

2024 Annual Review

Attachment C: 2024 Surface Water Monitoring



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1. Surface Water Monitoring Sites Sampling Method and Frequency

Table 1-1- Surface Water & EPL Monitoring Locations

Surface Water (SW) Monitoring Points & Location	Parameters	Sample Method & Frequency
(SW01) Goulburn River Upstream ¹	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU) & flow	Monthly grab sample during flow & grab sample after >30mm rainfall event
(SW02) Goulburn River Downstream ¹	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU) & flow	
(SW03) Ulan Ck. upstream of LDP6 ²	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU)	
(SW04) Ulan Creek at Old Ulan ^{2, 4}	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU)	
(SW05) Ulan Creek at Pleuger Road ³	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU)	
(SW06) Spring Gully ²	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU)	
(SW07) Bobadeen Creek ²	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU)	
(SW08) Curra Creek ²	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU)	
(SW09) Talbragar River ²	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU)	
(SW10) Mona Creek ²	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU)	
(SW11) Cockabutta Creek ²	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU)	Grab sample after >30mm rainfall event
(SW12) Clean Water Diversion System – Central ³	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU)	
(SW13) Clean Water Diversion Drain - Waratah ³	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU)	
(SW14) Clean Water Diversion Drain – Ulan West Box Cut ³	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU)	
(SW15) Clean Water Diversion System – Peanut Dam Discharge ³	pH, EC (µS/cm), TSS (mg/L), TDS (mg/L), Turbidity (NTU)	

Notes: ¹ Continuous monitoring by data logger for pH, EC and flow (continuous data logged every 15minutes for the 24hr period, reporting maximum, minimum and mean). ² Continuous monitoring by data logger for flow. ³ Flow by observation. ⁴ Flow monitoring damaged by fallen tree

Table 1-2- EPL Licensed Discharge & Monitoring Locations

LDP	LDP Location	Parameters	Sample Method & Frequency
1	Effluent Storage Dam	pH, EC (µS/cm), TSS (mg/L) , Oil & Grease (mg/L), BOD (mg/L), Nitrogen (mg/L), Phosphorous (mg/L)	Monthly grab sample during discharge
2	Millers Dam	pH, EC (µS/cm), TSS (mg/L), Oil & Grease (mg/L), Iron (mg/L), Zinc (mg/L)	Daily grab sample during discharge
3	Rowans Dam to Ulan Creek	pH, EC (µS/cm), TSS (mg/L) , Oil & Grease (mg/L), Iron (mg/L), Sulphate (mg/L) , Zinc (mg/L)	Daily grab sample during discharge
4	Truckfill Dam	pH, EC (µS/cm), TSS (mg/L) , Oil & Grease (mg/L), Iron (mg/L), Sulphate (mg/L) , Zinc (mg/L)	Daily grab sample during discharge
6	Ulan Creek from Bobadeen WTF	pH, EC(µS/cm), TSS (mg/L), Turbidity	pH, EC and turbidity continuous during discharge , TSS weekly^
18*	Downstream Goulburn River Gauging Station	pH, EC(µS/cm)	pH, EC continuous
19	Ulan Creek from NWSD	pH, EC(µS/cm), TSS (mg/L), Turbidity	pH, EC and turbidity continuous during discharge, TSS weekly^
23	Ulan West Box Cut clean water diversion	pH, EC(µS/cm), TSS (mg/L)	Daily grab sample during discharge
33*	Upstream Goulburn River Gauging Station	EC(µS/cm)	EC continuous

Note: * LDP 18 and 33 are water quality monitoring points only and are not discharge points. ^ EPL varied in 2015 to special frequency, collection of a sample weekly when a discharge occurs on the scheduled sampling day.

2. LDP 6 Daily Average Results

LDP 6		Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
	Minimum	0.0	7.22	341.0	0.0	1.0
	Maximum	13.03	8.33	841.0	35.0	25.0
Average		5.27	7.74	752.0	4.7	4.0

Table 2-1 LDP6 Daily Average Results

Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
1/01/2024	4.531	7.69	784	4	
2/01/2024	4.219	7.64	778	4	
3/01/2024	4.351	7.52	768	5	
4/01/2024	4.484	7.38	764	7	
5/01/2024	4.313	7.49	758	5	
6/01/2024	5.033	7.61	770	4	
7/01/2024	5.035	7.61	773	4	
8/01/2024	8.060	7.53	763	2	
9/01/2024	8.027	7.37	743	4	6
10/01/2024	10.298	7.55	761	2	
11/01/2024	8.543	7.54	777	6	
12/01/2024	8.024	7.64	757	4	
13/01/2024	8.024	7.41	777	6	
14/01/2024	8.045	7.40	812	2	
15/01/2024	8.037	7.62	816	1	
16/01/2024	7.127	7.66	801	6	3
17/01/2024	8.299	7.53	768	4	
18/01/2024	5.197	7.41	788	4	
19/01/2024	7.396	7.39	801	1	
20/01/2024	8.202	7.36	755	2	
21/01/2024	8.327	7.28	777	2	
22/01/2024	8.533	7.39	818	1	
23/01/2024	9.261	7.59	812	1	3
24/01/2024	8.365	7.32	804	2	
25/01/2024	8.363	7.27	790	2	
26/01/2024	7.135	7.24	790	2	
27/01/2024	7.511	7.32	793	1	
28/01/2024	8.202	7.34	808	3	
29/01/2024	8.508	7.54	810	2	
30/01/2024	4.097	7.24	787	1	2
31/01/2024	4.308	7.35	773	3	
1/02/2024	2.584	7.46	770	1	
2/02/2024	2.171	7.41	739	1	
3/02/2024	2.220	7.55	727	2	
4/02/2024	2.096	7.54	731	0	
5/02/2024	2.313	7.39	756	1	<1
6/02/2024	4.316	7.51	767	0	
7/02/2024	2.177	7.71	768	4	
8/02/2024	5.377	7.58	709	3	
9/02/2024	6.613	7.52	784	3	
10/02/2024	7.256	7.45	817	2	

Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
11/02/2024	5.386	7.65	779	4	
12/02/2024	2.033	7.67	767	3	
13/02/2024	4.361	7.44	758	2	2
14/02/2024	2.078	7.40	782	3	
15/02/2024	5.206	7.62	786	3	
16/02/2024	2.110	7.69	761	3	
17/02/2024	2.069	7.53	764	3	
18/02/2024	2.217	7.54	737	2	
19/02/2024	5.006	7.43	742	4	
20/02/2024	3.985	7.51	760	4	1
21/02/2024	5.632	7.63	767	5	
22/02/2024	8.723	7.53	757	4	
23/02/2024	2.086	7.44	789	5	
24/02/2024	5.358	7.33	769	3	
25/02/2024	5.081	7.54	718	6	
26/02/2024	6.412	7.42	788	4	
27/02/2024	6.062	7.61	792	4	2
28/02/2024	6.608	7.52	759	4	
29/02/2024	6.095	7.45	782	3	
1/03/2024	6.133	7.56	772	4	
2/03/2024	6.112	7.40	731	4	
3/03/2024	6.225	7.45	751	5	
4/03/2024	6.375	7.48	769	5	
5/03/2024	5.297	7.57	767	6	1
6/03/2024	4.155	7.59	767	4	
7/03/2024	4.137	7.47	777	3	
8/03/2024	3.382	7.57	792	2	
9/03/2024	3.086	7.73	781	1	
10/03/2024	3.113	7.51	747	1	
11/03/2024	4.320	7.55	760	2	
12/03/2024	4.060	7.52	769	3	2
13/03/2024	4.137	7.49	751	2	
14/03/2024	4.093	7.46	769	2	
15/03/2024	3.049	7.70	768	2	
16/03/2024	4.280	7.90	771	3	
17/03/2024	2.826	7.55	760	4	
18/03/2024	3.438	7.58	748	6	3
19/03/2024	5.174	7.55	706	7	
20/03/2024	5.222	7.43	732	2	
21/03/2024	7.434	7.84	777	5	
22/03/2024	7.441	7.72	760	6	
23/03/2024	7.278	7.37	772	8	
24/03/2024	7.370	7.34	819	13	
25/03/2024	8.613	7.23	784	11	
26/03/2024	8.370	7.36	782	17	7
27/03/2024	8.260	7.52	777	13	
28/03/2024	8.386	7.39	786	3	
29/03/2024	8.014	7.59	789	9	
30/03/2024	8.065	7.46	748	8	
31/03/2024	8.440	7.43	755	8	
1/04/2024	8.456	7.39	771	6	

Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
2/04/2024	8.296	7.31	794	10	
3/04/2024	8.282	7.53	786	13	4
4/04/2024	8.025	7.63	790	9	
5/04/2024	8.088	7.66	781	7	
6/04/2024	8.227	7.63	780	15	
7/04/2024	8.060	7.54	777	18	
8/04/2024	8.511	7.48	775	11	5
9/04/2024	8.086	7.39	806	11	
10/04/2024	7.979	7.57	788	8	
11/04/2024	8.056	7.46	798	10	
12/04/2024	4.586	7.53	770	32	
13/04/2024	9.085	7.44	778	15	
14/04/2024	6.509	7.25	766	8	
15/04/2024	6.088	7.37	742	10	
16/04/2024	9.116	7.31	747	9	3
17/04/2024	6.079	7.50	783	10	
18/04/2024	6.063	7.36	782	7	
19/04/2024	6.377	7.57	787	10	
20/04/2024	6.311	7.63	768	7	
21/04/2024	6.301	7.70	804	5	
22/04/2024	8.024	7.81	775	6	7
23/04/2024	7.881	7.75	766	7	
24/04/2024	7.084	7.52	777	6	
25/04/2024	7.554	7.80	803	10	
26/04/2024	6.055	7.61	794	6	
27/04/2024	10.709	7.64	787	9	
28/04/2024	10.382	7.43	807	10	
29/04/2024	8.035	7.34	816	17	
30/04/2024	10.255	7.33	791	17	
1/05/2024	8.946	7.32	809	19	7
2/05/2024	7.154	7.56	809	35	
3/05/2024	10.382	7.54	818	26	
4/05/2024	9.392	7.57	807	29	
5/05/2024	6.605	7.56	783	24	
6/05/2024	9.123	7.38	756	25	25
7/05/2024	8.674	7.51	810	31	
8/05/2024	ND	ND	ND	ND	
9/05/2024	ND	ND	ND	ND	
10/05/2024	ND	ND	ND	ND	
11/05/2024	ND	ND	ND	ND	
12/05/2024	ND	ND	ND	ND	
13/05/2024	ND	ND	ND	ND	
14/05/2024	ND	ND	ND	ND	
15/05/2024	ND	ND	ND	ND	N/A
16/05/2024	ND	ND	ND	ND	
17/05/2024	ND	ND	ND	ND	
18/05/2024	ND	ND	ND	ND	
19/05/2024	ND	ND	ND	ND	
20/05/2024	ND	ND	ND	ND	
21/05/2024	ND	ND	ND	ND	N/A
22/05/2024	ND	ND	ND	ND	

Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
23/05/2024	ND	ND	ND	ND	
24/05/2024	ND	ND	ND	ND	
25/05/2024	ND	ND	ND	ND	
26/05/2024	ND	ND	ND	ND	
27/05/2024	ND	ND	ND	ND	
28/05/2024	ND	ND	ND	ND	N/A
29/05/2024	ND	ND	ND	ND	
30/05/2024	ND	ND	ND	ND	
31/05/2024	ND	ND	ND	ND	
1/06/2024	ND	ND	ND	ND	
2/06/2024	ND	ND	ND	ND	
3/06/2024	1.248	7.34	369	2	
4/06/2024	3.198	7.60	341	4	
5/06/2024	5.001	7.62	617	2	
6/06/2024	12.152	7.32	780	6	
7/06/2024	6.888	7.50	780	17	
8/06/2024	11.112	7.78	841	11	
9/06/2024	3.515	7.73	810	8	
10/06/2024	7.444	7.91	774	5	
11/06/2024	8.990	7.97	753	6	4
12/06/2024	12.968	7.87	748	6	
13/06/2024	6.076	7.70	781	10	
14/06/2024	8.219	7.81	759	10	
15/06/2024	11.216	8.03	739	4	
16/06/2024	6.639	8.02	764	7	
17/06/2024	6.091	8.03	776	5	
18/06/2024	4.450	7.99	726	3	3
19/06/2024	0.511	7.92	678	3	
20/06/2024	6.026	7.83	621	3	
21/06/2024	5.169	7.47	738	23	
22/06/2024	10.063	7.35	738	10	
23/06/2024	4.359	7.60	738	10	
24/06/2024	5.945	7.82	710	10	
25/06/2024	7.047	7.61	758	7	6
26/06/2024	8.312	7.44	781	4	
27/06/2024	8.405	7.46	819	4	
28/06/2024	6.223	7.52	755	4	
29/06/2024	5.989	7.75	727	7	
30/06/2024	4.696	7.94	726	6	
1/07/2024	6.038	7.99	718	6	5
2/07/2024	7.224	7.84	745	5	
3/07/2024	9.479	7.84	745	3	
4/07/2024	7.022	7.92	736	4	
5/07/2024	6.022	7.76	743	2	
6/07/2024	8.151	7.83	689	2	
7/07/2024	11.584	7.58	721	2	
8/07/2024	13.027	7.45	777	5	
9/07/2024	7.126	7.55	777	4	3
10/07/2024	5.017	7.53	745	10	
11/07/2024	4.508	7.63	799	6	
12/07/2024	6.060	7.91	724	3	

