Water Quality Annual Report 2012/2013

East Gippsland Water

October 2013

133 Macleod Street, PO Box 52, Bairnsdale Victoria 3875
T 03 5150 4444 **F** (03) 5150 4477
E egw@egwater.vic.gov.au **W** www.egwater.vic.gov.au

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Picture on front cover: Betka River water supply off-take in Mallacoota

Document Status

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1	Draft for Comment (Internal)	July 2013	Rory McKeown	n.a.
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1 Introduction

At East Gippsland Water we aim to provide safe and reliable drinking water. This means supplying our customers with water that meets or exceeds all health requirements and ensuring it reaches our customers when they need it.

Last financial year we treated and delivered over 4.8 billion litres (an increase of 13% on the previous year). This water was distributed to over 22,000 customer connections across East Gippsland.

In East Gippsland most of the water we deliver to our customers comes from local river systems, but underground aquifers are utilised in our Mallacoota and Mitchell systems to supplement supply. Dinner Plain is our only locality where all drinking water is sourced from local aquifers.

We continue to work with stakeholders (such as East Gippsland Catchment Management Authority) to influence activities undertaken in our catchments. This improves the quality of water before it is processed by our plants and delivered to customer taps as drinking water.

Our drinking water quality consistently performs well against Department of Health standards. Last financial year over 27,000 individual tests were completed to ensure our water met stringent Australian standards. From these tests, a single non-compliance was detected during the year in our Orbost system.

Each year we continue to improve our supplies through strong investment in new infrastructure as well as maintaining existing infrastructure. We also continue to improve our operational activities to identify and reduce risks. Last year we were not audited under the Safe Drinking Water Act 2003 but we are preparing for an upcoming audit in early 2014.

1.1 Characterisation of the System

We supply a region covering approximately 21,000 square kilometres in the far south east corner of Victoria (Figure 1).

The area extends east from Lindenow and Bairnsdale, through Lakes Entrance to Mallacoota near the New South Wales border, and as far north as Dinner Plain in the High Country of the Victorian Alps.

Nine separate water supply systems serve the communities of Bairnsdale, Bemm River, Bruthen, Buchan, Cann River, Dinner Plain, Eagle Point, Johnsonville, Lakes Entrance, Lake Tyers Aboriginal Trust, Lake Tyers Beach, Lindenow, Lindenow South, Mallacoota, Marlo, Metung, Newlands Arm, Newmerella, Nicholson, Nowa Nowa, Omeo, Orbost, Paynesville, Raymond Island, Sarsfield, Swan Reach and Swifts Creek.

A summary of our water supply and treatment systems is provided in Section 2.1.

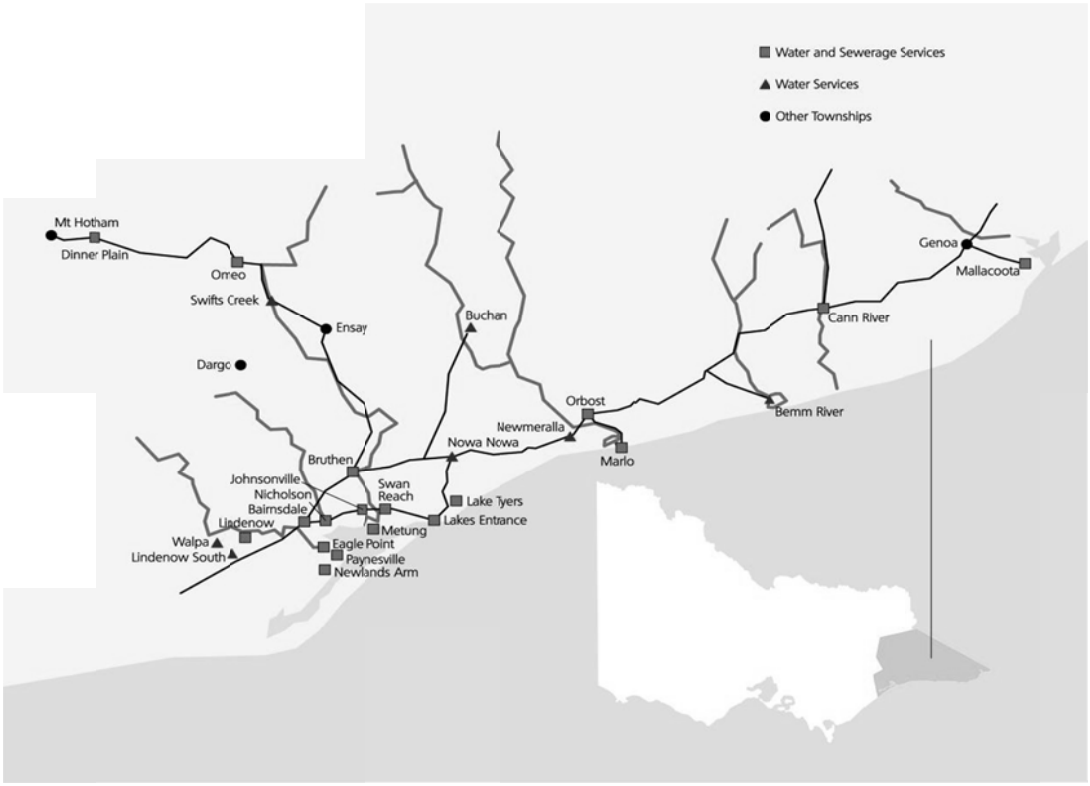

Figure 1: East Gippsland Water's region of operation

2 Water Treatment and Quality Management Systems

As described above, we manage nine separate water supply systems. A detailed summary of these systems is provided in Table 2.1.

To manage these supplies, we have a Drinking Water Quality Risk Management System (after this referred to as 'the system') which identifies key risks and ensures they are managed appropriately. Our system has been developed in accordance with Australian Drinking Water Guidelines 2011. An overview of its structure is shown in Figure 2 below.

Each year internal audits of the system are conducted to ensure we continually improve. We undertook an external audit in February 2012, and passed, receiving no non-conforming issues (refer to Section 7 for more details). This audit was undertaken at the request of the Department of Health and the next is scheduled to be complete by April 2014.

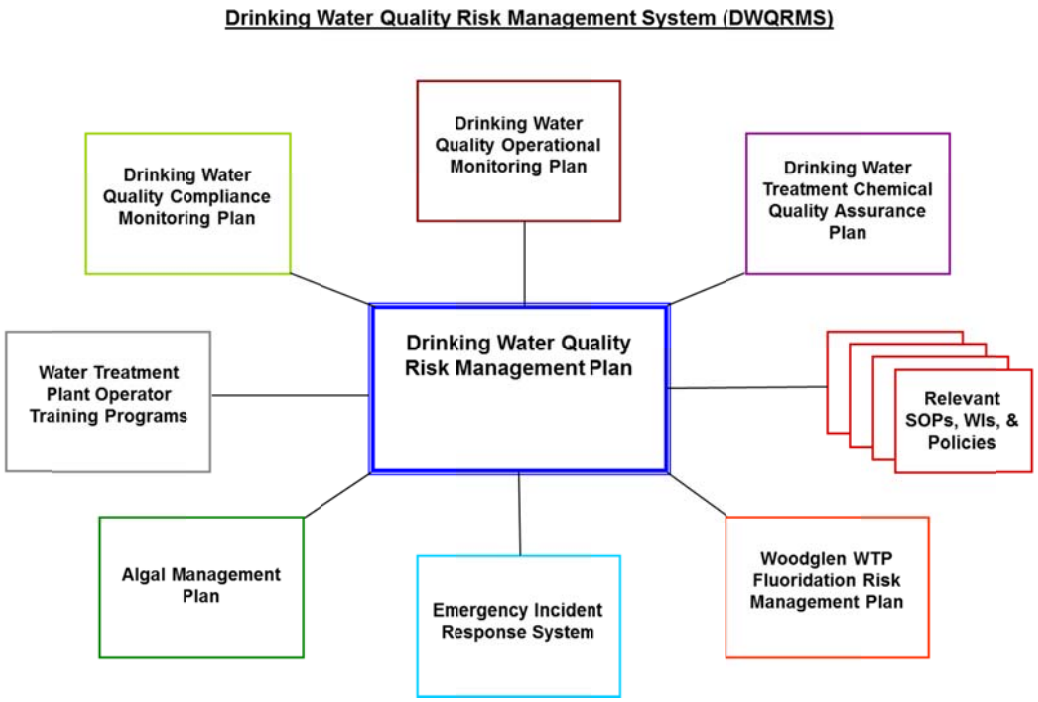

Figure 2: Structure of the Drinking Water Quality Risk Management System

2.1 System Summary

A summary of the methods undertaken to process our drinking water is presented in Table 2.1 below.

No significant changes were made to the water treatment processes in our sampling localities in 2012/13.

