Benton Harbor Water System
Water Quality Parameter Testing

Date	2/13/2019
Field Analyst	DE
Laboratory Analyst	

Site	Field Date and Time	Field Temp C	Calc Temp F	Field pH	Laboratory Chloride	Laboratory Sulfate	Field Conductivity	Field TDS	Laboratory Calcium	Calc CSMR	Laboratory TA	Calc LSI MO	Calc LSI AWWA
Raw	2/13/2019	1.5	34.7	7.8					40	#DIV/0!	114		
Tap	2/13/2019	2	35.6	7.7					41	#DIV/0!	105		
Abonmarche	2/13/2019	7.6	45.68	7.6	22	31	361	256	45	0.710	106		
Cornerstone	2/13/2019	10.9	51.62	7.7	23	29	367	260	44	0.793	107		
BP Station Main and Fair	2/13/2019	8.3	46.94	7.8	22	30	380	271	50	0.733	112		
May Street Service	2/13/2019	4.5	40.1	7.6	22	28	381	261	42	0.786	110		
City Hall	2/13/2019	10.9	51.62	7.7	24	29	368	264	41	0.828	109		
Villa Environmental	2/13/2019	11.9	53.42	7.5	21.5	31	356	253	46	0.694	109		
Babes Lounge	2/13/2019		32							#DIV/0!			
Sunny Spot	2/13/2019	13	55.4	7.6	19	31	364	257	47	0.613	109		
Blue Water Thermal	2/13/2019	11.9	53.42	7.7	23	29	371	266	46	0.793	109		
	2/13/2019	14	57.2		27	27	379	273	46	1.000	110		

Benton Harbor Water System
Water Quality Parameter Testing

Date	2/26/2019
Field Analyst	DE
Laboratory Analyst	MO DE DV

	Field	Field	Calc	Field	Laboratory	Laboratory	Field	Field	Laboratory	Calc	Laboratory	Calc	Calc
Site	Date and Time	Temp C	Temp F	pH	Chloride	Sulfate	Conductivity	TDS	Calcium	CSMR	TA	LSI MO	LSI AWWA
Raw	9:26 AM	3.3	32	7.9	21		340	253	46	#DIV/0!			
Tap	9:30 AM	4.5	32	7.5	24.5		376	267	48	#DIV/0!			
Abonmarche	10:33 AM	3.8	32	7.6	25	30	361	253	46	0.833	112		
Cornerstone	10:50 AM	4.1	32	7.9	24.5	30	362	267	46	0.817	117		
BP Station Main and Fair	11:29 AM	7.3	32	7.9	25.5	30	288	259	46	0.850	125		
May Street Service	12:37 PM	11.3	32	7.7	24	36	395	279	44	0.667	119		
City Hall	11:11 AM	7.2	32	7.9	23.5	33	359	251	244	0.712	113		
Villa Environmental	11:05 AM	4.7	32	7.9	25	36	374	268	45	0.694	123		
Babes Lounge			32							#DIV/0!			
Sunny Spot	12:11 PM	12.5	32	7.9	25.5	37	404	290	49	0.689	124		
Blue Water Thermal	11:54 AM	9.5	32	7.6	26	39	381	279	48	0.667	123		
B&Z Construction	12:21 PM	13.1	32	7.9	26.5	34	416	291	51	0.779	125		

Benton Harbor Water System
Water Quality Parameter Testing

Date	2/13/2019
Field Analyst	Denny Edwards
Laboratory Analyst	Assorted DE; DV; MO

Site	Field Date and Time	Field Temp C	Calc Temp F	Field pH	Laboratory Chloride	Laboratory Sulfate	Field Conductivity	Field TDS	Laboratory Calcium	Calc CSMR	Laboratory TA	Calc LSI MO	Calc LSI AWWA
Raw	2/13/2019	1.5	34.7	7.8			350		40		114	-1.01	-0.30
	2/26/2019	3.3	32	7.9	21		340	253	46		124	-0.76	-0.13
Tap	2/13/2019	2	35.6	7.7			375		41		105	-1.02	-0.87
	2/26/2019	4.5	32	7.5	24.5		376	267	48		131	-1.09	-0.56
Abonmarche	2/13/2019	7.6	45.68	7.6	22	31	361	256	45	0.710	106	-1.03	-0.44
	2/26/2019	3.8	32	7.6	25	30	361	253	46	0.833	112	-0.99	-0.48
Cornerstone	2/13/2019	10.9	51.62	7.7	23	29	367	260	44	0.793	107	-0.83	-0.28
	2/26/2019	4.1	32	7.9	24.5	30	362	267	46	0.817	117	-0.77	-0.19
BP Station Main and Fair	2/13/2019	8.3	46.94	7.8	22	30	380	271	50	0.733	112	-0.74	-0.16
	2/26/2019	7.3	32	7.9	25.5	30	288	259	46	0.850	125	-0.65	-0.06
May Street Service	2/13/2019	4.5	40.1	7.6	22	28	381	261	42	0.786	110	-1.12	-0.51
	2/26/2019	11.3	52.34	32	7.7	24	395	279	44	0.061	119	-0.805	-0.23
City Hall	2/13/2019	10.9	51.62	7.7	24	29	368	264	41	0.828	109	-0.87	-0.31
	2/26/2019	7.2	32	7.9	23.5	33	359	251	44	0.712	113	-0.81	-0.13
Villa Environmental	2/13/2019	11.9	53.42	7.5	21.5	31	356	253	46	0.694	109	-1.49	-0.44
	2/26/2019	4.7	32	7.9	25	36	374	268	45	0.694	123		-0.13
Sunny Spot	2/13/2019	13	55.4	7.6	19	31	364	257	47	0.613	109	-0.86	-0.31
	2/26/2019	12.5	32	7.9	25.5	37	404	290	49	0.689	124		-0.01
Blue Water Thermal	2/13/2019	11.9	53.42	7.7	23	29	371	266	46	0.793	109	-0.80	-0.24
	2/26/2019	9.5	32	7.6	26	39	381	279	48	0.667	123		-0.37
B&Z Construction	2/13/2019	14	57.2		27	27	379	273	46	1.000	110	-0.52	0.00
B&Z Construction	2/26/2019	13.1	32	7.9	26.5	34	416	291	51	0.779	125	-0.47	0.08

Benton Harbor Water System
Water Quality Parameter Testing

MI 0600 Benton Harbor WQP

Date	6/27/2019
Field Analyst	Denny Edwards
Laboratory Analyst	Denny and Doug

WSSN #0600 Benton Harbor Water Department

	Field	Field	Calc	Field	Laboratory	Laboratory	Field	Field	Laboratory	Calc	Laboratory	Calc	Calc
Site	Date and Time	Temp C	Temp F	pH	Chloride	Sulfate	Conductivity	TDS	Calcium	CSMR	TA	LSI MO	LSI AWWA
Raw	7.3.19 - 1:55 pm	16.6	61.9	7.7	19	18	372	264	37	1.056	108		-0.68
Tap	7.13.19- 1:59 pm	16.7	62.1	7.1	23	19	388	275	36	1.211	102		-1.32
Abonmarche	7.13.19- 11:05 am	20.7	69.3	8.1	21	31	428	281	51	0.677	101		-0.09
Cornerstone	7.13.19-10:30 am	23.9	75.0	8.2	21.5	26	393	280	49	0.827	102		0.06
BP Station Main and Fair	7.13.19- 11:35	24.4	75.9	8.4	22	24	393	276	45	0.917	103		0.23
May Street Service	7.13.19- 12:16	21.2	70.2	8	21.5	25	387	278	42	0.860	102		-0.26
City Hall	7.13.19-10:15 am	23.2	73.8	8.3	22	26	380	280	38	0.846	101		0.03
Villa Environmental	7.13.19- 11:26 am	23.8	74.8	8.1	22.5	27	391	279	41	0.833	102		-0.12
Babes Lounge	7.13.19- 11:15 am	21.9	71.4	8.1	22	28	391	280	38	0.786	101		-0.20
Sunny Spot	7.13.19- 11:56 am	21	69.8	8	21.5	26	399	284	39	0.827	102		-0.30
Blue Water Thermal	7.13.19- 11:50	28.1	82.6	8	21.5	26	401	281	41	0.827	101		0.03
B&Z Construction	7.13.19- 12:05	22.1	71.8	8.1	21	24	392	276	39	0.875	102		-0.18

Benton Harbor Water System
Water Quality Parameter Testing

Benton Harbor Water Department

Date	6/27/2019
Field Analyst	Denny Edwards
Laboratory Analyst	Denny and Doug

	Field	Laboratory	Laboratory	Calc			
Site	Date and Time	Chloride	Sulfate	CSMR	Ratio to Tap water with Complete Treatment and OPP Treatment	February 2019CSMR	Difference May -Feb
Raw	7.3.19 - 1:55 pm	19	18	1.056			
Tap	7.13.19- 1:59 pm	23	19	1.211			
Abonmarche	7.13.19- 11:05 am	21	31	0.677	55.96%	0.71	0.033
Cornerstone	7.13.19-10:30 am	21.5	26	0.827	68.31%	0.793	-0.034
BP Station Main and Fair	7.13.19- 11:35	22	24	0.917	75.72%	0.733	-0.184
May Street Service	7.13.19- 12:16	21.5	25	0.860	71.04%	0.786	-0.074
City Hall	7.13.19-10:15 am	22	26	0.846	69.90%	0.828	-0.018
Villa Environmental	7.13.19- 11:26 am	22.5	27	0.833	68.84%	0.694	-0.139
Babes Lounge	7.13.19- 11:15 am	22	28	0.786	64.91%		
Sunny Spot	7.13.19- 11:56 am	21.5	26	0.827	68.31%	0.613	-0.214
Blue Water Thermal	7.13.19- 11:50	21.5	26	0.827	68.31%	0.793	-0.034
B&Z Construction	7.13.19- 12:05	21	24	0.875	72.28%	0.779	-0.096

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Collert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1			1	A	60	0	13	19.0	1.0238	37	1.43	1.56
2			1	A	37	1	13	18.0	0.8865	44	1.96	1.29
3			1	A	24	3	12	17.0	1.0817	54	1.98	1.29
4	1.36	city hall	1	A	21	0	17	14.0	0.9943	55	2.20	1.70
4	1.02	wolfs	1	A	48	0	17	16.0	1.1656	49	1.66	1.46
4	1.33	bait shed	1	A	29	0	13	16.0	1.0912	55	1.99	1.94
4	1.27	sunny spot	1	A	45	0	12	15.5	1.1261	45	1.58	0.52
4	1.26	b&z	1	A	60	0	12	14.5	1.0585	54	2.01	1.09
			1	A	30	1	11	13.5	1.2730	56	1.74	0.00
			1	A	48	0	12	14.0	1.0787	54	2.00	1.51
			1	A	41	0	16	14.0	1.0156	49	1.92	1.32
			1	A	55	1	17	15.0	1.1444	54	1.87	0.00
			1	A	60	2	14	16.0	1.1473	48	1.65	1.29
			1	A	27	0	17	15.0	0.9596	51	2.09	1.30
			1	A	74	0	19	16.0	0.9952	47	1.85	1.95
			1	A	38	0	19	16.5	1.0306	35	1.35	1.37
			1	A	60	0	17	18.0	1.0057	48	1.87	1.56
16	1.34	city hall	1	A	23	0	17	17.5	1.0690	39	1.43	1.31
16	1.15	wolfs	1	A	48	0	14	18.0	0.9875	59	2.37	1.51
16	1.45	bait shed	1	A	37	0	14	17.0	1.0058	30	1.19	1.27
16	1.15	sunny spot	1	A	26	2	16	17.0	1.0800	36	1.32	1.29
16	0.63	b&z	1	A	30	1	20	18.0	0.9173	45	1.96	1.31
			1	A	21	0	20	16.5	1.0953	41	1.47	1.25
			1	A	16	0	19	18.0	1.0518	43	1.61	1.14
			1	A	25	0	20	18.5	0.9259	46	1.96	1.32
			1	A	59	0	19	19.5	1.1624	49	1.66	1.82
			1	A	33	0	19.3	19.5	1.1624	41	1.39	1.51
			1	A	42	0	9.0	12.0	1.0097	43	1.68	1.36
			1	A	19	0	8.7	8.5	1.0162	47	1.82	1.45
			1	A	57	5	8.5	9.5	1.0758	67	2.47	1.12
Totals									31.6369	1419.5		
AVG.	1.20		1	A	39	1	15	16	1.0546	47.3	1.79	1.28
Max	1.45				74	5	20	20	1.2730	67.2	2.47	1.95
Min	0.63				16	0	9	9	0.8865	30.2	1.19	0.00

MI 0600 Benton Harbor WQP 3rd qtr 2019 1 of 2

Benton Harbor Water System
Water Quality Parameter Testing

Date	9/11/2019
Field Analyst	D.V.
Laboratory Analyst	DV DE MO

Site	Date and Time	Field Temp C	Calc Temp F	Field pH	Laboratory Chloride	Laboratory Sulfate	Field Conductivity	Field TDS	Laboratory Calcium	Calc CSMR	Laboratory TA	Calc LSI MO	Calc LSI AWWA
Raw		15.9	60.62	8	21	23	387	396	43	0.913	113	-0.45	-0.11
Tap		13.6	56.48	7.6	24.5	36	425	399	42	0.681	101	-0.97	-0.61
Abonmarche		19.8	67.64	7.7	23	26	418	423	36	0.885	102	-0.80	-0.46
Cornerstone		20.7	69.26	7.8	23	27	412	426	38	0.852	105	-0.63	-0.31
BP Station Main and Fair		24	75.2	8.1	22.5	28	428	427	38	0.804	106	-0.25	0.05
May Street Service		23.1	73.58	7.7	22	31	427	427	37	0.710	102	-0.70	-0.39
City Hall		18.2	64.76	7.7	22	31	418	421	37	0.710	103	-0.81	-0.47
Villa Environmental		24.2	75.56	7.7	22.5	31	424	425	37	0.726	104	-0.67	-0.37
Pearson Construction		21.1	69.98	7.7	26.5	33	45.3	318	38	0.803	105	-0.69	-0.40
Sunny Spot		21.6	70.88	7.7	23	31	429	419	36	0.742	103	-0.75	-0.39
Blue Water Thermal		26.4	79.52	7.7	23.5	30	428	422	36	0.783	103	-0.63	-0.07
B&Z Construction		22	71.6	7.7	23	30	432	433	37	0.767	104	-0.72	-0.14

MI 0600 Benton Harbor WQP 3rd qtr 2019 2 of 2

Benton Harbor Water System
Water Quality Parameter Testing

Date	9/24/2019
Field Analyst	DE
Laboratory Analyst	DV DE MO

Site	Date and Time	Field Temp C	Calc Temp F	Field pH	Laboratory Chloride	Laboratory Sulfate	Field Conductivity	Field TDS	Laboratory Calcium	Calc CSMR	Laboratory TA	Calc LSI MO	Calc LSI AWWA
Raw		21.5	70.7	8.5	18.5	22	370	260	38	0.841	110	0.15	0.43
Tap		18.9	66.02	8.2	21.5	37	399	281	36	0.581	103	-0.26	0.03
Abonmarche		21.6	70.88	8	22	34	403	278	42	0.647	104	-0.33	-0.05
Cornerstone		23.2	73.76	8.1	23	32	398	280	39	0.719	105	-0.22	0.05
BP Station Main and Fair		23.9	75.02	8.3	24	30	400	286	39	0.800	104	-0.01	0.25
May Street Service		22.6	72.68	7.9	24.5	33	397	280	38	0.742	100	-0.47	-0.20
City Hall		23.5	74.3	8	24	32	401	282	39	0.750	100	-0.35	-0.07
Villa Environmental		22.6	72.68	8	23.5	28	406	283	38	0.839	102	-0.34	-0.09
Pearson Construction		20.1	68.18	8.7	26	30	464	326	46	0.867	108	0.38	0.67
Sunny Spot		21.8	71.24	8	23.5	31	398	285	39	0.758	104	-0.36	-0.08
Blue Water Thermal		24.7	76.46	8	23.5	32	396	279	38	0.734	106	-0.30	-0.04
B&Z Construction		22.3	72.14	8.1	24.5	35	411	285	42	0.700	105	-0.21	0.06

WSSN 0600 MONTH/YEAR November-19 PAGE 6

BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1			1	A	75	0	11	12.5	0.9548	46	1.91	1.54
2			1	A	93	0	11	12.5	0.7336	50	2.68	1.45
3			1	A	119	0	11	12.0	1.0696	47	1.73	1.46
4			1	A	119	9	10	11.5	0.9394	45	1.87	1.37
5			1	A	108	0	10	12.0	0.9170	50	2.16	1.62
6	1.47	City Hall	1	A	102	0	10	10.5	0.9492	49	2.03	1.55
6	1.39	Wolfs	1	A	97	0	10	11.0	0.9884	51	2.02	1.54
6	1.58	Bait Shed	1	A	164	0	10	11.0	0.9338	53	2.24	1.48
6	1.57	Sunny Spot	1	A	95	1	8	10.0	0.9478	45	1.88	1.51
6	1.33	B & Z	1	A	102	0	8	9.5	0.8554	52	2.41	0.00
11			1	A	111	0	8	9.0	0.9828	51	2.03	1.48
12	1.52	City Hall	1	A	168	0	8	9.0	0.9716	36	1.45	1.47
12	1.34	Wolfs	1	A	109	1	7	8.5	1.0136	54	2.11	1.46
12	1.45	Bait Shed	1	A	152	0	7	9.0	1.0374	60	2.28	1.56
12	1.40	Sunny Spot	1	A	146	0	7	8.0	1.0430	54	2.05	1.56
12	1.25	B & Z	1	A	50	2	6	8.5	0.9842	58	2.32	1.47
17			1	A	74	4	7	8.0	0.9639	59	2.43	1.53
18			1	A	58	0	7	7.0	1.0080	56	2.21	1.50
19			1	A	79	0	6	6.5	0.8960	58	2.54	1.57
20	1.66	City Hall	1	A	86	0	6	7.0	1.1354	56	1.94	1.50
20	1.47	Wolfs	1	A	98	1	6	6.5	0.9268	57	2.44	1.41
20	1.51	Bait Shed	1	A	85	0	7	7.5	0.9730	19	0.79	1.47
20	1.45	Sunny Spot	1	A	98	0	7	8.0	0.9240	58	2.48	1.51
20	1.24	B & Z	1	A	72	0	7	8.0	1.0080	65	2.54	1.56
25			1	A	58	0	7	8.0	0.9688	39	1.60	1.45
26			1	A	45	12	7	8.0	0.9898	52	2.07	1.49
27			1	A	153	0	7.2	7.5	0.9688	50	2.05	1.47
28			1	A	163	0	9.0	12.0	0.8582	46	2.11	1.52
29			1	A	236	0	8.7	8.5	0.8260	44	2.11	1.52
30			1	A	95	0	8.5	9.5	0.8316	46	2.20	1.48
			1									
Totals									28.5999	1502.5		
AVG.	1.44		1	A	108	1	8	9	0.9533	50.1	2.10	1.45
Max	1.66				236	12		13	1.1354	64.6	2.68	1.62
Min	1.24				45	0	6	7	0.7336	19.4	0.79	0.00

MI 0600 Benton Harbor
Water quality Report 4th Qtr 2019

Benton Harbor Water System
Water Quality Parameter Testing

Date	11/15/2019
Field Analyst	DV MN
Laboratory Analyst	all

WSSN #0600 Benton Harbor Water Department

	Field	Field	Calc	Field	Laboratory	Laboratory	Field	Field	Laboratory	Calc	Laboratory	Calc	Calc
Site	Date and Time	Temp C	Temp F	pH	Chloride	Sulfate	Conductivity	TDS	Calcium	CSMR	TA	LSI MO	LSI AWWA
Raw		7	44.6	8.1	19	28	438	318	51	0.679	119		0.15
Tap		8	46.4	8.1	22	39	448	322	52	0.564	116		0.16
Abonmarche		16.9	62.42	8.1	21.5	33	438	314	43	0.652	117		0.24
Cornerstone		18	64.4	8.1	24	31	437	335	45	0.774	114		0.27
BP Station Main and Fair		14.9	58.82	8.2	23.5	32	438	303	46	0.734	114		0.33
May Street Service		20.4	68.72	8	24.5	31	435	303	46	0.790	115		0.21
City Hall		18.7	65.66	7.9	24.5	31	906	924	45	0.790	117		-0.01
Villa Environmental		15.3	59.54	7.9	27.5	32	310	214	46	0.859	116		0.06
Pearson Construction		18.5	65.3	8	24.5	33	436	307	43	0.742	116		0.17
Sunny Spot		17.3	63.14	8	22	33	436	299	45	0.667	116		0.17
Blue Water Thermal		19.8	67.64	8	17	32	429	301	45	0.531	116		0.21
B&Z Construction		14.3	57.74	8	23.5	31	440	307	42	0.758	114		0.08

MI0600 Benton Harbor Water Quality Report
4th Qtr 2019

Benton Harbor Water System
Water Quality Parameter Testing

Date	11/27/2019
Field Analyst	DE
Laboratory Analyst	DE

WSSN #0600 Benton Harbor Water Department

Site	Date and Time	Field Temp C	Calc Temp F	Field pH	Laboratory Chloride	Laboratory Sulfate	Field Conductivity	Field TDS	Laboratory Calcium	Calc CSMR	Laboratory TA	Calc LSI MO	Calc LSI AWWA
Raw	1:27 PM	7.2	44.96	8.1	19	20	380	365	21	0.950	138		-0.18
Tap	1:29 PM	7.5	45.5	7.9	23.5	37	456	326	46	0.635	120		-0.09
Abonmarche	10:55 AM	15.4	59.72	8	24	38	446	314	50	0.632	124		0.21
Cornerstone	10:35 AM	12.2	53.96	8.1	24	34	460	324	49	0.706	120		0.23
BP Station Main and Fair	11:00 AM	12.2	53.96	8.2	27	29	459	323	49	0.931	125		0.34
May Street Service	10:05 AM	18.8	65.84	8	26	31	453	317	47	0.839	122		0.23
City Hall	10:45 AM	16.2	61.16	8.1	25	31	455	317	49	0.806	123		0.31
Villa Environmental	10:25 AM	16.3	61.34	8.1	26.5	32	452	319	48	0.828	121		0.29
Pearson Construction	11:20 AM	17.7	63.86	8.2	25.5	33	451	319	47	0.773	119		0.40
Sunny Spot	9:55 AM	15.4	59.72	8.2	27	36	457	322	51	0.750	126		0.42
Blue Water Thermal	9:49 AM	21.6	70.88	8.2	26	31	452	318	51	0.839	122		0.46
B&Z Construction	9:40 AM	18.5	65.3	8.5	24.5	33	524	346	46	0.742	124		0.42

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LI16087

Official Laboratory Report

Report To: ERNIE SARKIPATO
350 OTTAWA AVE NW
GRAND RAPIDS MI 49506

System Name/Owner:	CITY OF BENTON HARBOR	WSSN/Pool ID:	600	
Collection Address:	601 RIDGEWAY ST,ST JOSEPH	Source:	TYPE I	
Collected By:	ERNIE SARKIPATO	Site Code:	01	
Township/Well#/Section:	//	Collector:	Other	
County:	Berrien	Date Collected:	11/19/2018	10:45
Sample Point:	01	Date Received:	11/20/2018	10:53
Water System:	Public System Surface Water	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Calcium	39	11/27/2018	0.6		200.7	7440-70-2
Chloride	17	11/20/2018	4		SM 4500-Cl E	7647-14-5
Fluoride	0.47	11/20/2018	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO3	164	11/21/2018	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	11/21/2018	0.1		SM 3500 FeB	7439-89-6
Magnesium	13	11/27/2018	0.1		200.7	7439-95-4
Nitrate as N	0.5	11/20/2018	0.4	10	10-107-04-2-A	14797-55-8
Nitrite as N	Not detected	11/20/2018	0.05	1	10-107-04-2-A	14797-65-0
Sodium	12	11/27/2018	0.5		200.7	7440-23-5
Sodium (automated)	13	11/21/2018	5		SM 3500 NaB	7440-23-5
Sulfate	33	11/21/2018	10		SM 4500 SO4E	14808-79-8
Total Alkalinity as CaCO3	240	11/21/2018	20		EPA 310.2	TALK-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U .S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Berrien County
2149 E. Napier Ave.
Benton Harbor, MI 49022
269 927-5623

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contact: Scott Hayward

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LI16088

Official Laboratory Report

Report To: ERNIE SARKIPATO
350 OTTAWA AVE NW
GRAND RAPIDS MI 49506

System Name/Owner:	CITY OF BENTON HARBOR	WSSN/Pool ID:	600	
Collection Address:	174 W MAIN ST,BENTON HARBOR	Source:	TYPE I	
Collected By:	ERNIE SARKIPATO	Site Code:	SINK	
Township/Well#/Section:	//	Collector:	Other	
County:	Berrien	Date Collected:	11/19/2018	13:05
Sample Point:	02	Date Received:	11/20/2018	10:53
Water System:	Public System Surface Water	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Calcium	37	11/27/2018	0.6		200.7	7440-70-2
Chloride	16	11/20/2018	4		SM 4500-Cl E	7647-14-5
Fluoride	0.50	11/20/2018	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO3	152	11/21/2018	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	11/21/2018	0.1		SM 3500 FeB	7439-89-6
Magnesium	12	11/27/2018	0.1		200.7	7439-95-4
Nitrate as N	0.5	11/20/2018	0.4	10	10-107-04-2-A	14797-55-8
Nitrite as N	Not detected	11/20/2018	0.05	1	10-107-04-2-A	14797-65-0
Sodium	12	11/27/2018	0.5		200.7	7440-23-5
Sodium (automated)	12	11/21/2018	5		SM 3500 NaB	7440-23-5
Sulfate	32	11/21/2018	10		SM 4500 SO4E	14808-79-8
Total Alkalinity as CaCO3	220	11/21/2018	20		EPA 310.2	TALK-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U .S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Berrien County
2149 E. Napier Ave.
Benton Harbor, MI 49022
269 927-5623

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contact: Scott Hayward

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LI16089

Official Laboratory Report

Report To: ERNIE SARKIPATO
350 OTTAWA AVE NW
GRAND RAPIDS MI 49506

System Name/Owner:	CITY OF BENTON HARBOR	WSSN/Pool ID:	600	
Collection Address:	671 MCALISTER ST,BENTON HARBOR	Source:	TYPE I	
Collected By:	ERNIE SARKIPATO	Site Code:	SINK	
Township/Well#/Section:	//	Collector:	Other	
County:	Berrien	Date Collected:	11/19/2018	13:35
Sample Point:	03	Date Received:	11/20/2018	10:53
Water System:	Public System Surface Water	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Calcium	37	11/27/2018	0.6		200.7	7440-70-2
Chloride	17	11/20/2018	4		SM 4500-Cl E	7647-14-5
Fluoride	0.50	11/20/2018	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO3	153	11/21/2018	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	11/21/2018	0.1		SM 3500 FeB	7439-89-6
Magnesium	12	11/27/2018	0.1		200.7	7439-95-4
Nitrate as N	0.5	11/20/2018	0.4	10	10-107-04-2-A	14797-55-8
Nitrite as N	Not detected	11/20/2018	0.05	1	10-107-04-2-A	14797-65-0
Sodium	12	11/27/2018	0.5		200.7	7440-23-5
Sodium (automated)	12	11/21/2018	5		SM 3500 NaB	7440-23-5
Sulfate	29	11/21/2018	10		SM 4500 SO4E	14808-79-8
Total Alkalinity as CaCO3	210	11/21/2018	20		EPA 310.2	TALK-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U .S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Berrien County
2149 E. Napier Ave.
Benton Harbor, MI 49022
269 927-5623

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contact: Scott Hayward

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LI16090

Official Laboratory Report

Report To: ERNIE SARKIPATO
350 OTTAWA AVE NW
GRAND RAPIDS MI 49506

System Name/Owner:	CITY OF BENTON HARBOR	WSSN/Pool ID:	600	
Collection Address:	215 COLFAX AVE,BENTON HARBOR	Source:	TYPE I	
Collected By:	ERNIE SARKIPATO	Site Code:	SINK	
Township/Well#/Section:	//	Collector:	Other	
County:	Berrien	Date Collected:	11/19/2018	14:00
Sample Point:	04	Date Received:	11/20/2018	10:53
Water System:	Public System Surface Water	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Calcium	38	11/27/2018	0.6		200.7	7440-70-2
Chloride	17	11/20/2018	4		SM 4500-Cl E	7647-14-5
Fluoride	0.49	11/20/2018	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO3	158	11/21/2018	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	11/21/2018	0.1		SM 3500 FeB	7439-89-6
Magnesium	13	11/27/2018	0.1		200.7	7439-95-4
Nitrate as N	0.5	11/20/2018	0.4	10	10-107-04-2-A	14797-55-8
Nitrite as N	Not detected	11/20/2018	0.05	1	10-107-04-2-A	14797-65-0
Sodium	12	11/27/2018	0.5		200.7	7440-23-5
Sodium (automated)	12	11/21/2018	5		SM 3500 NaB	7440-23-5
Sulfate	32	11/21/2018	10		SM 4500 SO4E	14808-79-8
Total Alkalinity as CaCO3	200	11/21/2018	20		EPA 310.2	TALK-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U .S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Berrien County
2149 E. Napier Ave.
Benton Harbor, MI 49022
269 927-5623

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contact: Scott Hayward

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LI16091

Official Laboratory Report

Report To: ERNIE SARKIPATO
350 OTTAWA AVE NW
GRAND RAPIDS MI 49506

System Name/Owner:	CITY OF BENTON HARBOR	WSSN/Pool ID:	600	
Collection Address:	131 E MAY ST,BENTON HARBOR	Source:	TYPE I	
Collected By:	ERNIE SARKIPATO	Site Code:	SINK	
Township/Well#/Section:	//	Collector:	Other	
County:	Berrien	Date Collected:	11/19/2018	14:17
Sample Point:	05	Date Received:	11/20/2018	10:53
Water System:	Public System Surface Water	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Calcium	38	11/27/2018	0.6		200.7	7440-70-2
Chloride	16	11/20/2018	4		SM 4500-Cl E	7647-14-5
Fluoride	0.51	11/20/2018	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO3	157	11/21/2018	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	11/21/2018	0.1		SM 3500 FeB	7439-89-6
Magnesium	13	11/27/2018	0.1		200.7	7439-95-4
Nitrate as N	0.5	11/20/2018	0.4	10	10-107-04-2-A	14797-55-8
Nitrite as N	Not detected	11/20/2018	0.05	1	10-107-04-2-A	14797-65-0
Sodium	12	11/27/2018	0.5		200.7	7440-23-5
Sodium (automated)	12	11/21/2018	5		SM 3500 NaB	7440-23-5
Sulfate	32	11/21/2018	10		SM 4500 SO4E	14808-79-8
Total Alkalinity as CaCO3	210	11/21/2018	20		EPA 310.2	TALK-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U .S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Berrien County
2149 E. Napier Ave.
Benton Harbor, MI 49022
269 927-5623

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contact: Scott Hayward

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LI16092

Official Laboratory Report

Report To: ERNIE SARKIPATO
350 OTTAWA AVE NW
GRAND RAPIDS MI 49506

System Name/Owner:	CITY OF BENTON HARBOR	WSSN/Pool ID:	600	
Collection Address:	1171 MILTON ST,BENTON HARBOR	Source:	TYPE I	
Collected By:	ERNIE SARKIPATO	Site Code:	06	
Township/Well#/Section:	//	Collector:	Other	
County:	Berrien	Date Collected:	11/19/2018	14:30
Sample Point:	06	Date Received:	11/20/2018	10:53
Water System:	Public System Surface Water	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Calcium	38	11/27/2018	0.6		200.7	7440-70-2
Chloride	17	11/20/2018	4		SM 4500-Cl E	7647-14-5
Fluoride	0.49	11/20/2018	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO3	157	11/21/2018	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	11/21/2018	0.1		SM 3500 FeB	7439-89-6
Magnesium	13	11/27/2018	0.1		200.7	7439-95-4
Nitrate as N	0.5	11/20/2018	0.4	10	10-107-04-2-A	14797-55-8
Nitrite as N	Not detected	11/20/2018	0.05	1	10-107-04-2-A	14797-65-0
Sodium	12	11/27/2018	0.5		200.7	7440-23-5
Sodium (automated)	12	11/21/2018	5		SM 3500 NaB	7440-23-5
Sulfate	31	11/21/2018	10		SM 4500 SO4E	14808-79-8
Total Alkalinity as CaCO3	230	11/21/2018	20		EPA 310.2	TALK-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U .S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Berrien County
2149 E. Napier Ave.
Benton Harbor, MI 49022
269 927-5623

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contact: Scott Hayward

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LI16093

Official Laboratory Report

Report To: ERNIE SARKIPATO
350 OTTAWA AVE NW
GRAND RAPIDS MI 49506

System Name/Owner:	CITY OF BENTON HARBOR	WSSN/Pool ID:	600	
Collection Address:	800 S FAIR AVE,BENTON HARBOR	Source:	TYPE I	
Collected By:	ERNIE SARKIPATO	Site Code:	07	
Township/Well#/Section:	//	Collector:	Other	
County:	Berrien	Date Collected:	11/19/2018	14:50
Sample Point:	07	Date Received:	11/20/2018	10:53
Water System:	Public System Surface Water	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Calcium	38	11/27/2018	0.6		200.7	7440-70-2
Chloride	16	11/20/2018	4		SM 4500-Cl E	7647-14-5
Fluoride	0.48	11/20/2018	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO3	160	11/21/2018	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	11/21/2018	0.1		SM 3500 FeB	7439-89-6
Magnesium	13	11/27/2018	0.1		200.7	7439-95-4
Nitrate as N	0.5	11/20/2018	0.4	10	10-107-04-2-A	14797-55-8
Nitrite as N	Not detected	11/20/2018	0.05	1	10-107-04-2-A	14797-65-0
Sodium	12	11/27/2018	0.5		200.7	7440-23-5
Sodium (automated)	12	11/21/2018	5		SM 3500 NaB	7440-23-5
Sulfate	28	11/21/2018	10		SM 4500 SO4E	14808-79-8
Total Alkalinity as CaCO3	170	11/21/2018	20		EPA 310.2	TALK-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U .S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Berrien County
2149 E. Napier Ave.
Benton Harbor, MI 49022
269 927-5623

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contact: Scott Hayward

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LI16094

Official Laboratory Report

Report To: ERNIE SARKIPATO
350 OTTAWA AVE NW
GRAND RAPIDS MI 49506

System Name/Owner:	CITY OF BENTON HARBOR	WSSN/Pool ID:	600	
Collection Address:	895 PIPESTONE ST,BENTON HARBOR	Source:	TYPE I	
Collected By:	ERNIE SARKIPATO	Site Code:	08	
Township/Well#/Section:	//	Collector:	Other	
County:	Berrien	Date Collected:	11/19/2018	15:00
Sample Point:	08	Date Received:	11/20/2018	10:53
Water System:	Public System Surface Water	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Calcium	39	11/27/2018	0.6		200.7	7440-70-2
Chloride	16	11/20/2018	4		SM 4500-Cl E	7647-14-5
Fluoride	0.47	11/20/2018	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO3	156	11/21/2018	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	11/21/2018	0.1		SM 3500 FeB	7439-89-6
Magnesium	13	11/27/2018	0.1		200.7	7439-95-4
Nitrate as N	0.5	11/20/2018	0.4	10	10-107-04-2-A	14797-55-8
Nitrite as N	Not detected	11/20/2018	0.05	1	10-107-04-2-A	14797-65-0
Sodium	12	11/27/2018	0.5		200.7	7440-23-5
Sodium (automated)	13	11/21/2018	5		SM 3500 NaB	7440-23-5
Sulfate	32	11/21/2018	10		SM 4500 SO4E	14808-79-8
Total Alkalinity as CaCO3	230	11/21/2018	20		EPA 310.2	TALK-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U .S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

Berrien County
2149 E. Napier Ave.
Benton Harbor, MI 49022
269 927-5623

CAS# : Chemical Abstract Service Registry Number
MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contact: Scott Hayward

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LI16095

Official Laboratory Report

Report To: ERNIE SARKIPATO
350 OTTAWA AVE NW
GRAND RAPIDS MI 49506

System Name/Owner:	CITY OF BENTON HARBOR	WSSN/Pool ID:	600	
Collection Address:	200 E WALL ST,BENTON HARBOR	Source:	TYPE I	
Collected By:	ERNIE SARKIPATO	Site Code:	09	
Township/Well#/Section:	//	Collector:	Other	
County:	Berrien	Date Collected:	11/19/2018	15:30
Sample Point:	09	Date Received:	11/20/2018	10:53
Water System:	Public System Surface Water	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Calcium	40	11/27/2018	0.6		200.7	7440-70-2
Chloride	17	11/20/2018	4		SM 4500-Cl E	7647-14-5
Fluoride	0.47	11/20/2018	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO3	159	11/21/2018	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	11/21/2018	0.1		SM 3500 FeB	7439-89-6
Magnesium	13	11/27/2018	0.1		200.7	7439-95-4
Nitrate as N	0.6	11/20/2018	0.4	10	10-107-04-2-A	14797-55-8
Nitrite as N	Not detected	11/20/2018	0.05	1	10-107-04-2-A	14797-65-0
Sodium	12	11/27/2018	0.5		200.7	7440-23-5
Sodium (automated)	12	11/21/2018	5		SM 3500 NaB	7440-23-5
Sulfate	32	11/21/2018	10		SM 4500 SO4E	14808-79-8
Total Alkalinity as CaCO3	190	11/21/2018	20		EPA 310.2	TALK-00-C

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2149 E. Napier Ave.
Benton Harbor, MI 49022
269 927-5623

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Laboratory Contact: Scott Hayward

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LI16096

Official Laboratory Report

Report To: ERNIE SARKIPATO
350 OTTAWA AVE NW
GRAND RAPIDS MI 49506

System Name/Owner:	CITY OF BENTON HARBOR	WSSN/Pool ID:	600	
Collection Address:	95 W MAIN ST,BENTON HARBOR	Source:	TYPE I	
Collected By:	ERNIE SARKIPATO	Site Code:	10	
Township/Well#/Section:	//	Collector:	Other	
County:	Berrien	Date Collected:	11/19/2018	15:30
Sample Point:	10	Date Received:	11/20/2018	10:53
Water System:	Public System Surface Water	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Calcium	40	11/27/2018	0.6		200.7	7440-70-2
Chloride	17	11/20/2018	4		SM 4500-Cl E	7647-14-5
Fluoride	0.47	11/20/2018	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO3	170	11/21/2018	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	11/21/2018	0.1		SM 3500 FeB	7439-89-6
Magnesium	13	11/27/2018	0.1		200.7	7439-95-4
Nitrate as N	0.6	11/20/2018	0.4	10	10-107-04-2-A	14797-55-8
Nitrite as N	Not detected	11/20/2018	0.05	1	10-107-04-2-A	14797-65-0
Sodium	12	11/27/2018	0.5		200.7	7440-23-5
Sodium (automated)	12	11/21/2018	5		SM 3500 NaB	7440-23-5
Sulfate	31	11/21/2018	10		SM 4500 SO4E	14808-79-8
Total Alkalinity as CaCO3	260	11/21/2018	20		EPA 310.2	TALK-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U .S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contact: Scott Hayward

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER LABORATORY
USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LI16097

Official Laboratory Report

Report To: ERNIE SARKIPATO
350 OTTAWA AVE NW
GRAND RAPIDS MI 49506

System Name/Owner:	CITY OF BENTON HARBOR	WSSN/Pool ID:	600	
Collection Address:	80 W MAIN ST,BENTON HARBOR	Source:	TYPE I	
Collected By:	ERNIE SARKIPATO	Site Code:	11	
Township/Well#/Section:	//	Collector:	Other	
County:	Berrien	Date Collected:	11/19/2018	15:45
Sample Point:	11	Date Received:	11/20/2018	10:53
Water System:	Public System Surface Water	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Calcium	39	11/27/2018	0.6		200.7	7440-70-2
Chloride	17	11/20/2018	4		SM 4500-Cl E	7647-14-5
Fluoride	0.50	11/20/2018	0.1	4.0	SM 4500 FC	16984-48-8
Hardness as CaCO3	162	11/21/2018	20		SM 2340 C	HARD-00-C
Iron (automated)	Not detected	11/21/2018	0.1		SM 3500 FeB	7439-89-6
Magnesium	13	11/27/2018	0.1		200.7	7439-95-4
Nitrate as N	0.5	11/20/2018	0.4	10	10-107-04-2-A	14797-55-8
Nitrite as N	Not detected	11/20/2018	0.05	1	10-107-04-2-A	14797-65-0
Sodium	12	11/27/2018	0.5		200.7	7440-23-5
Sodium (automated)	12	11/21/2018	5		SM 3500 NaB	7440-23-5
Sulfate	29	11/21/2018	10		SM 4500 SO4E	14808-79-8
Total Alkalinity as CaCO3	200	11/21/2018	20		EPA 310.2	TALK-00-C

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U .S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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Benton Harbor, MI 49022
269 927-5623

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MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts per million
MPN : Most Probable Number
CFU : Colony Forming Unit

Laboratory Contact: Scott Hayward

MI 0600 Benton Harbor WQP. 12/19/2018

Water Quality Parameters

Benton Harbor Water System
Water Quality Parameter Testing
11/19/2018
by Ernie Sarikapto
and MDEQ Laboratory* Total Alk values in question.

Address	Sample Site	Date	pH	Temp (Degrees C)	Temp (Degrees F)	TDS (mg/L)	Conductivity mS/cm	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Alkalinity (mg/L as CaCO3)	CSMR	LSI
Raw	not sampled this date												
Plant tap		11/19/2018	8.1	9.2	48.56	263	0.526	17	33	39	240	0.51515152	0.38
174 w main	(larks, men's bathroom)	11/20/2018	8.2	10.6	51.08	252	0.504	16	32	37	220	0.5	0.45
671 McAlister	(River of Life, sink on left in men's bathroom)	11/21/2018	8.2	11.4	52.52	254	0.508	17	29	37	210	0.5862069	0.44
215 Colfax	(Villa, kitchenette)	11/22/2018	8.1	12.7	54.86	255	0.51	17	32	38	200	0.53125	0.36
131 E May St	(Marathon/May St Market, prep room sink)	11/23/2018	8.2	9.5	49.1	256	0.512	16	32	38	210	0.5	0.42
1171 Milton St	(B&Z, Kitchenette sink)	11/24/2018	8.2	9.2	48.56	255	0.51	17	31	38	230	0.5483871	0.45
800 S Fair	(Blue Water Thermal, Break Room sink)	11/25/2018	8.2	9.9	49.82	255	0.51	16	28	38	170	0.57142857	0.34
895 Pipestone St	(Sunny Spot, Bathroom sink)	11/26/2018	8.1	10.6	51.08	257	0.514	16	32	39	230	0.5	0.39
200 E Wall St	(City Hall, upstairs bathroom)	11/27/2018	8.2	10.8	51.44	261	0.522	17	32	40	190	0.53125	0.42
95 W Main	(Abonmarche, Lobby bathroom sink)	11/28/2018	8.2	10.1	50.18	265	0.53	17	31	40	260	0.5483871	0.54
80 W Main	(Cornerstone, break room sink)	11/29/2018	8.1	7	44.6	264	0.528	17	29	39	200	0.5862069	0.26

Benton Harbor Water System
Water Quality Parameter Testing
11/28/2018
by Mike O'Malley
and Eurofins Eaton Analytical.

