



East Gippsland **Water**

DRINKING WATER QUALITY ANNUAL REPORT 2022-23

EAST GIPPSLAND WATER



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OFFICIAL



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1. INTRODUCTION

Our role at East Gippsland Water (EGW) is to provide quality water and wastewater services to sustain and enhance our community. We are committed to providing customers with excellent quality and safe drinking water that meets the requirements of the *Safe Drinking Water Act 2003*, EGW's Statement of Obligations, customer expectations and in line with EGW's Drinking Water Quality Policy Statement. This provides our customers with safe and reliable drinking water that meets health-based requirements and is delivered to our customers when they need it.

In the last financial year (2022/23) we treated and delivered over 4,688 ML of drinking water. This water was distributed to 27,709 customer connections across East Gippsland. The quality of our drinking water consistently performs well against the *Safe Drinking Water Regulations 2015* with all drinking water supplied to our customers being fully compliant with drinking water quality standards during 2022-23.

We continue to improve our supplies through strategic investment in new infrastructure and focus on maintenance systems for existing infrastructure. We continue to improve our operational activities to identify hazards and manage risks.

1.1. Characteristics of the system

Our service region covers approximately 21,000 square kilometres and extends east from Lindenow and Bairnsdale, through Lakes Entrance to Mallacoota near the New South Wales border, and as far north as Omeo and Dinner Plain in the High Country of the Victorian Alps (Figure 1).

Most of the water delivered to customers is sourced from local river systems. 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.



Nine separate water supply systems serve the communities of East Gippsland including:

1. Bemm River;
2. Buchan;
3. Cann River;
4. Dinner Plain;
5. Mallecoota;
6. Mitchell System - Bairnsdale, Bruthen, Eagle Point, Johnsonville, Lakes Entrance, Lake Tyers Aboriginal Trust, Lake Tyers Beach, Lindenow, Lindenow South, Metung, Newlands Arm, Nicholson, Nowa, Paynesville, Raymond Island, Sarsfield, Swan Reach
7. Omeo;
8. Brodribb System - Orbost, Marlo, Newmerella; and
9. Swifts Creek.

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



Figure 1: EGW's region of operation

2. WATER TREATMENT AND QUALITY RISK MANAGEMENT SYSTEMS

To manage water quality risks, a Drinking Water Quality Risk Management System (DWQRMS) supports and identifies key risks ensuring they are managed appropriately. The DWQRMS has been developed in accordance with the Australian Drinking Water Guidelines 2011 (Version 3.8, Sept 22). An overview of its structure is shown in Figure 2.



Figure 2: Structure of the Drinking Water Quality Risk Management System with reference to internal documents.

2.1. Water Supply System Summary

Water treatment processes vary slightly according to each locality. A description of each treatment process and chemical additives is included in the glossary of terms.

A summary of the nine systems is provided in Table 1 below.

Table 1: Water Supply and Treatment Systems Summary

WATER SAMPLING LOCALITY	POPULATION SUPPLIED*	SOURCE WATER	CATCHMENT DESCRIPTION	RAW WATER STORAGE	TREATMENT PLANT	TREATMENT PROCESS	ADDED SUBSTANCES	COMMENTS
BAIRNSDALE	8620	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, mechanical dewatering	Caustic soda, poly (Magnafloc LT 25 & 27), poly aluminium chlorohydrate (PAC 23), chlorine (compressed chlorine gas and sodium hypochlorite); fluoride (fluorosilicic acid), powder activated carbon, copper sulphate (Earthtec)	LT 25 used for backwash water clarification LT 27 used for centrifuge Fluoride dosing commenced in August 2010 Capacity for powder activated carbon addition exists, but is not currently in use Earthtec is a product utilised to reduce algae in water basins
LINDENOW	250							
LINDENOW SOUTH	190							
SARSFIELD-BRUTHEN	710							
MERRANGBAUR	1020							
SUNLAKES-TOORLOO	3090							
KALIMNA	700							
EAGLE POINT-PAYNESVILLE	4240							
NICHOLSON-SWAN REACH	930							
METUNG	1480							
NOWA NOWA	120							



WATER SAMPLING LOCALITY	POPULATION SUPPLIED*	SOURCE WATER	CATCHMENT DESCRIPTION	RAW WATER STORAGE	TREATMENT PLANT	TREATMENT PROCESS	ADDED SUBSTANCES	COMMENTS
BUCHAN	110	Buchan River	80% forest with some minor impacts (forestry, agriculture, cattle and camping)	N/A	Buchan	Coagulation, flocculation, clarification (dissolved air flotation), filtration (granular media filter), disinfection, Geobag dewatering	Caustic soda, poly aluminium chlorohydrate (PAC 23), poly (LT 25), chlorine (sodium hypochlorite), copper sulphate (Earthtec)	LT 25 used for backwash water clarification 1 modular floating cover
CANN RIVER	200	Cann River	Forest, some agricultural land (cattle), minimal septic tanks, roads	3.4ML basin (shade-cloth covered)	Cann River			
BEMM RIVER	100	Bemm River	90% forest, with some minor forestry, agricultural and human impacts.	6.4 ML covered basin ¹ .	Bemm River			
SWIFTS CREEK	130	Tambo River	Forest, agricultural land (cattle), some septic tanks, roads and logging	4.6ML basin (shade-cloth covered)	Swifts Creek			



WATER SAMPLING LOCALITY	POPULATION SUPPLIED*	SOURCE WATER	CATCHMENT DESCRIPTION	RAW WATER STORAGE	TREATMENT PLANT	TREATMENT PROCESS	ADDED SUBSTANCES	COMMENTS
ORBOST	2070	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, Geobag dewatering,	Caustic Soda, poly aluminium chlorohydrate (PAC 23), poly (LT 20), chlorine (sodium hypochlorite)	Modular floating cover
OME0	270	Butchers Creek	State forest with minimal human impacts (some grazing)	5ML (shade-cloth covered) and 10ML covered basin ¹	Omeo			
MALLACOOTA	1040	Betka River & Aquifer (3 bores)	State forest with minimal human impacts (some forestry)	41ML basin (shade-cloth covered)	Mallacoota	Ultraviolet (UV) disinfection (Mallacoota only)	Caustic soda, poly aluminium chlorohydrate (PAC 23), poly (LT 20 & 25), chlorine (sodium hypochlorite)	LT 25 used for backwash water clarification
DINNER PLAIN	400	Aquifer (2 bores)	Supply is extracted from bores deeper than 70m	700kL tank	Dinner Plain	Ultraviolet (UV) disinfection	Manual dosing of chlorine	Community engagement underway regarding chlorine

* The Population Supplied is the equivalent number of customer connections, including both residential and non-residential customers.

2.2. Issues

There were no other Water Quality issues in addition to what has been reported in this document.

2.3. Source Water Protection

The Drinking Water Quality Risk Management Plan (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 and checks are in place to effectively manage those risks.

In accordance with Catchment and Water Protection Policy we recognise the critical importance of sustainable catchment management for the protection of water quality and quantity. We work in collaboration with a number of external stakeholders, including the Department of Energy, Environment and Climate Action and the East Gippsland and North East Catchment Management Authorities to identify and manage water quality risks at the catchment level. Our catchments' health risks are addressed in comprehensive waterway strategies developed by the above authorities with the support of EGW with the primary goal of continual improvement to river and catchment health. The works conducted as part of the waterway strategies reduce source water quality risks, through initiatives such as livestock exclusion from rivers, riparian zone revegetation and river bank stabilisation for erosion control.

This integrated management approach to protecting source water is underpinned via following legislation:

- *Water Act 1989*
- *Planning and Environment Act 1987*
- *Catchment and Land Protection Act 1994*
- *Land Act 1958*
- *Environment Protection Act 2017*

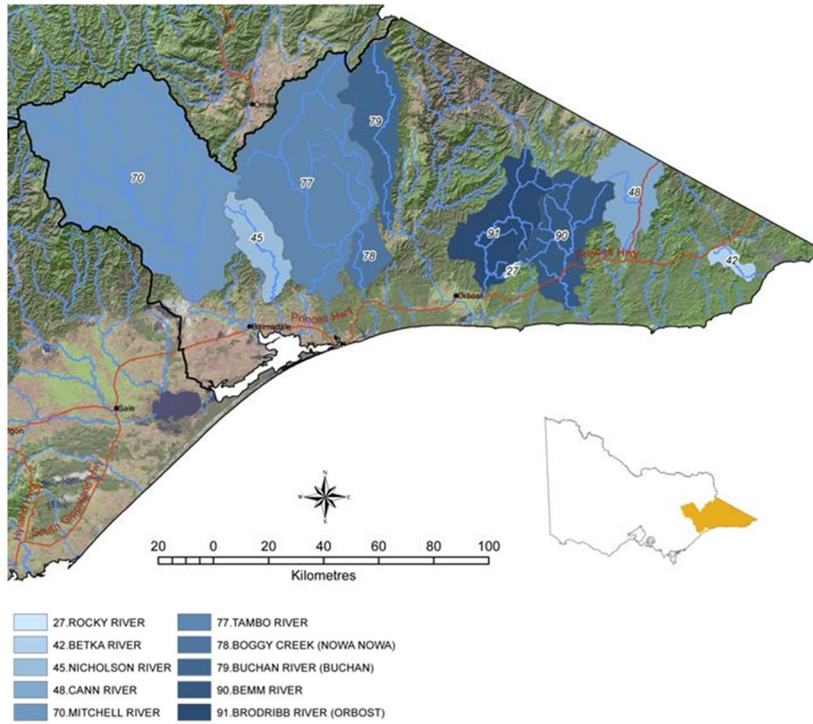


Figure 3: EGW Source water catchments (Source: vro.agriculture.vic.gov.au)

3. DRINKING WATER RISK MANAGEMENT PLAN AUDIT RESULTS

Internal audits of the DWQRMS are undertaken routinely to ensure we continually improve our systems. In February 2023, a regulatory audit of EGW's drinking water risk management plan was undertaken against the requirements of the *Safe Drinking Water Act 2003* (the Act) and *Regulations 2015*.

The regulatory audit concluded that:

- EGW has established a DWQ RMP that meets the requirement of the legislation and is adequate to manage risk.
- Processes and procedures are consistently implemented and operated across regions.
- Operational monitoring results confirm the treatment processes are well operated.
- Water quality compliance monitoring results demonstrate consistent compliance with the water quality standards.
- EGW demonstrated it has robust incident management procedures. Additionally, it was noted that there have been no repeated incidents, indicating that there are no systemic issues affecting water quality.
- Health based targets assessments have been undertaken to quantify microbial risk and critical control points reflect the outcomes of the assessments.
- One minor non-compliance was identified in relation to a number of instances where chemical samples were taken from the same location on consecutive sampling events.

