021	0.019	–	–	0.07	0.07	
South Gippsland Water	Wonthaggi	6,780	Clam	Filt	100	0.4	0.23	0.220	<0.005	0.016	0.010	–	–	0.10	0.10	
South Gippsland Water	Yarram	1,840	Clam	Filt	100	0.4	0.02	<0.004	<0.005	<0.005	<0.005	–	–	0.06	0.06	
Localities and population 19 25,640																
Wannon Water	Allansford	530	CL	Filt	100	0.3	0.35	0.038	<0.005	0.007	0.005	–	–	0.96	0.78	FL
Wannon Water	Balmoral	200	Clam	Filt	100	0.9	0.88	0.150	<0.005	0.009	0.005	–	–	0.50	0.50	
Wannon Water	Camperdown (Rural)	400	Clam	Filt	100	0.3	0.36	0.017	<0.005	0.007	<0.005	–	–	0.05	0.05	
Wannon Water	Camperdown (Urban)	3,130	CL	Filt	100	0.4	0.87	0.074	<0.005	0.014	<0.005	–	–	0.05	0.05	
Wannon Water	Caramut	100	CL	B	100	0.2	0.04	0.035	<0.005	<0.005	<0.005	–	–	0.10	0.08	
Wannon Water	Casterton	1,640	CL	B Filt	100	0.8	–	0.150	<0.005	0.010	0.006	–	–	0.19	0.16	
Wannon Water	Cavendish	120	Clam	Filt	98.1	2.8	0.38	0.220	0.010	0.045	<0.005	–	–	0.12	0.08	
Wannon Water	Cobden	1,420	CL	Filt	100	0.3	0.65	0.120	<0.005	0.019	0.025	–	–	0.05	0.05	
Wannon Water	Coleraine	980	CL	Filt	98.1	4.4	–	0.660	<0.005	<0.005	<0.005	–	–	0.65	0.44	
Wannon Water	Dartmoor	250	CL	B	100	0.1	–	0.004	<0.005	<0.005	<0.005	–	–	0.18	0.13	
Wannon Water	Derrinallum	265	CL	Filt	98.1	1.2	0.82	0.120	<0.005	0.021	0.010	–	–	0.11	0.07	
Wannon Water	Dunkeld	400	CL	Filt	100	1.5	0.99	0.120	0.008	0.045	0.039	–	–	0.07	0.06	
Wannon Water	Glenthompson	130	Clam	Filt	100	1.3	1.70	0.051	<0.005	0.011	<0.005	–	–	0.25	0.23	
Wannon Water	Hamilton	9,370	Clam	Filt	100	2.8	19.0	0.027	<0.005	0.016	<0.005	–	–	0.05	0.05	
Wannon Water	Henty	5	CL	B Filt	99.0	0.6	–	0.240	<0.005	0.010	0.007	–	–	0.23	0.18	
Wannon Water	Heywood	1,280	CL	B	100	0.8	–	0.027	<0.005	<0.005	<0.005	–	–	0.41	0.38	
Wannon Water	Koroit	1,380	Clam	Filt	100	0.7	0.36	0.024	<0.005	0.006	<0.005	–	–	1.00	0.79	FL
Wannon Water	Lismore	265	CL	Filt	100	0.3	0.18	0.073	<0.005	0.018	0.007	–	–	0.07	0.06	
Wannon Water	Merino	200	CL	B Filt	100	1.4	–	0.160	0.005	0.007	0.006	–	–	0.18	0.16	
Wannon Water	Mortlake	940	Clam	Filt	100	0.8	0.11	0.095	<0.005	0.018	0.038	–	–	0.08	0.06	
Wannon Water	Noorat/Glenormiston	350	Clam	Filt	100	0.1	0.13	0.150	<0.005	0.039	0.047	–	–	0.07	0.05	
Wannon Water	Paaratte	30	CL	B Filt	100	0.2	0.05	0.012	<0.005	<0.005	<0.005	–	–	0.30	0.17	
Wannon Water	Penshurst	500	CL	B	100	0.2	–	0.028	<0.005	<0.005	<0.005	–	–	0.25	0.19	
Wannon Water	Peterborough	150	CL	Filt	100	0.2	0.05	0.016	<0.005	<0.005	<0.005	–	–	0.26	0.18	
Wannon Water	Port Campbell	460	CL	B Filt	100	0.2	0.06	0.019	<0.005	<0.005	<0.005	–	–	0.18	0.16	
Wannon Water	Port Fairy	2,710	CL	B	100	0.5	–	0.063	<0.005	<0.005	<0.005	–	–	0.73	0.69	NF
Wannon Water	Portland	10,130	CL	B	100	0.1	–	0.069	<0.005	<0.005	<0.005	–	–	1.40	0.98	NF
Wannon Water	Purnim	70	CL	Filt	100	1.7	0.07	0.170	<0.005	0.037	0.050	–	–	0.09	0.07	
Wannon Water	Sandford	90	CL	B Filt	100	1.6	–	0.190	<0.005	0.009	0.006	–	–	0.18	0.14	
Wannon Water	Simpson	130	CL	Filt	100	0.2	0.10	0.100	<0.005	0.011	0.010	–	–	0.05	0.05	
Wannon Water	Tarrington	110	CL	Filt	100	0.8	3.50	0.011	<0.005	0.013	<0.005	–	–	0.22	0.11	
Wannon Water	Terang	1,860	Clam	Filt	100	0.1	0.16	0.150	<0.005	0.036	0.046	–	–	0.06	0.05	
Wannon Water	Timboon	780	CL	Filt	100	0.2	0.07	0.044	<0.005	<0.005	<0.005	–	–	0.20	0.16	
Wannon Water	Warrnambool	31,020	Clam	Filt	100	0.2	0.40	0.041	<0.005	0.007	0.007	–	–	1.00	0.74	FL
Localities and population 34 71,395																

