# DROUGHT PREPAREDNESS PLAN

March 2022

LOWER MURRAY WATER

## Document Control Sheet

### Version history

| Version no. | Date | Changed by | Nature of amendment |
|---|---|---|---|
| 1 | 2017 | KM | First issue |
| 2 | 1/10/19 | GR / LM | Update |
| 3 | 17/10/19 | GR | Update |
| 4 | 22/10/19 | GR/LM | Update |
| 5 | 25/10/19 | DRC | Updates & Recommendations |
| 6 | 25/03/22 | RM | Update |

### List of Abbreviations

| | |
|---|---|
| DPP | Drought Preparedness Plan |
| DRP | Drought Response Plan |
| CMA | Catchment Management Authority |
| WRPP | Water Restrictions Preparedness Plan |
| UWS | Urban Water Strategy |
| UWR | Urban Water Restrictions |
| LMW | Lower Murray Water |
| PWSR | Permanent Water Savings Rules |
| DRT | Drought Response Trigger |
| HA | Heightened Awareness |
| DELWP | Department of Environment, Land, Water and Planning |
| BOM | Bureau of Meteorology |
| MDBA | Murray Darling Basin Authority |
| MRCC | Mildura Rural City Council |
| SHSC | Swan Hill Shire Council |
| GSC | Gannawarra Shire Council |

**Disclaimer**

The information contained within this document may be updated and amended as part of Lower Murray Water's ongoing review of responses to a potential drought or urban water use shortfall events.

# 1. Purpose

This plan outlines the role of Lower Murray Water (LMW) in the event of drought conditions or a potential restriction to urban water use across 14 towns supplied with potable water in our service region. Guided by the Urban Water Restrictions By-Law No 2. The Drought Preparedness Plan (DPP) forms part of the overarching plan which incorporates the Urban Water Strategy coordinated approach when delivering water use restriction measures for our customers and the wider community. The plan has been intentionally made concise and information available in other documents has not been repeated in this plan where appropriate.

# 2. About this Document

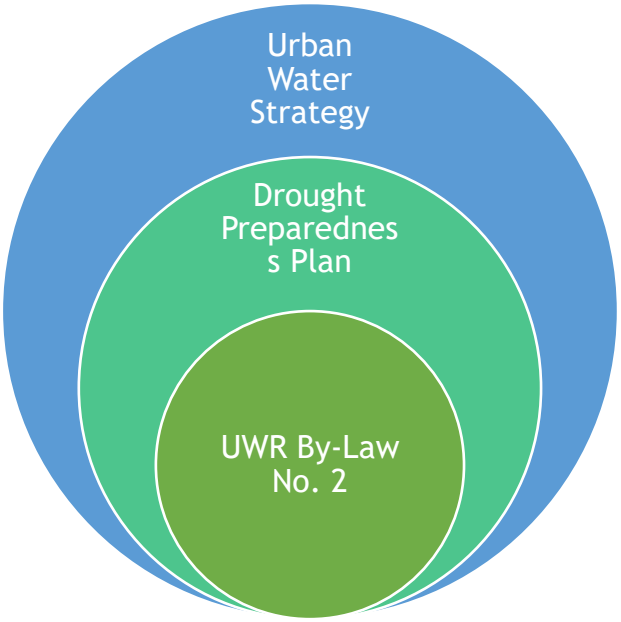
This plan supersedes the previous DPP (previously referred to as the *Drought Response Plan 2019-20*). The DPP is included as an attachment to LMW's 2022 Urban Water Strategy (UWS). The UWS and the DPP should be referred to obtain a full understanding of the requirements during drought conditions, low allocation, or water shortages.

This DPP forms part of the activity hierarchy in LMW's Water Restrictions planning. It incorporates actions contained within the Urban Water Restrictions (UWR) By- Law No2.

It also identifies pre-drought planning and activities that are necessary to ensure that LMW and the community are prepared and well informed should water restrictions be implemented.

The actions contained in the Victorian Government's ***Water for Victoria*** have helped to inform the development of this plan.

**Water Restriction Document hierarchy:**




**Urban Water Strategy:** identifies a strategy and actions to be implemented over a long term (50 year) plan to provide water services in our towns and cities.

**Drought Preparedness Plan:** is a requirement of the Statement of Obligations (Section 6 - 4) and details requirements to maintain water supply for critical human needs in the event of dry or extreme dry periods or a water quality event.

**Urban Water Restrictions By-Law No 2:** issued by the Minister Administering the Water Act, (Section1A of the Water Act 1989/1999 Amendment). The UWR By-Law No 2 promotes efficient use and conservation of water and the principles and rules to be applied during restrictions.

# 3. Background

LMW's Statement of Obligations imposes expectations in relation to the performance of its functions and exercise of its powers as described in the *Water Industry Act 1994*. In relation to drought response, Section 6 - 4 specifies that LMW to develop and implement an effective Drought Response Plan (DRP) for each water supply system and make its DRP available to the public.

This DPP has been developed in parallel to LMW's 2022 UWS. It is intended to be used by LMW to guide the organisation in making decisions about appropriate actions to manage potential water shortages.

Planning for response to drought involves consideration of three phases of activity:

1) *general monitoring,*
2) *drought response, and*
3) *post-drought evaluation.*

The previous DPP was last updated in 2019. This update has adopted similar objectives as the previous Plan, as well as any actions that are still relevant to the current LMW's water supply systems including the most recent projections around water allocation and River Murray inflows.