EGW was found non-compliant with the obligations imposed by section 7(1) of the *Safe Drinking Water Act 2003* during the audit period. The details of the reasons for the noncompliance are section r. 8(1)(d)(v) of the *Safe Drinking Water Regulation* which requires that a risk management plan developed by a water supplier, specifies the basis on which the location for the collection of a particular sample will be determined, so as to ensure that, for the purposes of routine sampling, samples are not taken from the same location within a water sampling locality on two consecutive occasions. Four Opportunities for Improvement (OFI) were also identified. EGW has committed to corrective actions to address the minor non-compliance and each of the four OFIs identified during the audit.

These are summarised in

Table 2.

Table 2: 2023 RMP Regulatory Audit – Summary of Findings

REFERENCE	AUDIT FINDINGS / OFI'S	STATUS
MINOR NON-COMPLIANCE	One minor non-compliance was identified in relation to a number of instances where chemical samples were taken from the same location on consecutive sampling events.	Our Laboratory contractor ALS, has taken prompt action and made significant improvements to their Laboratory Information Management Systems (LIMS). The revised LIMS now ensures that sampling schedules no longer repeat locations, thereby mitigating the risk of duplicate sampling. Moreover, we have implemented a manual management process, wherein our diligent team conducts thorough reviews of the

		sampling schedule to maintain accuracy and adherence to protocols.
OFI-2023-001	Consider undertaking a program to inspect the condition of the Mallacoota bore heads and a program to progress any improvements required.	We have temporarily sealed the bore using expanding foam to prevent any contamination from entering. Additionally, we are currently exploring more permanent solutions to ensure long-term protection and integrity.
OFI-2023-002	Review and update the process flow diagrams to ensure that they accurately reflect the system components.	Completed February 2023
OFI-2023-003	Consider expanding SOP023 to clearly delineate the type of 'events' that are reportable under section 18 and 22, and not reportable, linking these backs to the legislation.	Underway - we have taken immediate action to update SOP023 accordingly. Our team is working on the necessary revisions, ensuring that the updated SOP comprehensively outlines the reporting criteria in alignment with the appropriate legislative requirements. To ensure smooth implementation and understanding of the updated SOP, we will schedule a meeting with the DH to discuss the changes and seek their input.
OFI-2023-004	Develop a process for reviewing sample schedules to ensure chemical samples are not taken from the same collection point within a water sampling locality on two consecutive occasions.	Underway - We are in the process of developing a new schedule system within our Water Information Management Systems (WIMS), which will promptly alert us if there is a possibility of collecting samples from the same location, preventing any potential discrepancies in the future.

As a Victorian water agency, EGW treats the regulatory risk management plan audit findings seriously. The minor non-compliance and OFIs stated above has had no impact on the quality of water being delivered to customers, however EGW has used its findings to improve the drinking water quality system.

A copy of the audit certificate is provided in the Appendix A to this document.

4. EMERGENCY INCIDENT AND EVENT MANAGEMENT

4.1. COVID-19

As an essential service, EGW maintained its focus to deliver safe drinking water to our customers during the COVID-19 pandemic. Whilst adjustments have been made to EGW staff working arrangements, the delivery of safe drinking water continues to be maintained.

4.2. Section 18 Notifications

A Section 18 notification is a notification to DH required under Section 18 of the *Safe Drinking Water Act 2003*. Section 18 of the *Safe Drinking Water Act 2003* states:

'A water supplier must notify the Secretary in writing if it becomes aware that the drinking water it is supplying to another person does not comply, or is not likely to comply, with any relevant water quality standard and must do so within 10 days after it becomes aware of that fact.'

In 2022-23, **no** Section 18 notifications were made to DH.

4.3. Section 22 Reports

A Section 22 report is a report to DH required under Section 22 of the *Safe Drinking Water Act 2003*. Section 22 of the *Safe Drinking Water Act 2003* states:

'(1) This section applies if an officer of a water supplier, water storage manager or council believes or suspects, on reasonable grounds, that water supplied, or to be supplied, for drinking purposes-

- (a) may be the cause of an illness; or*
- (b) may be the means by which an illness is being, has been or will be, transmitted; or*
- (c) may contain any pathogen, substance, chemical or blue-green algae toxin, whether alone or in combination, at levels that may pose a risk to human health; or*
- (d) may cause widespread public complaint.*

'(2) On forming that belief or suspicion, the officer must immediately report his or her belief or suspicion to the Secretary, and must make the report in the form required by the Secretary.'

In 2022-23, **one** Section 22 report was made to DH, as outlined below:

The report was in relation to a *E. coli* detection in Mallacoota. On 3rd October 2022, routine water sampling at Mallacoota detected a single *E. coli* organism in a sample taken at the 007E11 Mallacoota Entry Water point. The detection was attributed to an incorrect sampling location where an offline tank was inadvertently sampled. Subsequent follow-up sampling at four reticulation sites on 5th October 2022 demonstrated that *E. coli* was not present in the Mallacoota reticulation system, and chlorine levels remained compliant. Following an investigation, it was concluded that the *E. coli* detection was not representative of the overall reticulation system and determined to be a false positive in accordance with the Safe Drinking Water Regulations 2015.

4.4. Conclusions

- The *E. coli* detection was not representative of water supplied and met the criteria for a false positive sample.
- The clear water tank was taken offline due to roof replacement works. The change to the sampling point which was not communicated sufficiently to the ALS sampler. The sampler noted zero chlorine in the field sample and should have stopped work and raised the issue with EGW operations.
- At no time was the water unsafe to drink and it was confirmed that drinking water was free of contaminants and met all regulatory standards of *the Safe Drinking Water Regulations 2015*.
- The clear water tank's roof has now been replaced and the tank is back in service.
- EGW is continually improving change management processes and communications with ALS and EGW field staff with regular contract reviews and reviews of lessons learned.
- EGW provides awareness training to ALS samplers and EGW staff of any changes to routine sample procedures including locations that may have changed due to construction works.

5. QUALITY OF DRINKING WATER FOR 2022-23

The 2022-23 Water Quality Annual Report includes Regulated Parameter data for the Safe Drinking Water Regulations 2015 (SDWR 15). All results irrespective of sample location and type for drinking water supply have been included.

Table 3: SDWR 2015 – Schedule 2 Drinking Water Quality Standards

SCHEDULE 2 PARAMETER	RELEVANT SAMPLING FREQUENCY PER WATER SAMPLING LOCALITY	WATER QUALITY STANDARD FOR EACH WATER SAMPLING LOCALITY	PRESENTATION OF EGW RESULTS
ESCHERICHIA COLI (E. COLI)	One sample per week	All samples of drinking water collected are found to contain no <i>Escherichia coli</i> per 100 millilitres of drinking water, with the exception of any false positive sample	Reported as 0 <i>Escherichia coli</i> detected in 100mL
TOTAL TRIHALOMETHANES	One sample per month	Less than or equal to 0.25 milligrams per litre (mg/L) of drinking water	Results expressed to two decimal places
TURBIDITY	One sample per week	The 95 th percentile of results for samples in any 12-month period must be less than or equal to 5.0 NTU	Results expressed to one decimal place.

EGW follows a risk-based sampling program from catchment to consumer throughout each drinking water supply system. In addition to the drinking water parameters sampled for, this determines the location and frequency of samples taken throughout each system.

In 2022-23 EGW fully complied with the risk-based drinking water sampling program.

5.1. Regulated Parameters

5.1.1. *Escherichia coli* (*E. coli*)

E. coli is a microorganism that may cause illness in susceptible individuals. *E. coli* is associated with contamination of water supplies with faecal material and is therefore considered to be an important indicator of the safety of the water supply. Samples are taken at least weekly in each of the water sampling localities. There must be 0 *E. coli*/100 ml within drinking water with the exception of any false positive sample.

Table 4: *E. coli* sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MAXIMUM DETECTED (ORGS/100ML)	NUMBER OF DETECTIONS AND INVESTIGATIONS CONDUCTED (S.22)	NUMBER OF SAMPLES WHERE STANDARD WAS NOT MET.	COMMENTS COMPLYING (YES / NO)
BAIRNSDALE	Weekly	125	0		0	YES
BEMM RIVER	Weekly	104	0		0	YES
BUCHAN	Weekly	106	0		0	YES
CANN RIVER	Weekly	104	0		0	YES
DINNER PLAIN	Weekly	104	0		0	YES
EAGLE POINT-PAYNESVILLE	Weekly	107	0		0	YES
KALIMNA	Weekly	104	0		0	YES
LINDENOW	Weekly	104	0		0	YES
LINDENOW SOUTH	Weekly	104	0		0	YES
MALLACOOTA	Weekly	105	1	1	0*	YES*
MERRANGBAUR	Weekly	104	0		0	YES
METUNG	Weekly	105	0		0	YES
NICHOLSON-SWAN REACH	Weekly	104	0		0	YES
NOWA NOWA	Weekly	127	0		0	YES
OMEIO	Weekly	105	0		0	YES
ORBOST	Weekly	104	0		0	YES
SARFIELD-BRUTHEN	Weekly	104	0		0	YES
SUNLAKES-TOORLOO	Weekly	109	0		0	YES
SWIFTS CREEK	Weekly	104	0		0	YES

*The Mallacoota (false positive) incident has been described in Section 4.3.

All water sampling localities were compliant with the *E. coli* water quality standard for the 2022-23 reporting period (Table 4).

5.1.2. Total Trihalomethanes

Trihalomethanes (THMs) are compounds that may be produced when chlorine disinfectant reacts with organic material present in the water. These compounds may impact public health if they are present in drinking water in high concentrations over a long period of time. Samples are taken monthly in each of the water sampling localities. There must be less than or equal to 0.25 mg/L of Total Trihalomethanes within drinking water.

Table 5: Total Trihalomethanes sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF SAMPLES ABOVE THE STANDARD	MAX mg/L	AVERAGE mg/L	MET THE STANDARD (YES / NO)
BAIRNSDALE	Monthly	12	0	0.05	0.04	Yes
BEMM RIVER	Monthly	12	0	0.09	0.05	Yes
BUCHAN	Monthly	13	0	0.06	0.04	Yes
CANN RIVER	Monthly	12	0	0.06	0.05	Yes
DINNER PLAIN	Monthly	49*	0	0.00	0.00	Yes
EAGLE POINT-PAYNESVILLE	Monthly	14	0	0.06	0.04	Yes
KALIMNA	Monthly	13	0	0.08	0.06	Yes
LINDENOW	Monthly	12	0	0.03	0.02	Yes
LINDENOW SOUTH	Monthly	12	0	0.03	0.03	Yes
MALLACOOTA	Monthly	14	0	0.10	0.05	Yes
MERRANGBAUR	Monthly	13	0	0.08	0.06	Yes
METUNG	Monthly	12	0	0.07	0.05	Yes
NICHOLSON-SWAN REACH	Monthly	12	0	0.05	0.04	Yes
NOWA NOWA	Monthly	13	0	0.09	0.06	Yes
OMEQ	Monthly	13	0	0.07	0.04	Yes
ORBOST	Monthly	13	0	0.06	0.03	Yes
SARFIELD-BRUTHEN	Monthly	13	0	0.05	0.04	Yes
SUNLAKES-TOORLOO	Monthly	13	0	0.09	0.06	Yes
SWIFTS CREEK	Monthly	13	0	0.05	0.04	Yes

* Dinner Plain had more samples in this twelve-month period due to the installation of a temporary disinfection chlorine system to manage an identified risk to the underground bore extraction.

