



Licence WU67 Monthly Environmental Flow Report May 2022

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1. Introduction

Icon Water holds a Licence to Take Water under the Water Resources Act 2007 – Licence Number WU67.

Under Licence Number WU67 clause C1, it is a requirement to provide the following information to the Environment Protection Authority (EPA) by the 15th day of each month.

2. Compliance Analysis and Operational Interactions

Table 1 - Notes relating to the reporting month Environmental Flow releases

Reservoir	Notes
Corin	Corin Dam spilled throughout May. Releases were at licence requirements throughout May.
Bendora	Bendora Dam spilled throughout May. Releases were at licence requirements throughout May.
Cotter	Cotter Dam spilled throughout May. Releases were at licence requirements throughout May. The bi-monthly riffle release was achieved from spillway flows.
Googong	Googong Dam spilled throughout May. Releases were at licence requirements throughout May. The bi-monthly riffle release was achieved from spillway flows.

Table 2 – Notes relating to abstraction from Murrumbidgee River

Mt MacDonald river gauge	Not applicable, natural river flows.
Murrumbidgee abstraction	There was no Murrumbidgee River abstraction for consumption in May.
Murrumbidgee To Cotter Eflow	M2C did not operate in May.
Murrumbidgee to Googong	M2G did not operate in May.
Angle Crossing river gauge	Not applicable, natural river flows.

3. Environmental Release Data

The environmental flow release requirements for the current month (a combination of requirements) are detailed in Table 3.

Table 3 – Current month Environmental Flow releases (Total for month in ML)

	Corin	Bendora	Cotter	Googong
Previous month's shortfall (-) or Excess (+) *	84.0	135		
Monthly 75% of the 80 th %tile ML #	840	1350		
Additional release required?	No	No	No	No
Current month's release target	1122	1530	450	300

Note: * Excess carried forward is capped at 10% of the current month's base flow.

Shortfall carried forward is 100% of the amount of water under released.

Under stage 1 or greater water restrictions, targets flow change to a predetermined base flow.

Daily totals in Table 4 to Table 7 are reported as the 24-hour average from midnight to midnight. Operational changes to environmental flow releases occur during business hours, and therefore the value reported may be slightly different to the target flow on the day the flow is changed. This is particularly evident for large changes in flow e.g. the riffle and pool flushes as the flow is averaged for the day.

The actual daily flows, in megalitres per day (ML/d), from each reservoir are detailed in Table 4 to Table 7 together with the water produced at the water treatment plants (WTP) in Table 10.

Table 8 provides more detail with respect to environmental flows provided below Cotter Dam. The e-flows are made up of two components: water released from the Cotter Dam and water being pumped from Murrumbidgee River to below Cotter Dam. This is to satisfy the requirements set out by ACT EPA and Federal Department of the Environment for the operation of the Enlarged Cotter Dam.

Table 9 provides flow details for the operations of the Murrumbidgee to Googong pipeline. It details daily flows through the high lift pumps station as well as daily flows in the Murrumbidgee River at Angle crossing. This is to demonstrate compliance with the requirements set out by ACT EPA, Federal Department of the Environment and NSW Department of Planning.

Table 10 also details the quantity of treated water that has been transferred to Googong reservoir from Stromlo WTP.

