



Safe Drinking Water Act 2003

Water Storage Manager 2019-20

Water Quality Annual Report



Excellence



Honesty



Accountability



Courage



Caring

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Front cover photo: Lake Buffalo

1. Introduction

Goulburn-Murray Rural Water Corporation, trading as Goulburn-Murray Water (GMW), is defined as a Water Storage Manager (WSM) under the *Safe Drinking Water Act 2003* (the Act). This 2019/20 Annual Report to the Secretary of the Department of Health and Human Services (DHHS) has been prepared to satisfy the annual reporting requirements of the Act and Safe Drinking Water Regulations 2015 (Regulations).

This report demonstrates GMW's ongoing commitment to managing risks to the quality of the water the corporation delivers to urban Water Suppliers.

The report contains the following sections:

- Section 2 Goulburn-Murray Water systems and role
- Section 3 Regulations component report
- Section 4 Other relevant information and activities

Further information regarding this report can be obtained by contacting the Water Quality Manager during business hours on (03) 5826 3500 or by email reception@gmwater.com.au.

2. Goulburn-Murray Water Systems and Role

2.1. Supply Systems

GMW manages the bulk water delivery and transfer for around 30% of Victoria's land area, or approximately 68,000 km² (Figure 1). GMW operates 22 storages in its region including Murray-Darling Basin Authority storages managed by Victoria. GMW's area of operation includes the Upper Murray, Mitta Mitta, Kiewa, Ovens, King, Broken, Goulburn, Campaspe and Loddon river basins as well as the River Murray. GMW also operates an extensive network of water distribution channels, pipelines and natural carriers to deliver raw water to its customers. Customers take water from these supply systems via a pump or a gravity irrigation outlet. Customers include irrigators, domestic (not for human consumption), stock, environment and regional water corporations (urban Water Suppliers).

Water supplied by GMW is not treated to improve its suitability for any particular use and should never be considered fit for human consumption without first being properly treated.

GMW provides water to six urban Water Suppliers in accordance with bulk entitlements granted under the *Water Act 1989*:

- Coliban Water (CW)
- Central Highlands Water (CHW)
- North East Water (NEW)
- Goulburn Valley Water (GVW)
- Grampians Wimmera Mallee Water (GMMWater)
- Lower Murray Water (LMW)

At times water may also be supplied to the three metropolitan water corporations via Melbourne Water infrastructure (see Section 4.3). The Sugarloaf (North-South) Pipeline was not used for transfers in 2019/20; however, water may be taken at times for maintenance and routine testing of the system.

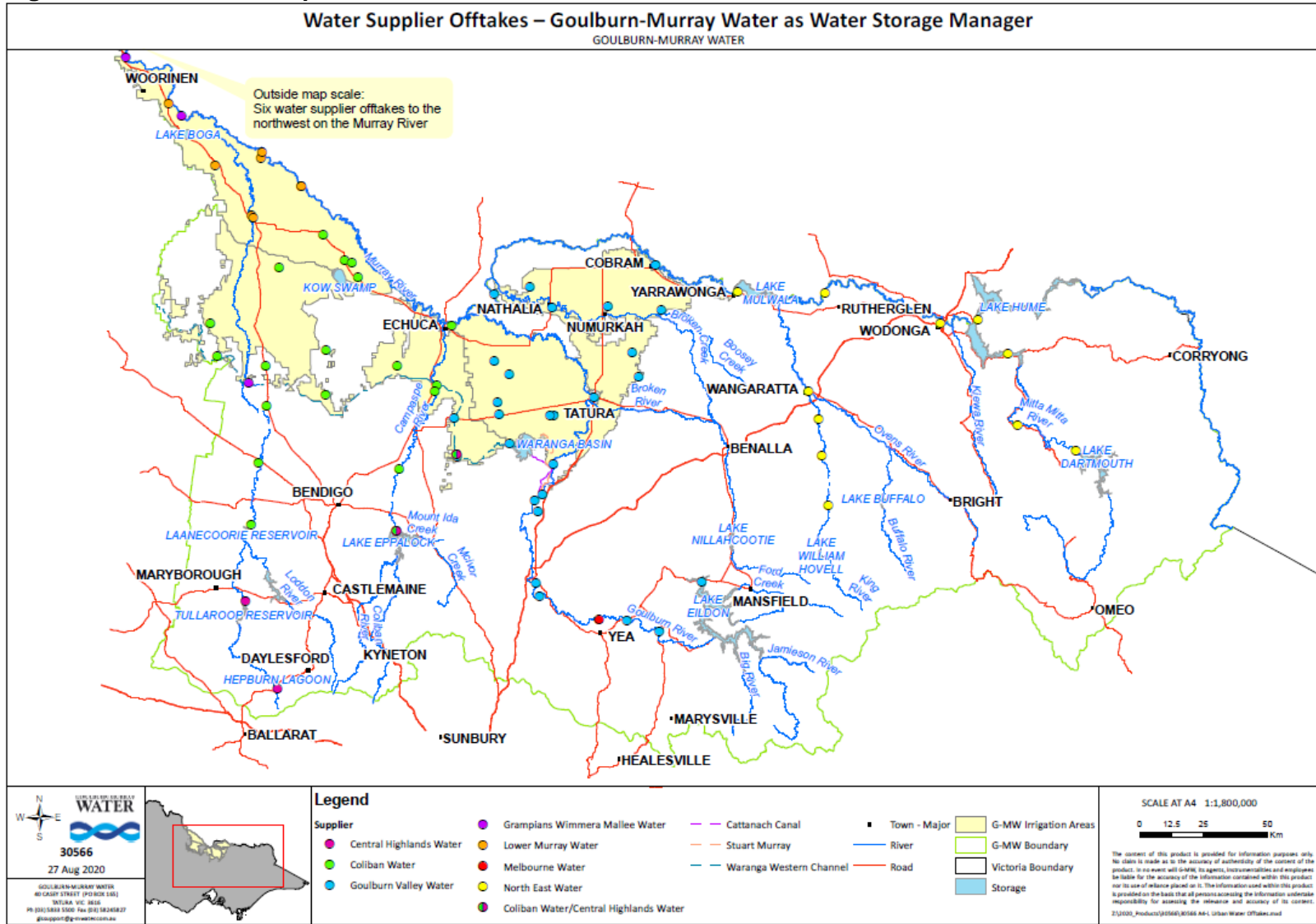
The bulk entitlements provide for quantity of supply, but make no guarantee of quality. Raw (untreated) water is supplied by GMW to urban Water Suppliers for treatment and distribution to their customers in 139 towns via 83 offtake points across northern Victoria (see Appendix 1 for a list of towns supplied including water sources).