I have all my Equipment now, I think I shall Re-do this. Also I changed a few sites, due to Access

Address	Site	Temp C	Temp F	pH	Chloride	Sulfate	Conductivity	TDS	Calcium	CSMR	TA	LSI MO	LSI AWWA
Raw Water tap	Raw	7	44.6	8.1	19.5	24	227	152	53	0.813	117	-0.38	-0.05
Plant Tap	Tap	7	44.6	7.8	21.0	33	248	166	49	0.636	110	-0.75	-0.15
95 W Main	Abonmarche	10.2	50.36	7.5	24.0	32	248	166	63	0.750	110	-0.86	-0.50
80 W Main	Cornerstone	8.4	47.12	7.6	23.5	32	262	176	60	0.734	110	-0.83	-0.50
	BP Station Main and Fair Replace Larkes	9.6	49.28	7.7	21.0	30	243	163	62	0.700	110	-0.68	-0.36
131 E May St	May Street Service replace Mens School	11.5	52.7	7.5	19.5	31	238	160	63	0.629	110	-0.82	-0.52
	City Hall	11.6	52.88	7.7	21.5	31	238	160	62	0.694	110	-0.63	-0.32
215 Colfax	Villa Environmental	13.4	56.12	7.7	21.0	30	243	163	60	0.700	110	-0.60	-0.31
	Babes Lounge Replace toL School	12.5	54.5	7.6	22.5	29	245	164	61	0.776	110	-0.71	-0.42
895 Pipestone St	Sunny Spot	12.5	54.5	7.5	22.0	31	222	111	63	0.710	110	-0.77	-0.50
800 S Fair	Blue Water Thermal Should remove	15	59	7.9	20.5	32	250	118	63	0.641	110	-0.32	-0.06
1171 Milton St	B&Z Construction	9.6	49.28	7.9	21.5	33	220	121	63	0.652	110	-0.45	-0.15

2nd Sampling better distribution. Have to NOT use Bluewater, sewer is TOO slow.

MO LSI is different than the AWWA LSI.

MI 0600 Benton Harbor WQP. 12/19/2018

Water Quality Parameters

Benton Harbor Water System
Water Quality Parameter Testing
11/19/2018
by Ernie Sarikapto
and MDEQ Laboratory* Total Alk values in question.

Address	Sample Site	Date	pH	Temp (Degrees C)	Temp (Degrees F)	TDS (mg/L)	Conductivity mS/cm	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Alkalinity (mg/L as CaCO3)	CSMR	LSI
Raw	not sampled this date												
Plant tap		11/19/2018	8.1	9.2	48.56	263	0.526	17	33	39	240	0.51515152	0.38
174 w main	(larks, men's bathroom)	11/20/2018	8.2	10.6	51.08	252	0.504	16	32	37	220	0.5	0.45
671 McAlister	(River of Life, sink on left in men's bathroom)	11/21/2018	8.2	11.4	52.52	254	0.508	17	29	37	210	0.5862069	0.44
215 Colfax	(Villa, kitchenette)	11/22/2018	8.1	12.7	54.86	255	0.51	17	32	38	200	0.53125	0.36
131 E May St	(Marathon/May St Market, prep room sink)	11/23/2018	8.2	9.5	49.1	256	0.512	16	32	38	210	0.5	0.42
1171 Milton St	(B&Z, Kitchenette sink)	11/24/2018	8.2	9.2	48.56	255	0.51	17	31	38	230	0.5483871	0.45
800 S Fair	(Blue Water Thermal, Break Room sink)	11/25/2018	8.2	9.9	49.82	255	0.51	16	28	38	170	0.57142857	0.34
895 Pipestone St	(Sunny Spot, Bathroom sink)	11/26/2018	8.1	10.6	51.08	257	0.514	16	32	39	230	0.5	0.39
200 E Wall St	(City Hall, upstairs bathroom)	11/27/2018	8.2	10.8	51.44	261	0.522	17	32	40	190	0.53125	0.42
95 W Main	(Abonmarche, Lobby bathroom sink)	11/28/2018	8.2	10.1	50.18	265	0.53	17	31	40	260	0.5483871	0.54
80 W Main	(Cornerstone, break room sink)	11/29/2018	8.1	7	44.6	264	0.528	17	29	39	200	0.5862069	0.26

Benton Harbor Water System
Water Quality Parameter Testing
11/28/2018
by Mike O'Malley
and Eurofins Eaton Analytical.

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Address	Site	Temp C	Temp F	pH	Chloride	Sulfate	Conductivity	TDS	Calcium	CSMR	TA	LSI MO	LSI AWWA
Raw Water tap	Raw	7	44.6	8.1	19.5	24	227	152	53	0.813	117	-0.38	-0.05
Plant Tap	Tap	7	44.6	7.8	21.0	33	248	166	49	0.636	110	-0.75	-0.15
95 W Main	Abonmarche	10.2	50.36	7.5	24.0	32	248	166	63	0.750	110	-0.86	-0.50
80 W Main	Cornerstone	8.4	47.12	7.6	23.5	32	262	176	60	0.734	110	-0.83	-0.50
	BP Station Main and Fair Replace Larkes	9.6	49.28	7.7	21.0	30	243	163	62	0.700	110	-0.68	-0.36
131 E May St	May Street Service replace Mens School	11.5	52.7	7.5	19.5	31	238	160	63	0.629	110	-0.82	-0.52
	City Hall	11.6	52.88	7.7	21.5	31	238	160	62	0.694	110	-0.63	-0.32
215 Colfax	Villa Environmental	13.4	56.12	7.7	21.0	30	243	163	60	0.700	110	-0.60	-0.31
	Babes Lounge Replace toL School	12.5	54.5	7.6	22.5	29	245	164	61	0.776	110	-0.71	-0.42
895 Pipestone St	Sunny Spot	12.5	54.5	7.5	22.0	31	222	111	63	0.710	110	-0.77	-0.50
800 S Fair	Blue Water Thermal Should remove	15	59	7.9	20.5	32	250	118	63	0.641	110	-0.32	-0.06
1171 Milton St	B&Z Construction	9.6	49.28	7.9	21.5	33	220	121	63	0.652	110	-0.45	-0.15

2nd Sampling better distribution. Have to NOT use Bluewater, sewer is TOO slow.

MO LSI is different than the AWWA LSI.

Benton Harbor WQP Sampling by E. Sarkipato, M. O'Malley

		Date	pH	Temp (Degrees C)	Temp (Degrees F)	TDS (mg/L)	Conductivity mS/cm	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Alkalinity (mg/L as CaCO3)	CSMR	LSI
Raw	not sampled this date												
601 Ridgeway St	Plant tap	11/19/2018	8.1	9.2	48.56	263	0.526	17	33	39	240	0.515	0.38
174 w main	(larks, men's bathroom)	11/19/2018	8.2	10.6	51.08	252	0.504	16	32	37	220	0.500	0.45
671 McAlister	(River of Life, sink on left in men's bathroom)	11/19/2018	8.2	11.4	52.52	254	0.508	17	29	37	210	0.586	0.44
215 Colfax	(Villa, kitchenette)	11/19/2018	8.1	12.7	54.86	255	0.51	17	32	38	200	0.531	0.36
131 E May St	(Marathon/May St Market, prep room sink)	11/19/2018	8.2	9.5	49.1	256	0.512	16	32	38	210	0.500	0.42
1171 Milton St	(B&Z, Kitchenette sink)	11/19/2018	8.2	9.2	48.56	255	0.51	17	31	38	230	0.548	0.45
800 S Fair	(Blue Water Thermal, Break Room sink)	11/19/2018	8.2	9.9	49.82	255	0.51	16	28	38	170	0.571	0.34
895 Pipestone St	(Sunny Spot, Bathroom sink)	11/19/2018	8.1	10.6	51.08	257	0.514	16	32	39	230	0.500	0.39
200 E Wall St	(City Hall, upstairs bathroom)	11/19/2018	8.2	10.8	51.44	261	0.522	17	32	40	190	0.531	0.42
95 W Main	(Abonmarche, Lobby bathroom sink)	11/19/2018	8.2	10.1	50.18	265	0.53	17	31	40	260	0.548	0.54
80 W Main	(Cornerstone, break room sink)	11/19/2018	8.1	7	44.6	264	0.528	17	29	39	200	0.586	0.26

Benton Harbor Water System
Water Quality Parameter Testing

Date	2/13/2019
Field Analyst	DE
Laboratory Analyst	

Site	Field Date and Time	Field Temp C	Calc Temp F	Field pH	Laboratory Chloride	Laboratory Sulfate	Field Conductivity	Field TDS	Laboratory Calcium	Calc CSMR	Laboratory TA	Calc LSI MO	Calc LSI AWWA
Raw	2/13/2019	1.5	34.7	7.8					40	#DIV/0!	114		
Tap	2/13/2019	2	35.6	7.7					41	#DIV/0!	105		
Abonmarche	2/13/2019	7.6	45.68	7.6	22	31	361	256	45	0.710	106		
Cornerstone	2/13/2019	10.9	51.62	7.7	23	29	367	260	44	0.793	107		
BP Station Main and Fair	2/13/2019	8.3	46.94	7.8	22	30	380	271	50	0.733	112		
May Street Service	2/13/2019	4.5	40.1	7.6	22	28	381	261	42	0.786	110		
City Hall	2/13/2019	10.9	51.62	7.7	24	29	368	264	41	0.828	109		
Villa Environmental	2/13/2019	11.9	53.42	7.5	21.5	31	356	253	46	0.694	109		
Babes Lounge	2/13/2019		32							#DIV/0!			
Sunny Spot	2/13/2019	13	55.4	7.6	19	31	364	257	47	0.613	109		
Blue Water Thermal	2/13/2019	11.9	53.42	7.7	23	29	371	266	46	0.793	109		
	2/13/2019	14	57.2		27	27	379	273	46	1.000	110		

Benton Harbor Water System
Water Quality Parameter Testing

Date	2/26/2019
Field Analyst	DE
Laboratory Analyst	MO DE DV

	Field	Field	Calc	Field	Laboratory	Laboratory	Field	Field	Laboratory	Calc	Laboratory	Calc	Calc
Site	Date and Time	Temp C	Temp F	pH	Chloride	Sulfate	Conductivity	TDS	Calcium	CSMR	TA	LSI MO	LSI AWWA
Raw	9:26 AM	3.3	32	7.9	21		340	253	46	#DIV/0!			
Tap	9:30 AM	4.5	32	7.5	24.5		376	267	48	#DIV/0!			
Abonmarche	10:33 AM	3.8	32	7.6	25	30	361	253	46	0.833	112		
Cornerstone	10:50 AM	4.1	32	7.9	24.5	30	362	267	46	0.817	117		
BP Station Main and Fair	11:29 AM	7.3	32	7.9	25.5	30	288	259	46	0.850	125		
May Street Service	12:37 PM	11.3	32	7.7	24	36	395	279	44	0.667	119		
City Hall	11:11 AM	7.2	32	7.9	23.5	33	359	251	244	0.712	113		
Villa Environmental	11:05 AM	4.7	32	7.9	25	36	374	268	45	0.694	123		
Babes Lounge			32							#DIV/0!			
Sunny Spot	12:11 PM	12.5	32	7.9	25.5	37	404	290	49	0.689	124		
Blue Water Thermal	11:54 AM	9.5	32	7.6	26	39	381	279	48	0.667	123		
B&Z Construction	12:21 PM	13.1	32	7.9	26.5	34	416	291	51	0.779	125		

Benton Harbor Water System
Water Quality Parameter Testing

Date	2/13/2019
Field Analyst	Denny Edwards
Laboratory Analyst	Assorted DE; DV; MO

Site	Field Date and Time	Field Temp C	Calc Temp F	Field pH	Laboratory Chloride	Laboratory Sulfate	Field Conductivity	Field TDS	Laboratory Calcium	Calc CSMR	Laboratory TA	Calc LSI MO	Calc LSI AWWA
Raw	2/13/2019	1.5	34.7	7.8			350		40		114	-1.01	-0.30
	2/26/2019	3.3	32	7.9	21		340	253	46		124	-0.76	-0.13
Tap	2/13/2019	2	35.6	7.7			375		41		105	-1.02	-0.87
	2/26/2019	4.5	32	7.5	24.5		376	267	48		131	-1.09	-0.56
Abonmarche	2/13/2019	7.6	45.68	7.6	22	31	361	256	45	0.710	106	-1.03	-0.44
	2/26/2019	3.8	32	7.6	25	30	361	253	46	0.833	112	-0.99	-0.48
Cornerstone	2/13/2019	10.9	51.62	7.7	23	29	367	260	44	0.793	107	-0.83	-0.28
	2/26/2019	4.1	32	7.9	24.5	30	362	267	46	0.817	117	-0.77	-0.19
BP Station Main and Fair	2/13/2019	8.3	46.94	7.8	22	30	380	271	50	0.733	112	-0.74	-0.16
	2/26/2019	7.3	32	7.9	25.5	30	288	259	46	0.850	125	-0.65	-0.06
May Street Service	2/13/2019	4.5	40.1	7.6	22	28	381	261	42	0.786	110	-1.12	-0.51
	2/26/2019	11.3	52.34	32	7.7	24	395	279	44	0.061	119	-0.805	-0.23
City Hall	2/13/2019	10.9	51.62	7.7	24	29	368	264	41	0.828	109	-0.87	-0.31
	2/26/2019	7.2	32	7.9	23.5	33	359	251	44	0.712	113	-0.81	-0.13
Villa Environmental	2/13/2019	11.9	53.42	7.5	21.5	31	356	253	46	0.694	109	-1.49	-0.44
	2/26/2019	4.7	32	7.9	25	36	374	268	45	0.694	123		-0.13
Sunny Spot	2/13/2019	13	55.4	7.6	19	31	364	257	47	0.613	109	-0.86	-0.31
	2/26/2019	12.5	32	7.9	25.5	37	404	290	49	0.689	124		-0.01
Blue Water Thermal	2/13/2019	11.9	53.42	7.7	23	29	371	266	46	0.793	109	-0.80	-0.24
	2/26/2019	9.5	32	7.6	26	39	381	279	48	0.667	123		-0.37
B&Z Construction	2/13/2019	14	57.2		27	27	379	273	46	1.000	110	-0.52	0.00
B&Z Construction	2/26/2019	13.1	32	7.9	26.5	34	416	291	51	0.779	125	-0.47	0.08

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LABORATORY REPORT

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Arkansas	IN00035	Nevada	IN00035
California	2920	New Hampshire*	2124
Colorado	IN035	New Jersey*	IN598
Colorado Radiochemistry	IN035	New Mexico	IN00035
Connecticut	PH-0132	New York*	11398
Delaware	IN035	North Carolina	18700
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Georgia	929	Ohio	87775
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Illinois*	200001	Pennsylvania*	68-00466
Illinois Microbiology	17767	Puerto Rico	IN00035
Illinois Radiochemistry	IN00035	Rhode Island	LAO00343
Indiana Chemistry	C-71-01	South Carolina	95005
Indiana Microbiology	M-76-07	South Dakota	IN00035
Iowa	098	Tennessee	TN02973
Kansas*	E-10233	Texas*	T104704187-15-8
Kentucky	90056	Texas/TCEQ	TX207
Louisiana*	LA180008	Utah*	IN00035
Maine	IN00035	Vermont	VT-8775
Maryland	209	Virginia*	460275
Massachusetts	M-IN035	Washington	C837
Michigan	9926	West Virginia	9927 C
Minnesota*	018-999-338	Wisconsin	999766900
Mississippi	IN035	Wyoming	IN035
EPA	IN00035		

*NELAP/TNI Recognized Accreditation Bodies

Revision date: 01/02/2018

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110 South Hill Street
South Bend, IN 46617
Tel: (574) 233-4777
Fax: (574) 233-8207
1 800 332 4345

Laboratory Report

Client: Benton Harbor, City of

Attn: Michael O'Malley
200 East Wall Street
Benton Harbor, MI 49002

Report: 437284
Priority: Standard Written
Status: Final
PWS ID: MI0600

Sample Information

EEA ID #	Client ID	Method	Collected Date / Time	Collected By:	Received Date / Time
4137015	95 W Main St.	300.0	11/28/18 12:23	Client	11/30/18 14:00
4137016	Raw Lake MI	300.0	11/28/18 08:00	Client	11/30/18 14:00
4137017	84 W Main Cornerstone	300.0	11/28/18 12:15	Client	11/30/18 14:00
4137018	May St. Market May & Colfax	300.0	11/28/18 13:33	Client	11/30/18 14:00
4137019	202 W Main & Fair	300.0	11/28/18 12:30	Client	11/30/18 14:00
4137020	Babes on Riverview	300.0	11/28/18 15:00	Client	11/30/18 14:00
4137021	8th St. Villa Enrivonmental	300.0	11/28/18 13:40	Client	11/30/18 14:00
4137022	200 & Wall City Hall	300.0	11/28/18 14:00	Client	11/30/18 14:00
4137023	Pipestone & Empire	300.0	11/28/18 15:25	Client	11/30/18 14:00
4137024	Blue Water Fair & Valley	300.0	11/28/18 16:00	Client	11/30/18 14:00
4137025	B&Z Milton St.	300.0	11/28/18 16:15	Client	11/30/18 14:00
4137026	Finished Water	300.0	11/28/18 16:30	Client	11/30/18 14:00

Report Summary

Note: Sample containers for Samples 4137016 and 4137026 were provided by the client.

Detailed quantitative results are presented on the following pages. The results presented relate only to the samples provided for analysis.

We appreciate the opportunity to provide you with this analysis. If you have any questions concerning this report, please do not hesitate to call Pat Muff at (574) 233-4777.

Note: This report may not be reproduced, except in full, without written approval from EEA.

Pat Muff ASM — 12/11/2018

Authorized Signature — Title — Date

Client Name: Benton Harbor, City of
Report #: 437284

Client Name: Benton Harbor, City of Report #: 437284

Sampling Point: 95 W Main St. PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**32**	mg/L	---	12/04/18 00:20	4137015

Sampling Point: Raw Lake MI PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**24**	mg/L	---	12/04/18 00:39	4137016

Sampling Point: 84 W Main Cornerstone PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**32**	mg/L	---	12/04/18 00:57	4137017

Sampling Point: May St. Market May & Colfax PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**31**	mg/L	---	12/04/18 01:15	4137018

Sampling Point: 202 W Main & Fair PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**30**	mg/L	---	12/04/18 01:33	4137019

Sampling Point: Babes on Riverview PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**29**	mg/L	---	12/04/18 01:51	4137020

Client Name: Benton Harbor, City of Report #: 437284

Sampling Point: 8th St. Villa Enrivonmental PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**30**	mg/L	---	12/04/18 02:10	4137021

Sampling Point: 200 & Wall City Hall PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**31**	mg/L	---	12/04/18 02:28	4137022

Sampling Point: Pipestone & Empire PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**31**	mg/L	---	12/04/18 02:46	4137023

Sampling Point: Blue Water Fair & Valley PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**32**	mg/L	---	12/04/18 13:26	4137024

Sampling Point: B&Z Milton St. PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**33**	mg/L	---	12/04/18 13:42	4137025

Sampling Point: Finished Water PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**33**	mg/L	---	12/04/18 15:56	4137026

† EEA has demonstrated it can achieve these report limits in reagent water, but can not document them in all sample matrices.

Reg Limit Type:	MCL	SMCL	AL
Symbol:	*	^	!

Lab Definitions

Continuing Calibration Check Standard (CCC) / Continuing Calibration Verification (CCV) / Initial Calibration Verification Standard (ICV) / Initial Performance Check (IPC) - is a standard containing one or more of the target analytes that is prepared from the same standards used to calibrate the instrument. This standard is used to verify the calibration curve at the beginning of each analytical sequence, and may also be analyzed throughout and at the end of the sequence. The concentration of continuing standards may be varied, when prescribed by the reference method, so that the range of the calibration curve is verified on a regular basis. CCL, CCM, and CCH are the CCC standards at low, mid, and high concentration levels, respectively.

Internal Standards (IS) - are pure compounds with properties similar to the analytes of interest, which are added to field samples or extracts, calibration standards, and quality control standards at a known concentration. They are used to measure the relative responses of the analytes of interest and surrogates in the sample, calibration standard or quality control standard.

Laboratory Duplicate (LD) - is a field sample aliquot taken from the same sample container in the laboratory and analyzed separately using identical procedures. Analysis of laboratory duplicates provides a measure of the precision of the laboratory procedures.

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) - is an aliquot of reagent water to which known concentrations of the analytes of interest are added. The LFB is analyzed exactly the same as the field samples. LFBs are used to determine whether the method is in control. FBL, FBM, and FBH are the LFB samples at low, mid, and high concentration levels, respectively.

Laboratory Method Blank (LMB) / Laboratory Reagent Blank (LRB) - is a sample of reagent water included in the sample batch analyzed in the same way as the associated field samples. The LMB is used to determine if method analytes or other background contamination have been introduced during the preparation or analytical procedure. The LMB is analyzed exactly the same as the field samples.

Laboratory Trip Blank (LTB) / Field Reagent Blank (FRB) - is a sample of laboratory reagent water placed in a sample container in the laboratory and treated as a field sample, including storage, preservation, and all analytical procedures. The FRB/LTB container follows the collection bottles to and from the collection site, but the FRB/LTB is not opened at any time during the trip. The FRB/LTB is primarily a travel blank used to verify that the samples were not contaminated during shipment.

Matrix Spike Duplicate Sample (MSD) / Laboratory Fortified Sample Matrix Duplicate (LFSMD) - is a sample aliquot taken from the same field sample source as the Matrix Spike Sample to which known quantities of the analytes of interest are added in the laboratory. The MSD is analyzed exactly the same as the field samples. Analysis of the MSD provides a measure of the precision of the laboratory procedures in a specific matrix. SDL, SDM, and SDH / LFSMDL, LFSMDM, and LFSMDH are the MSD or LFSMD at low, mid, and high concentration levels, respectively.

Matrix Spike Sample (MS) / Laboratory Fortified Sample Matrix (LFSM) - is a sample aliquot taken from field sample source to which known quantities of the analytes of interest are added in the laboratory. The MS is analyzed exactly the same as the field samples. The purpose is to demonstrate recovery of the analytes from a sample matrix to determine if the specific matrix contributes bias to the analytical results. MSL, MSM, and MSH / LFSML, LFSMM, and LFSMH are the MS or LFSM at low, mid, and high concentration levels, respectively.

Quality Control Standard (QCS) / Second Source Calibration Verification (SSCV) - is a solution containing known concentrations of the analytes of interest prepared from a source different from the source of the calibration standards. The solution is obtained from a second manufacturer or lot if the lot can be demonstrated by the manufacturer as prepared independently from other lots. The QCS sample is analyzed using the same procedures as field samples. The QCS is used as a check on the calibration standards used in the method on a routine basis.

Reporting Limit Check (RLC) / Initial Calibration Check Standard (ICCS) - is a procedural standard that is analyzed each day to evaluate instrument performance at or below the minimum reporting limit (MRL).

Surrogate Standard (SS) / Surrogate Analyte (SUR) - is a pure compound with properties similar to the analytes of interest, which is highly unlikely to be found in any field sample, that is added to the field samples, calibration standards, blanks and quality control standards before sample preparation. The SS is used to evaluate the efficiency of the sample preparation process.

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Order # 358541
Batch # 437284

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CHAIN OF CUSTODY RECORD

Page 1 of 1

Shaded area for EEA use only

REPORT TO:	SAMPLER (Signature)	PWS ID #	STATE (sample origin)	PROJECT NAME	PO#
Mike O'Malley momalley@City of Benton Harbor mi.gov	MF	MI 0600	MI	Water Quality Parameters	S3325560
BILL TO:	COMPLIANCE MONITORING: Yes: X / No:	POPULATION SERVED: 9126	SOURCE WATER: Lake Michigan		

LAB Number	COLLECTION DATE	TIME	AM	PM	SAMPLING SITE	TEST NAME	SAMPLE REMARKS	CHLORINATED YES	CHLORINATED NO	# OF CONTAINERS	MATRIX CODE	TURNAROUND TIME
1 4137015	11/28/18	12:10	X		95 W Main St	Sulfate		X		1	DW	SW
2 016	11/28/18	3:05	X		Raw Lake MI	Sulfate		X		1		
3 017	11/28/18	12:15		X	84 W. Main Cornerstone	Sulfate		X		1		
4 018	11/28/18	1:33		X	Main St Market Main & Colfax	Sulfate		X		1		
5 019	11/28/18	12:30		X	202 W. Main & Fair	Sulfate		X		1		
6 020	11/28/18	3:55		X	Babes on Riverview	Sulfate		X		1		
7 021	11/28/18	2:40		X	8th St Villa Environmental	Sulfate		X		1		
8 022	11/28/18	2:05		X	200 E. Wall City Hall	Sulfate		X		1		
9 023	11/28/18	3:25		X	Pipestone & Empire	Sulfate		X		1	DW	SW
10												
11 024	11/28/18	4:00		X	Blue Water Fair & Valley	Sulfate		X		1	DW	SW
12												
13 025	11/28/18	4:15		X	BAZ Milton St	Sulfate		X		1	DW	SW
14 026	11/28/18	4:30		X	Finished water	Sulfate		X		1		

RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED BY:(Signature)	DATE	TIME
	11/30/18	2:00 AM PM			AM PM
RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED BY:(Signature)	DATE	TIME
		AM PM			AM PM
RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY:	DATE	TIME
		AM PM	Rhonda Day	11/30/18	1400 AM PM

LAB RESERVES THE RIGHT TO RETURN UNUSED PORTIONS OF NON-AQUEOUS SAMPLES TO CLIENT

LAB COMMENTS: Client Provided Sample Container - only
RD 11/30/18 ~~Raw~~ Raw & finished

CONDITIONS UPON RECEIPT (check one): ✓ Iced: Wet/Blue ____ Ambient 0.4 °C Upon Receipt____ N/A

MATRIX CODES:

DW-DRINKING WATER
RW-REAGENT WATER
GW-GROUND WATER
EW-EXPOSURE WATER
SW-SURFACE WATER
PW-POOL WATER
WW-WASTE WATER

TURN-AROUND TIME (TAT) - SURCHARGES

SW = Standard Written: (15 working days)	0%	IV* = Immediate Verbal: (3 working days)	100%
RV* = Rush Verbal: (5 working days)	50%	IW* =Immediate Written: (3 working days)	125%
RW* = Rush Written: (5 working days)	75%	SP* = Weekend, Holiday	CALL
		STAT* = Less than 48 hours	CALL

* Please call, expedited service not available for all testing

Samples received unannounced with less than 48 hours holding time remaining may be subject to additional charges.

Sample analysis will be provided according to the standard EEA/Water Services Terms, which are available upon request. Any other terms proposed by Customer are deemed material alterations and are rejected unless expressly agreed to in writing by EEA.

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CITY OF BENTON HARBOR, MICH.

Purchase Requisition

TO BE FILLED IN BY PURCHASING AGENT
PURCHASE ORDER NO. _____
_____ 20___

REQUISITION NO. S 332560

DATE 11/30/18

Purchasing Agent:

Please purchase the Items listed. They are available at:

Eurofins Eaton Analytical

591.570.740 **DEPARTMENT**

water Plant WQP testing

ACCOUNT	WHERE USED	QUANTITY	DESCRIPTION	UNIT PRICE ESTIMATE	UNIT PRICE QUOTED	EXTENSION	TRADE DISCOUNT	NET PRICE
		Water	Quality Parameter testing	Required		by		
			Lead Exceedance 10/10/18					
			2nd Round by 11/30/18					
		12	Samples required for Sp Ifate					
		1 & 2	Raw & Tap					
			3 - 12 Jackson city sampling Sites					

Terms: _____ Deliver to: _____

F.O.B.: _____ Quo. No.: _____

REQUESTED BY _____ APPROVED BY _____

PURCHASING AGENT

☞ IMPORTANT – Please anticipate your requirements IN ADVANCE.

VENDOR

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LABORATORY REPORT

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Arkansas	IN00035	Nevada	IN00035
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Colorado	IN035	New Jersey*	IN598
Colorado Radiochemistry	IN035	New Mexico	IN00035
Connecticut	PH-0132	New York*	11398
Delaware	IN035	North Carolina	18700
Florida*	E87775	North Dakota	R-035
Georgia	929	Ohio	87775
Hawaii	IN035	Oklahoma	D9508
Idaho	IN00035	Oregon (Primary AB)*	4074-001
Illinois*	200001	Pennsylvania*	68-00466
Illinois Microbiology	17767	Puerto Rico	IN00035
Illinois Radiochemistry	IN00035	Rhode Island	LAO00343
Indiana Chemistry	C-71-01	South Carolina	95005
Indiana Microbiology	M-76-07	South Dakota	IN00035
Iowa	098	Tennessee	TN02973
Kansas*	E-10233	Texas*	T104704187-15-8
Kentucky	90056	Texas/TCEQ	TX207
Louisiana*	LA180008	Utah*	IN00035
Maine	IN00035	Vermont	VT-8775
Maryland	209	Virginia*	460275
Massachusetts	M-IN035	Washington	C837
Michigan	9926	West Virginia	9927 C
Minnesota*	018-999-338	Wisconsin	999766900
Mississippi	IN035	Wyoming	IN035
EPA	IN00035		

*NELAP/TNI Recognized Accreditation Bodies

Revision date: 01/02/2018

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South Bend, IN 46617
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1 800 332 4345

Laboratory Report

Client: Benton Harbor, City of

Attn: Michael O'Malley
200 East Wall Street
Benton Harbor, MI 49002

Report: 437284
Priority: Standard Written
Status: Final
PWS ID: MI0600

Sample Information

EEA ID #	Client ID	Method	Collected Date / Time	Collected By:	Received Date / Time
4137015	95 W Main St.	300.0	11/28/18 12:23	Client	11/30/18 14:00
4137016	Raw Lake MI	300.0	11/28/18 08:00	Client	11/30/18 14:00
4137017	84 W Main Cornerstone	300.0	11/28/18 12:15	Client	11/30/18 14:00
4137018	May St. Market May & Colfax	300.0	11/28/18 13:33	Client	11/30/18 14:00
4137019	202 W Main & Fair	300.0	11/28/18 12:30	Client	11/30/18 14:00
4137020	Babes on Riverview	300.0	11/28/18 15:00	Client	11/30/18 14:00
4137021	8th St. Villa Enrivonmental	300.0	11/28/18 13:40	Client	11/30/18 14:00
4137022	200 & Wall City Hall	300.0	11/28/18 14:00	Client	11/30/18 14:00
4137023	Pipestone & Empire	300.0	11/28/18 15:25	Client	11/30/18 14:00
4137024	Blue Water Fair & Valley	300.0	11/28/18 16:00	Client	11/30/18 14:00
4137025	B&Z Milton St.	300.0	11/28/18 16:15	Client	11/30/18 14:00
4137026	Finished Water	300.0	11/28/18 16:30	Client	11/30/18 14:00

Report Summary

Note: Sample containers for Samples 4137016 and 4137026 were provided by the client.

Detailed quantitative results are presented on the following pages. The results presented relate only to the samples provided for analysis.

We appreciate the opportunity to provide you with this analysis. If you have any questions concerning this report, please do not hesitate to call Pat Muff at (574) 233-4777.

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Pat Muff ASM — 12/11/2018

Authorized Signature — Title — Date

Client Name: Benton Harbor, City of
Report #: 437284

Client Name: Benton Harbor, City of Report #: 437284

Sampling Point: 95 W Main St. PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**32**	mg/L	---	12/04/18 00:20	4137015

Sampling Point: Raw Lake MI PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**24**	mg/L	---	12/04/18 00:39	4137016

Sampling Point: 84 W Main Cornerstone PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**32**	mg/L	---	12/04/18 00:57	4137017

Sampling Point: May St. Market May & Colfax PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**31**	mg/L	---	12/04/18 01:15	4137018

Sampling Point: 202 W Main & Fair PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**30**	mg/L	---	12/04/18 01:33	4137019

Sampling Point: Babes on Riverview PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**29**	mg/L	---	12/04/18 01:51	4137020

Client Name: Benton Harbor, City of Report #: 437284

Sampling Point: 8th St. Villa Enrivonmental PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**30**	mg/L	---	12/04/18 02:10	4137021

Sampling Point: 200 & Wall City Hall PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**31**	mg/L	---	12/04/18 02:28	4137022

Sampling Point: Pipestone & Empire PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**31**	mg/L	---	12/04/18 02:46	4137023

Sampling Point: Blue Water Fair & Valley PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**32**	mg/L	---	12/04/18 13:26	4137024

Sampling Point: B&Z Milton St. PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**33**	mg/L	---	12/04/18 13:42	4137025

Sampling Point: Finished Water PWS ID: MI0600

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
14808-79-8	Sulfate	300.0	250 ^	5.0	**33**	mg/L	---	12/04/18 15:56	4137026

† EEA has demonstrated it can achieve these report limits in reagent water, but can not document them in all sample matrices.

Reg Limit Type:	MCL	SMCL	AL
Symbol:	*	^	!

Lab Definitions

Continuing Calibration Check Standard (CCC) / Continuing Calibration Verification (CCV) / Initial Calibration Verification Standard (ICV) / Initial Performance Check (IPC) - is a standard containing one or more of the target analytes that is prepared from the same standards used to calibrate the instrument. This standard is used to verify the calibration curve at the beginning of each analytical sequence, and may also be analyzed throughout and at the end of the sequence. The concentration of continuing standards may be varied, when prescribed by the reference method, so that the range of the calibration curve is verified on a regular basis. CCL, CCM, and CCH are the CCC standards at low, mid, and high concentration levels, respectively.

Internal Standards (IS) - are pure compounds with properties similar to the analytes of interest, which are added to field samples or extracts, calibration standards, and quality control standards at a known concentration. They are used to measure the relative responses of the analytes of interest and surrogates in the sample, calibration standard or quality control standard.

Laboratory Duplicate (LD) - is a field sample aliquot taken from the same sample container in the laboratory and analyzed separately using identical procedures. Analysis of laboratory duplicates provides a measure of the precision of the laboratory procedures.

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) - is an aliquot of reagent water to which known concentrations of the analytes of interest are added. The LFB is analyzed exactly the same as the field samples. LFBs are used to determine whether the method is in control. FBL, FBM, and FBH are the LFB samples at low, mid, and high concentration levels, respectively.

Laboratory Method Blank (LMB) / Laboratory Reagent Blank (LRB) - is a sample of reagent water included in the sample batch analyzed in the same way as the associated field samples. The LMB is used to determine if method analytes or other background contamination have been introduced during the preparation or analytical procedure. The LMB is analyzed exactly the same as the field samples.

Laboratory Trip Blank (LTB) / Field Reagent Blank (FRB) - is a sample of laboratory reagent water placed in a sample container in the laboratory and treated as a field sample, including storage, preservation, and all analytical procedures. The FRB/LTB container follows the collection bottles to and from the collection site, but the FRB/LTB is not opened at any time during the trip. The FRB/LTB is primarily a travel blank used to verify that the samples were not contaminated during shipment.

Matrix Spike Duplicate Sample (MSD) / Laboratory Fortified Sample Matrix Duplicate (LFSMD) - is a sample aliquot taken from the same field sample source as the Matrix Spike Sample to which known quantities of the analytes of interest are added in the laboratory. The MSD is analyzed exactly the same as the field samples. Analysis of the MSD provides a measure of the precision of the laboratory procedures in a specific matrix. SDL, SDM, and SDH / LFSMDL, LFSMDM, and LFSMDH are the MSD or LFSMD at low, mid, and high concentration levels, respectively.

Matrix Spike Sample (MS) / Laboratory Fortified Sample Matrix (LFSM) - is a sample aliquot taken from field sample source to which known quantities of the analytes of interest are added in the laboratory. The MS is analyzed exactly the same as the field samples. The purpose is to demonstrate recovery of the analytes from a sample matrix to determine if the specific matrix contributes bias to the analytical results. MSL, MSM, and MSH / LFSML, LFSMM, and LFSMH are the MS or LFSM at low, mid, and high concentration levels, respectively.

Quality Control Standard (QCS) / Second Source Calibration Verification (SSCV) - is a solution containing known concentrations of the analytes of interest prepared from a source different from the source of the calibration standards. The solution is obtained from a second manufacturer or lot if the lot can be demonstrated by the manufacturer as prepared independently from other lots. The QCS sample is analyzed using the same procedures as field samples. The QCS is used as a check on the calibration standards used in the method on a routine basis.

Reporting Limit Check (RLC) / Initial Calibration Check Standard (ICCS) - is a procedural standard that is analyzed each day to evaluate instrument performance at or below the minimum reporting limit (MRL).

Surrogate Standard (SS) / Surrogate Analyte (SUR) - is a pure compound with properties similar to the analytes of interest, which is highly unlikely to be found in any field sample, that is added to the field samples, calibration standards, blanks and quality control standards before sample preparation. The SS is used to evaluate the efficiency of the sample preparation process.

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CHAIN OF CUSTODY RECORD

Page 1 of 1

Shaded area for EEA use only

REPORT TO:	SAMPLER (Signature)	PWS ID #	STATE (sample origin)	PROJECT NAME	PO#
Mike O'Malley momalley@City of Benton Harbor mi.gov	MF	MI 0600	MI	Water Quality Parameters	S3325560
BILL TO:	COMPLIANCE MONITORING: Yes: X / No:	POPULATION SERVED: 9126	SOURCE WATER: Lake Michigan		

LAB Number	COLLECTION DATE	TIME	AM	PM	SAMPLING SITE	TEST NAME	SAMPLE REMARKS	CHLORINATED YES	CHLORINATED NO	# OF CONTAINERS	MATRIX CODE	TURNAROUND TIME
1 4137015	11/28/18	12:10	X		95 W Main St	Sulfate		X		1	DW	SW
2 016	11/28/18	3:05	X		Raw Lake MI	Sulfate		X		1		
3 017	11/28/18	12:15		X	84 W. Main Cornerstone	Sulfate		X		1		
4 018	11/28/18	1:33		X	Main St Market Main & Colfax	Sulfate		X		1		
5 019	11/28/18	12:30		X	202 W. Main & Fair	Sulfate		X		1		
6 020	11/28/18	3:55		X	Babes on Riverview	Sulfate		X		1		
7 021	11/28/18	2:40		X	8th St Villa Environmental	Sulfate		X		1		
8 022	11/28/18	2:05		X	200 E. Wall City Hall	Sulfate		X		1		
9 023	11/28/18	3:25		X	Pipestone & Empire	Sulfate		X		1	DW	SW
10												
11 024	11/28/18	4:00		X	Blue Water Fair & Valley	Sulfate		X		1	DW	SW
12												
13 025	11/28/18	4:15		X	BAZ Milton St	Sulfate		X		1	DW	SW
14 026	11/28/18	4:30		X	Finished water	Sulfate		X		1		

RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED BY:(Signature)	DATE	TIME
	11/30/18	2:00 AM PM			AM PM
RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED BY:(Signature)	DATE	TIME
		AM PM			AM PM
RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY:	DATE	TIME
		AM PM	Rhonda Day	11/30/18	1400 AM PM

LAB RESERVES THE RIGHT TO RETURN UNUSED PORTIONS OF NON-AQUEOUS SAMPLES TO CLIENT

LAB COMMENTS: Client Provided Sample Container - only
RD 11/30/18 ~~Raw~~ Raw & finished

CONDITIONS UPON RECEIPT (check one): ✓ Iced: Wet/Blue ____ Ambient 0.4 °C Upon Receipt____ N/A

MATRIX CODES:

DW-DRINKING WATER
RW-REAGENT WATER
GW-GROUND WATER
EW-EXPOSURE WATER
SW-SURFACE WATER
PW-POOL WATER
WW-WASTE WATER

TURN-AROUND TIME (TAT) - SURCHARGES

SW = Standard Written: (15 working days)	0%	IV* = Immediate Verbal: (3 working days)	100%
RV* = Rush Verbal: (5 working days)	50%	IW* =Immediate Written: (3 working days)	125%
RW* = Rush Written: (5 working days)	75%	SP* = Weekend, Holiday	CALL
		STAT* = Less than 48 hours	CALL

* Please call, expedited service not available for all testing

Samples received unannounced with less than 48 hours holding time remaining may be subject to additional charges.

Sample analysis will be provided according to the standard EEA/Water Services Terms, which are available upon request. Any other terms proposed by Customer are deemed material alterations and are rejected unless expressly agreed to in writing by EEA.

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CITY OF BENTON HARBOR, MICH.

Purchase Requisition

TO BE FILLED IN BY PURCHASING AGENT
PURCHASE ORDER NO. _____
_____ 20___

REQUISITION NO. S 332560

DATE 11/30/18

Purchasing Agent:

Please purchase the Items listed. They are available at:

Eurofins Eaton Analytical

591.570.740 **DEPARTMENT**

water Plant WQP testing

ACCOUNT	WHERE USED	QUANTITY	DESCRIPTION	UNIT PRICE ESTIMATE	UNIT PRICE QUOTED	EXTENSION	TRADE DISCOUNT	NET PRICE
		Water	Quality Parameter testing	Required		by		
			Lead Exceedance 10/10/18					
			2nd Round by 11/30/18					
		12	Samples required for Sp Ifate					
		1 & 2	Raw & Tap					
			3 - 12 Jackson city sampling Sites					

Terms: _____ Deliver to: _____

F.O.B.: _____ Quo. No.: _____

REQUESTED BY _____ APPROVED BY _____

PURCHASING AGENT

☞ IMPORTANT – Please anticipate your requirements IN ADVANCE.

VENDOR

Benton Harbor WQP Sampling by E. Sarkipato, M.