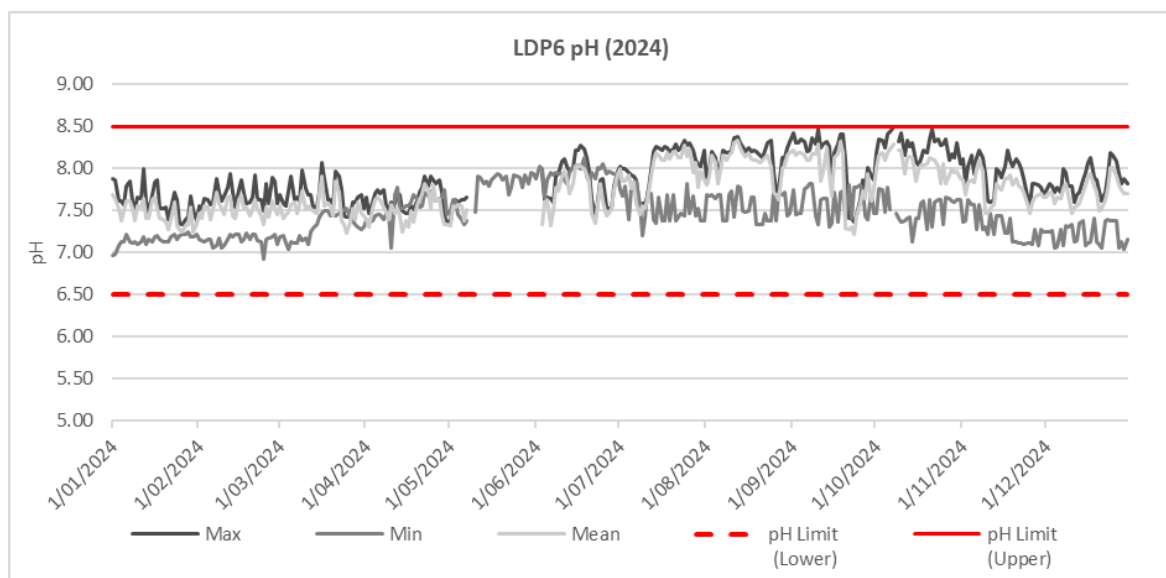
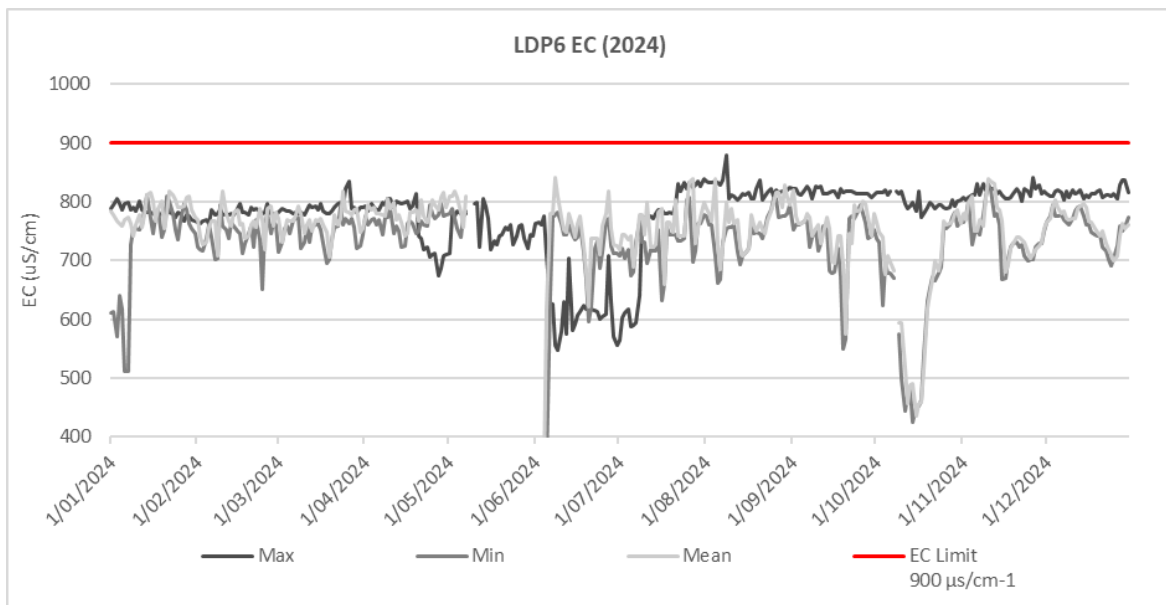
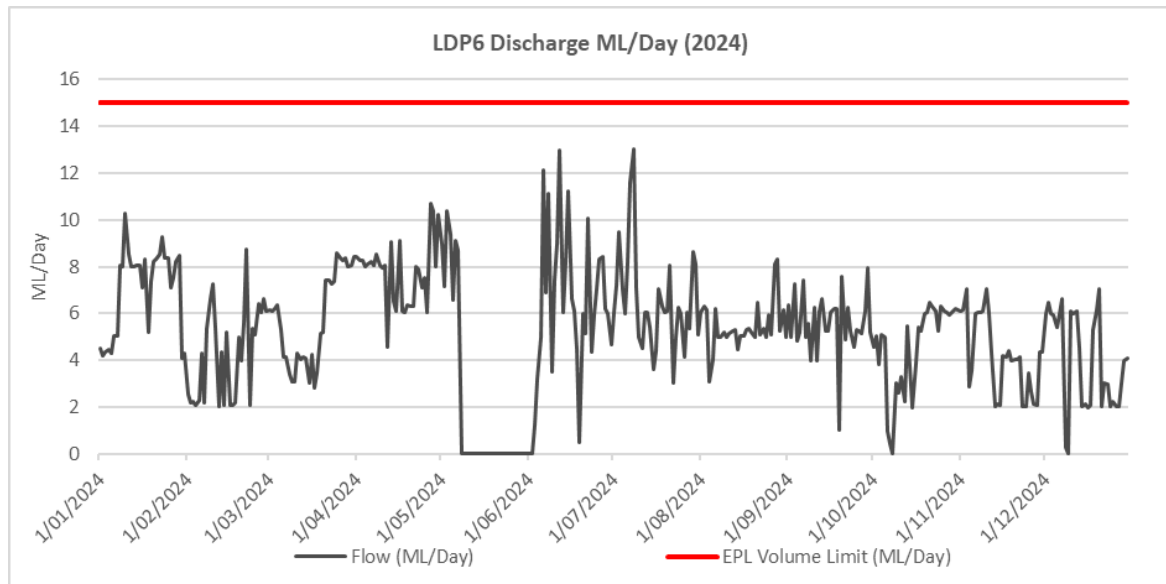
Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
13/07/2024	6.044	8.08	722	2	
14/07/2024	5.411	8.19	727	1	
15/07/2024	3.601	8.16	782	2	
16/07/2024	4.423	8.10	789	3	1
17/07/2024	7.078	8.10	659	2	
18/07/2024	6.302	8.18	766	15	
19/07/2024	6.074	8.11	766	3	
20/07/2024	6.084	8.20	748	1	
21/07/2024	8.058	8.19	803	2	
22/07/2024	3.056	8.12	743	3	
23/07/2024	4.980	8.13	743	2	2
24/07/2024	6.239	8.27	743	3	
25/07/2024	5.996	8.14	792	2	
26/07/2024	4.171	8.23	833	1	
27/07/2024	6.061	7.95	839	1	
28/07/2024	5.380	8.06	730	2	
29/07/2024	8.664	7.78	754	1	
30/07/2024	8.132	7.97	773	3	5
31/07/2024	5.082	7.86	799	2	
1/08/2024	6.079	7.80	788	5	
2/08/2024	6.304	7.90	779	2	
3/08/2024	6.142	8.15	768	1	
4/08/2024	3.082	8.07	840	1	
5/08/2024	4.067	7.82	727	1	
6/08/2024	6.214	7.98	684	1	2
7/08/2024	5.002	8.15	726	1	
8/08/2024	4.985	8.10	798	1	
9/08/2024	5.216	8.15	766	2	
10/08/2024	5.011	8.18	788	1	
11/08/2024	5.145	8.30	764	1	
12/08/2024	5.285	8.33	769	2	
13/08/2024	5.296	8.24	724	1	5
14/08/2024	4.469	8.18	709	2	
15/08/2024	5.023	8.14	713	2	
16/08/2024	5.041	8.17	721	4	
17/08/2024	5.298	8.11	777	2	
18/08/2024	5.349	8.10	762	2	
19/08/2024	5.203	8.09	750	2	
20/08/2024	4.991	8.06	766	2	4
21/08/2024	6.484	8.09	753	1	
22/08/2024	5.093	8.12	746	1	
23/08/2024	5.340	8.15	767	2	
24/08/2024	4.983	8.02	784	2	
25/08/2024	5.935	7.71	799	2	
26/08/2024	5.125	7.68	816	8	5
27/08/2024	8.127	7.63	815	3	
28/08/2024	8.300	7.99	790	3	
29/08/2024	5.244	8.04	828	10	
30/08/2024	6.177	8.15	807	3	
31/08/2024	4.981	8.19	794	1	
1/09/2024	6.389	8.22	821	5	

Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
2/09/2024	4.990	8.15	775	2	3
3/09/2024	7.281	8.18	764	6	
4/09/2024	4.833	8.19	764	2	
5/09/2024	5.194	8.16	768	2	
6/09/2024	7.444	8.10	779	7	
7/09/2024	4.982	8.09	774	2	
8/09/2024	5.603	8.17	741	1	
9/09/2024	3.998	8.17	755	1	
10/09/2024	6.275	8.29	760	1	2
11/09/2024	3.989	7.84	730	3	
12/09/2024	6.092	7.96	747	2	
13/09/2024	6.619	8.25	773	2	
14/09/2024	5.259	7.92	755	2	
15/09/2024	5.264	7.67	699	3	
16/09/2024	6.059	8.12	696	2	3
17/09/2024	6.229	8.17	742	4	
18/09/2024	6.186	8.32	741	1	
19/09/2024	1.045	8.19	694	2	
20/09/2024	7.596	7.29	576	1	
21/09/2024	4.910	7.28	746	12	
22/09/2024	6.243	7.31	730	21	
23/09/2024	5.275	7.22	794	19	
24/09/2024	4.568	7.43	784	19	2
25/09/2024	5.287	7.58	786	9	
26/09/2024	5.253	7.73	802	5	
27/09/2024	5.137	7.64	797	5	
28/09/2024	6.108	7.93	773	6	
29/09/2024	7.943	7.61	743	3	
30/09/2024	5.190	7.76	780	3	
1/10/2024	4.555	8.01	766	5	4
2/10/2024	5.052	8.16	748	6	
3/10/2024	3.846	8.19	740	3	
4/10/2024	5.104	8.09	676	6	
5/10/2024	4.995	8.18	709	5	
6/10/2024	0.954	8.23	697	5	
7/10/2024	0.443	8.29	682	2	
8/10/2024	ND	ND	ND	ND	
9/10/2024	3.016	8.22	594	0	2
10/10/2024	2.607	8.22	594	2	
11/10/2024	3.328	7.94	517	5	
12/10/2024	2.254	8.13	456	2	
13/10/2024	5.487	8.14	488	0	
14/10/2024	3.702	8.13	490	0	
15/10/2024	1.993	7.85	436	0	
16/10/2024	3.869	7.98	456	0	2
17/10/2024	5.421	8.04	458	2	
18/10/2024	5.245	8.04	515	2	
19/10/2024	5.995	8.05	620	4	
20/10/2024	6.034	8.12	644	6	
21/10/2024	6.479	8.11	669	0	
22/10/2024	6.342	8.10	699	6	

Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
23/10/2024	6.098	8.02	683	3	8.1
24/10/2024	5.243	7.82	703	2	
25/10/2024	6.315	8.05	767	7	
26/10/2024	6.108	7.82	760	5	
27/10/2024	6.056	7.92	763	3	
28/10/2024	5.966	7.99	768	2	
29/10/2024	6.030	7.95	781	2	7
30/10/2024	6.207	7.97	787	3	
31/10/2024	6.158	7.88	763	1	
1/11/2024	6.128	7.86	780	3	
2/11/2024	6.179	7.69	769	2	
3/11/2024	7.079	7.83	800	4	
4/11/2024	2.867	7.86	809	3	
5/11/2024	3.561	7.83	750	10	1
6/11/2024	6.004	8.00	751	1	
7/11/2024	6.046	8.09	769	3	
8/11/2024	6.039	7.97	758	6	
9/11/2024	6.097	7.47	807	1	
10/11/2024	7.063	7.47	839	1	
11/11/2024	6.000	7.52	836	1	
12/11/2024	4.315	7.57	831	4	2
13/11/2024	2.025	7.82	791	3	
14/11/2024	2.115	7.78	786	1	
15/11/2024	2.089	7.75	767	1	
16/11/2024	4.202	7.87	681	1	
17/11/2024	4.163	7.88	694	2	
18/11/2024	4.403	7.92	721	2	3
19/11/2024	4.009	7.80	730	4	
20/11/2024	4.051	7.88	739	0	
21/11/2024	4.052	7.79	740	0	
22/11/2024	4.154	7.77	735	1	
23/11/2024	2.058	7.71	732	0	
24/11/2024	2.050	7.58	714	0	
25/11/2024	3.484	7.46	703	0	3
26/11/2024	2.675	7.60	710	0	
27/11/2024	2.153	7.66	718	1	
28/11/2024	2.066	7.69	726	1	
29/11/2024	4.376	7.70	732	3	
30/11/2024	4.344	7.65	754	2	
1/12/2024	5.980	7.66	766	3	
2/12/2024	6.464	7.71	771	2	4
3/12/2024	6.003	7.70	792	4	
4/12/2024	5.972	7.58	803	3	
5/12/2024	5.443	7.65	790	3	
6/12/2024	6.001	7.64	780	2	
7/12/2024	6.614	7.76	784	2	
8/12/2024	0.314	7.81	771	2	
9/12/2024	0.000	7.68	770	2	
10/12/2024	6.122	7.47	772	1	4
11/12/2024	5.986	7.54	772	2	
12/12/2024	6.122	7.56	789	2	

Date	Flow (ML/Day)	pH	EC ($\mu\text{s}/\text{cm}-1$)	Turbidity (NTU)	TSS (mg/L)
13/12/2024	4.525	7.58	793	2	
14/12/2024	2.031	7.71	797	1	
15/12/2024	2.133	7.80	791	1	
16/12/2024	1.992	7.91	767	1	
17/12/2024	2.108	7.94	765	1	2
18/12/2024	5.289	7.79	754	1	
19/12/2024	6.153	7.71	749	2	
20/12/2024	7.053	7.50	742	1	
21/12/2024	2.019	7.53	750	2	
22/12/2024	3.050	7.63	729	1	
23/12/2024	3.004	7.76	719	0	
24/12/2024	2.012	8.01	710	1	
25/12/2024	2.240	8.01	700	1	
26/12/2024	2.031	7.90	708	0	
27/12/2024	2.022	7.80	743	0	
28/12/2024	3.026	7.74	764	0	
29/12/2024	4.012	7.70	754	1	
30/12/2024	4.090	7.70	762	0	

Notes: ND = No Discharge



3. LDP 19 Daily Average Results

LDP 19		Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
	Minimum	0.0	7.10	501.0	0.0	0.0
	Maximum	18.9	8.15	817.0	6.0	7.9
	Average	10.8	7.63	745.0	1.5	1.3

Table 3-1 LDP19 Daily Average Results

Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
1/01/2024	3.968	7.11	770	0	
2/01/2024	4.475	7.10	773	0	
3/01/2024	3.985	7.16	769	1	
4/01/2024	9.698	7.16	765	1	
5/01/2024	10.502	7.20	773	2	
6/01/2024	11.297	7.30	771	2	
7/01/2024	10.845	7.16	774	1	
8/01/2024	13.904	7.14	781	1	
9/01/2024	13.885	7.15	777	1	<1
10/01/2024	11.179	7.15	776	1	
11/01/2024	13.678	7.18	775	1	
12/01/2024	13.706	7.21	780	1	
13/01/2024	9.798	7.19	767	1	
14/01/2024	11.905	7.23	763	1	
15/01/2024	6.951	7.23	764	0	
16/01/2024	6.956	7.22	762	1	<1
17/01/2024	4.984	7.25	762	1	
18/01/2024	6.952	7.22	753	5	
19/01/2024	8.945	7.20	759	2	
20/01/2024	9.935	7.20	761	1	
21/01/2024	9.928	7.24	761	1	
22/01/2024	13.902	7.23	756	1	
23/01/2024	13.902	7.25	763	1	<1
24/01/2024	12.277	7.23	762	1	
25/01/2024	13.666	7.23	759	0	
26/01/2024	13.951	7.26	762	0	
27/01/2024	11.924	7.26	760	1	
28/01/2024	11.927	7.28	759	1	
29/01/2024	10.009	7.30	760	1	
30/01/2024	8.941	7.27	752	1	<1
31/01/2024	6.937	7.31	758	1	
1/02/2024	6.008	7.25	752	1	
2/02/2024	5.955	7.26	750	2	
3/02/2024	5.915	7.24	751	1	
4/02/2024	5.993	7.24	753	1	
5/02/2024	5.908	7.25	753	2	<1
6/02/2024	5.010	7.25	752	1	
7/02/2024	6.966	7.31	757	3	
8/02/2024	6.989	7.32	765	2	

Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
9/02/2024	5.010	7.25	752	1	
10/02/2024	6.966	7.31	757	3	
11/02/2024	6.989	7.32	765	2	
12/02/2024	8.654	7.29	757	3	
13/02/2024	9.196	7.32	753	1	<1
14/02/2024	10.923	7.31	757	1	
15/02/2024	11.782	7.30	758	1	
16/02/2024	13.043	7.30	758	1	
17/02/2024	13.691	7.28	758	1	
18/02/2024	13.669	7.26	759	1	
19/02/2024	13.866	7.26	761	1	
20/02/2024	13.069	7.26	760	1	<1
21/02/2024	13.687	7.24	761	0	
22/02/2024	13.903	7.23	762	0	
23/02/2024	13.898	7.23	761	1	
24/02/2024	11.750	7.23	760	1	
25/02/2024	13.684	7.24	752	1	
26/02/2024	13.907	7.25	761	1	
27/02/2024	13.462	7.24	758	1	1
28/02/2024	14.393	7.32	763	0	
29/02/2024	4.480	7.22	756	1	
1/03/2024	4.967	7.27	761	0	
2/03/2024	5.093	7.27	756	0	
3/03/2024	4.969	7.21	751	0	
4/03/2024	5.961	7.16	758	0	
5/03/2024	5.937	7.17	757	0	<1
6/03/2024	9.927	7.18	757	0	
7/03/2024	7.947	7.25	759	0	
8/03/2024	7.959	7.28	758	0	
9/03/2024	7.949	7.25	755	0	
10/03/2024	8.469	7.24	749	0	
11/03/2024	8.942	7.24	742	1	
12/03/2024	8.924	7.31	763	1	<1
13/03/2024	8.914	7.37	762	1	
14/03/2024	9.823	7.41	763	1	
15/03/2024	9.949	7.50	765	1	
16/03/2024	8.952	7.60	762	1	
17/03/2024	8.969	7.65	762	1	
18/03/2024	5.446	7.60	748	1	<1
19/03/2024	6.010	7.55	763	0	
20/03/2024	5.964	7.55	757	0	
21/03/2024	5.960	7.60	758	0	
22/03/2024	5.971	7.64	765	0	
23/03/2024	5.948	7.68	764	0	
24/03/2024	5.954	7.69	764	0	
25/03/2024	7.919	7.81	765	0	
26/03/2024	7.933	7.78	765	1	<1
27/03/2024	6.944	7.71	770	0	
28/03/2024	6.918	7.66	768	0	
29/03/2024	6.962	7.53	768	1	
30/03/2024	6.959	7.54	766	0	

Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
31/03/2024	6.956	7.66	765	0	
1/04/2024	6.949	7.69	766	0	
2/04/2024	6.947	7.66	767	0	
3/04/2024	7.932	7.77	765	0	2
4/04/2024	7.938	7.80	767	0	
5/04/2024	8.955	7.80	766	0	
6/04/2024	8.942	7.75	767	0	
7/04/2024	12.453	7.75	765	0	
8/04/2024	11.982	7.79	766	2	1.0
9/04/2024	11.942	7.80	772	0	
10/04/2024	11.623	7.84	769	0	
11/04/2024	11.132	7.92	738	0	
12/04/2024	11.941	7.91	737	1	
13/04/2024	11.919	7.90	774	0	
14/04/2024	11.881	7.88	774	0	
15/04/2024	11.934	7.92	773	0	
16/04/2024	12.058	7.94	773	0	<1
17/04/2024	10.570	7.94	767	0	
18/04/2024	11.806	7.95	735	1	
19/04/2024	6.494	7.93	753	0	
20/04/2024	1.145	7.90	722	0	
21/04/2024	7.954	7.91	677	0	
22/04/2024	6.904	7.93	681	0	2.0
23/04/2024	6.949	7.88	658	1	
24/04/2024	7.125	7.94	662	1	
25/04/2024	6.797	7.94	647	0	
26/04/2024	2.973	7.95	651	0	
27/04/2024	2.289	7.94	620	1	
28/04/2024	6.459	7.90	615	0	
29/04/2024	7.033	7.87	626	1	
30/04/2024	8.130	7.77	672	0	
1/05/2024	8.801	7.70	678	1	
2/05/2024	9.500	7.82	681	1	
3/05/2024	6.092	7.85	730	0	
4/05/2024	8.226	7.75	705	0	
5/05/2024	9.999	7.62	730	1	
6/05/2024	9.938	7.55	751	0	<1
7/05/2024	8.240	7.67	751	0	
8/05/2024	ND				
9/05/2024	ND				
10/05/2024	5.903	7.65	797*	0	
11/05/2024	13.281	8.03	775	2	
12/05/2024	13.927	7.95	703	1	
13/05/2024	11.982	7.99	704	1	
14/05/2024	13.480	8.04	739	1	
15/05/2024	13.714	7.96	760	1	<1
16/05/2024	14.467	7.95	685	1	
17/05/2024	15.155	7.97	691	1	
18/05/2024	13.826	7.97	708	1	
19/05/2024	12.148	7.97	710	1	
20/05/2024	13.575	7.99	712	1	

Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
21/05/2024	14.577	7.97	719	1	<1
22/05/2024	10.327	7.94	729	1	
23/05/2024	12.238	8.00	733	1	
24/05/2024	16.489	7.98	726	1	
25/05/2024	14.079	7.95	705	1	
26/05/2024	15.341	7.97	720	1	
27/05/2024	7.419	8.04	738	1	
28/05/2024	10.841	8.03	716	1	<1
29/05/2024	10.098	7.94	673	2	
30/05/2024	14.396	8.04	677	3	
31/05/2024	12.525	8.08	713	3	
1/06/2024	10.043	8.05	710	3	
2/06/2024	12.077	8.05	718	4	
3/06/2024	3.054	8.05	736	6	
4/06/2024	3.137	8.04	743	0	
5/06/2024	12.735	7.99	655	3	<1
6/06/2024	10.968	8.02	604	2	
7/06/2024	10.660	8.00	574	1	
8/06/2024	13.835	7.98	565	2	
9/06/2024	13.586	7.97	542	1	
10/06/2024	9.493	8.00	533	1	
11/06/2024	8.957	7.99	536	1	<1
12/06/2024	9.526	8.01	521	1	
13/06/2024	11.062	8.05	550	2	
14/06/2024	12.565	8.05	545	1	
15/06/2024	12.536	8.08	547	1	
16/06/2024	12.238	8.10	570	2	
17/06/2024	8.219	8.10	588	2	
18/06/2024	12.675	8.15	592	2	<1
19/06/2024	11.143	8.08	593	2	
20/06/2024	10.878	8.08	595	1	
21/06/2024	4.348	8.10	599	2	
22/06/2024	8.621	8.05	578	3	
23/06/2024	11.963	8.08	597	1	
24/06/2024	11.052	8.04	562	1	
25/06/2024	10.582	8.14	556	2	2.0
26/06/2024	6.998	8.08	584	2	
27/06/2024	6.179	8.07	586	1	
28/06/2024	6.988	8.05	501	1	
29/06/2024	6.689	8.07	539	1	
30/06/2024	8.097	7.99	543	1	
1/07/2024	1.455	7.93	542	0	<1
2/07/2024	5.311	7.92	527	1	
3/07/2024	7.173	8.05	562	2	
4/07/2024	6.213	7.92	571	3	
5/07/2024	6.857	7.92	549	1	
6/07/2024	6.149	7.92	561	2	
7/07/2024	8.286	7.95	565	1	
8/07/2024	9.695	7.79	561	0	
9/07/2024	8.678	7.69	582	2	<1
10/07/2024	8.243	7.79	749	3	

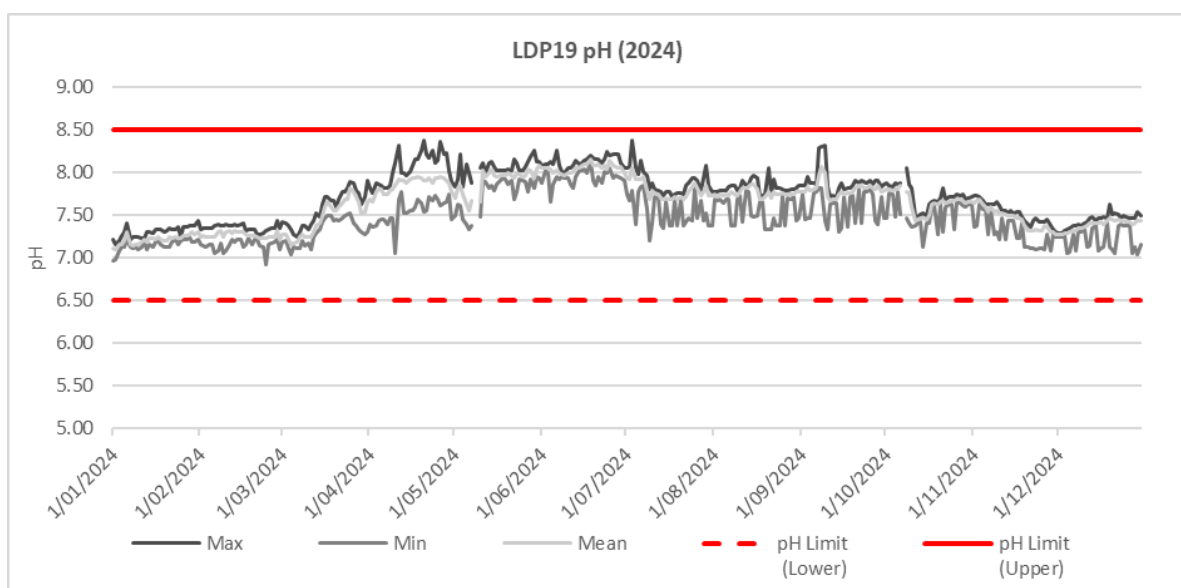
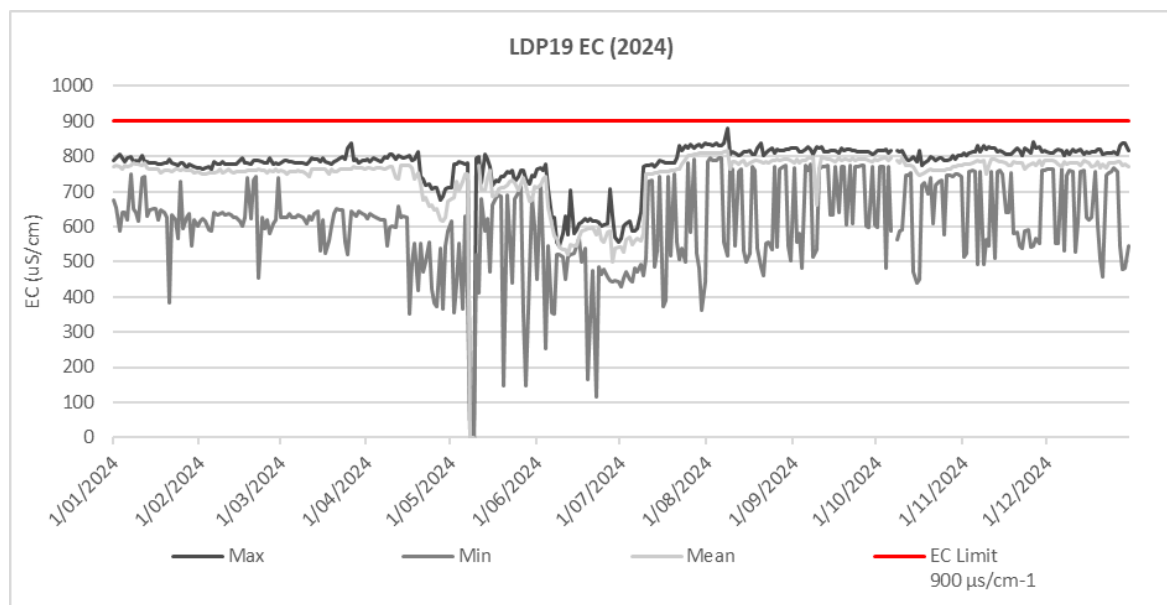
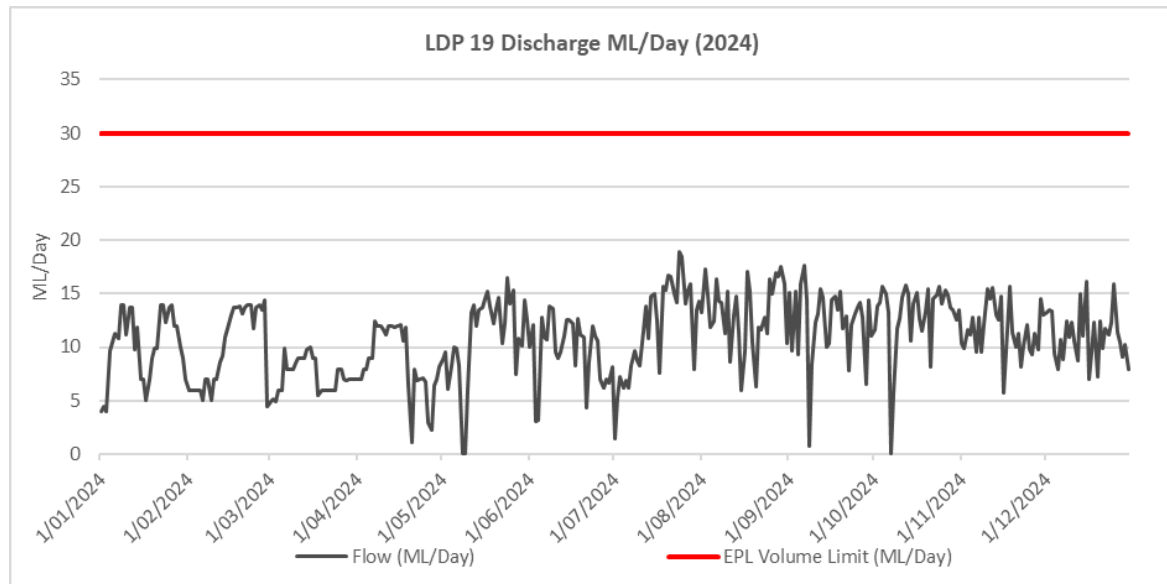
Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
11/07/2024	11.478	7.76	750	3	
12/07/2024	13.776	7.74	751	3	
13/07/2024	10.830	7.70	753	2	
14/07/2024	14.732	7.69	754	3	
15/07/2024	14.933	7.70	755	2	
16/07/2024	12.423	7.69	756	0	<1
17/07/2024	7.588	7.68	756	2	
18/07/2024	15.664	7.72	758	2	
19/07/2024	15.366	7.69	760	1	
20/07/2024	16.723	7.72	761	2	
21/07/2024	16.547	7.68	763	1	
22/07/2024	14.991	7.72	764	1	
23/07/2024	14.213	7.77	776	2	<1
24/07/2024	18.859	7.83	791	2	
25/07/2024	18.490	7.88	801	2	
26/07/2024	14.052	7.82	803	2	
27/07/2024	15.374	7.73	806	2	
28/07/2024	15.935	7.78	807	3	
29/07/2024	7.920	7.85	809	1	
30/07/2024	13.423	7.73	809	2	1.0
31/07/2024	14.288	7.73	809	2	
1/08/2024	13.281	7.74	810	2	
2/08/2024	17.275	7.72	809	2	
3/08/2024	14.851	7.74	809	2	
4/08/2024	11.800	7.73	809	2	
5/08/2024	12.464	7.74	810	1	
6/08/2024	16.368	7.73	811	1	
7/08/2024	14.298	7.77	813	2	0
8/08/2024	14.136	7.74	817	2	
9/08/2024	11.242	7.73	763	1	
10/08/2024	15.196	7.77	785	2	
11/08/2024	8.555	7.82	785	1	
12/08/2024	13.024	7.82	778	1	
13/08/2024	14.720	7.83	786	1	<1
14/08/2024	11.397	7.86	787	2	
15/08/2024	5.901	7.86	773	1	
16/08/2024	9.635	7.80	780	1	
17/08/2024	17.052	7.68	785	2	
18/08/2024	15.210	7.69	789	2	
19/08/2024	10.520	7.71	789	2	
20/08/2024	6.342	7.77	786	0	
21/08/2024	11.881	7.70	783	2	
22/08/2024	11.579	7.77	785	2	<1
23/08/2024	12.763	7.74	783	2	
24/08/2024	11.237	7.74	787	2	
25/08/2024	16.386	7.76	787	2	
26/08/2024	15.009	7.74	792	2	<1
27/08/2024	16.923	7.74	790	2	
28/08/2024	16.550	7.75	793	2	
29/08/2024	17.534	7.75	792	2	
30/08/2024	15.948	7.77	793	3	

Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
31/08/2024	10.291	7.77	790	2	
1/09/2024	15.054	7.78	780	2	
2/09/2024	9.643	7.77	793	2	1.0
3/09/2024	15.153	7.83	783	2	
4/09/2024	9.255	7.79	789	2	
5/09/2024	15.853	7.80	788	2	
6/09/2024	17.661	7.81	794	2	
7/09/2024	14.362	7.96	797	2	
8/09/2024	0.768	8.06	799	0	
9/09/2024	8.331	7.99	660	0	
10/09/2024	12.264	7.72	768	2	<1
11/09/2024	13.161	7.67	798	2	
12/09/2024	15.472	7.68	795	2	
13/09/2024	14.593	7.69	791	3	
14/09/2024	9.969	7.74	792	1	
15/09/2024	10.352	7.77	790	1	
16/09/2024	14.383	7.75	785	2	<1
17/09/2024	14.733	7.76	794	2	
18/09/2024	13.492	7.76	790	2	
19/09/2024	15.217	7.78	793	2	
20/09/2024	11.742	7.81	793	2	
21/09/2024	12.921	7.84	790	2	
22/09/2024	7.861	7.84	794	2	
23/09/2024	12.091	7.82	789	2	
24/09/2024	13.172	7.82	793	2	<1
25/09/2024	13.707	7.85	793	2	
26/09/2024	14.133	7.81	793	2	
27/09/2024	12.799	7.80	793	2	
28/09/2024	6.526	7.84	789	1	
29/09/2024	14.370	7.77	784	2	
30/09/2024	11.094	7.79	791	2	
1/10/2024	11.584	7.80	789	2	0
2/10/2024	13.811	7.80	791	2	
3/10/2024	14.151	7.79	794	2	
4/10/2024	15.715	7.80	795	2	
5/10/2024	14.978	7.82	788	2	
6/10/2024	13.237	7.84	794	2	
7/10/2024	ND				
8/10/2024	5.556	7.78	788	1	
9/10/2024	11.716	7.76	781	2	0
10/10/2024	12.647	7.59	795	2	
11/10/2024	14.619	7.43	775	2	
12/10/2024	15.770	7.45	774	3	
13/10/2024	14.959	7.47	775	2	
14/10/2024	10.537	7.46	772	2	
15/10/2024	14.091	7.45	753	3	
16/10/2024	15.088	7.49	746	2	0
17/10/2024	12.660	7.62	748	3	
18/10/2024	11.500	7.64	754	3	
19/10/2024	13.304	7.63	761	1	
20/10/2024	15.441	7.65	765	5	

Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
21/10/2024	8.186	7.67	761	4	
22/10/2024	14.524	7.64	759	4	
23/10/2024	14.849	7.66	759	4	7.9
24/10/2024	15.692	7.67	760	3	
25/10/2024	14.106	7.67	761	3	
26/10/2024	15.371	7.69	763	3	
27/10/2024	14.888	7.68	765	4	
28/10/2024	13.675	7.67	770	3	
29/10/2024	13.474	7.64	772	3	0
30/10/2024	12.554	7.66	774	3	
31/10/2024	13.438	7.66	775	2	
1/11/2024	10.390	7.64	776	2	
2/11/2024	9.880	7.67	776	2	
3/11/2024	11.633	7.68	778	2	
4/11/2024	11.151	7.62	781	2	
5/11/2024	12.774	7.60	785	2	<1
6/11/2024	9.530	7.54	787	1	
7/11/2024	12.774	7.60	785	2	
8/11/2024	9.530	7.54	787	1	
9/11/2024	12.091	7.55	750	1	
10/11/2024	15.387	7.52	773	2	
11/11/2024	14.552	7.52	791	2	
12/11/2024	15.570	7.51	792	2	<1
13/11/2024	12.986	7.49	788	2	
14/11/2024	12.535	7.49	786	2	
15/11/2024	14.738	7.49	785	2	
16/11/2024	5.700	7.46	783	2	
17/11/2024	11.635	7.46	774	0	
18/11/2024	15.691	7.45	775	3	
19/11/2024	11.424	7.38	784	1	
20/11/2024	9.960	7.32	782	1	0
21/11/2024	11.273	7.32	780	3	
22/11/2024	8.200	7.32	783	4	
23/11/2024	10.138	7.34	765	3	
24/11/2024	12.045	7.32	773	3	
25/11/2024	9.788	7.32	779	2	<1
26/11/2024	9.276	7.37	780	1	
27/11/2024	11.258	7.36	774	1	
28/11/2024	9.813	7.31	787	1	
29/11/2024	14.460	7.30	775	1	
30/11/2024	13.032	7.28	789	1	
1/12/2024	13.238	7.27	789	2	
2/12/2024	13.524	7.27	790	2	<1
3/12/2024	13.397	7.29	787	2	
4/12/2024	9.426	7.29	785	3	
5/12/2024	7.930	7.30	779	2	
6/12/2024	10.691	7.32	772	5	
7/12/2024	8.835	7.32	785	4	
8/12/2024	12.384	7.35	778	4	
9/12/2024	10.919	7.35	782	3	
10/12/2024	12.354	7.36	783	3	2

Date	Flow (ML/Day)	pH	EC (µs/cm-1)	Turbidity (NTU)	TSS (mg/L)
11/12/2024	10.540	7.37	783	3	
12/12/2024	8.738	7.40	783	2	
13/12/2024	15.021	7.41	775	2	
14/12/2024	11.065	7.41	787	2	
15/12/2024	16.103	7.41	784	2	
16/12/2024	7.037	7.42	782	2	
17/12/2024	9.376	7.39	771	1	1
18/12/2024	12.296	7.43	774	2	
19/12/2024	7.168	7.46	784	2	
20/12/2024	12.415	7.45	767	2	
21/12/2024	9.848	7.44	776	2	
22/12/2024	11.778	7.45	768	3	
23/12/2024	11.147	7.43	781	2	2.00
24/12/2024	12.317	7.43	782	2	
25/12/2024	15.879	7.42	783	2	
26/12/2024	11.438	7.42	785	2	
27/12/2024	10.483	7.39	784	1	
28/12/2024	9.053	7.40	773	2	
29/12/2024	10.269	7.44	777	1	
30/12/2024	7.932	7.43	770	2	

Notes: ND = No Discharge * Refers to Daily Maximum as discharge did not extend for the full 24hrs to obtain the Daily Average EC.



