Burnett Basin

Boyne River and Tarong Water Supply Scheme Operations Manual

November 2020

Statement of changes made to this manual

Version	Version Date	Statement of changes	Approved by
V1-0	February 2020	Initial document created and approved by Department of Natural Resource, Mines and Energy	David Wiskar – Executive Director, Water Policy. Department of Natural Resources, Mines and Energy on 26 February 2020
V1-1	November 2020	Amendment to correct administrative errors and typographical errors	Ian Gordon – Director, Divisional Support Water. Department of Regional Development, Manufacturing and Water on 27 November 2020

Contents

Chapter 1 Preliminary

1 Short title

(1) This operations manual may be cited as the Boyne River and Tarong Water Supply Scheme Operations Manual.

(2) Reference in this document to 'this manual' means the Boyne River and Tarong Water Supply Scheme Operations Manual.

2 Interpretation of words used in this manual

The dictionary in attachment 1 defines particular words used in this manual.

3 Water supply scheme

The extent of the Boyne River and Tarong Water Supply Scheme is defined in the Water Plan (Burnett Basin) 2014.

Chapter 2   Operating rules

4   Operating levels of storages

    (1)   The licence holder may only release water from a storage mentioned in table 1 for the following—

        (a)   meet the minimum waterhole level requirements in section 5;

        (b)   to comply with the environmental management rules in attachment 2 of the resource operations licence;

        (c)   to supply water under a water allocation under section 9.

    (2)   The licence holder must not, unless authorised by the chief executive, release or supply water from a storage mentioned in table 1 if the current storage level for the storage is at or below the minimum operating level stated in table 1, column 2 for the storage.

Table 1 – Minimum operating level of storage

Storage	Minimum operating level (m AHD)
Boondooma Dam	EL 252

5   Minimum levels in waterholes

    (1)   For waterholes within the extent of the water supply scheme that are not located within the ponded area of the storage—the water level should where possible be maintained at or near cease to flow level for that waterhole.

    (2)   However when Boondooma Dam is—

        (a)   greater than EL 268.67 m AHD, where the outlet discharge capacity of the storage upstream of the waterhole is insufficient to maintain the water level in the waterhole at or near its cease to flow level, the waterhole may be drawn down to 0.5m below its cease to flow level; or

        (b)   less than or equal to EL 268.67 m AHD, water allocation holders may take water from waterholes only if—

            (i)   the water level in the waterhole is above the level that is 0.5 m below the level at which the waterhole naturally overflows; or

            (ii)   the chief executive is satisfied the taking of water will not adversely affect the cultural and environmental values of the waterhole.

    (3)   Subsection (2) does not apply if the taking of water is in accordance with section 52 of the Water Plan (Burnett Basin) 2014.

Chapter 3   Water sharing rules

6   Announced allocations

(1)   The licence holder must—

     (a)   determine an announced allocation for each priority group for use in defining the share of the water available to be taken under water allocations in that priority group;

     (b)   use the water sharing rules specified in this chapter to calculate announced allocations throughout the water year;

     (c)   announce an interim announced allocation immediately prior to the commencement of a water year;

     (d)   calculate and set the announced allocation for each priority group to take effect on the first day of each water year;

     (e)   following the commencement of a water year—

         (i)   if the announced allocation percentage is less than 100%, recalculate the announced allocation—

            (A)   within 15 working days after a major inflow; and

            (B)   at intervals of not greater than three months.

         (ii)   reset the announced allocation, if a recalculation indicates that the announced allocation would—

            (A)   increase by five or more percentage points; or

            (B)   increase to 100%; and

     (f)   make public details of the announced allocations on the setting or resetting of an announced allocation—the announcement in regards to the initial setting of the announced allocation must be announced within 10 business days after the start of the water year.

(2)   The announced allocation percentage must not be greater than 100%.

(3)   The announced allocation percentage must not be reduced during a water year.

7   Calculation of announced allocations

(1)   The medium priority announced allocation is—

     (a)   100% if—

$$CV \geq Vcut + MPA + HPA + SL + TOL - MPD - HPD$$; or

     (b)   if subsection (1)(a) does not apply and Boondooma Dam is above EL 268.67 m AHD then—

$$AA_m = \left\{ \frac{UV_{cut} - HPA_{cut} + MPD - TOL}{MPA} \right\} \times 100$$

     or:

     (c)   0% if Boondooma Dam is equal to or below EL 268.67 m AHD.