		Date	pH	Temp (Degrees C)	Temp (Degrees F)	TDS (mg/L)	Conductivity mS/cm	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Alkalinity (mg/L as CaCO3)	CSMR	LSI
Raw	not sampled this date												
601 Ridgeway St	Plant tap	11/19/2018	8.1	9.2	48.56	263	0.526	17	33	39	240	0.515	0.38
		11/28/2018	7.8	7	44.6	166	248	21	33	49	110	0.636	
174 w main	(larks, men's bathroom)	11/19/2018	8.2	10.6	51.08	252	0.504	16	32	37	220	0.500	0.45
671 McAlister	(River of Life, sink on left in men's bathroom)	11/19/2018	8.2	11.4	52.52	254	0.508	17	29	37	210	0.586	0.44
215 Colfax	(Villa, kitchenette)	11/19/2018	8.1	12.7	54.86	255	0.51	17	32	38	200	0.531	0.36
		11/28/2018	7.7	13.4	56.12	163	243	21	30	60	110	0.700	
131 E May St	(Marathon/May St Market, prep room sink)	11/19/2018	8.2	9.5	49.1	256	0.512	16	32	38	210	0.500	0.42
		11/28/2018	7.5	11.5	52.7	160	238	19.5	31	63	110	0.629	
1171 Milton St	(B&Z, Kitchenette sink)	11/19/2018	8.2	9.2	48.56	255	0.51	17	31	38	230	0.548	0.45
		11/28/2018	7.9	9.6	49.28	121	220	21.5	31	63	110	0.694	
800 S Fair	(Blue Water Thermal, Break Room sink)	11/19/2018	8.2	9.9	49.82	255	0.51	16	28	38	170	0.571	0.34
		11/28/2018	7.9	15	59	118	250	20.5	32	63	110	0.641	
895 Pipestone St	(Sunny Spot, Bathroom sink)	11/19/2018	8.1	10.6	51.08	257	0.514	16	32	39	230	0.500	0.39
		11/28/2018	7.5	12.5	54.5	111	222	22	31	63	110	0.710	

200 E Wall St	(City Hall, upstairs bathroom)	11/19/2018	8.2	10.8	51.44	261	0.522	17	32	40	190	0.531	0.42
95 W Main	(Abonmarche, Lobby bathroom sink)	11/19/2018	8.2	10.1	50.18	265	0.53	17	31	40	260	0.548	0.54
		11/28/2018	7.5	10.2	50.36	166	248	24	32	63	110	0.750	
80 W Main	(Cornerstone, break room sink)	11/19/2018	8.1	7	44.6	264	0.528	17	29	39	200	0.586	0.26
		11/28/2018	7.6	8.4	47.12	176	262	23.5	32	60	110	0.734	
	BP Station Main and Fair	11/28/2018	7.7	9.6	49.28	163	243	21	30	62	110	0.700	
	City Hall	11/28/2018	7.7	11.6	52.88	160	238	21.5	31	62	110	0.694	
	Babes Louge	11/28/2018	7.6	12.5	54.5	164	245	22.5	29	61	110	0.776	

MI 0600 Benton Harbor WQPT Jan 2020 1 of 2

Benton Harbor Water System
Water Quality Parameter Testing

Date 1/15/2020 WSSN #0600 Benton Harbor Water Department

Field Analyst Denny Marque
Laboratory Analyst Denny Marque

Site	Field Ortho Poly Phosphate Res	Field Temp C	Calc Temp F	Field pH	Laboratory Chloride	Laboratory Sulfate	Field Conductivit	Field TDS	Laboratory Calcium	Calc CSMR	Laboratory TA	Calc LSI MO	Calc LSI AWWA
Raw	0	3.8	38.84	8	19.5	28			45	0.696	115		
Tap	1.61	4.5	40.1	8	23	39			46	0.59	120		
Abonmarche	1.69	16.3	61.34	8	23.5	31	469	311	43	0.758	118		
Cornerstone	1.7	9.2	48.56	8	24	35	442	311	42	0.686	115		
BP Station Main and Fair	1.56	10.7	51.26	8.2	23	27	449	316	42	0.852	114		
May Street Service	1.52	11.7	53.06	8	23.5	32	482	342	46	0.734	116		
City Hall	1.54	16.2	61.16	8	24	26	449	316	42	0.923	116		
Villa Environmental	1.58	14.2	57.56	8.1	25	27	442	311	43	0.926	118		
Babes Lounge	1.61	20.8	69.44	8.1	21.5	30	448	312	47	0.717	116		
Sunny Spot	1.38	15.1	59.18	8.1	25.5	33	440	3604	46	0.773	115		
Blue Water Thermal	1.54	20.4	68.72	8.1	23.5	34	445	316	44	0.691	115		
B&Z Construction	1.35	15.5	59.9	8.2	23.5	32	442	311	45	0.734	114		

MI 0600 Benton Harbor WQPT Jan 2020 2 of 2

Benton Harbor Water System
Water Quality Parameter Testing

Date 1/22/2020 WSSN #0600 Benton Harbor Water Department

Field Analyst MN

Laboratory Analyst MN,DE,DV

Site	Field Ortho Poly Phosphate Res	Field Temp C	Calc Temp F	Field pH	Laboratory Chloride	Laboratory Sulfate	Field Conductivit	Field TDS	Laboratory Calcium	Calc CSMR	Laboratory TA	Calc LSI MO	Calc LSI AWWA
Raw		2.3	36.14	7.9	23	24	411	295	47	0.958	132		
Tap	1.69	3.5	38.3	8	24	13	437	314	42	1.846	112		
Abonmarche	1.38	13.8	56.84	7.98	14	44	558	392	43	0.318	111		
Cornerstone	1.38	11	51.8	8.04	15.5	42	421	298	45	0.369	110		
BP Station Main and Fair	1.46	19.3	66.74	8.17	13	33	433	306	48	0.394	110		
May Street Service	1.52	18.4	65.12	7.98	16	38	460	317	46	0.421	114		
City Hall	1.68	17.9	64.22	8.1	15.5	37	429	292	45	0.419	113		
Villa Environmental	1.74	17.9	64.22	7.92	15.5	38	667	468	45	0.408	112		
Babes Lounge	1.59	17.6	63.68	8	17	45	454	319	48	0.378	113		
Sunny Spot	1.73	16.5	61.7	7.97	14	37	412	289	46	0.378	109		
Blue Water Thermal	1.6	15.7	60.26	7.96	16	38	593	414	46	0.421	110		
B&Z Construction	1.43	21.3	70.34	8.04	15	36	149.2	133	46	0.417	112		

MI 0600 Benton Harbor WQPs June 2020

Benton Harbor Water System
Water Quality Parameter Testing

Date	6/26/2020
Field Analyst	DV
Laboratory Analyst	MO DV DE

WSSN #060 Benton Harbor Water Department

Site	Field Ortho Poly Phosphate Residual	Field Temp C	Calc Temp F	Field pH	Laboratory Chloride	Laboratory Sulfate	Field Conductivity	Field TDS	Laboratory Calcium	Calc CSMR	Laboratory TA	Calc LSI AWWA	LSI AWWA	CSMR
Raw	0.00	18	64.4	8.1	23.5	77	341	242	35	0.305	110	0.14	mild scale	
Tap	2.91	19	66.2	8.2	25.5	36	336	248	35	0.708	106	0.26	mild scale	
Abonmarche	3.13	23.3	73.94	7.6	23	38	345	248	39	0.605	105	-0.23	mild Corrossion	
Cornerstone	3.05	23.1	73.6	7.6	22.5	33	347	239	38	0.682	106	-0.23	mild Corrossion	
BP Station Main and Fair	2.65	25.6	78.08	7.8	23	33	349	240	42	0.697	108	-0.13	mild Corrossion	
May Street Service	2.94	26.6	79.88	7.5	23.5	36	336	247	43	0.653	107	0.18	mild scale	
City Hall	2.84	21.9	71.42	7.7	26	32	339	243	42	0.813	105	-0.22	mild Corrossion	
Villa Environmental	3.06	25.7	78.26	7.5	24.5	33	332	240	42	0.742	106	-0.25	mild Corrossion	
Pearson Construction	2.49	25.7	78.26	7.6	25.5	33	348	246	40	0.773	105	-0.17	mild Corrossion	
Sunny Spot	2.91	29.1	84.38	7.6	26	36	337	246	41	0.722	104	-0.11	mild Corrossion	
Blue Water Thermal	3.20	27.3	81.14	7.9	25.5	33	338	243	41	0.773	105	0.17	mild scale	
B&Z Construction	2.91	23.3	73.94	7.6	26.5	33	339	242	40	0.803	105	-0.21	mild Corrossion	

WATER QUALITY PARAMETER DATA (when applicable):

System Name: Benton Harbor Water WSSN: 0600

	Sample Location	Date	pH (Field)	Alk. (mg/L)	Ca as $CaCO_3$ (mg/L)	Cond. (umhos) (Field)	Temp (ºC) (Field)	Inhibitor (mg/L) Orthophosphate	Chloride (mg/L)	Sulfate (mg/L)
Entry Point to the Distribution System (Plant Tap)	Plant Tap									
Distribution System	Abonmarche	2-3-2021	7.91	117	45	339	14.8	2.79	26	48
	Cornerstone	~~2-3-2021~~ 2-3-2021	~~7.89~~ 8.50	119	38	342	18.2	3.06	30	~~49~~ 49
	BP (Main & Fair)	2-3-2021	~~8.50~~ 8.44	116	39	201	19.8	3.28	24	39
	May Street Service	2-3-2021	8.06	114	39	349	21.4	3.15	25.5	41
	City Hall	2-3-2021	8.01	119	38	342	15.3	2.98	25	42
	Villa Environmental	2-3-2021	7.94	117	33	341	20.9	2.78	26	42
	Pearson Const.	2-3-2021	8.17	121	37	344	24.1	2.85	25.5	42
	Sunny Spot	2-3-2021	8.21	121	34	345	16.6	3.04	24.5	40
	Blue Water Thermal	2-3-2021	8.48	121	34	387	17.6	3.07	23.5	43
	B&Z Construction	2-3-2021	8.24	122	38	348	12.7	3.17	24	41

WATER QUALITY PARAMETER DATA (when applicable):

System Name:_____Benton Harbor Water_____ WSSN:___0600_____

Entry Point to the Distribution System (Plant Tap)	Sample Location	Date	pH (Field)	Alk. (mg/L)	Ca as $CaCO_3$ (mg/L)	Cond. (umhos) (Field)	Temp (ºC) (Field)	Inhibitor (mg/L) Orthophosphate	Chloride (mg/L)	Sulfate (mg/L)
	Plant Tap	12/21/20	8.1	162	53		7.0	3.14	245	
	Abonmarche	12/21/20	8.19	133	33	702	16.5	3.07	27.5	44
	Cornerstone	12/21/20	8.30	125	20	371	18.2	2.88	27.5	35
	BP (Main & Fair)	12/21/20	8.2	124	36	352	18.5	2.79	24.5	35
	May Street Service	12/21/20	8.28	128	22	361	22.9	3.08	26.5	39
	City Hall	12/21/20	8.14	134	30	371	18.8	3.07	26	39
	Villa Environmental	12/21/20	8.12	126	28	361	23.6	2.84	26	36
	Pearson Const.	12/21/20	8.19	126	39	360	20.3	2.38	25.5	33
	Sunny Spot	12/21/20	8.1	125	39	359	22.1	2.92	24.5	34
	Blue Water Thermal	12/21/20	8.39	126	40	355	21.1	2.74	25	34
	B&Z Construction	12/21/20	8.21	132	38	372	19.1	2.56	25	33

INSTRUCTIONS:

WATER QUALITY PARAMETER SAMPLING LOCATIONS:

- Point-of-entry sampling locations: Each point-of-entry location is a required sampling point for WQPs. Exceptions can be made for wells that are offline or standby, or consecutive connections without additional treatment. Review your supply's monitoring schedule for specific requirements.
- Distribution sampling locations: Distribution sampling locations should be representative locations throughout the distribution system. Established bacteriological sampling locations can be used for WQP sampling.

WATER QUALITY PARAMETER SAMPLING:

Sampling procedure: WQP sampling requirements are a combination of analytes and test codes. Double check your monitoring schedule and check with your certified lab to make sure you have the correct bottle types, number of bottles, or appropriate field test kits to have your water analyzed for all required WQP analytes.

Note: Unlike lead and copper sampling, WQP sampling does not need to be within a home, does not require a stagnation period and does not need to be a first draw sample.

EGLE Laboratory test codes for WQP samples:

Test Description	Analytes	Fee	Unit Number	Test Code	Hold Time	Thermal Preservation
Automated Partial Chemistry	Chloride and Sulfate	$18	32,33	R	48 hours	Yes
Corrosion	Conductivity, Alkalinity, Orthophosphate, and Calcium	$51	33	CORR	48 hours	Yes
Field tests (at the time of sample collection)	pH, Temperature	N/A	N/A	N/A	N/A	N/A

WATER QUALTIY PARAMETER REPORTING:

Enter the water supply name, WSSN and corresponding related information from the water quality parameter monitoring carried out, if applicable. Indicate the street address of the sampling point (and the site code for entry point sampling points), date of sample collection and the results of chemical analyses. Dosages for corrosion control inhibitors (orthophosphate, silicates and alkalinity) must be reported on your Monthly Operational Report (MOR), due to your local district office on the 10th of the following month. Note: alkalinity and calcium analyses should be reported as mg/l as CaCO3; conductivity should be reported in umhos; temperature in degrees Celsius; and where applicable, phosphate as PO_4 and Silica a Si.

WATER QUALITY PARAMETER DATA (when applicable):

System Name:_____Benton Harbor Water_____ WSSN:___0600_____

	Sample Location	Date	pH (Field)	Alk. (mg/L)	Ca as $CaCO_3$ (mg/L)	Cond. (Field)	Temp (ºC) (Field)	Inhibitor (mg/L) Orthophosphate	Chloride (mg/L)	Sulfate (mg/L)
Entry Point to the Distribution System (Plant Tap)	Plant Tap									
Distribution System	Abonmarche	12/15/20	8.16	127	49	390	21	3.03	28	35
	Cornerstone	12/15/20	8.13	127	64	367	20	2.86	28	33
	BP (Main & Fair)	12/15/20	8.43	131	55	380	19	2.58	26	33
	May Street Service	12/15/20	8.08	130	69	255	24	2.87	27.5	43
	City Hall	12/15/20	8.08	121	45	356	17.7	3.19	27.5	37
	Villa Environmental	12/15/20	8.16	124	41	358	18.6	2.88	24	28
	Pearson Const.	12/15/20	8.17	132	56	374	24	2.78	27.5	33
	Sunny Spot	12/15/20	8.20	123	49	363	17.8	2.87	28.6	37
	Blue Water Thermal	12/15/20	8.16	131	66	367	18.8	3.17	28	31
	B&Z Construction	12/15/20	8.19	125	42	362	17.6	2.93	26.4	35

INSTRUCTIONS:

WATER QUALITY PARAMETER SAMPLING LOCATIONS:

- Point-of-entry sampling locations: Each point-of-entry location is a required sampling point for WQPs. Exceptions can be made for wells that are offline or standby, or consecutive connections without additional treatment. Review your supply's monitoring schedule for specific requirements.
- Distribution sampling locations: Distribution sampling locations should be representative locations throughout the distribution system. Established bacteriological sampling locations can be used for WQP sampling.

WATER QUALITY PARAMETER SAMPLING:

Sampling procedure: WQP sampling requirements are a combination of analytes and test codes. Double check your monitoring schedule and check with your certified lab to make sure you have the correct bottle types, number of bottles, or appropriate field test kits to have your water analyzed for all required WQP analytes.

Note: Unlike lead and copper sampling, WQP sampling does not need to be within a home, does not require a stagnation period and does not need to be a first draw sample.

EGLE Laboratory test codes for WQP samples:

Test Description	Analytes	Fee	Unit Number	Test Code	Hold Time	Thermal Preservation
Automated Partial Chemistry	Chloride and Sulfate	$18	32,33	R	48 hours	Yes
Corrosion	Conductivity, Alkalinity, Orthophosphate, and Calcium	$51	33	CORR	48 hours	Yes
Field tests (at the time of sample collection)	pH, Temperature	N/A	N/A	N/A	N/A	N/A

WATER QUALTIY PARAMETER REPORTING:

Enter the water supply name, WSSN and corresponding related information from the water quality parameter monitoring carried out, if applicable. Indicate the street address of the sampling point (and the site code for entry point sampling points), date of sample collection and the results of chemical analyses. Dosages for corrosion control inhibitors (orthophosphate, silicates and alkalinity) must be reported on your Monthly Operational Report (MOR), due to your local district office on the 10th of the following month. Note: alkalinity and calcium analyses should be reported as mg/l as CaCO3; conductivity should be reported in umhos; temperature in degrees Celsius; and where applicable, phosphate as PO_4 and Silica a Si.

Benton Harbor Water System
Water Quality Parameter Testing

MI 0600 Benton Harbor WQP

Date	7/3/2019
Field Analyst	Denny Edwards
Laboratory Analyst	Denny and Doug

WSSN #0600 Benton Harbor Water Department

	Field	Field	Calc	Field	Laboratory	Laboratory	Field	Field	Laboratory	Calc	Laboratory	Calc	Calc
Site	Date and Time	Temp C	Temp F	pH	Chloride	Sulfate	Conductivity	TDS	Calcium	CSMR	TA	LSI MO	LSI AWWA
Raw	7.3.19 - 1:55 pm	16.6	61.9	7.7	19	18	372	264	37	1.056	108		-0.68
Tap	7.3.19- 1:59 pm	16.7	62.1	7.1	23	19	388	275	36	1.211	102		-1.32
Abonmarche	7.3.19- 11:05 am	20.7	69.3	8.1	21	31	428	281	51	0.677	101		-0.09
Cornerstone	7.3.19-10:30 am	23.9	75.0	8.2	21.5	26	393	280	49	0.827	102		0.06
BP Station Main and Fair	7.3.19- 11:35	24.4	75.9	8.4	22	24	393	276	45	0.917	103		0.23
May Street Service	7.3.19- 12:16	21.2	70.2	8	21.5	25	387	278	42	0.860	102		-0.26
City Hall	7.3.19-10:15 am	23.2	73.8	8.3	22	26	380	280	38	0.846	101		0.03
Villa Environmental	7.3.19- 11:26 am	23.8	74.8	8.1	22.5	27	391	279	41	0.833	102		-0.12
Babes Lounge	7.3.19- 11:15 am	21.9	71.4	8.1	22	28	391	280	38	0.786	101		-0.20
Sunny Spot	7.3.19- 11:56 am	21	69.8	8	21.5	26	399	284	39	0.827	102		-0.30
Blue Water Thermal	7.3.19- 11:50	28.1	82.6	8	21.5	26	401	281	41	0.827	101		0.03
B&Z Construction	7.3.19- 12:05	22.1	71.8	8.1	21	24	392	276	39	0.875	102		-0.18

Benton Harbor Water System
Water Quality Parameter Testing

Benton Harbor Water Department

Date	6/27/2019
Field Analyst	Denny Edwards
Laboratory Analyst	Denny and Doug

	Field	Laboratory	Laboratory	Calc			
Site	Date and Time	Chloride	Sulfate	CSMR	Ratio to Tap water with Complete Treatment and OPP Treatment	February 2019CSMR	Difference May -Feb
Raw	7.3.19 - 1:55 pm	19	18	1.056			
Tap	7.13.19- 1:59 pm	23	19	1.211			
Abonmarche	7.13.19- 11:05 am	21	31	0.677	55.96%	0.71	0.033
Cornerstone	7.13.19-10:30 am	21.5	26	0.827	68.31%	0.793	-0.034
BP Station Main and Fair	7.13.19- 11:35	22	24	0.917	75.72%	0.733	-0.184
May Street Service	7.13.19- 12:16	21.5	25	0.860	71.04%	0.786	-0.074
City Hall	7.13.19-10:15 am	22	26	0.846	69.90%	0.828	-0.018
Villa Environmental	7.13.19- 11:26 am	22.5	27	0.833	68.84%	0.694	-0.139
Babes Lounge	7.13.19- 11:15 am	22	28	0.786	64.91%		
Sunny Spot	7.13.19- 11:56 am	21.5	26	0.827	68.31%	0.613	-0.214
Blue Water Thermal	7.13.19- 11:50	21.5	26	0.827	68.31%	0.793	-0.034
B&Z Construction	7.13.19- 12:05	21	24	0.875	72.28%	0.779	-0.096

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **March-18**

F1-S1 **F1-S2**

Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.1286	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	25.67	Hours/day no washes this month
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.96	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.97	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.00%	Percent of Treated Water

Chemical Data

Chlorine on hand:	17928	lb.	Est. supply: 268	days
Primary Coagulant (Alum (Al3+)) on hand:	61558	lb.	Est. supply: 78	days
Cost of All Chemicals per Million Gallons:	$64.83	dollars		
Total Power Cost per Million Gallons:		dollars		

Remarks

Number of filter confluence samples > 0.3 NTU:	0	North	0	South
Number of filter confluence samples collected:	93	CFE	93	CFE
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.

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.

Remarks:
New Fluoride System on March 1, 2018

WSSN 0600 City of Benton Harbor Month/Year March-18

COAGULATION PARAMETERS

	MIL.	ALUM	ALUM	TURBIDITY UNITS			FILTERED (CFE) NORTH		#	FILTERED (CFE) SOUTH		#	2-hrs Compliance Peroids	
D	GAL.	Dry	as Al3+	RAW		Applied								
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	Avg.	Max.	Samples	Avg.	Max.	Samples	#of	#of
T		Pounds							Taken			Taken	Periods	Periods
E		Add							North			South	>.30NTU	>.30NTU
													North	South
1	1.1286	326.00	1.52	6.20	6.30	0.57	0.09	0.09	3	0.09	0.09	3	0	0
2	1.0333	299.00	1.52	4.70	5.10	0.40	0.07	0.08	3	0.08	0.09	3	0	0
3	0.9894	313.00	1.66	24.00	57.20	0.67	0.08	0.09	3	0.09	0.10	3	0	0
4	0.9367	270.00	1.52	7.70	12.70	0.67	0.11	0.12	3	0.12	0.13	3	0	0
5	0.9927	310.00	1.64	4.00	5.90	0.31	0.07	0.08	3	0.07	0.08	3	0	0
6	0.9668	296.00	1.69	3.60	5.10	0.31	0.06	0.07	3	0.08	0.08	3	0	0
7	1.0112	287.00	1.49	5.60	6.00	0.41	0.06	0.06	3	0.07	0.08	3	0	0
8	1.0003	289.00	1.52	8.10	10.10	0.58	0.07	0.08	3	0.06	0.07	3	0	0
9	1.0310	312.00	1.59	7.90	11.40	0.71	0.08	0.08	3	0.09	0.10	3	0	0
10	1.0178	295.00	1.52	6.70	11.10	0.79	0.08	0.09	3	0.08	0.09	3	0	0
11	0.9422	277.00	1.55	5.10	5.80	0.55	0.08	0.08	3	0.08	0.09	3	0	0
12	0.9758	295.00	1.59	7.00	10.40	0.41	0.08	0.08	3	0.09	0.10	3	0	0
13	0.9360	262.00	1.47	14.60	30.30	0.37	0.07	0.07	3	0.07	0.07	3	0	0
14	0.9883	338.00	1.80	6.60	7.80	0.34	0.08	0.08	3	0.08	0.09	3	0	0
15	1.0094	282.00	1.47	4.40	5.00	0.36	0.07	0.08	3	0.07	0.08	3	0	0
16	0.9793	284.00	1.53	4.50	5.10	0.45	0.06	0.07	3	0.07	0.08	3	0	0
17	0.8786	248.00	1.49	3.30	5.10	0.04	0.07	0.07	3	0.07	0.07	3	0	0
18	0.9632	291.00	1.59	3.90	4.50	0.36	0.70	0.08	3	0.08	0.09	3	0	0
19	0.9504	291.00	1.61	3.50	6.10	0.43	0.07	0.07	3	0.07	0.07	3	0	0
20	0.9741	284.00	1.53	3.90	4.20	0.37	0.07	0.07	3	0.08	0.09	3	0	0
21	0.9380	300.00	1.68	10.40	21.50	0.32	0.08	0.08	3	0.07	0.07	3	0	0
22	0.9374	268.00	1.50	4.10	5.40	0.28	0.08	0.10	3	0.09	0.10	3	0	0
23	0.9353	300.00	1.69	3.70	4.80	0.31	0.08	0.08	3	0.08	0.09	3	0	0
24	0.8733	277.00	1.67	12.50	31.70	0.33	0.07	0.08	3	0.08	0.08	3	0	0
25	0.8817	262.00	1.56	9.00	20.50	0.32	0.09	0.10	3	0.07	0.08	3	0	0
26	1.0121	283.00	1.56	1.70	2.00	0.36	0.08	0.09	3	0.07	0.08	3	0	0
27	0.9321	277.00	1.56	2.90	3.40	0.36	0.06	0.07	3	0.08	0.09	3	0	0
28	0.9764	302.00	1.63	2.90	4.00	0.40	0.07	0.07	3	0.09	0.10	3	0	0
29	1.0046	298.00	1.56	2.20	2.50	0.39	0.08	0.10	3	0.10	0.11	3	0	0
30	1.0303	324.00	1.65	2.20	2.70	0.37	0.07	0.07	3	0.09	0.09	3	0	0
31	0.8266	249.00	1.58	10.00	25.10	0.28	0.08	0.08	3	0.10	0.10	3	0	0
Total	30.0529	8989.00						# N CFE take	93		# S CFE take	93	#N > .3	#S > .3
Avg.	0.9694	289.97	1.58	6.35	10.93	0.41	0.10	0.08	0.08	0.08	0.09		Total	Total
Max	1.1286	338.00	1.80	24.00	57.20	0.79	0.70	0.12	0.12	0.12	0.13	# > 0.3	0	0
Min.	0.8266	248.00	1.47	1.70	2.00	0.04	0.06	0.06	0.06	0.06	0.07	% Comp	1.00	1.00

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **March-18**

FLUORIDATION AND CHLORINATION

		Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D		Fluoride		mg/l												
A	Pounds	Applied				INTAKE		After Wetwell		FILTERED		Total NaOCl Use			TAP	
T	NaF	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E							mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	105	0.82	0.00	0.00				284	3.76	34	0.45	318	4.32	2.38	1.71	1.94
2	330	0.70	0.21	0.37				256	3.70	31	0.45	287	4.29	2.31	1.67	1.98
3	175	0.39	0.11	0.59				248	3.74	37	0.56	285	4.44	2.60	1.60	1.84
4	340	0.80	0.21	0.67	0.53			226	3.60	22	0.35	248	4.11	2.17	1.55	1.94
5	282	0.63	0.20	0.62				232	3.49	55	0.83	287	4.52	2.43	1.76	2.09
6	347	0.79	0.37	0.83	0.71			215	3.32	30	0.46	245	3.84	1.75	1.92	2.09
7	364	0.79	0.30	0.87				212	3.13	30	0.44	242	3.69	1.52	1.95	2.17
8	334	0.74	0.37	0.92	0.53			213	3.18	26	0.39	239	3.69	1.63	1.89	2.06
9	399	0.85	0.31	0.88	0.72			226	3.27	25	0.36	251	3.76	1.87	1.70	1.89
10	358	0.78	0.43	0.91				231	3.39	32	0.47	263	3.99	2.16	1.69	1.83
11	370	0.87	0.30	0.91				198	3.14	26	0.41	224	3.68	1.84	1.67	1.84
12	315	0.71	0.33	0.79				211	3.23	31	0.47	242	3.82	2.05	1.60	1.77
13	237	0.56	0.38	0.79				194	3.09	26	0.41	220	3.63	1.93	1.53	1.70
14	308	0.69	0.34	0.85	0.70			210	3.17	32	0.48	242	3.76	2.05	1.54	1.71
15	300	0.66	0.31	0.80				214	3.16	35	0.52	249	3.80	1.68	1.96	2.12
16	366	0.82	0.34	0.81				205	3.12	29	0.44	234	3.69	1.61	1.92	2.08
17	323	0.81	0.00	0.00				187	3.18	23	0.39	210	3.71	1.87	1.68	1.84
18	262	0.60	0.29	0.77				202	3.13	23	0.36	225	3.61	1.57	1.76	2.04
19	286	0.66	0.24	0.80				196	3.08	20	0.31	216	3.51	1.57	1.83	1.94
20	274	0.62	0.27	0.85				200	3.06	21	0.32	221	3.51	1.58	1.74	1.93
21	307	0.72	0.33	0.84				209	3.33	26	0.41	235	3.86	2.20	1.46	1.66
22	304	0.72	0.31	0.82	0.72			199	3.17	24	0.38	223	3.67	1.93	1.56	1.74
23	269	0.63	0.16	0.77				203	3.24	29	0.46	232	3.83	1.87	1.79	1.96
24	203	0.51	0.36	0.76				185	3.16	22	0.38	207	3.67	1.84	1.64	1.83
25	250	0.63	0.29	0.90				188	3.18	22	0.37	210	3.68	1.87	1.63	1.81
26	230	0.50	0.32	0.81				215	3.17	29	0.43	244	3.73	1.98	1.56	1.75
27	244	0.58	0.37	0.79				196	3.14	23	0.37	219	3.64	1.94	1.45	1.70
28	173	0.39	0.41	0.83	0.65			204	3.12	24	0.37	228	3.63	1.86	1.48	1.77
29	281	0.62	0.38	0.85	0.45			208	3.09	23	0.34	231	3.56	2.01	1.31	1.55
30	279	0.60	0.31	0.73				220	3.19	24	0.35	244	3.63	1.97	1.52	1.66
31	374	1.00	0.39	0.78				183	3.30	30	0.54	213	3.98	2.60	1.23	1.38
Tot.	8989							6570		864		7434				
Avg.	289.97	0.68	0.29	0.74	0.63			211.94	3.26	27.87	0.43	239.81	3.81	1.96	1.65	1.86
Max	399.00	1.00	0.43	0.92	0.72			284.00	3.76	55.00	0.83	318.00	4.52	2.60	1.96	2.17
Min.	105.00	0.39	0.00	0.00	0.45			183.00	3.06	20.00	0.31	207.00	3.51	1.52	1.23	1.38

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total		Total		Non-Carb.							
			Hardness		Alkalinity		Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	7.9	7.8	144	140	109	103	35	37	46	46	7	6		
2	8.0	7.7	144	138	104	103	40	35	47	49	6	4		
3	8.0	7.8	162	154	114	103	48	51	46	45	11	10		
4	7.9	7.8	164	152	113	104	51	48	48	46	11	9		
5	8.0	7.8	166	158	106	106	60	52	42	40	15	14		
6	7.9	7.8	154	146	107	101	47	45	41	40	13	11		
7	7.9	7.6	142	138	106	101	36	37	45	42	7	8	19.5	21.0
8	8.0	7.7	164	150	118	101	46	49	59	46	4	9		
9	7.9	7.7	156	142	117	99	39	43	51	46	7	7		
10	8.0	7.7	158	148	119	109	39	39	45	42	11	11		
11	8.0	7.8	162	156	113	107	49	49	45	42	12	12		
12	7.9	7.8	156	154	114	114	42	40	14	38	8	14		
13	8.1	7.9	162	158	110	110	52	48	42	41	14	14		
14	7.9	8.0	168	162	110	108	58	54	42	41	15	15		
15	8.0	7.6	158	142	120	111	38	31	55	47	5	6	17.0	21.5
16	7.9	7.8	148	142	111	104	37	38	43	38	10	11		
17	8.0	7.8	148	144	108	106	40	38	46	43	8	9		
18	8.2	8.0	148	140	113	105	35	35	43	42	10	9		
19	8.2	7.9	162	134	140	103	22	31	55	46	6	4	19.0	21.5
20	8.1	7.7	148	134	124	105	24	29	51	47	5	4		
21	7.9	7.8	150	156	110	114	40	42	38	40	13	14		
22	8.1	7.9	160	156	113	110	47	46	42	40	14	14		
23	7.9	8.0	152	148	110	104	42	44	37	38	15	13		
24	8.1	7.8	158	154	111	106	47	48	38	38	16	14		
25	8.0	7.9	152	146	114	106	38	40	37	38	15	13	19.5	21.5
26	8.2	7.7	158	144	121	106	37	38	51	46	8	7		
27	8.1	7.8	184	136	153	106	31	30	50	43	15	14		
28	8.1	8.1	178	136	148	108	30	28	55	47	10	5		
29	8.2	8.0	190	158	152	121	38	37	57	49	12	9		
30	8.2	8.0	146	156	114	123	32	33	53	58	3	3	26.0	27.5
31	8.0	7.9	178	174	131	128	47	46	45	43	16	16		
Avg.	8.0	7.8	158.1	147.4	117.4	106.9	40.7	40.5	45.5	43.5	10.2	9.8	20.2	22.6
Max	8.2	8.1	190.0	162.0	153.0	123.0	60.0	54.0	59.0	58.0	16.0	15.0	26.0	27.5
Min.	7.9	7.6	142.0	134.0	104.0	99.0	22.0	28.0	14.0	38.0	3.0	3.0	17.0	21.0

WSSN 0600 MONTH/YEAR March-18 PAGE 6

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.	___True		___Cold	
A	Samples	P/A	Samples	P/A			'C	'C	___Appar.		___60'C	
T					Raw	Tap			Raw	Tap	Raw	Tap
E												
1			1	A	134	0	3	3				
2			1	A	71	1	3	3				
3			1	A	128	0	3	3				
4			1	A	80	0	3	3				
5			1	A	77	0	3	3				
6			1	A	112	4	3	3				
7			1	A	110	0	3	3				
8			1	A	77	0	3	3				
9			1	A	119	0	3	3				
10			1	A	65	1	3	3				
11			1	A	92	0	3	3				
12			1	A	149	0	3	3				
13			1	A	175	1	3	3				
14			1	A	127	0	3	3				
15			1	A	152	0	3	3				
16			1	A	129	0	3	3				
17			1	A	80	0	3	3				
18			1	A	62	0	3	3				
19			1	A	91	0	3	3				
20			1	A	40	0	3	3				
21			1	A	38	0	3	3				
22			1	A	32	0	3	3				
23			1	A	59	0	3	3				
24			1	A	66	1	3	3				
25			1	A	69	0	3	3				
26			1	A	78	0	3	3				
27			1	A	73	0	3	3				
28			1	A	88	0	3	3				
29			1	A	92	1	3	3				
30			1	A	51	0	3	3				
31			1	A	62	0	3	3				
AVG.			1	A	90	0	3	3				
Max					175	4	3	3				
Min					32	0	3	3				

DISTRIBUTION SYSTEM MONITORING WSSN 0600 March-18

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6										
7	1.37		1.42	1.17	1.35		1.57			
8										
9										
10										
11										
12										
13										
14	0.78		1.06	0.82	0.89		1.05			
15										
16										
17										
18										
19										
20										
21										
22							0.86			
23										
24										
25										
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	8		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.12	1.57	0.78
Total number of check samples	0600			
Total number of positive check samples	0600			

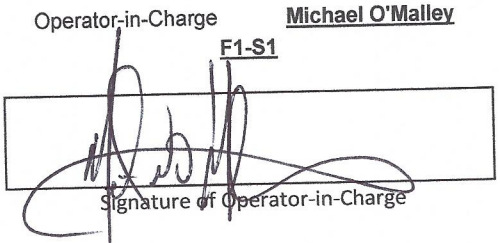
MONTHLY OPERATION REPORT OF
THE CITY OF BENTON HARBOR WATER TREATMENT PLANT

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **February-18**

F1-S1 **F1-S2**



Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.3549	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	27.81	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.08	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.26	Gallons Per Square Feet per Minute
Average Wash Water Use:	1.82%	Percent of Treated Water

Chemical Data

Chlorine on hand:	17928	lb.	Est. supply:	279	days
Primary Coagulant (Alum (Al3+)) on hand:	61558	lb.	Est. supply:	81	days
Cost of All Chemicals per Million Gallons:	$62.01	dollars			
Total Power Cost per Million Gallons:		dollars			

Remarks

Number of filter confluence samples > 0.3 NTU:	0
Number of filter confluence samples collected:	170
Percent of filter confluence samples > 0.3 NTU:	4%
Number of filter confluence samples > 1 NTU	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? Yes
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? Yes
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.

Remarks:
Turbidity exceeded typical units during the Snow Melt and Rain Storm at the end of the operations Day Sunday 2/25/2018 and all day 2/26/2018. Many attempts to lower the filtered water turbidity done by the operators did get the turbidity down near the end of Monday and the Start of Tuesday. Fluoride Treatment will resume March 1, 2018. Jon B noted 1 IFE sample was > 1 NTU

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **February-18**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
											New addition you like?				
D	Fluoride		mg/l								Total NaOCl Use			TAP	
A	Applied				INTAKE		After Wetwell		FILTERED						
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1							180	2.49	7	0.10	187	2.66	0.64	1.84	2.02
2							181	2.56	13	0.18	194	2.83	0.91	1.69	1.92
3							166	2.62	31	0.49	197	3.22	0.95	2.09	2.27
4							197	2.64	14	0.19	211	2.91	0.88	1.85	2.03
5							201	2.77	22	0.30	223	2.99	1.24	1.57	1.75
6							215	2.89	29	0.39	244	3.53	1.94	1.42	1.59
7		0.26	0.27	0.04			180	2.65	20	0.29	200	3.09	1.50	1.41	1.59
8							202	2.68	21	0.28	223	3.04	1.42	1.56	1.62
9							197	3.05	27	0.42	224	3.59	2.00	1.42	1.59
10							203	3.21	27	0.43	230	3.76	2.02	1.42	1.74
11							200	3.00	30	0.45	230	3.56	1.81	1.59	1.75
12							227	3.12	29	0.40	256	3.57	1.77	1.63	1.80
13							246	3.37	35	0.48	281	3.85	2.30	1.39	1.55
14							232	3.20	48	0.66	280	4.10	2.38	1.55	1.72
15		0.34	0.32	0.24			226	2.98	29	0.38	255	3.60	1.62	1.81	1.98
16							230	3.09	26	0.35	256	3.17	1.07	1.90	2.10
17							213	3.10	28	0.41	241	3.73	1.92	1.64	1.81
18							242	2.67	25	0.28	267	4.03	2.14	1.79	1.89
19							231	3.14	25	0.34	256	3.59	1.81	1.66	1.78
20							231	3.15	25	0.34	256	3.60	1.64	1.72	1.96
21				0.27			237	3.26	26	0.36	263	3.62	1.91	1.54	1.71
22							220	3.09	29	0.41	249	3.71	2.05	1.49	1.66
23							217	2.95	30	0.41	247	3.26	1.24	1.85	2.02
24							220	2.99	33	0.45	253	4.09	1.87	2.03	2.22
25							254	3.64	31	0.44	285	4.40	2.37	1.84	2.03
26							302	4.05	33	0.44	335	8.50	7.01	1.29	1.49
27							304	4.07	34	0.46	338	5.33	3.84	1.27	1.49
28		0.30	0.30	0.23			304	3.99	30	0.39	334	4.53	2.68	1.63	1.85
29															
30															
31															
Tot.							6,078		750		7,015	105.86			
Avg.		0.30	0.30	0.20			223.50	3.09	27.04	0.38	250.54	3.78	1.96	1.64	1.82
Max		0.34	0.32	0.27			304.00	4.07	48.00	0.66	338.00	8.50	7.01	2.09	2.27
Min.		0.26	0.27	0.04			166.00	2.49	7.00	0.10	187.00	2.66	0.64	1.27	1.49

WSSN 0600 City of Benton Harbor

Month/Year ####### Feb 2018

COAGULATION PARAMETERS

D A T E	MIL. GAL. TREAT.	Dry Al2(SO3)4 Pounds Add	ALUM as Al3+ mg/l	TURBIDITY UNITS RAW Avg.	RAW Max.	Applied Avg.	# sample	FILTERED NORTH Avg.	FILTERED NORTH Max.	# Samples	FILTERED SOUTH Avg.	FILTERED SOUTH Max.	2 Hour Compliance Periods # of Periods	#of Periods >.30NTU North	#of Periods >.30NTU South
1	1.0795	324.00	1.58	7.50	7.80	0.40	3	0.06	0.07	3	0.07	0.08	6	0	0
2	1.0560	311.00	1.55	6.50	7.00	0.46	3	0.06	0.06	3	0.07	0.08	6	0	0
3	0.9453	278.00	1.55	5.90	7.80	0.60	3	0.07	0.08	3	0.07	0.08	6	0	0
4	1.1139	328.00	1.55	8.70	11.10	0.60	3	0.08	0.10	3	0.07	0.09	6	0	0
5	1.0825	307.00	1.49	6.60	8.60	0.66	3	0.10	0.12	3	0.10	0.13	6	0	0
6	1.1094	321.00	1.46	6.60	9.80	0.60	3	0.07	0.08	3	0.08	0.08	6	0	0
7	1.0133	290.00	1.51	4.60	5.10	0.63	3	0.06	0.07	3	0.06	0.07	6	0	0
8	1.1269	324.00	1.51	4.00	4.90	0.56	3	0.08	0.09	3	0.06	0.07	6	0	0
9	0.9638	296.00	1.62	5.50	8.70	0.47	3	0.06	0.07	3	0.08	0.09	6	0	0
10	0.9432	322.00	1.80	4.00	4.80	0.57	3	0.07	0.07	3	0.08	0.08	6	0	0
11	0.9955	282.00	1.49	4.10	5.60	0.56	3	0.08	0.08	3	0.08	0.09	6	0	0
12	1.0866	330.00	1.60	3.50	4.40	0.51	3	0.08	0.09	3	0.08	0.10	6	0	0
13	1.0881	327.00	1.58	3.00	4.20	0.50	3	0.05	0.07	3	0.07	0.08	6	0	0
14	1.0815	312.00	1.52	2.90	4.20	0.41	3	0.07	0.07	3	0.06	0.06	6	0	0
15	1.1337	328.00	1.52	4.10	7.10	0.53	3	0.06	0.07	3	0.08	0.09	6	0	0
16	1.1115	337.00	1.60	4.90	5.90	0.38	3	0.06	0.06	3	0.07	0.08	6	0	0
17	1.0266	305.00	1.56	3.10	4.30	0.44	3	0.07	0.07	3	0.08	0.08	6	0	0
18	1.3549	354.00	1.37	5.80	8.60	0.65	3	0.08	0.09	3	0.09	0.10	6	0	0
19	1.0990	310.00	1.48	2.50	3.00	0.47	3	0.07	0.07	3	0.07	0.08	6	0	0
20	1.0959	316.00	1.52	3.90	5.00	0.47	3	0.07	0.08	3	0.08	0.09	6	0	0
21	1.0847	324.00	1.57	6.40	7.00	0.53	3	0.06	0.07	3	0.09	0.09	6	0	0
22	1.0621	308.00	1.53	3.90	6.60	0.37	3	0.06	0.06	3	0.07	0.07	6	0	0
23	1.0997	329.00	1.57	2.90	4.80	0.32	3	0.07	0.07	3	0.08	0.09	6	0	0
24	1.0999	323.00	1.55	11.20	14.60	0.67	3	0.07	0.07	3	0.08	0.08	6	0	0
25	1.0425	320.00	1.61	19.60	20.60	0.19	3	0.09	0.12	3	0.15	0.21	6	0	0
26	1.1120	332.00	1.61	10.50	17.50	2.30	3	0.47	0.68	4	0.54	0.84	8	3	3
27	1.1145	332.00	1.57	5.80	6.10	0.75	3	0.14	0.17	3	0.15	0.18	6	0	0
28	1.1372	337.00	1.56	4.80	5.00	0.72	3	0.11	0.11	3	0.11	0.11	6	0	0
29															
30															
31															
Total	30.2597	8907.00					84			85			170	3	3
Avg.	1.0807	318.11	1.55	5.81	7.50	0.58	85	0.09	0.10		0.10		Total	Total	Total
Max	1.3549	354.00	1.80	19.60	20.60	2.30		0.47	0.68		0.54	0.84	8	3	3
Min.	0.9432	278.00	1.37	2.50	3.00	0.19		0.05	0.06		0.06				

