



MONTHLY REPORTING PERIOD - FEBRUARY, 2021

1. SUMMARY

The list below provides a summary of the water quality information collected by BMID in February 2021. Documentation and figures are provided on the following pages to support this submission.

Source	Total (US Gals)	Total (Mega Litres)
Mission Creek	56,444,934	213.64
Well 4	1,858,000	7.03
Well 5	0	0
Well 6 (Irrigation Only)	0	0
Scotty Creek (Irrigation Only)	0	0
Total	58,302,934	220.68

1. To better align with the sampling recommendations under the Canadian Drinking Water Guidelines, BMID has changed the sampling schedule by streamlining the number of samples taken per month. Raw water samples will be taken on a weekly basis, disinfection by-products will be sampled quarterly, and distribution samples will take place on a rotating schedule;
2. A portion of the BMID's transmission main west of the Mission Creek Intake and east of the tunnel is located on an unstable slope. Slope movement has been minimal over the past 12 months. Monitoring has showed minor variations in groundwater levels, but no substantial changes. The hillside is being monitored for surface movement on a monthly basis and groundwater levels as required.
3. The Water Treatment Plant was in stand-by mode for most of February as raw water quality in Mission Creek did not require chemical treatment to maintain acceptable water quality. The WTP resumed normal operations on February 21, 2021 as turbidity levels began to necessitate treatment. The WTP will continue to run full-time until raw water in Mission Creek is of sufficient quality to bypass treatment, later in winter;
4. Raw water turbidity levels in Mission Creek peaked at 5.26 NTU on February 27, 2021. Turbidity levels at the Distribution Intake (end of Hadden Reservoir) high reading was 0.41 NTU on February 27, 2021. Average turbidity for February was 0.36 NTU at the Distribution Intake at the lower end of Hadden Reservoir;
5. The highest recorded monthly turbidity level at the first customer (Booster #1) was 0.77 NTU on February 11, 2021. Average monthly turbidity at the first customer was 0.46 NTU for February;
6. BMID's Ultraviolet Treatment Facility treated 213,666.86 m³ of water, only 0.5 m³ of which was "Off-Spec" (0.0002%). Average UV Transmissivity was 86.5%. The average inlet chlorine residual level at the UV site was 1.16 mg/L. The average outgoing chlorine was 1.38 mg/L after the sodium hypochlorite top-up system;
7. BMID's Scotty Creek source, used for irrigation in the north-end, was placed on Stand-by in September 2020;

8. Well # 4 resumed operations as the primary domestic water source for the north-end on September 11, 2020. Well #4 will continue to operate until spring 2021;
9. Well #5, used as the primary domestic water source in the north-end of the system for both irrigation and domestic consumption was turned off for the year on September 11, 2020. Well #5 is undergoing maintenance which will continue throughout the winter;
10. Well #6, which supplies irrigation water to the twinned north-end water distribution systems, was placed in stand-by for the year in October. Well #6 will remain in stand-by mode for fire protection only until flows increase in spring 2021;
11. *E.Coli* levels at Mission Creek's Point-of-Diversion (creek intake prior to WTP) had normal counts for winter with a peak count of 5 on February 2, 2021. The average *E.Coli* count was 3 for the month based on 3 samples;
12. *E.Coli* levels in the raw water at the water distribution system intake down-stream of the WTP, immediately prior to disinfection, had zero counts on all three samples. The reduction in *E.Coli* levels is credited to the settling of particles in the water in Stevens and Hadden Reservoirs;
13. No *E.Coli* or *Total Coliforms* were found in treated water in the distribution system through third-party analysis. In addition, no positive samples were detected by BMID's in-house presence/absence testing;

1.0 FLOWS - FEBRUARY, 2021

The Maximum Daily Flow was on February 16, at 2,459,353 US gallons (9.31 ML)

The Minimum Daily Flow was on February 23, at 1,663,653 US gallons (6.30 ML)

Mission Creek provided 97% of domestic and irrigation flow throughout February.

