GIPPSLAND WATER

Gippsland Water 2007-08 Annual Report on Drinking Water Quality

Safe Drinking Water Act 2003

Pictured: Flood affected Macalister River

EXECUTIVE SUMMARY

Gippsland Water is committed to providing safe drinking water that meets customer and stakeholder expectations. Gippsland Water's objective is to ensure the quality of water supplied to its customers meets the requirements of the *Safe Drinking Water Act 2003*.

The *Safe Drinking Water Act 2003* (SDWA*)* came into effect on 1 July 2004 and is the first Act in Victoria to deal specifically with the regulation of drinking water supplies.

The SDWA requires water suppliers and water storage managers to provide the Department of Human Services (DHS) with an annual report, covering issues relating to the quality and management of drinking water.

A region-wide water quality monitoring program tests the quality of the drinking water present at customer taps in accordance with the Safe Drinking Water Regulations 2005. A summary of the results for the reporting period of July 2007 to June 2008 has been provided for water quality parameters. The regulated parameters include *E.coli*, turbidity, aluminium and disinfection by-products (chloroacetic acid, dichloroacetic acid, trichloroacetic acid and trihalomethanes).

As part of Gippsland Water's monitoring program, 5,928 tests were performed on samples taken from customer taps. Six were found to be non-compliant for the following water quality parameters:

- Aluminium:
    - Erica (August 2007)
    - Traralgon (January 2008)
    - Rawson (May 2008)

- Trihalomethanes (THMs):
    - Seaspray (March, April and May 2008)

During the reporting year, the Maffra and Coongulla raw water systems were severely affected by a flood event in the Macalister River catchment in May 2007. Gippsland Water successfully implemented its emergency management and business continuity response, and customer water supply quality was maintained within regulatory requirements.

Gippsland Water supplies 59,820 properties with water and received 172 complaints regarding water quality (discoloured, air in water, blue water, illness, taste, odour, and other) during the reporting period. The corporation's extensive customer complaint response procedure ensures all complaints are responded to effectively and in a timely manner. There have been no outstanding or major issues arising from the customer complaints process.

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1 INTRODUCTION

1.1 CHARACTERISATION OF THE SYSTEM

Gippsland Water manages five business streams, one of which is the provision of water services. Its region consists of 42 towns with approximately 59,820 properties connected to the 17 drinking water supply systems. These towns are grouped into 35 localities for the purposes of monitoring and reporting in accordance with the Safe Drinking Water Regulations 2005.

Gippsland Water is committed to providing responsible asset management, quality management, incident management and operational audit of the reticulated urban water supply system to ensure that customer service levels are achieved according to its Customer Charter targets and the *Safe Drinking Water Act 2003*.

A major objective for the corporation is to achieve and maintain community confidence in the safety, reliability and quality of their water supply.

Our mission

To manage the resources in our care in a manner that ensures Gippsland's sustainability and secures social, environmental and economic benefits to our customers, stakeholders and region.

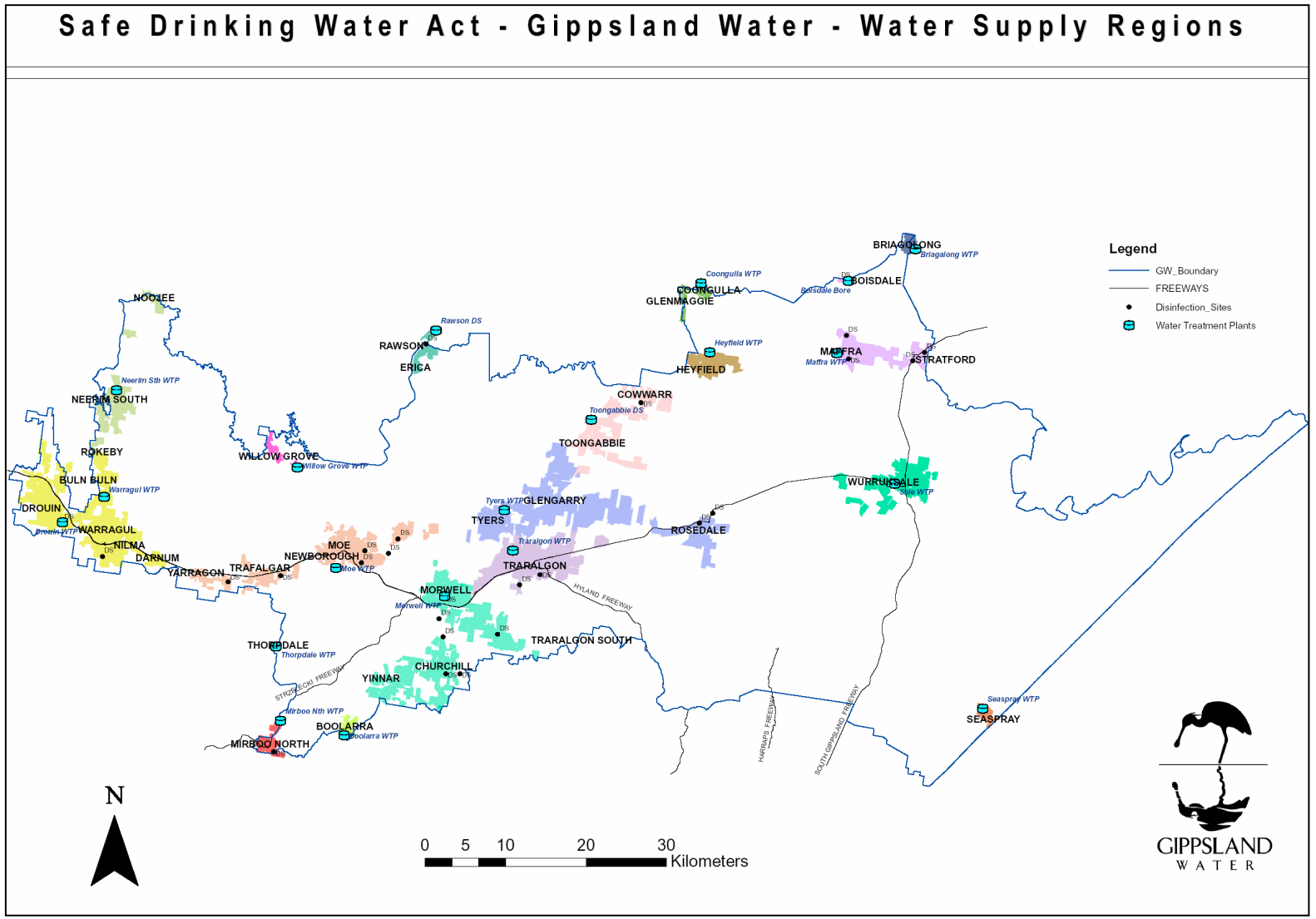
Our vision

In an increasingly challenging operating environment, Gippsland Water will strive for best practice sustainable water and waste management within central Gippsland.

1.1.1 Map of the Gippsland Water system

Figure 1 provides an overview of the water supply system operated by Gippsland Water.

Figure 1



1.1.2 Source of water

Gippsland Water operated 17 water treatment systems supplying 35 localities (42 towns) in 2007-08. The water for these systems is sourced from a variety of water supplies including stream off-takes, reservoirs, and groundwater (bore water). Table 1.1 provides information on where the raw water is sourced for each of the water sampling localities and identifies the raw water storage - if one exists prior to the water treatment plants.

The Coongulla/Glenmaggie system was impacted by poor water quality between February and October 2007 due to previous bushfire activity in the Macalister River catchment and rainfall events. An alternative water source (from the Heyfield system) was supplied by mobile tanker into this system during this time.

Table 1.1 Water source

Locality	Population[1]	Source water	Storage	Water treatment plant
Maffra	3,916	Macalister River	N/A	Maffra
Stratford	1,330			
Boisdale	70			
Boolarra	478	Walkley Creek O'Gradys Creek (supplementary supply)	Raw water basin	Boolarra
Briagolong	472	Bore (Boisdale Aquifer)	N/A	Briagolong
Morwell	12,278	Tyers River	Moondarra	Morwell
Churchill	4,898			
Yinnar	550			
Jumbuk	180			
Traralgon South/Hazelwood North	1,053			
Tyers/Glengarry	914	Tyers River	Moondarra	Tyers
Rosedale	1,042			
Toongabbie	463			
Cowwarr	225			
Traralgon	19,614	Tyers River	Moondarra	Traralgon
Warragul (including Nilma, Darnum, Drouin East)	14,040	Pederson Weir (Tarago River) Tarago Reservoir - (supplementary supply)	Tarago Reservoir (supplementary supply)	Warragul
Warragul South	330			
Drouin	5,815			
Rokeby/Buln Buln	357			
Coongulla/ Glenmaggie	176	Macalister River Alternative source – tankered water from Heyfield for the period of February 2007 to September 2007.	Lake Glenmaggie	Coongulla
Rawson	277	Trigger Creek	Amours Basins	Rawson
Erica	194			
Heyfield	1,436	Thomson River	Raw water storage	Heyfield

Locality	Population[1]	Source water	Storage	Water treatment plant
Mirboo North	1,382	Little Morwell River	N/A	Mirboo North
Moe	15,770	Tanjil River and Narracan Creek	N/A	Moe
Newborough	4013			
Yallourn North	1,185			
Trafalgar	2,279			
Yarragon	707			
Neerim South	535	Tarago River	Tarago Reservoir	Neerim South
Noojee	119			
Sale/Wurruk	12,854	Bore (Boisdale Aquifer)	N/A	Sale
Seaspray	208	Merrimans Creek	N/A	Seaspray
Thorpdale	155	Easterbrook Creek	Thorpdale raw water storage	Thorpdale
Willow Grove	194	Tanjil River	Blue Rock Lake	Willow Grove

[1.] The listed populations are for the water sampling localities as registered with DHS in June 2006.

2 WATER TREATMENT AND QUALITY MANAGEMENT SYSTEMS

2.1 WATER TREATMENT

Gippsland Water operates 17 water supply systems, with 17 water treatment plants (WTP), supplying 35 localities (42 towns). The source waters are treated prior to distribution to Gippsland Water's customers with the objective of providing safe drinking water at all times. The treatment varies for each water supply system with the specific treatment process dependent on the quality and risks of the source water. Table 2.1 identifies the regular treatment process for each of the water localities and lists the added substances and any periodic treatment activities.

The corporation uses the following treatment processes to produce safe drinking water.

2.1.1 Coagulation and flocculation

Coagulation is a process to remove very fine suspended particles often associated with turbidity, colour or colloidal matter in water. These particles have a negative charge that causes them to repel each other and stay suspended in water. The addition of a suitable 'coagulant' of iron and/or aluminium salt with a positive charge neutralises or destabilises the negative charge enabling the fine particles to join together to form larger particles. The flocculation (floc) process involves stirring the water gently after the coagulant has been added. This allows the particles to come into contact, and eventually causes it to stick together and form floc. This process removes the fine particles, dirt and colour present in the water.

2.1.2 Clarification/sedimentation

The clarification or sedimentation of the floc materials is usually carried out under still conditions (e.g. in the sedimentation tank or clarifier). A sedimentation tank relies on gravity to separate the floc from the water, which is heavy and falls to the bottom of the tank – leaving the 'cleaner' water on top. A clarifier uses a mechanical process to separate the floc, and the water is collected in troughs at the surface. Once the floc has been removed the clean water is sent to filters.

2.1.3 Filtration

The clarified water is passed through a filter consisting of several types of graded filter media (sand, gravel and coal) to remove any remaining particles, floc or dissolved chemicals that may have passed through the clarification/sedimentation process.

Over time, the filters gradually become clogged with trapped particles. A filter backwash is carried out to clean the filters, returning it to optimum condition. Air and water is forced up through the filter nozzles to agitate the filter bed and remove any trapped particles. The final turbidity of water leaving the filters, during normal plant operation, is less than 0.1 NTU (unit of measure for turbidity).

The backwash water produced during the filter cleaning process is discharged to the sludge thickening system to separate solids from process water. To maximise water use, the separated process water is then returned to the treatment plant and mixed with new raw water to recommence the treatment process.

2.1.4 Disinfection

Drinking water is disinfected to prevent the spread of waterborne pathogens that cause diseases such as dysentery, cholera, typhoid and gastroenteritis. A low residual level of disinfection also ensures that the water remains disinfected once it leaves the water treatment plant until it arrives at the customer's tap. In Gippsland Water's service area, chlorination is the most commonly used disinfectant because of its reliability and cost effectiveness. Chlorine is the most widely used disinfectant for water supplies in the world. The other disinfection treatment processes used in our region is chloramination.

2.1.5 Fluoridation

Fluoridation has been part of the treatment process for the following of Gippsland Water's water supply systems for a number of years: Maffra, Stratford, and Drouin. In 2006 Gippsland Water fluoridated the drinking water supplies of Moe, Morwell, Traralgon, Sale, and Warragul. For information about the health issues associated with the water fluoridation program contact the Department of Human Services on 1800 651 723.

Table 2.1 Water treatment process

Locality	WTP	Treatment process	Added substances	Comments
Maffra Stratford Boisdale	Maffra	Coagulation, Flocculation Primary Solids Separation - (Clarification) Secondary Solids Separation - (Sand Filters) Primary and Secondary Disinfection, pH Correction, Fluoridation	Soda Ash Hydrofluorosilic acid Alum Polymer LT22, PACL-23, Chlorine (gas) Sodium Hypochlorite Powdered Activated Carbon (PAC)	PAC use as required to treat for taste and odour compounds. PACL-23 is used as required, to treat highly turbid waters.
Boolarra	Boolarra	Coagulation Primary Solids Separation – (Plate Clarifier) Secondary Solids Separation – (Dual Media Filter) Disinfection, pH Correction	Alum Chlorine (gas) Soda Ash	
Briagolong	Briagolong	Coagulation, Flocculation Primary and Secondary Filtration Disinfection, pH Correction	PFS (Polymerised Ferric Sulphate) Polymers 1115 and 1160 Sodium Hypochlorite Soda Ash	
Morwell Churchill Yinnar Jumbuk Traralgon South/Hazelwood North	Morwell	Coagulation, Flocculation Primary Solids Separation (Clarification), Secondary Solids Separation – (Sand Filters), Primary and Secondary Disinfection, pH Correction, Fluoridation	Soda Ash Alum, Polymer LT20 Chlorine (gas) Sodium Hypochlorite Sodium Fluoride Calcium Hypochlorite	
Tyers/Glengarry Rosedale Toongabbie Cowwarr	Tyers	Coagulation, Flocculation **Plant 1** Primary and Secondary Filtration Primary and Secondary Disinfection, pH Correction **Plant 2** Primary Solids Separation (Dissolved Air Flotation) Secondary Solids Separation (Dual Media Filters) Tertiary Solids Separation (Micro Membrane Filtration)	Soda Ash Alum Polymers 1115 and 1160 Sodium Hypochlorite Calcium Hypochlorite	

Locality	WTP	Treatment process	Added substances	Comments
Traralgon	Traralgon	Coagulation, Flocculation Primary Solids Separation - (Dissolved Air Floatation) Secondary Solids Separation - (Dual Media Filters) Primary and Secondary Disinfection, pH Correction, Fluoridation	Soda Ash, Alum Polymer LT20 Chlorine (gas) Sodium Hypochlorite Sodium Fluoride	
Warragul, Nilma, Darnum, Drouin East Warragul South Drouin Rokeby/Buln Buln	Warragul	Coagulation, Flocculation Primary Solids Separation - (Dissolved Air Floatation) Secondary Solids Separation - (Dual Media Filters) Primary and Secondary Disinfection, pH Correction, Fluoridation	Lime Alum, Polymer LT20 Chlorine (gas) Sodium Hypochlorite Sodium Fluoride	
Coongulla/ Glenmaggie	Coongulla	Coagulation, Flocculation Primary and Secondary Filtration Disinfection, pH Correction, Granular Activated Carbon (GAC) Filtration	Soda Ash Alum 90, Polymers 1190, 1115 (1160) Sodium Hypochlorite	
Rawson Erica	Rawson	Coagulation, Flocculation Primary Solids Separation - (Dissolved Air Flotation) Secondary Solids Separation - (Dual Media Filters) Primary and Secondary Disinfection, pH Correction	Soda Ash Polymer 1160, PACL Sodium Hypochlorite	
Heyfield	Heyfield	Coagulation, Flocculation Primary and Secondary Filtration Disinfection, pH Correction	PFS, Polymers 1115 and 1160, Chlorine (gas) Soda Ash, Alum 90	Alum 90 coagulant used during poor/dirty raw water periods.
Mirboo North	Mirboo North	Coagulation, Flocculation Primary Solids Separation - (Dissolved Air Floatation) Secondary Solids Separation - (Dual Media Filters) Primary and Secondary Disinfection, pH Correction	Soda Ash PASS, Polymer LT20 Chlorine (gas) Sodium Hypochlorite	
Moe Newborough Yallourn North Trafalgar Yarragon	Moe	Coagulation, Flocculation Primary Solids Separation - (Clarification) Secondary Solids Separation - (Sand Filters & Dual Media Filters) Primary and Secondary Disinfection, pH Correction, Fluoridation	Alum, Polymer LT20 Chlorine (gas) Lime, Soda Ash Sodium Hypochlorite Sodium Fluoride Carbon Dioxide	
Neerim South Noojee	Neerim South	Coagulation, Flocculation Primary and Secondary Filtration Chlorination and Chloramination Disinfection, pH Correction	Soda Ash PFS, Polymers 1115 and 1160 Sodium Hypochlorite Ammonia (Noojee system only)	
Sale/Wurruk	Sale	Aeration, Chemical Oxidisation, Precipitation Primary Solids Separation - (Sedimentation) Secondary Solids Separation - (Dual Media Filters) Disinfection, Fluoridation	Lime Potassium Permanganate Chlorine (gas), Sodium Fluoride	

Locality	WTP	Treatment process	Added substances	Comments
Seaspray	Seaspray	Coagulation, Flocculation Primary and Secondary Filtration Disinfection, pH Correction	Soda Ash, Alum 90, Polymers 1115, (1160) Sodium Hypochlorite	
Thorpdale	Thorpdale	Coagulation, Flocculation Primary Solids Separation - (Clarification) Secondary Solids Separation - (Dual Media Filters) Disinfection, pH Correction	Alum Soda Ash Sodium Hypochlorite	
Willow Grove	Willow Grove	Coagulation, Flocculation Secondary Solids Separation - (Dual Media Filter) Chloramination Disinfection pH Correction	Soda Ash Alum, Polymer 1115 and 1160 Sodium Hypochlorite Ammonia	

2.2 SYSTEM ISSUES FOR 2007-08

During the 2007-08 monitoring period, the following upgrades/changes to water treatment systems have been implemented:

Maffra Water Treatment Plant (WTP) was enhanced to treat highly turbid water as a result from the previous fires combined with floods experienced in Gippsland in May/June 2007. The WTP maintained quality production water meeting the required water quality standards, whilst experiencing raw water turbidity levels as high as 3,000 NTU.