Water supplier	Water sampling locality	Estimated Population	Type of disinfection	Filtered supply	E. coli/100 mL	Turbidity	Aluminium	THMs	MCA	DCA	TCA	Bromate	Formaldehyde		Fluoride		Fluoride dated supply
													Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Mean [mg/L]	
Western Water	Bulla	730	CL/Clam	Filt	100	0.9	0.13	0.064	0.005	0.023	0.036	—	—	1.2	0.9	FL	
Western Water	Darley	3,190	CL	—	100	0.9	0.13	0.118	0.005	0.014	0.056	—	—	1.1	0.9	FL	
Western Water	Diggers Rest	2,480	CL/Clam	—	100	1.0	0.10	0.063	0.005	0.005	0.025	—	—	1.2	0.9	FL	
Western Water	Gisborne	9,320	CL/Clam	—	100	1.0	0.13	0.071	0.005	0.006	0.013	—	—	1.2	0.9	FL	
Western Water	Lancefield	1,920	CL	Filt	100	0.3	0.02	0.113	0.005	0.006	0.005	—	—	0.1	0.1	FL	
Western Water	Lerdererg	10,380	CL	—	100	1.1	0.13	0.088	0.005	0.013	0.020	—	—	1.1	0.9	FL	
Western Water	Macedon	2,450	CL/Clam	—	100	0.9	0.15	0.107	0.005	0.014	0.020	—	—	1.2	0.9	FL	
Western Water	Maddingley	3,940	CL	—	100	0.9	0.16	0.109	0.005	0.007	0.053	—	—	1.0	0.9	FL	
Western Water	Melton South	42,020	CL	—	100	1.0	0.11	0.062	0.005	0.029	0.046	—	—	1.1	0.9	FL	
Western Water	Merrimu	8,830	CL	—	100	1.0	0.13	0.092	0.005	0.012	0.027	—	—	1.1	0.9	FL	
Western Water	Mount Macedon	790	CL/Clam	—	100	0.8	0.16	0.112	0.005	0.014	0.023	—	—	1.2	0.9	FL	
Western Water	Myrmong	280	CL	Filt	100	0.5	0.08	0.239	0.005	0.024	0.059	—	—	0.2	0.2	FL	
Western Water	Riddells Creek	3,500	CL/Clam	—	100	1.0	0.10	0.068	0.005	0.014	0.019	—	—	1.1	0.9	FL	
Western Water	Rockbank	2,210	CL	—	100	1.0	0.09	0.100	0.005	0.026	0.065	—	—	1.2	0.9	FL	
Western Water	Romsey	4,500	Clam	Filt	100	0.3	0.04	0.029	0.005	0.015	0.005	—	—	0.4	0.2	FL	
Western Water	Sunbury	37,310	CL/Clam	—	100	1.1	0.19	0.052	0.005	0.024	0.032	—	—	1.1	0.9	FL	
Western Water	Toolern Vale	590	CL	—	100	0.7	0.18	0.153	0.005	0.018	0.029	—	—	1.0	0.8	FL	
Western Water	Woodend	5,290	Clam	Filt	98.4	0.3	0.12	0.005	0.005	0.005	0.005	—	—	0.6	0.3	FL	
Localities and population 18																	
Westernport Water	Bass	1,260	CL	Filt	100	0.7	0.15	0.114	<0.005	0.009	0.010	—	—	—	—	—	FL
Westernport Water	Cape Woolamai	3,100	CL	Filt	100	0.4	0.02	0.178	<0.005	0.008	0.009	—	—	—	—	—	FL
Westernport Water	Corinella	1,400	CL	Filt	100	0.4	0.02	0.144	<0.005	0.021	0.014	—	—	—	—	—	FL
Westernport Water	Cowes	3,870	CL	Filt	100	0.2	0.02	0.210	<0.005	0.012	0.011	—	—	—	—	—	FL
Westernport Water	Grantville	830	CL	Filt	100	1.4	0.05	0.228	0.005	0.034	0.022	—	—	—	—	—	FL
Westernport Water	Kilcunda	540	CL	Filt	100	0.2	0.03	0.186	<0.005	0.018	0.013	—	—	—	—	—	FL
Westernport Water	Rhyll	500	CL	Filt	100	1.0	0.02	0.212	<0.005	0.016	0.012	—	—	—	—	—	FL
Westernport Water	San Remo	1,020	CL	Filt	100	0.4	0.04	0.177	<0.005	0.008	0.010	—	—	—	—	—	FL
Westernport Water	Ventnor	660	UV/CL	Filt	100	0.4	0.03	0.235	<0.005	0.005	0.008	—	—	—	—	—	FL
Localities and population 9																	
Yarra Valley Water	Brahams Road	140	UV/CL	—	100	1.6	—	0.055	0.002	0.019	0.021	—	—	—	—	—	FL
Yarra Valley Water	Bundoora	118,210	CL	—	99.7	0.6	0.02	0.048	0.002	0.002	0.019	—	—	1.0	0.87	FL	
Yarra Valley Water	Croydon	129,630	CL	—	100	1.0	—	0.078	0.002	0.019	0.035	—	—	1.1	0.94	FL	
Yarra Valley Water	Doncaster	87,340	CL	—	100	1.0	—	0.095	0.002	0.007	0.032	—	—	—	—	FL	
Yarra Valley Water	Eltham	22,000	CL	Filt	100	0.4	0.15	0.046	0.002	0.002	0.006	—	—	1.0	0.87	FL	
Yarra Valley Water	Emerald	16,180	Clam	—	100	1.1	—	0.004	0.002	0.010	0.002	—	—	—	—	FL	
Yarra Valley Water	Epping	59,700	CL	Filt	100	0.5	0.02	0.038	0.002	0.002	0.005	—	—	1.0	0.89	FL	
Yarra Valley Water	Glen Waverley	94,100	CL	—	100	1.2	—	0.097	0.002	0.009	0.034	—	—	—	—	FL	
Yarra Valley Water	Glenroy	126,120	CL	—	100	1.2	—	0.038	0.002	0.007	0.016	—	—	—	—	FL	
Yarra Valley Water	Healesville	9,760	CL	Filt	100	0.5	0.04	0.130	0.002	0.006	0.052	—	—	—	—	FL	
Yarra Valley Water	Ivanhoe	22,010	CL	—	100	0.9	0.07	0.066	0.002	0.002	0.030	—	—	1.1	0.93	FL	
Yarra Valley Water	Kew	149,110	CL	—	100	1.0	0.06	0.082	0.002	0.002	0.012	—	—	1.1	0.94	FL	

Water supplier	Water sampling locality	Estimated Population	Type of disinfection	Filtered supply	E. coli/100 mL % 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		Fluoride		Fluoride dated supply
													Maximum [mg/L]	Maximum [mg/L]	Maximum [mg/L]	Mean [mg/L]	
Yarra Valley Water	Lilydale	39,940	CL		100	1.1	--	0.094	0.002	0.013	0.035	--	--	1.1	0.94	FL	
Yarra Valley Water	Lower Plenty	16,790	CL		99.0	1.0	--	0.086	0.002	0.019	0.037	--	--	--	--	FL	
Yarra Valley Water	Lyrebird Avenue	830	UV		100	5.4	--	0.001	0.002	0.002	0.002	--	--	--	--	FL	
Yarra Valley Water	Malvern	83,410	CL		100	1.1	--	0.100	0.002	0.005	0.031	--	--	--	--	FL	
Yarra Valley Water	Mernda/Hursbridge	19,830	CL	Filt	100	0.5	0.02	0.047	0.002	0.002	0.002	--	--	0.98	0.83	FL	
Yarra Valley Water	Mitcham	112,090	CL		100	1.0	--	0.083	0.002	0.007	0.033	--	--	1.1	0.95	FL	
Yarra Valley Water	Montrose	15,700	CL		100	0.9	--	0.080	0.002	0.016	0.035	--	--	1.1	0.92	FL	
Yarra Valley Water	Northcote	98,300	CL		100	0.6	0.03	0.057	0.002	0.002	0.020	--	--	--	--	FL	
Yarra Valley Water	Plenty	34,060	CL	Filt	100	0.4	0.03	0.039	0.002	0.002	0.002	--	--	--	--	FL	
Yarra Valley Water	Preston	126,510	CL		100	0.6	0.03	0.065	0.002	0.002	0.013	--	--	--	--	FL	
Yarra Valley Water	Ridge/Monbulk	14,670	Clam		100	1.2	--	0.087	0.002	0.019	0.023	--	--	1.1	0.91	FL	
Yarra Valley Water	Seville	5,490	Clam		100	1.1	--	0.009	0.002	0.009	0.002	--	--	--	--	FL	
Yarra Valley Water	Somerton	77,990	CL		100	0.9	--	0.097	0.002	0.008	0.039	--	--	--	--	FL	
Yarra Valley Water	Wallan	6,470	CL		99.0	1.1	--	0.150	0.002	0.008	0.033	--	--	--	--	FL	
Yarra Valley Water	Warburton	3,790	UV/CL		100	1.9	--	0.059	0.002	0.008	0.017	--	--	--	--	FL	
Yarra Valley Water	Warranwood	50,180	CL		100	1.1	--	0.097	0.002	0.017	0.038	--	--	1.1	0.94	FL	
Yarra Valley Water	Whittlesea	5,240	CL	Filt	100	0.6	0.05	0.067	0.002	0.002	0.002	--	--	1.0	0.87	FL	
Yarra Valley Water	Woori/Yallock	6,840	UV/CL		100	1.8	--	0.057	0.002	0.014	0.025	--	--	--	--	FL	
Yarra Valley Water	Yarra Glen	2,710	CL	Filt	100	0.4	0.04	0.150	0.002	0.022	0.067	--	--	--	--	FL	
Yarra Valley Water	Yarra Junction	3,580	UV/CL		100	1.9	--	0.047	0.002	0.010	0.013	--	--	--	--	FL	
Localities and population 32																	
Falls Creek ARMB	Falls Creek	Seasonal population	UV		100	1.3	--	--	--	--	--	--	--	<0.05	<0.05	--	
Localities and population 1																	
Mount Baw Baw ARMB	Mount Baw Baw	Seasonal population	UV/CL		100	0.4	--	0.180	<0.05	<0.02	<0.06	--	--	--	--	--	
Localities and population 1																	
Mount Hotham ARMB	Mount Hotham	Seasonal population	UV		96.2	0.3	--	--	--	--	--	--	--	--	--	--	
Localities and population 1																	