Figure 1.1 - Domestic Water System Flow

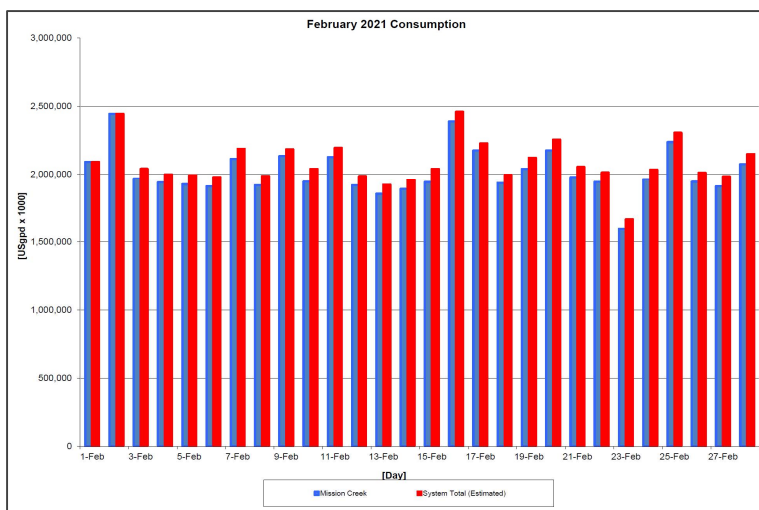


Table 1.2 - February 2021 - Daily Consumption Report

Year	Mission Creek	Well #4	Well #5	Well #6	System Total	System Total
2021	Usgpd	Usgpd	Usgpd	Usgpd	Usgpd	ML/Day
1-Feb	2,090,287	0	0	0	2,090,287	7.91
2-Feb	2,444,119	0	0	0	2,444,119	9.25
3-Feb	1,967,500	72,000	0	0	2,039,500	7.72
4-Feb	1,937,411	61,000	0	0	1,998,411	7.56
5-Feb	1,922,485	70,000	0	0	1,992,485	7.54
6-Feb	1,907,454	71,000	0	0	1,978,454	7.49
7-Feb	2,113,667	73,000	0	0	2,186,667	8.28
8-Feb	1,916,964	70,000	0	0	1,986,964	7.52
9-Feb	2,134,404	50,000	0	0	2,184,404	8.27
10-Feb	1,943,249	96,000	0	0	2,039,249	7.72
11-Feb	2,126,188	68,000	0	0	2,194,188	8.31
12-Feb	1,916,224	69,000	0	0	1,985,224	7.51
13-Feb	1,851,317	68,000	0	0	1,919,317	7.26
14-Feb	1,887,430	67,000	0	0	1,954,430	7.40
15-Feb	1,939,128	100,000	0	0	2,039,128	7.72
16-Feb	2,388,353	71,000	0	0	2,459,353	9.31
17-Feb	2,175,377	52,000	0	0	2,227,377	8.43
18-Feb	1,933,319	62,000	0	0	1,995,319	7.55
19-Feb	2,038,967	83,000	0	0	2,121,967	8.03
20-Feb	2,175,245	80,000	0	0	2,255,245	8.54
21-Feb	1,977,552	76,000	0	0	2,053,552	7.77
22-Feb	1,940,753	72,000	0	0	2,012,753	7.62
23-Feb	1,594,653	69,000	0	0	1,663,653	6.30
24-Feb	1,961,900	71,000	0	0	2,032,900	7.69
25-Feb	2,236,322	69,000	0	0	2,305,322	8.73
26-Feb	1,941,849	69,000	0	0	2,010,849	7.61
27-Feb	1,908,220	75,000	0	0	1,983,220	7.51
28-Feb	2,074,596	74,000	0	0	2,148,596	8.13
Totals Usgpd	56,444,934	1,858,000	0	0	58,302,934	220.68
Totals ML	213.64	7.03	0.00	0.00	221	
Avg's	2,015,890	7.63			2,082,248	7.88
Max	2,444,119	9.25			2,459,353	9.31
Min	1,594,653	6.04			1,663,653	6.30

2.0 RAW WATER QUALITY - BACTERIOLOGICAL MONITORING

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

Samples were taken at the Distribution Intake's Point of Disinfection and at the Mission Creek raw water Point of Diversion and 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 WTP lowers colour, turbidity and particle counts in the raw water. The *E. Coli* readings are consistent with the reduction in those other parameters. The *E. Coli* readings confirm the WTP's effectiveness in reducing raw water quality risks with coagulation, flocculation, and sedimentation process followed by settling times across Stevens and Hadden Reservoirs.

