Operations Manual

Central Lockyer Valley Water Supply Scheme (draft)

October 2018

SOURCE STORE SUPPLY

Contents

1 Preliminary

1.1 Short title

(1) This operations manual may be cited as the Central Lockyer Valley Water Supply Scheme Operations Manual.

(2) Reference in this document to 'this manual' means the Central Lockyer Valley Water Supply Scheme Operations Manual.

1.2 Interpretation of words used in this manual

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

1.3 Water supply scheme

The extent of the Central Lockyer Valley Water Supply Scheme is defined in schedule 4 of the Water Plan (Moreton) 2007.

2 Operating rules

2.1 Operating levels for infrastructure

(1) The minimum operating levels for the infrastructure in the Central Lockyer Valley Water Supply Scheme are specified in Table 1.

(2) The licence holder may release water from any infrastructure if the water level in that infrastructure is above its minimum operating level and the release is required:

a. for underground water recharge; or

b. for operational purposes.

(3) When releasing water, the licence holder should:

a. start releases once flow at Jordan I Weir (Lake Clarendon) or Showgrounds Weir (Lake Dyer) requires augmentation;

b. maintain a flow over Clarendon Weir and Glenore Grove Weir;

c. maintain Kentville Weir within 1 metre of full supply volume.

(4) When making releases from Lake Clarendon, water that has been set aside to satisfy Morton Vale Pipeline demands (including reserve volume) must be retained in storage ($MPAB_{MV}$ - DIV_{MV} + $RELC_{MV}$).

(5) There are no passflow requirements for Kentville Weir.

Table 1 – Operating levels of storage infrastructure

Infrastructure	Minimum operating level (m AHD)
Lake Dyer (Bill Gunn Dam)	EL 101.09
Lake Clarendon (Clarendon Dam)	EL 84.30 for Morton Vale Pipeline
	EL 87.00 for Lockyer Creek

2.2 Diversion capacity for scheme

(1) The full supply volume levels for the diversion infrastructure in the Central Lockyer Valley Water Supply Scheme are specified in Table 2.

(2) The licence holder may operate diversion infrastructure to divert water into Lake Clarendon or Lake Dyer if the combined flow in Lockyer and Laidley Creeks (including what is being diverted into Lake Clarendon and Lake Dyer) is expected to overtop Kentville Weir.

Table 2 – Operating levels of diversion infrastructure

Infrastructure	Full supply level (m AHD)
Jordan I Weir	EL 87.20
Jordan II Weir	EL 87.50
Laidley Creek Diversion Weir	EL 110.56
Kentville Weir	EL 69.09

2.3 Diversions to Morton Vale Pipeline

The licence holder may divert water into Morton Vale Pipeline.

3 Water sharing rules

3.1 Calculating and setting announced allocations for underground water

(1) The licence holder must:

a. calculate the announced allocation for each priority group using the water sharing rules for the scheme to take effect on the first day of the water year;

b. following the commencement of a water year:

i. recalculate the announced allocation at the beginning of each month;

ii. reset the announced allocation no later than 5 business days following the first day of the month only if the recalculation indicates that the announced allocation would:

1. increase to the next announced allocation threshold; or

2. increase to 100 percent;

c. make public details of the announced allocation, including the monitoring bore levels used for determining the announced allocation for water allocations belonging to the medium priority group, on the licence holder's website within 5 business days of setting or resetting an announced allocation;

d. not reduce the announced allocation during a water year;

e. not set an announced allocation that is less than 40 percent or greater than 100 percent.