## 3.1. Regulatory Context

In a regulatory sense, LMW is required to develop and maintain a DRP under the Statement of Obligations (2015) with the Victorian Government. This identifies expectations of the business and where it must act as follows:

1. The Corporation must:
   (a) develop a DRP that governs the management of the supply of water by the Corporation in any period of drought or when the supply of water is limited;
   (b) not rely on the Minister declaring a water shortage and qualifying rights to water under *the Water Act 1989* as an option for maintaining supplies as part of a DRP;
   (c) comply with any guidelines issued by the Minister for the purpose of drought response planning; and make its DRP available to the public unless the Minister consents in writing to not making available a Plan or part of a Plan (urban only).
2. The Corporation must review, and if necessary, amend its DRP:
   (a) at intervals of no more than five years; and
   (b) within twelve months of either:
      (i) the lifting of any period of water restriction imposed in accordance with the Corporation's Drought Response Plan; or
      (ii) any major change occurring to works or arrangements for conserving water for, or supplying water to, any water supply system that is relied upon for the supply of water by the Corporation (urban only).
3. The Corporations that share water supply systems must cooperate and coordinate with each other when developing, reviewing or implementing their Drought Response Plans"

## 3.2. Customer and Stakeholder Sentiment

As a part of the 2022 UWS development, customers and stakeholders were engaged to obtain feedback on various aspects of the UWS. This feedback from customers included the following:

- *Continue to meet level of service and high quality of water.*
- *LMW to keep the water restriction as low as possible.*
- *Act environmentally friendly.*
- *Consider alternative water supply source such as recycled water.*
- *Continue investment in community education and intervention programs on water efficiency and climate change.*

Other factors to be considered from customer and stakeholder feedback are social amenity with the browning off-of sporting grounds, community parks and gardens and filling of public swimming pools. These were all considered to be important for the community during the consultation process and the community expected these factors to be considered during future drought planning processes and the possible implementation of staged water restrictions.

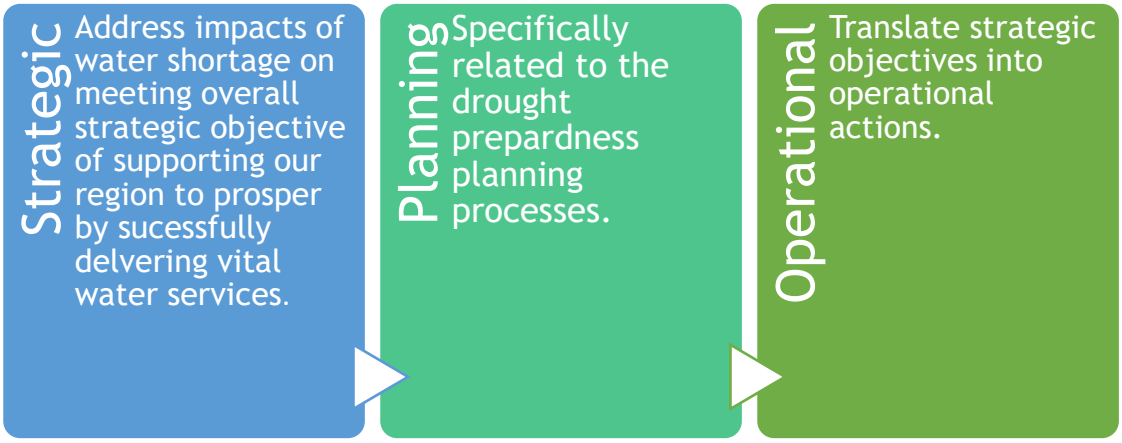
# 4. Objectives

The DPP is designed to manage the demand/supply balance of a water supply over a short-term outlook period. Typically, over a summer period or dry – extreme dry conditions where allocation is low and results in pressure on urban water supplies.

The purpose of the DPP is to:

1. Proactively manage our water supply systems to reduce likelihood of restrictions.
2. Identify when to trigger water restrictions.
3. Detail management actions to meet human needs during the following events:
    - An extreme dry period, or
    - A water quality event of an intensity, magnitude and duration that is sufficient to render water acutely toxic or unusable for established local uses and values.

**The figure below shows the objectives considered in the development of the DPP:**




## 4.1. Strategic Objectives

The DPP aims to support the following strategic objectives: 1) achieve high quality outcomes for our customers and 2) Ensure our assets and infrastructure meet current and future customer needs by ensuring a systematic, timely and efficient response to drought and minimise the impact on customers. The actions include but not limited to the following:

- Providing timely warning of any water shortages that might occur during future drought events and the preparedness to deal with such shortages when they occur; and
- Identifying long term planning issues that should be considered in developing a DPP.
- Build the customer and community support for the LMW DPP including implementation of staged restrictions.

## 4.2. Planning Objectives

To ensure that in the short term:

- Consumers and representatives of other interested groups are involved in the development of the DPP.
- The plan identifies all necessary steps that need to be taken throughout a drought including clear triggers that instigate certain actions.
- The plan is subject to regular review as the systems develop and as more information becomes available.
- The plan is reviewed throughout the course of a drought and adjusted where necessary, and that all actions taken be evaluated after the end of the drought.

To ensure that in the long term:

- The agreed level of service (including security of supply) satisfies the requirements of LMW and its customers at an acceptable cost; and
- All feasible options for achieving a balance between supply and demand are considered and evaluated in terms of their impact on stakeholders.

Noting that the long-term actions will be considered in the UWS.

## 4.3. Operational Objectives

To ensure that in the short term:

- In drought conditions a minimum supply is maintained to cater for critical needs of the community.

  The forecasted average annual demand for residential indoor use at current year (2021) and 2028 (end of WP5) are approximately 9260 ML and 9860 ML respectively. These figures are calculated based on the demand projections undertaken for the development of the 2022 UWS.
- The most efficient use is made of water resources during periods of water shortages.
- A reliable assessment of drought status is provided so that LMW is aware of the severity of the drought.
- Provide the community with clear communication to keep them informed.
- LMW keeps informed of changes to total levels and patterns of demand and of consumer expectations in relation to desirable levels of service, so that it can assess whether the systems will be able to perform satisfactorily during future drought.
- Restrictions are implemented and reviewed to ensure that bulk water entitlements and/or seasonal allocations are not exceeded.

  *Note that indoor water use component (e.g., air conditioners, evaporative coolers, showering, swimming pools, washing etc) is higher during summer months.*

# 5. Drought Response Committee

During the lead-in to heightened awareness and restrictions, a drought response committee (DRC) will be formed with the following objectives:

1. Water availability management – ensure LMW understands and communicates the volume of water available for urban use to the internal (within LMW) and external stakeholders (customers, regulators, industries & other stakeholders).
2. Urban water restrictions management – ensure LMW considers and implements any necessary water-use restrictions on urban customers in a timely manner.
3. Stakeholder management – ensure LMW is appropriately engaging with stakeholders (e.g., Councils, government departments, health and aged care providers, industry representative bodies etc.) to inform them of the circumstance and their contribution to the response plan, as appropriate.
4. Compliance – ensure LMW adequately oversees rural and urban customers' compliance with any water availability constraints.
5. Security – ensure to the best of its ability the security of all LMW interests including its staff, customers, and asset base.
6. Communication – ensure LMW appropriately communicates the circumstance, its implications, and our response.
7. DELWP liaison – ensure LMW engages with DELWP to seek its input to the response plan and its assistance with its implementation.
8. Financial implications – LMW describes and quantifies the financial implications of the drought response plan's implementation.
9. Operational implications – LMW describes and quantifies the impact on its operations of the drought plan's implementation.
10. Staff wellbeing – LMW consciously and proactively responds to the likely physical and mental impacts the drought response plan's implementation will have on staff.
11. Customer wellbeing – LMW consciously and proactively responds to the likely physical and mental impacts the drought response plan's implementation will have on customers.