(2)   The high priority announced allocation is—

     (a)   100% if the announced allocation for medium priority allocations calculated under subsection (1) is greater than zero; or

(b) if the announced allocation for medium priority allocations is zero then—

$$\text{AA}_h = \left\{ \frac{UV + HPD}{HPA} \right\} \times 100.$$

(3) The parameters used in the formulae are defined in table 2.

Table 2 – Parameters for calculation of announced allocation

Parameter	Definition
AA_m	Announced allocation percentage medium priority. That is the percentage of the nominal volume for a medium priority water allocation that may be taken for the current water year.
AA_h	Announced allocation percentage high priority. That is the percentage of the nominal volume for a high priority water allocation that may be taken for the current water year.
MPA	Medium priority water allocations. That is the volume of medium priority water allocations.
MPD	Medium priority diversions. That is the volume of water taken by medium priority water allocation holders in the current water year up to the time of the resource assessment.
HPA	High priority allocations. That is the volume of high priority water allocations.
HPD	High priority diversions. That is the volume of water taken by high priority water allocation holders in the current water year up to the time of the resource assessment.
UV	Useable volume. That is the useable volume of Boondooma Dam at the time of the announced allocation computation and is determined as per the following equation: UV = CV – DSV – SL UV = 0 if (CV – DSV – SL) is less than zero Where: **CV** is the current volume in Boondooma Dam **DSV** is the dead storage of Boondooma Dam **SL** is the storage losses from the current month to the end of water year. The storage loss depths for the remainder of the water year to be used for Boondooma Dam are given in table 3, column 2. The storage loss volume is calculated by using the value next to the current month multiplied by the current surface area of the storage.
UV_{cut}	Useable volume above EL 268.67 m AHD being shared between medium and high priority allocations. Computation is determined as per the following equation: $UV_{cut} = CV - V_{cut} - SL_{cut}$ Where: V_{cut} = Cut-off volume of Boondooma Dam for medium priority supplies, that is the volume of Boondooma Dam at cut-off level of 268.67 m AHD below which no releases are to be made to meet downstream medium priority demand SL_{cut} = projected storage loss to the sooner of the month when Boondooma Dam is expected to fall below the cut-off volume (V_{cut}) and the end of the current water year. The projected storage loss is to be calculated as the sum of the monthly storage loss volumes which are based on the storage loss depths given in table 3, column 3. Each monthly storage loss volume (ML) is calculated by multiplying the monthly storage (km^2) loss depth (mm) by the projected surface area of the storage for the beginning of that month.
HPA_{cut}	High priority demands from the current month to the month when Boondooma Dam is expected to fall below V_{cut} volume.
TOL	Transmission and operation losses, an allowance for the river transmission and operational losses expected to occur in running the system to the end of the current water year. TOL varies with the announced allocation for medium priority water

Parameter	Definition
	allocations. The transmission and operational loss allowances to be used is given in table 4. TOL is to be linearly interpolated for intermediate values of medium priority announced allocation

Table 3 – Storage loss

Month in which Announced Allocation is Calculated	Boondooma Dam	
	Storage loss till end of Water Year (mm)	Storage loss on each month (mm)
Column 1	**Column 2**	**Column 3**
July	1845	86
August	1759	112
September	1647	144
October	1503	186
November	1317	204
December	1113	220
January	893	217
February	676	179
March	497	179
April	318	135
May	183	102
June	81	81

Table 4 – Transmission and operational losses

Month in which Announced Allocation is calculated	Transmission and Operational Losses			
	At AA_M= 0%	At AA_M= 25%	At AA_M= 75%	At AA_M= 100%
July	0	1109	3327	4436
August	0	1031	3094	4126
September	0	954	2861	3815
October	0	876	2629	3505
November	0	765	2296	3061
December	0	665	1996	2662
January	0	555	1664	2218
February	0	433	1298	1730
March	0	333	998	1331
April	0	222	665	887
May	0	144	433	577
June	0	67	200	266

8   Taking water during critical water shortage

(1)   A critical water supply situation starts and ends when the licence holder notifies under subsection (9) of these critical water supply arrangements.

