



MONTHLY REPORTING PERIOD - AUGUST, 2018

1. SUMMARY

The list below provides a summary of the water quality information collected by BMID in August, 2018. Documentation and figures are provided on the following pages to support this submission.

August 2018		
Source	Total (US Gals)	Total (Mega Litres)
Mission Creek	612,121,000	2,316.88
Well 4	0	0
Well 5	34,457,390	130.42
Well 6 (Irrigation Only)	22,595,382	85.52
Scotty Creek (Irrigation Only)	12,258,000	46.40
Total	681,431,772	2579.22

1. Turbidity levels at the Distribution Intake peaked at 0.62 NTU on August 4. Average turbidity for August was 0.30 NTU;
2. The highest monthly turbidity level recorded at the first customer (Booster #1) was 0.50 NTU on August 6 and 7. Average monthly turbidity was 0.30 NTU for August;
3. Mission Creek experienced average flows for August. However, long periods of hot dry weather required BMID to release water from the upper watershed reservoirs to supplement Mission Creek flows;
4. BMID's Scotty Creek source, used for irrigation in the north-end, was closed for the year on August 24;
5. Well #5 was used throughout August as a source for both domestic and irrigation water in the north-end of the system, in conjunction with Mission Creek system water, as determined by usage and pressures in the area;
6. Well #6 supplies irrigation water in the north-end of the system and was utilized throughout August;
7. *E. Coli* levels at Mission Creek's Point of Diversion averaged 19 counts per sample. The highest raw water *E. Coli* count was 36 on August 16, 2018;
8. *E. Coli* levels at the Distribution Intake, down-stream of the WTP, had low counts on all samples throughout August, averaging 1.5 counts per sample, with a peak count of 4 on August 16, 2018;
9. No *E. Coli* and no *Coliforms* were found in treated water in the distribution system through third-party analysis. In addition, no positive bacteria tests were found from the in-house presence-absence tests during routine testing;
10. BMID's Water Treatment Plant started operating on March 15, 2018. The WTP will remain in use as Mission Creek has high colour in the water this summer due to a high contribution from Belgo Reservoir;

1.0 FLOWS - AUGUST, 2018

Maximum est. Daily Flow was on August 11, 2018 at 32,423,765 US gallons (122.72 ML)

Minimum est. Daily Flow was on August 28, 2018 at 10,080,982 US gallons (38.16 ML)

Mission Creek provided 90% of domestic flow throughout August.