3.2 Announced allocation for Medium Priority A – Underground Water

(1) The announced allocation for Medium Priority A underground water allocations ($MPAA_{GW}$) in the Central Locker Valley Water Supply Scheme must be calculated using the methodology set out as follows:

a. The announced allocation that is set by the licence holder must be 100, 80, 70, 60, 50 or 40 percent.

b. For each groundwater zone, the announced allocation for water allocations located in that zone must be calculated as follows by the licence holder:

   i. for each assessment site within a groundwater zone in table 3, determine the underground water level; and

   ii. for each assessment site, using the underground water level obtained in step i, identify the column in which the water level falls under and then assign to the assessment site the corresponding announced allocation threshold from table 3; and

   iii. for each zone:

      1. average all the announced allocation thresholds for the assessment sites; and

      2. round to the nearest announced allocation threshold.

c. If the monitoring bore for the assessment site cannot be used, the licence holder may use another method of determining the underground water level for the site, subject to approval by the chief executive.

Table 3 – Underground water announced allocation determination table

	Announced allocation threshold	100%	80%	70%	60%	50%	40%
Groundwater zone	**Assessment site (registered number)**	**m AHD**	**m AHD**	**m AHD**	**m AHD**	**m AHD**	**m AHD**
2	14320451	> 93.56	93.56 to 92.80	92.79 to 92.04	92.03 to 91.27	91.26 to 90.51	< 90.51
	14320325	> 88.07	88.07 to 87.34	87.33 to 86.61	86.60 to 85.87	85.86 to 85.14	< 85.14
	14320527	> 84.54	84.54 to 83.78	83.77 to 83.02	83.01 to 82.25	82.24 to 81.49	< 81.49
3a	14320527	> 84.54	84.54 to 83.78	83.77 to 83.02	83.01 to 82.25	82.24 to 81.49	< 81.49
	14320277	> 80.07	80.07 to 79.21	79.20 to 78.34	78.33 to 77.47	77.46 to 76.60	< 76.60
	14320528	> 78.03	78.03 to 77.24	77.23 to 76.45	76.44 to 75.65	75.64 to 74.86	< 74.86
	14320525	> 74.45	74.45 to 73.65	73.64 to 72.84	72.83 to 72.03	72.02 to 71.22	< 71.22
5	14320457	> 81.44	81.44 to 80.94	80.93 to 80.43	80.42 to 79.92	79.91 to 79.42	< 79.42
	14320594	> 80.21	80.21 to 79.75	79.74 to 79.28	79.27 to 78.81	78.80 to 78.34	< 78.34
	14320809	> 74.20	74.20 to 73.11	73.10 to 72.01	72.00 to 70.91	70.90 to 69.80	< 69.80
	14320351	> 80.24	80.24 to 79.53	79.52 to 78.82	78.81 to 78.10	78.09 to 77.39	< 77.39
6	14320787	> 72.22	72.22 to 71.45	71.44 to 70.67	70.66 to 69.89	69.88 to 69.10	< 69.10
	14320379	> 71.51	71.51 to 70.49	70.48 to 69.46	69.45 to 68.43	68.42 to 67.40	< 67.40
	14320779	> 64.72	64.72 to 63.85	63.84 to 62.96	62.95 to 62.08	62.07 to 61.20	< 61.20
8	14320551	> 61.52	61.52 to 60.66	60.65 to 59.80	59.79 to 58.93	58.92 to 58.07	< 58.07

	14320782	> 64.46	64.46 to 63.63	63.62 to 62.79	62.78 to 61.95	61.94 to 61.11	< 61.11
	14320791	> 62.13	62.13 to 61.07	61.06 to 60.00	59.99 to 58.93	58.92 to 57.86	< 57.86
	14320121	> 63.65	63.65 to 62.94	62.93 to 62.22	62.21 to 61.50	61.49 to 60.79	< 60.79
	14320131	> 64.20	64.20 to 63.26	63.25 to 62.31	62.30 to 61.36	61.35 to 60.41	< 60.41
9	73471	> 61.10	61.10 to 60.36	60.35 to 59.61	59.60 to 58.86	58.85 to 58.12	< 58.12
	14320480	> 57.35	57.35 to 56.74	56.73 to 56.11	56.10 to 55.49	55.48 to 54.86	< 54.86
	14320558	> 57.80	57.80 to 56.71	56.70 to 55.61	55.60 to 54.51	54.50 to 53.41	< 53.41
	14320437	> 57.37	57.37 to 56.37	56.36 to 55.36	55.35 to 54.35	54.34 to 53.35	< 53.35
	14320534	> 54.96	54.96 to 54.12	54.11 to 53.26	53.25 to 52.41	52.40 to 51.56	< 51.56

(2) The parameters used in the announced allocation formula for $MPAA_{GW}$ allocations are defined in Tables 3 and 4.

