

**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  
July-22

County:  
Berrien

Abul D. Ahmed  
 Certified Operator

F-1  
 Water Plant Classification

*Abul D. Ahmed*  
 Signature

Operator-in-Charge  
 Title

**Treatment Rate and Filter Data**

- |                                  |              |                                   |
|----------------------------------|--------------|-----------------------------------|
| 1. Maximum Treatment Rate        | <u>5.059</u> | million gallons per day           |
| 2. Approved Rated Plant Capacity | <u>8</u>     | million gallons per day           |
| 3. Average Filter Run            | <u>104.1</u> | hours                             |
| 4. Average Filtration Rate       | <u>0.43</u>  | gallons per square ft. per minute |
| 5. Maximum Filtration Rate       | <u>2.01</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>37010</u> lbs. | Est. Supply                 | <u>107</u> days |
| 8. Alum (Al <sup>3+</sup> ) on hand | <u>69726</u> lbs. | Est. Supply                 | <u>298</u> days |
| 9. Cost of All Chemicals            | <u>203.63</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	67	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?                              | <b>No</b>  |
| <b>If yes, attach specific filter(s) information and indicate required follow up status.</b> |            |
| 0.5 NTU in two consecutive measurements taken 15 minutes apart after 4 hours of operation?   | <b>No</b>  |
| <b>If yes, attach specific filter(s) information and indicate required follow up status.</b> |            |
| 1.0 NTU in two consecutive measurements taken 15 minutes apart for 3 consecutive months?     | <b>No</b>  |
| <b>If yes, attach specific filter(s) information and indicate required follow up status.</b> |            |
| 2.0 NTU in two consecutive measurements taken 15 minutes apart for 2 consecutive months?     | <b>No</b>  |
| <b>If yes, attach specific filter(s) information and indicate required follow up status.</b> |            |
| Did plant tap disinfectant residual fall below 0.2 ppm during the month?                     | <b>No</b>  |
| <b>If yes, indicate date(s) and duration on a separate sheet</b>                             |            |
| Was minimum C*T credit achieved for the entire month?  | <b>Yes</b> |
| <b>If no, indicate on a separate sheet the date(s) not achieved</b>                          |            |
| Was continuous POE chlorine residual monitoring equipment off-line during the month?         | <b>No</b>  |
| <b>If yes, indicate date(s) and duration on a separate sheet</b>                             |            |
| Was continuous (every 15 minutes) filter monitoring equipment off-line during the month?     | <b>No</b>  |
| <b>If yes, indicate date(s) and duration on a separate sheet.</b>                            |            |

