

# Licence WU67 Monthly Environmental Flow Report August 2022

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# **Document management**

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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 15<sup>th</sup> 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 August. The annual pool flush was achieved by spillway flows. Releases were at licence requirements throughout August.
Bendora	Bendora Dam spilled throughout August.  The annual pool flush was achieved by spillway flows.  Releases were at licence requirements throughout August.
Cotter	Cotter Dam spilled throughout August.  Releases were at licence requirements throughout August.
Googong	Googong Dam spilled throughout August.  The Googong mini-hydro generator operated from 23 August for the remainder of the month  Releases above licence requirements while the mini-hydro was operating.

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 August.
Murrumbidgee To Cotter Eflow	M2C did not operate in August.
Murrumbidgee to Googong	M2G did not operate in August.
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 (+) *	276	432		
Monthly 75% of the 80 <sup>th</sup> %tile ML #	2760	4320		
Additional release required?	No	No	No	No
Current month's release target	2484	1980.9	535	390

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	410730 Gingera (verified)	Environmental flow release below Corin Date		Additional release (pool / riffle)	+/- 50%	Calculated Natural Flow. (Unverified)	Calculated Natural Flow. (Verified)	Adjusted daily base flow. <b>EOM</b> = Revised monthly target	410752 Corin D/S (Unverified)	410752 Corin D/S (Verified)	EOM Excess (+) / Shortfall (-) to carry forward	EOM Correction to <b>410730</b> , Verified Vs unverified	EOM Correction to <b>410752</b> , Verified Vs unverified	Comments
Previo	us months ad	iustment			,		,	,	-192.2	,	,				
	230.62		Mon 1-Aug-22	62.00		93.0	329.4	327.2		314.01	315.9				
	155.39		Tue 2-Aug-22			93.0			62.0	264.69					
	251.75		Wed 3-Aug-22			93.0			62.0						
	1060.47		Thu 4-Aug-22			31.0			62.0						
	817.1		Fri 5-Aug-22			31.0			550.0						
	606.6		Sat 6-Aug-22						550.0						Pool maintenance flow achieved
	493.0		Sun 7-Aug-22			31.0			62.0						
	426.1		Mon 8-Aug-22			31.0			62.0						
	375.08		Tue 9-Aug-22			31.0	535.7		62.0	536.33	536.7				
	334.25		Wed 10-Aug-22			31.0	477.4		62.0	485.94	485.3				
	360.67		Thu 11-Aug-22	62.00		93.0	515.1		62.0	476.2	475.3				
	381.86		Fri 12-Aug-22	62.00		93.0	545.4		62.0	548.8	548.7				
	328.17		Sat 13-Aug-22	62.00		93.0	468.7		62.0	493.1	494.7				
	335.73		Sun 14-Aug-22	62.00		93.0	479.5		62.0	478.1	478.8				
	322.64		Mon 15-Aug-22	62.00		93.0	460.8		62.0		477.8				
	295.85		Tue 16-Aug-22	62.00		93.0	422.6		62.0	442.7	442.9				
	277.79		Wed 17-Aug-22	62.00		93.0	396.8		62.0	419.1	419				
	262.44		Thu 18-Aug-22	62.00		31.0	374.8		62.0	401.98	401.3				
	278.02		Fri 19-Aug-22	62.00		31.0			62.0	407.52	408.5				
	269.71		Sat 20-Aug-22			31.0			62.0						
	245.18		Sun 21-Aug-22			31.0			62.0						
			Mon 22-Aug-22			31.0			62.0						
	305.30		Tue 23-Aug-22			31.0			62.0	430.04					
	258.72		Wed 24-Aug-22			31.0			62.0						
	244.02		Thu 25-Aug-22			93.0			62.0						
	230.43		Fri 26-Aug-22			93.0			62.0						
	223.38		Sat 27-Aug-22			93.0			62.0						
	220.90		Sun 28-Aug-22			93.0			62.0						
	272.25		Mon 29-Aug-22			93.0			62.0						
	271.41		Tue 30-Aug-22			93.0			62.0						
	231.81		Wed 31-Aug-22			93.0			62.0	375.01					
SUM	10,366.59	229.1		1922.0	1100.0	2015.0	14806.6	327.2	2705.8	13920.9	14413.2	276.0	-97.8%	<b>6</b> 3.5%	D

