

# Licence WU67 Monthly Environmental Flow Report March 2023

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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 did not spill in March.
	Additional release above licence requirements were made through the cone valve for consumption purposes throughout March.
	Investigation into the discrepancy between flow measured at the new outlet flow meter and the ALS gauge reading is ongoing.
	The encoder for site 410730 Cotter River at Gingera failed on 26 March and was replaced on 6 April. No data is available between these dates.
Bendora	Bendora Dam did not spill in March.
	Releases were at licence requirements throughout March.
Cotter	Cotter Dam spilled for the majority of March.
	The bi-monthly riffle release was achieved by a combination of spillway flow and controlled release.
	Releases were at licence requirements throughout March.
Googong	Googong Dam did not spill in March.
	The planned bi-monthly riffle release was not able to be achieved in March due to asset limitations. There was sufficient release via the spillway and mini-hydro generator in February to meet the riffle release requirement on multiple occasions. Due to this the next planned riffle release has been moved to April 2023.
	The Googong mini-hydro generator operated intermittently throughout March. Releases were above licence requirements while the mini-hydro was operating. Releases were at licence requirements when the mini-hydro was not 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 March.
Murrumbidgee To Cotter Eflow	M2C did not operate in March.
Murrumbidgee to Googong	M2G did not operate in March.
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 (+) *	45	72		
Monthly 75% of the 80 <sup>th</sup> %tile ML #	450	720		
Additional release required?	No	No	No	No
Current month's release target	810	1026	465	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

												EOM	EOM	EOM	
			Environmental			Planned	Calculated	Calculated	Adjusted daily			Excess (+) /		Correction	
		410730	flow release		Additional		Natural	Natural	base flow.	410752	410752		to <b>410730</b> ,	to <b>410752</b> ,	
	410730 Gingera		below Corin	Daily base	release (pool		Flow.	Flow.	EOM = Revised	Corin D/S	Corin D/S	to carry	Verified Vs		
		(verified)		flow	/ riffle)		(Unverified)		monthly target	(Unverified)	(Verified)	forward	unverified	unverified	Comments
	,	, ,	Date	11011	/ IIIIIC)	rogimo	(Orrivernica)	(voillou)		(Orivernica)	(Vollilou)	lorwara	unvenned	unvenned	Comments
Previo	us months ac								-34.1	_					
	50.38		Wed 1-Mar-23			15.0				122.71					
	50.07	51.87	Thu 2-Mar-23			5.5				121.53					
	47.22		Fri 3-Mar-23			5.5				104.70					
	47.17	47.22	Sat 4-Mar-23			5.5				96.63					
	48.9		Sun 5-Mar-23			5.5				97.7					
	52.9		Mon 6-Mar-23			5.5				95.2					
	44.2		Tue 7-Mar-23			5.5									
	43.5		Wed 8-Mar-23			5.5				99.3					
	43.0		Thu 9-Mar-23			16.5				100.18					
	41.5	41.77	Fri 10-Mar-23	11.00		16.5	59.3	59.7	11.0	99.78	99.2				
	40.6	40.8	Sat 11-Mar-23	11.00		16.5	58.0	58.3	11.0	100.2	99.19				
	40.5	40.03	Sun 12-Mar-23	11.00		16.5	57.8	57.2	11.0	99.8	98.7				
	43.7	43.57	Mon 13-Mar-23	11.00		16.5	62.3	62.2	11.0	100.1	98.31				
	41.7	42.02	Tue 14-Mar-23	11.00		16.5	59.5	60.0	11.0	102.1	99.97				
	40.1	40.49	Wed 15-Mar-23	11.00		16.5	57.3	57.8	11.0	122.8	120.9				
	37.5	38.1	Thu 16-Mar-23	11.00		5.5	53.6	54.4	11.0	122.0	119.4				
	35.3	35.66	Fri 17-Mar-23	11.00		5.5	50.4	50.9	11.0	144.3	141.5				
	34.4	34.57	Sat 18-Mar-23	11.00		5.5	49.2	49.4	11.0	143.82	140.9				
	33.1	33.45	Sun 19-Mar-23	11.00		5.5	47.3	47.8	11.0	144.46	140.8				
	33.5	33.13	Mon 20-Mar-23	11.00		5.5	47.9	47.3	11.0	144.83	141.1				
	37.5	36.03	Tue 21-Mar-23	11.00		5.5	53.5	51.5	11.0	145.78	142				
	43.5	42.85	Wed 22-Mar-23	11.00		5.5	62.2	61.2	11.0	145.51	140.9				
	67.1	62.37	Thu 23-Mar-23	11.00		16.5	95.9	89.1	11.0	146.82	142				
	57.4	58.96	Fri 24-Mar-23	11.00		16.5	81.9	84.2	11.0	147.95	142.6				
	56.7	52.87	Sat 25-Mar-23	11.00		16.5	81.0	75.5	11.0	147.19	141.5				
															Data not available for site 410730 due to
			Sun 26-Mar-23	11.00		16.5			11.0	147.46	141.6				failed encoder. Replaced on 6 April
			Mon 27-Mar-23			16.5			11.0	114.25					
			Tue 28-Mar-23			16.5			11.0	106.67					ii aa
			Wed 29-Mar-23			16.5			11.0	103.08					ii aa
			Thu 30-Mar-23			7.5			11.0	69.95			1		ii aa
			Fri 31-Mar-23			7.5			11.0	42.27					ii —
SUM	1,111.51	1104.9	1 11 01 mai 20	341.0			1587.6	1578.1		3579.0		45.0	-0.6%	-1.8%	ii —
3014	1,111.31	1104.9		341.0	0.0	330.0	1307.0	13/0.1	300.9	3313.0	3313.3	+3.0	-0.0 /0	-1.076	

