

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
August-22

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>5.047</u> | million gallons per day |
| 2. Approved Rated Plant Capacity | <u>8</u> | million gallons per day |
| 3. Average Filter Run | <u>103.6</u> | hours |
| 4. Average Filtration Rate | <u>0.46</u> | gallons per square ft. per minute |
| 5. Maximum Filtration Rate | <u>1.97</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>64510</u> lbs. | Est. Supply | <u>146</u> days |
| 8. Alum (Al ³⁺) on hand | <u>39734</u> lbs. | Est. Supply | <u>141</u> days |
| 9. Cost of All Chemicals | <u>233.40</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	0	0
Number of filter confluence samples collected	34	93
Percent of filter confluence samples >0.3 NTU	0%	0%
Number of filter confluence samples >1 NTU	0	0

Did any individual filter exceed:

- | | |
|--|------------|
| 1.0 NTU in two consecutive measurements taken 15 minutes apart? | No |
| 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? | No |
| 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? | No |
| 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? | No |
| 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? | No |
| If yes, indicate date(s) and duration on a separate sheet | |
| Was minimum C*T credit achieved for the entire month? | Yes |
| If no, indicate on a separate sheet the date(s) not achieved | |
| Was continuous POE chlorine residual monitoring equipment off-line during the month? | No |
| If yes, indicate date(s) and duration on a separate sheet | |
| Was continuous (every 15 minutes) filter monitoring equipment off-line during the month? | No |
| If yes, indicate date(s) and duration on a separate sheet. | |