Coongulla WTP remained off-line between February to October 2007 as the raw water supply was severely affected by bushfire and flood events. Once the raw water quality improved, the WTP resumed normal operation.

Neerim South WTP process was slightly modified by extending the chlorine contact time and adding granular activated carbon to the filters, to manage the impacts of the blue green algae bloom on the Tarago Reservoir from late January to May 2008.

3 WATER QUALITY RESULTS FOR 2007-08

The *Safe Drinking Water Regulations 2005* require a water quality monitoring program to be undertaken to verify compliance or non-compliance of specified water quality parameters as listed in the regulations. The quality of water is to be measured at a customer's tap in each of the 35 localities to determine that the water meets the specified quality standard. The following section provides a summary of the results against the water quality parameters monitored through the year at the required sampling frequency.

A brief explanation of the required water quality parameters is provided below. A more detailed explanation can be obtained from the *Australian Drinking Water Guidelines 2004* prepared by the National Health and Medical Research Council (Section 10).

Escherichia coli (*E.coli*) – *E.coli* is the most common thermo tolerant coliform present in faeces and is regarded as the most specific indicator of recent faecal contamination from warm blooded animals. The presence of *E.coli* in the water supply can therefore indicate the potential for other pathogenic bacteria to be present. Any *E.coli* detections at customer tap samples must be reported to DHS under section 22 or section 18 of the SDWA.

Chloroacetic, Dichloroacetic and Trichloroacetic Acid – These chloroacetic acids are produced in drinking water as by-products of the reaction between chlorine and naturally occurring organic matter derived from the decay of aquatic and terrestrial vegetative matter, present in water supplies. Results from samples taken at customer taps that exceed the maximum levels for these parameters are reported to the DHS under section 18 of SDWA.

Trihalomethanes (THM) – Trihalomethanes are a category of by-products produced in drinking water, principally as a result of disinfection chemicals (chlorine) reacting with naturally occurring organic matter derived from the decay of aquatic and terrestrial vegetative matter, present in water supplies. Results from samples taken at customer taps that exceed the maximum levels for these parameters are most reported to DHS under section 18 of the SDWA.

Acid Soluble Aluminium – Aluminium concentrations may be present in water through natural leaching from soil and rock, or from the use of aluminium salts as coagulants in water treatment. The naturally occurring aluminium concentrations are removed using conventional water treatment practices. "Acid soluble aluminium" is the biologically available fraction of aluminium present in water. Results from samples taken at customer taps that exceed the maximum level of this parameter are reported to DHS under section 22 or section 18 of the SDWA.

Turbidity – Turbidity is caused by the presence of fine suspended matter such as clay, silt, colloidal particles, algae and other microscopic organisms in the water. In high levels, this matter gives the water the appearance of being dirty, muddy or milky. Turbidity is best removed by coagulation and filtration treatment processes. Results from samples taken at customer taps that exceed the maximum level of this parameter are reported to DHS under section 22 or section 18 of the SDWA.

3.1 ESCHERICHIA COLI (*E. COLI*) RESULTS

3.1.1 Compliance

Compliance under the *Safe Drinking Water Regulations 2005* requires at least 98% of all samples of drinking water collected within a locality in any 12 month period to contain no *E.coli* organism/100ml of drinking water. Gippsland Water has an internal target of 100% compliance for *E.coli*. All Gippsland Water sites achieved 100% compliance with no *E.coli*.

Figure 3: *E.coli* results for towns 2007-08

Locality	Sampling Frequency	No. of samples #	No. of Non complying results	Max result	% with no *E. coli*	Complying (Yes/No)
Boisdale	Weekly	52	0	0	100%	Yes
Boolarra	Weekly	52	0	0	100%	Yes
Briagolong	Weekly	52	0	0	100%	Yes
Churchill	Weekly	52	0	0	100%	Yes
Coongulla-Glenmaggie	Weekly	52	0	0	100%	Yes
Cowwarr	Weekly	52	0	0	100%	Yes
Drouin	Weekly	64	0	0	100%	Yes
Erica	Weekly	52	0	0	100%	Yes
Heyfield	Weekly	52	0	0	100%	Yes
Jumbuk	Weekly	52	0	0	100%	Yes
Maffra	Weekly	52	0	0	100%	Yes
Mirboo North	Weekly	52	0	0	100%	Yes
Moe	Weekly	104	0	0	100%	Yes
Morwell	Weekly	76	0	0	100%	Yes
Neerim South	Weekly	52	0	0	100%	Yes
Newborough	Weekly	52	0	0	100%	Yes
Noojee	Weekly	52	0	0	100%	Yes
Rawson	Weekly	52	0	0	100%	Yes
Rokeby-Buln Buln	Weekly	52	0	0	100%	Yes
Rosedale	Weekly	52	0	0	100%	Yes
Sale-Wurruk	Weekly	76	0	0	100%	Yes
Seaspray	Weekly	52	0	0	100%	Yes
Stratford	Weekly	52	0	0	100%	Yes
Thorpdale	Weekly	52	0	0	100%	Yes
Toongabbie	Weekly	52	0	0	100%	Yes
Trafalgar	Weekly	52	0	0	100%	Yes
Traralgon	Weekly	104	0	0	100%	Yes
Traralgon South-Hazelwood North	Weekly	52	0	0	100%	Yes
Tyers-Glengarry	Weekly	52	0	0	100%	Yes
Warragul, Nilma, Darnum, Drouin East	Weekly	76	0	0	100%	Yes
Warragul South	Weekly	52	0	0	100%	Yes
Willow Grove	Weekly	52	0	0	100%	Yes
Yallourn North	Weekly	52	0	0	100%	Yes
Yarragon	Weekly	52	0	0	100%	Yes
Yinnar	Weekly	52	0	0	100%	Yes

The number of samples collected in a locality is determined by the ADWG recommendations (10-5) regarding population-based sampling frequency for *E.coli*. Localities with populations greater than 5,000 have samples taken more frequently than weekly.

3.1.2 Actions taken in relation to non-compliance

All towns complied with this water quality parameter.

3.2 CHLORINE BASED DISINFECTION BY-PRODUCT CHEMICALS

3.2.1 Chloroacetic acid results

For compliance with the *Safe Drinking Water Regulations 2005* a sample result must not exceed 0.150 mg/L for chloroacetic acid. Results of <0.050 mg/L are at the detection limit for this parameter. Gippsland Water has an internal target of 100% compliance for chloroacetic acid. All Gippsland Water sites achieved 100% compliance with chloroacetic acid levels.

Figure 4: Chloroacetic acid results for all towns 2007-08

Locality	Frequency of sampling	No. of samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)	Non compliant results
Boisdale	Monthly	12	<0.05	<0.05	Yes	0
Boolarra	Monthly	12	<0.05	<0.05	Yes	0
Briagolong	Monthly	12	<0.05	<0.05	Yes	0
Churchill	Monthly	12	<0.05	<0.05	Yes	0
Coongulla-Glenmaggie	Monthly	12	<0.05	<0.05	Yes	0
Cowwarr	Monthly	12	<0.05	<0.05	Yes	0
Drouin	Monthly	12	<0.05	<0.05	Yes	0
Erica	Monthly	12	<0.05	<0.05	Yes	0
Heyfield	Monthly	12	<0.05	<0.05	Yes	0
Jumbuk	Monthly	12	<0.05	<0.05	Yes	0
Maffra	Monthly	12	<0.05	<0.05	Yes	0
Mirboo North	Monthly	12	<0.05	<0.05	Yes	0
Moe	Monthly	12	<0.05	<0.05	Yes	0
Morwell	Monthly	12	<0.05	<0.05	Yes	0
Neerim South	Monthly	12	<0.05	<0.05	Yes	0
Newborough	Monthly	12	<0.05	<0.05	Yes	0
Noojee	Monthly	12	<0.05	<0.05	Yes	0
Rawson	Monthly	12	<0.05	<0.05	Yes	0
Rokeby-Buln Buln	Monthly	12	<0.05	<0.05	Yes	0
Rosedale	Monthly	12	<0.05	<0.05	Yes	0
Sale-Wurruk	Monthly	12	<0.05	<0.05	Yes	0
Seaspray	Monthly	12	<0.05	<0.05	Yes	0
Stratford	Monthly	12	<0.05	<0.05	Yes	0
Thorpdale	Monthly	12	<0.05	<0.05	Yes	0
Toongabbie	Monthly	12	<0.05	<0.05	Yes	0
Trafalgar	Monthly	12	<0.05	<0.05	Yes	0
Traralgon	Monthly	12	<0.05	<0.05	Yes	0
Traralgon South-Hazelwood North	Monthly	12	<0.05	<0.05	Yes	0
Tyers-Glengarry	Monthly	12	<0.05	<0.05	Yes	0
Warragul, Nilma, Darnum, Drouin East	Monthly	12	<0.05	<0.05	Yes	0
Warragul South	Monthly	12	<0.05	<0.05	Yes	0
Willow Grove	Monthly	12	<0.05	<0.05	Yes	0
Yallourn North	Monthly	12	<0.05	<0.05	Yes	0
Yarragon	Monthly	12	<0.05	<0.05	Yes	0
Yinnar	Monthly	12	<0.05	<0.05	Yes	0

3.2.1.1 Actions taken in relation to non-compliance

All towns complied with this water quality parameter.

3.2.2 Dichloroacetic acid results

For compliance with the *Safe Drinking Water Regulations 2005*, a sample result must not exceed 0.100 mg/L dichloroacetic acid. Results of <0.020 mg/L are at the detection limit for the parameter. Gippsland Water has an internal target of 100% compliance for dichloroacetic acid. All Gippsland Water sites achieved 100% compliance with dichloroacetic acid levels.

Figure 5: Dichloroacetic acid results for all towns 2007-08

Locality	Frequency of sampling	No. of samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)	Non compliant results
Boisdale	Monthly	12	0.03	<0.02	Yes	0
Boolarra	Monthly	12	<0.02	<0.02	Yes	0
Briagolong	Monthly	12	<0.02	<0.02	Yes	0
Churchill	Monthly	12	0.02	<0.02	Yes	0
Coongulla-Glenmaggie	Monthly	12	<0.02	<0.02	Yes	0
Cowwarr	Monthly	12	<0.02	<0.02	Yes	0
Drouin	Monthly	12	0.02	<0.02	Yes	0
Erica	Monthly	12	<0.02	<0.02	Yes	0
Heyfield	Monthly	12	0.02	<0.02	Yes	0
Jumbuk	Monthly	12	0.03	<0.02	Yes	0
Maffra	Monthly	12	<0.02	<0.02	Yes	0
Mirboo North	Monthly	12	<0.02	<0.02	Yes	0
Moe	Monthly	12	<0.02	<0.02	Yes	0
Morwell	Monthly	12	0.02	<0.02	Yes	0
Neerim South	Monthly	12	<0.02	<0.02	Yes	0
Newborough	Monthly	12	0.03	<0.02	Yes	0
Noojee	Monthly	12	<0.02	<0.02	Yes	0
Rawson	Monthly	12	0.05	<0.02	Yes	0
Rokeby-Buln Buln	Monthly	12	0.02	<0.02	Yes	0
Rosedale	Monthly	12	<0.02	<0.02	Yes	0
Sale-Wurruk	Monthly	12	<0.02	<0.02	Yes	0
Seaspray	Monthly	12	<0.02	<0.02	Yes	0
Stratford	Monthly	12	<0.02	<0.02	Yes	0
Thorpdale	Monthly	12	<0.02	<0.02	Yes	0
Toongabbie	Monthly	12	0.02	<0.02	Yes	0
Trafalgar	Monthly	12	0.02	<0.02	Yes	0
Traralgon	Monthly	12	<0.02	<0.02	Yes	0
Traralgon South-Hazelwood North	Monthly	12	<0.02	<0.02	Yes	0
Tyers-Glengarry	Monthly	12	0.03	<0.02	Yes	0
Warragul, Nilma, Darnum, Drouin East	Monthly	12	0.02	<0.02	Yes	0
Warragul South	Monthly	12	<0.02	<0.02	Yes	0
Willow Grove	Monthly	12	<0.02	<0.02	Yes	0
Yallourn North	Monthly	12	<0.02	<0.02	Yes	0
Yarragon	Monthly	12	0.02	<0.02	Yes	0
Yinnar	Monthly	12	<0.02	<0.02	Yes	0

3.2.2.1 Actions taken in relation to non-compliance

All towns complied with this water quality parameter.

3.2.3 Trichloroacetic acid results

For compliance with the *Safe Drinking Water Regulations 2005*, a sample result must not exceed 0.100 mg/L trichloroacetic acid. Results of <0.020 mg/L are at the detection limit for the parameter. Gippsland Water has an internal target of 100% compliance for trichloroacetic acid. All Gippsland Water sites achieved 100% compliance with trichloroacetic acid levels.

Figure 6: Trichloroacetic acid for all towns 2007-08

Locality	Frequency of sampling	No. of samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)	Non Compliant Results
Boisdale	Monthly	12	0.033	<0.02	Yes	0
Boolarra	Monthly	12	<0.02	<0.02	Yes	0
Briagolong	Monthly	12	<0.02	<0.02	Yes	0
Churchill	Monthly	12	0.066	<0.02	Yes	0
Coongulla-Glenmaggie	Monthly	12	<0.02	<0.02	Yes	0
Cowwarr	Monthly	12	0.038	<0.02	Yes	0
Drouin	Monthly	12	0.029	<0.02	Yes	0
Erica	Monthly	12	0.078	<0.02	Yes	0
Heyfield	Monthly	12	0.022	<0.02	Yes	0
Jumbuk	Monthly	12	0.057	<0.02	Yes	0
Maffra	Monthly	12	<0.02	<0.02	Yes	0
Mirboo North	Monthly	12	0.025	<0.02	Yes	0
Moe	Monthly	12	<0.02	<0.02	Yes	0
Morwell	Monthly	12	0.03	<0.02	Yes	0
Neerim South	Monthly	12	<0.02	<0.02	Yes	0
Newborough	Monthly	12	0.034	<0.02	Yes	0
Noojee	Monthly	12	<0.02	<0.02	Yes	0
Rawson	Monthly	12	0.068	<0.02	Yes	0
Rokeby-Buln Buln	Monthly	12	0.039	<0.02	Yes	0
Rosedale	Monthly	12	0.033	<0.02	Yes	0
Sale-Wurruk	Monthly	12	<0.02	<0.02	Yes	0
Seaspray	Monthly	12	0.028	<0.02	Yes	0
Stratford	Monthly	12	0.021	<0.02	Yes	0
Thorpdale	Monthly	12	<0.02	<0.02	Yes	0
Toongabbie	Monthly	12	0.037	<0.02	Yes	0
Trafalgar	Monthly	12	0.028	<0.02	Yes	0
Traralgon	Monthly	12	0.049	<0.02	Yes	0
Traralgon South-Hazelwood North	Monthly	12	0.036	<0.02	Yes	0
Tyers-Glengarry	Monthly	12	0.028	<0.02	Yes	0
Warragul, Nilma, Darnum, Drouin East	Monthly	12	0.032	<0.02	Yes	0
Warragul South	Monthly	12	0.028	<0.02	Yes	0
Willow Grove	Monthly	12	<0.02	<0.02	Yes	0
Yallourn North	Monthly	12	<0.02	<0.02	Yes	0
Yarragon	Monthly	12	<0.02	<0.02	Yes	0
Yinnar	Monthly	12	0.044	<0.02	Yes	0

3.2.3.1 Actions taken in relation to non-compliance

All towns complied with this water quality parameter.

3.2.4 Trihalomethanes (THM) results

For compliance with the *Safe Drinking Water Regulations 2005*, a sample result must not exceed 0.250 mg/L trihalomethane. Gippsland Water has an internal target of 100% compliance for trihalomethane; however, through the year three exceedances were experienced. See section 3.2.4.1.

