

**MONTHLY OPERATION REPORT OF  
THE CITY OF BENTON HARBOR WATER TREATMENT PLANT**

SUPPLY NAME:

CITY OF BENTON HARBOR

WSSN:600

Operator-in-Charge Catherine A. Winn  
F1-S1

Month/Year April-21  
F1-S2

*Catherine A. Winn*

Signature of Operator-in-Charge

REVISED  
5/17/2021

Water Plant Classification

Berrien  
County

**Treatment Rate and Filter Data**

Maximum Treatment Rate:	1.1866	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	169.67	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.97	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.93	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.88%	Percent of Treated Water

**Chemical Data**

Chlorine on hand:	66357	lb.	Est. supply:	293	days
Primary Coagulant (Alum (Al3+)) on hand:	65530	lb.	Est. supply:	230	days
Cost of All Chemicals per Million Gallons:	\$64.74	dollars			
Total Power Cost per Million Gallons:		dollars			

**Remarks**

	North Filter	South Filter
Number of filter confluence samples > 0.3 NTU:	0	0
Number of filter confluence samples collected:	87	90
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>If yes</b> , attach specific filter(s) information and indicate required follow-up status.	<u>NO</u>
0.5 NTU in two consecutive measurements taken 15 minutes apart after 4 hours of operation? <b>If yes</b> , attach specific filter(s) information and indicate required follow-up status.	<u>NO</u>
1.0 NTU in two consecutive measurements taken 15 minutes apart for 3 consecutive months? <b>If yes</b> , attach specific filter(s) information and indicate required follow-up status.	<u>NO</u>
2.0 NTU in two consecutive measurements taken 15 minutes apart for 2 consecutive months? <b>If yes</b> , attach specific filter(s) information and indicate required follow-up status.	<u>NO</u>
Was continuous (every 15 minutes) filter monitoring equipment off-line during the month? <b>If yes</b> , indicate date(s), duration, and individual filter grab sampling frequency on a separate sheet.	<u>NO</u>
Did POE disinfectant residual fall below 0.2 ppm during the month? <b>If yes</b> , indicate date(s) and duration on a separate sheet.	<u>NO</u>
Was minimum C*T credit achieved for the entire month? <b>If no</b> , indicate on a separate sheet the date(s) not achieved.	<u>YES</u>
Was continuous POE chlorine residual monitoring equipment off-line during the month? <b>If yes</b> , indicate date(s) and duration on a separate sheet.	<u>NO</u>

Distribution	Total	26.495952	Avg	0.9172796	Max	1.333876	Min	0.733097
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**Remarks:**

Catherine A. Winn is OIC for final data review only.  
We continue to work with City staff on plant tap WQP analysis frequency.