All water sampling localities were compliant with the Total Trihalomethanes water quality standard for the 2022-23 reporting period (Table 5).

5.1.3. Turbidity

Turbidity measures the presence of fine suspended material present in the water and at elevated levels may result in a 'cloudy' appearance of water. Turbidity is an indirect indicator for the general quality of water and may represent fine particles such as clays, minerals or microscopic organisms. Samples are taken weekly in each of the water sampling localities (Table 6). The 95th percentile of turbidity results for samples in any 12-month period must be less than or equal to 5.0 NTU within drinking water.

Table 6: Turbidity sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MAX NTU	95TH %TILE	MET THE STANDARD (YES / NO)
BAIRNSDALE	Weekly	127	0.2	0.1	YES
BEMM RIVER	Weekly	104	0.4	0.2	YES
BUCHAN	Weekly	108	1.5	0.1	YES
CANN RIVER	Weekly	104	0.2	0.1	YES
DINNER PLAIN	Weekly	104	0.7	0.2	YES
EAGLE POINT-PAYNESVILLE	Weekly	107	0.7	0.2	YES
KALIMNA	Weekly	106	0.4	0.2	YES
LINDENOW	Weekly	104	0.4	0.2	YES
LINDENOW SOUTH	Weekly	104	0.2	0.2	YES
MALLACOOTA	Weekly	105	1.8	1.4	YES
MERRANGBAUR	Weekly	106	0.2	0.1	YES
METUNG	Weekly	107	0.2	0.1	YES
NICHOLSON-SWAN REACH	Weekly	104	0.3	0.2	YES
NOWA NOWA	Weekly	106	1.1	0.2	YES
OMELO	Weekly	106	0.2	0.1	YES
ORBOST	Weekly	106	0.9	0.3	YES
SARFIELD-BRUTHEN	Weekly	106	0.4	0.2	YES
SUNLAKES-TOORLOO	Weekly	111	0.2	0.1	YES
SWIFTS CREEK	Weekly	106	0.6	0.3	YES

All samples taken in water sampling localities were compliant with the turbidity water quality standard for the 2022-23 reporting period (Table 6).

5.1.4. Fluoride

Fluoride is added to the water sampling localities of the Mitchell system (the only system providing fluoridation) to promote oral health as directed by DH under the *Health (Fluoridation) Act 1973*. Fluoride samples are taken monthly in each of the fluoridated water sampling localities, effectively resulting in a weekly sample being taken at different locations in the fluoridated Mitchell system.

EGW's Woodglen water treatment plant's fluoride system was temporarily ceased on 8th September 2022 for service and maintenance works. This period of time was in accordance with the Victorian Code of Practice Fluoridation.

Compliance is measured as: annual average fluoride level must not exceed 1 milligram per litre and all individual samples must be less than 1.5 mg/L. *Meeting Obligation* is measured as: annual average fluoride level between 0.8 – 1.0 mg/L in fluoridated systems.

Table 7: Fluoride sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	OPERATING TARGET (mg/L)	MAX (mg/L)	AVERAGE	NUMBER OF SAMPLES WHERE STANDARD (>1.5MG/L) WAS NOT MET.
BAIRNSDALE	Monthly	42	0.9	0.95	0.85	0
BEMM RIVER	Annually	1	N/A	0.05	0.05	0
BUCHAN	Annually	1	N/A	0.05	0.05	0
CANN RIVER	Annually	1	N/A	0.05	0.05	0
DINNER PLAIN	Annually	1	N/A	0.05	0.05	0
EAGLE POINT-PAYNESVILLE	Monthly	13	0.9	0.92	0.78	0
KALIMNA	Monthly	13	0.9	0.97	0.80	0
LINDENOW	Monthly	14	0.9	0.89	0.78	0
LINDENOW SOUTH	Monthly	13	0.9	0.92	0.78	0
MALLACOOTA	Annually	1	N/A	0.06	0.06	0
MERRANGBAUR	Monthly	13	0.9	0.95	0.83	0
METUNG	Monthly	14	0.9	0.96	0.79	0
NICHOLSON-SWAN REACH	Monthly	13	0.9	0.94	0.79	0
NOWA NOWA	Monthly	14	0.9	0.90	0.84	0
OMELO	Annually	1	N/A	0.05	0.05	0
ORBOST	Annually	1	N/A	0.05	0.05	0
SARFIELD-BRUTHEN	Monthly	14	0.9	0.96	0.80	0
SUNLAKES-TOORLOO	Monthly	13	0.9	0.98	0.80	0
SWIFTS CREEK	Monthly	1	N/A	0.06	0.06	0

N/A - Not Applicable as these systems are not fluoridated.

All water sampling localities were compliant for fluoride in the 2022-23 reporting period

Table 7). EGW has been 100% compliant with this standard at each fluoridated sampling locality since fluoridation began in 2010.

Variance in fluoride levels throughout the Mitchell system occurred for two weeks from 8th September 2022 due to the maintenance downtime on the fluoridation plant at Woodglen WTP.

Low levels of fluoride detected in non-fluoridated water sampling localities is due to the natural occurrence of fluoride in source waters.

5.2. Other Substances

5.2.1. Arsenic

Arsenic is a naturally occurring element, which can be introduced into water in the catchment through the presence of naturally occurring minerals and ores. Short and long-term exposure to arsenic may result in potential health impacts. Samples are taken annually in each applicable water sampling locality.

Compliance is measured as: less than or equal to 0.01 mg/L (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Table 8: Arsenic sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF SAMPLES ABOVE THE STANDARD	MAX (mg/L)	COMPLYING (YES / NO)
BAIRNSDALE	Annually	1	0	<0.001	YES
BEMM RIVER	Annually	1	0	<0.001	YES
BUCHAN	Annually	1	0	<0.001	YES
CANN RIVER	Annually	1	0	<0.001	YES
DINNER PLAIN	Annually	1	0	<0.001	YES
EAGLE POINT-PAYNESVILLE	Annually	1	0	<0.001	YES
KALIMNA	Annually	1	0	<0.001	YES
LINDENOW	Annually	1	0	<0.001	YES
LINDENOW SOUTH	Annually	1	0	<0.001	YES
MALLACOOTA	Annually	1	0	<0.001	YES
MERRANGBAUR	Annually	1	0	<0.001	YES
METUNG	Annually	1	0	<0.001	YES
NICHOLSON-SWAN REACH	Annually	1	0	<0.001	YES
NOWA NOWA	Annually	1	0	<0.001	YES
OMELO	Annually	1	0	<0.001	YES
ORBOST	Annually	1	0	<0.001	YES
SARFIELD-BRUTHEN	Annually	1	0	<0.001	YES
SUNLAKES-TOORLOO	Annually	1	0	<0.001	YES
SWIFTS CREEK	Annually	1	0	<0.001	YES

Note: The average of Arsenic has not been provided because the majority of results were below detectable limits.

All water sampling localities were compliant for Arsenic in the 2022-23 reporting period (Table 8).

5.2.2. Barium

Barium in drinking water is primarily from natural sources. Based on health considerations, the concentration of barium in drinking water should not exceed 2 mg/L under the Australian Drinking Water Guidelines 2011.

Table 9: Barium sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF SAMPLES ABOVE THE STANDARD	MAX (mg/L)	COMPLYING (YES / NO)
BAIRNSDALE	Annually	1	0	0.009	YES
BEMM RIVER	Annually	1	0	0.010	YES
BUCHAN	Annually	1	0	0.006	YES
CANN RIVER	Annually	1	0	0.011	YES
DINNER PLAIN	Annually	1	0	0.001	YES
EAGLE POINT-PAYNESVILLE	Annually	1	0	0.009	YES
KALIMNA	Annually	1	0	0.010	YES
LINDENOW	Annually	1	0	0.010	YES
LINDENOW SOUTH	Annually	1	0	0.008	YES
MALLACOOTA	Annually	1	0	0.025	YES
MERRANGBAUR	Annually	1	0	0.010	YES
METUNG	Annually	1	0	0.008	YES
NICHOLSON-SWAN REACH	Annually	1	0	0.010	YES
NOWA NOWA	Annually	1	0	0.010	YES
OMEQ	Annually	1	0	0.009	YES
ORBOST	Annually	1	0	0.012	YES
SARFIELD-BRUTHEN	Annually	1	0	0.010	YES
SUNLAKES-TOORLOO	Annually	1	0	0.010	YES
SWIFTS CREEK	Annually	1	0	0.014	YES

All water sampling localities were compliant for Barium in the 2022/23 reporting period Table 9.

5.2.3. Cadmium

Cadmium may be introduced into drinking water supplies through corrosion of pipes and fittings. Exposure to high concentrations of cadmium may result in potential health implications. Samples are taken quarterly in each of the water sampling localities.

Compliance is measured as: less than or equal to 0.002 mg/L (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Table 10: Cadmium sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (mg/L)	COMPLYING (YES / NO)
BAIRNSDALE	Quarterly	8	0	<0.0002	YES
BEMM RIVER	Quarterly	8	0	<0.0002	YES
BUCHAN	Quarterly	9	0	<0.0002	YES
CANN RIVER	Quarterly	8	0	<0.0002	YES
DINNER PLAIN	Quarterly	8	0	<0.0002	YES
EAGLE POINT-PAYNESVILLE	Quarterly	10	0	<0.0002	YES
KALIMNA	Quarterly	9	0	<0.0002	YES
LINDENOW	Quarterly	8	0	<0.0002	YES
LINDENOW SOUTH	Quarterly	8	0	<0.0002	YES
MALLACOOTA	Quarterly	8	0	<0.0002	YES
MERRANGBAUR	Quarterly	9	0	<0.0002	YES
METUNG	Quarterly	8	0	<0.0002	YES
NICHOLSON-SWAN REACH	Quarterly	8	0	<0.0002	YES
NOWA NOWA	Quarterly	9	0	<0.0002	YES
OMELO	Quarterly	9	0	<0.0002	YES
ORBOST	Quarterly	9	0	<0.0002	YES
SARFIELD-BRUTHEN	Quarterly	9	0	<0.0002	YES
SUNLAKES-TOORLOO	Quarterly	9	0	<0.0002	YES
SWIFTS CREEK	Quarterly	9	0	<0.0002	YES

All water sampling localities were compliant for Cadmium in the 2022-23 reporting period (Table 10).