3.3 Calculating and setting announced allocations for surface water and pipeline

(1) The licence holder must:

a. calculate the announced allocation for each priority group using the water sharing rules for the scheme to take effect on the first day of the water year;

b. following the commencement of a water year:

i. recalculate the announced allocation at the beginning of each month;

ii. reset the announced allocation no later than 5 business days following the first day of the month only if the recalculation indicates that the announced allocation would:

1. increase by 5 or more percentage points; or

2. increase to 100 percent.

(2) make public details of the announced allocation, including parameters for determining the announced allocation, on the licence holder's website within 5 business days of setting an announced allocation;

(3) not reduce the announced allocation during a water year;

(4) round the announced allocation to the nearest whole percentage point; and

(5) not set an announced allocation that is less than zero or greater than 100 percent.

3.4 Announced allocation for Medium Priority B – Morton Vale Pipeline

(1) The licence holder must calculate the announced allocation for Medium Priority B Morton Vale Pipeline allocations ($MPAB_{MV}$) using the formula and methodology as follows:

$$AA_{MV} = \left\{\frac{UV_{LC} + DIV_{MV} - HPA_{LOSS}}{MPAB_{MV}}\right\} \times 100$$

(2) The parameters used in the announced allocation formula for $MPAB_{MV}$ allocations are defined in Tables 4 and 5.

3.5 Announced allocation for Medium Priority C – Surface Water

(1) The licence holder must determine the announced allocation for Medium Priority C surface water allocations ($MPAC_{SW}$) using the formula and methodology set out as follows:

(a) Calculate the announced allocation for medium priority water allocations (surface water) using the following formula –

$$AA_1 = \left\{ \frac{UV_{LC} - HPA_{LOSS} - MPAB_{MV} - RELC_{MV} - RELC_{GW1} - RELC_{GW2} + DIV_{MV} + DIV_{SW\,\sum(Z1,Z2,Z4)}}{MPAC_{SW\,\sum(Z1,Z2,Z4)}} \right\} \times 100$$

$$AA_2 = \left\{ \frac{UV_{LD} - RELD_{GW} + DIV_{SW\,\sum(Z2,Z3,Z5)}}{MPAC_{SW\,\sum(Z2,Z3,Z5)}} \right\} \times 100$$

$$AA_3 = \left\{ \frac{UV_{LC} - HPA_{LOSS} - MPAB_{MV} - RELC_{MV} - RELC_{GW1} - RELC_{GW2} + DIV_{MV} + DIV_{SW\,\sum(Z1,Z4)}}{MPAC_{SW\,\sum(Z1,Z4)}} \right\} \times 100$$

$$AA_4 = \left\{ \frac{UV_{LD} - RELD_{GW} + DIV_{SW\,\sum(Z3,Z5)}}{MPAC_{SW\,\sum(Z3,Z5)}} \right\} \times 100$$

(b) Where $AA_1 >= AA_2$, the announced allocation for medium priority water allocations is determined as follows:

(i) For water allocations in zone 1, 2 and 4 the announced allocation is determined by formula AA_1.

(ii) For water allocations in zone 3 and 5, the announced allocation is determined as by the lesser of either formula AA_1 or AA_4.

(c) Where $AA_2 > AA_1$, the announced allocation for medium priority water allocations is determined as follows:

(i) For water allocations in zone 2, 3 and 5, the announced allocation determined by formula AA_2.

(ii) For water allocations in zone 1 and 4 the announced allocation is determined by the lesser of either formula AA_2 or AA_3.

