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BMID FILE: 486

MONTHLY REPORTING PERIOD - FEBRUARY, 2024

SUMMARY

This document provides a summary of the water quality information collected by BMID in February 2024. Documentation and figures are provided on the following pages to support this submission.

WATER SUPPLY & USAGE SUMMARY

1. Water usage data for February, 2024 is as follows:

Source	Total (US Gallons)	Total (Mega Litres)
Mission Creek	62,386,252	236.13
Well 4	3,471,458	13.14
Well 5	0	0
Well 6 (Irrigation Only)	0	0
Scotty Creek (Irrigation Only)	0	0
Total	65,857,710	249.27

2. The control gates for all of BMID's high-elevation reservoirs are closed for the season. The reservoirs will be opened after spring freshet 2024, to supplement flows in Mission Creek during the summer/fall;
3. BMID's Scotty Creek source supplying irrigation water to the north-end of the service area, was placed in stand-by mode on September 8th, 2023. The Scotty Creek source will remain in stand-by until irrigation demands increase in the summer of 2024;
4. Well #5, used as the primary water source in the north-end of the system for both irrigation and domestic consumption, was placed in stand-by mode on September 29th, 2023. Well #5 will resume operations in the summer of 2024 as irrigation demands increase in the north-end;
5. Well #4, used as a primary source for domestic water in the north-end of the distribution system during low-flow periods, resumed operation on September 27th, 2023. Well #4 was in operation throughout February and will remain in service until the spring/summer of 2024;
6. Well #6, which supplies water to the north-end irrigation distribution system, was placed in stand-by mode on September 24th, 2023. Well #6 will resume operations in the summer of 2024;
7. 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 continues to be monitored. It is currently stable and is not moving;

WATER QUALITY SUMMARY

1. The WTP was in operation throughout much of February as Mission Creek had experienced increased turbidity and colour in the raw water. The WTP remained in stand-by mode for the remainder of February when Mission Creek had acceptable turbidity and colour in the raw water. The WTP remains available to treat water when raw water quality diminishes;
2. Raw water turbidity levels in Mission Creek peaked at 3.17 NTU on February 2nd. Average daily raw water turbidity for February was 1.58 NTU at the Mission Creek Intake;
3. The highest turbidity level at the Distribution Intake (end of Hadden Reservoir) was 0.58 NTU on February 29th, 2024. Average settled water turbidity for February was 0.44 NTU at the Distribution Intake at the lower end of Hadden Reservoir;
4. The highest turbidity level at the first customer (Booster #1) was 0.48 NTU on February 29th. Average monthly turbidity at the first customer was 0.40 NTU;
5. Average daily turbidity at the UV station peaked at 0.86 NTU on February 29th. The turbidity meter reads consistently higher at this location, however, the turbidity results upstream and downstream of the UV plant have lower turbidity results. Average monthly turbidity at the UV disinfection station was 0.72 NTU;
6. BMID's Ultraviolet Treatment Facility treated 228,344 m^3 of water, 27 m^3 of which was Off-Spec (0.018%);
7. Regarding microbiological readings, BMID ceased withdrawing water from the upper elevation reservoirs earlier in the fall. Throughout the remainder of winter, Mission Creek is expected to have stable microbiological readings as freezing conditions continue in the watershed;
8. *E.Coli* levels at Mission Creek's Point-of-Diversion (creek intake prior to WTP) had normal counts for February. The February 5th sample had the peak monthly count of 6 coliforms. The average monthly *E.Coli* was 6, based on 4 samples;
9. *E.Coli* levels in the raw water at the water distribution system intake at the east end of Hadden Reservoir, immediately prior to disinfection, had a peak count of 1 on February 12th. Average *E.Coli* reading for the month was 0.25 coliforms/sample based on 4 samples. Reduction in *E.Coli* levels is due to the effectiveness of the Water Treatment Plant as well as the settling of particles as water passes through Stevens and Hadden Reservoirs;
10. No *E.Coli* or *Total* Coliforms were found in treated water in the distribution system through third-party analysis. In addition, zero positive samples were detected by BMID's in-house presence/absence testing throughout February;

1.0 FLOWS - FEBRUARY, 2024

The Maximum Daily Flow was on February 7th, at 2,485,065 US gallons (9.41 ML)

The Minimum Daily Flow was on February 18th, at 2,061,545 US gallons (7.80 ML)

Mission Creek provided 95% of domestic flow supplied in February.