The DRC membership will be defined by the Managing Director who will decide on Roles and Responsibilities for the group. The DRC will continue until the 'drought' event is declared over and restrictions are lifted.

# 6. Past Drought Experience

All LMW's supply systems draw water from fully regulated stream and channel systems, which relatively have a high security of supply. Since the period from the installation of weirs and major storages until the Millennium Drought, the Murray and Loddon Rivers were not severely affected by droughts, and domestic/town water supplies have not had to be restricted.

Before the current system of storages were constructed, the Murray and Loddon Rivers would cease flowing during severe drought conditions. The last time the Murray River ceased flowing at Swan Hill and Mildura was in 1914. The Loddon River would have ceased flowing at Kerang in more recent times if supplementary flows were not provided from the Murray River.

The Millennium drought that occurred between 1997 to 2009 resulted in LMW implementing water restrictions from 2007 to 2010. Imposing Stage 4 water restrictions was especially hard on the community, and LMW applied overall exemptions in September and December of 2007 to ensure customers'gardens did not die. Most customers accepted that water restrictions were necessary, particularly given local irrigators were experiencing extremely low water allocations.

**Table 1: Water Restrictions History**

| Date | Level |
|---|---|
| 4 December 2006 | Stage 1 |
| 30 April 2007 | Stage 2 |
| 4 June 2007 | Stage 3 |
| 1 July 2007 | Stage 4 |
| 17 January 2008 | Stage 3 |
| 9 November 2009 | Stage 1 |
| 3 October 2010 | PWS Rules |
| 21 November 2019 | Stage 1 |
| 05 June 2020 | PWS Rules |

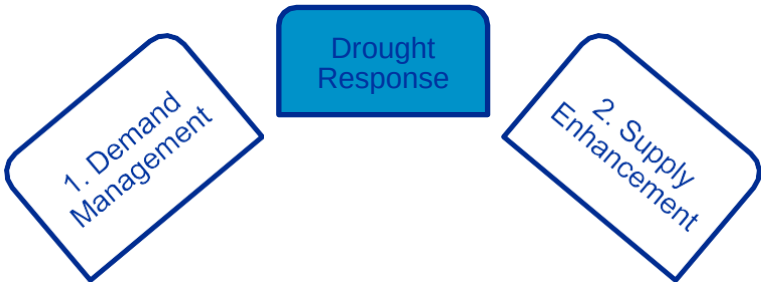
A range of variations and exceptions were permitted under the previous By-law over the period 2006 to 2011. With the subsequent review and implementation of the state-wide By-law in 2012 going forward exemptions may be issued on a case by case basis. The DRC will review the exemption applications and provide recommendations for issuing permits or exemptions. However, blanket exemptions or revisions of allowable water use under particular stages is not permitted.

In last five years, Stage 1 restriction was imposed for a short period of time between November 2019 and June 2020 due to low water allocations for the Murray River system. During this period exemptions were permitted by reviewing the request for exemption applications on case by case basis under the UWR By-law No. 2. It was observed that water savings during this period was less than the expected savings (i.e., 10% of total demand) as per the 2019 DRP.

Under restrictions an LMW appointed Permits/Exemption staff member may have delegation to review these requests.

# 7. Drought Response Options

Drought response options can be classified into two broad categories:




This section identifies the potential demand management and supply enhancement options available to LMW.

## 7.1. Demand Reduction

There are several demand reduction options that can be deployed during times of water shortage. A summary of these is provided in Table 2.

**Table 2: Summary of Demand Reduction Options**

| Option | Details | Actions/Comments |
|---|---|---|
| Community Education Programs | Water efficiency awareness (showerhead giveaways, trigger nozzles, information brochures), linked to ongoing State Government programs.<br>Estimated savings are around 2-5% of total demand. | Ongoing implementation. |
| Voluntary Demand Reduction Measures | Self-regulated water conservation measures by customers aimed at improving effectiveness of the measures within the PermanentWater Saving (PWS) Rules. | It is anticipated that water savings in addition to the savings already achieved from the PWS rules can be achieved with this option.<br>Note that community education programs are essential part of this action. |
| Major User Water Conservation | The Government has previously implemented a voluntary program for all non-residential customers with consumption of 5 ML/year or greater. | LMW to work with the large commercial customers and promote them to implement water conservation. |

| Option | Details | Actions/Comments |
|---|---|---|
| Mandatory Staged Water Restrictions | Options available under By-Law No. 2<br>Revised as per VicWater Guidelines in 2011. | LMW to assess water availability and determine appropriate Stage of restriction during the drought or a water quality event period. |
| Training of Staff | Awareness of increased responsibilities in supporting customers during drought.<br>Specialist training for front of house (Customers and Stakeholders Team) to deal with larger call volumes and difficult enquiries | LMW to continue to provide appropriate training to relevant staff, which may include customer support staff and enforcement officers. |
| Community rebates and retrofit program | Generating water efficiency in the home particularly those in hardship | There is a government funding for this program up to 2021/22.<br>LMW to consider continuing the program. |
| Integrated Water Management | Waterwise – community engagement measures | LMW to work with Councils to develop opportunities for integrated water management projects that are suitable for the dry Mallee climate<br>Funding will be required. |

**Voluntary Demand Reduction Measures**

Voluntary demand reduction measures are an initial measure during the onset of drought conditions. Historically, when water allocations are less than 100%, a corresponding reduction in demand has been observed, despite any formal water conservation activities.

LMW supports voluntary water saving measures, with initiatives including showerhead exchanges, trigger nozzles and other merchandise. LMW aims to encourage its customers to play an active role in managing their water supply and play their part in times of water shortages to ensure efficient use of the precious resource.

A broad base of local media (press and electronic) can be utilised to raise community awareness of system supply levels and encourage voluntary water saving measures.