Table 5 - Monthly Environmental Flow release data for Bendora dam

SIIM	410730 Gingera (unverified)	410730 Gingera (verified)	Environmental flow release below Bendora	Daily base	Additional release (pool / riffle)	Planned +/- 50% release regime	Calculated Natural Flow. (Unverified)	Calculated Natural Flow. (Verified)	Adjusted daily base flow. <b>EOM</b> = Revised monthly target	410747 Bendora D/S (Unverified)	410747 Bendora D/S (Verified)	EOM Excess (+) / Shortfall (-) to carry forward	EOM Correction to <b>410730</b> , Verified Vs unverified	EOM Correction to 410747, Verified Vs unverified	Comments
	ous months	,		llow	iiiio)	regime	(Orivernied)	(vermeu)	-58.9	, ,	(Verilled)	lorward	unvenneu	unvermed	Commence
rievio		48.35	Wed 1-Mar-23	19.00		9	.5 110	.8 106			6 17.67		-	-	
	50.38 50.07	51.87	Thu 2-Mar-23	19.00		9									
	47.22	47.31	Fri 3-Mar-23			9									
	47.22	47.22	Sat 4-Mar-23	19.00		9									
	47.17	47.03	Sat 4-Mar-23 Sun 5-Mar-23	19.00		9									
	52.9	54.78	Mon 6-Mar-23	19.00		9									
	44.2	45.02	Tue 7-Mar-23	19.00		9									
	44.2	43.23	Wed 8-Mar-23	19.00		28									
	43.0	43.43	Thu 9-Mar-23			28									
	43.0	43.43	Fri 10-Mar-23	19.00		28									
	40.6		Sat 11-Mar-23	19.00		28									
	40.5	40.03	Sun 12-Mar-23	19.00		28									
	43.7	43.57	Mon 13-Mar-23	19.00		28									
	43.7	43.37	Tue 14-Mar-23	19.00		28									
	40.1	40.49	Wed 15-Mar-23	19.00		9									
	37.5	38.1	Thu 16-Mar-23	19.00		9									
	35.3	35.66	Fri 17-Mar-23	19.00		9									
	34.4	34.57	Sat 18-Mar-23	19.00		9									
	33.1	33.45	Sun 19-Mar-23	19.00		9									
	33.5	33.13	Mon 20-Mar-23	19.00		9									
	37.5	36.03	Tue 21-Mar-23	19.00		9									
	43.5	42.85	Wed 22-Mar-23	19.00		28									
	67.1	62.37	Thu 23-Mar-23	19.00		28							-		
	57.4	58.96	Fri 24-Mar-23	19.00		28							-		
	56.7	52.87	Sat 25-Mar-23	19.00		28									
	30.7	32.01	Sat 25-iviai-25	19.00		20	.5 124.	.0 110	.5 19.0	32.2	.5 20.51				Data not available for site 410730 due to
			Sun 26-Mar-23	19.00		28	.5		19.0	31.5	5 28.57				failed encoder. Replaced on 6 April
			Mon 27-Mar-23	19.00		28			19.0						I I I I I I I I I I I I I I I I I I I
			Tue 28-Mar-23	19.00		28			19.0						
			Wed 29-Mar-23	19.00		9			19.0						
			Thu 30-Mar-23	19.00		9			19.0						
			Fri 31-Mar-23	19.00		9			19.0						
SUM	1.111.51	1104.9	oviai 20	589.0	0.0	560.		3 2430.		663.		72.0	-0.6%	6.3%	