Figure 2.1 - Raw Water *E. Coli* Readings (CARO Lab results) January 2021 - February 2021

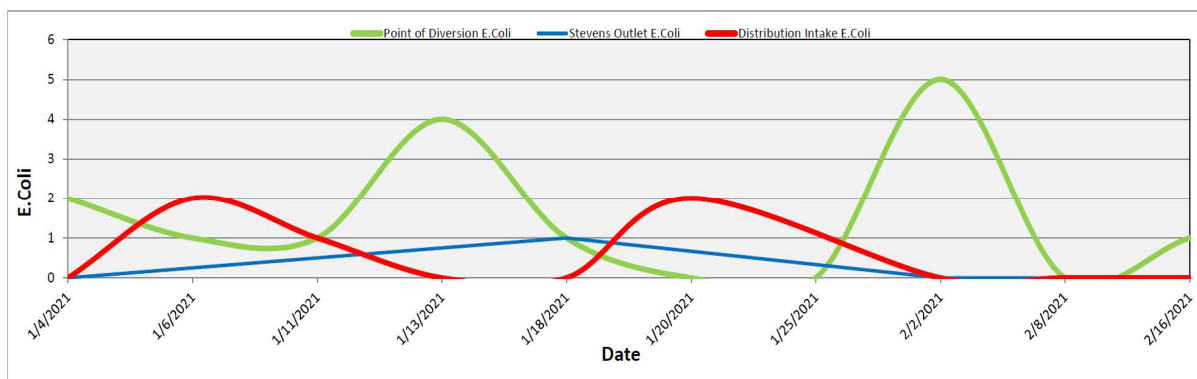


Table 2.1 - *E. Coli* Readings (CARO Labs)

Date	Point of Diversion E. Coli	Stevens Outlet E. Coli	Distribution Intake E. Coli
4-Jan-21	2	0	0
6-Jan-21	1	0	2
11-Jan-21	1	0	1
13-Jan-21	4	0	0
18-Jan-21	1	1	0
20-Jan-21	0	0	2
25-Jan-21	0	0	0
2-Feb-21	5	0	0
8-Feb-21	0	0	0
16-Feb-21	1	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 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

Through February 2021, turbidity for the Mission Creek source was measured at Booster Station No. 1 on Gallagher’s Road, which is the approximate location of the first-customer. The highest turbidity level recorded at this location was 0.77 NTU on February 11, 2021.

The distribution intake is where the water leaves Hadden Reservoir. Turbidity levels are greatly reduced through the settling process as Mission Creek treated water makes its way through the reservoirs.

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

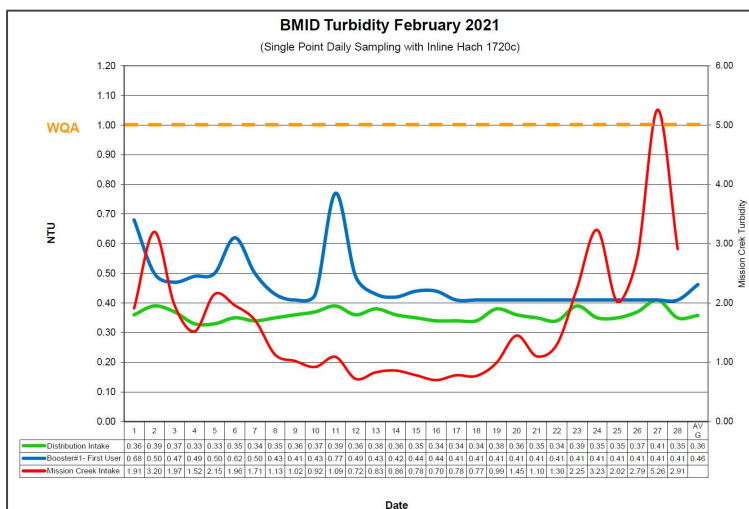


Table 3.1 - Daily Monitoring Record – Turbidity at Distribution Intake & Bst Stn 1