Table 2.1 Water sampling locality and treatment summary table

Water Sampling Locality	Population Supplied (Connections)	Source Water	Catchment Description	Raw Water Storage	Treatment Plant	Treatment process	Added substances	Comments
Bairnsdale	7,308	Mitchell River Aquifer (5 bores, seasonal supplemental supply)	Primarily forest (> 90%) with some human, forestry and agricultural impacts some cattle and some septic tanks particularly around the town of Dargo. The non-forested area is around 5-10% of the catchment, but is mostly located near the river banks	Woodglen No. 1 (850ML) & 2 (713ML) storage basins	Woodglen	Coagulation, flocculation, clarification (dissolved air flotation), filtration (granular media filter), disinfection, fluoridation	Caustic soda, poly (LT 25[1] & 27[2]), fluoride[3], poly aluminium chlorohydrate[3] (PAC 23), chlorine (chlorine dioxide and sodium hypochlorite); fluoride (fluorosilicic acid)[3]; powder activated carbon[4]	[1]LT 25 used for backwash water clarification [2]LT 27 used for centrifuge [3]Fluoride dosing commenced in August 2010 [4]Capacity for powder activated carbon addition exists, but is not currently in use
Lindenow	220							
Lindenow South	156							
Sarsfield-Bruthen	573							
Merrangbaur	868							
Sunlakes-Toorloo	2,916							
Kalimna	637							
Eagle Point-Paynesville	3,530							
Nicholson-Swan Reach	681							
Metung	1,161							
Nowa Nowa	100							
Buchan	108	Buchan River	80% forest with some impacts (forestry, agriculture, cattle and camping)	n/a	Buchan	Coagulation, flocculation, clarification (dissolved air flotation), filtration (granular media filter), disinfection	Caustic soda, poly aluminium chlorohydrate (PAC 23), poly (LT 25[1]), chlorine (sodium hypochlorite)	[1]LT 25 used for backwash water clarification
Cann River	195	Cann River	Forest, agricultural land (cattle), some septic tanks, roads and logging	n/a	Cann River			
Swifts Creek	128	Tambo River	Forest, agricultural land (cattle), some septic tanks, roads and logging	4.6ML basin (shade-cloth covered)	Swifts Creek			
Bemm River	95	Bemm River	90% forest, with some forestry, agricultural and human impacts	n/a	Bemm River			
Orbost	1,981	Brodribb River & Rocky River	90% Forest, with some forestry, agricultural and human impacts	6ML basin	Orbost	Coagulation, flocculation, clarification (upflow clarifier), filtration (granular media filter), disinfection	Soda ash, poly aluminium chlorohydrate (PAC 23), poly (LT 20), chlorine (sodium hypochlorite)	Nil
Omeo	255	Butchers Creek	State forest with minimal human impacts (some grazing)	5ML (shade-cloth covered) and 10ML basin	Omeo			
Mallacoota	928	Betka River & Aquifer (2 bores)	State forest with minimal human impacts (some forestry)	41ML basin (shade-cloth covered)	Mallacoota		Caustic soda, poly aluminium chlorohydrate (PAC 23), poly (LT 20 & 25[1]), chlorine (sodium hypochlorite)	[1]LT 25 used for backwash water clarification
Dinner Plain	380	Aquifer (2 bores)	Supply is extracted from bores deeper than 70m, with an exclusion zone	700kL tank	Dinner Plain	Ultraviolet (UV) disinfection	Nil	Nil

2.2 System Issues

Our supply systems operated as designed last financial year and no significant issues were identified with their capacity to routinely meet the required water quality standards.

One Section 18 notification was made to the Department of Health under the Safe Drinking Water Act (2003) during 2012/2013. Further information relating to this notification is presented in Section 5.

A summary of the opportunities for improvement identified during the February 2012 Drinking Water Regulatory Audit, alongside their current progress, is also provided in Section 7.

2.3 System Improvements

Last financial year, the following improvements were made to our systems:

- a $180,00 electrical upgrade at the Omeo water treatment plant to improve its operational performance
- outsourcing all of our water quality sampling and scheduling to an independent NATA (National Association of Testing Authorities) accredited external laboratory
- 73.3km of water mains high-pressure-cleaned across our Metung, Lakes Entrance and Dinner Plain systems
- a $50,000 upgrade at the Woodglen water treatment to improve chemical mixing and optimise chemical usage
- works were well underway to construct a $640,000 shade cloth cover over a treated water storage in Orbost to improve water quality and control algal blooms.

3 Significant Water Quality Improvements 2008-2013

Our five-year program between 2008 and 2013 (known in the Victorian water industry as 'Water Plan 2') came to an end in June 2013, presenting an opportunity to reflect on our more significant water quality improvements during this time.

Over the past five years we have successfully completed a $67m dollar infrastructure investment programme. A significant proportion of this investment was in water quality improvement projects which have transformed our operations.

A summary of the notable water quality improvement projects completed in Water Plan 2 is highlighted below:

Woodglen Water Treatment Plant & Second Storage

Our flagship project during Water Plan 2 was the commissioning of a new 20ML per day state-of-the-art water treatment plant at Woodglen (refer to Figure 3 below). This facility has markedly improved the water quality for over 80 per-cent of customers. Our customers in the Mitchell system were previously receiving a supply which was susceptible to the impacts of algae, and events such as fires and floods.

A second 850ML raw water storage reservoir was also commissioned in 2010 at our Woodglen site (refer to Figure 3 below). In addition to ensuring security of water supply during drought conditions, the additional raw water storage capacity is an important water quality barrier, improving our ability to selectively harvest good quality river water.

Figure 3: Woodglen water treatment plant and additional raw water storage (right) commissioned in 2010

Removing Open Treated Water Storages

During Water Plan 2 an extensive improvement programme was undertaken to eliminate treated water (intermediate) storages that are open to the environment. Open treated water storages can impact water quality due to the presence of algae and airborne contamination (dust, organic material, faecal matter from wildlife). During Water Plan 2, East Gippsland Water:

- lined and covered a 48ML intermediate storage at Sunlakes-Toorloo and an 88ML intermediate storage at Wy Yung
- replaced the open intermediate storage at Eagle Point-Paynesville with 2 enclosed tanks (6ML each; refer to Figure 4)
- replaced the open intermediate storage at Sarsfield with a 6ML tank
- replaced the open intermediate storage at Swifts Creek with a 270kL tank
- covered the Mallacoota raw water storage with a shade cloth structure, as well as the Orbost clear water storage which is almost complete.

Figure 4: Tanks with 12ML storage capacity replaced an open treated water basin at Eagle Point

Investment in Supervisory Control and Data Acquisition (SCADA) Systems

During Water Plan 2, we invested significantly in our SCADA systems across key sites. Using remote monitoring, this system is designed to provide early warning of faults or performance issues at key facilities such as water treatment plants, wastewater treatment plants and pump stations. Its objective is to minimise operational problems and improve equipment reliability, compliance and customer service. During a number of significant severe weather and bushfire events over the past five-years, this technology

has enabled East Gippsland Water to remotely supervise plant operations and review on-line critical water quality trends. This has allowed a high degree of assurance that water quality is maintained during these events, even when sites are inaccessible to operators for a number of days. East Gippsland Water will continue to expand its SCADA programme into Water Plan 3.

Replacement of Aging Intermediate Storages

In Water Plan 2, a number of elevated intermediate water storages were replaced with variable speed drive pumps. Old water storages are often reported as the source of microbiological contamination during water quality incidents worldwide. Intermediate storages were taken off-line in the Sunlakes-Toorloo, Lindenow South and Dinner Plain water sampling localities, eliminating a potential water quality risk within each of these sites. A programmed replacement of the remaining aging storages will continue in Water Plan 3.

Omeo 10ML Raw Water Basin

We finished construction of a new 10ML raw water storage basin for the community of Omeo (see Figure 5). This increases the town's drinking water storage capacity to 15ML, enabling enough water to be harvested and stored during sizeable water flow events to protect the community against prolonged periods of dry weather.

Figure 5: new 10ML raw water storage will ensure the continued quality and security of water supply for Omeo into the future.

Proactive Pipeline Cleaning

An extensive water main cleaning programme was undertaken in Water Plan 2, with a significant majority of our 924km of water distribution mains air-scoured during this period. This work has improved the efficiency of the supply network and contributed to improved drinking water quality across all water sampling localities.

4 Quality of Drinking Water for 2012/2013

4.1 Regulated Parameters- *Escherichia coli (E. coli)*

E. coli samples are taken at least weekly in each of the water sampling localities. Compliance is measured as: ≥ 98% of all samples collected in any 12-month period contain no *E. coli.*

Water Sampling Locality	Sampling Frequency	No. of Samples taken	Maximum Result (orgs/100mL)	% samples with no *E. coli*	Complying (Yes / No)
Bairnsdale	Weekly	72[a]	0	100%	Yes
Bemm River	Weekly	52	0	100%	Yes
Buchan	Weekly	52	0	100%	Yes
Cann River	Weekly	52	0	100%	Yes
Dinner Plain	Weekly	52	0	100%	Yes
Eagle Point- Paynesville	Weekly	52	0	100%	Yes
Kalimna	Weekly	52	0	100%	Yes
Lindenow	Weekly	52	0	100%	Yes
Lindenow South	Weekly	52	0	100%	Yes
Mallacoota	Weekly	52	0	100%	Yes
Merrangbaur	Weekly	52	0	100%	Yes
Metung	Weekly	52	0	100%	Yes
Nicholson-Swan Reach	Weekly	52	0	100%	Yes
Nowa Nowa	Weekly	52	0	100%	Yes
Omeo	Weekly	52	0	100%	Yes
Orbost	Weekly	52	0	100%	Yes
Sarsfield-Bruthen	Weekly	52	0	100%	Yes
Sunlakes-Toorloo	Weekly	57[b]	0	100%	Yes
Swifts Creek	Weekly	52	0	100%	Yes

[a]Due to the population in the Bairnsdale water sampling locality, samples are taken at a frequency of six per month.

[b]The frequency of samples taken in Sunlakes-Toorloo increased between December 2012 and February 2013 due to seasonal population influxes during the summer period.

4.1.1 Comments on results

All water quality sampling localities were compliant for the *E. coli* water quality standard for the 2012/2013 reporting period.

East Gippsland Water has been fully compliant with the *E. coli* water quality standard over the past five years.

4.2 Regulated Parameters- Trihalomethanes

Trihalomethanes samples are taken monthly in each of the water sampling localities. Compliance is measured as: trihalomethanes < 0.25 milligrams per litre.

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-Complying Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Monthly	12	0	0.045	Yes
Bemm River	Monthly	12	0	0.042	Yes
Buchan	Monthly	12	0	0.089	Yes
Cann River	Monthly	12	0	0.051	Yes
Dinner Plain	n/a[a]	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Eagle Point- Paynesville	Monthly	12	0	0.065	Yes
Kalimna	Monthly	12	0	0.069	Yes
Lindenow	Monthly	12	0	0.029	Yes
Lindenow South	Monthly	12	0	0.037	Yes
Mallacoota	Monthly	12	0	0.130	Yes
Merrangbaur	Monthly	12	0	0.066	Yes
Metung	Monthly	12	0	0.069	Yes
Nicholson-Swan Reach	Monthly	12	0	0.053	Yes
Nowa Nowa	Monthly	12	0	0.080	Yes
Omeo	Monthly	12	0	0.040	Yes
Orbost	Monthly	12	0	0.053	Yes
Sarsfield-Bruthen	Monthly	12	0	0.054	Yes
Sunlakes-Toorloo	Monthly	12	0	0.078	Yes
Swifts Creek	Monthly	12	0	0.077	Yes

[a]n/a– not applicable; Dinner Plain water sampling locality is not sampled for chlorine-based disinfection by-products as ultra-violet disinfection is employed in lieu of chlorine.

