



MONTHLY REPORTING PERIOD - JULY, 2017

1. SUMMARY

The list below provides a summary of the water quality information collected by BMID in July, 2017. Documentation and figures are provided on the following pages to support this submission.

Source	July 2017	
	Total (US Gals)	Total (Mega Litres)
Mission Creek	834,017,000	3,156.75
Well 4	0	0
Well 5	45,862,000	173.59
Scotty Creek (Irrigation Only)	7,376,200	27.92
Total	887,255,200	3,358.26

1. Turbidity levels at Hadden Pond Outlet, remained below 1.0 NTU for all of July. Peak turbidity at the Hadden Pond intake was 0.51 NTU on July 21, 2017;
2. The highest monthly turbidity level recorded at the first customer (Booster #1) was 0.60 NTU on July 21, 2017 and average monthly turbidity was 0.37 NTU;
3. Mission Creek experienced low flows for most of July as snow melt upstream of Mission Creek concluded the previous month. The watershed witnessed above-average temperatures and no precipitation throughout July. As a result, BMID began to release water from its upstream reservoirs mid-month;
4. BMID's Scotty Creek intake, used for irrigation water, ran throughout July as irrigation usage in the north-end was high throughout July;
5. *E.Coli* levels at the raw water intake on Mission Creek were average during July. The highest raw water *E.Coli* count was 41 on July 31, 2017;
6. *E.Coli* levels at the point immediately prior to disinfection (Hadden Outlet) had low counts on all samples during July, with a peak count of 6 on July 24, 2017;
7. No *E.Coli* and no *Coliform* 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;
8. Well #5 was used throughout July as a source for 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;
9. BMID's Water Treatment Plant continued operations as water quality in Mission Creek required chemical treatment to achieve desired turbidity and colour levels;

1.0 FLOWS - JULY, 2017

Maximum est. Daily Flow was on July 4, 2017 at 42,604,300 US gallons (161.26 ML)

Minimum est. Daily Flow was on July 3, 2017 at 22,595,500 US gallons (85.52 ML)

Mission Creek provided 95% of domestic flow throughout July.