Figure 1.1 - Domestic Water System Flow

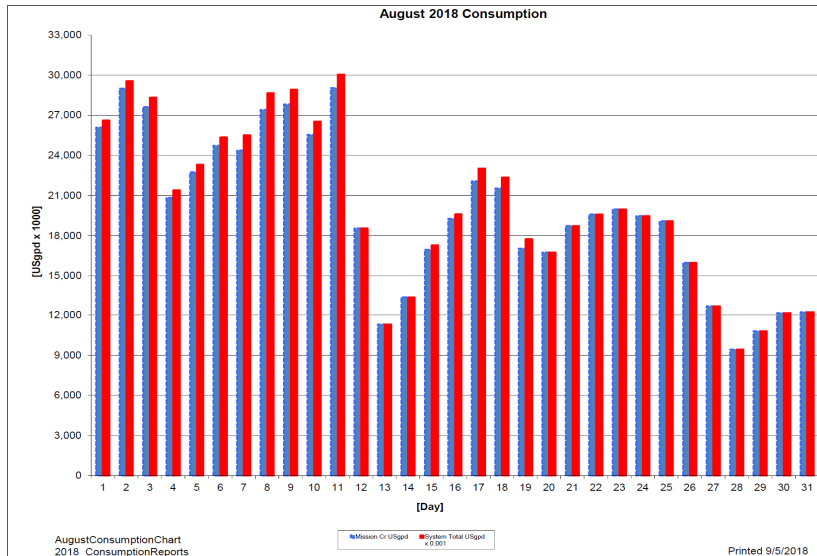


Table 1.2 - August, 2018 Daily Consumption Report

Year	Mission Cr	Well #4	Well #5	Well #6	Scotty Crk	System Total	System Total
2018	Usgpd	Usgpd	Usgpd	Usgpd	Usgpd	Usgpd	ML/Day
1-Aug	26,085,000	0	1,149,975.0	887,168.0	539,000.0	28,661,143	108.48
2-Aug	28,995,000	0	1,176,471.0	1,048,732.0	568,000.0	31,788,203	120.32
3-Aug	27,627,000	0	1,300,430.0	1,075,147.0	700,000.0	30,702,577	116.21
4-Aug	20,834,000	0	1,050,426.0	1,061,511.0	568,000.0	23,513,937	89.00
5-Aug	22,746,000	0	1,181,614.0	1,052,068.0	580,000.0	25,559,682	96.74
6-Aug	24,736,000	0	1,289,130.0	1,122,105.0	623,000.0	27,770,235	105.11
7-Aug	24,375,000	0	1,247,976.0	906,919.0	1,145,000.0	27,674,895	104.75
8-Aug	27,406,000	0	1,580,921.0	1,119,666.0	1,263,000.0	31,369,587	118.73
9-Aug	27,818,000	0	1,251,601.0	1,091,165.0	1,110,000.0	31,270,766	118.36
10-Aug	25,542,000	0	1,321,535.0	896,151.0	1,005,000.0	28,764,686	108.87
11-Aug	29,041,000	0	1,271,535.0	1,101,230.0	1,010,000.0	32,423,765	122.72
12-Aug	18,552,000	0	604,161.0	1,048,003.0	0.0	20,204,164	76.47
13-Aug	11,311,000	0	541,764.0	1,904,822.0	0.0	13,757,586	52.07
14-Aug	13,321,000	0	529,582.0	0.0	3,000.0	13,853,582	52.44
15-Aug	16,952,000	0	1,095,742.0	1,204,507.0	342,000.0	19,594,249	74.16
16-Aug	19,275,000	0	1,347,934.0	987,217.0	335,000.0	21,945,151	83.06
17-Aug	22,079,000	0	1,281,052.0	721,042.0	948,000.0	25,029,094	94.74
18-Aug	21,544,000	0	0.0	988,255.0	819,000.0	23,351,255	88.38
19-Aug	17,044,000	0	2,323,923.0	1,030,928.0	700,000.0	21,098,851	79.86
20-Aug	16,750,000	0	1,197,461.0	1,135,650.0	0.0	19,083,111	72.23
21-Aug	18,727,000	0	717,944.0	1,019,795.0	0.0	20,464,739	77.46
22-Aug	19,591,000	0	1,216,278.0	241,082.0	0.0	21,048,360	79.67
23-Aug	19,976,000	0	1,286,227.0	332,224.0	0.0	21,594,451	81.73
24-Aug	19,470,000	0	1,445,502.0	158,352.0	0.0	21,073,854	79.76
25-Aug	19,088,000	0	1,451,537.0	310,315.0	0.0	20,849,852	78.92
26-Aug	15,984,000	0	1,268,650.0	125,744.0	0.0	17,378,394	65.78
27-Aug	12,657,000	0	1,062,144.0	24,856.0	0.0	13,744,000	52.02
28-Aug	9,437,000	0	643,982.0	0.0	0.0	10,080,982	38.16
29-Aug	10,792,000	0	971,693.0	0.0	0.0	11,763,693	44.53
30-Aug	12,147,000	0	778,661.0	728.0	0.0	12,926,389	48.93
31-Aug	12,219,000	0	871,539.0	0.0	0.0	13,090,539	49.55
Totals Usgpd	612,121,000	0	34,457,390	22,595,382	12,258,000	681,431,772	2579.22
Totals ML	2,316.88	0.00	130.42	85.52	46.40		
Avg's	19,745,839	74.74				22,278,041	83.20
Max	29,041,000	109.92				32,423,765	122.72
Min	9,437,000	35.72				10,080,982	38.16