COAGULATION PARAMETERS

D	MIL.	Dry Al <sub>2</sub> (SO <sub>3</sub> ) <sub>4</sub> Pounds Add	ALUM as Al <sub>3</sub> <sup>+</sup> mg/l	TURBIDITY UNITS									2 Hour Compliance Periods		
	GAL.			RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		# of	#of	#of
A	TREAT.			Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	Periods	Periods	Periods
T													North	South	
E													>.30 NTU	>.30 NTU	
1	1.0800	331.00	1.61	4.50	5.40	0.78	3	0.07	0.07	3	0.16	0.20	6	0	0
2	1.1200	340.00	1.60	4.90	5.20	0.95	3	0.07	0.07	3	0.15	0.17	6	0	0
3	1.1050	317.00	1.51	6.30	6.90	1.40	3	0.07	0.08	3	0.16	0.18	6	0	0
4	1.1325	326.00	1.51	3.60	4.10	0.92	3	0.08	0.09	3	0.11	0.14	6	0	0
5	0.8925	254.00	1.50	3.10	5.10	0.81	3	0.08	0.08	3	0.09	0.13	6	0	0
6	0.9275	281.00	1.44	4.40	6.40	0.74	3	0.07	0.07	3	0.11	0.11	6	0	0
7	0.9150	274.00	1.58	4.30	8.00	0.76	3	0.07	0.07	3	0.08	0.08	6	0	0
8	0.9525	287.00	1.59	3.20	5.40	0.58	3	0.07	0.08	3	0.09	0.09	6	0	0
9	1.1866	399.00	1.77	5.20	6.40	0.74	3	0.08	0.09	3	0.08	0.08	6	0	0
10	1.0125	408.00	2.12	1.80	1.90	0.38	3	0.07	0.07	3	0.07	0.07	6	0	0
11	1.0500	312.00	1.56	2.00	2.00	0.49	3	0.00	0.00	3	0.07	0.07	3	0	0
12	1.0375	322.00	1.63	2.00	2.20	0.50	3	0.08	0.09	3	0.07	0.08	6	0	0
13	1.0875	313.00	1.51	2.30	2.90	0.52	3	0.08	0.08	3	0.06	0.07	6	0	0
14	0.9425	274.00	1.53	2.40	2.90	0.54	3	0.08	0.10	3	0.09	0.09	6	0	0
15	0.8925	275.00	1.62	2.80	4.30	0.48	3	0.08	0.09	3	0.09	0.10	6	0	0
16	0.9475	276.00	1.53	2.90	3.40	0.47	3	0.08	0.10	3	0.07	0.07	6	0	0
17	0.9475	288.00	1.60	3.70	6.90	0.55	3	0.09	0.12	3	0.07	0.08	6	0	0
18	0.7675	235.00	1.61	2.60	5.50	0.48	3	0.08	0.09	3	0.07	0.08	6	0	0
19	1.0050	310.00	1.62	2.40	2.70	0.78	3	0.07	0.08	3	0.07	0.07	6	0	0
20	0.7625	215.00	1.48	3.40	4.10	0.65	3	0.08	0.10	3	0.08	0.09	6	0	0
21	1.1275	343.00	1.60	3.10	3.50	0.64	3	0.08	0.09	3	0.08	0.08	6	0	0
22	1.0625	328.00	1.62	3.60	4.30	0.82	3	0.08	0.09	3	0.09	0.11	6	0	0
23	0.9150	284.00	1.63	3.10	3.60	0.70	3	0.10	0.10	3	0.09	0.10	6	0	0
24	0.9000	276.00	1.61	2.30	2.50	0.61	3	0.09	0.12	3	0.10	0.12	6	0	0
25	0.8900	274.00	1.62	3.80	4.00	0.59	3	0.08	0.08	3	0.08	0.10	6	0	0
26	0.8725	264.00	1.62	2.80	3.10	0.57	3	0.08	0.09	3	0.10	0.10	6	0	0
27	0.9175	283.00	1.62	3.20	3.70	0.77	3	0.08	0.09	3	0.07	0.07	6	0	0
28	0.9400	287.00	1.61	3.10	4.10	0.55	3	0.09	0.09	3	0.08	0.09	6	0	0
29	0.9525	289.00	1.60	2.20	2.30	0.52	3	0.08	0.07	3	0.08	0.10	6	0	0
30	0.8725	265.00	1.60	2.40	2.50	0.53	3	0.07	0.08	3	0.08	0.09	6	0	0
31											0.00	0.00	0	0	0
Total	29.2141	8930.00					90			90			177	0	0
Avg.	0.9738	297.67	1.60	3.25	4.18	0.66		0.08	0.08		0.09		Total	Total	Total
Max	1.1866	408.00	2.12	6.30	8.00	1.40		0.10	0.12		0.16	0.20	6	0	0
Min.	0.7625	215.00	1.44	1.80	1.90	0.38		0.00	0.00		0.00				