Distribution MGD

Total 32.852 **Average** 1.06 **Max** 1.421 **Min** 0.751

Comments

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	1.149	165	17.2	0.76	3	1.85	3.15	0.34	3	0.13	0.14	3	0.11	0.14	6	0	0	0.18	0.20
2	1.125	238	25.4	1.11	3	2.08	3.34	0.98	3	0.19	0.22	3	0.19	0.23	6	0	0	0.17	0.20
3	1.087	334	36.8	1.62	3	1.20	1.50	0.28	3	0.10	0.11	3	0.09	0.11	6	0	6	0.18	0.24
4	1.280	519	48.6	2.13	3	4.50	9.90	0.27	3	0.09	0.09	3	0.09	0.11	6	0	0	0.15	0.20
5	1.095	427	46.7	2.05	3	1.30	1.90	0.16	3	0.13	0.24	3	0.09	0.11	6	0	0	0.14	0.16
6	1.124	199	21.2	0.93	3	1.00	1.40	0.27	3	0.09	0.10	3	0.10	0.11	6	0	0	0.12	0.14
7	1.099	349	38.0	1.67	3	1.50	2.40	0.23	3	0.08	0.09	3	0.09	0.10	6	0	0	0.17	0.18
8	1.175	297	30.3	1.33	3	1.69	2.33	0.28				3	0.13	0.16	3	0	0	0.14	0.19
9	1.141	285	29.9	1.31	3	2.29	3.15	0.31				3	0.12	0.13	3	0	0	0.17	0.21
10	1.218	316	31.1	1.37	3	1.80	2.30	0.29				3	0.10	0.11	3	0	0	0.12	0.13
11	1.117	289	31.0	1.36	3	2.30	3.70	0.30				3	0.11	0.12	3	0	0	0.14	0.17
12	1.148	298	31.1	1.37	3	1.90	2.20	0.35				3	0.10	0.11	3	0	0	0.10	0.12
13	1.080	272	30.2	1.33	3	1.10	1.40	0.23				3	0.10	0.11	3	0	0	0.13	0.15
14	1.005	256	30.5	1.34	3	1.10	1.70	0.23				3	0.09	0.10	3	0	0	0.10	0.11
15	1.124	292	31.1	1.37	3	1.30	1.70	0.23				3	0.10	0.12	3	0	0	0.10	0.12
16	1.062	258	29.1	1.28	3	1.50	2.00	0.23				3	0.11	0.14	3	0	0	0.12	0.14
17	1.122	293	31.3	1.37	3	2.00	3.20	0.35				3	0.10	0.10	3	0	0	0.12	0.12
18	1.126	291	31.0	1.36	3	1.50	2.00	0.33				3	0.11	0.11	3	0	0	0.11	0.12
19	1.109	282	30.5	1.34	3	1.30	1.40	0.40	3	0.11	0.12	3	0.10	0.10	6	0	0	0.10	0.11
20	0.969	254	31.4	1.38	3	1.40	1.80	0.30	3	0.11	0.13	3	0.11	0.12	6	0	0	0.11	0.13
21	1.054	265	30.1	1.32	3	1.00	1.20	0.32	3	0.10	0.10	3	0.09	0.10	6	0	0	0.11	0.11
22	1.081	255	28.3	1.24	3	10.90	29.10	0.53	3	0.10	0.12	3	0.10	0.11	6	0	0	0.15	0.18
23	1.087	271	29.9	1.31	3	1.10	1.30	0.36	1	0.09	0.09	3	0.09	0.10	4	0	0	0.12	0.12
24	1.002	245	29.3	1.29	3	1.20	1.70	0.25				3	0.09	0.09	3	0	0	0.11	0.15
25	1.105	288	31.2	1.37	3	0.88	0.97	0.23				3	0.09	0.09	3	0	0	0.16	0.21
26	1.274	229	21.5	0.95	3	1.30	1.70	0.23				3	0.09	0.09	3	0	0	0.14	0.16
27	1.012	250	29.6	1.30	3	1.30	1.40	0.30				3	0.09	0.10	3	0	0	0.16	0.20
28	1.012	261	30.9	1.36	3	0.88	0.96	0.28				3	0.12	0.12	3	0	0	0.12	0.12
29	1.013	281	33.2	1.46	3	1.00	1.10	0.28				3	0.09	0.10	3	0	0	0.12	0.13
30	0.938	245	31.3	1.37	3	2.44	3.09	0.32				3	0.12	0.15	3	0	0	0.15	0.17
31	0.957	224	28.0	1.23	3	1.70	1.80	0.27				3	0.12	0.14	3	0	0	0.14	0.16
AVG	1.093			1.35	3	1.88		0.31		0.11			0.10					0.13	0.16
MAX	1.280			2.13	3	10.90	29.10	0.98		0.19	0.24		0.19	0.23				0.18	0.24
MIN	0.938			0.76	3	0.88		0.16		0.08			0.09					0.10	0.11
TOTAL	33.890	8728			93				34			93				0	6		