Figure 7: Trihalomethanes results for all towns for 2007-08

Locality	Frequency of sampling	No. of samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)	Non compliant results
Boisdale	Monthly	12	0.100	0.058	Yes	0
Boolarra	Monthly	12	0.110	0.068	Yes	0
Briagolong	Monthly	12	0.026	0.013	Yes	0
Churchill	Monthly	12	0.150	0.049	Yes	0
Coongulla-Glenmaggie	Monthly	12	0.059	0.006	Yes	0
Cowwarr	Monthly	12	0.087	0.052	Yes	0
Drouin	Monthly	12	0.079	0.036	Yes	0
Erica	Monthly	12	0.120	0.044	Yes	0
Heyfield	Monthly	12	0.075	0.030	Yes	0
Jumbuk	Monthly	12	0.200	0.019	Yes	0
Maffra	Monthly	12	0.083	0.022	Yes	0
Mirboo North	Monthly	12	0.087	0.032	Yes	0
Moe	Monthly	12	0.080	0.035	Yes	0
Morwell	Monthly	12	0.076	0.046	Yes	0
Neerim South	Monthly	12	0.065	0.026	Yes	0
Newborough	Monthly	12	0.072	0.034	Yes	0
Noojee	Monthly	12	0.063	0.010	Yes	0
Rawson	Monthly	12	0.100	0.024	Yes	0
Rokeby-Buln Buln	Monthly	12	0.073	0.033	Yes	0
Rosedale	Monthly	12	0.100	0.057	Yes	0
Sale-Wurruk	Monthly	12	0.091	0.027	Yes	0
Seaspray	Monthly	12	0.450	0.034	**No**	3
Stratford	Monthly	12	0.220	0.030	Yes	0
Thorpdale	Monthly	12	0.083	0.050	Yes	0
Toongabbie	Monthly	12	0.085	0.054	Yes	0
Trafalgar	Monthly	12	0.094	0.036	Yes	0
Traralgon	Monthly	12	0.090	0.014	Yes	0
Traralgon South-Hazelwood North	Monthly	12	0.091	0.043	Yes	0
Tyers-Glengarry	Monthly	12	0.081	0.043	Yes	0
Warragul, Nilma, Darnum, Drouin East	Monthly	12	0.067	0.029	Yes	0
Warragul South	Monthly	12	0.087	0.045	Yes	0
Willow Grove	Monthly	12	0.004	<0.002	Yes	0
Yallourn North	Monthly	12	0.075	0.034	Yes	0
Yarragon	Monthly	12	0.120	0.046	Yes	0
Yinnar	Monthly	12	0.120	0.058	Yes	0

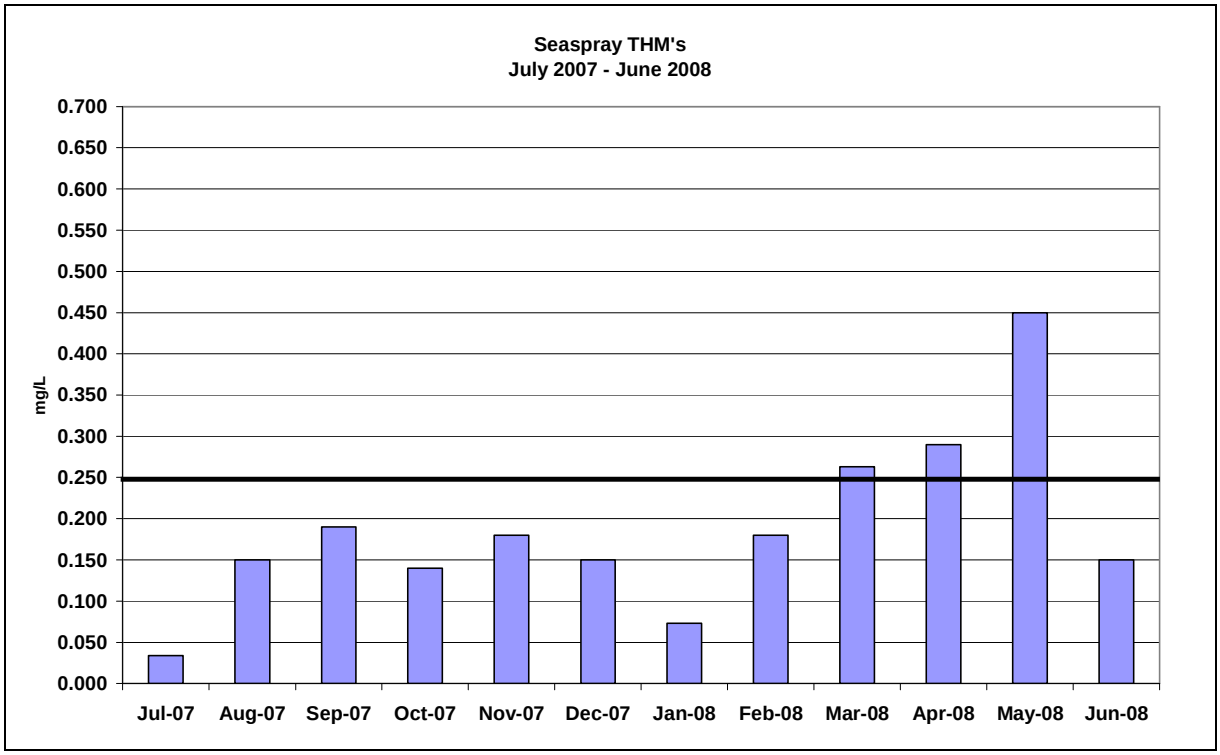
3.2.4.1 Actions taken in relation to non-compliance

The township of Seaspray experienced samples above the limit for trihalomethane during March, April and May 2008. Increased chlorine dosing combined with the natural organic content experienced in the raw water supply, resulted in elevated THM levels in the reticulation system for the three months. This incident was reported to DHS under Section 18 of the SDWA (see section 4.1).

The actions taken to manage this non-compliance included; increased flushing in the reticulation, aeration of the treated water to remove the volatile organics, and the addition of granular activated carbon in the filters.

Figure 8 indicates the THM levels for the past year for the Seaspray system.

Figure 8: Seaspray THMs 2007-08



3.3 OZONE BASED DISINFECTION BY-PRODUCT CHEMICALS

Gippsland Water has no ozone dosing systems and therefore the ozone based chemical concentrations of bromate and formaldehyde have not been included in the routine testing program.

3.4 ALUMINIUM

For compliance with the *Safe Drinking Water Regulations 2005*, a sample result must not exceed a maximum of 0.20 mg/L aluminium (acid soluble) in drinking water. Gippsland Water has an internal target of 100% compliance for aluminium.

3.4.1 Aluminium results

Figure 9: Aluminium results for all towns in 2007-08

Locality	Frequency of Sampling	No. of Samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)	Non Compliant Results
Boisdale	Monthly	12	0.03	<0.02	Yes	0
Boolarra	Monthly	12	0.06	<0.02	Yes	0
Briagolong	Monthly	12	<0.02	<0.02	Yes	0
Churchill	Monthly	12	0.19	<0.02	Yes	0
Coongulla & Glenmaggie	Monthly	12	0.05	<0.02	Yes	0
Cowwarr	Monthly	12	0.06	0.02	Yes	0
Drouin	Monthly	12	0.08	0.03	Yes	0
Erica	Monthly	12	0.56	<0.02	**No**	1
Heyfield	Monthly	12	0.08	<0.02	Yes	0
Jumbuk	Monthly	12	0.19	<0.02	Yes	0
Maffra	Monthly	12	0.04	<0.02	Yes	0
Mirboo North	Monthly	12	<0.02	<0.02	Yes	0
Moe	Monthly	12	0.12	<0.02	Yes	0
sMorwell	Monthly	12	0.15	0.03	Yes	0
Neerim South	Monthly	12	0.06	<0.02	Yes	0
Newborough	Monthly	12	0.06	<0.02	Yes	0
Noojee	Monthly	12	0.10	<0.02	Yes	0
Rawson	Monthly	12	0.50	<0.02	**No**	1
Rokeby & Buln Buln	Monthly	12	0.09	0.03	Yes	0
Rosedale	Monthly	12	0.11	<0.02	Yes	0
Sale/Wurruk	Monthly	12	0.06	<0.02	Yes	0
Seaspray	Monthly	12	0.06	<0.02	Yes	0
Stratford	Monthly	12	<0.02	<0.02	Yes	0
Thorpdale	Monthly	12	<0.02	<0.02	Yes	0
Toongabbie	Monthly	12	0.09	<0.02	Yes	0
Trafalgar	Monthly	12	0.06	<0.02	Yes	0
Traralgon	Monthly	12	0.26	0.02	**No**	1
Traralgon South & Hazelwood North	Monthly	12	0.17	<0.02	Yes	0
Tyers & Glengarry	Monthly	12	0.08	0.03	Yes	0
Warragul, Nilma, Darnum, Drouin East	Monthly	12	0.13	0.04	Yes	0
Warragul South	Monthly	12	0.09	0.03	Yes	0
Willow Grove	Monthly	12	0.08	<0.02	Yes	0
Yallourn North	Monthly	12	0.06	<0.02	Yes	0
Yarragon	Monthly	12	0.14	0.02	Yes	0
Yinnar	Monthly	12	0.17	<0.02	Yes	0

3.4.2 Actions taken in relation to non-compliance

During the 2007-2008 reporting period, three localities recorded elevated Aluminium (Acid Soluble) levels:

Erica – One sample of elevated aluminium level was recorded in August 2007. Gippsland Water investigated the exceedance and could not identify a cause. All follow up monitoring samples complied with the Aluminium standard.

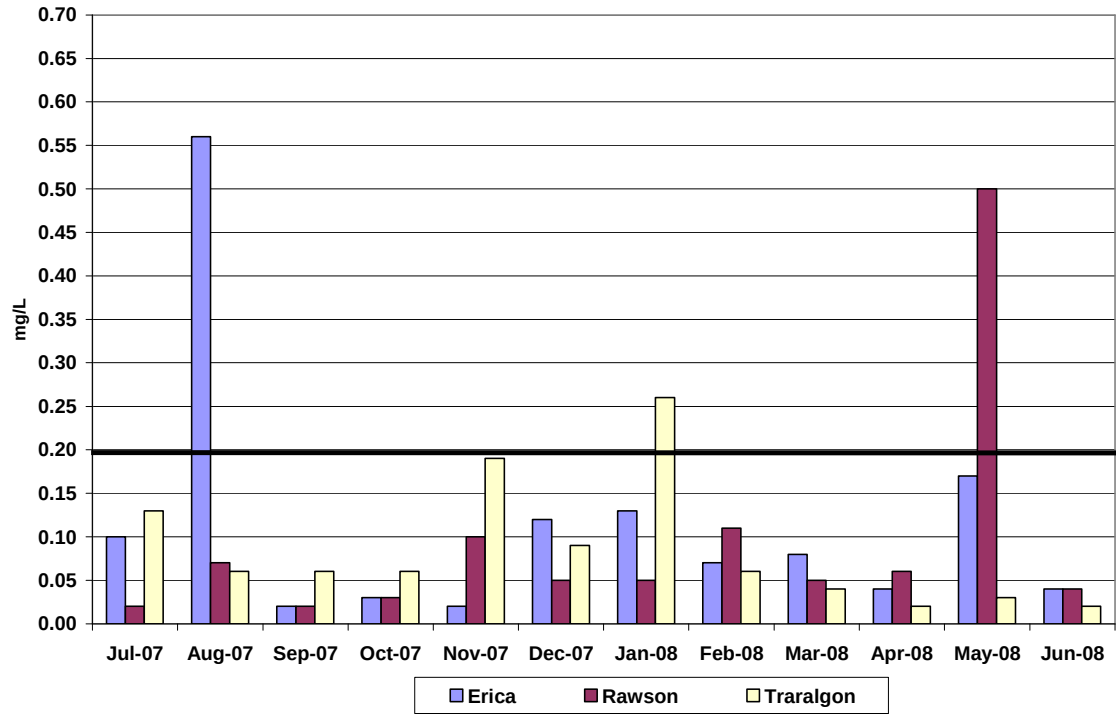
Actions taken in relation to non-compliance (*cont.*)

Traralgon - One sample with an elevated Aluminium level was recorded in January 2008 due to the water treatment plant experiencing a malfunction caused by a faulty power supply on the chemical dosing system.

Rawson – One sample of elevated Aluminium was recorded in May 2008. Gippsland Water investigated the exceedance and could not identify a cause. All follow up monitoring samples complied with the Aluminium standard.

Figure 9 gives a 12-month trend for each of the three towns experiencing a non-conformance in the year.

Figure 9: Aluminium mg/L for 2007-2008



3.5 TURBIDITY RESULTS

For compliance with the *Safe Drinking Water Regulations 2005*, the 95% upper confidence limit of the mean of all values for samples of drinking water collected in any 12-month period, must have turbidity measured as less than or equal to 5.0 NTU (Nephelometric Turbidity Unit). Gippsland Water has an internal target of 0.2 NTU for major systems and 0.5 NTU for small systems.

Figure 10: Turbidity results for all towns in 2007-08

Locality	Frequency of Sampling	No. of Samples	Max (NTU)	Min (NTU)	95% UCL of mean	Complying (Yes/No)	Non Compliant Results
Boisdale	Weekly	52	0.50	0.10	0.20	Yes	0
Boolarra	Weekly	52	0.70	0.10	0.27	Yes	0
Briagolong	Weekly	52	0.50	0.10	0.21	Yes	0
Churchill	Weekly	52	0.70	0.10	0.25	Yes	0
Coongulla & Glenmaggie	Weekly	52	2.10	0.10	0.38	Yes	0
Cowwarr	Weekly	52	0.60	0.10	0.24	Yes	0
Drouin	Weekly	52	0.40	0.10	0.23	Yes	0
Erica	Weekly	52	0.40	0.10	0.22	Yes	0
Heyfield	Weekly	52	0.40	0.10	0.26	Yes	0
Jumbuk	Weekly	52	0.80	0.10	0.29	Yes	0
Maffra	Weekly	52	4.30	0.10	0.46	Yes	0
Mirboo North	Weekly	52	0.70	0.10	0.20	Yes	0
Moe	Weekly	52	1.50	0.10	0.33	Yes	0
Morwell	Weekly	52	0.50	0.10	0.22	Yes	0
Neerim South	Weekly	52	0.40	0.10	0.20	Yes	0
Newborough	Weekly	52	2.80	0.10	0.43	Yes	0
Noojee	Weekly	52	0.80	0.20	0.30	Yes	0
Rawson	Weekly	52	0.40	0.10	0.19	Yes	0
Rokeby & Buln Buln	Weekly	52	0.40	0.10	0.21	Yes	0
Rosedale	Weekly	52	1.50	0.10	0.29	Yes	0
Sale/Wurruk	Weekly	52	0.40	0.10	0.19	Yes	0
Seaspray	Weekly	52	2.50	0.20	0.62	Yes	0
Stratford	Weekly	52	5.10	0.10	0.48	Yes	0
Thorpdale	Weekly	52	1.10	0.20	0.47	Yes	0
Toongabbie	Weekly	52	0.60	0.10	0.24	Yes	0
Trafalgar	Weekly	52	2.60	0.10	0.41	Yes	0
Traralgon	Weekly	52	0.50	0.10	0.20	Yes	0
Traralgon South & Hazelwood North	Weekly	52	0.60	0.10	0.25	Yes	0
Tyers & Glengarry	Weekly	52	0.70	0.10	0.23	Yes	0
Warragul, Nilma, Darnum, Drouin East	Weekly	52	1.30	0.10	0.28	Yes	0
Warragul South	Weekly	52	0.40	0.10	0.24	Yes	0
Willow Grove	Weekly	52	1.30	0.10	0.27	Yes	0
Yallourn North	Weekly	52	1.40	0.10	0.35	Yes	0
Yarragon	Weekly	52	1.40	0.10	0.34	Yes	0
Yinnar	Weekly	52	2.00	0.10	0.34	Yes	0

3.5.1.1 Actions taken in relation to non-compliance

All towns complied with this water quality parameter.

3.6 FLUORIDE

Fluoride testing has been performed in the water supply systems where fluoride is artificially added to the water (Maffra, Warragul, Sale Traralgon, Morwell and Moe). The operational level of fluoride is monitored by online instrumentation as well as field measurements on a weekly basis. Based on health considerations, no single sample concentration of fluoride in drinking water should exceed 1.5 mg/L, and the average level of fluoride should not exceed 1.0 mg/L. In the reporting period all samples were processed by an independent laboratory, with all results showing fluoride below these concentration levels. Gippsland Water's general target is 0.7-1.0 mg/L.

Figure 11: Fluoride results for all systems in 2007-08 (Compliance - Max < 1.5 mg/L and Average < 1.0mg/L)

Locality	Frequency of Sampling	No. of Samples	Max (mg/L)	Min (mg/L)	Average (mg/L)	Complying(Yes/No)
Drouin	Monthly	12	1.00	0.80	0.88	Yes
Maffra	Monthly	12	1.10	0.60	0.86	Yes
Moe	Monthly	12	1.00	0.60	0.81	Yes
Morwell	Monthly	12	1.00	0.80	0.95	Yes
Sale	Monthly	12	1.00	0.80	0.91	Yes
Stratford	Monthly	12	1.10	0.60	0.83	Yes
Traralgon	Monthly	12	1.00	0.60	0.86	Yes
Warragul, Nilma, Darnum, Drouin East	Monthly	12	1.10	0.60	0.88	Yes

No other parameters of concern have been detected at customer taps that require reporting in this area.

3.7 OTHER ALGAE, PATHOGEN, CHEMICAL OR SUBSTANCE NOT SPECIFIED THAT MAY POSE A RISK TO HUMAN HEALTH

3.7.1 Overall results

During the reporting period, the corporation monitored for the following health-related aspects of the drinking water supplied to customer taps. Figure 12 lists the parameters and the frequency of samples taken, comparing the results to the *2004 Australian Drinking Water Guidelines* (ADWG) and the recommended value.

Figure 12: Other sampled parameter results for all towns in 2007-08

Parameter	Frequency of sampling	No. samples	Results above ADWG values		
			Recommended value	Result	Locality
Nitrite	Weekly (2 Localities)	104	≤ 3 mg/L	All results below ADWG health guideline values.	
Mercury	Quarterly	140	≤ 0.001 mg/L		
Chromium	Quarterly	140	≤ 0.05 mg/L		
Cadmium	Quarterly	140	≤ 0.002 mg/L		
Nitrate	Quarterly	140	≤ 50 mg/L		
Nickel	Annual	35	≤ 0.02 mg/L		

Monitoring for other parameters such as pesticides and protozoan organisms is conducted as risks arise and identified in the source water catchment areas.

3.7.2 Manganese

Manganese can be naturally present in either soluble or insoluble forms in water. When concentrations exceed 0.1 mg/L, manganese can create unacceptable tastes in water, as well as stain fixtures and laundry. Compliance is measured against the aesthetic guideline values 0.1 mg/L and the health guideline value of 0.5 mg/L in ADWG. During the 2007-08 year all sample results were below this level.