## CHEMICAL ANALYSES

D	pH		Total Hardness as CaCO3 mg/l		Total Alkalinity as CaCO3 mg/l		Non-Carb. Hardness as CaCO3 mg/l		Calcium as Ca++ mg/l		Magnesium as Mg++ mg/l		Chloride as Cl- mg/l		Conductivity umhos	Sulfate mg/l
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Tap	Tap
A	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.	39.	40.	41.	42.		
T																
E																
1	8.4	8.3	186	178	156	149	30	29	53	54	13	11				
2	8.3	8.2	168	172	138	138	30	34	46	50	13	12				
3	8.4	8.2	196	174	163	136	33	38	59	55	12	9				
4	8.2	7.9	156	174	131	138	25	36	44	49	11	13				
5	8.2	8.1	172	186	129	136	43	50	41	48	17	16				
6	8.1	7.9	196	182	142	131	54	51	48	45	18	17				
7	8.1	7.8	190	182	136	129	54	53	47	45	17	17				
8	8.1	8.0	178	184	131	130	47	54	45	48	16	16	21.0	25.5	754	45
9	8.2	7.9	176	178	128	127	48	51	45	47	16	15				
10	8.2	8.1	152	156	127	127	25	29	41	46	12	10				
11	8.3	8.2	158	154	129	124	29	30	42	49	13	8				
12	8.3	8.2	156	154	131	123	25	31	42	46	12	9				
13	8.1	8.1	172	158	145	125	27	33	50	46	12	11	25.5	28.5		
14	8.2	7.9	176	166	134	124	42	42	39	38	19	17				
15	8.1	7.8	176	182	129	125	47	57	46	50	15	14				
16	8.2	8.3	152	158	124	123	28	35	42	42	12	13				
17	8.1	8.0	176	178	125	122	51	56	46	47	15	15				
18	8.1	8.0	172	168	124	119	48	49	41	42	17	15	19.5	24.0		
19	8.3	7.9	146	144	132	123	14	21	42	42	10	10				
20	8.1	7.7	168	158	139	120	29	38	48	46	12	11				
21	8.3	8.2	158	152	134	126	24	26	45	43	11	11	23.0	26.5		42
22	8.4	8.2	176	166	145	139	31	27	49	47	13	12				
23	8.5	8.3	186	168	150	137	36	31	51	47	14	12				
24	8.2	8.1	194	190	141	140	53	50	49	48	17	17				
25	8.1	7.8	196	192	138	138	58	54	48	50	18	17	21.5	26.5		
26	8.2	8.0	198	194	136	136	62	58	48	50	19	17				
27	8.1	7.9	204	194	142	132	62	62	49	47	20	18				
28	8.2	8.0	204	196	143	134	61	62	46	44	22	21				
29	8.0	8.0	204	196	137	134	67	62	49	48	20	18				
30	8.0	8.0	198	192	140	131	58	61	50	48	18	17	23.0	27.5		
31																
Avg.	8.2	8.0	178.0	174.2	136.6	130.5	41.4	43.7	46.4	46.9	15.1	14.0	22.3	26.4	754	44
Max	8.5	8.3	204.0	196.0	163.0	149.0	67.0	62.0	59.0	55.0	22.0	21.0	25.5	28.5	754	45
Min.	8.0	7.7	146.0	144.0	124.0	119.0	14.0	21.0	39.0	38.0	10.0	8.0	19.5	24.0	754	42