4. Surface Water Monitoring Result Comparison to Trigger Values

Table 4-1- Adopted Trigger Values for Key Water Quality Parameters

Water Quality Variable	pH	EC (µS/cm)	TSS (mg/L)
Goulburn River Downstream (SW02) ²	6.5 – 8.5 ³	900 ³	13 ¹
Ulan Creek Upstream of LDP6 (SW03)	6.5 – 8.1 ⁷	1440 ⁷	18 ⁷
Ulan Creek at Old Ulan (SW04)	6.5 – 8.5 ⁶	900 ⁶	47 ⁷
Ulan Creek at Pleuger Road (SW05)	6.5 – 8.5 ⁶	900 ⁶	18 ⁷
Spring Gully (SW06)	6.5 – 7.6 ⁷	417 ⁷	102 ⁷
Bobadeen Creek (SW07)	6.8 – 7.4 ⁷	205 ⁷	150 ⁷
Curra Creek (SW08)	6.5 – 8.0 ⁴	30 – 350 ⁴	50 ⁵
Mona Creek (SW10)	6.5 – 7.4 ⁷	214 ⁷	92 ⁷
Cockabutta Creek (SW11)	6.5 – 8.0 ⁴	30 – 350 ⁴	50 ⁵
Clean Water Diversion/System (SW12, SW13 (EPL 23), SW14, SW15)	6.5 – 8.5 ⁶	900 ⁶	50 ⁵

Notes: ¹ 80th percentile based on historical data for the Goulburn River. ² SW02 is downstream of the Ulan Mine Complex and as such water quality at this location can be influenced by other developments in the catchment outside of UCML influence, such as neighbouring mines discharge downstream of SW01. ³ Trigger based on EPL394 limits for discharge points LDP6 and LDP19 which are upstream of this monitoring site. ⁴ Interim trigger values based on ANZECC (2000) default trigger values for lowland rivers in NSW. Site-specific trigger values will be developed as monitoring data becomes available. ⁵ Interim trigger values based on Volume 1 of Managing Urban Stormwater: Soils and Construction (Landcom, 2004). ⁶ Trigger level reflects upstream discharge limit approved under EPL394. ⁷ 80th percentile of baseline data-upper limit trigger value. Lower value trigger for pH based on ANZECC (2000) default trigger values for lowland rivers in NSW.

Table 4-2- 2024 Monthly Sampling Result Summary

SW Sites	pH			EC (µS/cm)			TSS (mg/L)		
	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
SW01	6.2	7.3	7.0	167.0	590.0	384.8	8.0	314.0	48.8
SW02	7.3	8.1	7.9	309.0	777.0	547.8	1.0	91.0	24.6
SW03	7.8	9.1	8.2	621.0	1280.0	1054.7	1.0	36.0	13.1
SW04	8.0	8.6	8.4	576.0	824.0	737.2	1.0	14.0	5.2
SW05	7.1	8.3	7.6	548.0	905.0	756.7	1.0	16.0	5.1
SW06	*	*	*	*	*	*	*	*	*
SW07	*	*	*	*	*	*	*	*	*
SW08	*	*	*	*	*	*	*	*	*
SW09	8.2	8.7	8.4	472.0	1270.0	974.5	18.0	156.0	63.1
SW10 [#]	6.8	6.8	6.8	75.0	91.0	83.0	22.0	41.0	31.5
SW11	*	*	*	*	*	*	*	*	*
SW12 [^]	7.8	7.8	7.8	165.0	165.0	165.0	16.0	16.0	16.0
SW13 [^]	7.4	7.4	7.4	162.0	162.0	162.0	14.0	14.0	14.0
SW14 [^]	7.1	7.1	7.1	97.0	97.0	97.0	10.0	10.0	10.0
SW15 [^]	6.4	6.4	6.4	213.0	213.0	213.0	12.0	12.0	12.0

Notes: Shaded results were periodically outside the adopted trigger values. Shaded results indicate a trigger has occurred i.e. three or more consecutive monthly results are outside of respective water quality criteria. * No flows in creeks or drainage systems at the time of monthly surface water sampling in 2023. # Only two monthly samples available for analysis. ^ Only one monthly sample available for analysis

5. Goulburn River Monitoring

5.1 SW01 Upstream Goulburn River

SW01 is located in the Goulburn River upstream of operations, near the confluence of Moolarben Creek and Sportsman Hollow Creek. SW01 is sampled monthly, after specific rainfall events and is equipped with sensors recording daily average EC, pH and flow volumes. SW01 is located at an existing level concrete causeway crossing across the Goulburn River, at the end of Short Street in the Ulan Village. SW01 is considered outside the influence of UCMPL mining activities. The 2024 water quality monitoring and flow results from SW01 indicate that:

- Continuous daily water monitoring indicates that pH ranged between pH 6.29 – pH 7.58 for 2024.
- Continuous water monitoring indicates that EC concentrations ranged between 202 $\mu\text{S}/\text{cm}$ – 720 $\mu\text{S}/\text{cm}$ for 2024:
 - The maximum daily EC result of 720 $\mu\text{S}/\text{cm}$ occurred on 18 October 2024.
 - The daily average EC was 432.79 $\mu\text{S}/\text{cm}$ for 2024.
- Monthly grab sample monitoring results for pH ranged between pH 6.2 – pH 7.3 for 2024.
- Monthly grab sample monitoring results for EC ranged between 167 $\mu\text{S}/\text{cm}$ – 590 $\mu\text{S}/\text{cm}$ for 2024.
- Monthly grab sample monitoring results for TSS ranged between 8 mg/L – 314 mg/L for 2024.
 - The 314mg/L TSS result on the 18/01/2024 was likely influenced by the 58.4mm rainfall event recorded the day before on the 17 January 2024.

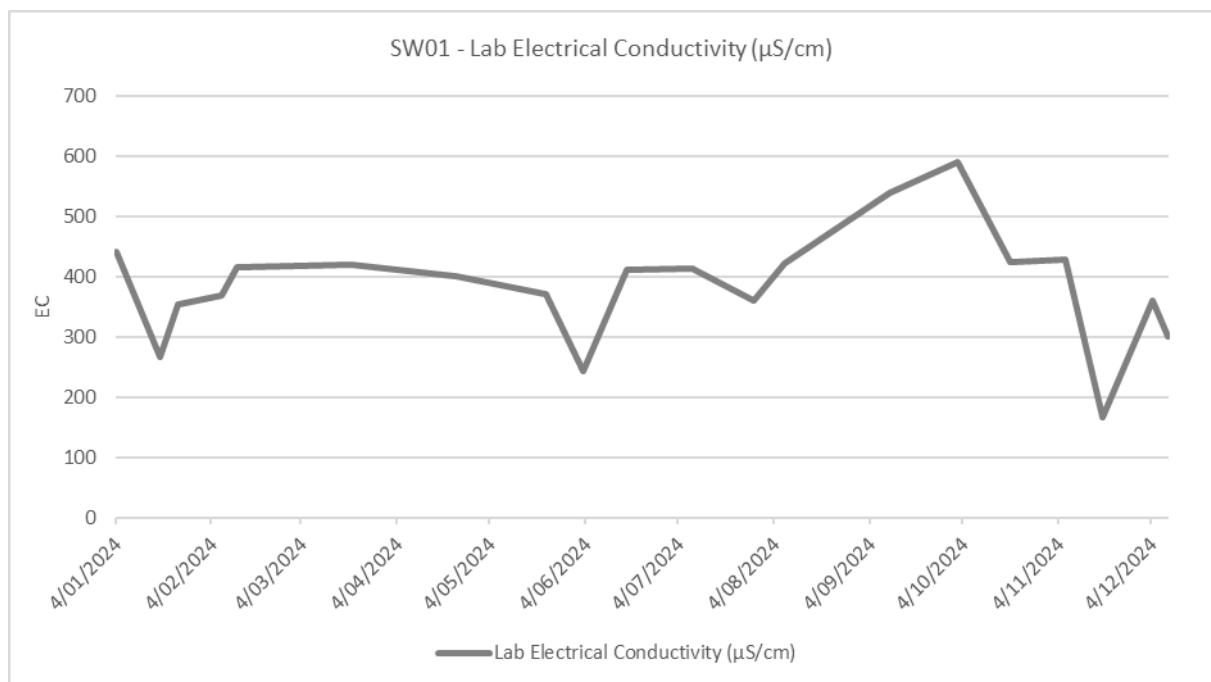


Figure 5-1 SW01 Upstream Goulburn River Monthly Grab Sample EC Results 2024

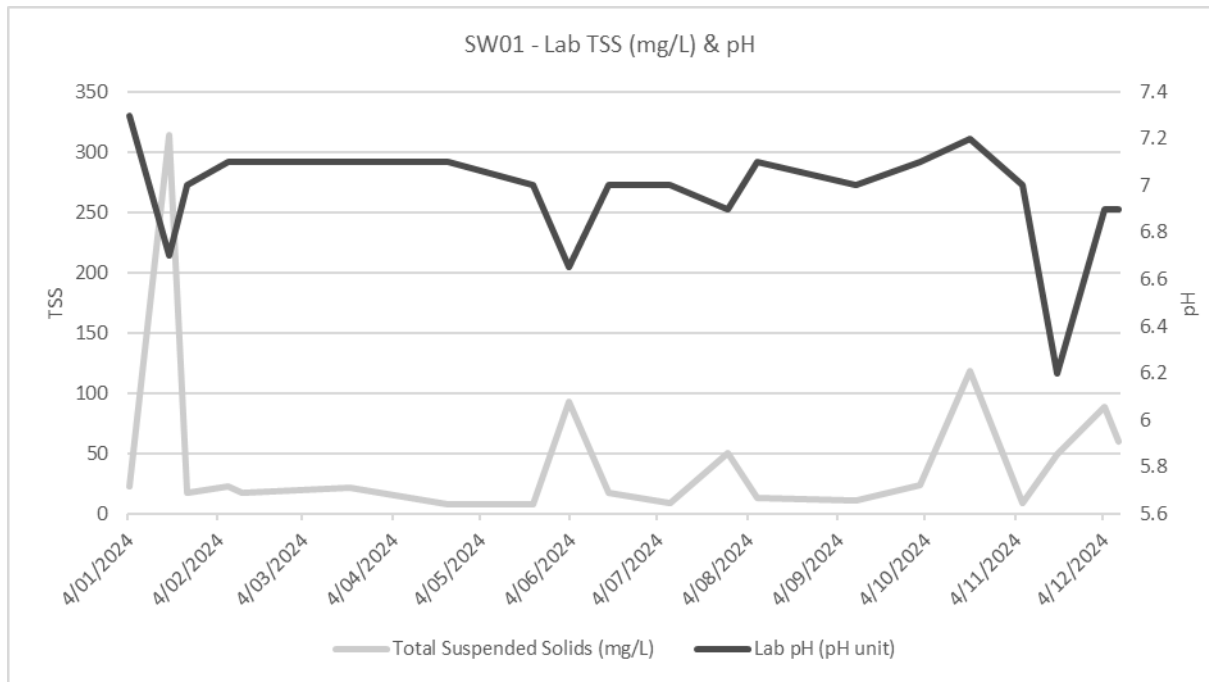


Figure 5-2 SW01 Upstream Goulburn River Monthly Grab Sample pH & TSS Results 2024

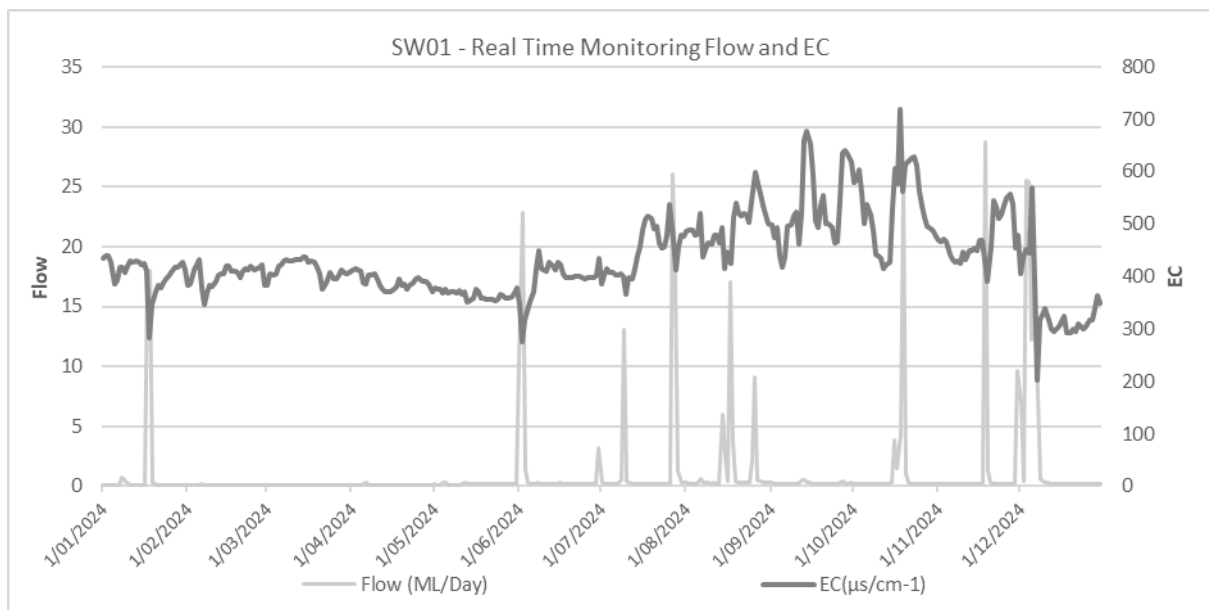


Figure 5-3 SW01 Upstream Goulburn River Real Time Flow & EC Results 2024

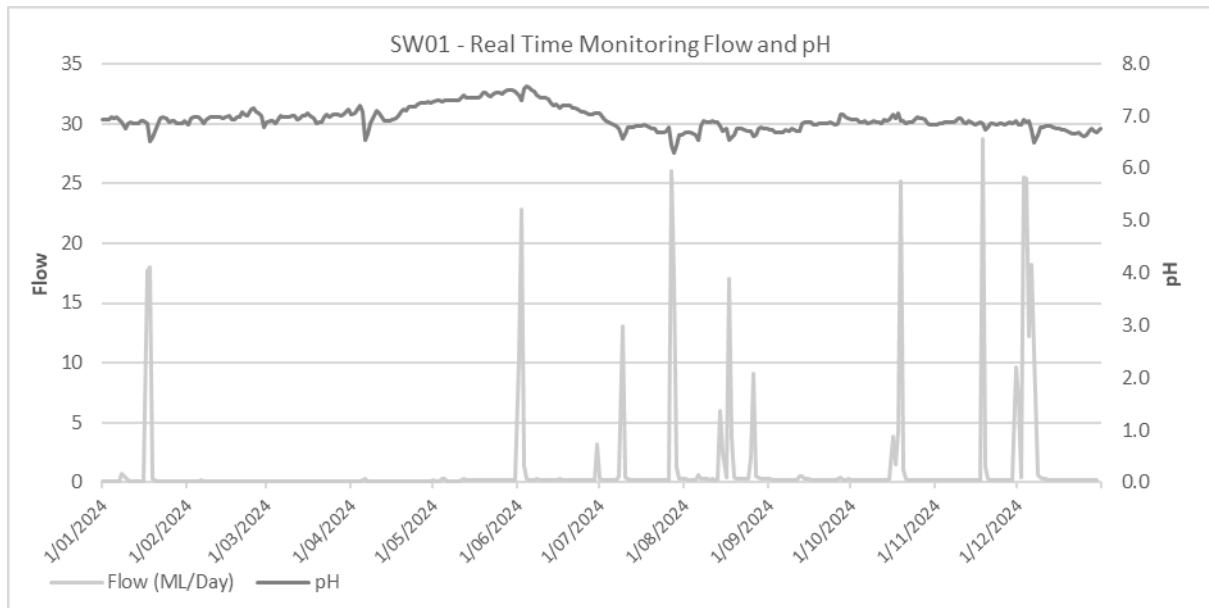


Figure 5-4 SW01 Upstream Goulburn River Real Time Flow & pH Results 2024

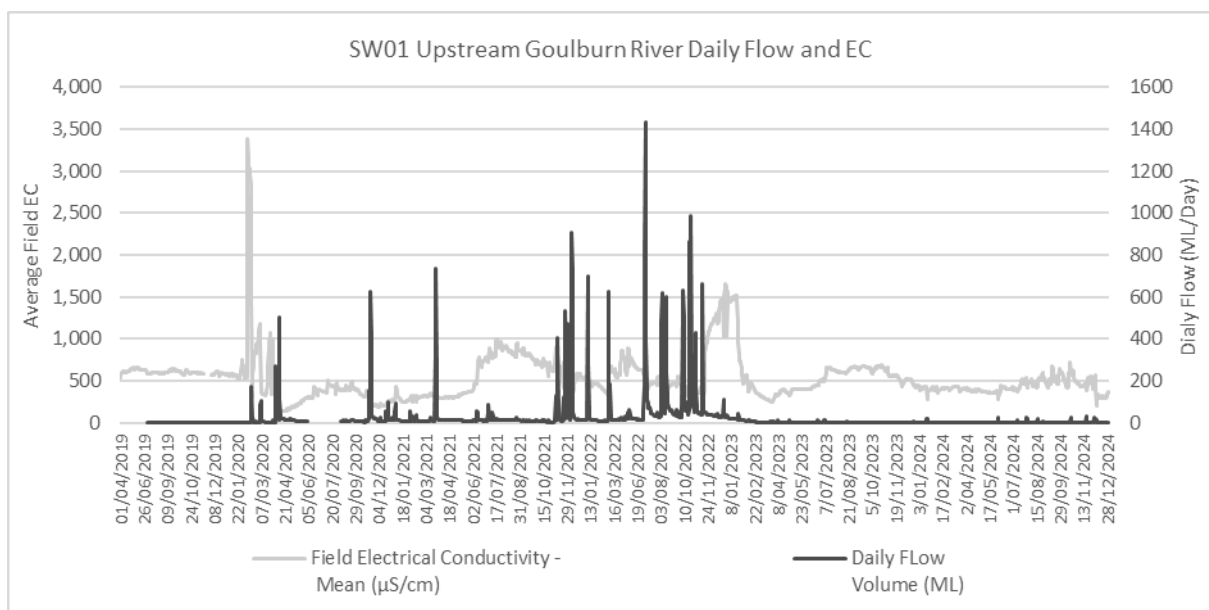


Figure 5-5 SW01 Upstream Goulburn River Historical Real Time Flow & EC (2019 - 2024)