Figure 13: Manganese results for all towns in 2007-08 (Compliance <0.10 mg/L – ADWG)

Locality	Frequency of Sampling	No. of Samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)
Boisdale	Monthly	12	0.018	<0.001	Yes
Boolarra	Monthly	12	0.026	<0.001	Yes
Briagolong	Monthly	12	0.002	<0.001	Yes
Churchill	Monthly	12	0.003	<0.001	Yes
Coongulla & Glenmaggie	Monthly	12	0.008	0.002	Yes
Cowwarr	Monthly	12	<0.001	<0.001	Yes
Drouin	Monthly	12	0.002	<0.001	Yes
Erica	Monthly	12	0.005	<0.001	Yes
Heyfield	Monthly	12	0.013	0.001	Yes
Jumbuk	Monthly	12	0.002	<0.001	Yes
Maffra	Monthly	12	0.012	<0.001	Yes
Mirboo North	Monthly	12	0.001	<0.001	Yes
Moe	Monthly	12	0.014	<0.001	Yes
Morwell	Monthly	12	0.009	<0.001	Yes
Neerim South	Monthly	12	0.044	<0.001	Yes
Newborough	Monthly	12	0.010	<0.001	Yes
Noojee	Monthly	12	0.066	0.003	Yes
Rawson	Monthly	12	0.002	<0.001	Yes
Rokeby & Buln Buln	Monthly	12	0.002	<0.001	Yes
Rosedale	Monthly	12	0.001	<0.001	Yes
Sale/Wurruk	Monthly	12	0.002	<0.001	Yes
Seaspray	Monthly	12	0.012	0.002	Yes
Stratford	Monthly	12	0.005	<0.001	Yes
Thorpdale	Monthly	12	0.037	0.005	Yes
Toongabbie	Monthly	12	<0.001	<0.001	Yes
Trafalgar	Monthly	12	0.007	<0.001	Yes
Traralgon	Monthly	12	0.003	<0.001	Yes
Traralgon South & Hazelwood North	Monthly	12	0.003	<0.001	Yes
Tyers & Glengarry	Monthly	12	0.004	<0.001	Yes
Warragul, Nilma, Darnum, Drouin East	Monthly	12	0.003	<0.001	Yes
Warragul South	Monthly	12	0.001	<0.001	Yes
Willow Grove	Monthly	12	0.008	<0.001	Yes
Yallourn North	Monthly	12	0.004	<0.001	Yes
Yarragon	Monthly	12	0.005	<0.001	Yes
Yinnar	Monthly	12	0.003	<0.001	Yes

3.7.3 Lead

Lead can be present in drinking water as a result of dissolution from natural sources or from household plumbing. Based on heath considerations in the ADWG, concentrations of lead in drinking water should not exceed 0.01 mg/L. During the reporting period all sample results were below this level.

Figure 14: Lead results for all towns in 2007-08 (Compliance <0.01 mg/L - ADWG)

Locality	Frequency of Sampling	No. of Samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)
Boisdale	Quarterly	4	<0.002	<0.002	Yes
Boolarra	Quarterly	4	<0.002	<0.002	Yes
Briagolong	Quarterly	4	<0.002	<0.002	Yes
Churchill	Quarterly	4	<0.002	<0.002	Yes
Coongulla & Glenmaggie	Quarterly	4	<0.002	<0.002	Yes
Cowwarr	Quarterly	4	<0.002	<0.002	Yes
Drouin	Quarterly	4	<0.002	<0.002	Yes
Erica	Quarterly	4	<0.002	<0.002	Yes
Heyfield	Quarterly	4	<0.002	<0.002	Yes
Jumbuk	Quarterly	4	<0.002	<0.002	Yes
Maffra	Quarterly	4	<0.002	<0.002	Yes
Mirboo North	Quarterly	4	<0.002	<0.002	Yes
Moe	Quarterly	4	<0.002	<0.002	Yes
Morwell	Quarterly	4	<0.002	<0.002	Yes
Neerim South	Quarterly	4	<0.002	<0.002	Yes
Newborough	Quarterly	4	<0.002	<0.002	Yes
Noojee	Quarterly	4	<0.002	<0.002	Yes
Rawson	Quarterly	4	<0.002	<0.002	Yes
Rokeby & Buln Buln	Quarterly	4	<0.002	<0.002	Yes
Rosedale	Quarterly	4	<0.002	<0.002	Yes
Sale/Wurruk	Quarterly	4	<0.002	<0.002	Yes
Seaspray	Quarterly	4	<0.002	<0.002	Yes
Stratford	Quarterly	4	<0.002	<0.002	Yes
Thorpdale	Quarterly	4	<0.002	<0.002	Yes
Toongabbie	Quarterly	4	<0.002	<0.002	Yes
Trafalgar	Quarterly	4	<0.002	<0.002	Yes
Traralgon	Quarterly	4	<0.002	<0.002	Yes
Traralgon South & Hazelwood North	Quarterly	4	<0.002	<0.002	Yes
Tyers & Glengarry	Quarterly	4	<0.002	<0.002	Yes
Warragul, Nilma, Darnum, Drouin East	Quarterly	4	<0.002	<0.002	Yes
Warragul South	Quarterly	4	<0.002	<0.002	Yes
Willow Grove	Quarterly	4	<0.002	<0.002	Yes
Yallourn North	Quarterly	4	<0.002	<0.002	Yes
Yarragon	Quarterly	4	<0.002	<0.002	Yes

3.7.4 Copper

Copper is present in raw water supplies at very low concentrations. Copper can be found in higher concentrations in drinking water as a result of corrosion of copper pipes and fittings. Based on heath considerations in the ADWG, concentrations of copper in drinking water should not exceed 2 mg/L. For the reporting period, all sample results were below this level.

Figure 15: Copper results for all towns in 2007-08 (Compliance <2 mg/L - ADWG)

Locality	Frequency of Sampling	No. of Samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)
Boisdale	Quarterly	4	0.013	0.003	Yes
Boolarra	Quarterly	4	0.005	0.003	Yes
Briagolong	Quarterly	4	0.006	0.004	Yes
Churchill	Quarterly	4	0.011	0.003	Yes
Coongulla & Glenmaggie	Quarterly	4	0.015	<0.001	Yes
Cowwarr	Quarterly	4	0.008	0.002	Yes
Drouin	Quarterly	4	0.011	<0.001	Yes
Erica	Quarterly	4	0.010	0.001	Yes
Heyfield	Quarterly	4	0.072	0.007	Yes
Jumbuk	Quarterly	4	0.014	0.002	Yes
Maffra	Quarterly	4	0.029	0.002	Yes
Mirboo North	Quarterly	4	0.061	0.005	Yes
Moe	Quarterly	4	0.007	0.001	Yes
Morwell	Quarterly	4	0.016	0.003	Yes
Neerim South	Quarterly	4	0.064	0.012	Yes
Newborough	Quarterly	4	0.008	0.003	Yes
Noojee	Quarterly	4	0.013	0.003	Yes
Rawson	Quarterly	4	0.002	<0.001	Yes
Rokeby & Buln Buln	Quarterly	4	0.003	0.002	Yes
Rosedale	Quarterly	4	0.033	0.003	Yes
Sale-Wurruk	Quarterly	4	0.002	<0.001	Yes
Seaspray	Quarterly	4	0.110	0.010	Yes
Stratford	Quarterly	4	0.042	0.004	Yes
Thorpdale	Quarterly	4	0.010	0.006	Yes
Toongabbie	Quarterly	4	0.018	0.006	Yes
Trafalgar	Quarterly	4	0.007	<0.001	Yes
Traralgon	Quarterly	4	0.006	0.002	Yes
Traralgon South & Hazelwood North	Quarterly	4	0.009	0.005	Yes
Tyers & Glengarry	Quarterly	4	0.017	0.003	Yes
Warragul, Nilma, Darnum, Drouin East	Quarterly	4	0.007	<0.001	Yes
Warragul South	Quarterly	4	0.002	<0.001	Yes
Willow Grove	Quarterly	4	0.014	0.004	Yes
Yallourn North	Quarterly	4	0.007	0.003	Yes
Yarragon	Quarterly	4	0.005	<0.001	Yes
Yinnar	Quarterly	4	0.006	0.003	Yes

3.8 AESTHETICS

3.8.1 pH results

In addition to the monitoring of parameters to determine compliance against the SDWA regulations, pH is routinely monitored in the reticulation system. The ADWG suggest that the drinking water be between pH 6.5 and pH 8.5.

The pH results for all towns are provided below.

Figure 16: pH results for all towns in 2007-08

Locality	Frequency of Sampling	No. of Samples	Max (mg/L)	Min (mg/L)
Boisdale	Weekly	52	8.2	7.1
Boolarra	Weekly	52	7.8	6.6
Briagolong	Weekly	52	7.8	7.0
Churchill	Weekly	52	8.2	7.1
Coongulla & Glenmaggie	Weekly	52	**8.9**	7.0
Cowwarr	Weekly	52	8.2	7.0
Drouin	Weekly	52	**8.6**	6.9
Erica	Weekly	52	**9.2**	7.2
Heyfield	Weekly	52	8.2	6.8
Jumbuk	Weekly	52	8.2	7.2
Maffra	Weekly	52	7.9	6.8
Mirboo North	Weekly	52	7.9	6.6
Moe	Weekly	52	8.2	6.7
Morwell	Weekly	52	7.8	7.0
Neerim South	Weekly	52	7.6	**6.4**
Newborough	Weekly	52	**8.9**	6.8
Noojee	Weekly	52	**8.9**	6.8
Rawson	Weekly	52	**8.7**	7.4
Rokeby & Buln Buln	Weekly	52	**9.3**	6.5
Rosedale	Weekly	52	**8.9**	7.0
Sale/Wurruk	Weekly	52	**8.8**	7.4
Seaspray	Weekly	52	8.4	6.9
Stratford	Weekly	52	7.8	6.9
Thorpdale	Weekly	52	8.5	6.8
Toongabbie	Weekly	52	7.9	7.0
Trafalgar	Weekly	52	**8.6**	7.2
Traralgon	Weekly	52	7.9	6.6
Traralgon South & Hazelwood North	Weekly	52	7.9	6.7
Tyers & Glengarry	Weekly	52	8.3	7.0
Warragul	Weekly	52	8.4	6.8
Warragul South	Weekly	52	**9.0**	7.1
Willow Grove	Weekly	52	7.7	6.9
Yallourn North	Weekly	52	7.9	6.8
Yarragon	Weekly	52	**9.7**	7.1
Yinnar	Weekly	52	8.2	7.1

Yarragon, Coongulla and Glenmaggie experience higher pH levels due to cement-lined pipes in the reticulation. Sale pH is generally in the higher range due to the treatment process required to eliminate the naturally occurring iron and manganese levels present in the raw water. Other systems experience elevated pH results, as a result of long residence in the reticulation. Neerim South experienced a low pH due to the treatment process.

3.8.2 Iron results

Iron can become apparent in taste in water at about 0.3 mg/L and above. High concentrations can give water a rust-brown appearance and cause staining of laundry and plumbing fittings. For the reporting period, all sample results were below this level.

Figure 17: Iron results for all towns in 2007-08

Locality	Frequency of Sampling	No. of Samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)
Boisdale	Monthly	12	<0.1	<0.1	Yes
Boolarra	Monthly	12	<0.1	<0.1	Yes
Briagolong	Monthly	12	<0.1	<0.1	Yes
Churchill	Monthly	12	<0.1	<0.1	Yes
Coongulla & Glenmaggie	Monthly	12	<0.1	<0.1	Yes
Cowwarr	Monthly	12	<0.1	<0.1	Yes
Drouin	Monthly	12	<0.1	<0.1	Yes
Erica	Monthly	12	0.1	<0.1	Yes
Heyfield	Monthly	12	<0.1	<0.1	Yes
Jumbuk	Monthly	12	0.1	<0.1	Yes
Maffra	Monthly	12	<0.1	<0.1	Yes
Mirboo North	Monthly	12	<0.1	<0.1	Yes
Moe	Monthly	12	<0.1	<0.1	Yes
Morwell	Monthly	12	0.1	<0.1	Yes
Neerim South	Monthly	12	<0.1	<0.1	Yes
Newborough	Monthly	12	<0.1	<0.1	Yes
Noojee	Monthly	12	<0.1	<0.1	Yes
Rawson	Monthly	12	<0.1	<0.1	Yes
Rokeby & Buln Buln	Monthly	12	<0.1	<0.1	Yes
Rosedale	Monthly	12	<0.1	<0.1	Yes
Sale/Wurruk	Monthly	12	<0.1	<0.1	Yes
Seaspray	Monthly	12	0.1	<0.1	Yes
Stratford	Monthly	12	0.1	<0.1	Yes
Thorpdale	Monthly	12	0.1	<0.1	Yes
Toongabbie	Monthly	12	0.1	<0.1	Yes
Trafalgar	Monthly	12	<0.1	<0.1	Yes
Traralgon	Monthly	12	0.1	<0.1	Yes
Traralgon South & Hazelwood North	Monthly	12	<0.1	<0.1	Yes
Tyers & Glengarry	Monthly	12	<0.1	<0.1	Yes
Warragul	Monthly	12	0.1	<0.1	Yes
Warragul South	Monthly	12	<0.1	<0.1	Yes
Willow Grove	Monthly	12	<0.1	<0.1	Yes
Yallourn North	Monthly	12	<0.1	<0.1	Yes
Yarragon	Monthly	12	<0.1	<0.1	Yes
Yinnar	Monthly	12	0.2	<0.1	Yes

3.9 ANALYSIS OF RESULTS

3.9.1 Comparison to previous years

The water quality parameters required under the SDWA regulations have been represented as trend data over the previous four financial years. This information allows for a comparison of data for the major towns. See Appendix 1 for trend information on the major towns for each of the water quality reporting standards.

An analysis by the percentage of water sampling localities where the drinking water complied with each of Schedule 2 of the *Safe Drinking Water Regulation* parameters, over the past three reporting periods, is shown below in Figure 18. The table also shows an analysis of the percentage of customers supplied with drinking water that complied with the standards.

Figure 18: Compliance by locality and population

	Percent of Localities			Percent of Population		
Parameter	**2005-2006**	**2006-2007**	**2007-2008**	**2005-2006**	**2006-2007**	**2007-2008**
Aluminium	88.89%	100%	91.43%	96.81%	100%	81.82%
Chloroacetic Acid	100%	100%	100%	100%	100%	100%
Dichloroacetic Acid	97.22%	100%	100%	99.75%	100%	100%
E.coli	100%	100%	100%	100%	100%	100%
Trichloroacetic Acid	94.44%	100%	100%	99.57%	100%	100%
Trihalomethanes	97.22%	97.14%	97.14%	99.82%	99.82%	99.81%
Turbidity	100.00%	100%	100%	100%	100%	100%

4 EMERGENCY/INCIDENT MANAGEMENT

4.1 EMERGENCY/INCIDENT MANAGEMENT

During the reporting year there was one reportable event that required notification to the Drinking Water Regulatory Unit of DHS, under section 22 of the *SDWA 2003*.

Due to a heavy rainfall event and a malfunction at the Moe Water Treatment Plant in November 2007, treated water with a higher than usual turbidity and Aluminium levels entered the reticulation system. DHS was notified of this incident under a *SDWA* Section 22 notification. This event and other events due to flooding and blue green algae bloom are summarised in Figure 19.

Figure 19: Summary of incidents and actions taken

Locality	Date and duration of incident	Location of incident	Nature of the incident	Drinking water supplies affected	Actions taken in response to the incident	Was the community notified
Section 22 Notifications						
Moe	10/11/07	Narracan & Tanjil catchments - Moe WTP	Increase of turbidity and aluminium in water supply due to heavy rainfall event	Moe, Newborough, Yallourn North, Trafalgar, Yarragon	Department of Human Services (DHS) Notification under Section 22 *SDWA*. Malfunction rectified and the WTP resumed operation.	No
Section 18 Notifications – See Section 3						
Other events that occurred that did not require Section 22 reporting						
Neerim South	Jan - May 08	Tarago Reservoir	Blue Green Algae Bloom	Neerim South & Noojee	Additional treatment steps (extended chlorination contact time and granular activated carbon added to filters) at the WTP, ensured that no issues were experienced at customer taps. GW coordinated with Melbourne Water and DHS on the treatment and monitoring of the water supply.	Yes
Maffra	July 07-ongoing	Macalister River	Severe flooding events in late June 07 & Nov 07.	Maffra, Stratford & Boisdale	Modifications made to WTP ensured successful treatment of the highly turbid source water as a result of severe flooding.	Yes
Coongulla	July – Oct 07	Lake Glenmaggie Macalister River	Severe flooding event	Coongulla & Glenmaggie	The WTP was taken offline during the poor water event, and an alternative supply of water carted into township.	Yes

5 COMPLAINTS

5.1 WATER QUALITY COMPLAINTS

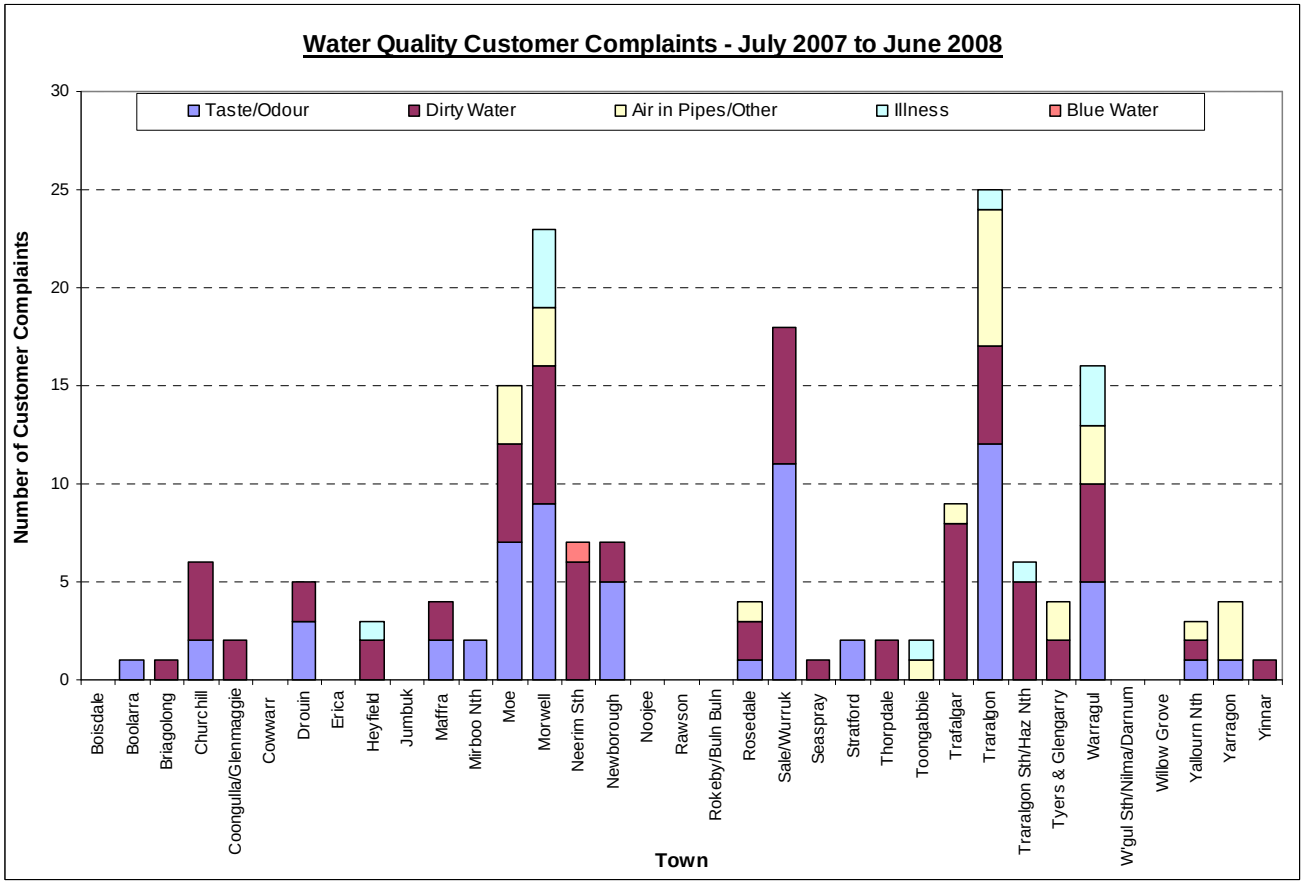
A summary of customer complaints received by Gippsland Water relating to the quality of drinking water supplied is reported below in Figure 20 and 21. A summary of how Gippsland Water responds to such complaints is provided below.