Table 5 - Monthly Environmental Flow release data for Bendora dam

	410730	410730	Environmental flow release		Additional release	Planned +/- 50%	Calculated Natural	Calculated Natural	Adjusted daily base flow.	410747 Bendora	410747 Bendora	EOM Excess (+) / Shortfall (-)	EOM Correction to <b>410730</b> ,	EOM Correction to <b>410747</b> ,	
	Gingera	Gingera	below Bendora	Daily base	(pool /	release	Flow.	Flow.	EOM = Revised	D/S	D/S	to carry	Verified Vs	Verified Vs	
SUM	(unverified)	(verified)	Date	flow	riffle)	regime	(Unverified)	(Verified)	monthly target	(Unverified)	(Verified)	forward	unverified	unverified	Comments
Previo	us months a	djustment							-300.7						
	230.62	229.1	Mon 1-Aug-22	97.00		35.5	507.4	504.0	97.0	223.13	219				
	155.39		Tue 2-Aug-22	97.00		35.5	341.8		97.0	269.05	262.4				
	251.75		Wed 3-Aug-22	97.00		48.5	553.9		97.0	270.48	256.1				
	1060.47		Thu 4-Aug-22	97.00		48.5	2333.0		97.0	1108.89	1025				
	817.1		Fri 5-Aug-22	97.00		48.5	1797.5		97.0	3147.4	2882				
	606.6		Sat 6-Aug-22	97.00		48.5	1334.5		97.0	1974.8	1769				
	493.0		Sun 7-Aug-22	97.00		48.5	1084.6		97.0	1422.8	1245				
	426.1		Mon 8-Aug-22	97.00		48.5	937.4		97.0	1105.8	972.1				
	375.08		Tue 9-Aug-22	97.00		48.5	825.2		97.0	921.59	813.4				
	334.25		Wed 10-Aug-22	97.00		145.5	735.3		97.0	772.59	684.3				
	360.67		Thu 11-Aug-22			145.5	793.5		97.0	705.3	624.4				
	381.86		Fri 12-Aug-22				840.1		550.0	935.8	836.2				
	328.17		Sat 13-Aug-22	97.00	550	145.5	722.0		550.0	855.1	769.9				Pool maintenance flow achieved
	335.73		Sun 14-Aug-22			145.5	738.6		97.0	780.6					
	322.64		Mon 15-Aug-22			145.5	709.8		97.0	784.9					
	295.85		Tue 16-Aug-22			145.5	650.9		97.0	723.8					
	277.79		Wed 17-Aug-22	97.00		48.5	611.1		97.0	647.1					
	262.44		Thu 18-Aug-22			48.5	577.4		97.0	601.45					
	278.02		Fri 19-Aug-22			48.5	611.7		97.0	596.88					
	269.71		Sat 20-Aug-22			48.5			97.0	556.22					
	245.18		Sun 21-Aug-22			48.5	539.4		97.0	516.61					
			Mon 22-Aug-22			48.5			97.0	478.43					
	305.30		Tue 23-Aug-22			48.5	671.7		97.0	550.22					
	258.72		Wed 24-Aug-22			145.5	569.2		97.0	568.54					
	244.02		Thu 25-Aug-22			145.5	536.8		97.0	482.69					
	230.43		Fri 26-Aug-22			145.5	506.9		97.0	437.05					
	223.38		Sat 27-Aug-22			145.5	491.4		97.0	410.18					
	220.90		Sun 28-Aug-22			145.5	486.0		97.0	391.68					
	272.25		Mon 29-Aug-22			145.5	599.0		97.0	393.83					
	271.41		Tue 30-Aug-22			145.5	597.1		97.0	528.22					
	231.81		Wed 31-Aug-22			72.0	510.0		97.0	494.16					
SUM	10,366.59	229.1		3007.0	1100.0	2859.0	22806.5	504.0	3612.3	23655.2	21389.8	432.0	-97.8%	6 -9.6%	

Table 6 - Monthly Environmental Flow release data for Cotter dam

SUM		Daily base flow	Additional release (pool / riffle)	<b>EOM</b> = Revised monthly target	410700 Cotter D/S (Unverified)	410700 Cotter D/S (Verified)	EOM Excess (+) / Shortfall (-)	EOM Correction to <b>410700</b> , Verified Vs unverified	Comments
Previous	months adjustment			0.0					
	Mon 1-Aug-22	15	5	15.0	258.6	258.6			
	Tue 2-Aug-22		5	15.0	302.3	301.4			
	Wed 3-Aug-22			15.0	338.3				
	Thu 4-Aug-22			15.0	2115.3				
	Fri 5-Aug-22			15.0	5439.4				
	Sat 6-Aug-22			15.0	3702.3				
	Sun 7-Aug-22			15.0	2342.8				
	Mon 8-Aug-22			15.0	1714.2				
	Tue 9-Aug-22			15.0	1402.3				
	Wed 10-Aug-22			15.0	1173.6				
	Thu 11-Aug-22			15.0	976.4				
	Fri 12-Aug-22			15.0	1231.9				
	Sat 13-Aug-22		5	15.0	1297.7				
	Sun 14-Aug-22			15.0	1188.3				
	Mon 15-Aug-22			15.0	1137.4				
	Tue 16-Aug-22			15.0	1062.7	1026			
	Wed 17-Aug-22			15.0	975.8				
	Thu 18-Aug-22			15.0	897.8				
	Fri 19-Aug-22			15.0	861.9				
	Sat 20-Aug-22			15.0	844.1				
	Sun 21-Aug-22			15.0	782.2				
	Mon 22-Aug-22			15.0	725.6				
	Tue 23-Aug-22			15.0	752.9				
	Wed 24-Aug-22			15.0	815.83				
	Thu 25-Aug-22			15.0	727.43				
	Fri 26-Aug-22			15.0	647.55				
	Sat 27-Aug-22			15.0	595.32				
	Sun 28-Aug-22			15.0	565.16				
	Mon 29-Aug-22			15.0	568.41				
	Tue 30-Aug-22			15.0	711.31				
	Wed 31-Aug-22			15.0	708.2				
SUM		465.0		465.0	36863.1		34295.4	-5.7%	

