

Pioneer Valley

Pioneer River Water Supply Scheme Operations Manual

October 2019

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Contents

| | | |
|---------------------|--|------------|
| Chapter 1 | Preliminary | iv |
| 1 | Short title | iv |
| 2 | Interpretation of words used in this manual | iv |
| 3 | Water supply scheme..... | iv |
| Chapter 2 | Operating rules..... | v |
| 4 | Operating levels of storages | v |
| 5 | Waterhole management..... | v |
| 6 | Operation of Mirani Weir fabridam | v |
| 7 | Operation of Dumbleton Rocks Weir fabridams..... | vi |
| 8 | Dumbleton Rocks Weir: operation of fish lock | vi |
| 9 | Deliveries..... | vi |
| Chapter 3 | Water sharing rules | vii |
| 10 | Announced allocations | vii |
| 11 | Calculation of announced allocations | vii |
| 12 | Announced allocation formulas | viii |
| 13 | Teemburra Dam water level classification | x |
| 14 | Stream Flow Period..... | xi |
| 15 | Taking water under a water allocation | xii |
| Chapter 4 | Seasonal water assignment rules | xiii |
| 16 | Seasonal water assignment rules | xiii |
| Attachment 1 | Dictionary | xiv |

Chapter 1 Preliminary

1 Short title

- (1) This operations manual may be cited as the Pioneer River Water Supply Scheme Operations Manual.
- (2) Reference in this document to 'this manual' means the Pioneer River 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 Pioneer River Water Supply Scheme is defined in the Water Plan (Pioneer Valley) 2002.

Chapter 2 Operating rules

4 Operating levels of storages

- (1) The minimum operating levels and nominal operating levels for Teemburra Dam, Mirani Weir, Marian Weir and Dumbleton Rocks Weir are specified in table 1.
- (2) The scheme licence holder must not release or supply water from a storage when the water level in that storage is at or below its minimum operating level as specified in table 1.
- (3) The scheme licence holder must not release water to a downstream storage unless the release is necessary to—
 - (a) meet minimum flow rates in attachment 2 of the resource operations licence;
 - (b) supply downstream demand; or
 - (c) maintain the downstream storage at its nominal operating level;
- (4) Notwithstanding subsection 1, where stage 4 or 5 water level classifications determined under section 13 are in effect, the minimum operating level for Teemburra Dam is EL 250.50m AHD.
- (5) Notwithstanding subsections (2) and (3), where stage 3, 4 or 5 water level classifications determined under section 13 are in effect, the requirements of these subsections do not apply to the release or supply of water from Teemburra Dam.

Table 1 – Operating levels of storages

| Storage | Minimum operating level (m AHD) | Nominal operating level (m AHD) | |
|----------------------|---------------------------------|---------------------------------|----------|
| | | Dec-Sept | Oct-Nov |
| Teemburra Dam | EL 264.35 | Not applicable | |
| Mirani Weir | EL 40.01 | EL 44.50 | EL 43.50 |
| Marian Weir | EL 26.54 | EL 31.00 | EL 30.00 |
| Dumbleton Rocks Weir | EL 9.0 | EL 12.00 | EL 12.00 |

5 Waterhole management

- (1) The water level in the Dumbleton Rocks Waterhole (located immediately downstream of Dumbleton Rocks Weir) may be drawn down 0.5m below the natural cease to flow level to allow water to be taken under a water allocation.
- (2) Subsection (1) applies when there is no requirement to pass flows to meet the minimum flow rates set out in attachment 2 of the resource operations licence.

6 Operation of Mirani Weir fabridam

Operating rules for the licence holder for Mirani Weir fabridam are as follows—

- (a) deflation of the fabridam must commence when the storage level of the weir exceeds the level 47.4 m AHD and may be deflated at lower levels for operational purposes;
- (b) the fabridam should be completely deflated when the storage level reaches 47.6m AHD;
- (c) the fabridam should be reinflated as stream flows recede; and

- (d) a passing flow of water at Mirani Weir must be maintained during reinflation of the fabridam.

