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BMID FILE: 486

MONTHLY REPORTING PERIOD - APRIL, 2017

1. SUMMARY

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

	April 2017	
Source	**Total (US Gals)**	**Total (Mega Litres)**
Mission Creek	61,206,000	231.66
Well 4	0	0
Well 5	2,542,000	9.62
Scotty Creek (Irrigation Only)	0	0
Total	63,748,000	241.29

1. Turbidity levels at Hadden Pond Outlet, remained below 1.0 NTU for all of April. Peak turbidity at the Hadden Pond intake was 0.70 NTU on April 11, 2017;
2. The highest monthly turbidity level recorded at the first customer (Booster #1) was 0.69 NTU on April 21, 2017 and average monthly turbidity was 0.57 NTU;
3. Mission Creek had average flows for April as temperatures in the Mission Creek watershed remained below seasonal norms, resulting in predictable flows throughout the month;
4. *E.Coli* levels at the raw water intake on Mission Creek were low during April as the watershed continued to thaw for spring. The highest raw water *E.Coli* count was 9 on April 21, 2017;
5. *E.Coli* levels at the point immediately prior to disinfection (Hadden Outlet) had zero counts on all but one sample during April, with a peak count of 1 on April 28, 2017;
6. 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 ;
7. Well #5 was used throughout April as a source for domestic water in the north-end of the system in conjunction with Mission Creek system water as determined by usage and pressures in the area;
8. BMID's Water Treatment Plant resumed operations on March 15, 2017 as water quality in Mission Creek began to diminish due to melting conditions in the watershed which initiated the yearly spring freshet resulting in high turbidity;

1.0 FLOWS - APRIL, 2017

Maximum est. Daily Flow was on April 29, 2017 at 3,004,00 US gallons (11.37 ML)

Minimum est. Daily Flow was on April 5, 2017 at 1,620,000 US gallons (6.13 ML)

Mission Creek provided 96% of domestic flow throughout April.