Gippsland Water records and reports on customer complaints relating to dirty water, taste and odour problems, illness/health concerns, blue water, and appearance of air-filled or "white" water received from the tap.

Figure 20: Water quality complaints per 100 customers supplied

Type of Complaint	2007-2008		2006-2007	2005-2006
	No. of Complaints	Complaints per 100 properties	Complaints per 100 properties	Complaints per 100 properties
Discoloured water	69	0.116	0.162	0.086
Taste / odour	67	0.113	0.091	0.021
Blue water	0	0.000	0.005	N/A
Air in water	25	0.042	0.039	0.055
Illness	11	0.019	0.025	N/A
Other	0	0.000	0.012	N/A
Total	172	0.290	0.334	0.161

Figure 21: Customer complaints summary for 2007-08



5.2 A SUMMARY OF THE CUSTOMER COMPLAINT PROCESS

Customer complaints are managed according to the following procedure:

Customer complaints received by Gippsland Water's Service Centre are recorded in a database. Details include information of who, where, time and nature of complaint. The Water Quality Group investigates by visiting the site and contacting the customer to determine details of the water quality problem.

For complaints associated with taste and odour, dirty water, and air in pipes, the reticulation system is typically flushed, field measurements performed and once the problem has been corrected, returned to service.

Follow up contact is made with the customer to determine if they are satisfied with the quality of service. This also encourages customers to keep Gippsland Water informed of any reoccurrence of water quality problems.

Details of actions undertaken are entered into a database to provide a record/history of the site, to document issues for maintenance programs, and to inform capital upgrade requirements where a history of system failures occurs.

6 RISK MANAGEMENT

Gippsland Water's Water Quality Risk Management Plan was audited in June 2008 for compliance with section 7(1) of the SDWA. The auditor found that Gippsland Water complied with the obligations of the Act, and seven opportunities for improvement as minor non-compliances were received.

See Appendix 2 for a copy of the audit certificate and Appendix 3 for the audit findings.

7 UNDERTAKINGS UNDER SECTION 30 OF THE ACT

Gippsland Water has no undertakings relevant to the 2007-08 reporting year.

8 EXEMPTIONS UNDER SECTION 20 OF THE ACT

Gippsland Water has no exemptions relevant to the 2007-08 reporting year.

9 REGULATED WATER

Regulated water refers to water that has subject of declaration made by the Minister under Section 6 of the SDWA. This is water which is not intended for drinking and cannot be mistaken as being drinking water. Gippsland Water does not manage any regulated water supplies.

10 GLOSSARY OF TERMS

ADWG	*Australian Drinking Water Guidelines* prepared by National Health and Medical Research Council.
Detection limit	The lowest concentration of analytical parameter in the sample that can be detected by the process laboratory.
Drinking Water Supply systems	Towns supplied with water from a common water source.
E.coli	Escherichia coli.
Locality	Under the SDW Regulations, a specified area that is supplied with drinking water by a water supplier.
mg/L	Milligram per litre.
NTU	Nephelometric Turbidity Units.
Properties	A registered customer connection to the drinking water supply.
SDWA	*Safe Drinking Water Act 2003* Act No.46/2003.
SDWR	Safe Drinking Water Regulations 2005 S.R No.88/2005.
Source Water	Raw water supply for town, prior to treatment.
THM	Trihalomethane.
WTP	Water Treatment Plant.
100mL	100 millilitres.
<	Less than.
>	Greater than.
≤	Less than or equal to.
≥	Greater than or equal to.
<1 MPN/100ml	Reporting for *E.coli* where the detection limit is less then 1 most probable number of *E.coli* organism per 100ml.

11 FURTHER INFORMATION

For further information about the details of this report, or to make an enquiry related to water quality issues, contact Gippsland Water on 1800 066 401 or visit www.gippswater.com.au.

12 REFERENCES

National Health and Medical Research Council. *Australian Drinking Water Guidelines 2004.* Web address www.nhmrc.gov.au

Department of Human Services *2007-08 Annual report format - Drinking Water Regulation Guidance Note 10 June 2008*

Safe Drinking Water Act 2003 Act No.46/2003

Safe Drinking Water Regulations 2005 S.R No.88/2005

APPENDIX 1: TREND GRAPHS

To allow for a comparison of information, data and results relating to the quality of water supplied trend graphs have been provided from the July 2004 and June 2008 period for each major water system for the drinking water quality standards.

1.1 E.COLI TRENDS

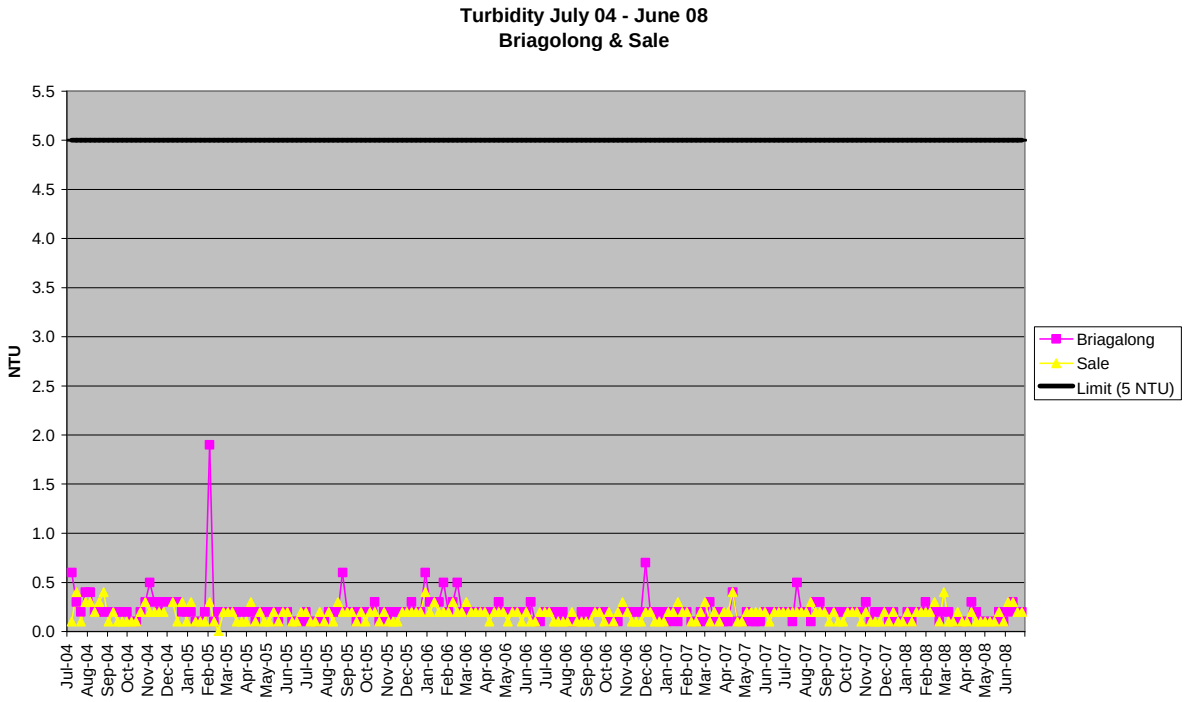
Trends for *E.coli* were not produced due to the consistent reporting of <1 MPN/100ml (a results of 0 MPN/100ml is equivalent to <1 MPN/100ml). During the previous four reporting periods (2004-05 to 2007-08) Gippsland Water has had two samples across all localities show *E.coli*:

Jumbuk – 14/12/2004 – 62 MPN/100ml
Seaspray – 14/02/2006 – 4 MPN/100ml

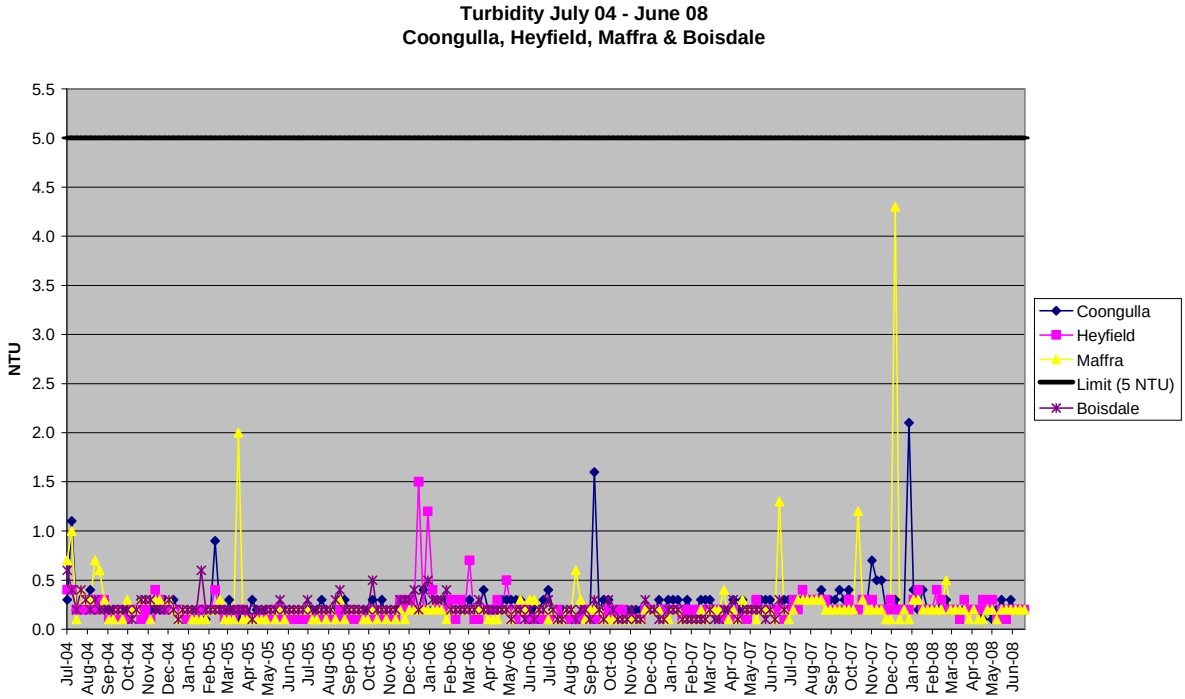
No samples recorded a positive *E.coli* during the 2007-08 reporting period.

1.2 TURBIDITY TRENDS

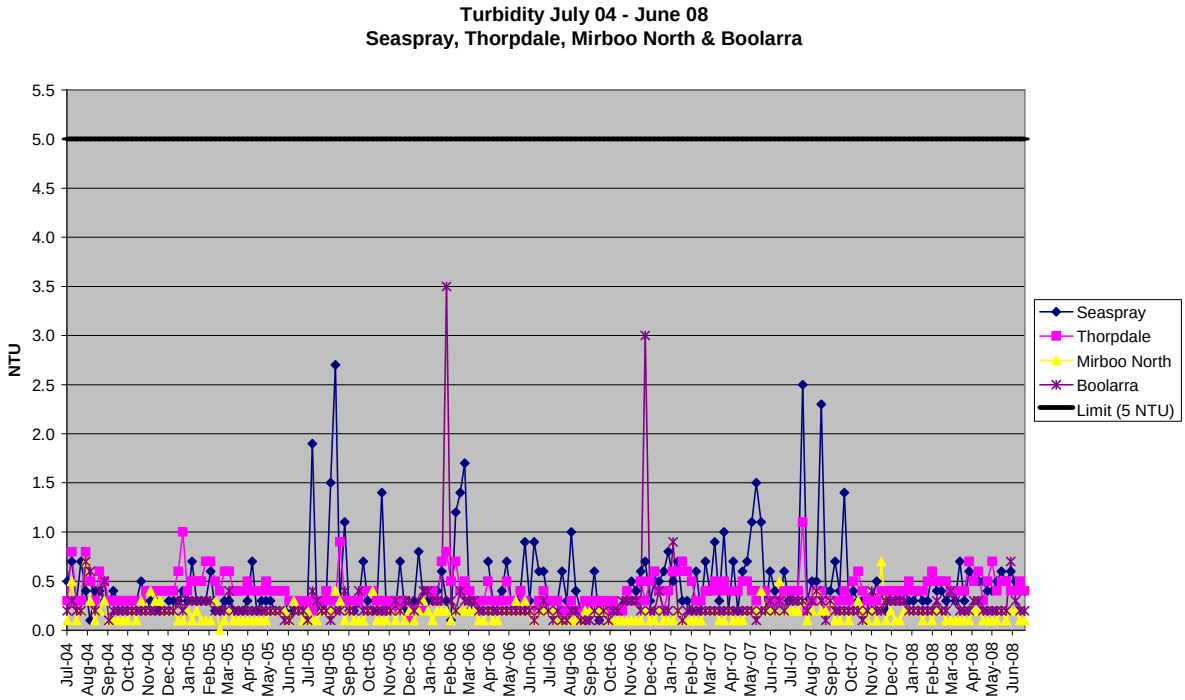
1.2.1 Briagolong and Sale



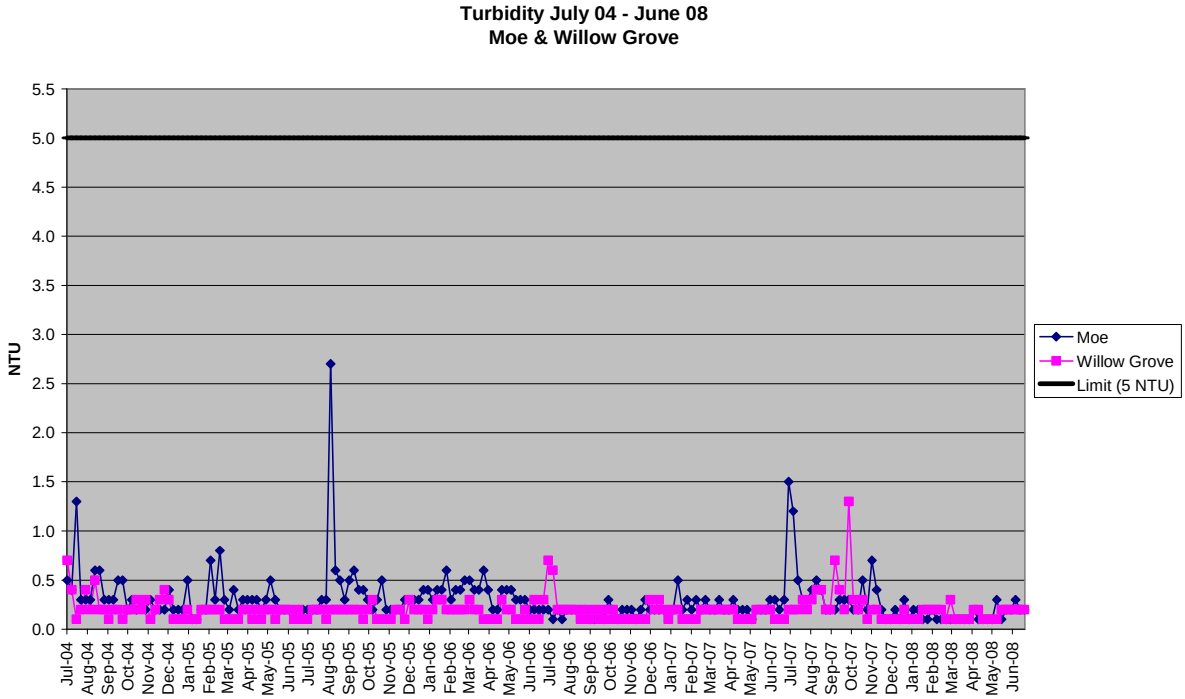
1.2.2 Coongulla, Heyfield, Maffra and Boisdale