GMW provides raw water to urban Water Suppliers in four different ways:

1. From GMW storages directly via water supplier infrastructure e.g. GVW for Nagambie from Goulburn Weir/Lake Nagambie.
2. Via the outlet works of GMW storages e.g. CW for Bendigo from Lake Eppalock.
3. Indirectly from rivers supplied by GMW storages e.g. GVW for Seymour from Goulburn River, supplied by Lake Eildon.
4. Via GMW's channel and pipeline systems e.g. multiple urban Water Suppliers for towns in the Goulburn Murray Irrigation District.

During the year GMMWater's South West Loddon Pipeline commenced operation, which is partly supplied by GMW's Waranga Western Channel. Coliban Water can access water from the pipeline for a number of townships. There were no other changes during 2019/20 to water supply arrangements where GMW is the Water Storage Manager (WSM).

Figure 1: GMW's area of operation



2.2. Policy & Plan

GMW's commitment to drinking water quality management is reflected in the corporate Safe Drinking Water policy. The objective of this policy is to ensure that GMW meets its obligations as a WSM under the Act and Regulations. It requires GMW to *address threats to safe drinking water as a WSM by preparing and implementing a risk management plan in relation to its supply of water to an urban Water Supplier.*

GMW is required to consider risk management for all of the water supply mechanisms it uses to provide water to urban Water Suppliers. This includes risks associated with:

- the catchment leading to each storage;
- each storage itself;
- the supply of water downstream of storages using natural carriers such as rivers and creeks; and
- the supply of water via channel and pipeline systems to each town offtake.

A Risk Management Plan (RMP) has been prepared and implemented in accordance with the Act and Regulations and is regularly reviewed by GMW. The plan includes requirements of the Act and Regulations and outlines GMW activities to manage the risks to water quality. The RMP includes a section that specifically focuses on risks in and around GMW's storages and within GMW's irrigation districts.

2.3. Communications

GMW communicates regularly with urban Water Suppliers to discuss any issues arising from the RMP or operations including incident response, blue-green algae risk and water resource management as well as sharing other relevant information. Engagement with each urban Water Supplier includes two scheduled urban Water Supplier-WSM meetings per year and additional communication when required.

Urban Water Suppliers are invited to participate in GMW's risk identification and review process for the storages and irrigation areas relevant to their town offtakes. This involves participation in a review workshop to ensure that all hazards to water quality are identified and appropriately rated, which helps to ensure a consistent understanding of hazards amongst the organisations. The storage and irrigation areas risk assessment reviews are scheduled every 2 to 5 years based on a calculated overall risk rating for each location. During 2019/20 risk assessments were reviewed for 3 storages, 3 irrigation areas and the overall GMW region (see Section 4.1).

GMW has entered into a Memorandum of Understanding with each of its six urban Water Suppliers (since 2009), Melbourne Water and Melbourne's three retail water businesses (since 2011) that documents commitment by the parties to work together and share information relevant to the implementation of their respective RMPs. The MoUs with the regional water corporations were renewed in early 2020 without any significant changes.

GMW also engages with representatives of the North East, Goulburn Broken and North Central catchment management authorities (CMAs) and other organisations with a role in land and/or water management to enable knowledge exchange and a coordinated approach to issues impacting water quality. Section 4.1 provides a summary of activities GMW undertakes to manage risks to water quality, including water quality monitoring.

2.4. Monitoring

Regular water quality monitoring is undertaken at GMW storages for blue-green algae (BGA) and basic physico-chemical parameters including nutrients, pH, turbidity and electrical conductivity. Regular testing for BGA is undertaken in other parts of GMW's system where it has been determined, based on historical data, that there is a likelihood of high algae counts. The

frequency of monitoring at each location is based on BGA risk, which is determined from frequency of historic blooms and the consequence of high BGA levels. The consequence takes into consideration presence of town offtakes, size of population supplied, the type of recreation permitted and popularity. Section 3.1 provides an overview of BGA management and warnings during 2019/20.