**Distribution MGD**

**Total** 31.562      **Average** 1.018      **Max** 1.255      **Min** 0.784

**Comments**

DATE	Million Gallons Treated	Alum Added lbs	Alum Applied as Product mg/L <i>NSF Max 400 mg/L</i>	Alum as Al <sup>3+</sup> 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	1.118	309	33.1	1.45	3	1.60	2.40	0.26	3	0.10	0.13	3	0.09	0.09	6	0	0	0.17	0.20
2	0.996	218	26.2	1.15	3	0.61	0.80	0.28	3	0.11	0.12	3	0.10	0.11	6	0	0	0.12	0.13
3	1.025	227	26.5	1.17	3	0.63	0.76	0.29	3	0.10	0.11	3	0.10	0.11	6	0	0	0.13	0.16
4	0.946	212	26.9	1.18	3	0.73	0.84	0.28	3	0.11	0.12	3	0.11	0.13	6	0	0	0.15	0.17
5	1.129	251	26.6	1.17	3	0.90	1.80	0.28	3	0.10	0.10	3	0.10	0.11	6	0	0	0.14	0.17
6	1.065	235	26.4	1.16	3	0.49	0.61	0.22	3	0.09	0.10	3	0.10	0.11	6	0	0	0.14	0.18
7	1.057	238	27.0	1.18	3	0.69	0.86	0.21				3	0.10	0.10	3	0	0	0.13	0.15
8	1.005	220	26.2	1.15	3	1.90	1.10	0.21				3	0.09	0.11	3	0	0	0.11	0.13
9	1.125	253	27.0	1.18	3	1.60	0.97	0.23	2	0.09	0.09	3	0.12	0.13	5	0	0	0.11	0.11
10	0.895	199	26.6	1.17	3	1.20	0.82	0.22				3	0.10	0.10	3	0	0	0.11	0.12
11	1.072	243	27.2	1.19	3	1.00	1.40	0.40				3	0.10	0.12	3	0	0	0.12	0.16
12	0.971	225	27.8	1.22	3	2.43	1.38	0.33				3	0.13	0.15	3	0	0	0.11	0.11
13	1.066	248	27.9	1.22	3	0.92	1.00	0.26				3	0.11	0.11	3	0	0	0.11	0.12
14	0.997	228	27.4	1.20	3	1.30	2.00	0.27				3	0.11	0.12	3	0	0	0.12	0.15
15	1.158	267	27.6	1.21	3	1.50	2.50	0.32				3	0.09	0.09	3	0	0	0.11	0.14
16	1.044	246	28.2	1.24	3	1.00	1.20	0.27	3	0.10	0.11	3	0.10	0.12	6	0	0	0.14	0.15
17	1.186	192	19.4	0.85	3	1.40	2.10	0.26	3	0.10	0.11	3	0.09	0.10	6	0	0	0.12	0.13
18	0.974	230	28.3	1.24	3	1.10	1.80	0.25	3	0.10	0.11	3	0.08	0.09	6	0	0	0.12	0.16
19	1.043	234	26.9	1.18	3	0.94	1.30	0.24	3	0.09	0.10	3	0.09	0.09	6	0	0	0.13	0.16
20	1.220	224	22.0	0.97	3	1.40	1.80	0.25	3	0.10	0.10	3	0.09	0.10	6	0	0	0.12	0.15
21	1.074	255	28.5	1.25	3	3.20	1.90	0.35	3	0.10	0.10	3	0.11	0.12	6	0	0	0.13	0.16
22	1.043	246	28.3	1.24	3	1.41	1.98	0.28	2	0.11	0.14	3	0.10	0.10	6	0	0	0.11	0.12
23	0.921	209	27.2	1.19	3	1.40	1.40	0.30	3	0.10	0.11	3	0.10	0.10	6	0	0	0.13	0.14
24	0.965	222	27.6	1.21	3	1.70	2.30	0.35	3	0.10	0.10	3	0.09	0.10	6	0	0	0.16	0.17
25	0.974	226	27.8	1.22	3	2.38	4.40	0.33	3	0.13	0.15	3	0.13	0.16	6	0	0	0.19	0.22
26	1.001	233	27.9	1.22	3	1.65	2.94	0.28	3	0.12	0.14	3	0.15	0.17	6	0	0	0.16	0.20
27	1.111	241	26.0	1.14	3	1.30	1.90	0.24	3	0.08	0.10	3	0.10	0.11	6	0	0	0.15	0.16
28	0.967	218	27.0	1.19	3	2.17	2.97	0.23	3	0.10	0.13	3	0.10	0.11	6	0	0	0.12	0.13
29	1.068	239	26.8	1.18	3	2.00	3.10	0.24	3	0.08	0.09	3	0.08	0.09	6	0	0	0.14	0.15
30	1.109	250	27.0	1.19	3	1.50	1.60	0.30	3	0.11	0.11	3	0.10	0.10	6	0	0	0.12	0.13
31	0.918	209	27.3	1.20	3	1.30	1.50	0.33	3	0.10	0.1	3	0.1	0.1	6	0	0	0.11	0.14
<b>AVG</b>	1.040			1.18	3	1.40		0.28		0.10			0.10					0.13	0.15
<b>MAX</b>	1.220			1.45	3	3.20	4.40	0.40		0.13	0.15		0.15	0.17				0.19	0.22
<b>MIN</b>	0.895			0.85	3	0.49		0.21		0.08			0.08					0.11	0.11
<b>TOTAL</b>	32.241	7247			93				67			93				0	0		