5.2.4. Chlorite

Chlorine dioxide (chlorite) is rarely used as a disinfectant in Australian reticulated supplies. When used, the chlorite residual is generally maintained between 0.2 mg/L and 0.4 mg/L.

Table 11: Chlorite sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (mg/L)	COMPLYING (YES / NO)
BAIRNSDALE	Annually	1	0	<0.050	YES
BEMM RIVER	Annually	1	0	<0.050	YES
BUCHAN	Annually	1	0	<0.050	YES
CANN RIVER	Annually	1	0	<0.050	YES
DINNER PLAIN	Annually	N/A	N/A	N/A	N/A
EAGLE POINT-PAYNESVILLE	Annually	3	0	<0.050	YES
KALIMNA	Annually	1	0	<0.050	YES
LINDENOW	Annually	1	0	<0.050	YES
LINDENOW SOUTH	Annually	1	0	<0.050	YES
MALLACOOTA	Annually	1	0	<0.050	YES
MERRANGBAUR	Annually	1	0	<0.050	YES
METUNG	Annually	1	0	<0.050	YES
NICHOLSON-SWAN REACH	Annually	1	0	<0.050	YES
NOWA NOWA	Annually	1	0	<0.050	YES
OMEQ	Annually	1	0	<0.050	YES
ORBOST	Annually	1	0	<0.050	YES
SARFIELD-BRUTHEN	Annually	1	0	<0.050	YES
SUNLAKES-TOORLOO	Annually	1	0	<0.050	YES
SWIFTS CREEK	Annually	1	0	<0.050	YES

All water sampling localities were compliant for Chlorite in the 2022/23 reporting period Table 11.

5.2.5. Chromium

Chromium may occur naturally in the environment or be introduced through human activity. Exposure to high concentrations of Chromium may have adverse dermatological effects over many years, such as allergic dermatitis (skin reactions). Samples are taken quarterly in each of the water sampling localities.

Compliance is measured as: less than or equal to 0.05 mg/L of Cr (VI) (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Table 12: Chromium sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (mg/L)	COMPLYING (YES / NO)
BAIRNSDALE	Quarterly	8	0	<0.001	YES
BEMM RIVER	Quarterly	8	0	<0.001	YES
BUCHAN	Quarterly	9	0	<0.001	YES
CANN RIVER	Quarterly	8	0	<0.001	YES
DINNER PLAIN	Quarterly	8	0	0.001	YES
EAGLE POINT-PAYNESVILLE	Quarterly	10	0	<0.001	YES
KALIMNA	Quarterly	9	0	<0.001	YES
LINDENOW	Quarterly	8	0	<0.001	YES
LINDENOW SOUTH	Quarterly	8	0	<0.001	YES
MALLACOOTA	Quarterly	8	0	<0.001	YES
MERRANGBAUR	Quarterly	9	0	<0.001	YES
METUNG	Quarterly	8	0	<0.001	YES
NICHOLSON-SWAN REACH	Quarterly	8	0	<0.001	YES
NOWA NOWA	Quarterly	9	0	<0.001	YES
OMEQ	Quarterly	9	0	<0.001	YES
ORBOST	Quarterly	9	0	<0.001	YES
SARSFIELD-BRUTHEN	Quarterly	9	0	<0.001	YES
SUNLAKES-TOORLOO	Quarterly	9	0	<0.001	YES
SWIFTS CREEK	Quarterly	9	0	<0.001	YES

All water sampling localities were compliant for Chromium in the 2022-23 reporting period (Table 12).

5.2.6. Copper

Copper may occur naturally in the environment or be introduced into water through contact with corroding copper pipes and fittings. Exposure to high levels of copper can cause nausea, vomiting, diarrhoea, gastric (stomach) complaints and headaches. Samples are taken quarterly in each applicable water sampling locality.

Compliance is measured as: less than 2 mg/L (health-based guideline value under the Australian Drinking Water Guidelines 2011) and less than or equal to 1 milligram per litre (aesthetic guideline value under the Australian Drinking Water Guidelines 2011).

Table 13: Copper sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (mg/L)	COMPLYING (YES / NO)
BAIRNSDALE	Quarterly	8	0	0.018	YES
BEMM RIVER	Quarterly	8	0	0.010	YES
BUCHAN	Quarterly	9	0	<0.001	YES
CANN RIVER	Quarterly	9	0	0.006	YES
DINNER PLAIN	Quarterly	8	0	0.100	YES
EAGLE POINT-PAYNESVILLE	Quarterly	10	0	0.058	YES
KALIMNA	Quarterly	9	0	0.016	YES
LINDENOW	Quarterly	8	0	0.029	YES
LINDENOW SOUTH	Quarterly	8	0	0.021	YES
MALLACOOTA	Quarterly	8	0	0.005	YES
MERRANGBAUR	Quarterly	9	0	0.010	YES
METUNG	Quarterly	8	0	0.013	YES
NICHOLSON-SWAN REACH	Quarterly	8	0	0.012	YES
NOWA NOWA	Quarterly	9	0	0.007	YES
OMELO	Quarterly	9	0	0.002	YES
ORBOST	Quarterly	26	0	0.006	YES
SARFIELD-BRUTHEN	Quarterly	9	0	0.048	YES
SUNLAKES-TOORLOO	Quarterly	9	0	0.011	YES
SWIFTS CREEK	Quarterly	9	0	0.015	YES

All water sampling localities were compliant for Copper in the 2022-23 reporting period (Table 13).

5.2.7. Cyanide

Cyanide may occur naturally in the environment or be introduced through human activity. Exposure to cyanide may cause rapid breathing, tremors and other neurological effects. Testing for cyanide is performed annually in each applicable water sampling locality.

Compliance is measured as: less than or equal to 0.08 mg/L (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Table 14: Cyanide sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (mg/L)	COMPLYING (YES / NO)
BAIRNSDALE	Annually	1	0	<0.005	Yes
BEMM RIVER	Annually	1	0	<0.005	Yes
BUCHAN	Annually	1	0	<0.005	Yes
CANN RIVER	Annually	1	0	<0.005	Yes
DINNER PLAIN	Annually	1	0	<0.005	Yes
EAGLE POINT-PAYNESVILLE	Annually	1	0	<0.005	Yes
KALIMNA	Annually	1	0	<0.005	Yes
LINDENOW	Annually	1	0	<0.005	Yes
LINDENOW SOUTH	Annually	1	0	<0.005	Yes
MALLACOOTA	Annually	1	0	<0.005	Yes
MERRANGBAUR	Annually	1	0	<0.005	Yes
METUNG	Annually	1	0	<0.005	Yes
NICHOLSON-SWAN REACH	Annually	1	0	<0.005	Yes
NOWA NOWA	Annually	1	0	<0.005	Yes
OMELO	Annually	1	0	<0.005	Yes
ORBOST	Annually	1	0	<0.005	Yes
SARSFIELD-BRUTHEN	Annually	1	0	<0.005	Yes
SUNLAKES-TOORLOO	Annually	1	0	<0.005	Yes
SWIFTS CREEK	Annually	1	0	<0.005	Yes

All water sampling localities were compliant for Cyanide in the 2022-23 reporting period (Table 14).

5.2.8. Dichloroacetic Acid

Based on preliminary data concentrations of dichloroacetic acid in Australian drinking waters range from 0.001 mg/L to 0.1 mg/L.

Table 15: Dichloroacetic Acid sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (mg/L)	COMPLYING (YES / NO)
BAIRNSDALE	Biannually	3	0	0.007	Yes
BEMM RIVER	Biannually	3	0	0.013	Yes
BUCHAN	Biannually	3	0	<0.005	Yes
CANN RIVER	Biannually	3	0	0.007	Yes
DINNER PLAIN	N/A	N/A	N/A	N/A	N/A
EAGLE POINT-PAYNESVILLE	Biannually	5	0	<0.005	Yes
KALIMNA	Biannually	3	0	0.011	Yes
LINDENOW	Biannually	3	0	<0.005	Yes
LINDENOW SOUTH	Biannually	3	0	<0.005	Yes
MALLACOOTA	Biannually	4	0	<0.005	Yes
MERRANGBAUR	Biannually	3	0	0.007	Yes
METUNG	Biannually	3	0	0.007	Yes
NICHOLSON-SWAN REACH	Biannually	3	0	0.007	Yes
NOWA NOWA	Biannually	3	0	0.007	Yes
OMELO	Biannually	3	0	0.007	Yes
ORBOST	Biannually	3	0	<0.005	Yes
SARFIELD-BRUTHEN	Biannually	3	0	0.007	Yes
SUNLAKES-TOORLOO	Biannually	3	0	0.008	Yes
SWIFTS CREEK	Biannually	3	0	0.008	Yes

Notes: Dichloroacetic acid is not sampled in Dinner Plain based on risk assessment.

All water sampling localities were compliant for Dichloroacetic Acid in the 2022-23 reporting period (Table 15).

5.2.9. Free Chlorine

Chlorine is a disinfection agent that is added to drinking water to kill harmful microorganisms and ensure the water is safe to drink.

The Australian Drinking Water Guidelines 2011 state that Chlorine concentrations in the drinking water supply must be less than or equal to 5 mg/L for health purposes.

Table 16: Free Chlorine sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (mg/L)	MAXIMUM (mg/L)	AVERAGE (mg/L) ²	COMPLYING (YES / NO)
BAIRNSDALE	Weekly	127	0.22	1.20	0.82	YES
BEMM RIVER	Weekly	104	0.57	1.20	0.91	YES
BUCHAN	Weekly	108	0.47	1.20	0.89	YES
CANN RIVER	Weekly	103	0.34	1.70	0.91	YES
DINNER PLAIN ¹	Weekly	104	0.08	0.47	0.25	YES
EAGLE POINT-PAYNESVILLE	Weekly	107	0.21	0.88	0.55	YES
KALIMNA	Weekly	106	0.28	1.30	0.70	YES
LINDENOW	Weekly	104	0.33	1.60	0.88	YES
LINDENOW SOUTH	Weekly	104	0.23	1.10	0.57	YES
MALLACOOTA	Weekly	105	0.05 ²	1.30	0.86	YES
MERRANGBAUR	Weekly	106	0.22	0.84	0.70	YES
METUNG	Weekly	107	0.38	1.00	0.72	YES
NICHOLSON-SWAN REACH	Weekly	104	0.38	1.00	0.72	YES
NOWA NOWA	Weekly	106	0.28	0.88	0.59	YES
OMEQ	Weekly	106	0.05 ²	0.98	0.68	YES
ORBOST	Weekly	106	0.47	1.40	0.98	YES
SARFIELD-BRUTHEN	Weekly	106	0.26	1.10	0.68	YES
SUNLAKES-TOORLOO	Weekly	111	0.23	1.00	0.82	YES
SWIFTS CREEK	Weekly	106	0.23	1.10	0.76	YES

Notes:

1 Dinner Plain was previously not sampled for free chlorine as ultra-violet disinfection was employed in lieu of chlorine. In response to *E. Coli* detection in the Dinner Plain raw water source, chlorine disinfection has recently been introduced informally as a secondary treatment barrier and the sampling program updated.

