

MONTHLY OPERATION REPORT OF THE CITY OF BENTON HARBOR WATER FILTRATION PLANT
SUPPLY NAME: CITY OF BENTON HARBOR | WSSN: 0600

For the month/year of
January 2023

County:
Berrien

Abul D. Ahmed
 Certified Operator

F-1
 Water Plant Classification


 Signature

Operator-in-Charge
 Title

Treatment Rate and Filter Data

1. Maximum Treatment Rate	<u>5.710</u>	million gallons per day
2. Approved Rated Plant Capacity	<u>8</u>	million gallons per day
3. Average Filter Run	<u>113.2</u>	hours
4. Average Filtration Rate	<u>0.29</u>	gallons per square ft. per minute
5. Maximum Filtration Rate	<u>2.74</u>	gallons per square ft. per minute
6. Average Wash Water Use	<u>0.01</u>	percent of treated water

Chemical Data

7. Chlorine on hand	<u>23310</u> lbs.	Est. Supply	<u>77</u> days
8. Alum (Al ³⁺) on hand	<u>40498</u> lbs.	Est. Supply	<u>205</u> days
9. Cost of All Chemicals	<u>212.83</u>	dollars per million gallons	
10. Total Power Cost	<u>0.00</u>	dollars per million gallons	

Remarks

	North Filter	South Filter
Number of filter confluence samples >0.3 NTU	<u>0</u>	<u>0</u>
Number of filter confluence samples collected	<u>65</u>	<u>65</u>
Percent of filter confluence samples >0.3 NTU	<u>0%</u>	<u>0%</u>
Number of filter confluence samples >1 NTU	<u>0</u>	<u>0</u>

Did any individual filter exceed:

1.0 NTU in two consecutive measurements taken 15 minutes apart?	<u>No</u>
If yes, attach specific filter(s) information and indicate required follow up status.	
0.5 NTU in two consecutive measurements taken 15 minutes apart after 4 hours of operation?	<u>No</u>
If yes, attach specific filter(s) information and indicate required follow up status.	
1.0 NTU in two consecutive measurements taken 15 minutes apart for 3 consecutive months?	<u>No</u>
If yes, attach specific filter(s) information and indicate required follow up status.	
2.0 NTU in two consecutive measurements taken 15 minutes apart for 2 consecutive months?	<u>No</u>
If yes, attach specific filter(s) information and indicate required follow up status.	
Did plant tap disinfectant residual fall below 0.2 ppm during the month?	<u>No</u>
If yes, indicate date(s) and duration on a separate sheet	
Was minimum C*T credit achieved for the entire month?	<u>Yes</u>
If no, indicate on a separate sheet the date(s) not achieved	
Was continuous POE chlorine residual monitoring equipment off-line during the month?	<u>No</u>
If yes, indicate date(s) and duration on a separate sheet	
Was continuous (every 15 minutes) filter monitoring equipment off-line during the month?	<u>No</u>
If yes, indicate date(s) and duration on a separate sheet.	

Distribution MGD

Total 26.831 **Average** 0.866 **Max** 1.121 **Min** 0.679

Comments

Filters 11 and 12 were off line on 1/3/2023.
 A distribution system sample could not be collected at Wolf Marine on 1/4/2023 because they were closed for the holidays.