Figure 1.1 - Domestic Water System Flow

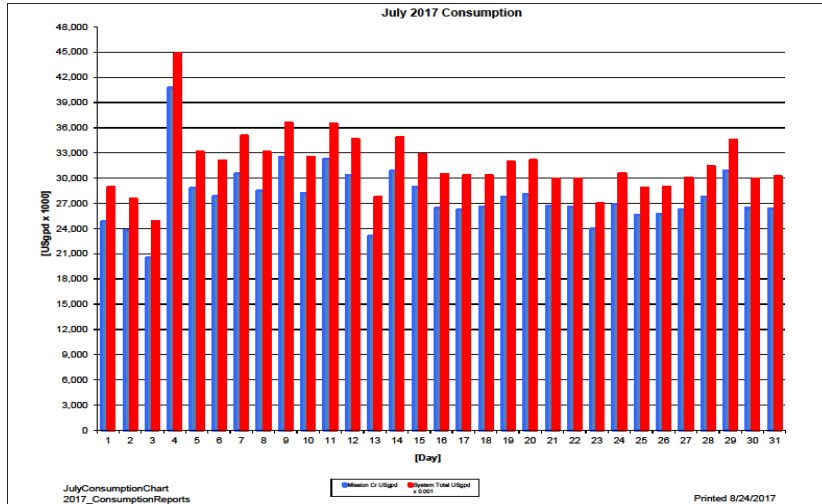


Table 1.2 - July, 2017 Daily Consumption Report

Year	Mission Cr	Well #4	Well #5	Scotty Crk	System Total	System Total
2017	Usqpd	Usqpd	Usqpd	Usqpd	Usqpd	ML/Day
1-Jul	24,810,000	0	1,565,000.0	255,900.0	26,630,900	100.80
2-Jul	23,824,000	0	1,438,000.0	229,100.0	25,491,100	96.48
3-Jul	20,504,000	0	1,839,000.0	252,500.0	22,595,500	85.52
4-Jul	40,752,000	0	1,603,000.0	249,300.0	42,604,300	161.26
5-Jul	28,821,000	0	1,695,000.0	264,500.0	30,780,500	116.50
6-Jul	27,819,000	0	1,705,000.0	256,300.0	29,780,300	112.72
7-Jul	30,532,000	0	1,287,000.0	321,600.0	32,140,600	121.65
8-Jul	28,552,000	0	1,615,000.0	293,600.0	30,460,600	115.29
9-Jul	32,521,000	0	1,664,000.0	239,500.0	34,424,500	130.30
10-Jul	28,223,000	0	1,589,000.0	271,600.0	30,083,600	113.87
11-Jul	32,248,000	0	1,590,000.0	265,700.0	34,103,700	129.08
12-Jul	30,386,000	0	1,697,000.0	254,600.0	32,337,600	122.40
13-Jul	23,111,000	0	1,793,000.0	283,900.0	25,187,900	95.34
14-Jul	30,848,000	0	1,233,000.0	274,600.0	32,355,600	122.47
15-Jul	28,927,000	0	1,713,000.0	219,900.0	30,859,900	116.80
16-Jul	26,444,000	0	1,446,000.0	260,200.0	28,150,200	106.55
17-Jul	26,250,000	0	1,755,000.0	234,600.0	28,239,600	106.89
18-Jul	26,602,000	0	1,526,000.0	217,500.0	28,345,500	107.29
19-Jul	27,816,000	0	1,607,000.0	251,600.0	29,674,600	112.32
20-Jul	28,121,000	0	1,680,000.0	232,700.0	30,033,700	113.68
21-Jul	26,648,000	0	1,175,000.0	207,300.0	28,030,300	106.09
22-Jul	26,543,000	0	1,559,000.0	179,300.0	28,281,300	107.04
23-Jul	23,972,000	0	1,506,000.0	150,900.0	25,628,900	97.01
24-Jul	26,907,000	0	1,686,000.0	196,300.0	28,789,300	108.97
25-Jul	25,570,000	0	1,108,000.0	217,800.0	26,895,800	101.80
26-Jul	25,736,000	0	1,380,000.0	187,500.0	27,303,500	103.34
27-Jul	26,301,000	0	1,419,000.0	233,800.0	27,953,800	105.81
28-Jul	27,804,000	0	1,271,000.0	235,600.0	29,310,600	110.94
29-Jul	30,903,000	0	1,501,000.0	217,500.0	32,621,500	123.47
30-Jul	26,522,000	0	1,217,000.0	219,600.0	27,958,600	105.82
31-Jul	26,365,000	0	1,868,000.0	201,400.0	28,434,400	107.62
Totals Usqpd	834,017,000	0	45,862,000	7,376,200	887,255,200	3358.26
Totals ML	3,156.75	0.00	173.59	27.92		
Avg's	27,800,567	105.23			29,568,460	111.92
Max	40,752,000	154.25			42,604,300	161.26
Min	20,504,000	77.61			22,595,500	85.52

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 Hadden Reservoir Outlet (point of disinfection) and at the raw water intake on Mission Creek; one sample is taken per week at Stevens (east, upstream settling basin) outlet.