WSSN 0600 MONTH/YEAR February-18

CITY OF BENTON HARBOR CHEMICAL ANALYSES

			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	
D A T E	pH Raw 29.	pH Tap 30.	Raw 31.	Tap 32.	Raw 33.	Tap 34.	Raw 35.	Tap 36.	Raw 37	Tap 38	Raw 39	Tap 40	Raw 41	Tap 42
1	8.1	7.9	154	150	114	107	40	43	49	45	8	9		
2	8.0	7.8	152	144	114	109	38	35	49	46	7	7		
3	8.1	7.8	170	160	127	115	43	45	42	43	16	13		
4	8.2	8.0	190	166	133	112	57	54	49	42	17	15		
5	8.0	7.8	176	166	122	117	54	49	45	42	16	15		
6	8.0	7.9	184	170	132	116	52	54	44	42	18	16		
7	7.8	7.7	178	164	139	119	39	45	59	51	8	9		
8	8.0	7.7	172	168	131	119	41	49	55	50	9	11		
9	7.9	7.9	186	176	130	124	56	52	50	45	15	16		
10	8.0	7.8	168	162	126	123	42	39	61	31	4	8		
11	8.0	7.9	224	178	162	128	62	50	58	49	19	14		
12	8.1	8.0	226	188	154	130	72	58	59	51	19	15		
13	8.0	7.9	194	186	138	136	56	50	51	49	17	16		
14	8.1	8.0	198	192	134	129	64	63	51	49	17	17		
15	8.1	8.0	182	192	126	134	56	58	47	51	16	16		
16	8.0	7.9	184	180	123	125	61	55	51	49	14	14		
17	8.0	7.7	176	170	126	124	50	46	61	54	6	9		
18	8.1	7.9	172	170	128	119	44	51	57	53	7	9		
19	8.0	7.7	184	162	133	124	51	38	55	51	12	8		
20	8.1	7.9	162	154	128	121	34	33	55	51	6	6		
21	8.2	8.0	184	174	118	123	66	51	42	43	19	16		
22	8.0	8.0	172	184	114	121	58	63	45	49	15	15		
23	8.0	7.8	166	160	117	113	49	47	45	44	13	12		
24	8.2	7.9	162	158	112	110	50	48	42	40	14	14		
25	8.0	7.9	174	168	112	111	62	57	47	45	14	14		
26	7.9	7.8	152	146	114	106	38	40	49	46	7	7		
27	7.9	7.9	160	150	115	112	45	38	51	50	8	6		
28	8.0	7.9	158	152	117	106	41	46	55	50	5	7		
Avg.	8.0	7.9	177.1	167.5	126.4	119.0	50.8	48.5	50.9	46.8	12.4	11.9		
Max	8.2	8.0	226.0	192.0	162.0	136.0	72.0	63.0	61.0	54.0	19.0	17.0		
Min.	7.8	7.7	152.0	144.0	112.0	106.0	34.0	33.0	42.0	31.0	4.0	6.0		

WSSN 0600 MONTH/YEAR February-18 PAGE 6

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.	___True		___Cold	
A	Samples	P/A	Samples	P/A			'C	'C	___Appar.		___60'C	
T					Raw	Tap			Raw	Tap	Raw	Tap
E												
1			1	A	95	0	3	3				
2			1	A	91	1	3	3				
3			1	A	92	0	3	3				
4			1	A	61	0	3	3				
5			1	A	31	3	3	3				
6			1	A	53	0	3	3				
7			1	A	106	1	3	3				
8			1	A	84	0	3	3				
9			1	A	46	0	3	3				
10			1	A	39	0	3	3				
11			1	A	38	0	3	3				
12			1	A	57	0	3	3				
13			1	A	153	0	3	3				
14			1	A	28	0	3	3				
15			1	A	60	0	3	3				
16			1	A	50	0	3	3				
17			1	A	61	0	3	3				
18			1	A	52	0	3	3				
19			1	A	82	1	3	3				
20			1	A	203	2	3	3				
21			1	A	81	0	3	3				
22			1	A	185	0	3	3				
23			1	A	103	0	3	3				
24			1	A	131	3	3	3				
25			1	A	150	0	3	3				
26			1	A	175	0	4	4				
27			1	A	150	0	3	3				
28			1	A	161	0	3	3				
29												
30												
31												
AVG.			1	A	94	0	3	3				
Max					203	3	4	4				
Min					28	0	3	3				

Benton Harbor Water MI0600
Dist system Monitoring

Feb 2018
#########

DISTRIBUTION SYSTEM MONITORING

WSSN 0600

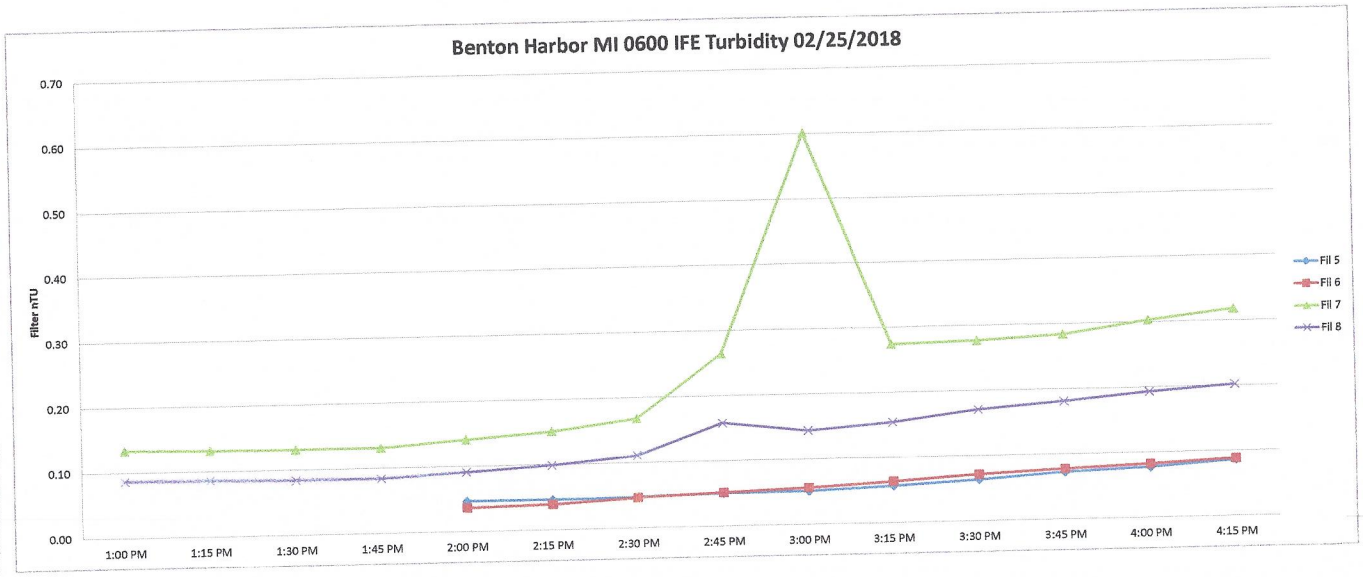
DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6										
7	0.99		0.94	1.02	0.32		0.98			
8										
9										
10										
11										
12										
13										
14	0.68		1.05	0.85	0.77		0.90			
15										
16										
17										
18										
19										
20										
21	1.00		1.26	1.00	1.22		1.21			
22										
23										
24										
25										
26										
27										
28	1.17		1.11	1.03	0.77		0.71			
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	16	
Total number of positive routine distribution samples	0600		
Total number of routine distribution samples required	0600	10	Max / Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.95	1.26 / 0.32
Total number of check samples	0600		
Total number of positive check samples	0600		

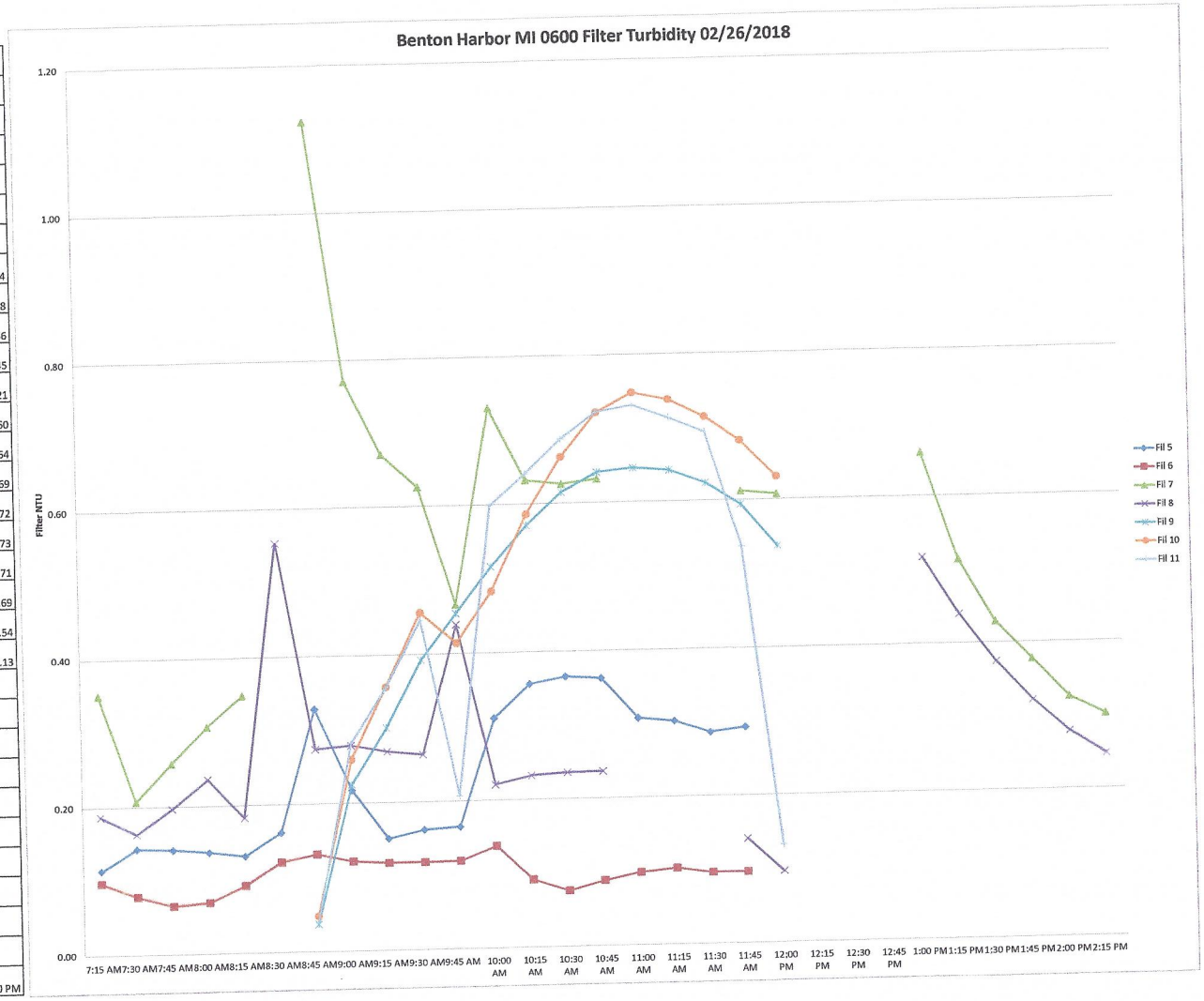
Benton Harbor MI 0600
Individual Filter Turbidity
February 25, 2018

DT	Fil 5	Fil 6	Fil 7	Fil 8	Raw	Plate Settler
1:00 PM			0.13	0.09	18.53	0.41
1:15 PM			0.13	0.09	18.88	0.41
1:30 PM			0.13	0.08	18.41	0.41
1:45 PM			0.13	0.08	17.55	0.41
2:00 PM	0.05	0.04	0.14	0.09	17.54	0.40
2:15 PM	0.05	0.04	0.15	0.10	17.83	0.40
2:30 PM	0.05	0.05	0.17	0.11	17.30	0.41
2:45 PM	0.05	0.05	0.26	0.16	17.07	0.41
3:00 PM	0.05	0.06	0.60	0.14	16.53	0.41
3:15 PM	0.06	0.06	0.27	0.15	16.62	0.41
3:30 PM	0.06	0.07	0.28	0.17	17.12	0.41
3:45 PM	0.07	0.08	0.28	0.18	17.31	0.40
4:00 PM	0.08	0.08	0.30	0.19	17.21	0.40
4:15 PM	0.09	0.09	0.32	0.20	17.30	0.41



Benton Harbor MI 0600
Individual Filter Turbidity
February 26, 2018

time	Fil 5	Fil 6	Fil 7	Fil 8	Fil 9	Fil 10	Fil 11
7:15 AM	0.11	0.10	0.35	0.19			
7:30 AM	0.14	0.08	0.21	0.16			
7:45 AM	0.14	0.07	0.26	0.20			
8:00 AM	0.14	0.07	0.31	0.24			
8:15 AM	0.13	0.09	0.35	0.18			
8:30 AM	0.16	0.12		0.55			
8:45 AM	0.33	0.13	1.12	0.27	0.04	0.05	0.04
9:00 AM	0.22	0.12	0.77	0.28	0.23	0.26	0.28
9:15 AM	0.15	0.12	0.67	0.27	0.30	0.36	0.36
9:30 AM	0.16	0.12	0.63	0.26	0.39	0.46	0.45
9:45 AM	0.17	0.12	0.47	0.44	0.45	0.41	0.21
10:00 AM	0.31	0.14	0.73	0.22	0.52	0.48	0.60
10:15 AM	0.36	0.09	0.63	0.23	0.57	0.59	0.64
10:30 AM	0.37	0.08	0.63	0.24	0.62	0.66	0.69
10:45 AM	0.36	0.09	0.63	0.24	0.64	0.72	0.72
11:00 AM	0.31	0.10			0.65	0.75	0.73
11:15 AM	0.30	0.10			0.64	0.74	0.71
11:30 AM	0.29	0.10			0.62	0.71	0.69
11:45 AM	0.29	0.10	0.61	0.14	0.59	0.68	0.54
12:00 PM			0.61	0.10	0.54	0.63	0.13
12:15 PM							
12:30 PM							
12:45 PM							
1:00 PM			0.66	0.52			
1:15 PM			0.51	0.44			
1:30 PM			0.43	0.37			
1:45 PM			0.38	0.32			
2:00 PM			0.33	0.28			
2:15 PM			0.30	0.25			
	Fil 5	Fil 6	Fil 7	Fil 8	Fil 9	Fil 10	Fil 11
Washes	12:00 PM	12:00 PM	11:00 AM	11:00 AM	1:00 PM	1:00 PM	12:30 PM



All 6 Filters in the plant were washed. Only filters 7 & 8 were re-started after Washing.

As you can see in the cover page of Feb's MOR: 170 CFE Turbidity Samples taken; 4 were > 0.3<1.0 which leaves 96% samples taken < 0.3 NTU

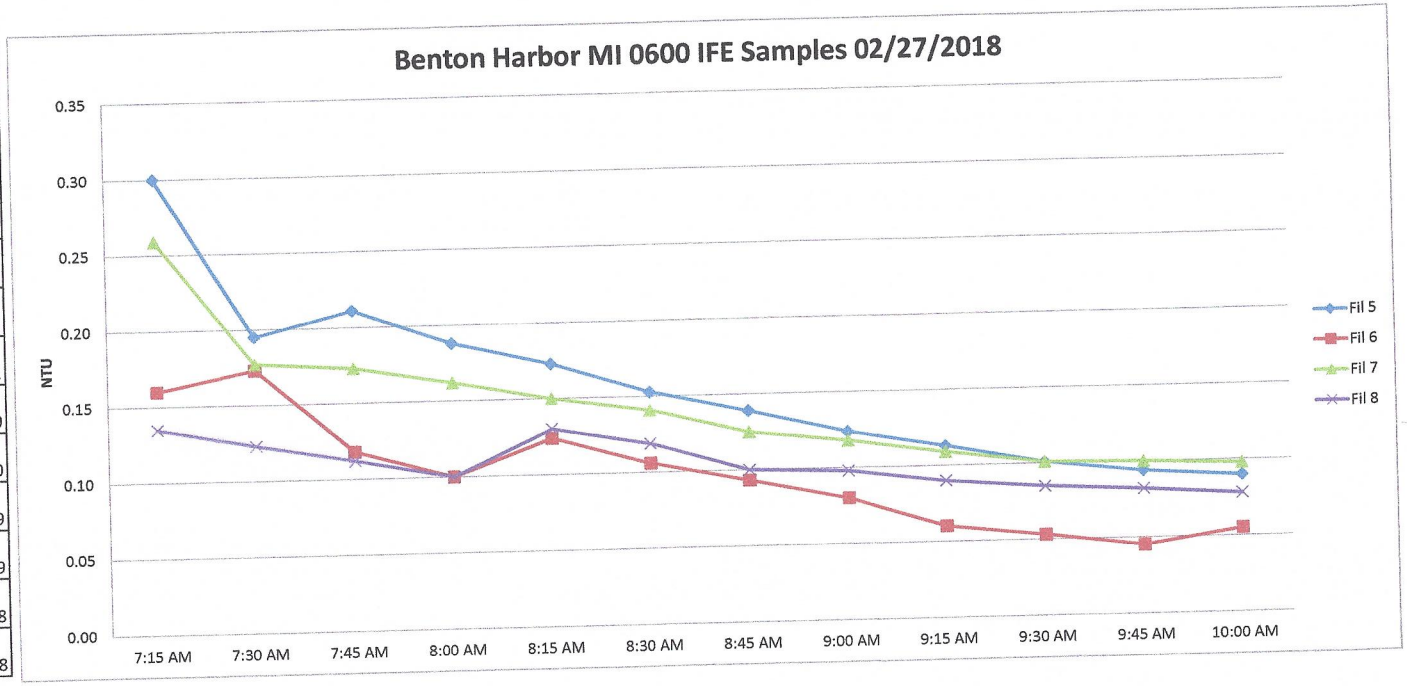
Those turbidiy values at the CFE were

North CFE Average 0.47 Maximum 0.68 # taken 4

South CFE Average 0.54 Maximum 0.84 # taken 4

Benton Harbor MI 0600
Individual Filter Turbidity
February 27, 2018

DT	Fil 5	Fil 6	Fil 7	Fil 8
7:15 AM	0.30	0.16	0.26	0.14
7:30 AM	0.20	0.17	0.18	0.12
7:45 AM	0.21	0.12	0.17	0.11
8:00 AM	0.19	0.10	0.16	0.10
8:15 AM	0.17	0.12	0.15	0.13
8:30 AM	0.15	0.11	0.14	0.12
8:45 AM	0.14	0.09	0.13	0.10
9:00 AM	0.12	0.08	0.12	0.10
9:15 AM	0.11	0.06	0.11	0.09
9:30 AM	0.10	0.05	0.10	0.09
9:45 AM	0.09	0.05	0.10	0.08
10:00 AM	0.09	0.06	0.10	0.08



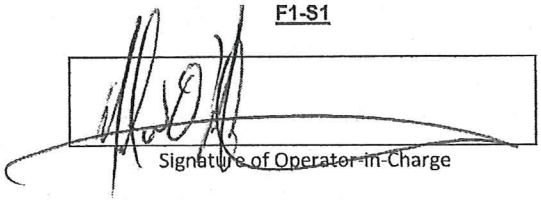
00600 / Benton

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

SUPPLY NAME: CITY OF BENTON HARBOR

WSSN:600

Operator-in-Charge **Michael O'Malley** — **F1-S1**



Signature of Operator-in-Charge

Month/Year **January-18** — **F1-S2**

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.2735	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	27.67	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.06	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.98	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.68%	Percent of Treated Water

Chemical Data

Chlorine on hand:	22978	lb.	Est. supply:	110	days
Primary Coagulant (Alum (Al3+)) on hand:	69501	lb.	Est. supply:	333	days
Cost of All Chemicals per Million Gallons:	$57.73	dollars			
Total Power Cost per Million Gallons:		dollars			

Remarks

Number of filter confluence samples > 0.3 NTU:	0
Number of filter confluence samples collected:	182
Percent of filter confluence samples > 0.3 NTU:	0%
Number of filter confluence samples > 1 NTU	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.	

Remarks:

MJ

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **January-18**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l								New addition you like?				
A	Applied				INTAKE		SETTLED		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.00				0	0.00	199	2.71	29	0.39	228	3.29	1.34	1.78	1.95
2	0.00				0	0.00	200	2.80	32	0.45	232	3.25	1.23	1.78	2.02
3	0.00			0.18	0	0.00	209	2.76	34	0.45	243	3.40	1.44	1.81	1.96
4	0.00	0.22	0.26		0	0.00	205	2.74	27	0.36	232	3.10	1.07	1.89	2.03
5	0.00				0	0.00	213	2.59	26	0.32	239	3.06	0.84	2.00	2.22
6	0.00				0	0.00	179	2.90	28	0.45	207	3.45	1.61	1.68	1.84
7	0.00				0	0.00	186	2.68	30	0.43	216	3.20	1.24	1.80	1.96
8	0.00				0	0.00	195	2.78	32	0.46	227	3.34	1.46	1.72	1.88
9	0.00				0	0.00	212	2.57	28	0.34	240	3.42	1.27	1.98	2.15
10	0.00				0	0.00	206	2.76	34	0.46	240	3.26	1.08	2.01	2.18
11	0.00	0.26	0.22	0.18	0	0.00	217	2.54	26	0.30	243	3.07	1.01	1.83	2.06
12	0.00				0	0.00	191	2.70	20	0.28	211	3.07	0.97	1.83	2.10
13	0.00				0	0.00	195	2.71	19	0.26	214	3.06	1.10	1.76	1.96
14	0.00				0	0.00	196	2.72	20	0.28	216	3.07	0.94	1.93	2.13
15	0.00				0	0.00	164	2.79	9	0.15	173	3.03	1.13	1.61	1.90
16	0.00				0	0.00	209	2.83	24	0.32	233	3.24	1.24	1.84	2.00
17	0.00			0.18	0	0.00	235	3.35	26	0.37	261	3.83	1.86	1.80	1.97
18	0.00	0.25	0.28		0	0.00	190	2.90	22	0.34	212	3.34	1.45	1.72	1.89
19	0.00				0	0.00	156	2.60	18	0.30	174	2.89	0.97	1.75	1.92
20	0.00				0	0.00	165	2.53	19	0.29	184	2.99	0.81	1.88	2.18
21	0.00				0	0.00	179	2.48	21	0.29	200	3.51	1.33	1.88	2.18
22	0.00				0	0.00	142	2.09	11	0.16	153	2.34	0.38	1.76	1.96
23	0.00				0	0.00	193	2.48	14	0.18	207	2.74	0.85	1.64	1.89
24	0.00			0.26	0	0.00	180	2.57	19	0.27	199	2.93	1.30	1.47	1.63
25	0.00	0.28	0.29		0	0.00	191	2.52	34	0.45	225	2.93	1.03	1.74	1.90
26															
27	0.00				0	0.00	178	2.84	23	0.37	201	3.32	1.53	1.63	1.79
28	0.00				0	0.00	203	2.86	29	0.41	232	3.36	1.28	1.90	2.08
29	0.00				0	0.00	187	2.65	42	0.60	229	3.34	0.89	2.26	2.45
30	0.00				0	0.00	190	2.67	17	0.24	207	3.00	1.10	1.70	1.90
31	0.00				0	0.00	176	2.61	14	0.21	190	2.88	0.83	1.80	2.05
Tot.	0.00						5,755		721		6,468	94.73			
Avg.	0.00	0.25	0.26	0.20	0.00	0.00	191.90	2.69	24.59	0.34	216.48	3.17	1.16	1.81	2.00
Max	0.00	0.28	0.29	0.26	0.00	0.00	235.00	3.35	42.00	0.60	261.00	3.83	1.86	2.26	2.45
Min.	0.00	0.22	0.22	0.18	0.00	0.00	142.00	2.09	9.00	0.15	153.00	2.34	0.38	1.47	1.63

WSSN 0600 City of Benton Harbor Month/Year January-18

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS				FILTERED NORTH			FILTERED SOUTH			2 Hour Compliance Periods		
D	GAL.	Dry	as Al3+	RAW		Applied	#	Avg.	Max.	#	Avg.	Max.	# of	#of	#of
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample			Samples			Periods	Periods	Periods
T		Pounds												>.30NTU	>.30NTU
E		Add													
														North	South
1	1.0981	315.00	1.51	5.50	7.50	0.45	3	0.05	0.06	3	0.06	0.06	6	0	0
2	1.0648	292.00	1.44	4.60	5.80	0.38	3	0.07	0.08	3	0.07	0.08	6	0	0
3	1.1295	352.00	1.64	3.30	4.70	0.32	3	0.06	0.06	3	0.07	0.07	6	0	0
4	1.1156	303.00	1.43	2.10	2.90	0.34	3	0.07	0.07	3	0.06	0.07	6	0	0
5	1.2284	346.00	1.48	4.10	5.10	0.40	3	0.07	0.08	3	0.07	0.08	6	0	0
6	0.9227	245.00	1.97	1.90	2.90	0.47	3	0.07	0.08	3	0.06	0.07	6	0	0
7	1.0369	318.00	1.61	1.30	1.80	0.25	3	0.06	0.08	3	0.07	0.08	6	0	0
8	1.0459	313.00	1.57	1.30	2.30	0.27	3	0.07	0.08	3	0.06	0.07	6	0	0
9	1.2291	354.00	1.52	2.20	3.50	0.21	3	0.06	0.07	3	0.06	0.06	6	0	0
10	1.1134	311.00	1.47	1.30	1.50	0.27	3	0.06	0.07	3	0.05	0.06	6	0	0
11	1.2735	338.00	1.40	2.10	4.20	0.28	3	0.07	0.07	3	0.08	0.08	6	0	0
12	1.0576	313.00	1.56	1.70	2.00	0.39	3	0.07	0.08	3	0.07	0.09	6	0	0
13	1.0739	319.00	1.56	3.10	4.00	0.26	3	0.06	0.07	3	0.06	0.08	6	0	0
14	1.0757	315.00	1.54	3.40	4.10	0.54	3	0.07	0.09	3	0.07	0.07	6	0	0
15	0.8760	248.00	1.49	2.50	2.80	0.82	3	0.08	0.08	2	0.08	0.08	4	0	0
16	1.1033	329.00	1.57	4.60	4.80	0.55	3	0.09	0.11	3	0.10	0.12	6	0	0
17	1.0468	287.00	1.44	3.80	4.30	0.45	3	0.06	0.07	3	0.06	0.08	6	0	0
18	0.9771	294.00	1.58	7.70	7.90	0.40	3	0.07	0.08	3	0.07	0.08	6	0	0
19	0.8970	264.00	1.55	7.40	9.50	0.47	3	0.06	0.07	3	0.05	0.06	6	0	0
20	0.9735	279.00	1.51	6.10	7.80	0.54	3	0.07	0.08	3	0.08	0.08	6	0	0
21	1.0786	295.00	1.44	3.40	4.10	0.48	3	0.06	0.07	3	0.07	0.07	6	0	0
22	1.0163	234.00	1.21	7.90	8.30	1.05	3	0.16	0.20	2	0.18	0.24	4	0	0
23	1.1598	333.00	1.51	6.60	12.40	1.25	3	0.08	0.08	3	0.08	0.08	6	0	0
24	1.0446	302.00	1.52	7.20	8.70	0.48	3	0.06	0.08	3	0.07	0.08	6	0	0
25	1.1320	313.00	1.45	6.50	7.90	0.45	3	0.06	0.07	3	0.06	0.07	6	0	0
26	1.0779	299.00	1.45	5.90	6.20	0.46	3	0.06	0.07	3	0.06	0.08	6	0	0
27	0.9341	271.00	1.53	11.90	20.70	0.68	3	0.06	0.07	3	0.08	0.09	6	0	0
28	1.0608	299.00	1.48	6.30	7.20	0.61	3	0.07	0.07	3	0.07	0.09	6	0	0
29	1.0526	310.00	1.55	7.00	7.40	0.38	3	0.06	0.07	3	0.08	0.09	6	0	0
30	1.0614	294.00	1.46	7.20	10.20	0.36	3	0.05	0.06	3	0.08	0.10	6	0	0
31	1.0056	263.00	1.38	6.50	6.80	0.53	3	0.07	0.08	3	0.08	0.09	6	0	0
Total	32.9625	9348.00					93			91			182	0	0
Avg.	1.0633	301.55	1.51	4.72	6.11	0.48	91	0.07	0.08		0.07		Total	Total	Total
Max	1.2735	354.00	1.97	11.90	20.70	1.25		0.16	0.20		0.18	0.24	6	0	0
Min.	0.8760	234.00	1.21	1.30	1.50	0.21		0.05	0.06		0.05				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

D A T E	pH Raw 29.	pH Tap 30.	Total Hardness as CaCO3 mg/l Raw 31.	Total Hardness as CaCO3 mg/l Tap 32.	Total Alkalinity as CaCO3 mg/l Raw 33.	Total Alkalinity as CaCO3 mg/l Tap 34.	Non-Carb. Hardness as CaCO3 mg/l Raw 35.	Non-Carb. Hardness as CaCO3 mg/l Tap 36.	Calcium as Ca++ mg/l Raw 37	Calcium as Ca++ mg/l Tap 38	Magnesium as Mg++ mg/l Raw 39	Magnesium as Mg++ mg/l Tap 40	Chloride as Cl- mg/l Raw 41	Chloride as Cl- mg/l Tap 42
1	7.9	7.9	160	158	112	112	48	46	43	42	13	13		
2	7.8	7.6	164	154	122	116	42	38	57	51	5	6		
3	7.8	7.6	142	150	105	116	37	34	51	47	4	8		
4	7.9	7.5	186	164	144	114	42	50	59	51	10	9		
5	7.9	7.6	188	166	131	115	57	51	59	51	10	10		
6	8.0	7.9	172	162	127	119	45	43	44	42	15	14		
7	7.9	7.8	178	172	126	121	52	51	49	48	14	13		
8	7.9	8.0	174	184	111	119	63	65	45	47	15	16		
9	8.0	7.8	160	170	109	117	51	53	43	46	13	14		
10	8.0	7.7	172	160	119	110	53	50	46	43	14	13		
11	8.1	7.7	168	152	127	107	41	45	57	51	6	6	18.0	19.5
12	8.1	7.8	154	156	110	114	44	42	51	49	7	8		
13	8.0	7.8	152	156	104	113	48	43	52	51	5	7		
14	8.0	7.6	178	144	127	104	51	40	63	51	5	4		
15	8.0	7.7	168	156	117	108	51	48	57	50	6	8		
16	8.0	7.8	180	164	127	116	53	48	46	44	16	13		
17	7.9	7.8	182	170	129	122	53	48	50	46	14	14		
18	7.9	7.9	168	182	115	122	53	60	45	49	14	15		
19	8.0	7.9	164	170	116	122	48	48	42	46	14	14		
20	7.9	7.8	160	150	121	113	39	37	55	51	6	5		
21	8.1	8.0	162	154	126	112	36	42	51	47	9	9		
22	8.2	7.9	168	160	126	113	42	47	50	45	11	12		
23	8.1	7.8	164	150	128	116	36	34	59	51	4	5	21.5	23.0
24	8.1	8.0	176	180	121	120	55	60	42	45	17	17		
25	7.9	7.8	180	166	127	116	53	50	46	44	16	14		
26	8.0	7.9	208	168	146	116	62	52	55	45	17	14		
27	7.9	7.9	190	174	129	118	61	56	50	45	17	15		
28	8.0	8.0	186	182	121	123	65	59	50	48	15	15		
29	8.0	7.9	164	180	109	120	55	60	42	49	15	14		
30	7.9	7.6	148	150	116	118	32	32	46	46	8	8		
31	8.1	7.8	168	154	128	109	40	45	54	47	8	9	22.5	26.5
Avg.	8.0	7.8	170.5	163.5	121.6	115.7	48.9	47.7	50.2	47.4	11.2	11.1	19.8	21.3
Max	8.2	8.0	208.0	184.0	146.0	123.0	65.0	65.0	63.0	51.0	17.0	17.0	62.0	69.0
Min.	7.8	7.5	142.0	144.0	104.0	104.0	32.0	32.0	42.0	42.0	4.0	4.0	20.7	23.0

WSSN 0600 MONTH/YEAR January-18 PAGE 6

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.	True		Cold	
A	Samples	P/A	Samples	P/A			'C	'C	Appar.		60'C	
T					Raw	Tap			Raw	Tap	Raw	Tap
E												
1			1	A	0	1	2	3.0				
2			1	A	0	1	2	4.0				
3			1	A	0	0	2	5.0				
4			1	A	0	0	2	5.0				
5			1	A	0	0	2	4.0				
6			1	A	0	0	2	2.5				
7			1	A	0	0	2	2.5				
8			1	A	0	0	2	3.0				
9			1	A	0	1	2	2.5				
10			1	A	0	2	2	3.0				
11			1	A	0	0	3	9.0				
12			1	A	0	0	3	5.0				
13			1	A	0	0	3	5.0				
14			1	A	0	0	2	6.0				
15			1	A	0	0	2	2.0				
16			1	A	0	0	2	2.5				
17			1	A	0	0	2	2.5				
18			1	A	0	2	2	3.0				
19			1	A	0	1	2	3.0				
20			1	A	0	0	3	8.0				
21			1	A	0	0	2	5.0				
22			1	A	0	12	3	5.0				
23			1	A	0	9	3	5.0				
24			1	A	0	0	2	3.0				
25			1	A	31	0	2	2.5				
26			1	A	57	0	2	3.0				
27			1	A	102	0	3.0	3.5				
28			1	A	73	1	9.0	12.0				
29			1	A	67	0	8.7	8.5				
30			1	A	28	0	8.5	9.5				
31			1	A	0	0	2.0	6.0				
AVG.			1	A	12	1	3	5				
Max					102	12	9	12				
Min					0	0	2	2				

CITY OF BENTON HARBOR

DISTRIBUTION SYSTEM MONITORING

WSSN 0600 MONTH/YEAR January-18

DAY	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR									
	1	2	3	4	5	6	7			
1										
2										
3	1.28		0.84	0.77	0.73		0.49			
4										
5										
6										
7										
8										
9										
10										
11	1.20		1.07	1.19	1.11		0.68			
12										
13										
14										
15										
16										
17	0.39		1.03	0.98	1.06		0.99			
18										
19										
20										
21										
22										
23										
24	0.93			0.97			0.56			
25										
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES – BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	18		
Total number of positive routine distribution samples	0600	0		
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.90	1.28	0.39
Total number of check samples	0600	0		
Total number of positive check samples	0600	0		

THE CITY OF BENTON HARBOR WATER TREATMENT PLANT

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **November-18**

F1-S1 **F1-S2**

Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.0826	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	285.00	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.99	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.36	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.42%	Percent of Treated Water

Chemical Data

Chlorine on hand:	21715	lb.	Est. supply:	231	days
Primary Coagulant (Alum (Al3+)) on hand:	64735	lb.	Est. supply:	78	days
Cost of All Chemicals per Million Gallons:	$67.42	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:	90	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? 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.

Remarks: Sorry report looks different - Printed at Home
12/9/18

COAGULATION PARAMETERS

DATE	MIL. GAL. TREAT.	Dry Al2(SO3)4 Pounds Add	ALUM as Al3+ mg/l	TURBIDITY UNITS RAW Avg.	Max.	Applied Avg.	# Samples	FILTERED NORTH Avg.	Max.	# Samples	FILTERED SOUTH Avg.	Max.	2 Hour Compliance Periods # of Periods	#of Periods >.30NTU North	#of Periods >.30NTU South
1	0.9164	255.00	1.46	3.30	4.60	0.18	3	0.07	0.07	3	0.06	0.06	6	0	0
2	0.9843	292.00	1.56	4.50	6.50	0.20	3	0.07	0.07	3	0.06	0.06	6	0	0
3	0.8999	259.00	1.51	2.80	3.40	0.20	3	0.07	0.07	3	0.06	0.06	6	0	0
4	0.9796	290.00	1.56	5.10	8.50	0.19	3	0.07	0.07	3	0.06	0.06	6	0	0
5	0.8301	234.00	1.48	3.70	4.40	0.19	3	0.07	0.07	3	0.07	0.09	6	0	0
6	1.0590	317.00	1.57	3.40	4.10	0.27	3	0.08	0.08	3	0.07	0.07	6	0	0
7	1.0826	315.00	1.53	3.80	4.50	0.17	3	0.08	0.08	3	0.07	0.09	6	0	0
8	1.0486	312.00	1.57	3.70	5.00	0.15	3	0.08	0.08	3	0.06	0.07	6	0	0
9	0.9470	270.00	1.50	3.40	4.50	0.17	3	0.08	0.08	3	0.06	0.06	6	0	0
10	0.9883	298.00	1.59	7.10	8.80	0.21	3	0.07	0.08	3	0.07	0.08	6	0	0
11	0.8784	330.00	1.98	3.10	3.20	0.20	3	0.06	0.07	3	0.06	0.06	6	0	0
12	1.0405	308.00	1.56	5.30	7.80	0.26	3	0.07	0.07	3	0.06	0.06	6	0	0
13	1.0130	278.00	1.44	6.00	8.20	0.20	3	0.06	0.07	3	0.06	0.06	6	0	0
14	1.0179	299.00	1.55	5.60	7.80	0.23	3	0.07	0.08	3	0.06	0.07	6	0	0
15	1.0346	290.00	1.47	3.90	4.40	0.25	3	0.09	0.11	3	0.08	0.09	6	0	0
16	0.9650	279.00	1.52	4.00	5.00	0.26	3	0.07	0.08	3	0.07	0.08	6	0	0
17	0.9153	260.00	1.49	4.60	7.20	0.24	3	0.07	0.08	3	0.06	0.07	6	0	0
18	0.9458	276.00	1.54	2.40	3.20	0.25	3	0.07	0.09	3	0.08	0.09	6	0	0
19	1.0666	312.00	1.54	2.50	3.20	0.23	3	0.08	0.09	3	0.06	0.07	6	0	0
20	0.9785	279.00	1.50	2.50	2.60	0.19	3	0.07	0.07	3	0.07	0.08	6	0	0
21	1.0653	297.00	1.47	3.50	5.00	0.16	3	0.07	0.08	3	0.07	0.08	6	0	0
22	1.0285	324.00	1.66	2.00	2.40	0.15	3	0.06	0.07	3	0.07	0.07	6	0	0
23	0.9065	242.00	1.40	3.10	5.80	0.17	3	0.07	0.09	3	0.07	0.08	6	0	0
24	0.9827	304.00	1.63	2.00	2.10	0.19	3	0.07	0.08	3	0.09	0.10	6	0	0
25	0.8888	259.00	1.53	3.30	6.60	0.18	3	0.07	0.08	3	0.10	0.11	6	0	0
26	1.0724	304.00	1.53	3.30	5.90	0.17	3	0.06	0.07	3	0.08	0.10	6	0	0
27	0.9743	283.00	1.53	3.00	3.40	0.16	3	0.06	0.06	3	0.06	0.08	6	0	0
28	1.0363	297.00	1.51	4.60	8.10	0.22	3	0.07	0.09	3	0.08	0.09	6	0	0
29	1.0468	322.00	1.62	3.30	4.30	0.23	3	0.07	0.07	3	0.07	0.08	6	0	0
30	1.0590	276.00	1.37	3.60	4.60	0.25	3	0.07	0.07	3	0.07	0.07	6	0	0
Total	29.6520	8661.00					90			90			180	0	0
Avg.	0.9884	288.70	1.54	3.75	5.17	0.20	90	0.07	0.08		0.07		Total	Total	Total
Max	1.0826	330.00	1.98	7.10	8.80	0.27		0.09	0.11		0.10	0.11	6	0	0
Min.	0.8301	234.00	1.37	2.00	2.10	0.15		0.06	0.06		0.06				

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
DATE	Fluoride Applied as Fmg/l	Raw mg/l	Tap mg/l	Dist.	INTAKE PPD	INTAKE Free mg/l	SETTLED PPD	SETTLED Free mg/l	FILTERED PPD	FILTERED Free mg/l	Total NaOCl Use PPD	Use Free mg/l	Demand mg/L	TAP Free. mg/l	TAP Total mg/l
1	0.73	0.27	0.73		0	0.00	247	4.02	51	0.83	298	13.35	10.92	2.25	2.43
2	0.62	0.29	0.75		0	0.00	247	3.75	49	0.74	296	13.03	11.15	1.70	1.88
3	0.58	0.28	0.78		0	0.00	217	3.60	44	0.73	261	12.40	10.52	1.70	1.88
4	0.61	0.23	0.69		0	0.00	225	3.43	43	0.66	268	11.45	9.16	2.10	2.29
5	0.39	0.29	0.62		0	0.00	206	3.70	38	0.68	244	15.58	13.74	1.60	1.84
6	0.51	0.29	0.73		0	0.00	263	3.71	44	0.62	307	11.22	9.47	1.59	1.75
7	0.43	0.33	0.71		0	0.00	277	3.82	48	0.66	325	19.88	18.29	1.54	1.59
8	0.44	0.21	0.54		0	0.00	271	3.86	50	0.71	321	12.50	10.79	1.57	1.71
9	0.39	0.23	0.62		0	0.00	244	3.85	41	0.65	285	14.21	12.12	1.85	2.09
10	0.66	0.29	0.65		0	0.00	262	3.96	45	0.68	307	10.93	9.26	1.51	1.67
11	0.78	0.32	0.72		0	0.00	264	4.49	49	0.83	313	17.86	16.20	1.49	1.66
12	0.68	0.28	0.74		0	0.00	255	3.66	44	0.63	299	10.47	8.61	1.68	1.86
13	0.59	0.29	0.78		0	0.00	259	3.82	47	0.69	306	11.09	9.45	1.47	1.64
14	0.57	0.37	0.77		0	0.00	260	3.81	44	0.65	304	10.90	9.06	1.64	1.84
15	0.43	0.30	0.71		0	0.00	271	3.91	47	0.68	318	12.54	10.72	1.78	1.82
16	0.42	0.41	0.73	0.70	0	0.00	242	3.74	37	0.57	279	11.66	9.76	1.71	1.90
17	0.39	0.32	0.62		0	0.00	237	3.87	42	0.68	279	16.75	15.06	1.47	1.69
18	0.45	0.28	0.63		0	0.00	247	3.90	37	0.58	284	12.25	10.26	1.81	1.99
19	0.54	0.27	0.66		0	0.00	286	4.00	51	0.71	337	11.10	9.47	1.46	1.63
20	0.44	0.37	0.65		0	0.00	256	3.91	44	0.67	300	14.33	12.16	2.02	2.17
21	0.40	0.34	0.65		0	0.00	268	3.76	45	0.63	313	13.66	11.77	1.77	1.89
22	0.50	0.39	0.65		0	0.00	285	4.14	49	0.71	334	13.96	11.69	2.01	2.27
23	0.53	0.38	0.65		0	0.00	230	3.79	38	0.63	268	15.42	13.44	1.81	1.98
24	0.36	0.29	0.63		0	0.00	248	3.77	38	0.58	286	11.16	9.12	1.85	2.04
25	0.44	0.42	0.63		0	0.00	227	3.81	34	0.57	261	13.51	11.61	1.66	1.90
26	0.55	0.38	0.65		0	0.00	266	3.70	36	0.50	302	10.58	8.62	1.69	1.96
27	0.43	0.36	0.64		0	0.00	265	4.06	42	0.64	307	13.99	12.04	1.77	1.95
28	0.36	0.27	0.61		0	0.00	281	4.05	26	0.37	307	11.76	9.98	1.53	1.78
29	0.59	0.42	0.67	0.61	0	0.00	288	4.11	51	0.73	339	12.13	10.32	1.64	1.81
30	0.54	0.40	0.71		0	0.00	284	4.00	66	0.93	350	13.19	10.93	2.08	2.26
Tot.	15.33						7,431		1,269		8,998	392.85			
Avg.	0.51	0.32	0.68	0.66	0.00	0.00	255.93	3.87	44.00	0.67	299.93	13.09	11.19	1.73	1.91
Max	0.78	0.42	0.78	0.70	0.00	0.00	288.00	4.49	66.00	0.93	350.00	19.88	18.29	2.25	2.43
Min.	0.36	0.21	0.54	0.61	0.00	0.00	206.00	3.43	26.00	0.37	244.00	10.47	8.61	1.46	1.59