MONTH/YEAR

April-21

## FLUORIDATION AND CHLORINATION

D A T E	Fluoride Applied as Fmg/l	Fluoride Analysis mg/l			Chlorine Application And Chlorine Residual in mg/L										
		Raw	Tap	Dist.	INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use		TAP		
					PPD	Free mg/l	PPD	Free mg/l	PPD	Free mg/l	PPD	Free mg/l	Demand mg/L	Free mg/l	Total mg/l
1	0.48	0.28	0.69		0	0.00	245	3.39	46	0.64	291	4.25	2.25	1.76	2.00
2	0.48	0.36	0.70		0	0.00	244	3.25	26	0.35	270	3.60	1.84	1.56	1.76
3	0.41	0.38	0.73		0	0.00	240	3.24	35	0.47	275	4.41	2.31	1.96	2.10
4	0.46	0.29	0.78		0	0.00	242	3.19	38	0.50	280	3.68	1.49	2.01	2.19
5	0.42	0.29	0.77		0	0.00	186	3.11	50	0.84	236	4.32	1.64	2.51	2.68
6	0.41	0.24	0.77		0	0.00	183	2.95	36	0.58	219	4.05	2.07	1.82	1.98
7	0.41	0.23	0.78	0.78	0	0.00	185	3.02	54	0.88	239	4.00	0.81	3.02	3.19
8	0.49	0.38	0.77		0	0.00	189	2.96	37	0.58	226	3.91	1.84	1.91	2.07
9	0.37	0.26	0.81		0	0.00	227	2.86	26	0.33	253	2.83	0.53	2.14	2.30
10	0.47	0.23	0.74		0	0.00	234	3.45	41	0.60	275	4.19	1.77	2.20	2.42
11	0.43	0.36	0.82		0	0.00	209	2.97	37	0.53	246	4.44	2.24	2.00	2.20
12	0.47	0.34	0.76		0	0.00	205	2.95	36	0.52	241	4.09	1.84	2.00	2.25
13	0.66	0.31	0.72		0	0.00	222	3.05	38	0.52	260	3.77	1.59	1.90	2.18
14	0.64	0.27	0.73		0	0.00	197	3.12	31	0.49	228	3.81	1.94	1.72	1.87
15	0.63	0.41	0.83		0	0.00	185	3.09	38	0.64	223	4.00	1.99	1.86	2.01
16	0.51	0.50	0.90		0	0.00	187	2.95	20	0.32	207	3.33	1.50	1.63	1.83
17	0.64	0.29	0.71		0	0.00	193	3.04	38	0.60	231	3.89	1.87	1.87	2.02
18	0.61	0.27	0.69		0	0.00	147	2.86	30	0.58	177	3.60	1.70	1.74	1.90
19	0.44	0.30	0.72		0	0.00	162	2.41	33	0.49	195	3.16	0.78	2.10	2.38
20	0.59	0.31	0.79		0	0.00	151	2.96	34	0.67	185	3.77	1.97	1.60	1.80
21	0.51	0.29	0.82	0.61	0	0.00	223	2.95	45	0.60	268	3.41	1.23	1.93	2.18
22	0.50	0.40	0.84		0	0.00	220	3.09	39	0.55	259	4.00	1.97	1.79	2.03
23	0.56	0.38	0.87		0	0.00	191	3.12	26	0.42	217	3.81	2.20	1.34	1.61
24	0.76	0.30	0.87		0	0.00	211	3.50	43	0.71	254	4.67	3.01	1.51	1.66
25	0.55	0.26	0.80		0	0.00	206	3.46	40	0.67	246	4.44	2.74	1.55	1.70
26	0.55	0.26	0.68		0	0.00	203	3.47	37	0.63	240	4.26	2.35	1.75	1.91
27	0.53	0.32	0.65		0	0.00	211	3.43	41	0.67	252	4.10	1.97	1.96	2.13
28	0.69	0.22	0.67	0.84	0	0.00	214	3.40	41	0.65	255	5.05	2.57	2.31	2.48
29	0.42	0.26	0.76		0	0.00	215	3.37	42	0.66	257	3.98	1.66	2.18	2.32
30	0.43	0.24	0.76		0	0.00	176	3.01	38	0.65	214	3.77	1.68	1.94	2.09
31															
Avg.	0.52	0.31	0.76	0.74	0.00	0.00	203.43	3.12	37.20	0.58	240.63	3.95	1.84	1.92	2.11
Max	0.76	0.50	0.90	0.84	0.00	0.00	245.00	3.50	54.00	0.88	291.00	5.05	3.01	3.02	3.19
Min.	0.37	0.22	0.65	0.61	0.00	0.00	147.00	2.41	20.00	0.32	177.00	2.83	0.53	1.34	1.61

MONTH/YEAR

April-21

## BACTERIOLOGICAL AND PHYSICAL PARAMETERS

D A T E	PLANT TAP		Standard Plate Count		Raw	Tap
	No. of Samples	Colilert P/A	Raw	Tap	TEMP. 'C	TEMP. 'C
1	1	A	57	0	9	9.0
2	1	A	51	0	7	9.0
3	1	A	79	4	8	8.5
4	1	A	92	1	7	9.0
5	1	A	21	0	7	7.5
6	1	A	48	0	8	7.5
7	1	A	50	1	9	8.0
8	1	A	38	1	9	8.5
9	1	A	53	0	9	9.0
10	1	A	64	0	9	10.0
11	1	A	43	0	10	11.0
12	1	A	62	1	9	10.0
13	1	A	39	0	10	11.0
14	1	A	40	1	10	10.0
15	1	A	41	0	10	10.0
16	1	A	43	1	10	11.0
17	1	A	10	2	9	10.0
18	1	A	11	0	8	9.5
19	1	A	19	0	9	10.0
20	1	A	24	0	9	9.5
21	1	A	28	0	9	10.0
22	1	A	46	0	9	9.0
23	1	A	30	0	10	10.0
24	1	A	22	1	10	10.5
25	1	A	23	0	9	9.5
26	1	A	46	1	9	9.5
27	1	A	35	0	9.8	9.5
28	1	A	36	1	10.5	10.0
29	1	A	57	0	10.5	10.5
30	1	A	31	0	10.5	11.0
31						
AVG.	1	A	41	1	9	10
Max			92	4	11	11
Min			10	0	7	8