Figure 1.1 - Domestic Water System Flow

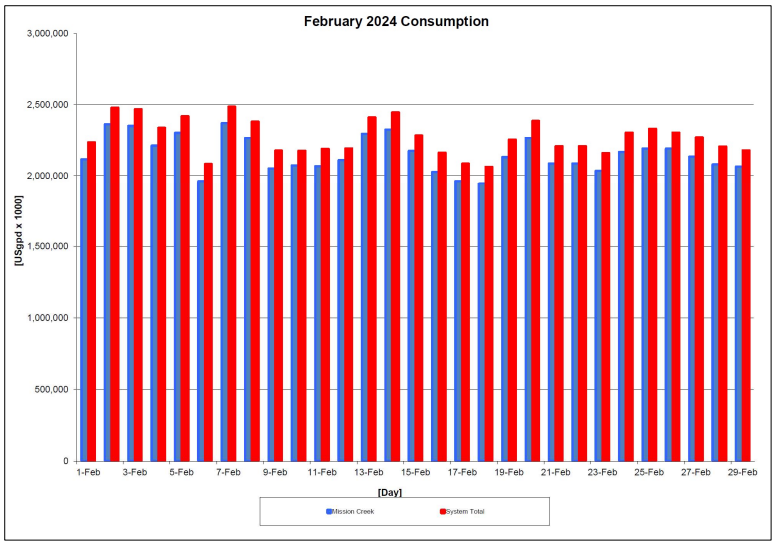


Table 1.2 - February 2024 - Daily Consumption Report

Year	Mission Creek	Well #4	Well #5	Well #6	System Total	System Total
2024	Usgpd	Usgpd	Usgpd	Usgpd	Usgpd	ML/Day
1-Feb	2,115,859	118,348	0	0	2,234,207	8.46
2-Feb	2,362,120	115,971	0	0	2,478,091	9.38
3-Feb	2,349,361	117,291	0	0	2,466,652	9.34
4-Feb	2,211,542	124,688	0	0	2,336,231	8.84
5-Feb	2,300,595	117,291	0	0	2,417,886	9.15
6-Feb	1,960,103	122,047	0	0	2,082,150	7.88
7-Feb	2,369,359	115,706	0	0	2,485,065	9.41
8-Feb	2,264,562	115,178	0	0	2,379,740	9.01
9-Feb	2,050,318	126,537	0	0	2,176,856	8.24
10-Feb	2,072,746	102,498	0	0	2,175,244	8.23
11-Feb	2,067,701	120,726	0	0	2,188,426	8.28
12-Feb	2,109,123	82,949	0	0	2,192,072	8.30
13-Feb	2,294,756	115,178	0	0	2,409,935	9.12
14-Feb	2,322,864	121,782	0	0	2,444,647	9.25
15-Feb	2,174,558	107,517	0	0	2,282,075	8.64
16-Feb	2,025,433	136,840	0	0	2,162,273	8.18
17-Feb	1,961,609	122,311	0	0	2,083,920	7.89
18-Feb	1,943,725	117,820	0	0	2,061,545	7.80
19-Feb	2,130,574	123,103	0	0	2,253,677	8.53
20-Feb	2,265,407	119,933	0	0	2,385,340	9.03
21-Feb	2,086,298	121,254	0	0	2,207,552	8.36
22-Feb	2,086,351	121,518	0	0	2,207,869	8.36
23-Feb	2,033,781	124,688	0	0	2,158,469	8.17
24-Feb	2,167,980	134,727	0	0	2,302,707	8.72
25-Feb	2,191,069	138,689	0	0	2,329,758	8.82
26-Feb	2,191,122	111,216	0	0	2,302,337	8.71
27-Feb	2,133,876	135,255	0	0	2,269,131	8.59
28-Feb	2,079,219	125,745	0	0	2,204,963	8.35
29-Feb	2,064,240	114,650	0	0	2,178,890	8.25
Totals Usgpd	62,386,252	3,471,458	0	0	65,857,710	249.27
Totals ML	236.13	13.14	0.00	0.00	249	
Avg's	2,154,358	8.15			2,274,244	8.60
Max	2,369,359	8.97			2,485,065	9.41
Min	1,943,725	7.36			2,061,545	7.80

