



## MONTHLY REPORTING PERIOD - APRIL, 2018

### 1. SUMMARY

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

Source	April 2018	
	Total (US Gals)	Total (Mega Litres)
Mission Creek	64,581,000	244.44
Well 4	0	0
Well 5	4,186,185	15.84
Scotty Creek (Irrigation Only)	0	0
Total	68,767,185	260.28

1. Turbidity levels at the Distribution Intake remained below 1.0 NTU for all of April. Peak turbidity at the Distribution Intake was 0.66 NTU on April 30, 2018;
2. The highest monthly turbidity level recorded at the first customer (Booster #1) was 0.69 NTU on April 19, 2018 and average monthly turbidity was 0.52 NTU;
3. Mission Creek experienced normal flows for spring as the lower elevations of the watershed continued melting;
4. BMID's Scotty Creek source, used for irrigation in the north end, was shut-off for the season on September 10, 2017;
5. Well #5 was used throughout April 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. *E. Coli* levels at Mission Creek's Point of Diversion were average during April. The highest raw water *E. Coli* count was 11 on April 16 and 30, 2018;
7. *E. Coli* levels at the Distribution Intake had zero counts on all samples throughout April 2018;
8. 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;
9. BMID's Water Treatment Plant resumed normal operations on March 15, 2018. The WTP will remain in use throughout the spring and summer until the Mission Creek water source is of sufficient quality to by-pass treatment;

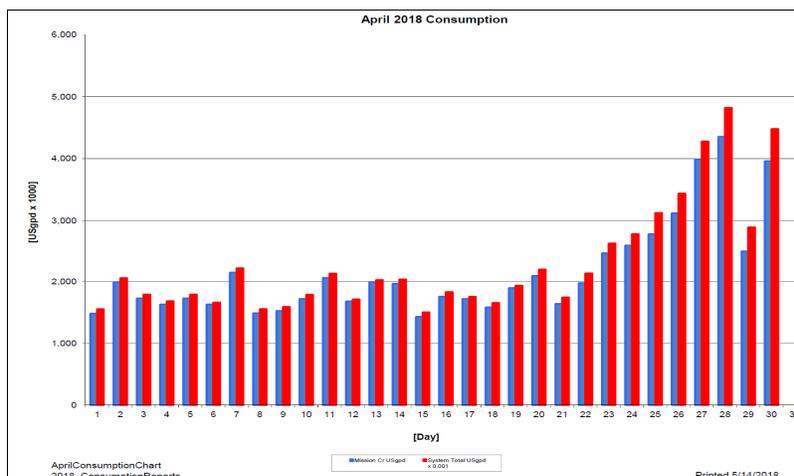
## 1.0 FLOWS - APRIL, 2018

Maximum est. Daily Flow was on April 28, 2018 at 4,821,617 US gallons (18.25 ML)

Minimum est. Daily Flow was on April 15, 2018 at 1,502,000 US gallons (5.69 ML)

Mission Creek provided 94% of domestic flow throughout April.