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

Figure 2.1 - E.Coli Readings (CARO Lab results) June 2017 - July 2017

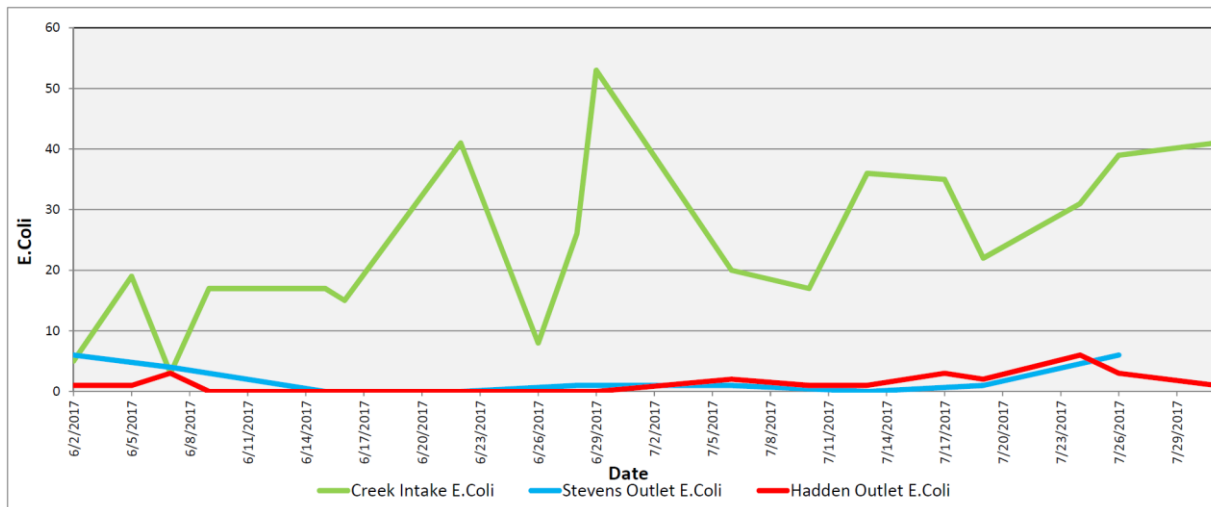


Table 2.2 - E.Coli Readings (CARO Labs)

Date	Creek Intake E.Coli	Stevens Outlet E.Coli	Hadden Outlet E.Coli
2-Jun-17	5	6	1
5-Jun-17	19	3	1
7-Jun-17	3	4	3
9-Jun-17	17	0	0
15-Jun-17	17	0	0
16-Jun-17	15	0	0
22-Jun-17	41	0	0
26-Jun-17	8	0	0
28-Jun-17	26	1	0
29-Jun-17	53	0	0
6-Jul-17	20	1	2
10-Jul-17	17	0	1
13-Jul-17	36	0	1
17-Jul-17	35	0	3
19-Jul-17	22	1	2
24-Jul-17	31	6	6
26-Jul-17	39	3	3
31-Jul-17	41	1	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 = 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 July 2017. The highest turbidity recorded at this location was 0.60 NTU on July 21, 2017.

Figure 3.1 – Daily Turbidity Readings (Hadden Outlet and Booster Station 1)