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 control gates on BMID's high-elevation reservoirs were closed throughout February, making for a greater contribution of ground water to the overall flow of Mission Creek leading to reduced E.Coli levels in the raw water.

Figure 2.1 - Raw Water *E.Coli* Readings (CARO Lab results) January 2024 - February 2024

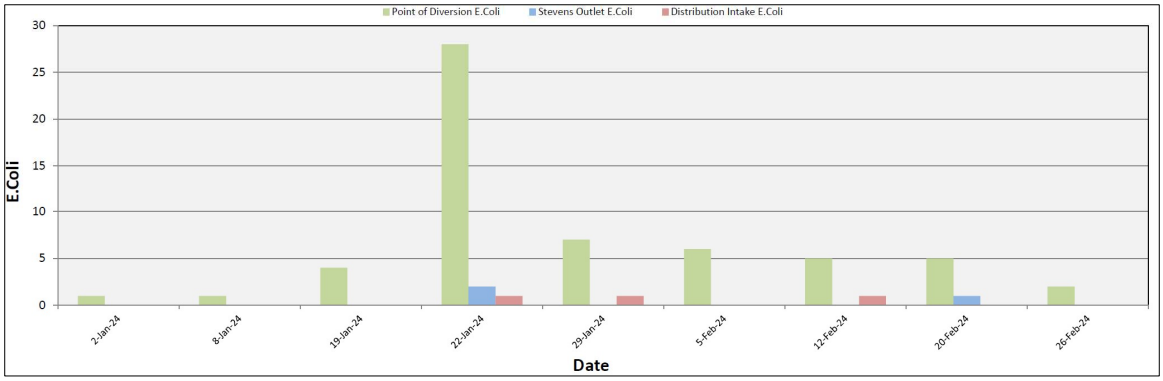


Table 2.1 - *E.Coli* Readings (CARO Labs)

Date	Point of Diversion E.Coli	Stevens Outlet E.Coli	Distribution Intake E.Coli
2-Jan-24	1	0	0
8-Jan-24	1	0	0
19-Jan-24	4	0	0
22-Jan-24	28	2	1
29-Jan-24	7	0	1
5-Feb-24	6	0	0
12-Feb-24	5	0	1
20-Feb-24	5	1	0
26-Feb-24	2	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^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 = Distribution Intake - Point of Disinfection*)

3.0 RAW AND TREATED WATER TURBIDITY

Through February 2024, 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 0.48 NTU on February 29th 2024. The lowest turbidity level was 0.35 NTU and the average turbidity was 0.40 NTU.

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

Figure 3.1 – Daily Turbidity Readings (Mission Creek Raw - Distribution Intake - Booster Station 1 and UV Plant)