7 Operation of Dumbleton Rocks Weir fabridams

Operating rules for the licence holder for Dumbleton Rocks Weir fabridams are as follows—

- (a) deflation of the fabridams must commence when the storage level of the weir exceeds the level 16.4 m AHD and may be deflated at lower levels for operational purposes;
- (b) the fabridams should be completely deflated when the storage level reaches 16.55 m AHD;
- (c) the fabridams should be reinflated as stream flows recede; and
- (d) a passing flow of water at Dumbleton Rocks Weir must be maintained during reinflation of the fabridams.

8 Dumbleton Rocks Weir: operation of fish lock

When maintaining a passing flow at Dumbleton Rocks Weir, the licence holder must preferentially use—

- (a) the fish lock; then
- (b) the outlet valve and over the crest of the weir.

9 Deliveries

The licence holder must not deliver more than 70 per cent of the total nominal volume for the Pioneer River Water Supply Scheme in any quarterly period.

Chapter 3 Water sharing rules

10 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) calculate and set the announced allocation for each priority group to take effect on the first day of each water year;
 - (d) following the commencement of a water year—
 - (i) recalculate the announced allocation to take effect no later than five business days following the first day of every month; and
 - (ii) reset the announced allocation if a recalculation indicates that the calculated announced allocation would—
 - (A) increase by five or more percentage points; or
 - (B) increase to 100 per cent; and
 - (e) publish details of the announced allocation, including parameters used in determining the announced allocations, on the licence holder's internet site within five business days of—
 - (i) setting an announced allocation under subsection 1(c); or
 - (ii) the first calendar day of every month when resetting the announced allocation under subsection 1(d).
- (2) The announced allocation must not be greater than 100 per cent.

11 Calculation of announced allocations

- (1) The licence holder must determine the announced allocations for water allocation using the formulae set out in section 12 as follows—
 - (a) Where Formula 1 results in a number less than 80 per cent and Formula 2 results in a number less than zero, then—
 - (i) the announced allocation for high class A (Pioneer) water allocations is calculated using Formula 1; and
 - (ii) the announced allocation for high class B (Pioneer) water allocations is zero per cent.
 - (b) Where subsection (a) does not apply and where Formula 3 results in a number less than 10 per cent and Formula 4 results in a number less than zero, then—
 - (i) the announced allocation for high class A (Pioneer) water allocation is 80 per cent; and
 - (ii) the announced allocation for high class B (Pioneer) water allocations is calculated using Formula 3;
 - (c) Where subsections (a) or (b) do not apply and where—
 - (i) Formula 3 results in a number greater than or equal to 10 per cent or Formula 4 results in a number greater than or equal to zero; and

- (ii) Formula 5 results in a number greater than or equal to 80 per cent but less than 100 per cent; and
- (iii) Formula 6 results in a number less than zero, then—
 - (A) the announced allocation for high class A (Pioneer) water allocations is calculated using Formula 5; and
 - (B) the announced allocation for high class B (Pioneer) water allocations is 10 per cent.
- (d) Where subsections (a), (b) or (c) do not apply, then—
 - (i) the announced allocation for high class A (Pioneer) water allocations is 100 per cent; and
 - (ii) the announced allocation for high class B (Pioneer) water allocations where Formula 4 results in—
 - (A) a number less than zero—is calculated using Formula 7; or
 - (B) a number greater than or equal to zero—is 100 per cent.

12 Announced allocation formulas

- (1) The formulae for the calculation of announced allocations under section 11 are set out in table 2.
- (2) The parameters used in the formulae for the announced allocation are defined in table 3.