Figure 1.1 - Domestic Water System Flow

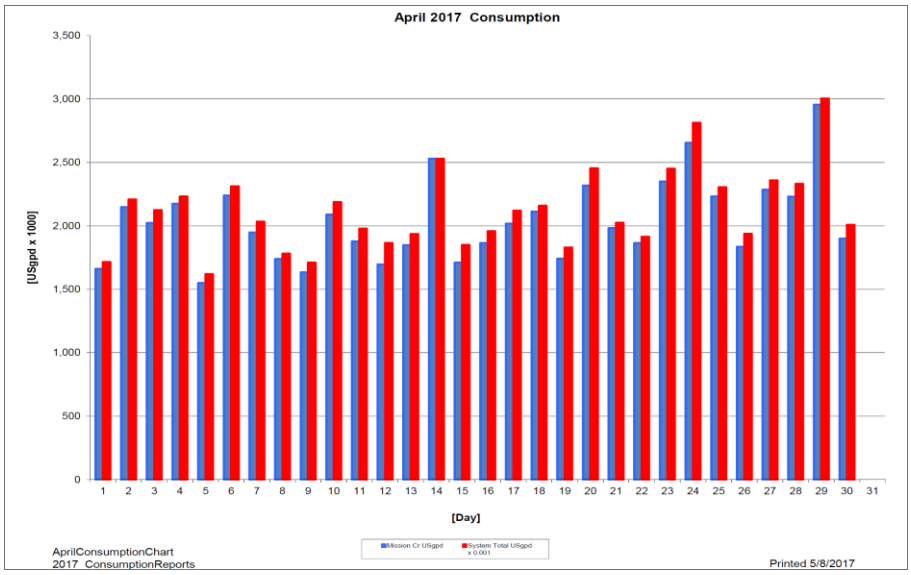

Table 1.2 - April, 2017 Daily Consumption Report

Year	Mission Cr	Well #4	Well #5	Scotty Creek	System Total	System Total
2017	Usgpd	Usgpd	Usgpd	Usgpd	Usgpd	ML/Day
1-Apr	1,661,000	0	54,000.0	0.0	1,715,000	6.49
2-Apr	2,148,000	0	60,000.0	0.0	2,208,000	8.36
3-Apr	2,023,000	0	102,000.0	0.0	2,125,000	8.04
4-Apr	2,174,000	0	57,000.0	0.0	2,231,000	8.44
5-Apr	1,550,000	0	70,000.0	0.0	1,620,000	6.13
6-Apr	2,239,000	0	73,000.0	0.0	2,312,000	8.75
7-Apr	1,948,000	0	85,000.0	0.0	2,033,000	7.69
8-Apr	1,739,000	0	43,000.0	0.0	1,782,000	6.74
9-Apr	1,634,000	0	76,000.0	0.0	1,710,000	6.47
10-Apr	2,089,000	0	98,000.0	0.0	2,187,000	8.28
11-Apr	1,878,000	0	101,000.0	0.0	1,979,000	7.49
12-Apr	1,696,000	0	169,000.0	0.0	1,865,000	7.06
13-Apr	1,848,000	0	88,000.0	0.0	1,936,000	7.33
14-Apr	2,529,000	0	0.0	0.0	2,529,000	9.57
15-Apr	1,710,000	0	140,000.0	0.0	1,850,000	7.00
16-Apr	1,864,000	0	94,000.0	0.0	1,958,000	7.41
17-Apr	2,018,000	0	102,000.0	0.0	2,120,000	8.02
18-Apr	2,112,000	0	46,000.0	0.0	2,158,000	8.17
19-Apr	1,741,000	0	89,000.0	0.0	1,830,000	6.93
20-Apr	2,318,000	0	136,000.0	0.0	2,454,000	9.29
21-Apr	1,982,000	0	43,000.0	0.0	2,025,000	7.66
22-Apr	1,864,000	0	50,000.0	0.0	1,914,000	7.24
23-Apr	2,350,000	0	101,000.0	0.0	2,451,000	9.28
24-Apr	2,654,000	0	159,000.0	0.0	2,813,000	10.65
25-Apr	2,232,000	0	72,000.0	0.0	2,304,000	8.72
26-Apr	1,835,000	0	102,000.0	0.0	1,937,000	7.33
27-Apr	2,285,000	0	74,000.0	0.0	2,359,000	8.93
28-Apr	2,230,000	0	101,000.0	0.0	2,331,000	8.82
29-Apr	2,955,000	0	49,000.0	0.0	3,004,000	11.37
30-Apr	1,900,000	0	108,000.0	0.0	2,008,000	7.60
Totals Usgpd	61,206,000	0	2,542,000	0	63,748,000	241.29
Totals ML	231.66	0.00	9.62	0.00		
Avg's	2,040,200	7.72			2,124,933	8.04
Max	2,955,000	11.18			3,004,000	11.37
Min	1,550,000	5.87			1,620,000	6.13

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) March 2017 - April 2017

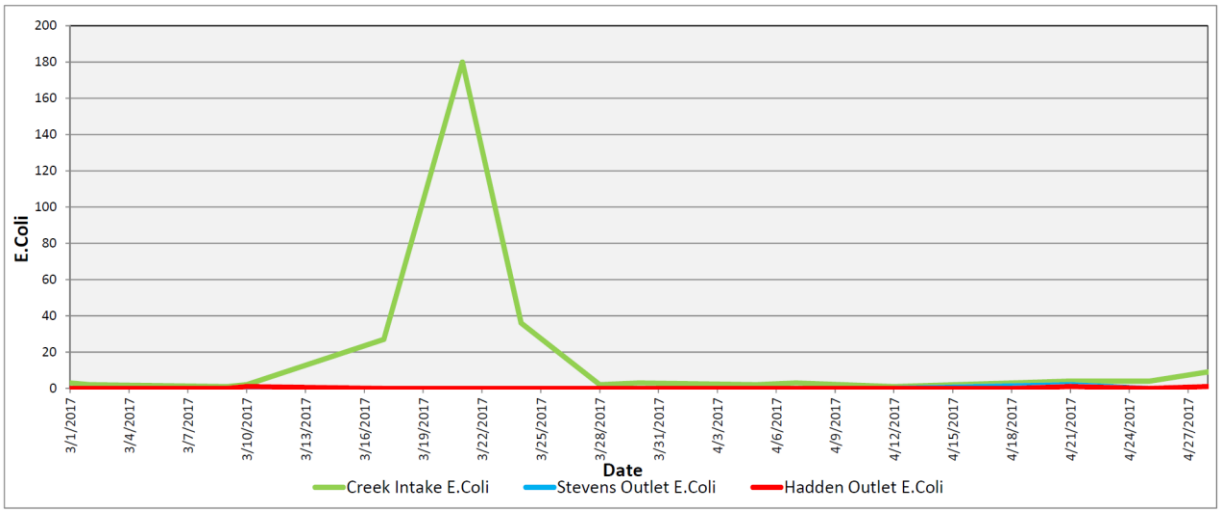

Table 2.2 - E.Coli Readings (CARO Labs)