**Mandatory Water Use Restrictions**

Mandatory water use restrictions provide an effective mechanism to reduce urban demand during times of water shortage. Water restrictions are designed to predominately impact on non-essential water uses (for example garden watering and filling of pools), and to minimise the impact on the use of water for commercial purposes, public health and essential

residential use.

LMW has developed a Schedule of Restrictions in accordance with the Victorian Uniform Drought Water Restriction Guidelines (Table 3). The restriction schedule has been given legal effect under By-Law No. 2, which is available on LMW's website

https://www.lmw.vic.gov.au/wp-content/uploads/2018/08/Urban-Water-Restrictions-By-Law-No-2.pdf

Lower Murray Water's adopted restriction schedule defines four successive stages of water restrictions.

**Table 3: Intention of 4-stage Water Restrictions**

| Restriction Stage | Description | Purpose |
|---|---|---|
| Stage 1 | Alert | Achieve a modest level of water savings and to get the message out that water shortages are possible. |
| Stage 2 | Save | Achieve a notable level of water savings to ensure water supply during low to moderate supply shortage periods. |
| Stage 3 | Just enough | Achieve water savings just enough to ensure water supply for essential needs whilst allowing communities to keep valuable plants/amenities alive. |
| Stage 4 | Critical | Implement measures to achieve water savings to ensure water supply for essential needs. This level of restrictions will normally be implemented during severe supply shortage periods. |

The anticipated water savings under each stage of restriction affects water availability and assists to maintain the required level of water security. The estimated savings for each stage and the associated trigger levels for the implementation of water restrictions are described in subsequent parts of this document. The anticipated water savings for each level of restriction is shown in Table 4.

**Table 4: Expected Water Savings from Water Restrictions**

| Stage of Restriction | % Reduction in Restrictable Demand[2] | % Reduction in Demand[3] |
|---|---|---|
| **Phase 1 - Heightened Awareness**[1] | - | - |
| **Phase 2 – Drought Response** | | |
| Stage 1 **ALERT** | 14% | 6% |
| Stage 2 **SAVE** | 44% | 19% |
| Stage 3 **JUST ENOUGH** | 67% | 28% |
| Stage 4 **CRITICAL** | 98% | 42% |

Note:

1) *It is possible to achieve a small amount of savings during heightened awareness period, but it is difficult to quantify the potential savings.*

2) *Restrictable demand is the portion of water demand that can be reduced or restricted by implementing water restrictions, which is generally the outdoor use such as watering gardens. The adopted % reductions in restrictable demand were the typical values.*

3) *The % reductions in total demand were calculated based on the proportion of restrictable demand of the total demand using historical water consumption data.*

## 7.2. Supply Enhancement

**Purchasing of Permanent Water Entitlements**

The purchasing of permanent water entitlements will be guided by the longer-term objectives as detailed in the 2022 UWS. Permanent entitlements underpin the reliability of the system and over the longer term, the adopted purchasing strategy aims to reduce the risk of water shortages during drier periods.

**Purchasing of Temporary Water Entitlements**

Whilst purchasing of temporary water allocations is not considered in the preferred strategy of the 2022 UWS, it remains one of options for LMW to manage the water supply shortages as the utilisation of temporary water during relatively infrequent low allocation years provides a cost-effective alternative to the full reliance on permanent entitlements. However, this option to be implemented in conjunction with the other demand reduction and supply enhancement measures.

**Use of Carryover Water**

In 2006 the allocation of water in the northern catchments was amended to allow for the carry-over of allocation volumes from season to season. This means that unused allocation in a year can be carried over to the next year provided that certain conditions are met. The carryover volumes are recorded in a spillable account.

If the storages in the system spill, then the volume of water in the spillable account is reset to zero. Otherwise, the water is available for use in the next season and is added to LMW's entitlement. The total volume of allocation remains independent from the seasonal allocation.

Given that LMW aims to maintain its volume of entitlement at approximately 50% above the average annual demand over the previous three years, in an average year it will not use its full entitlement. If there are reduced seasonal allocations in the next year, any carryover of unused water will assist in reducing the need for the introduction of water restrictions, or at least reduce the severity of restrictions required.

# 8. Drought Response Actions

LMW will have a DRP that incorporates the following actions:

## 8.1. Integrated Water Management

Under an integrated management approach, the use of alternative water sources available to our customers should be considered including rainwater, recycled water and other local sources where available. As conditions dry there may be opportunity to increase the use of such supplies for uses such as gardens and other non-potable applications, thus preserving the available potable source. These initiatives should be considered at the front end of restrictions and should align with *Water for Victoria*, Victorian Government's Strategic Plan for managing our water resources.

The integrated management approach embraces the concept of contribution by all members of the community; hence it is important that cooperative arrangements be established with relevant stakeholders e.g., councils, and other organisations as staged restrictions progress.

## 8.2. Situation Assessment

Regular system monitoring will be undertaken to assess the status of the supply and available reserves. The internal LMW process to introduce restrictions will be coordinated through the DRC based on review of multiple factors that will drive a decision to trigger or not. Factors to be considered in decision making for restrictions include:

- ***Supply / Demand Balance:***

  Urban demand estimate should be based generally on a 5 years historical data and this volume compared against available supply including carryover. A preserved volume should be considered that may include the total or a component of carryover volume.

- ***Timeframe:***

  The timeframe for supply and demand projections will be considered is a 2-year window, at least 2 summer seasons.

- ***Carryover:***

  The carryover rules must apply in using this supply as part of bulk entitlement, which allows for unused allocations at the end of the year to be taken in the following years. Carryover is designed to provide added supply during dry periods for entitlement holders and is an important safeguard against progressing restrictions to a higher stage.

- ***Resource Availability:***

  Water resource availability from Resource Managers, the Murray Darling Basin Authority (MDBA) and Bureau of Meteorology (BOM) must be taken into consideration. Predictions beyond the current season are difficult to make but weather outlook should range between dry and very dry conditions for restrictions to apply.