**Figure 1.1 - Domestic Water System Flow**



**Table 1.2 - April, 2018 Daily Consumption Report**

Year	Mission Cr	Well #4	Well #5	Scotty Creek	System Total	System Total
2018	Usgpd	Usgpd	Usgpd	Usgpd	Usgpd	ML/Day
1-Apr	1,482,000	0	70,500.0	0.0	1,552,500	5.88
2-Apr	1,986,000	0	69,028.0	0.0	2,055,028	7.78
3-Apr	1,728,000	0	60,712.0	0.0	1,788,712	6.77
4-Apr	1,629,000	0	54,248.0	0.0	1,683,248	6.37
5-Apr	1,727,000	0	61,288.0	0.0	1,788,288	6.77
6-Apr	1,628,000	0	32,405.0	0.0	1,660,405	6.28
7-Apr	2,145,000	0	70,405.0	0.0	2,215,405	8.39
8-Apr	1,487,000	0	66,830.0	0.0	1,553,830	5.88
9-Apr	1,525,000	0	66,028.0	0.0	1,591,028	6.02
10-Apr	1,720,000	0	67,094.0	0.0	1,787,094	6.76
11-Apr	2,058,000	0	69,594.0	0.0	2,127,594	8.05
12-Apr	1,679,000	0	32,348.0	0.0	1,711,348	6.48
13-Apr	1,990,000	0	33,741.0	0.0	2,023,741	7.66
14-Apr	1,965,000	0	69,274.0	0.0	2,034,274	7.70
15-Apr	1,429,000	0	73,180.0	0.0	1,502,180	5.69
16-Apr	1,755,000	0	74,050.0	0.0	1,829,050	6.92
17-Apr	1,718,000	0	33,913.0	0.0	1,751,913	6.63
18-Apr	1,583,000	0	68,887.0	0.0	1,651,887	6.25
19-Apr	1,895,000	0	39,022.0	0.0	1,934,022	7.32
20-Apr	2,090,000	0	104,748.0	0.0	2,194,748	8.31
21-Apr	1,639,000	0	104,882.0	0.0	1,743,882	6.60
22-Apr	1,975,000	0	158,221.0	0.0	2,133,221	8.07
23-Apr	2,458,000	0	174,351.0	0.0	2,632,351	9.96
24-Apr	2,599,000	0	185,567.0	0.0	2,784,567	10.54
25-Apr	2,780,000	0	345,220.0	0.0	3,125,220	11.83
26-Apr	3,118,000	0	320,452.0	0.0	3,438,452	13.01
27-Apr	3,990,000	0	288,050.0	0.0	4,278,050	16.19
28-Apr	4,354,000	0	467,617.0	0.0	4,821,617	18.25
29-Apr	2,489,000	0	404,224.0	0.0	2,893,224	10.95
30-Apr	3,960,000	0	520,306.0	0.0	4,480,306	16.96
Totals Usqpd	64,581,000	0	4,186,185	0	68,767,185	260.28
Totals ML	244.44	0.00	15.84	0.00		
Avg's	2,152,700	8.15			2,292,240	8.68
Max	4,354,000	16.48			4,821,617	18.25
Min	1,429,000	5.41			1,502,180	5.69