2 EGW aims for a free chlorine concentration of >0.2 mg/L within all reticulation systems. While some free chlorine levels were less than 0.2 mg/L, they were not considered a health risk.

All water sampling localities were compliant for Free Chlorine in the 2022-23 reporting period (Table 16).

5.2.10. Iodide

The element iodine is present naturally in seawater, nitrate minerals and seaweed, mostly in the form of iodide salts. Concentrations of iodide in Australian source waters or treated water ranges from 0.005 to 2.9 mg/L (median 0.03 mg/L, mean 0.1 mg/L).

Table 17: Iodide sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (mg/L)	COMPLYING (YES / NO)
BAIRNSDALE	Annually	1	0	<0.010	Yes
BEMM RIVER	Annually	1	0	<0.010	Yes
BUCHAN	Annually	1	0	<0.010	Yes
CANN RIVER	Annually	1	0	<0.010	Yes
DINNER PLAIN	N/A	N/A	N/A	N/A	N/A
EAGLE POINT-PAYNESVILLE	Annually	1	0	<0.010	Yes
KALIMNA	Annually	1	0	<0.010	Yes
LINDENOW	Annually	1	0	<0.010	Yes
LINDENOW SOUTH	Annually	1	0	<0.010	Yes
MALLACOOTA	Annually	1	0	<0.010	Yes
MERRANGBAUR	Annually	1	0	<0.010	Yes
METUNG	Annually	1	0	<0.010	Yes
NICHOLSON-SWAN REACH	Annually	1	0	<0.010	Yes
NOWA NOWA	Annually	1	0	<0.010	Yes
OMELO	Annually	1	0	<0.010	Yes
ORBOST	Annually	1	0	<0.010	Yes
SARFIELD-BRUTHEN	Annually	1	0	<0.010	Yes
SUNLAKES-TOORLOO	Annually	1	0	<0.010	Yes
SWIFTS CREEK	Annually	1	0	<0.010	Yes

Notes: iodide is not sampled in Dinner Plain based on risk assessment.

All water sampling localities were compliant for Iodine in the 2022-23 reporting period (Table 17).

5.2.11. Lead

Lead may occur naturally in water or be introduced through contact with lead pipes and fittings. Human exposure to high levels of lead may result in toxic effects. Samples are taken quarterly in each applicable water sampling locality.

Compliance is measured as: less than or equal to 0.01 mg/L (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Table 18: Lead sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (mg/L)	COMPLYING (YES / NO)
BAIRNSDALE	Quarterly	8	0	<0.001	Yes
BEMM RIVER	Quarterly	8	0	<0.001	Yes
BUCHAN	Quarterly	9	0	<0.001	Yes
CANN RIVER	Quarterly	8	0	<0.001	Yes
DINNER PLAIN	Quarterly	8	0	<0.001	Yes
EAGLE POINT-PAYNESVILLE	Quarterly	10	0	<0.001	Yes
KALIMNA	Quarterly	9	0	<0.001	Yes
LINDENOW	Quarterly	8	0	<0.001	Yes
LINDENOW SOUTH	Quarterly	8	0	<0.001	Yes
MALLACOOTA	Quarterly	8	0	<0.001	Yes
MERRANGBAUR	Quarterly	9	0	<0.001	Yes
METUNG	Quarterly	8	0	<0.001	Yes
NICHOLSON-SWAN REACH	Quarterly	8	0	<0.001	Yes
NOWA NOWA	Quarterly	9	0	<0.001	Yes
OMELO	Quarterly	9	0	<0.001	Yes
ORBOST	Quarterly	9	0	<0.001	Yes
SARFIELD-BRUTHEN	Quarterly	9	0	0.002	Yes
SUNLAKES-TOORLOO	Quarterly	9	0	<0.001	Yes
SWIFTS CREEK	Quarterly	9	0	<0.001	Yes

All water sampling localities were compliant for Lead in the 2022-23 reporting period (Table 18).

5.2.12. Manganese

Manganese may occur naturally in the environment, or may be introduced through industrial activity. Manganese may cause aesthetic issues such as taste or staining of laundry and appliances as well as health issues at high concentrations.

Compliance is measured as: less than or equal to 0.1 mg/L (aesthetic value) and less than or equal to 0.5 mg/L (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Table 19: Manganese sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (MG/L)	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Quarterly	16	<0.001	<0.001	Yes
BEMM RIVER	Quarterly	11	<0.001	<0.001	Yes
BUCHAN	Quarterly	13	<0.001	0.003	Yes
CANN RIVER	Quarterly	11	<0.001	0.003	Yes
DINNER PLAIN	Quarterly	8	<0.001	<0.001	Yes
EAGLE POINT-PAYNESVILLE	Quarterly	10	<0.001	<0.001	Yes
KALIMNA	Quarterly	9	<0.001	<0.001	Yes
LINDENOW	Quarterly	8	<0.001	<0.001	Yes
LINDENOW SOUTH	Quarterly	8	<0.001	<0.001	Yes
MALLACOOTA	Monthly	22	<0.001	0.006	Yes
MERRANGBAUR	Quarterly	9	<0.001	<0.001	Yes
METUNG	Quarterly	8	<0.001	<0.001	Yes
NICHOLSON-SWAN REACH	Quarterly	8	<0.001	<0.001	Yes
NOWA NOWA	Quarterly	9	<0.001	<0.001	Yes
OMEQ	Quarterly	13	<0.001	<0.001	Yes
ORBOST	Quarterly	13	<0.001	0.009	Yes
SARFIELD-BRUTHEN	Quarterly	9	<0.001	<0.001	Yes
SUNLAKES-TOORLOO	Quarterly	9	<0.001	<0.001	Yes
SWIFTS CREEK	Quarterly	13	<0.001	<0.001	Yes

All water sampling localities were compliant for Manganese in the 2022-23 reporting period (both aesthetic and health values) (Table 19).

5.2.13. Trichloroacetic Acid

Based on preliminary data, concentrations of trichloroacetic acid in Australian drinking waters range from 0.001 mg/L to 0.1 mg/L.

Table 20: Trichloroacetic Acid sampling frequency and results for 2022/23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Biannually	3	0	0.011	Yes
BEMM RIVER	Biannually	3	0	0.009	Yes
BUCHAN	Biannually	3	0	0.012	Yes
CANN RIVER	Biannually	3	0	<0.005	Yes
DINNER PLAIN	N/A	N/A	N/A	N/A	N/A
EAGLE POINT-PAYNESVILLE	Biannually	5	0	0.013	Yes
KALIMNA	Biannually	3	0	0.019	Yes
LINDENOW	Biannually	3	0	<0.005	Yes
LINDENOW SOUTH	Biannually	3	0	<0.005	Yes
MALLACOOTA	Biannually	4	0	<0.005	Yes
MERRANGBAUR	Biannually	3	0	0.021	Yes
METUNG	Biannually	3	0	0.015	Yes
NICHOLSON-SWAN REACH	Biannually	3	0	0.013	Yes
NOWA NOWA	Biannually	3	0	0.024	Yes
OMEQ	Biannually	3	0	0.023	Yes
ORBOST	Biannually	3	0	<0.005	Yes
SARFIELD-BRUTHEN	Biannually	3	0	0.014	Yes
SUNLAKES-TOORLOO	Biannually	3	0	0.020	Yes
SWIFTS CREEK	Biannually	3	0	0.007	Yes

Notes: Dichloroacetic acid is not sampled in Dinner Plain based on risk assessment.

All water sampling localities were compliant for Trichloroacetic Acid in the 2022-23 reporting period (Table 20).

5.3. Aesthetic Characteristics

5.3.1. Colour (True)

Colour generally occurs in water as a result of dissolved organic material. Although not a health consideration, elevated colour can be an aesthetic issue.

Compliance is measured as: less than or equal to 15 Hazen Units (HU); (Australian Drinking Water Guidelines 2011 aesthetic value).

Table 21: Colour sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (HU)	MAXIMUM (HU)	COMPLYING (YES / NO)
BAIRNSDALE	Monthly	67	<2	4	Yes
BEMM RIVER	Monthly	47	<2	<2	Yes
BUCHAN	Monthly	54	<2	<2	Yes
CANN RIVER	Monthly	48	<2	<2	Yes
DINNER PLAIN	Monthly	60	<2	<2	N/A
EAGLE POINT-PAYNESVILLE	Monthly	55	<2	<2	Yes
KALIMNA	Monthly	54	<2	<2	Yes
LINDENOW	Monthly	53	<2	4	Yes
LINDENOW SOUTH	N/A	N/A	N/A	N/A	Yes
MALLACOOTA	Monthly	58	<2	<2	Yes
MERRANGBAUR	Monthly	31	<2	<2	Yes
METUNG	Monthly	55	<2	<2	Yes
NICHOLSON-SWAN REACH	N/A	N/A	N/A	N/A	Yes
NOWA NOWA	Monthly	54	<2	<2	Yes
OMELO	Monthly	62	<2	<2	Yes
ORBOST	Monthly	62	<2	<2	Yes
SARFIELD-BRUTHEN	Monthly	54	<2	<2	Yes
SUNLAKES-TOORLOO	Monthly	55	<2	<2	Yes
SWIFTS CREEK	Monthly	62	<2	<2	Yes

Note: Colour is not sampled in some sampling localities within the Mitchell system based on risk assessment and results from network samples taken downstream of these localities i.e., Lindenow South, Nicholson-Swan Reach.

All water sampling localities were compliant for colour in the 2022-23 reporting period (Table 21).

5.3.2. Hardness

Hardness is caused by the presence of dissolved calcium compounds in water. Hard water may result in scaling issues.

Compliance is measured as: less than or equal to 200 mg/L (Australian Drinking Water Guidelines 2011 aesthetic value) as total hardness (as calcium carbonate).