3. Regulation Components Report

3.1. Emergency and incident management

Safe Drinking Water Regulation 17 – Additional details to be included in annual reports of water storage managers:

(a) information about actions taken by the water storage manager in respect of each emergency, incident or event that has arisen that has affected—

(i) the quality of the water supplied for drinking purposes generally; and

(ii) the quality of the water supplied where that supply posed a risk to human health;

(b) any issues that may have arisen out of the taking of the actions referred to in paragraph (a);

Section 22 Notifications

There were no incidents that required GMW to report to DHHS under Section 22 of the Act during 2019/20.

Other emergencies, issues or events

There were significant bushfires between December 2019 and March 2020 that impacted the upper Murray, Mitta Mitta, Ovens and, to a lesser extent, upper Goulburn catchments. Hume Dam, Lake Buffalo, Dartmouth Dam and Lake Eildon were the storages that had the potential for water quality to be impacted by runoff from burnt areas. Four town offtakes where GMW is the Water Storage Manager were at risk from poor water quality namely: Wangaratta, Tallangatta, Bellbridge and Dartmouth, which are all supplied by North East Water.

GMW and North East Water are part of the North East Region Water Quality Group and other wider scale working groups that monitored and managed the potential impacts to water quality from the fires. Additional continuous and spot water quality monitoring was established, along with communication and data sharing between key stakeholders. The additional monitoring focused on turbidity, dissolved oxygen, temperature, pH and electrical conductivity at key locations within and downstream of the burnt catchments. GMW initiated additional spot monitoring at seven locations upstream, downstream and within Lake Buffalo. The monitoring was undertaken weekly and after rainfall events for the first 5 months. Initial observations showed greatest impacts after the first rainfall events following the fires are extreme turbidities (>200 NTU). Other agencies led by DELWP established the bushfire Rapid Risk Assessment Team (RRAT) that investigated priorities for rehabilitation measures in fire affected catchments.

In order to understand the incident information below and in Appendix 2, it should be noted that the catchments in northern Victorian where water is harvested are open to a wide variety of land and water based activities and are not closed to public access or use like some of Melbourne's water supply catchments. These land use activities include agriculture, aquaculture, mining, forestry, industry, regional urban centres, townships, transport infrastructure and recreation.

During 2019/20 GMW recorded an additional 9 incidents that had the potential to affect the quality of water delivered to an urban Water Supplier (urban Water Supplier potentially impacted shown in brackets):

- Six blue green algae recreational warnings (NEW, GVW, CW)

- A spill from a sewerage pipe damaged during construction work at Yarrawonga Weir (NEW)
- A potential oil/fuel spill from a car, boat and trailer entering Waranga Basin (GVW)
- A sewage spill from another authority's failed air valve into Torrumbarry Irrigation Area Number 1 Channel (CW)

GMW notified the relevant urban Water Supplier in each instance. Each incident was handled using GMW's Incident Response and Recovery Plan and associated procedures. This plan includes processes for communicating about, responding to and reviewing the incidents. Further details of these incidents including actions undertaken by GMW are listed in Appendix 2.

GMW continues to work with urban Water Suppliers and other catchment partners to minimise the impact to water quality from incidents and activities that occur within GMW's area of operation (see Section 4.1 for details). For example, GMW participated in a workshop in February 2020 with urban Water Suppliers, DELWP, DHHS and SA Water to understand the emerging taste and odour complaints across a wide area and explore solutions. Moderate levels of a blue-green algae (BGA) species previously uncommon in northern Victoria were causing unusually high Geosmin concentrations. Agencies shared their experiences and approaches to the problem, with the aim of developing a consistent response.

Blue-green algae management

Management of BGA by GMW is a key program that addresses a common threat to the supply of safe water. The Blue-green Algae Circular (the Circular) issued by the Department of Environment, Land, Water and Planning (DELWP) provides the main guidance for BGA preparedness and response.

High levels of BGA regularly occur in waterbodies within GMW's region and have the potential to affect drinking water supplies. In accordance with the Circular, GMW is the Local Water Manager (LWM) for BGA risk management in its storages and water supply network (largely open channels) and is the Regional Coordinator (RC) for BGA preparedness and response across the region. Algae in the River Murray is primarily monitored and managed by New South Wales authorities, in partnership with GMW and other Victorian agencies via the Murray Region Algal Coordinating Committee (MRACC).

GMW prepared BGA Response Plans and monitoring programs for all GMW managed water bodies and river basins in accordance with the protocols set out in the Circular. These plans provided guidance on the preparation for and response to BGA incidents, including notification of relevant stakeholders. GMW continued to engage with relevant stakeholders, including hosting the pre-season meeting on 25 October 2019, which is also a requirement of the Circular.

Monitoring programs focus on those sites and parameters that can affect recreation and system operations, in particular major storages and weirs. These assets are monitored at least monthly throughout the year, with frequency increasing during the summer months for many assets when the risk of harmful BGA levels being reached is higher.