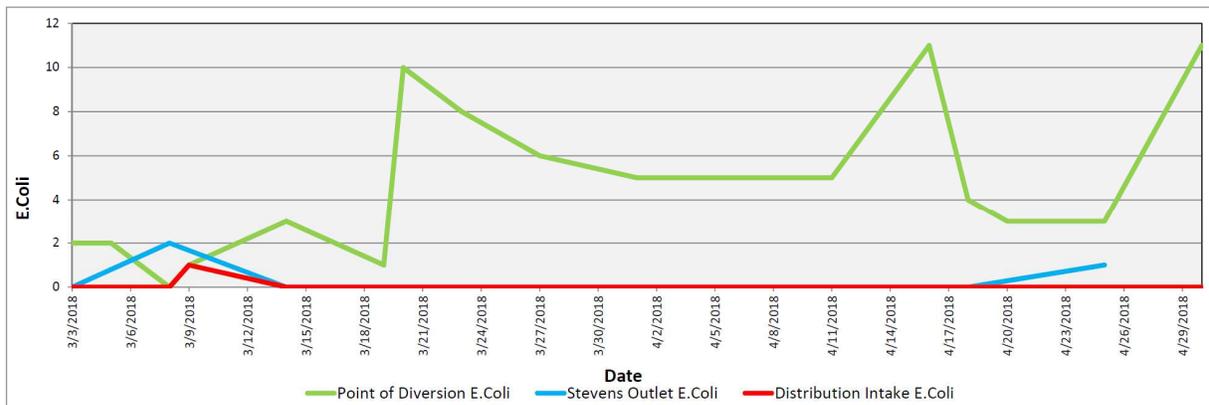
## 2.0 RAW WATER QUALITY - BACTERIOLOGICAL MONITORING

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

**Figure 2.1 - E.Coli Readings (CARO Lab results) March 2018 - April 2018**



**Table 2.2 - E.Coli Readings (CARO Labs)**

Date	Point of Diversion E.Coli	Stevens Outlet E.Coli	Distribution Intake E.Coli
3-Mar-18	2	0	0
5-Mar-18	2	0	0
8-Mar-18	0	2	0
9-Mar-18	1	0	1
14-Mar-18	3	0	0
19-Mar-18	1	0	0
20-Mar-18	10	0	0
23-Mar-18	8	0	0
27-Mar-18	6	0	0
1-Apr-18	5	0	0
4-Apr-18	5	0	0
11-Apr-18	5	0	0
16-Apr-18	11	0	0
18-Apr-18	4	0	0
20-Apr-18	3	0	0
25-Apr-18	3	1	0
30-Apr-18	11	0	0

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

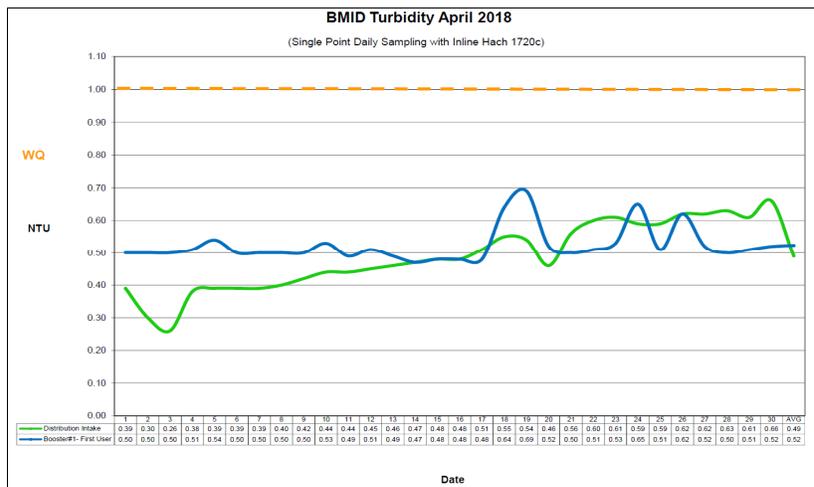
Stevens Outlet (Raw) - Sampling point after exiting 142,000 m<sup>3</sup> 1<sup>st</sup> upper balancing reservoir (Stevens Res.)

Hadden Outlet (Raw) - Sampling point after exiting 75,000 m<sup>3</sup> 2<sup>nd</sup> 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 April 2018. The highest turbidity recorded at this location was 0.69 NTU on April 19, 2018.

**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 April 2018				
Date	Distribution Intake		Booster#1- First User	
	Sample Time	[NTU]	Sample Time	[NTU]
1	8:26 AM	0.39	8:03 AM	0.50
2	9:10 AM	0.30	7:55 AM	0.50
3	8:41 AM	0.26	8:17 AM	0.50
4	10:04 AM	0.38	8:04 AM	0.51
5	8:30 AM	0.39	7:58 AM	0.54
6	9:18 AM	0.39	8:29 AM	0.50
7	12:38 PM	0.39	12:04 PM	0.50
8	10:52 AM	0.40	10:23 AM	0.50
9	8:30 AM	0.42	7:54 AM	0.50
10	8:46 AM	0.44	7:49 AM	0.53
11	9:24 AM	0.44	8:09 AM	0.49
12	8:39 AM	0.45	7:50 AM	0.51
13	8:50 AM	0.46	7:58 AM	0.49
14	12:00 PM	0.47	11:11 AM	0.47
15	8:40 AM	0.48	8:26 AM	0.48
16	8:46 AM	0.48	8:00 AM	0.48
17	8:41 AM	0.51	7:58 AM	0.48
18	8:40 AM	0.55	8:00 AM	0.64
19	8:50 AM	0.54	8:00 AM	0.69
20	9:34 AM	0.46	8:17 AM	0.52
21	8:21 AM	0.56	7:36 AM	0.50
22	8:15 AM	0.60	7:46 AM	0.51
23	8:49 AM	0.61	8:12 AM	0.53
24	8:19 AM	0.59	7:47 AM	0.65
25	8:55 AM	0.59	8:01 AM	0.51
26	8:33 AM	0.62	7:48 AM	0.62
27	8:48 AM	0.62	8:09 AM	0.52
28	10:33 AM	0.63	10:03 AM	0.50
29	8:04 AM	0.61	7:43 AM	0.51
30	8:47 AM	0.66	7:59 AM	0.52
AVG		0.49		0.52