Table 4 - Monthly Environmental Flow release data for Corin dam

SUM	410730 Gingera (unverified)	410730 Gingera (verified)	Environmental flow release below Corin Date	Daily base flow	Additional release (pool / riffle)	Planned +/- 50% release regime	Calculated Natural Flow. (Unverified)	Calculated Natural Flow. (Verified)	Adjusted daily base flow. EOM = Revised monthly target	410752 Corin D/S (Unverified)	410752 Corin D/S (Verified)	EOM Excess (+) / Shortfall (-) to carry forward	EOM Correction to 410730, Verified Vs unverified	EOM Correction to 410752, Verified Vs unverified	Comments
	Previous months adjustment									-58.9					
	157.24	163.2	Sun 1-May-22	19.00		7.5	224.6	233.1	19.0	303.94	285				
		147	Mon 2-May-22	19.00		7.5		210.0	19.0		239.6				
	138.02	139.2	Tue 3-May-22	19.00		7.5	197.1	198.8	19.0	227.75	219.2				
	163.69	152.5	Wed 4-May-22	19.00		7.5	233.8	217.8	19.0	238.78	238.8				
	152.8	162.5	Thu 5-May-22	19.00		28.5	218.2	232.1	19.0	261.7	260.9				
	137.4	139	Fri 6-May-22	19.00		28.5	196.2	198.5	19.0	224.9	223.4				
	131.9	132.7	Sat 7-May-22	19.00		28.5	188.3	189.5	19.0	203.8	203.4				
	127.4	128.9	Sun 8-May-22	19.00		28.5	182.0	184.1	19.0	200.8	198.7				
	123.35	124.9	Mon 9-May-22	19.00		28.5	176.2	178.4	19.0	196.10	194.8				
	128.71	124.6	Tue 10-May-22	19.00		28.5	183.8	178.0	19.0	195.85	194.5				
	153.25	144.3	Wed 11-May-22	19.00		28.5	218.9	206.1	19.0	224.6	222.2				
	565.16	463.8	Thu 12-May-22	19.00		9.5	807.2	662.4	19.0	475.8	471.7				
	481.42	538	Fri 13-May-22	19.00		9.5	687.6	768.4	19.0	698.2	696.5				
	383.23	396.1	Sat 14-May-22	19.00		9.5	547.4	565.7	19.0	580.3	578.5				
	389.37	391.4	Sun 15-May-22	19.00		9.5	556.1	559.0	19.0	555.7	551				
	322.43	334.8	Mon 16-May-22	19.00		9.5	460.5	478.2	19.0	515.9	513.8				
	285.38	293	Tue 17-May-22	19.00		9.5	407.6	418.5	19.0	451.1	448.5				
	262.97	269	Wed 18-May-22	19.00		9.5	375.6	384.2	19.0	422.34	418.3				
	242.15	248.4	Thu 19-May-22	19.00		28.5	345.9	354.8	19.0	389.41	384.5				
	225.79	230.3	Fri 20-May-22	19.00		28.5	322.5	328.9	19.0	364.88	359.7				
	213.02	217.6	Sat 21-May-22	19.00		28.5	304.3	310.8	19.0	346.94	341.1				
	201.08	205.2	Sun 22-May-22	19.00		28.5	287.2	293.1	19.0	326.86	321.2				
	191.33	194.7	Mon 23-May-22	19.00		28.5	273.3	278.1	19.0	312.30	305.8				
	182.16	185.9	Tue 24-May-22	19.00		28.5	260.2	265.5	19.0	301.61	294.2				
	175.46	178.1	Wed 25-May-22	19.00		28.5	250.6	254.4	19.0	284.47	276.3				
	170.70	173	Thu 26-May-22	19.00		9.5	243.8	247.1	19.0	275.44	267.4				
	173.54	172.7	Fri 27-May-22	19.00		9.5	247.9	246.7	19.0	279.74	271.8				
	176.16	182.4	Sat 28-May-22	19.00		9.5	251.6	260.5	19.0	290.24	282.3				
	158.88	163.5	Sun 29-May-22	19.00		9.5	226.9	233.5	19.0	265.80	256.9				
		176.4	Mon 30-May-22	19.00		9.5		252.0	19.0	295.82	285.4				
		224.9	Tue 31-May-22	19.00		9.5		321.2	19.0		354.2				
SUM	6,213.92	6798.0		589.0	0.0	552.5	8875.3	9709.6	530.1	9711.2	10159.6	84.0	9.4%	4.6%	

