

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


SUPPLY NAME:

CITY OF BENTON HARBOR

WSSN:600

Operator-in-Charge George Regan
F-1/S-2

Month/Year February-21
F1-S2



Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.396	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	104.88	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.98	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.02	Gallons Per Square Feet per Minute
Average Wash Water Use:	1.67%	Percent of Treated Water

Chemical Data

Chlorine on hand:	72831	lb.	Est. supply:	298	days
Primary Coagulant (Alum (Al3+)) on hand:	58778	lb.	Est. supply:	263	days
Cost of All Chemicals per Million Gallons:	\$64.07	dollars			
Total Power Cost per Million Gallons:		dollars			

Remarks

Number of filter confluence samples > 0.3 NTU:
Number of filter confluence samples collected:
Percent of filter confluence samples > 0.3 NTU:
Number of filter confluence samples > 1 NTU

North Filter South Filter

0	0
81	81
0%	0%
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.
- Was continuous (every 15 minutes) filter monitoring equipment off-line during the month? NO
If yes, indicate date(s), duration, and individual filter grab sampling frequency on a separate sheet.
- Did POE 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.

Distribution	Total	25.483492	Avg	0.9362938	Max	1.310021	Min	0.71353
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OIC in review of final data only. Phosphate residuals average good, at greater than 3.0 mg/l (distribution).
Remarks: We have begun to feed Orthophosphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

COAGULATION PARAMETERS

D A T E	MIL. GAL.	Dry Al ₂ (SO ₃) ₄ Pounds Add	ALUM	TURBIDITY UNITS			Applied # Samples	FILTERED NORTH		# Samples	FILTERED SOUTH		2 Hour Compliance Periods		
	as Al ₃ ⁺ mg/l		RAW	Avg.	Max.	Avg.		Avg.	Max.		Avg.	Max.	# of Periods	#of Periods >.30 NTU North	#of Periods >.30 NTU South
1	0.7750	250.00	1.70	3.40	4.80	1.30	3	0.08	0.09	3	0.08	0.08	3	0	0
2	0.7850	254.00	1.70	3.70	5.20	1.20	3	0.08	0.09	3	0.07	0.07	3	0	0
3	0.7525	257.00	1.80	4.80	7.50	1.20	3	0.08	0.09	3	0.08	0.10	3	0	0
4	0.8175	295.00	1.90	4.50	7.60	1.10	3	0.07	0.08	3	0.08	0.10	3	0	0
5	0.8850	280.00	1.66	7.20	9.70	1.50	3	0.09	0.10	3	0.08	0.09	3	0	0
6	0.9750	269.00	1.51	4.40	4.90	1.40	3	0.09	0.10	3	0.11	0.12	3	0	0
7	0.8775	277.00	1.66	5.70	7.00	1.40	3	0.07	0.07	2	0.09	0.09	2	0	0
8	0.7425	227.00	1.61	3.90	4.60	1.50	3	0.08	0.08	3	0.08	0.09	3	0	0
9	0.9300	301.00	1.70	5.00	8.40	1.30	3	0.07	0.08	3	0.07	0.09	3	0	0
10	0.9325	301.00	1.70	3.60	4.80	1.40	3	0.09	0.10	3	0.09	0.09	3	0	0
11	0.8950	277.00	1.63	2.60	3.10	1.60	3	0.09	0.10	3	0.11	0.12	3	0	0
12	0.9725	297.00	1.61	2.70	3.50	1.50	3	0.07	0.08	3	0.13	0.16	3	0	0
13	0.8050	246.00	1.61	3.70	4.90	1.40	3	0.07	0.07	2	0.12	0.14	2	0	0
14	0.7850	240.00	1.61	4.60	6.20	1.40	3	0.07	0.07	2	0.17	0.18	2	0	0
15	1.3960	333.00	1.26	9.90	15.40	4.60	3	0.18	0.22	3	0.16	0.18	3	0	0
16	1.2565	357.00	1.49	11.90	20.10	2.80	3	0.09	0.09	3	0.11	0.15	3	0	0
17	1.0350	318.00	1.62	3.40	4.70	1.60	3	0.08	0.10	3	0.11	0.11	3	0	0
18	0.7275	228.00	1.65	3.60	5.70	1.70	3	0.08	0.11	3	0.11	0.14	3	0	0
19	0.9650	323.00	1.76	2.40	3.30	1.30	3	0.07	0.08	3	0.11	0.15	3	0	0
20	0.9775	325.00	1.75	2.00	3.20	1.10	3	0.08	0.09	3	0.13	0.16	3	0	0
21	0.9875	329.00	1.75	1.90	3.40	0.93	3	0.08	0.09	3	0.14	0.18	3	0	0
22	1.0900	336.00	1.62	1.80	1.90	0.85	3	0.08	0.08	3	0.16	0.18	3	0	0
23	1.1425	367.00	1.69	1.40	2.60	0.86	3	0.07	0.08	3	0.14	0.15	3	0	0
24	1.1325	349.00	1.62	1.50	3.00	0.64	3	0.09	0.10	3	0.17	0.20	3	0	0
25	1.2650	432.00	1.80	1.70	3.10	0.95	3	0.08	0.09	3	0.12	0.15	3	0	0
26	1.1250	354.00	1.80	0.98	1.70	0.82	3	0.09	0.12	3	0.12	0.13	3	0	0
27	1.0750	329.00	1.61	0.93	1.20	0.72	3	0.08	0.09	3	0.11	0.14	3	0	0
28	1.2566	432.00	1.81	1.80	3.40	0.87	3	0.10	0.11	3	0.11	0.12	3	0	0
29															
30															
31															
Total	27.3616	8583.00					84			81			81	0	0
Avg.	0.9772	306.54	1.66	3.75	5.53	1.39		0.08	0.09		0.11		3	0	0
Max	1.3960	432.00	1.90	11.90	20.10	4.60		0.18	0.22		0.17	0.20	3	0	0
Min.	0.7275	227.00	1.26	0.93	1.20	0.64		0.07	0.07		0.07		2		