Appendix 8: Notifications 2008–09

(Sorted alphabetically by type then water sampling locality)

Date	Water sampling locality	Type	Water Supplier
Oct-08	Glenthompson	Aluminium	Wannon Water
Feb-09	Coleraine	Blue Green Algae in raw water	Wannon Water
Apr-09	Gunbower	Blue Green Algae in raw water	Coliban Water
Jan-09	Boolarra	Boil water notice after fires	Gippsland Water
Feb–March 09	Marysville & Buxton	Boil water notice after fires	Goulburn Valley Water
Feb-09	Mount Baw Baw	Boil water notice after fires	Mount Baw Baw ARMB
Nov-08	Whitfield	Boil water notice due to dirty water	North East Water
Dec-08	Broadford	Chloral hydrate	Goulburn Valley Water
Dec-08	Eildon	Chloral hydrate	Goulburn Valley Water
Jan-09	Eildon	Chloral hydrate	Goulburn Valley Water
Apr-09	Eildon	Chloral hydrate	Goulburn Valley Water
Oct-08	Longwood	Chloral hydrate	Goulburn Valley Water
May-09	Longwood	Chloral hydrate	Goulburn Valley Water
Jun-09	Longwood	Chloral hydrate	Goulburn Valley Water
Jul-08	Thornton	Chloral hydrate	Goulburn Valley Water
Sep-08	Thornton	Chloral hydrate	Goulburn Valley Water
Nov-08	Thornton	Chloral hydrate	Goulburn Valley Water
Mar-09	Thornton	Chloral hydrate	Goulburn Valley Water
Nov-08	Upper Delatite	Chloral hydrate	Goulburn Valley Water
Feb-09	Upper Delatite	Chloral hydrate	Goulburn Valley Water
Apr-09	Upper Delatite	Chloral hydrate	Goulburn Valley Water
Dec-08	Violet Town	Chloral hydrate	Goulburn Valley Water
Jul-08	Buxton	Chlorite	Goulburn Valley Water
Jul-08	Marysville	Chlorite	Goulburn Valley Water
Aug-08	Marysville	Chlorite	Goulburn Valley Water
Oct-08	Marysville	Chlorite	Goulburn Valley Water
Jun-09	Marysville	Chlorite	Goulburn Valley Water
Aug-08	Whitfield	Chlorite	North East Water
Dec-08	Whitfield	Chlorite	North East Water
Jan-09	Whitfield	Chlorite	North East Water
Feb-09	Whitfield	Chlorite	North East Water
Apr-09	Whitfield	Chlorite	North East Water
July 08–June 09	Lake Bolac	Chlorite	Grampians Wimmera Mallee Water
July 08–June 09	Willaura	Chlorite	Grampians Wimmera Mallee Water
Aug-08	Corryong	Cryptosporidium	North East Water
Nov-08	Corryong	Cryptosporidium	North East Water
Nov-08	Myrtleford	Cryptosporidium	North East Water
Nov-08	Tawonga	Cryptosporidium	North East Water

Date	Water sampling locality	Type	Water Supplier
Jan-Feb 09	Dunkeld	Elevated chlorine	Wannon Water
Dec-08	Raywood	Elevated chlorine	Coliban Water
Dec-08	Walwa	Elevated chlorine	North East Water
Nov-08	Mount Beauty	Enterococci	North East Water
Dec-08	Mount Beauty	Enterococci	North East Water
Nov 08-March 09	Myrtleford	Enterococci	North East Water
Dec-08	Tawonga	Enterococci	North East Water
Jan-09	Tawonga	Enterococci	North East Water
Mar-09	Traralgon	Escherichia coli at entry point	Gippsland Water
Apr-09	Berwick	Escherichia coli at hydrant	South East Water
Oct-08	Ferntree Gully	Escherichia coli at hydrant	South East Water
Feb-09	Balnarring	Escherichia coli at tank outlet	South East Water
Apr-09	Balnarring	Escherichia coli at tank outlet	South East Water
Dec-08	Cavendish	Escherichia coli at tank outlet	Wannon Water
Jun-09	Chum Creek	Escherichia coli at tank outlet	Yarra Valley Water
Apr-09	Cranbourne	Escherichia coli at tank outlet	South East Water
Dec-08	Frankston South	Escherichia coli at tank outlet	South East Water
Oct-08	Goorambat	Escherichia coli at tank outlet	North East Water
Feb-09	Inglewood	Escherichia coli at tank outlet	Coliban Water
May-09	Maldon	Escherichia coli at tank outlet	Coliban Water
Oct-08	Tawonga	Escherichia coli at tank outlet	North East Water
May-09	Warburton	Escherichia coli at tank outlet	Yarra Valley Water
Apr-09	Werribee	Escherichia coli at tank outlet	City West Water
Mar-09	Ian Bartlett WTP	Escherichia coli at treatment plant outlet	Westernport Water
Feb-09	Portland	Escherichia coli at treatment plant outlet	Wannon Water
Feb-09	Tawonga	Escherichia coli at treatment plant outlet	North East Water
Nov-08	Winneke WTP	Escherichia coli at treatment plant outlet	Melbourne Water [#]
Dec-08	Kyabram	Escherichia coli at water tower	Goulburn Valley Water
Dec-08	Creswick	Escherichia coli in basin	Central Highlands Water
Nov-08	Bittern	Escherichia coli in main	Melbourne Water [#]
Dec-08	Anakie	Escherichia coli in tank	Barwon Water
Nov-08	Birregurra	Escherichia coli in tank	Barwon Water
Nov-08	Buninyong	Escherichia coli in tank	Central Highlands Water
Mar-09	Cardigan Village	Escherichia coli in tank	Central Highlands Water
Jul-08	Dean	Escherichia coli in tank	Central Highlands Water
Mar-09	Grantville	Escherichia coli in tank	Westernport Water
Mar-09	Myrning	Escherichia coli in tank	Western Water
Jan-09	Portarlington	Escherichia coli in tank	Barwon Water
Feb-09	Portarlington	Escherichia coli in tank	Barwon Water
Dec-08	Sunbury	Escherichia coli in tank	Western Water
Feb-09	Talbot	Escherichia coli in tank	Central Highlands Water