Table 6 - Monthly Environmental Flow release data for Cotter dam

SUM	Environmental flow release below Cotter	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					
	Wed 1-Mar-23	15		15	25.8	25.81			
	Thu 2-Mar-23	15		15	22.4	22.41			
	Fri 3-Mar-23	15		15	16.6	16.58			
	Sat 4-Mar-23	15		15	17.4	17.37			
	Sun 5-Mar-23	15		15	26.8	26.76			
	Mon 6-Mar-23			15	58.6	58.55			
	Tue 7-Mar-23			15	49.6	49.51			
	Wed 8-Mar-23	15		15	39.5	38.95			
	Thu 9-Mar-23	15		15	37.4	36.36			
	Fri 10-Mar-23	15		100	21.0	19.99			
	Sat 11-Mar-23	15		15	35.7	33.59			
	Sun 12-Mar-23	15		15	41.5	38.43			
	Mon 13-Mar-23	15		15	74.4	69.95			
	Tue 14-Mar-23	15		15	65.0	60.04			
	Wed 15-Mar-23	15		15	64.8	59.18			
	Thu 16-Mar-23	15		15	66.6	60.55			
	Fri 17-Mar-23	15		15	40.4	34.67			
	Sat 18-Mar-23	15		15	34.9	29.8			
	Sun 19-Mar-23	15		15	32.1	26.75			
	Mon 20-Mar-23	15		15	25.4	20.37			
	Tue 21-Mar-23	15		15	27.36	21.64			
	Wed 22-Mar-23	15		15	37.49	28.89			
	Thu 23-Mar-23	15		15	58.92	48.13			
	Fri 24-Mar-23	15	100	15	120.47	106.7			Riffle release achieved
	Sat 25-Mar-23	15		15	88.65	75.37			
	Sun 26-Mar-23	15		15	93.47	79.74			
	Mon 27-Mar-23	15		15	109.23	94.31			
	Tue 28-Mar-23	15		15	91.91	76.73			
	Wed 29-Mar-23	15		15	121.83	104.6			
	Thu 30-Mar-23	15		15	111.34	93.99			
	Fri 31-Mar-23	15		15	83.95	66.63			
SUM		420.0	100.0	520.0	1675.7	1477.6	957.6	-11.8%	