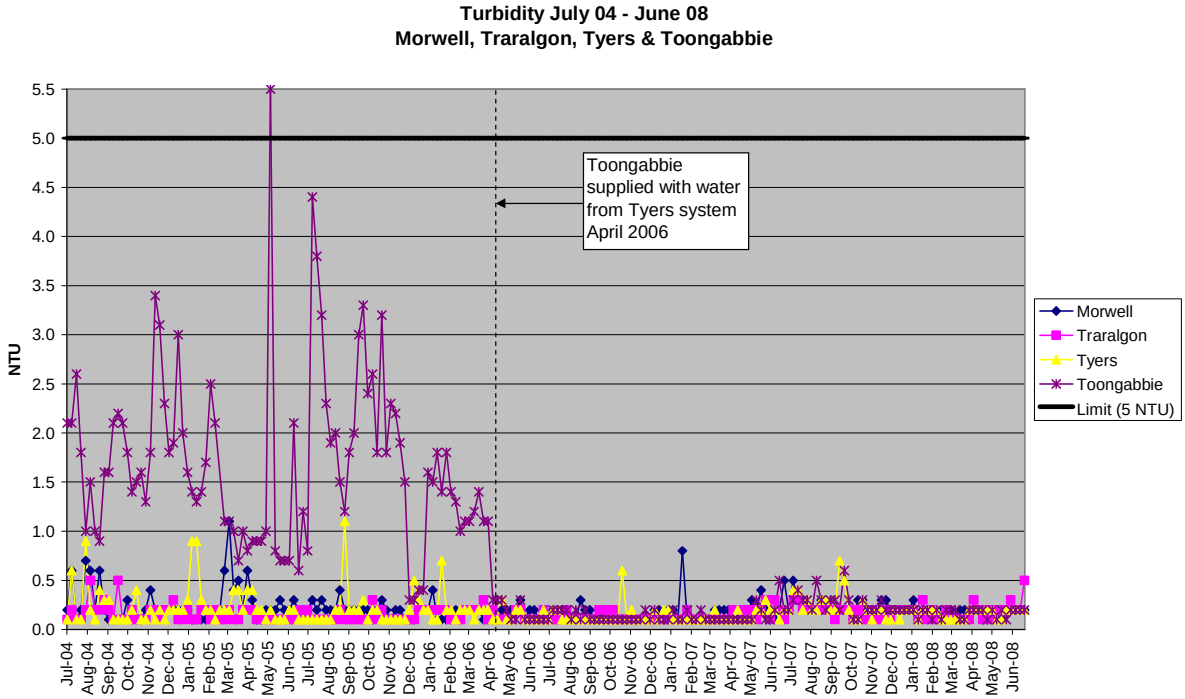
1.2.3 Seaspray, Thorpdale, Mirboo North and Boolarra



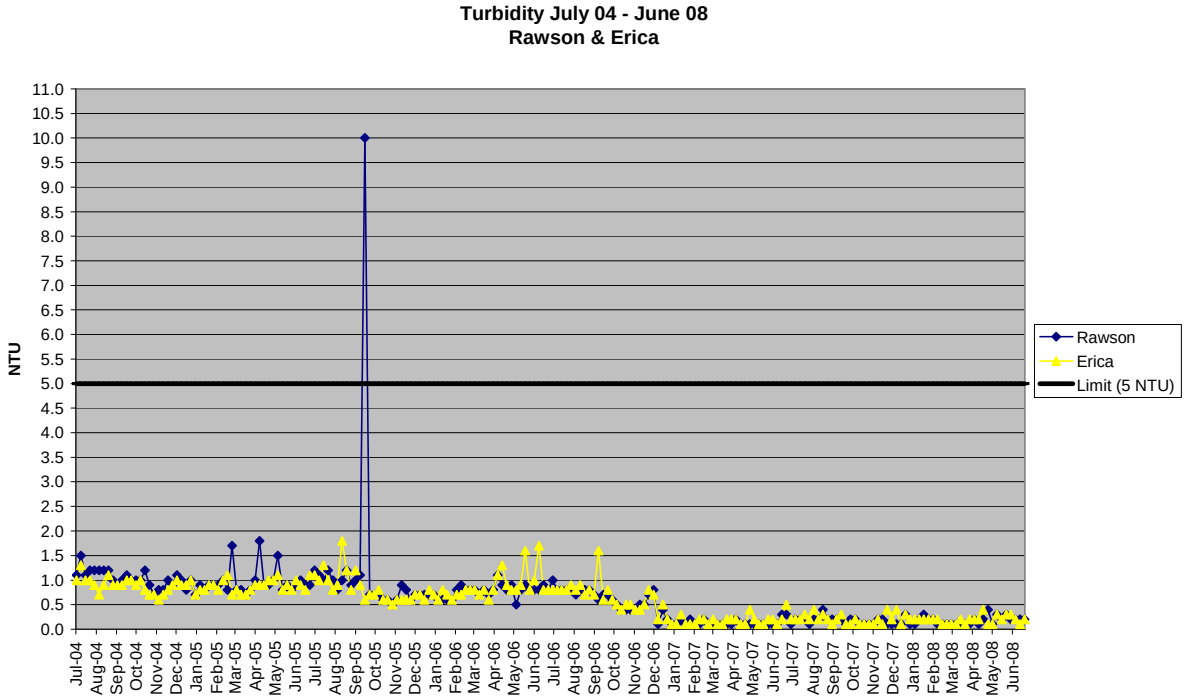
1.2.4 Moe and Willow Grove



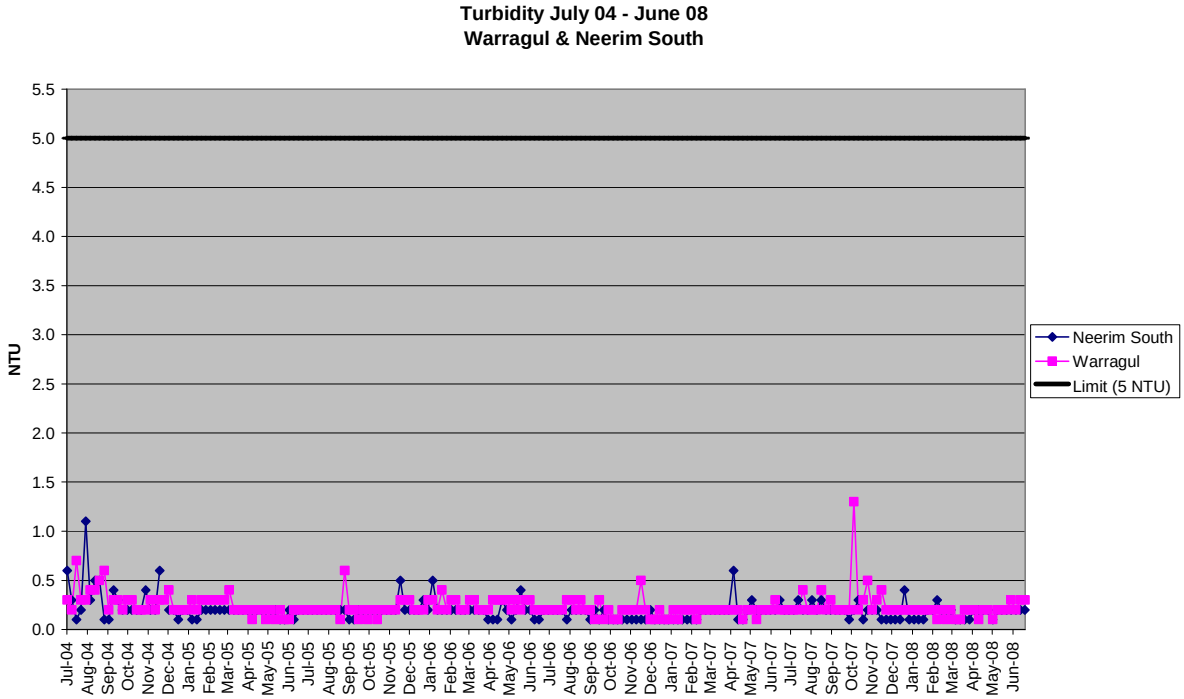
1.2.5 Morwell, Traralgon, Tyers and Toongabbie



1.2.6 Rawson and Erica

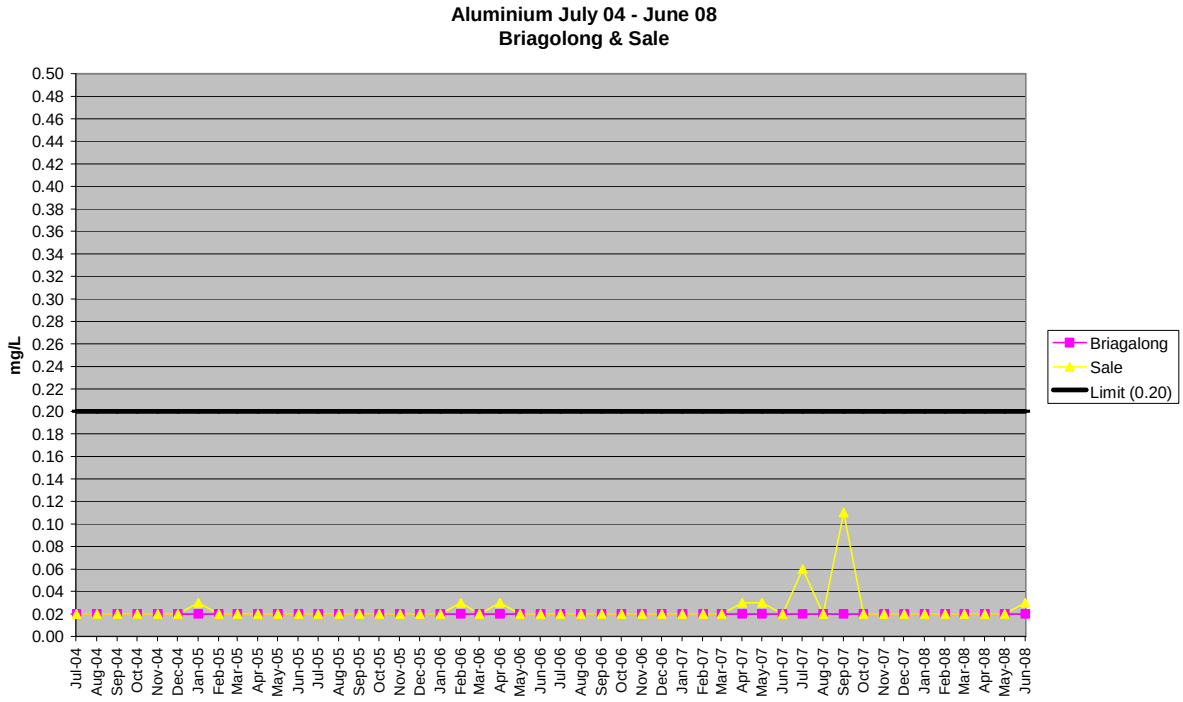


1.2.7 Warragul and Neerim South

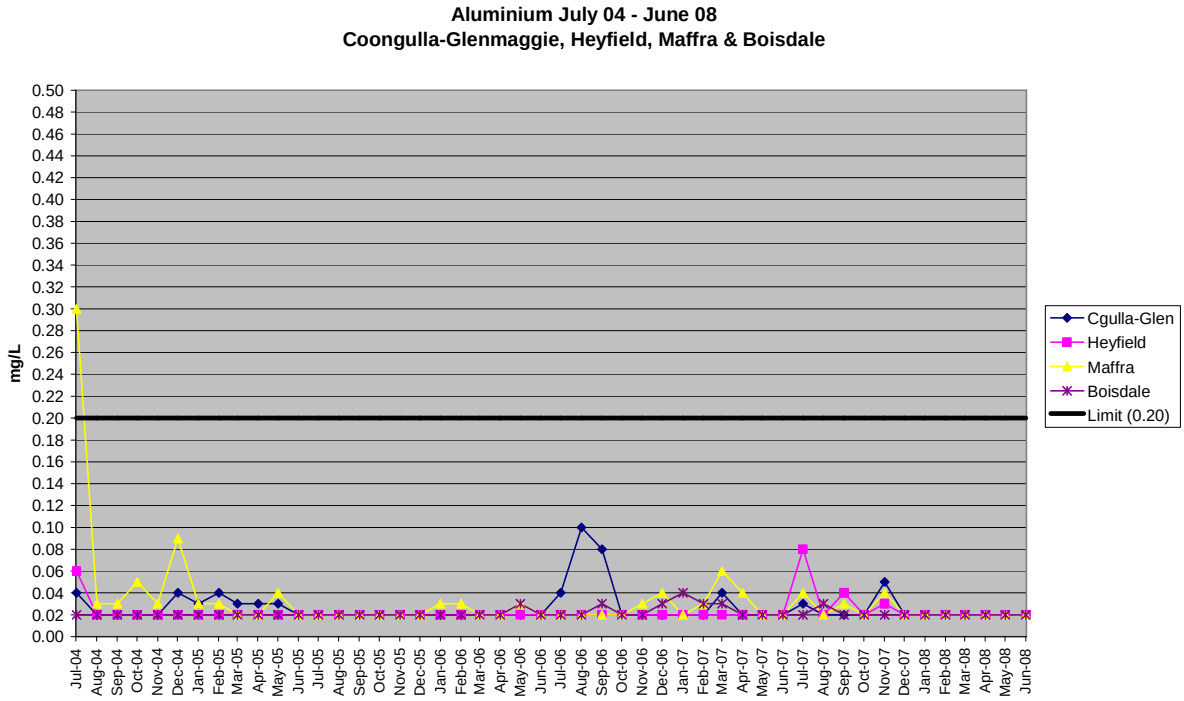


1.3 ALUMINIUM TRENDS

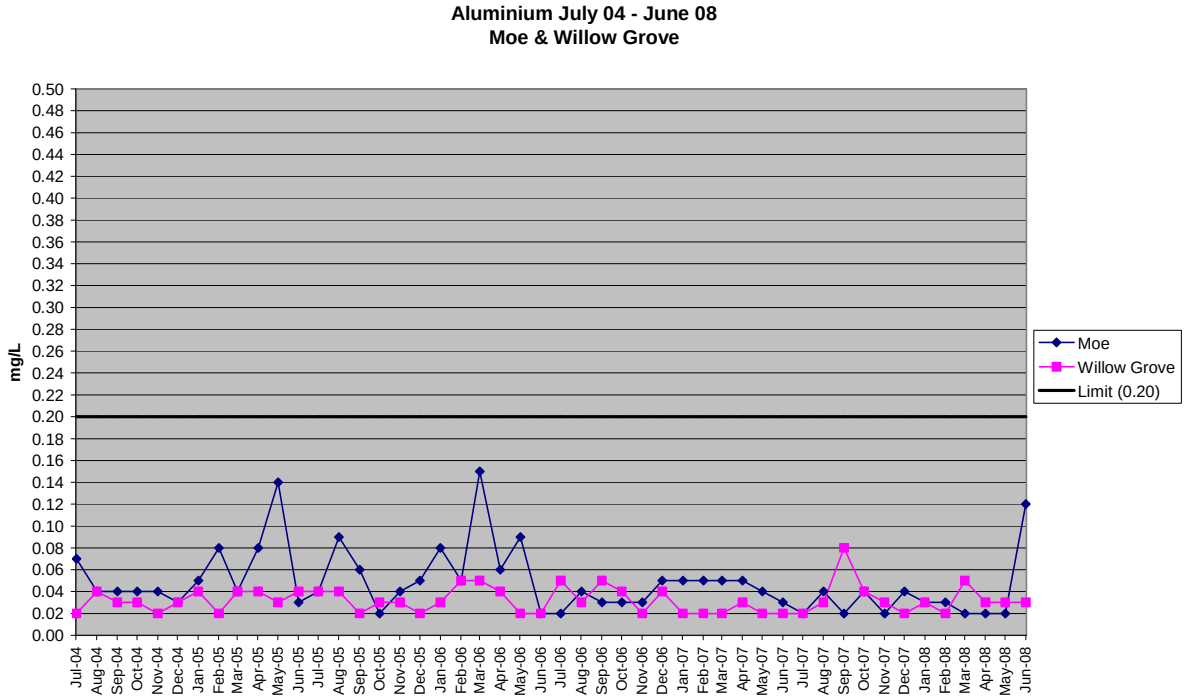
1.3.1 Briagolong and Sale



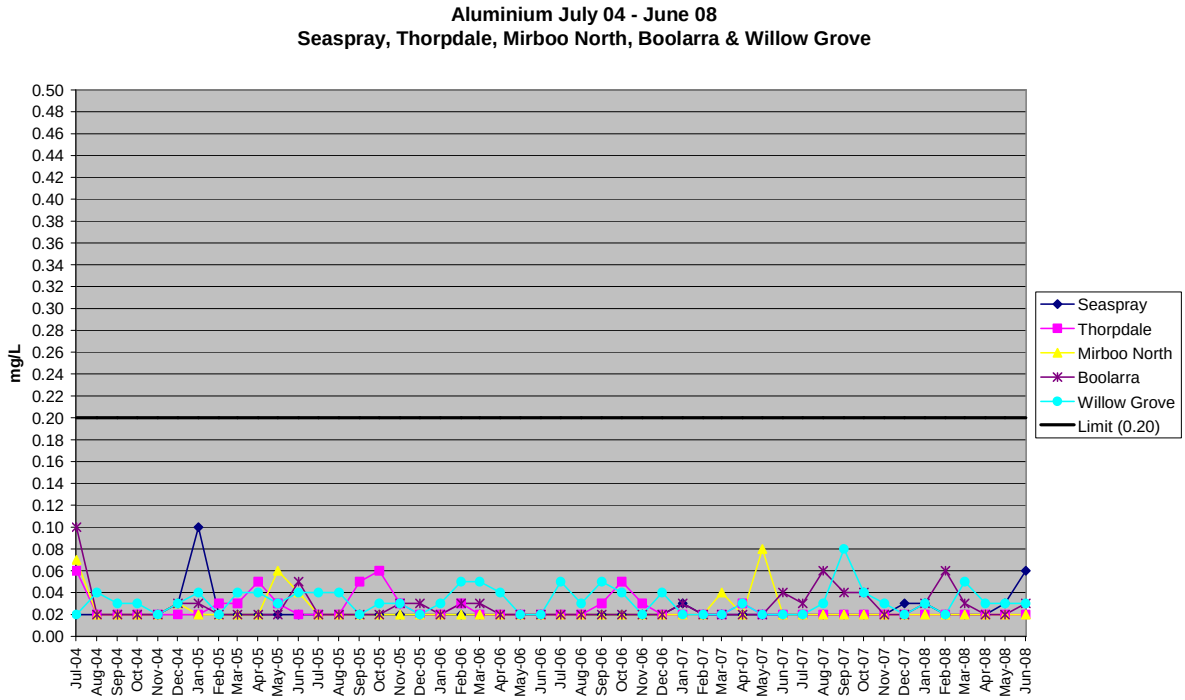
1.3.2 Coongulla, Heyfield, Maffra and Boisdale