Date	Water sampling locality	Type	Water Supplier
Dec-08	Beaufort	Escherichia coli in drinking water	Central Highlands Water
Jan-09	Beaufort	Escherichia coli in drinking water	Central Highlands Water
Mar-09	Beaufort	Escherichia coli in drinking water	Central Highlands Water
Jun-09	Boort	Escherichia coli in drinking water	Coliban Water
Feb-09	Brighton/Heatherton	Escherichia coli in drinking water	South East Water
Feb-09	Buchan	Escherichia coli in drinking water	East Gippsland Water
Jun-09	Cavendish	Escherichia coli in drinking water	Wannon Water
Oct-08	Chiltern	Escherichia coli in drinking water	North East Water
May-09	Coleraine	Escherichia coli in drinking water	Wannon Water
Jun-09	Corryong	Escherichia coli in drinking water	North East Water
Jan-09	Dartmouth	Escherichia coli in drinking water	North East Water
Jan-09	Derrinallum	Escherichia coli in drinking water	Wannon Water
Dec-08	Gabo Island Lightstation	Escherichia coli in drinking water	Parks Victoria
Jun-09	Gabo Island Lightstation	Escherichia coli in drinking water	Parks Victoria
Mar-09	Henty	Escherichia coli in drinking water	Wannon Water
Mar-09	Horsham	Escherichia coli in drinking water	Grampians Wimmera Mallee Water
Dec-08	Koo Wee Rup	Escherichia coli in drinking water	South East Water
Mar-09	Leongatha	Escherichia coli in drinking water	South Gippsland Water
Apr-09	Leongatha	Escherichia coli in drinking water	South Gippsland Water
May-09	Malmsbury	Escherichia coli in drinking water	Coliban Water
May-09	Marysville	Escherichia coli in drinking water	Goulburn Valley Water
Jan-09	Mirimbah	Escherichia coli in drinking water	Mount Buller & Mount Stirling ARMB
Jul-08	Mount Hotham	Escherichia coli in drinking water	Mount Hotham ARMB
Feb-09	Mount Hotham	Escherichia coli in drinking water	Mount Hotham ARMB
Feb-09	Myrtleford	Escherichia coli in drinking water	North East Water
Apr-09	Quambatook	Escherichia coli in drinking water	Grampians Wimmera Mallee Water
Apr-09	Somerville	Escherichia coli in drinking water	South East Water
Jun-09	Thomastown	Escherichia coli in drinking water	Yarra Valley Water
Mar-09	Toora	Escherichia coli in drinking water	South Gippsland Water
Mar-09	Wallan	Escherichia coli in drinking water	Yarra Valley Water
Nov-08	Willaura	Escherichia coli in drinking water	Grampians Wimmera Mallee Water
Dec-08	Wilsons Promontory Lightstation	Escherichia coli in drinking water	Parks Victoria
Jul-08	Wimbledon Heights	Escherichia coli in drinking water	Westernport Water
Feb-09	Woodend	Escherichia coli in drinking water	Western Water
Jun-09	Yackandandah	Escherichia coli in drinking water	North East Water
May-09	Coleraine	Escherichia coli in drinking water and disinfection failure	Wannon Water
Jun-09	Warburton East	Escherichia coli in drinking water and turbid water event	Yarra Valley Water

Date	Water sampling locality	Type	Water Supplier
May-09	Moonee Ponds	Giardia	City West Water
Dec-08	Grantville	Heterotrophic plate count	Westernport Water
Oct-08	Gordon	Lead	Central Highlands Water
Dec-08	Gordon	Lead	Central Highlands Water
Dec-08	Corryong	Loss of disinfection	North East Water
Feb-09	Mount Beauty & Tawonga	Loss of disinfection	North East Water
Aug-08	Woomelang	Loss of disinfection	Grampians Wimmera Mallee Water
Feb-09	Thornton	Loss of power to disinfection plant	Goulburn Valley Water
Jul-08	Bright	Manganese	North East Water
Mar-09	Casterton	Manganese	Wannon Water
Aug-08	Mount Macedon	Raw water supply due to pump failure – boil water notice	Western Water
Mar-09	Buxton	Trichloroacetic acid	Goulburn Valley Water
Sep-08	Mt Stirling – Telephone Box Junction	Trichloroacetic acid	Mount Buller & Mount Stirling ARMB
Oct-08	Rupanyup	Trichloroacetic acid	Grampians Wimmera Mallee Water
Mar-09	Thornton	Trichloroacetic acid	Goulburn Valley Water
May–June 09	Thornton	Trichloroacetic acid	Goulburn Valley Water
Nov-08	Upper Delatite	Trichloroacetic acid	Goulburn Valley Water
Oct-08	Alma	Trihalomethanes	Central Highlands Water
Nov-08	Charlton	Trihalomethanes	Grampians Wimmera Mallee Water
Apr-09	Charlton	Trihalomethanes	Grampians Wimmera Mallee Water
July 08–June 09	Coleraine	Trihalomethanes	Wannon Water
Feb-09	Hopetoun	Trihalomethanes	Grampians Wimmera Mallee Water
Aug-08	Lexton	Trihalomethanes	Central Highlands Water
Jul-08	Maryborough system	Trihalomethanes	Central Highlands Water
Oct-08	Maryborough system	Trihalomethanes	Central Highlands Water
Nov-08	Maryborough system	Trihalomethanes	Central Highlands Water
Feb–March 09	Pyalong	Trihalomethanes	Goulburn Valley Water
Oct 08–Jan 09	Quambatook	Trihalomethanes	Grampians Wimmera Mallee Water
Feb–March 09	Quambatook	Trihalomethanes	Grampians Wimmera Mallee Water
Oct-08	Rokewood	Trihalomethanes	Central Highlands Water
Nov-08	Rokewood	Trihalomethanes	Central Highlands Water
July–Oct 08	Warracknabeal	Trihalomethanes	Grampians Wimmera Mallee Water
Oct–Dec 08	Bealiba	Trihalomethanes	Coliban Water
Jul-08	Beulah	Trihalomethanes	Grampians Wimmera Mallee Water
Oct 08–Jan 09	Beulah	Trihalomethanes	Grampians Wimmera Mallee Water
July 08–June 09	Donald	Trihalomethanes	Grampians Wimmera Mallee Water
July–Oct 08	Jung	Trihalomethanes	Grampians Wimmera Mallee Water
July 08–April 09	Minyip	Trihalomethanes	Grampians Wimmera Mallee Water

Date	Water sampling locality	Type	Water Supplier
July–Oct 08	Murtoa	Trihalomethanes	Grampians Wimmera Mallee Water
Jul-08	Rainbow	Trihalomethanes	Grampians Wimmera Mallee Water
Oct-08	Rainbow	Trihalomethanes	Grampians Wimmera Mallee Water
July 08–May 09	Rupanyup	Trihalomethanes	Grampians Wimmera Mallee Water
Jan-09	Serpentine	Trihalomethanes	Coliban Water
July 08–March 09	Woomelang	Trihalomethanes	Grampians Wimmera Mallee Water
Aug 08–May 09	Wycheproof	Trihalomethanes	Grampians Wimmera Mallee Water
Nov-08	Cavendish	Turbidity	Wannon Water
Feb-09	Grantville	Turbidity	Westernport Water
Jun-09	Trawool	Turbidity	Goulburn Valley Water
Dec-08	Wallan	Unauthorised access to tank	Yarra Valley Water
Jun-09	Preston	Widespread customer complaint	Yarra Valley Water
Aug-08	Hamilton	Widespread customer complaint and elevated turbidity	Wannon Water
Jan-09	Melton West and Kurunjang	Widespread customer complaint due to burst water main	Western Water
Jan-09	Broadford	Widespread customer complaint due to dirty water	Goulburn Valley Water
Dec-08	Horsham	Widespread customer complaint due to dirty water	Grampians Wimmera Mallee Water
Oct-08	Maryborough	Widespread customer complaint due to dirty water	Central Highlands Water
Nov-08	Maryborough	Widespread customer complaint due to taste and odour	Central Highlands Water