Table 5 - Monthly Environmental Flow release data for Bendora dam

SUM	410730 Gingera (unverified)	410730 Gingera (verified)	Environmental flow release below Bendora Date	Daily base flow	Additional release (pool / riffle)	Planned +/- 50% release regime	Calculated Natural Flow. (Unverified)	Calculated Natural Flow. (Verified)	Adjusted daily base flow. EOM = Revised monthly target	410747 Bendora D/S (Unverified)	410747 Bendora D/S (Verified)	EOM Excess (+) / Shortfall (-) to carry forward	EOM Correction to 410730 , Verified Vs unverified	EOM Correction to 410747 , Verified Vs unverified	Comments
Previous months adjustment									-96.1						
	157.24	163.2	Sun 1-May-22	31.00		36.0	345.9	359.0	31.0	395.55	363.3				
		147	Mon 2-May-22	31.00		36.0		323.4	31.0	329.37	303.9				
	138.02	139.2	Tue 3-May-22	31.00		36.0	303.6	306.2	31.0	275.62	271.4				
	163.69	152.5	Wed 4-May-22	31.00		15.5	360.1	335.5	31.0	280.78	270.2				
	152.8	162.5	Thu 5-May-22	31.00		15.5	336.2	357.5	31.0	321.9	309.9				
	137.4	139	Fri 6-May-22	31.00		15.5	302.2	305.8	31.0	294.2	280.3				
	131.9	132.7	Sat 7-May-22	31.00		15.5	290.1	291.9	31.0	260.3	249.9				
	127.4	128.9	Sun 8-May-22	31.00		15.5	280.3	283.6	31.0	243.1	235.5				
	123.35	124.9	Mon 9-May-22	31.00		15.5	271.4	274.8	31.0	236.14	230.2				
	128.71	124.6	Tue 10-May-22	31.00		15.5	283.2	274.1	31.0	230.61	221.2				
	153.25	144.3	Wed 11-May-22	31.00		46.5	337.2	317.5	31.0	251.2	241.9				
	565.16	463.8	Thu 12-May-22	31.00		46.5	1243.4	1020.4	31.0	607.3	557				
	481.42	538	Fri 13-May-22	31.00		46.5	1059.1	1183.6	31.0	1744.3	1578				
	383.23	396.1	Sat 14-May-22	31.00		46.5	843.1	871.4	31.0	1172.5	1057				
	389.37	391.4	Sun 15-May-22	31.00		46.5	856.6	861.1	31.0	920.8	833.7				
	322.43	334.8	Mon 16-May-22	31.00		46.5	709.3	736.6	31.0	802.0	724.7				
	285.38	293	Tue 17-May-22	31.00		46.5	627.8	644.6	31.0	658.6	592.1				
	262.97	269	Wed 18-May-22	31.00		15.5	578.5	591.8	31.0	604.26	536.3				
	242.15	248.4	Thu 19-May-22	31.00		15.5	532.7	546.5	31.0	514.58	457.2				
	225.79	230.3	Fri 20-May-22	31.00		15.5	496.7	506.7	31.0	453.76	399.2				
	213.02	217.6	Sat 21-May-22	31.00		15.5	468.6	478.7	31.0	395.99	347.5				
	201.08	205.2	Sun 22-May-22	31.00		15.5	442.4	451.4	31.0	364.62	317.1				
	191.33	194.7	Mon 23-May-22	31.00		15.5	420.9	428.3	31.0	339.64	293.6				
	182.16	185.9	Tue 24-May-22	31.00		15.5	400.7	409.0	31.0	334.75	285.5				
	175.46	178.1	Wed 25-May-22	31.00		46.5	386.0	391.8	31.0	314.48	266.4				
	170.70	173	Thu 26-May-22	31.00		46.5	375.5	380.6	31.0	295.65	250.8				
	173.54	172.7	Fri 27-May-22	31.00		46.5	381.8	379.9	31.0	293.84	248.3				
	176.16	182.4	Sat 28-May-22	31.00		46.5	387.6	401.3	31.0	323.20	265.1				
	158.88	163.5	Sun 29-May-22	31.00		46.5	349.5	359.7	31.0	304.86	249.6				
		176.4	Mon 30-May-22	31.00		46.5		388.1	31.0	316.33	253				
		224.9	Tue 31-May-22	31.00		46.5		494.8	31.0		348.3				
SUM	6,213.92	6798.0		961.0	0.0	976.0	13670.6	14955.6	864.9	13880.2	12838.1	135.0	9.4%	-7.5%	