(2) The parameters used in the announced allocation formula for medium priority water allocation holders (surface water) are defined in tables 4 and 5.

Table 4 – Announced allocation parameters

<table>
<tr><th>Term</th><th>Details</th></tr>
<tr><td>UV
(ML)</td><td>UV(storage) = CV – MOV – SL

Where:

Usable volume in a storage (UV(Storage)) is the volume in a storage that is available for supplying demand after projected losses and inaccessible volume is accounted for.

CV = current volume in a storage.

SL = storage loss. The net projected storage loss from for the remainder of the water year. Includes evaporation and seepage, minus direct rainfall onto the storage. Calculated by multiplying the storage loss value for the current month (Table 4) by the surface area of the storage.

MOV = minimum operating volume. The volume of water in a storage that cannot be accessed to meet demand under normal operating conditions.</td></tr>
<tr><td>HGW / LGW</td><td>High underground water level / low underground water level – an assessment of the water level in five representative bores to determine underground water recharge effectiveness. Each of the five bores has a nominated high / low threshold. If water levels in at least three of the five bores is above their nominated thresholds, then water levels are deemed to be high (HGW). If water levels in at least three of the five bores are below the nominated thresholds, then water levels are deemed to be low (LGW).

The representative bores and each of their thresholds are as follows:

<table><tr><th>Registered number (RN)</th><th>EL (metres)</th></tr><tr><td>14320101</td><td>58.0</td></tr><tr><td>14320503</td><td>74.7</td></tr><tr><td>14320531</td><td>68.5</td></tr><tr><td>14320558</td><td>60.0</td></tr><tr><td>14320655</td><td>66.0</td></tr></table></td></tr>
</table>

$RELC_{MV}$ (ML)	Reserve volume in Lake Clarendon set aside for Morton Vale Pipeline is the volume of water set aside for supplying Medium Priority B - Morton Vale Pipeline allocations in the future months beyond the current resource assessment. It does not include any provision for losses that may be incurred in those future months. The methodology for calculating reserve volume differs depending whether the underground water level assessment is determined to be HGW or LGW. This methodology is set at the beginning of the water year (and cannot change during the water year) as follows. $where\ HGW\ then\ RELC_{MV} = UV_{LC} - MPAB_{MV} + DIV_{MV}$ $where\ LGW\ then\ RELC_{MV} = (UV_{LC} - MPAB_{MV} + DIV_{MV}) \times 0.5$ $RELC_{MV}$ (in megalitres) cannot exceed the total volume of $MPAB_{MV}$ and cannot be less than zero. $RELC_{MV}$ is recalculated at the beginning of each month and can be reset if the recalculation shows it would increase. It cannot decrease during a water year.
$RELC_{GW1}$ (ML)	Primary reserve volume in Lake Clarendon set aside for underground water recharge is the volume set aside for underground water recharge for the remainder of the water year. The calculation of the reserve volume differs depending on the AA_{GW} as follows. $where\ HGW\ then\ RELC_{GW1} = (UV_{LC} - (MPAB_{MV} \times 2) + DIV_{MV}) \times 0.7$ $where\ LGW\ then\ RELC_{GW1} = (UV_{LC} - (MPAB_{MV} \times 3) + DIV_{MV}) \times 0.7$ $RELC_{GW1}$ (in megalitres) cannot be less than zero.
$RELC_{GW2}$ (ML)	Secondary reserve volume in Lake Clarendon set aside for underground water recharge is the volume set aside for underground water recharge for the remainder of the water year as follows. $where\ HGW\ then\ RELC_{GW2} = 0$ $where\ LGW\ then\ RELC_{GW2} = \big((UV_{LC} - MPAB_{MV}) + DIV_{MV}\big) \times 0.35$ $RELC_{GW2}$ (in megalitres) cannot exceed $MPAB_{MV} \times 0.7$ and cannot be less than zero.
$RELD_{GW}$ (ML)	Reserve volume in Lake Dyer set aside for underground water recharge is the volume set aside for underground water recharge for the remainder of the water year. $RELD_{GW} = UV_{LD} \times 0.7$
$MPAA_{GW}$ (ML)	Medium Priority A allocations for underground water is the total volume of underground water allocations (ML) and may be specified by zone.
$MPAB_{MV}$ (ML)	Medium Priority B allocations for Morton Vale Pipeline is the total volume of water allocations (ML) on the Morton Vale Pipeline.
HPA_{LOSS} (ML)	High Priority loss allocation associated with recharging of the Morton Vale Pipeline.

