Annual Water Outlook

December 2023

EGW Ref: DOC/23/67390

Photo: Re-commissioning the Wy Yung tank in preparation for summer.

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Executive Summary

The Bureau of Meteorology has predicted a drier and hotter season ahead for East Gippsland, with below average rainfall and higher temperatures. Australia has officially entered an El Nino cycle that is expected to continue until early 2024. Additionally, a positive Indian Ocean Dipole is currently underway, which typically lasts until the end of spring and can suppress rainfall in Australia. These climate drivers have caused a rapid change in weather conditions for East Gippsland, which had previously experienced three consecutive wet years during a La Nina cycle.

Australia's climate is highly unpredictable thus making it difficult to make long-range forecasts. If the spring and summer seasons experience substantially below average rainfall, the likelihood of water restrictions increases. In the event of a repeat of the worst streamflow on record, which occurred in the summer of 1997/98, water restrictions will almost certainly be necessary in all systems, except for Mallacoota and Dinner Plain which have reliable groundwater supplies.

According to the Bureau of Meteorology and CSIRO, there is a long-term trend towards reduced cool season rainfall and longer periods of drought due to climate change. This can lead to more intense rainfall events. Despite below-average rainfall throughout most of the year, all raw water and treated water storages are near full capacity. This provides the best opportunity to meet peak demand during the upcoming summer.

The Bureau of Meteorology has updated the streamflow forecast to 'Low'. This change was reflected in many of the East Gippsland streamflow status, which ad previous been above average to average. The Mitchell River streamflow was also affected by the dry winter, which was comparable to the dry years of 2017-19. However, the status of the East Gippsland streamflow improved after a heavy rainfall event in early October, where over 100mm of rain fell in just two days.

The annual water outlook report provides a summary of the nine urban water supply systems managed by East Gippsland Water (EGW) with focus on supply only. The report assesses the likelihood of water restrictions being imposed for the upcoming summer period in 2023/24 (as shown in table 1.1). Based on the current three-month rainfall forecast, most systems are unlikely to have water restrictions (with probabilities ranging from 5% to 19%). However, should dry conditions persist, it is possible (with a probability of 20% to 49%) that the largest system, The Mitchell, will reach stage 2 water restrictions trigger. Nevertheless, it is still unlikely that the system will have stage 4 restrictions in place. EGW's website remains up-to-date in terms of current water restrictions in force, their definitions and exemption applications.

Despite the possibility of East Gippsland receiving around 100-200mm of rainfall from November to January, as predicted in 'Section 3 Climate Outlook' (figure 3.1), with 200mm being average for the region, preparations for short-term water harvesting and supply improvement works are still underway. Operational plans are being developed alongside the annual water outlook and drought response plan to ensure a sustainable water supply.

There are several important factors to consider when it comes to the EGW Water Supply and Systems. These include the potential effects of climate change, which may result in more frequent droughts and floods, as well as impacts from bushfires that could contaminate the water source. Additionally, extreme weather events may impact the availability of source water and increase the risk of power supply and asset performance issues. All of these factors may require the implementation of water demand management restrictions.

Water Supply System	Townships supplied	No. of water connections (2022/23)	Water source	2022/23 annual extraction (ML*)	Likelihood of water restrictions over 2023/24 summer[1]
Mitchell River	Bairnsdale (including Wy Yung and Lucknow), Lindenow, Paynesville, Raymond Island, Metung, Tambo Bluff, Lakes Entrance (including Lake Tyers, Lake Tyers Beach and Kalimna), Nowa Nowa, Nicholson, Johnsonville, Swan Reach, Bruthen and Sarsfield	21,338	Mitchell River + 5 groundwater bores (take and use plus Aquifer Storage and Recovery)	4093.4	"Possible"
Bemm River	Bemm River	103	Bemm River	11.9	"Rare"
Buchan	Buchan	109	Buchan River	21.0	"Possible"
Cann River	Cann River	195	Cann River	33.8	"Unlikely"
Dinner Plain	Dinner Plain	399	Groundwater bores (2)	79.6	"Rare"
Orbost	Orbost, Marlo, Newmerella	2364	Brodribb Rivers.	778.1	"Unlikely"
Mallacoota	Mallacoota	1037	Betka River and 3 groundwater bores	141.3	"Rare"
Omeo	Omeo	267	Butchers Creek	44.7	"Unlikely"
Swifts Creek	Swifts Creek	129	Tambo River	29.9	"Unlikely"

Table 1.1: Likelihood of water restrictions rated according to DELWP (2017) guidance.

Likelihood of water restrictions range: *very rare <1%; rare 1-4%; unlikely 5-19%; possible 20-49%; likely 50-79%; almost certain 80-100%.*

* ML - megalitres

1 INTRODUCTION

1.1 Water Systems

East Gippsland Water operates nine different potable water supply systems. These systems are made up of:

• Surface water (rivers, streams and creeks) supplied with off-stream storages (Bemm River, Buchan, Cann River, Orbost, Omeo and Swifts Creek supply systems);

• A combination of surface water and groundwater supplied with off-stream storages (Mitchell River and Mallacoota systems); and

• Groundwater supplied with storage (Dinner Plain).

The townships that receive water services from EGW (as shown in figure 1.1) include Dinner Plain, Omeo, Swifts Creek, Buchan, Orbost, Bemm River, Cann River, Mallacoota, and some larger towns within the Mitchell water supply system such as Bairnsdale, Lakes Entrance, Metung, and Paynesville.

All of these systems are independent of each other and are not connected to the Victoria Water grid.

Figure 1.1: Towns supplied with reticulated sewer and water services

1.2 Recent Water Supply Improvements

East Gippsland Water is continually working to improve its water supply systems to cater for future growth in the region. The company is implementing an asset improvement plan that focuses on enhancing network efficiency and reducing water losses.

East Gippsland Water has programs in place to actively identify leak detection, update and renew mains and metering, and is currently trialing intelligent network technologies. These measures are aimed at minimising water losses and ensuring that the network can meet the growing needs of the region.

The key improvements planned for 2023/24, in relation to water supply, include:
- Re-commissioning both the Wy Yung 36ML tank and Sarsfield 6ML tank

- Reducing water loss from the Metung tank
- Buchan Raw water tank
- Optimising performance of the Aquifer Storage & Recovery (ASR) at Woodglen

East Gippsland Water is also developing future programs to increase storage capacity options, such as:
- Woodglen III - 800 ML storage basin
- Recommissioning of Toorloo storage and network
- Expansion of ASR groundwater assets.

1.3 Rainfall Trends

In 2023, there was a sudden shift from wet to dry conditions after three years of La Nina and above-average rainfall. All systems experienced prolonged periods of below-average rainfall this year, which dried out the catchment faster than expected. East Gippsland experienced four consecutive months from JUN23 to SEP3 of well below average rainfall, except for Omeo which experienced 7 months of above average rainfall over the twelve-month period (figure 1.2).

The Mitchell River's streamflow experienced a rapid decline after going through 8 months of below-average rainfall, especially during the dry winter season, with five out of the previous eight months deviating significantly from the average (as shown in figure 1.3). As a result, SRW had to suspend farm irrigation pumping in AUG23 due to low river flow. Nevertheless, this situation changed with a heavy rainfall event in early October, which caused moderate flooding in some systems.

There has been below-average rainfall in Bairnsdale since April (figure 1.3), with 128mm less rainfall than average for the 12-month period between October 2022 and September 2023. However, above-average rainfall occurred in the first week of October.

Below average rainfall over nine (9) months has been recorded in Orbost, with 147mm less than average and a significant dry spell in June with 80mm below average (Figure 1.4).

The town of Mallacoota has been heavily affected by a severe lack of rainfall. The region has experienced 219mm less rain than the average, and has had significantly lower than average rainfall since June (figure 1.5). Over the past year, there have only been 3 months with above average rainfall, resulting in a significant decrease in soil moisture levels.