Table 22: Hardness sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (MG/L)	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Quarterly	10	16	27	Yes
BEMM RIVER	Quarterly	11	14	22	Yes
BUCHAN	Quarterly	13	19	37	Yes
CANN RIVER	Quarterly	11	17	27	Yes
DINNER PLAIN	Quarterly	6	28	39	Yes
EAGLE POINT-PAYNESVILLE	Quarterly	9	21	28	Yes
KALIMNA	Quarterly	13	18	29	Yes
LINDENOW	Quarterly	11	16	26	Yes
LINDENOW SOUTH	Quarterly	11	20	26	Yes
MALLACOOTA	Quarterly	11	56	85	Yes
MERRANGBAUR	Quarterly	13	19	31	Yes
METUNG	Quarterly	11	19	29	Yes
NICHOLSON-SWAN REACH	NA	NA	NA	NA	NA
NOWA NOWA	Quarterly	13	19	35	Yes
OMELO	Quarterly	13	11	18	Yes
ORBOST	Quarterly	12	17	25	Yes
SARSFIELD-BRUTHEN	Quarterly	13	17	31	Yes
SUNLAKES-TOORLOO	Quarterly	13	18	33	Yes
SWIFTS CREEK	Quarterly	13	50	120	Yes

Notes: NA - Not Applicable;

Hardness is not sampled in some sampling localities within the Mitchell system based on risk assessment and results from network samples taken downstream of these localities i.e., Nicholson-Swan Reach.

All water sampling localities were compliant for Hardness in the 2022-23 reporting period (Table 22).

5.3.3. Iron

Iron may occur naturally in the environment and can be introduced through industrial activity, as well as through cast iron pipework. High levels of iron in water can impart taste and may stain laundry or fittings. There is no health-based guideline for iron in drinking water.

Compliance is measured as: less than or equal to 0.3 mg/L (Australian Drinking Water Guidelines 2011 aesthetic value).

Table 23: Iron sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (MG/L)	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Monthly	16	<0.01	0.05	Yes
BEMM RIVER	Quarterly	11	<0.01	0.03	Yes
BUCHAN	Quarterly	13	<0.01	<0.01	Yes
CANN RIVER	Quarterly	11	<0.01	0.02	Yes
DINNER PLAIN	Quarterly	8	<0.01	0.07	Yes
EAGLE POINT-PAYNESVILLE	Quarterly	10	<0.01	0.03	Yes
KALIMNA	Quarterly	9	<0.01	0.02	Yes
LINDENOW	Quarterly	8	<0.01	<0.01	Yes
LINDENOW SOUTH	Quarterly	8	<0.01	<0.01	Yes
MALLACOOTA	Monthly	22	<0.01	0.05	Yes
MERRANGBAUR	Quarterly	9	<0.01	0.01	Yes
METUNG	Quarterly	8	<0.01	<0.01	Yes
NICHOLSON-SWAN REACH	Quarterly	8	<0.01	0.03	Yes
NOWA NOWA	Quarterly	9	<0.01	0.04	Yes
OMELO	Quarterly	13	<0.01	0.02	Yes
ORBOST	Quarterly	13	<0.01	0.03	Yes
SARFIELD-BRUTHEN	Quarterly	9	<0.01	0.02	Yes
SUNLAKES-TOORLOO	Quarterly	9	<0.01	0.01	Yes
SWIFTS CREEK	Quarterly	13	<0.01	0.02	Yes

All water sampling localities were compliant for iron in the 2022-23 reporting period (Table 23).

5.3.4. pH

pH is the measure of the acidity (pH <7.0) or alkalinity (pH >7.0) of the water. Extreme pH values may cause corrosion or scaling in certain circumstances. High pH may also reduce the effectiveness of chlorine disinfection.

The Australian Drinking Water Guidelines 2011 state that the pH of drinking water should be between pH 6.5 and 8.5 (aesthetic guideline limit). However, 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.

Table 24: pH sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (MG/L)	MAXIMUM (MG/L)	AVERAGE (MG/L)
BAIRNSDALE	Weekly	127	7.00	7.90	7.39
BEMM RIVER	Weekly	104	7.10	8.20	7.70
BUCHAN	Weekly	108	7.10	9.40	8.17
CANN RIVER	Weekly	104	6.40	9.30	8.20
DINNER PLAIN	Weekly	104	6.50	8.00	6.95
EAGLE POINT-PAYNESVILLE	Weekly	106	7.00	8.40	7.48
KALIMNA	Weekly	106	6.80	7.80	7.39
LINDENOW	Weekly	103	6.90	8.00	7.51
LINDENOW SOUTH	Weekly	104	7.00	8.10	7.56
MALLACOOTA	Weekly	105	6.90	8.50	7.78
MERRANGBAUR	Weekly	106	6.80	8.00	7.46
METUNG	Weekly	107	6.50	8.60	7.78
NICHOLSON-SWAN REACH	Weekly	104	6.70	7.80	7.36
NOWA NOWA	Weekly	106	7.00	9.20	7.92
OMEQ	Weekly	106	6.80	8.90	7.70
ORBOST	Weekly	106	7.20	9.00	7.94
SARFIELD-BRUTHEN	Weekly	106	6.90	8.50	7.34
SUNLAKES-TOORLOO	Weekly	111	6.80	8.50	7.49
SWIFTS CREEK	Weekly	106	6.80	8.00	7.45

Based on the average values over the year (Table 24), pH values for all water sampling localities are within the aesthetic guideline limit (6.5 to 8.5). Elevated individual pH values have been observed in a number of 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 or asset condition (pipes and tanks). When higher than expected pH is detected EGW will flush the network and review the entry water pH.

5.3.5. Zinc

Zinc may occur naturally in the environment, or may be introduced through industrial activity, as well as through corrosion of customer piping. High levels of zinc in water can impart taste and appearance issues with drinking water.

Compliance is measured as: less than or equal to 3 mg/L (Australian Drinking Water Guidelines 2011 aesthetic value).

Table 25: Zinc sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (MG/L)	MAXIMUM (MG/L)	% COMPLIANCE
BAIRNSDALE	Quarterly	8	<0.001	0.004	100
BEMM RIVER	Quarterly	8	0.002	0.007	100
BUCHAN	Quarterly	9	<0.001	<0.001	100
CANN RIVER	Quarterly	8	<0.001	<0.001	100
DINNER PLAIN	Quarterly	8	0.003	0.010	100
EAGLE POINT-PAYNESVILLE	Quarterly	10	0.001	0.006	100
KALIMNA	Quarterly	9	<0.001	0.019	100
LINDENOW	Quarterly	8	0.002	0.007	100
LINDENOW SOUTH	Quarterly	8	0.003	0.009	100
MALLACOOTA	Quarterly	8	<0.001	0.012	100
MERRANGBAUR	Quarterly	9	<0.001	0.004	100
METUNG	Quarterly	8	<0.001	0.002	100
NICHOLSON-SWAN REACH	Quarterly	8	<0.001	0.005	100
NOWA NOWA	Quarterly	9	<0.001	0.003	100
OMELO	Quarterly	9	<0.001	0.002	100
ORBOST	Quarterly	9	<0.001	0.007	100
SARFIELD-BRUTHEN	Quarterly	9	<0.001	0.018	100
SUNLAKES-TOORLOO	Quarterly	9	<0.001	0.003	100
SWIFTS CREEK	Quarterly	9	<0.001	0.004	100

All water sampling localities were compliant for Zinc in the 2022-23 reporting period (Table 25).

5.3.6. Acid Soluble Aluminium

As outlined in table 26, EGW applies Poly Aluminium Chlorohydrate to multiple water treatment processes as a coagulant. This can result in the presence of acid soluble aluminium within drinking water. Should acid soluble aluminium exceed a concentration of 0.2 mg/L, a white gelatinous precipitate can form within the distribution network causing “milky coloured” water (depending on the pH of the water).

Table 26: Acid Soluble Aluminium sampling frequency and results for 2022-23

WATER SAMPLING LOCALITY	ENTRY WATER SAMPLING FREQUENCY	RETICULATION SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MIN (MG/L)	MAX (MG/L)	% COMPLIANCE
BAIRNSDALE	Weekly	Quarterly	73	0.01	0.04	100
BEMM RIVER	Monthly	Quarterly	60	<0.01	0.13	100
BUCHAN	Monthly	Quarterly	23	<0.01	0.06	100
CANN RIVER	Monthly	Quarterly	60	<0.01	0.06	100
DINNER PLAIN ¹	NA	NA	NA	NA	NA	NA
EAGLE POINT-PAYNESVILLE	NA	Quarterly	10	<0.01	0.02	100
KALIMNA	NA	Quarterly	10	0.01	0.02	100
LINDENOW	NA	Quarterly	8	0.01	0.03	100
LINDENOW SOUTH	Quarterly	Quarterly	11	0.01	0.02	100
MALLACOOTA	Weekly	Quarterly	59	<0.01	0.15	100
MERRANGBAUR	NA	Quarterly	10	0.01	0.02	100
METUNG	NA	Quarterly	8	0.01	0.02	100
NICHOLSON-SWAN REACH	NA	Quarterly	8	0.01	0.03	100
NOWA NOWA	NA	Quarterly	10	0.01	0.02	100
OMEQ	Weekly	Quarterly	62	<0.01	0.06	100
ORBOST	Weekly	Quarterly	63	<0.01	0.38	92 ²
SARSFIELD-BRUTHEN	NA	Quarterly	9	0.01	0.03	100
SUNLAKES-TOORLOO	NA	Quarterly	10	0.01	0.02	100
SWIFTS CREEK	Weekly	Quarterly	62	<0.01	0.03	100

Note 1: Dinner Plain does not use aluminium based coagulant. Consequently, acid soluble aluminium is not sampled as it is not deemed a risk to safe drinking water at Dinner Plain.

Note 2: Orbost entry water had one reading of 0.38 mg/L, this was attributable to water treatment plant performance.

All of the sampling localities were compliant for Acid Soluble Aluminium for the 2022-23 reporting period (Table 26), with the exception of Orbost. No customer complaints for milky coloured water were received at the time of the exceedance at Orbost.

5.4. Analysis of Results

All water sampling localities demonstrates our high standard of compliance over the past two financial years. All sampling localities were fully compliant with the parameters described in Schedule 2 of the *Safe Drinking Water Regulations 2015*.

EGW samples for additional parameters in raw water, entry points and throughout the reticulation system. As outlined in Table 27, all entry point and reticulation samples have been 100% compliant against the health guideline values in the Australian Drinking Water Guidelines 2011.



Table 27: Reticulation and entry point monitoring and results 2020/21 to 2022/23.

