

**Lower Balonne Water Management Area**  
**Waterharvesting announced period guide**  
February 2019

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## **Introduction**

The purpose of this paper is to describe the method used by the chief executive in making determinations for announced periods of take for waterharvesting entitlements, located in the Lower Balonne Water Management Area (Attachment 1), that state flow conditions referencing the St George Weir. The considerations that the chief executive must have regard to when determining an announced period requirements are stated in section 78 of the Condamine and Balonne Water Management Protocol.

Conditions during unsupplemented events occur in in real-time and can be unpredictable. As such this guideline may not capture all possible considerations under every circumstance, and is intended to be descriptive rather than prescriptive.

## Definitions

This Guideline contains a number of terms not defined in the Condamine-Balonne Water Plan (2019) or the Condamine-Balonne Water Management Protocol (2019) these definitions apply to all sections of this document. Other terms may be defined for individual calculations.

**Daily Available Flow Volume** means the volume of water that has flowed into the Lower Balonne Water Management Area from the Balonne River and/or Maranoa River that coincides with the announced period for waterharvesting. While the announced period is normally based on a 24 hour time interval, it can be for a greater or shorter period of time depending on the volume and duration of the flow event.

**Pre-Waterharvesting Flow Volume** means the volume of water required to satisfy water requirements downstream of Jack Taylor Weir to the Queensland and New South Wales border that must be met to before making an announcement for waterharvesting.

**Required Inflow Volume** means the volume of water required to satisfy the various requirements for a particular waterharvesting announced period (or 'flow window'). This volume includes allowances for environmental stock and domestic water, Commonwealth held environmental water (i.e. held upstream of the Lower Balonne Water Management Area), system requirements and waterharvesting commitments.

**Supplemented Flow** in the Lower Balonne means the flow that comprise either wholly or partly water released from a dam or weir, water re-regulated by a weir or unregulated inflow from one or more of the tributary stream and is used by the resource operations licence holder for the St George Water Supply Scheme to satisfy water orders, essential supplies and delivery losses or for filling of re-regulating weirs.

**Unsupplemented Flow** means a flow that results from tributary inflow (including dam and weir spills) that exceeds the requirements to satisfy supplemented uses (i.e. filling ROL holder dams and weirs, water orders, etc).

**Waterharvesting** means for the Lower Balonne, the taking of unsupplemented water under a water allocation and the taking of overland flow water or waterharvesting under a water licence.

**Flow Event** means a flow passing through the Lower Balonne Water Management Area where one or more consecutive announced periods apply.

## Overview of steps in managing a potential flow event.

Figure 2 (below) demonstrates an overview of the steps involved in managing water harvesting events from identification through to announcement.