$MPAC_{SW}$ (ML)	Medium Priority C allocations for surface water is the total volume of surface water allocations (ML) and may be specified by zone.
DIV_{SW} (ML)	Diversion medium priority for surface water allocations is the volume (in megalitres) of water taken under medium priority water allocations for surface water since the start of the current water year up to the time of assessment of the announced allocation and may be specified by zone. At the start of the water year $DIV_{SW} = 0$
DIV_{MV} (ML)	Diversion medium priority for Morton Vale Pipeline allocations is the volume (in megalitres) of water taken under medium priority water allocations for the Morton Vale Pipeline since the start of the current water year up to the time of assessment of the announced allocation. At the start of the water year $DIV_{MW} = 0$

Table 5 – Total storage loss depths for the remainder of the water year (mm)

Month in which announced allocation was calculated	Loss depth (mm) from Lake Clarendon and Lake Dyer
July	628
August	606
September	551
October	473
November	395
December	317
January	240
February	181
March	134
April	82
May	31
June	12

3.6 Alternative water sharing arrangements for Morton Vale Pipeline

When the announced allocation for medium priority allocation holders on the Morton Vale Pipeline as determined under section 3.4 is zero percent, the licence holder may make water available from Lake Clarendon by announcement.

3.7 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 total volume of water that may be taken under a water allocation in a water year other than the water made available by announcement in section 3.6, must not exceed the nominal volume of the water allocation multiplied by the announced allocation percentage.

4 Seasonal water assignment rules

4.1 Seasonal water assignments

(1) The licence holder may approve a seasonal assignment of a volume of water.

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

(3) The licence holder may only approve a seasonal water assignment that occurs within the same zone. Seasonal water assignments between different zones are not permitted.

(4) The licence holder may only approve a seasonal water assignment that occurs within the same priority group. Seasonal water assignments between different priority groups are not permitted.

Attachment 1 – Dictionary

Term	Definition
AHD	Australian Height Datum, which references 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 in a water year under the authority of a water allocation.
EL	Elevation level.
Full supply volume	The specified maximum volume of water within the ponded area of a dam, weir or barrage, which corresponds to the full supply level.
Infrastructure	A dam, weir or other water storage and any associated works for taking or interfering with water in a watercourse, lake or spring.
Inlet	Infrastructure comprised of an entrance channel, intake structure, and gate or valve which allow for water to be taken from the ponded area of a dam, weir or barrage and discharged via an outlet into the watercourse downstream of the storage.
Megalitre (ML)	One million litres.
Minimum operating level	For a dam or weir, is the volume of water within the ponded area of a dam, weir or barrage below which water cannot be released or taken from the infrastructure under normal operating conditions.
Minimum operating volume	The specified minimum volume of water within the ponded area of a dam weir or barrage below which water cannot be released or taken from the infrastructure under normal operating conditions.
Outlet	Means an arrangement on a dam or weir that allows stored water to be released downstream.
Ponded area	Area of inundation at full supply level of a dam, weir or barrage.
Release	Water from a dam or weir that passes downstream from the dam or weir either through the dam or weir outlet works or over the dam spillway.
Release rate	Rate of release of water from a storage facility, for example, a dam or weir.
Water use	Refers to actual take of water.
Water year	For the Central Lockyer Valley Water Supply Scheme, the water year is 1 July to 30 June