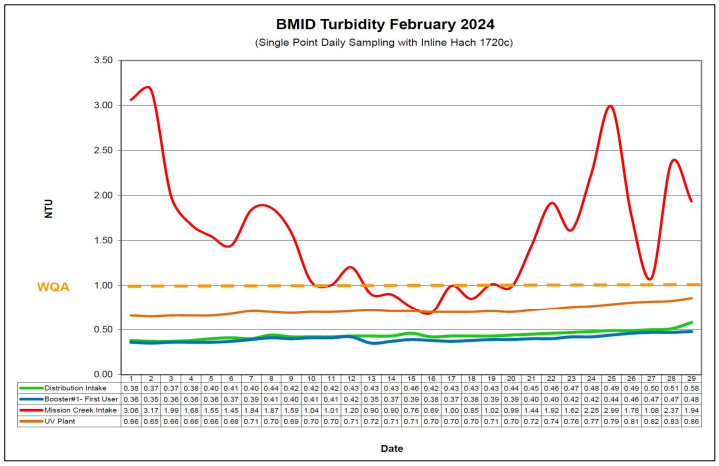


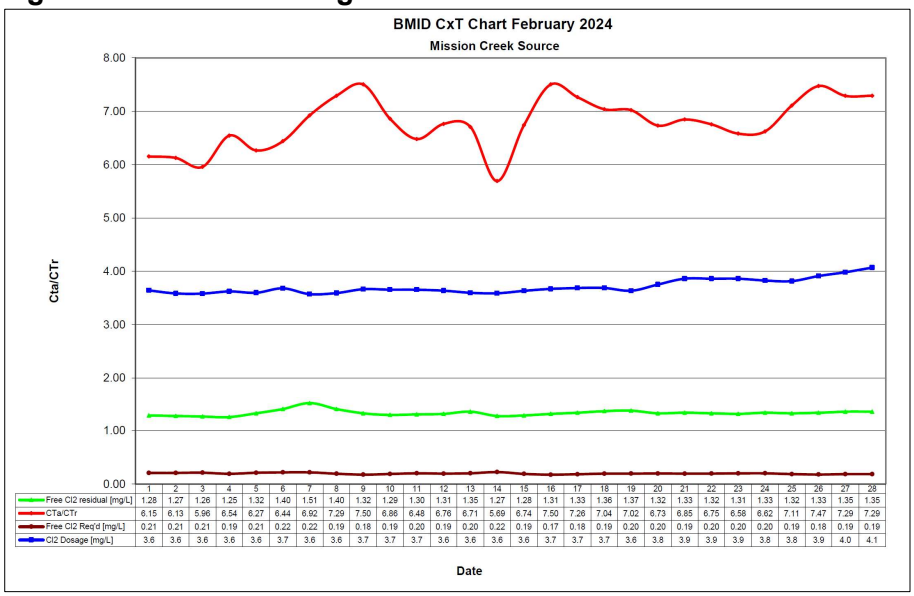
Table 3.1 - Daily Monitoring Record – Turbidity at On-Line Turbidity Analysers

Turbidity Point Sampling for February 2024				
Date	Mission Creek Intake Daily Average [NTU]	Distribution Intake Daily Average NTU	Booster#1- First User Daily Average NTU	UV Plant Daily Average [NTU]
1	3.06	0.38	0.36	0.66
2	3.17	0.37	0.35	0.65
3	1.99	0.37	0.36	0.66
4	1.68	0.38	0.36	0.66
5	1.55	0.40	0.36	0.66
6	1.45	0.41	0.37	0.68
7	1.84	0.40	0.39	0.71
8	1.87	0.44	0.41	0.70
9	1.59	0.42	0.40	0.69
10	1.04	0.42	0.41	0.70
11	1.01	0.42	0.41	0.70
12	1.20	0.43	0.42	0.71
13	0.90	0.43	0.35	0.72
14	0.90	0.43	0.37	0.71
15	0.76	0.46	0.39	0.71
16	0.69	0.42	0.38	0.70
17	1.00	0.43	0.37	0.70
18	0.85	0.43	0.38	0.70
19	1.02	0.43	0.39	0.71
20	0.99	0.44	0.39	0.70
21	1.44	0.45	0.40	0.72
22	1.92	0.46	0.40	0.74
23	1.62	0.47	0.42	0.76
24	2.25	0.48	0.42	0.77
25	2.99	0.49	0.44	0.79
26	1.78	0.49	0.46	0.81
27	1.08	0.50	0.47	0.82
28	2.37	0.51	0.47	0.83
29	1.94	0.58	0.48	0.86
AVG	1.58	0.44	0.40	0.72

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, 2024.