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	
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
A	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.	39.	40.	41.	42.
T	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
E	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.	39.	40.	41.	42.
1	8.1	7.9	176	170	123	119	53	51	43	42	17	17		
2	8.0	8.0	178	174	123	120	55	54	41	40	18	18		
3	8.0	7.8	176	172	124	118	52	54	40	38	18	18		
4	8.0	7.8	184	174	127	115	57	59	43	42	18	17		
5	8.2	8.1	154	150	124	120	30	30	47	47	9	8	23.0	24.5
6	8.1	8.1	150	146	123	118	27	28	46	45	8	8		
7	8.1	8.0	148	144	121	120	27	24	46	47	8	6		
8	8.1	7.9	198	172	132	116	66	56	50	42	18	16	19.0	24.0
9	8.1	8.0	178	166	136	119	42	47	39	38	19	17		
10	8.3	8.1	162	158	138	128	24	30	51	51	8	8		
11	8.3	8.0	182	176	152	126	30	50	59	54	8	10		
12	8.2	8.1	184	172	131	135	53	37	55	49	11	12		
13	8.2	8.1	172	168	134	129	38	39	57	51	7	10		
14	8.1	8.1	168	166	134	137	34	29	55	54	7	8		
15	8.1	8.0	164	162	134	134	30	28	49	47	10	11		
16	8.3	8.2	162	164	127	133	35	31	44	46	13	12	23.0	24.5
17	8.1	7.8	206	176	154	124	52	52	50	43	20	17		
18	8.1	7.9	218	180	161	129	57	51	51	47	22	15	22.0	26.0
19	8.1	8.0	206	186	151	134	55	52	49	45	20	18	22.0	26.5
20	8.1	7.8	202	194	144	138	58	56	46	44	21	20	23.5	28.5
21	8.1	8.0	190	188	135	135	55	53	46	45	18	18	21.0	25.5
22	8.2	8.2	150	154	126	136	24	18	49	51	7	6	22.0	25.0
23	8.1	8.0	150	158	123	128	27	30	49	52	7	7		
24	8.0	8.0	156	154	130	125	26	29	47	46	9	9		
25	8.2	8.0	154	150	128	125	26	25	47	49	9	7		
26	8.0	8.0	158	156	133	129	25	27	50	51	8	7		
27	8.1	8.1	178	170	130	124	48	46	43	42	17	16	20.0	24.5
28	8.1	7.9	182	180	124	123	58	57	48	46	15	16	19.0	23.5
29														
30														
31														
Avg.	8.1	8.0	174.5	167.1	132.9	126.3	41.6	40.8	47.9	46.2	13.2	12.6	21.5	25.3
Max	8.3	8.2	218.0	194.0	161.0	138.0	66.0	59.0	59.0	54.0	22.0	20.0	23.5	28.5
Min.	8.0	7.8	148.0	144.0	121.0	115.0	24.0	18.0	39.0	38.0	7.0	6.0	19.0	23.5