PARAMETER	EGW PERFORMANCE AGAINST GUIDELINE VALUES 2020-21 (% COMPLIANCE)	EGW PERFORMANCE AGAINST GUIDELINE VALUES 2021-22 (% COMPLIANCE)	EGW PERFORMANCE AGAINST GUIDELINE VALUES 2022-23 (% COMPLIANCE)
ACID SOLUBLE ALUMINIUM	100%	97.7%	100%
ARSENIC	100%	100%	100%
BARIUM	100%	100%	100%
CADMIUM	100%	100%	100%
CHLORINE (AS FREE CHLORINE)	100%	100%	100%
CHLORITE	100%	100%	100%
CHROMIUM	100%	100%	100%
COLOUR (TRUE)	100%	100%	100%
COPPER	100%	100%	100%
CYANIDE	100%	100%	100%
E. coli	100%	100%	100%
FLUORIDE	100%	100%	100%
DICHLOROACETIC ACID	100%	100%	100%
TRICHLOROACETIC ACID	100%	100%	100%
HARDNESS (as CaCO ₃)	100%	100%	100%
IODIDE	100%	100%	100%
IRON	100%	100%	100%
LEAD	100%	100%	100%
MANGANESE	100%	100%	100%
PH (FIELD)	99.6% ¹	99.3% ¹	99.8% ¹
SILVER	Not tested	100%	Not tested
TOTAL TRIHALOMETHANES	100%	100%	100%

Note 1: Elevated individual pH values have been observed in a number of 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 and aesthetic quality in 2022-23.

Based on the average values over the year, pH values for all water sampling localities are within the upper guideline range for pH (i.e., pH < 9.2).



Parameters not listed in the ADWG were also analysed (Table 28).

Table 28: Reticulation and entry point - other parameter monitoring results 2022-23

PARAMETER	UNIT	2022-23 MAXIMUM
CALCIUM	mg/L	29.0
CHLORATE	mg/L	0.44
COLIFORMS	Colilert	210
ELECTRICAL CONDUCTIVITY	(μ S/cm @ 25C)	610
MONOCHLORACETIC ACID	mg/L	0.005
BROMOACETIC ACID	mg/L	0.005
BROMOCHLOROACETIC ACID	mg/L	0.008
BROMODICHLOROACETIC ACID	mg/L	0.007
DIBROMOACETIC ACID	mg/L	0.009
MAGNESIUM	mg/L	13.0
TOTAL ALUMINIUM	mg/L	0.38



6. QUALITY OF RAW AND PARTIALLY TREATED WATER FOR 2022-23

The following information applies to substances of interest that are sampled for in EGW's raw water storages (untreated water) and partially treated clear water storages (water that has been treated, but not undergone secondary disinfection).

6.1. Other Substances

6.1.1. Radiological

Radiologically active compounds may impact public health. Based on risk assessment, radiological activity samples are taken from bore waters every two years and from surface waters every five years.

6.1.2. Biocides in raw water sources

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 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.

EGW maintains close liaison with local stakeholders (e.g. catchment management authorities) regarding biocide application in water supply catchments to ensure minimal risk to the drinking water supply. This informs the frequency of biocide sampling and testing.

In the 2022-23 period, raw surface water samples were analysed from Bairnsdale, Bemm River, Buchan, Cann River, Mallacoota, Orbost, Omeo, and Swifts Creek.

Table 29: Biocide sampling program and results 2022-23

WATER SAMPLING LOCALITY	CLASS	COMPOUND	UNITS	MAX RESULT
JULY 2022 - BEMM RIVER, BUCHAN, CANN RIVER & ORBOST	N/A	Glyphosate	mg/L	<0.030
	Organo-Chlorine Biocides	BHC (Alpha Isomer)	mg/L	<0.0001
		BHC (Beta Isomer)	mg/L	<0.0001
		BHC (Delta Isomer)	mg/L	<0.0001
		cis-Chlordane	mg/L	<0.00050
		trans-Chlordane	mg/L	<0.00050
		4,4'-DDD	mg/L	<0.0001
		4,4'-DDE	mg/L	<0.0001



SEPTEMBER 2022 – BAIRNSDALE, MALLACOOTA, OMELO & SWIFTS CREEK		4,4'-DDT	mg/L	<0.0001
		Endosulfan I	mg/L	<0.0001
		Endosulfan II	mg/L	<0.0001
		Endosulphan Sulphate	mg/L	<0.0001
		Endrin	mg/L	<0.0001
		Endrin Aldehyde	mg/L	<0.0001
		Heptachlor	mg/L	<0.1000
		Heptachlor Epoxide	mg/L	<0.1000
		Lindane (BHC Gamma Isomer)	mg/L	<0.0010
		Methoxychlor	mg/L	<0.2000
JANUARY 2023 – BAIRNSDALE, BEMM RIVER, ORBOST, BUCHAN, CANN RIVER MALLACOOTA, OMELO & SWIFTS CREEK	Organo- Phosphorus Biocides	Dichlorvos	mg/L	<0.001
		Monocrotophos	mg/L	<0.001
		Prophos	mg/L	<0.001
		Tetraethyldithiopyrphos	mg/L	<0.001
		Phorate	mg/L	<0.001
		Demeton-S	mg/L	<0.001
		Diazinon	mg/L	<0.001
		Methyl Parathion	mg/L	<0.001
		Ronnel	mg/L	<0.001
		Malathion	mg/L	<0.001
		Fenthion	mg/L	<0.001
		Chloropyrifos	mg/L	<0.001
		Trichlorinate	mg/L	<0.001
		Tetrachlovinphos	mg/L	<0.001
		Tukuthion	mg/L	<0.001
		Fensulfotion	mg/L	<0.001
		EPN	mg/L	<0.001
		Coumaphos	mg/L	<0.001
Phenoxy acid biocides	2,4,5-T	µg/L	<0.01	
	2,4,5-TP	µg/L	<0.01	
	2,4,6-T	µg/L	<0.1	
	2,4-D	µg/L	<0.01	
	2,4-DB	µg/L	<0.01	
	2,4-DP	µg/L	<0.01	
	2,6-D	µg/L	<0.1	
	4 Chlorophenoxy Acetic Acid	µg/L	0.04	
	Clopyralid	µg/L	<0.05	
	Dicamba	µg/L	<0.01	
	Fluroxypyr	µg/L	<0.05	
	MCPA	µg/L	<0.01	
	MCPB	µg/L	<0.01	
	Mecoprop	µg/L	<0.01	
	Picloram	µg/L	<0.05	
	Triclopyr	µg/L	<0.01	

Table 29 results were below the health-based guideline values in the Australian Drinking Water Guidelines, or if not specified in the Guidelines, were below the lower limits of detection, and were deemed to be compliant in 2022-23.



6.1.3. Blue green algae in raw water and clear water

Blue green algae (or cyanobacteria) are microscopic organisms that may thrive in warm, nutrient rich waters. They may impact water quality by releasing taste and odour compounds. In some extreme circumstances, these organisms may release concentrations of toxins. 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.

Under the Victorian Blue Green Algae Circular (2018), DH must be notified when samples representing the quality of drinking water supplied to customers indicate any of the following:

- 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 cubic millimetres per litre.
- Total combined biovolume of all cyanobacterial species is greater than or equal to 10 cubic millimetres per litre.

Table 30 below summarises our monitoring program for blue green algae in 2022-23 in both raw water and clear water supplies.

Table 30: Blue green algae sampling program and results 2022-23

WATER SAMPLING LOCALITY	NO. OF SAMPLES (RAW WATER)	NO. OF SAMPLES (CLEAR WATER)
BAIRNSDALE	94	N/A
EAGLE POINT-PAYNESVILLE		N/A
KALIMNA		N/A
LINDENOW		2
LINDENOW SOUTH		0
MERRANGBAUR		N/A
METUNG		N/A
NICHOLSON-SWAN REACH		N/A
NOWA NOWA		N/A
SARFIELD-BRUTHEN		0
SUNLAKES-TOORLOO		0
BEMM RIVER		9
BUCHAN	N/A	N/A
CANN RIVER	28	N/A
DINNER PLAIN	N/A	N/A
MALLACOOTA	34	7
OMEQ	14	N/A
ORBOST	30	5
SWIFTS CREEK	18	0

Note: N/A – Not Applicable; this may be due to the absence of an open storage within this locality, or due to the low risk from algal growth due to the presence of a fully sealed storage tank.



While no samples exceeded the reporting thresholds for blue green algae (BGA) in 2022-23, some species of algae released compounds (by-products) that have objectionable taste and odour. This caused a number of customer complaints during this last financial year.

Geosmin and MIB are two such compounds produced by BGA. While a source of potential customer complaints, these compounds are not known to be a health risk. Early intervention is required as these compounds are detectible at low concentrations (>~9 ng/L).

Under optimal conditions chlorination may destroy some of the above compounds that cause objectional taste and odour however at EGW, activated carbon has been found to be a much more effective treatment method for their removal. While this treatment method is not routinely available at our water treatment plants (only Woodglen WTP), a mobile Powder Activated Carbon (PAC) trailer has been set up to respond to potential taste/odour issues.

To ensure the risks associated with algal blooms are appropriately managed and communicated, EGW have an Algae Risk Management Plan that is regularly reviewed and updated.



7. CONTINUOUS IMPROVEMENT MEASURES

Throughout 2022-23, EGW diligently executed and sustained significant initiatives aimed at preserving and enhancing water quality for our valued customers. Our primary focus during this period was on the management of drinking water and addressing associated risks. To this end, we successfully carried out a series of projects, including:

- **Implementation of an updated Risk Management Software System - Riskware:** This modern system has significantly enhanced the efficiency and effectiveness of managing water quality and associated risks, allowing for more informed decision-making and proactive risk mitigation.
- **Enhanced water quality sampling:** EGW has undertaken a significant expansion of our water quality sampling program. By increasing the number of water quality monitoring sites and the frequency of sampling, we have achieved a more comprehensive understanding of the water systems' health and have better identified potential risks in a timely manner.
- **Revision of Health-Based Targets (HBT) Assessments leading to water treatment upgrades:** A thorough revision of the HBT assessments was conducted, resulting in the identification of areas requiring additional water treatment barriers. As a result, new UV water treatment systems are being designed for both the Cann River and Buchan water treatment plants.
- **Installation of a new chlorine disinfection station at Eagle Point:** The new disinfection station will improve the chlorine residual at the extremities of the network in the Paynesville/Raymond Island and Newlands Arm areas, reducing any potential microbiological risk.
- **Disinfection plant upgrades:** A number of disinfection plants across the region have undergone significant upgrades.
- **Drinking water sampling tap review:** A comprehensive review of drinking water sampling tap procedures was undertaken to ensure the reliability and accuracy of water quality data. The assessment resulted in the installation of a number of new sampling points to provide a better representation of the water quality in the network.
- **Algae Management Plan:** In response to the risk of algal blooms within our drinking water systems, a comprehensive algae management plan was developed and implemented. This plan includes proactive strategies to detect and mitigate algae proliferation, safeguarding water quality. This plan has improved our response to managing our algae levels.
- **Review of DWQRMP:** The organisation carried out a thorough review and update of its drinking water quality risk management plan. This plan incorporates best practice and industry standards, enhancing the organisation's ability to proactively identify, assess, and mitigate risks related to water quality.
- **Internal and external audits across the system:** To ensure compliance with regulations and internal quality standards, the organisation conducted a series of rigorous internal and external audits across its entire drinking water system. These audits provided valuable insights, enabling the identification of areas for improvement and



the implementation of corrective measures to maintain a high standard of water quality.