Turbidity Point Sampling for February 2021			
Date	Mission Creek Intake Daily Average [NTU]	Distribution Intake Daily Average NTU	Booster#1- First User Daily Average NTU
1	1.91	0.36	0.68
2	3.20	0.39	0.50
3	1.97	0.37	0.47
4	1.52	0.33	0.49
5	2.15	0.33	0.50
6	1.96	0.35	0.62
7	1.71	0.34	0.50
8	1.13	0.35	0.43
9	1.02	0.36	0.41
10	0.92	0.37	0.43
11	1.09	0.39	0.77
12	0.72	0.36	0.49
13	0.83	0.38	0.43
14	0.86	0.36	0.42
15	0.78	0.35	0.44
16	0.70	0.34	0.44
17	0.78	0.34	0.41
18	0.77	0.34	0.41
19	0.99	0.38	0.41
20	1.45	0.36	0.41
21	1.10	0.35	0.41
22	1.30	0.34	0.41
23	2.25	0.39	0.41
24	3.23	0.35	0.41
25	2.02	0.35	0.41
26	2.79	0.37	0.41
27	5.26	0.41	0.41
28	2.91	0.35	0.41
AVG	1.69	0.36	0.46

4.0 CHLORINE CONTACT TIME

Temperature, pH, peak 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 February, 2021.