Table 6 - Monthly Environmental Flow release data for Cotter dam

SUM	Environmental flow release below Cotter	Daily base flow	Additional release (pool / riffle)				EOM = Revised monthly target	410700 Cotter D/S (Unverified)	410700 Cotter D/S (Verified)	EOM Excess (+) / Shortfall (-)	EOM Correction to 410700 , Verified Vs unverified	Comments
	Date											
Previous months adjustment							0.0					
	Sun 1-May-22	15					15.0	599.0	587.5			
	Mon 2-May-22	15					15.0	518.6	508.4			
	Tue 3-May-22	15					15.0	427.7	427.6			
	Wed 4-May-22	15					15.0	383.3	383.3			
	Thu 5-May-22	15					15.0	424.2	424.4			
	Fri 6-May-22	15					15.0	401.7	401.7			
	Sat 7-May-22	15					15.0	360.1	360.1			
	Sun 8-May-22	15					15.0	323.1	323.1			
	Mon 9-May-22	15					15.0	310.3	310.3			
	Tue 10-May-22	15					15.0	303.8	303.8			
	Wed 11-May-22	15	100				100.0	315.5	315.5			Riffle release achieved
	Thu 12-May-22	15					15.0	1319.2	1319.0			
	Fri 13-May-22	15					15.0	3673.1	3673.0			
	Sat 14-May-22	15					15.0	2379.6	2380.0			
	Sun 15-May-22	15					15.0	1630.9	1631			
	Mon 16-May-22	15					15.0	1330.1	1330			
	Tue 17-May-22	15					15.0	1077.0	1077			
	Wed 18-May-22	15					15.0	916.3	916.4			
	Thu 19-May-22	15					15.0	787.4	787.4			
	Fri 20-May-22	15					15.0	688.6	688.6			
	Sat 21-May-22	15					15.0	605.6	605.6			
	Sun 22-May-22	15					15.0	539.5	539.5			
	Mon 23-May-22	15					15.0	483.0	483			
	Tue 24-May-22	15					15.0	431.37	431.4			
	Wed 25-May-22	15					15.0	404.10	404.1			
	Thu 26-May-22	15					15.0	376.23	376.2			
	Fri 27-May-22	15					15.0	365.59	365.6			
	Sat 28-May-22	15					15.0	397.19	397.2			
	Sun 29-May-22	15					15.0	373.26	373.3			
	Mon 30-May-22	15					15.0	389.12	389.1			
	Tue 31-May-22	15					15.0	694.2	694.2			
SUM		465.0	100.0				550.0	23228.4	23207.3	22657.3	-0.1%	