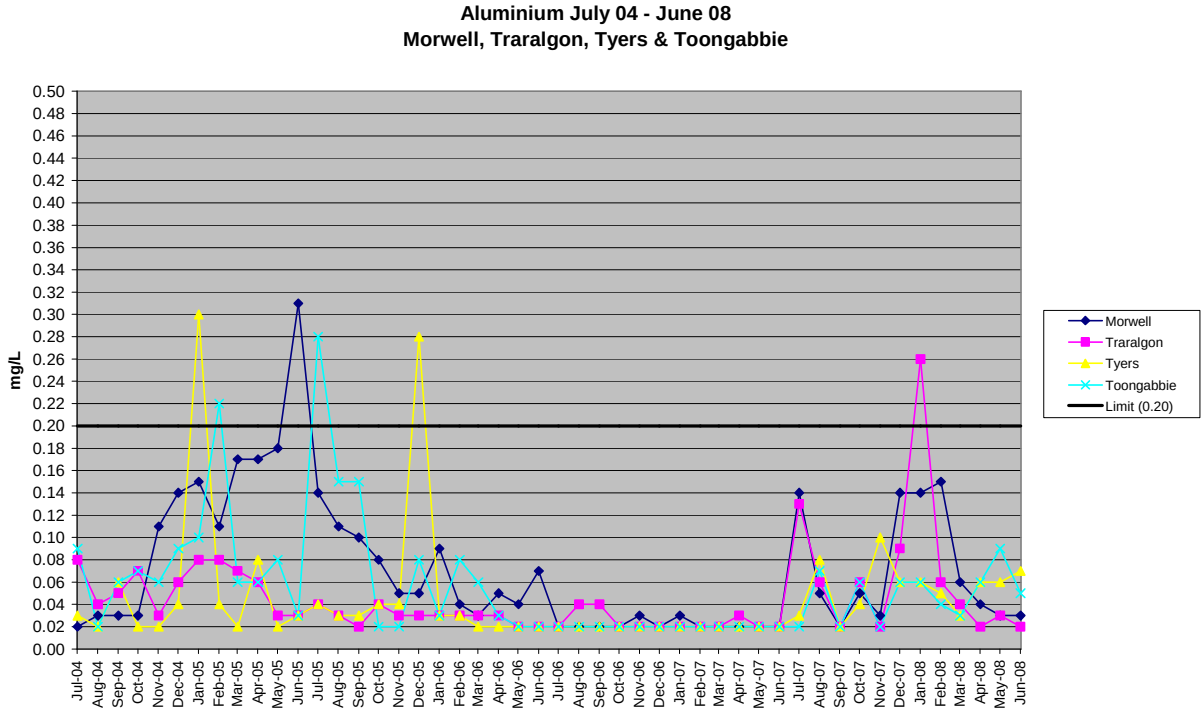
1.3.3 Moe and Willow Grove



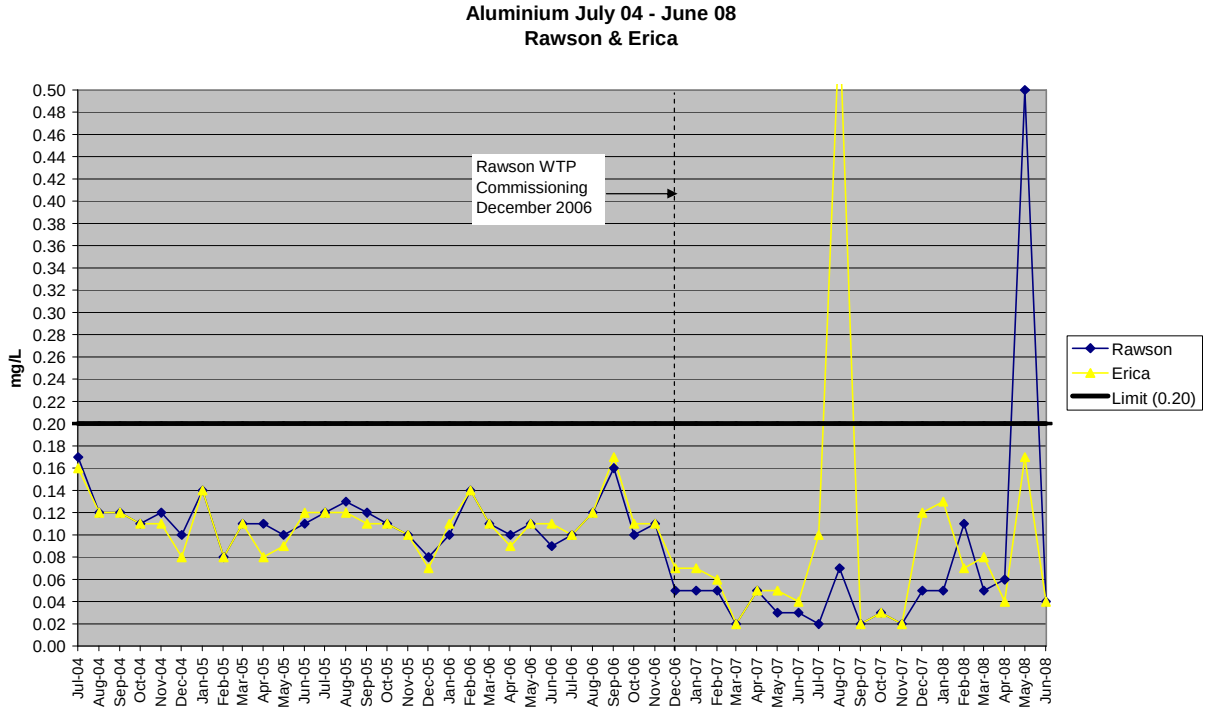
1.3.4 Seaspray, Thorpdale, Mirboo North and Boolarra



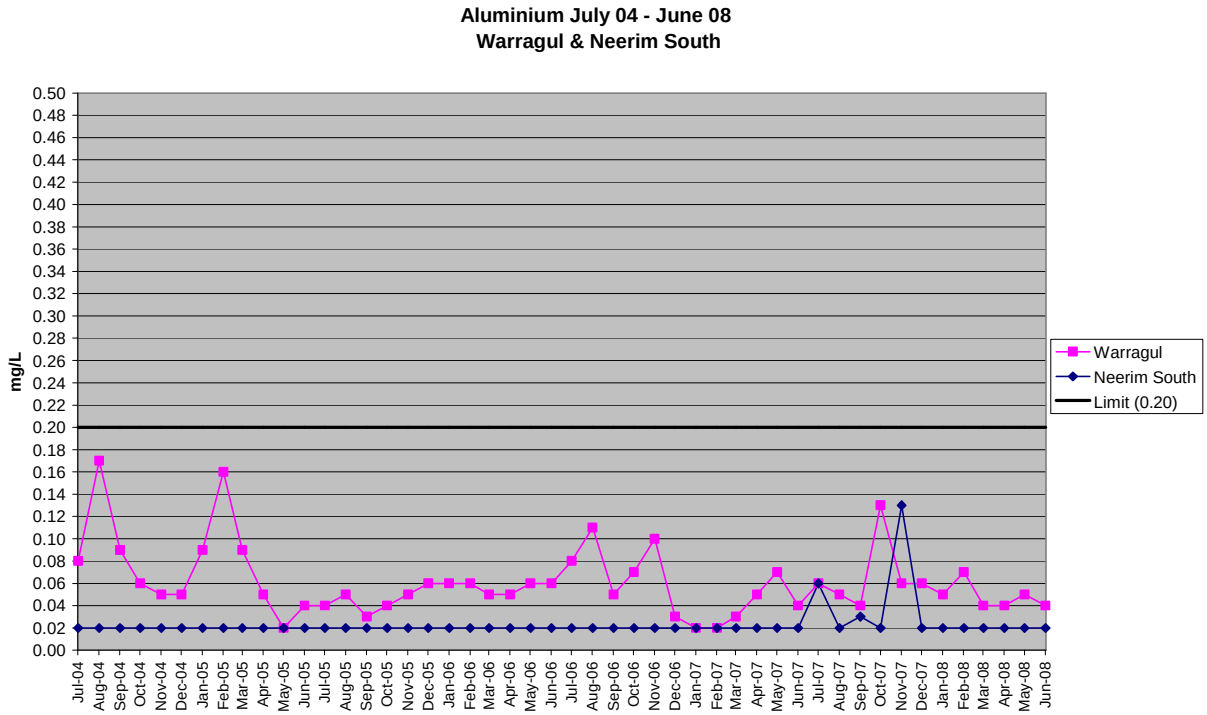
1.3.5 Morwell, Traralgon, Tyers and Toongabbie



1.3.6 Rawson and Erica

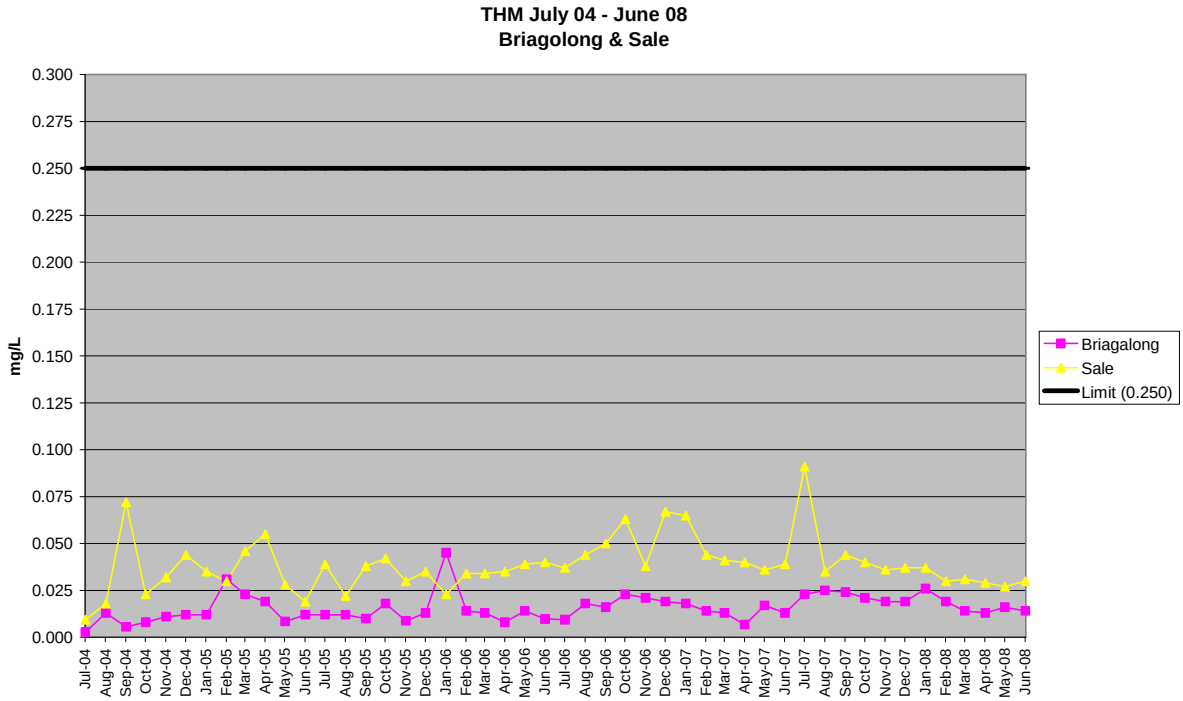


1.3.7 Neerim South and Warragul

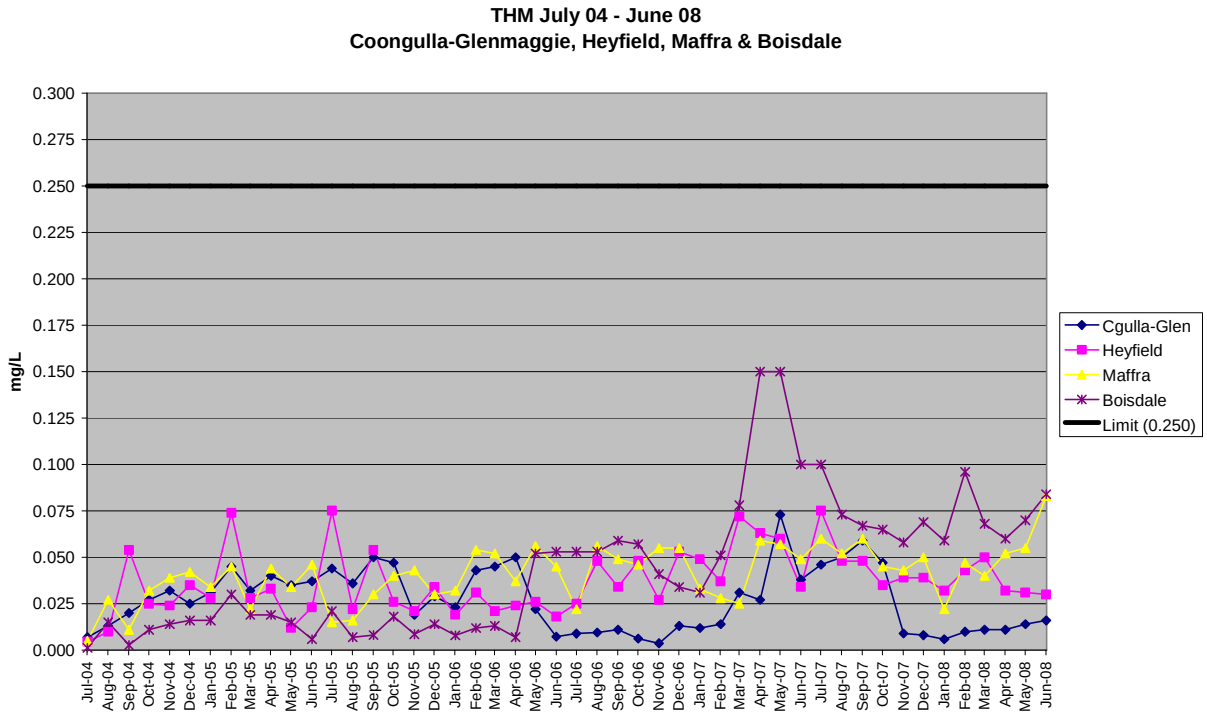


1.4 TRIHALOMETHANE TRENDS

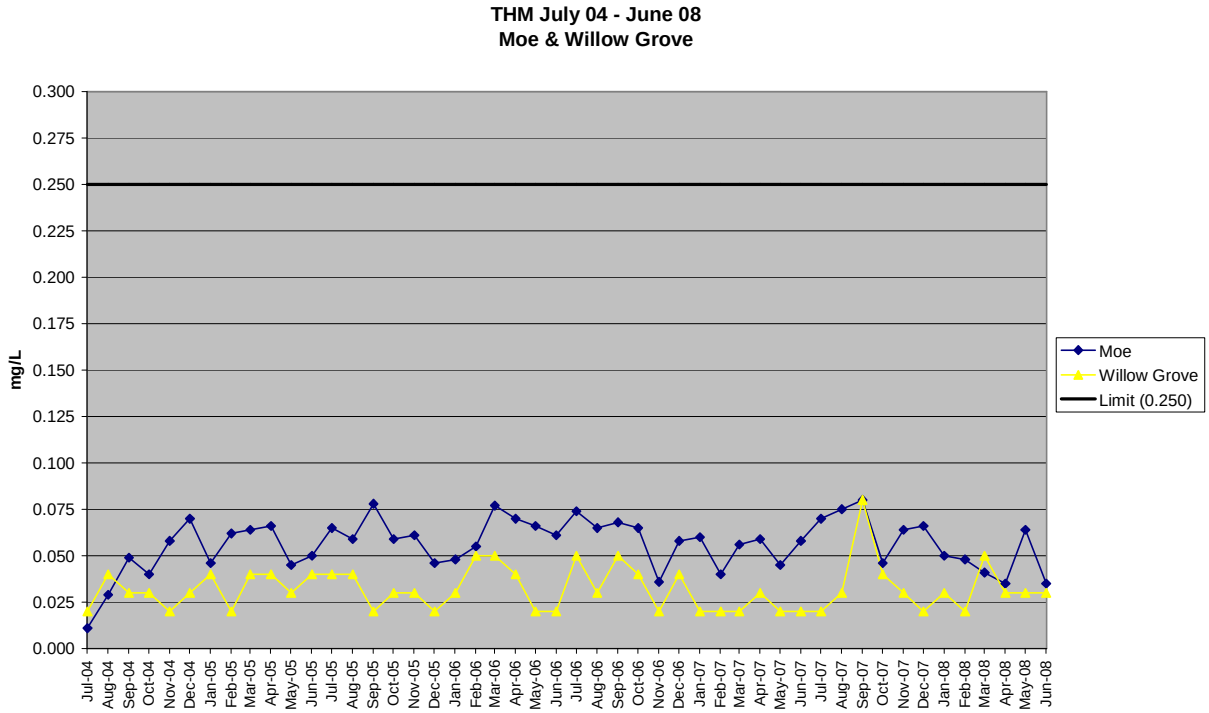
1.4.1 Briagolong and Sale



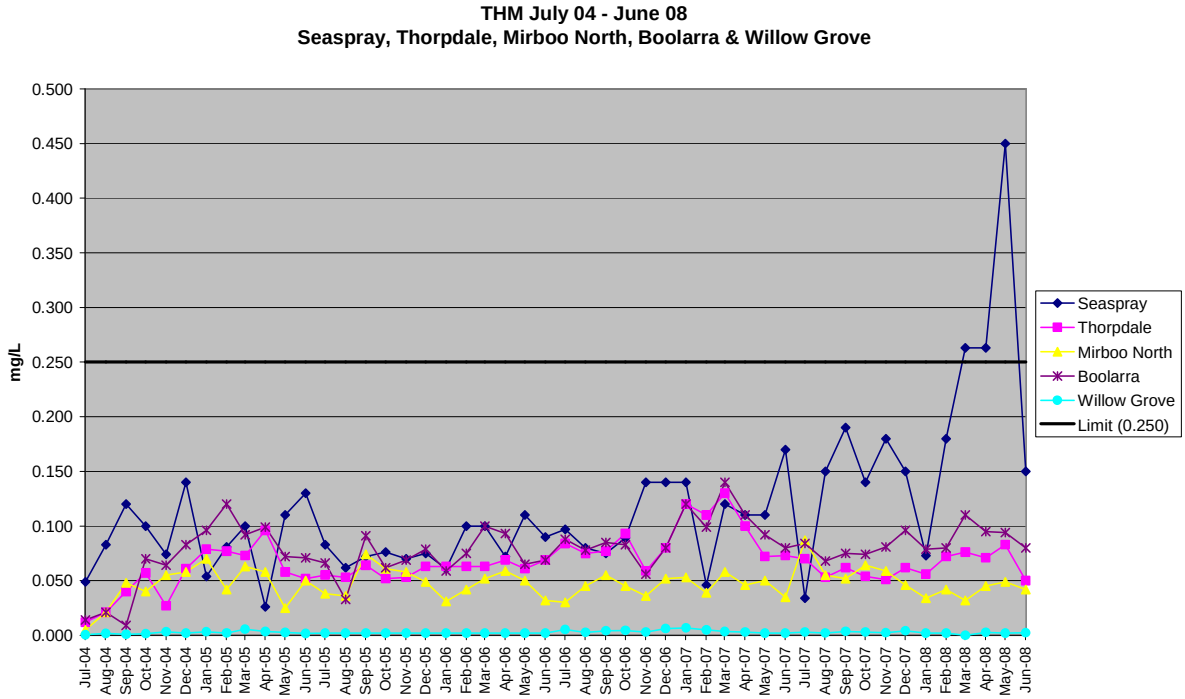
1.4.2 Coongulla, Heyfield, Maffra and Boisdale