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	8.2	7.9	138	136	115	117	23	19	39	39	6	5	18	20	349	33	0.59
2	8.2	8.0	144	136	125	119	19	17	40	37	5	4		23	350	36	0.64
3	8.3	7.8	180	172	119	114	61	58	42	38	15	14		24	362	39	0.60
4	8.2	7.8	176	166	130	111	46	55	41	42	11	13		26	355	41	0.62
5	8.2	7.9	168	162	119	113	49	49	37	42	12	12		22	383	38	0.57
6	8.1	7.9	176	172	118	115	58	57	39	38	14	14		27	372	38	0.70
7	8.0	7.9	180	168	119	112	61	56	40	36	15	14		27	360	37	0.72
8	8.4	8.0	146	146	126	113	20	33	47	44	5	8	18	24	368	39	0.62
9	8.2	7.9	132	144	118	124	14	20	42	40	3	5		23	352	41	0.55
10	8.1	7.9	140	142	112	113	28	29	38	42	7	7	21	25	348	33	0.74
11	8.2	8.1	142	142	114	111	28	31	39	41	7	8		26	353	33	0.77
12	8.2	8.0	140	138	111	109	29	29	39	41	7	7		28	346	41	0.67
13	8.0	7.7	166	158	115	108	51	50	38	36	12	12		24	347	36	0.67
14	8.0	7.8	168	156	115	107	53	49	39	35	13	12		25	342	36	0.69
15	8.1	8.0	140	120	115	109	25	11	36	42	6	3		26	340	33	0.77
16	8.2	8.0	144	144	116	110	28	34	49	53	7	8		25	345	34	0.72
17	8.3	8.1	146	142	117	110	29	32	45	46	7	8	23	28	348	32	0.88
18	8.2	8.1	144	140	113	109	31	31	51	50	8	8		25	343	34	0.72
19	8.3	8.1	142	140	115	108	27	32	39	41	7	8		27	344	33	0.80
20	8.2	8.0	148	144	117	112	31	32	39	40	8	8		26	348	32	0.81
21	8.4	8.1	142	140	116	109	26	31	38	42	6	8	21	26	342	32	0.80
22	8.4	8.0	156	136	120	118	36	18	45	46	9	4		27	339	33	0.80
23	8.2	7.7	168	162	113	112	55	50	38	36	13	12		26	344	41	0.62
24	8.1	8.0	176	168	118	112	58	56	38	36	14	14		26	349	40	0.65
25	8.2	7.8	176	166	118	110	58	56	40	38	14	14		27	358	40	0.68
26	8.1	7.9	186	172	130	113	56	59	39	37	14	14		26	350	36	0.72
27	8.4	8.1	138	144	116	114	22	30	38	41	5	7		26	349	31	0.84
28	8.4	8.2	140	140	119	114	21	26	38	40	5	6		27	355	32	0.84
29	8.3	8.2	142	144	125	111	17	33	41	43	4	8	23	28	344	32	0.86
30	8.3	8.0	144	140	125	119	19	21	38	49	5	5		22	359	37	0.59
31	8.4	8.0	178	170	124	115	54	55	41	40	13	13		27	361	37	0.72

AVG	8.2	8.0	155	150	118	113	37	37	40	41	9	9	20	25	352	36	0.71
MAX	8.4	8.2	186	172	130	124	61	59	51	53	15	14	23	28	383	41	0.88
MIN	8.0	7.7	132	120	111	107	14	11	36	35	3	3	18	20	339	31	0.55

Date	Number of Samples	Colilert P/A	Heterotrophic Plate Count - CFU/mL		Temperature °C	
	Tap		Tap	Raw	Tap	Raw
1	1	A	132	1	24.0	22.0
2	1	A	148	0	23.0	22.0
3	1	A	205	0	23.5	23.0
4	1	A	500	0	23.7	23.5
5	1	A	500	0	23.5	24.0
6	1	A	120	0	23.0	23.5
7	1	A	246	0	24.0	23.5
8	1	A	232	0	25.0	24.0
9	1	A	407	0	23.6	24.0
10	1	A	462	0	14.0	20.0
11	1	A	174	5	16.0	19.0
12	1	A	89	2	12.0	17.0
13	1	A	81	0	11.5	14.5
14	1	A	123	0	11.3	13.5
15	1	A	113	1	12.5	12.8
16	1	A	103	1	11.8	13.0
17	1	A	68	0	12.0	13.0
18	1	A	70	0	13.0	14.0
19	1	A	52	0	13.0	13.0
20	1	A	63	0	19.0	16.0
21	1	A	57	0	20.0	21.0
22	1	A	97	1	18.5	18.2
23	1	A	64	0	17.0	18.5
24	1	A	113	0	18.8	20.0
25	1	A	78	0	20.3	18.5
26	1	A	101	0	21.3	19.5
27	1	A	43	0	19.0	20.0
28	1	A	54	0	20.0	20.0
29	1	A	107	0	20.0	20.0
30	1	A	117	2	22.6	21.3
31	1	A	144	0	22.7	21.5