A BGA Status Report is circulated at least monthly to a broad range of stakeholders including DHHS, DELWP, urban Water Suppliers, CMAs and local government. The report contains the latest BGA laboratory results for GMW's storages and key water supply assets.

BGA warnings issued by GMW are communicated to urban Water Suppliers, stakeholders, customers and public via multiple mechanisms including phone, GMW's website, the BGA hotline, letters, text messages, social media and the BGA Status Report.

Blue-green algae warnings

In 2019/20, six BGA warnings were issued based on recreational guidelines. In addition, 13 warnings issued during 2018/19 were still in place after 1 July 2019. The BGA warning at Lake Eppalock was the only warning that extended into the 2020/21 year. Table 1 summarises the BGA warnings issued by GMW in 2019/20 or still in place and the urban Water suppliers notified. Actions undertaken for each warning included notification of affected urban Water Supplies,

customers and stakeholders via phone, email, SMS or letter; advice to public via signage, media release, website, telephone hotline & social media; and additional surveillance and monitoring.

In accordance with the 2019/20 BGA response plans, GMW advised DELWP and DHHS via the BGA status report of any BGA levels that had the potential to affect public health. DHHS and DELWP were also notified via telephone and email when the concentration of BGA exceeded a recreational trigger and/or widespread BGA scums were observed.

BGA factsheets and information on the current BGA warnings for GMW's storages and irrigation areas can be found on the BGA Warnings webpage www.gmwater.com.au/bluegreenalgae-alert/.

In addition, the public can access warning information by calling GMW's BGA Hotline on (03) 5826 3785, by contacting GMW directly during business hours on 1800 013 357 or by emailing reception@gmwater.com.au.

Table 1: Blue Green Algae Recreational Warnings issued by GMW 2019/20

Basin/System	Location	Warning dates (duration)	Water Supplier (WS) notified
Murray River Basin	Yarrowonga Weir	13/2/20 to 7/5/20 84 days	NEW
Goulburn River Basin	<i>Lake Nagambie/Goulburn Weir - Turners Lane Backwaters East & West near Kirwan's Bridge</i>	<i>25/3/19 - 30/8/19</i> <i>158 days</i>	<i>GVW</i>
	Lake Nagambie/Goulburn Weir - confined to the Turners Lane Backwater East	5/2/20 to 29/4/20 84 days	GVW
	Lake Nagambie/Goulburn Weir - confined to the Turners Lane Backwater West	5/3/20 to 29/4/20 55 days	GVW
	<i>Lake Nagambie/Goulburn Weir</i>	<i>23/5/19 - 30/8/19</i> <i>99 days</i>	<i>GVW</i>
	<i>Waranga Basin</i>	<i>1/3/19 - 3/7/19</i> <i>124 days</i>	<i>GVW</i>
Central Goulburn Irrigation Area	CG No 7 & 8	26/2/19 - 8/7/19 132 days	GVW
	CG No 9	26/2/19 - 16/7/19 140 days	GVW
	CG channel 12/7/9	10/1/19 - 16/7/19 187 days	No WS impacted
Rochester Irrigation Area	<i>Entire irrigation area</i>	<i>26/2/19 - 8/8/19</i> <i>163 days</i>	<i>GVW/CW</i>
	<i>Rochester channel 23 - RO716</i>	<i>5/2/19 - 8/8/19</i> <i>184 days</i>	<i>No WS impacted</i>
Campaspe River Basin	Lake Eppalock	18/2/19 - 26/7/19 158 days	CW
		16/12/19 to 21/8/20 249 days	CW
Loddon River Basin	<i>Cairn Curran Reservoir</i>	<i>5/3/19 - 8/8/19</i> <i>156 days</i>	<i>No WS impacted</i>
	<i>Tullaroop Reservoir</i>	<i>17/4/19 - 19/2/20</i>	<i>CHW</i>
Loddon Valley Irrigation Area	<i>Loddon Valley channels East of the Loddon River</i>	<i>21/2/19 - 16/7/19</i> <i>145 days</i>	<i>CW</i>

Basin/System	Location	Warning dates (duration)	Water Supplier (WS) notified
East Loddon Water District	<i>East Loddon Storage Dam</i>	<i>1/5/19 - 9/7/19</i> 69 days	<i>CW</i>
Torrumbarry Irrigation Area	No. 1 Lagoon	17/12/19 to 24/1/20 38 days	No WS impacted
		18/3/20 to 15/4/20 28 days	No WS impacted
Torrumbarry Irrigation Area cont.	No. 2 Lagoon	2/4/20 to 16/6/20 75 days	No WS impacted
	No. 4 Lagoon	22/1/20 to 15/4/20 84 days	No WS impacted
	Gum Lagoon	22/1/20 to 29/4/20 98 days	No WS impacted

Grey italics indicates warning periods that commenced in 2018/19 and continued into 2019/20.

3.2. Summary of exemptions and undertakings

Safe Drinking Water Regulation 17 –

(c) A summary of every written undertaking by the water storage manager accepted by the Secretary under section 30 of the Act.

(f) Details of any exemption granted to the water storage manager under section 8 of the Act and any condition imposed in relation to any exemption.

There were no exemptions or undertakings in place with DHHS during 2019/20.