(2) The triggers for commencement of each stage of a critical water supply situation are as follows—

(a) Stage 1 commences when the storage level in Boondooma Dam is estimated to be less than or equal to EL 268.7 m AHD (approximately 70 000 ML).

(b) Stage 2 commences when the announced allocation for high priority water allocations, calculated in accordance with section 7, is less than 100%.

(c) Stage 3 commences when the storage level in Boondooma Dam is estimated to be less than or equal to EL 247.2 m AHD (approximately 3360 ML) or announced allocation for high priority, as calculated in accordance with subsection (7), is 0%.

(3) The triggers for the cessation of each stage of a critical water supply situation are as follows—

(a) Stage 1 ceases when the announced allocation for medium priority water allocations, calculated in accordance with section 7 is greater than 0%, and the storage level in Boondooma Dam is greater than EL 268.7 m AHD (approximately 70 000 ML).

(b) Stage 2 ceases when the announced allocation for high priority water allocations, calculated in accordance with section 7 is equal to 100%.

(c) Stage 3 ceases when the storage level in Boondooma Dam is estimated to be greater than or equal to EL 249.2 m AHD (approximately 5000 ML).

(4) The rules that will be applied to Stage 1 are as follows—

(a) Announced allocation percentages for high priority and medium priority water allocations will be calculated in accordance with section 7.

(b) High priority water allocations will be supplied.

(c) Medium priority access will be suspended except for water that can be accessed through bed sands and/or waterholes in accordance with section 5.

(5) The rules that will be applied to Stage 2 are as follows—

(a) Announced allocations for high priority water allocation holders will be made in accordance with subsection 7.

(b) High priority allocations will be supplied.

(c) Medium priority access will be suspended except for water that can be accessed through bed sands and/or waterholes in accordance with section 5.

(d) Boondooma Dam can be drawn down below the minimum operating level of EL 252 m AHD (approximately 8360 ML).

(6) The rules that will be applied to Stage 3 are as follows—

(a) High priority access will be suspended. The taking of water from the remaining water stored in Boondooma Dam, to meet essential water supply requirements, will be considered under the provisions of the *Water Act 2000*.

(b) Medium priority access will be suspended except for water that can be accessed through bed sands and/or waterholes in accordance with section 5.

(c) Boondooma Dam can be drawn down below the minimum operating level of EL 252 m AHD (approximately 8360 ML).

(7) The announced allocation for high priority water allocations is to be calculated for Stage 2 as follows—

$$\text{AAh} = \frac{(UV^{CW2} + HPD)}{HPA} \times 100$$

(8) Taking water under a water allocation—

(a) The total volume of water taken under a water allocation in a water year must not be more than the nominal volume for the water allocation.

(b) The volume of water taken under a water allocation in a water year, other than from bed sands or waterholes, must not exceed the nominal volume of the water allocation multiplied by the announced allocation and divided by 100.

(9) Notification arrangements—

(a) The licence holder must notify the water allocation holders of the commencement and cessation of Stage 1 of a critical water supply situation.

(b) The licence holder must notify the high priority water allocation holders of the commencement and cessation of Stages 2 and 3 of a critical water supply situation.

(10) A medium priority water allocation holder may only take water from a waterhole if the water level in the waterhole is above the level that is 0.5 m below the level at which the waterhole naturally overflows.

(11) The parameters used in the formula are defined in table 5.

Table 5 – Parameters for calculation of announced allocation

Parameter	Definition
AA_h	Announced allocation percentage high priority. That is the percentage of the nominal volume for a high priority water allocation that may be taken for the current water year.
UV^{cw2}	The usable storage volume of Boondooma Dam during Stage 2 of a critical water shortage as defined below— $UV^{cw2} = (CV - COV - SL)$ $UV^{cw2} = 0$ if $(CV - COV - SL)$ is less than zero Where— **CV** means the current volume in Boondooma Dam **COV** means the critical operating volume of Boondooma Dam (with the addition of a vacuum pump) = 3 360 ML **SL** means the projected storage loss (calculated using data in table 3), from Boondooma Dam for the remainder of the water year. Storage losses include lake evaporation and seepage. The depth for the month in question is used with the relevant storage curve and current storage volume to determine the resulting storage loss.
HPA	High priority water allocations. That is the volume of high priority water allocations.
HPD	High priority diversions. That is the volume of water taken by high priority water allocation holders in the current water year up to the time of the resource assessment.