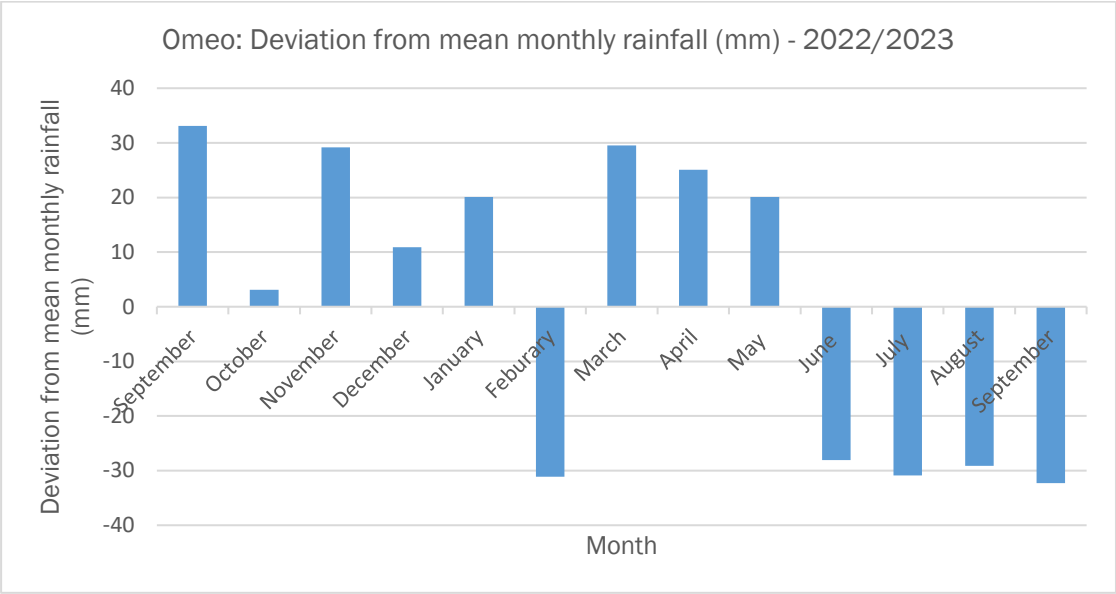


Figure 1.2: deviation from mean monthly rainfall at Omeo

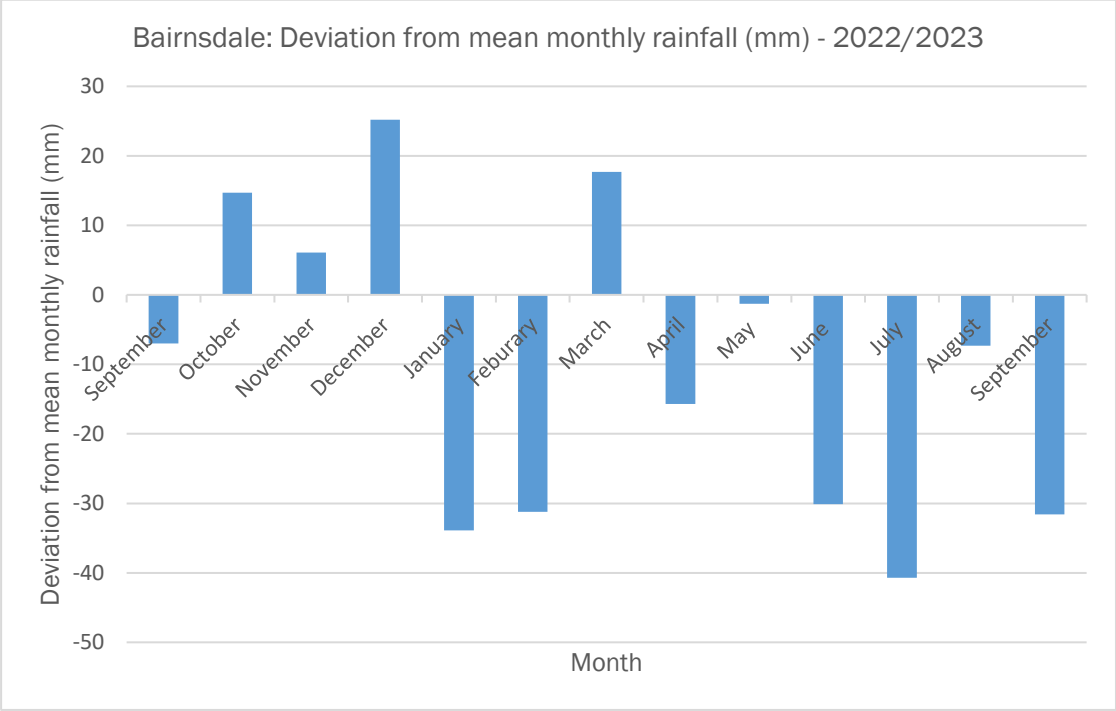


Figure 1.3: deviation from mean monthly rainfall at Bairnsdale

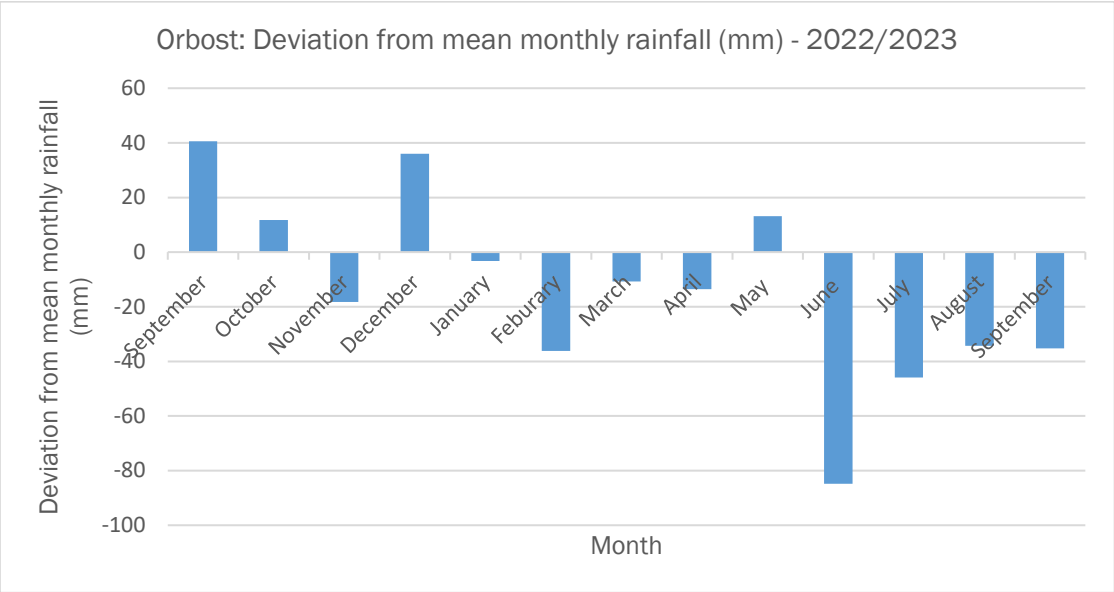


Figure 1.4: deviation from mean monthly rainfall at Orbost

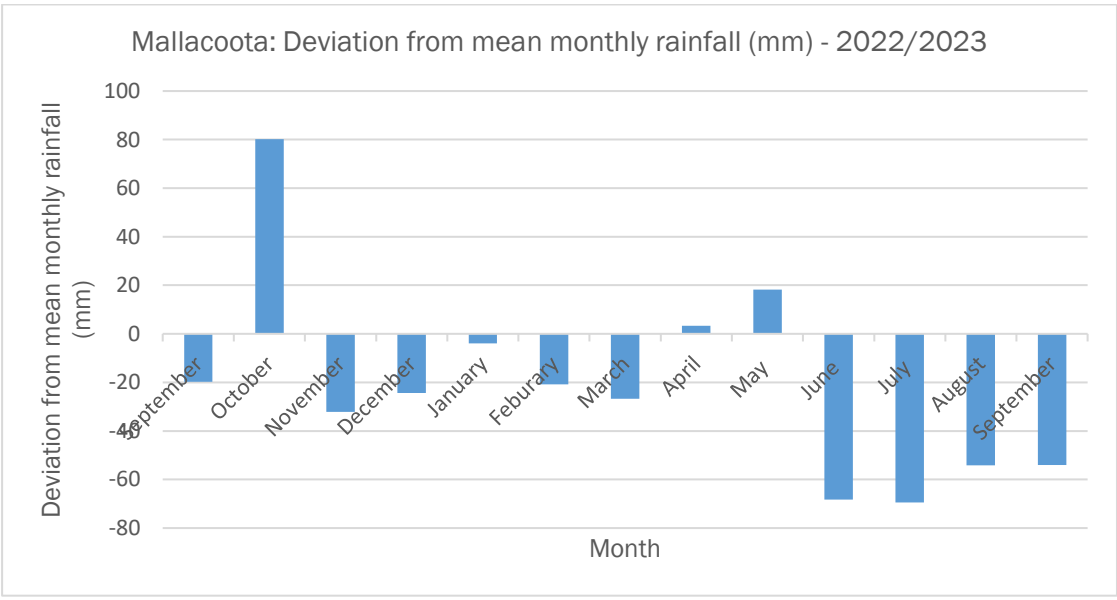


Figure 1.5: deviation from mean monthly rainfall at Mallacoota

1.4 Demand Trends

The demand for all nine supply systems of East Gippsland Waters has remained relatively stable since 2006/07. Two main factors influencing this stability is the loss of water (non-revenue water) within the distribution network (as shown in Table 1.2), and natural climate variability such as El Nino and La Nina events. Water loss can also occur during the commissioning of new assets like tanks and water mains, as well as in response to drinking water quality events or service failures.

The average residential water usage per connection has remained relatively constant since 2010, at around 148 K/L per connection, which aligns with the amount of annual rainfall received. However, there has been a reduction in residential water usage since 2019, likely due to the wet conditions, with the lowest usage period being 2021, where widespread flooding lowered the average residential usage to 126 Kl. Currently, usage is increasing due to drier conditions being experienced (Figure 1.6).

In contrast, for non-residential customers, the average usage since 2010 is 571 KL per connection, with the peak being 2011 at 615 KL, and the lowest being 2022 at 498 KL, a decline of 117 KL or 23%. This decline is likely due to the disruption of visitors to the region over the 2020/22 period. Since the low of 2022, usage has increased to 559 KL for 2022/2023, an increase of 61 KL. This increase is again likely due to the increased number of visitors returning to the region and the increased production through regional industries such as One Harvest (previously Vegco).

Permanent water-saving rules are always in place, but the state government is encouraging a domestic water use target of 150kl per person. They suggest that we can all make every drop count with simple and easy behavior changes, such as shortening our showers and watering our gardens between dusk and dawn. This statement holds great relevance, as the trend for domestic water use typically follows the dry and wet cycles, with water usage during dry years being higher than during wet years. For instance, water use during the dry year of 2018/19 was 193kl, while in 2021/22, during a wetter year, it was 152kl (refer to figure 1.7).

Year	Residential					Non- Residential				Non-Revenue Water			Total Use (ML)
	No of Assessm.	No. of Connect.	Use (ML)	Use per Connection (KL/Yr)	Use per Person per day (l/day)	No of Assessm.	No. of Connect.	Use (ML)	Use per Connection (KL/Yr)	Unaccounted for water (ML)	Accounted for Non-Revenue Water	Non Revenue as a % of total water	
2006/07	19084	N/A	3097	N/A	N/A	2877	N/A	1755	N/A	801	193	17%	5846
2007/08	19860	N/A	2648	N/A	N/A	2956	N/A	1639	N/A	686	161	17%	5133
2008/09	20222	18001	3224	179	216	3005	2737	1767	646	393	70	8%	5454
2009/10	20655	18329	3049	166	201	3036	2782	1671	601	617	331	17%	5668
2010/11	20928	19048	2700	145	175	3077	2832	1741	615	853	84	17%	5378
2011/12	21671	19389	2620	138	166	3121	2859	1634	572	698	183	17%	5135
2012/13	22030	19697	3058	158	190	3105	2865	1738	607	651	189	15%	5636
2013/14	22309	19984	2966	151	182	3128	2872	1692	589	490	152	12%	5298
2014/15	22543	20266	2797	140	169	3141	2871	1669	581	529	19	11%	5013
2015/16	22822	20266	2961	146	176	3171	2944	1702	578	652	26	13%	5341
2016/17	23051	20266	3036	150	181	3206	2862	1635	571	510	34	10%	5215
2017/18	23194	20823	3278	157	189	3256	2937	1724	587	730	140	13%	5732
2018/19	23396	21179	3386	160	193	3386	2949	1707	579	441	41	8%	5534
2019/20	23691	21485	3286	153	185	3219	2962	1592	537	481	49	9%	5415
2020/21	24050	21915	3177	145	175	3205	2944	1515	515	605	76	11%	5373
2021/22	24233	22323	2818	126	152	3205	2948	1467	498	523	34	11%	4841
2022/23	24504	22654	3017	133	161	3240	2989	1671	559	555	51	10%	5297

Table 1.2: Water demand over time for all nine water systems

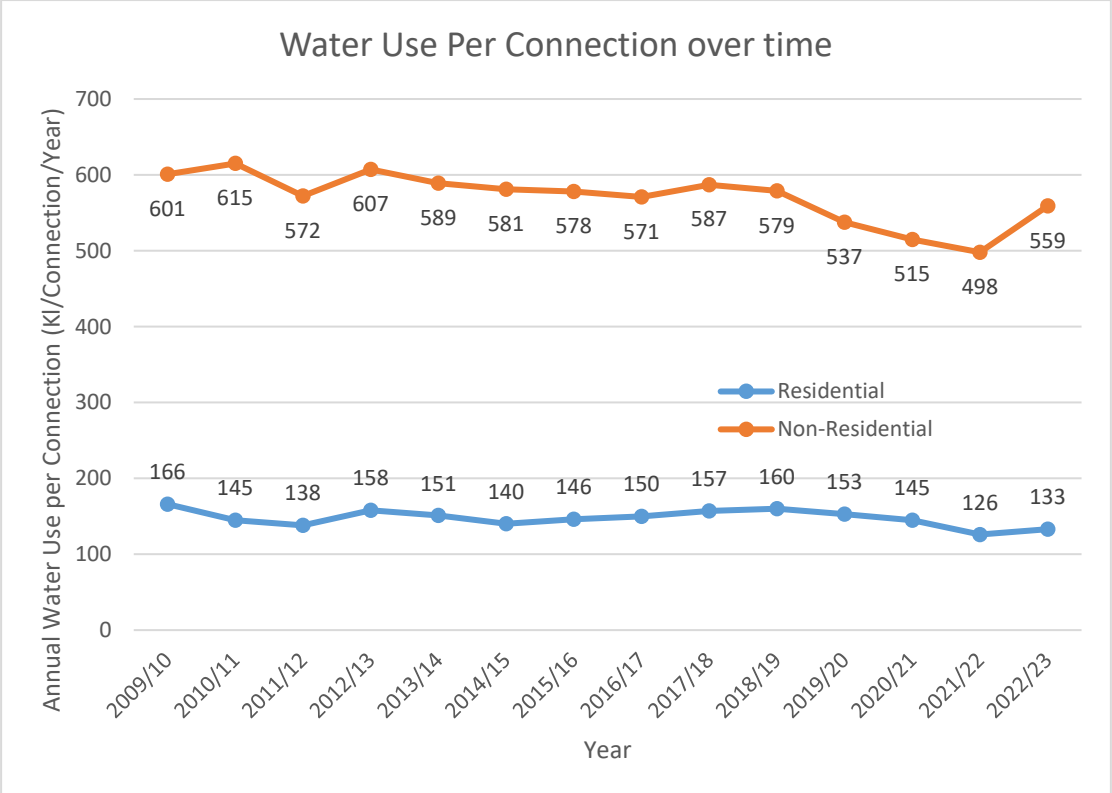


Figure 1-6: Annual residential and non-residential water use per connection over time.

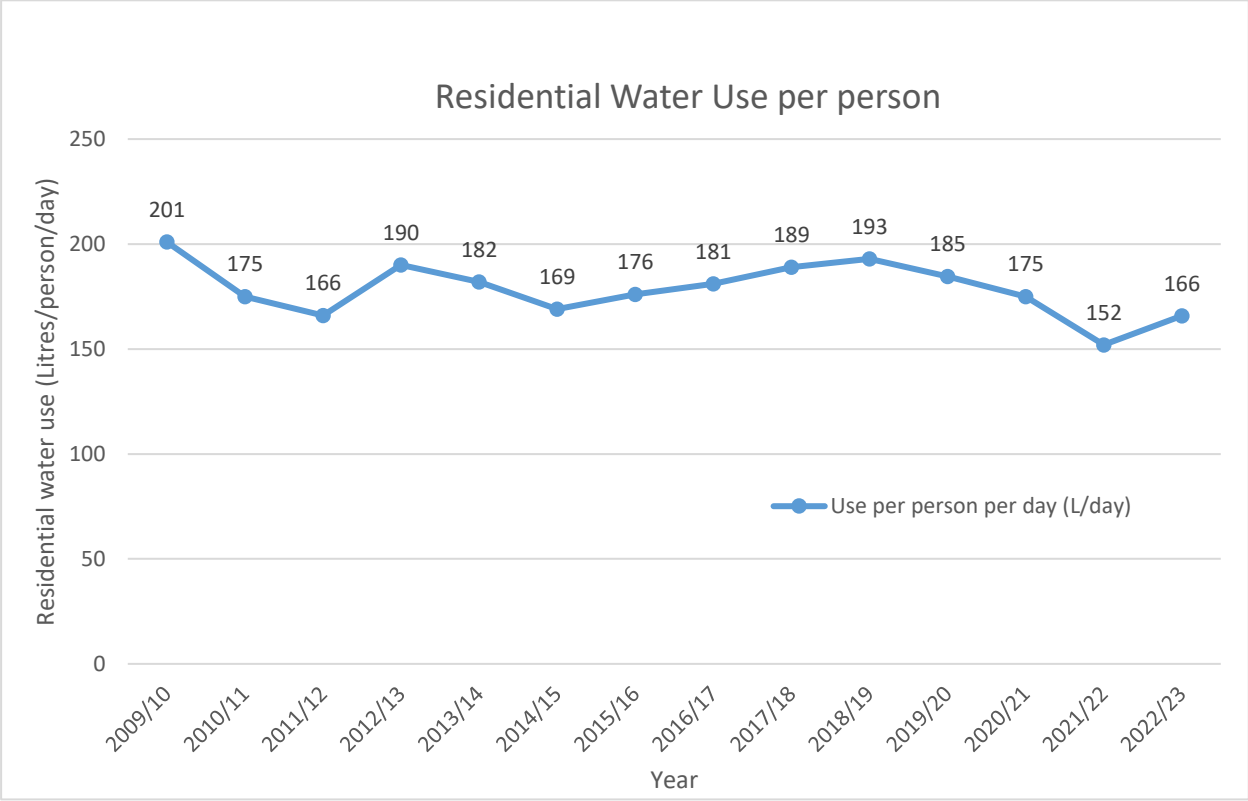


Figure 1-7: Annual residential water use per person (Australian Bureau of Statistics assumes East Gippsland has 2.2 people per household).