Table 2 – Announced allocation formulae

| Formula number | Formula definition |
|----------------|--|
| 1. | $100 \times \frac{(UV^P - TOA - MFR + DIV^P HA^P_{nonSFP})}{HA^P}$ |
| 2. | $DIV^P HA^P_{SFP} + (0.01 \times AA_{HAP} \times HA^P) - HA^P$ (NB: AA_{HAP} in Formula 2 is to be calculated using Formula 1.) |
| 3. | $100 \times (UV^P - [\text{the lesser}^* \text{ of } \{HA^P - (DIV^P HA^P_{SFP} + DIV^P HA^P_{nonSFP})\} \text{ and } \{(0.8 \times HA^P) - DIV^P HA^P_{nonSFP}\}] - TOA - MFR + DIV^P HB^P_{nonSFP}) / HB^P$ *but not less than zero. |
| 4. | $DIV^P HB^P_{SFP} + (0.01 \times AA_{HBP} \times HB^P) - HB^P$ (NB: AA_{HBP} in Formula 4 is to be calculated using Formula 3.) |
| 5. | $100 \times (UV^P - [\text{the lesser}^* \text{ of } \{HB^P - ((DIV^P HB^P_{SFP} + DIV^P HB^P_{nonSFP}))\} \text{ and } \{(0.1 \times HB^P) - DIV^P HB^P_{nonSFP}\}] - TOA - MFR + DIV^P HA^P_{nonSFP}) / HA^P$ *but not less than zero. |
| 6. | $DIV^P HA^P_{SFP} + (0.01 \times AA_{HAP} \times HA^P) - HA^P$ (NB: AA_{HAP} in Formula 6 is to be calculated using Formula 5.) |
| 7. | $100 \times (UV^P - [\text{the lesser}^* \text{ of } \{HA^P - DIV^P HA^P_{SFP} + DIV^P HA^P_{nonSFP}\} \text{ and } \{(0.01 \times AA_{HAP} \times HA^P) - DIV^P HA^P_{nonSFP}\}] - TOA - MFR + DIV^P HB^P_{nonSFP}) / HB^P$ *but not less than zero. |

Table 3 – Announced allocation parameters

| Term | Definition |
|--|--|
| High class A priority announced allocation percentage (AA_{HAP}) | The percentage of the water allocation volume for a high class A water allocation in the Pioneer River water supply scheme that may be taken for the current water year. |
| High class B priority announced allocation percentage (AA_{HBP}) | The percentage of the water allocation volume for a high class B water allocation in the Pioneer River water supply scheme that may be taken for the current water year. |
| High class A priority water allocations (HA^P) | The total nominal volume (ML) of high class A (Pioneer) water allocations in the Pioneer River water supply scheme. |
| High class B priority water allocations (HB^P) | The total nominal volume (ML) of high class B (Pioneer) water allocations in the Pioneer River water supply scheme. |
| Useable volume (UV^P) | <p>UV^P (ML) is the sum of the useable storage volume of all storages (Teemburra Dam, Mirani Weir, Marian Weir & Dumbleton Rocks Weir).</p> $UV = \text{sum}(US)$ $US = (CV - DSV - SL)$ <p>$US = 0$ if $(CV - DSV - SL)$ is less than 0</p> <p>Where:</p> <ul style="list-style-type: none"> • US is the useable storage volume of each storage (Teemburra Dam, Mirani Weir, Marian Weir & Dumbleton Rocks Weir). • CV is the current volume of each storage. • DSV is the dead storage volume of each storage (refer attachment 1 of the Pioneer River water supply scheme resource operations licence). • SL is the projected storage loss from each storage for the remainder of the water year. Storage losses include lake evaporation and seepage. The storage loss depths to be used for each storage are given in table 4. The depth for the month in question is used with the relevant storage curves and current storage volumes to determine the resulting storage loss. |
| Transmission operational allowance (TOA) | TOA (in mm) is an allowance for the transmission and operational losses expected to occur in running the system to the end of the water year. TOA varies with the announced allocation for high class B water allocations. TOA is to be linearly interpolated from Table 5. |
| Minimum flow rate (MFR) | MFR (in ML) is an allowance for releases from storage to meet minimum flow rates at the Pioneer River tidal limit as detailed in attachment 2, table 1 of the Pioneer River water supply scheme resource operations licence. MFR is to be linearly interpolated from Table 6. |
| Diverted volume (DIV^P) | DIV^P is the volume (in ML) of water taken under all water allocations in a water year in the water supply scheme up to the time of assessment of the announced allocation, less any water taken during a stream flow period under section 14. |
| Non stream flow period (non SFP) | non SFP is a period of time when water may be taken under announced allocation for a water allocation in a water year that is not a stream flow period as notified under section 14. |
| Stream flow period (SFP) | SFP is a period of time when water may be taken under announced allocation for a water allocation in a water year that is notified under section 14. |