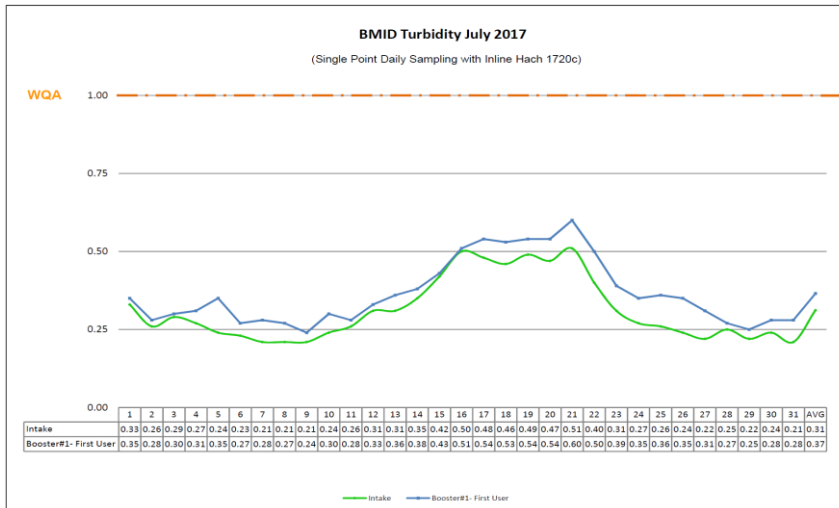


Table 3.2 - Daily Monitoring Record – Turbidity at Intake & Bst Stn 1

Turbidity Point Sampling for July 2017				
Date	Intake		Booster#1- First User	
	Sample Time	[NTU]	Sample Time	[NTU]
1	7:41 AM	0.33	7:07 AM	0.35
2	5:56 AM	0.26	5:27 AM	0.28
3	11:10 AM	0.29	8:55 AM	0.30
4	9:03 AM	0.27	9:56 AM	0.31
5	11:28 AM	0.24	9:39 AM	0.35
6	8:31 AM	0.23	7:51 AM	0.27
7	9:39 AM	0.21	7:54 AM	0.28
8	7:00 AM	0.21	6:33 AM	0.27
9	8:56 AM	0.21	9:12 AM	0.24
10	8:46 AM	0.24	7:58 AM	0.30
11	8:46 AM	0.26	10:48 AM	0.28
12	11:31 AM	0.31	12:46 PM	0.33
13	1:11 PM	0.31	8:02 AM	0.36
14	8:13 AM	0.35	10:16 AM	0.38
15	10:52 AM	0.42	11:32 AM	0.43
16	12:02 PM	0.50	9:40 AM	0.51
17	10:05 AM	0.48	8:18 AM	0.54
18	8:05 AM	0.46	7:45 AM	0.53
19	8:00 AM	0.49	8:10 AM	0.54
20	8:47 AM	0.47	8:06 AM	0.54
21	8:37 AM	0.51	8:02 AM	0.60
22	8:52 AM	0.40	8:10 AM	0.50
23	8:37 AM	0.31	6:55 AM	0.39
24	7:21 AM	0.27	8:04 AM	0.35
25	8:52 AM	0.26	7:44 AM	0.36
26	8:15 AM	0.24	7:58 AM	0.35
27	9:08 AM	0.22	8:14 AM	0.31
28	9:09 AM	0.25	8:31 AM	0.27
29	11:15 AM	0.22	11:45 AM	0.25
30	10:30 AM	0.24	10:00 AM	0.28
31	8:54 AM	0.21	8:01 AM	0.28
AVG		0.31		0.37

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 July, 2017.