Table 7 - Monthly Environmental Flow release data for Googong dam

		410781 Upstream	Environmental flow release		Additional release	Calculated Natural	Calculated Natural		410760	410760	EOM	EOM Correction to <b>410781</b> ,	EOM Correction to <b>410760</b> ,	
		Googong (Verified)		Daily base flow	(pool / riffle)	Flow. (Unverified)	Flow. (Verified)	<b>EOM</b> = Revised monthly target	Wickerslack (Unverified)	Wickerslac k (Verified)	Excess (+) / Shortfall (-)		Verified Vs unverified	Comments
evio	us months	adjustme	nt											
	219.1	232.3	Mon 1-Aug-22	10.0		280.4	297.3	10.0	240.72	232.3				
	238.9	243.6	Tue 2-Aug-22	10.0		305.8	311.8	10.0	252.12	243.6				
	203.9	243.3	Wed 3-Aug-22	10.0		260.9	311.4	10.0	253.35	243.3				
	5764.9	6287	Thu 4-Aug-22	10.0		7379.1	8047.4	10.0	6317.0	6287				
	2915.7		Fri 5-Aug-22			3732.2		10.0	10801.0					
	1144.7		Sat 6-Aug-22			1465.2		10.0	3375.8					
	722.8		Sun 7-Aug-22			925.2		10.0	1622.5					
	546.4		Mon 8-Aug-22			699.5		10.0	1037.4					
	470.21		Tue 9-Aug-22			601.9		10.0	784.8					
	408.31		Wed 10-Aug-22			522.6		10.0	636.1					
	378.9		Thu 11-Aug-22			485.1		10.0	541.0					
	393.9		Fri 12-Aug-22			504.2		10.0	532.4					
	412.4		Sat 13-Aug-22			527.9		10.0	588.3					
	367.9		Sun 14-Aug-22			470.9		10.0	563.4					
	333.9		Mon 15-Aug-22			427.4		10.0	502.19					
	304.7		Tue 16-Aug-22			390.0		10.0	444.32					
	288.4		Wed 17-Aug-22			369.1		10.0	419.73					
	279.63		Thu 18-Aug-22			357.9		10.0	386.05					
	282.20		Fri 19-Aug-22			361.2		10.0	388.63					
	276.22		Sat 20-Aug-22			353.6		10.0	379.03					
	256.52		Sun 21-Aug-22			328.4		10.0	338.95					
	244.21		Mon 22-Aug-22			312.6		10.0	309.95					
	319.13		Tue 23-Aug-22			408.5		10.0	414.42					
	331.83		Wed 24-Aug-22			424.7		10.0	519.19					
	287.18		Thu 25-Aug-22			367.6		10.0	454.59					
	269.84		Fri 26-Aug-22			345.4		10.0	388.36					
	241.80		Sat 27-Aug-22			309.5		10.0	344.42					
	225.28		Sun 28-Aug-22			288.4		10.0	303.04					
	242.19		Mon 29-Aug-22			310.0		10.0	286.81					
	339.11		Tue 30-Aug-22			434.1		10.0	355.89					
	292.44		Wed 31-Aug-22			374.3		10.0	385.95		00744	00.40	, 0.40	
UM	19002.7	7006.2		310.0	0.0	24323.4	8967.9	310.0	34167.5	34021.6	33711.6	-63.1%	6 -0.4%	o