Table 4 –Storage losses

| Storage loss until end of year (mm) | | | | |
|---|---------------|-------------|-------------|----------------------|
| Month in which announced allocation is calculated | Teemburra Dam | Mirani Weir | Marian Weir | Dumbleton Rocks Weir |
| July | 1740 | 1740 | 1740 | 1740 |
| August | 1650 | 1650 | 1650 | 1650 |
| September | 1530 | 1530 | 1530 | 1530 |
| October | 1390 | 1390 | 1390 | 1390 |
| November | 1210 | 1210 | 1214 | 1214 |
| December | 1020 | 1020 | 1020 | 1020 |
| January | 820 | 820 | 820 | 820 |
| February | 640 | 640 | 640 | 640 |
| March | 480 | 480 | 480 | 480 |
| April | 320 | 320 | 320 | 320 |
| May | 190 | 190 | 190 | 190 |
| June | 90 | 90 | 90 | 90 |

Table 5 – Transmission and operational allowance

| Announced allocation [AA _{HB} (Pioneer)] | Transmission and operation allowance (ML) | | | | | | | | | | | |
|--|---|------|------|------|------|------|------|------|-------|-------|-----|------|
| | July | Aug | Sept | Oct | Nov | Dec | Jan | Feb | March | April | May | June |
| 0% | 2560 | 2340 | 2120 | 1680 | 1400 | 1080 | 900 | 750 | 630 | 500 | 360 | 200 |
| 25% | 3510 | 3240 | 2980 | 2490 | 2050 | 1570 | 1230 | 1030 | 840 | 640 | 460 | 250 |
| 75% | 5410 | 5050 | 4690 | 4110 | 3350 | 2550 | 1900 | 1570 | 1250 | 930 | 650 | 340 |
| 100% | 6360 | 5960 | 5550 | 4920 | 4010 | 3040 | 2240 | 1840 | 1450 | 1070 | 740 | 390 |

Table 6 – Minimum flow rate allowance

| Month in which announced allocation is calculated | Teemburra Dam storage volume (ML) | | |
|---|-----------------------------------|---|---------------------|
| | Greater than 117,800 ML | Less than 117,800 ML and greater than 73,630 ML | Less than 73,630 ML |
| July | 9000 | 1700 | 360 |
| August | 8075 | 1545 | 330 |
| September | 7880 | 1515 | 300 |
| October | 7685 | 1490 | 270 |
| November | 7490 | 1460 | 240 |
| December | 7295 | 1435 | 210 |
| January | 6165 | 1190 | 180 |
| February | 5035 | 950 | 150 |
| March | 3905 | 710 | 120 |
| April | 2775 | 470 | 90 |
| May | 1850 | 315 | 60 |
| June | 925 | 160 | 30 |

13 Teemburra Dam water level classification

- (1) For the purpose of this Chapter, table 7 applies in determining the relevant water level classification for Teemburra Dam as stage 1, 2, 3, 4 or 5.
- (2) The licence holder must—
 - (a) determine the water level classification to take effect on the first day of the water year;
 - (b) redetermine the water level classification to take effect on the first day of every month following the commencement of the water year and reset the water level classification if a redetermination indicates that the stage has changed;

- (c) within five business days of setting or resetting the water level classification, publish the details of the stage including parameters for determining the stage, on the licence holder's internet site.
- (3) Notwithstanding subsection 1 and table 7—
 - (a) Stage 2 water level classification for Teemburra Dam does not take effect unless the announced allocation for High Class B (Pioneer) water allocations is equal to or less than 10 per cent; and
 - (b) Stage 1 water level classification applies where—
 - (i) the storage level of Teemburra Dam is greater than EL 271.00 m AHD; and
 - (ii) the announced allocation for High Class B (Pioneer) water allocations is greater than 10 per cent.