2.0 RAW WATER QUALITY - BACTERIOLOGICAL MONITORING

Raw water samples were taken at three points at BMID settling ponds before chlorination

Samples were taken twice per week at the Distribution Intake's Point of Disinfection and at the Mission Creek raw water Point of Diversion; one sample is taken per week at Stevens Pond outlet (point halfway between WTP Outlet and Distribution Intake).

Samples from the previous month are also provided to show a two-month trend

The E.Coli readings clearly show the effectiveness in risk reduction from the Water Treatment Plant and extended settling times in Stevens and Hadden Reservoirs.

Figure 2.1 - E.Coli Readings (CARO Lab results) July 2018 - August 2018

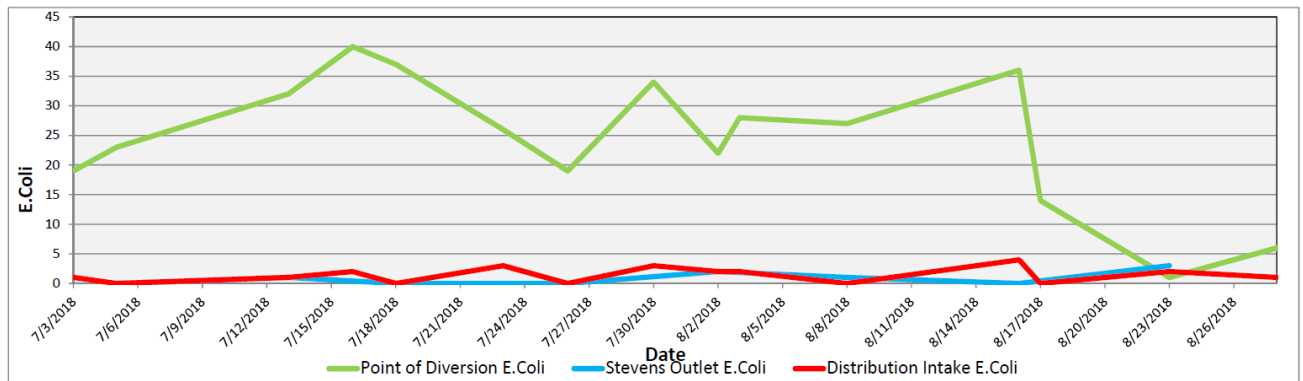


Table 2.2 - E.Coli Readings (CARO Labs)

Date	Point of Diversion E.Coli	Stevens Outlet E.Coli	Distribution Intake E.Coli
3-Jul-18	19		1
5-Jul-18	23	0	0
13-Jul-18	32	1	1
16-Jul-18	40		2
18-Jul-18	37	0	0
23-Jul-18	26		3
26-Jul-18	19	0	0
30-Jul-18	34		3
2-Aug-18	22	2	2
3-Aug-18	28		2
8-Aug-18	27	1	0
16-Aug-18	36	0	4
17-Aug-18	14		0
23-Aug-18	1	3	2
28-Aug-18	6		1

Stevens or WTP Intake (Raw) - Sampling of raw water at intake from Mission Creek

Stevens Outlet (Raw) - Sampling point after exiting 142,000 m³ 1st upper balancing reservoir (Stevens Res.)

Hadden Outlet (Raw) - Sampling point after exiting 75,000 m³ 2nd lower balancing reservoir (Hadden Res.)
(Hadden Outlet = Distribution Intake - Point of Disinfection)

3.0 RAW AND TREATED WATER TURBIDITY

Turbidity for the Mission Creek source was measured at Booster Station No. 1 on Gallagher's Road, the first-customer, through August 2018. The highest turbidity recorded at this location was 0.50 NTU on August 6 and 7, 2018. The lowest reading was 0.20 NTU on Aug. 19.