Date	pH		Total Hardness as CaCO <sub>3</sub> mg/L		Total Alkalinity as CaCO <sub>3</sub> mg/L		Non-Carb. Hardness as CaCO <sub>3</sub> mg/L		Calcium as Ca <sup>++</sup> mg/L		Magnesium as Mg <sup>++</sup> mg/L		Chloride as Cl <sup>-</sup> 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	7.9	180	176	119	120	61	56	42	39	15	14		27	372	34	0.78
2	8.2	8.1	144	152	116	118	28	34	43	46	7	8		27	381	30	0.90
3	8.4	8.2	142	148	115	116	27	32	42	43	7	8	22	27	346	42	0.63
4	8.1	8.2	136	144	112	117	24	27	38	44	6	7		26	367	39	0.67
5	8.2	8.0	142	144	116	113	26	31	42	42	6	8		28	335	32	0.88
6	8.1	7.8	164	160	114	112	50	48	42	40	12	12		26	354	35	0.73
7	8.1	7.7	166	168	114	115	52	53	38	37	13	13		26	349	37	0.69
8	8.0	7.8	168	162	116	112	52	50	39	38	13	12		25	341	35	0.70
9	8.0	7.7	166	160	117	112	49	48	37	36	12	12		25	337	36	0.68
10	8.0	7.7	172	166	117	112	55	54	39	38	13	13		24	342	33	0.73
11	8.2	8.1	142	138	116	112	26	26	43	42	6	6	21	25	338	33	0.74
12	8.1	7.8	148	144	118	115	30	29	45	56	7	7		22	341	37	0.58
13	8.2	8.0	148	142	116	112	32	30	39	43	8	7		24	340	34	0.71
14	8.1	7.9	142	144	116	114	26	30	42	43	6	7		26	337	29	0.88
15	8.3	8.1	136	138	116	112	20	26	38	41	5	6		26	335	32	0.80
16	8.2	7.6	180	170	126	112	54	58	38	36	13	14		26	342	37	0.69
17	8.1	7.7	174	168	121	112	53	56	37	35	13	14		26	349	35	0.74
18	8.0	7.7	184	176	118	116	64	60	37	35	16	15		27	348	35	0.76
19	8.2	7.6	168	162	117	112	51	50	38	37	12	12		27	342	37	0.72
20	8.1	7.9	184	172	130	113	54	59	37	35	13	14		23	344	35	0.64
21	8.2	8.1	152	146	122	114	30	32	49	46	7	8		26	344	31	0.82
22	8.1	8.0	147	147	119	110	28	37	38.5	39	7	9	19	20	333	34	0.59
23	8.3	8.2	156	158	123	113	33	45	42	42	8	11		25	327	30	0.83
24	8.4	8.2	140	142	112	114	28	28	39	46	7	7	22	26	328	32	0.80
25	8.2	7.8	144	144	125	117	19	27	42	46	5	7	17	18	362	47	0.38
26	8.1	8.0	136	142	120	116	16	26	31	57	4	6		18	362	37	0.47
27	8.1	7.9	168	166	114	111	54	55	37	36	13	13		21	356	37	0.57
28	8.0	7.7	130	130	112	106	18	24	40	44	4	6		21	349	31	0.68
29	8.0	7.6	135	139	116	107	19	32	36	38	5	8		21	346	35	0.59
30	8.2	8.1	138	140	108	107	30	33	41	41	7	8		27	334	32	0.84
31	8.4	8.2	142	140	117	109	25	31	38	41	6	8		29	356	29	0.98

<b>AVG</b>	8.1	7.9	154	153	117	113	37	40	40	41	9	10	20	24	346	34.5806	0.72
<b>MAX</b>	8.4	8.2	184	176	130	120	64	60	49	57	16	15	22	29	381	47	0.98
<b>MIN</b>	7.97	7.6	130	130	108	106	16	24	31	35	4	6	17	18	327	29	0.38



Date	Number of Samples	Colilert P/A	Heterotrophic Plate Count - CFU/mL		Temperature °C	
	Tap		Tap	Raw	Tap	Raw
1	1	A	67	0	20.8	19.5
2	1	A	81	0	22.0	20.0
3	1	A	52	0	21.0	21.0
4	1	A	82	2	16.0	21.0
5	1	A	152	0	21.0	21.0
6	1	A	211	0	17.7	19.5
7	1	A	138	0	15.8	19.5
8	1	A	59	0	15.7	18.0
9	1	A	53	0	14.2	16.5
10	1	A	34	0	13.7	15.5
11	1	A	23	0	14.0	15.0
12	1	A	46	1	16.0	15.0
13	1	A	50	0	19.0	15.0
14	1	A	46	0	19.0	16.0
15	1	A	42	1	20.0	18.0
16	1	A	63	0	20.2	18.5
17	1	A	144	0	19.3	19.5
18	1	A	133	0	20.2	19.5
19	1	A	118	0	21.2	19.5
20	1	A	130	0	22.3	20.5
21	1	A	66	0	24.0	22.0
22	1	A	56	0	24.0	23.0
23	1	A	46	0	24.0	23.0
24	1	A	107	0	22.0	23.0
25	1	A	404	1	24.0	23.0
26	1	A	230	0	23.0	23.0
27	1	A	343	0	21.5	22.5
28	1	A	136	0	22.0	22.0
29	1	A	189	0	22.5	22.5
30	1	A	88	0	22.0	24.0
31	1	A	94	0	22.0	23.0