DATE	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
	29.	30.	31.	32.	33.	34.	35.	36.	37	38	39	40	41	42
1	8.0	8.0	162	156	110	107	52	49	41	39	15	14		
2	8.0	8.0	150	142	112	105	38	37	36	35	12	13	18.5	21.0
3	8.0	8.0	152	144	110	103	42	41	38	37	14	13		
4	7.9	7.9	150	140	111	103	39	37	37	36	14	12		
5	8.0	7.9	194	152	143	104	51	48	62	47	10	8	23.0	24.5
6	7.9	8.0	184	174	126	103	58	71	49	47	15	14		
7	8.0	7.9	152	154	111	108	41	46	42	45	11	10		
8	8.1	8.1	164	160	118	112	46	48	47	46	11	11		
9	8.2	7.9	156	158	117	114	39	44	49	46	8	10		
10	8.0	7.9	164	154	118	110	46	44	42	40	15	13	19.0	21.5
11	7.9	8.0	172	162	112	108	60	54	46	43	14	13		
12	8.0	8.1	166	156	123	111	43	45	42	40	15	14		
13	8.1	7.9	178	174	118	112	60	62	46	44	16	16		
14	8.2	8.0	170	156	126	110	44	46	42	41	16	13		
15	8.0	7.8	172	166	122	114	50	52	57	55	7	7		
16	8.0	7.9	198	162	147	110	51	52	61	51	11	9	19.5	22.5
17	8.2	8.0	168	158	132	119	36	39	55	51	8	7		
18	8.0	7.9	184	166	135	123	49	43	49	51	15	9		
19	7.9	8.0	170	168	119	123	51	45	43	42	15	15		
20	8.0	7.8	160	174	119	126	41	48	45	49	12	13	19.5	22.0
21	8.1	8.0	158	168	109	120	49	48	47	50	10	11		
22	8.1	8.0	148	158	104	111	44	47	44	47	9	10		
23	8.1	8.0	152	154	115	119	37	35	46	44	9	11		
24	7.9	7.7	156	146	114	103	42	43	47	38	9	12		
25	8.0	7.8	162	148	121	102	41	46	47	42	11	10		
26	7.9	7.9	158	148	110	109	48	39	47	45	10	9	19.5	21.5
27	8.0	7.8	162	156	109	112	53	44	47	46	11	10		
28	8.1	7.7	168	154	117	110	51	44	53	49	9	8	19.5	21.0
29	7.9	7.9	168	156	126	113	42	43	41	40	16	14		
30	7.9	7.9	176	162	125	115	51	47	45	41	16	15		
Avg.	8.0	7.9	165.8	157.5	119.3	111.3	46.5	46.2	46.4	44.2	12.1	11.5	19.8	22.0
Max	8.2	8.1	198.0	174.0	147.0	126.0	60.0	71.0	62.0	55.0	16.0	16.0	23.0	24.5
Min.	7.9	7.7	148.0	140.0	104.0	102.0	36.0	35.0	36.0	35.0	7.0	7.0	18.5	21.0

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

DATE	RAW No. of Samples	RAW Colilert P/A	PLANT TAP No. of Samples	PLANT TAP Colilert P/A	Standard Plate Count Raw	Standard Plate Count Tap	Raw TEMP. 'C	Tap TEMP. 'C	COLOR ___True ___Appar. Raw	COLOR Tap	ODOR ___Cold ___60'C Raw	ODOR Tap
1			1	A	52	0	12	13.0				
2			1	A	79	0	12	13.0				
3			1	A	95	0	12	13.0				
4			1	A	103	0	12	12.5				
5			1	A	67	0	11	14.0				
6			1	A	103	2	12	12.5				
7			1	A	54	0	12	14.0				
8			1	A	54	1	12	14.0				
9			1	A	37	2	11	14.0				
10			1	A	44	0	11	12.0				
11			1	A	43	0	10	11.5				
12			1	A	124	0	9	12.0				
13			1	A	124	0	9	11.0				
14			1	A	80	0	9	10.5				
15			1	A	58	0	13	11.0				
16			1	A	81	0	8	13.0				
17			1	A	41	1	8	11.0				
18			1	A	37	0	9	12.0				
19			1	A	27	2	8	9.0				
20			1	A	20	0	8	11.0				
21			1	A	18	0	9	11.0				
22			1	A	18	0	8	11.0				
23			1	A	25	0	8	12.0				
24			1	A	24	0	8	11.0				
25			1	A	13	0	8	11.0				
26			1	A	28	0	8	11.0				
27			1	A	22	1	7.0	10.0				
28			1	A	102	5	9.0	12.0				
29			1	A	58	0	8.7	8.5				
30			1	A	54	0	8.5	9.5				
AVG.			1	A	56	0	10	12				
Max					124	5	13	14				
Min					13	0	7	9				

DISTRIBUTION SYSTEM MONITORING

WSSN 0600

NOV 2018

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DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6										
7						0.32	0.93			
8										
9										
10										
11										
12										
13										
14										
15										
16	1.03		1.69	1.00	1.17		1.01			
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29	0.82		1.15	1.19	1.07		1.12			
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	12		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.04	1.69	0.32
Total number of check samples	0600			
Total number of positive check samples	0600			

Carus Corporation
1500 8th Street
LaSalle, IL 61301

Benton Harbor, MI

Date Received:	11/8/2018
Date Analyzed:	11/12/2018
Lab Number:	1108-07744
Product:	N/A
PWS No.:	N/A
Number of Samples:	2
Tests per Sample:	14

cc: Mike Enlow
Elhorn Engineering Co.
889 Eden Road
Mason, MI 48854

SAMPLE INFORMATION

	Sample Site	Date	Time	Sampler
A	Raw	10/31/2018		ME
B	Finished	10/31/2018		ME
C				
D				
E				
F				
G				

RESULTS

Parameter	A	B	C	D	E	F	G	Units
Hardness	149.8	151.2						mg/L as $CaCO_3$
Orthophosphate	0.05	0.04						mg/L as PO_4
Iron	0.08	<0.02						mg/L
Manganese	<0.01	<0.01						mg/L
Copper								mg/L
Lead								mg/L
Initial pH								
Final Temp.	21.9	22.0						Celsius
Final pH	7.8	7.7						
Alkalinity	53.0	58.3						mg/L as $CaCO_3$
Calcium	38.7	39.2						mg/L
Langelier	-0.21	-0.29						mg/L
Conductivity	153	180						umhos/cm
Chloride								mg/L
TDS	102	120						mg/L
Sulfate	23	32						mg/L
Poly Phosphate	0.08	0.01						mg/L as PO_4
Total Phosphate	0.13	0.05						mg/L as PO_4

Comments:

Note: These results are for monitoring purposes only. They cannot be used for compliance reporting.
Tina Garcia, Senior TS Lab Specialist
Tel: (815) 224-6880

INVOICE

Account Address:

Reference:

Lab Number: 1108-07744
Date: 11/8/2018

Description of Service	Number of Samples	Tests Per Sample	Price Per Test	Net Extension
Carus Corporation Laboratory Services	2	14	$25.00	$700.00
Customer Appreciation Credit				($700.00)
			Total USD	$0.00

By teaming with Elhorn Engineering and Carus, you just saved $700.00 in outside laboratory fees!

Thank you for giving us the opportunity to serve you.

We appreciate your business and the confidence you have placed in us.
Please contact Tina Garcia at (815) 224-6880 for further assistance.

Benton Harbor Water System
Water Quality Parameter Testing

Benton Harbor Water Department

Date	7/3/2019
Field Analyst	Denny Edwards
Laboratory Analyst	Denny and Doug

cold water February
cold water February but include 90 days OPP
Take out raw and tap

	Field	Laboratory	Laboratory	Calc									
Site	Date and Time	Chloride	Sulfate	CSMR	Ratio to Tap water with Complete Treatment and OPP Treatment	February 2019CSMR	Difference July -Feb	February 2019 LSI AWWA	July 3 2019 LSI AWWA	Difference July -Feb	February 2019 LSI AWWA	July 3 2019 LSI AWWA	Difference July -Feb
Raw	7.3.19 - 1:55 pm	19	18	1.056				-0.2974	-0.68	-0.382			
Tap	7.3.19- 1:59 pm	23	19	1.211				-0.5638	-1.32	-0.752			
Abonmarche	7.3.19- 11:05 am	21	31	0.677	55.96%	0.71	0.033	-0.438	-0.09	0.343	-0.438	-0.09	0.343
Cornerstone	7.3.19-10:30 am	21.5	26	0.827	68.31%	0.793	-0.034	-0.284	0.06	0.341	-0.284	0.06	0.341
BP Station Main and Fair	7.3.19- 11:35	22	24	0.917	75.72%	0.733	-0.184	-0.156	0.23	0.390	-0.156	0.23	0.390
May Street Service	7.3.19- 12:16	21.5	25	0.860	71.04%	0.786	-0.074	-0.511	-0.26	0.250	-0.511	-0.26	0.250
City Hall	7.3.19-10:15 am	22	26	0.846	69.90%	0.828	-0.018	-0.307	0.03	0.338	-0.307	0.03	0.338
Villa Environmental	7.3.19- 11:26 am	22.5	27	0.833	68.84%	0.694	-0.139	-0.437	-0.12	0.314	-0.437	-0.12	0.314
Babes Lounge	7.3.19- 11:15 am	22	28	0.786	64.91%				-0.20	-0.196		-0.20	-0.196
Sunny Spot	7.3.19- 11:56 am	21.5	26	0.827	68.31%	0.613	-0.214	-0.309	-0.30	0.010	-0.309	-0.30	0.010
Blue Water Thermal	7.3.19- 11:50	21.5	26	0.827	68.31%	0.793	-0.034	-0.240	0.03	0.272	-0.240	0.03	0.272
B&Z Construction	7.3.19- 12:05	21	24	0.875	72.28%	0.779	-0.096	0.082	-0.18	-0.258	0.082	-0.18	-0.258
								Leave in Raw and Tap			Take out raw and tap		
Average		21.65	26.3	0.828	68.36%	0.748	-0.084	-0.315	-0.080	0.181	-0.289	-0.080	0.181
Maximum		22.5	31	0.917	75.72%	0.828	0.033	0.082	0.234	0.390	0.082	0.234	0.390
Minimum		21	24	0.677	55.96%	0.613	-0.214	-0.564	-0.299	-0.258	-0.511	-0.299	-0.258

From:	Mike O"Malley
To:	Bolf, Michael (EGLE); Henderson, Shannon (EGLE); Sarkipato, Ernest (EGLE)
Cc:	emitchell@bhcity.us; Darold Harlan; Darel Rice; Denny Edwards; Mike O"Malley
Subject:	Re: MI 0600 Benton Harbor 2 submittals for August 2020: DMR & MOR
Date:	Wednesday, September 16, 2020 11:20:16 AM
Attachments:	MI 0600 BHWW IFE Turbidity Request.pdf

CAUTION: This is an External email. Please send suspicious emails to abuse@michigan.gov

Michael Bolf and the rest of EGLE,
I had a heck of a time trying to get IFE data over the weekend but fortunately my IT specialist came on Tuesday and uncovered all. the secrets I could not. .

I have attached what data I could for your request, although none of it meets the IFE requirements, it is all I have to give.

Apparently there were power surges that tripped the old wonderware computer and the new Historian computer.
Couple that with the Wonderware main computer that is on its last leg the past couple of months.
And further couple that with the failures of the DWRLF project handling of processing digital data for IFE collection.

See Attached:

Now for everyone else on the copy line as well, (except maybe Ellis).

For the record: There was NO Problem with the CFE turbidity sampling Doug and Denny do! So you know Doug and Denny, that is why you actually measure CFE N&S on the schedule and by an operator every time you treat water. So good job.
The IFE question on page 1 could be considered a failure, but there is no evidence of it either way for August 1, 2020.
Including the Back Up sheet for that day.

Somehow the only digital data that did not crash were the datagraph picture displays that Doug and Denny read and record every hour for what I call the "**back up IFE** sheet" that someone had you use after I was thrown out by the Emergency Financial Manager.
I know what EGLE is thinking; and NO this does not come anywhere close to meeting the IFE regulations.
It did (somewhat) early on when I knew how to extract data off the picture cards. It took a lot to figure it out but I did, but now I cannot repeat my methods I used before I was laid off for a cheaper Water Superintendent at the hands of the State's EM Law..

Electronic data was lost in various ways, only the "back up" paper data was saved. This is evidenced by the attached IFE data sheet for August 1, 2020. And even a portion of the morning was lost on the IFE back up sheet. The table at the top.of one of the sheets in the attachment.

Tom installed our new Intouch Computer and upgraded it, and figured out why the historian crashed, and it still is starting August 29th.

So, Tom and I are going to bring all IFE turbidity into the 21st century and eliminate all of the pitfalls of the past.
All Hach S100s will be eliminated.
All new or re-purposed Hach SC200s will be installed for all filters 5-12.
The picture cards may stay for viewing and back up.
But a more robust IFE turbidity collection system will be in place with the Historian and I am thinking another stand alone in the lab.

For Doug and Denny and any new operator (Marc'que), the trip down to the basement will be eliminated except for operations monitoring and maintenance.
However, I may add to that a weekly evaluation of IFE data and then of course at the End of the month.
As certain IFE triggers are still in place during really bad turbidity events any time of the month. They include turbidity levels ≥ 0.5 NTUs and any ≥ 1.0 NTUs.
We'll figure that out and include some record keeping.

EGLE, consider this the best I can do with the cards I've been dealt.
But please keep in mind, the water treatment plant with its new Plate Settler Technology has not had a failure short of the near miss in early 2018.
Where failures were commonplace prior to the DWRLF project.
As Doug & Denny will tell you, the desktop turbidity display on the operator's desk was quickly installed by the City during those bad days. Then thrown in the trash at the hands of the DWRLF project, despite my best efforts to stop them.
We would not be having this conversation if it was left in place!

Some may hate that I bring up the past, but I have been charged with fixing mistakes made in that past.

Mike O'Malley
Benton Harbor's Community Water Supply Operator IN Charge

On Fri, Sep 11, 2020 at 12:55 PM Bolf, Michael (EGLE) <BOLFM@michigan.gov> wrote:

> Mike,
>
> What we need to verify is the maximum turbidity levels for **each <u>individual filter</u> effluent** on August 1, 2020. Can you provide that data?
>
> Michael Bolf, P.E.
>
> Engineering Unit Supervisor
>
> Drinking Water and Environmental Health Division

Michigan Department of Environment, Great Lakes, and Energy

906-630-4107 (mobile) | bolfm@michigan.gov

From: Mike O'Malley <momalley@bhcity.us>
Sent: Friday, September 11, 2020 12:33 PM
To: Sarkipato, Ernest (EGLE) <SARKIPATOE@michigan.gov>; Bolf, Michael (EGLE) <BOLFM@michigan.gov>; Henderson, Shannon (EGLE) <HendersonS8@michigan.gov>
Cc: emitchell@bhcity.us; Mike O'Malley <momalley@bhcity.us>; Darold Harlan <dharlan@fv-operations.com>; Darel Rice <drice@bhcity.us>; Denny Edwards <dedwards@bhcity.us>
Subject: Re: MI 0600 Benton Harbor 2 submittals for August 2020: DMR & MOR

CAUTION: This is an External email. Please send suspicious emails to abuse@michigan.gov

Denny, Darold, Darel, please read this email, for either a **refresher** or as **actual learning session**.

Share it with Doug and Marc'que as they do not have a city email.

Ernie and Ellis,

Let me open this reply.

1. The water plant team is Mike; Denny; Doug: and Marc'que.
2. It has to be a team effort, because no one person can do all the operations, recordkeeping, sampling, ect.
3. And these 4 people all do their part!.
4. And I am the only official EGLE Drinking Water Supply Operator in charge,(Doug and Denny are certified Operators) and can be the ONLY PERSON allowed to converse officially with EGLE!

And, even though Denny says it is his *just part of his job*; **I really appreciate all the effort he puts in filing in our massive data collections spreadsheets, Thank you.**

(Hopefully Stewart and Jay said the same to him)

Just for giggles, I created these spreadsheets back in the 1990's as a means to monitor BHWW as "contracted F1 Operator" Except when Jay played with them, they are exactly the same.

But I have answers:

1. There are only 3 samplings (each) required by the Law and to done by hand:
2. You have already seen IN THE MOR: the Average North 0.20; South 0.22 The Maximum: North 0.23; South 0.27
3. What you did not see is the 3rd and the Minimum that is not required: North 0.16 & South 0.15
4. If you would like (but NOT allowed to be included in the CFE) tap water was: Average: 0.13; Max: 0.15, Min: 0.12
5. Compliance Data for the Combined Filter Effluent (CFE)Turbidity is and has always been done by a licensed operator by hand.
6. I checked and yes, we missed 1 OPP tap water residual on March 21, 2020

If you visit page 1 of the MOR you will find on the North CFE 93 samples were taken with 0 results greater than the required 0.3 NTU as well as the South CFE 93 samples were taken with 0 results greater than the 0.3 NTU. In the Month.

If you are not familiar with the Combined Filter Effluent (CFE) Line(s). There are only 2 points where the CFE can actually be measured in the Benton Harbor Water Plant.

That being the 2 available CFEs that have a constant flow of filtered water in the filter gallery downstairs, by the Filter Effluent Drop Leg pipe, that do not combine until the actual Drinking Water Reservoir in the Northeast corner of the water plant property.

(that is why the water cannot be turned off and the wall drains need to be kept clear)

These points had to be chosen and submitted to MDEQ at the on-set of the Combined Filter Effluent Law. And because of the terribly wet environment in that tunnel could not be continuously monitored.

Which was not an issue with the USEPA, only an allowance in the event that a certified operator could not physically measure the turbidity in the laboratory with an approved benchtop turbidimeter and verified by MDEQ field agent.

And, just for fun by the way, at the time the HACH bench top turbidimeter was literally the USEPA preferred and Standard, but they did make allowances for other brands, as long as the State Approved.

So, No Worries.

On Thu, Sep 10, 2020 at 4:23 PM Sarkipato, Ernest (EGLE) <SARKIPATOE@michigan.gov> wrote:

> Thanks for the submittal, Mike. Mr. Mitchell, FYI this is pertaining to the August operating report Mike submitted this morning.
>
> Mike – we are seeing elevated turbidity on 8/1/2020 at the combined filter effluent (but still below 0.3 NTU), as well as at the applied water. Was that when you switched the floc/sed over, or is there some other cause for higher turbidity? To verify the individual filter turbidities that day, **please submit the highest turbidity reading from each individual filter in operation on 8/1/2020.**
>
> Also, there are a couple '0.00' on the measured orthophosphate at the plant tap (8/15/2020, 8/31/2020). I'm assuming these are days where the residual was not measured, rather than days it was and found to be zero?
>
> Ernie Sarkipato, P.E.
>
> Surface Water Treatment Specialist
>
> Drinking Water and Environmental Health Division
>
> MI Department of Environment, Great Lakes, and Energy
>
> 616-307-0261 mobile
>
> EGLE
>
> www.michigan.gov/drinkingwater
>
> ---
>
> **From:** Mike O'Malley <momalley@bhcity.us>
> **Sent:** Thursday, September 10, 2020 10:27 AM
> **To:** EGLE-DWEH-Grand-Rapids <EGLE-DWEH-Grand-Rapids@michigan.gov>;

EGLE-DWEH-Kalamazoo <EGLE-DWEH-Kalamazoo@michigan.gov>
Cc: Mike O'Malley <momalley@bhcity.us>; Denny Edwards <dedwards@bhcity.us>
Subject: MI 0600 Benton Harbor 2 submittals for August 2020: DMR & MOR

CAUTION: This is an External email. Please send suspicious emails to abuse@michigan.gov

Please see 2 reports attached:

MI 0600 Benton Harbor DMR August 2020.pdf

MI 0600 Benton Harbor MOR August 2020.pdf

Thank you

Mike O'Malley

Benton Harbor Community Water Operator IN Charge

Bentor ·Water Filter Plant
Fil(Turbidity Monitoring Sheet

Date 5-1-2020 Operator PC
Day Saturday

Clean IFE back-up Shed ( )

	6:00 AM	6:30 AM	7:00 AM	7:30 AM	8:00 AM	8:30 AM	9:00 AM	9:30 AM	10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 P
Filter 1																	
Filter 2																	
Filter 3																	
Filter 4																	
Filter 5							004		006		014		013		011		
Filter 6							003		005		017		014		014		
Filter 7							003		004		004		004		003		
Filter 8							003		004		006		006		008		
Filter 9																	
Filter 10																	
Filter 11																	
Filter 12																	

Benton Harbor Water Filter Plant
Filtered Water Turbidity Monitoring Sheet

Date Sunday Operator PC
Day 5-2-20

Shift 2

	2:00 PM	2:30 PM	3:00 PM	3:30 PM	4:00 PM	4:30 PM	5:00 PM	5:30 PM	6:00 PM	6:30 PM	7:00 PM	7:30 PM	8:00 PM	8:30 PM	9:00 PM	9:30 PM	10:00 PI
Filter 1																	
Filter 2																	
Filter 3																	
Filter 4																	
Filter 5					005		004		003		003		003		003		
Filter 6					003		003		003		003		003		003		
Filter 7					003		003		003		003		003		003		
Filter 8					003		003		003		003		003		003		
Filter 9																	
Filter 10																	
Filter 11							004		004		004		004		004		
Filter 12							003		003		003		003		003		

MI 0600 Historian Filter Turbidity reads August 1, 2020
Something happened to crash the data collection

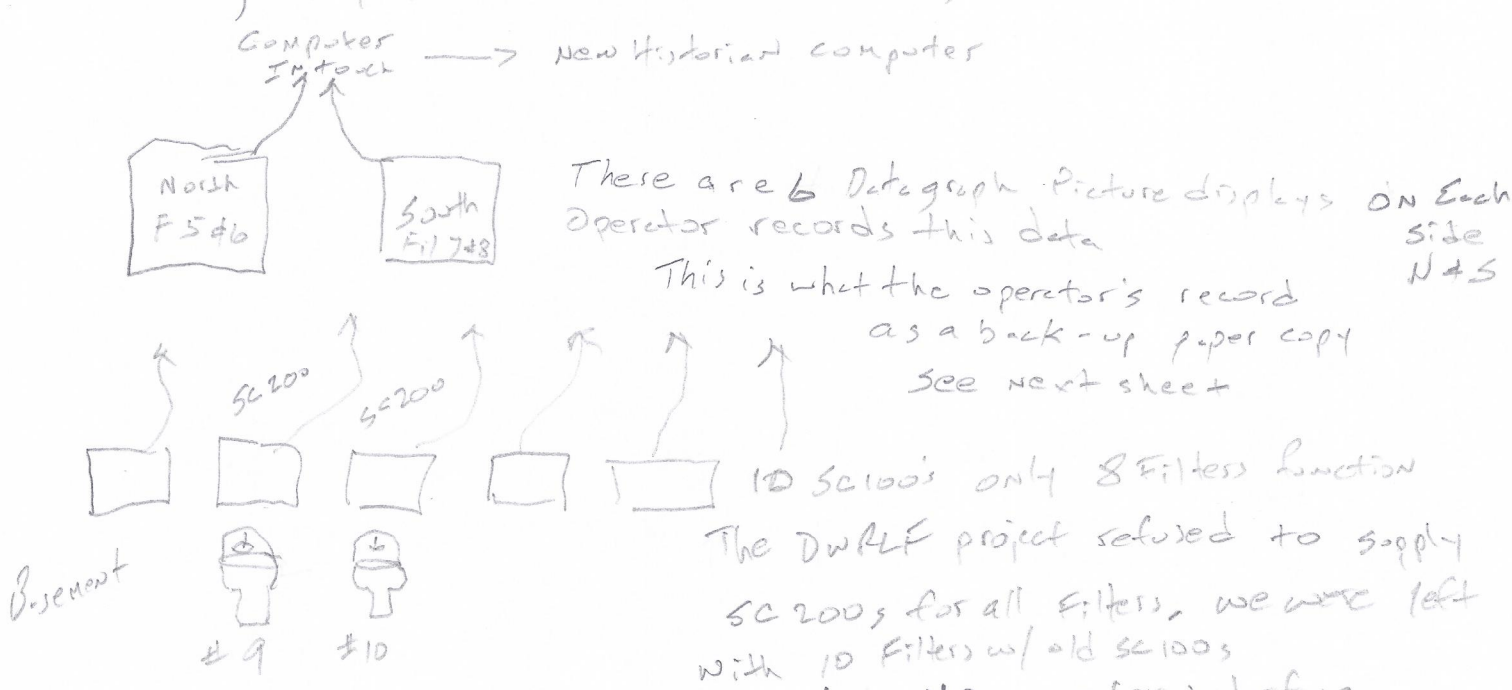
DateTime	Filter5Turbidity	Filter6Turbidity	Filter7Turbidity	Filter8Turbidity
8/1/20 11:01:12 AM	0.00	0.00	-1.00	-1.00
8/1/20 11:16:12 AM	0.00	0.01	0.01	0.10
8/1/20 11:31:12 AM	0.00	0.01	0.01	0.10
8/1/20 11:46:12 AM	0.00	0.01	0.01	0.11
8/1/20 12:01:12 PM	0.00	0.01	0.01	0.11
8/1/20 12:16:12 PM	0.01	0.01	0.01	0.11
8/1/20 12:31:12 PM	0.01	0.01	0.01	0.10
8/1/20 12:46:12 PM	0.01	0.01	0.01	0.08
8/1/20 1:01:12 PM	0.01	0.01	0.01	0.07
8/1/20 1:16:12 PM	0.01	0.01	0.01	0.05
8/1/20 1:31:12 PM	0.01	0.01	0.01	0.04
8/1/20 1:46:12 PM	0.01	0.01	0.01	0.04

9/15/20 - My IT guru came today & resolved the issue w/ Historian
I cannot figure this out

There were more than 1 data crashes
in August: ? 8/1 ; ? Some time ? 8/29/20

These readings are from the Historian after
my IT tech restored some crash on some day

Following the path of Turb Monitoring



There are 6 Datagraph Picture displays on Each side N & S
Operator records this data
This is what the operator's record
as a back-up paper copy
See next sheet

10 SC100's only 8 Filters function
The DWRLF project refused to supply
SC200's for all Filters, we were left
with 10 Filters w/ old SC100's
that have NO operator interface

Denny Edwards

Bentor Water Filter Plant
Fil Turbidity Monitoring Sheet

Date 5-1-2020 Operator DE
Day Saturday

Copy of Turbidity reads operator takes as backup from Datagraph display

	6:00 AM	6:30 AM	7:00 AM	7:30 AM	8:00 AM	8:30 AM	9:00 AM	9:30 AM	10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 P
Filter 1				N&W bad	ACO												
Filter 2		Why the	Historian					In the	OWRLF	Project	only	2					
Filter 3	did	not	collect	data	for			SC	200	controllers	were	supplied					
Filter 4								&	only	on #9	& #10						
Filter 5	6:30	am	to	9:00 am			004		006		014		013		011		
Filter 6							003		005		017		014		014		
Filter 7		is	a	mystery	to	me?	003		004		004		004		003		
Filter 8							003		004		006		006		008		
Filter 9																	
Filter 10						SC	200s	can	capture	2	inputs						
Filter 11	When	we are	done	we		&	has	a	means	to	physically	transfer	their	data			
Filter 12	will	have a	2nd	Back-up		simple &	Easy	-	I talked	to	MYST	Gulf &	we are	going			

with the new SC200s to set-up IFG collection with additional SC200 controllers

Sometime when I was gone 2012-2016. Someone created this data backup sheet.

Benton Harbor Water Filter Plant
Filtered Water Turbidity Monitoring Sheet

I did not but I think I know why

Date Sunday
Day 5-2-20 Operator DE

I was the only person who could figure out how to interface

Shift 2

	2:00 PM	2:30 PM	3:00 PM	3:30 PM	4:00 PM	4:30 PM	5:00 PM	5:30 PM	6:00 PM	6:30 PM	7:00 PM	7:30 PM	8:00 PM	8:30 PM	9:00 PM	9:30 PM	10:00 PI
Filter 1												with	the	d.t.	Cord	- & I	by the	values
Filter 2											& I	cannot	remember	how	many	were		
Filter 3	These	data	cards	were								&	The	Replaced		never	did.	
Filter 4																		
Filter 5	the	only	way	to	005		004		003		003		003		003		
Filter 6	get	IFG	data		003		003		003		003		003		003		
Filter 7	with	the	OWRL	Fwd	003		003		003		003		003		003		
Filter 8	project.		NO		003		003		003		003		003		003		
Filter 9	As	you	know														
Filter 10																	
Filter 11	HISTORIAN	was					004		004		004		004		004		
Filter 12	included	in	the	SCADA			003		003		003		003		003		

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

SUPPLY NAME: **CITY OF BENTON HARBOR** Page 1

WSSN:600

Operator-in-Charge **Abul D Ahmed** Month/Year **June-21**

F1

Water Plant Classification

Signature of Operator-in-Charge

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.2966	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	190.50	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.06	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.26	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.88%	Percent of Treated Water

Chemical Data

Chlorine on hand:	57570	lb.	Est. supply:	382	days
Primary Coagulant (Alum (Al3+)) on hand:	104450	lb.	Est. supply:	182	days
Cost of All Chemicals per Million Gallons:	$67.34	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:	90	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?	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	32.593847	Avg	1.1208767	Max	1.39052	Min	0.796215

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

WSSN 0600 City of Benton Harbor Month/Year June-21

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	1.0075	303.00	1.58	1.60	2.90	0.44	3	0.08	0.10	3	0.09	0.09	6	0	0
2	0.9875	299.00	1.59	1.40	1.60	0.41	3	0.08	0.09	3	0.08	0.08	6	0	0
3	0.9600	293.00	1.61	1.20	1.40	0.40	3	0.07	0.07	3	0.07	0.08	6	0	0
4	1.0650	328.00	1.62	1.60	2.90	0.35	3	0.07	0.07	3	0.07	0.08	6	0	0
5	0.9425	284.00	1.59	1.60	2.40	0.28	3	0.07	0.08	3	0.07	0.07	6	0	0
6	1.0800	332.00	1.38	1.10	1.40	0.28	3	0.06	0.07	3	0.07	0.08	6	0	0
7	1.0500	321.00	1.61	1.20	1.90	0.44	3	0.08	0.10	3	0.09	0.10	6	0	0
8	1.0475	325.00	1.63	1.02	1.50	0.51	3	0.09	0.10	3	0.09	0.09	6	0	0
9	1.0525	322.00	1.61	1.10	1.70	0.30	3	0.08	0.09	3	0.07	0.08	6	0	0
10	1.2000	368.00	1.61	0.78	0.91	0.29	3	0.07	0.08	3	0.07	0.08	6	0	0
11	1.1600	394.00	1.79	3.00	4.50	0.60	3	0.06	0.07	3	0.08	0.09	6	0	0
12	0.9850	299.00	1.60	1.20	2.00	0.38	3	0.08	0.09	3	0.08	0.10	6	0	0
13	1.1375	300.00	1.39	0.89	1.50	0.32	3	0.08	0.09	3	0.09	0.10	6	0	0
14	1.1775	357.00	1.60	0.67	0.76	0.34	3	0.08	0.08	3	0.08	0.09	6	0	0
15	1.1375	331.00	1.53	1.00	1.24	0.49	3	0.09	0.09	3	0.08	0.09	6	0	0
16	1.1975	359.00	1.58	1.10	1.40	0.48	3	0.07	0.07	3	0.06	0.07	6	0	0
17	1.0050	310.00	1.62	0.99	1.30	0.36	3	0.06	0.06	3	0.07	0.07	6	0	0
18	1.0875	322.00	1.56	1.70	1.90	0.64	3	0.07	0.07	3	0.06	0.06	6	0	0
19	0.8600	253.00	1.55	1.00	1.50	0.31	3	0.07	0.08	3	0.07	0.08	6	0	0
20	1.0600	327.00	1.62	1.90	3.70	0.44	3	0.08	0.09	3	0.08	0.10	6	0	0
21	1.0000	293.00	1.54	1.10	1.50	0.41	3	0.07	0.09	3	0.07	0.09	6	0	0
22	1.1075	350.00	1.66	7.70	14.10	0.40	3	0.10	0.12	3	0.08	0.09	6	0	0
23	1.2966	447.00	1.81	4.30	5.00	0.91	3	0.08	0.09	3	0.07	0.07	6	0	0
24	1.1316	358.00	1.66	4.50	5.80	0.78	3	0.08	0.08	3	0.07	0.08	6	0	0
25	1.0166	299.00	1.55	4.40	4.60	0.91	3	0.07	0.07	3	0.07	0.07	6	0	0
26	1.0350	311.00	1.55	2.00	3.00	0.48	3	0.09	0.10	3	0.10	0.10	6	0	0
27	0.8150	254.00	1.64	1.90	2.40	0.42	3	0.07	0.07	3	0.09	0.10	6	0	0
28	1.0125	315.00	1.64	2.20	4.20	0.32	3	0.07	0.08	3	0.08	0.09	6	0	0
29	1.1508	362.00	1.66	2.00	3.30	0.36	3	0.09	0.10	3	0.09	0.10	6	0	0
30	1.0799	406.00	1.98	3.80	7.50	0.64	3	0.09	0.10	3	0.09	0.10	6	0	0
31															
Total	31.8455	9822.00					90			90			180	0	0
Avg.	1.0615	327.40	1.61	2.00	2.99	0.46		0.08	0.08		0.08		Total	Total	Total
Max	1.2966	447.00	1.98	7.70	14.10	0.91		0.10	0.12		0.10	0.10	6	0	0
Min.	0.8150	253.00	1.38	0.67	0.76	0.28		0.06	0.06		0.06				

WSSN 0600 CITY OF BENTON HARBOR MONTH/YEAR **June-21**

CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness		Calcium		Magnesium		Chloride		WQP	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-		Conductivity	Sulfate
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		umhos	mg/l
T	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Tap	Tap
E	29.	30.	31.	32.	33.	34.	35.	36.	37	38	39	40	41	42		
1	8.1	7.7	152	150	128	118	24	32	42	40	12	12				
2	8.1	8.1	154	148	126	119	28	29	54	51	5	5	22.5	24.5		
3	8.1	8.1	148	146	127	117	21	29	43	43	10	9				
4	8.1	8.0	148	150	118	121	30	29	50	51	6	6				
5	8.2	8.1	144	148	118	115	26	33	41	46	10	8				
6	8.3	8.1	144	142	117	119	27	23	39	41	11	10				
7	8.3	7.9	150	136	120	114	30	22	60	39	99	5	23.0	26.0		
8	8.0	8.0	154	138	128	108	26	30	40	46	10	6				
9	8.1	8.1	170	166	121	113	49	53	37	38	19	17			324.0	39.0
10	8.2	7.9	140	144	119	112	21	32	37	41	12	10				
11	8.2	7.9	172	168	119	111	53	57	38	37	18	18				
12	8.1	8.0	174	168	119	112	55	56	46	45	15	14				
13	8.1	8.0	172	166	117	112	55	54	41	38	17	17	18.5	22.5		
14	8.2	7.9	162	154	112	113	50	41	48	59	12	14	22.5	25.5		
15	8.6	8.1	144	140	122	112	22	28	57	62	14	15				
16	8.1	8.1	136	138	119	114	17	24	38	42	10	8				
17	8.1	8.0	138	136	123	116	15	20	39	42	10	8			288.0	31.0
18	8.2	8.1	146	144	121	116	25	28	38	38	13	12				
19	8.2	8.1	168	160	120	114	48	46	42	40	16	15	19.5	24.0		
20	8.1	8.0	172	166	119	114	53	52	45	42	15	15				
21	8.4	8.0	146	144	120	111	26	33	40	64	10	15				
22	8.0	8.0	146	138	126	112	20	26	45	68	11	16				
23	8.3	8.2	144	142	126	118	18	24	42	40	10	10				
24	8.3	8.2	156	150	134	119	22	31	44	41	11	12			323.0	42.0
25	8.4	8.3	154	150	129	121	25	29	42	45	12	9				
26	8.2	8.1	176	170	124	120	52	50	44	43	16	15				
27	8.2	8.2	164	158	122	118	42	40	39	38	16	16	19.5	24.0		
28	8.1	8.1	164	156	121	116	43	40	39	37	16	16				
29	8.1	8.0	146	150	123	117	23	33	60	60	14	15				
30	8.2	8.0	166	156	120	112	46	44	39	38	17	15				
31																
Avg.	8.2	8.0	155.0	150.7	121.9	115.1	33.1	35.6	43.6	45.2	15.6	12.1	20.9	24.4	311.7	37.3
Max	8.6	8.3	176.0	170.0	134.0	121.0	55.0	57.0	60.0	68.0	99.0	18.0	23.0	26.0	324.0	42.0
Min.	8.0	7.7	136.0	136.0	112.0	108.0	15.0	20.0	37.0	37.0	5.0	22.0	18.5	22.5	288.0	31.0

WSSN 0600 MONTH/YEAR **June-21**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.57	0.34	0.66		0	0.00	211	3.13	49	0.73	260	3.76	1.70	1.93	2.06
2	0.74	0.23	0.75	0.03	0	0.00	208	3.14	25	0.38	233	3.70	1.87	1.61	1.83
3	0.63	0.27	0.75		0	0.00	201	3.13	48	0.75	249	3.51	0.84	2.39	2.67
4	0.61	0.22	0.75		0	0.00	225	3.15	57	0.80	282	4.11	1.97	1.84	2.14
5	0.62	0.14	0.63		0	0.00	199	3.15	51	0.81	250	3.48	1.40	1.81	2.08
6	0.61	0.17	0.53		0	0.00	227	3.14	55	0.76	282	3.68	1.25	2.22	2.43
7	0.68	0.21	0.51		0	0.00	223	3.17	49	0.70	272	4.24	2.60	1.41	1.64
8	0.61	0.36	0.76		0	0.00	219	3.12	33	0.47	252	3.59	1.82	1.47	1.77
9	0.66	0.30	0.95	0.75	0	0.00	230	3.26	43	0.61	273	4.03	2.38	1.50	1.65
10	0.60	0.24	0.71		0	0.00	266	3.31	53	0.66	319	4.31	1.43	2.71	2.88
11	0.38	0.25	0.73		0	0.00	254	3.27	51	0.66	305	3.77	1.72	1.89	2.05
12	0.63	0.24	0.70		0	0.00	218	3.30	59	0.89	277	4.35	2.25	1.93	2.10
13	0.62	0.32	0.84		0	0.00	213	2.80	64	0.84	277	3.73	1.80	1.77	1.93
14	0.68	0.24	0.71		0	0.00	253	3.21	52	0.66	305	3.86	1.77	1.87	2.09
15	0.59	0.23	0.33		0	0.00	244	3.20	51	0.67	295	4.03	2.16	1.65	1.87
16	0.59	0.14	0.74	0.70	0	0.00	254	3.17	44	0.55	298	3.92	1.99	1.72	1.93
17	0.55	0.31	0.80		0	0.00	216	3.21	41	0.61	257	3.88	1.96	1.67	1.92
18	0.63	0.21	0.67		0	0.00	223	3.06	51	0.70	274	3.69	1.91	1.63	1.78
19	0.61	0.27	0.77		0	0.00	194	3.37	46	0.80	240	3.71	2.06	1.49	1.65
20	0.66	0.22	0.74		0	0.00	255	3.59	64	0.90	319	4.31	2.30	1.86	2.01
21	0.56	0.15	0.54		0	0.00	259	3.87	42	0.63	301	5.64	3.80	1.71	1.84
22	0.68	0.16	0.60		0	0.00	269	3.63	81	1.09	350	6.00	3.92	1.96	2.08
23	0.57	0.11	0.57	0.63	0	0.00	308	3.55	95	1.09	403	4.58	1.67	2.69	2.91
24	0.51	0.16	0.80		0	0.00	272	3.59	72	0.95	344	3.91	0.96	2.72	2.95
25	0.44	0.19	0.72		0	0.00	246	3.61	52	0.76	298	3.20	0.75	2.28	2.45
26	0.67	0.31	0.71		0	0.00	264	3.81	77	1.11	341	3.66	1.26	2.24	2.40
27	0.78	0.22	0.74		0	0.00	212	3.88	57	1.04	269	3.17	1.08	1.93	2.09
28	0.62	0.25	0.64		0	0.00	258	3.80	64	0.94	322	3.50	0.97	2.37	2.53
29	0.62	0.19	0.58		0	0.00	264	3.42	63	0.82	327	3.59	1.06	2.37	2.53
30	0.65	0.16	0.61	0.66	0	0.00	201	2.78	55	0.76	256	2.91	0.29	2.45	2.62
Avg.	0.61	0.23	0.68	0.55	0.00	0.00	236.20	3.33	54.80	0.77	291.00	3.93	1.76	1.97	2.16
Max	0.78	0.36	0.95	0.75	0.00	0.00	308.00	3.88	95.00	1.11	403.00	6.00	3.92	2.72	2.95
Min.	0.38	0.11	0.33	0.03	0.00	0.00	194.00	2.78	25.00	0.38	233.00	2.91	0.29	1.41	1.64

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MONTH/YEAR June-21

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	PLANT TAP		Standard Plate Count		Raw	Tap
D	No. of	Colilert			TEMP.	TEMP.
A	Samples	P/A			'C	'C
T			Raw	Tap		
E						
1	1	A	14	0	11	12.5
2	1	A	18	0	10	12.0
3	1	A	32	0	10	12.0
4	1	A	55	0	12	13.0
5	1	A	16	2	13	13.0
6	1	A	3	1	15	14.0
7	1	A	13	8	15	15.0
8	1	A	57	14	18	16.0
9	1	A	21	1	16	15.0
10	1	A	12	0	13	15.5
11	1	A	28	0	12	14.5
12	1	A	3	5	12	13.5
13	1	A	9	0	11	13.5
14	1	A	5	0	14	16.0
15	1	A	3	0	13	14.0
16	1	A	2	0	12	13.0
17	1	A	5	2	12	13.0
18	1	A	55	1	17	14.0
19	1	A	5	2	17	14.0
20	1	A	126	2	18	14.5
21	1	A	158	1	19	17.0
22	1	A	12	1	16	18.0
23	1	A	14	1	20	18.0
24	1	A	67	2	20	19.0
25	1	A	116	1	20	21.0
26	1	A	82	0	19	19.5
27	1	A	366	3	19.3	19.5
28	1	A	138	0	18.3	19.0
29	1	A	91	0	18.2	18.5
30	1	A	30	0	18.8	18.5
31	1	A	0	0	0.0	0.0
AVG.	1	A	51	2	15	15
Max			366	14	20	21
Min			0	0	0	0