3.3. Risk Management Plan audit findings and issues raised

Safe Drinking Water Regulation 17 –

(d) A summary of the findings of the most recent risk management plan audit and any issues that the approved auditor raised during the risk management plan audit.

The Secretary to the Department of Health and Human Services required GMW to undertake an audit of its risk management plan between 1 November 2019 and 28 August 2020. While GMW engaged an auditor during the 2019/20 reporting period, the audit was completed in August 2020, therefore outcomes and GMW's response to the audit will be outlined in the 2020/21 annual report. No opportunities for improvement from previous audits were addressed in this period.

3.4. Water treatment processes

Safe Drinking Water Regulation 17 –

(e)(i) a summary of the process by which the water supplied by the water storage manager is disinfected or treated and any other processes applied to the water by the water storage manager, and any issues arising out of the application of those processes; and

(e)(ii) a list of all the chemicals and other substances, and any processes, used by a water storage manager to disinfect or treat the water supplied, or to be supplied, by it for drinking purposes;

GMW does not disinfect, treat or process any water supplied to its customers. All water supplied by GMW is not suitable for direct human consumption. All GMW customers are advised of this (see also Section 4.2).

Chemicals are used in and adjacent to water systems to control weeds. All herbicide application is undertaken in accordance with GMW's operating guidelines, which include utilising trained staff, notifying the relevant urban Water Supplier and adherence to product labels and minor use permits.

4. Other Relevant Information

4.1. Other activities

GMW has completed individual risk assessments for each GMW storage and irrigation area as well as an organisation-wide risk assessment. All assessments are regularly reviewed and the following reviews occurred during 2019/20: Lake Eildon, Laanecoorie Reservoir, Waranga Basin, Loddon Valley, Rochester and Torrumbarry Irrigation Areas and the overall GMW region.

The risk level at Waranga Basin and Rochester Irrigation Area from *Algal blooms and release of algal toxins* hazardous event was increased from low to very high due to the BGA warnings experienced at these locations since the previous risk assessment.

As part of a continual review process a new hazardous event has been added to irrigation areas risk assessments namely: *Irrigation season start-up (refilling of channels leading to transfer or sediment and stagnant water)*. This hazardous event was assessed as a high risk at Torrumbarry and Rochester Irrigation areas and will be assessed at other irrigation areas as part of the review process.

The risk level from *sabotage (deliberate contamination of water systems using human waste, pesticides, chemicals)* was increased to a high risk at the locations reviewed due a reassessment of the consequence of this hazardous event.

GMW continues to implement key programs to manage the identified risks to water quality. Examples of the types of activities undertaken by GMW are summarised in Table 2.

Table 2: GMW Key Programs

Program	2019/20 Activities/Achievements
Blue-green algae management	All warnings were managed in accordance with the DELWP BGA Circular, including notification to relevant water suppliers and sharing of test results (Section 3.1).
Water quality monitoring	Water quality monitoring and analysis was undertaken at GMW's major storages. This data was used to prepare quarterly exception reports and the annual Major Storages Water Quality report, which were sent to relevant stakeholders, including water suppliers. Additional monitoring was undertaken in 2020 within the Buffalo catchment in response to the bushfires (Section 3.1)
External Stakeholder controls	Continued engagement with regional and state catchment partners including implementation of Regional Catchment Strategies.
GMW staff training	Staff training for SDWA awareness, BGA and water quality sampling was conducted in 2019 for operational teams working at GMW storages and irrigation areas.
Best Management Practices	The Best Management Practice Register was kept up to date.
Statutory Planning	1703 applications reviewed from 28 local government authorities and DELWP.
Land Management	Review of lease conditions as required. Site inspections completed and records of these inspections maintained.
Land and On Water Management Plans	Implementation and review (where required) of the existing 16 Land and On Water Management plans, including consultation with water suppliers and other key stakeholders. A Land and On Water Management Plan for Dartmouth Dam was completed and released.

Program	2019/20 Activities/Achievements
Land and On Water Management Plans cont.	<p>Some examples of works completed during the reporting period include:</p> <ul style="list-style-type: none"> • Boat ramp works at Majors Creek to shift wake boating focus away from Murray River channel to the main body of Lake Mulwala; • Fishing at Lake Boga is being promoted via Fishing Victoria funding as part of the Target 1 Million program; interpretive signage has been installed at the storage; • A Cultural Heritage Management Plan is nearly complete for the planning of works at Lions Park (failing toilet block and BBQ facilities) passive recreation area at Kow Swamp; • A new toilet and shower amenity block (including onsite wastewater management system) was officially opened at Greens Lake at the end of 2019; • A Tourism Strategy, and report: <i>Options for enhancing recreational boating and fishing at Lake Eppalock</i> was developed; Kimbolton reserve foreshore redevelopment; installation of interpretive signage both internal and external to the Lake Eppalock reserve.
Lake Eildon houseboats and on-water services	Ongoing management of on-water fuel and sewage facilities, houseboat inspections undertaken in accordance with schedule and details of inspections documented.
Weed Management	All herbicide applications conducted in accordance with the GMW Herbicide Operating Manual, including notification to urban Water Suppliers when required. The GMW asset management database was updated to remind works planners to contact urban Water Suppliers of pending spraying, where notification is required
Environmental Management System (EMS)	GMW maintained its ISO14001 accreditation. Continuation of compliance audits conducted by GMW staff in accordance with the Health Safety and Environment Audit Schedule. Staff are continuing to complete annual online Health Safety and Environment refresher training.
Incident Response	Refer to Section 3.1 for details on GMW's incident response
GMW Operations including surveillance, fire management	Various activities including channel and storage erosion control and prevention works, fencing, licensing and monitoring of activities on GMW land. GMW activities are conducted in accordance with the approved EMS. Notification to relevant urban Water Supplier if water quality impacted.
Water Resource Management	Water resource management continued to be conducted in accordance with bulk water operating agreements with urban Water Suppliers.