4.2.1 Comments on results

All water quality sampling localities were compliant for the trihalomethane water quality standard for the 2012/2013 reporting period.

East Gippsland Water has been fully compliant with the trihalomethane water quality standard over the past five years.

4.3 Regulated Parameters - Chloroacetic acid

Chloroacetic acid samples are taken monthly in each of the water sampling localities. Compliance is measured as: chloroacetic acid < 0.15 milligrams per litre.

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-Complying Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Monthly	12	0	0.005	Yes
Bemm River	Monthly	12	0	0.005	Yes
Buchan	Monthly	12	0	0.005	Yes
Cann River	Monthly	12	0	0.005	Yes
Dinner Plain	n/a[a]	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Eagle Point- Paynesville	Monthly	12	0	0.005	Yes
Kalimna	Monthly	12	0	0.005	Yes
Lindenow	Monthly	12	0	0.005	Yes
Lindenow South	Monthly	12	0	0.005	Yes
Mallacoota	Monthly	12	0	0.005	Yes
Merrangbaur	Monthly	12	0	0.005	Yes
Metung	Monthly	12	0	0.005	Yes
Nicholson-Swan Reach	Monthly	12	0	0.005	Yes
Nowa Nowa	Monthly	12	0	0.005	Yes
Omeo	Monthly	12	0	0.005	Yes
Orbost	Monthly	12	0	0.005	Yes
Sarsfield-Bruthen	Monthly	12	0	0.005	Yes
Sunlakes-Toorloo	Monthly	12	0	0.005	Yes
Swifts Creek	Monthly	12	0	0.005	Yes

[a]n/a– not applicable; Dinner Plain water sampling locality is not sampled for chlorine-based disinfection by-products as ultra-violet disinfection is employed in lieu of chlorine.

4.3.1 Comments on results

All water quality sampling localities were compliant for the chloroacetic acid water quality standard for the 2012/2013 reporting period.

East Gippsland Water has been fully compliant with the chloroacetic acid water quality standard over the past five years.

4.4 Regulated Parameters- Dichloroacetic acid

Dichloroacetic acid samples are taken monthly in each of the water sampling localities. Compliance is measured as: dichloroacetic acid < 0.1 milligrams per litre.

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-Complying Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Monthly	12	0	0.012	Yes
Bemm River	Monthly	12	0	0.005	Yes
Buchan	Monthly	12	0	0.006	Yes
Cann River	Monthly	12	0	0.007	Yes
Dinner Plain	n/a[a]	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Eagle Point- Paynesville	Monthly	12	0	0.011	Yes
Kalimna	Monthly	12	0	0.016	Yes
Lindenow	Monthly	12	0	0.006	Yes
Lindenow South	Monthly	12	0	0.008	Yes
Mallacoota	Monthly	12	0	0.011	Yes
Merrangbaur	Monthly	12	0	0.015	Yes
Metung	Monthly	12	0	0.008	Yes
Nicholson-Swan Reach	Monthly	12	0	0.011	Yes
Nowa Nowa	Monthly	12	0	0.016	Yes
Omeo	Monthly	12	0	0.014	Yes
Orbost	Monthly	12	0	0.009	Yes
Sarsfield-Bruthen	Monthly	12	0	0.010	Yes
Sunlakes-Toorloo	Monthly	12	0	0.017	Yes
Swifts Creek	Monthly	12	0	0.021	Yes

[a]n/a– not applicable; Dinner Plain water sampling locality is not sampled for chlorine-based disinfection by-products as ultra-violet disinfection is employed in lieu of chlorine.

4.4.1 Comments on results

All water quality sampling localities were compliant for the dichloroacetic acid water quality standard for the 2012/2013 reporting period.

East Gippsland Water has been fully compliant with the dichloroacetic acid water quality standard over the past five years.

4.5 Regulated Parameters- Trichloroacetic acid

Trichloroacetic acid samples are taken monthly in each of the water sampling localities. Compliance is measured as: trichloroacetic acid < 0.1 milligrams per litre.

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-Complying Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Monthly	12	0	0.014	Yes
Bemm River	Monthly	12	0	0.005	Yes
Buchan	Monthly	12	0	0.019	Yes
Cann River	Monthly	12	0	0.006	Yes
Dinner Plain	n/a[a]	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Eagle Point- Paynesville	Monthly	12	0	0.024	Yes
Kalimna	Monthly	12	0	0.015	Yes
Lindenow	Monthly	12	0	0.008	Yes
Lindenow South	Monthly	12	0	0.010	Yes
Mallacoota	Monthly	12	0	0.023	Yes
Merrangbaur	Monthly	12	0	0.016	Yes
Metung	Monthly	12	0	0.013	Yes
Nicholson-Swan Reach	Monthly	12	0	0.013	Yes
Nowa Nowa	Monthly	12	0	0.019	Yes
Omeo	Monthly	12	0	0.018	Yes
Orbost	Monthly	12	0	0.010	Yes
Sarsfield-Bruthen	Monthly	12	0	0.019	Yes
Sunlakes-Toorloo	Monthly	12	0	0.015	Yes
Swifts Creek	Monthly	12	0	0.020	Yes

[a]n/a– not applicable; Dinner Plain water sampling locality is not sampled for chlorine-based disinfection by-products as ultra-violet disinfection is employed in lieu of chlorine.

4.5.1 Comments on results

All water quality sampling localities were compliant for the trichloroacetic acid water quality standard for the 2012/2013 reporting period.

East Gippsland Water has been fully compliant with the trichloroacetic acid water quality standard over the past five years.

4.6 Regulated Parameters- Aluminium (acid soluble)

Aluminium samples are taken monthly in each of the water sampling localities. Compliance is measured as: aluminium (acid soluble) < 0.2 milligrams per litre.

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-Complying Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Monthly	12	0	0.03	Yes
Bemm River	Monthly	12	0	0.02	Yes
Buchan	Monthly	12	0	0.09	Yes
Cann River	Monthly	12	0	0.18	Yes
Dinner Plain	n/a[a]	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Eagle Point- Paynesville	Monthly	12	0	0.03	Yes
Kalimna	Monthly	12	0	0.02	Yes
Lindenow	Monthly	12	0	0.02	Yes
Lindenow South	Monthly	12	0	0.02	Yes
Mallacoota	Monthly	12	0	0.01	Yes
Merrangbaur	Monthly	12	0	0.02	Yes
Metung	Monthly	12	0	0.02	Yes
Nicholson-Swan Reach	Monthly	12	0	0.03	Yes
Nowa Nowa	Monthly	12	0	0.03	Yes
Omeo	Monthly	12	0	0.03	Yes
Orbost	Monthly	12	1	2.10	No
Sarsfield-Bruthen	Monthly	12	0	0.02	Yes
Sunlakes-Toorloo	Monthly	12	0	0.02	Yes
Swifts Creek	Monthly	12	0	0.19	Yes

[a]n/a– not applicable; Dinner Plain water sampling locality is exempt from aluminium testing requirements as aluminium-based coagulants are not used for treatment within this locality.

4.6.1 Comments on results

With the exception of Orbost, all water quality sampling localities were compliant for the acid soluble aluminium water quality standard for the 2012/2013 reporting period.

Following a brief period of sub-optimal performance at the Orbost water treatment plant, an aluminium exceedence was detected in a reticulation sample taken on the 08/10/2012. In response, a system wide programme of flushing and monitoring was undertaken, resulting in compliant levels of acid soluble aluminium being obtained.

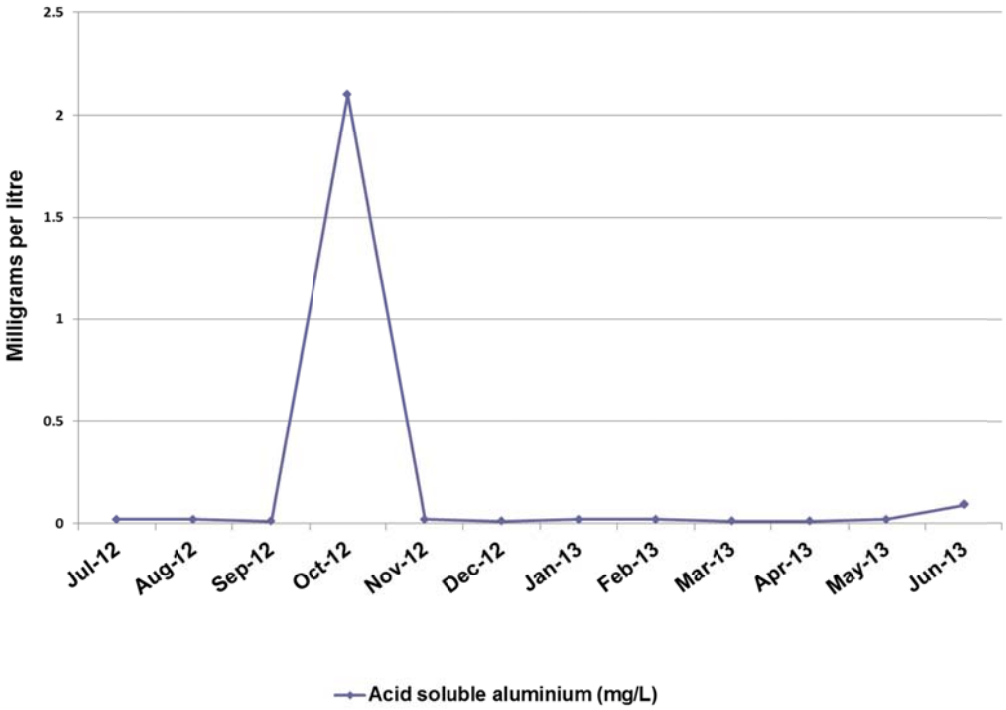

Figure 5: Acid soluble aluminium levels in the Orbost reticulation samples in 2012/2013; high levels of acid soluble aluminium were detected in the October 2012 sample, following a brief period of sub-optimal water treatment plant performance; follow-up samples returned compliant results after a flushing programme was implemented.