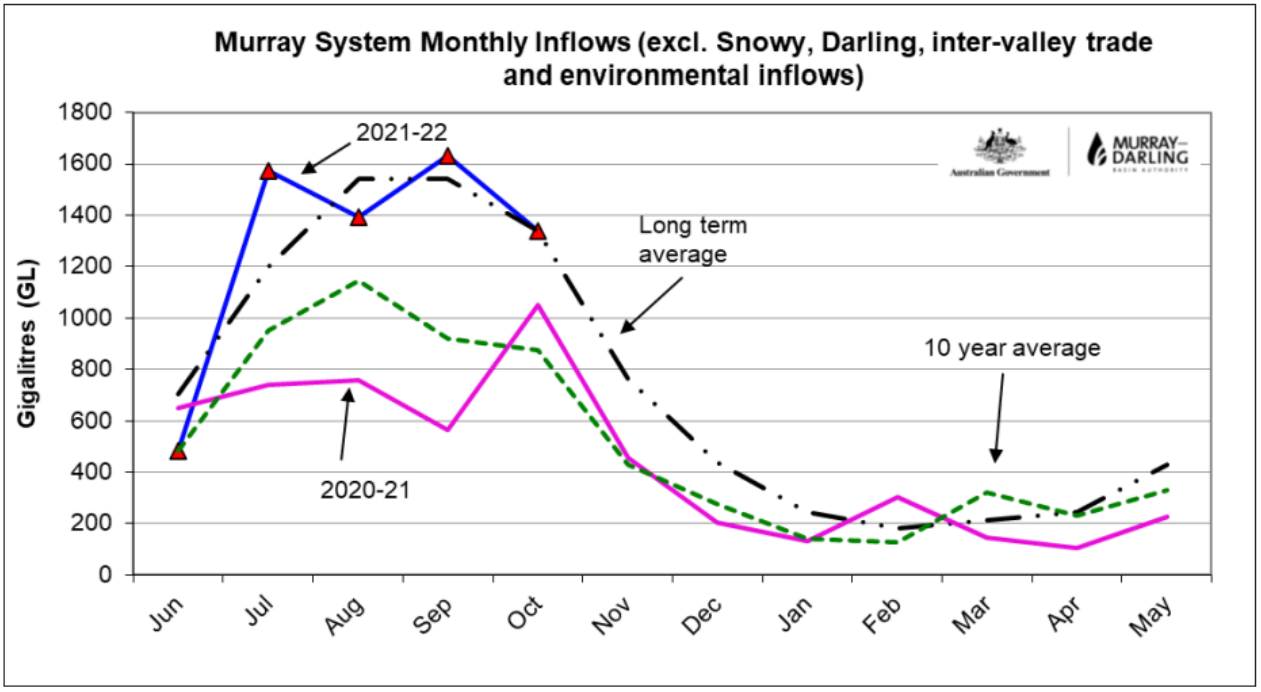
- ***Allocation:***

  The decision to announce restrictions must take into account LMW's allocation of high reliability water shares (HRWS) and the Bulk Water Entitlement in the Murray River system. This information is announced monthly via the Northern Victorian Resource Manager and should be evaluated against LMW's unrestricted usage (i.e., usage under the PWSRs) in a typical year, which is in the order of 21,000 ML now. It should be noted that demand is expected to increase with the population growth, therefore water demand projections completed as a part of the 2022 UWS to be considered.

- ***Outlook:***

  Future planning for restrictions should take account of long-term inflows to the Murray System, based on historical outcomes consider the risk to supply. This analysis should include the inflows to the Murray River system and storage levels. The annual operating outlook for the Murray River system published by MDBA contains useful information related to inflows and storage levels. Figure 1 shows an example of the Murray River inflows summary that can be consideredin decision making, i.e., viewing current and historical averages.

**Figure 1. Murray System inflows summary information**[1]




[1] Source: River Murray System Annual Operating Outlook, Oct 2021 (MDBA website).

## 8.3. Timing considerations

Points to consider - when to introduce restrictions or not.

1. The decision to impose restrictions should be based around opening allocation (If low percentage) and what the scenario is being predicted by the Resource Manager. Advice from the BOM and MDBA can be used to determine whether the climate and water resource situation is tracking under the 'Dry' or 'Extreme Dry' scenarios.
2. The introduction of water restrictions should be done at a time it will have an impact on consumption and behaviour. There would be no point introducing restrictions during July, August even September as outdoor use is generally very low (i.e., restrictable demand is low, hence savings will be low or negligible).
3. October / November is generally considered the most accurate period in predicting what the allocation will be as the Spring inflows have been accounted for (anything before this is speculation or best guess).
4. LMW's peak demand is always in summer period (December, January, February and March) and it is over this period the greatest impact from restrictions will be measured.

## 8.4. Operational Phases

The DRP action plan will be operationalised via the following three phases:

1. General Monitoring Phase.
2. Heightened Awareness Phase.
3. Drought Response Phase.

### 8.4.1. General monitoring in water restrictions

The general monitoring phase involves LMW undertaking general monitoring of supply and demand to trigger for the implementation of drought response actions as required.

This section outlines the steps which have or need to be taken to ensure LMW is adequately prepared to respond to a drought.

**Trigger for Phase Implementation**

The general monitoring phase applies during periods when:

- Existing seasonal allocations will not meet demand projections 2 years out
- Access to carryover water is declared
- Risk of spill is declared.

**Actions under this Phase include but not limited to the following:**

- Preparation of an Annual Water Outlook.
- Monitoring of Cumulative Water Demand.
- Adjustment of Water Entitlements.
- Feasibility study - Purchase of additional allocation.

**Weekly Updates – Demand Monitoring**

LMW monitors all systems, and these are reviewed regularly to ensure loss provisions and system optimisation is continuously reviewed for treatment plant operations and issues can be identified and rectified.

**Water Outlooks**

The Annual Water Outlook is a tool used to monitor supply and demand side aspects of the system. During the general monitoring phase, the system status is updated in November and reviewed monthly thereafter.

Undertake forward look projections and document using the Annual Water Outlook. In addition, regularly monitor areas of greatest uncertainty to identify significant departures from the longer-term forecasts estimated in the 2022 UWS.