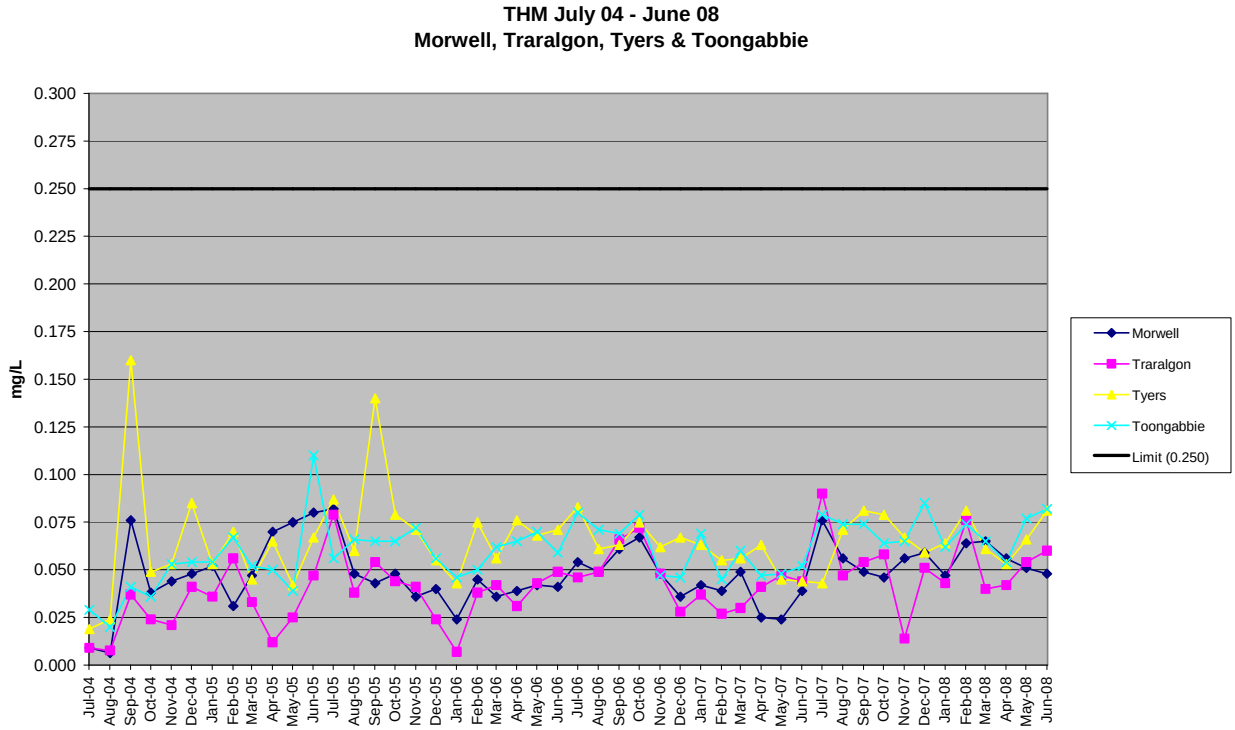
1.4.3 Moe and Willow Grove



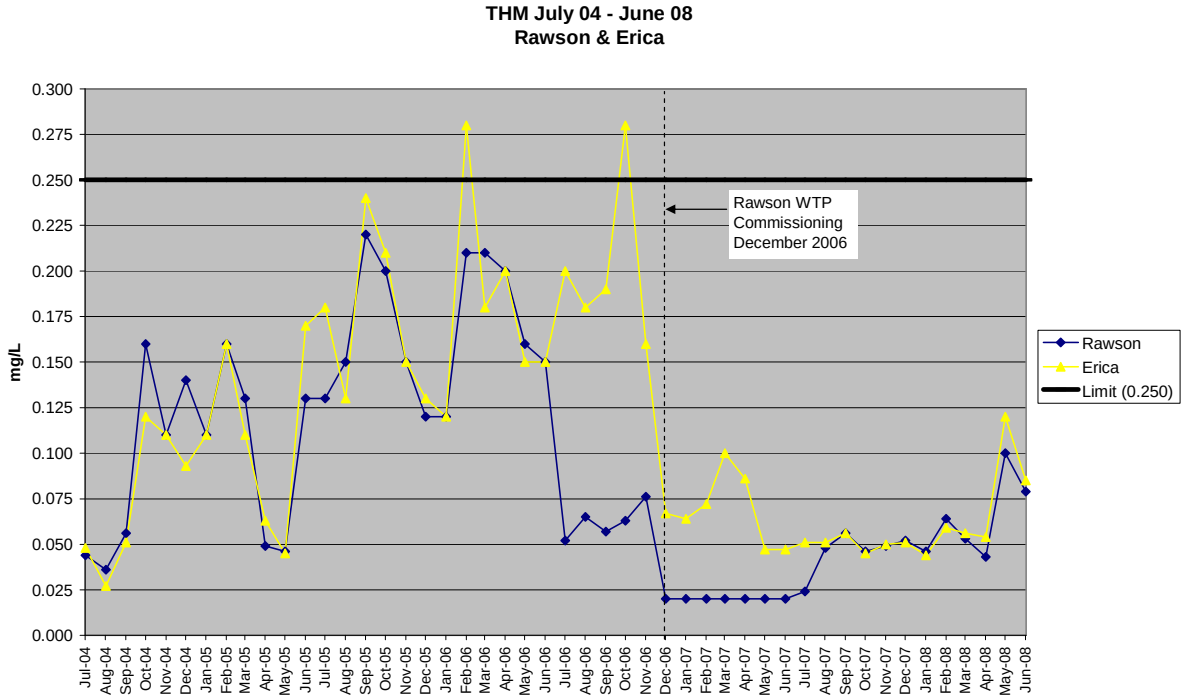
1.4.4 Seaspray, Thorpdale, Mirboo North and Boolarra



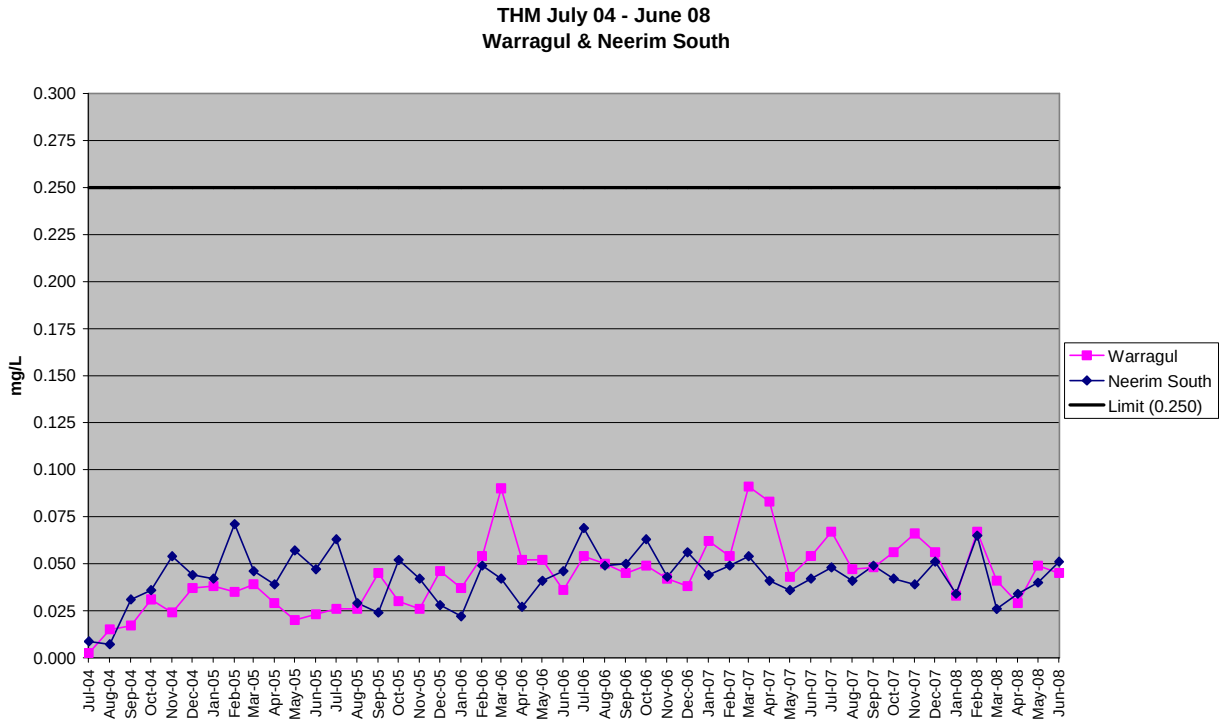
1.4.5 Morwell, Traralgon, Tyers and Toongabbie



1.4.6 Rawson and Erica



1.4.7 Warragul and Neerim South



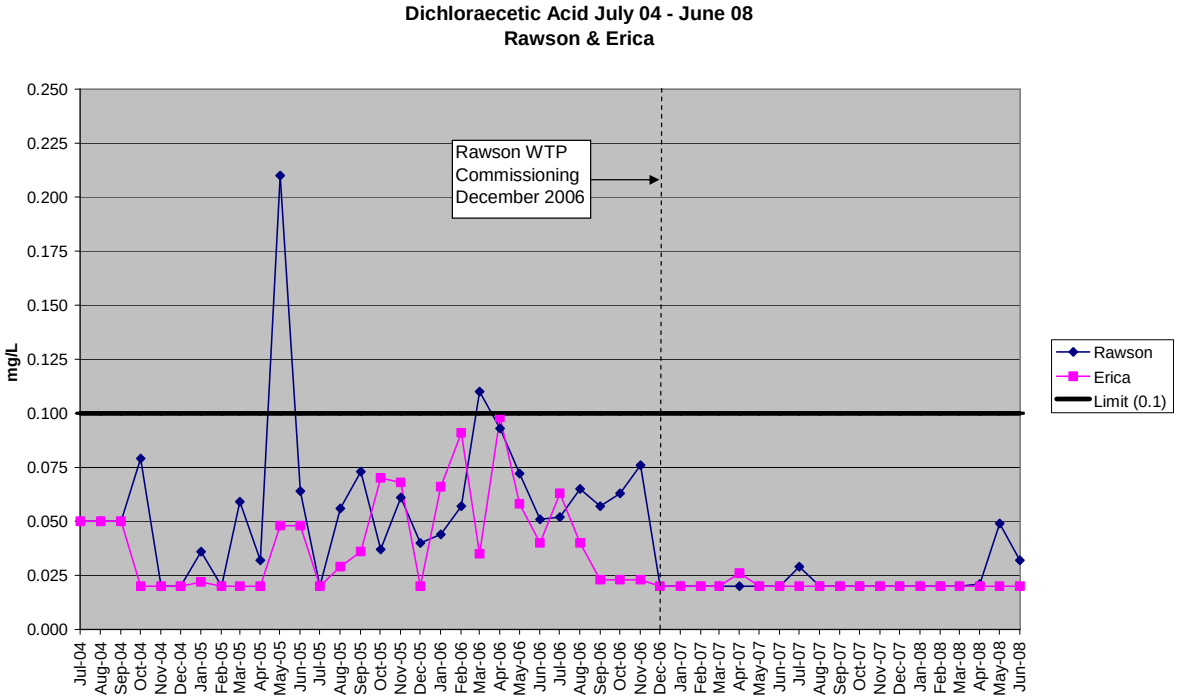
1.5 CHLOROACETIC ACID TRENDS

1.5.1 All localities

All samples across localities reported results of chloroacetic acid below the detection limit (<0.050 mg/L).

1.6 DICHLOROACETIC ACID TRENDS

1.6.1 Rawson and Erica

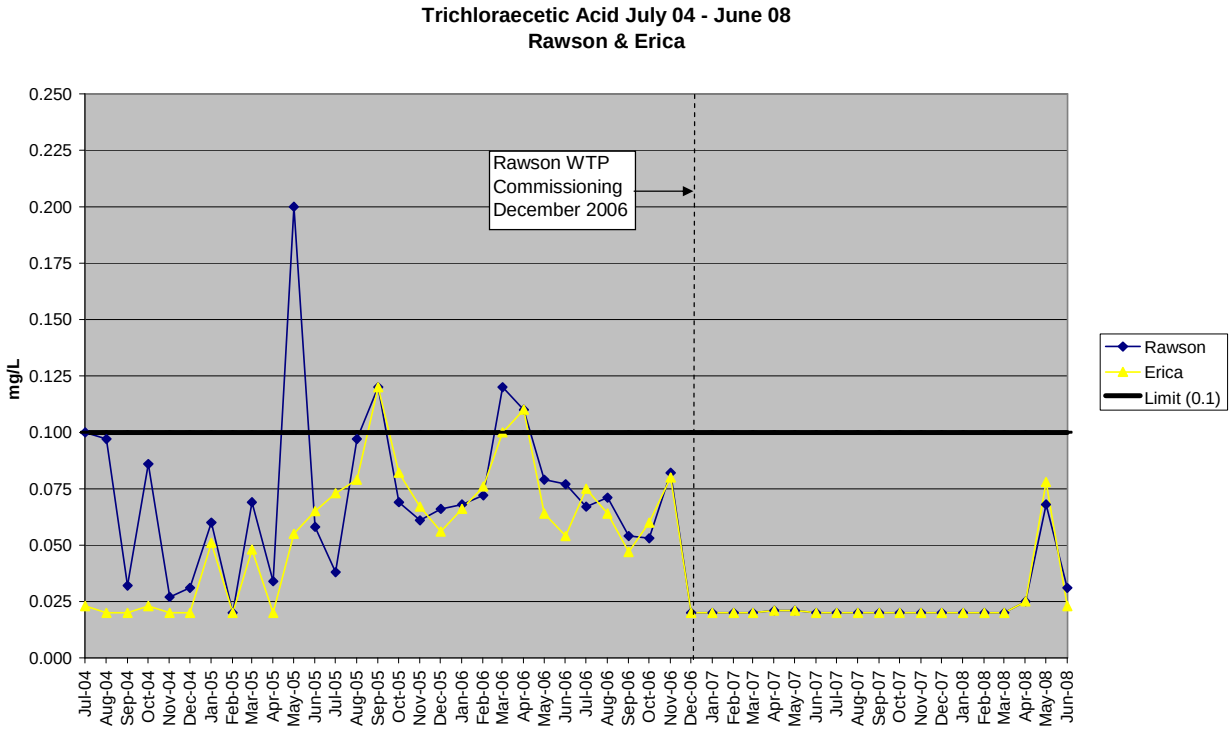


1.6.2 All other localities

All other localities compliance results were below or marginally above the detection limit (<0.020 mg/L).

1.7 TRICHLOROACETIC ACID TRENDS

1.7.1 Rawson and Erica



1.7.2 All other localities

All other localities compliance results were below or marginally above the detection limit (<0.020 mg/L).

APPENDIX 2 : AUDIT CERTIFICATE

Schedule 1

Regulation 8

Safe Drinking Water Regulations 2005

RISK MANAGEMENT PLAN AUDIT CERTIFICATE

Risk Management Plan Audit Pursuant to the *Safe Drinking Water Act 2003* for Gippsland Water for Period 1 January 2006 to 31 December 2007.

Certificate Number: 06

Audit period: 1 January 2006 to 31 December 2007

To: Lynley Keene, Gippsland Water, PO Box 348, Traralgon, Vic, 3844.

Australian Business Number (ABN): 75 830 750 413

I, Dr Daniel Deere, after conducting a risk management plan audit of the water supplied by Gippsland Water, am of the opinion that—

Gippsland Water has complied with the obligations imposed by section 7(1) of the ***Safe Drinking Water Act* 2003** during the audit period.

Signature of approved auditor: DA Deere

Date: 23rd June 2008

APPENDIX 3: AUDIT FINDINGS

External Audit Report – Safe Drinking Water Act Regulatory Audit – June 2008

Audit	Results of Audit	Improvement Opportunities	Outcomes
The Safe drinking Water Act 2003 (Act) and *Safe Drinking Water Regulations 2005* (Regulations) require a Risk Management Plan (RMP) to be implemented and adhered to by water suppliers and water storage mangers in the State of Victoria. In June 2008, an external independent audit was conducted on Gippsland Water's Risk Management Plans for the audit period of 1 January 2006 to 31 December 2007. The audit was completed on 23 June 2008. The audit was performed in accordance with the Act, Regulations, and the DHS Drinking Water Regulatory Audit Guidance Note November 2007.	The audit findings determined that Gippsland Water **complied** with the obligations imposed by section 7 (1) of the Act, during the audit period. Specific opportunities for improvement were identified, seven of which were as a result of minor non-compliances	The improvement opportunities can be summarised as: ▪ Minor amendments/additions to administrative details within the Risk Management Plan documentation ▪ Provide more details on the description of water supply (flow diagrams) ▪ The need to expand the documentation detail of areas of management of catchment and water quality risks ▪ The need to formalise communication meetings and procedures with bulk water suppliers in relation to water quality management ▪ Noting water quality parameters that are not considered a significant risk in plans, and explaining why.	A list of actions has been prepared with completion timelines to address the issues of minor non-compliance and improvement opportunities, and has forwarded to DHS.