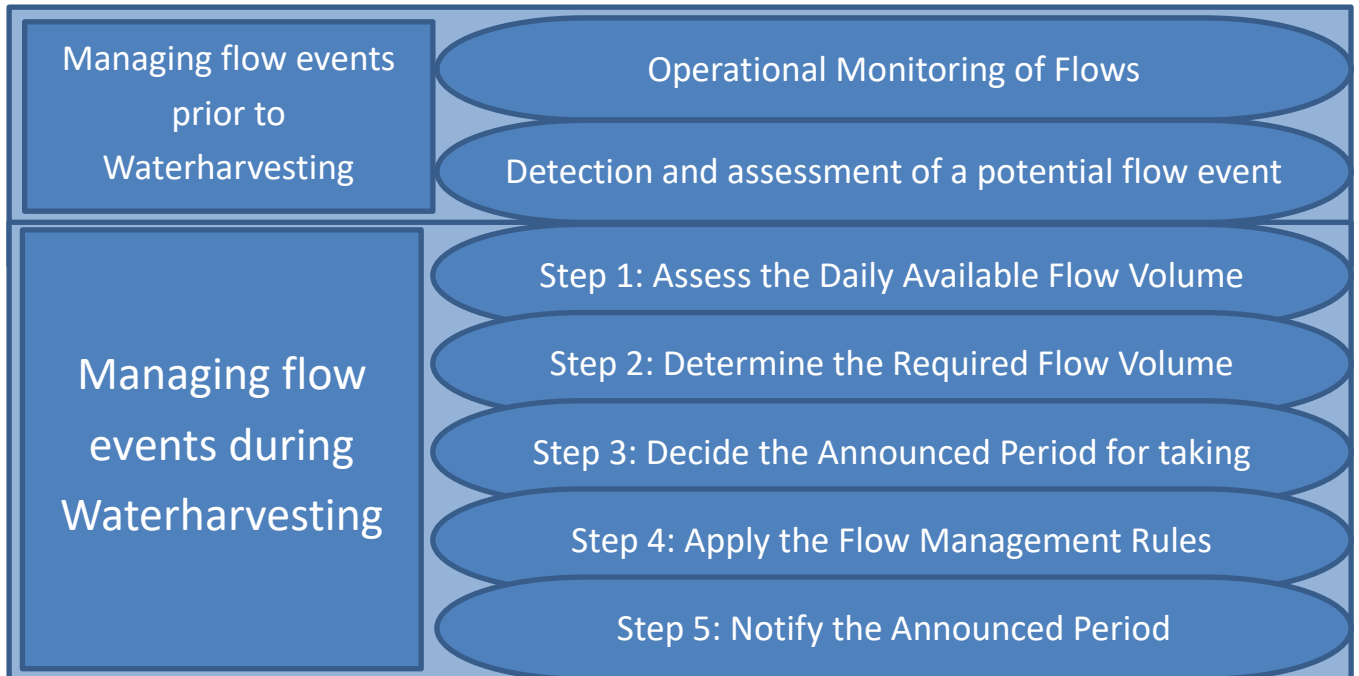


Figure 2: Steps involved in managing a potential flow event.

### Managing flow events prior to waterharvesting

If through monitoring and assessment of upstream flows, there is a likelihood Beardmore Dam will fill and spill, the chief executive must direct the resource operation licence holder for the St George Water Supply Scheme to release the volume of water held in the environmental, stock and domestic water account as a priority.

When Beardmore Dam fills and spills, there is a requirement to allow a sufficient volume of water to pass downstream of St George to provide for the Pre-Waterharvesting Flow Volume prior to considering an announcement for waterharvesting. The Pre-Waterharvesting Flow Volume is determined as follows:

$$\begin{aligned} \text{Pre-Waterharvesting Flow Volume (ML)} = & \text{ESD Allowance} \\ & + \text{Supplemented Water Requirement} \\ & + \text{Initial Downstream Requirement} \end{aligned}$$

Where -

**ESD Allowance** means the volume of water required to comply with the environmental, stock and domestic allowance (up to 730 ML/day).<sup>1</sup>

**Supplemented Water Requirement** means the volume of water required to satisfy supplemented water orders downstream of Jack Taylor Weir.<sup>2</sup>

<sup>1</sup> ESD Allowance to be in accordance with section 165 of the Condamine and Balonne water management protocol

<sup>2</sup> Volume of water required for supplemented water orders is obtained from the ROL holder for the St George Water Supply Scheme

**Initial downstream requirement** is the volume of water required to pass downstream of Jack Taylor Weir for topping up instream weirs and for channel-wetting purposes downstream to the Queensland and New South Wales border. This requirement is essential for the delivery of water to entitlement holders through possible future announcements. The volume of water required is based on estimates made by the chief executive. These estimates take into consideration the expected size and duration of the flow event, the prevailing antecedent conditions of the Balonne River and Lower Balonne distributary system and the prevailing climatic conditions. The following table includes the range of volumes required for Initial Downstream Requirement based on the period of time since the last spill of Beardmore Dam, that are used for determining the Pre-Waterharvesting Flow Volume above.

Period of time since the last spill of Beardmore Dam	Initial Downstream Requirement (megalitres)
< 30 days	1,000 – 3,000
< 90 days	3,000 – 5,000
< 180 days	5,000 – 8,000
< 365 days	8,000 – 12,000
> 365 days	12,000 +

While the assessment of the Initial Downstream Requirement is based on the antecedent conditions at the time, it does take into account any benefit realised through previous releases of stored Environmental, Stock and Domestic water.

## Managing flow events during waterharvesting

In accordance with the water sharing rules for the Lower Balonne Water Management Area stated in the water management protocol, the chief executive must have regard to –

- (i) information about the flows in the Balonne and Maranoa River
- (ii) other information about flows in the Lower Balonne Water Management Area (including rainfall assist)
- (iii) all authorisations to take water in the Lower Balonne Water Management Area (including unsupplemented water allocations and OLF water licences)
- (iv) the water allocation held by the Commonwealth of Australia at the downstream extent of Zone CBU-09 of the Condamine and Balonne Water Management Area (above Beardmore Dam)
- (v) the provisions of any management guideline that may apply to the waterharvesting entitlements
- (vi) the flow event management rules.

When a volume of water has passed downstream of St George Weir equal to the volume of water required to provide for the Pre-Waterharvesting Flow Volume, the following method is used for determining an announced period for waterharvesting.