- **Water storage roof replacements:** As part of our ongoing efforts to maintain infrastructure integrity and high standards of drinking water quality; the water storage facilities at Omeo and Mallacoota had their roofs replaced. These roof replacements further protect the storages from potential contamination and ensure the ongoing supply of high-quality drinking water.
- **Shade cloth storage cover repairs:** To safeguard water reservoirs from external contaminants and to maintain ideal water temperatures, extensive repairs were carried out shade cloth repair at Mallacoota that was impacted by extreme weather events. These repairs have contributed to preserving water quality and protecting valuable water resources.
- **Facility master planning for water treatment facilities:** These master plans provide the function of long-term (25 years) planning to ensure that we continue to meet the required water quality standards and agreed levels of service.



8. COMPLAINTS RELATING TO WATER QUALITY

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

The 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 EGW's Customer Charter can be found on our website www.egwater.vic.gov.au.

EGW defines a water quality complaint as "A customer contacts EGW and informs EGW they are unhappy with the water being supplied, or, informs EGW of an issue that has affected the quality of the water being supplied, or, expresses opposition to EGW's use of water treatment chemicals".

Table 31: Summary of all customer water quality complaints 2020-2023

TYPE OF COMPLAINTS	NUMBER OF COMPLAINTS			COMPARISON BETWEEN YEARS	COMMENTS
	2020/21	2021-22	2022-23		
ALLEGED ILLNESS	0	0	2	Increase from zero to two	See section 8.1
DISCOLOURED WATER	11	18	11	Decrease of seven complaints from previous reporting period.	Nil
TASTE AND ODOUR	11	23	14	Decrease of nine complaints from previous reporting period.	The Algae Risk Management Plan underwent a full review and introduced improvements that reduced the prevalence of taste and odour issues
AIR IN WATER (WHITE WATER)	23	7	6	Decrease of seventeen complaints from 2020/21. No significant change from last year reporting period.	Nil
OTHER	6	5	3	No significant change.	Nil

Table 32: Summary of all customer water quality complaints per locality 2022-23



WATER SAMPLING LOCALITY	TYPE OF COMPLAINT					Total
	Alleged Illness	Discoloured Water	Taste and Odour	White Water	Other	
BAIRNSDALE		3				3
BEMM RIVER						
BUCHAN						
CANN RIVER	1		1			2
DINNER PLAIN			1			1
EAGLE POINT- PAYNESVILLE		3	2	3		8
KALIMNA						
LAKES ENTRANCE		2	2			4
LINDENOW						
LINDENOW SOUTH						
MALLACOOTA			4			4
MERRANGBAUR						
METUNG		1	1	1	1	4
NICHOLSON-SWAN REACH		1		1		2
NOWA NOWA					1	1
OMEQ						
ORBOST		1	2	1	1	5
SUNLAKES-TOORLOO						
SARSFIELD-BRUTHEN						
SWIFTS CREEK			1			1
UNKNOWN (ANONYMOUS)	1					1
TOTAL	2	11	14	6	3	36



8.1. Alleged Health Complaints

Two alleged health complaints were recorded in 2022-23. These complaints were related to the belief that our drinking water was making them sick. Despite our best efforts to address these concerns, the complaints were either anonymous or the customer chose not to provide further evidence or detailed information that could facilitate a thorough investigation. We diligently monitored our customer database and other communication channels to record any complaints concerning health issues attributed to the consumption of our drinking water and these matters were not ongoing.

8.2. Discoloured Water

Eleven (11) complaints of discoloured drinking water were recorded in 2022-23. These were mostly due to works being undertaken on water mains, high draw down from fire hydrants, blue water or as a result of internal plumbing issues. The majority of these were managed through flushing of the reticulation system.

8.3. Taste and Odour

Fourteen (14) taste and odour complaints were recorded in 2022-23. The majority of these complaints related to drinking water taste and the smell of chlorine. EGW manages these complaints by sampling for chlorine residual and/or flushing the system where required. Sampling confirmed 100% compliance with health-based guidelines. In the last financial year periodic algal growth also caused issues with taste and odour (MIB and Geosmin).

8.4. Air in Water (White Water)

Air in water can cause drinking water to appear cloudy as a result of the formation of tiny bubbles. Six (6) complaints related to air in water were recorded in 2022-23 (Table 32). This was a significant reduction in customer complaints compared to the previous years. This was due to a number of new air valves being installed across our systems.

8.5. Summary

Our staff always strive to provide the best customer service. The results of the customer surveys conducted by the Essential Services Commission during 2022-23 continued to rank EGW as one of the top performing Water Corporations in Victoria. EGW takes great pride in these results as they reinforce our commitment to provide a level of service that our customers expect.



9. REGULATED WATER

Regulated Water is “water that is not intended for drinking but could reasonably be mistaken for drinking water”. EGW has no declared Regulated Water supplies as defined in Section 6 (2) of the *Safe Drinking Water Act 2003*.

EGW has no regulated water supplies, however, there are 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. UNDERTAKINGS, AESTHETIC STANDARD VARIATIONS AND EXEMPTIONS

EGW has no undertakings, aesthetic standard variations or exemptions relating to the provision of Safe Drinking Water.

11. FURTHER INFORMATION

This Water Quality Annual Report is prepared in accordance with Section 26 of the *Safe Drinking Water Act 2003*.

Section 23 of the *Safe Drinking Water Act 2003* requires that EGW make available for inspection by the public the results of any water quality monitoring program that is conducted on any drinking water supplied by us.

Customers and members of the public may access drinking water quality data by contacting EGW on the details provided below;

For further information regarding water quality information, please refer to the EGW website (www.egwater.vic.gov.au), or contact EGW on 1800 671 841.



12. GLOSSARY OF TERMS

TERM	EXPOSITION
COAGULATION/ FLOCCULATION	Treatment process where chemicals are added to raw water to bind suspended solids, generally expressed as turbidity. Once bound, the chemical and turbidity form “floc” which is either settled out in the clarification process or floated off during the dissolved air flotation process.
CHLORINE GAS	Chemical added for disinfection of water.
CWS	Clear water storage (treated drinking water storage)
DH	Department of Health
DWQRMS	Drinking Water Quality Risk Management System
DISSOLVED AIR FLOTATION	Treatment process utilising air dissolved in water to float suspended particles to the surface of a treatment plant clarifier cell. The float is periodically removed and clear water is drained from the bottom of the cell.
DISINFECTION	Treatment process where chlorine or ultraviolet light is introduced to the flow of clear water prior to customer consumption to kill any pathogenic organisms (make it safe to drink) that may be present in the clear water following the sedimentation/dissolved air flotation and granular media filtration processes.
FLUORIDATION	The addition of fluoride to the water supply system for the benefit of dental hygiene.
FLUOROSILICIC ACID	Chemical used for fluoridation of water.
GEOBAG DEWATERING	Treatment process utilising large material bags to separate water from solids. The solids are restricted from passing through the fine material while water is able to seep through.
GRANULAR MEDIA FILTRATION	Treatment process which utilises anthracite, sands and gravels to filter out suspended particles following the sedimentation/dissolved air flotation processes. Suspended particles are trapped within the media and clear water passes through prior to being disinfected. The particles build up in the media and are periodically washed out in a reverse flow process.
HU	Hazen units
KL	Kilolitres (1,000 litres)
L/s	Litres per second
mg/L	Milligrams per litre
ng	Nanograms
MECHANICAL DEWATERING	Treatment process where solids and water are separated through a high-speed centrifugal separation process. High speed revolutions force separation between the solid and liquid, solids are captured for processing and water is returned back to the treatment process.
ML	Megalitre (1,000,000 litres)
N/A	Not applicable
NTU	Nephelometric turbidity units
POLY ALUMINIUM CHLOROHYDRATE (PAC 23)	Coagulant chemical used during coagulation process to remove suspended solids from raw water.



POLYMER (MAGNAFLOC LT20, 25, 27)	Chemical used as a flocculation aid to increase settlement rate of suspended solids in the coagulation process.
POWDER ACTIVATED CARBON	Product used for reduction/removal of taste and odour compounds and algae toxins in water.
RMP	Risk management plan
SOP	Standard operating procedure
SODA ASH	Chemical used for pH correction to aid the coagulation/flocculation process
SODIUM HYDROXIDE (CAUSTIC SODA)	Chemical used for pH correction to aid the coagulation/ flocculation process.
SODIUM HYPOCHLORITE	Chemical added for disinfection of water.
SEDIMENTATION/ CLARIFICATION	Treatment process where flocculated particles in the raw water are settled into the bottom of a clarifier and periodically removed. Clear water is taken from the top of the clarifier prior to filtration and disinfection.
WTP	Water treatment plant



APPENDIX A. RISK MANAGEMENT PLAN CERTIFICATE OF COMPLIANCE

Risk Management Plan Audit Certificate Safe Drinking Water Regulations 2015

Certificate Number: 186
Audit period: 1 January 2021 – 31 December 2022

To:
Aline Cardoso
Coordinator Operations Monitoring and Reporting
East Gippsland Water
PO Box 52
Bairnsdale, Vic 3875
Australian Business Number (ABN): 40 096 764 586

I, Karen Pither, after conducting a risk management plan audit of the water supplied by East Gippsland Water, am of the opinion that East Gippsland Water *has not* complied with the obligations imposed by section 7(1) of the *Safe Drinking Water Act 2003* during the audit period.

The details of the reasons for noncompliance are—

Section 8(1)(d)(v) of the Safe Drinking Water Regulation requires that a risk management plan developed by a water supplier, specifies the basis on which the location for the collection of a particular sample will be determined, so as to ensure that, for the purposes of routine sampling, samples are not taken from the same location within a water sampling locality on two consecutive occasions.

The audit noted that some chemical parameters were sampled from the same location within a sampling location on two or more consecutive occasions.

The non-compliance was considered minor as there is a low potential for a risk situation, and the potential impact of the noncompliance is not likely to be a serious or imminent risk to public health, or compromise public health.

Karen Pither

10/3/2023

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East Gippsland **Water**