Although below reportable limits, elevated levels of acid soluble aluminium were detected in Cann River and Swifts Creek water sampling localities (0.18 mg/L and 0.19 mg/L, respectively). Neither incident was attributable to any period of sub-optimal plant performance. These occurrences were believed to be as a result of re-suspension of old aluminium deposits, which had accumulated in the system over time. In response, extensive air-scouring of the Swifts Creek reticulation system was completed in July 2013, and air-scouring at Cann River is programmed in the coming months.

4.7 Regulated Parameters- Turbidity

Turbidity samples are taken monthly in each of the water sampling localities. Compliance is measured as: 95% upper confidence limit (UCL) of the mean < 5.0 NTU.

Water Sampling Locality	Sampling Frequency	No. of Samples	Maximum (NTU)	95% UCL of mean	Complying (Yes / No)
Bairnsdale	Weekly	72[a]	0.3	0.1	Yes
Bemm River	Weekly	52	4.7	0.9	Yes
Buchan	Weekly	52	0.5	0.1	Yes
Cann River	Weekly	52	1.5	0.4	Yes
Dinner Plain	Weekly	52	0.8	0.2	Yes
Eagle Point-Paynesville	Weekly	52	0.1	0.1	Yes
Kalimna	Weekly	52	0.2	0.1	Yes
Lindenow	Weekly	52	1.0	0.2	Yes
Lindenow South	Weekly	52	1.3	0.2	Yes
Mallacoota	Weekly	52	0.9	0.4	Yes
Merrangbaur	Weekly	52	0.3	0.1	Yes
Metung	Weekly	52	0.1	0.1	Yes
Nicholson-Swan Reach	Weekly	52	0.6	0.1	Yes
Nowa Nowa	Weekly	52	0.5	0.2	Yes
Omeo	Weekly	52	2.6	0.5	Yes
Orbost	Weekly	52	1.3	0.3	Yes
Sarsfield-Bruthen	Weekly	52	0.2	0.1	Yes
Sunlakes-Toorloo	Weekly	57[b]	0.5	0.1	Yes
Swifts Creek	Weekly	52	0.2	0.1	Yes

[a]Due to the population in the Bairnsdale water sampling locality, samples are taken at a frequency of 6 per month.

[b]The frequency of samples taken in Sunlakes-Toorloo increased between December 2012 and February 2013 due to seasonal population influxes during the summer period.

4.7.1 Comments on results

All water quality locations were compliant for the turbidity water quality standard for the 2012/2013 reporting period. East Gippsland Water has been fully compliant for the turbidity water quality standard in each sampling locality over the past five years.

It is noteworthy that, due to the commissioning of the Swifts Creek clear water tank in 2011/2012, the turbidity result has fallen from 1.2 NTU in 2011/2012 to 0.1 NTU in 2012/2013 (95% UCL of the mean). This significant infrastructure upgrade has resulted in a notable improvement in the quality of water supplied to the township of Swifts Creek.

With the exception of Bemm River and Omeo, the turbidity result has either improved, or stayed the same, for all remaining 17 water quality sampling localities. This is a reflection on East Gippsland Water's continuous water treatment process optimisation, infrastructure upgrades and proactive network cleaning programme.

4.8 Fluoride

Fluoridation of the Mitchell System began in August 2010. Fluoride samples are taken monthly in each of the fluoridated water sampling localities, such that a weekly sample is taken at different locations in the fluoridated Mitchell system.

Complying is measured as: annual average fluoride level must not exceed 1 milligram per litre and all individual samples must be < 1.5 milligram per litre.

Meeting Obligation is measured as: annual average fluoride level > 0.6 milligram per litre in fluoridated systems.

Water Sampling Locality	Sampling Frequency	Operating Target (mg/L)	No. of Samples	Min. (mg/L)	Max. (mg/L)	Average (mg/L)	Complying (Yes/No)	Meeting Obligation (Yes/No)
Bairnsdale[b]	Monthly	0.9	12	0.79	0.89	0.85	Yes	Yes
Bemm River	Biannually	n/a[a]	2	0.05	0.05	0.05	Yes	n/a[a]
Buchan	Biannually	n/a[a]	2	0.05	0.05	0.05	Yes	n/a[a]
Cann River	Biannually	n/a[a]	2	0.05	0.05	0.05	Yes	n/a[a]
Dinner Plain	Biannually	n/a[a]	2	0.05	0.05	0.05	Yes	n/a[a]
Eagle Point-Paynesville[b]	Monthly	0.9	12	0.78	0.88	0.85	Yes	Yes
Kalimna[b]	Monthly	0.9	12	0.58	0.90	0.81	Yes	Yes
Lindenow[b]	Monthly	0.9	12	0.64	0.88	0.81	Yes	Yes
Lindenow South[b]	Monthly	0.9	12	0.67	0.85	0.80	Yes	Yes
Mallacoota	Biannually	n/a[a]	2	0.05	0.05	0.05	Yes	n/a[a]
Merrangbaur[b]	Monthly	0.9	12	0.71	0.87	0.81	Yes	Yes
Metung[b]	Monthly	0.9	12	0.68	0.88	0.82	Yes	Yes
Nicholson-Swan Reach[b]	Monthly	0.9	12	0.54	0.89	0.80	Yes	Yes
Nowa Nowa[b]	Monthly	0.9	12	0.72	0.87	0.81	Yes	Yes
Omeo	Biannually	n/a[a]	2	0.05	0.05	0.05	Yes	n/a[a]
Orbost	Biannually	n/a[a]	2	0.05	0.05	0.05	Yes	n/a[a]
Sarsfield-Bruthen[b]	Monthly	0.9	12	0.75	0.93	0.85	Yes	Yes
Sunlakes-Toorloo[b]	Monthly	0.9	12	0.67	0.89	0.82	Yes	Yes
Swifts Creek	Biannually	n/a[a]	2	0.06	0.10	0.08	Yes	n/a[a]

[a]n/a – not applicable.

[b] indicates fluoridated localities

4.8.1 Comments on results

All water quality locations were compliant for fluoride for the 2012/2013 reporting period. East Gippsland Water has been 100% compliant for this standard at each fluoridated sampling locality since fluoridation began in 2010.

The Department of Health was notified in advance of two separate occasions when the fluoride dosing at Woodglen water treatment plant stopped for periods >72 hours:

(i) 20th February 2013 for fluoridation plant servicing;

(ii) 16th March 2013 for reactive maintenance of a system flow meter.

In both instances, the events did not impact the quality of water supplied to customers.

4.9 Other Substances- Blue green algae

Blue green algae (or 'cyanobacteria') samples are taken seasonally in each of the relevant water sampling localities. In addition to routine monitoring samples, additional samples may be taken to monitor the progression of algal growth during the summer/autumn seasons. All biovolume results > 0.200 millimetres cubed per litre are reported to the Department of Sustainability and Environment.

The Department of Health must also be notified under section 22 of the *Safe Drinking Water Act 2003* if any of the following are true:

- Total microcystins are detected at greater than or equal to 1.3 micrograms per litre;
- *Microcystis aeruginosa* is present at greater than or equal to 6,500 cells per millilitre;
- Total combined biovolume of known toxic cyanobacterial species is greater than or equal to 0.6 millimetres cubed per litre;
- Total combined biovolume of all cyanobacterial species is greater than or equal to 10 millimetres cubed per litre.

	Raw Water Storage		Clear Water Storage	
Water Sampling Locality	No. of Samples	Maximum (mm^3/L)	No. of Samples	Maximum (mm^3/L)
Bairnsdale	64	0.298	12	0
Bemm River	n/a[a]	n/a[a]	12	0.002
Buchan	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Cann River	n/a[a]	n/a[a]	12	0.005
Dinner Plain	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Eagle Point- Paynesville	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Kalimna	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Lindenow	n/a[a]	n/a[a]	12	0.002
Lindenow South	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Mallacoota	19	0.03	12	0.002
Merrangbaur	n/a[a]	n/a[a]	12	0.003
Metung	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Nicholson-Swan Reach	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Nowa Nowa	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Omeo	77	0.268	n/a[a]	n/a[a]
Orbost	31	0.046	30	0.213
Sarsfield-Bruthen	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Sunlakes-Toorloo	n/a[a]	n/a[a]	12	0.002
Swifts Creek	12	0.006	n/a[a]	n/a[a]

[a]n/a – not applicable; this may be due to the absence of the specified storage within this locality, or due to the absence of any risk from algal growth due to the presence of a fully sealed storage tank.

4.9.1 Comments on results

No samples exceeded the reporting criteria for Section 22 of the *Safe Drinking Water Act* (*2003*) in 2012/2013.

Any blue green algae biovolumes > 0.2 millimetres cubed per litre were reported to the Department of Sustainability and Environment as per the Blue Green Algae Circular (2012).