MONTH/YEAR

February 2021

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		Demand	Free	Total
					PPD	mg/L	PPD	mg/L	PPD	mg/L	PPD	mg/L	mg/L	mg/l	mg/l
1	0.47	0.34	0.50		0	0.00	147	2.83	20	0.39	167	3.40	1.36	1.88	2.04
2	0.57	0.34	0.62		0	0.00	150	2.85	69	1.31	219	4.21	1.39	2.65	2.82
3	0.76	0.35	0.57	0.47	0	0.00	153	3.04	51	1.01	204	3.81	1.18	2.47	2.63
4	0.57	0.31	0.66		0	0.00	156	2.85	28	0.51	184	3.78	1.83	1.78	1.95
5	0.50	0.24	0.70		0	0.00	172	2.90	25	0.42	197	3.12	1.34	1.53	1.78
6	0.42	0.32	0.71		0	0.00	175	2.68	29	0.44	204	4.27	2.32	1.84	1.95
7	0.73	0.21	0.69		0	0.00	168	2.86	30	0.51	198	3.41	1.38	1.79	2.03
8	0.58	0.11	0.61		0	0.00	149	3.00	53	1.07	202	3.21	1.62	1.43	1.59
9	0.50	0.20	0.64		0	0.00	186	2.99	37	0.59	223	3.08	1.14	1.79	1.94
10	0.60	0.25	0.70	0.56	0	0.00	189	3.03	34	0.54	223	4.59	2.31	2.06	2.28
11	0.55	0.39	0.65		0	0.00	176	2.94	29	0.48	205	3.37	1.10	2.16	2.27
12	0.57	0.34	0.69		0	0.00	195	2.99	46	0.71	241	4.60	2.55	1.95	2.05
13	0.66	0.39	0.76		0	0.00	160	2.97	22	0.41	182	3.57	1.57	1.78	2.00
14	0.56	0.33	0.77		0	0.00	153	2.91	25	0.48	178	3.02	1.22	1.62	1.80
15	0.30				0	0.00	256	2.74	16	0.17	272	4.72	2.89	1.59	1.83
16	0.40	0.37	0.73		0	0.00	250	2.97	39	0.46	289	5.29	3.17	1.97	2.12
17	0.74	0.38	0.62		0	0.00	214	3.09	41	0.59	255	3.83	1.89	1.78	1.94
18	0.61	0.29	0.73	0.82	0	0.00	150	3.08	23	0.47	173	3.42	1.37	1.89	2.05
19	0.56	0.08	0.74		0	0.00	198	3.06	32	0.50	230	3.71	1.64	1.91	2.07
20	0.60	0.44	0.78		0	0.00	196	2.99	73	1.11	269	3.85	1.54	2.15	2.31
21	0.57	0.43	0.83		0	0.00	189	2.86	35	0.53	224	3.18	0.92	2.09	2.26
22	0.54	0.35	0.81		0	0.00	195	2.67	45	0.62	240	3.32	0.83	2.18	2.49
23	0.43	0.44	0.90		0	0.00	199	2.60	40	0.52	239	3.12	0.88	2.04	2.24
24	0.54	0.38	0.85	0.70	0	0.00	198	2.61	46	0.61	244	3.08	0.72	2.08	2.36
25	0.49	0.48	0.76		0	0.00	228	2.69	48	0.57	276	3.40	1.09	2.04	2.31
26	0.57	0.49	0.83		0	0.00	205	2.72	47	0.62	252	3.21	0.92	2.08	2.29
27	0.61	0.44	0.81		0	0.00	194	2.69	37	0.51	231	3.32	1.38	1.78	1.94
28	0.50	0.49	0.90		0	0.00	222	2.64	37	0.44	259	2.95	1.06	1.74	1.89
29															
30															
31															
Avg.	0.55	0.34	0.72	0.64	0.00	0.00	186.54	2.87	37.75	0.59	224.29	3.64	1.52	1.93	2.12
Max	0.76	0.49	0.90	0.82	0.00	0.00	256.00	3.09	73.00	1.31	289.00	5.29	3.17	2.65	2.82
Min.	0.30	0.08	0.50	0.47	0.00	0.00	147.00	2.60	16.00	0.17	167.00	2.95	0.72	1.43	1.59