Table 7 - Monthly Environmental Flow release data for Googong dam

SUM	410781 Upstream Googong (Unverified)	410781 Upstream Googong (Verified)	Environmental flow release below Googong	Daily base flow	Additional release (pool / riffle)	Calculated Natural Flow. (Unverified)	Calculated Natural Flow. (Verified)	EOM = Revised monthly target	410760 Wickerslack (Unverified)	410760 Wickerslac k (Verified)	EOM Excess (+) / Shortfall (-)	EOM Correction to 410781, Verified Vs unverified	EOM Correction to 410760, Verified Vs unverified	Comments
Previous months adjustment														
	521.8	554.3		Sun 1-May-22	10.0		667.9	709.5	10.0	636.79	608.2			
	421.6	433.9		Mon 2-May-22	10.0		539.7	555.4	10.0	519.39	494.1			
	374.3	379.2		Tue 3-May-22	10.0		479.2	485.4	10.0	392.30	392.3			
	360.4	358.5		Wed 4-May-22	10.0		461.3	458.9	10.0	330.3	330.3			
	424.0	406.7		Thu 5-May-22	10.0		542.7	520.6	10.0	329.5	329.5			
	382.0	393.0		Fri 6-May-22	10.0		489.0	503.0	10.0	338.1	338.1			
	337.7	339.9		Sat 7-May-22	10.0		432.2	435.1	10.0	288.3	288.3			
	316.2	316.1		Sun 8-May-22	10.0		404.7	404.6	10.0	249.2	249.2			
	302.73	300.7		Mon 9-May-22	10.0		387.5	384.9	10.0	254.9	254.9			
	293.13	290.6		Tue 10-May-22	10.0		375.2	372.0	10.0	240.1	240.1			
	338.8	316.4		Wed 11-May-22	10.0	100	433.7	405.0	100.0	229.7	229.7			Riffle release achieved
	3717.4	2246.0		Thu 12-May-22	10.0		4758.3	2874.9	10.0	1347.6	1348			
	3887.9	4938.0		Fri 13-May-22	10.0		4976.5	6320.6	10.0	8254.9	8255			
	1626.0	1820.0		Sat 14-May-22	10.0		2081.2	2329.6	10.0	3954.7	3955			
	1313.7	1311.0		Sun 15-May-22	10.0		1681.6	1678.1	10.0	2185.69	2186			
	1118.5	1181.0		Mon 16-May-22	10.0		1431.7	1511.7	10.0	1755.73	1756			
	831.3	873.7		Tue 17-May-22	10.0		1064.0	1118.3	10.0	1311.82	1312			
	672.80	689.2		Wed 18-May-22	10.0		861.2	882.2	10.0	999.68	999.7			
	580.20	590.9		Thu 19-May-22	10.0		742.7	756.4	10.0	810.99	811			
	520.54	527.7		Fri 20-May-22	10.0		666.3	675.5	10.0	685.44	685.4			
	484.93	484.4		Sat 21-May-22	10.0		620.7	620.0	10.0	612.17	612.2			
	458.03	459.3		Sun 22-May-22	10.0		586.3	587.9	10.0	560.96	561			
	430.02	430.9		Mon 23-May-22	10.0		550.4	551.6	10.0	521.49	521.5			
	418.13	415.4		Tue 24-May-22	10.0		535.2	531.7	10.0	494.13	494.1			
	402.56	399.9		Wed 25-May-22	10.0		515.3	511.9	10.0	471.92	471.9			
	391.37	387.0		Thu 26-May-22	10.0		501.0	495.4	10.0	451.79	451.8			
	382.10	374.3		Fri 27-May-22	10.0		489.1	479.1	10.0	448.44	448.4			
	439.13	416.0		Sat 28-May-22	10.0		562.1	532.5	10.0	571.16	571.2			
	441.93	444.3		Sun 29-May-22	10.0		565.7	568.7	10.0	586.70	586.7			
	571.19	477.2		Mon 30-May-22	10.0		731.1	610.8	10.0	606.06	606.1			
		827.6		Tue 31-May-22	10.0			1059.3	10.0	1042				
SUM	22760.3	23383.1			310.0	100.0	29133.1	29930.4	400.0	30440.0	31429.7	31029.7	2.7%	3.3%

Note:

410781 Upstream Googong verified data is provided every second month.

Table 8 – Monthly flow data for Cotter River Environmental Flows

Date	Cotter River e-flows below Cotter Dam		Comments
	E-flow sourced from Murrumbidgee via M2C	E-flow sourced from Cotter Dam release/spill	
Sun 1-May-22	0.0	587.5	
Mon 2-May-22	0.0	508.4	
Tue 3-May-22	0.0	427.6	
Wed 4-May-22	0.0	383.3	
Thu 5-May-22	0.0	424.4	
Fri 6-May-22	0.0	401.7	
Sat 7-May-22	0.0	360.1	
Sun 8-May-22	0.0	323.1	
Mon 9-May-22	0.0	310.3	
Tue 10-May-22	0.0	303.8	
Wed 11-May-22	0.0	315.5	
Thu 12-May-22	0.0	1319.0	
Fri 13-May-22	0.0	3673.0	
Sat 14-May-22	0.0	2380.0	
Sun 15-May-22	0.0	1631	
Mon 16-May-22	0.0	1330	
Tue 17-May-22	0.0	1077	
Wed 18-May-22	0.0	916.4	
Thu 19-May-22	0.0	787.4	
Fri 20-May-22	0.0	688.6	
Sat 21-May-22	0.0	605.6	
Sun 22-May-22	0.0	539.5	
Mon 23-May-22	0.0	483	
Tue 24-May-22	0.0	431.4	
Wed 25-May-22	0.0	404.1	
Thu 26-May-22	0.0	376.2	
Fri 27-May-22	0.0	365.6	
Sat 28-May-22	0.0	397.2	
Sun 29-May-22	0.0	373.3	
Mon 30-May-22	0.0	389.1	
Tue 31-May-22	0.0	694.2	
Total	0.0	23207.3	