4.10 Other Substances- Cadmium

Cadmium samples are taken quarterly in each of the water sampling localities. Compliance is measured as: ≤ 0.002 milligrams per litre (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Water Sampling Locality	Frequency	No. of Samples	No. of Non-Complying Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Quarterly	4	0	0.0002	Yes
Bemm River	Quarterly	4	0	0.0002	Yes
Buchan	Quarterly	4	0	0.0002	Yes
Cann River	Quarterly	4	0	0.0002	Yes
Dinner Plain	Quarterly	4	0	0.0002	Yes
Eagle Point- Paynesville	Quarterly	4	0	0.0002	Yes
Kalimna	Quarterly	4	0	0.0002	Yes
Lindenow	Quarterly	4	0	0.0002	Yes
Lindenow South	Quarterly	4	0	0.0002	Yes
Mallacoota	Quarterly	4	0	0.0002	Yes
Merrangbaur	Quarterly	4	0	0.0002	Yes
Metung	Quarterly	4	0	0.0002	Yes
Nicholson-Swan Reach	Quarterly	4	0	0.0002	Yes
Nowa Nowa	Quarterly	4	0	0.0002	Yes
Omeo	Quarterly	4	0	0.0002	Yes
Orbost	Quarterly	4	0	0.0002	Yes
Sarsfield-Bruthen	Quarterly	4	0	0.0002	Yes
Sunlakes-Toorloo	Quarterly	4	0	0.0002	Yes
Swifts Creek	Quarterly	4	0	0.0002	Yes

4.10.1 Comments on results

All water quality locations were compliant for cadmium for the 2012/2013 reporting period.

4.11 Other Substances- Chromium

Chromium samples are taken quarterly in each of the water sampling localities. Compliance is measured as: ≤ 0.05 milligrams per litre of Cr(VI) (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-Complying Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Quarterly	4	0	0.001	Yes
Bemm River	Quarterly	4	0	0.001	Yes
Buchan	Quarterly	4	0	0.001	Yes
Cann River	Quarterly	4	0	0.001	Yes
Dinner Plain	Quarterly	4	0	0.001	Yes
Eagle Point- Paynesville	Quarterly	4	0	0.001	Yes
Kalimna	Quarterly	4	0	0.001	Yes
Lindenow	Quarterly	4	0	0.001	Yes
Lindenow South	Quarterly	4	0	0.001	Yes
Mallacoota	Quarterly	4	0	0.001	Yes
Merrangbaur	Quarterly	4	0	0.001	Yes
Metung	Quarterly	4	0	0.001	Yes
Nicholson-Swan Reach	Quarterly	4	0	0.001	Yes
Nowa Nowa	Quarterly	4	0	0.001	Yes
Omeo	Quarterly	4	0	0.001	Yes
Orbost	Quarterly	4	0	0.001	Yes
Sarsfield-Bruthen	Quarterly	4	0	0.001	Yes
Sunlakes-Toorloo	Quarterly	4	0	0.001	Yes
Swifts Creek	Quarterly	4	0	0.001	Yes

4.11.1 Comments on results

All water quality localities were compliant for chromium for the 2012/2013 reporting period.

4.12 Other Substances- Arsenic

Arsenic samples are taken biannually in each applicable water sampling locality. Compliance is measured as: ≤ 0.01 milligrams per litre (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-Complying Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Biannually	4[a]	0	0.001	Yes
Bemm River	Biannually	2	0	0.001	Yes
Buchan	Biannually	2	0	0.001	Yes
Cann River	Biannually	2	0	0.001	Yes
Dinner Plain	Biannually	2	0	0.001	Yes
Eagle Point- Paynesville	Biannually	2	0	0.001	Yes
Kalimna	Biannually	2	0	0.001	Yes
Lindenow	Biannually	2	0	0.001	Yes
Lindenow South	Biannually	2	0	0.001	Yes
Mallacoota	Biannually	2	0	0.001	Yes
Merrangbaur	Biannually	2	0	0.001	Yes
Metung	Biannually	2	0	0.001	Yes
Nicholson-Swan Reach	Biannually	2	0	0.001	Yes
Nowa Nowa	Biannually	4[a]	0	0.001	Yes
Omeo	Biannually	2	0	0.001	Yes
Orbost	Biannually	2	0	0.001	Yes
Sarsfield-Bruthen	Biannually	2	0	0.001	Yes
Sunlakes-Toorloo	Biannually	2	0	0.001	Yes
Swifts Creek	Biannually	2	0	0.001	Yes

[a]Water Sampling locality has two entry point locations, each sampled biannually.

4.12.1 Comments on results

All water quality localities were compliant for arsenic for the 2012/2013 reporting period.

4.13 Other Substances- Cyanide

Testing for cyanide is performed biannually in each applicable water sampling locality. Compliance is measured as: ≤ 0.08 milligram per litre (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-Complying Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Biannually	4[a]	0	0.005	Yes
Bemm River	Biannually	2	0	0.005	Yes
Buchan	Biannually	2	0	0.005	Yes
Cann River	Biannually	2	0	0.005	Yes
Dinner Plain	Biannually	2	0	0.005	Yes
Eagle Point- Paynesville	Biannually	2	0	0.005	Yes
Kalimna	Biannually	2	0	0.005	Yes
Lindenow	Biannually	2	0	0.005	Yes
Lindenow South	Biannually	2	0	0.005	Yes
Mallacoota	Biannually	2	0	0.005	Yes
Merrangbaur	Biannually	2	0	0.005	Yes
Metung	Biannually	2	0	0.005	Yes
Nicholson-Swan Reach	Biannually	2	0	0.005	Yes
Nowa Nowa	Biannually	4[a]	0	0.005	Yes
Omeo	Biannually	2	0	0.005	Yes
Orbost	Biannually	2	0	0.005	Yes
Sarsfield-Bruthen	Biannually	2	0	0.005	Yes
Sunlakes-Toorloo	Biannually	2	0	0.005	Yes
Swifts Creek	Biannually	2	0	0.005	Yes

[a]Water Sampling locality has two entry point locations, each sampled biannually.

4.13.1 Comments on results

All water quality localities were compliant for cyanide for the 2012/2013 reporting period.

4.14 Other Substances- Copper

Copper samples are taken quarterly in each applicable water sampling localities. Compliance is measured as: ≤ 2 mg/L (health-based guideline value under the Australian Drinking Water Guidelines) and ≤ 1 milligram per litre (aesthetic guideline value under the Australian Drinking Water Guidelines 2011).

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-Complying Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Quarterly	4	0	0.007	Yes
Bemm River	Quarterly	4	0	0.011	Yes
Buchan	Quarterly	4	0	0.002	Yes
Cann River	Quarterly	4	0	0.002	Yes
Dinner Plain	Quarterly	4	0	0.092	Yes
Eagle Point- Paynesville	Quarterly	4	0	0.009	Yes
Kalimna	Quarterly	4	0	0.011	Yes
Lindenow	Quarterly	4	0	0.014	Yes
Lindenow South	Quarterly	4	0	0.008	Yes
Mallacoota	Quarterly	4	0	0.006	Yes
Merrangbaur	Quarterly	4	0	0.008	Yes
Metung	Quarterly	4	0	0.002	Yes
Nicholson-Swan Reach	Quarterly	4	0	0.015	Yes
Nowa Nowa	Quarterly	4	0	0.003	Yes
Omeo	Quarterly	4	0	0.003	Yes
Orbost	Quarterly	4	0	0.003	Yes
Sarsfield-Bruthen	Quarterly	4	0	0.008	Yes
Sunlakes-Toorloo	Quarterly	4	0	0.008	Yes
Swifts Creek	Quarterly	4	0	0.005	Yes

4.14.1 Comments on results

All water quality localities were compliant for copper for the 2012/2013 reporting period.

4.15 Other Substances- Lead

Lead samples are taken quarterly in each applicable water sampling locality. Compliance is measured as: ≤ 0.01 milligram per litre (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-Complying Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Quarterly	4	0	0.001	Yes
Bemm River	Quarterly	4	0	0.001	Yes
Buchan	Quarterly	4	0	0.001	Yes
Cann River	Quarterly	4	0	0.001	Yes
Dinner Plain	Quarterly	4	0	0.001	Yes
Eagle Point- Paynesville	Quarterly	4	0	0.001	Yes
Kalimna	Quarterly	4	0	0.001	Yes
Lindenow	Quarterly	4	0	0.001	Yes
Lindenow South	Quarterly	4	0	0.001	Yes
Mallacoota	Quarterly	4	0	0.001	Yes
Merrangbaur	Quarterly	4	0	0.001	Yes
Metung	Quarterly	4	0	0.001	Yes
Nicholson-Swan Reach	Quarterly	4	0	0.001	Yes
Nowa Nowa	Quarterly	4	0	0.001	Yes
Omeo	Quarterly	4	0	0.001	Yes
Orbost	Quarterly	4	0	0.001	Yes
Sarsfield-Bruthen	Quarterly	4	0	0.001	Yes
Sunlakes-Toorloo	Quarterly	4	0	0.001	Yes
Swifts Creek	Quarterly	4	0	0.001	Yes

4.15.1 Comments on results

All water quality localities were compliant for lead for the 2012/2013 reporting period.

4.16 Other Substances- Biocides

All surface raw water sources are analysed annually for biocides (i.e. herbicides and pesticides). A representative suite of these biocides is examined based on land management activities in the water supply catchments. Sampling occurs during the months of heaviest rainfall, namely July or September. The targeted biocides, alongside their associated limits of detection, are presented in the table below. Compliance is measured as recorded values being below the Australian Drinking Water Guidelines 2011 health-based guideline value, or if not specified in the Guidelines, the absence of the compound above the laboratory's limits of detection.

In 2011/2012, East Gippsland Water expanded its biocide monitoring programme (to include the triazine and phenoxy acid families of biocides), in close consultation with East Gippsland Catchment Management Authority, and based on land management activities in the water supply catchments. The addition of approximately 30 of these biocide compounds to the screening programme provides further assurance that the risk from biocide application impacting drinking water supplies is effectively managed in all water sampling localities. East Gippsland Water maintains close liaison with local stake holders (e.g. Catchment Management Authority, Vic Forests) regarding biocide application in water supply catchments, to ensure minimal risk to the drinking water supply.

In July 2012, surface raw water samples were analysed from Bemm River, Buchan, Cann River and Orbost. In September 2012, surface raw water samples were analysed from the Mitchell River, Woodglen storages (1 and 2), Mallacoota, Swifts Creek and Omeo.