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MONTH/YEAR June-21

Distrubution Flow and Corrosion Treatment

	Ortho P System					Distrubution flow and Corrosion Treatment			
D A T E	City Hall Ortho P Residual mg/L	Wolfs Ortho P Residual mg/L	Bait Shed Ortho P Residual mg/L	Sunny Spot Ortho P Residual mg/L	B&Z Ortho P Residual mg/L	High Lift To Distribution	Lbs PO4	PO4 Treatment mg/L	Ortho P Residual mg/L
1						1.0325	111	4.25	3.55
2	3.92	3.68	4.02	4.02	3.50	0.9413	92	3.87	4.20
3						1.0593	97	3.62	3.86
4						1.0233	97	3.75	4.36
5						1.0712	87	3.21	4.28
6						1.1453	94	3.25	4.06
7						0.9571	93	3.84	4.05
8						1.0486	57	2.15	4.66
9	3.50	3.22	3.56	3.40	3.20	1.0119	91	3.56	5.02
10						1.1056	146	5.23	4.28
11						1.2067	104	3.41	4.16
12						0.9517	117	4.86	3.96
13						1.1078	106	3.79	4.36
14						1.1797	141	4.73	4.48
15						1.0926	119	4.31	4.42
16	4.38	4.39	4.10	4.18	4.44	1.1334	111	3.88	4.76
17						0.9878	28	1.12	4.24
18						1.1100	102	3.64	4.10
19						0.9655	81	3.32	4.20
20						1.1047	89	3.19	3.96
21						0.7962	25	1.24	4.34
22						0.8706	100	4.55	3.58
23	3.98	4.02	3.74	4.44	3.64	1.3135	91	2.74	4.20
24						1.3135	112	3.37	4.58
25						1.3905	91	2.59	4.26
26						1.3905	83	2.36	4.12
27						1.2673	72	2.25	3.94
28						1.3751	93	2.68	4.04
29						1.3597	79	2.30	3.60
30	3.98	3.76	3.90	3.80	3.97	1.3135	90	2.71	3.68
31									
Totals						33.6264	2799.0		
AVG.	3.95	3.81	3.86	3.97	3.75	1.1209	93.3	3.29	4.20
Max	4.38	4.39	4.10	4.44	4.44	1.3905	146.0	5.23	5.02
Min	3.50	3.22	3.56	3.40	3.20	0.7962	25.0	1.12	3.55

CITY OF BENTON HARBOR

DISTRIBUTION SYSTEM MONITORING WSSN 0600 June-21

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	City Hall		Wolf Marine	470 W.main	Sunny Spot	blu water	B&Z			
	1	2	3	4	5	6	7			
1	0.00		0.00	0.00	0.00		0.00			
2	1.67		1.44	1.21	0.41		1.09			
3	0.00		0.00	0.00	0.00		0.00			
4	0.00		0.00	0.00	0.00		0.00			
5	0.00		0.00	0.00	0.00		0.00			
6	0.00		0.00	0.00	0.00		0.00			
7	0.00		0.00	0.00	0.00		0.00			
8	0.00		0.00	0.00	0.00		0.00			
9	2.12		2.25	2.19	0.27		1.47			
10	0.00		0.00	0.00	0.00		0.00			
11	0.00		0.00	0.00	0.00		0.00			
12	0.00		0.00	0.00	0.00		0.00			
13	0.00		0.00	0.00	0.00		0.00			
14	0.00		0.00	0.00	0.00		0.00			
15	0.00		0.00	0.00	0.00		0.00			
16	1.46		1.36	1.47	0.24		0.42			
17	0.00		0.00	0.00	0.00		0.00			
18	0.00		0.00	0.00	0.00		0.00			
19	0.00		0.00	0.00	0.00		0.00			
20	0.00		0.00	0.00	0.00		0.00			
21	0.00		0.00	0.00	0.00		0.00			
22	0.00		0.00	0.00	0.00		0.00			
23	0.99		0.85	0.86	0.71		0.34			
24	0.00		0.00	0.00	0.00		0.00			
25	0.00		0.00	0.00	0.00		0.00			
26	0.00		0.00	0.00	0.00		0.00			
27	0.00		0.00	0.00	0.00		0.00			
28	0.00		0.00	0.00	0.00		0.00			
29	0.00		0.00	0.00	0.00		0.00			
30	1.16		0.00	1.49	0.16		0.71			
31	0.00		0.00	0.00	0.00		0.00			

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	155		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.17	2.25	0.00
Total number of check samples	0600	6		
Total number of positive check samples	0600	0		

MI 0600 Cover Page Feb 2020 MOR Revised

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

SUPPLY NAME: CITY OF BENTON HARBOR

WSSN:600

Operator-in-Charge **Michael O'Malley** F1-S1

Signature of Operator-in-Charge

Month/Year **February-20** F1-S2

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.2575	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	149.50	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.02	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.15	Gallons Per Square Feet per Minute
Average Wash Water Use:	1.43%	Percent of Treated Water

Chemical Data

Chlorine on hand:	38885	lb.	Est. supply:	424 days
Primary Coagulant (Alum (Al3+)) on hand:	93330	lb.	Est. supply:	129 days
Cost of All Chemicals per Million Gallons:	$65.32	dollars		
Total Power Cost per Million Gallons:		dollars		

Remarks

	North Filter	South Filter
Number of filter confluence samples > 0.3 NTU:	0	2
Number of filter confluence samples collected:	87	87
Percent of filter confluence samples > 0.3 NTU:	0%	2%
Number of filter confluence samples > 1 NTU	0	0

Missing in original

Did any individual filter exceed:

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

Distribution

Total	27.124642	Avg	0.9680086	Max	1.084577	Min	0.878279

Remarks. We have begun to feed a new and more effective Orthopolyphosphate (OPP) 90 /10 Carus 32% February 21, 2020 Flow Meter is in full service at this time.
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

2 Filter Confluence of Effluent (CFE)

Date	North Filter Line		South Filter Line		3samples/day Analyzed by Operator 3 sample taken per day	29 day
	Filt Avg	Filt Max	Filt Avg	Filt Max	87	
2/1/2020	0.10	0.11	0.08	0.10		
2/2/2020	0.10	0.14	0.08	0.10		
2/3/2020	0.10	0.12	0.08	0.09		
2/4/2020	0.12	0.15	0.08	0.08		
2/5/2020	0.15	0.18	0.07	0.08		
2/6/2020	0.15	0.15	0.09	0.10		
2/7/2020	0.12	0.18	0.11	0.14		
2/8/2020	0.09	0.12	0.11	0.13		
2/9/2020	0.11	0.13	0.11	0.12		
2/10/2020	0.13	0.17	0.12	0.16		
2/11/2020	0.13	0.16	0.08	0.09		
2/12/2020	0.15	0.19	0.12	0.16		
2/13/2020	0.12	0.15	0.11	0.13		
2/14/2020	0.12	0.16	0.15	0.17		
2/15/2020	0.14	0.15	0.25	0.31		
2/16/2020	0.13	0.15	0.29	0.33		
2/17/2020	0.11	0.14	0.11	0.16		
2/18/2020	0.10	0.12	0.08	0.09		
2/19/2020	0.09	0.10	0.10	0.16		
2/20/2020	0.07	0.07	0.07	0.08		
2/21/2020	0.08	0.10	0.08	0.08		
2/22/2020	0.12	0.15	0.08	0.09		
2/23/2020	0.08	0.08	0.08	0.11		
2/24/2020	0.08	0.09	0.08	0.09		
2/25/2020	0.07	0.07	0.09	0.10		
2/26/2020	0.07	0.08	0.08	0.09		
2/27/2020	0.07	0.08	0.07	0.07		
2/28/2020	0.08	0.08	0.08	0.08		
2/29/2020	0.08	0.08	0.12	0.14		

water plant has 2 CFE 1) North 2) South

Reg on CFE Sampling original rule preferred Samples be taken by operators every 3 hrs so that is what we do

Reg CFE Turbidity must be ≤ 0.3 NTU in 95% of Samples Taken during the month.

2/87 = 0.23 or 97.7% <0.3 NTU

There was supposed to be a data section below that populates the Turbidity answers on the Cover sheet. It got lost in all the changes I've had to make to my MOR file I created originally in 1992

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** **F1-S1**

Signature of Operator-in-Charge

Month/Year **July-19** **F1-S2**

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.5398	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	257.00	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.14	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.45	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.69%	Percent of Treated Water

Chemical Data

Chlorine on hand:	38885	lb.	Est. supply:	131	days
Primary Coagulant (Alum (Al3+)) on hand:	42495	lb.	Est. supply:	114	days
Cost of All Chemicals per Million Gallons:	$67.57	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:	93	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.

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	32.3742	Avg	1.0785645	Max	1.2337	Min	0.9288

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **July-19**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.55	0.30	0.72		0	0.00	244	3.49	57	0.81	301	4.23	2.45	1.59	1.78
2	0.39	0.29	0.75		0	0.00	247	3.38	30	0.41	277	3.51	1.76	1.57	1.75
3	0.55	0.30	0.80		0	0.00	248	3.38	30	0.41	278	4.09	2.28	1.63	1.81
4	0.56	0.37	0.82		0	0.00	243	3.34	54	0.74	297	4.35	1.09	3.05	3.26
5	0.00	0.34	0.69		0	0.00	229	3.29	27	0.39	256	3.94	2.11	1.63	1.83
6	0.00	0.30	0.70		0	0.00	222	3.40	19	0.29	241	3.27	1.55	1.52	1.72
7	0.00	0.49	0.60		0	0.00	241	3.27	14	0.19	255	3.92	2.31	1.43	1.61
8	0.00	0.34	0.53		0	0.00	252	3.29	19	0.25	271	3.39	1.66	1.57	1.73
9	0.00	0.41	0.52		0	0.00	254	3.33	19	0.25	273	4.15	2.47	1.51	1.68
10	0.00	0.26	0.37		0	0.00	237	3.30	40	0.56	277	3.70	2.04	1.47	1.66
11	0.40	0.28	0.39	0.71	0	0.00	245	3.37	21	0.29	266	3.28	1.75	1.36	1.53
12	0.51	0.30	0.58		0	0.00	290	3.81	32	0.42	322	4.87	3.02	1.69	1.85
13	0.58	0.24	0.66		0	0.00	248	3.36	51	0.69	299	4.14	1.28	2.65	2.86
14	0.32	0.24	0.74		0	0.00	249	3.50	30	0.42	279	3.99	2.31	1.51	1.68
15	0.20	0.32	0.74		0	0.00	266	3.59	24	0.32	290	4.39	2.95	1.32	1.44
16	0.17	0.44	0.63		0	0.00	288	3.73	22	0.28	310	4.48	3.13	1.25	1.35
17	0.54	0.52	0.57	0.61	0	0.00	312	3.94	33	0.42	345	4.17	2.75	1.30	1.42
18	0.47	0.51	0.66		0	0.00	323	4.10	38	0.48	361	4.90	3.36	1.41	1.54
19	0.00	0.23	0.73		0	0.00	342	4.01	35	0.41	377	4.71	3.16	1.38	1.55
20	0.42	0.25	0.69		0	0.00	357	4.56	62	0.79	419	5.55	3.95	1.42	1.60
21	0.00	0.30	0.82		0	0.00	282	3.98	84	1.19	366	4.67	3.15	1.35	1.52
22	0.51	0.31	0.69		0	0.00	314	4.19	108	1.44	422	5.58	3.77	1.63	1.81
23	0.00	0.39	0.73		0	0.00	361	4.42	87	1.07	448	6.35	3.99	2.16	2.36
24	0.52	0.34	0.77	0.72	0	0.00	323	4.34	81	1.09	404	5.90	3.45	2.19	2.45
25	0.00	0.27	0.76		0	0.00	338	4.34	82	1.05	420	5.32	2.60	2.51	2.72
26	0.52	0.33	0.81		0	0.00	350	4.31	49	0.60	399	5.80	3.81	1.80	1.99
27	0.49	0.29	0.71		0	0.00	326	4.32	56	0.74	382	5.59	2.98	2.37	2.61
28	0.51	0.24	0.63		0	0.00	332	4.29	0	0.00	332	5.34	3.68	1.49	1.66
29	0.48	0.26	0.62		0	0.00	337	3.27	35	0.34	372	5.12	3.56	1.39	1.56
30	0.47	0.26	0.55		0	0.00	415	4.96	31	0.37	446	5.71	4.18	1.36	1.53
31	0.37	0.29	0.59		0	0.00	336	4.72	21	0.30	357	5.03	3.42	1.43	1.61
Tot.							8,807		1,234		10,342				
Avg.	0.31	0.32	0.67	0.68	0.00	0.00	290.50	3.79	42.33	0.56	332.83	4.61	2.75	1.68	1.86
Max	0.58	0.52	0.82	0.72	0.00	0.00	415.00	4.96	108.00	1.44	448.00	6.35	4.18	3.05	3.26
Min.	0.00	0.23	0.37	0.61	0.00	0.00	222.00	3.27	0.00	0.00	241.00	3.27	1.09	1.25	1.35

WSSN 0600 City of Benton Harbor Month/Year July-19

COAGULATION PARAMETERS

D A T E	MIL. GAL. TREAT.	Dry Al2(SO3)4 Pounds Add	ALUM as Al3+ mg/l	TURBIDITY UNITS RAW Avg.	RAW Max.	Applied Avg.	# ample	FILTERED NORTH Avg.	FILTERED NORTH Max.	# Samples	FILTERED SOUTH Avg.	FILTERED SOUTH Max.	2 Hour Compliance Periods # of Periods	#of Periods >.30NTU North	#of Periods >.30NTU South
1	1.0450	311.00	1.57	2.20	4.20	0.25	3	0.04	0.04	3	0.04	0.04	6	0	0
2	1.0900	322.00	1.55	1.90	2.30	0.19	3	0.04	0.06	3	0.03	0.04	6	0	0
3	1.0950	323.00	1.55	1.90	2.80	0.18	3	0.04	0.04	3	0.03	0.03	6	0	0
4	1.0850	320.00	1.55	2.50	4.40	0.16	3	0.02	0.02	3	0.03	0.03	6	0	0
5	1.0375	303.00	1.54	1.70	2.70	0.17	3	0.03	0.03	3	0.03	0.04	6	0	0
6	0.9750	298.00	1.64	1.20	1.20	0.13	3	0.02	0.02	3	0.03	0.03	6	0	0
7	1.1000	323.00	1.54	6.20	7.60	0.18	3	0.02	0.02	3	0.02	0.03	6	0	0
8	1.1450	337.00	1.55	2.60	3.10	0.14	3	0.02	0.02	3	0.02	0.03	6	0	0
9	1.1400	340.00	1.57	2.70	3.00	0.14	3	0.02	0.02	3	0.02	0.03	6	0	0
10	1.0725	331.00	1.62	3.50	6.40	0.18	3	0.04	0.04	3	0.03	0.03	6	0	0
11	1.0850	323.00	1.57	3.10	4.50	0.17	3	0.03	0.04	3	0.03	0.04	6	0	0
12	1.1375	373.00	1.73	2.60	3.50	0.17	3	0.03	0.04	3	0.03	0.04	6	0	0
13	1.1025	317.00	1.51	2.70	3.50	0.16	3	0.02	0.02	3	0.03	0.04	6	0	0
14	1.0625	304.00	1.51	2.20	3.40	0.17	3	0.02	0.03	3	0.02	0.03	6	0	0
15	1.1050	309.00	1.47	2.20	3.20	0.14	3	0.02	0.02	3	0.03	0.04	6	0	0
16	1.1525	344.00	1.57	1.90	2.20	0.19	3	0.03	0.03	3	0.03	0.04	6	0	0
17	1.1825	351.00	1.56	1.70	2.00	0.20	3	0.02	0.02	3	0.04	0.05	6	0	0
18	1.1750	352.00	1.58	1.40	1.80	0.17	3	0.02	0.02	3	0.03	0.03	6	0	0
19	1.2746	415.00	1.71	2.90	5.50	0.22	3	0.03	0.03	3	0.03	0.03	6	0	0
20	1.1699	416.00	1.87	5.60	7.30	0.22	3	0.03	0.03	3	0.03	0.03	6	0	0
21	1.0575	291.00	1.45	1.50	2.00	0.18	3	0.03	0.04	3	0.03	0.04	6	0	0
22	1.1200	308.00	1.45	2.60	3.20	0.17	3	0.02	0.02	3	0.03	0.05	6	0	0
23	1.2182	440.00	1.90	6.30	7.50	0.21	3	0.03	0.03	3	0.04	0.04	6	0	0
24	1.1100	330.00	1.56	1.60	1.70	0.13	3	0.02	0.03	3	0.03	0.03	6	0	0
25	1.1625	347.00	1.57	1.70	1.90	0.18	3	0.03	0.04	3	0.03	0.04	6	0	0
26	1.2125	361.00	1.57	1.40	1.70	0.13	3	0.03	0.06	3	0.03	0.03	6	0	0
27	1.1275	337.00	1.57	1.50	1.50	0.14	3	0.02	0.02	3	0.03	0.03	6	0	0
28	1.1550	345.00	1.57	1.50	1.60	0.14	3	0.02	0.02	3	0.03	0.03	6	0	0
29	1.5398	324.00	1.11	1.70	1.90	0.18	3	0.03	0.04	3	0.04	0.04	6	0	0
30	1.2499	431.00	1.81	5.90	9.90	0.21	3	0.05	0.07	3	0.04	0.04	6	0	0
31	1.0625	318.00	1.57	2.50	3.10	0.13	3	0.04	0.04	3	0.03	0.03	6	0	0
Total	35.2474	10544.00					93			93			186	0	0
Avg.	1.1370	340.13	1.58	2.61	3.57	0.17		0.03	0.03		0.03		Total	Total	Total
Max	1.5398	440.00	1.90	6.30	9.90	0.25		0.05	0.07		0.04	0.05	6	0	0
Min.	0.9750	291.00	1.11	1.20	1.20	0.13		0.02	0.02		0.02				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.0	7.9	160	150	111	100	49	50	37	36	17	15		
2	8.0	8.1	152	148	108	102	44	46	40	42	13	11		
3	7.9	8.0	148	144	108	102	40	42	37	36	14	13	19.0	23.0
4	8.0	8.1	150	144	110	105	40	39	37	36	14	13		
5	8.0	8.0	154	146	109	101	45	45	36	35	16	14		
6	7.9	8.0	142	146	114	102	28	44	38	39	12	12		
7	8.1	7.9	138	136	107	104	31	32	39	41	10	8		
8	8.0	8.0	142	134	106	105	36	29	46	46	6	5	16.0	20.5
9	8.0	8.1	144	142	109	105	35	37	38	37	12	12		
10	8.0	8.1	150	144	109	103	41	41	38	38	14	12		
11	8.1	8.1	150	140	114	105	36	35	35	34	15	13		
12	8.1	8.1	150	142	109	102	41	40	37	36	14	13		
13	8.1	8.1	148	144	108	105	40	39	36	35	14	14		
14	8.1	8.1	154	142	114	102	40	40	37	35	15	13	19.5	22.5
15	8.2	8.2	144	142	105	109	39	33	37	39	13	11	18.5	21.5
16	8.3	8.2	146	136	104	104	42	32	41	38	11	10		
17	8.3	8.2	142	134	112	105	30	29	38	36	12	11		
18	8.1	8.2	134	138	113	107	21	31	42	43	7	7		
19	8.3	8.3	146	140	118	108	28	32	42	41	10	9		
20	8.1	8.0	154	152	111	111	43	41	38	37	15	15		
21	8.1	8.0	158	150	113	106	45	44	38	37	16	14	18.5	23.5
22	8.1	8.1	150	144	109	105	41	39	36	37	15	13		
23	8.0	8.1	154	146	111	105	43	41	37	36	15	14		
24	8.0	7.9	136	132	108	102	28	30	37	36	11	10	20.5	23.5
25	8.1	8.0	146	138	107	103	39	35	36	34	14	13		
26	8.1	7.8	136	130	108	102	28	28	38	41	10	7		
27	8.3	8.2	136	138	108	105	28	33	39	41	9	9		
28	8.2	8.2	138	134	112	105	26	29	39	35	10	11		
29	8.1	8.1	150	144	109	104	41	40	36	34	15	14		
30	8.2	8.2	160	146	114	101	46	45	37	35	17	15		
31	8.1	8.1	136	136	107	108	29	28	37	38	11	10		
Avg.	8.1	8.1	147.1	141.5	109.9	104.2	37.1	37.4	38.1	37.5	12.9	11.7	18.7	22.4
Max	8.3	8.3	160.0	152.0	118.0	111.0	49.0	50.0	46.0	46.0	17.0	15.0	20.5	23.5
Min.	7.9	7.8	134.0	130.0	104.0	100.0	21.0	28.0	35.0	34.0	6.0	5.0	16.0	20.5

DISTRIBUTION SYSTEM MONITORING WSSN 0600 July-19

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11	1.07		1.01	0.81	0.71		0.71			
12										
13										
14										
15										
16										
17	1.33		0.89	1.02	0.71		0.66			
18										
19										
20										
21										
22										
23										
24	1.04		1.05	1.00	0.58		0.94			
25										
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	15		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	**0.90**	1.33	0.58
Total number of check samples	0600			
Total number of positive check samples	0600			

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1			1	A	39	1	14	16.5	1.1126	51	1.80	1.23
2			1	A	54	1	15	15.5	1.2394	43	1.37	1.51
3			1	A	68	0	15	16.5	1.0664	45	1.68	1.28
4			1	A	52	1	13	16.0	1.0816	46	1.67	1.05
5			1	A	60	0	15	15.0	1.0202	42	1.64	
6			1	A	34	0	14	16.5	1.1568	39	1.34	1.11
7			1	A	31	1	12	12.0	0.9966	39	1.54	1.27
8			1	A	80	0	12	15.0	1.2567	46	1.46	0.93
9			1	A	60	0	13	14.0	1.0346	47	1.78	1.49
10			1	A	142	0	15	14.0	1.1580	48	1.64	1.26
11			1	A	44	1	18	15.0	1.2646	44	1.37	1.85
12			1	A	70	0	14	16.5	1.0404	49	1.86	1.24
13			1	A	30	0	15	15.5	1.1384	47	1.64	1.07
14			1	A	30	0	19	16.5	1.0943	56	2.03	1.12
15			1	A	20	0	16	18.0	1.0139	44	1.71	1.81
16			1	A	15	0	21	18.0	1.0866	33	1.20	1.23
17	1.22	ch	1	A	51	1	22	23.0	1.2972	35	1.07	0.39
18	1.12	ss	1	A	38	0	18	20.0	1.1643	65	2.22	1.42
19	1.10	bz	1	A	83	3	24	20.0	1.2436	52	1.64	1.83
20			1	A	24	0	21	22.0	1.1714	53	1.77	1.23
21			1	A	99	0	20	21.5	1.2308	50	1.59	1.44
22			1	A	61	0	12	21.0	1.1781	49	1.65	1.24
23			1	A	61	0	11	16.0	1.1181	20	0.71	0.61
24	1.40	ch	1	A	18	0	12	15.0	1.0750	13	0.48	1.48
25	1.22	w	1	A	66	0	13	14.0	1.2338	0	0.00	0.43
26	1.13	bs	1	A	52	0	15	14.0	1.0808	12	0.44	1.39
27	1.19	ss	1	A	29	1	19.0	15.0	1.0542	0	0.01	0.13
28	0.86	bz	1	A	43	0	9.0	12.0	0.9600	42	1.71	1.01
29			1	A	55	0	8.7	8.5	1.1489	42	1.45	
30			1	A	32	0	8.5	9.5	0.7089	45	2.53	0.88
31			1	A	159	3	19.0	21.0	1.1239	50	1.75	1.17
Totals									34.5501	1246.0		
AVG.	1.16		1	A	55	0	15	16	1.1145	40.2	1.43	1.17
Max	1.40				159	3	24	23	1.2972	65.4	2.53	1.85
Min	0.86				15	0	9	9	0.7089	0.1	0.00	0.13

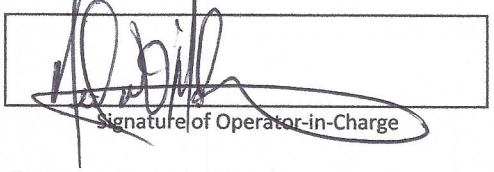
MONTHLY OPERATION REPORT OF
THE CITY OF BENTON HARBOR WATER TREATMENT PLANT

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **May-19**

F1-S1 **F1-S2**



Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.115	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	182.50	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.00	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.98	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.86%	Percent of Treated Water

Chemical Data

Chlorine on hand:	31815	lb.	Est. supply:	167	days
Primary Coagulant (Alum (Al3+)) on hand:	42495	lb.	Est. supply:	102	days
Cost of All Chemicals per Million Gallons:	$66.68	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:	93	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.	
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	28.25652	Avg	0.9396705	Max	1.181429	Min	0.797596

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
Calculated Distribution OPP 70/30 Carus 33% feed and residuals on Bacti/OPP Page

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **May-19**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.57	0.42	0.73	0.73	0	0.00	228	3.22	15	0.21	243	4.15	2.15	1.80	2.00
2	0.57	0.36	0.75		0	0.00	216	3.29	40	0.61	256	4.08	1.98	1.89	2.10
3	0.56	0.41	0.73		0	0.00	214	3.47	20	0.32	234	4.09	2.07	1.79	2.02
4	0.61	0.44	0.61		0	0.00	219	3.56	17	0.28	236	4.11	2.24	1.63	1.87
5	0.56	0.41	0.69		0	0.00	208	3.57	18	0.31	226	4.19	2.24	1.69	1.95
6	0.58	0.37	0.67		0	0.00	246	3.54	18	0.26	264	3.82	2.01	1.61	1.81
7	0.55	0.40	0.68		0	0.00	234	3.48	20	0.30	254	3.90	1.82	1.87	2.08
8	0.61	0.41	0.75	0.61	0	0.00	211	3.41	29	0.47	240	3.89	2.01	1.68	1.88
9	0.57	0.23	0.54		0	0.00	208	3.34	19	0.30	227	3.34	1.31	1.82	2.03
10	0.55	0.41	0.73		0	0.00	223	3.29	39	0.58	262	3.91	1.27	2.41	2.64
11	0.71	0.43	0.71		0	0.00	208	3.13	16	0.24	224	3.45	1.66	1.58	1.79
12	0.51	0.40	0.62		0	0.00	216	3.28	16	0.24	232	3.42	1.75	1.48	1.67
13	0.44	0.27	0.65		0	0.00	213	3.33	22	0.34	235	3.73	1.77	1.74	1.96
14	0.55	0.39	0.67		0	0.00	244	3.28	94	1.26	338	4.27	1.80	2.22	2.47
15	0.57	0.36	0.74		0	0.00	240	3.28	29	0.40	269	4.22	2.17	1.88	2.05
16	0.53	0.39	0.58	0.57	0	0.00	262	3.51	48	0.64	310	4.67	1.82	2.61	2.85
17	0.57	0.37	0.72		0	0.00	270	3.67	22	0.30	292	4.42	2.50	1.73	1.92
18	0.57	0.32	0.81		0	0.00	281	3.77	23	0.31	304	5.69	3.92	1.58	1.77
19	0.70	0.35	0.86		0	0.00	239	3.76	29	0.46	268	4.30	2.31	1.81	1.99
20	0.58	0.38	0.84		0	0.00	265	3.77	49	0.70	314	5.00	2.28	2.50	2.72
21	0.49	0.42	0.84		0	0.00	246	3.80	24	0.37	270	4.35	2.08	2.06	2.27
22	0.47	0.36	0.75		0	0.00	257	3.76	31	0.45	288	4.79	2.84	1.75	1.95
23	0.52	0.25	0.78	0.72	0	0.00	240	3.52	25	0.37	265	4.63	2.73	1.70	1.90
24	0.59	0.15	0.62		0	0.00	249	3.53	46	0.65	295	4.86	2.51	2.16	2.35
25	0.70	0.27	0.82		0	0.00	228	3.43	33	0.50	261	4.38	2.10	2.06	2.28
26	0.59	0.27	0.79		0	0.00	199	3.27	17	0.28	216	3.82	2.14	1.49	1.68
27	0.75	0.30	0.84		0	0.00	221	3.36	22	0.33	243	3.76	2.17	1.41	1.59
28	0.61	0.29	0.77		0	0.00	241	3.47	30	0.43	271	4.08	2.38	1.61	1.70
29	0.55	0.28	0.73	0.79	0	0.00	240	3.51	24	0.35	264	4.04	2.28	1.60	1.76
30	0.66	0.35	0.76	0.00	0	0.00	242	3.61	27	0.40	269	4.21	2.26	1.76	1.95
31	0.52	0.04	0.81		0	0.00	237	3.62	29	0.44	266	4.10	2.07	1.85	2.03
Tot.							7,017		876		8,136				
Avg.	0.58	0.35	0.73	0.57	0.00	0.00	233.60	3.47	28.73	0.42	262.33	4.19	2.15	1.83	2.03
Max	0.75	0.44	0.86	0.79	0.00	0.00	281.00	3.80	94.00	1.26	338.00	5.69	3.92	2.61	2.85
Min.	0.44	0.15	0.54	0.00	0.00	0.00	199.00	3.13	15.00	0.21	216.00	3.34	1.27	1.41	1.59

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COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	1.0575	327.00	1.63	1.90	3.10	0.32	3	0.09	0.12	3	0.08	0.10	6	0	0
2	0.9800	307.00	1.65	2.90	3.30	0.34	3	0.07	0.07	3	0.07	0.08	6	0	0
3	0.9200	280.00	1.60	1.80	2.10	0.30	3	0.08	0.09	3	0.07	0.07	6	0	0
4	0.9175	281.00	1.61	1.90	3.50	0.22	3	0.07	0.07	3	0.07	0.08	6	0	0
5	0.8700	267.00	1.61	1.80	3.60	0.22	3	0.07	0.09	3	0.07	0.07	6	0	0
6	1.0375	328.00	1.35	1.30	1.50	0.30	3	0.08	0.10	3	0.08	0.09	6	0	0
7	1.0050	315.00	1.65	2.90	5.60	0.33	3	0.08	0.09	3	0.09	0.11	6	0	0
8	0.9250	293.00	1.67	1.30	1.50	0.30	3	0.09	0.11	3	0.06	0.07	6	0	0
9	0.9300	288.00	1.63	1.60	1.90	0.30	3	0.08	0.11	3	0.09	0.10	6	0	0
10	1.0125	318.00	1.65	2.20	3.90	0.31	3	0.07	0.09	3	0.09	0.11	6	0	0
11	0.9925	290.00	1.54	2.00	3.60	0.39	3	0.09	0.11	3	0.08	0.09	6	0	0
12	0.9825	309.00	1.65	1.80	3.00	0.26	3	0.07	0.09	3	0.07	0.08	6	0	0
13	0.9550	298.00	1.64	1.20	2.10	0.22	3	0.07	0.07	3	0.08	0.08	6	0	0
14	1.1100	343.00	1.63	1.10	1.40	0.24	3	0.07	0.08	3	0.07	0.08	6	0	0
15	1.0916	341.00	1.64	1.50	2.60	0.30	3	0.07	0.08	3	0.08	0.10	6	0	0
16	1.1150	409.00	1.93	2.10	2.80	0.36	3	0.08	0.08	3	0.08	0.08	6	0	0
17	1.0975	343.00	1.64	1.90	2.90	0.47	3	0.09	0.10	3	0.08	0.09	6	0	0
18	1.1118	342.00	1.62	2.20	2.40	0.35	3	0.08	0.08	3	0.08	0.08	6	0	0
19	0.9500	292.00	1.62	2.50	3.10	0.35	3	0.07	0.08	3	0.07	0.08	6	0	0
20	1.0500	330.00	1.65	2.50	3.00	0.33	3	0.07	0.09	3	0.07	0.07	6	0	0
21	0.9675	301.00	1.64	1.10	1.80	0.25	3	0.07	0.07	3	0.07	0.07	6	0	0
22	1.0200	310.00	1.60	2.30	3.50	0.27	3	0.07	0.07	3	0.08	0.09	6	0	0
23	1.0175	308.00	1.59	2.90	5.00	0.29	3	0.08	0.09	3	0.06	0.07	6	0	0
24	1.0525	320.00	1.60	2.50	2.80	0.32	3	0.08	0.09	3	0.07	0.07	6	0	0
25	0.9925	296.00	1.57	3.10	5.20	0.28	3	0.07	0.08	3	0.07	0.08	6	0	0
26	0.9075	268.00	1.57	1.80	2.50	0.24	3	0.07	0.08	3	0.06	0.07	6	0	0
27	0.9825	298.00	1.60	1.30	1.70	0.16	3	0.04	0.04	3	0.02	0.03	6	0	0
28	1.0375	312.00	1.58	1.70	2.00	0.17	3	0.03	0.05	3	0.02	0.02	6	0	0
29	1.0200	308.00	1.59	1.60	1.90	0.15	3	0.02	0.02	3	0.03	0.06	6	0	0
30	1.0000	312.00	1.64	1.10	1.20	0.15	3	0.02	0.02	3	0.02	0.03	6	0	0
31	0.9775	310.00	1.67	1.10	1.50	0.14	3	0.02	0.03	3	0.02	0.03	6	0	0
Total	31.0859	9644.00					93			93			186	0	0
Avg.	1.0028	311.10	1.62	1.90	2.77	0.28		0.07	0.08		0.07		Total	Total	Total
Max	1.1150	409.00	1.93	3.10	5.60	0.47		0.09	0.12		0.09	0.11	6	0	0
Min.	0.8700	267.00	1.35	1.10	1.20	0.14		0.02	0.02		0.02				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	7.9	8.0	166	156	111	105	55	51	44	42	14	13		
2	8.0	8.0	166	156	116	104	50	52	43	41	14	13		
3	8.1	8.1	156	150	121	109	35	41	43	41	12	12		
4	8.1	8.1	164	158	104	112	60	46	45	42	13	13		
5	8.1	8.1	156	148	111	109	45	39	45	46	11	8		
6	8.2	8.0	170	164	113	101	57	63	43	41	15	15		
7	8.0	8.0	174	168	118	104	56	64	42	40	17	17		
8	8.0	7.9	164	156	110	105	54	51	42	40	15	14		
9	7.9	8.0	158	152	115	105	43	47	42	41	13	12		
10	8.0	8.0	164	152	118	108	46	44	40	39	16	13	20.5	23.5
11	7.9	8.0	166	154	118	108	48	46	42	40	16	13		
12	7.9	8.0	164	156	115	110	49	46	42	40	15	14		
13	8.1	8.0	154	152	112	109	42	43	50	47	7	8	19.5	21.5
14	8.1	8.1	158	152	112	109	46	43	42	41	13	12		
15	8.0	8.0	166	142	122	109	44	33	51	43	9	8		
16	8.0	8.0	170	158	121	111	49	47	42	40	16	14		
17	8.0	8.1	182	162	134	113	48	49	45	40	17	15		
18	8.0	8.0	160	156	119	120	41	36	46	46	11	10		
19	8.1	7.9	162	160	124	122	38	38	46	44	11	12		
20	8.2	8.1	178	170	125	116	53	54	43	42	17	16		
21	8.0	7.8	162	154	122	119	40	35	47	46	11	9	20.5	22.5
22	8.0	8.0	170	162	115	114	55	48	43	41	15	15		
23	7.9	8.0	168	164	114	110	54	54	43	44	15	13		
24	8.2	8.0	174	166	117	111	57	55	43	42	16	15		
25	8.0	8.0	172	162	117	111	55	51	43	41	16	15	20.5	23.5
26	8.1	8.1	166	158	115	110	51	48	44	42	14	13		
27	8.2	8.3	158	156	122	118	36	38	45	43	11	12	20.0	22.5
28	8.2	8.2	156	158	123	116	33	42	45	45	11	11		
29	8.0	8.1	152	148	115	113	37	35	46	44	9	9		
30	8.1	8.1	158	152	116	114	42	38	42	46	13	9		
31	8.2	8.1	152	148	113	109	39	39	49	47	9	7		
Avg.	8.0	8.0	164.5	156.7	117.2	110.8	47.3	45.9	44.0	42.3	13.4	12.4	20.2	22.7
Max	8.2	8.3	182.0	170.0	134.0	122.0	60.0	64.0	51.0	47.0	17.0	17.0	20.5	23.5
Min.	7.9	7.8	152.0	142.0	104.0	101.0	33.0	33.0	40.0	39.0	7.0	8.0	19.5	21.5

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.				
A	Samples	P/A	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T					Raw	Tap			To	Lbs PO4	Treatment	Residual
E									Distribution		mg/L	mg/L
1			1	A	44	0	8	8.0	0.8733	39	1.77	1.80
2			1	A	19	0	8	8.0	0.9377	39	1.65	1.80
3			1	A	34	0	8	9.0	0.8540	39	1.81	1.10
4			1	A	42	1	8	9.5	1.2263	30	0.97	1.20
5			1	A	25	1	8	9.0	0.8045	38	1.86	
6			1	A	19	0	8	8.5	1.0308	35	1.33	1.14
7			1	A	63	1	8	8.0	0.9711	37	1.51	1.31
8			1	A	38	0	7	8.5	0.9200	41	1.76	1.08
9			1	A	33	1	8	8.0	1.0134	34	1.31	1.16
10			1	A	0	0	9	8.0	1.0009	44	1.76	0.82
11			1	A	46	1	8	8.5	0.9705	29	1.17	1.22
12			1	A	38	0	8	8.5	1.0114	41	1.59	1.28
13			1	A	71	0	8	9.0	0.7560	36	1.89	0.80
14			1	A	46	1	9	10.0	1.1814	37	1.25	1.00
15			1	A	58	0	9	9.0	0.8256	37	1.79	0.80
16			1	A	53	0	9	9.0	0.9910	37	1.48	1.20
17			1	A	55	0	10	8.5	0.9851	37	1.48	1.25
18			1	A	64	8	8	10.0	0.7976	35	1.74	1.18
19			1	A	45	8	12	11.0	0.9296	38	1.62	1.14
20			1	A	23	0	13	10.0	0.9375	18	0.78	0.28
21			1	A	41	1	11	12.0	0.9257	4	0.16	0.11
22			1	A	30	0	11	11.0	0.8983	9	0.41	1.43
23			1	A	59	0	11	10.5	0.8535	20	0.93	1.03
24			1	A	58	0	13	11.5	0.9068	13	0.57	1.31
25			1	A	33	0	12	11.5	0.8899	33	1.45	1.14
26			1	A	112	18	13	12.5	0.8437	32	1.48	1.12
27			1	A	78	0	13.5	14.0	0.9646	33	1.35	1.15
28			1	A	63	0	9.0	12.0	0.9910	35	1.41	1.14
29			1	A	51	0	8.7	8.5	0.9759	34	1.39	
30			1	A	24	0	8.5	9.5	0.9535	41	1.69	1.50
31			1	A	46	0	13.0	14.0	0.9690	44	1.81	1.32
Totals									29.1900	1019.1		
AVG.			1	A	46	1	9	10	0.9416	32.9	1.38	1.11
Max					112	18	14	14	1.2263	44.4	1.89	1.80
Min					0	0	7	8	0.7560	3.7	0.16	0.11

MI0600 DMR May 2019 6/7/19

MI 0600 Distribution Monitoring Report MI 0600 DMR

DISTRIBUTION SYSTEM MONITORING WSSN 0600 May-19

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1	1.01		1.06	0.87	1.10		0.55			
2										
3										
4										
5										
6										
7										
8	0.61		1.31	1.20	1.27		0.95			
9										
10										
11										
12										
13										
14										
15										
16	0.86		1.01	1.12	1.04		1.08			
17										
18										
19										
20										
21										
22										
23	0.96		1.02	1.18	0.77		0.63			
24										
25										
26										
27										
28										
29	0.81		0.91	1.01	0.49		0.69			
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	25		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.94	1.31	0.49
Total number of check samples	0600			
Total number of positive check samples	0600			

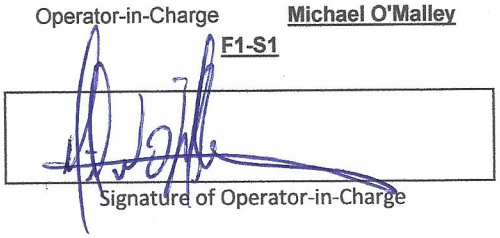
MONTHLY OPERATION REPORT OF
THE CITY OF BENTON HARBOR WATER TREATMENT PLANT

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **April-18**

F1-S1 **F1-S2**



Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.0975	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	25.31	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.97	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.62	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.57%	Percent of Treated Water

Chemical Data

Chlorine on hand:	53025	lb.	Est. supply:	368	days
Primary Coagulant (Alum (Al3+)) on hand:	85784	lb.	Est. supply:	227	days
Cost of All Chemicals per Million Gallons:	$64.18	dollars			
Total Power Cost per Million Gallons:		dollars			

Remarks

Number of filter confluence samples > 0.3 NTU:	0
Number of filter confluence samples collected:	174
Percent of filter confluence samples > 0.3 NTU:	0%
Number of filter confluence samples > 1 NTU	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.