Figure 4.1 - CT Trending – BMID Mission Creek Source – February 2024



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Free Cl2 residual [mg/L]	1.28	1.27	1.26	1.25	1.32	1.40	1.51	1.40	1.32	1.29	1.30	1.31	1.35	1.27	1.28	1.31	1.33	1.36	1.37	1.32	1.33	1.32	1.31	1.33	1.32	1.33	1.35	1.35
CTa/CTr	6.15	6.13	5.96	6.54	6.27	6.44	6.92	7.29	7.50	6.86	6.48	6.76	6.71	5.69	6.74	7.50	7.26	7.04	7.02	6.73	6.85	6.75	6.58	6.62	7.11	7.47	7.29	7.29
Free Cl2 Req'd [mg/L]	0.21	0.21	0.21	0.19	0.21	0.22	0.22	0.19	0.18	0.19	0.20	0.19	0.20	0.22	0.19	0.17	0.18	0.19	0.20	0.20	0.19	0.20	0.20	0.20	0.19	0.18	0.19	0.19
Cl2 Dosage [mg/L]	3.6	3.6	3.6	3.6	3.6	3.7	3.6	3.6	3.7	3.7	3.7	3.6	3.6	3.6	3.6	3.7	3.7	3.7	3.6	3.8	3.9	3.9	3.9	3.8	3.8	3.9	4.0	4.1

Table 4.2 - CT Table – Mission Creek Source

	BMID February 2024												
	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		Daily Average	Average
February		[°C]	[Usgpm]	[mg/L]				[mg/L]	[mg/L]	[USgal]	[mins]	US Gallons	[PPD]
1	7.41	2.6	2424	1.28	1398.9	227.4	6.15	0.21	3.6	2649600	1093	1474	65
2	7.42	2.7	2427	1.27	1386.7	226.4	6.13	0.21	3.6	2649600	1092	1662	72
3	7.42	2.8	2496	1.26	1337.7	224.5	5.96	0.21	3.6	2649600	1062	1659	71
4	7.39	2.9	2298	1.25	1441.6	220.3	6.54	0.19	3.6	2649600	1153	1560	68
5	7.37	2.7	2496	1.32	1401.0	223.6	6.27	0.21	3.6	2649600	1061	1621	70
6	7.37	2.7	2554	1.40	1452.2	225.6	6.44	0.22	3.7	2649600	1037	1384	61
7	7.36	2.8	2561	1.51	1562.5	225.7	6.92	0.22	3.6	2649600	1035	1668	72
8	7.32	2.8	2313	1.40	1603.5	219.9	7.29	0.19	3.6	2649600	1145	1601	69
9	7.32	2.6	2109	1.32	1658.4	221.1	7.50	0.18	3.7	2649600	1256	1445	64
10	7.32	2.6	2262	1.29	1511.1	220.3	6.86	0.19	3.7	2649600	1171	1457	64
11	7.32	2.6	2411	1.30	1428.7	220.6	6.48	0.20	3.7	2649600	1099	1455	64
12	7.32	2.6	2324	1.31	1493.2	220.8	6.76	0.19	3.6	2649600	1140	1487	65
13	7.32	2.3	2355	1.35	1518.6	226.5	6.71	0.20	3.6	2649600	1125	1618	70
14	7.32	2.5	2672	1.27	1259.6	221.3	5.69	0.22	3.6	2649600	992	1635	71
15	7.32	2.3	2240	1.28	1513.8	224.7	6.74	0.19	3.6	2649600	1183	1530	67
16	7.32	2.1	2024	1.31	1714.8	228.6	7.50	0.17	3.7	2649600	1309	1422	63
17	7.32	2.4	2162	1.33	1630.0	224.4	7.26	0.18	3.7	2649600	1226	1384	61
18	7.34	2.3	2242	1.36	1607.2	228.4	7.04	0.19	3.7	2649600	1182	1372	61
19	7.37	2.7	2300	1.37	1578.3	224.8	7.02	0.20	3.6	2649600	1152	1504	66
20	7.37	3.0	2373	1.32	1474.0	219.0	6.73	0.20	3.8	2649600	1117	1597	72
21	7.37	3.0	2348	1.33	1500.7	219.2	6.85	0.19	3.9	2649600	1128	1463	68
22	7.37	3.0	2365	1.32	1478.9	219.0	6.75	0.20	3.9	2649600	1120	1433	67
23	7.34	2.9	2421	1.31	1433.6	217.9	6.58	0.20	3.9	2649600	1094	1429	66
24	7.37	3.2	2462	1.33	1431.6	216.2	6.62	0.20	3.8	2649600	1076	1529	70
25	7.37	3.4	2310	1.32	1513.9	213.0	7.11	0.19	3.8	2649600	1147	1549	71
26	7.37	3.5	2227	1.33	1582.4	211.8	7.47	0.18	3.9	2649600	1190	1504	71
27	7.37	3.6	2328	1.35	1536.2	210.8	7.29	0.19	4.0	2649600	1138	1471	70
28	7.37	3.5	2312	1.35	1547.3	212.2	7.29	0.19	4.1	2649600	1146	1448	71
29	7.35	4.4	2228	1.29	1534.3	196.6	7.80	0.17	4.1	2649600	1189	1439	70
Averages	7.36	2.8	2346	1.33	1501.1	220	6.82	0.2	4	2649600	1133.1	1510	67.51