4.2. Advising People about Non-potable Water Supplies

All water supplied by GMW is not suitable for human consumption or related uses without first being properly treated. GMW has a Customer Information Statement to advise customers of the non-potable nature of the water supplied. This statement is provided to all new customers and periodically provided to all GMW customers via customer newsletters. It is also located on the GMW website: www.gmwater.com.au.

Customer invoices, licences and leases include a statement about the non-potable nature of the water supplied by GMW. The public and stakeholders are also made aware via statements included in the BGA status report and signs on non-potable water taps at GMW properties.

4.3. Melbourne Water

The Sugarloaf (North-South) Pipeline was constructed to supply water from the Goulburn River downstream of Lake Eildon to Melbourne Water's Sugarloaf Reservoir (and subsequently to

Yarra Valley Water, City West Water, and South East Water) and was completed in February 2010. The pipeline has not been utilised for transfers since November 2010; however, water has been taken for maintenance and routine testing of the system. GMW's agreement with Melbourne Water and bulk entitlements with the three retail water businesses are still in place. GMW has continued to provide the opportunity for Melbourne Water to be involved in GMW's identification and management of risks to water quality within the Goulburn catchment.

5. Further Information

This report and further information is available from our website www.gmwater.com.au or by contacting:

Goulburn-Murray Water
40 Casey Street
PO Box 165
Tatura VIC 3616

Free call: 1800 013 357
Standard call: (03) 5826 3500
Fax: (03) 5826 3334
Email: reception@gmwater.com.au

Appendix 1 - Towns supplied where GMW is the water storage manager

Water Supplier Offtakes - GMW as Water Storage Manager ¹			
Water System/ Irrigation Area (IA)	Supply Source	Water Treatment Plant ²	Towns Supplied
Central Highlands Water			
Loddon	Tullaroop Reservoir	MARYBOROUGH	Maryborough, Carisbrook and districts
Bullarook	Newlyn Reservoir	WHITE SWAN	Ballarat and district
Campaspe	Lake Eppalock	WHITE SWAN	Ballarat and district
Rochester IA	Waranga Western Channel (Colbinabbin)	WHITE SWAN	Ballarat and district
Coliban Water			
Campaspe	Lake Eppalock	BENDIGO	Bendigo, Axedale, Huntly, Marong, Raywood, Sebastian
Rochester IA	Waranga Western Channel (Colbinabbin)	BENDIGO	Bendigo, Axedale, Huntly, Marong, Raywood, Sebastian
Loddon Valley IA	PH Channel No.3	BOORT	Boort
Loddon	Loddon River (Bridgewater offtake)	BRIDGEWATER	Bridgewater, Inglewood
Loddon Valley IA	Waranga Western Channel via SW Loddon Pipeline ⁴	BRIDGEWATER	Bridgewater, Inglewood
Torrumbarry IA	Gunbower Creek (Cohuna offtake)	COHUNA	Cohuna
Loddon Valley IA	PH Channel No.1	N/A – regulated ³	Dingee
Murray	River Murray (Echuca offtake)	ECHUCA	Echuca
Campaspe	Campaspe River (Goornong offtake)	GOORNONG	Goornong
Torrumbarry IA	Taylor's Creek	GUNBOWER	Gunbower
Campaspe	Lake Eppalock	HEATHCOTE	Heathcote, Tooborac
Rochester IA	Waranga Western Channel (Colbinabbin)	HEATHCOTE	Heathcote, Tooborac
Loddon Valley IA	Waranga Western Channel via SW Loddon Pipeline ⁴	KORONG VALE	Korong Vale, Wedderburn
Loddon Valley IA	East Loddon Pipeline	N/A – regulated ³	Jarklin
Loddon	Loddon River (Laanecoore offtake)	LAANECOORIE	Laanecoore, Bealiba, Dunolly, Tarnagulla
Torrumbarry IA	T 1 Channel	LEITCHVILLE	Leitchville
Torrumbarry IA	Gunbower Creek (Leitchville offtake)	LEITCHVILLE	Leitchville