Figure 3.1 – Daily Turbidity Readings (Distribution Intake and Booster Station 1)

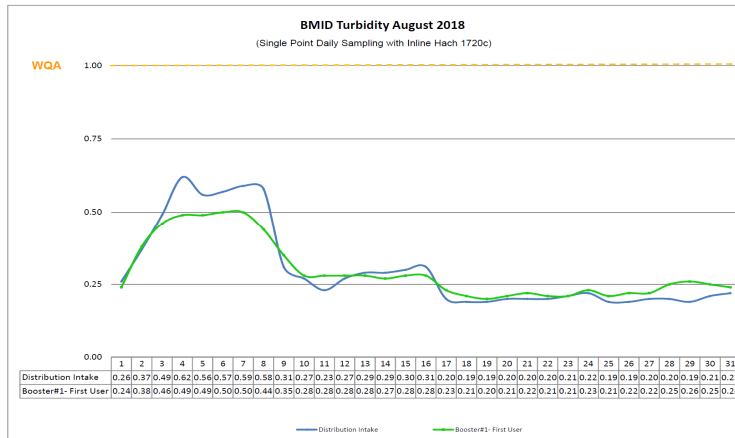


Table 3.2 - Daily Monitoring Record – Turbidity at Distribution Intake & Bst Stn 1

Turbidity Point Sampling for August 2018				
Date	Distribution Intake		Booster#1- First User	
	Sample Time	[NTU]	Sample Time	[NTU]
1	8:41 AM	0.26	8:04 AM	0.24
2	8:34 AM	0.37	8:13 AM	0.38
3	8:54 AM	0.49	8:24 AM	0.46
4	8:00 AM	0.62	7:39 AM	0.49
5	9:15 AM	0.56	8:26 AM	0.49
6	9:25 AM	0.57	9:05 AM	0.50
7	8:46 AM	0.59	8:11 AM	0.50
8	8:18 AM	0.58	7:53 AM	0.44
9	8:49 AM	0.31	8:20 AM	0.35
10	8:38 AM	0.27	8:00 AM	0.28
11	12:10 PM	0.23	11:01 AM	0.28
12	12:30 PM	0.27	12:05 PM	0.28
13	11:10 AM	0.29	11:22 AM	0.28
14	8:44 AM	0.29	8:49 AM	0.27
15	9:30 AM	0.30	8:09 AM	0.28
16	8:39 AM	0.31	8:04 AM	0.28
17	8:37 AM	0.20	8:00 AM	0.23
18	8:34 AM	0.19	8:13 AM	0.21
19	7:55 AM	0.19	7:34 AM	0.20
20	8:57 AM	0.20	8:19 AM	0.21
21	8:38 AM	0.20	8:05 AM	0.22
22	8:29 AM	0.20	7:56 AM	0.21
23	8:30 AM	0.21	8:05 AM	0.21
24	9:05 AM	0.22	8:01 AM	0.23
25	8:18 AM	0.19	7:52 AM	0.21
26	8:05 AM	0.19	7:39 AM	0.22
27	8:43 AM	0.20	8:06 AM	0.22
28	8:29 AM	0.20	7:56 AM	0.25
29	8:09 AM	0.19	7:37 AM	0.26
30	7:53 AM	0.21	7:25 AM	0.25
31	8:25 AM	0.22	7:48 AM	0.24
Average		0.30		0.30

4.0 CHLORINE CONTACT TIME

Temperature, pH, current flow and chlorine residual levels are recorded to determine the CT levels that are required to provide 3 log inactivation of *Giardia*. Chlorine Contact times exceeded the CT levels required to provide 3 log (99.9%) inactivation of *Giardia Lamblia* throughout the month of August, 2018.