Table 7 - Monthly Environmental Flow release data for Googong dam

Iabi	C 1 - IAIC	Jiitiiiy L	nvironmentai	I IOW IE	icase u	ata iti t	Juogui	iy uaiii						
	440704	440704	Environmental		A alalitica al	Coloulated	Calavilatad					EOM	EOM	
	410781	410781	flow release		Additional		Calculated					Correction	Correction	
		Upstream			release	Natural	Natural		410760	410760	EOM	to <b>410781</b> ,	to <b>410760</b> ,	
	Googong	Googong		,	(pool /	Flow.		EOM = Revised	Wickerslack	Wickerslac	Excess (+) /		Verified Vs	
SUM	(Unverified)	(Verified)	Date	flow	riffle)	(Unverified)	(Verified)	monthly target	(Unverified)	k (Verified)	Shortfall (-)	unverified	unverified	Comments
Previo	us month	s adjustm	ent											
	59.4	60.15	Wed 1-Mar-23	10.0		76.1	77.0	10.0	70.16	64.97				
	59.7	59.62	Thu 2-Mar-23	10.0		76.5	76.3	10.0	70.15	63.26				
	59.3	59.41	Fri 3-Mar-23	10.0		75.9	76.0	10.0	67.02	62.95				
	57.9	57.64	Sat 4-Mar-23	10.0		74.2	73.8	10.0	64.2	64.18				
	70.0	66.31	Sun 5-Mar-23	10.0		89.6	84.9	10.0	64.6	64.58				
	93.6	89.23	Mon 6-Mar-23	10.0		119.8	114.2	10.0	71.1	71.06				
	98.4	99.63	Tue 7-Mar-23	10.0		125.9	127.5	10.0	65.0	64.98				
	78.4	82.26	Wed 8-Mar-23	10.0		100.4	105.3	10.0	64.2	64.15				
	65.27	67.8	Thu 9-Mar-23	10.0		83.5	86.8	10.0	64.4	64.43				
	58.06	59	Fri 10-Mar-23	10.0		74.3	75.5	10.0	64.4	64.43				
	54.2	54.82	Sat 11-Mar-23	10.0		69.4	70.2	10.0	64.5	64.48				
	52.0	52.54	Sun 12-Mar-23	10.0		66.6	67.3	10.0	65.5	65.52				
	51.1	50.99	Mon 13-Mar-23	10.0		65.4	65.3	10.0	40.2	40.25				
	52.9	52.25	Tue 14-Mar-23	10.0		67.7	66.9	10.0	16.8	16.83				
	59.9	57.68	Wed 15-Mar-23	10.0		76.6	73.8	10.0	22.43	22.43				
	62.3	62.76	Thu 16-Mar-23	10.0		79.8	80.3	10.0	65.09	65.31				
	60.6	61.9	Fri 17-Mar-23	10.0		77.6	79.2	10.0	66.46	66.61				
	51.87	53.35	Sat 18-Mar-23	10.0		66.4	68.3	10.0	65.91	65.91				
	47.58	48.27	Sun 19-Mar-23	10.0		60.9	61.8	10.0	62.24	62.24				
	45.17	45.62	Mon 20-Mar-23	10.0		57.8	58.4	10.0	39.66	39.75				
	43.32	43.33	Tue 21-Mar-23	10.0		55.4	55.5	10.0	68.05	68.05				
	47.66	46.52	Wed 22-Mar-23			61.0			67.23					
	59.41	56.33	Thu 23-Mar-23			76.0	72.1	10.0	50.06	50.06				
	75.61	71.62	Fri 24-Mar-23	10.0		96.8	91.7	10.0	25.92	25.92				
	85.27	85.5	Sat 25-Mar-23	10.0		109.1	109.4	10.0	77.49	77.91				
	83.82	83.94	Sun 26-Mar-23	10.0		107.3			78.17					
	76.80	78.54	Mon 27-Mar-23	10.0		98.3	100.5	10.0	73.00	73				
	72.69		Tue 28-Mar-23			93.0			69.26					
	81.73	77.72	Wed 29-Mar-23	10.0		104.6	99.5	10.0	86.30	86.3				
	147.31		Thu 30-Mar-23			188.6			76.69					
	138.42	146.1	Fri 31-Mar-23	10.0		177.2	187.0	10.0	71.61	71.61				
SUM	2149.7	2137.1		310.0	0.0	2751.7	2735.5	310.0	1917.8	1903.3	1593.3	-0.6%	-0.8%	