Notes

Bold means the incident was associated with a **Boil Water notice**

ARMB means Alpine Resort Management Board

WTP means water treatment plant

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

Melbourne Water is a water storage manager

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, Skenes Creek, Marengo
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, Wallington, Swan Bay
Colac	Barwon Water	Colac, Coragulac, Beeac, Cororooke, Alvie, Elliminyt
Cressy	Barwon Water	Cressy
Forrest	Barwon Water	Forrest
Gellibrand	Barwon Water	Gellibrand
Highton	Barwon Water	Highton, Geelong West, Newtown, Geelong, South Geelong, East Geelong, Breakwater, Thomson, Newcomb, Whittington, Moolap, Rippleside
Highton High Level	Barwon Water	Ceres, Wandana Heights
Leopold	Barwon Water	Leopold, Curlewis
Lethbridge	Barwon Water	Lethbridge, She Oaks
Little River West	Barwon Water	Little River West
Lorne	Barwon Water	Lorne
Lovely Banks	Barwon Water	Geelong North, Hamlyn Heights, Bell Park, Norlane, North Shore, Corio, Lara
Lovely Banks – Carrs Rd	Barwon Water	Lovely Banks, Moorabool
Meredith	Barwon Water	Meredith
Montpellier	Barwon Water	Montpellier, Bell Post Hill, Hamlyn Heights, Hern Hill, Highton, Newtown, Belmont, Geelong West, Fyansford
Moriac	Barwon Water	Moriac
Ocean Acres	Barwon Water	Ocean Acres (near Torquay)
Ocean Grove	Barwon Water	Ocean Grove, Barwon Heads, Marcus Hill
Pettavel	Barwon Water	Pettavel, Mount Duneed, Fresh Water Creek, Connewarre, Breamlea, Grovedale, Waurn Ponds, Marshall
Portarlington	Barwon Water	Portarlington, St Leonards, Indented Heads
Queenscliff	Barwon Water	Queenscliff, Point Lonsdale
Teesdale	Barwon Water	Teesdale, Shelford, Inverleigh
Torquay	Barwon Water	Torquay, Jan Juc
Winchelsea	Barwon Water	Winchelsea
Alma	Central Highlands Water	Alma, Adelaide Lead, Moonlight
Avoca	Central Highlands Water	Avoca
Ballan	Central Highlands Water	Ballan
Ballarat Central	Central Highlands Water	Alfredton pt, Ballarat, Ballarat East pt, Canadian, Delacombe pt, Golden Point, Mount Pleasant, Redan, Woodmans Hill
Ballarat North/Nerrina	Central Highlands Water	Ballarat North pt, Nerrina
Beaufort	Central Highlands Water	Beaufort
Bet Bet	Central Highlands Water	Bet Bet, Havelock, Betley, Simson

Water Sampling Locality	Water Supplier	Suburb/Town Supplied
Blackwood/Barrys Reef	Central Highlands Water	Blackwood, Barrys Reef
Bungaree/Wallace	Central Highlands Water	Bungaree, Wallace
Buninyong/Mount Helen	Central Highlands Water	Buninyong, Mount Helen, Mount Clear, Mount Pleasant
Cardigan Village	Central Highlands Water	Cardigan, Cardigan Village, Alfredton pt
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	Rokewood, Enfield pt, Corindhap, Dereel
Fiskville/Glenmore	Central Highlands Water	Fiskville, Glenmore, Rowsley
Forest Hill	Central Highlands Water	Broomfield, Newlyn, Springmount, Allendale, Kingston, Smeaton
Gordon/Mount Egerton	Central Highlands Water	Gordon, Mount Egerton
Haddon	Central Highlands Water	Haddon, Snake Valley, Carngham, Smythes Creek, Delacombe pt
Lal Lal	Central Highlands Water	Lal Lal, Bungal, Yendon, Navigators
Learmonth	Central Highlands Water	Learmonth
Lexton	Central Highlands Water	Lexton
Linton	Central Highlands Water	Linton, Pittong
Majorca	Central Highlands Water	Majorca, Golden Point, Craigie
Maryborough	Central Highlands Water	Maryborough
Napoleons	Central Highlands Water	Napoleons, Enfield pt, Woodlands
Sebastopol	Central Highlands Water	Sebastopol, Magpie, Delacombe pt
Skipton	Central Highlands Water	Skipton, Pittong
Smythesdale	Central Highlands Water	Smythesdale, Newtown, Scarsdale
Talbot	Central Highlands Water	Talbot
Timor	Central Highlands Water	Timor, Bowenvale
Waubra	Central Highlands Water	Waubra
Wendouree	Central Highlands Water	Wendouree, Brown Hill, Invermay, Black Hill, Miners Rest, Mitchell Park, Mount Rowan, Lake Gardens, Ballarat North pt, Ballarat East pt, Warrenheip
Altona	City West Water	Altona, Altona North pt, Laverton, Point Cook, Truganina
Caroline Springs	City West Water	Caroline Springs, Kealba, Keilor, Kings Park, St Albans pt
Deer Park	City West Water	Cairnlea, Deer Park, Derrimut, St Albans pt, Sunshine North
East Keilor	City West Water	Avondale Heights, Essendon pt, 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 pt, 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

Water Sampling Locality	Water Supplier	Suburb/Town Supplied
Taylors Lakes	City West Water	Hillside, Sydenham, Taylors Lakes
Tullamarine	City West Water	Airport West, Melbourne Airport, Strathmore Heights, Tullamarine pt
Werribee	City West Water	Hoppers Crossing, Tarneit, Werribee, Wyndham Vale
Werribee South	City West Water	Werribee South
Williamstown	City West Water	Altona North pt, Newport, Spotswood, Williamstown
Axedale	Coliban Water	Axedale
Bealiba	Coliban Water	Bealiba
Bendigo (Northern)	Coliban Water	Bendigo, California Gully pt, Eaglehawk, Bendigo East, Jackass Flat, pt Long Gully, Myers Flat, Bendigo North, Sailors Gully, White Hills
Bendigo (Southern)	Coliban Water	California Gully pt, Flora Hill pt, Golden Square, Kangaroo Flat, Kennington pt, Long Gully pt, Quarry Hill, Bendigo West
Bendigo (Spring Gully)	Coliban Water	Flora Hill pt, Kennington pt, Spring Gully, Strathdale
Big Hill	Coliban Water	Big Hill, Belvoir Park
Boort	Coliban Water	Boort
Bridgewater	Coliban Water	Bridgewater
Castlemaine	Coliban Water	Castlemaine, Campbells Creek, Chewton, Golden Point
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	Harcourt, Castlemaine North pt
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

Water Sampling Locality	Water Supplier	Suburb/Town Supplied
Serpentine	Coliban Water	Serpentine
Strathfieldsaye	Coliban Water	Strathfieldsaye
Taradale – Elphinstone	Coliban Water	Taradale, Elphinstone
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, Wy Yung, Lucknow, Bairnsdale East, Eastwood, Granite Rock
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
Eagle Point – Paynesville	East Gippsland Water	Paynesville, Eagle Point, Raymond Island, Newlands Arm, Banksia Peninsula
Kalimna	East Gippsland Water	Kalimna
Lindenow	East Gippsland Water	Lindenow
Lindenow South	East Gippsland Water	Lindenow South
Mallacoota	East Gippsland Water	Mallacoota, Karbethong, Mirrabooka
Merrangbaur	East Gippsland Water	Merrangbaur, Lake Tyers, Lake Bunga
Metung	East Gippsland Water	Metung pt
Nicholson – Swan Reach	East Gippsland Water	Nicholson, Johnsonville, Swan Reach, Metung pt, Tambo Upper
Nowa Nowa	East Gippsland Water	Nowa Nowa
Omeo	East Gippsland Water	Omeo
Orbost	East Gippsland Water	Orbost, Newmerella, Marlo
Sarsfield – Bruthen	East Gippsland Water	Sarsfield, Bruthen, Wiseleigh, Mossiface
Sunlakes – Toorloo	East Gippsland Water	Lakes Entrance, Lake Tyers, Lake Bunga
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	Jumbuk, Jeeralang Junction
Maffra	Gippsland Water	Maffra
Mirboo North	Gippsland Water	Mirboo North
Moe	Gippsland Water	Moe, Newborough pt
Morwell	Gippsland Water	Morwell
Neerim South	Gippsland Water	Neerim South

Water Sampling Locality	Water Supplier	Suburb/Town Supplied
Newborough	Gippsland Water	Newborough pt
Noojee	Gippsland Water	Noojee
Rawson	Gippsland Water	Rawson
Rokeby/Buln Buln	Gippsland Water	Rokeby, Buln Buln
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
Traralgon South/ Hazelwood North	Gippsland Water	Traralgon South, Hazelwood North
Tyers/Glengarry	Gippsland Water	Tyers, Glengarry
Warragul	Gippsland Water	Warragul, Nilma, Darnum
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