DATE	Million Gallons Treated	Alum Added lbs	Alum Applied as Product mg/L <i>NSF Max 400 mg/L</i>	Alum as Al ³⁺ mg/L	Turbidity Units														
					Raw			Applied	North Filter			South Filter			No. of 2 hr Compliance periods	No. of 4 hr Compliance periods >0.3 NTU	No. of samples >0.3 NTU	Plant Tap	
					Number of Samples	Avg.	Max.	Avg.	Number of Samples	Avg.	Max.	Number of Samples	Avg.	Max.				Avg.	Max.
1	1.103	217	23.6	1.04	2	2.00	2.50	0.78	2	0.10	0.10	2	0.09	0.09	4	0	0	0.13	0.13
2	0.908	177	23.4	1.03	2	1.40	1.50	0.63	2	0.11	0.12	2	0.10	0.10	4	0	0	0.14	0.14
3	0.909	175	23.1	1.01	2	3.06	4.24	0.57	2	0.13	0.14	2	0.14	0.14	4	0	0	0.13	0.14
4	1.108	219	23.7	1.04	3	5.60	13.90	1.23	3	0.12	0.12	3	0.12	0.12	6	0	0	0.13	0.13
5	0.973	191	23.5	1.03	2	2.80	3.20	0.98	2	0.15	0.15	2	0.13	0.13	4	0	0	0.13	0.14
6	1.133	221	23.4	1.03	3	1.70	2.60	0.71	3	0.13	0.14	3	0.10	0.11	6	0	0	0.13	0.16
7	0.870	172	23.7	1.04	2	1.30	1.30	0.68	2	0.11	0.11	2	0.13	0.14	4	0	0	0.12	0.12
8	0.913	183	24.0	1.05	2	1.00	1.20	0.61	2	0.11	0.11	2	0.10	0.10	4	0	0	0.13	0.13
9	0.842	172	24.5	1.07	2	2.10	3.20	0.70	2	0.12	0.14	2	0.12	0.14	4	0	0	0.11	0.11
10	0.853	171	24.0	1.06	2	1.60	1.90	0.50	2	0.09	0.09	2	0.11	0.11	4	0	0	0.12	0.12
11	0.730	146	24.0	1.05	2	0.99	1.10	0.57	2	0.11	0.13	2	0.10	0.10	4	0	0	0.15	0.15
12	0.943	200	25.4	1.12	2	1.10	1.40	0.53	2	0.10	0.10	2	0.09	0.11	4	0	0	0.12	0.12
13	0.790	168	25.5	1.12	2	2.10	2.10	0.50	2	0.10	0.10	2	0.10	0.10	4	0	0	0.12	0.12
14	0.865	176	24.4	1.07	2	3.10	3.90	0.64	2	0.10	0.11	2	0.10	0.11	4	0	0	0.13	0.14
15	0.901	180	24.0	1.05	2	3.90	4.20	0.88	2	0.11	0.11	2	0.11	0.11	4	0	0	0.11	0.11
16	0.855	176	24.7	1.08	2	2.80	3.50	1.10	2	0.12	0.13	2	0.12	0.13	4	0	0	0.11	0.11
17	1.036	165	19.1	0.84	2	2.60	3.30	0.70	2	0.12	0.14	2	0.12	0.12	4	0	0	0.14	0.15
18	0.897	188	25.1	1.10	2	2.20	2.30	0.72	2	0.09	0.09	2	0.12	0.14	4	0	0	0.13	0.14
19	0.813	174	25.6	1.13	2	2.20	2.40	0.63	2	0.10	0.10	2	0.11	0.12	4	0	0	0.12	0.14
20	0.820	169	24.7	1.08	2	3.40	4.40	0.72	2	0.11	0.11	2	0.09	0.09	4	0	0	0.11	0.11
21	0.711	139	23.4	1.03	2	2.20	2.40	0.68	2	0.09	0.10	2	0.10	0.10	4	0	0	0.12	0.12
22	0.932	187	24.0	1.06	2	2.10	2.40	0.64	2	0.10	0.10	2	0.09	0.09	4	0	0	0.14	0.15
23	1.210	241	23.9	1.05	3	2.30	3.70	0.75	3	0.13	0.14	3	0.13	0.16	6	0	0	0.10	0.12
24	0.850	174	24.5	1.08	2	1.33	1.89	0.59	2	0.14	0.15	2	0.08	0.09	4	0	0	0.11	0.11
25	0.837	173	24.8	1.09	2	2.70	3.20	0.82	2	0.11	0.13	2	0.10	0.10	4	0	0	0.11	0.11
26	0.931	189	24.3	1.07	2	2.30	2.60	0.83	2	0.11	0.11	2	0.11	0.11	4	0	0	0.12	0.12
27	0.887	179	24.2	1.06	2	3.50	4.10	0.68	2	0.12	0.12	2	0.11	0.13	4	0	0	0.11	0.11
28	0.854	167	23.4	1.03	2	3.90	4.00	1.01	2	0.11	0.11	2	0.10	0.11	4	0	0	0.11	0.11
29	0.847	162	22.9	1.01	2	3.60	3.60	1.05	2	0.09	0.10	2	0.11	0.12	4	0	0	0.11	0.12
30	0.796	386	58.1	2.55	2	4.34	5.41	0.85	2	0.14	0.15	2	0.16	0.16	4	0	0	0.15	0.15
31	1.062	484	54.6	2.40	2	4.65	5.26	0.57	2	0.11	0.13	2	0.11	0.12	4	0	0	0.09	0.12
AVG	0.909			1.14	2	2.58		0.74		0.11			0.11					0.12	0.13
MAX	1.210			2.55	3	5.60	13.90	1.23		0.15	0.15		0.16	0.16				0.15	0.16
MIN	0.711			0.84	2	0.99		0.50		0.09			0.08					0.09	0.11
TOTAL	28.176	6121			65				65			65				0	0		