2 CURRENT WATER RESOURCE POSITION

Water Storage levels- Percentage Full Table

Town Supply- December 2023	Raw water storage (ML)	Percentage full	Clear water storage (ML)	Percentage full
Bemm River (Bemm River)	5.0	78.1%	0.47	94%
Betka River (Mallacoota)	34.7	84.6%	21.3	92.6%
Brodribb River (Orbost)	6.0	100%	41.0	89%
Buchan River (Buchan)	0.19	44.2%	0.58	92%
Butchers Creek (Omeo)	11.8	78.7%	0.3	75%
Cann River (Cann River)	3.3	97.1%	0.3	75%
Mitchell River (Bairnsdale)	1432.0	93.8%	198.9	89.2%
Tambo River (Swifts Creek)	2.6	56.5%	0.3	83.3%

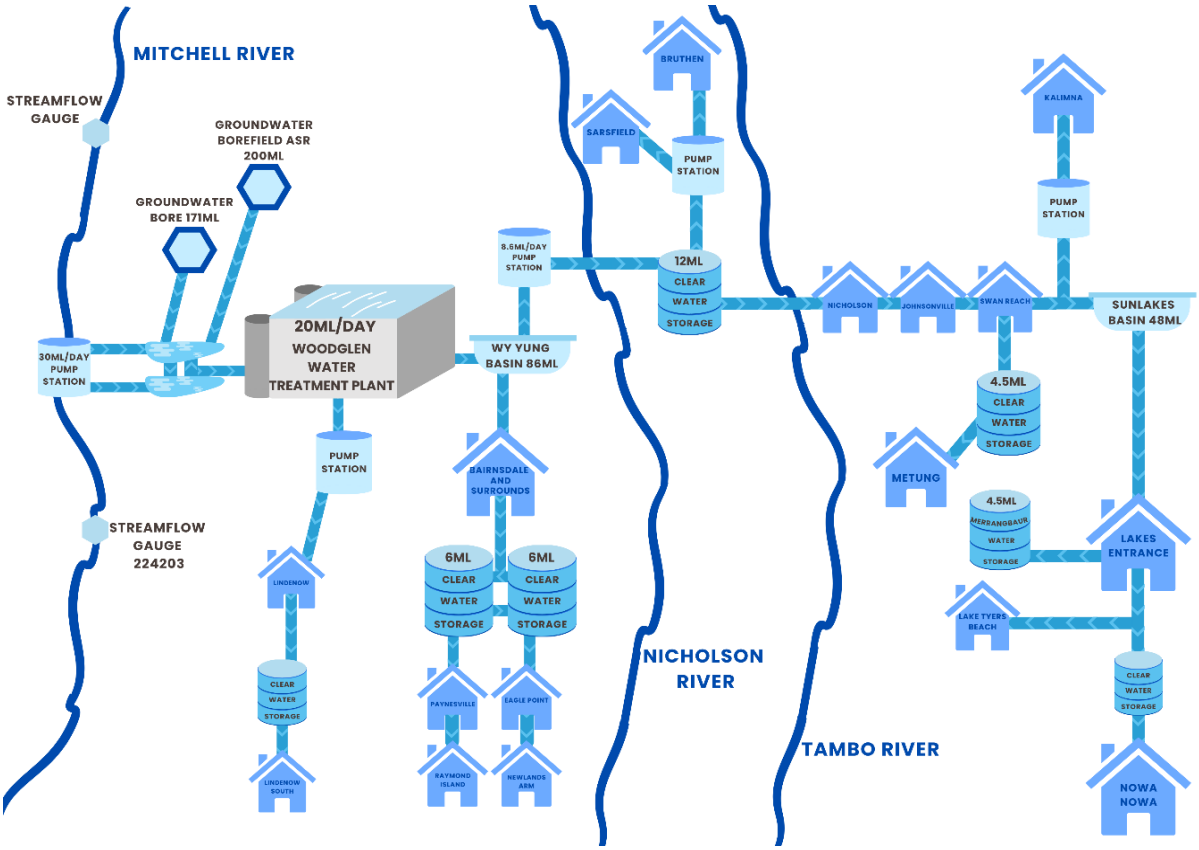
2.1 Mitchell System

2.1.1 Mitchell System Configuration

The following townships are supplied by the Mitchell system: Bairnsdale, Wy Yung, Lucknow, Paynesville, Metung, Lakes Entrance, Nowa Nowa, Nicholson, Johnsonville, Swan Reach, Bruthen, and Sarsfield. The primary source of water for the Mitchell system is the Mitchell River, which is supplemented by five groundwater bores. There are 21,338 connections in the Mitchell system, and its major customers include Vegco (One Harvest), Patties, Bairnsdale Hospital, and Dennison Foods.

System operation

Water from the Mitchell River, along with water from five groundwater bores, is treated at the Woodglen Water Treatment Plant using the Dissolved Air Flotation and Filtration (DAFF) process. The plant can treat up to 20ML/d of water, which is then stored in several balancing storages before being distributed to various supply networks.



2.1.2 Mitchell System Water Supply information

Water Source	Volume Available (ML)	Volume Used z (ML)
Mitchell River (bulk entitlement)	9208.0	4093.3
Groundwater (Take and Use)	171.0	0.1
Groundwater (Aquifer Storage)	200.0	0*
Total:	9579.0	4093.4

*Refer to section 4.

Storage	Size (ML)	Volume Instore (ML Oct 2023) *	Percentage Instore
Raw water	1526.0	1432.0	93.8%
Aquifer (groundwater recharge)	200.0	195.0	97.5%
Treated Water	223.0	198.9	89.2%
Total:	1949.0	1825.9	93.7%

*Drawn from SCADA

2.1.3 Mitchell System Water Demand Information.

The annual demand for water in Mitchell system was 4133ML during 2022/23, which is less than the demand in the past 7 years (as shown in figure 2.1), except for the very wet period of 2021/22. During that period, tourism was also reduced. However, the demand for water has increased in 2022/23 due to the hotter and drier weather conditions, along with the commissioning of Wy Yung

36 ML tank and maintenance work on the Metung Tank. The demand for water was high during 2017-2019, due to drought and bushfires.

Considering the current dry outlook, it is likely that the demand for water in the Mitchell system in 2023/24 will be around 4500ML, similar to the demand in 2018/19.

It is important to note that no water restrictions were imposed during 2022/23.

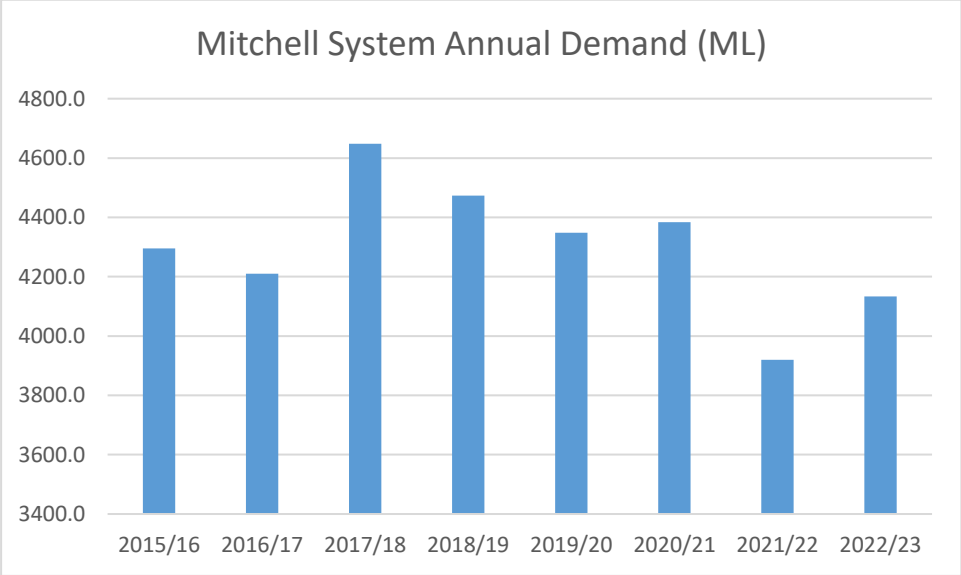


Figure 2-1: Annual water demand in the Mitchell System (Megalitres - ML)

2.2 Orbost Water Supply

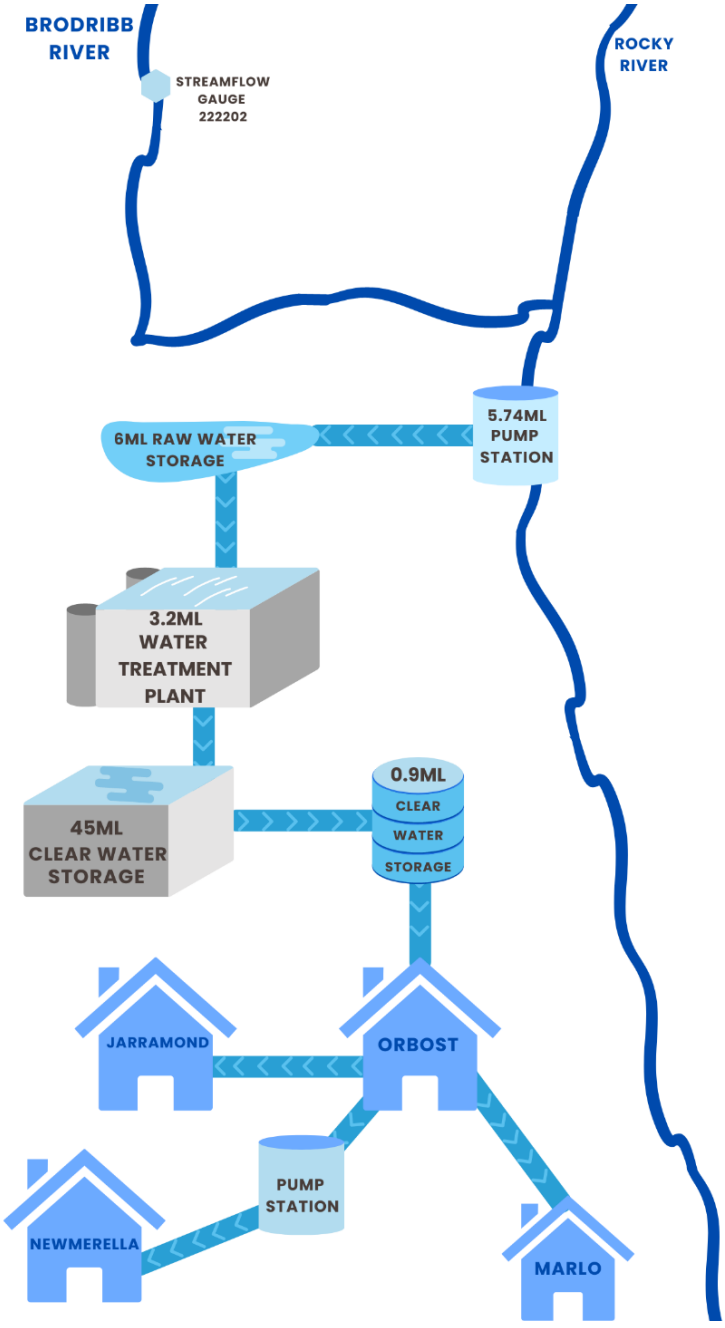
2.2.1 Orbost System Configuration

Townships Supplied: Orbost, Marlo, Newmerella

The Brodribb River is the source of water for the 2364 connections in the Orbost system, which include major customers like the Corringal gas plant, Orbost abattoir, Orbost Hospital, and several large dairy farms.

System operation

Water is pumped from Brodribb River and stored in a 6ML raw water storage. It undergoes full treatment before being stored in a 45ML clear water storage or a 0.9ML clear water tank. Finally, the water is distributed to customers.



2.2.2 Orbost system Water Supply Information

Water Source	Volume Available (ML)	Volume Used 2022/23 (ML)
Brodribb River (Bulk Entitlement)	2031.0	778.1

Storage	Size (ML)	Volume Instore (ML Oct 2023)	Percentage Instore
Raw water	6.0	6.0	100%
Treated Water	45.9	41.0	89%
Total:	51.9	47.0	90.6%

2.2.3 Orbost System Demand Information

The demand for water in the Orbost system was higher than usual at 177ML in 2022/23. This was due to the renewals projects on the 45ML CWS and a watermain failure. The CWS had to be emptied to install a new staged offtake pipework, and locating the watermain failure was challenging. However, the issue has been resolved, and monitoring controls have been put in place.

It is predicted that the annual water demand for the Orbost System in 2023/24 will be around 700ML.

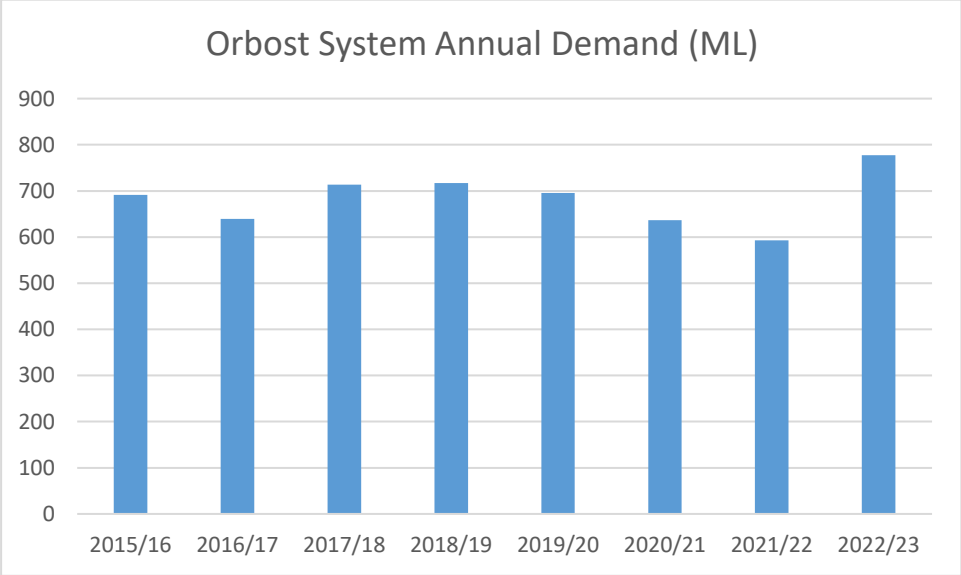


Figure 2-2: Annual Water Demand Orbost System (ML)