Figure 4.1 - CT Trending – BMID Mission Creek Source – August 2018

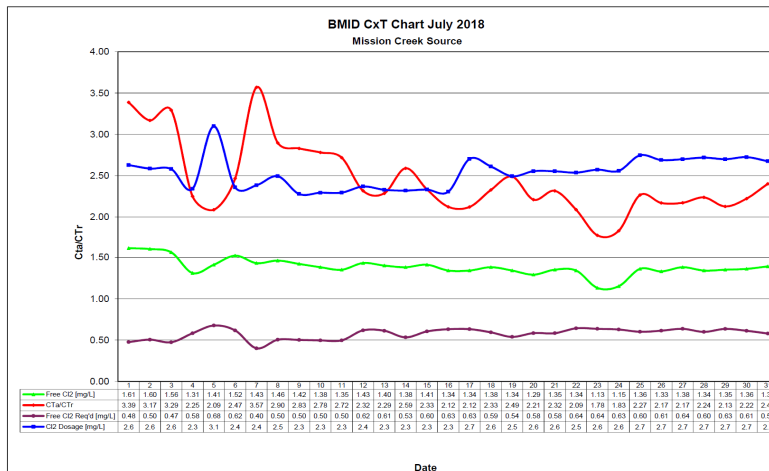


Table 4.2 - CT Table – Mission Creek Source

BMID July 2018 Mission Creek Source													
DATE	pH (highest)	TEMP (lowest)	PEAK FLOW	Free Cl ₂ [mg/L]	CT achieved	CT req'd	CTa/CTr	Free Cl ₂ Req'd [mg/L]	Cl ₂ Dosage [mg/L]	VOLUME TOTAL [USgal]	TIME [mins]	FLOW PRESENT [USGPM]	CL ₂ DOSAGE PRESENT [PPD]
July		[°C]	[USgpm]										
1	6.94	14.3	14370	1.61	296.9	87.7	3.39	0.48	2.6	2649600	184	11271	356
2	6.90	14.2	15411	1.60	275.1	86.8	3.17	0.50	2.6	2649600	172	8690	270
3	6.99	14.2	14017	1.56	294.9	89.6	3.29	0.47	2.6	2649600	189	10386	322
4	7.07	14.3	17263	1.31	201.1	89.3	2.25	0.58	2.3	2649600	153	12585	354
5	7.07	14.8	20516	1.41	182.1	87.2	2.09	0.68	3.1	2649600	129	15930	593
6	7.06	15.7	19775	1.52	203.7	82.6	2.47	0.62	2.4	2649600	134	16830	477
7	7.06	16.2	13433	1.43	282.1	79.0	3.57	0.40	2.4	2649600	197	9356	268
8	7.11	16.9	17345	1.46	223.0	77.0	2.90	0.50	2.5	2649600	153	14352	430
9	7.14	17.4	17755	1.42	211.9	74.9	2.83	0.50	2.3	2649600	149	15416	422
10	7.13	17.7	18070	1.38	202.3	72.8	2.78	0.50	2.3	2649600	147	12919	356
11	7.20	17.2	17074	1.35	209.5	77.1	2.72	0.50	2.3	2649600	155	13382	369
12	7.23	17.5	21237	1.43	178.4	77.0	2.32	0.62	2.4	2649600	125	15917	453
13	7.23	18.1	22037	1.40	168.3	73.6	2.29	0.61	2.3	2649600	120	17545	491
14	7.23	19.2	20742	1.38	176.3	68.1	2.59	0.53	2.3	2649600	128	18910	527
15	7.28	18.4	21768	1.41	171.6	73.5	2.33	0.60	2.3	2649600	122	17956	503
16	7.33	18.4	22497	1.34	157.8	74.3	2.12	0.63	2.3	2649600	118	18122	502
17	7.33	18.6	22830	1.34	155.5	73.3	2.12	0.63	2.7	2649600	116	17738	576
18	7.37	19.1	21774	1.38	167.9	72.2	2.33	0.59	2.6	2649600	122	16701	524
19	7.39	19.4	20120	1.34	176.5	70.9	2.49	0.54	2.5	2649600	132	19127	573
20	7.39	19.1	21495	1.29	159.0	72.0	2.21	0.58	2.6	2649600	123	16813	516
21	7.39	18.2	20020	1.35	178.7	77.1	2.32	0.58	2.6	2649600	132	17114	525
22	7.39	17.7	21318	1.34	166.5	79.8	2.09	0.64	2.5	2649600	124	16336	498
23	7.40	17.7	21583	1.13	138.7	78.0	1.78	0.64	2.6	2649600	123	17889	553
24	7.34	17.9	22029	1.15	138.3	75.5	1.83	0.63	2.6	2649600	120	18705	575
25	7.31	18.1	21068	1.36	171.0	75.5	2.27	0.60	2.7	2649600	126	16029	529
26	7.32	18.2	21657	1.33	162.7	75.0	2.17	0.61	2.7	2649600	122	20425	660
27	7.29	18.1	22415	1.38	163.1	75.1	2.17	0.64	2.7	2649600	118	17111	555
28	7.27	18.3	21683	1.34	163.7	73.2	2.24	0.60	2.7	2649600	122	15763	515
29	7.26	18.4	23183	1.35	154.3	72.5	2.13	0.63	2.7	2649600	114	18464	599
30	7.25	18.6	22732	1.36	158.5	71.3	2.22	0.61	2.7	2649600	117	16558	542
31	7.24	18.9	21952	1.39	167.8	69.8	2.40	0.58	2.7	2649600	121	18355	590
Averages	7.22	17.445	19973	1.38	188.947	76.8	2.45	0.5753	2.5327				