AVG	1		157	0	18.7	19.2
MAX	1		500	5	25.0	24.0
MIN	1		43	0	11.3	12.8

Date	Free Chlorine Residual mg/L															
	City Hall	Wolf Marine	Bait Shed	Sunny Spot	B&Z											
1																
2																
3																
4	1.20	1.37	1.48	0.48	0.63											
5																
6																
7																
8																
9																
10																
11																
12	1.05	1.32	1.75	0.21	0.62											
13																
14																
15																
16																
17	1.92	1.83	1.59	0.56	0.50											
18																
19																
20																
21																
22																
23																
24	1.77	1.70	1.67	0.78	0.67											
25																
26																
27																
28																
29																
30																
31	1.18	1.46	1.56	0.81	0.48											

DISTRIBUTION SAMPLES BACTERIOLOGICAL SUMMARY	AVG	MAX	MIN
Chlorine Residuals, mg/L	1.14	1.92	0.21
Total Number of routine distribution samples analyzed	25		
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			

BENTON HARBOR WTP
CT Calculations August 2022

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
8/1/2022	2379	100	1.71	8.1	22.5	100	1.71	8.1	22.5
8/2/2022	2401	100	1.20	8.2	23.5	100	1.20	8.2	23.5
8/3/2022	2423	100	1.26	7.9	23.5	100	1.26	7.9	23.5
8/4/2022	3505	100	1.08	7.9	24.4	100	1.08	7.9	24.4
8/5/2022	2490	100	1.20	7.9	24.6	100	1.20	7.9	24.6
8/6/2022	2395	100	1.57	7.9	23.7	100	1.57	7.9	23.7
8/7/2022	2415	100	1.73	7.9	23.4	100	1.73	7.9	23.4
8/8/2022	2405	100	1.44	7.8	22.4	100	1.44	7.8	22.4
8/9/2022	2424	100	1.21	8.1	24.4	100	1.21	8.1	24.4
8/10/2022	2548	100	1.60	8.0	15.0	100	1.60	8.0	15.0
8/11/2022	2567	100	1.57	8.1	12.6	100	1.57	8.1	12.6
8/12/2022	2751	100	1.43	8.0	14.0	100	1.43	8.0	14.0
8/13/2022	2646	100	1.63	7.7	11.4	100	1.63	7.7	11.4
8/14/2022	2543	100	1.76	7.8	10.6	100	1.76	7.8	10.6
8/15/2022	2409	100	1.72	7.8	10.9	100	1.72	7.8	10.9
8/16/2022	2460	100	1.87	7.8	12.2	100	1.87	7.8	12.2
8/17/2022	2410	100	1.53	8.1	11.4	100	1.53	8.1	11.4
8/18/2022	2412	100	1.44	8.1	12.8	100	1.44	8.1	12.8
8/19/2022	2394	100	1.36	8.2	13.9	100	1.36	8.2	13.9
8/20/2022	2606	100	1.44	8.1	16.4	100	1.44	8.1	16.4
8/21/2022	2419	100	1.24	8.2	19.0	100	1.24	8.2	19.0
8/22/2022	5610	100	1.19	8.0	19.9	100	1.19	8.0	19.9
8/23/2022	2407	100	1.41	7.8	17.6	100	1.41	7.8	17.6
8/24/2022	2407	100	1.47	8.0	17.6	100	1.47	8.0	17.6
8/25/2022	2391	100	1.60	7.8	19.4	100	1.60	7.8	19.4
8/26/2022	2507	100	1.20	7.9	21.2	100	1.20	7.9	21.2
8/27/2022	2655	100	1.15	8.2	21.5	100	1.15	8.2	21.5
8/28/2022	2478	100	1.49	8.3	19.1	100	1.49	8.3	19.1
8/29/2022	2493	100	1.19	8.2	20.4	100	1.19	8.2	20.4
8/30/2022	2371	100	1.13	8.0	22.0	100	1.13	8.0	22.0
8/31/2022	2440	100	0.90	8.0	22.7	100	0.90	8.0	22.7