2.3 Mallacoota Water Supply

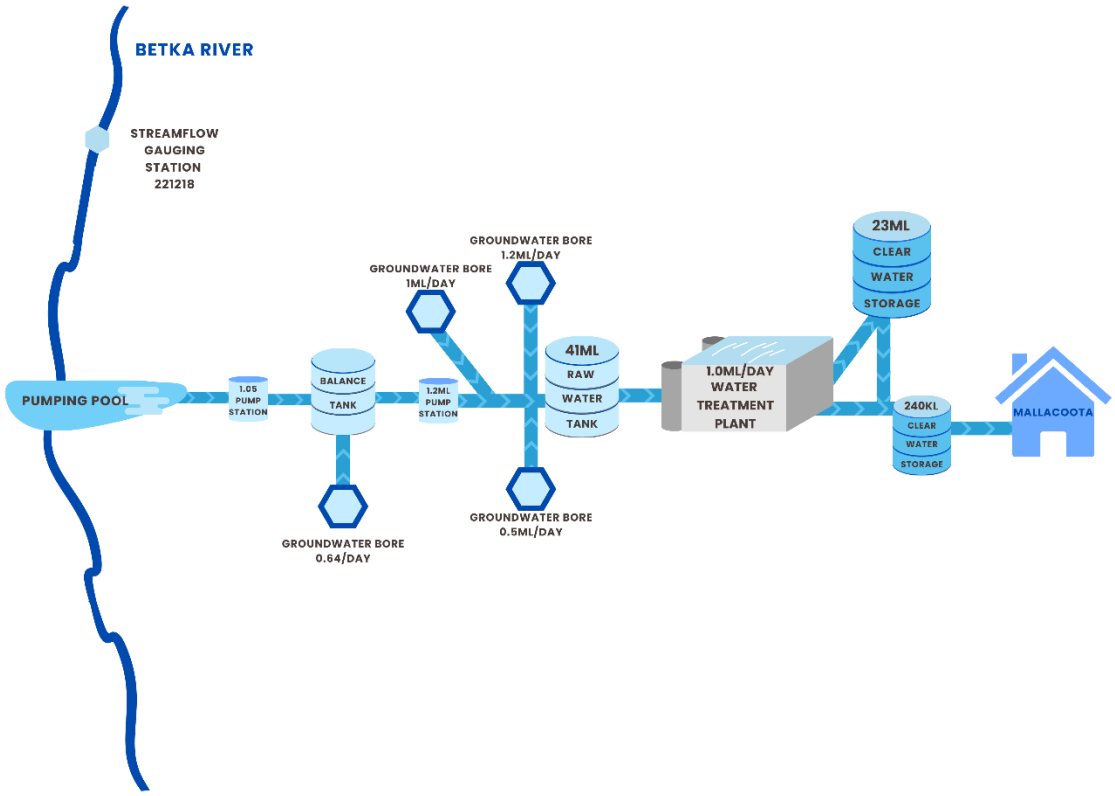
2.3.1 Mallacoota System Configuration

Township Supplied: Mallacoota

The Mallacoota System is supplied with water from the Betka River and four groundwater bores. There are 1037 connections in Mallacoota.

System Operation

Water is sourced from the Betka River or one of four operational groundwater bores and pumped into a 41ML raw water storage for treatment. After treatment, the water is stored in a 23ML clear water storage basin or a 0.24ML clear water tank and further treated with UV before being distributed to customers.



2.3.2 Mallacoota Water Supply Information

Water Source	Volume Available (ML)	Volume Used 2022/23 (ML)
Betka River (Bulk Entitlement)	330.0	45.6
Groundwater	220.0	95.7
Total:	550.0	141.3

Storage	Size (ML)	Volume Instore (ML Oct 2023)	Percentage Instore
Raw water	41.0	34.7	84.6%
Treated Water	23.0	21.3	92.6%
Total:	64.0	56.0	87.5%

2.3.3 Mallacoota Demand Information

The demand for water at Mallacoota has remained steady at 140-180ML per year for 8 years, despite tourism, drought, and bushfires. Predicted 2023/24 demand is 160ML.

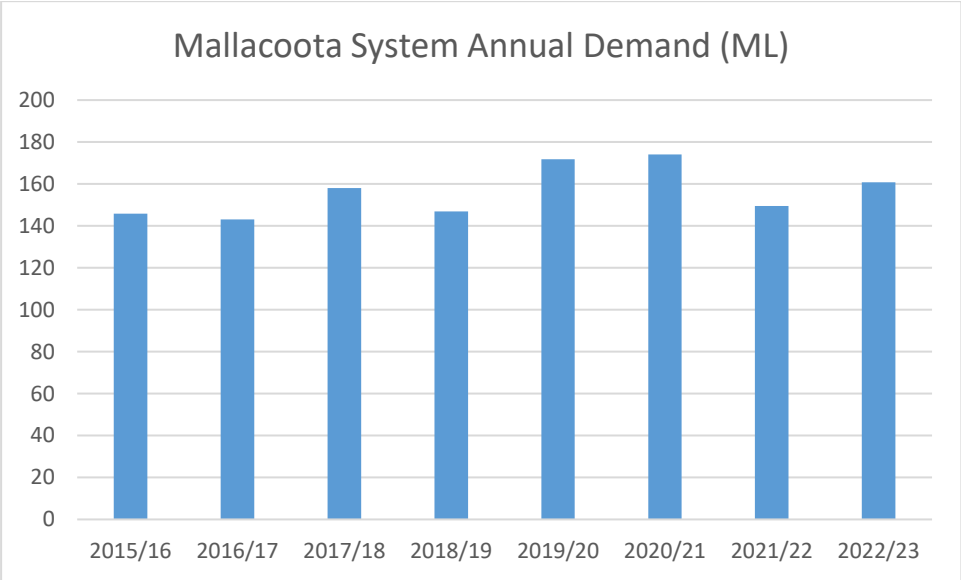


Figure 2-3: Annual Demand Mallacoota (ML)

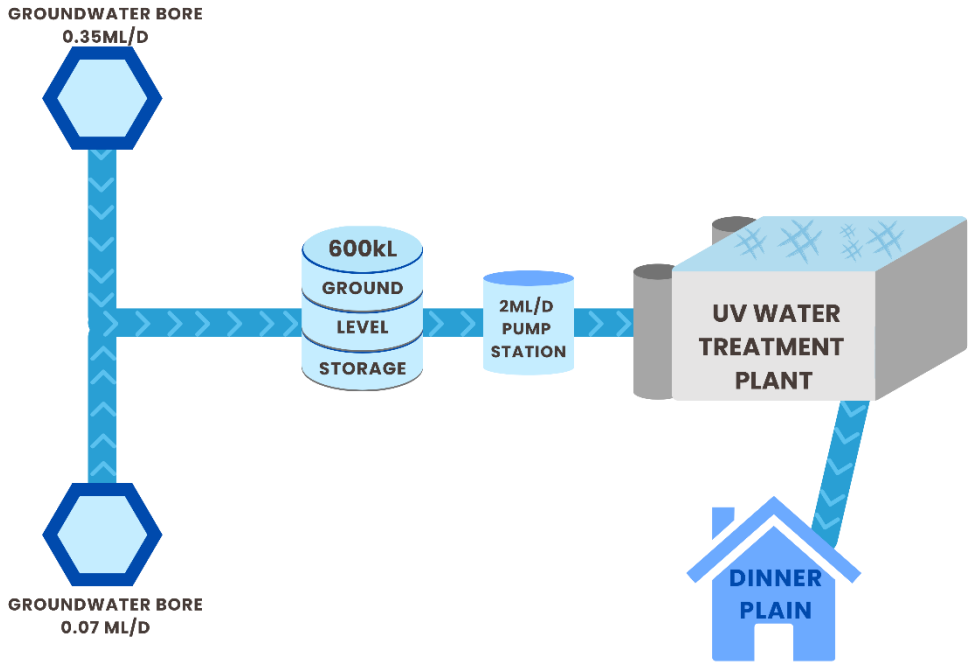
2.4 Dinner Plain Water Supply

2.4.1 Dinner Plain System Configuration

Township Supplied: Dinner Plain

The Dinner Plain system is supplied by two groundwater bores, serving 395 connections.

System Operation
Water is pumped from two groundwater wells into a 600kL storage. It is then pressurised and treated with ultraviolet disinfection before being distributed to customers through the reticulation network.



2.4.2 Dinner Plain Water Supply Information

Water Source	Volume Available (ML)	Volume Used 2022/23 (ML)
Ground Water Bores	120.0	79.6

Storage	Size (ML)	Volume Instore (ML Oct 2023)	Percentage Instore
Raw water	0.6	0.6	100%

2.4.3 Dinner Plain Demand Information

The annual water demand for Dinner Plain in 2022/23 has increased to 80ML, which is higher than the previous seven years. The demand for water is mostly driven by tourism and snowmaking activities, and it puts pressure on the water supply system. To address this issue, the Dinner Plain Resort Council is working on an independent bore for snowmaking purposes, which will significantly reduce the winter demand. However, the project needs to consider the potential risks of contamination and interference on the EGW bore.

In addition, there has been an increase in water loss in 2022/23, mainly due to infrastructure deterioration in the harsh alpine environment.

Looking ahead, the annual water demand for 2023/24 is expected to be between 60-70ML.

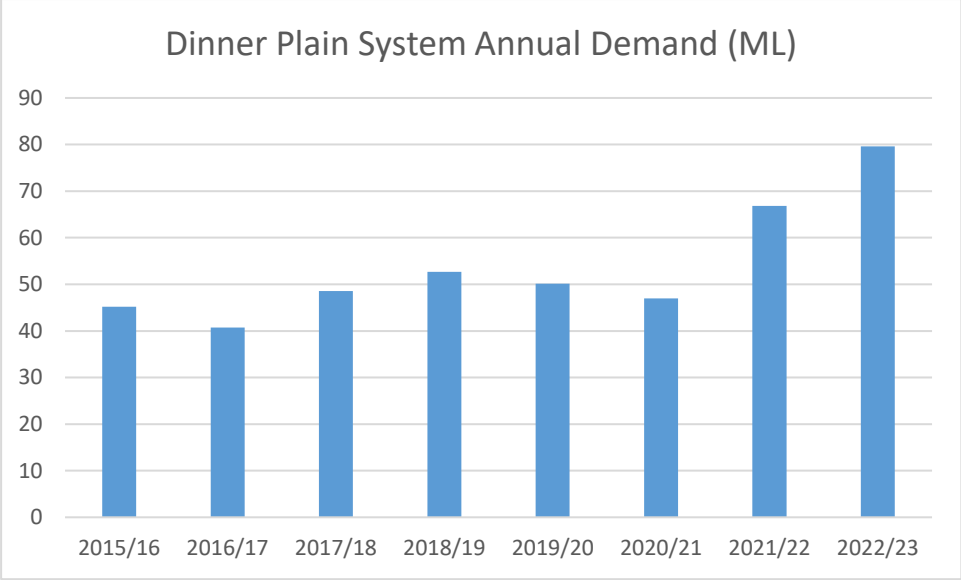


Figure 2-4: Annual Demand Dinner Plain (ML)

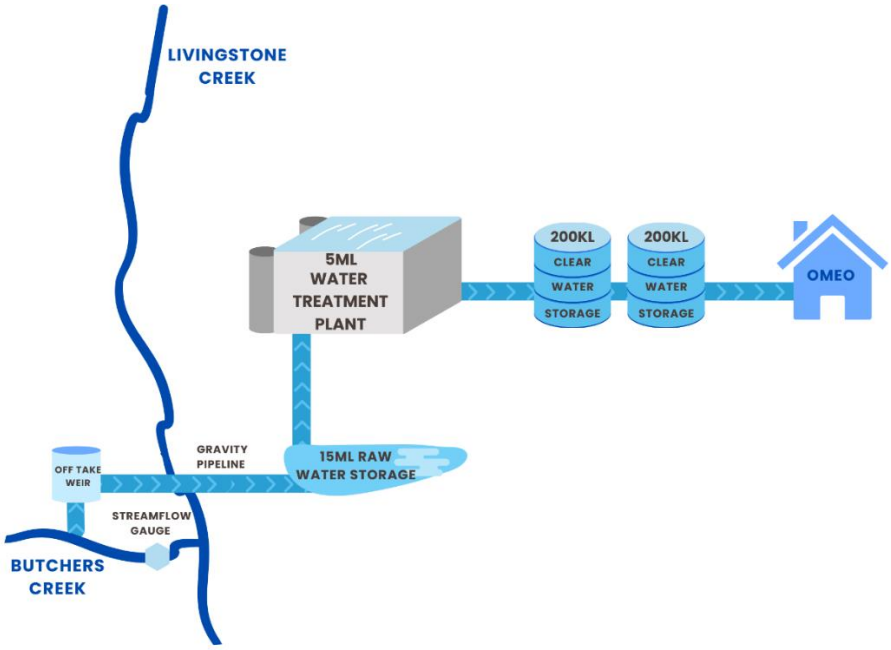
2.5 Omeo Water Supply

2.5.1 Omeo System Configuration

Township Supplied: Omeo

The town of Omeo has 264 water connections supplied by Butchers Creek.

System Operation
Water is transferred by gravity to one of two raw water storages. It is then treated, stored in either of two 200kL clear water storages, and delivered to customers through the reticulation system.



2.5.2 Omeo Water Supply Information

Water Source	Volume Available (ML)	Volume Used 2022/23 (ML)
Butchers Creek (Bulk Entitlement)	77.0	44.7

Storage	Size (ML)	Volume Instore (ML Oct 2023)	Percentage Instore
Raw water	15.0	11.8	78.7%
Treated Water	0.4	0.3	75.0%
Total:	15.4	12.1	78.6%

2.5.3 Omeo Demand Information

The yearly water demand in Omeo has remained stable in the range of 45-65ML for the last 8 years (as shown in figure 2.5), despite the influence of factors like tourism, drought, and bushfires. Since 2016/17, there has been a downward trend that could be due to a decrease in the town's permanent population. Also, many properties in Omeo are likely to have been purchased by investors who want to take advantage of the new mountain bike track construction, and as a result, they remain mostly unoccupied.

It is expected that the annual water demand for 2023/24 will be approximately 50ML.