5.0 WATER DISTRIBUTION SAMPLING (TREATED)

Third Party Analysis (CARO Analytical Services)

- Samples taken once per week at eight locations around the BMID service area
- 35 samples were found to be absent of Coliforms.
- 35 samples were found to be absent of *E. Coli*.

Table 5.1 - CARO Independent Lab Testing – Total Coliforms – E.Coli

Date	PRV 7		Booster 1		Elison Blow-Off		Elison School		612 Adams Rd		3976 Highway 97		Prospect Reservoir		Tower Reservoir		Well #5	
	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli
3-Jul-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5-Jul-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-Jul-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Jul-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Jul-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-Aug-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Aug-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16-Aug-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23-Aug-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

In-House Analysis (BMID Staff)

- Presence/Absence samples taken on a three week cycle at ten sites around the BMID service area.
- All samples were found to be absent of both Total Coliforms and *E. Coli*.

Table 5.2 - BMID In-house Testing – Presence Absence

Location	8/7/2018				8/13/2018				8/20/2018				8/27/2018			
	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.
Sylvania Cres									0.78	19.0	-	X				
170 Kneller Rd	0.70	19.6	-	X									0.85	16.4	-	X
2105 Morrison									1.10	18.0	-	X				
Pearson School					1.15	18.0	-	X								
Staymen Rd	0.46	19.6	-	X									0.63	19.0	-	X
PRV #10									1.04	16.8	-	X				
260 Campion Rd					0.28	19.0	-	X								
Fenwick Rd	0.21	21.0	-	X									0.49	20.0	-	X
2931 Belgo Rd					1.08	18.0	-	X								
Solly Ct					1.25	18	-	X								

- BMID Population = 22,550

RECOMMENDED TESTS

- Recommended number of samples per month = 22
(as per Guide for Canadian Drinking Water Quality)

ACTUAL TESTS

- Total tests by BMID staff (presence/absence) = 13
- Total tests sampled by BMID and tested by Caro Labs = 38
- Total tests sampled in BMID treated distribution system = 48 (Zero Positive Samples)