Date	Creek Intake E.Coli	Stevens Outlet E.Coli	Hadden Outlet E.Coli
1-Mar-17	3	0	0
2-Mar-17	2		0
9-Mar-17	1	0	0
10-Mar-17	2		1
17-Mar-17	27		0
21-Mar-17	180	0	0
24-Mar-17	36		0
28-Mar-17	2	0	0
30-Mar-17	3		0
5-Apr-17	2	0	0
7-Apr-17	3		0
12-Apr-17	1	0	0
18-Apr-17	3		0
21-Apr-17	4	2	1
25-Apr-17	4	0	0
28-Apr-17	9		1

Stevens or WTP Intake (Raw) - Sampling of raw water at intake from Mission Creek
Stevens Outlet (Raw) - Sampling point after exiting 142,000 m^3 1st upper balancing reservoir (Stevens Res.)
Hadden Outlet (Raw) - Sampling point after exiting 75,000 m^3 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 April 2017. The highest turbidity recorded at this location was 0.69 NTU on April 21, 2017.

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

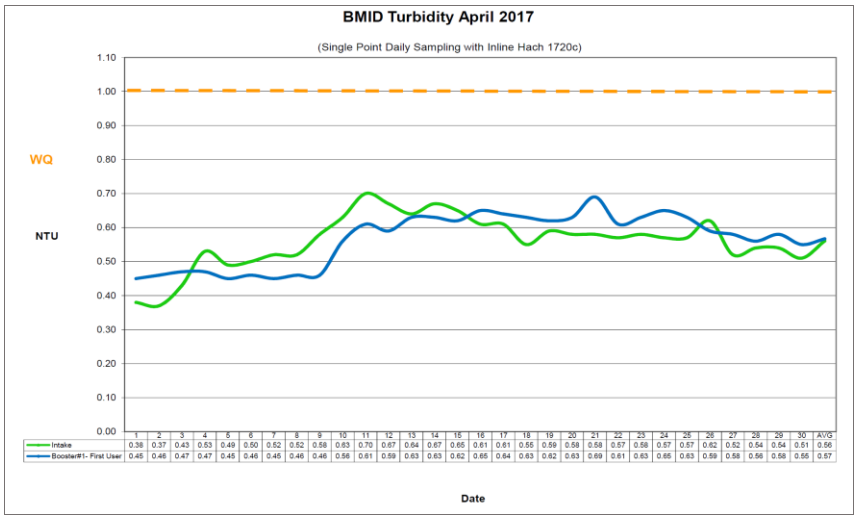

Table 3.2 - Daily Monitoring Record – Turbidity at Intake & Bst Stn 1

Turbidity Point Sampling for April 2017				
Date	Intake		Booster#1- First User	
	Sample Time	[NTU]	Sample Time	[NTU]
1	8:19 AM	0.38	7:44 AM	0.45
2	7:52 AM	0.37	7:24 AM	0.46
3	11:16 AM	0.43	9:43 AM	0.47
4	11:43 AM	0.53	10:46 AM	0.47
5	8:59 AM	0.49	8:19 AM	0.45
6	8:30 AM	0.50	7:57 AM	0.46
7	12:50 PM	0.52	10:48 AM	0.45
8	9:22 AM	0.52	9:00 AM	0.46
9	8:36 AM	0.58	8:17 AM	0.46
10	1:50 PM	0.63	11:14 AM	0.56
11	11:37 AM	0.70	12:12 PM	0.61
12	8:35 AM	0.67	7:58 AM	0.59
13	9:39 AM	0.64	9:01 AM	0.63
14	12:38 PM	0.67	12:06 PM	0.63
15	12:25 PM	0.65	12:02 PM	0.62
16	11:21 AM	0.61	10:52 AM	0.65
17	11:34 AM	0.61	10:49 AM	0.64
18	11:38 AM	0.55	10:58 AM	0.63
19	8:42 AM	0.59	7:57 AM	0.62
20	8:21 AM	0.58	7:45 AM	0.63
21	8:39 AM	0.58	7:54 AM	0.69
22	7:20 AM	0.57	7:00 AM	0.61
23	7:45 AM	0.58	7:15 AM	0.63
24	2:11 PM	0.57	11:16 AM	0.65
25	1:06 PM	0.57	12:41 PM	0.63
26	9:18 AM	0.62	8:23 AM	0.59
27	8:36 AM	0.52	8:02 AM	0.58
28	8:42 AM	0.54	8:00 AM	0.56
29	11:38 AM	0.54	11:09 AM	0.58
30	8:05 AM	0.51	7:45 AM	0.55
AVG		0.56		0.57