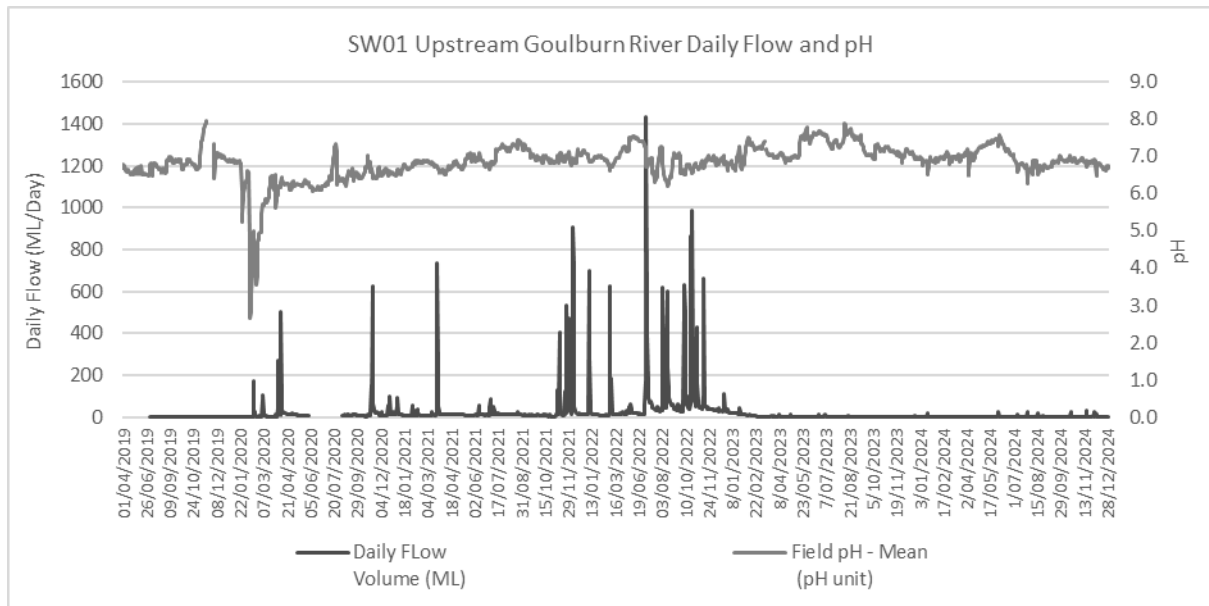


Figure 5-6 SW01 Upstream Goulburn River Real Time Historical Flow & pH (2019 - 2024)

5.1.1 SW01 Daily Average Results

	pH	EC($\mu\text{S}/\text{cm}^{-1}$)	Flow (ML/Day)
Min	6.29	202	0.09
Max	7.58	720	28.68
Average	6.94	432.79	1.13

Table 5-1 SW01 Daily Average Results

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
1/01/2024	435	6.92	0.114
2/01/2024	440	6.94	0.111
3/01/2024	439	6.93	0.112
4/01/2024	427	6.99	0.128
5/01/2024	385	6.96	0.136
6/01/2024	394	6.98	0.121
7/01/2024	418	6.94	0.119
8/01/2024	418	6.88	0.699
9/01/2024	407	6.76	0.395
10/01/2024	420	6.85	0.166
11/01/2024	429	6.88	0.141
12/01/2024	427	6.86	0.130
13/01/2024	431	6.86	0.123
14/01/2024	428	6.87	0.120
15/01/2024	422	6.91	0.120
16/01/2024	426	6.90	0.122
17/01/2024	411	6.87	17.723
18/01/2024	284	6.52	17.953
19/01/2024	347	6.60	0.293
20/01/2024	370	6.72	0.181
21/01/2024	383	6.83	0.150
22/01/2024	378	6.96	0.133
23/01/2024	389	6.99	0.125
24/01/2024	396	6.95	0.125
25/01/2024	400	6.89	0.123
26/01/2024	409	6.90	0.122
27/01/2024	417	6.91	0.123
28/01/2024	417	6.87	0.123
29/01/2024	423	6.87	0.121
30/01/2024	428	6.86	0.120
31/01/2024	413	6.90	0.142
1/02/2024	383	6.83	0.151
2/02/2024	385	6.95	0.123
3/02/2024	412	6.97	0.119
4/02/2024	423	6.98	0.120
5/02/2024	432	6.98	0.120

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
6/02/2024	378	6.94	0.168
7/02/2024	347	6.87	0.150
8/02/2024	368	6.94	0.132
9/02/2024	383	6.98	0.130
10/02/2024	382	6.98	0.127
11/02/2024	391	6.99	0.127
12/02/2024	403	6.98	0.135
13/02/2024	405	6.98	0.125
14/02/2024	406	6.95	0.118
15/02/2024	420	6.97	0.124
16/02/2024	421	7.01	0.122
17/02/2024	410	6.93	0.120
18/02/2024	410	6.93	0.122
19/02/2024	408	6.97	0.127
20/02/2024	398	6.99	0.124
21/02/2024	410	7.08	0.121
22/02/2024	414	7.03	0.118
23/02/2024	412	7.00	0.115
24/02/2024	421	7.12	0.116
25/02/2024	412	7.15	0.114
26/02/2024	414	7.08	0.113
27/02/2024	417	7.06	0.112
28/02/2024	422	7.01	0.104
29/02/2024	383	6.79	0.148
1/03/2024	384	6.89	0.111
2/03/2024	405	6.91	0.108
3/03/2024	403	6.90	0.107
4/03/2024	406	6.87	0.103
5/03/2024	419	6.93	0.106
6/03/2024	422	7	0.107
7/03/2024	429	6.99	0.107
8/03/2024	432	6.99	0.108
9/03/2024	430	6.99	0.106
10/03/2024	430	7.00	0.105
11/03/2024	433	7.01	0.107
12/03/2024	432	6.93	0.105
13/03/2024	433	6.96	0.103
14/03/2024	436	7.00	0.104
15/03/2024	438	7.00	0.105
16/03/2024	428	7.06	0.106
17/03/2024	430	7.01	0.110
18/03/2024	427	6.95	0.126
19/03/2024	418	6.87	0.114
20/03/2024	405	6.89	0.125
21/03/2024	377	6.89	0.119
22/03/2024	384	6.99	0.112

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
23/03/2024	392	7.04	0.111
24/03/2024	408	6.99	0.111
25/03/2024	396	7.03	0.108
26/03/2024	396	7.04	0.105
27/03/2024	403	7.04	0.105
28/03/2024	412	7.00	0.106
29/03/2024	409	7.04	0.105
30/03/2024	406	7.09	0.105
31/03/2024	408	7.13	0.105
1/04/2024	413	7.03	0.105
2/04/2024	414	7.06	0.116
3/04/2024	413	7.14	0.113
4/04/2024	411	7.20	0.114
5/04/2024	388	7.07	0.201
6/04/2024	386	6.53	0.352
7/04/2024	404	6.67	0.145
8/04/2024	403	6.86	0.124
9/04/2024	405	7.00	0.114
10/04/2024	396	7.10	0.113
11/04/2024	383	7.05	0.109
12/04/2024	377	6.97	0.093
13/04/2024	370	6.91	0.091
14/04/2024	371	6.90	0.091
15/04/2024	371	6.91	0.090
16/04/2024	377	6.92	0.089
17/04/2024	382	6.96	0.092
18/04/2024	395	7.01	0.136
19/04/2024	384	7.09	0.116
20/04/2024	385	7.12	0.110
21/04/2024	377	7.11	0.120
22/04/2024	383	7.17	0.128
23/04/2024	389	7.17	0.111
24/04/2024	395	7.18	0.103
25/04/2024	398	7.23	0.102
26/04/2024	392	7.25	0.101
27/04/2024	391	7.25	0.102
28/04/2024	390	7.24	0.101
29/04/2024	386	7.28	0.104
30/04/2024	372	7.25	0.136
1/05/2024	378	7.28	0.181
2/05/2024	377	7.29	0.139
3/05/2024	375	7.31	0.119
4/05/2024	368	7.28	0.319
5/05/2024	377	7.31	0.306
6/05/2024	369	7.29	0.151
7/05/2024	372	7.30	0.135

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
8/05/2024	370	7.31	0.128
9/05/2024	369	7.31	0.126
10/05/2024	373	7.31	0.137
11/05/2024	367	7.35	0.232
12/05/2024	370	7.40	0.306
13/05/2024	352	7.36	0.203
14/05/2024	354	7.34	0.172
15/05/2024	360	7.35	0.161
16/05/2024	375	7.36	0.158
17/05/2024	371	7.35	0.161
18/05/2024	358	7.38	0.163
19/05/2024	358	7.45	0.166
20/05/2024	357	7.45	0.164
21/05/2024	356	7.39	0.162
22/05/2024	356	7.38	0.164
23/05/2024	355	7.42	0.164
24/05/2024	357	7.44	0.161
25/05/2024	367	7.45	0.163
26/05/2024	364	7.43	0.169
27/05/2024	359	7.48	0.170
28/05/2024	359	7.49	0.167
29/05/2024	361	7.49	0.164
30/05/2024	369	7.49	0.161
31/05/2024	378	7.46	0.247
1/06/2024	347	7.40	10.277
2/06/2024	275	7.29	22.773
3/06/2024	316	7.53	1.400
4/06/2024	334	7.58	0.306
5/06/2024	351	7.55	0.234
6/06/2024	371	7.50	0.206
7/06/2024	416	7.47	0.236
8/06/2024	449	7.40	0.278
9/06/2024	415	7.34	0.224
10/06/2024	412	7.36	0.207
11/06/2024	411	7.35	0.183
12/06/2024	427	7.33	0.209
13/06/2024	419	7.25	0.183
14/06/2024	412	7.21	0.166
15/06/2024	427	7.22	0.244
16/06/2024	422	7.15	0.267
17/06/2024	406	7.20	0.227
18/06/2024	399	7.21	0.205
19/06/2024	398	7.21	0.197
20/06/2024	399	7.19	0.197
21/06/2024	401	7.15	0.202
22/06/2024	401	7.15	0.202

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
23/06/2024	400	7.12	0.191
24/06/2024	398	7.08	0.183
25/06/2024	396	7.08	0.183
26/06/2024	398	7.06	0.188
27/06/2024	397	7.04	0.182
28/06/2024	397	7.03	0.167
29/06/2024	402	7.05	0.176
30/06/2024	434	7.06	3.163
1/07/2024	385	7.06	0.335
2/07/2024	403	6.95	0.245
3/07/2024	415	6.90	0.220
4/07/2024	407	6.88	0.193
5/07/2024	408	6.86	0.186
6/07/2024	404	6.83	0.178
7/07/2024	404	6.82	0.169
8/07/2024	405	6.77	0.565
9/07/2024	401	6.57	13.046
10/07/2024	367	6.67	0.453
11/07/2024	399	6.79	0.286
12/07/2024	395	6.78	0.245
13/07/2024	414	6.79	0.227
14/07/2024	439	6.80	0.217
15/07/2024	458	6.80	0.216
16/07/2024	488	6.82	0.229
17/07/2024	509	6.84	0.236
18/07/2024	516	6.81	0.227
19/07/2024	511	6.79	0.214
20/07/2024	491	6.75	0.209
21/07/2024	497	6.76	0.199
22/07/2024	463	6.69	0.180
23/07/2024	455	6.69	0.177
24/07/2024	458	6.68	0.182
25/07/2024	478	6.71	0.181
26/07/2024	537	6.79	0.254
27/07/2024	469	6.43	26.077
28/07/2024	413	6.29	17.371
29/07/2024	458	6.44	1.325
30/07/2024	478	6.63	0.345
31/07/2024	476	6.63	0.279
1/08/2024	487	6.68	0.266
2/08/2024	488	6.68	0.261
3/08/2024	489	6.68	0.251
4/08/2024	478	6.67	0.249
5/08/2024	482	6.64	0.263
6/08/2024	521	6.53	0.628
7/08/2024	436	6.80	0.338

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
8/08/2024	453	6.90	0.279
9/08/2024	465	6.89	0.269
10/08/2024	462	6.88	0.262
11/08/2024	479	6.90	0.279
12/08/2024	480	6.89	0.262
13/08/2024	465	6.88	0.257
14/08/2024	493	6.80	5.964
15/08/2024	414	6.70	2.439
16/08/2024	447	6.77	0.413
17/08/2024	425	6.53	17.058
18/08/2024	512	6.58	3.788
19/08/2024	539	6.63	0.448
20/08/2024	521	6.77	0.353
21/08/2024	515	6.77	0.321
22/08/2024	521	6.75	0.293
23/08/2024	517	6.73	0.278
24/08/2024	503	6.72	0.290
25/08/2024	562	6.70	2.174
26/08/2024	600	6.62	9.103
27/08/2024	578	6.64	0.548
28/08/2024	557	6.75	0.372
29/08/2024	534	6.78	0.316
30/08/2024	519	6.76	0.298
31/08/2024	501	6.75	0.280
1/09/2024	498	6.74	0.266
2/09/2024	473	6.73	0.255
3/09/2024	493	6.69	0.244
4/09/2024	439	6.68	0.234
5/09/2024	418	6.69	0.235
6/09/2024	437	6.69	0.242
7/09/2024	495	6.74	0.244
8/09/2024	498	6.71	0.239
9/09/2024	516	6.75	0.253
10/09/2024	522	6.74	0.231
11/09/2024	462	6.72	0.220
12/09/2024	520	6.72	0.488
13/09/2024	659	6.85	0.548
14/09/2024	677	6.88	0.319
15/09/2024	652	6.88	0.271
16/09/2024	594	6.88	0.238
17/09/2024	507	6.83	0.216
18/09/2024	493	6.83	0.218
19/09/2024	534	6.86	0.224
20/09/2024	554	6.87	0.220
21/09/2024	502	6.87	0.206
22/09/2024	501	6.87	0.203

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
23/09/2024	494	6.88	0.197
24/09/2024	464	6.87	0.191
25/09/2024	467	6.84	0.192
26/09/2024	546	6.87	0.291
27/09/2024	636	7.04	0.386
28/09/2024	641	7.04	0.251
29/09/2024	632	6.99	0.226
30/09/2024	619	6.96	0.269
1/10/2024	579	6.94	0.229
2/10/2024	585	6.92	0.209
3/10/2024	605	6.93	0.205
4/10/2024	559	6.88	0.191
5/10/2024	500	6.88	0.206
6/10/2024	538	6.90	0.198
7/10/2024	519	6.85	0.177
8/10/2024	489	6.88	0.172
9/10/2024	442	6.91	0.163
10/10/2024	439	6.89	0.159
11/10/2024	434	6.88	0.160
12/10/2024	414	6.87	0.159
13/10/2024	422	6.92	0.160
14/10/2024	427	6.91	0.171
15/10/2024	530	6.92	0.305
16/10/2024	607	7.02	3.836
17/10/2024	576	6.96	1.536
18/10/2024	720	7.05	4.439
19/10/2024	562	6.90	25.202
20/10/2024	614	6.91	1.116
21/10/2024	618	6.86	0.285
22/10/2024	625	6.88	0.229
23/10/2024	628	6.89	0.212
24/10/2024	610	6.93	0.201
25/10/2024	562	6.98	0.192
26/10/2024	536	6.95	0.186
27/10/2024	514	6.96	0.183
28/10/2024	497	6.94	0.182
29/10/2024	492	6.85	0.180
30/10/2024	487	6.83	0.180
31/10/2024	476	6.84	0.179
1/11/2024	469	6.84	0.178
2/11/2024	467	6.85	0.180
3/11/2024	471	6.87	0.181
4/11/2024	466	6.88	0.183
5/11/2024	441	6.89	0.184
6/11/2024	433	6.88	0.182
7/11/2024	427	6.88	0.183

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
8/11/2024	430	6.91	0.186
9/11/2024	424	6.95	0.177
10/11/2024	448	6.95	0.176
11/11/2024	433	6.88	0.182
12/11/2024	449	6.87	0.196
13/11/2024	449	6.90	0.193
14/11/2024	454	6.88	0.191
15/11/2024	450	6.84	0.187
16/11/2024	468	6.85	0.185
17/11/2024	470	6.88	0.192
18/11/2024	433	6.86	28.681
19/11/2024	391	6.73	1.236
20/11/2024	457	6.79	0.268
21/11/2024	545	6.86	0.230
22/11/2024	532	6.86	0.211
23/11/2024	511	6.84	0.204
24/11/2024	519	6.86	0.200
25/11/2024	534	6.85	0.197
26/11/2024	549	6.83	0.197
27/11/2024	558	6.87	0.194
28/11/2024	538	6.89	0.253
29/11/2024	455	6.85	0.249
30/11/2024	479	6.90	9.649
1/12/2024	406	6.83	6.860
2/12/2024	434	6.84	0.401
3/12/2024	451	6.92	25.527
4/12/2024	444	6.88	25.439
5/12/2024	570	6.91	12.164
6/12/2024	394	6.73	18.211
7/12/2024	202	6.48	11.049
8/12/2024	316	6.65	0.658
9/12/2024	327	6.78	0.385
10/12/2024	339	6.79	0.329
11/12/2024	317	6.82	0.268
12/12/2024	301	6.82	0.242
13/12/2024	295	6.81	0.230
14/12/2024	299	6.79	0.223
15/12/2024	305	6.77	0.218
16/12/2024	315	6.77	0.208
17/12/2024	324	6.74	0.204
18/12/2024	292	6.73	0.197
19/12/2024	292	6.71	0.194
20/12/2024	299	6.68	0.189
21/12/2024	296	6.67	0.186
22/12/2024	311	6.66	0.179
23/12/2024	306	6.68	0.190