Figure 4.1 - CT Trending – BMD Mission Creek Source – February 2021

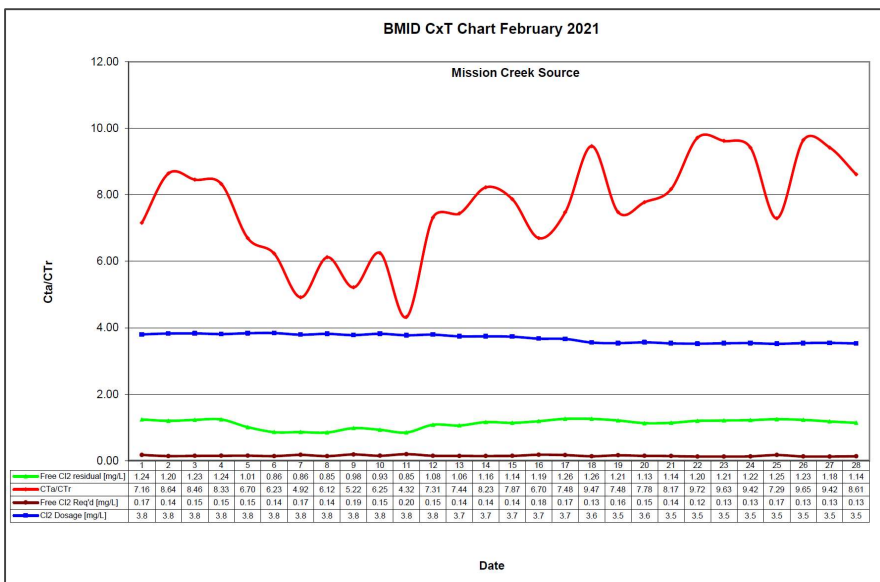


Table 4.2 - CT Table – Mission Creek Source

BMD February 2021													
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
	(Average)	(Present)	FLOW	residual	achieved	req'd		Req'd	Dosage	TOTAL	[mins]	Daily Average	Average
February		[°C]	[Usgpm]	[mg/L]				[mg/L]	[mg/L]	[USgal]		US Gallons	[PPD]
1	7.61	5.5	2308	1.24	1423.6	198.8	7.16	0.17	3.8	2649600	1148	1473	67
2	7.62	5.5	1853	1.20	1716.0	198.6	8.64	0.14	3.8	2649600	1430	1340	62
3	7.63	5.4	1913	1.23	1703.5	201.4	8.46	0.15	3.8	2649600	1385	1381	64
4	7.64	5.2	1923	1.24	1708.8	205.2	8.33	0.15	3.8	2649600	1378	1365	63
5	7.62	5.2	2023	1.01	1323.2	197.6	6.70	0.15	3.8	2649600	1310	1352	62
6	7.61	5.5	1942	0.86	1173.1	188.2	6.23	0.14	3.8	2649600	1364	1339	62
7	7.59	5.1	2412	0.86	944.5	192.1	4.92	0.17	3.8	2649600	1098	1492	68
8	7.58	4.6	1859	0.85	1211.3	197.9	6.12	0.14	3.8	2649600	1425	1350	62
9	7.56	3.0	2220	0.98	1169.7	224.3	5.22	0.19	3.8	2649600	1194	1508	69
10	7.48	3.5	1888	0.93	1305.3	208.9	6.25	0.15	3.8	2649600	1404	1366	63
11	7.31	3.1	2616	0.85	860.9	199.1	4.32	0.20	3.8	2649600	1013	1501	68
12	7.34	3.3	1900	1.08	1505.7	205.8	7.31	0.15	3.8	2649600	1394	1347	61
13	7.32	3.5	1879	1.06	1494.7	201.0	7.44	0.14	3.7	2649600	1410	1303	59
14	7.31	4.0	1906	1.16	1612.6	196.0	8.23	0.14	3.7	2649600	1390	1327	60
15	7.29	4.4	2033	1.14	1485.9	188.8	7.87	0.14	3.7	2649600	1303	1365	61
16	7.27	4.9	2584	1.19	1220.0	182.2	6.70	0.18	3.7	2649600	1025	1685	74
17	7.29	5.0	2429	1.26	1374.4	183.8	7.48	0.17	3.7	2649600	1091	1524	67
18	7.29	4.5	1853	1.26	1801.8	190.3	9.47	0.13	3.6	2649600	1430	1357	58
19	7.33	5.0	2312	1.21	1386.8	185.4	7.48	0.16	3.5	2649600	1146	1442	61
20	7.32	4.9	2091	1.13	1432.1	184.1	7.78	0.15	3.6	2649600	1267	1357	58
21	7.33	4.8	1984	1.14	1522.7	186.3	8.17	0.14	3.5	2649600	1336	1393	59
22	7.27	6.3	1977	1.20	1608.6	165.5	9.72	0.12	3.5	2649600	1341	1432	61
23	7.24	6.1	2004	1.21	1599.6	166.2	9.63	0.13	3.5	2649600	1322	1411	60
24	7.24	5.6	1992	1.22	1623.1	172.3	9.42	0.13	3.5	2649600	1330	1380	59
25	7.27	5.9	2653	1.25	1248.6	171.2	7.29	0.17	3.5	2649600	999	1571	66
26	7.25	5.9	1992	1.23	1635.7	169.5	9.65	0.13	3.5	2649600	1330	1365	58
27	7.25	6.0	1983	1.18	1576.8	167.3	9.42	0.13	3.5	2649600	1336	1345	57
28	7.22	5.6	2072	1.14	1458.0	169.3	8.61	0.13	3.5	2649600	1279	1462	62
Averages	7.40	4.9	2093	1.12	1433.1	189.2	7.64	0.15	3.7		1281	1412	63

5.0 ULTRAVIOLET DISINFECTION

Total Water Treated: 213667.4 m³ 100.0%
 On-Spec Water: 213,666.9 m³ 99.9998%
 Off-Spec Water: 0.5 m³ 0.0002%

Average monthly chlorine residual before UV Treatment was 1.16 mg/L
 The average monthly chlorine residual after UV treatment and re-chlorination was 1.38 mg/L.