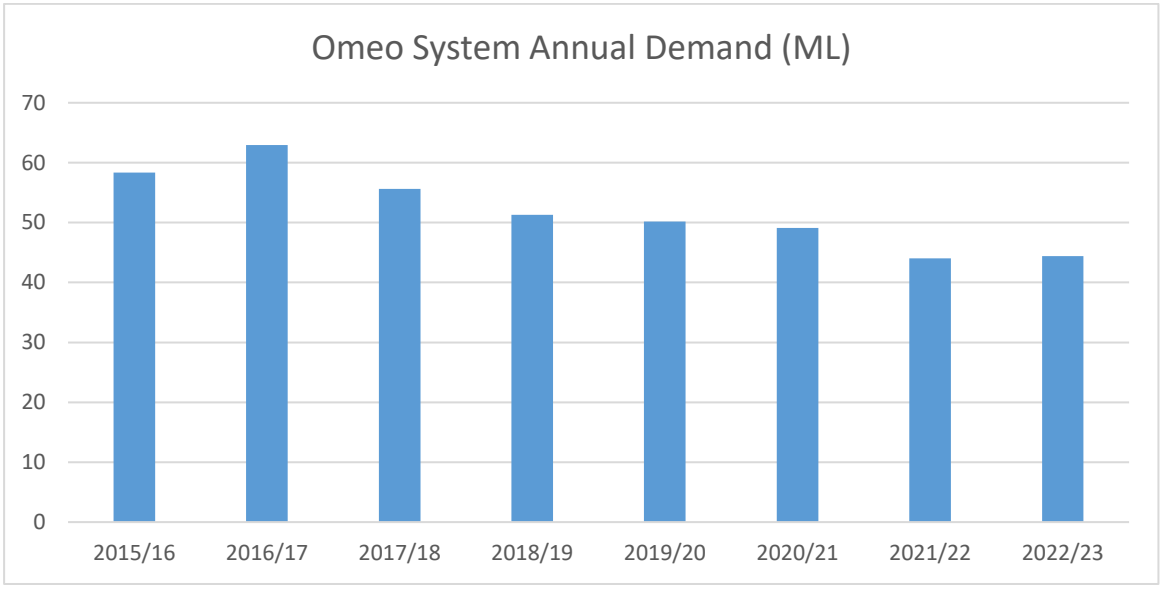


Figure 2-5: Annual Demand Omeo (ML)

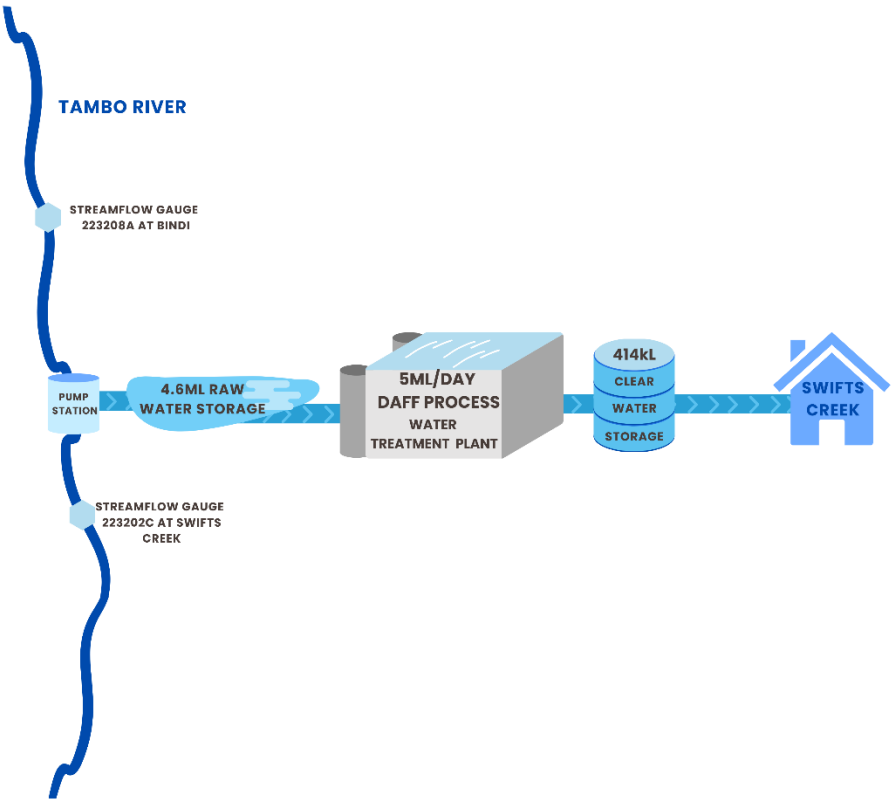
2.6 Swifts Creek Water Supply

2.6.1 Swifts Creek Configuration

Township Supplied: Swifts Creek

Swifts Creek has 128 water connections supplied by the Tambo River.

System Operation
Water is extracted from the Tambo River and stored in a raw water storage with a capacity of 4.6 million liters. The water is then treated in a Dissolved Air Flocculation (DAFF) plant and stored in a clear water storage with a capacity of 414,000 liters before being supplied to customers through the reticulation network.



2.6.2 Swifts Creek Supply Information

Water Source	Volume Available (ML)	Volume Used 2022/23 (ML)
Tambo River (Bulk Entitlement)	224.0	29.9

Storage	Size (ML)	Volume Instore (ML Oct 2023)	Percentage Instore
Raw water	4.6	2.6	56.5%
Treated Water	0.4	0.3	83.3%
Total:	5.0	2.9	58%

2.6.3 Swifts Creek Demand Information

In 2022/23, Swifts Creek experienced an unusually high demand for water due to an extended watermain failure, totaling to 30ML. This is much higher compared to the past seven years, as shown in figure 2.6. Due to the relatively small size of the water supply system, any water loss was quite noticeable. On the other hand, the demand for water for 2023/24 is expected to be around 25ML.

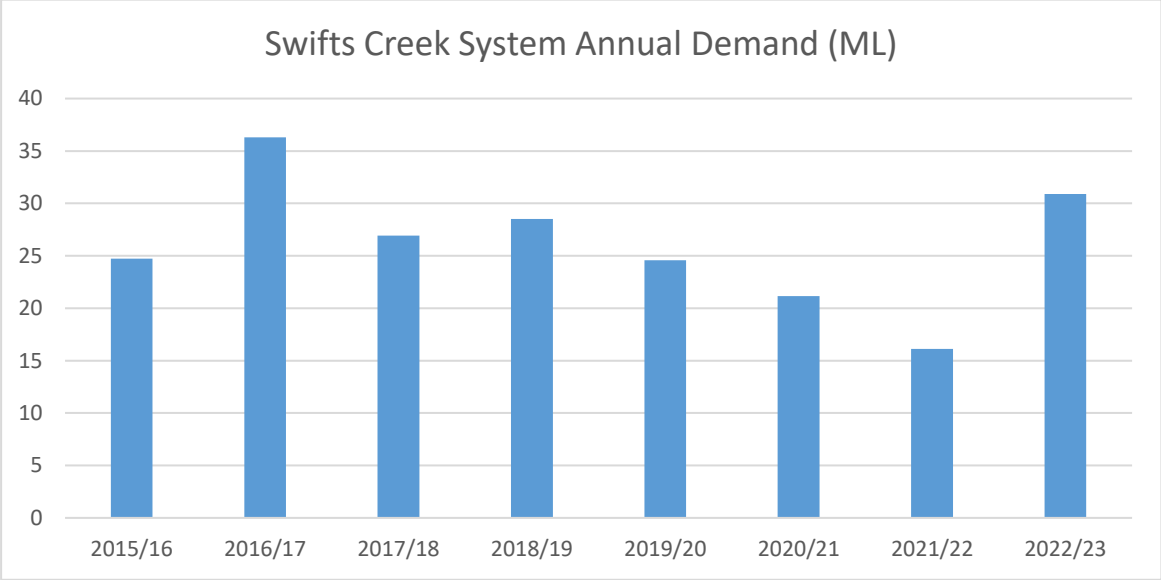


Figure 2-6: Swifts Creek Annual Demand (ML)

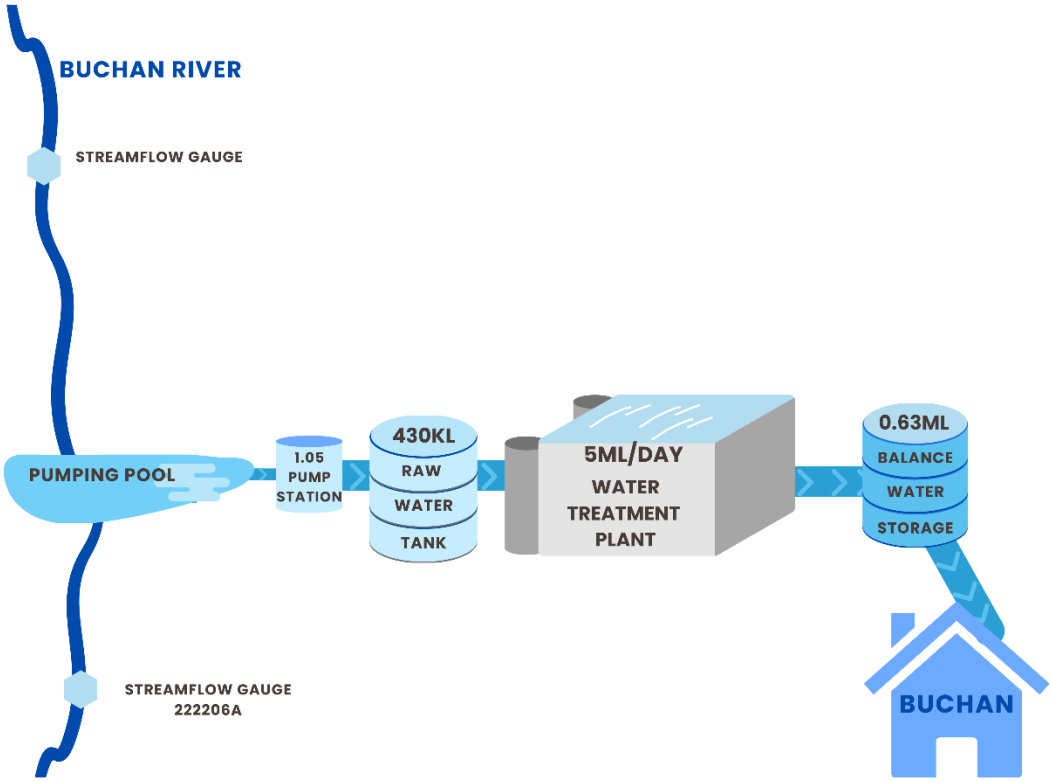
2.7 Buchan Water Supply

2.7.1 Buchan System Configuration

Township Supplied: Buchan

Buchan has 109 connections and is supplied water by the Buchan River.

System Operation
Water from Buchan River is pumped into 430kl tank, treated, stored, and supplied to customers.



2.7.2 Buchan Water Supply Information

Water Source	Volume Available (ML)	Volume Used 2022/23 (ML)
Buchan River (Bulk Entitlement)	170.0	21.0

Storage	Size (ML)	Volume Instore (ML Oct 2022)	Percentage Instore
Raw water	0.43	0.19	44.2%
Treated Water	0.63	0.58	92.0%
Total	1.06	0.77	72.6%

2.7.3 Buchan Demand Information

The demand for water in Buchan has remained relatively constant between 15 to 25 megaliters per year over the past 8 years, as shown in figure 2.7. Despite the impacts of tourism, drought, and

bushfires, the annual demand has not seen any major variations. Due to the small size of the water supply system, any water loss is easily noticeable.

It is expected that the annual demand for water in 2023/24 will be 20 megalitres.

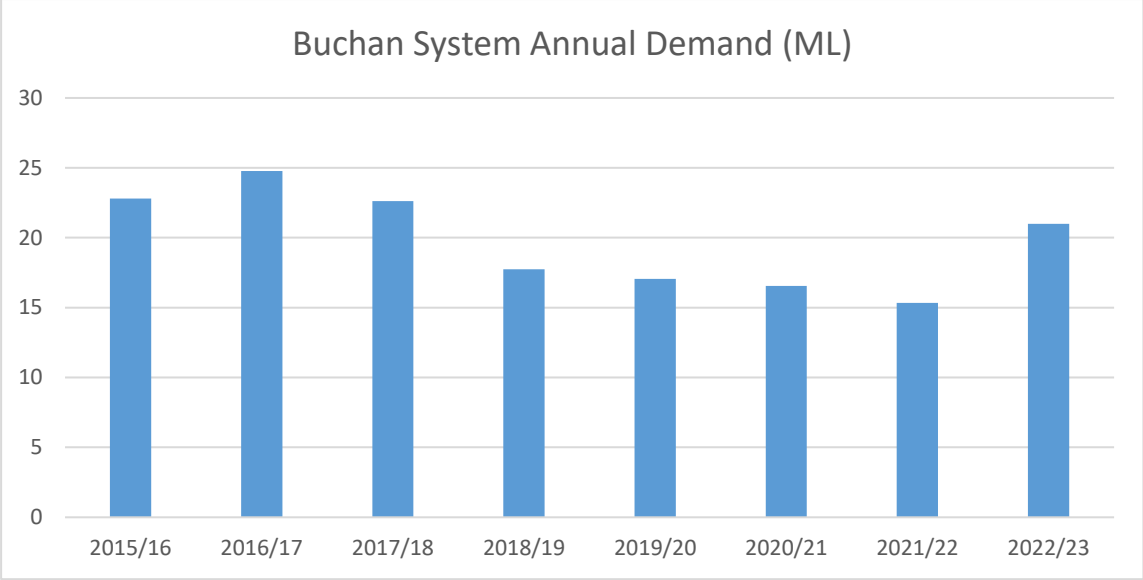


Figure 2-7: Buchan Annual Demand (ML)

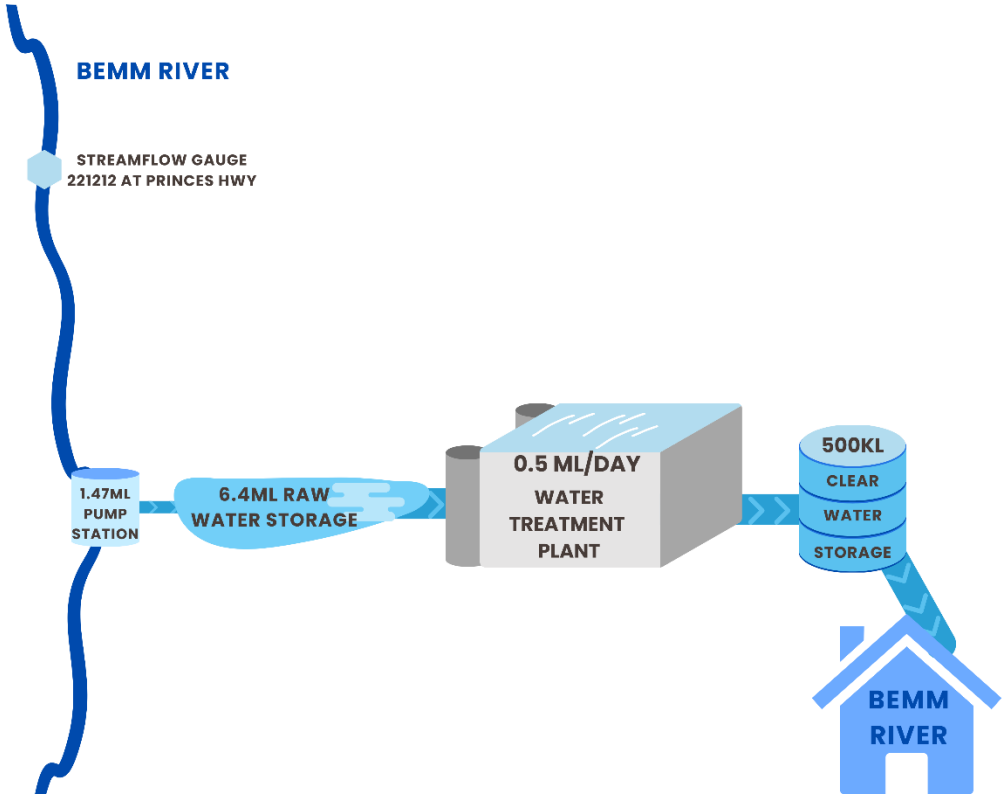
2.8 Bemm River Water Supply

2.8.1 Bemm River System Configuration

Township Supplied: Bemm River

The Bemm River supplies water to the town of Bemm River, which has 102 connections.