Date	EC($\mu\text{s}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
24/12/2024	300	6.64	0.190
25/12/2024	306	6.62	0.206
26/12/2024	317	6.63	0.205
27/12/2024	316	6.70	0.217
28/12/2024	340	6.77	0.202
29/12/2024	364	6.71	0.168
30/12/2024	348	6.69	0.161

5.2 SW02 Goulburn River Downstream

SW02 is located in the Goulburn River downstream of UCMPL's and MCO activities and other non-UCMPL mining activities. SW02 is sampled monthly, after specific rainfall events and is equipped with sensors recording daily average EC, pH and flow volumes. The 2024 water quality monitoring and flow results from SW02 indicate that:

- Continuous daily water monitoring indicates that pH remained within the adopted criteria of pH 6.5 – pH 8.5 in 2024 for approximately 98% of the time.
- Continuous water monitoring indicates that EC concentrations were below the adopted trigger value of 900 $\mu\text{S}/\text{cm}$ in 2024 approximately 100% of the time.
 - The maximum daily EC result of 839 $\mu\text{S}/\text{cm}$ occurred on 01 January 2024.
 - The daily average EC was 608.07 $\mu\text{S}/\text{cm}$ for 2024.
- Monthly grab sample monitoring results for pH ranged between pH 7.33 – pH 8.1 for 2024 and within the adopted criteria of pH 6.5 – pH 8.5.
- Monthly grab sample monitoring results for EC ranged between 309 $\mu\text{S}/\text{cm}$ – 777 $\mu\text{S}/\text{cm}$ for 2024 and below the adopted trigger value of 900 $\mu\text{S}/\text{cm}$.
- Monthly grab sample monitoring results for TSS ranged between 1 mg/L – 91 mg/L for 2024.
 - There were elevated TSS results above the adopted criteria of 13mg/L:
 - 18 January 2024 TSS of 71 mg/L
 - Likely influenced by 58.4mm of rainfall on the 17/01/2024
 - 7 February 2024 TSS of 15 mg/L
 - Likely influenced by 33.8mm of rainfall on the 6/02/2024
 - 3 June 2024 TSS of 47 mg/L
 - Likely influenced by 19.6mm and 39.4mm of rainfall on the 31/05/2024 and the 01/06/2024 respectively.
 - 28 July 2024 TSS of 56 mg/L
 - Likely influenced by 31mm of rainfall on the 27/07/2024
 - 19 October 2024 TSS of 81 mg/L
 - Likely influenced by 30.2mm of rainfall on the 18/10/2024
 - 4 and 9 December 2024 TSS of 91 mg/L and 23 mg/L respectively
 - Likely influenced by 37.1mm record on the 3/12/2024 and 20.3mm recorded on the 6/12/2024.

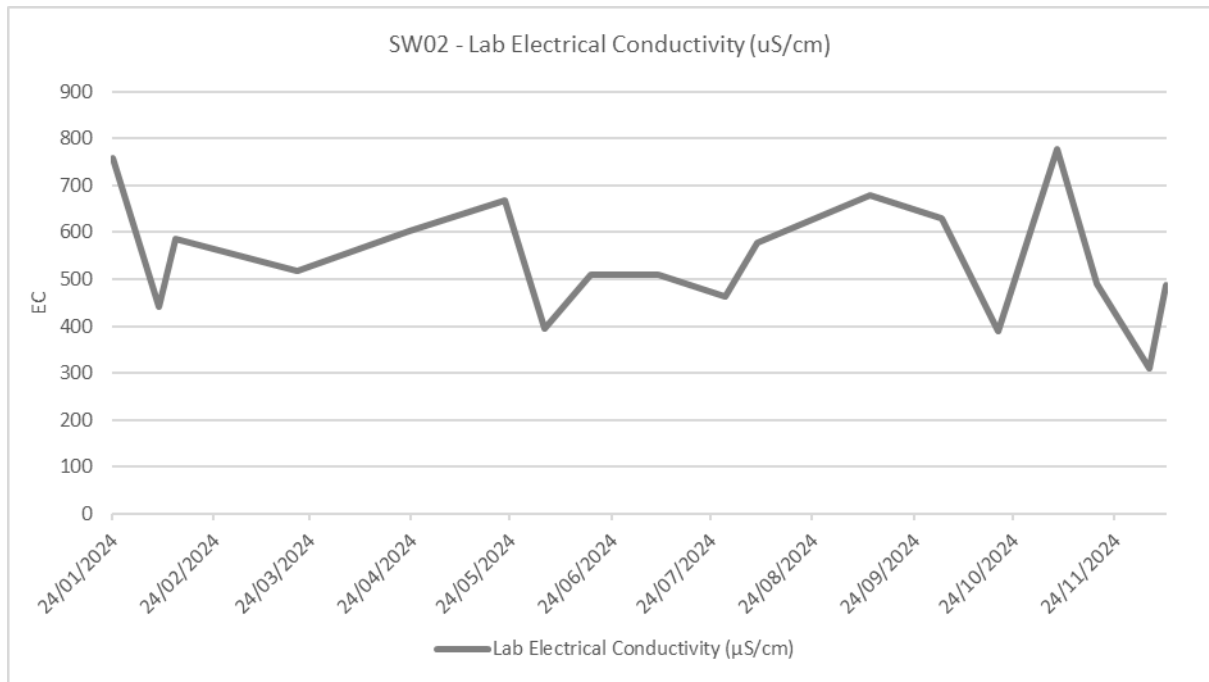


Figure 5-7 SW02 Downstream Goulburn River Monthly Grab Sample EC Results 2024

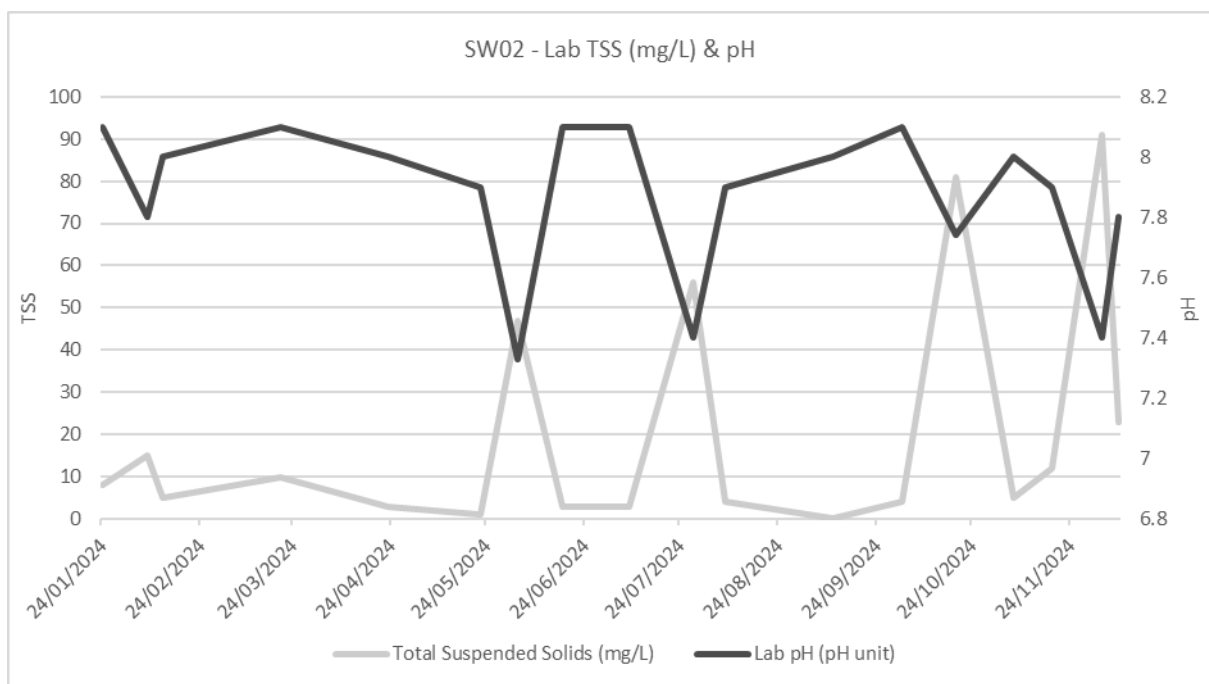


Figure 5-8 SW02 Downstream Goulburn River Monthly Grab Sample pH & TSS Results 2024

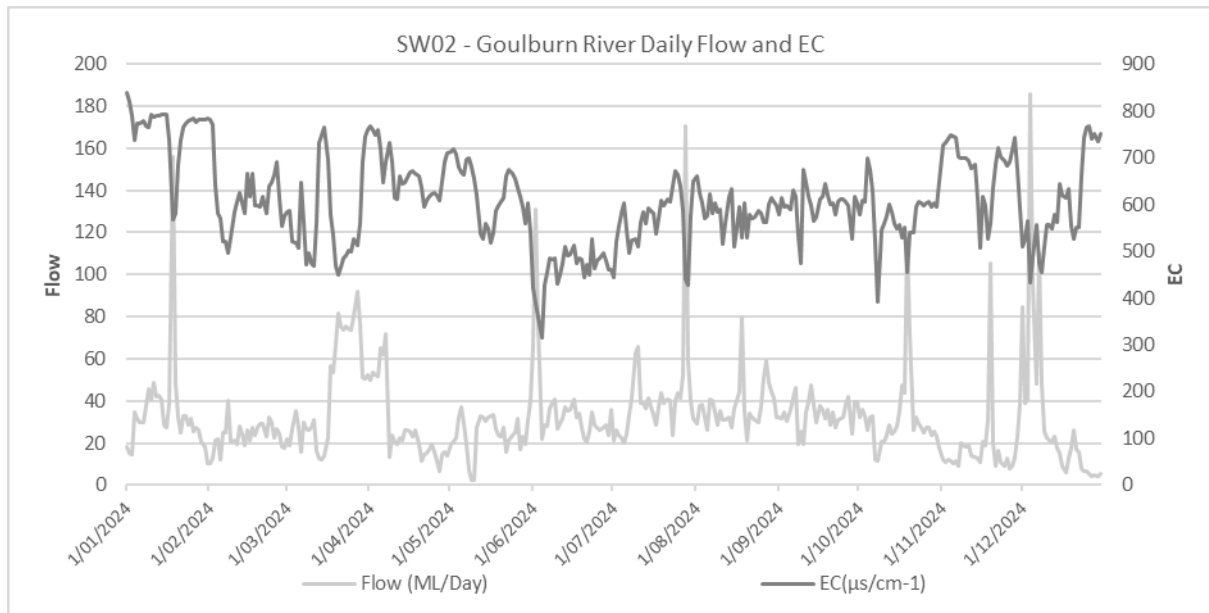


Figure 5-9 SW02 Downstream Goulburn River Real Time Flow & EC Results 2024

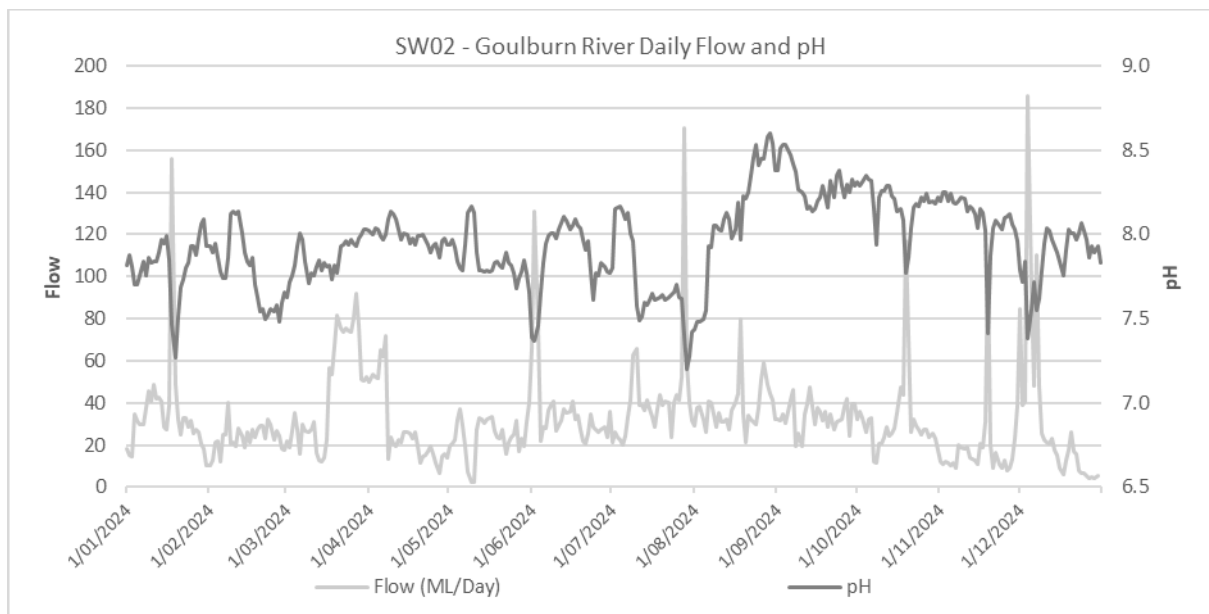


Figure 5-10 SW02 Downstream Goulburn River Real Time Flow & pH Results 2024

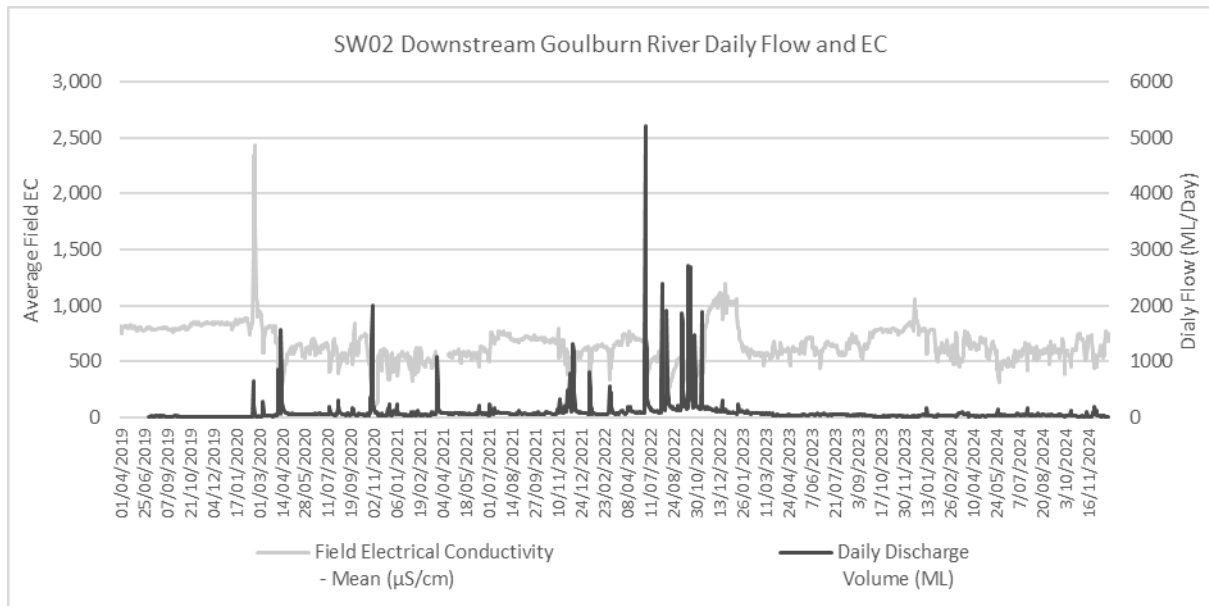


Figure 5-11 SW02 Downstream Goulburn River Historical Real Time Flow & EC (2019 - 2024)

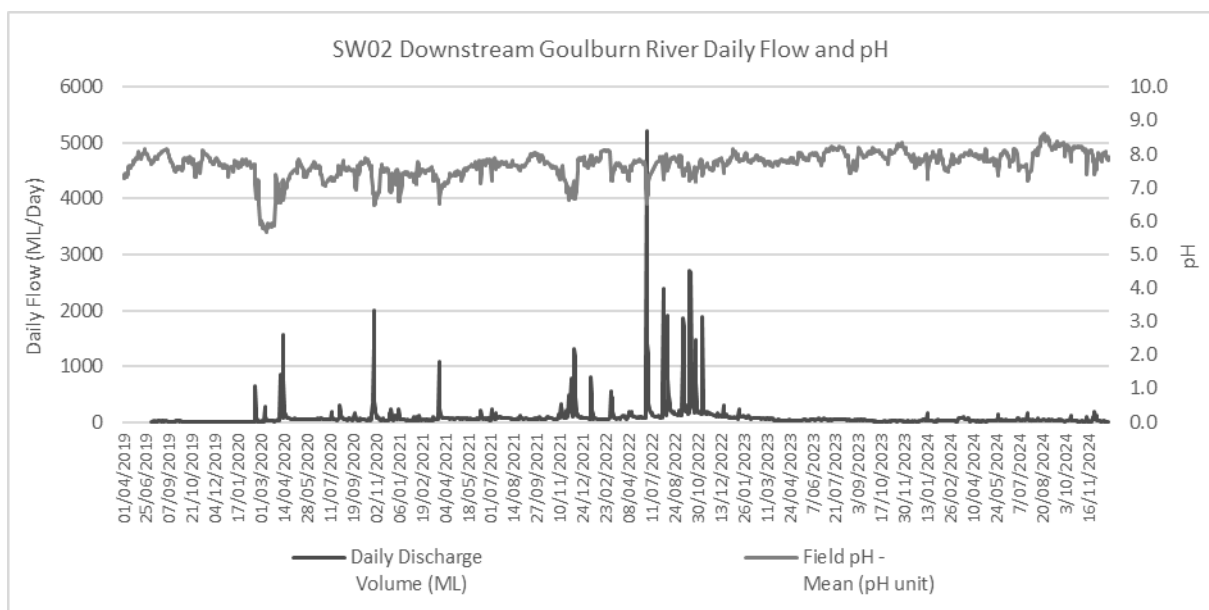


Figure 5-12 SW02 Downstream Goulburn River Real Time Historical Flow & pH (2019 - 2024)