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 April, 2017.

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

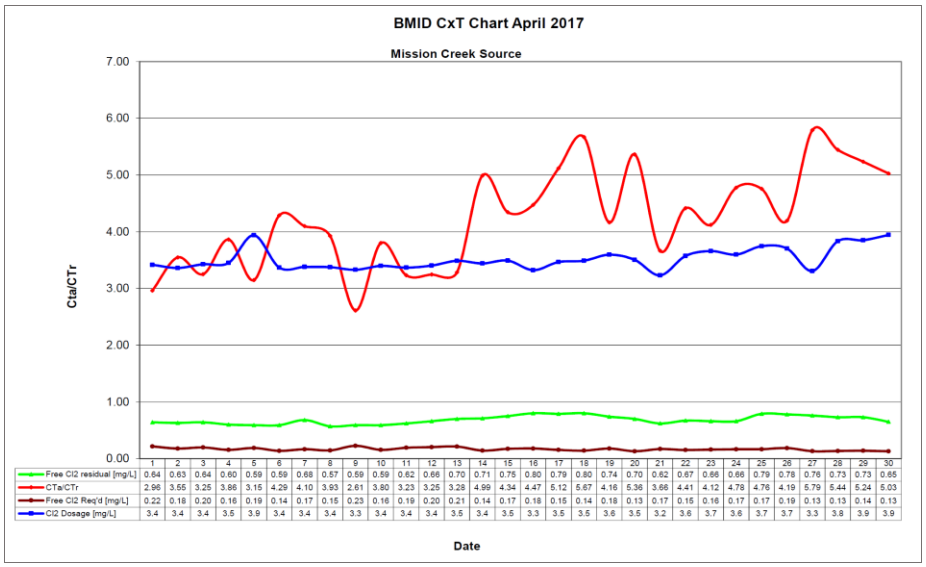

Table 4.2 - CT Table – Mission Creek Source

	BMID April 2017													
	Mission Creek Source													
DATE	pH	TEMP	PEAK	Free Cl_2	CT	CT	CTa/CTr	Free Cl_2	Cl_2	VOLUME	TIME	FLOW	CL_2 **DOSAGE**
	(highest)	(lowest)	FLOW	residual	achieved	req'd		Req'd	Dosage	TOTAL		PRESENT	PRESENT
April		[°C]	[Usgpm]	[mg/L]				[mg/L]	[mg/L]	[USgal]	[mins]	US Gallons	[PPD]
1	7.86	3.5	2537	0.64	668.4	225.6	2.96	0.22	3.4	2649600	1044	1583	65
2	7.87	3.6	2098	0.63	795.6	224.3	3.55	0.18	3.4	2649600	1263	1337	54
3	7.86	4.1	2408	0.64	704.2	216.6	3.25	0.20	3.4	2649600	1100	1530	63
4	7.84	4.2	1949	0.60	815.7	211.1	3.86	0.16	3.5	2649600	1359	1230	51
5	7.87	7.6	2941	0.59	531.5	168.9	3.15	0.19	3.9	2649600	901	1162	55
6	7.87	4.9	1799	0.59	869.0	202.7	4.29	0.14	3.4	2649600	1473	1581	64
7	7.86	5.1	2153	0.68	836.8	204.2	4.10	0.17	3.4	2649600	1231	1182	48
8	7.86	5.1	1938	0.57	779.3	198.5	3.93	0.15	3.4	2649600	1367	1627	66
9	7.84	5.1	3021	0.59	517.5	198.1	2.61	0.23	3.3	2649600	877	1500	60
10	7.86	5.4	2106	0.59	742.3	195.4	3.80	0.16	3.4	2649600	1258	1396	57
11	7.90	5.5	2570	0.62	639.2	197.7	3.23	0.19	3.4	2649600	1031	1384	56
12	7.88	5.3	2677	0.66	653.2	201.3	3.25	0.20	3.4	2649600	990	1394	57
13	7.87	5.4	2812	0.70	659.6	200.9	3.28	0.21	3.5	2649600	942	1408	59
14	7.87	5.6	1902	0.71	989.1	198.2	4.99	0.14	3.4	2649600	1393	1572	65
15	7.86	5.9	2332	0.75	852.1	196.2	4.34	0.17	3.5	2649600	1136	1454	61
16	7.87	6.0	2401	0.80	882.8	197.4	4.47	0.18	3.3	2649600	1104	1803	72
17	7.86	6.4	2148	0.79	974.5	190.4	5.12	0.15	3.5	2649600	1234	1705	71
18	7.85	6.8	2022	0.80	1048.3	184.9	5.67	0.14	3.5	2649600	1310	1431	60
19	7.85	7.1	2627	0.74	746.4	179.3	4.16	0.18	3.6	2649600	1009	1551	67
20	7.85	7.4	1991	0.70	931.6	173.7	5.36	0.13	3.5	2649600	1331	1686	71
21	7.85	7.6	2658	0.62	618.0	168.8	3.66	0.17	3.2	2649600	997	2344	91
22	7.85	8.8	2565	0.67	692.1	156.8	4.41	0.15	3.6	2649600	1033	1980	85
23	7.85	8.0	2567	0.66	681.2	165.3	4.12	0.16	3.7	2649600	1032	2024	89
24	7.85	8.0	2654	0.66	788.7	165.1	4.78	0.17	3.6	2649600	998	1596	69