MONTH/YEAR

April-21

Distrubution Flow and Corrosion Treatment

D A T E	Ortho P System					Distrubution flow and Corrosion Treatment			
	City Hall	Wolfs	Bait Shed	Sunny Spot	B&Z	High Lift		PO4	Ortho P
	Ortho P	Ortho P	Ortho P	Ortho P	Ortho P	To	Lbs PO4	Treatment	Residual
	Residual	Residual	Residual	Residual	Residual	Distribution		mg/L	mg/L
E	mg/L	mg/L	mg/L	mg/L	mg/L				
1						0.7238	98	5.36	3.11
2						0.7084	105	5.86	2.94
3						0.6314	113	7.08	2.93
4						0.7392	96	5.14	3.27
5						0.5082	87	6.77	3.24
6						0.4774	92	7.63	3.29
7	3.30		3.21	3.09	3.07	0.5082	96	7.47	3.16
8						0.5236	137	10.35	3.15
9						0.9394	99	4.17	3.25
10						0.6622	83	4.96	3.12
11						0.4620	87	7.45	3.14
12						0.5082	103	8.02	3.10
13						0.6314	93	5.83	3.25
14	3.27	3.00	3.29	3.15	3.14	0.4774	101	8.37	3.19
15						0.5852	86	5.81	4.08
16						0.5698	98	6.81	3.08
17						0.4928	100	8.03	3.36
18						0.4928	88	7.07	3.74
19						0.5544	98	6.99	2.99
20						0.4928	117	9.39	4.00
21	3.10	3.10	3.24	3.07	2.96	0.8316	99	4.71	3.14
22						0.5544	108	7.71	3.09
23						0.4928	99	7.95	3.10
24						0.4774	95	7.87	3.11
25						0.4928	65	5.22	3.21
26						0.4928	59	4.74	3.04
27						0.9185	96	4.14	3.14
28	2.93	2.54	2.60	1.59	2.57	0.5698	109	7.57	4.28
29						0.5698	107	7.43	4.24
30						0.5544	106	7.57	4.44
31									
<b>Totals</b>						<b>17.6429</b>	<b>2920.0</b>		
<b>AVG.</b>	<b>3.15</b>	<b>2.88</b>	<b>3.09</b>	<b>2.73</b>	<b>2.94</b>	<b>0.5881</b>	<b>97.3</b>	<b>6.83</b>	<b>3.35</b>
<b>Max</b>	<b>3.30</b>	<b>3.10</b>	<b>3.29</b>	<b>3.15</b>	<b>3.14</b>	<b>0.9394</b>	<b>137.0</b>	<b>10.35</b>	<b>4.44</b>
<b>Min</b>	<b>2.93</b>	<b>2.54</b>	<b>2.60</b>	<b>1.59</b>	<b>2.57</b>	<b>0.4620</b>	<b>59.0</b>	<b>4.14</b>	<b>2.93</b>

DISTRIBUTION SYSTEM MONITORING

WSSN 0600

April-21

Chlorine Residual at Bacteriological Monitoring Stations mg/l

	City Hall		Wolf Marine	470 W. Main	Sunny Spot		B&Z
DATE	1	2	3	4	5	6	7
1							
2							
3							
4							
5							
6							
7	1.26		1.24	1.28	0.75		1.09
8							
9							
10							
11							
12							
13							
14	1.20		1.25	1.25	0.44		0.89
15							
16							
17							
18							
19							
20							
21	1.13		0.89	1.13	0.81		0.44
22							
23							
24							
25							
26							
27							
28	1.61		1.35	1.24	1.04		0.46
29							
30							
31							

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Chlorine Residuals, mg/L

Total number of routine distribution samples analyzed

Total number of positive routine distribution samples

Total number of routine distribution samples required

Total number of check samples

Total number of positive check samples

Avg.	Max.	Min.
1.04	1.61	0.44
20		
0		
10		
0		
0		