5.2.1 SW02 Daily Average Results

	pH	EC($\mu\text{S}/\text{cm}^{-1}$)	Flow (ML/Day)
Min	7.20	316	2.19
Max	8.60	839	185.82
Average	7.95	608.07	32.33

Table 5-2 SW02 Daily Average Results

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
1/01/2024	839	7.82	18.357
2/01/2024	819	7.88	15.448
3/01/2024	790	7.81	14.510
4/01/2024	737	7.70	34.504
5/01/2024	772	7.70	31.526
6/01/2024	774	7.76	29.914
7/01/2024	778	7.84	29.676
8/01/2024	768	7.76	37.465
9/01/2024	766	7.86	45.824
10/01/2024	792	7.83	40.776
11/01/2024	786	7.84	48.766
12/01/2024	789	7.84	42.227
13/01/2024	789	7.89	42.439
14/01/2024	792	7.97	40.867
15/01/2024	791	7.95	28.592
16/01/2024	791	7.99	27.137
17/01/2024	738	7.85	38.779
18/01/2024	568	7.47	155.855
19/01/2024	581	7.27	48.951
20/01/2024	685	7.51	32.076
21/01/2024	737	7.69	24.826
22/01/2024	764	7.73	32.942
23/01/2024	774	7.80	32.695
24/01/2024	778	7.83	28.429
25/01/2024	782	7.93	31.952
26/01/2024	784	7.93	25.468
27/01/2024	777	7.88	27.701
28/01/2024	782	7.98	26.055
29/01/2024	782	8.06	20.996
30/01/2024	782	8.09	18.034
31/01/2024	785	7.93	10.464
1/02/2024	780	7.93	10.061
2/02/2024	769	7.89	13.000
3/02/2024	641	7.95	21.098
4/02/2024	582	7.86	22.078
5/02/2024	570	7.78	12.320

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
6/02/2024	521	7.74	24.670
7/02/2024	521	7.74	24.670
8/02/2024	497	7.86	40.140
9/02/2024	530	8.12	20.786
10/02/2024	583	8.14	21.354
11/02/2024	606	8.12	19.469
12/02/2024	626	8.14	27.995
13/02/2024	602	8.01	24.127
14/02/2024	581	7.89	18.681
15/02/2024	665	7.84	26.420
16/02/2024	618	7.82	21.366
17/02/2024	666	7.86	27.614
18/02/2024	597	7.70	23.521
19/02/2024	598	7.63	27.571
20/02/2024	594	7.54	29.392
21/02/2024	618	7.56	29.247
22/02/2024	581	7.5	22.870
23/02/2024	639	7.52	32.313
24/02/2024	646	7.56	30.004
25/02/2024	664	7.54	22.241
26/02/2024	691	7.58	26.938
27/02/2024	615	7.48	24.224
28/02/2024	554	7.6	17.998
29/02/2024	576	7.66	17.685
1/03/2024	584	7.63	22.106
2/03/2024	586	7.72	18.639
3/03/2024	520	7.76	26.678
4/03/2024	517	7.82	35.336
5/03/2024	508	7.93	27.375
6/03/2024	648	8.01	15.603
7/03/2024	563	7.97	29.853
8/03/2024	472	7.84	26.724
9/03/2024	496	7.71	26.429
10/03/2024	475	7.77	27.449
11/03/2024	470	7.76	31.337
12/03/2024	563	7.81	16.420
13/03/2024	733	7.85	12.944
14/03/2024	748	7.79	11.894
15/03/2024	764	7.83	14.146
16/03/2024	697	7.81	22.837
17/03/2024	579	7.82	56.645
18/03/2024	534	7.73	53.743
19/03/2024	470	7.82	67.283
20/03/2024	449	7.77	81.404
21/03/2024	466	7.93	75.619
22/03/2024	486	7.94	73.488

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
23/03/2024	490	7.96	75.538
24/03/2024	501	7.94	74.521
25/03/2024	498	7.97	73.581
26/03/2024	526	7.95	80.428
27/03/2024	513	7.93	91.828
28/03/2024	558	7.98	77.004
29/03/2024	690	8	51.082
30/03/2024	745	8.03	50.692
31/03/2024	760	8.03	52.686
1/04/2024	768	8.02	49.751
2/04/2024	759	8	53.348
3/04/2024	747	8.04	52.669
4/04/2024	758	8.03	51.933
5/04/2024	719	7.99	65.301
6/04/2024	646	7.97	62.251
7/04/2024	691	8	72.033
8/04/2024	731	8.09	13.600
9/04/2024	692	8.14	23.804
10/04/2024	614	8.12	20.428
11/04/2024	610	8.09	19.310
12/04/2024	661	8.03	22.570
13/04/2024	645	7.97	21.104
14/04/2024	647	8.01	26.456
15/04/2024	657	8.00	26.420
16/04/2024	668	7.95	25.707
17/04/2024	672	7.98	23.265
18/04/2024	665	7.94	26.472
19/04/2024	661	7.99	19.478
20/04/2024	636	7.99	11.471
21/04/2024	596	8.00	14.647
22/04/2024	608	7.97	15.168
23/04/2024	618	7.94	17.261
24/04/2024	623	7.89	19.288
25/04/2024	626	7.93	16.033
26/04/2024	619	7.95	11.348
27/04/2024	609	7.86	6.462
28/04/2024	650	7.96	14.486
29/04/2024	690	7.98	15.976
30/04/2024	711	7.94	14.061
1/05/2024	714	7.94	19.665
2/05/2024	717	7.97	20.545
3/05/2024	708	7.92	22.380
4/05/2024	679	7.84	32.200
5/05/2024	668	7.80	37.056
6/05/2024	663	7.79	29.436
7/05/2024	695	7.94	19.553

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
8/05/2024	700	8.13	7.260
9/05/2024	680	8.17	2.188
10/05/2024	656	8.13	2.621
11/05/2024	620	7.89	27.390
12/05/2024	538	7.79	33.107
13/05/2024	525	7.79	32.184
14/05/2024	560	7.78	30.670
15/05/2024	549	7.79	32.102
16/05/2024	518	7.78	33.033
17/05/2024	539	7.79	33.241
18/05/2024	586	7.83	26.671
19/05/2024	598	7.84	23.767
20/05/2024	605	7.82	23.013
21/05/2024	615	7.80	27.343
22/05/2024	661	7.89	15.873
23/05/2024	674	7.83	21.167
24/05/2024	666	7.82	23.755
25/05/2024	656	7.77	24.960
26/05/2024	637	7.68	31.706
27/05/2024	618	7.74	17.205
28/05/2024	595	7.78	22.883
29/05/2024	559	7.85	19.530
30/05/2024	603	7.77	31.182
31/05/2024	540	7.66	39.966
1/06/2024	423	7.39	66.071
2/06/2024	389	7.37	131.055
3/06/2024	358	7.46	75.709
4/06/2024	316	7.66	21.739
5/06/2024	427	7.83	28.726
6/06/2024	454	7.95	28.181
7/06/2024	486	7.99	36.264
8/06/2024	483	8.01	39.080
9/06/2024	484	8.01	40.523
10/06/2024	429	7.98	26.697
11/06/2024	450	8.03	28.980
12/06/2024	474	8.07	31.696
13/06/2024	511	8.11	37.278
14/06/2024	490	8.08	35.070
15/06/2024	494	8.03	35.876
16/06/2024	512	8.05	40.638
17/06/2024	473	8.09	32.125
18/06/2024	485	8.05	34.189
19/06/2024	483	8.04	27.552
20/06/2024	445	7.97	21.684
21/06/2024	472	7.91	20.644
22/06/2024	450	7.96	25.529

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
23/06/2024	526	7.78	34.842
24/06/2024	463	7.61	28.668
25/06/2024	480	7.77	27.264
26/06/2024	484	7.76	26.225
27/06/2024	495	7.83	27.355
28/06/2024	481	7.81	28.408
29/06/2024	461	7.78	23.621
30/06/2024	460	7.77	36.082
1/07/2024	444	7.80	21.268
2/07/2024	522	8.15	26.317
3/07/2024	555	8.16	23.927
4/07/2024	581	8.17	22.448
5/07/2024	602	8.14	20.099
6/07/2024	546	8.09	24.362
7/07/2024	495	8.13	33.214
8/07/2024	524	8.01	41.251
9/07/2024	525	7.96	62.975
10/07/2024	509	7.57	65.924
11/07/2024	562	7.49	38.815
12/07/2024	584	7.51	39.198
13/07/2024	560	7.60	36.251
14/07/2024	592	7.58	41.278
15/07/2024	587	7.61	37.010
16/07/2024	580	7.65	33.658
17/07/2024	537	7.61	28.598
18/07/2024	569	7.62	37.154
19/07/2024	609	7.63	43.629
20/07/2024	598	7.64	38.957
21/07/2024	610	7.61	40.516
22/07/2024	607	7.63	40.232
23/07/2024	640	7.64	23.451
24/07/2024	672	7.66	40.316
25/07/2024	663	7.7	43.836
26/07/2024	639	7.63	41.394
27/07/2024	586	7.62	52.089
28/07/2024	441	7.4	170.729
29/07/2024	428	7.2	59.006
30/07/2024	576	7.28	40.466
31/07/2024	649	7.42	31.956
1/08/2024	661	7.44	29.083
2/08/2024	626	7.48	37.637
3/08/2024	602	7.48	38.087
4/08/2024	571	7.50	32.014
5/08/2024	576	7.55	26.290
6/08/2024	622	7.93	40.712
7/08/2024	582	7.92	40.161

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
8/08/2024	603	8.05	34.668
9/08/2024	584	8.05	28.705
10/08/2024	588	8.03	35.204
11/08/2024	514	8.02	30.837
12/08/2024	559	8.09	30.764
13/08/2024	617	8.13	32.154
14/08/2024	634	8.09	27.487
15/08/2024	509	7.98	36.647
16/08/2024	549	8.03	40.159
17/08/2024	595	8.19	44.388
18/08/2024	528	7.97	79.740
19/08/2024	602	8.23	35.051
20/08/2024	529	8.21	21.264
21/08/2024	577	8.25	34.278
22/08/2024	570	8.35	32.078
23/08/2024	574	8.46	31.110
24/08/2024	586	8.53	29.649
25/08/2024	581	8.41	37.721
26/08/2024	561	8.45	51.364
27/08/2024	562	8.45	59.230
28/08/2024	599	8.58	48.970
29/08/2024	614	8.60	44.300
30/08/2024	605	8.54	41.187
31/08/2024	598	8.38	32.444
1/09/2024	577	8.38	32.050
2/09/2024	613	8.51	31.975
3/09/2024	595	8.53	34.604
4/09/2024	597	8.53	30.273
5/09/2024	588	8.50	36.201
6/09/2024	630	8.47	41.145
7/09/2024	618	8.42	46.231
8/09/2024	532	8.37	19.650
9/09/2024	474	8.27	25.427
10/09/2024	675	8.25	19.781
11/09/2024	647	8.23	34.824
12/09/2024	616	8.15	39.447
13/09/2024	598	8.17	47.736
14/09/2024	565	8.14	38.509
15/09/2024	572	8.15	29.860
16/09/2024	610	8.20	37.513
17/09/2024	618	8.22	36.234
18/09/2024	645	8.29	31.676
19/09/2024	620	8.23	35.750
20/09/2024	601	8.16	28.882
21/09/2024	603	8.32	34.551
22/09/2024	579	8.22	27.243

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
23/09/2024	605	8.35	31.358
24/09/2024	612	8.38	31.708
25/09/2024	611	8.29	32.498
26/09/2024	605	8.22	38.349
27/09/2024	597	8.30	41.848
28/09/2024	527	8.25	24.392
29/09/2024	616	8.33	39.702
30/09/2024	604	8.29	39.778
1/10/2024	579	8.31	32.312
2/10/2024	609	8.29	35.898
3/10/2024	607	8.31	32.790
4/10/2024	698	8.35	26.111
5/10/2024	673	8.33	32.223
6/10/2024	629	8.32	33.065
7/10/2024	520	8.15	12.267
8/10/2024	393	7.94	11.761
9/10/2024	545	8.22	20.506
10/10/2024	559	8.26	20.608
11/10/2024	576	8.26	23.941
12/10/2024	600	8.29	28.731
13/10/2024	584	8.29	24.533
14/10/2024	560	8.23	25.323
15/10/2024	549	8.21	28.245
16/10/2024	556	8.14	35.543
17/10/2024	529	8.15	47.211
18/10/2024	550	8.08	43.938
19/10/2024	454	7.77	117.023
20/10/2024	539	7.86	72.159
21/10/2024	541	8.04	26.357
22/10/2024	594	8.16	32.368
23/10/2024	605	8.18	28.964
24/10/2024	602	8.17	27.331
25/10/2024	598	8.22	24.737
26/10/2024	602	8.20	27.160
27/10/2024	606	8.24	27.709
28/10/2024	595	8.19	24.012
29/10/2024	602	8.20	25.597
30/10/2024	595	8.18	22.961
31/10/2024	650	8.22	17.915
1/11/2024	725	8.20	12.293
2/11/2024	733	8.25	11.023
3/11/2024	739	8.25	11.912
4/11/2024	749	8.20	11.471
5/11/2024	745	8.24	10.229
6/11/2024	744	8.19	11.540
7/11/2024	702	8.18	9.033

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
8/11/2024	698	8.20	20.398
9/11/2024	700	8.22	18.643
10/11/2024	698	8.21	18.178
11/11/2024	693	8.14	18.621
12/11/2024	678	8.17	14.288
13/11/2024	684	8.15	13.673
14/11/2024	610	8.12	12.852
15/11/2024	506	8.04	10.901
16/11/2024	618	8.15	20.439
17/11/2024	598	8.13	18.617
18/11/2024	526	8.02	31.260
19/11/2024	560	7.41	105.673
20/11/2024	637	7.88	20.055
21/11/2024	684	8.04	9.284
22/11/2024	720	8.08	16.458
23/11/2024	701	8.05	11.024
24/11/2024	693	8.03	8.837
25/11/2024	683	8.10	13.031
26/11/2024	691	8.11	7.637
27/11/2024	715	8.12	9.393
28/11/2024	742	8.06	13.118
29/11/2024	673	8.03	22.929
30/11/2024	593	7.96	39.101
1/12/2024	509	7.79	84.748
2/12/2024	525	7.72	38.938
3/12/2024	564	7.84	40.509
4/12/2024	434	7.38	185.823
5/12/2024	489	7.56	95.177
6/12/2024	556	7.72	48.004
7/12/2024	474	7.55	110.022
8/12/2024	455	7.62	47.913
9/12/2024	511	7.79	25.879
10/12/2024	557	7.95	22.545
11/12/2024	557	8.04	21.131
12/12/2024	549	8.02	20.436
13/12/2024	577	7.97	23.301
14/12/2024	561	7.93	17.625
15/12/2024	645	7.89	15.095
16/12/2024	620	7.84	8.965
17/12/2024	615	7.76	5.879
18/12/2024	634	7.91	12.913
19/12/2024	553	8.03	17.407
20/12/2024	526	8.01	26.169
21/12/2024	551	8.01	16.874
22/12/2024	551	7.97	15.584
23/12/2024	660	8.01	7.914

Date	EC($\mu\text{S}/\text{cm}^{-1}$)	pH	Flow (ML/Day)
24/12/2024	742	8.07	6.484
25/12/2024	765	8.02	6.463
26/12/2024	768	7.97	5.635
27/12/2024	740	7.86	4.347
28/12/2024	750	7.93	5.065
29/12/2024	734	7.89	4.416
30/12/2024	751	7.93	5.466

6. Flow Sampling Creek Lines

SW03 is located in Ulan Creek, upstream from all of the LDP6 and sampled at a semi-permanent pool within the creek. Ulan Creek is a fourth order stream flowing in a southerly then easterly direction, through the Project Approval boundary before joining the Goulburn River. Ulan Creek is an ephemeral creek system with flows occurring during storm events or after prolonged rainfall. Downstream from SW03, creek flows are augmented by discharge from LDP6. The results from surface water monitoring at SW03 (**Table 4-2**) indicate:

- There were 18 sampling events during 2024.
- EC remained below the adopted criteria of 1400 $\mu\text{S}/\text{cm}$ during 2024.
- There were four elevated TSS results above the adopted criteria of 18mg/L:
 - 7 February 2024 TSS of 36 mg/L
 - Likely influenced by 33.8mm of rainfall on the 6/02/2024
 - 3 June 2024 TSS of 20 mg/L
 - Likely influenced by 19.6mm and 39.4mm of rainfall on the 31/05/2024 and the 01/06/2024 respectively.
 - 19 October 2024 TSS of 21 mg/L
 - Likely influenced by 30.2mm of rainfall on the 18/10/2024
 - 4 December 2024 TSS of 32 mg/L
 - Likely influenced by 37.1mm record on the 3/12/2024
- There were three consecutive monthly results outside of the adopted criteria of pH 6.5 – pH 8.1 during 2024 where the pH was above pH 8.1 in June, July, August, September and October.
- Surface Water TARP Triggered in accordance with the WMP, UCMPL commenced investigations to determine if the trigger exceedance is mining related or not. Engeny Australia Pty Ltd (Engeny) was engaged by UCMPL to assist with a review of elevated pH values in water quality results at the monitoring site SW03 in Ulan Creek. The assessment included a review of historical and recent sampling data and concluded that photosynthetic activity of aquatic plants and evapo-concentration of solutes in the waterway due to lack of flow resulted in elevated values of pH and electrical conductivity (EC), respectively.
- The outcome of this investigation is detailed in the memorandum titled *Ulan Water Quality Investigation – pH at SW03* (Engeny, August 2024), in summary concluded:
 - *No correlation between the EC monitoring results for SW03 and the mine water management system monitoring locations (Blend Dam and Bobadeen Dam). Indicating that the rise in pH is unlikely to be related to mine water or mine water systems.*
 - *All samples with elevated values were collected from pooled water sources due to low flow conditions in the watercourse and are therefore unrepresentative of water quality during flow events*
 - *Site observations (see photographs taken on 24 July 2024) (see Figure 2.2) at sample site SW03 shows a submergent aquatic plant (likely a Potamogeton, maybe P. crispus). Previously, no aquatic plants were evident at SW04. Further, no elevated pH results were observed at SW04, strengthening the likelihood that the elevated SW03 pH is aquatic plant related and proportionate to the aquatic plant density present at the site.*
 - *Through photosynthesis aquatic plants remove carbon dioxide from water bodies and in doing so alkalis the water. The investigation indicates that the likely cause of the elevated pH values at SW03 is due the lack of flow at the monitoring point and the*

aquatic plant photosynthesising. This process also supported by the increasing Dissolved Oxygen and Organic Carbon readings for Algae site 5.