Date	pH		Total Hardness as CaCO ₃ mg/L		Total Alkalinity as CaCO ₃ mg/L		Non-Carb. Hardness as CaCO ₃ mg/L		Calcium as Ca ⁺⁺ mg/L		Magnesium as Mg ⁺⁺ mg/L		Chloride as Cl ⁻ mg/L		Conductivity umhos	Sulfate mg/L	CSMR
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Tap	Tap	Tap
1	8.0	7.5	210	202	140	125	70	77	45	42	17	19		27	385	41	0.65
2	7.9	7.5	214	208	132	131	82	77	46	43	20	19		27	396	43	0.63
3	8.1	7.8	184	168	144	127	40	41	56	60	10	10		24	408	30	0.80
4	8.1	8.0	160	158	127	126	33	32	46	51	8	8		25	378	35	0.70
5	8.1	7.9	158	164	128	127	30	37	51	55	7	9		27	376	33	0.80
6	8.2	8.0	150	162	118	131	32	31	43	55	8	8	21	27	393	34	0.78
7	8.3	8.1	154	162	118	126	36	36	44	47	9	9		25	367	32	0.77
8	8.2	8.0	148	154	119	120	29	34	42	48	7	8		24	345	34	0.71
9	8.1	7.5	140	148	123	119	17	29	42	48	4	7		22	364	19	1.13
10	7.9	7.6	188	176	133	116	55	60	43	40	13	15		25	346	37	0.66
11	8.0	7.5	194	186	122	115	72	71	41	38	17	17		24	368	39	0.62
12	8.0	7.5	196	190	123	120	73	70	42	39	18	17		24	365	38	0.62
13	8.0	7.5	190	184	120	120	70	64	41	38	17	16		24	369	37	0.65
14	8.1	7.9	142	144	114	117	28	27	41	46	7	7		24	354	35	0.69
15	8.2	8.0	156	146	131	115	25	31	49	53	6	8		24	336	32	0.75
16	8.3	8.0	156	148	132	115	24	33	47	46	6	8	22	24	329	31	0.76
17	8.1	7.6	174	150	135	113	39	37	55	54	9	9		22	382	30	0.73
18	8.0	7.5	192	184	133	119	59	65	41	38	14	16		25	372	29	0.84
19	8.1	7.6	198	190	133	121	65	69	42	39	16	17		25	377	40	0.63
20	8.0	7.5	184	192	119	122	65	70	41	43	16	17		25	377	37	0.68
21	8.0	7.6	182	186	124	121	58	65	42	40	14	16		26	385	40	0.64
22	8.0	7.6	198	186	136	121	62	65	42	40	15	16		26	373	37	0.69
23	8.1	7.6	154	152	121	119	33	33	54	51	8	8	17	20	375	37	0.54
24	7.7	7.6	150	164	126	123	24	41	47	55	6	10		22	383	27	0.81
25	8.2	8.1	158	150	128	121	30	29	53	46	7	7		24	364	36	0.67
26	8.2	8.0	152	148	113	119	39	29	41	42	9	7		24	365	36	0.67
27	8.1	7.5	208	198	122	120	86	78	51	40	21	19		25	363	41	0.60
28	8.0	7.5	176	180	118	118	58	62	40	38	14	15		24	368	40	0.59
29	8.0	7.5	182	178	125	122	57	56	42	40	14	14		26	378	41	0.62
30	7.9	7.5	142	158	114	110	28	48	43	60	7	12	23	18	378	41	0.44
31	8.1	7.5	162	148	116	112	46	36	60	51	11	9		21	369	39	0.54