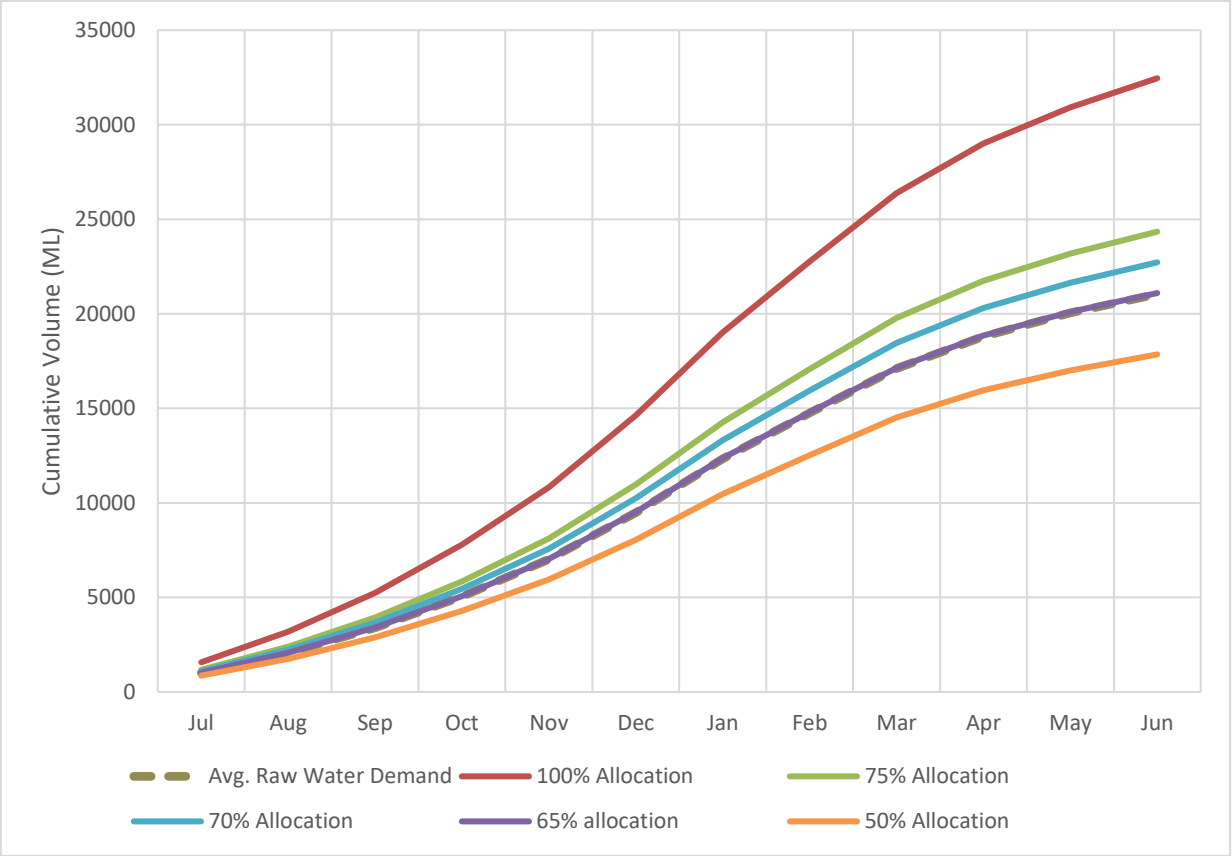
**Monitor Cumulative Water Demand**

LMW records the volume of raw water extracted for the urban water supply systems. This information has been used as a means of determining cumulative raw water demand curves

for a range of seasonal allocations plotted monthly.

In monitoring demand versus available supply, the cumulative raw water demand is plotted against the seasonal allocation curve to determine whether the raw water demand likely to exceed the seasonal allocation. The cumulative demand will be monitored as the season progresses with a plot equivalent to that provided in Figure 2. The cumulative demand curve was developed using the average raw water extracted for each month for last five years (i.e. 2020/21 – 2016/17). The total water entitlements include bulk water entitlement (30,971 ML) and the HRWS for the Murray River (940 ML) and the Goulburn (550 ML) Systems. As can be seen in Figure 2, allocation below 65% may not meet the current demand.

**Figure 2. Cumulative raw water demand curves for different seasonal allocations based on the current entitlement 32,461 ML**




**Adjust Water Entitlements**

LMW has a policy of purchasing water entitlement volumes such that the total volume is approximately 50% higher than the average raw water demand recorded over the previous three years. At the start of each financial year, LMW determines whether it needs to purchase water entitlements or reduce entitlements based on meeting these criteria.

### 8.4.2. Heightened Awareness

Heightened awareness activities normally occur within 1-2 months prior to initiating water restrictions and continue during the start of the water restriction period (i.e., around 1- 2 months). These activities are based on a prospective outlook where supply will not meet the demand profile over the next 2 years. General activities under the heightened Awareness campaign (HA) require more regular monitoring of system performance, with the aim of

increasing awareness of pending water shortages among LMW Water staff and the community. The HA phase applies during periods when there is a high probability of imposing restrictions within the next quarter.

Suggested actions and responses under the HA phase are in Table 5.

**Table 5: Actions during the Heightened Awareness Phase**

| Trigger | Responses |
|---|---|
| Within HA | • Undertake regular forward-look projections.<br>• Consider establishing a DRC to guide decision-making within LMW.<br>• Prepare public awareness campaign and provide information to the community.<br>• Train and educate LMW staff.<br>• Consider and or implement options for purchasing temporary water entitlements.<br>• Assess resourcing and logistics for the organisation.<br>• Consider integrated water management activities. |

### 8.4.3. Drought Response

This phase defines an active drought management period where supply and/or demand measures are required to maintain supply security. Drought response trigger curves are used to guide the timing of management actions, with management actions and responses during each level of restriction summarised in Table 7.

Demand reduction will commence under the HA provisions with public awareness campaigns that will highlight the pending drought situation and provide information on wise water use. This campaign will be followed by the introduction of By-Law No. 2 water restrictions. The seasonal allocations and cumulative demand versus the seasonal allocation curve will determine which drought response action is current and hence the appropriate responses to be progressively implemented.

**Trigger for Phase Implementation**

The drought response phase applies during periods when the seasonal allocation is insufficient to meet a two-year demand window.

**Trigger for Implementation of Actions**

Drought response trigger curves (Figure 3) are used to guide the increase or decrease in management actions in response to the risk of water shortage. Table 6 shows the triggers for each staged water restriction.