Water Sampling Locality	Sampling Frequency	Class	Compound	Units	Result	Complying (Yes / No)
July 2012 Bemm River, Buchan, Cann River & Orbost *September 2012* Bairnsdale (Mitchell River, Woodglen storages 1 & 2), Mallacoota, Omeo & Swifts Creek	Annually	n/a	Glyphosate	mg/L	<0.03	Yes
		n/a	Metsulfuron Methyl	µg/L	<0.1	Yes
		Organo-chlorine Biocides	Aldrin	mg/L	<0.00001	Yes
			BHC (Alpha Isomer)	mg/L	<0.00005	Yes
			BHC (Beta Isomer)	mg/L	<0.00005	Yes
			BHC (Delta Isomer)	mg/L	<0.00005	Yes
			cis-Chlordane	mg/L	<0.00001	Yes
			trans-Chlordane	mg/L	<0.00001	Yes
			4,4'-DDD	mg/L	<0.00006	Yes
			4,4'-DDE	mg/L	<0.00006	Yes
			4,4'-DDT	mg/L	<0.00006	Yes
			Dieldrin	mg/L	<0.00001	Yes
			Endosulfan I	mg/L	<0.00005	Yes
			Endosulfan II	mg/L	<0.00005	Yes
			Endosulphan Sulphate	mg/L	<0.00005	Yes
			Endrin	mg/L	<0.0001	Yes
			Endrin Aldehyde	mg/L	<0.0001	Yes
			Hexachlorobenzene	mg/L	<0.00000	Yes

Water Sampling Locality	Sampling Frequency	Class	Compound	Units	Result	Complying (Yes / No)
			Heptachlor	mg/L	<0.00005	Yes
			Heptachlor Epoxide	mg/L	<0.00005	Yes
			Lindane (BHC Gamma	mg/L	<0.00005	Yes
			Methoxychlor	mg/L	<0.0002	Yes
			Endrin Ketone	mg/L	<0.00005	Yes
		Organo-phosphorus Biocides	Dichlorvos	mg/L	<0.001	Yes
			Monocrotophos	mg/L	<0.001	Yes
			Prophos	mg/L	<0.001	Yes
			Tetraethyldithiopyrphos	mg/L	<0.001	Yes
			Phorate	mg/L	<0.001	Yes
			Demeton-S	mg/L	<0.001	Yes
			Diazinon	mg/L	<0.001	Yes
			Methyl Parathion	mg/L	<0.001	Yes
			Ronnel	mg/L	<0.001	Yes
			Malathion	mg/L	<0.001	Yes
			Fenthion	mg/L	<0.001	Yes
			Chloropyrifos	mg/L	<0.001	Yes
			Ethyl Parathion	mg/L	<0.001	Yes
			Trichlorinate	mg/L	<0.001	Yes
			Tetrachlovinphos	mg/L	<0.001	Yes
			Tukuthion	mg/L	<0.001	Yes
			Fensulfothion	mg/L	<0.001	Yes
			EPN	mg/L	<0.001	Yes
			Coumaphos	mg/L	<0.001	Yes
		Triazines	Ametryn	mg/L	<0.002	Yes
			Atrazine	mg/L	<0.002	Yes
			Prometon	mg/L	<0.002	Yes
			Prometryn	mg/L	<0.002	Yes
			Propazine	mg/L	<0.002	Yes
			Simazine	mg/L	<0.002	Yes
			Terbuthylazine	mg/L	<0.002	Yes
			Simetryn	mg/L	<0.002	Yes
			Terbutryn	mg/L	<0.002	Yes
		Phenoxy acid biocides	2,4,5-T	µg/L	<0.01	Yes
			2,4,5-TP	µg/L	<0.01	Yes
			2,4,6-T	µg/L	<0.1	Yes
			2,4-D	µg/L	<0.01	Yes

Water Sampling Locality	Sampling Frequency	Class	Compound	Units	Result	Complying (Yes / No)
			2,4-DB	µg/L	<0.01	Yes
			2,4-DP	µg/L	<0.01	Yes
			2,6-D	µg/L	<0.1	Yes
			4 Chlorophenoxy Acetic	µg/L	<0.01	Yes
			Clopyralid	µg/L	<0.05	Yes
			Dicamba	µg/L	<0.01	Yes
			Fluroxypyr	µg/L	<0.05	Yes
			MCPA	µg/L	<0.01	Yes
			MCPB	µg/L	<0.01	Yes
			Mecoprop	µg/L	<0.01	Yes
			Metsulfuron Methyl	µg/L	<0.1	Yes
			Picloram	µg/L	<0.05	Yes
			Triclopyr	µg/L	<0.01	Yes

4.16.1 Comments on results

All the above results were below the health-based guideline value in the Australian Drinking Water Guidelines, or if not specified in the Guidelines, were below the lower limits of detection, and therefore were deemed to be compliant in 2012/2013.

4.17 Other Substances- Radiological

Radiological activity samples are taken from bore waters biennially (i.e. every two years). While there are no specific guidelines for radiological activity, the Australian Drinking Water Guidelines 2011 advise that radionuclides should be identified and determined if gross alpha or beta activities exceed 0.5 Bq/L.

Water Sampling Locality	Sampling Frequency	No. of Sites Sampled	Gross Alpha Activity Max. (Bq/L)	Gross Beta Activity Max. (Bq/L)	Complying (Yes / No)
Dinner Plain	Biannually	2	0.02	0.07	Yes
Mallacoota	Biennially	1	0.02	0.07	Yes

4.17.1 Comments on results

All results obtained were below the guideline values in Australian Drinking Water Guidelines and were therefore deemed compliant for the 2012/2013 reporting period.

4.18 Aesthetic Characteristics- pH

pH samples are taken weekly in each water sampling locality. The Australian Drinking Water Guidelines (2011) state that the pH of drinking water should lie between pH ≥ 6.5 and ≤ 8.5 (aesthetic guideline limit). However, as cement mortar-lined pipes and newly constructed concrete water storages may raise pH, values up to pH 9.2 may be tolerated, provided no deterioration in microbiological quality of the water supply is observed.

Water Sampling Locality	Sampling Frequency	No. of Samples	Minimum (mg/L)	Maximum (mg/L)	Average (mg/L)
Bairnsdale	Weekly	72	7.1	7.2	7.3
Bemm River	Weekly	52	7.0	7.5	7.3
Buchan	Weekly	52	8.0	9.1	8.4
Cann River	Weekly	52	7.6	8.8	8.2
Dinner Plain	Weekly	52	6.6	7.4	6.8
Eagle Point- Paynesville	Weekly	52	7.3	8.3	7.6
Kalimna	Weekly	52	7.2	7.8	7.4
Lindenow	Weekly	52	7.2	8.1	7.5
Lindenow South	Weekly	52	7.5	7.9	7.7
Mallacoota	Weekly	52	7.2	8.4	7.9
Merrangbaur	Weekly	52	7.4	7.8	7.6
Metung	Weekly	52	8.0	9.1	8.6
Nicholson-Swan Reach	Weekly	52	7.1	8.7	7.5
Nowa Nowa	Weekly	52	7.7	9.2	8.6
Omeo	Weekly	52	7.6	8.8	8.0
Orbost	Weekly	52	7.5	9.1	8.3
Sarsfield-Bruthen	Weekly	52	7.1	8.0	7.4
Sunlakes-Toorloo	Weekly	57[a]	7.3	8.8	7.7
Swifts Creek	Weekly	52	7.7	8.4	8.0

[a]The frequency of pH samples taken in Sunlakes-Toorloo increased in December 2012 to February 2013 due to seasonal population influxes during the summer period.

4.18.1 Comments on results

Based on the average values over the year, pH values for all localities are within the upper guideline range for pH (i.e. pH < 9.2). High pH values are due to a number of factors, including changes in sample composition during transit to the testing laboratory, interaction between the water and pipe material (leaching of lime from cement concrete mains), presence of algae in the source water and booster sodium hypochlorite stations throughout the system.

Higher pH values have been observed in Buchan, Nowa Nowa and Metung water sampling localities. This is largely due to the presence of cement-lined distribution pipes. However, these higher pH values have not impacted water quality, as evidenced by compliant microbiological (Table 3.1) and aesthetic quality (Section 6) during 2012/2013.

4.19 Aesthetic Characteristics- Hardness

Compliance is measured as: ≤ 200 milligrams per litre (Australian Drinking Water Guidelines 2011 aesthetic value) as total hardness (as calcium carbonate).

Water Sampling Locality	Sampling Frequency	No. of Samples	Maximum (mg/L)	% Complying
Bairnsdale	Quarterly	4	44	100%
Bemm River	Quarterly	4	15	100%
Buchan	Quarterly	4	31	100%
Cann River	Quarterly	4	25	100%
Dinner Plain	Quarterly	4	39	100%
Eagle Point- Paynesville	Quarterly	n/a[b]	n/a[b]	n/a[b]
Kalimna	Quarterly	n/a[b]	n/a[b]	n/a[b]
Lindenow	Quarterly	n/a[b]	n/a[b]	n/a[b]
Lindenow South	Quarterly	n/a[b]	n/a[b]	n/a[b]
Mallacoota	Quarterly	4	37	100%
Merrangbaur	Quarterly	n/a[b]	n/a[b]	n/a[b]
Metung	Quarterly	n/a[b]	n/a[b]	n/a[b]
Nicholson-Swan Reach	Quarterly	n/a[b]	n/a[b]	n/a[b]
Nowa Nowa	Quarterly	n/a[b]	n/a[b]	n/a[b]
Omeo	Quarterly	4	19	100%
Orbost	Quarterly	4	18	100%
Sarsfield-Bruthen	Quarterly	n/a[b]	n/a[b]	n/a[b]
Sunlakes-Toorloo	Quarterly	n/a[b]	n/a[b]	n/a[b]
Swifts Creek	Quarterly	4	82	100%

[b]Not applicable; Bairnsdale samples represent the entry point for the Mitchell system; accordingly, hardness is not routinely sampled in the other Mitchell system sampling localities i.e. Eagle Point-Paynesville, Kalimna, Lindenow, Lindenow South, Merrangbaur, Metung, Nicholson-Swan Reach, Nowa Nowa, Sarsfield-Bruthen, Sunlakes Toorloo.