AVG	8.1	7.7	173	170	125	120	47	49	46	46	11	12	21	24	371	36	0.69
MAX	8.3	8.1	214	208	144	131	86	78	60	60	21	19	23	27	408	43	1.13
MIN	7.7	7.5	140	144	113	110	17	27	40	38	4	7	17	18	329	19	0.44

Date	Number of Samples	Colilert P/A	Heterotrophic Plate Count - CFU/mL		Temperature °C	
	Tap		Tap	Raw	Tap	Raw
1	1	A	124	0	3.3	4.5
2	1	A	12	0	3.5	4.5
3	1	A	121	0	4.0	5.0
4	1	A	91	0	5.0	5.0
5	1	A	61	0	4.0	5.0
6	1	A	95	0	4.0	5.0
7	1	A	25	0	4.0	5.0
8	1	A	43	0	4.0	5.0
9	1	A	48	0	5.0	6.0
10	1	A	22	0	4.3	5.5
11	1	A	60	0	4.5	5.0
12	1	A	58	0	4.3	5.5
13	1	A	79	0	4.3	5.5
14	1	A	53	0	4.0	5.0
15	1	A	48	0	5.0	6.0
16	1	A	39	11	4.0	5.0
17	1	A	68	0	4.5	5.5
18	1	A	57	0	4.5	5.5
19	1	A	41	0	4.5	5.5
20	1	A	23	0	4.5	5.5
21	1	A	55	0	4.5	5.0
22	1	A	57	0	4.5	5.5
23	1	A	46	0	5.0	6.0
24	1	A	27	0	5.0	6.0
25	1	A	63	0	6.0	6.5
26	1	A	24	0	5.0	6.0
27	1	A	24	0	4.8	5.5
28	1	A	46	0	4.3	5.5
29	1	A	23	0	3.8	5.5
30	1	A	23	0	5.0	6.0
31	1	A	18	0	4.0	6.0

AVG	1		51	0	4.4	5.4
MAX	1		124	11	6.0	6.5
MIN	1		12	0	3.3	4.5

Date	Free Chlorine Residual mg/L															
	City Hall	Wolf Marine	Bait Shed	Sunny Spot	B&Z											
1																
2																
3																
4	2.13			2.03	1.69		1.67									
5																
6																
7																
8																
9																
10																
11	2.07		1.89	1.25	1.74		1.62									
12																
13																
14																
15																
16																
17																
18	1.88		1.68	1.82	0.88		1.10									
19																
20																
21																
22																
23																
24																
25	2.17		1.99	2.19	1.79		1.54									
26																
27																
28																
29																
30																
31																

DISTRIBUTION SAMPLES BACTERIOLOGICAL SUMMARY	AVG	MAX	MIN
Chlorine Residuals, mg/L	1.74	2.19	0.88
Total Number of routine distribution samples analyzed	19		
Total number of positive routine distribution samples	0		
Total number of routine distribution samples required	10		
Total number of check samples	0		
Total number of positive check samples			