Remarks: We took delivery of Chlorine and Alum by the time this report was completed.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **April-18**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		SETTLED		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.92	0.41	0.78		0	0.00	184	3.90	32	0.68	216	3.64	2.20	1.28	1.44
2	0.48	0.40	0.90		0	0.00	225	3.25	35	0.51	260	4.74	3.02	1.55	1.72
3	0.74	0.36	0.83		0	0.00	249	3.39	39	0.53	288	4.09	2.29	1.63	1.80
4	0.50	0.28	0.67	0.67	0	0.00	230	3.41	34	0.50	264	4.10	2.36	1.39	1.74
5	0.52	0.27	0.66		0	0.00	251	3.49	35	0.49	286	4.98	2.97	1.80	2.01
6	0.35	0.31	0.67		0	0.00	239	3.46	33	0.48	272	4.83	2.63	1.99	2.20
7	0.43	0.25	0.64		0	0.00	203	3.31	29	0.47	232	3.92	2.11	1.66	1.81
8	0.46	0.24	0.65		0	0.00	169	3.21	21	0.40	190	3.72	2.01	1.51	1.71
9	0.47	0.21	0.69		0	0.00	246	3.36	36	0.49	282	3.96	2.08	1.71	1.88
10	0.55	0.23	0.64		0	0.00	211	3.32	25	0.39	236	3.84	2.21	1.46	1.63
11	0.47	0.30	0.69		0	0.00	211	3.53	33	0.55	244	4.23	2.62	1.44	1.61
12	0.47	0.33	0.70		0	0.00	246	3.68	30	0.45	276	4.26	2.53	1.57	1.73
13	0.48	0.31	0.62		0	0.00	214	3.52	34	0.56	248	4.22	2.55	1.50	1.67
14	0.45	0.14	0.58		0	0.00	178	3.23	23	0.42	201	3.84	2.01	1.67	1.83
15	0.59	0.29	0.76		0	0.00	202	3.14	30	0.47	232	3.73	1.78	1.76	1.95
16	0.64	0.11	0.81		0	0.00	146	2.48	19	0.32	165	2.95	1.19	1.60	1.76
17	0.36	0.30	0.71		0	0.00	223	3.28	36	0.53	259	3.93	2.04	1.70	1.89
18	0.61	0.35	0.68	0.82	0	0.00	215	3.30	39	0.60	254	4.03	2.58	1.29	1.45
19	0.77	0.43	0.86		0	0.00	222	3.39	50	0.76	272	4.28	2.83	1.29	1.45
20	0.64	0.21	0.72		0	0.00	211	3.15	44	0.66	255	3.93	2.00	1.77	1.93
21	0.54	0.37	0.87		0	0.00	211	3.23	48	0.73	259	4.09	2.46	1.46	1.63
22	0.57	0.38	0.88		0	0.00	197	3.18	37	0.60	234	3.91	2.01	1.73	1.90
23	0.62	0.34	0.88		0	0.00	227	3.40	41	0.61	268	4.14	2.61	1.34	1.53
24	0.60	0.37	0.86		0	0.00	233	3.52	41	0.62	274	4.28	2.61	1.49	1.67
25	0.50	0.30	0.81	0.73	0	0.00	226	3.34	37	0.55	263	9.24	7.79	1.28	1.45
26	0.61	0.30	0.82		0	0.00	226	3.40	39	0.59	265	10.16	8.39	1.60	1.77
27	0.51	0.32	0.79		0	0.00	198	3.38	27	0.46	225	13.87	12.28	1.36	1.59
28	0.54	0.24	0.75		0	0.00	231	3.39	32	0.47	263	10.59	8.94	1.44	1.65
29	0.00	0.31	0.74		0	0.00	168	3.25	25	0.48	193	8.36	6.64	1.56	1.72
30	0.63	0.42	0.62		0	0.00	231	3.22	37	0.52	268	8.79	6.80	1.81	1.99
31															
Tot.	16.05						6,239		989		7,444	158.64			
Avg.	0.53	0.30	0.74	0.74	0.00	0.00	214.10	3.34	34.03	0.53	248.13	5.29	3.55	1.55	1.74
Max	0.92	0.43	0.90	0.82	0.00	0.00	251.00	3.90	50.00	0.76	288.00	13.87	12.28	1.99	2.20
Min.	0.00	0.11	0.58	0.67	0.00	0.00	146.00	2.48	19.00	0.32	165.00	2.95	1.19	1.28	1.44
	4/4/2018	0.72	0.65	0.66	0.63	0.665	Average								

WSSN 0600 City of Benton Harbor Month/Year April-18

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	0.7050	182.00	1.36	0.92	1.10	0.26	3	0.07	0.08	3	0.08	0.08	6	0	0
2	1.0340	317.00	1.61	2.80	3.50	0.28	3	0.08	0.08	3	0.09	0.11	6	0	0
3	1.0975	330.00	1.58	1.80	2.30	0.34	3	0.08	0.09	3	0.10	0.11	6	0	0
4	1.0073	274.00	1.43	3.50	4.50	0.22	3	0.09	0.10	3	0.08	0.09	6	0	0
5	1.0731	319.00	1.56	5.10	5.90	0.34	3	0.07	0.08	3	0.07	0.08	6	0	0
6	1.0318	301.00	1.63	4.30	5.40	0.40	3	0.08	0.09	3	0.09	0.11	6	0	0
7	0.9147	256.00	1.47	4.60	5.00	0.37	3	0.08	0.08	3	0.08	0.09	6	0	0
8	0.7859	244.00	1.63	4.80	5.40	0.39	3	0.07	0.07	3	0.07	0.08	6	0	0
9	1.0924	331.00	1.59	4.90	5.40	0.47	3	0.08	0.09	3	0.11	0.13	6	0	0
10	0.9482	255.00	1.41	10.60	23.50	0.37	3	0.08	0.08	3	0.09	0.09	6	0	0
11	0.8919	275.00	1.62	8.60	18.50	0.34	3	0.07	0.08	3	0.08	0.11	6	0	0
12	0.9975	307.00	1.62	8.30	18.60	0.36	3	0.07	0.08	3	0.08	0.08	6	0	0
13	0.9076	251.00	1.46	12.60	31.40	0.29	3	0.07	0.07	3	0.08	0.09	6	0	0
14	0.8236	255.00	1.63	4.50	4.50	0.28	3	0.07	0.07	2	0.08	0.08	4	0	0
15	0.9597	274.00	1.50	4.80	6.40	0.31	3	0.07	0.08	3	0.08	0.09	6	0	0
16	0.8772	189.00	1.13	16.00	18.40	0.80	3	0.08	0.08	2	0.09	0.10	4	0	0
17	1.0154	294.00	1.52	7.70	7.90	0.63	3	0.09	0.09	3	0.09	0.09	6	0	0
18	0.9712	293.00	1.59	5.40	6.50	0.47	3	0.08	0.09	3	0.09	0.09	6	0	0
19	0.9788	262.00	1.41	5.60	6.90	0.31	3	0.07	0.07	3	0.08	0.08	6	0	0
20	0.9990	305.00	1.61	4.60	5.80	0.35	3	0.07	0.08	3	0.08	0.08	6	0	0
21	0.9757	295.00	1.59	4.90	7.40	0.46	3	0.07	0.08	3	0.08	0.09	6	0	0
22	0.9243	269.00	1.53	11.00	24.20	0.32	3	0.08	0.08	3	0.08	0.08	6	0	0
23	0.9979	285.00	1.50	2.60	3.30	0.41	3	0.08	0.09	3	0.09	0.09	6	0	0
24	0.9870	304.00	1.62	3.10	5.10	0.35	3	0.08	0.08	3	0.07	0.08	6	0	0
25	1.0109	306.00	1.59	4.00	4.60	0.43	3	0.07	0.08	3	0.08	0.09	6	0	0
26	0.9909	291.00	1.59	2.80	3.90	0.35	3	0.07	0.08	3	0.07	0.07	6	0	0
27	0.8742	263.00	1.58	4.10	5.60	0.27	3	0.07	0.09	3	0.08	0.08	6	0	0
28	1.0174	302.00	1.56	3.90	6.00	0.30	3	0.08	0.09	3	0.06	0.07	6	0	0
29	0.7706	234.00	1.60	3.80	5.50	0.22	3	0.08	0.08	2	0.06	0.06	4	0	0
30	1.0704	324.00	1.59	2.40	3.40	0.24	3	0.07	0.09	3	0.08	0.09	6	0	0
31															
Total	28.7311	8387.00					90			87			174	0	0
Avg.	0.9577	279.57	1.54	5.47	8.53	0.36	87	0.08	0.08		0.08		Total	Total	Total
Max	1.0975	331.00	1.63	16.00	31.40	0.80		0.09	0.10		0.11	0.13	6	0	0
Min.	0.7050	182.00	1.13	0.92	1.10	0.22		0.07	0.07		0.06				

WSSN 0600 | MONTH/YEAR | April-18 |

CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total		Total		Non-Carb.							
			Hardness		Alkalinity		Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.1	188	178	140	127	48	51	42	43	20	17		
2	8.0	8.0	174	170	120	125	54	45	42	40	17	17		
3	8.1	8.1	194	176	146	125	48	51	45	46	20	15		
4	8.1	7.8	152	156	117	125	35	31	55	53	4	6		
5	8.1	7.9	172	166	132	124	40	42	50	48	12	11		
6	8.1	7.9	166	142	136	123	30	19	56	53	6	3	24.0	25.5
7	7.9	7.9	168	166	136	123	32	43	55	51	8	9		
8	8.1	8.0	156	148	143	123	13	25	55	50	4	6		
9	8.2	7.8	198	180	143	120	55	60	53	50	16	14		
10	8.0	8.0	194	190	130	129	64	61	47	46	18	18		
11	8.0	7.9	188	184	134	129	54	55	47	46	17	17		
12	8.1	8.1	192	184	134	127	58	57	51	48	16	16		
13	8.1	8.0	170	188	117	128	53	60	46	51	14	15		
14	8.0	7.8	190	186	131	129	59	57	50	48	16	16		
15	8.2	7.8	164	160	128	127	36	33	48	46	11	11		
16	8.1	7.9	190	182	131	122	59	60	49	47	17	16		
17	8.1	7.8	202	168	153	126	49	42	63	51	11	10	19.0	23.0
18	8.1	7.9	194	188	133	124	61	64	46	48	19	17		
19	8.1	8.1	174	180	123	127	51	53	45	46	15	16		
20	8.1	8.0	182	172	132	116	50	56	46	45	16	15		
21	7.9	8.0	188	172	133	120	55	52	50	47	16	13		
22	8.0	8.0	194	188	136	124	58	64	53	51	15	15		
23	8.1	7.8	174	158	134	126	40	32	55	52	9	7		
24	8.0	7.9	166	166	133	127	33	39	53	51	8	9	20.5	23.0
25	8.1	7.9	178	170	136	128	42	42	51	45	13	14		
26	8.1	8.0	144	140	118	126	26	14	50	47	5	5		
27	8.1	7.7	156	166	122	127	34	39	52	54	6	8		
28	8.1	7.8	154	164	115	122	39	42	51	50	7	10		
29	8.1	7.9	152	158	114	118	38	40	44	46	10	11		
30	8.0	8.0	180	176	119	117	61	59	50	48	14	14		
Avg.	8.1	7.9	176.5	170.7	130.6	124.5	45.8	46.3	50.0	48.2	12.7	12.4	21.2	23.8
Max	8.2	8.1	202.0	190.0	153.0	129.0	64.0	64.0	63.0	54.0	20.0	18.0	63.5	71.5
Min.	7.9	7.7	144.0	140.0	114.0	116.0	13.0	14.0	42.0	40.0	4.0	3.0	21.2	23.8

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.	___True		___Cold	
A	Samples	P/A	Samples	P/A			'C	'C	___Appar.		___60'C	
T					Raw	Tap			Raw	Tap	Raw	Tap
E												
1			1	A	0	1	5	5.5				
2			1	A	0	1	5	5.5				
3			1	A	0	0	5	5.5				
4			1	A	0	0	5	7.0				
5			1	A	0	0	5	8.0				
6			1	A	0	0	5	8.0				
7			1	A	0	0	5	8.0				
8			1	A	0	0	6	8.0				
9			1	A	0	1	5	5.5				
10			1	A	0	2	5	5.5				
11			1	A	0	0	6	5.5				
12			1	A	0	0	6	6.0				
13			1	A	0	0	6	6.0				
14			1	A	0	0	7	6.5				
15			1	A	0	0	6	9.0				
16			1	A	0	0	6	6.5				
17			1	A	0	0	7	9.0				
18			1	A	0	2	6	6.5				
19			1	A	0	1	6	6.5				
20			1	A	0	0	6	7.0				
21			1	A	0	0	7	6.5				
22			1	A	0	12	7	6.5				
23			1	A	0	9	8	10.0				
24			1	A	0	0	9	10.0				
25			1	A	31	0	8	9.0				
26			1	A	57	0	8	11.0				
27			1	A	102	0	8.0	12.0				
28			1	A	73	1	9.0	12.0				
29			1	A	67	0	8.7	8.5				
30			1	A	28	0	8.5	9.5				
31												
AVG.			1	A	12	1	6	8				
Max					102	12	9	12				
Min					0	0	5	6				

DISTRIBUTION SYSTEM MONITORING WSSN 0600 April-18

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4	1.14		1.37	1.07	1.15		1.23			
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18	1.04		0.98	0.82	0.96		1.03			
19				0.81	0.70					
20										
21										
22										
23										
24										
25	0.54		0.90	0.88	0.60		0.96			
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	14		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.95	1.37	0.54
Total number of check samples	0600			
Total number of positive check samples	0600			

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley**
F1-S1

Signature of Operator-in-Charge

Month/Year **April-19**
F1-S2

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.145	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	257.25	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.98	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.40	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.89%	Percent of Treated Water

Chemical Data

Chlorine on hand:	27775	lb.	Est. supply:	371	days
Primary Coagulant (Alum (Al3+)) on hand:	90947	lb.	Est. supply:	93	days
Cost of All Chemicals per Million Gallons:	$67.29	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:	89	89
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.

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	26.890474	Avg	0.9254891	Max	1.06516	Min	0.79744

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
Page 6 modified to show Calculated Distribution Flows and Corrosion Control Treatment

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **April-19**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.65	0.25	0.63		0	0.00	148	2.19	22	0.33	170	2.90	1.01	1.70	1.89
2	0.61	0.19	0.63		0	0.00	275	4.55	111	1.84	386	6.12	3.48	2.39	2.64
3	0.51	0.31	0.69	0.56	0	0.00	354	5.09	4	0.06	358	5.92	4.23	1.42	1.69
4	0.39	0.27	0.69		0	0.00	290	3.94	7	0.09	297	4.89	2.83	1.84	2.06
5	0.39	0.33	0.59		0	0.00	293	4.26	5	0.07	298	4.59	2.39	1.99	2.20
6	0.59	0.25	0.53		0	0.00	234	3.92	20	0.34	254	4.02	1.59	2.19	2.43
7	0.50	0.28	0.63		0	0.00	253	3.86	8	0.12	261	4.25	1.91	2.11	2.34
8	0.52	0.28	0.42		0	0.00	224	3.54	14	0.22	238	3.87	1.08	2.54	2.79
9	0.60	0.21	0.57		0	0.00	221	3.34	0	0.00	221	3.63	1.47	1.94	2.16
10	0.84	0.36	0.42	0.53	0	0.00	231	3.42	0	0.00	231	3.75	1.77	1.75	1.98
11	0.60	0.26	0.47		0	0.00	223	3.44	0	0.00	223	3.59	1.77	1.63	1.82
12	0.76	0.23	0.42		0	0.00	216	3.32	0	0.00	216	3.21	1.26	1.74	1.95
13	0.56	0.37	0.58		0	0.00	245	3.53	20	0.29	265	4.13	2.12	1.88	2.01
14	0.57	0.39	0.63		0	0.00	199	3.60	18	0.33	217	3.51	1.61	1.73	1.90
15	0.51	0.33	0.62		0	0.00	258	3.55	17	0.23	275	3.85	1.95	1.68	1.90
16	0.65	0.32	0.74		0	0.00	230	3.52	21	0.32	251	4.17	2.21	1.75	1.96
17	0.45	0.55	0.74		0	0.00	246	3.64	15	0.22	261	4.35	2.53	1.62	1.82
18	0.69	0.36	0.74	0.65	0	0.00	259	3.99	54	0.83	313	5.22	3.41	1.60	1.81
19	0.61	0.39	0.86		0	0.00	226	3.53	13	0.20	239	3.86	2.09	1.62	1.77
20	0.53	0.35	0.83		0	0.00	199	3.59	17	0.31	216	3.93	2.22	1.55	1.71
21	0.60	0.40	0.84		0	0.00	231	3.56	22	0.34	253	4.02	2.11	1.71	1.91
22	0.49	0.35	0.78		0	0.00	231	3.58	19	0.29	250	3.75	1.80	1.67	1.95
23	0.67	0.26	0.70		0	0.00	242	3.55	16	0.23	258	4.83	2.94	1.70	1.89
24	0.55	0.40	0.80	0.76	0	0.00	282	3.68	16	0.21	298	4.36	2.60	1.56	1.76
25	0.53	0.43	0.77		0	0.00	261	3.66	10	0.14	271	4.22	2.46	1.61	1.76
26	0.65	0.50	0.83		0	0.00	253	3.67	12	0.17	265	4.41	2.46	1.76	1.95
27	0.56	0.34	0.66		0	0.00	218	3.57	48	0.79	266	4.75	2.16	2.37	2.59
28	0.74	0.23	0.65		0	0.00	217	3.41	26	0.41	243	3.83	1.78	1.84	2.05
29	0.52	0.40	0.74		0	0.00	217	3.31	14	0.21	231	3.74	1.65	1.89	2.09
30	0.45	0.28	0.81		0	0.00	229	3.34	13	0.19	242	3.82	1.79	1.87	2.03
Tot.							7,057		540		7,767				
Avg.	0.58	0.33	0.67	0.63	0.00	0.00	240.17	3.64	18.73	0.29	258.90	4.18	2.16	1.82	2.03
Max	0.84	0.55	0.86	0.76	0.00	0.00	354.00	5.09	111.00	1.84	386.00	6.12	4.23	2.54	2.79
Min.	0.39	0.19	0.42	0.53	0.00	0.00	148.00	2.19	0.00	0.00	170.00	2.90	1.01	1.42	1.69

WSSN 0600 City of Benton Harbor Month/Year April-19

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	1.0100	329.00	1.71	4.10	4.40	0.51	3	0.07	0.08	3	0.07	0.08	6	0	0
2	0.9028	317.00	1.85	10.00	11.60	1.10	3	0.07	0.08	3	0.08	0.08	5	0	0
3	1.0375	330.00	1.67	5.10	5.90	0.84	3	0.08	0.10	3	0.10	0.10	3	0	0
4	1.1000	297.00	1.42	4.60	4.70	0.70	3	0.08	0.09	3	0.11	0.11	6	0	0
5	1.0275	323.00	1.65	3.00	4.80	0.55	3	0.07	0.07	3	0.08	0.08	6	0	0
6	0.8900	281.00	1.91	2.10	2.50	0.52	3	0.10	0.11	3	0.10	0.11	6	0	0
7	0.9775	302.00	1.63	2.00	2.60	0.46	3	0.11	0.16	3	0.09	0.09	6	0	0
8	0.9450	292.00	1.63	2.40	3.60	0.43	3	0.08	0.09	3	0.07	0.08	6	0	0
9	0.9875	310.00	1.65	2.00	2.10	0.45	3	0.08	0.08	3	0.08	0.09	6	0	0
10	1.0075	316.00	1.65	3.10	3.70	0.47	3	0.07	0.08	3	0.08	0.08	6	0	0
11	0.9675	282.00	1.53	2.10	2.60	0.39	3	0.07	0.07	3	0.09	0.10	6	0	0
12	0.9725	294.00	1.59	2.80	5.30	0.95	3	0.09	0.09	3	0.12	0.16	6	0	0
13	1.0350	324.00	1.65	4.40	4.80	0.48	3	0.06	0.06	3	0.07	0.08	6	0	0
14	0.8250	261.00	1.66	1.90	2.00	0.41	3	0.07	0.07	2	0.10	0.10	4	0	0
15	1.0850	337.00	1.63	3.20	3.60	0.44	3	0.06	0.07	3	0.07	0.09	6	0	0
16	0.9750	309.00	1.67	6.70	9.70	0.61	3	0.06	0.06	3	0.08	0.08	6	0	0
17	1.0075	322.00	1.68	5.20	8.60	0.64	3	0.08	0.09	3	0.09	0.10	6	0	0
18	0.9700	303.00	1.64	4.30	4.80	0.48	3	0.08	0.09	3	0.09	0.11	6	0	0
19	0.9550	298.00	1.64	5.70	6.00	0.55	3	0.06	0.06	3	0.07	0.08	6	0	0
20	0.8275	260.00	1.65	4.70	6.70	0.42	3	0.06	0.06	3	0.07	0.07	6	0	0
21	0.9675	301.00	1.64	2.80	3.40	0.37	3	0.06	0.07	3	0.07	0.07	6	0	0
22	0.9625	301.00	1.65	3.40	3.70	0.35	3	0.06	0.06	3	0.07	0.08	6	0	0
23	1.0175	317.00	1.64	3.90	5.00	0.48	3	0.07	0.08	3	0.08	0.08	6	0	0
24	1.1450	356.00	1.64	2.20	2.60	0.38	3	0.08	0.09	3	0.09	0.11	6	0	0
25	1.0650	332.00	1.64	1.80	2.60	0.26	3	0.07	0.07	3	0.07	0.07	6	0	0
26	1.0300	321.00	1.64	3.60	5.10	0.29	3	0.06	0.06	3	0.08	0.09	6	0	0
27	0.9125	290.00	1.67	3.30	5.70	0.37	3	0.07	0.07	3	0.06	0.07	6	0	0
28	0.9500	304.00	1.68	3.30	5.60	0.26	3	0.08	0.09	3	0.07	0.07	6	0	0
29	0.9775	303.00	1.63	2.50	4.30	0.22	3	0.06	0.06	3	0.07	0.07	6	0	0
30	1.0250	325.00	1.67	2.00	2.90	0.26	3	0.07	0.07	3	0.07	0.08	6	0	0
31															
Total	29.5578	9237.00					90			89			174	0	0
Avg.	0.9853	307.90	1.65	3.61	4.70	0.49		0.07	0.08		0.08		Total	Total	Total
Max	1.1450	356.00	1.91	10.00	11.60	1.10		0.11	0.16		0.12	0.16	6	0	0
Min.	0.8250	260.00	1.42	1.80	2.00	0.22		0.06	0.06		0.06				

WSSN 0600 MONTH/YEAR April-19

CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness							
D	pH		as CaCO3		as CaCO3		as CaCO3		Calcium as Ca++		Magnesium as Mg++		Chloride as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	7.9	7.9	188	176	122	117	66	59	49	44	16	16		
2	7.9	8.0	212	192	163	119	49	73	47	52	23	15		
3	8.0	7.8	172	176	133	139	39	37	49	54	12	10	22.0	24.0
4	8.2	8.0	178	170	141	128	37	42	51	50	12	11		
5	7.9	7.9	170	176	121	127	49	49	53	59	9	7		
6	8.1	8.0	186	190	124	131	62	59	46	48	17	17		
7	8.2	8.1	172	168	129	127	43	41	51	51	11	10		
8	8.0	8.0	186	178	126	124	60	54	50	47	15	15		
9	8.1	8.1	190	178	138	128	52	50	50	47	16	15		
10	8.2	8.1	190	192	125	126	65	66	49	50	17	17		
11	7.8	7.8	186	192	125	122	61	70	46	51	17	16		
12	7.9	8.0	164	176	110	117	54	59	42	49	14	13	19.0	24.0
13	8.2	8.1	182	158	147	119	35	39	55	50	11	8		
14	8.2	7.9	174	164	135	122	39	42	58	53	7	8	20.5	23.0
15	8.1	8.0	164	158	131	129	33	29	51	50	9	8		
16	8.1	8.0	178	168	137	128	41	40	53	50	11	11		
17	8.0	8.0	192	174	139	124	53	50	50	46	17	14		
18	8.0	8.0	194	180	137	128	57	52	51	47	16	15		
19	8.0	8.0	186	174	139	128	47	46	55	51	12	12		
20	8.2	8.2	182	172	138	133	44	39	59	58	8	7		
21	8.1	8.1	172	176	121	129	51	47	47	54	13	10	21.5	26.0
22	8.2	8.0	164	164	124	123	40	41	47	49	11	10		
23	8.1	8.0	174	168	135	124	39	44	55	55	9	7		
24	8.1	8.0	162	166	119	125	43	41	45	46	12	12		
25	8.2	7.9	154	158	119	124	35	34	46	54	10	6		
26	8.1	8.2	174	164	119	120	55	44	57	51	8	9		
27	8.1	8.0	174	166	123	112	51	54	42	40	17	16		
28	8.2	8.0	170	164	121	114	49	50	43	42	15	15	18.5	22.0
29	8.0	7.9	152	154	113	114	39	40	46	47	9	9	18.5	21.0
30	8.1	8.0	164	146	112	111	52	35	46	46	12	8		
Avg.	8.1	8.0	176.9	171.3	128.9	123.7	48.0	47.5	49.6	49.7	12.9	11.6	20.0	23.3
Max	8.2	8.2	212.0	192.0	163.0	139.0	66.0	73.0	59.0	59.0	23.0	17.0	22.0	26.0
Min.	7.8	7.8	152.0	146.0	110.0	111.0	33.0	29.0	42.0	40.0	7.0	6.0	18.5	21.0

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS DISTRIBUTION METER; CORROSION CONTROL FEED OPP

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.				
A	Samples	P/A	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T					Raw	Tap			To	Lbs PO4	Treatment	Residual
E									Distribution		mg/L	mg/L
1			1	A	55	0	4	5.5	0.8742	6	0.57	
2			1	A	29	0	5	5.0	0.9413	13	1.16	
3			1	A	51	0	5	6.0	0.9030	12	1.11	
4			1	A	75	2	6	7.0	0.9069	12	1.11	
5			1	A	67	0	5	7.0	0.9684	12	1.05	1.57
6			1	A	65	0	6	5.5	0.9443	11	0.99	1.43
7			1	A	61	0	6	7.0	0.9163	13	1.15	1.71
8			1	A	34	0	6	6.0	0.9184	13	1.20	0.29
9			1	A	69	0	7	6.5	0.9078	12	1.11	0.29
10			1	A	36	1	6	7.0	0.9203	14	1.24	0.43
11			1	A	34	3	6	7.0	0.9260	12	1.10	1.00
12			1	A	57	1	6	6.5	1.0049	14	1.20	1.14
13			1	A	23	0	6	7.0	0.9567	13	1.10	1.29
14			1	A	24	0	8	8.0	0.9222	12	1.06	1.86
15			1	A	29	3	7	8.0	1.0652	14	1.12	0.57
16			1	A	76	2	8	9.0	0.8992	13	1.24	1.29
17			1	A	25	0	7	7.5	0.8961	12	1.16	1.00
18			1	A	17	0	8	8.0	0.8944	14	1.27	2.00
19			1	A	65	0	9	9.5	0.9240	12	1.12	1.14
20			1	A	58	0	8	9.5	0.8195	12	1.27	1.29
21			1	A	32	0	8	9.0	0.9384	12	1.11	0.57
22			1	A	17	0	8	10.0	0.9943	14	1.22	1.57
23			1	A	29	0	9	9.5	0.7974	10	1.07	0.57
24			1	A	38	0	8	9.0	1.0202	13	1.09	0.29
25			1	A	29	0	8	9.0	0.9578	14	1.20	0.57
26			1	A	30	4	8	9.0	0.8971	12	1.14	0.71
27			1	A	30	0	7.8	8.0	0.8358	11	1.11	2.43
28			1	A	23	0	9.0	12.0	0.9462	14	1.23	2.14
29			1	A	21	1	8.7	8.5	0.9230	12	1.13	1.43
30			1	A	75	1	8.5	9.5	0.9453	14	1.22	1.71
TOTAL								TOTALS	27.7647	373		
AVG.			1	A	42	1	7	8	0.9255	12	1.13	1.16
Max					76	4	9	12	1.0652	14	1.27	2.43
Min					17	0	4	5	0.7974	6	0.57	0.29

DISTRIBUTION SYSTEM MONITORING WSSN 0600 April-19

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3	1.00		0.80	1.11	1.16		1.29			
4										
5										
6										
7										
8										
9										
10	1.29		1.34	1.17	0.92		1.42			
11										
12										
13										
14										
15										
16										
17										
18	0.94		0.66	0.84	1.13		0.82			
19										
20										
21										
22										
23										
24	0.82		1.16	0.49	0.87		0.77			
25										
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	20		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.00	1.42	0.49
Total number of check samples	0600			
Total number of positive check samples	0600			

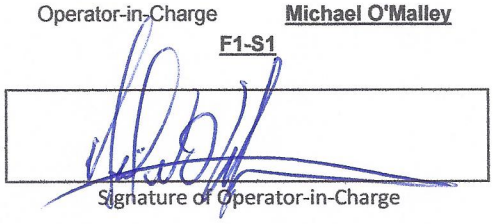
MONTHLY OPERATION REPORT OF
THE CITY OF BENTON HARBOR WATER TREATMENT PLANT

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **August-18**

F1-S1 **F1-S2**



Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	4.6851	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	269.25	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.88	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.00	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.64%	Percent of Treated Water

Chemical Data

Chlorine on hand:	7,575	lb.	Est. supply:	92	days
Primary Coagulant (Alum (Al3+)) on hand:	45,275	lb.	Est. supply:	22	days
Cost of All Chemicals per Million Gallons:	$81.83	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:	92	89
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.

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.

Remarks:

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **August-18**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		SETTLED		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.09	0.27	0.74		0	0.00	547	1.74	81	0.26	628	2.43	0.83	1.44	1.60
2	0.50	0.14	0.57		0	0.00	494	6.45	83	1.08	577	16.82	15.06	1.59	1.76
3	0.54	0.11	0.60	0.54	0	0.00	483	6.35	83	1.09	566	26.42	24.58	1.65	1.84
4	0.49	0.24	0.73		0	0.00	437	5.86	83	1.11	520	20.01	17.98	1.86	2.03
5	0.53	0.20	0.68		0	0.00	432	5.72	81	1.07	513	15.05	13.21	1.60	1.84
6	0.42	0.19	0.65		0	0.00	393	5.72	70	1.02	463	18.35	16.17	2.02	2.18
7	0.63	0.22	0.63		0	0.00	424	5.65	67	0.89	491	15.58	13.99	1.39	1.59
8	0.43	0.20	0.63	0.66	0	0.00	450	6.07	66	0.89	516	15.21	13.49	1.56	1.72
9	0.48	0.13	0.62		0	0.00	455	5.91	67	0.87	522	16.52	14.81	1.55	1.71
10	0.51	0.07	0.55		0	0.00	459	6.05	67	0.88	526	17.45	15.58	1.71	1.87
11	0.52	0.23	0.60		0	0.00	448	5.79	72	0.93	520	16.24	14.55	1.52	1.69
12	0.49	0.18	0.60		0	0.00	452	5.55	63	0.77	515	22.26	20.26	1.82	2.00
13	0.53	0.00	0.00		0	0.00	430	5.75	68	0.91	498	16.51	14.31	1.97	2.20
14	0.38	0.24	0.66		0	0.00	414	5.36	72	0.93	486	15.99	14.17	1.66	1.82
15	0.51	0.23	0.65	0.62	0	0.00	469	5.54	72	0.85	541	19.30	17.42	1.71	1.88
16	0.53	0.20	0.68		0	0.00	421	5.63	71	0.95	492	16.72	14.73	1.80	1.99
17	0.49	0.26	0.71		0	0.00	470	5.53	72	0.85	542	18.56	16.43	1.91	2.13
18	0.52	0.08	0.49		0	0.00	412	5.73	70	0.97	482	16.76	15.31	1.29	1.45
19	0.51	0.29	0.63		0	0.00	381	5.74	62	0.93	443	18.13	16.36	1.60	1.77
20	0.49	0.26	0.69		0	0.00	422	5.41	71	0.91	493	17.91	16.30	1.45	1.61
21	0.53	0.25	0.63	0.54	0	0.00	412	5.39	77	1.01	489	15.69	13.92	1.60	1.77
22	0.44	0.24	0.70	0.62	0	0.00	413	5.63	70	0.95	483	16.23	14.15	1.89	2.08
23	0.24	0.32	0.66		0	0.00	386	5.29	67	0.92	453	15.49	13.75	1.58	1.74
24	0.54	0.25	0.61		0	0.00	429	5.63	73	0.96	502	14.53	12.72	1.61	1.81
25	0.44	0.23	0.61		0	0.00	437	5.99	69	0.95	506	17.11	15.40	1.55	1.71
26	0.43	0.28	0.64		0	0.00	430	6.34	65	0.96	495	17.90	16.41	1.35	1.49
27	0.55	0.22	0.62		0	0.00	484	6.51	83	1.12	567	17.08	15.66	1.26	1.42
28	0.50	0.15	0.61		0	0.00	458	6.24	72	0.98	530	16.95	15.38	1.41	1.57
29	0.61	0.19	0.68		0	0.00	460	6.14	71	0.95	531	16.76	15.03	1.56	1.73
30	0.49	0.30	0.67		0	0.00	467	6.19	75	0.99	542	16.91	15.17	1.58	1.74
31	0.51	0.28	0.70		0	0.00	454	6.16	74	1.00	528	16.74	14.88	1.69	1.86
Tot.	14.37						13,176		2,156		15,960	523.63			
Avg.	0.48	0.21	0.62	0.60	0.00	0.00	442.30	5.70	72.10	0.93	514.40	16.90	15.10	1.62	1.79
Max	0.63	0.32	0.74	0.66	0.00	0.00	547.00	6.51	83.00	1.12	628.00	26.42	24.58	2.02	2.20
Min.	0.09	0.00	0.00	0.54	0.00	0.00	381.00	1.74	62.00	0.26	443.00	2.43	0.83	1.26	1.42

WSSN 0600 City of Benton Harbor Month/Year ######

August 2017

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS												
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	4.6851	381.00	0.43	2.20	2.90	0.21	3	0.06	0.07	3	0.08	0.08	6	0	0
2	1.1432	332.00	1.53	1.30	1.40	0.19	3	0.07	0.07	3	0.07	0.07	6	0	0
3	1.1361	336.00	1.56	1.40	1.50	0.22	3	0.08	0.08	3	0.07	0.08	6	0	0
4	1.1135	338.00	1.60	0.89	1.00	0.17	3	0.07	0.07	3	0.07	0.08	6	0	0
5	1.1271	342.00	1.60	1.20	1.30	0.16	3	0.06	0.06	3	0.07	0.08	6	0	0
6	1.0250	314.00	1.76	1.20	1.30	0.17	3	0.07	0.08	3	0.07	0.07	6	0	0
7	1.1200	340.00	1.60	0.99	1.10	0.16	3	0.06	0.06	3	0.06	0.07	6	0	0
8	1.1065	322.00	1.53	1.10	1.10	0.18	3	0.06	0.07	3	0.07	0.08	6	0	0
9	1.1485	323.00	1.48	1.30	1.50	0.17	3	0.07	0.07	3	0.06	0.06	6	0	0
10	1.1323	328.00	1.52	1.40	1.70	0.19	3	0.07	0.07	3	0.06	0.07	6	0	0
11	1.1546	328.00	1.49	1.20	1.30	0.18	3	0.06	0.07	3	0.07	0.08	6	0	0
12	1.2153	371.00	1.61	2.50	3.90	0.20	3	0.09	0.10	3	0.07	0.08	6	0	0
13	1.1167	338.00	1.59	1.20	1.40	0.14	3	0.06	0.07	3	0.06	0.07	6	0	0
14	1.1527	347.00	1.58	1.20	1.40	0.13	3	0.07	0.08	2	0.06	0.06	2	0	0
15	1.2642	381.00	1.59	2.10	3.30	0.20	3	0.07	0.08	3	0.08	0.08	6	0	0
16	1.1171	339.00	1.60	1.00	1.10	0.15	3	0.07	0.09	3	0.07	0.07	6	0	0
17	1.2684	384.00	1.59	1.40	2.00	0.14	3	0.06	0.06	3	0.07	0.08	6	0	0
18	1.0737	316.00	1.55	1.20	1.40	0.20	3	0.07	0.07	3	0.07	0.07	6	0	0
19	0.9902	288.00	1.53	1.60	2.10	0.16	3	0.06	0.07	3	0.07	0.07	6	0	0
20	1.1638	345.00	1.56	1.30	1.40	0.19	3	0.08	0.08	3	0.07	0.07	6	0	0
21	1.1407	341.00	1.57	1.10	1.30	0.17	3	0.07	0.07	3	0.06	0.07	6	0	0
22	1.0946	345.00	1.66	6.90	8.30	0.16	3	0.06	0.07	3	0.06	0.06	6	0	0
23	1.0892	322.00	1.56	4.70	5.00	0.15	3	0.06	0.06	3	0.06	0.06	6	0	0
24	1.1368	349.00	1.62	2.60	2.90	0.18	3	0.07	0.07	3	0.08	0.10	6	0	0
25	1.0898	331.00	1.60	2.30	2.50	0.18	3	0.06	0.07	3	0.07	0.07	6	0	0
26	1.0132	305.00	1.60	2.00	2.20	0.18	3	0.07	0.07	3	0.07	0.08	6	0	0
27	1.1097	342.00	1.62	2.20	2.80	0.20	3	0.07	0.08	3	0.08	0.09	6	0	0
28	1.0964	328.00	1.57	2.40	2.70	0.18	3	0.06	0.07	3	0.07	0.08	6	0	0
29	1.1178	330.00	1.55	2.00	2.50	0.18	3	0.06	0.07	3	0.07	0.08	6	0	0
30	1.1266	338.00	1.58	3.10	3.80	0.19	3	0.07	0.08	3	0.07	0.08	6	0	0
31	1.1008	338.00	1.62	1.70	2.30	0.17	3	0.06	0.06	3	0.06	0.06	6	0	0
Total	38.3696	10462.00					93			92			182	0	0
Avg.	1.2377	337.48	1.54	1.89	2.27	0.17	92	0.07	0.07		0.07		Total	Total	Total
Max	4.6851	384.00	1.76	6.90	8.30	0.22		0.09	0.10		0.08	0.10	6	0	0
Min.	0.9902	288.00	0.43	0.89	1.00	0.13		0.06	0.06		0.06				

WSSN 0600 MONTH/YEAR **August-18**

CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total		Total		Non-Carb.							
			Hardness		Alkalinity		Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.1	152	146	110	107	42	39	37	35	15	14		
2	8.1	8.2	162	144	126	106	36	38	35	34	18	14	19.2	20.8
3	8.2	8.0	166	148	126	108	40	40	39	36	17	14		
4	8.2	8.0	144	146	116	116	28	30	42	41	10	11	18.0	24.5
5	8.2	8.1	148	142	120	116	28	26	45	41	9	10		
6	8.4	8.0	150	144	126	114	24	30	41	38	12	12		
7	8.0	8.0	142	134	113	111	29	23	44	42	8	7		
8	8.2	8.0	158	152	110	108	48	44	41	40	11	13		
9	8.1	8.1	152	148	110	110	42	38	38	36	14	14		
10	8.2	8.1	158	146	119	108	39	38	36	34	17	15		
11	8.1	8.1	148	142	111	108	37	34	36	34	14	14		
12	8.2	8.1	152	146	112	111	40	35	36	34	15	15		
13	8.1	7.9	132	136	108	107	24	29	37	39	10	9	19.5	24.0
14	8.2	8.0	138	140	107	106	31	34	39	39	10	10		
15	8.3	8.1	154	146	111	106	43	40	38	37	14	13		
16	8.1	8.1	144	136	117	109	27	27	45	38	8	10		
17	8.3	8.1	136	140	107	107	29	33	42	40	8	10		
18	8.2	8.1	150	146	108	106	42	40	38	37	14	13		
19	8.0	8.0	150	142	108	103	42	39	37	35	14	13		
20	8.1	8.1	148	138	108	101	40	37	36	35	14	12		
21	8.1	8.1	148	138	109	101	39	37	37	35	14	12		
22	8.0	8.1	136	132	111	101	25	31	42	41	8	7	19.5	22.0
23	8.2	8.1	142	132	107	103	35	29	44	38	8	9		
24	8.1	7.9	142	128	123	101	19	27	45	38	7	8		
25	8.1	7.9	132	128	118	106	14	22	43	41	6	6		
26	8.2	8.2	142	144	111	113	31	31	43	42	8	10		
27	8.2	8.2	156	150	117	112	39	38	36	37	16	14		
28	8.1	8.1	162	154	110	111	52	43	39	38	16	15		
29	8.0	8.1	158	154	112	110	46	44	39	38	15	15		
30	8.1	8.1	154	150	111	108	43	42	38	37	14	14	19.5	22.0
31	8.1	8.1	156	152	108	108	48	44	42	41	13	12		
Avg.	8.1	8.1	148.5	142.4	113.4	107.8	35.1	34.6	39.6	37.7	12.1	11.8	19.1	22.7
Max	8.4	8.2	166.0	154.0	126.0	116.0	52.0	44.0	45.0	42.0	18.0	15.0	19.5	24.5
Min.	8.0	7.9	132.0	128.0	107.0	101.0	14.0	22.0	35.0	34.0	6.0	6.0	18.0	20.8

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.	___True		___Cold	
A	Samples	P/A	Samples	P/A			'C	'C	___Appar.		___60'C	
T					Raw	Tap			Raw	Tap	Raw	Tap
E												
1			1	A	396	0	21	21.5				
2			1	A	44	0	21	21.5				
3			1	A	35	1	23	21.5				
4			1	A	87	0	25	24.0				
5			1	A	167	0	23	23.0				
6			1	A	239	0	24	24.0				
7			1	A	600	1	23	23.0				
8			1	A	184	0	21	22.5				
9			1	A	167	0	23	22.5				
10			1	A	147	0	23	22.5				
11			1	A	101	0	21	22.5				
12			1	A	104	0	21	22.5				
13			1	A	151	0	20	23.0				
14			1	A	119	0	20	23.0				
15			1	A	155	0	23	21.0				
16			1	A	138	11	23	20.0				
17			1	A	144	1	20	22.0				
18			1	A	136	0	22	22.0				
19			1	A	88	0	14	21.5				
20			1	A	104	0	16	18.5				
21			1	A	79	0	20	18.0				
22			1	A	35	0	12	19.0				
23			1	A	40	0	13	20.0				
24			1	A	33	0	21	18.0				
25			1	A	89	0	21	18.0				
26			1	A	116	0	21	20.0				
27			1	A	71	0	21.7	20.5				
28			1	A	92	0	9.0	12.0				
29			1	A	56	0	8.7	8.5				
30			1	A	71	0	8.5	9.5				
31			1	A	85	2	16.5	21.0				
AVG.			1	A	131	1	19	20				
Max					600	11	25	24				
Min					33	0	9	9				

DISTRIBUTION SYSTEM MONITORING WSSN 0600 August-18

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3	0.83		0.85	0.89	0.66		0.23			
4										
5										
6										
7										
8	0.56		0.81	0.69	0.35	0.26	0.73			
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22	1.01		1.06	0.45	0.60		0.45			
23										
24										
25										
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	16		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.65	1.06	0.23
Total number of check samples	0600			
Total number of positive check samples	0600			

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **August-19**

F1-S1 **F1-S2**

Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.2133	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	251.00	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.10	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.89	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.35%	Percent of Treated Water

Chemical Data

Chlorine on hand:	38885	lb.	Est. supply:	244	days
Primary Coagulant (Alum (Al3+)) on hand:	102862	lb.	Est. supply:	119	days
Cost of All Chemicals per Million Gallons:	$76.21	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:	93	0
Percent of filter confluence samples > 0.3 NTU:	0%	#DIV/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.