MONTH/YEAR

February 2021

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	36	0	2	3.0
2	1	A	36	0	2	3.5
3	1	A	33	0	2	3.5
4	1	A	24	0	2	3.5
5	1	A	39	0	2	4.0
6	1	A	14	0	3	4.0
7	1	A	21	10	3	4.5
8	1	A	19	0	1	3.5
9	1	A	16	0	2	2.5
10	1	A	23	0	2	3.0
11	1	A	29	1	2	3.0
12	1	A	30	0	2	3.0
13	1	A	36	0	2	3.0
14	1	A	12	0	2	3.0
15	1	A	22	1	2	3.0
16	1	A	37	0	2	3.5
17	1	A	27	0	1	2.0
18	1	A	54	0	2	2.5
19	1	A	48	0	2	2.0
20	1	A	47	0	2	2.0
21	1	A	66	0	1	2.0
22	1	A	56	0	2	3.0
23	1	A	40	0	2	3.5
24	1	A	18	0	2	3.0
25	1	A	17	1	2	3.5
26	1	A	15	0	2	3.0
27	1	A	21	0	2	2.0
28	1	A	43	0	2	2.5
29						
30						
31						
AVG.	1	A	31	0	2	3
Max			66	10	3	5
Min			12	0	1	2

MONTH/YEAR

February 2021

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
	mg/L	mg/L	mg/L	mg/L	mg/L				
1						0.4466	83	7.33	3.15
2						0.4774	84	7.00	3.10
3	2.98	3.22	3.05	3.04	3.17	0.4928	85	6.82	3.15
4						0.4774	94	7.75	3.24
5						0.6314	84	5.26	3.17
6						0.4774	90	7.43	3.25
7						0.6160	93	5.95	3.26
8						0.5852	62	4.16	3.06
9						0.7238	71	3.89	3.09
10	2.95	3.19	3.16	3.29	2.87	0.4928	84	6.75	3.17
11						0.5390	74	5.43	2.95
12						0.4466	76	6.71	3.01
13						0.4466	79	7.03	3.22
14						0.5390	75	5.48	3.11
15						0.5082	60	4.70	3.01
16						0.5852	89	6.04	2.71
17						0.7084	58	3.24	2.98
18	2.88	2.54	2.95	2.89	2.75	0.4620	76	6.49	2.88
19						0.6930	80	4.56	2.70
20						0.7392	73	3.89	2.72
21						0.6468	77	4.73	3.04
22						0.6622	97	5.78	2.76
23						0.7546	97	5.07	3.07
24	3.03	3.07	3.02	3.07	2.80	0.7700	120	6.16	3.16
25						0.7700	119	6.12	3.19
26						0.6930	116	6.63	3.19
27						0.7084	114	6.36	3.00
28						0.9086	96	4.20	2.86
29									
30									
31									
Totals						17.0016	2404.5		
AVG.	2.96	3.01	3.05	3.07	2.90	0.6072	85.9	5.69	3.04
Max	3.03	3.22	3.16	3.29	3.17	0.9086	119.8	7.75	3.26
Min	2.88	2.54	2.95	2.89	2.75	0.4466	58.0	3.24	2.70

DISTRIBUTION SYSTEM MONITORING

WSSN 0600

February 2021

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	1.99		1.93	2.09	1.48		1.33
4							
5							
6							
7							
8							
9							
10	1.60		1.46	1.22	1.74		1.34
11							
12							
13							
14							
15							
16							
17							
18	1.41		1.57	1.94	1.61		1.16
19							
20							
21							
22							
23							
24	1.53		1.30	1.36	1.46		1.37
25							
26							
27							
28							
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.
1.54	2.09	1.16
20		
0		
10		
0		
0		