CITY OF BENTON HARBOR
CT BENCHMARKING
January 2023

Date	Peak	Segment 2 - Flocculation (2)				Segment 3 - Sedimentation (2)			
	Low Service Flow	In Use	Residual	pH	Temp.	In Use	Residual	pH	Temp.
	gpm	%	mg/L		C	%	mg/L		C
1/1/2023	3507	100	1.63	7.7	3.6	100	1.63	7.7	3.6
1/2/2023	3965	100	1.75	7.6	3.6	100	1.75	7.6	3.6
1/3/2023	3821	100	1.77	7.6	3.8	100	1.77	7.6	3.8
1/4/2023	3442	100	1.33	8.0	4.0	100	1.33	8.0	4.0
1/5/2023	3411	100	1.52	8.0	4.7	100	1.52	8.0	4.7
1/6/2023	3422	100	1.43	8.1	4.8	100	1.43	8.1	4.8
1/7/2023	3443	100	1.68	8.1	5.3	100	1.68	8.1	5.3
1/8/2023	3437	100	1.69	8.1	5.5	100	1.69	8.1	5.5
1/9/2023	3456	100	1.79	7.6	4.9	100	1.79	7.6	4.9
1/10/2023	3462	100	1.63	7.7	5.0	100	1.63	7.7	5.0
1/11/2023	3457	100	1.53	7.7	5.3	100	1.53	7.7	5.3
1/12/2023	3400	100	1.52	7.7	5.4	100	1.52	7.7	5.4
1/13/2023	3487	100	1.65	7.7	5.1	100	1.65	7.7	5.1
1/14/2023	3435	100	1.66	8.0	5.1	100	1.66	8.0	5.1
1/15/2023	3385	100	1.81	8.1	5.0	100	1.81	8.1	5.0
1/16/2023	3531	100	1.48	8.2	5.0	100	1.48	8.2	5.0
1/17/2023	3488	100	1.57	8.0	4.5	100	1.57	8.0	4.5
1/18/2023	3469	100	1.60	7.7	5.0	100	1.60	7.7	5.0
1/19/2023	3645	100	1.61	7.8	5.2	100	1.61	7.8	5.2
1/20/2023	3429	100	1.63	7.7	5.6	100	1.63	7.7	5.6
1/21/2023	3449	100	1.85	7.6	5.8	100	1.85	7.6	5.8
1/22/2023	3799	100	1.81	7.7	6.0	100	1.81	7.7	6.0
1/23/2023	3394	100	1.57	7.8	5.0	100	1.57	7.8	5.0
1/24/2023	3489	100	1.77	7.7	5.0	100	1.77	7.7	5.0
1/25/2023	3559	100	1.79	8.0	5.6	100	1.79	8.0	5.6
1/26/2023	3401	100	1.55	8.1	5.9	100	1.55	8.1	5.9
1/27/2023	3417	100	1.72	7.7	6.2	100	1.72	7.7	6.2
1/28/2023	3413	100	1.48	7.8	6.2	100	1.48	7.8	6.2
1/29/2023	3447	100	1.73	7.7	4.7	100	1.73	7.7	4.7
1/30/2023	3671	100	1.82	7.7	5.0	100	1.82	7.7	5.0
1/31/2023	3894	100	1.53	7.7	5.0	100	1.53	7.7	5.0

CITY OF BENTON HARBOR
CT BENCHMARKING
January 2023

Date	Seg2 CT-M	Seg2 CT-R	Seg2 Ratio	Seg3 CT-M	Seg3 CT-R	Seg3 Ratio	Total Ratio	Total Inact.
	mg/L-min	mg/L-min	M/R	mg/L-min	mg/L-min	M/R	M/R	Log
1/1/2023	110	41	3	38	41	1	4	1.8
1/2/2023	104	40	3	36	40	1	4	1.8
1/3/2023	109	39	3	37	39	1	4	1.9
1/4/2023	91	43	2	31	43	1	3	1.4
1/5/2023	105	41	3	36	41	1	3	1.7
1/6/2023	98	42	2	34	42	1	3	1.6
1/7/2023	115	42	3	39	42	1	4	1.9
1/8/2023	116	41	3	40	41	1	4	1.9
1/9/2023	122	36	3	42	36	1	5	2.3
1/10/2023	111	37	3	38	37	1	4	2.0
1/11/2023	104	36	3	36	36	1	4	2.0
1/12/2023	105	36	3	36	36	1	4	2.0
1/13/2023	111	37	3	38	37	1	4	2.0
1/14/2023	114	41	3	39	41	1	4	1.9
1/15/2023	126	43	3	43	43	1	4	2.0
1/16/2023	99	43	2	34	43	1	3	1.5
1/17/2023	106	42	3	36	42	1	3	1.7
1/18/2023	109	37	3	37	37	1	4	2.0
1/19/2023	104	38	3	36	38	1	4	1.9
1/20/2023	112	35	3	38	35	1	4	2.1
1/21/2023	126	34	4	43	34	1	5	2.5
1/22/2023	112	35	3	38	35	1	4	2.2
1/23/2023	109	38	3	37	38	1	4	1.9
1/24/2023	120	37	3	41	37	1	4	2.1
1/25/2023	119	40	3	41	40	1	4	2.0
1/26/2023	107	39	3	37	39	1	4	1.8
1/27/2023	119	34	3	41	34	1	5	2.3
1/28/2023	102	35	3	35	35	1	4	2.0
1/29/2023	118	38	3	41	38	1	4	2.1
1/30/2023	117	38	3	40	38	1	4	2.1
1/31/2023	93	37	3	32	37	1	3	1.7