Water Sampling Locality	Water Supplier	Suburb/Town Supplied
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	Seymour (low level area), Mangalore
Shepparton	Goulburn Valley Water	Shepparton, Congupna
Stanhope	Goulburn Valley Water	Stanhope
Strathmerton	Goulburn Valley Water	Strathmerton
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	Wandong, Heathcote Junction
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	Halls Gap, Bellfield
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

Water Sampling Locality	Water Supplier	Suburb/Town Supplied
Manangatang	Grampians Wimmera Mallee Water	Manangatang
Minyip	Grampians Wimmera Mallee Water	Minyip
Murtoa	Grampians Wimmera Mallee Water	Murtoa
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
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	Irymple, Cardross
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	Mildura, Nichols Point, Birdwoodton, Cabarita, Kings Billabong
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)

Water Sampling Locality	Water Supplier	Suburb/Town Supplied
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	Ebden, Baranduda pt
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
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
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 pt, Killara
Wodonga High Level	North East Water	Wodonga pt
Wodonga Logic Centre	North East Water	Wodonga Logic Centre
Wodonga Low Level	North East Water	Wodonga pt
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 (Wilson's Promontory National Park)
Twelve Apostles Visitor Facility	Parks Victoria	Twelve Apostles Visitor Facility (Port Campbell National Park)
Wilson's Promontory Lightstation	Parks Victoria	Wilson's Promontory Lightstation (Wilson's Promontory National Park)

Water Sampling Locality	Water Supplier	Suburb/Town Supplied
Balnarring	South East Water	Balnarring, Merricks, Somers
Bayswater	South East Water	Bayswater, Boronia, Knoxfield, The Basin, Wantirna pt
Beaumaris	South East Water	Beaumaris, Black Rock, Cheltenham
Belgrave	South East Water	Belgrave, Selby, Tecoma, Upwey
Berwick	South East Water	Berwick, Beaconsfield, Narre Warren South, Narre Warren North, Officer
Bittern	South East Water	Bittern, Crib Point, HMAS Cerberus
Brighton/Heatherton	South East Water	Bentleigh, Bentleigh East, Brighton, Brighton East, Cheltenham, Clarinda, Clayton South, Hampton, Heatherton, Highett, McKinnon, Mentone, Moorabbin, Oakleigh South, Ormond, Sandringham, Springvale, Westall
Bunyip	South East Water	Bunyip, Longwarry
Carrum Downs	South East Water	Carrum Downs, Skye
Caulfield	South East Water	Armadale pt, Balaclava, Carnegie, Caulfield, Clayton, Elsternwick, Elwood, Glen Huntly, Hughesdale, Huntingdale, Murrumbeena, Oakleigh, Prahran, Ripponlea, St Kilda East, Toorak pt
Chelsea	South East Water	Aspendale Gardens, Bonbeach, Carrum, Chelsea, Edithvale, Patterson Lakes
Cora Lynn	South East Water	Cora Lynn
Cranbourne	South East Water	Cranbourne
Dandenong	South East Water	Dandenong, Dandenong South, Dingley, Keysborough, Noble Park, Springvale South, Bangholme
Dandenong North	South East Water	Dandenong North, Noble Park North, Clayton, Springvale North
Devon Meadows	South East Water	Blind Bight, Cannons Creek, Clyde, Devon Meadows, Five Ways, Tooradin, Warneet
Dromana	South East Water	Dromana, McCrae, Safety Beach, Mount Martha pt
Ferntree Gully	South East Water	Boronia, Ferntree Gully/Upper, The Basin
Frankston	South East Water	Frankston, Frankston North, Langwarrin, Baxter, Seaford
Frankston South	South East Water	Frankston South, Mount Eliza pt
Garfield	South East Water	Garfield
Hallam	South East Water	Doveton, Endeavour Hills, Eumemmerring, Hallam, Hampton Park, Lynbrook
Hastings	South East Water	Hastings
Karingal	South East Water	Karingal, Frankston East
Koo Wee Rup	South East Water	Koo Wee Rup
Lang Lang	South East Water	Lang Lang
Moorooduc	South East Water	Moorooduc, Tuerong
Mordialloc	South East Water	Braeside, Dingley, Mentone, Mordialloc, Parkdale, Waterways
Mornington	South East Water	Mornington, Mount Martha pt, Mount Eliza pt
Mount Martha	South East Water	Balcombe, Mount Martha pt
Pakenham	South East Water	Pakenham
Rowville	South East Water	Rowville, Lysterfield
Rye	South East Water	Blairstown, Boneo, Cape Schanck, Portsea, Rosebud, Rye, Sorrento, Tootgarook, Fingal
Shoreham	South East Water	Shoreham, Flinders, Point Leo
Somerville	South East Water	Somerville, Tyabb, Pearcedale
South Melbourne	South East Water	Albert Park, Garden City, Middle Park, Port Melbourne, South Melbourne, South Yarra, Southbank, St Kilda West, St Kilda Road, Windsor

Water Sampling Locality	Water Supplier	Suburb/Town Supplied
Tynong	South East Water	Tynong, Nar Nar Goon
Upper Beaconsfield	South East Water	Upper Beaconsfield
Wantirna	South East Water	Knoxfield, Scoresby, Wantirna pt
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
Meeniyah	South Gippsland Water	Meeniyah
Nyora	South Gippsland Water	Nyora
Poowong	South Gippsland Water	Poowong
Port Franklin	South Gippsland Water	Port Franklin, Bennison
Port Welshpool	South Gippsland Water	Welshpool, Port Welshpool, Hedley
Toora	South Gippsland Water	Toora, Agnes, Barry Beach
Wonthaggi	South Gippsland Water	Wonthaggi
Yarram	South Gippsland Water	Yarram, Devon North
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
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
Henty [#]	Wannon Water	Henty
Heywood	Wannon Water	Heywood
Koroit	Wannon Water	Koroit
Lismore	Wannon Water	Lismore
Merino	Wannon Water	Merino
Mortlake	Wannon Water	Mortlake

Water Sampling Locality	Water Supplier	Suburb/Town Supplied
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
Darley	Western Water	Bacchus Marsh pt, Darley
Diggers Rest	Western Water	Diggers Rest
Gisborne	Western Water	Gisborne, New Gisborne, Gisborne South
Lancefield	Western Water	Lancefield
Lerderderg	Western Water	Bacchus Marsh pt, Coimadaí
Macedon	Western Water	Macedon
Maddingley	Western Water	Bacchus Marsh pt, Maddingley, Parwan
Melton South	Western Water	Melton pt, Melton South, Melton West pt, Kurunjang pt, Hopetoun Park
Merrimu	Western Water	Long Forest, Merrimu, Melton pt, Melton West pt, Kurunjang pt
Mount Macedon	Western Water	Mount Macedon
Myrning	Western Water	Myrning
Riddells Creek	Western Water	Riddells Creek
Rockbank	Western Water	Rockbank, Plumpton
Romsey	Western Water	Romsey
Sunbury	Western Water	Sunbury, Goonawarra, Jacksons Hill
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	Kilcunda, Dalyston, Archies Creek
Rhyll	Westernport Water	Rhyll
San Remo	Westernport Water	San Remo, Newhaven
Ventnor	Westernport Water	Ventnor, Summerlands