5.0 ULTRAVIOLET DISINFECTION

Total Water Treated:	228,334 m^3	100.00%
On-Spec Water:	228,317 m^3	99.988%
Off-Spec Water:	27 m^3	0.0117%

Average monthly chlorine residual before UV Treatment was 1.40 mg/L
The average monthly chlorine residual after UV treatment and re-chlorination was 1.40 mg/L.

Figure 5.1 - UV Disinfection – BMID Mission Creek Source – February 2024

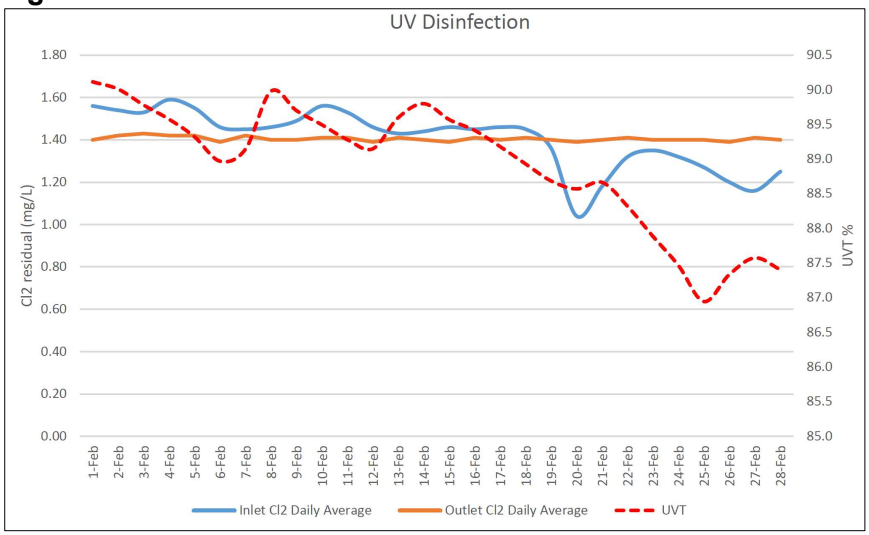


Table 5.2 - UV Disinfection Table – Mission Creek Source

	Inlet Cl2 Daily Average	Outlet Cl2 Daily Average		UVT	Turbidity		In Spec Water Volume	Off Spec Water	Off Spec % of Water
Date	mg/L	mg/L		% T	NTU		Cubic Meters	Cubic Meters	Percentage
1-Feb	1.56	1.4		90.1	0.66		7984	25.4	0.32%
2-Feb	1.54	1.42		90.0	0.65		8940.3	1.3	0.01%
3-Feb	1.53	1.43		89.8	0.66		8893.3	0	0.00%
4-Feb	1.59	1.42		89.6	0.66		8371.6	0	0.00%
5-Feb	1.55	1.42		89.3	0.66		8708.7	0	0.00%
6-Feb	1.46	1.39		89.0	0.68		7419.8	0	0.00%
7-Feb	1.45	1.42		89.1	0.71		8969	0	0.00%
8-Feb	1.46	1.4		90.0	0.70		8572.3	0	0.00%
9-Feb	1.49	1.4		89.7	0.69		7761.3	0	0.00%
10-Feb	1.56	1.41		89.5	0.70		7846.2	0	0.00%
11-Feb	1.53	1.41		89.3	0.70		7827.1	0	0.00%
12-Feb	1.46	1.39		89.2	0.71		7983.9	0	0.00%
13-Feb	1.43	1.41		89.6	0.72		8686.6	0	0.00%
14-Feb	1.44	1.4		89.8	0.71		8793	0	0.00%
15-Feb	1.46	1.39		89.6	0.71		8231.6	0	0.00%
16-Feb	1.45	1.41		89.4	0.70		7667.1	0	0.00%
17-Feb	1.46	1.4		89.2	0.70		7425.5	0	0.00%
18-Feb	1.45	1.41		88.9	0.70		7357.8	0	0.00%
19-Feb	1.36	1.4		88.7	0.71		8065.1	0	0.00%
20-Feb	1.04	1.39		88.6	0.70		8575.5	0	0.00%
21-Feb	1.18	1.4		88.7	0.72		7897.5	0	0.00%
22-Feb	1.32	1.41		88.3	0.74		7897.7	0	0.00%
23-Feb	1.35	1.4		87.9	0.76		7698.7	0	0.00%
24-Feb	1.32	1.4		87.5	0.77		8206.7	0	0.00%
25-Feb	1.27	1.4		86.9	0.79		8294.1	0	0.00%
26-Feb	1.20	1.39		87.3	0.81		8294.3	0	0.00%
27-Feb	1.16	1.41		87.6	0.82		8077.6	0	0.00%