System Configuration
Water is extracted from Bemm River, stored in a 6.4ML tank, treated, moved to a 0.5ML tank, and distributed to customers.



2.8.2 Bemm River Supply Information

Water Source	Volume Available (ML)	Volume Used 2022/23 (ML)
Bemm River (Bulk Entitlement)	100.0	11.9

Storage	Size (ML)	Volume Instore (ML Oct 2023)	Percentage Instore
Raw water	6.4	5.0	78.1%
Treated Water	0.5	0.47	94.0%
Total:	6.9	5.47	79.3%

2.8.3 Bemm River Demand Information

The water demand in Bemm River for the year 2022/23 was nearly 15 million liters. The reticulation network has low water loss and is not affected by drought or bushfires. The water demand is likely to

fluctuate around 15ML each year because of the number of visitors to the town. It is anticipated that the water demand for the year 2023/24 will also be around 15ML.

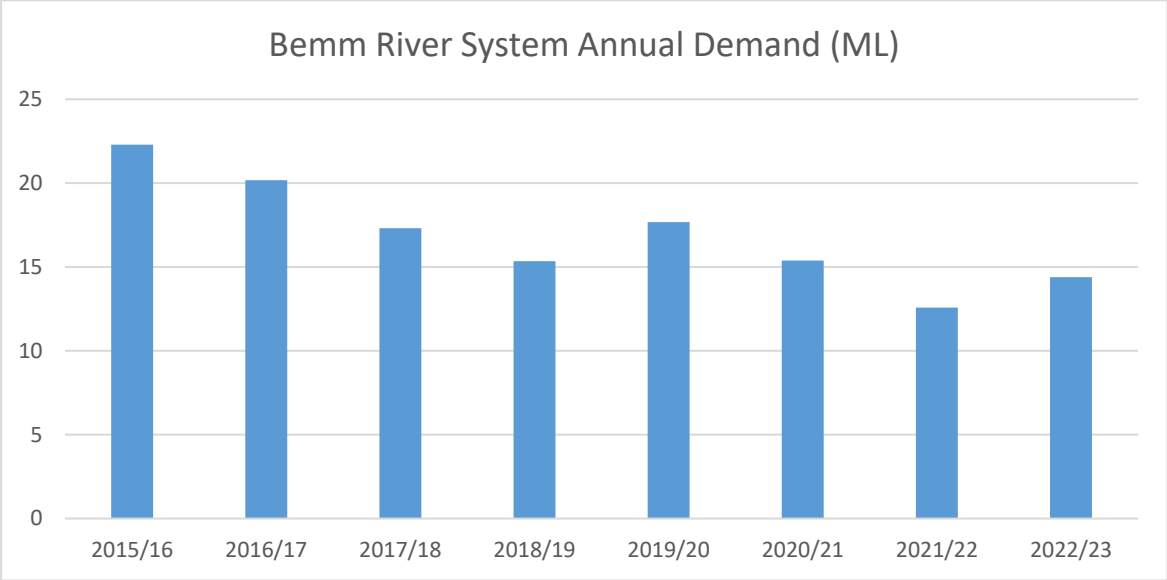


Figure 2-8: Bemm River Annual Demand (ML)

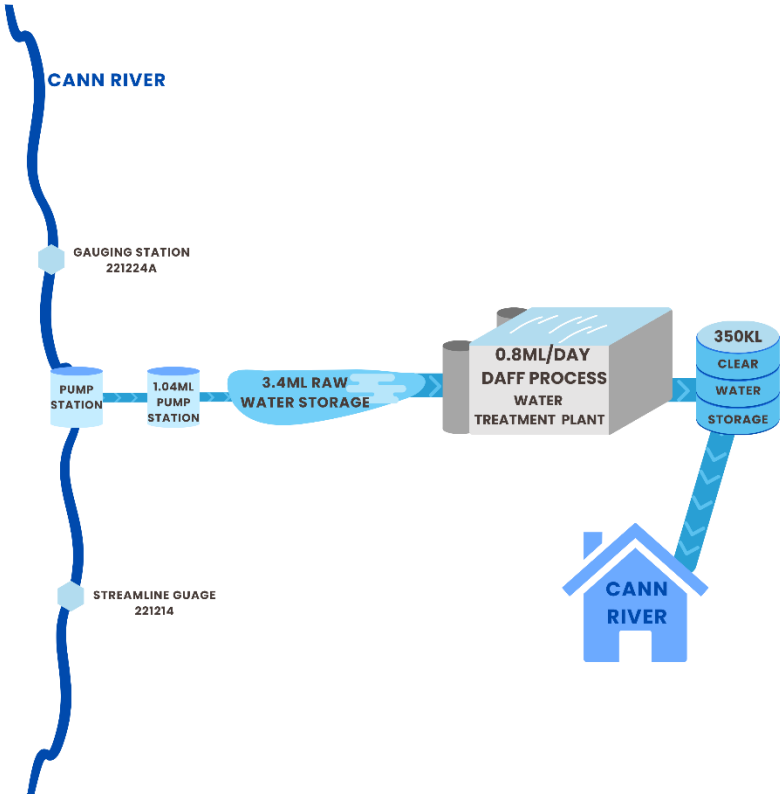
2.9 Cann River Water Supply

2.9.1 Cann River Configuration

Township Supplied: Cann River

The township of Cann River is supplied with water from the river. There are 194 water connections in the area.

System Configuration
Water is drawn from the Cann River, pumped into a 3.4ML raw water storage, treated, and then transferred to a 0.35ML clear water storage before being delivered to customers via the reticulation system.



2.9.2 Cann River Supply Information

Water Source	Volume Available (ML)	Volume Used 2022/23 (ML)
Cann River (Bulk Entitlement)	192.0	33.8

Storage	Size (ML)	Volume Instore (ML Oct 2023)	Percentage Instore
Raw water	3.4	3.3	97.1%
Treated Water	0.4	0.3	75%
Total:	3.8	3.6	94.7%

2.9.3 Cann River Demand Information

Over the past 8 years, the annual water demand in Cann River has been fluctuating, reaching 35ML for 2022/23 as shown in figure 2.9. The fluctuations are likely due to seasonal influences of wet and dry years, as well as tourism.

It is anticipated that the annual water demand for 2023/24 will be approximately 30ML per year.

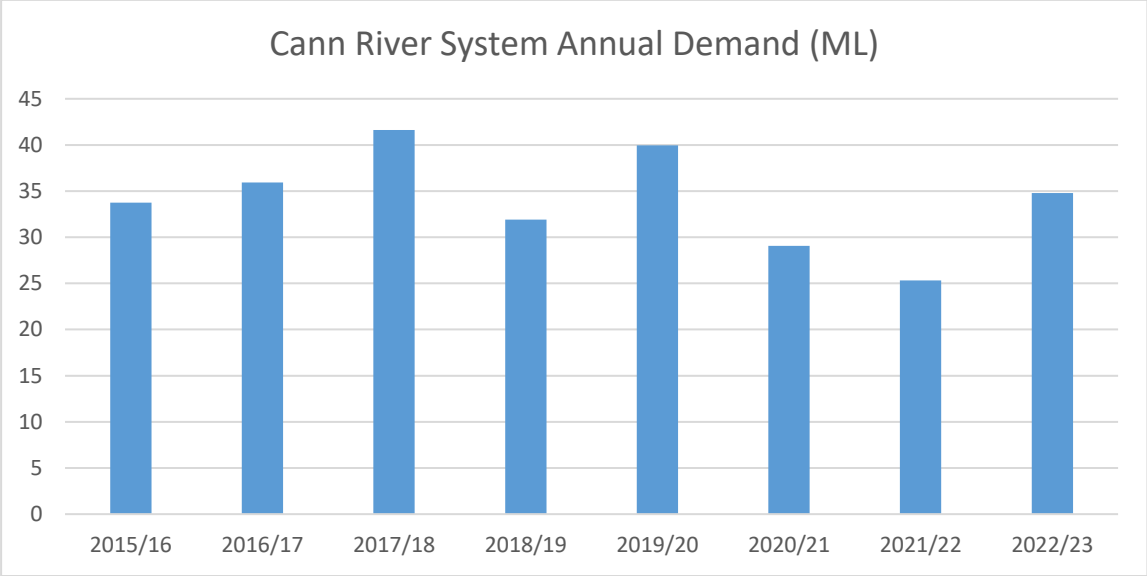


Figure 2-9: Cann River Annual Demand Information (ML)

3 CLIMATE OUTLOOK

3.1 East Gippsland Outlook

According to the Bureau of Meteorology, the climate outlook for East Gippsland is similar to the rest of Australia. For November to January, the rainfall forecast shows that much of western, northern and southern Australia is likely to be below median, with only small areas of northern NSW having an increased chance of above median rainfall.

For East Gippsland, the Bureau of Meteorology predicts below-average rainfall totals for November to January. However, there is a chance of receiving 200mm, which would be close to the average (as shown in figure 3.1). Additionally, some parts of the upper Mitchell catchment may even reach above-average levels.

Regarding temperatures, it is almost certain that maximum temperatures will exceed the median, with November to January maximum temperatures at least twice as likely to be unusually warm for almost all of Australia (as shown in figure 3.2).

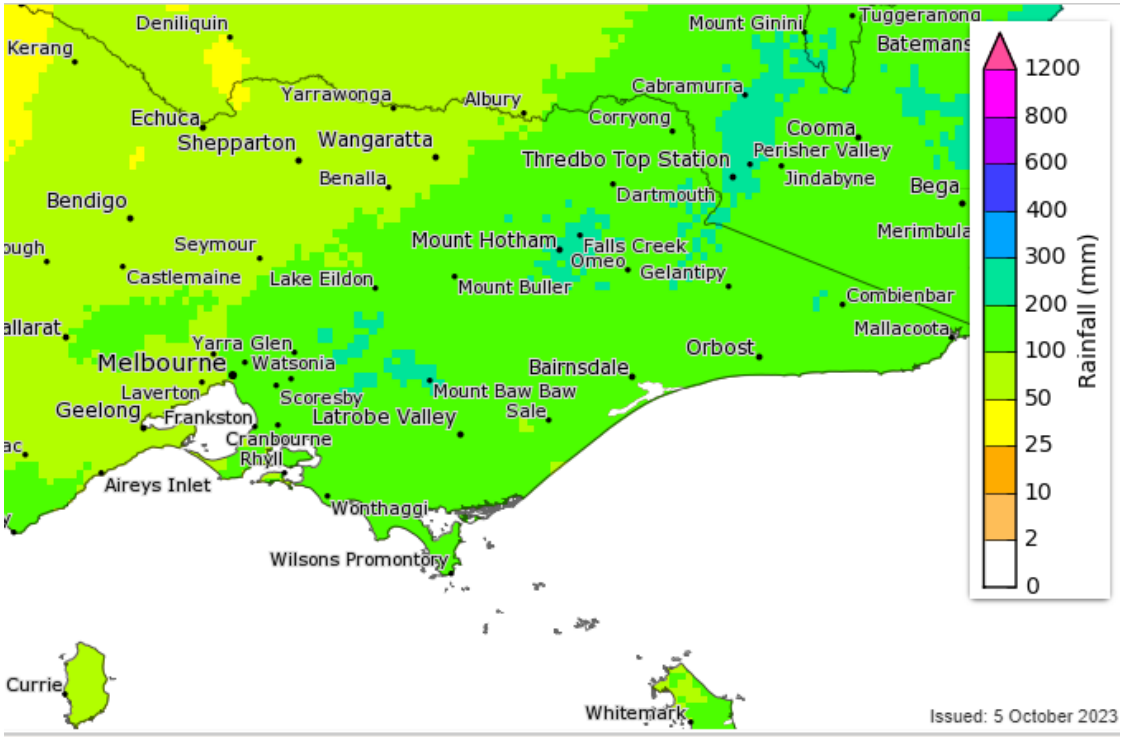


Figure 3.1: The Bureau of Meteorology predicted rainfall totals for November to January