Table 7: Teemburra Dam water level classification stages

| Stage | Water level of Teemburra Dam (m AHD) |
|-------|--|
| 1 | EL greater than 276.75. |
| 2 | EL greater than 271.00 but less than or equal to 276.75. |
| 3 | EL greater than 264.35 but less than or equal to 271.00. |
| 4 | EL greater than 250.50 but less than or equal to 264.35. |
| 5 | EL less than or equal to 250.50. |

14 Stream Flow Period

- (1) A stream flow period is a period of time, for a zone, that starts and ends at such time that the licence holder notifies under subsection (2).
- (2) The licence holder must notify the distribution operations licence holder and water allocation holders for the zone of the start and end of a stream flow period for the zone.
- (3) Notwithstanding subsection (2), where the announced allocation for a priority group is 100%, the licence holder is not required to notify the distribution operations licence holder and water allocation holders of the start and end of a stream flow period for that priority group.
- (4) The licence holder must start a stream flow period for a zone when the requirements of subsection 5 are met for the zone and either of the following occur—
 - (a) the inflow to Mirani Weir is greater than or equal to 250 ML/day; or
 - (b) the storage level of –
 - (i) Mirani Weir is that stated in table 8 column 2A; and
 - (ii) Dumbleton Rocks Weir is that stated in table 8 column 2B; and
- (5) Where, for the stage determined under section 13—
 - (a) for zones Pioneer 01, Pioneer 02, Pioneer 03 and Bakers 01 the—
 - (i) natural stream flow at Node F is that stated in table 8 column 3A; or
 - (ii) inflow to Mirani Weir is as specified in table 8 column 4; and
 - (b) for zone Pioneer 04 where the natural stream flow at Node C is as specified in table 8 column 3B; and

- (c) for zones Cattle 01, Cattle 02 and Siler McGregor 01 where the natural stream flow at Node F is as specified in table 8 column 3A.
- (6) The licence holder must end a stream flow period for a zone whenever the requirements in subsection 4 for the zone are no longer being met.
- (7) Notwithstanding subsection 4(b) the fixed crest level for the relevant storage applies where—
 - (a) a stage 4 or 5 water level classification is determined under section 13; and
 - (b) an operational report is provided under Attachment 4, section 16 of the Pioneer River Water Supply Scheme resource operations licence that indicates the fabridam at Mirani Weir or fabridams at Dumbleton Rocks Weir are unable to be reinflated.

Table 8 – conditions for accessing water during a stream flow period

| Column 1 | Column 2A | Column 2B | Column 3A | Column 3B | Column 4 |
|--|-----------------------|-----------------------|------------------------------|-----------------------------|--------------------------------|
| Teemburra Dam water level classification | Storage level (m AHD) | | Natural stream flow (ML/day) | | Inflow to Mirani Weir (ML/day) |
| | Mirani Weir | Dumblerton Rocks Weir | Node F | Node C | |
| Stage 1 | 45.2 | 14 | Greater than or equal to 100 | Greater than or equal to 40 | Greater than or equal to 140 |
| Stage 2 | 45.2 | 14 | Greater than or equal to 75 | Greater than or equal to 30 | Greater than or equal to 105 |
| Stage 3 | 45.2 | 14 | Greater than or equal to 75 | Greater than or equal to 30 | Greater than or equal to 105 |
| Stage 4 | 46 | 15 | Greater than or equal to 50 | Greater than or equal to 20 | Greater than or equal to 70 |
| Stage 5 | 46.5 | 15.5 | Greater than or equal to 50 | Greater than or equal to 20 | Greater than or equal to 70 |

15 Taking water under a water allocation

- (1) The total volume of water taken under a water allocation in a water year must not exceed the nominal volume for the water allocation.
- (2) The volume of water taken under a water allocation in a water year, other than during stream flow periods, must not exceed the nominal volume of the water allocation multiplied by the announced allocation and divided by 100.
- (3) During a stream flow period for the zone to which a water allocation applied, water may be taken under the water allocation in addition to that which may be taken under subsection (2).
- (4) Subsection (3) applies to water allocations in the Pioneer River Water Supply Scheme, except those water allocations where water is taken from the following locations—
 - (a) zone Teemburra 01; and
 - (b) Palm Tree Creek in zone Cattle 01.