Date	Filter Number											
	1	2	3	4	5	6	7	8	9	10	11	12
1					0.03	0.04	0.04	0.03			0.04	0.03
2					0.04	0.05	0.03	0.04			0.05	0.05
3					0.03	0.04	0.05	0.03				
4					0.03	0.04	0.06	0.04			0.05	0.04
5					0.03	0.04	0.05	0.04			0.05	0.09
6					0.03	0.04	0.05	0.03			0.04	0.03
7					0.03	0.03	0.04	0.04			0.04	0.03
8					0.03	0.03	0.04	0.03			0.04	0.03
9					0.03	0.03	0.04	0.02			0.05	0.03
10					0.03	0.03	0.04	0.03			0.05	0.07
11					0.03	0.03	0.04	0.03			0.03	0.03
12					0.03	0.03	0.04	0.03			0.03	0.03
13					0.03	0.03	0.03	0.02			0.04	0.03
14					0.03	0.03	0.03	0.02			0.04	0.02
15					0.03	0.03	0.04	0.02			0.04	0.02
16					0.03	0.03	0.04	0.03			0.04	0.03
17					0.03	0.03	0.04	0.03			0.04	0.03
18					0.03	0.03	0.04	0.03			0.04	0.02
19					0.03	0.03	0.04	0.03			0.04	0.02
20					0.04	0.04	0.04	0.04			0.03	0.03
21					0.04	0.04	0.04	0.04			0.03	0.03
22					0.10	0.07	0.04	0.03			0.03	0.01
23					0.05	0.04	0.09	0.07			0.03	0.02
24					0.04	0.04	0.05	0.05			0.03	0.03
25					0.03	0.03	0.04	0.03			0.03	0.03
26					0.03	0.04	0.04	0.03			0.08	0.06
27					0.04	0.03	0.04	0.03			0.03	0.03
28					0.04	0.04	0.04	0.03			0.04	0.03
29					0.03	0.04	0.04	0.03			0.04	0.03
30					0.03	0.04	0.04	0.03			0.05	0.03
31					0.03	0.04	0.04	0.03			0.04	0.03
MAX					0.10	0.07	0.09	0.07	0	0	0.08	0.09

ENTRY POINT TO THE DISTRIBUTION SYSTEM WQP

Daily Excursions	Jan.	Feb.	Mar.	Apr.	May	Jun.	Total	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
pH	0						0							0
Ortho-phosphate	0						0							0
# Days with Excursions (9 days allowed per 6 months)	0						0							0

EPTDS WQP Range

pH minimum of 7.2 s.u.
Ortho-phosphate minimum of 3.0 mg/L as PO₄

DISTRIBUTION WQP 10 Samples Quarterly

Daily excursions	Jan.	Feb.	Mar.	Apr.	May	Jun.	Total	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
pH	0						0							0
Ortho-phosphate	0						0							0
# Days with Excursions (9 days allowed per 6 months)	0						0							0

Distribution WQP Range

pH minimum of 7.2 s.u.
Ortho-phosphate minimum of 3.0 mg/L as PO₄