Table 9 – Monthly flow data for Murrumbidgee to Googong

Date	M2G Flow	Comments
Sun 1-May-22	0.0	
Mon 2-May-22	0.0	
Tue 3-May-22	0.0	
Wed 4-May-22	0.0	
Thu 5-May-22	0.0	
Fri 6-May-22	0.0	
Sat 7-May-22	0.0	
Sun 8-May-22	0.0	
Mon 9-May-22	0.0	
Tue 10-May-22	0.0	
Wed 11-May-22	0.0	
Thu 12-May-22	0.0	
Fri 13-May-22	0.0	
Sat 14-May-22	0.0	
Sun 15-May-22	0.0	
Mon 16-May-22	0.0	
Tue 17-May-22	0.0	
Wed 18-May-22	0.0	
Thu 19-May-22	0.0	
Fri 20-May-22	0.0	
Sat 21-May-22	0.0	
Sun 22-May-22	0.0	
Mon 23-May-22	0.0	
Tue 24-May-22	0.0	
Wed 25-May-22	0.0	
Thu 26-May-22	0.0	
Fri 27-May-22	0.0	
Sat 28-May-22	0.0	
Sun 29-May-22	0.0	
Mon 30-May-22	0.0	
Tue 31-May-22	0.0	
Total	0.0	

Table 10 – Monthly water production data and water transferred to Googong reservoir

Day	Stromlo WTP ML			Googong WTP ML	Transfer from SWTP to Googong res.
	M'bidgee	Cotter	Bendora		
1	0.0	0.0	0.0	104.5	0.0
2	0.0	0.0	0.0	111.9	0.0
3	0.0	0.0	0.0	102.0	0.0
4	0.0	0.0	0.0	108.4	0.0
5	0.0	0.0	0.0	102.1	0.0
6	0.0	0.0	0.0	130.3	0.0
7	0.0	0.0	0.0	133.2	0.0
8	0.0	0.0	0.0	120.8	0.0
9	0.0	0.0	0.0	102.5	0.0
10	0.0	0.0	0.0	106.2	0.0
11	0.0	0.0	7.4	108.5	0.0
12	0.0	0.0	10.6	108.2	0.0
13	0.0	0.0	53.0	78.6	0.0
14	0.0	0.0	98.7	23.5	0.0
15	0.0	0.0	134.1	0.0	0.0
16	0.0	0.0	120.9	0.0	0.0
17	0.0	0.0	113.3	0.0	0.0
18	0.0	0.0	111.0	0.0	0.0
19	0.0	0.0	108.5	0.0	0.0
20	0.0	0.0	119.8	0.0	0.0
21	0.0	0.0	126.1	0.0	0.0
22	0.0	0.0	127.8	0.0	0.0
23	0.0	0.0	119.7	0.0	0.0
24	0.0	0.0	122.4	0.0	0.0
25	0.0	0.0	117.5	0.0	0.0
26	0.0	17.9	100.5	0.0	0.0
27	0.0	29.0	85.9	0.0	0.0
28	0.0	29.0	85.6	0.0	0.0
29	0.0	29.1	85.9	0.0	0.0
30	0.0	29.0	87.6	0.0	0.0
31	0.0	29.1	84.9	0.0	0.0
Total	0.0	163.1	2021.2	1440.8	0.0

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