AVG	1		112	0	20.0	20.0
MAX	1		404	2	24.0	24.0
MIN	1		23	0	13.7	15.0



Date	Free Chlorine Residual mg/L															
	City Hall	Wolf Marine	Bait Shed	Sunny Spot	B&Z											
1																
2																
3																
4																
5																
6	1.58	1.54	1.68	0.43	0.66											
7																
8																
9																
10																
11																
12																
13	1.56	1.72	1.62	0.50	0.69											
14																
15																
16																
17																
18																
19																
20	1.13	1.40	1.36	0.23	0.69											
21																
22																
23																
24																
25																
26																
27	1.42	1.16	0.99	0.22	0.36											
28																
29																
30																
31																

DISTRIBUTION SAMPLES BACTERIOLOGICAL SUMMARY			
	AVG	MAX	MIN
Chlorine Residuals, mg/L	1.05	1.72	0.22
Total Number of routine distribution samples analyzed	20		
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			

### CT Calculations July 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
7/1/2022	3513	100	2.47	8	19.5	100	1.4	8	19.5
7/2/2022	2380	100	1.84	8.1	21.2	100	1.58	8.1	21.2
7/3/2022	2383	100	2.04	8.2	21.6	100	1.23	8.2	21.6
7/4/2022	2375	100	1.91	8.2	21.5	100	1.44	8.2	21.5
7/5/2022	2395	100	1.77	8.1	17.4	100	1.43	8.1	17.4
7/6/2022	2410	100	2.2	7.9	17.7	100	1.67	7.9	17.8
7/7/2022	2475	100	2.28	7.8	16.5	100	1.86	7.8	16.5
7/8/2022	2571	100	2.3	7.8	17.3	100	1.84	7.8	17.3
7/9/2022	2707	100	2.2	7.7	15	100	1.82	7.7	15
7/10/2022	2473	100	2.26	7.9	14.8	100	1.92	7.9	14.8
7/11/2022	2636	100	2.02	8.1	10.6	100	1.46	8.1	10.6
7/12/2022	2413	100	1.66	7.9	14	100	1.56	7.9	14
7/13/2022	2616	100	1.66	8.1	16.7	100	1.08	8.1	16.7
7/14/2022	2747	100	1.89	8	16.7	100	1.37	8	16.7
7/15/2022	2490	100	1.62	8.1	18.8	100	1.48	8.1	18.8
7/16/2022	2435	100	1.82	7.9	20	100	1.52	7.9	20
7/17/2022	2450	100	1.73	7.8	20	100	1.24	7.8	20
7/18/2022	2417	100	1.98	7.8	19.7	100	1.31	7.8	19.7
7/19/2022	2425	100	1.91	7.9	20.5	100	1.36	7.9	20.5
7/20/2022	2399	100	1.74	7.9	21.2	100	1.38	7.9	21.2
7/21/2022	2446	100	1.7	8.2	23.2	100	0.86	8.2	23.2
7/22/2022	2599	100	1.43	8.02	23.4	100	1.12	8.02	23.4
7/23/2022	2434	100	1.55	8.1	23.7	100	1.04	8.1	23.7
7/24/2022	2446	100	2.22	8.2	23.9	100	1.01	8.2	23.9
7/25/2022	2449	100	2.05	7.9	21.8	100	1.54	7.9	21.8
7/26/2022	2514	100	2.5	7.9	23	100	1.67	7.9	23
7/27/2022	2440	100	2.35	7.8	22.6	100	1.65	7.8	22.6
7/28/2022	2410	100	2.44	7.76	21.4	100	1.8	7.76	22.8
7/29/2022	2455	100	1.64	7.9	22.8	100	1.58	7.9	22.8
7/30/2022	2391	100	2.19	8.1	22.8	100	1.24	8.1	22.8
7/31/2022	2389	100	1.61	8.2	20.4	100	1.2	8.2	20.4