BENTON HARBOR WTP
CT Calculations August 2022

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
8/1/2022	169	13	13	58	13	5	18	9.0
8/2/2022	118	12	10	40	12	3	14	6.8
8/3/2022	123	11	12	42	11	4	16	7.8
8/4/2022	73	10	8	25	10	3	10	5.0
8/5/2022	114	10	12	39	10	4	16	7.9
8/6/2022	154	11	14	53	11	5	19	9.7
8/7/2022	169	11	15	58	11	5	20	10.2
8/8/2022	141	11	13	48	11	4	17	8.4
8/9/2022	118	11	11	40	11	4	15	7.5
8/10/2022	148	20	7	51	20	2	10	4.9
8/11/2022	144	25	6	49	25	2	8	3.9
8/12/2022	122	21	6	42	21	2	8	3.8
8/13/2022	145	24	6	50	24	2	8	4.1
8/14/2022	163	26	6	56	26	2	8	4.2
8/15/2022	168	26	7	58	26	2	9	4.4
8/16/2022	179	24	8	61	24	3	10	5.1
8/17/2022	150	27	6	51	27	2	7	3.7
8/18/2022	141	24	6	48	24	2	8	3.9
8/19/2022	134	23	6	46	23	2	8	3.9
8/20/2022	130	19	7	45	19	2	9	4.6
8/21/2022	121	16	8	41	16	3	10	5.1
8/22/2022	50	14	4	17	14	1	5	2.4
8/23/2022	138	16	9	47	16	3	12	5.9
8/24/2022	144	17	9	49	17	3	12	5.8
8/25/2022	158	14	11	54	14	4	15	7.5
8/26/2022	113	12	9	39	12	3	12	6.2
8/27/2022	102	13	8	35	13	3	10	5.2
8/28/2022	142	17	8	49	17	3	11	5.7
8/29/2022	112	14	8	39	14	3	11	5.3
8/30/2022	112	12	9	39	12	3	13	6.3
8/31/2022	87	11	8	30	11	3	11	5.3

Date	Filter Number											
	1	2	3	4	5	6	7	8	9	10	11	12
1					0.02	0.02					0.04	0.07
2					0.08	0.11					0.14	0.15
3					0.03	0.04					0.06	0.07
4					0.02	0.03	0.07	0.06			0.04	0.04
5					0.02	0.02	0.03	0.03				
6					0.02	0.02	0.03	0.03				
7					0.02	0.02	0.03	0.03				
8							0.03	0.03			0.07	0.05
9							0.03	0.03			0.05	0.04
10							0.03	0.03			0.04	0.05
11							0.02	0.03			0.03	0.10
12							0.02	0.03			0.04	0.09
13							0.03	0.02			0.03	0.03
14							0.02	0.02			0.03	0.03
15							0.03	0.03			0.03	0.03
16							0.02	0.02			0.04	0.06
17							0.03	0.03			0.03	0.03
18					0.02	0.02					0.04	0.06
19					0.03	0.03					0.04	0.04
20					0.02	0.02					0.03	0.03
21					0.03	0.02					0.03	0.03
22					0.03	0.03	0.03	0.07				
23							0.03	0.04			0.11	0.10
24							0.03	0.03			0.03	0.06
25							0.03	0.03			0.03	0.03
26							0.02	0.03			0.03	0.04
27							0.02	0.03			0.05	0.04
28							0.02	0.03			0.03	0.04
29							0.02	0.03			0.03	0.03
30							0.02	0.03			0.04	0.03
31							0.02	0.03			0.04	0.03
MAX					0.08	0.11	0.07	0.07	0	0	0.14	0.15

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	1	0	0	0	0	1	0	0					0
Ortho-phosphate	0	0	0	0	0	0	0	0	0					0
# Days with Excursions (9 days allowed per 6 months)	0	1	0	0	0	0	1	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	0	0	0	0	0	0					0
Ortho-phosphate	1	0	0	0	0	0	1	0	0					0
# Days with Excursions (9 days allowed per 6 months)	1	0	0	0	0	0	1	0	0					0

Distribution WQP Range

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