### 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, 2018.

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

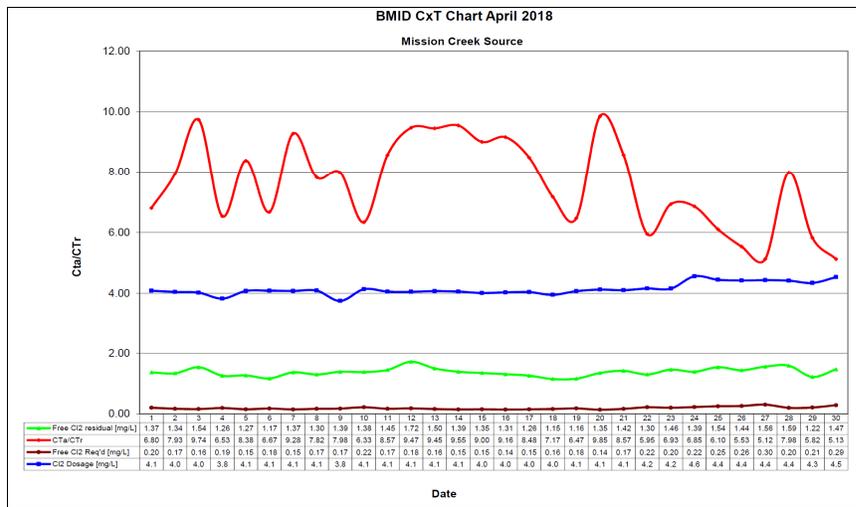


Table 4.2 - CT Table – Mission Creek Source

BMID April 2018													
Mission Creek Source													
DATE	pH (highest)	TEMP (lowest)	PEAK FLOW	Free Cl2 residual	CT achieved	CT req'd	CTa/CTr	Free Cl2 Req'd	Cl2 Dosage	VOLUME TOTAL	TIME	FLOW PRESENT	CL2 DOSAGE PRESENT
April		[°C]	[Usgpm]	[mg/L]				[mg/L]	[mg/L]	[USgal]	[mins]	US Gallons	[PPD]
1	7.76	3.3	2156	1.37	1683.7	247.6	6.80	0.20	4.1	2649600	1229	1262	62
2	7.74	3.4	1838	1.34	1931.7	243.5	7.93	0.17	4.0	2649600	1442	1316	64
3	7.75	3.6	1704	1.54	2394.6	245.9	9.74	0.16	4.0	2649600	1555	1282	62
4	7.77	3.8	2149	1.26	1553.5	237.8	6.53	0.19	3.8	2649600	1233	978	45
5	7.74	7.8	2258	1.27	1490.3	177.8	8.38	0.15	4.1	2649600	1173	1469	72
6	7.76	3.8	1987	1.17	1560.2	234.0	6.67	0.18	4.1	2649600	1333	1364	67
7	7.74	3.9	1652	1.37	2197.3	236.8	9.28	0.15	4.1	2649600	1604	1326	65
8	7.74	3.9	1883	1.30	1829.3	234.0	7.82	0.17	4.1	2649600	1407	1465	72
9	7.75	4.1	1971	1.39	1868.6	234.3	7.98	0.17	3.8	2649600	1344	1486	67
10	7.75	4.0	2459	1.38	1487.0	234.8	6.33	0.22	4.1	2649600	1078	1267	63
11	7.74	4.4	1945	1.45	1975.3	230.6	8.57	0.17	4.1	2649600	1362	1538	75
12	7.74	4.7	2084	1.72	2186.8	230.9	9.47	0.18	4.1	2649600	1271	1479	72
13	7.79	4.9	1850	1.50	2148.3	227.3	9.45	0.16	4.1	2649600	1432	1348	66
14	7.76	5.3	1786	1.39	2062.1	216.0	9.55	0.15	4.1	2649600	1484	1476	72
15	7.77	5.0	1797	1.35	1990.5	221.1	9.00	0.15	4.0	2649600	1474	1514	73
16	7.77	4.9	1718	1.31	2020.4	220.6	9.16	0.14	4.0	2649600	1542	1465	71
17	7.78	5.3	1831	1.26	1823.3	214.9	8.48	0.15	4.0	2649600	1447	1441	70
18	7.79	5.6	2041	1.15	1492.9	208.2	7.17	0.16	4.0	2649600	1298	1221	58
19	7.78	5.9	2345	1.16	1310.7	202.6	6.47	0.18	4.1	2649600	1130	1716	84
20	7.77	6.4	1811	1.35	1975.1	200.5	9.85	0.14	4.1	2649600	1463	1150	57
21	7.80	6.5	2169	1.42	1734.6	202.4	8.57	0.17	4.1	2649600	1222	1115	55
22	7.80	7.0	3002	1.30	1147.4	193.0	5.95	0.22	4.2	2649600	883	1740	87