### CT Calculations July 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
7/1/2022	166	16	10	32	15	2	13	6.3
7/2/2022	182	14	13	54	14	4	17	8.5
7/3/2022	202	14	14	42	13	3	17	8.6
7/4/2022	189	14	13	49	14	4	17	8.4
7/5/2022	174	18	10	48	18	3	12	6.2
7/6/2022	215	17	13	56	16	3	16	8.0
7/7/2022	217	18	12	61	18	3	15	7.7
7/8/2022	211	17	12	58	17	3	16	7.9
7/9/2022	191	19	10	54	19	3	13	6.4
7/10/2022	215	21	10	63	21	3	13	6.6
7/11/2022	181	30	6	45	28	2	8	3.8
7/12/2022	162	21	8	52	21	2	10	5.1
7/13/2022	150	19	8	33	18	2	10	4.9
7/14/2022	162	19	9	40	18	2	11	5.5
7/15/2022	153	16	9	48	16	3	12	6.2
7/16/2022	176	14	12	50	14	4	16	8.0
7/17/2022	166	14	12	41	13	3	15	7.7
7/18/2022	193	14	14	44	13	3	17	8.4
7/19/2022	186	14	13	45	13	3	17	8.4
7/20/2022	171	13	13	46	13	4	17	8.4
7/21/2022	164	12	13	28	11	3	16	7.8
7/22/2022	130	11	12	35	11	3	15	7.4
7/23/2022	150	11	13	35	11	3	16	8.1
7/24/2022	214	12	17	33	11	3	20	10.2
7/25/2022	197	13	15	51	12	4	20	9.8
7/26/2022	234	12	19	54	11	5	24	12.0
7/27/2022	227	12	19	55	11	5	24	11.9
7/28/2022	239	13	19	60	11	5	24	12.0
7/29/2022	157	12	14	52	11	5	18	9.1
7/30/2022	216	13	17	42	12	4	20	10.2
7/31/2022	159	15	11	41	14	3	13	6.7

Date	Filter Number											
	1	2	3	4	5	6	7	8	9	10	11	12
1					0.03	0.02	0.04				0.04	0.04
2					0.03	0.03	0.03				0.05	0.03
3					0.03	0.02	0.03				0.04	0.02
4					0.03	0.02	0.03				0.04	0.03
5					0.03	0.02					0.04	0.03
6					0.03	0.03					0.04	0.03
7							0.02	0.06			0.03	0.02
8							0.03	0.03			0.04	0.03
9					0.27	0.04	0.03	0.02			0.04	0.03
10							0.03	0.02			0.04	0.03
11							0.02	0.02			0.03	0.03
12							0.02	0.03			0.04	0.03
13							0.02	0.03			0.04	0.06
14							0.02	0.03			0.04	0.03
15					0.09	0.03	0.03	0.02			0.04	0.02
16					0.08	0.03					0.04	0.02
17					0.05	0.03					0.04	0.03
18					0.06	0.03					0.04	0.02
19					0.04	0.03					0.03	0.03
20					0.04	0.03					0.04	0.03
21					0.06	0.03	0.08	0.04				
22					0.16	0.10					0.05	0.05
23					0.03	0.03					0.03	0.03
24					0.02	0.03					0.03	0.03
25					0.02	0.03					0.03	0.03
26					0.02	0.02					0.03	0.03
27					0.03	0.03					0.04	0.03
28					0.03	0.02					0.04	0.03
29					0.02	0.02					0.03	0.03
30					0.03	0.03					0.06	0.06
31					0.02	0.02					0.03	0.03
<b>MAX</b>					0.27	0.10	0.08	0.06	0	0	0.06	0.06

**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
Ortho-phosphate	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

**EPTDS WQP Range**

pH minimum of 7.2 s.u.  
Ortho-phosphate minimum of 3.0 mg/L as PO<sub>4</sub>

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

**Distribution WQP Range**

pH minimum of 7.2 s.u.  
Ortho-phosphate minimum of 3.0 mg/L as PO<sub>4</sub>