**Figure 3. Drought Response Triggers (DRTs)**

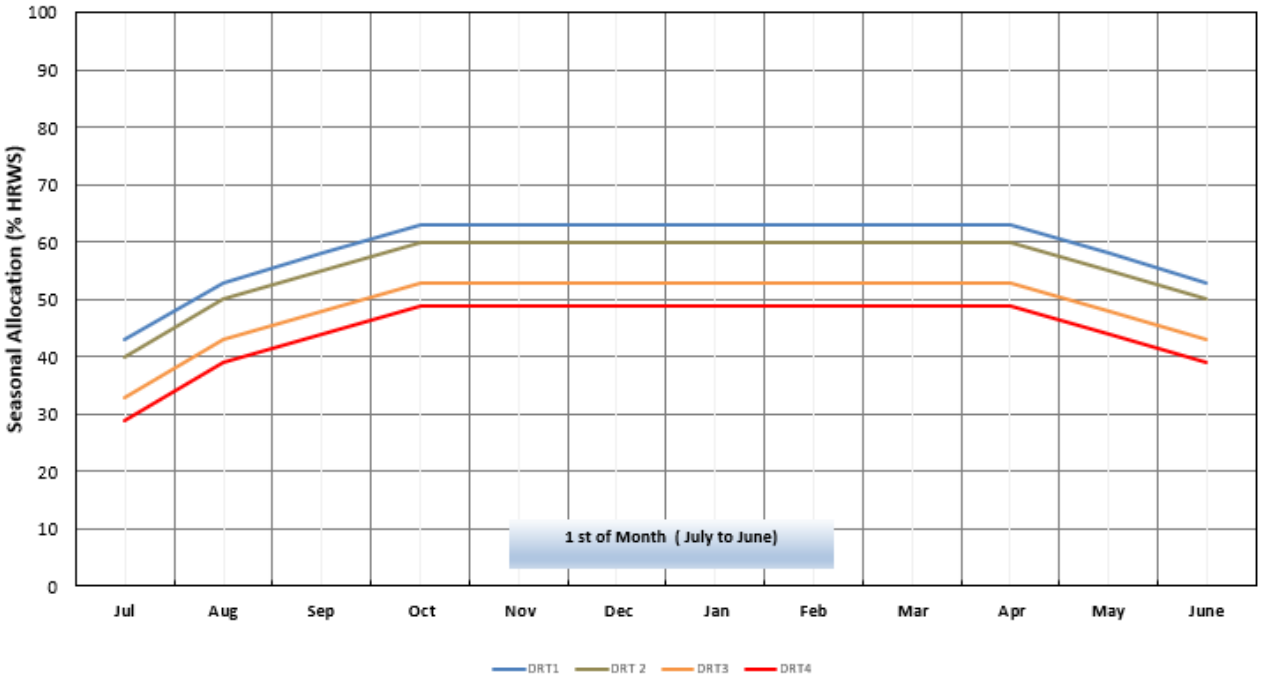



**Table 6: Triggers for Staged Water Restrictions**

| Month | Stage 1 (% Allocation) | Stage 2 (% Allocation) | Stage 3 (% Allocation) | Stage 4 (% Allocation) |
|---|---|---|---|---|
| July | 43 | 40 | 33 | 29 |
| August | 53 | 50 | 43 | 39 |
| September | 58 | 55 | 48 | 44 |
| October | 63 | 60 | 53 | 49 |
| November | 63 | 60 | 53 | 49 |
| December | 63 | 60 | 53 | 49 |
| January | 63 | 60 | 53 | 49 |
| February | 63 | 60 | 53 | 49 |
| March | 63 | 60 | 53 | 49 |
| April | 63 | 60 | 53 | 49 |
| May | 58 | 55 | 48 | 44 |
| June | 53 | 50 | 43 | 39 |

**Actions under Water Restrictions Staging:**

As drought conditions develop and less than full seasonal allocations are announced, a staged plan of action will be implemented, and weekly demand monitoring will commence. The timing of the implementation of restrictions will be based on the results of monitoring progressive seasonal allocation announcements. '*Too early won't give a true indication of allocation/storage levels and too late will mean possible high levels of restrictions and community shock/outrage'.*

A DRC (Refer to Section 5) will convene and meet weekly to assess the drought situation in terms of climate data, river flows, seasonal allocations, cumulative water consumption for the year, bulk entitlements, temporary entitlements, actions being taken, and the current or proposed restriction levels. Also, the assessment should consider resourcing and community impacts such as impacts on social amenities and liveability etc.

Monitoring during a drought or low allocation levels will involve several separate processes. The frequency of water quality monitoring may be increased if water quality is predicted to be compromised by low flow, biological events such as Blue-green algae or long detention times.

This information will be used to evaluate the effectiveness of the drought response so that necessary adjustments can be made. All information collected and decisions made will be documented for evaluation in the post drought phase and for use in future drought planning.

Actions and responses for each response stage are summarised in Table 7 (in order of increasing impact from water shortages. Note that actions listed in the table are not exhaustive.

**Table 7: Triggers and Responses for** Each Stage

| Trigger | Responses |
|---|---|
| Seasonal allocation below Stage 1 Response Trigger. | 1. Establish public awareness campaign.<br>2. Drought Monitoring Committee meets weekly.<br>3. Consider implementation of Stage 1 Restrictions. E.g., service agreements and community sentiment.<br>4. Introduce advertising campaign using all appropriateforms of media.<br>5. Monitor raw water extraction and perform regular checks of cumulative demand versus seasonal allocation curve. |
| Seasonal allocation below Stage 2 Response Trigger | 1. Consider implementation of Stage 2 Restrictions.<br>2. Continue media advertising.<br>3. Weekly monitoring of raw water extraction and checkcumulative extraction against seasonal allocation entitlement curve.<br>4. Liaising with key stakeholders – important to keep an open dialogue with Councils, Tourism Industries, Pool companies etc as Stage 2 has relatively high consequences for social amenities. |

| Trigger | Responses |
|---|---|
| Seasonal allocation below Stage 3 Response Trigger. | 1. Consider implementation of Stage 3 Restrictions.<br>2. Continue media advertising and stakeholder liaison.<br>3. Daily monitoring of storages.<br>4. Monitor storage volume response and perform regular forward look storage volume projections.<br>5. Identify and plan for implementation of emergency options.<br>6. Alternative supplies – standpipes may be introduced |
| Seasonal allocation below Stage 4 Response Trigger. | 1. Consider implementation of Stage 3 Restrictions.<br>2. Continue media advertising and stakeholder liaison.<br>3. Daily monitoring of storages.<br>4. Monitor storage volume response and perform regular forward look storage volume projections.<br>5. Implement emergency supply options.<br>6. Tanker water to areas of critical shortage. |

**Exemptions to the Water Restrictions**

As per the Water Restriction By-law No. 2, general exemptions are applicable for the following purposes:

a) human health requirements;

b) stock and animal health requirements;

c) fire-fighting; and

d) the safety, but not the cleaning, of vehicles or equipment.