SW04 is located in Ulan Creek approximately 3.7 km downstream from LDP6 at Old Ulan. Excluding significant rain events, water flows at SW04 are augmented entirely by discharges from LDP6. The results from surface water monitoring at SW04 (**Table 4-2**) indicate:

- There were 19 sampling events during 2024.
- EC remained below the adopted criteria of 900 $\mu\text{S}/\text{cm}$ during 2024.
- TSS remained below the adopted criteria of 47 mg/L during 2024.
- There were two elevated pH results above the adopted criteria of pH 6.5 – pH 8.5 during 2024. pH 8.6 was recorded on the 4 January 2025 and pH 8.6 was recorded on the 20 March 2024. There were no three consecutive monthly results outside of the adopted pH criteria during 2024.

SW05 is located in Ulan Creek approximately 4 km downstream from SW04 at an internal causeway crossing. SW05 is approximately 900 m upstream of LDP19 and approximately 2 km from Goulburn River confluence. Excluding significant rain events, water flows at SW05 are augmented entirely by discharges from LDP6. The results from surface water monitoring at SW05 (**Table 4-2**) indicate:

- There were 19 sampling events during 2024.
- pH remained within the adopted criteria of pH 6.5 – pH 8.5 during 2024.
- TSS remained below the adopted criteria of 18 mg/L during 2024.
- There was one elevated EC result above the adopted criteria of 900 $\mu\text{S}/\text{cm}$ during 2024. An EC of 905 $\mu\text{S}/\text{cm}$ was recorded on the 22 May 2024. There were no three consecutive monthly results outside of the adopted EC criteria during 2024.

SW06 is located in Spring Gully (off Pleuger Road) and is a second order, ephemeral stream passing through remote bushland in the eastern section of the Project Approval boundary. Spring Gully joins Bobadeen Creek outside the Project Approval boundary, approximately 350 m upstream of its confluence with the Goulburn River:

- There were no available water samples during 2024. Dry at the time of monthly and event sampling.

SW07 is located in Bobadeen Creek, a fourth order stream flowing through cleared grazing land in the north-eastern section of the Project Approval boundary. The creek flows in a south-easterly direction towards the Goulburn River. The creek is ephemeral and generally experiences low flows, with pools of permanent or semi-permanent water present in the downstream reaches:

- There were no available water samples during 2024. Dry at the time of monthly and event sampling.

SW08 is located at the upper reach of Curra Creek, a third order, ephemeral stream, which flows only during storm events or after prolonged rainfall, typically in a southerly direction in the very north-eastern section of the Project Approval boundary, upstream of the influence of mining activities, before joining with Bobadeen Creek:

- There were no available water samples during 2024. Dry at the time of monthly and event sampling.

SW09 is located in the Talbragar River, a Category 3 stream and a tributary of the Macquarie River on the western side of the Great Dividing Range, within the Murray-Darling Basin catchment. The

Talbragar River flows in a south-westerly direction across the north-western corner of the Project Approval boundary area and outside mining activities.

- There were 14 sampling events during 2024.
- Monthly grab sample monitoring results for pH ranged between pH 8.2 – pH 8.7 for 2024.
- Monthly grab sample monitoring results for EC ranged between 472 $\mu\text{S}/\text{cm}$ – 1270 $\mu\text{S}/\text{cm}$ for 2024.
- Monthly grab sample monitoring results for TSS ranged between 18 mg/L – 156 mg/L for 2024. The 156mg/L TSS result on the 28/07/2024 was likely influenced by the 31mm rainfall event recorded the day before on the 27/07/2024.

SW10 is located within Mona Creek, a fourth order, ephemeral stream which flows through cleared grazing land in the north-western section of the Project Approval boundary, in a north-westerly direction, towards the Talbragar River. Flows in Mona Creek are triggered during storm events or after prolonged rainfall and pools of permanent or semi-permanent water are present in the downstream reaches.

- There were 2 sampling events during 2024.
- pH remained within the adopted criteria of pH 6.5 – pH 7.4 during 2024.
- TSS remained below the adopted criteria of 92 mg/L during 2024.
- EC remained below the adopted criteria of 214 $\mu\text{S}/\text{cm}$ during 2024.

SW11 is located in Cockabutta Creek, a second order, ephemeral stream, which is not subject to the influence of mining activities, flowing in a westerly direction towards the Talbragar River, passing through bushland and rural allotments in the western section of the Project Approval boundary.

- There were no available water samples during 2024. Dry at the time of monthly and event sampling.

7. Flow Sampling Clean Water Diversion Drain and System

SW12 is located in the Clean Water Diversion System, a drain that captures the runoff from rehabilitated land around the mine operations. The water is not subject to the influence of mining activities and flows into and remains in Peanut Dam.

- There was one sampling event during 2024.
- pH remained within the adopted criteria of pH 6.5 – pH 8.5 during 2024.
- EC remained below the adopted criteria of 900 $\mu\text{S}/\text{cm}$ during 2024.
- TSS remained below the adopted criteria of 50 mg/L during 2024.

SW13 is located in the Clean Water Diversion Drain, a drain that captures the runoff from rehabilitated land around the mine operations. The water is not subject to the influence of mining activities and flows into a tributary of Ulan, then flows into Ulan Creek and then flows into the Goulburn River.

- There was one sampling event during 2024.
- pH remained within the adopted criteria of pH 6.5 – pH 8.5 during 2024.
- EC remained below the adopted criteria of 900 $\mu\text{S}/\text{cm}$ during 2024.
- TSS remained below the adopted criteria of 50 mg/L during 2024.

SW14 is located in the Clean Water Diversion Drain, a drain that captures the runoff from rehabilitated land around the mine operations. The water is not subject to the influence of mining activities and flows into a tributary of Ulan, then flows into Ulan Creek and then flows into the Goulburn River.

- There was one sampling event during 2024.
- pH remained within the adopted criteria of pH 6.5 – pH 8.5 during 2024.
- EC remained below the adopted criteria of 900 $\mu\text{S}/\text{cm}$ during 2024.
- TSS remained below the adopted criteria of 50 mg/L during 2024.

SW15 is located in the Clean Water Diversion System, a drain that captures the runoff from rehabilitated land around the mine operations. The water is not subject to the influence of mining activities and flows into and remains in Peanut Dam.

- There was one sampling event during 2024.
- pH 6.4 was below the adopted criteria of pH 6.5 – pH 8.5 during 2024.
- EC remained below the adopted criteria of 900 $\mu\text{S}/\text{cm}$ during 2024.
- TSS remained below the adopted criteria of 50 mg/L during 2024.

SW16 is located in the Clean Water Diversion System, a drain that captures the runoff from rehabilitated land around the mine operations. The water is not subject to the influence of mining activities and flows into and remains in Peanut Dam.

- There was one sampling event during 2024.
 - pH 7.43
 - EC 372 $\mu\text{S}/\text{cm}$
 - TSS 128 mg/L

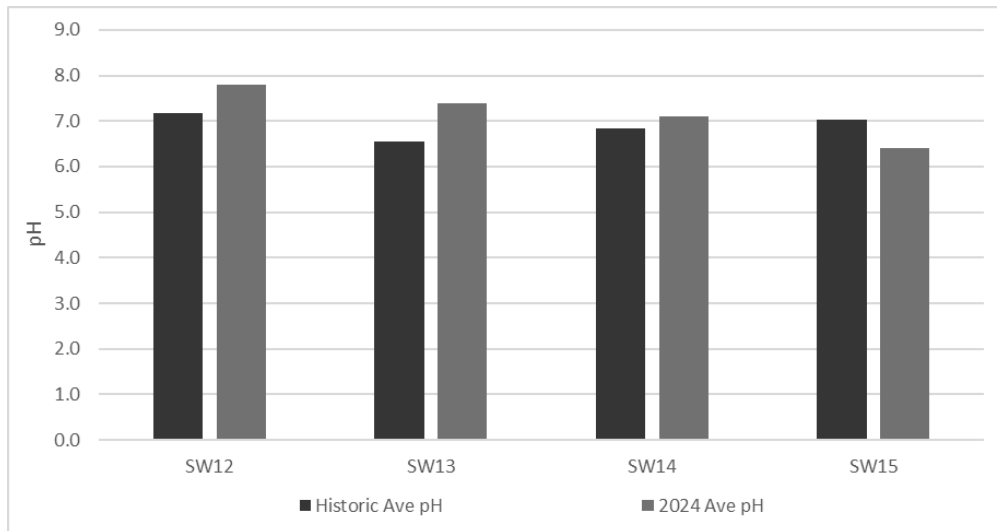


Figure 7-1 Comparison 2024 to Historical Average pH Monitoring Results

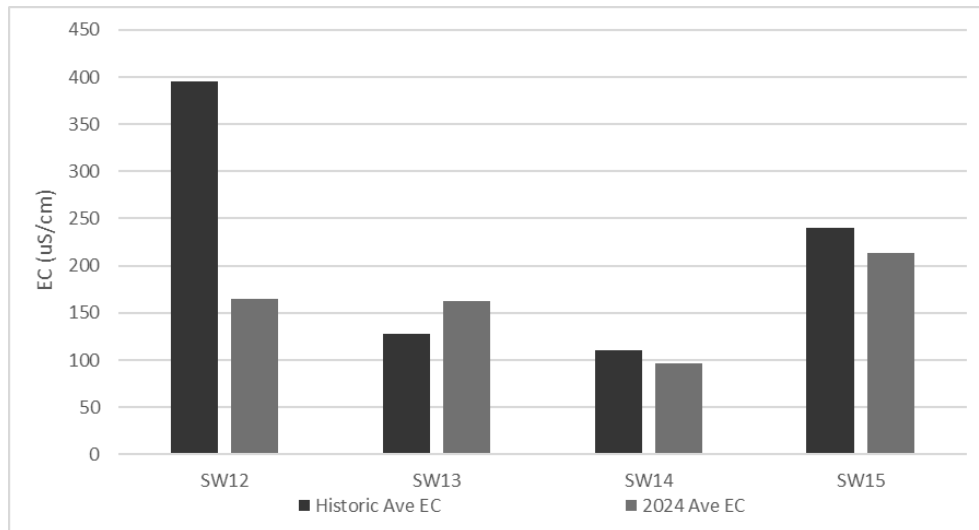


Figure 7-2 Comparison 2024 to Historical Average EC Monitoring Results

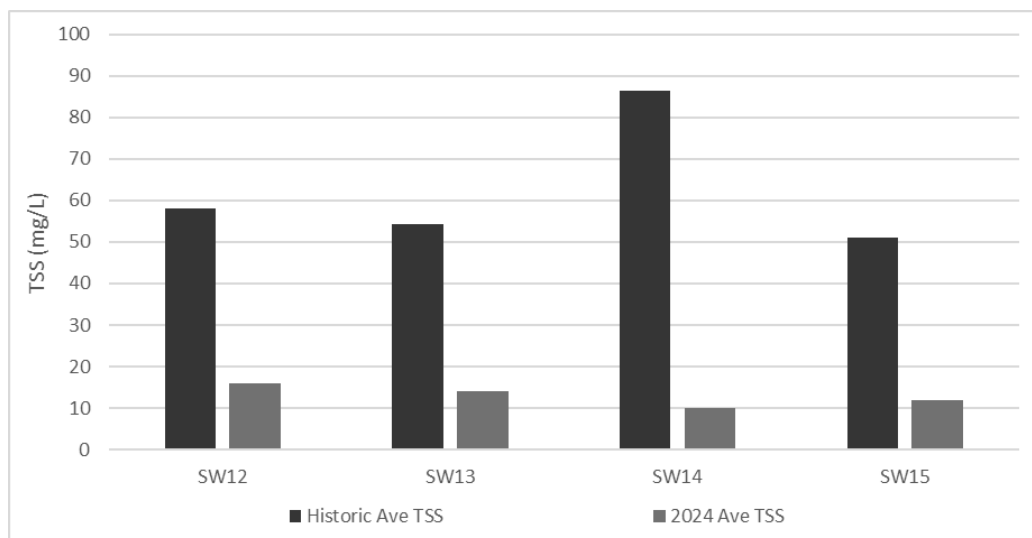
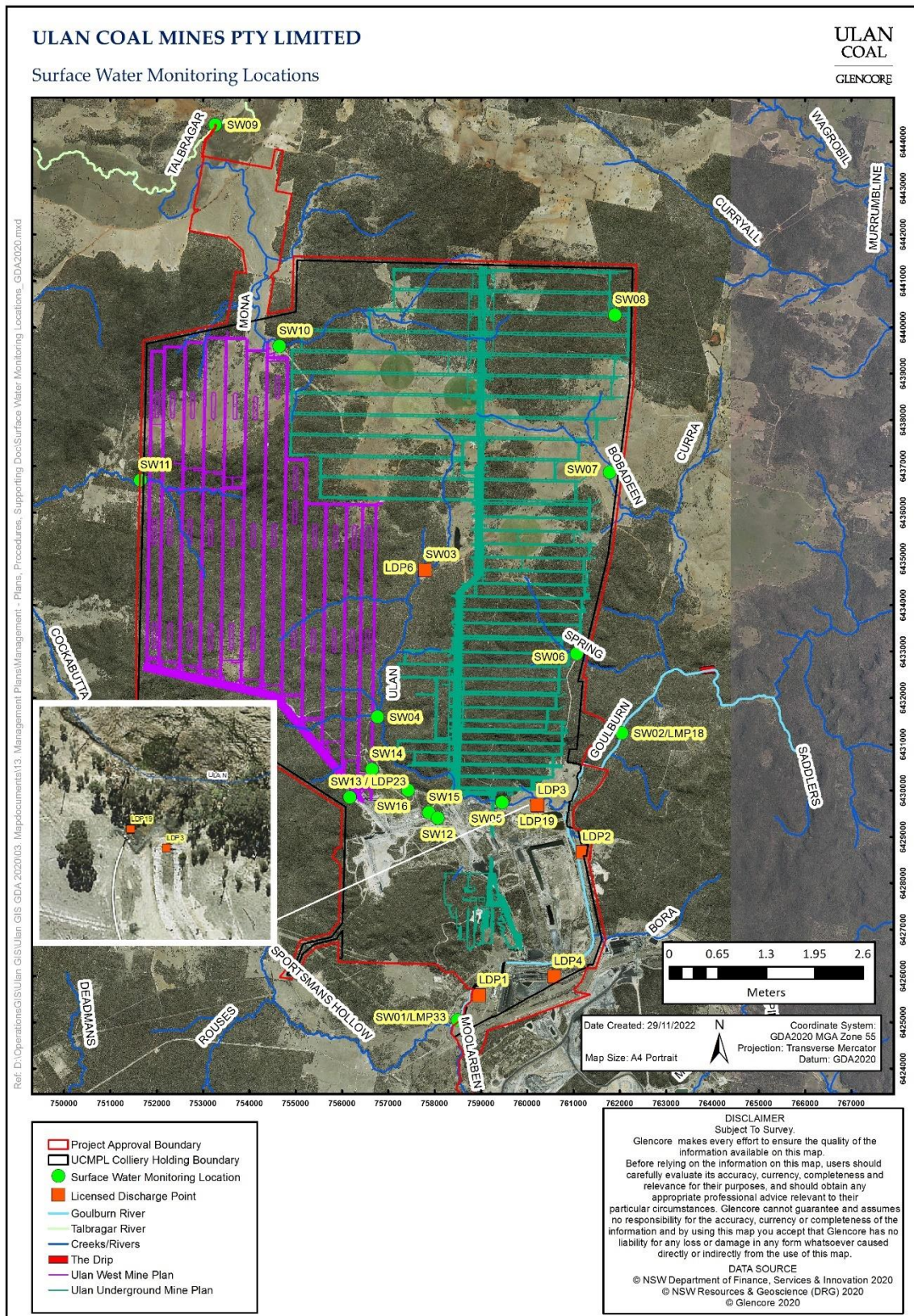


Figure 7-3 Comparison 2024 to Historical Average TSS Monitoring Results

8. Surface Water Monitoring Locations



GLENCORE