Table 8 – Monthly flow data for Cotter River Environmental Flows

	Cotter River e-flows I	pelow Cotter Dam	
Date	E-flow sourced from Murrumbidgee via M2C	E-flow sourced from Cotter Dam release/spill	Comments
Wed 1-Mar-23	0	25.81	
Thu 2-Mar-23	0	22.41	
Fri 3-Mar-23	0	16.58	
Sat 4-Mar-23	0	17.37	
Sun 5-Mar-23	0	26.76	
Mon 6-Mar-23	0	58.55	
Tue 7-Mar-23	0	49.51	
Wed 8-Mar-23	0	38.95	
Thu 9-Mar-23	0	36.36	
Fri 10-Mar-23	0	19.99	
Sat 11-Mar-23	0	33.59	
Sun 12-Mar-23	0	38.43	
Mon 13-Mar-23	0	69.95	
Tue 14-Mar-23	0	60.04	
Wed 15-Mar-23	0	59.18	
Thu 16-Mar-23	0	60.55	
Fri 17-Mar-23	0	34.67	
Sat 18-Mar-23	0	29.8	
Sun 19-Mar-23	0	26.75	
Mon 20-Mar-23	0	20.37	
Tue 21-Mar-23	0	21.64	
Wed 22-Mar-23	0	28.89	
Thu 23-Mar-23	0	48.13	
Fri 24-Mar-23	0	106.7	
Sat 25-Mar-23	0	75.37	
Sun 26-Mar-23	0	79.74	
Mon 27-Mar-23	0	94.31	
Tue 28-Mar-23	0	76.73	
Wed 29-Mar-23	0	104.6	
Thu 30-Mar-23	0	93.99	
Fri 31-Mar-23	0	66.63	
Total	0.0	1477.6	

Table 9 – Monthly flow data for Murrumbidgee to Googong

Date	M2G Flow	Comments
Wed 1-Mar-23	0.0	
Thu 2-Mar-23	0.0	
Fri 3-Mar-23	0.0	
Sat 4-Mar-23	0.0	
Sun 5-Mar-23	0.0	
Mon 6-Mar-23	0.0	
Tue 7-Mar-23	0.0	
Wed 8-Mar-23	0.0	
Thu 9-Mar-23	0.0	
Fri 10-Mar-23	0.0	
Sat 11-Mar-23	0.0	
Sun 12-Mar-23	0.0	
Mon 13-Mar-23	0.0	
Tue 14-Mar-23	0.0	
Wed 15-Mar-23	0.0	
Thu 16-Mar-23	0.0	
Fri 17-Mar-23	0.0	
Sat 18-Mar-23	0.0	
Sun 19-Mar-23	0.0	
Mon 20-Mar-23	0.0	
Tue 21-Mar-23	0.0	
Wed 22-Mar-23	0.0	
Thu 23-Mar-23	0.0	
Fri 24-Mar-23	0.0	
Sat 25-Mar-23	0.0	
Sun 26-Mar-23	0.0	
Mon 27-Mar-23	0.0	
Tue 28-Mar-23	0.0	
Wed 29-Mar-23	0.0	
Thu 30-Mar-23	0.0	
Fri 31-Mar-23	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	28.1	148.7	0.0	0.0
2	0.0	26.7	146.4	0.0	0.0
3	0.0	56.4	111.1	0.0	0.0
4	0.0	11.2	162.1	0.0	0.0
5	0.0	0.0	168.1	0.0	0.0
6	0.0	0.0	158.9	0.0	0.0
7	0.0	0.0	153.3	0.0	0.0
8	0.0	0.0	150.1	0.0	0.0
9	0.0	0.0	137.0	0.0	0.0
10	0.0	0.0	141.6	0.0	0.0
11	0.0	0.0	162.7	0.0	0.0
12	0.0	0.0	157.2	0.0	0.0
13	0.0	0.0	144.4	0.0	0.0
14	0.0	0.0	157.2	0.0	0.0
15	0.0	0.0	168.5	0.0	0.0
16	0.0	0.0	183.2	0.0	0.0
17	0.0	0.0	187.4	0.0	0.0
18	0.0	0.0	197.5	0.0	0.0
19	0.0	0.0	202.5	0.0	0.0
20	0.0	0.0	202.0	0.0	0.0
21	0.0	0.0	186.2	0.0	0.0
22	0.0	0.0	151.2	0.0	0.0
23	0.0	0.0	138.3	0.0	0.0
24	0.0	0.0	155.4	0.0	0.0
25	0.0	0.0	147.0	0.0	0.0
26	0.0	0.0	124.0	0.0	0.0
27	0.0	0.0	109.6	0.0	0.0
28	0.0	0.0	123.7	0.0	0.0
29	0.0	0.0	121.4	0.0	0.0
30	0.0	0.0	119.2	0.0	0.0
31	0.0	0.0	105.5	0.0	0.0
Total	0.0	122.4	4721.4	0.0	0.0

## Talk to us

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