Chapter 4 Seasonal water assignment rules

16 Seasonal water assignment rules

- (1) The licence holder may approve a seasonal assignment of a volume of water provided that the total water use in a water year for each zone does not exceed the maximum allowable water use volume in table 9 for each zone or zone group.
- (2) The distribution operations licence holder is responsible for dealing with applications for seasonal assignment where the distribution operations licence holder distributes to the assignee.
- (3) The licence holder is responsible for dealing with applications for seasonal assignment where the resource operations licence holder distributes to the assignee.
- (4) The scheme licence holder must notify the distribution operations licence holder of the approval of any seasonal assignment in accordance with attachment 3 of the Pioneer River Water Supply Scheme resource operations licence.

Table 9 – Maximum allowable water use volumes

| Zone | Maximum allowable water use volume (ML) |
|--------------------------|--|
| Upper Pioneer zone group | 38 750 |
| Lower Pioneer zone group | 51 650 |
| Zone Teemburra 01 | 6 575 |
| Zone Cattle 01 | 9 280 |
| Zone Cattle 02 | 4 610 |
| Zone Silver/McGregor 01 | 6 000 |
| Zone Pioneer 04 | 4 650 |
| Zone Pioneer 03 | 16 000 |
| Zone Pioneer 02 | 27 300 |
| Zone Pioneer 01 | 48 100 |
| Zone Bakers 01 | 6 000 |

Attachment 1 Dictionary

| Term | Definition |
|-------------------------|--|
| AHD | The Australian height datum, which references to a level or height to a standard base level. |
| Announced allocation | For a water allocation managed under a resource operations licence means a number, expressed as a percentage, which is used to determine the maximum volume of water that may be taken, other than during a stream flow period, in a water year under a water allocation. The announced allocation forms all or part of the total volume of water that may be taken under the authority of a water allocation in accordance with Section 15 of this operations manual. |
| Assignee | The person or entity to whom an interest or right to water is being transferred (e.g. seasonally assigned). |
| Cease to flow level | For a waterhole, the level at which water stops flowing from a waterhole over its downstream control. |
| Dead storage | For a dam or weir, is the volume of water within the ponded area of the storage that cannot be released or used from the storage under normal operating conditions. |
| EL | Elevation level |
| Fixed crest level | The part of a dam or weir, the level of which cannot be easily altered due to its nature of construction, over which water flows are designed to spill from the ponded storage. |
| Inflow to Mirani Weir | The total daily flow in megalitres measured on the Pioneer River at AMTD 58.1 km and Cattle Creek at AMTD 11.0 km less any water released from Teemburra Dam. |
| Location | For a water allocation, means the zone from which water under the water allocation can be taken. |
| Megalitre (ML) | One million litres. |
| Natural stream flow | The total daily flow in megalitres measured at a given point along a watercourse, less any water released from an upstream storage which contributes to flow at that point. |
| Node | F – Cattle Creek at Gargett gauging station (AMTD 11.0km) C – Pioneer River at Sarich's gauging station (AMTD 57.7km) |
| Nominal operating level | Is the level in a weir that requires releases from upstream weirs or dams. From time to time under normal conditions the weirs may drop below these levels, for example if water has been released from an upstream storage but for unseen circumstances the released water has not travelled to the storage in time. |
| Outlet | An arrangement on a dam or weir that allows stored water to be released downstream. |
| Passing flow | Means the flow in a watercourse as defined by either litres per second, cubic metres per second or megalitres per day, past a specified location. |
| Ponded area | Area of inundation at full supply level of a storage. |
| Priority group | A grouping of water allocations for taking supplemented water from a water supply scheme with the same Water Allocation Security Objective (WASO). |
| Quarterly | Three monthly intervals commencing at the start of the water year |
| Release | Water from a dam or weir that passes downstream from the dam or weir through the dam or weir outlet works. |

| | |
|-------------|---|
| Stream flow | The total daily flow in megalitres measured at a given point along a watercourse. This includes both natural stream flow and water released from an upstream storage which contributes to flow at that point. |
| Water use | Refers to actual consumption of water. |