Water Supplier Offtakes - GMW as Water Storage Manager¹			
Water System/ Irrigation Area (IA)	Supply Source	Water Treatment Plant²	Towns Supplied
Rochester IA	Waranga Western Channel via R Channel No. 24 (piped)	LOCKINGTON	Lockington
Loddon Valley IA	PH 10/1 Channel	N/A – regulated ³	Macorna
Loddon Valley IA	Mitiamo spur off the PH No. 1 Channel	N/A – regulated ³	Mitiamo
Loddon Valley IA	Waranga Western Channel (Mysia offtake)	N/A – regulated ³	Mysia
Loddon Valley IA	PH 5/1 Channel	PYRAMID HILL	Pyramid Hill
Rochester IA	Waranga Western Channel (Rochester offtake)	ROCHESTER	Rochester
Campaspe	Campaspe River (Rochester offtake)	ROCHESTER	Rochester
Loddon Valley IA	East Loddon Pipeline	SERPENTINE	Serpentine
Goulburn Valley Water			
Goulburn	Goulburn River (Alexandra offtake)	ALEXANDRA	Alexandra, Eildon, Thornton
Murray	River Murray (Barmah offtake)	BARMAH	Barmah
Goulburn	Lake Eildon	BONNIE DOON	Bonnie Doon
Goulburn	Goulburn River (Tallarook offtake)	BROADFORD	Broadford, Waterford Park
Murray	River Murray (Cobram offtake)	COBRAM	Cobram, Strathmerton, Yarroweyah
Rochester IA	Waranga Western Channel (Colbinabbin offtake)	COLBINABBIN	Colbinabbin
Rochester IA	Waranga Western Channel (Corop offtake)	N/A - regulated ³	Corop
Shepparton IA	East Goulburn Main Channel	DOOKIE	Dookie
Central Goulburn IA	CG 12/9 Channel	GIRGARRE	Girgarre
Goulburn	Lake Nagambie/Goulburn Weir (Baxters Road offtake)	N/A – regulated ³	Goulburn Weir
Murray Valley IA	MV 7/3 Channel	KATAMATITE	Katamatite
Shepparton IA	SH 2/24 Channel (piped)	KATANDRA WEST	Katandra West
Goulburn	Lake Nagambie/Goulburn Weir (Kirwans Bridge offtake)	N/A – regulated ³	Kirwans Bridge
Central Goulburn IA	CG 9 Channel	KYABRAM	Kyabram, Merrigum
Goulburn	Goulburn River (Molesworth offtake)	N/A – regulated ³	Molesworth

Water Supplier Offtakes - GMW as Water Storage Manager¹

Water System/ Irrigation Area (IA)	Supply Source	Water Treatment Plant ²	Towns Supplied
Goulburn	Goulburn River (Murchison offtake)	MURCHISON	Murchison
Goulburn	Lake Nagambie/Goulburn Weir (Nagambie offtake)	NAGAMBIE	Nagambie
Murray Valley IA	Broken Creek	NATHALIA	Nathalia
Murray Valley IA	MV 6/6 Channel	NUMURKAH	Numurkah, Wunghnu
Murray Valley IA	MV 9/9/6 Channel	PICOLA	Picola
Central Goulburn IA	Waranga Basin	RUSHWORTH	Rushworth
Goulburn	Goulburn River (Seymour offtake)	SEYMOUR	Seymour, Avenel, Tallarook, Trawool
Goulburn	Goulburn River (Shepparton offtake)	SHEPPARTON	Shepparton, Congupna, Tallygaroopna, Toolamba, Mooroopna
Central Goulburn IA	CG 1/12/9 Channel	STANHOPE	Stanhope
Central Goulburn IA	CG 3/5A Channel	TATURA	Tatura
Central Goulburn IA	CG 2/5/6 Channel	TATURA	Tatura
Central Goulburn IA	CG 28/9 Channel	TONGALA	Tongala
Grampians Wimmera Mallee Water			
Murray	River Murray (Nyah offtake)	N/A – regulated ³	Berriwillock, Chillingollah, Chinkapook, Waitchie
Murray	River Murray - Piangil Pump Station	MANANGATANG	Manangatang
Loddon Valley IA	4/1 Channel (Normanville Pipeline)	QUAMBATOOK	Quambatook
Murray	River Murray - Swan Hill (Pental Island)	SEA LAKE	Sea Lake
Murray	River Murray - Swan Hill (Pental Island)	N/A – regulated ³	Culgoa, Lalbert, Nullawil, Ultima
Murray	River Murray (Wemen offtake)	OUYEN, UNDERBOOL	Ouyen, Underbool
Murray	River Murray (Wemen offtake)	N/A – regulated ³	Nandaly, Patchewollock, Speed, Tempy, Walpeup
Lower Murray Water			
Murray	River Murray (Mildura offtake)	MILDURA & MILDURA WEST	Mildura, Mildura West, Irymple, Merbein
Murray	River Murray (Mildura West offtake)	MILDURA & MILDURA WEST	Mildura, Mildura West, Irymple, Merbein
Loddon	Loddon River (Kerang alt. offtake)	KERANG	Kerang
Murray	River Murray (Koondrook offtake)	KERANG	Kerang
Torrumbarry IA	Torrumbarry 14/2 Channel	KERANG	Kerang