### Step 1: Assessing the Daily Available Flow Volume

The assessment of the Daily Available Flow Volume is –

- based on the volume of water passing the gauging stations immediately upstream of Beardmore Dam on the Balonne and Maranoa River
- adjusted to take into account the different travel time between the gauging stations and the Lower Balonne water management area.

While the travel times can vary from flow to flow, the following travel times are generally applied subject to adjustments depending on circumstances at the time:

Watercourse	Gauging Station	Travel Time to the water management area
Balonne River	Weribone G/S	36 hours
Maranoa River	Cashmere G/S	12 hours

It is important to note that while an assessment of the Daily Available Flow Volume is a critical requirement of managing flow events and making announcements for waterharvesting, the actual resultant flow at St George is subject to daily releases of water from Beardmore Dam by the resource operations licence holder in accordance with standing operating procedures.

## Step 2: Determining the Required Flow Volume

The Required Flow Volume for each Waterharvesting flow window is determined as follows –

$$\text{Required Flow Volume (ML)} = \text{ESD Allowance} + \text{Commonwealth HEW Requirement} + \text{System Requirements} + \text{Unsupplemented Water Allocation Commitment} + \text{Unsupplemented Water Licence Commitments}$$

Where –

**ESD Allowance** means the volume of water required to comply with the environmental, stock and domestic allowance (up to 730 ML/day).<sup>3</sup>

**Commonwealth HEW Requirement** means the volume of water that is being protected through the Lower Balonne which is authorised under the water allocation held by the Commonwealth of Australia at the downstream extent of water management area zone CBU-09 in the Condamine and Balonne Water Management Area (above Beardmore Dam).

**System Requirements** means the volume of water that is set aside on a daily basis to provide for downstream requirements including transmission losses, bank seepage, riparian use and wetland and floodplain inundation. The estimate of losses are for average conditions and may be varied depending on antecedent condition and other factors such as rainfall assist within the Lower Balonne Distributary system.

**Unsupplemented Water Allocation Commitments** means the volume of water that is required to satisfy the authorised take of unsupplemented water allocation up to a stated flow window. This volume of water is equal to the cumulative rate of take for all unsupplemented water allocations during a 24 hour period up to the stated flow window.<sup>4</sup>

**Unsupplemented Water Licence Commitments** means the volume of water that is required to satisfy the authorised take of water from watercourses and overland flow up to a stated flow window. This volume of water is equal to the cumulative rate of take for all overland flow water licences up to the stated flow window.<sup>5</sup>

Schedule A sets out the Required Flow Volume for each flow window from 1,200 ML/day to 120,000 ML/day according to the above determination.

<sup>3</sup> ESD Allowance to be in accordance with section 165 of the Condamine and Balonne water management protocol

<sup>4</sup> Unsupplemented Water Allocation Commitments includes water allocations held by the Commonwealth of Australia

<sup>5</sup> Unsupplemented Water Licence Commitments includes OLF water licences held by the Commonwealth of Australia



### Step 3: Deciding Announced Period for taking Waterharvesting

Deciding the flow window for a Waterharvesting announcement is based on a correlation of the Daily Available Flow Volume with the Required Flow Volume plus any supplemented water orders.

*Announced Flow Window* is decided using Schedule A as follows:

*Required Flow Volume + Supplemented Water Orders ≤ Daily Available Flow Volume*

Where –

**Announced Flow Window** is the passing flow condition stated on a waterharvesting entitlement that allows the entitlement holder to take water at a specified rate of take from a flow event in accordance with announcements made by the chief executive.

**Required Inflow Volume** is derived from Schedule A.<sup>6</sup>

**Supplemented Water Orders** are sourced from the resource operations licence holder for the St George Water Supply Scheme on a daily basis.

**Daily Available Flow Volume** is sourced from the assessment undertaken in Step 1.

The outcome of this correlation is checked against the predicted flow passing the St George Weir at the start and end of the announced period. The predicted flow is based on flow monitoring activities and advice from the resource operations licence holder for the St George Water Supply Scheme in relation to expected rate/s of release from Beardmore Dam during the announced period.

### Step 4: Applying the Flow Management Rules

A requirement of deciding an announced period for waterharvesting is determining if the flow event management rules for the Lower Balonne Water management Area apply. These rules are stated in chapter 9 of the Condamine and Balonne water management protocol and include:

- managing low flow events
- managing medium flow events
- managing flow events to support Narran Lakes.

Where these rules have triggered, the chief executive is required to apply the rules in accordance with the stated criteria (e.g. apply a reduction in take for a period of time). Where more than one rule has triggered at the same time, the chief executive is required to apply one of the rules in accordance with section 163 of the Condamine and Balonne water management protocol. The chief executive monitors the flow event management rules and maintains a record for each rule when the trigger activated and ceased.