9 Supplying and taking water under a water allocation

(1) The licence holder may supply under a water allocation, and the water allocation holder may take, in a water year, the volume of water calculated under subsection (2).

(2) The volume of water is calculated by multiplying the nominal volume for the water allocation by the announced allocation percentage for the priority group to which the water allocation belongs.

(3) However, for medium priority water allocation holders, if the level of Boondooma Dam falls below EL 268.67 m AHD during a water year, then any remaining unused announced allocation will not be available for use.

(4)   Despite subsection (3), water allocation holders may access water from bed sands and/or waterholes under section 5.

(5)   If subsection (4) applies, the volume of water taken in the relevant water year must not exceed the water allocation holder's nominal volume.

Chapter 4   Seasonal water assignment rules

10   Seasonal water assignment rules

(1)   The holder of a water allocation may enter into an arrangement for a seasonal water assignment in relation to the allocation under section 61 of the Water Regulation 2016 only if—

   (a)   the potential take volume for each zone for the priority group in table 6 is—

      (i)   less than or equal to the maximum volume for the zone for the priority group; and

      (ii)   greater than or equal to the minimum volume for the zone for the priority group.

(2)   Water supplied under a seasonal assignment may be used for any purpose.

Table 6 – Minimum and maximum volumes for seasonal water assignment

Priority Group	Volume	LA	KA
High	Minimum volume (ML)	0	32 390
	Maximum volume (ML)	0	37 714
Medium	Minimum volume (ML)	0	0
	Maximum volume (ML)	13 309.3	13 309.3

Attachment 1   Dictionary

Term	Definition
AHD	The Australian height datum, which references to a level or height to a standard base level.
Announced allocation percentage	For the high priority water allocations, or medium priority water allocations means the percentage used to calculate the maximum volume of water that may be supplied, under section 7, in a water year to the holders of high priority water allocations, or medium priority water allocations.
Cease to flow	For a waterhole, the level at which water stops flowing from a waterhole over its downstream control.
Current storage level	For a storage, means the current level of water in the storage in AHD.
Current storage volume	For a storage, means the volume of water in the storage for the current storage level calculated using the storage curve for the storage.
Dead storage	For a storage, means the dead storage volume of the storage stated in the infrastructure details for the storage in the resource operations licence.
EL	Elevation level
High priority water allocations	The water allocations in the high priority group in the Boyne River and Tarong Water Supply Scheme.
Licence holder	The holder of the resource operations licence for the Boyne River and Tarong Water Supply Scheme.
Major inflow	For a water supply scheme, means a flow of water into the scheme that would allow the announced allocation percentage for the high priority water allocations, or medium priority water allocations to increase by more than 5%.
Medium priority water allocations	The water allocations in the medium priority group in the Boyne River and Tarong Water Supply Scheme.
Megalitre (ML)	One million litres.
Minimum operating level	For a storage, is the volume of water within the ponded area of the storage below which water cannot be released or taken from the infrastructure under normal operating conditions.
Priority group	A grouping of water allocations for taking supplemented water from a water supply scheme with the same Water Allocation Security Objective as defined in the Water Plan (Burnett Basin) 2014.
Release	Water from a dam or weir that passes downstream from the dam or weir through the dam or weir outlet works.
Storage	In this manual refers to a storage listed in attachment 1 of the resource operations licence.
Storage curve	For a storage, means the drawing, showing the volume of water in the storage for a range of water levels, stated in the resource operations licence for the storage.
Storage Loss	For a storage, for a month, means the loss of water from the storage, due to evaporation and seepage, stated in table 3 for the storage for the month in which the announced allocation percentage is calculated.
Transmission and operation losses	An allowance for the river transmission and operational losses expected to occur in running the system to the end of the current water year.

Waterhole	A part of a watercourse that contains water after the watercourse ceases to flow, other than a part of a watercourse that is within the storage area of a dam on the watercourse.
Zone	A geographic location defined by a reach of a watercourse. Zones are for defining the location of a water allocation and operational arrangements under an operations manual. Zones are defined in the Water Plan (Burnett Basin) 2014.