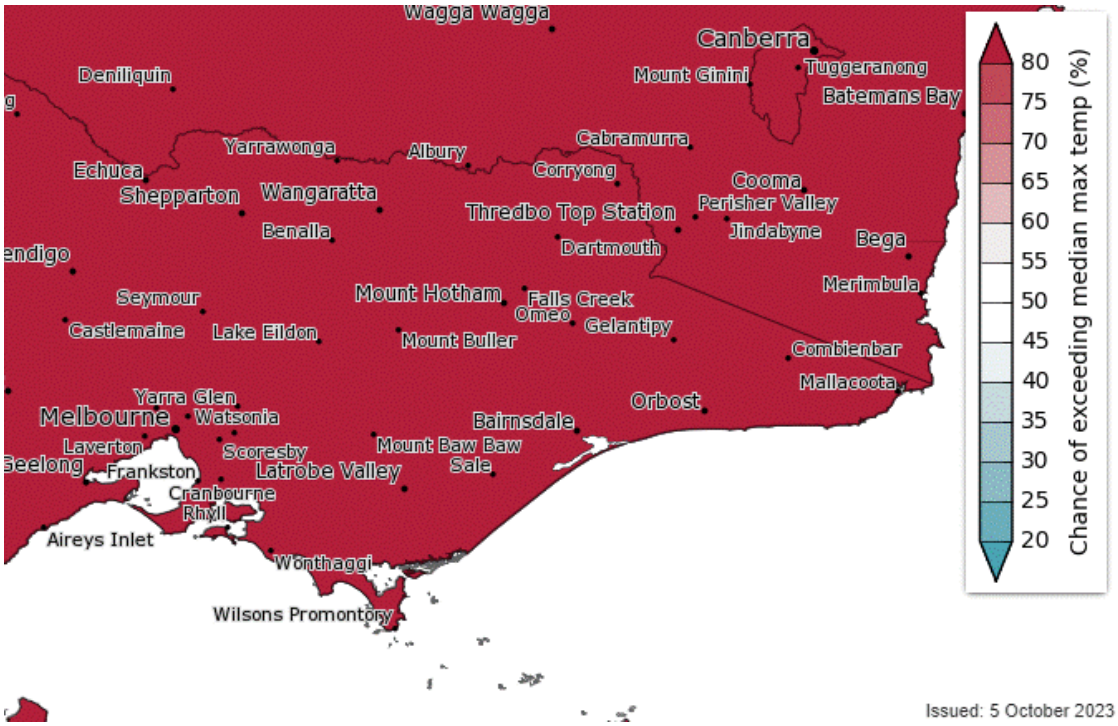


Figure 3.2: The Bureau of Meteorology predicted chance of exceeding median maximum temperatures for November to January

4 FORWARD OUTLOOK

4.1 Mitchell System Forward Outlook

4.1.1 Short term strategy

East Gippsland has an unpredictable and variable climate. Thus, it is possible that by late summer, the Mitchell streamflow could drop below the levels at which EGW is allowed to extract water under its bulk entitlement. To address this issue, water from the Mitchell River has been injected into five groundwater bores located in the Woodglen area. This serves as an additional raw water storage. The Aquifer Storage and Recovery (ASR) groundwater licence allows up to 200ML to be stored in the aquifer for later use when needed. As of now, 195ML of water is available for use under East Gippsland Water's ASR licence. Moreover, there is an additional 171ML of a separate "take and use" licence, giving a current total of 366ML of groundwater available.

To further improve the situation, the planning stage is ongoing for an additional raw water storage at Woodglen. This proposed Woodglen Basin 3 will provide an extra buffer during periods of low flow in the Mitchell River. When constructed, this project would lessen the likelihood of future restrictions to customers in the Mitchell system. However, the construction of this project will not be completed this year, and therefore, it will not improve water security this summer.

A comprehensive risk assessment on Woodglen water basins was completed resulting in the Woodglen #1 raw water storage being returned to its intended full supply level. It is expected that the 150ML shortfall, due to running lower levels, will be recovered by November 2023.

4.1.2 Outlook

The Mitchell River catchment area has received more rainfall in 2023 than it did in the years 2017-2019. However, the months of July and August were dry, causing soil moisture in East Gippsland to drop below average. The Mitchell River streamflows reduced rapidly during this period due to minimal rainfall. Fortunately, streamflows have recovered after a substantial rainfall event in October.

Between 2017 and 2020, the Mitchell River flows fell below 265ML/day, which is the trigger for restricted pumping by EGW. Each year, this occurred progressively earlier. Restricted pumping did not happen in 2022, and it is unlikely to happen in 2023 (Table 4.1). However, the current conditions and long-range forecasts from The Bureau of Meteorology suggest that restricted pumping may occur again in 2024.

The Mitchell River streamflow was comparable to the dry period of 2017-2019 (Figure 4-1), briefly dropping below average in September. During the October rainfall event, streamflows peaked at an incredible 70000ML/day (Figure 4-1), and are currently trending around average.

The monthly rainfall recorded at Bairnsdale over the past six years, compared to the long-term average, shows that the rainfall totals for 2023 are below average (Figure 4.2). It is about 100mm less rainfall as compared to 2017. Despite three consecutive wet years over 2020-22, the catchments have dried out with soil moisture below average. This is a good indication that streamflows in the coming summer are likely to be below average, similar to 2017-2019 (Figure 4.2).

Summer	Date of restricted pumping
2017	5th February
2018	23rd January
2019	5th January
2020	11th December (2019)
2021	19th March
2022	Restricted pumping not triggered
2023	Restricted pumping not expected
2024	Restricted pumping expected

Table 4.1: date of restricted pumping on the Mitchell River

4.1.3 Overall outlook and probability of water restrictions

Based on the current position and a dry outlook, it is possible that the Mitchell River streamflow over the coming summer will be below average. This scenario is expected to be similar to 2018/19, when extraction from the river stopped in late February for approximately a month due to streamflows dropping below 265ML/day and reaching 30ML/d, which caused restricted pumping. A decision will be made to implement stage 2 water restrictions if no significant rainfall is anticipated. Therefore, it is unlikely that stage 4 water restrictions will be necessary, as the Woodglen storage volume should not reach 800ML (as shown in figure 4.3). Consequently, the likelihood of water restrictions is rated as "Possible" using the DELWP (2017) grading system (as shown in table 1).

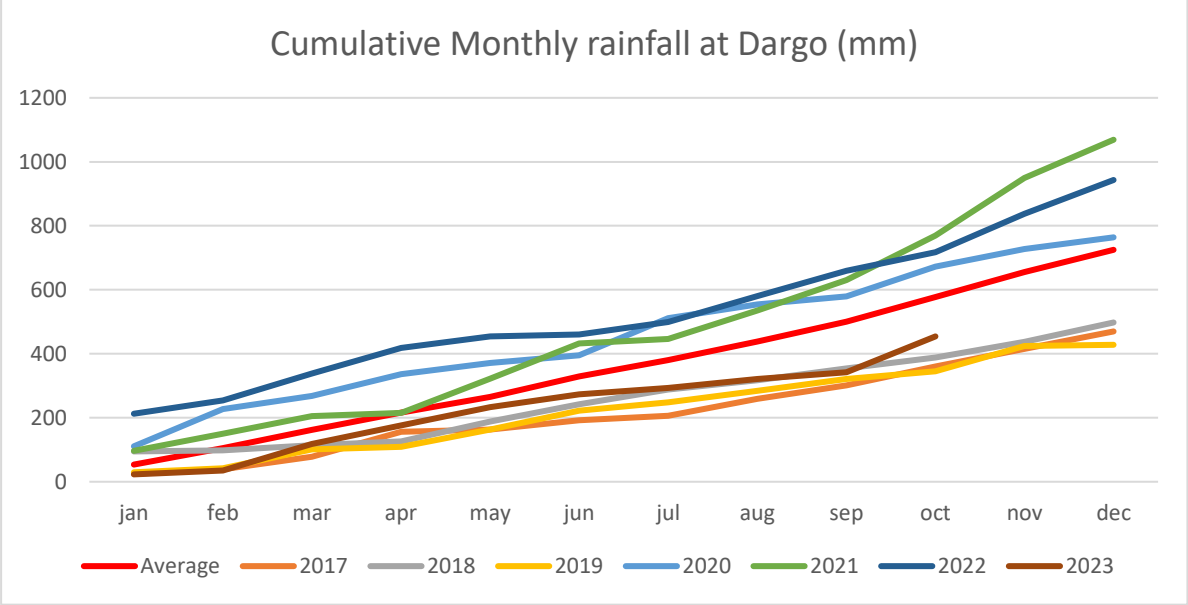


Figure 4-1: Cumulative Monthly Rainfall at Dargo (Long term average rainfall 1939 to present)

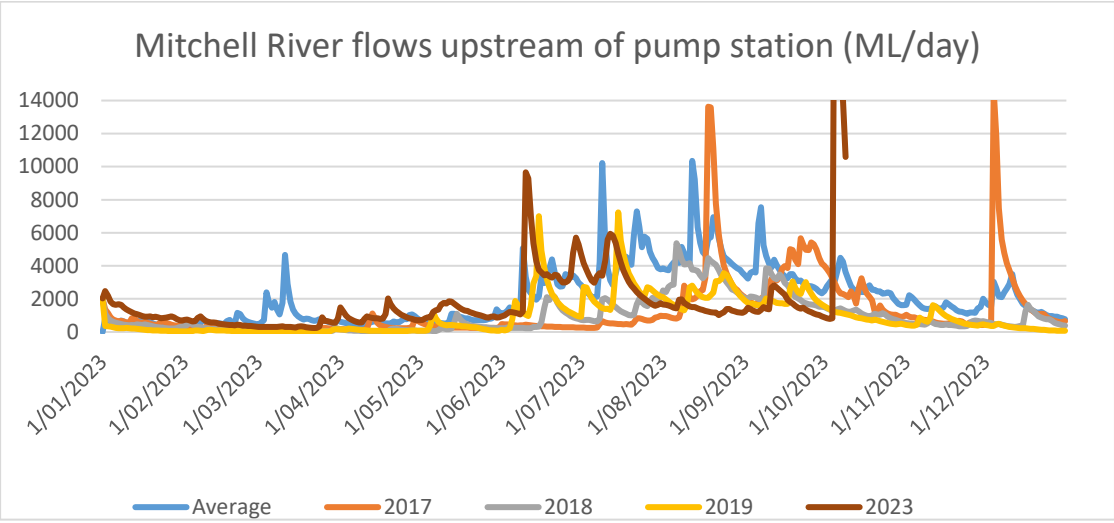


Figure 4-2: Mitchell River daily flow at Glenaladale for 2023 compared to the 2017/19 dry periods against the average flow (2010-2020)

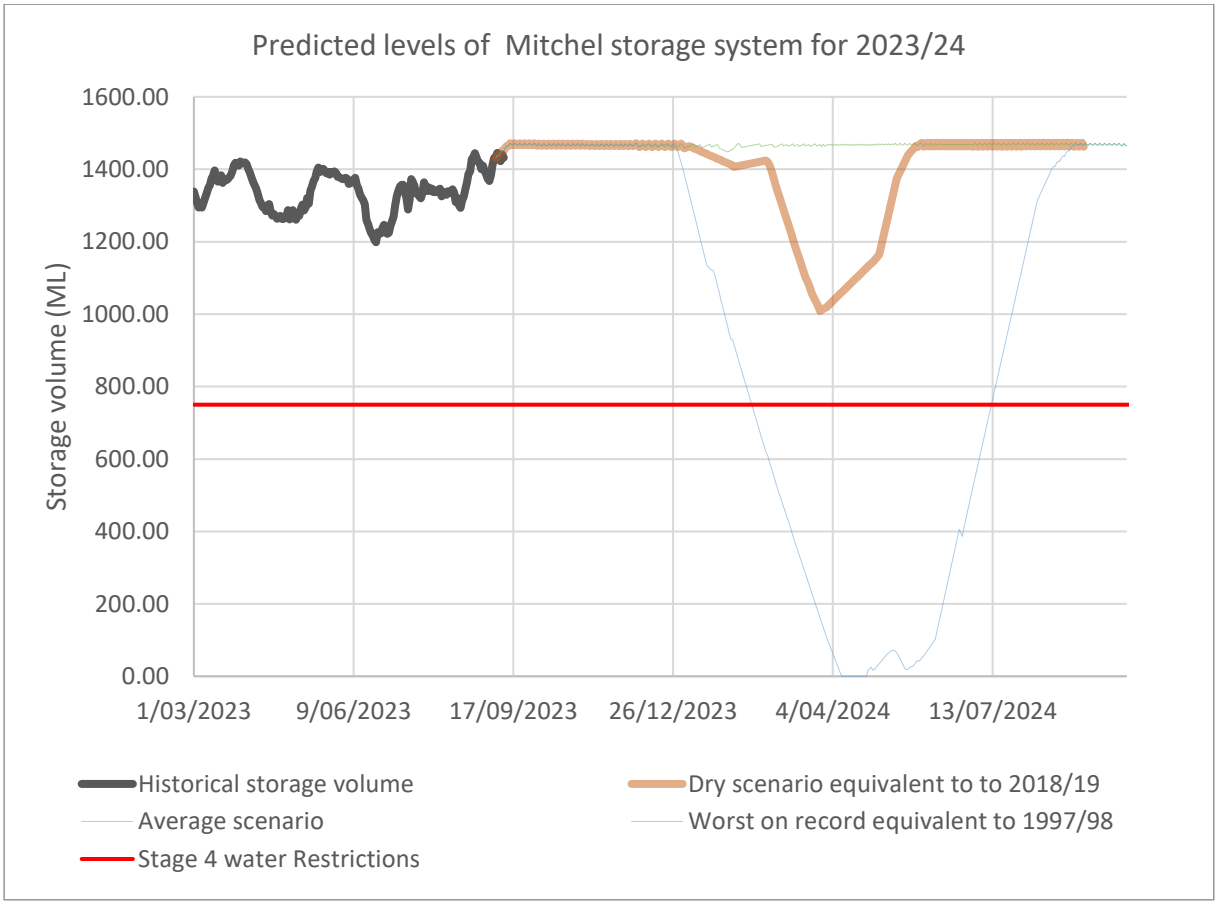


Figure 4-3: Woodglen Storages Dry Scenario (Most probable)

4.2 Orbost System Forward Outlook

4.2.1 Short term strategy and five year plan

In order to meet the demand during the upcoming summer, it is crucial to keep all the storages as full as possible. Experiences from the last summer season after the bushfire in 2019/20, which burned a significant part of the Brodribb River catchment, have highlighted the importance of pre-treating highly

turbid water. Lamella-type infrastructure has been permanently installed to enable quick implementation of the treatment process in case of any dirty water event. In the long run, to ensure the peak demands are met, new clear water storages are planned to be constructed in both Orbost and Marlo.