4.19.1 Comments on results

All water quality localities were compliant for hardness for the 2012/2013 reporting period.

4.20 Aesthetic Characteristics- Free chlorine

The Australian Drinking Water Guidelines (2011) state that chlorine concentrations in the drinking water supply must be ≤ 5 milligrams per litre for health purposes. Based on aesthetic considerations (i.e. taste and odour), chlorine concentration > 0.6 milligrams per litre may be noticeable by certain customers. However, in certain water sampling localities, this taste/odour threshold concentration may need to be exceeded, to provide adequate disinfection to the end of the distribution system.

Water Sampling Locality	Sampling Frequency	No. of Samples	Minimum (mg/L)	Maximum (mg/L)	Average (mg/L)
Bairnsdale	Weekly	72	0.39	1.00	0.76
Bemm River	Weekly	52	0.11	1.20	0.55
Buchan	Weekly	52	0.05	0.96	0.56
Cann River	Weekly	52	0.21	2.20	0.73
Dinner Plain	Weekly	n/a[a]	n/a[a]	n/a[a]	n/a[a]
Eagle Point- Paynesville	Weekly	52	0.21	0.69	0.51
Kalimna	Weekly	52	0.43	0.94	0.63
Lindenow	Weekly	52	0.41	0.90	0.69
Lindenow South	Weekly	52	0.28	0.80	0.55
Mallacoota	Weekly	52	0.02	1.10	0.55
Merrangbaur	Weekly	52	0.41	0.93	0.70
Metung	Weekly	52	0.36	0.85	0.58
Nicholson-Swan Reach	Weekly	52	0.38	1.00	0.79
Nowa Nowa	Weekly	52	0.26	1.04	0.56
Omeo	Weekly	52	0.05	1.10	0.61
Orbost	Weekly	52	0.20	1.12	0.74
Sarsfield-Bruthen	Weekly	52	0.14	1.10	0.65
Sunlakes-Toorloo	Weekly	57[b]	0.46	1.20	0.84
Swifts Creek	Weekly	52	0.28	1.20	0.74

[a]Dinner Plain is not sampled for free chlorine as ultra-violet disinfection is employed in lieu of chlorine.

[b]The frequency of free chlorine residual samples taken in Sunlakes-Toorloo increased in December 2012 to February 2013 due to seasonal population influxes during the summer period.

4.20.1 Comments on results

Variations in chlorine levels can arise from a number of factors, including proximity to a disinfection plant, interaction with pipe material, increase/decrease in usage (and therefore flow rates and detention times), changes in water temperature, and the presence of trace organic matter in the water/pipeline.

Based on the average concentration over the year, all water sampling localities were below the health-related limit of ≤ 5 milligrams per litre. Average chlorine levels were occasional higher than the aesthetic limit of > 0.6 milligrams per litre in several water sampling localities to maintain adequate disinfection through to the end of these distribution systems. We strive to balance the requirement for adequate disinfection throughout our distribution system (health considerations), whilst supplying water that is

acceptable to customers in terms of taste and odour (aesthetic considerations). This can be seen by our free chlorine results in all water sampling localities (above), as well as the low level of chlorine-related customer complaints received in 2012/2013 (refer Section 6).

4.21 Aesthetic Characteristics- Colour

Compliance is measured as: ≤ 15 Hazen Units (HU; Australian Drinking Water Guidelines 2011 aesthetic value).

Water Sampling Locality	Sampling Frequency	No. of Samples	Minimum (HU)	Maximum (HU)	% Complying
Bairnsdale	Monthly	12	2	2	100%
Bemm River	Monthly	12	2	2	100%
Buchan	Monthly	12	2	2	100%
Cann River	Monthly	12	2	3	100%
Dinner Plain	Monthly	12	2	2	100%
Eagle Point- Paynesville	Monthly	12	2	2	100%
Kalimna	Monthly	12	2	2	100%
Lindenow	Monthly	12	2	2	100%
Lindenow South	Monthly	12	2	2	100%
Mallacoota	Monthly	12	2	4	100%
Merrangbaur	Monthly	12	2	2	100%
Metung	Monthly	12	2	2	100%
Nicholson-Swan Reach	Monthly	12	2	2	100%
Nowa Nowa	Monthly	12	2	2	100%
Omeo	Monthly	12	2	2	100%
Orbost	Monthly	12	2	2	100%
Sarsfield-Bruthen	Monthly	12	2	2	100%
Sunlakes-Toorloo	Monthly	12	2	2	100%
Swifts Creek	Monthly	12	2	2	100%

4.21.1 Comments on results

All water quality localities were compliant for colour for the 2012/2013 reporting period.

4.22 Aesthetic Characteristics- Manganese

Compliance is measured as: ≤ 0.1 milligrams per litre (Australian Drinking Water Guidelines 2011 aesthetic value) and ≤ 0.5 milligrams per litre (Australian Drinking Water Guidelines 2011 health-based guideline value).

Water Sampling Locality	Sampling Frequency	No. of Samples	Maximum (mg/L)	% Complying
Bairnsdale	Monthly	12	0.006	100%
Bemm River	Monthly	12	0.002	100%
Buchan	Monthly	12	0.001	100%
Cann River	Monthly	12	0.007	100%
Dinner Plain	Monthly	12	0.001	100%
Eagle Point- Paynesville	Monthly	12	0.001	100%
Kalimna	Monthly	12	0.001	100%
Lindenow	Monthly	12	0.001	100%
Lindenow South	Monthly	12	0.001	100%
Mallacoota	Monthly	12	0.002	100%
Merrangbaur	Monthly	12	0.001	100%
Metung	Monthly	12	0.001	100%
Nicholson-Swan Reach	Monthly	12	0.001	100%
Nowa Nowa	Monthly	12	0.001	100%
Omeo	Monthly	12	0.001	100%
Orbost	Monthly	12	0.005	100%
Sarsfield-Bruthen	Monthly	12	0.001	100%
Sunlakes-Toorloo	Monthly	12	0.001	100%
Swifts Creek	Monthly	12	0.001	100%

4.22.1 Comments on results

All water quality localities were compliant for manganese for the 2012/2013 reporting period (both aesthetic and health values).

4.23 Aesthetic Characteristics- Iron

Compliance is measured as: ≤ 0.3 milligrams per litre (Australian Drinking Water Guidelines 2011 aesthetic value).

Water Sampling Locality	Sampling Frequency	No. of Samples	Maximum (mg/L)	% Complying
Bairnsdale	Monthly	12	0.06	100%
Bemm River	Monthly	12	0.15	100%
Buchan	Monthly	12	0.02	100%
Cann River	Monthly	12	0.08	100%
Dinner Plain	Monthly	12	0.01	100%
Eagle Point- Paynesville	Monthly	12	0.01	100%
Kalimna	Monthly	12	0.01	100%
Lindenow	Monthly	12	0.02	100%
Lindenow South	Monthly	12	0.01	100%
Mallacoota	Monthly	12	0.06	100%
Merrangbaur	Monthly	12	0.02	100%
Metung	Monthly	12	0.02	100%
Nicholson-Swan Reach	Monthly	12	0.02	100%
Nowa Nowa	Monthly	12	0.02	100%
Omeo	Monthly	12	0.04	100%
Orbost	Monthly	12	0.08	100%
Sarsfield-Bruthen	Monthly	12	0.01	100%
Sunlakes-Toorloo	Monthly	12	0.01	100%
Swifts Creek	Monthly	12	0.02	100%

4.23.1 Comments on results

All water quality localities were compliant for iron for the 2012/2013 reporting period.

4.24 Aesthetic Characteristics- Zinc

Compliance is measured as: ≤ 3 milligrams per litre (Australian Drinking Water Guidelines 2011 aesthetic value).

Water Sampling Locality	Sampling Frequency	No. of Samples	Maximum (mg/L)	% Complying
Bairnsdale	Quarterly	4	0.004	100%
Bemm River	Quarterly	4	0.012	100%
Buchan	Quarterly	4	0.002	100%
Cann River	Quarterly	4	0.005	100%
Dinner Plain	Quarterly	4	0.029	100%
Eagle Point- Paynesville	Quarterly	4	0.003	100%
Kalimna	Quarterly	4	0.002	100%
Lindenow	Quarterly	4	0.002	100%
Lindenow South	Quarterly	4	0.010	100%
Mallacoota	Quarterly	4	0.005	100%
Merrangbaur	Quarterly	4	0.004	100%
Metung	Quarterly	4	0.002	100%
Nicholson-Swan Reach	Quarterly	4	0.002	100%
Nowa Nowa	Quarterly	4	0.002	100%
Omeo	Quarterly	4	0.006	100%
Orbost	Quarterly	4	0.009	100%
Sarsfield-Bruthen	Quarterly	4	0.015	100%
Sunlakes-Toorloo	Quarterly	4	0.004	100%
Swifts Creek	Quarterly	4	0.007	100%

4.24.1 Comments on results

All water quality localities were compliant for zinc for the 2012/2013 reporting period.

4.25 Analysis of Results

Comparing the percentage compliance in all water sampling localities (refer to Figure 6) demonstrates our high standard of compliance over the past three years. All sampling localities were fully compliant with the parameters described in Schedule 2 of the Safe Drinking Water Regulations 2005 in 2012/2013, with the exception of Orbost, where an acid soluble aluminium exceeded was detected in one routine sample during this period (refer to Section 5 for further details). Despite this singular event, East Gippsland Water supplied 91% of our customer connections with fully compliant drinking water in 2012/2013 (refer to Figure 7).