Water Sampling Locality	Water Supplier	Suburb/Town Supplied
Brahams Road	Yarra Valley Water	Warburton East pt
Bundoora	Yarra Valley Water	Bundoora, Kingsbury, Watsonia, Greensborough, Keon Park, Reservoir, Thomastown, Lalor, Mill Park
Croydon	Yarra Valley Water	Croydon, Wonga Park, Blackburn, Forest Hill, Nunawading, Heatherdale, Mitcham, Vermont, Ringwood, Heathmont, Ringwood East, Kilsyth, Mooroolbark, Bayswater North
Doncaster	Yarra Valley Water	Templestowe, Templestowe Lower, Doncaster, Doncaster East, Donvale, Warrandyte, Blackburn North pt
Eltham	Yarra Valley Water	Eltham, Diamond Creek, Research, Wattle Glen
Emerald	Yarra Valley Water	Emerald, Menzies Creek, Cockatoo, Avonsleigh, Clematis, Macclesfield, Gembrook, Kallista
Epping	Yarra Valley Water	Epping, Lalor, Mill Park, Morang South
Glen Waverley	Yarra Valley Water	Glen Waverley, Syndal, Mount Waverley, Wheelers Hill, Burwood East, Clayton North, Notting Hill, Oakleigh East, Mulgrave pt
Glenroy	Yarra Valley Water	Glenroy, Gladstone Park, Tullamarine pt, Oak Park, Broadmeadows, Dallas, Coolaroo, Meadow Heights, Westmeadows, Pascoe Vale, Fawkner
Healesville	Yarra Valley Water	Healesville, Badger Creek, Chum Creek
Ivanhoe	Yarra Valley Water	Ivanhoe, Banyule, Eaglemont, Heidelberg
Kew	Yarra Valley Water	Kew, Kew East, Balwyn, Balwyn North pt, Hawthorn, Hawthorn East, Camberwell, Burwood, Canterbury, Surrey Hills, Bulleen, Doncaster pt
Lilydale	Yarra Valley Water	Lilydale, Chirnside Park, Mooroolbark, Coldstream, Olinda, Mount Evelyn
Lower Plenty	Yarra Valley Water	Lower Plenty, View Bank, Macleod, Yallambie, Watsonia, Greensborough, Montmorency
Lyrebird Avenue	Yarra Valley Water	Warburton East pt
Malvern	Yarra Valley Water	Burwood, Toorak pt, Armadale pt, Kooyong, Malvern, Malvern East, Glen Iris, Ashburton, Ashwood, Chadstone, Holmesglen
Mernda/Hurstbridge	Yarra Valley Water	Mernda, Diamond Creek, Yarrambat, Research, Wattle Glen, Kangaroo Ground, Arthurs Creek, Hurstbridge, Nutfield, Doreen, Mernda, Panton Hill, Smiths Gully
Mitcham	Yarra Valley Water	Burwood, Surrey Hills, Box Hill, Balwyn North pt, Box Hill North, Blackburn, Blackburn North pt, Forest Hill, Vermont, Mount Waverley, Burwood East, Mont Albert
Montrose	Yarra Valley Water	Montrose, Kilsyth
Northcote	Yarra Valley Water	Brunswick West, Brunswick, Brunswick East, Coburg, Northcote, Thornbury, Alphington, Fairfield
Plenty	Yarra Valley Water	Briar Hill, Greensborough, Diamond Creek, Plenty, Montmorency
Preston	Yarra Valley Water	Coburg, Preston, Reservoir, pt Heidelberg Heights, Heidelberg West, Rosanna, View Bank, Macleod, Pascoe Vale
Ridge/Monbulk	Yarra Valley Water	Menzies Creek, Kalorama, Mount Dandenong, Tremont, Ferny Creek, Sassafras, Olinda, Sherbrooke, Kallista, The Patch, Monbulk, Burleigh pt, Silvan
Seville	Yarra Valley Water	Seville, Seville East, Wandin
Somerton	Yarra Valley Water	Broadmeadows, Dallas, Coolaroo, Meadow Heights, Attwood, Westmeadows, Greenvale, Campbellfield, Somerton, Oaklands Junction, Craigieburn, Mickleham, Roxburgh Park
Wallan	Yarra Valley Water	Wallan
Warburton	Yarra Valley Water	Warburton, Wesburn, Millgrove
Warranwood	Yarra Valley Water	Warranwood, Research, Kangaroo Ground, Donvale, Warrandyte, Park Orchards, Wonga Park, Ringwood, Ringwood North, Croydon North

Water Sampling Locality	Water Supplier	Suburb/Town Supplied
Whittlesea	Yarra Valley Water	Whittlesea, Doreen, Mernda, Yan Yean
Woori Yallock	Yarra Valley Water	Woori Yallock, Yellingbo pt, Don Valley, Launching Place
Yarra Glen	Yarra Valley Water	Yarra Glen
Yarra Junction	Yarra Valley Water	Yarra Junction, Wesburn
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

pt means part

This appendix lists drinking water supplies for 2008–09. In July 2009 water sampling localities were gazetted for the supply of drinking water to Eynesbury (Western Water) and Sebastian (Coliban Water).

The water sampling locality of Henty (Wannon Water) was abolished from July 2009.

Underbool drinking water supply since September 2008.

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

Appendix 10: Towns without a drinking water supply from a water supplier

(please refer to explanatory notes at foot of table)

Town or supply	Local council area	Water supplier [#]
North East Victoria		
Bogong Village	Alpine Shire	—
Dederang	Alpine Shire	—
Howmans Gap camp	Alpine Shire	—
Dhurringile	Greater Shepparton City	—
Kialla and Kialla West	Greater Shepparton City	—
Kergunyah	Indigo Shire	—
Stanley	Indigo Shire	—
Wooragee	Indigo Shire	—
Goughs Bay	Mansfield Shire	—
Jamieson	Mansfield Shire	—
Woods Point	Mansfield Shire	Goulburn Valley Water
Puckapunyal Army Reserve	Mitchell Shire (notional)	—
Invergorden private pipeline	Moira Shire	—
Waaia	Moira Shire	—
Flowerdale	Murrindindi Shire	—
Kinglake	Murrindindi Shire	—
Lake Mountain Alpine Resort	Murrindindi Shire (notional)	Lake Mountain Alpine Resort Management Board
Molesworth	Murrindindi Shire	Goulburn Valley Water
Narbethong	Murrindindi Shire	—
Taggerty	Murrindindi Shire	—
Toolangi	Murrindindi Shire	—
Baddaginnie	Rural City of Benalla	—
Thoona	Rural City of Benalla	—
Winton	Rural City of Benalla	—
Edi and Edi Upper	Rural City of Wangaratta	—
Everton	Rural City of Wangaratta	—
Greta	Rural City of Wangaratta	—
Londrigan	Rural City of Wangaratta	—
Milawa (three co-operatives)	Rural City of Wangaratta	—
Myrree	Rural City of Wangaratta	—
Peechelba and Peechelba East	Rural City of Wangaratta	—
Whorouly	Rural City of Wangaratta	—
Boho South	Strathbogie Shire	—
Goulburn Weir	Strathbogie Shire	Goulburn Valley Water
Kirwans Bridge	Strathbogie Shire	Goulburn Valley Water
Strathbogie	Strathbogie Shire	Goulburn Valley Water
Bethanga	Towong Shire	—
Lake Dartmouth recreation area	Towong Shire	—
Mitta Mitta	Towong Shire	—
Talgarno	Towong Shire	—