Figure 4.1 - CT Trending – BMID Mission Creek Source – July 2017

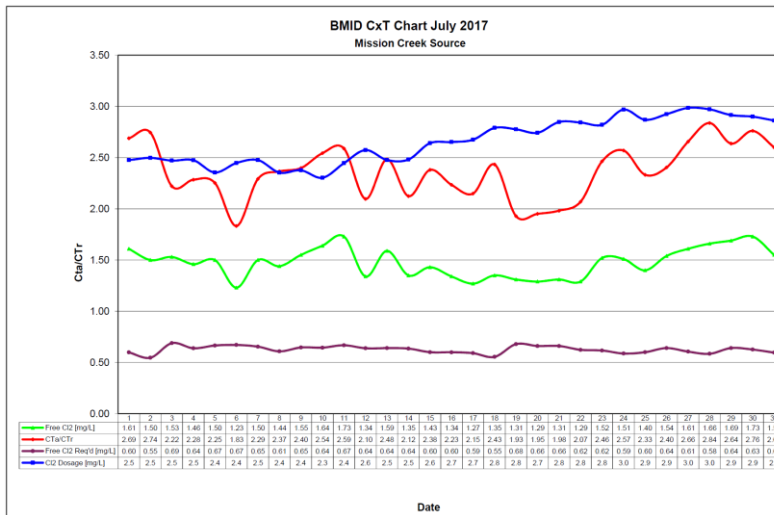


Table 4.2 - CT Table – Mission Creek Source

BMID July 2017 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 1	7.21	17.7	20675	1.61	206.3	76.7	2.69	0.60	2.5	2649600	128	18487	550
2	7.24	18.8	20356	1.50	195.2	71.1	2.74	0.55	2.5	2649600	130	15660	470
3	7.25	18.1	24284	1.53	166.9	75.2	2.22	0.69	2.5	2649600	109	18526	550
4	7.20	18.2	23273	1.46	166.2	72.8	2.28	0.64	2.5	2649600	114	20681	615
5	7.23	18.1	23710	1.50	167.6	74.4	2.25	0.67	2.4	2649600	112	20957	593
6	7.23	18.0	24463	1.23	133.2	72.7	1.83	0.67	2.4	2649600	108	19656	578
7	7.23	18.5	23973	1.50	165.8	72.4	2.29	0.65	2.5	2649600	111	20772	618
8	7.26	18.6	22334	1.44	170.8	72.2	2.37	0.61	2.4	2649600	119	17893	506
9	7.28	18.4	22965	1.55	178.8	74.6	2.40	0.65	2.4	2649600	115	19295	551
10	7.32	18.7	22850	1.64	190.2	74.8	2.54	0.64	2.3	2649600	116	20848	577
11	7.34	18.6	23157	1.73	197.9	76.5	2.59	0.67	2.4	2649600	114	18070	531
12	7.39	18.7	22754	1.34	156.0	74.4	2.10	0.64	2.6	2649600	116	17945	555
13	7.37	18.9	22690	1.59	185.7	74.8	2.48	0.64	2.5	2649600	117	18920	563
14	7.36	19.1	23499	1.35	152.2	71.7	2.12	0.64	2.5	2649600	113	17404	519
15	7.36	19.2	22172	1.43	170.9	71.8	2.38	0.60	2.6	2649600	120	20072	637
16	7.34	19.2	22515	1.34	157.7	70.6	2.23	0.60	2.7	2649600	118	19677	627
17	7.33	18.7	21685	1.27	155.2	72.2	2.15	0.59	2.7	2649600	122	17610	566
18	7.35	19.7	21459	1.35	166.7	68.5	2.43	0.55	2.8	2649600	123	16915	567
19	7.35	17.5	22657	1.31	153.2	79.4	1.93	0.68	2.8	2649600	117	18074	603
20	7.33	17.6	22422	1.29	152.4	78.1	1.95	0.66	2.7	2649600	118	17449	575
21	7.32	17.3	21985	1.31	157.9	79.7	1.98	0.66	2.8	2649600	121	17299	592
22	7.30	17.3	20941	1.29	163.2	78.9	2.07	0.62	2.8	2649600	127	17830	609
23	7.23	17.3	20750	1.52	194.1	78.8	2.46	0.62	2.8	2649600	128	17969	609
24	7.21	17.5	20207	1.51	198.0	77.1	2.57	0.59	3.0	2649600	131	16426	586
25	7.26	17.6	20634	1.40	179.8	77.1	2.33	0.60	2.9	2649600	128	15807	545
26	7.24	17.7	22023	1.54	185.3	77.1	2.40	0.64	2.9	2649600	120	18272	642
27	7.23	18.3	21658	1.61	197.0	74.2	2.66	0.61	3.0	2649600	122	18816	675
28	7.21	18.7	21549	1.66	204.1	71.9	2.84	0.58	3.0	2649600	123	16833	601
29	7.26	18.8	23276	1.69	192.4	73.0	2.64	0.64	2.9	2649600	114	17556	615
30	7.24	18.9	23004	1.73	199.3	72.2	2.76	0.63	2.9	2649600	115	19485	679
31	7.24	18.9	22250	1.55	184.6	71.0	2.60	0.60	2.9	2649600	119	18493	636
Averages	7.28	18.342	22328	1.48	175.635	74.4	2.36	0.6265	2.6575				

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
- 32 samples were found to be absent of Coliforms.
- 32 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		Ellison Blow-Off		Ellison School		612 Adams Rd		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
2-Jun-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Jun-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-Jun-17	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
22-Jun-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28-Jun-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6-Jul-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Jul-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-Jul-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28-Jul-17	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	7/4/2017				7/10/2017				7/17/2017				7/24/2017			
	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.
2670 Enterprise Way									0.62	23.4	-	X				
#5 217 Franklin Rd	0.93	21.8	-	X									0.61	21.6	-	X
2105 Morrison									1.04	21.6	-	X				
654 Mayfair Ct					0.77	23.2	-	X								
800 Galbraith Ct	1.08	22.8	-	X									1.14	20.4	-	X
1200 Belgo Rd	1.28	20.6	-	X									1.23	22.6	-	X
PRV #10									1.03	20.6	-	X				
260 Campion Rd					0.66	23.8	-	X								
2821 Fenwick Rd	0.54	24.4	-	X									0.31	23.2	-	X
2931 Belgo Rd					1.27	23.4	-	X								

- BMID Population = 22,400

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) = 14
- Total tests sampled by BMID and tested by Caro Labs = 32
- Total tests sampled in BMID treated distribution system = 46 (Zero Positive Samples)