28-Feb	1.25	1.4		87.4	0.83		7870.7	0	0.00%
29-Feb	1.32	1.4		87.0	0.86		11632.6	0	0.00%
Average	1.40	1.40		88.9		Total	228317	26.7	0.0117%

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

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

	2921 Belgo Rd		Booster 1		Ellison Blow-Off		Ellison School		3976 Highway 97		Prospect Reservoir		Tower Reservoir		Well #4		Kirschner Res		Pearson School	
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	Coliforms	E.coli	Coliforms	E.coli
2-Jan-24			0	0	0	0	0	0	0	0			0	0	0	0				
8-Jan-24	0	0	0	0							0	0			0	0	0	0	0	0
19-Jan-24			0	0	0	0	0	0	0	0			0	0	0	0				
22-Jan-24	0	0	0	0							0	0			0	0	0	0	0	0
29-Jan-24			0	0	0	0	0	0	0	0			0	0						
5-Feb-24	0	0	0	0							0	0			0	0	0	0	0	0
12-Feb-24			0	0	0	0	0	0	0	0			0	0	0	0				
20-Feb-24	0	0	0	0							0	0			0	0	0	0	0	0
26-Feb-24			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 10 samples were found to be absent of both *Total Coliforms* and *E.Coli*.

Table 6.2 - BMID In-house Testing – Presence Absence

	2/5/2024				2/12/2024				2/20/2024				2/27/2024			
Location	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.	Cl2	Temp.	Pres.	Abs.
Sylvania Cres	0.86	8.8	-	X									0.97	8.0	-	X
170 Kneller Rd	0.98	4.8	-	X									0.91	2.2	-	X
2105 Morrison					0.69	9.8	-	X								
Staymen Rd					0.78	10.6	-	X								
260 Campion Rd									0.63	9.2	-	X				
Fenwick Rd									0.60	9.2	-	X				
Solly Ct	1.01	5.8	-	X									0.96	3.4	-	X

- BMID Population = 28,000

RECOMMENDED TESTS

- Recommended number of samples per month = 28

  (as per Guide for Canadian Drinking Water Quality)

ACTUAL TESTS

- Total tests by BMID staff (presence/absence) = 10
- Total tests sampled by BMID and tested by Caro Labs 24
- Total tests sampled in BMID treated distribution system = 34
- 0 Positive *E.Coli* and Total Coliform Samples