#### Note:

410781 Upstream Googong verified data is provided every second month.

Table 8 – Monthly flow data for Cotter River Environmental Flows

	Cotter River e-flows I	below Cotter Dam	
Date	E-flow sourced from Murrumbidgee via M2C	E-flow sourced from Cotter Dam release/spill	Comments
Mon 1-Aug-22	0.0	232.3	
Tue 2-Aug-22	0.0	243.6	
Wed 3-Aug-22	0.0	243.3	
Thu 4-Aug-22	0.0	6287	
Fri 5-Aug-22	0.0	10779	
Sat 6-Aug-22	0.0	3376	
Sun 7-Aug-22	0.0	1623	
Mon 8-Aug-22	0.0	1037	
Tue 9-Aug-22	0.0	784.8	
Wed 10-Aug-22	0.0	636.1	
Thu 11-Aug-22	0.0	540.6	
Fri 12-Aug-22	0.0	529.5	
Sat 13-Aug-22	0.0	585.3	
Sun 14-Aug-22	0.0	560.5	
Mon 15-Aug-22	0.0	499.4	
Tue 16-Aug-22	0.0	441.7	
Wed 17-Aug-22	0.0	417.2	
Thu 18-Aug-22	0.0	383.7	
Fri 19-Aug-22	0.0	386.2	
Sat 20-Aug-22	0.0	376.7	
Sun 21-Aug-22	0.0	336.7	
Mon 22-Aug-22	0.0	307.9	
Tue 23-Aug-22	0.0	411.9	
Wed 24-Aug-22	0.0	515.1	
Thu 25-Aug-22	0.0	449.3	
Fri 26-Aug-22	0.0	383.6	
Sat 27-Aug-22	0.0	340	
Sun 28-Aug-22	0.0	298.8	
Mon 29-Aug-22	0.0	282.8	
Tue 30-Aug-22	0.0	351.4	
Wed 31-Aug-22	0.0	381.2	
Total	0.0	34021.6	

Table 9 – Monthly flow data for Murrumbidgee to Googong

Date	M2G Flow	Comments
Mon 1-Aug-22	0.0	
Tue 2-Aug-22	0.0	
Wed 3-Aug-22	0.0	
Thu 4-Aug-22	0.0	
Fri 5-Aug-22	0.0	
Sat 6-Aug-22	0.0	
Sun 7-Aug-22	0.0	
Mon 8-Aug-22	0.0	
Tue 9-Aug-22	0.0	
Wed 10-Aug-22	0.0	
Thu 11-Aug-22	0.0	
Fri 12-Aug-22	0.0	
Sat 13-Aug-22	0.0	
Sun 14-Aug-22	0.0	
Mon 15-Aug-22	0.0	
Tue 16-Aug-22	0.0	
Wed 17-Aug-22	0.0	
Thu 18-Aug-22	0.0	
Fri 19-Aug-22	0.0	
Sat 20-Aug-22	0.0	
Sun 21-Aug-22	0.0	
Mon 22-Aug-22	0.0	
Tue 23-Aug-22	0.0	
Wed 24-Aug-22	0.0	
Thu 25-Aug-22	0.0	
Fri 26-Aug-22	0.0	
Sat 27-Aug-22	0.0	
Sun 28-Aug-22	0.0	
Mon 29-Aug-22	0.0	
Tue 30-Aug-22	0.0	
Wed 31-Aug-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	, <u>-</u>	
1	0.0	0.0	110.4	0.0	0.0
2	0.0	0.0	118.2	0.0	0.0
3	0.0	0.0	120.3	0.0	0.0
4	0.0	0.0	111.8	0.0	0.0
5	0.0	0.0	111.2	0.0	0.0
6	0.0	0.0	113.9	0.0	0.0
7	0.0	0.0	114.4	0.0	0.0
8	0.0	0.0	117.3	0.0	0.0
9	0.0	0.0	116.3	0.0	0.0
10	0.0	0.0	116.4	0.0	0.0
11	0.0	0.0	100.1	0.0	0.0
12	0.0	0.0	99.5	0.0	0.0
13	0.0	0.0	104.7	0.0	0.0
14	0.0	0.0	118.1	0.0	0.0
15	0.0	0.0	110.5	0.0	0.0
16	0.0	26.1	89.4	0.0	2.8
17	0.0	28.8	94.8	0.0	11.3
18	0.0	26.6	99.2	0.0	0.0
19	0.0	28.8	90.9	0.0	0.0
20	0.0	14.6	94.4	0.0	0.0
21	0.0	0.0	110.8	0.0	0.0
22	0.0	0.0	108.2	0.0	0.0
23	0.0	0.0	106.7	0.0	0.0
24	0.0	0.0	111.7	0.0	0.0
25	0.0	0.0	97.9	0.0	0.0
26	0.0	0.0	128.0	0.0	0.0
27	0.0	0.0	117.8	0.0	0.0
28	0.0	0.0	122.4	0.0	0.0
29	0.0	0.0	118.4	0.0	0.0
30	0.0	0.0	133.0	0.0	0.0
31	0.0	0.0	121.9	0.0	0.0
Total	0.0	124.9	3428.6	0.0	14.1

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