23	7.81	7.6	2817	1.46	1307.4	188.7	6.93	0.20	4.2	2649600	941	1422	71
24	7.77	8.1	3327	1.39	1226.4	179.0	6.85	0.22	4.6	2649600	796	1989	109
25	7.80	8.4	3731	1.54	1093.6	179.2	6.10	0.25	4.4	2649600	710	1497	80
26	7.70	9.0	4189	1.44	910.8	164.6	5.53	0.26	4.4	2649600	633	2521	134
27	7.76	9.6	4936	1.56	837.4	163.4	5.12	0.30	4.4	2649600	537	2102	112
28	7.75	10.3	3397	1.59	1240.2	155.4	7.98	0.20	4.4	2649600	780	2524	134
29	7.76	10.6	3784	1.22	854.3	146.8	5.82	0.21	4.3	2649600	700	2376	124
30	7.72	10.5	5070	1.47	768.2	149.9	5.13	0.29	4.5	2649600	523	2203	120
Averages	7.76	6.048333	2523	1.38067	1603.39	207.4	7.62	0.188	4.1423				

## 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**

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
1-Mar-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-Mar-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-Mar-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-Mar-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-Mar-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4-Apr-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Apr-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Apr-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Apr-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

### Testing – Total Coliforms – E.Coli

### 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	4/3/2018				4/9/2018				4/16/2018				4/23/2018				4/30/2018			
	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.
Sylvania Cres									0.99	7.0	-	X								
170 Kneller Rd	0.23	9.6	-	X					0.89	7.0	-	X	0.31	9.4	-	X				
2105 Morrison																	0.93	10.0	-	X
Pearson School					0.84	7.0	-	X					0.79	8.6	-	X				
Staymen Rd	0.69	5.2	-	X					1.06	6.4	-	X								
PRV #10																	0.79	10.0	-	X
260 Campion Rd					0.65	7.4	-	X					0.72	12.0	-	X				
Fenwick Rd	0.64	8.0	-	X													1.03	9.4	-	X
2931 Belgo Rd					0.81	7.2	-	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) = 15
- Total tests sampled by BMID and tested by Caro Labs = 32
- Total tests sampled in BMID treated distribution system = 47 (Zero Positive Samples)