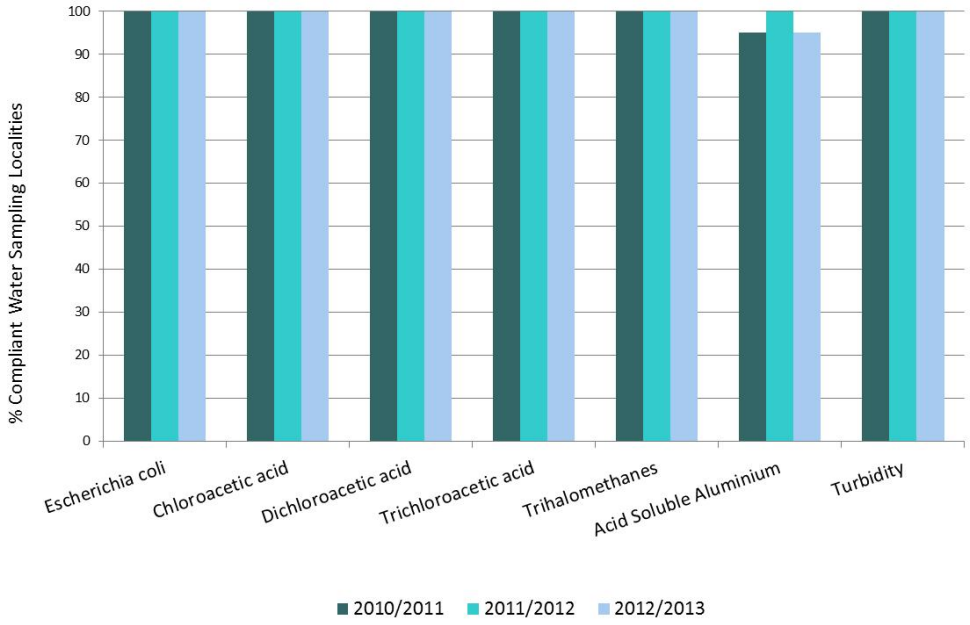

Figure 6: Percentage of water sampling localities compliant with Schedule 2 parameters

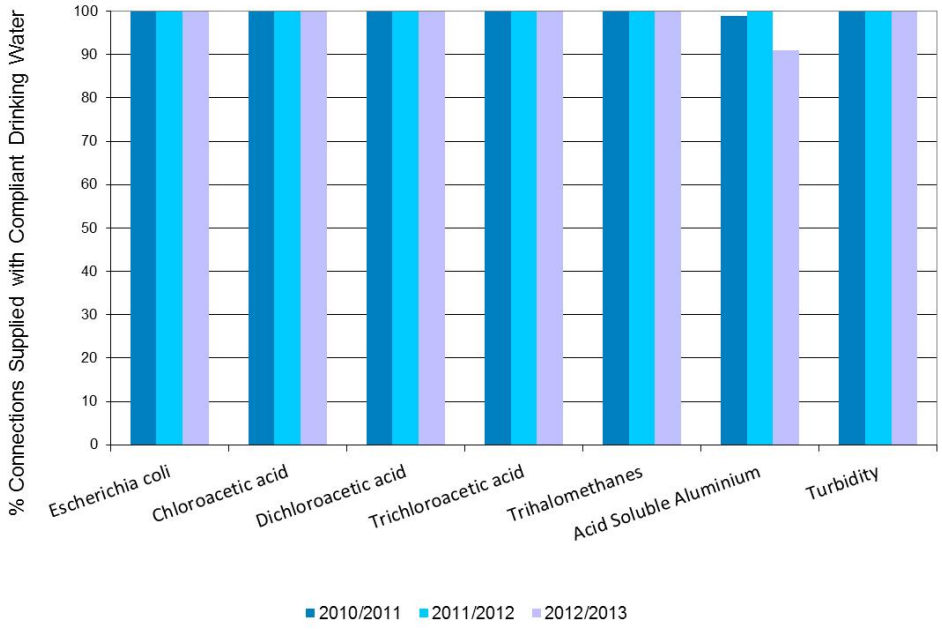

Figure 7: Percentage of connections supplied with compliant drinking water in all localities

5 Emergency and Incident Management

5.1 Notification Events under Section 22 or Section 18

Under the Safe Drinking Water Act 2003, the Department of Health must be notified of circumstances where drinking water supplied to the public does not comply, or is not likely to comply, with any relevant water quality standard, or where drinking water is supplied such that it may pose a risk to human health or cause widespread public complaint. In 2012/2013, no Section 22 notifications were made to the Department of Health.

A water supplier must notify the Department of Health under section 18 of the Act when drinking water supplied to the public does not comply with any relevant water quality standard set out in Schedule 2 of the Safe Drinking Water Regulations 2005. One Section 18 notification was lodged in 2012/2013. Following a brief period of sub-optimal water treatment plant performance at the Orbost water treatment plant, an aluminium exceedence was detected in a reticulation sample taken on 08/10/2012. In response, a system wide programme of flushing and monitoring was undertaken, resulting in compliant levels of acid soluble aluminium being obtained on 18/10/2012.

5.2 Other

East Gippsland experienced a severe weather event in June 2013 which resulted in prolonged heavy rainfall across the region. Despite the heavy rainfall and subsequent negative impact on the raw (river) water quality, we maintained high treated water quality and supply during the entire period. Sufficient raw water and/or treated water storage capacity at all water treatment facilities ensured that poorer quality river water did not need to be harvested during this period, and that all affected towns had ample, high quality, treated water in the days that followed the weather event.

6 Complaints Relating to Water Quality

Our Customer Charter outlines our commitments, responsibilities and standards of service to be provided to our customers.

This Charter also sets out the obligations to customers as outlined by the Essential Services Commission's Customer Service Code for metropolitan retail and regional water businesses. This includes specific standards and conditions of service that apply to all water businesses in Victoria. Further information relating to East Gippsland Water's Customer Charter can be found on our website www.egwater.vic.gov.au.

Customer complaints relating to Water Quality were again low in 2012/13, which is likely due to (1) the ongoing optimisation of chlorine addition to the treated water supply and (2) air scouring and other proactive maintenance activities.

Table 6.1 Summary of customer water quality complaints in 2012/2013

Complaint	Number of complaints	Number per 100 connections*
Discoloured Water	0	0.000
Taste and Odour	4	0.018
Dirty Water	0	0.000
Air in water	0	0.000
Alleged Illness	0	0.000
Other	2	0.009

*Calculations based on 22,220 water supply connections.

6.1 Taste and Odour

Taste and odour complaints fell in 2012/2013, with four complaints received, relative to a total of 5 complaints in this category in 2011/2012. These complaints were largely related to variability in customer tolerance to the levels of chlorine in drinking water. Average free chlorine residual results were generally in line with the Australian Drinking Water Guidelines 2011 aesthetic guideline across all water sampling localities (see Section 4.20). This is reflected in the low number of customer complaints regarding chlorine taste and odour.

6.2 Other

The other water quality complaints in 2012/2013 related to customer concerns regarding (1) the level of nutrients in the water supply, and (2) the water reacting with a new kitchen appliance. Upon investigation, both issues were determined not to be as a consequence of the water supply.

7 Status of Actions Arising from the most Recent Risk Management Plan Audit

Our Drinking Water Quality Risk Management System was audited in February 2012 by an external certified auditor. The Drinking Water Quality Risk Management Plan (RMP), which is the central component of East Gippsland Water's Drinking Water Quality Risk Management System, outlines a preventive, systematic and comprehensive approach to drinking water quality assurance. The RMP identifies risks to drinking water quality at all steps in the water supply chain, from catchment to consumer, and ensures that appropriate control measures are in place to effectively manage those risks. The RMP also describes supporting plans and policies that are essential to the ongoing provision of safe, high quality drinking water to our consumers. The audit activity found that East Gippsland Water's Drinking Water Quality Risk Management System satisfies the requirements detailed in the Safe Drinking Water Act and associated Regulations.

There were no non-conformances identified during the audit. However a number of corrective actions were noted by the Auditor. A summary of the actions identified during the 2012 audit, alongside their current status, is outlined in the table below.

Table 7.1 Summary of corrective actions following the 2012 audit

Corrective Action Identified	Status
Risk assessments for all water supply systems to be updated to state that recycled water connections are not present in all nine water supply systems.	Complete
Prepare Works Instruction specifically addressing the procedure to manage a dual burst drinking water and sewerage reticulation main in the same location	Complete
Standard operating procedure to be created describing the management of back-flow/trade waste risks though an external provider. Document to encompass: (i) monitoring/performance tracking of external service provider and (ii) process for dealing with non-conformances.	Complete
The requirement to record free chlorine residuals following mains works to be communicated to all relevant Depot Team Leaders at a Networks Operations Co-ordination Meeting.	Complete
Free chlorine residual data entry field to be coded in Depot works management system (AquaTact) to allow free chlorine residual data to be recorded with each specific mains repair job.	Complete
Relevant works instructions to be updated to reflect the requirement to enter free chlorine residual field data in AquaTact following completion of mains repair work.	Complete
Conduct staff training on finalised procedures.	Complete

8 Undertakings Under Section 30 of the Act

Section 30 of the *Safe Drinking Water Act 2003* allows for the Secretary of the Department of Health to accept a written undertaking from a water supplier that certain actions will be performed in the event that they are, or are likely to be, in contravention of the *Safe Drinking Water Act 2003* or its associated regulations.

During the 2012/2013 period, we did not require any undertakings.

9 Regulated Water

We have no declared Regulated Water supplies as defined in section 6 (2) of the *Safe Drinking Water Act 2003*.

We have a number of customers who are supplied non-potable water by agreement. We remind those customers that their water is non-potable on their quarterly invoice.

10 Further Information

This Water Quality Annual Report is prepared in accordance with section 26 of the *Safe Drinking Water Act 2003*. This index facilitates identification of East Gippsland Water's compliance with statutory disclosure requirements.

For further information regarding water quality information, please refer to the East Gippsland Water's website (www.egwater.vic.gov.au), or contact East Gippsland Water on 1300 720 700.

11 Glossary of terms

CWS	Clear water storage
DWQMS	Drinking Water Quality Management System
ISES	Integrated standards enforcement system
kL	Kilolitres (1,000 litres)
L/s	Litres per second
mg/L	Milligrams per litre
ML	Megalitre (1,000,000 litres)
n/a	Not applicable
NTU	Nephelometric turbidity units
PAC	Polyaluminium chlorohydrate
PCU	Platinum cobalt units
RMP	Risk management plan
SOP	Standard operating procedure
WTP	Water treatment plant
m	Millions