Particular exemption requests will be assessed case by case basis in accordance with the By-Law No. 2. The major criteria that will be used to assess the exemption is the significance to the community in terms of liveability, health and wellbeing and economic aspects. Additionally, consideration must be given to the factors such as access to alternative water, potential for irreversible or long-term impacts (e.g., based on millennium drought experience, some large trees were lost may a long time to re-establish) and potential for financial loss etc. The request for exemptions applications will be reviewed and responded within 10 business days.

When implementing staged water restrictions, the priority community assets that require water to be made available and asset managers to be identified as a part of the stakeholder liaison plan. In LMW's service area most of the social amenities are managed by the following Councils:

- Mildura Rural City Council (MRCC);
- Swan Hill Rural City Council (SHRCC); and
- Gannawarra Shire Council (GSC).

The priority community assets within the MRCC are provided below:

1. 7th St Nature Strip – Langtree Ave to Orange, Mildura.
2. 11th St Nature Strip – Deakin Av to San Mateo Av, Mildura
3. 16th St Park – Oasis Drive & Diablo Cres., Mildura.
4. Bingara Park – 12 Bingarra Cl, Mildura.
5. Brodie Park – 22A Brodie Cl, Mildura.
6. Deakin Ave Nature Strip – 7th St to 15th St, Mildura.
7. Hector St Park – Hector St, Mildura.
8. Henderson Park – Deakin Av, Mildura.
9. Mansell Reserve – 218/228 Eighth St, Mildura.
10. Washington Park – 28A Washington Dr, Mildura.
11. Barclay Square – Jacaranda St, Red Cliffs.
12. Henshilwood Oval Reserve – Karadoc Ave, Irymple.
13. Kenny Park – Box St, Merbein.
14. Swimming pools and immediate surrounding areas in Mildura region. With reference to Purpose 9 of By Law No 2 Water Restrictions for Drought Response, Council will be able to top up the level of water in the pool once filled.

The priority community assets within the SHRCC and GSH are provided below:

1. Swimming pools and immediate surrounding areas in Swan Hill, Nyah, Kerang, Koondrook and Robinvale. With reference to Purpose 9 of By Law No 2 Water Restrictions for Drought Response, Council will be able to top up the level of water in the pool once filled.
2. Burke and Wills Tree in Swan Hill.
3. McCallum Street median between Curlewis Street and Beveridge Street Swan Hill.
4. High Street median between McCallum and Rutherford Street Swan Hill.
5. Campbell Street median between McCallum and Rutherford Street Swan Hill.
6. Sporting Oval in in Bromley Road Robinvale.
7. Victoria Street median and roundabout central gardens between Wellington and Scoresby Streets Kerang.
8. Lawn Cemeteries in Kerang and Swan Hill. Noting that arrangements were made for donations of raw water to LMW to provide potable water for lawn cemeteries.

Note that relevant councils and other asset managers such as Parks Victoria to be consulted as a part of the drought response to review and confirm the assets of community significance that require water to be made available.

# 9. Post Drought Evaluation and Revision

## 9.1. Evaluation of Objectives

Once LMW lifts the Drought Response Phase, a review of the effectiveness of the DPP should be undertaken. The first part of the review process should be to assess the suitability, appropriateness and achievability of the objectives (i.e., strategic, planning and operational), with each objective being critically reviewed to determine if they were achieved. If they were not achieved, comment needs to be made as to why not, and the objectives refined, or new actions set for the next drought event.

## 9.2. Evaluation of Actions

**Water Savings**

The timing and effectiveness of each phase and stage of the four-stage restriction regime needs to be assessed and documented. Comparisons between historical deliveries and drought deliveries will be made as part of the monitoring process during the drought. These will be documented as part of the post drought evaluation, and comments and decisions made about the impact of each stage of restrictions during a drought. Trigger levels for each phase and stage of restrictions may then be fine-tuned if required.

**Impact of Restrictions on the Community**

Community response to the imposition of restrictions will be evaluated through contact with representatives of the Major Water User Groups, the Customer Consultative Committees and interested individuals (this should include focus groups, online surveys, digital channel comments from the community). In addition, commercial, accommodation and industrial customers, including nurseries and landscape contractors, will be invited to comment so that any effects on their businesses are fully documented.

**Impact on LMW**

An examination of the financial and staffing burdens placed on LMW during the drought will be carried out. This will allow LMW to better prepare itself and its staff for the next drought event.

**Gap Analysis**

An analysis of a wide range of monitoring and data collection within LMW systems to identify areas which could provide value for future drought planning and also providing the community real time data about consumption and water restrictions impacts.

## 9.3. Revision

DPPs are dynamic in nature and will only be appropriate for a system for a short period of time. For the water supply systems operated by LMW there is an expectation of continued growth, changing customer behaviour in regard-to water conservation, increased impacts of climate change on allocations, and increased use of alternative water. For this reason, DPPs need to be reviewed and updated at intervals of no more than five years and within twelve months of either the lifting of any period of restriction imposed. Additionally, the DPP should be updated under the following circumstances:

- any major change occurring to works or arrangements for conserving water for, or supplying water to, any water supply system.
- any legislation changes occur, the Ministers declared a Drought for either the state or region.

# 10. References and Resources


1. DELWP. (2021). *Guidelines for Development of Urban Water Strategies*, March 2021.

2. Lower Murray Water. (2021). *2021 Urban Water Strategy*, Under Development.

3. Lower Murray Water. (2015). *Statement of Obligations.*

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4. Lower Murray Water. (2011). *Permanent Water Savings Rules By- Law.*

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5. Victorian Water Register. (2011). *Bulk Entitlement (River Murray - Lower Murray Water urban & Rural Water – Urban) conversion order 1999 as at June 2011.*

   https://waterregister.vic.gov.au/water-entitlements/bulk-entitlements

6. MDBA. (2021). *River Murray System Annual Operating Outlook 2021-22 (End October 2021).*

   https://www.mdba.gov.au/publications/mdba-reports/river-murray-system-annual-operating-plan

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