25	7.84	8.1	2624	0.79	797.7	167.8	4.76	0.17	3.7	2649600	1010	2133	96
26	7.83	8.4	3005	0.78	687.7	164.0	4.19	0.19	3.7	2649600	882	1775	79
27	7.45	8.5	2456	0.76	819.9	141.6	5.79	0.13	3.3	2649600	1079	1761	70
28	7.45	8.9	2597	0.73	744.8	136.8	5.44	0.13	3.8	2649600	1020	1650	76
29	7.43	9.3	2783	0.73	695.0	132.8	5.24	0.14	3.9	2649600	952	1772	82
30	7.43	9.6	2683	0.65	641.9	127.7	5.03	0.13	3.9	2649600	988	1456	69
Averages	7.80	6.503667	2434	0.68133	760.142	183.1	4.23	0.167	3.515				

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
- 31 samples were found to be absent of Coliforms.
- 31 samples were found to be absent of *E.Coli*.

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

	PRV 7		Booster 1		Ellison Blow-Off		Ellison School		612 Adams Rd		Prospect Reservoir		Tower Reservoir		Well #5	
Date	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli	Coliforms	E.coli
1-Mar-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6-Mar-17	0	0	0	0	0	0	22	0	0	0	0	0	0	0	-	-
9-Mar-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-Mar-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-Mar-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28-Mar-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5-Apr-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Apr-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
20-Apr-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Apr-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

	4/3/2017				4/10/2017				4/18/2017				4/24/2017			
Location	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.
2670 Enterprise Way									0.57	6.7	-	X				
#5 217 Franklin Rd	1.14	5.0	-	X									0.83	9.0	-	X
2105 Morrison									0.66	4.8	-	X				
654 Mayfair Ct					1.28	6.8	-	X								
800 Galbraith Ct	1.45	5.2	-	X									0.88	8.2	-	X
1625 Hyashi	0.79	5.2	-	X									0.70	6.0	-	X
PRV #10									0.85	5.0	-	X				
260 Campion Rd					0.71	6.4	-	X								
2821 Fenwick Rd	0.59	5.0	-	X									0.52	11.0	-	X
2931 Belgo Rd					0.84	6.0	-	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 = 31
- Total tests sampled in BMID treated distribution system = 45 (Zero positive samples)