### Step 5: Notifying the announced period<sup>7</sup>

The chief executive is required to notify holders of waterharvesting entitlements of –

- (a) The start and end of an announced period
- (b) The waterharvesting entitlements that the announcements relates to
- (c) Any rules relating to the taking of water during the announced period (e.g. reduction in take under a flow event management rule).

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<sup>7</sup> Notifications are formally sent to all entitlement holders. The Department also provides flow advice and updates via e-mail to entitlement holders and other interested stakeholders.

Following the announcement for waterharvesting, the monitoring of the flow event continues in readiness for the next announcement of waterharvesting where Step 1 to 5 are repeated, or a cessation of flows occur and operational monitoring resumes.

# Schedule A

## LOWER BALONNE WATER MANAGEMENT AREA ANNOUNCED FLOW WINDOW REQUIREMENTS

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
ANNOUNCED FLOW WINDOW	ENVIRONMENTAL STOCK & DOMESTIC ALLOWANCE	COMMONWEALTH HEW REQUIREMENT (Note 1)	SYSTEM REQUIREMENTS	UNSUPPLEMENTED WATER ALLOCATION COMMITMENTS (Note 2)	UNSUPPLEMENTED WATER LICENCE COMMITMENTS (Note 3)	REQUIRED INFLOW VOLUME (Note 4)
ML/day	ML/day	ML/day	ML/day	ML/day	ML/day	ML/day
1200	730	0	784	774	12	2300
1500	730	0	902	856	12	2500
2000	730	0	1590	2268	12	4600
3000	730	0	1308	3450	12	5500
3500	730	0	1580	3478	12	5800
4000	730	0	1216	3928	126	6000
5000	730	0	1445	4499	126	6800
6000	730	0	1643	5201	126	7700
7000	730	0	2009	5935	126	8800
8000	730	0	2489	11752	429	15400
10000	730	0	2662	13479	429	17300
11000	730	0	3123	13518	429	17800
12000	730	0	2820	14321	429	18300
13000	730	0	3582	14359	429	19100
14000	730	0	3062	15579	429	19800
15000	730	0	3516	15617	537	20400
16000	730	0	3625	16608	537	21500
17000	730	0	4587	16646	537	22500
18000	730	0	4630	17589	651	23600
19000	730	0	5692	17627	651	24700
20000	730	0	4443	18606	1921	25700
22000	730	0	5682	19214	2174	27800
24000	730	0	7116	19735	2319	29900
26000	730	0	8588	20248	2334	31900
28000	730	0	10093	20723	2354	33900
30000	730	0	5890	20994	9386	37000
32000	730	0	6394	21470	9406	38000
34000	730	0	8275	21574	9421	40000
35000	730	0	8847	21574	9849	41000
36000	730	0	9228	22059	9983	42000
38000	730	0	10920	22164	10186	44000
40000	730	0	9401	22515	13354	46000
42000	730	0	11325	22591	13354	48000
44000	730	0	12879	23037	13354	50000
45000	730	0	11875	23037	15358	51000
46000	730	0	12808	23104	15358	52000
48000	730	0	13801	23351	16118	54000
50000	730	0	10918	23351	21001	56000
52000	730	0	12481	23598	21191	58000
55000	730	0	15301	23598	21371	61000
56000	730	0	16054	23845	21371	62000
60000	730	0	15924	24092	25254	66000
70000	730	0	10100	24092	41078	76000
80000	730	0	17487	24092	43691	86000
90000	730	0	28318	24092	44860	98000
100000	730	0	39273	24092	45905	110000
120000	730	0	52219	24092	52959	130000

**Note 1:** Commonwealth HEW Requirement means the volume of water that is being protected through the Lower Balonne which is authorised under the water allocation held by the Commonwealth of Australia at the downstream extent of water management area zone CBU-09 in the Condamine and Balonne Water Management Area (above Beardmore Dam). Column 3 maybe adjusted to include a daily allowance equal to the rate of take of the water allocation held by the Commonwealth.

**Note 2:** Unsupplemented Water Allocation/Water Licence Commitments includes water allocations and licences held by the Commonwealth of Australia.

**Note 3:** Unsupplemented Water Licence Commitments includes the volume of water authorised to be taken by water licences from overland flow and watercourses that are referenced to the St George Weir.

**Note 4:** Where Column 3 is adjusted to include an allowance for the Commonwealth HEW Requirement, the Required Flow Volume in Column 7 is increased by the same daily rate for each Announced Flow Window.

# Attachment 1: Location of Lower Balonne Water Plan Area