4.2.2 Outlook

Flow in the Brodribb River has been consistently reliable, with water restrictions only being required twice since 1973. The river flow has never exceeded the limit for a reduction in pumping under the Bulk Entitlement rules from 1975 to June 2015 (as shown in Figure 4-3). The minimum flow recorded over the entire period on record, dating back to 1922, is 16.4 ML/day in February 2010, followed by 17.0 ML/day in February 2007. These values are well above the 5.74 ML/d trigger for a reduction in pumping. Annual extraction volumes are also significantly below the maximum allowable in the Bulk Entitlement and are expected to remain so in the foreseeable future. Based on the historical flow records, the conditions of the Bulk Entitlement, and current climatic conditions, it is unlikely that water restrictions will be imposed over the upcoming summer period. This estimate is based on the DELWP (2017) grading system.

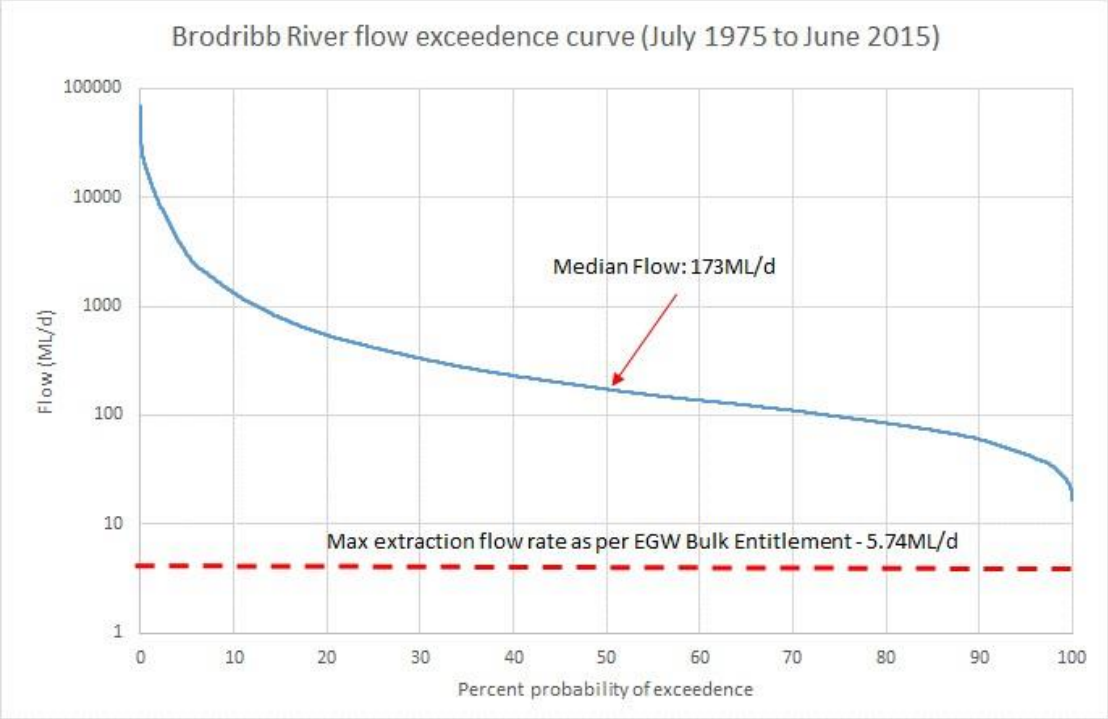


Figure 4-1: Brodribb River flow exceedance – 1975 to 2015

4.3 Mallacoota Forward Outlook

4.3.1 Short term strategy and five year plan

To ensure demand can be met during the upcoming summer, the strategy is to fill all storages to their maximum capacity. Currently, four extraction bores are in operation, out of which one has a dedicated solar pump that reduces emissions and provides uninterrupted service during power outages. Initial tests indicate that the pump can supply enough water to serve approximately 100 houses per day, or 10% of Mallacoota's population. The replacement of a treated water storage tank is planned within the next five years.

4.3.2 Outlook

The Betka River has proven to be an unreliable source of water for Mallacoota during drought years. As a result, the river remains low for most of the year due to the lack of rainfall. Groundwater, on the other hand, has proven to be a more reliable source. Bores have been intermittently pumped at a rate of approximately 12l/s without any long-term impact on groundwater levels.

An Urban Water Strategy water balance has shown that groundwater supply alone is sufficient to cater for current summer demands. This has been proven over the previous summers of drought.

Having a climate-independent groundwater supply and a storage capacity representing 40% of annual demand provides the flexibility to avoid water restrictions in the coming summer period. Using the DELWP (2017) grading system, the likelihood of water restrictions is rated as "Rare".

4.4 Dinner Plain Forward Outlook

4.4.1 Short term strategy and five year plan

Dinner Plain experiences peak demand during the winter snow season due to tourism and snow making. The Dinner Plain Resort council is currently working on establishing an independent snow making system, which will significantly reduce the impact on the water supply. Despite an increase in non-revenue water during 2022/23, the current water supply system has sufficient capacity to meet the demand of the village. However, the corporation has identified the need for a non-revenue water operational plan. There are no plans for any further major capital works in the next five years.

4.4.2 Outlook

The groundwater bores at Dinner Plain are a reliable source of water that is not affected by changes in the climate in terms of volume. Therefore, it is more certain that the water supply will meet the demand than if the source was surface water. According to the Urban Water Strategy's water balance model, the current groundwater bores, along with the 0.6ML storage, can meet the predicted demand at least until 2040. Since the groundwater bores are relatively independent of the climate, the likelihood of water restrictions in the next year is rated as "Rare" using the DELWP (2017) grading system.

4.5 Omeo Forward Outlook

4.5.1 Short term strategy and five year plan

To meet the peak summer demands, it is crucial to maintain the storages as close to their maximum capacity as possible. There are no plans for any capital works to be carried out on the Omeo system in the next five years, except for exploring alternative sources of water.

4.5.2 Outlook

According to the Urban Water Strategy's water balance, even with the lowest Butchers Creek flow on record (2009/10), there is enough raw water storage to meet current demand without any water restrictions. The main issue is the impact of bushfires, which caused the WTP to be bypassed during the 2019/20 event in order to keep up with demand.

Butchers Creek catchment is located north of the Great Dividing Range and receives rainfall from the northeast that other areas of East Gippsland do not receive. Throughout winter and early spring, it receives more rainfall than other catchments across East Gippsland. However, it is possible that Butchers Creek may cease to flow this summer. Nevertheless, storage volumes in Omeo are sufficient to withstand a cease flow event in Butchers Creek for a couple of months without imposing water restrictions.

As a result, the likelihood of water restrictions in the next twelve months is considered "unlikely" using the DELWP (2017) grading system. In extreme circumstances, there may be a need to transport water from Omeo to Swifts Creek to address a water shortage. This was necessary in 2006/07, but given improvements at Swifts Creek and the fact that it was not required during the most recent drought years, it is considered unlikely.

4.6 Swifts Creek Forward Outlook

4.6.1 Short term strategy and five year plan

To ensure that we are ready to meet the high demands expected in the upcoming summer season, it is important to maintain our storage facilities at or near full capacity. It is also crucial to keep the Tambo River's off-take pool clear of obstacles and as deep as possible.
During the summer of 2019, a submersible pump was installed at the Swifts Creek off-take. This allowed us to harvest water even when the river levels were low, which was a great success.
We do not have any plans for major capital works in the next five years, except for regular maintenance work at the off-take.

4.6.2 Outlook

The Urban Water Strategy has evaluated that the current demand for water can be mostly met by relying on historical flows and current storage volumes. However, the main concern is the possibility of the Tambo River ceasing to flow, which poses a significant risk to meeting demand.

Since 1947, the Tambo River's flow has dropped below 1 ML/d approximately eight times, with a single instance of a cease to flow event occurring in 2007. During such low flow events, water restrictions are likely to be imposed. For instance, since 1998, Swifts Creek has been subjected to water restrictions thrice due to low flow events. However, during the 2017-2020 drought years, EGW was able to maintain water supply to Swifts Creek without having to cart water.

In case of an extended no flow event in the Tambo River, the town's water supply can be ensured by trucking in water. This was successfully carried out in 2003 and 2006 when potable water was carted from Omeo. Furthermore, with the installation of the raw water basin, the opportunity exists to cart raw water from alternate sources.

Considering the current seasonal outlook in East Gippsland, it is possible that the Tambo River's flow may drop below 1ML/d, but it is unlikely to cease to flow this summer. Therefore, the probability of water restrictions being imposed in the next twelve months is rated as "Possible" by using the DELWP (2017) grading system.

4.7 Buchan Forward Outlook

4.7.1 Short term strategy and five year plan

To meet the peak summer demands, the best short-term strategy is to keep the storage at Buchan as full as possible. However, this storage represents less than a week's supply during summers. As a solution, a new 0.43ML Raw Water Tank was constructed earlier this year to enhance the water supply system's resilience during low streamflows or high turbidity periods.

4.7.2 Outlook

During the summer of 2019/20, there were massive bushfires that destroyed the remaining part of the Buchan river catchment that had not been burnt in previous years. The area was already experiencing a drought, and water had to be transported from both Nowa Nowa (Mitchell system) and Orbost to meet the demand.

After the rains, the river began to flow again, but it was heavily affected by ash and silt from the fire. To treat the water, the lamella plate clarifier that was used the previous year was reinstalled, and it was successful. The unit has now been permanently installed and can be used to treat highly turbid water after any heavy rain event.

If the Buchan River stops flowing, the town can still get water through carting. However, with the current seasonal outlook, the Buchan River may stop flowing in the coming summer. Due to this, the probability of water restrictions in the next twelve months has been rated as "Possible" using the DELWP (2017) grading system.

4.8 Bemm River Forward Outlook

4.8.1 Short term strategy and five year plan

The best short-term strategy to meet the upcoming peak summer demands is to maintain full storage. No capital projects are planned for the next five years.

4.8.2 Outlook

According to the Urban Water Strategy, the current storage volumes, Bulk Entitlement, and expected future river flow are sufficient to meet the current and future demands for potable water. However, the biggest risk to the supply of potable water is the possibility of an event such as a bushfire, which could temporarily render the quality of the water in Bemm River unusable.

The treated water storage capacity of 0.500ML and the raw water storage capacity of 6.4ML can provide enough supply for about three months. This period provides enough time to implement actions to address water quality risks, such as high turbidity.

The Bemm River water supply system has been in operation since 1984, and there has only been one instance of voluntary water restrictions imposed in 2003, and that was due to the threat of bushfire which did not occur. The system was able to manage significantly lower flows in 1997/98 without imposing any restrictions.

Given the current dry outlook, the Bemm River is still considered very dependable. With its large storage capacity of three months and the infrequent previous water restrictions, the likelihood of water restrictions in the next year is rated as "Rare" using the DELWP (2017) grading system.

4.9 Cann River Forward Outlook

4.9.1 Short term strategy and five year plan

The best short-term strategy to meet the upcoming peak summer demands is to keep the storage facilities at maximum capacity. No major capital projects are planned for the next five years.

4.9.2 Outlook

According to the Urban Water Strategy, the flow of the river has dropped below the 1.04 ML/day Bulk Entitlement trigger (for reduced pumping) only 2% of the time and stopped flowing only once (briefly) over the last decade. This means that the risk of not being able to meet restricted demand is relatively low and in case of an unlikely extreme short term water shortage, carting from Bemm River can be considered as a viable option. Over the past forty years, Cann River has not faced any water restrictions, except for two brief periods of voluntary restrictions in 1998 and 2003. Even with the current dry outlook, the Cann River is considered reliable. According to the DELWP (2017) grading system, the likelihood of water restrictions in the next twelve months is rated as “Unlikely”.

5 Short Term Actions

5.1 Mitchell System Actions

Action	Timing	Status	Comments
Optimise volume in Woodglen storages	October 2023 until pumping stops	On track	Storages currently full and will be maintained at Top Water Level (TWL) throughout summer
Maximise volume in Groundwater storage	October 2023 until demand exceeds pumping	On track	Will achieve 200ML of ASR water.
Investigate additional entitlements	End of 2024	On track	Potential for ASR expansion
Woodglen III - 800 ML storage	Under consideration	On track	
Recommissioning of Toorloo storage and network	Under consideration	On track	Feasibility study underway

5.2 All other System Actions

Action	Timing	Status	Comments
Maximise volume in storages	Ongoing	On track	Most will be at capacity by December.
Orbost: Extend suction pipework, and sandbag pump hole.	If stream flows drop and pumping becomes difficult	Not Started	Pipework purchased, confirm permission from EGCMA for riparian works granted.
Orbost: Establish an operational plan for the Siltbusters (lamella process)	A preliminary assessment has seen the system in a good state	On track	A few minor works are to be completed to keep this process in a ready and automated state.
Mallacoota: Establish triggers to switch the supply between the Betka river to bores	ongoing	Not Started	Low flow and water quality issues are the main triggers.
Dinner Plain: Investigate causes of non-revenue water	Ongoing and as required	On track	A leak detection program is being developed and be implemented if excessive demand is anticipated.
Bemm River: Assess condition of offtake pump	As required	On track	Run to fail mode was selected due to the difficulties with servicing. A spare pump is ready to install when the offtake pump fails
Cann River: Clean and inspect offtake	As required	On track	A biannual inspection is carried out over low demand periods

spear and service pump			
Permanent water saving signs in key locations	All year round	Completed	Permanent reminder of the message to save water

6 Urban Water Strategy Actions

Action	Timing	Status	Comments
Construction of an additional off-stream raw water storage at the existing Woodglen site	2027-28	On track	Preliminary business case in progress in parallel to storage design.
Explore alternative water sources for Orbost and Omeo systems	2024-25	Not started	Scheduled as part of normal master planning processes.
Construction of Class A Recycled Treatment Plant at Bainsdale	2024-28	On track	In the concept and design phase.

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