Figure 5.1 - UV Disinfection – BMID Mission Creek Source – February 2021

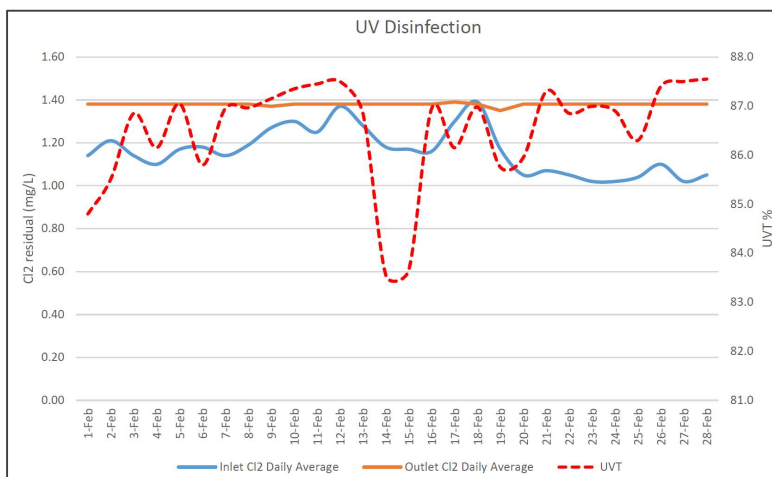


Table 5.2 - UV Disinfection Table – Mission Creek Source

Date	Inlet Cl2 Daily Average mg/L	Outlet Cl2 Daily Average mg/L	UVT % T	In Spec Water Volume Cubic Meters	Off Spec Water Cubic Meters	Off Spec % of Water Percentage
1-Feb	1.14	1.38	84.8	7912.1	0.5	0.01%
2-Feb	1.21	1.38	85.5	9252	0	0.00%
3-Feb	1.14	1.38	86.9	7447.8	0	0.00%
4-Feb	1.10	1.38	86.2	7333.9	0	0.00%
5-Feb	1.17	1.38	87.1	7277.4	0	0.00%
6-Feb	1.18	1.38	85.8	7220.5	0	0.00%
7-Feb	1.14	1.38	87.0	8001.1	0	0.00%
8-Feb	1.19	1.38	87.0	7256.5	0	0.00%
9-Feb	1.27	1.37	87.2	8079.6	0	0.00%
10-Feb	1.30	1.38	87.4	7356	0	0.00%
11-Feb	1.25	1.38	87.5	8048.5	0	0.00%
12-Feb	1.37	1.38	87.5	7253.7	0	0.00%
13-Feb	1.28	1.38	86.9	7008	0	0.00%
14-Feb	1.18	1.38	83.6	7144.7	0	0.00%
15-Feb	1.17	1.38	83.7	7340.4	0	0.00%
16-Feb	1.16	1.38	87.0	9040.9	0	0.00%
17-Feb	1.30	1.39	86.2	8234.7	0	0.00%
18-Feb	1.39	1.38	87.0	7318.41	0	0.00%
19-Feb	1.17	1.35	85.8	7718.33	0	0.00%
20-Feb	1.05	1.38	86.0	8234.2	0	0.00%
21-Feb	1.07	1.38	87.3	7485.85	0	0.00%
22-Feb	1.05	1.38	86.9	7346.55	0	0.00%
23-Feb	1.02	1.38	87.0	6036.42	0	0.00%
24-Feb	1.02	1.38	86.9	7426.6	0	0.00%
25-Feb	1.04	1.38	86.3	8465.4	0	0.00%
26-Feb	1.10	1.38	87.4	7350.7	0	0.00%
27-Feb	1.02	1.38	87.5	7223.4	0	0.00%
28-Feb	1.05	1.38	87.6	7853.2	0	0.00%
Average	1.16	1.38	86.5	Total 213666.86	0.5	0.0002%

6.0 WATER DISTRIBUTION SAMPLING (TREATED)

Third Party Analysis (CARO Analytical Services)

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

Table 6.1 - CARO Independent Lab Testing – Total Coliforms – E.Coli

Date	2021 Belgo Rd		Booster 1		Elison Blow-Off		Elison School		3976 Highway 97		Prospect Reservoir		Tower Reservoir		Well #4		Kirschner Res		Pearson School	
	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	Coliforms	E.coli
4-Jan-21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Jan-21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Jan-21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Jan-21	0	0	0	0	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Jan-21	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Feb-21	0	0	0	0	-	-	-	-	-	-	0	0	-	-	0	0	0	0	0	0
8-Feb-21	-	-	0	0	0	0	0	0	0	0	-	-	0	0	-	-	-	-	0	0
16-Feb-21	0	0	0	0	-	-	-	-	-	-	0	0	-	-	0	0	0	0	0	0
22-Feb-21	-	-	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 seven sites around the BMID service area.
- All 9 samples were found to be absent of both Total Coliforms and *E. Coli*.

Table 6.2 - BMID In-house Testing – Presence Absence

Location	2/1/2021				2/8/2021				2/16/2021				2/22/2021			
	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.
Sylvania Cres									0.66	8.6	-	X				
170 Kneller Rd									0.63	7.6	-	X				
2105 Morrison					0.77	6.4	-	X								
Staymen Rd					0.36	8.8	-	X								
260 Campion Rd	0.33	8.4	-	X									0.54	7.1	-	X
Fenwick Rd	0.00	10.8	-	X									0.09	11.1	-	X
Solly Ct									0.77	9.2	-	X				

- BMID Population = 25,000

RECOMMENDED TESTS

- Recommended number of samples per month = 25
(as per Guide for Canadian Drinking Water Quality)

ACTUAL TESTS

- Total tests by BMID staff (presence/absence) = 9
- Total tests sampled by BMID and tested by Caro Labs = 25
- Total tests sampled in BMID treated distribution system = 25 (Zero Positive Samples)