Water Supplier Offtakes - GMW as Water Storage Manager¹

Water System/ Irrigation Area (IA)	Supply Source	Water Treatment Plant ²	Towns Supplied
Murray	River Murray (Koondrook offtake)	KOONDROOK	Koondrook
Murray	River Murray (Murrabit offtake)	MURRABIT	Murrabit
Torrumbarry IA	Torrumbarry 2/11/4 Channel	MURRABIT	Murrabit
Torrumbarry IA	Kangaroo Lake (Mystic Park Non Potable offtake)	N/A – regulated ³	Mystic Park
Murray	River Murray (Piangil town offtake)	PIANGIL	Piangil
Murray	River Murray (Red Cliffs offtake)	RED CLIFFS	Red Cliffs
Murray	River Murray (Robinvale offtake)	ROBINVALE	Robinvale
Murray	River Murray (Swan Hill offtake)	SWAN HILL	Lake Boga, Nyah, Nyah West, Swan Hill, Woorinen South
Melbourne Water			
Goulburn	Goulburn River (via Sugarloaf Pipeline at Killingworth)	MELBOURNE - various	Melbourne metropolitan region
North East Water			
Murray	Lake Hume	BELLBRIDGE	Bellbridge
Murray	Mitta Mitta River (Dartmouth offtake)	DARTMOUTH	Dartmouth
Murray	Mitta Mitta River (Eskdale offtake)	ESKDALE	Eskdale
King	King River (Moyhu offtake)	MOYHU	Moyhu
King	King River (Oxley offtake)	OXLEY	Oxley
Murray	Lake Hume / Mitta Mitta River	TALLANGATTA	Tallangatta
Ovens	River Murray (Wahgunyah offtake)	WAHGUNYAH	Wahgunyah, Rutherglen
Ovens	Ovens River (confluence with King River)	WANGARATTA	Wangaratta, Glenrowan
King	Shallow groundwater bore adjacent King River	WHITFIELD	Whitfield
Murray	Wodonga Creek (an anabranh of the Murray River)	WODONGA	Wodonga, Bandiana, Baranduda, Bonegilla, Kiewa, Tangambalanga Barnawartha, Chiltern, Springhurst

Water Supplier Offtakes - GMW as Water Storage Manager¹			
Water System/ Irrigation Area (IA)	Supply Source	Water Treatment Plant²	Towns Supplied
Murray	Lake Mulwala/Yarrawonga Weir	YARRAWONGA	Yarrawonga, Bundalong, Devenish, St. James, Tungamah, Goorambat

¹ All water supplied by GMW is raw i.e. not treated.

² Water supplier's water treatment plant

³ Regulated supply as defined under the Act i.e. water supplied by urban Water Suppliers that is not intended for drinking but could be mistaken as drinking water

⁴ South West Loddon Pipeline managed by GMMWater

Appendix 2 - Water quality incidents reported during 2019/20 related to water provided to urban Water Suppliers

Risk #	Date	Incident Description	Location	Action undertaken by GMW
IRIS003920	30/09/2019	Excavator damaged sewerage pipe whilst undertaking construction works along Yarrowonga Weir foreshore	Murray River - Yarrowonga Weir	GMW notified North East Water. GMW constructed an earthen coffer around the area to contain the effluent to ensure it did not discharge into the lake. NEW repaired the pipe and removed effluent and contaminated soil. GMW engaged a licence service locator to locate the remaining sewer line to ensure it was not hit again.
IRIS003985	16/12/2019	High levels of BGA in Lake Eppalock.	Campaspe Basin - Lake Eppalock	Actions completed in accordance with BGA Response Plan, including notification of customers & stakeholders via email or letter, advice to public via signage, media release, website, hotline & social media and additional surveillance & monitoring - Coliban Water notified
IRIS004062	05/02/2020	High levels of blue-green algae in the East backwater at Turners Island near Kirwans Bridge in Lake Nagambie.	Goulburn Basin - Goulburn Weir	Actions completed in accordance with BGA Response Plan - Goulburn Valley Water notified
IRIS004026	13/02/2020	High levels of blue-green algae at Yarrowonga Weir.	Murray River - Yarrowonga Weir	Actions completed in accordance with BGA Response Plan - North East Water notified
IRIS004031	25/02/2020	High levels of blue-green algae at Hume Dam.	Murray River - Hume Dam	Actions completed in accordance with BGA Response Plan - North East Water notified
IRIS004063	5/03/2020	High levels of blue-green algae in the West backwater at Turners Island near Kirwans Bridge in Lake Nagambie.	Goulburn Basin - Goulburn Weir	Actions completed in accordance with BGA Response Plan - Goulburn Valley Water notified

Risk #	Date	Incident Description	Location	Action undertaken by GMW
IRIS004073	2/04/2020	Water NSW issued a blue-green algae warning for the Murray River from Corowa to Barmah. Echuca-Moama warning also issued by WaterNSW on 8 April 2020.	Murray River - Corowa to Barmah	Actions completed in accordance with BGA Response Plan - Goulburn Valley Water, North East Water and Coliban Water notified
IRIS004140	12/06/2020	Car with boat and trailer reversed into the water at Caravan Park boat ramp, unknown if oil or fuel entered waterway.	Goulburn Basin – Waranga Basin	GMW notified Goulburn Valley Water and CFA. The owner was able to retrieve the car, boat and trailer.
IRIS004158	29/06/2020	Sewage spill from a failed air release valve into Number 1 Channel. The channel was not flowing at the time.	Torrumbarry Irrigation Area - Number 1 Channel	GMW notified Coliban Water and impacted landowners.