Town or supply	Local council area	Water supplier [#]
Tallangatta Valley	Towong Shire	–
Towong	Towong Shire	–
Mount Beauty area power stations	(various)	–
North West Victoria		
Coman Spring at Buninyong	Ballarat City	–
Berriwillock	Buloke Shire	GWM Water
Culgoa	Buloke Shire	GWM Water
Nandaly	Buloke Shire	GWM Water
Watchem	Buloke Shire	GWM Water
Corop	Campaspe Shire	Goulburn Valley Water
Torrumbarry and Torrumbarry Weir	Campaspe Shire	
Macorna	Gannawarra Shire	Coliban Water
Mystic Park	Gannawarra Shire	Lower Murray Water
Costerfield	Greater Bendigo City	–
Drummartin	Greater Bendigo City	–
Lake Eppalock foreshore area	Greater Bendigo City	–
Hepburn Mineral Springs (areas not managed by Parks Victoria)	Hepburn Shire	–
Yandoit	Hepburn Shire	–
Antwerp	Hindmarsh Shire	GWM Water
Jeparit	Hindmarsh Shire	GWM Water
Kiata	Hindmarsh Shire	GWM Water
Nhill	Hindmarsh Shire	GWM Water
Tarranyurk	Hindmarsh Shire	GWM Water
Borong	Loddon Shire	Coliban Water
Dingee	Loddon Shire	Coliban Water
Jarklin	Loddon Shire	Coliban Water
Mitiamo	Loddon Shire	Coliban Water
Mysia	Loddon Shire	Coliban Water
Wychitella	Loddon Shire	Coliban Water
Carlsruhe	Macedon Ranges Shire	–
Darraweit Guim	Macedon Ranges Shire	–
Hesket	Macedon Ranges Shire	–
Lauriston	Macedon Ranges Shire	–
Newham and Hanging Rock	Macedon Ranges Shire	–
Balliang	Moorabool Shire	–
Greendale	Moorabool Shire	–
Baringhup	Mount Alexander Shire	–
Metcalfe	Mount Alexander Shire	–
Redesdale	Mount Alexander Shire	–
Glenorchy	Northern Grampians Shire	GWM Water
Marnoo	Northern Grampians Shire	GWM Water
Navarre	Northern Grampians Shire	Central Highlands Water

Town or supply	Local council area	Water supplier [#]
Stuart Mill	Northern Grampians Shire	—
Amphitheatre	Pyrenees Shire	Central Highlands Water
Crowlands	Pyrenees Shire	—
Landsborough	Pyrenees Shire	Central Highlands Water
Langi Kal Kal	Pyrenees Shire	—
Moonambel	Pyrenees Shire	—
Natte Yallock	Pyrenees Shire	—
Raglan	Pyrenees Shire	Central Highlands Water
Redbank	Pyrenees Shire	Central Highlands Water
Buangor	Rural City of Ararat	GWM Water
Elmhurst	Rural City of Ararat	GWM Water
Maroona	Rural City of Ararat	—
Mininera	Rural City of Ararat	—
Moyston	Rural City of Ararat	GWM Water
Rossbridge	Rural City of Ararat	—
Streatham	Rural City of Ararat	GWM Water
Tatyoan	Rural City of Ararat	—
Warrak	Rural City of Ararat	—
Westmere	Rural City of Ararat	GWM Water
Wickliffe	Rural City of Ararat	GWM Water
Clear Lake	Rural City of Horsham	GWM Water
Dadswells Bridge	Rural City of Horsham	—
Dooen	Rural City of Horsham	GWM Water
Laharum	Rural City of Horsham	—
Natimuk	Rural City of Horsham	GWM Water
Noradjuha	Rural City of Horsham	GWM Water
Pimpinio	Rural City of Horsham	GWM Water
Wartook	Rural City of Horsham	—
Carwarp	Rural City of Mildura	—
Cowangie	Rural City of Mildura	GWM Water
Hattah	Rural City of Mildura	—
Millewa water supply system (including Cullulleraine, Meringur and Werrimull)	Rural City of Mildura	Lower Murray Water
Murrayville	Rural City of Mildura	GWM Water
Nangiloc	Rural City of Mildura	—
Boundary Bend	Rural City of Swan Hill	—
Chillingollah	Rural City of Swan Hill	GWM Water
Chinkapook	Rural City of Swan Hill	GWM Water
Waitchie	Rural City of Swan Hill	GWM Water
Apsley	West Wimmera Shire	GWM Water
Goroke	West Wimmera Shire	GWM Water
Harrow	West Wimmera Shire	GWM Water
Kaniva	West Wimmera Shire	GWM Water
Lillimur	West Wimmera Shire	GWM Water

Town or supply	Local council area	Water supplier [#]
Miram	West Wimmera Shire	GWM Water
Serviceton	West Wimmera Shire	GWM Water
Lascelles	Yarriambiack Shire	GWM Water
Lubeck	Yarriambiack Shire	–
Patchewollock	Yarriambiack Shire	GWM Water
Speed	Yarriambiack Shire	GWM Water
Tempy	Yarriambiack Shire	GWM Water
Yaapeet	Yarriambiack Shire	GWM Water
Outer metropolitan and South East Victoria		
Ripplebrook	Baw Baw Shire	–
Jindivick	Baw Baw Shire	–
Nayook	Baw Baw Shire	–
Tanjil Bren	Baw Baw Shire	–
Walhalla	Baw Baw Shire	–
Bayles	Cardinia Shire	–
Harkaway	City of Casey	–
Ensay	East Gippsland Shire	–
Genoa	East Gippsland Shire	–
Goongerah	East Gippsland Shire	–
Noorinbee	East Gippsland Shire	–
Tubbut	East Gippsland Shire	–
Main Ridge	Mornington Peninsula Shire	–
Red Hill	Mornington Peninsula Shire	–
Christmas Hills	Nillumbik Shire	–
St Andrews	Nillumbik Shire	–
Strathewen	Nillumbik Shire	–
Sandy Point	South Gippsland Shire	–
Strzelecki	South Gippsland Shire	–
Tarwin Lower	South Gippsland Shire	–
Venus Bay	South Gippsland Shire	–
Waratah Bay	South Gippsland Shire	–
Carrajung	Wellington Shire	–
Dargo	Wellington Shire	–
Licola	Wellington Shire	–
Loch Sport	Wellington Shire	–
Meerlieu	Wellington Shire	–
Woodside	Wellington Shire	–
Dixons Creek	Yarra Ranges Shire	–
Gladysdale	Yarra Ranges Shire	–
Gruyere	Yarra Ranges Shire	–
McMahons Creek and Reefton	Yarra Ranges Shire	–
Powelltown	Yarra Ranges Shire	–
Steels Creek	Yarra Ranges Shire	–

Town or supply	Local council area	Water supplier [#]
Warburton area private water supply schemes (e.g. Big Pats Creek)	Yarra Ranges Shire	—
Tankerton and French Island	unincorporated (Bass Coast Shire notional)	—
South West Victoria		
Barongarook	Colac - Otway Shire	—
Barwon Downs	Colac - Otway Shire	—
Beech Forest	Colac - Otway Shire	—
Carlisle River	Colac - Otway Shire	Wannon Water
Kawarren	Colac - Otway Shire	—
Kennett River	Colac - Otway Shire	—
Lavers Hill	Colac - Otway Shire	—
Poroduc scheme	Colac - Otway Shire	—
Wye River and Separation Creek	Colac - Otway Shire	—
Darlington	Corangamite Shire	Wannon Water
Princetown	Corangamite Shire	—
Bolwarra	Glenelg Shire	—
Digby	Glenelg Shire	—
Henty area	Glenelg Shire	Wannon Water
Narrawong	Glenelg Shire	—
Nelson	Glenelg Shire	—
Steiglitz	Golden Plains Shire	—
Cudgee	Moyne Shire	Wannon Water
Framlingham	Moyne Shire	—
Garvoc	Moyne Shire	Wannon Water
Hawkesdale	Moyne Shire	—
Hexham	Moyne Shire	—
Macarthur	Moyne Shire	Wannon Water
Nullawarre	Moyne Shire	—
Panmure	Moyne Shire	—
Winslow	Moyne Shire	—
Woolsthorpe	Moyne Shire	—
Woorndoo	Moyne Shire	—
Yambuk	Moyne Shire	—
Branxholme	Southern Grampians Shire	—
Byaduk	Southern Grampians Shire	—
Mirranatwa	Southern Grampians Shire	—
Bambra	Surf Coast Shire	—
Deans Marsh	Surf Coast Shire	—

[#] The listed water supplier supplies regulated water (or similar non-potable water) to the town in question. If this column is blank this means that the town either has no reticulated water supply or has a private water supply that is not supplied by a water supplier (as at January 2010).

Regulated water supplies are listed in more detail in Appendix 5.

For information on facilities at national and state parks, please contact Parks Victoria on 13 1963.