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	30.9438	Avg	1.0364258	Max	1.1536	Min	0.8373

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **August-19**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.56	0.44	0.65		0	0.00	352	4.74	38	0.51	390	4.91	3.33	1.40	1.58
2	0.62	0.35	0.71	0.71	0	0.00	337	4.72	37	0.52	374	5.53	3.67	1.68	1.86
3	0.56	0.35	0.82		0	0.00	373	4.71	24	0.30	397	5.14	3.16	1.84	1.98
4	0.47	0.38	0.75		0	0.00	353	4.92	24	0.33	377	5.32	3.41	1.70	1.91
5	0.52	0.29	0.76		0	0.00	384	4.90	37	0.47	421	6.00	3.95	1.82	2.05
6	0.43	0.26	0.82		0	0.00	384	4.98	29	0.38	413	7.36	5.22	1.98	2.14
7	0.54	0.29	0.74		0	0.00	368	5.05	58	0.80	426	5.90	3.79	1.90	2.11
8	0.55	0.22	0.67		0	0.00	378	5.11	41	0.55	419	5.99	4.06	1.84	1.93
9	0.53	0.14	0.62		0	0.00	284	3.94	71	0.99	355	5.23	3.09	1.96	2.14
10	0.56	0.23	0.62		0	0.00	450	5.54	84	1.03	534	8.21	5.85	2.19	2.36
11	0.62	0.20	0.61		0	0.00	376	5.31	46	0.65	422	5.73	4.05	1.50	1.68
12	0.57	0.09	0.47		0	0.00	385	5.31	37	0.51	422	5.95	4.27	1.56	1.68
13	0.42	0.11	0.52		0	0.00	400	5.32	37	0.49	437	5.68	4.01	1.55	1.67
14	0.44	0.17	0.49		0	0.00	408	5.34	32	0.42	440	6.32	4.38	1.77	1.94
15	0.41	0.26	0.72		0	0.00	421	5.35	29	0.37	450	6.34	4.41	1.81	1.93
16	0.49	0.26	0.70	0.75	0	0.00	385	5.30	22	0.30	407	6.42	4.63	1.69	1.79
17	0.56	0.20	0.74		0	0.00	384	5.33	35	0.49	419	5.92	4.00	1.74	1.92
18	0.64	0.22	0.80		0	0.00	372	5.51	37	0.55	409	6.22	4.26	1.78	1.96
19	0.54	0.22	0.75		0	0.00	403	5.51	72	0.98	475	6.32	4.31	1.80	2.01
20	0.53	0.26	0.74		0	0.00	421	5.99	68	0.97	489	6.83	5.24	1.42	1.59
21	0.48	0.16	0.70		0	0.00	449	5.88	56	0.73	505	7.68	5.85	1.67	1.83
22	0.57	0.36	0.77	0.87	0	0.00	440	5.83	50	0.66	490	7.17	5.50	1.48	1.67
23	0.54	0.42	0.59		0	0.00	448	5.88	39	0.51	487	6.37	4.81	1.36	1.56
24	0.41	0.26	0.57		0	0.00	423	5.82	39	0.54	462	7.19	5.20	1.84	1.99
25	0.57	0.31	0.62		0	0.00	420	5.77	42	0.58	462	7.43	5.46	1.80	1.97
26	0.52	0.37	0.69		0	0.00	401	5.53	43	0.59	444	6.44	4.28	1.98	2.16
27	0.54	0.30	0.77		0	0.00	402	5.53	33	0.45	435	6.11	4.02	1.91	2.09
28	0.50	0.26	0.65	0.65	0	0.00	401	5.52	38	0.52	439	7.22	4.99	2.04	2.23
29	0.56	0.23	0.73		0	0.00	392	5.47	34	0.47	426	5.92	3.73	2.00	2.19
30	0.68	0.18	0.67		0	0.00	399	5.43	37	0.50	436	5.93	4.01	1.72	1.92
31	0.57	0.22	0.62		0	0.00	392	5.49	19	0.27	411	6.45	4.49	1.82	1.96
Tot.							11,833		1,250		13,473				
Avg.	0.53	0.26	0.68	0.75	0.00	0.00	393.10	5.32	42.30	0.57	435.40	6.29	4.37	1.76	1.93
Max	0.68	0.44	0.82	0.87	0.00	0.00	450.00	5.99	84.00	1.03	534.00	8.21	5.85	2.19	2.36
Min.	0.41	0.09	0.47	0.65	0.00	0.00	284.00	3.94	22.00	0.30	355.00	4.91	3.09	1.36	1.56

WSSN 0600 City of Benton Harbor Month/Year August-19

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	1.1075	321.00	1.52	1.70	2.60	0.17	3	0.03	0.04	0	0.03	0.04	3	0	0
2	1.0650	327.00	1.62	1.10	1.20	0.16	3	0.04	0.04	0	0.03	0.03	3	0	0
3	1.1832	393.00	1.75	2.00	2.20	0.21	3	0.05	0.07	0	0.05	0.08	3	0	0
4	1.0700	320.00	1.57	1.10	1.30	0.15	3	0.02	0.02	0	0.02	0.02	3	0	0
5	1.1705	345.00	1.55	1.10	1.20	0.17	3	0.02	0.03	0	0.03	0.04	3	0	0
6	1.1500	344.00	1.58	1.10	1.30	0.16	3	0.05	0.08	0	0.06	0.09	3	0	0
7	1.0875	327.00	1.58	1.70	2.60	0.16	3	0.03	0.03	0	0.03	0.04	3	0	0
8	1.1050	317.00	1.51	2.40	3.40	0.28	3	0.03	0.04	0	0.03	0.03	3	0	0
9	1.0750	315.00	1.54	3.20	4.80	0.23	3	0.03	0.04	0	0.03	0.03	3	0	0
10	1.2133	382.00	1.66	3.40	5.80	0.21	3	0.04	0.04	0	0.03	0.04	3	0	0
11	1.0575	303.00	1.51	1.70	2.60	0.16	3	0.04	0.04	0	0.03	0.03	3	0	0
12	1.0825	325.00	1.58	0.99	1.10	0.14	3	0.02	0.02	0	0.03	0.03	3	0	0
13	1.1225	337.00	1.58	1.20	1.30	0.13	3	0.02	0.02	0	0.03	0.03	3	0	0
14	1.1400	340.00	1.57	1.70	1.80	0.17	3	0.02	0.03	0	0.02	0.03	3	0	0
15	1.1750	350.00	1.57	1.60	1.90	0.14	3	0.03	0.04	0	0.02	0.03	3	0	0
16	1.0850	320.00	1.55	1.50	1.50	0.16	3	0.03	0.03	0	0.03	0.03	3	0	0
17	1.0750	298.00	1.46	1.80	2.40	0.20	3	0.04	0.05	0	0.04	0.05	3	0	0
18	1.0075	278.00	1.45	1.90	2.30	0.21	3	0.05	0.07	0	0.06	0.08	3	0	0
19	1.0925	308.00	1.48	1.90	2.50	0.32	3	0.07	0.08	0	0.08	0.08	3	0	0
20	1.0500	316.00	1.58	1.80	2.00	0.25	3	0.07	0.08	0	0.08	0.08	3	0	0
21	1.1400	341.00	1.57	1.30	1.40	0.20	3	0.07	0.07	0	0.07	0.08	3	0	0
22	1.1275	332.00	1.55	1.70	2.00	0.21	3	0.07	0.08	0	0.07	0.08	3	0	0
23	1.1375	344.00	1.59	1.30	1.80	0.19	3	0.07	0.08	0	0.08	0.09	3	0	0
24	1.0850	323.00	1.57	0.69	0.72	0.15	3	0.07	0.07	0	0.08	0.09	3	0	0
25	1.0875	326.00	1.58	0.70	0.87	0.15	3	0.06	0.07	0	0.07	0.07	3	0	0
26	1.0825	316.00	1.58	0.99	1.50	0.18	3	0.07	0.09	0	0.08	0.08	3	0	0
27	1.0850	319.00	1.55	0.92	1.20	0.20	3	0.07	0.09	0	0.08	0.09	3	0	0
28	1.0850	317.00	1.54	1.30	1.40	0.17	3	0.07	0.07	0	0.08	0.08	3	0	0
29	1.0700	314.00	1.54	2.10	2.40	0.20	3	0.06	0.07	0	0.08	0.09	3	0	0
30	1.0975	336.00	1.61	2.20	2.70	0.21	3	0.07	0.07	0	0.08	0.08	3	0	0
31	1.0650	321.00	1.59	1.40	1.70	0.16	3	0.07	0.07	0	0.07	0.07	3	0	0
Total	34.1770	10155.00					93			0			93	0	0
Avg.	1.1025	327.58	1.56	1.60	2.05	0.19		0.05	0.06		0.05		Total	Total	Total
Max	1.2133	393.00	1.75	3.40	5.80	0.32		0.07	0.09		0.08	0.09	3	0	0
Min.	1.0075	278.00	1.45	0.69	0.72	0.13		0.02	0.02		0.02				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total		Total		Non-Carb.							
			Hardness		Alkalinity		Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.0	8.1	154	146	108	103	46	43	38	36	15	14	20.5	24.0
2	7.9	8.0	158	152	112	103	46	49	38	36	16	15		
3	8.0	8.0	148	136	112	104	36	32	43	42	10	7		
4	8.3	8.1	138	132	112	105	26	27	42	42	8	7		
5	8.2	8.2	142	136	111	107	31	29	39	38	11	11		
6	8.2	8.1	138	134	112	106	26	28	40	42	9	7		
7	8.0	8.0	154	148	109	106	45	42	37	36	15	14		
8	8.2	8.1	166	154	122	105	44	49	42	37	15	15		
9	8.0	8.1	160	152	114	108	46	44	38	37	16	15		
10	8.1	8.1	156	148	113	108	43	40	38	36	15	14	19.0	24.5
11	8.0	8.1	154	148	113	109	41	39	37	35	15	15		
12	8.3	8.2	138	136	114	107	24	29	38	38	11	10	19.5	23.0
13	8.1	8.1	142	144	108	107	34	37	46	47	6	6		
14	8.2	8.0	156	148	110	107	46	41	38	36	15	14		
15	8.2	8.1	146	150	110	107	36	43	43	45	9	9		
16	8.1	8.1	142	140	108	107	34	33	40	41	10	9		
17	8.2	8.1	176	162	119	105	57	57	16	41	44	15		
18	8.1	8.2	166	152	119	107	47	45	42	38	15	14		
19	8.1	8.1	178	162	117	110	61	52	45	41	16	15	22.0	26.0
20	8.2	8.1	182	172	123	115	59	57	45	43	17	16		
21	8.2	7.9	152	164	118	122	34	42	43	46	11	12	23.0	25.5
22	8.3	8.2	168	156	129	116	39	40	43	42	15	13		
23	8.2	8.3	146	154	110	119	36	35	43	47	9	9		
24	8.2	8.2	146	152	106	109	40	43	43	44	9	10		
25	8.1	8.1	146	150	107	108	39	42	42	43	10	10		
26	8.1	8.0	162	152	107	103	55	49	38	37	16	15		
27	8.0	8.1	160	150	109	104	51	46	38	38	15	14		
28	7.9	8.0	160	150	112	105	48	45	39	38	15	14	19.5	23.5
29	8.1	8.0	160	152	112	105	48	47	41	40	14	13		
30	8.0	8.1	164	152	114	107	50	45	41	40	15	13		
31	8.3	8.2	150	148	111	110	39	38	43	43	10	10	17.5	21.5
Avg.	8.1	8.1	155.3	149.5	113.0	107.8	42.3	41.7	39.9	40.1	13.9	12.2	20.6	24.4
Max	8.3	8.3	182.0	172.0	129.0	122.0	61.0	57.0	46.0	47.0	44.0	16.0	23.0	26.0
Min.	7.9	7.9	138.0	132.0	106.0	103.0	24.0	27.0	16.0	35.0	6.0	6.0	19.0	23.0

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1	0.93		1	A	37	1	11	18.5	1.0648	45	1.65	0.93
2	1.09		1	A	38	0	11	16.5	1.0361	60	2.29	1.09
3	1.76		1	A	63	0	11	15.0	1.1908	54	1.78	1.76
4	1.81		1	A	36	0	12	14.0	1.0207	63	2.45	1.81
5	1.46		1	A	72	2	16	14.0	1.0793	53	1.94	1.46
6	1.37		1	A	57	0	20	14.0	0.8780	49	2.23	1.37
7	1.26	City Hall	1	A	35	1	15	16.5	1.1242	49	1.72	1.26
8	1.55	Wolfs	1	A	75	1	17	16.5	1.1085	50	1.80	1.55
9	1.38	Bait Shed	1	A	49	1	20	19.0	1.0720	47	1.73	1.38
10	1.13	Sunny Spot	1	A	57	7	19	19.5	1.0250	58	2.23	1.13
11	1.58	B&Z	1	A	79	5	21	20.0	1.1539	52	1.78	1.58
12	1.05		1	A	33	2	20	20.0	1.0956	59	2.13	1.05
13	1.68		1	A	82	0	18	21.0	1.2011	55	1.82	1.68
14	1.48		1	A	52	0	15	20.0	1.1027	58	2.06	1.48
15	1.31		1	A	73	1	17	19.0	1.1239	50	1.77	1.31
16	1.16	City Hall	1	A	151	1	16	18.0	0.9962	54	2.13	1.16
17	1.39	Wolfs	1	A	135	1	21	18.0	1.1031	50	1.80	1.39
18	1.53	Bait Shed	1	A	141	2	22	19.6	1.0346	52	2.00	1.53
19	1.70	Sunny Spot	1	A	90	0	23	21.0	1.1761	57	1.90	1.70
20	1.76	B&Z	1	A	63	3	23	22.5	1.1212	58	2.06	1.76
21	1.34		1	A	57	0	23	23.0	1.0327	54	2.07	1.34
22	1.48	City Hall	1	A	98	0	23	23.0	1.0599	57	2.11	1.48
23	1.20	Wolfs	1	A	58	1	13	23.0	1.2048	58	1.90	1.20
24	1.26	Bait Shed	1	A	79	1	11	19.0	1.0087	26	1.04	1.26
25	1.41	Sunny Spot	1	A	88	2	10	17.0	0.9760	64	2.59	1.41
26	1.36	B&Z	1	A	42	0	11	14.5	1.0714	44	1.62	1.36
27	2.28	City Hall	1	A	69	0	12.3	13.5	1.1192	44	1.54	2.28
28	1.47	Wolfs	1	A	99	0	9.0	12.0	0.9586	48	2.00	1.47
29	1.61	Bait Shed	1	A	95	0	8.7	8.5	1.1374	55	1.90	1.61
30	1.25	Sunny Spot	1	A	54	0	8.5	9.5	1.1473	46	1.57	1.25
31	1.67	B&Z	1	A	97	0	19.0	18.0	1.0019	48	1.88	1.67
Totals									33.4256	1614.6		
AVG.	1.46		1	A	74	1	16	18	1.0782	52.1	1.93	1.46
Max	2.28				151	7	23	23	1.2048	63.8	2.59	2.28
Min	1.05				33	0	9	9	0.8780	26.4	1.04	1.05

DISTRIBUTION SYSTEM MONITORING WSSN 0600 August-19

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6										
7	0.86		1.15	0.70	1.25		0.92			
8										
9										
10										
11										
12										
13										
14										
15										
16	1.26		1.09	1.17	1.01		0.71			
17										
18										
19										
20										
21										
22	0.72		0.54	0.60	0.60		0.91			
23										
24										
25										
26										
27										
28	1.19		1.16	1.18	0.88		0.81			
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	20		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.94	1.26	0.54
Total number of check samples	0600			
Total number of positive check samples	0600			

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **August-20**

F1-S1 **F1-S2**

Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.0925	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	176.17	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.01	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.89	Gallons Per Square Feet per Minute
Average Wash Water Use:	1.01%	Percent of Treated Water

Chemical Data

Chlorine on hand:	38885	lb.	Est. supply:	133 days
Primary Coagulant (Alum (Al3+)) on hand:	67913	lb.	Est. supply:	125 days
Cost of All Chemicals per Million Gallons:	$89.00	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:	93	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.

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	29.505554	Avg	0.9852258	Max	1.120149	Min	0.839929

Remarks. We began to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
In early 2020, EGLE forced the city to change to (OPP) 90/10 Carus Aquadene at 2x's rate Feb 20, 2020
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **August-20**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.67	0.35	0.71		0	0.00	416	6.35	75	1.15	491	7.07	5.09	1.81	1.98
2	0.54	0.31	0.64		0	0.00	389	6.26	70	1.13	459	7.33	5.04	2.14	2.29
3	0.53	0.26	0.67		0	0.00	418	6.01	74	1.06	492	7.32	5.31	1.86	2.01
4	0.55	0.32	0.77		0	0.00	384	6.03	68	1.07	452	7.10	5.14	1.77	1.96
5	0.61	0.23	0.71	0.74	0	0.00	393	6.18	68	1.07	461	7.02	5.11	1.76	1.91
6	0.56	0.11	0.71		0	0.00	414	6.31	75	1.14	489	7.96	6.09	1.71	1.87
7	0.66	0.20	0.83		0	0.00	439	6.65	95	1.44	534	8.04	6.35	1.53	1.69
8	0.54	0.12	0.77		0	0.00	421	6.70	93	1.48	514	8.54	6.93	1.46	1.61
9	0.50	0.20	0.76		0	0.00	425	6.24	76	1.12	501	7.64	5.58	1.90	2.06
10	0.54	0.16	0.71		0	0.00	483	6.60	73	1.00	556	8.18	6.18	1.83	2.00
11	0.55	0.12	0.72		0	0.00	482	6.59	73	1.00	555	8.44	6.47	1.75	1.97
12	0.58	0.10	0.67	0.63	0	0.00	404	6.47	62	0.99	466	7.64	6.10	1.39	1.54
13	*0.70*	*0.17*	*0.71*		*0*	*0.00*	*464*	*6.43*	*72*	*1.00*	*536*	*7.72*	*6.04*	*1.52*	*1.68*
14	0.58	0.13	0.58		0	0.00	456	6.55	71	1.02	527	7.63	5.29	2.14	2.34
15	0.59	0.29	0.69		0	0.00	454	6.79	73	1.09	527	8.07	6.54	1.37	1.53
16	0.73	0.29	0.67		0	0.00	445	6.66	76	1.14	521	7.67	6.00	1.51	1.67
17	0.73	0.24	0.56		0	0.00	449	6.64	77	1.14	526	7.76	6.00	1.69	1.76
18	0.63	0.22	0.50		0	0.00	462	6.88	79	1.18	541	8.20	6.48	1.56	1.72
19	0.60	0.22	0.49		0	0.00	424	6.97	69	1.14	493	8.19	6.55	1.39	1.64
20	0.56	0.25	0.49	0.59	0	0.00	474	6.97	81	1.19	555	8.45	6.70	1.61	1.75
21	0.71	0.17	0.56		0	0.00	475	6.97	79	1.16	554	8.01	5.74	2.11	2.27
22	0.71	0.19	0.49		0	0.00	485	7.00	79	1.14	564	8.88	7.13	1.63	1.75
23	0.65	0.24	0.52		0	0.00	500	7.02	80	1.12	580	8.43	6.26	1.91	2.17
24	0.70	0.20	0.46		0	0.00	476	7.05	78	1.16	554	8.28	6.21	1.89	2.07
25	0.58	0.23	0.55		0	0.00	498	6.98	80	1.12	578	8.19	6.34	1.61	1.85
26	0.58	0.19	0.69	0.59	0	0.00	519	7.11	85	1.16	604	8.05	6.22	1.68	1.83
27	0.65	0.22	0.74		0	0.00	428	7.02	74	1.21	502	7.83	5.89	1.79	1.94
28	0.43	0.13	0.69		0	0.00	500	6.91	86	1.19	586	7.92	5.95	1.81	1.97
29	0.63	0.24	0.77		0	0.00	475	6.80	76	1.09	551	8.39	6.21	2.00	2.18
30	0.56	0.32	0.74		0	0.00	408	6.86	65	1.09	473	8.41	6.45	1.71	1.96
31	0.53	0.28	0.77		0	0.00	491	6.88	80	1.12	571	8.97	6.89	1.98	2.08
Tot.							13,535		2,287		16,313				
Avg.	0.60	0.21	0.65	0.64	0.00	0.00	448.67	6.67	76.07	1.13	524.73	7.95	6.05	1.73	1.90
Max	0.73	0.35	0.83	0.74	0.00	0.00	519.00	7.11	95.00	1.48	604.00	8.88	7.13	2.14	2.34
Min.	0.43	0.10	0.46	0.59	0.00	0.00	384.00	6.01	62.00	0.99	452.00	7.02	5.04	1.37	1.53

WSSN 0600 City of Benton Harbor Month/Year August-20

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
F		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	0.9775	290.00	1.56	0.99	1.20	1.70	3	0.20	0.23	3	0.22	0.27	6	0	0
2	0.9275	305.00	1.73	1.50	2.20	0.31	3	0.08	0.08	3	0.10	0.13	6	0	0
3	1.0375	317.00	1.61	2.30	2.50	0.31	3	0.07	0.07	3	0.08	0.09	6	0	0
4	0.9500	292.00	1.62	6.20	8.50	0.42	3	0.07	0.08	3	0.08	0.09	6	0	0
5	0.9500	292.00	1.62	4.50	6.30	0.55	3	0.08	0.08	3	0.08	0.09	6	0	0
6	0.9800	291.00	1.57	3.30	4.40	0.38	3	0.08	0.09	3	0.08	0.08	6	0	0
7	0.9850	292.00	1.56	2.90	4.30	0.37	3	0.08	0.09	3	0.07	0.08	6	0	0
8	0.9375	281.00	1.58	2.50	3.70	0.32	3	0.08	0.08	3	0.08	0.09	6	0	0
9	1.0175	300.00	1.55	3.60	6.60	0.36	3	0.09	0.10	3	0.09	0.09	6	0	0
10	1.0925	330.00	1.59	2.60	2.90	0.42	3	0.08	0.09	3	0.09	0.10	6	0	0
11	1.0925	338.00	1.63	1.90	2.10	0.26	3	0.11	0.11	3	0.09	0.09	6	0	0
12	0.9325	282.00	1.59	2.10	2.30	0.25	3	0.11	0.16	3	0.08	0.09	6	0	0
13	1.0775	329.00	1.61	2.10	2.20	0.26	3	0.08	0.08	3	0.08	0.09	6	0	0
14	1.0400	318.00	1.61	1.80	2.30	0.25	3	0.09	0.11	3	0.10	0.12	6	0	0
15	0.9975	309.00	1.63	2.20	2.70	0.33	3	0.08	0.08	3	0.08	0.08	6	0	0
16	0.9975	307.00	1.62	2.50	3.90	0.34	3	0.08	0.09	3	0.09	0.10	6	0	0
17	1.0100	328.00	1.71	2.50	3.40	0.37	3	0.09	0.10	3	0.09	0.09	6	0	0
18	1.0025	388.00	2.04	3.30	4.70	0.29	3	0.09	0.10	3	0.08	0.09	6	0	0
19	0.9075	286.00	1.66	2.40	4.00	0.40	3	0.09	0.10	3	0.10	0.15	6	0	0
20	1.0150	310.00	1.61	1.60	2.10	0.29	3	0.09	0.10	3	0.08	0.08	6	0	0
21	1.0175	319.00	1.65	2.60	3.20	0.28	3	0.10	0.12	3	0.08	0.08	6	0	0
22	1.0350	325.00	1.65	2.30	3.10	0.27	3	0.11	0.13	3	0.08	0.08	6	0	0
23	1.0625	330.00	1.63	2.10	2.20	0.27	3	0.09	0.10	3	0.08	0.10	6	0	0
24	1.0075	317.00	1.66	2.00	2.70	0.29	3	0.09	0.10	3	0.07	0.07	6	0	0
25	1.0650	320.00	1.58	2.40	3.60	0.37	3	0.09	0.09	3	0.07	0.07	6	0	0
26	1.0900	324.00	1.58	2.00	2.20	0.31	3	0.08	0.08	3	0.09	0.11	6	0	0
27	0.9100	285.00	1.65	2.70	3.00	0.41	3	0.09	0.11	3	0.09	0.09	6	0	0
28	1.0800	339.00	1.65	2.70	4.20	0.29	3	0.09	0.09	3	0.08	0.08	6	0	0
29	1.0425	319.00	1.61	2.40	2.80	0.28	3	0.09	0.10	3	0.08	0.09	6	0	0
30	0.8875	271.00	1.61	3.50	3.90	0.35	3	0.10	0.12	3	0.08	0.08	6	0	0
31	1.0650	326.00	1.61	3.30	3.60	0.36	3	0.10	0.11	3	0.08	0.08	6	0	0
Total	31.1900	9660.00					93			93			186	0	0
Avg.	1.0061	311.61	1.63	2.61	3.45	0.38		0.09	0.10		0.09		Total	Total	Total
Max	1.0925	388.00	2.04	6.20	8.50	1.70		0.20	0.23		0.22	0.15	6	0	0
Min.	0.8875	271.00	1.55	0.99	1.20	0.25		0.07	0.07		0.07				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.3	8.2	138	136	104	105	34	31	38	38	10	10		
2	8.1	8.0	138	136	108	104	30	32	43	43	7	7		
3	8.1	8.1	134	138	108	105	26	33	36	37	11	11	24.0	27.5
4	8.1	8.1	146	142	106	104	40	38	39	41	12	10		
5	8.1	7.9	176	154	119	102	57	52	41	38	18	14	19.5	24.0
6	8.3	8.2	176	154	126	104	50	50	42	39	17	14	21.0	26.0
7	8.2	8.2	162	156	118	111	44	45	39	38	16	15	19.5	26.5
8	8.2	8.1	162	154	119	111	43	43	39	38	16	14	20.0	28.5
9	8.2	8.2	178	162	126	111	52	51	43	38	17	16	21.5	25.5
10	8.4	8.3	152	144	127	114	25	30	42	41	11	10		
11	8.5	8.4	148	152	118	117	30	35	39	42	12	12	23.0	29.0
12	8.4	8.3	138	142	109	114	29	28	38	41	10	10		
13	8.3	8.2	142	144	110	109	32	35	38	39	12	11		
14	8.3	8.3	142	140	106	107	36	33	36	36	13	12		
15	8.1	8.1	156	150	111	107	45	43	38	37	15	14	19.5	26.0
16	8.3	8.1	158	152	113	106	45	46	38	36	16	15	19.0	24.5
17	8.2	8.2	164	154	112	105	52	49	38	37	17	15	20.0	25.0
18	8.3	8.3	162	152	116	107	46	45	38	37	16	15	19.5	25.5
19	8.2	8.2	144	142	113	107	31	35	39	40	11	10	23.5	27.0
20	8.2	8.2	134	132	113	107	21	25	38	37	10	10		
21	8.4	8.3	142	140	112	104	30	36	37	38	12	11		
22	8.3	8.3	142	140	113	105	29	35	41	38	10	11		
23	8.3	8.2	144	142	114	108	30	34	39	40	11	10		
24	8.3	8.2	142	140	112	107	30	33	38	38	11	11	21.5	29.0
25	8.4	8.2	146	140	117	105	29	35	39	38	12	11		
26	8.3	8.1	166	156	111	107	55	49	38	37	17	16	20.0	26.0
27	8.2	8.1	168	158	115	107	53	51	38	37	17	16	20.5	26.5
28	8.1	8.2	164	152	117	107	47	45	38	35	17	16	19.5	26.0
29	8.4	8.2	142	140	113	110	29	30	37	41	12	9		
30	8.2	8.4	146	142	116	108	30	34	40	42	11	9		
31	8.4	8.3	142	144	114	109	28	35	38	42	11	9	24.5	28.5
Avg.	8.3	8.2	151.7	146.2	114.1	107.5	37.7	38.7	38.9	38.6	13.2	12.2	20.7	26.4
Max	8.5	8.4	178.0	162.0	127.0	117.0	57.0	52.0	43.0	43.0	18.0	16.0	24.0	29.0
Min.	8.1	7.9	134.0	132.0	104.0	102.0	21.0	25.0	36.0	35.0	7.0	7.0	19.0	24.0

DISTRIBUTION SYSTEM MONITORING WSSN 0600 August-20

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5	1.50		0.74	1.08	1.55		1.69			
6										
7										
8										
9										
10										
11										
12	0.61		1.27	1.18	1.19		0.52			
13										
14										
15										
16										
17										
18										
19										
20	1.22		1.03	0.72	1.00		1.17			
21										
22										
23										
24										
25										
26	1.26		1.49	1.09	1.15		1.43			
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	20		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.14	1.69	0.52
Total number of check samples	0600	0		
Total number of positive check samples	0600	0		

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

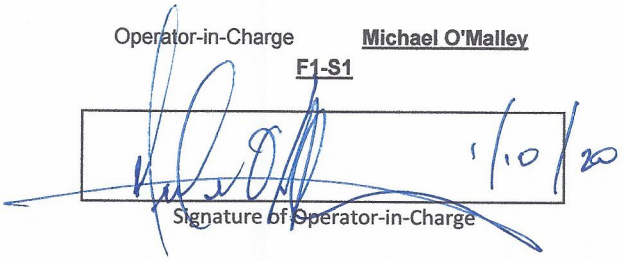
	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1			1	A	102	0	13	13.0	1.0705	74	2.74	3.03
2			1	A	134	0	12	18.0	0.9780	85	3.44	2.84
3			1	A	134	0	15	17.0	1.0425	85	3.23	3.21
4			1	A	83	0	13	16.0	0.9806	84	3.39	2.71
5	2.82	City Hall	1	A	57	0	17	14.0	1.0204	88	3.40	3.27
5	2.79	Wolfs	1	A	92	0	20	15.5	0.9456	82	3.44	2.80
5	2.87	Bait Shed	1	A	114	0	21	18.0	1.0301	85	3.25	3.18
5	2.77	SunnySpot	1	A	132	0	21	19.5	0.9273	82	3.49	2.71
5	2.69	B&Z	1	A	123	0	21	20.5	0.9795	89	3.60	3.26
10			1	A	110	0	23	21.0	1.0541	72	2.70	3.28
11			1	A	96	0	24	25.0	1.0327	83	3.17	2.98
12	2.45	City Hall	1	A	98	0	24	23.0	0.9443	93	3.88	3.29
12	2.28	Wolfs	1	A	197	0	22	24.0	1.0650	85	3.15	2.87
12	2.73	Bait Shed	1	A	113	0	21	23.0	1.0941	186	6.71	3.27
12	2.66	SunnySpot	1	A	137	0	18	21.5	0.9751	126	5.13	0.00
12	2.39	B&Z	1	A	189	0	19	20.0	1.0140	113	4.39	3.12
17			1	A	176	0	21	19.5	1.0123	91	3.55	3.10
18			1	A	148	0	21	20.5	0.9843	85	3.43	3.14
19			1	A	127	0	17	22.0	0.9249	56	2.38	3.01
20	2.96	City Hall	1	A	171	0	17	21.0	1.0204	85	3.28	3.29
20	3.03	Wolfs	1	A	159	0	20	20.0	1.0679	82	3.03	3.14
20	3.01	Bait Shed	1	A	131	0	21	20.0	0.9764	80	3.24	2.81
20	3.09	SunnySpot	1	A	104	0	22	21.0	1.0666	113	4.21	3.18
20	2.90	B&Z	1	A	45	0	23	21.0	1.0294	90	3.46	2.83
25			1	A	46	1	22	22.0	1.0917	96	3.49	3.12
26			1	A	57	0	20	22.0	1.1201	88	3.13	2.87
27	2.83	City Hall	1	A	58	1	22.0	22.0	0.9571	117	4.84	3.25
27	2.67	Wolfs	1	A	96	13	9.0	12.0	1.1040	99	3.56	2.96
27	2.86	Bait Shed	1	A	104	0	8.7	8.5	1.0086	91	3.55	2.85
27	2.76	SunnySpot	1	A	107	1	8.5	9.5	0.8950	93	4.11	3.26
27	2.51	B&Z	1	A	143	2	21.0	23.0	0.9754	71	2.86	0.00
Totals									31.3880	2846.3		
AVG.	2.75		1	A	116	1	19	19	1.0125	91.8	3.62	2.85
Max	3.09				197	13	24	25	1.1201	185.6	6.71	3.29
Min	2.28				45	0	9	9	0.8950	55.6	2.38	0.00

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** **F1-S1**



Signature of Operator-in-Charge

Month/Year **December-19** **F1-S2**

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.1125	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	185.25	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.98	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.23	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.82%	Percent of Treated Water

Chemical Data

Chlorine on hand:	42420	lb.	Est. supply:	201 days
Primary Coagulant (Alum (Al3+)) on hand:	52027	lb.	Est. supply:	143 days
Cost of All Chemicals per Million Gallons:	$66.41	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:	93	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.

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	28.2086	Avg	0.9353806	Max	1.0808	Min	0.8288

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **December-19**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.58	0.32	0.85		0	0.00	202	3.37	16	0.27	218	4.13	2.35	1.62	1.78
2	0.69	0.29	0.79		0	0.00	242	3.44	13	0.18	255	3.85	2.13	1.56	1.72
3	0.54	0.20	0.86		0	0.00	258	3.55	25	0.34	283	4.27	2.52	1.63	1.75
4	0.55	0.37	0.88	0.73	0	0.00	238	3.82	26	0.42	264	4.22	2.40	1.69	1.82
5	0.48	0.19	0.79		0	0.00	262	3.91	32	0.48	294	4.45	2.65	1.69	1.80
6	0.58	0.25	0.81		0	0.00	289	3.88	29	0.39	318	4.98	3.18	1.66	1.80
7	0.53	0.30	0.79		0	0.00	238	3.94	29	0.48	267	4.81	2.86	1.81	1.95
8	0.54	0.25	0.81		0	0.00	262	3.90	28	0.42	290	4.65	2.67	1.85	1.98
9	0.47	0.26	0.80		0	0.00	242	3.91	21	0.34	263	4.24	2.42	1.65	1.82
10	0.54	0.32	0.82		0	0.00	258	3.98	28	0.43	286	4.31	2.35	1.78	1.96
11	0.52	0.23	0.75		0	0.00	278	3.91	36	0.51	314	4.67	2.77	1.80	1.90
12	0.55	0.32	0.80	0.73	0	0.00	278	3.93	34	0.48	312	4.55	2.62	1.64	1.93
13	0.48	0.39	0.84		0	0.00	288	3.91	35	0.47	323	4.46	2.41	1.73	2.05
14	0.51	0.32	0.85		0	0.00	245	3.92	29	0.46	274	4.37	2.62	1.50	1.75
15	0.60	0.29	0.79		0	0.00	270	3.92	29	0.42	299	4.83	3.01	1.51	1.82
16	0.48	0.37	0.82		0	0.00	249	4.04	33	0.54	282	4.28	2.35	1.76	1.93
17	0.55	0.31	0.80		0	0.00	272	3.83	28	0.39	300	4.53	2.82	1.54	1.71
18	0.53	0.22	0.75	0.75	0	0.00	227	3.63	24	0.38	251	4.25	2.31	1.77	1.94
19	0.44	0.29	0.80		0	0.00	264	3.60	49	0.67	313	4.75	2.00	2.55	2.75
20	0.40	0.33	0.79		0	0.00	215	3.61	20	0.34	235	4.04	2.07	1.79	1.97
21	0.23	0.34	0.78		0	0.00	231	3.78	27	0.44	258	4.54	2.73	1.66	1.81
22	0.49	0.31	0.69		0	0.00	236	3.70	22	0.34	258	4.25	2.41	1.46	1.84
23	0.64	0.22	0.72		0	0.00	220	3.69	17	0.29	237	3.78	1.93	1.68	1.85
24	0.47	0.33	0.75		0	0.00	247	3.67	19	0.28	266	4.03	2.06	1.73	1.97
25	0.46	0.15	0.61		0	0.00	225	3.70	20	0.33	245	4.41	2.34	1.88	2.07
26	0.41	0.09	0.63	0.61	0	0.00	219	3.35	31	0.47	250	4.20	1.95	2.08	2.25
27	0.56	0.17	0.63		0	0.00	198	3.17	20	0.32	218	3.44	1.19	2.05	2.25
28	0.59	0.10	0.69		0	0.00	185	3.00	17	0.28	202	3.24	1.25	1.82	1.99
29	0.60	0.27	0.72		0	0.00	194	3.01	27	0.42	221	3.66	1.29	2.19	2.37
30	0.42	0.27	0.78		0	0.00	212	3.25	26	0.40	238	3.71	1.81	1.67	1.90
31	0.47	0.31	0.77		0	0.00	205	3.13	23	0.35	228	3.88	1.94	1.68	1.94
Tot.				-			7,247		797		8,262				
Avg.	0.51	0.27	0.77	0.71	0.00	0.00	241.47	3.68	26.33	0.40	267.80	4.26	2.32	1.76	1.95
Max	0.69	0.39	0.88	0.75	0.00	0.00	289.00	4.04	49.00	0.67	323.00	4.98	3.18	2.55	2.75
Min.	0.23	0.09	0.61	0.61	0.00	0.00	185.00	3.00	13.00	0.18	202.00	3.24	1.19	1.46	1.71

WSSN 0600 City of Benton Harbor Month/Year December-19

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	0.8950	246.00	1.45	15.30	24.00	1.60	3	0.07	0.08	3	0.07	0.08	6	0	0
2	1.0500	306.00	1.53	23.70	31.60	2.40	3	0.07	0.07	3	0.07	0.08	6	0	0
3	1.0850	324.00	1.57	23.30	26.70	1.70	3	0.08	0.09	3	0.08	0.10	6	0	0
4	0.9300	287.00	1.62	14.50	15.40	2.60	3	0.09	0.10	3	0.10	0.13	6	0	0
5	1.0000	316.00	1.66	12.90	16.60	1.70	3	0.08	0.09	3	0.09	0.12	6	0	0
6	1.1125	344.00	1.49	10.70	14.30	1.80	3	0.09	0.09	3	0.08	0.10	6	0	0
7	0.9025	280.00	1.63	17.20	18.00	2.70	3	0.09	0.10	3	0.10	0.12	6	0	0
8	1.0025	309.00	1.62	11.60	13.90	2.40	3	0.08	0.10	3	0.07	0.08	6	0	0
9	0.9250	278.00	1.58	9.50	11.10	2.10	3	0.08	0.09	3	0.08	0.08	6	0	0
10	0.9675	300.00	1.63	8.80	9.00	1.30	3	0.07	0.08	3	0.08	0.09	6	0	0
11	1.0625	327.00	1.62	7.40	8.20	1.30	3	0.08	0.09	3	0.07	0.07	6	0	0
12	1.0550	329.00	1.64	5.80	7.00	1.40	3	0.08	0.09	3	0.07	0.08	6	0	0
13	1.1000	336.00	1.61	5.60	8.20	1.40	3	0.07	0.07	3	0.06	0.07	6	0	0
14	0.9325	279.00	1.57	3.50	4.30	0.99	3	0.08	0.09	3	0.08	0.09	6	0	0
15	1.0275	311.00	1.59	4.10	4.40	1.40	3	0.07	0.08	3	0.08	0.08	6	0	0
16	0.9200	291.00	1.66	4.70	8.80	1.20	3	0.09	0.10	3	0.10	0.11	6	0	0
17	1.0600	322.00	1.60	5.20	8.90	1.40	3	0.08	0.10	3	0.10	0.12	6	0	0
18	0.9325	196.00	1.11	6.20	10.00	1.60	3	0.11	0.13	3	0.13	0.14	6	0	0
19	1.0950	359.00	1.72	9.00	11.50	1.80	3	0.08	0.10	3	0.09	0.10	6	0	0
20	0.8900	303.00	1.79	10.40	17.50	2.20	3	0.09	0.11	3	0.09	0.09	6	0	0
21	0.9125	270.00	1.56	4.50	5.90	1.30	3	0.07	0.07	3	0.10	0.10	6	0	0
22	0.9525	296.00	1.64	2.30	2.40	1.10	3	0.08	0.10	3	0.13	0.13	6	0	0
23	0.8900	273.00	1.61	3.80	6.10	1.00	3	0.07	0.07	3	0.14	0.18	6	0	0
24	1.0050	309.00	1.62	3.20	4.70	1.10	3	0.07	0.08	3	0.14	0.17	6	0	0
25	0.9075	275.00	1.59	3.00	5.10	0.95	3	0.07	0.08	3	0.12	0.15	6	0	0
26	0.9750	299.00	1.59	5.20	12.10	0.84	3	0.08	0.08	3	0.16	0.19	6	0	0
27	0.9325	279.00	1.57	1.60	2.10	0.72	3	0.07	0.08	3	0.14	0.17	6	0	0
28	0.9200	283.00	1.62	12.20	30.80	0.83	3	0.07	0.09	3	0.12	0.13	6	0	0
29	0.9625	289.00	1.58	3.90	8.80	0.78	3	0.09	0.09	3	0.17	0.17	6	0	0
30	0.9750	294.00	1.59	4.80	7.40	0.84	3	0.08	0.11	3	0.18	0.19	6	0	0
31	0.9775	303.00	1.63	3.80	4.80	0.69	3	0.07	0.08	3	0.12	0.12	6	0	0
Total	30.3550	9213.00					93			93			186	0	0
Avg.	0.9792	297.19	1.59	8.31	11.60	1.46		0.08	0.09		0.10		Total	Total	Total
Max	1.1125	359.00	1.79	23.70	31.60	2.70		0.11	0.13		0.18	0.19	6	0	0
Min.	0.8900	196.00	1.11	1.60	2.10	0.69		0.07	0.07		0.06				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total		Total		Non-Carb.							
			Hardness		Alkalinity		Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.0	8.0	156	160	111	105	45	55	40	43	14	13		
2	8.1	8.0	182	156	131	105	51	51	46	42	16	13	18.0	21.5
3	8.2	8.1	168	152	133	114	35	38	47	45	12	10		
4	8.2	8.1	178	158	132	111	46	47	57	47	9	10		
5	8.0	7.6	156	160	121	123	35	37	47	51	9	8		
6	8.2	8.2	160	162	121	121	39	41	47	51	10	9		
7	8.0	7.8	166	160	119	114	47	46	52	51	9	8		
8	8.2	8.1	172	158	140	117	32	41	55	47	9	10		
9	8.2	7.9	184	162	146	122	38	40	63	53	6	7		
10	8.1	8.0	146	150	114	126	32	24	44	48	9	7		
11	8.0	7.9	146	164	113	121	33	43	40	46	11	12		
12	8.2	7.9	176	164	129	118	47	46	58	57	8	5		
13	8.1	8.0	162	156	131	117	31	39	51	53	8	6	22.0	25.5
14	8.2	8.2	148	158	117	122	31	36	46	51	8	7		
15	8.2	8.1	178	160	142	122	36	38	59	52	7	7		
16	8.1	8.0	174	170	128	121	46	49	45	46	15	13		
17	8.0	8.0	176	180	120	123	56	57	45	48	16	15		
18	8.0	8.1	192	188	123	118	69	70	46	47	18	17		
19	8.0	8.0	204	172	135	117	69	55	54	46	17	14		
20	8.0	8.0	208	176	147	125	61	51	54	47	18	14	23.0	25.5
21	8.1	8.0	182	172	143	132	39	40	58	55	9	9		
22	8.2	8.2	152	156	121	133	31	23	47	51	8	7		
23	8.1	7.9	170	164	141	129	29	35	52	51	10	9	23.0	25.5
24	8.2	8.1	176	162	142	127	34	35	53	51	11	9		
25	8.0	8.0	184	176	127	121	57	55	46	45	17	16		
26	8.0	8.1	184	186	132	121	52	65	46	47	17	17		
27	8.0	8.1	180	174	124	122	56	52	44	42	17	17		
28	8.0	7.9	184	180	119	115	65	65	47	46	16	16		
29	8.0	8.1	178	168	132	116	46	52	45	43	16	15		
30	8.1	8.1	144	150	119	119	25	31	47	49	6	7	22.0	23.5
31	8.2	8.0	140	156	106	117	34	39	42	46	8	10		
Avg.	8.1	8.0	172.2	165.1	128.4	119.9	43.8	45.2	49.4	48.4	11.9	10.9	21.6	24.3
Max	8.2	8.2	208.0	188.0	147.0	133.0	69.0	70.0	63.0	57.0	18.0	17.0	23.0	25.5
Min.	8.0	7.6	144.0	150.0	111.0	105.0	25.0	23.0	40.0	42.0	6.0	5.0	18.0	21.5

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1			1	A	115	0	7	8.0	0.7882	49	2.47	1.53
2			1	A	161	0	6	7.5	0.9898	50	2.00	1.54
3			1	A	150	1	7	8.0	0.9884	48	1.93	1.44
4	1.43	City Hall	1	A	165	0	7	8.0	0.9338	46	1.94	1.44
4	1.40	Wolfs	1	A	178	0	7	8.0	0.9870	48	1.91	1.48
4	1.40	Bait Shed	1	A	115	0	7	8.0	0.9534	37	1.54	1.56
4	1.59	Sunny Spot	1	A	142	0	6	8.0	0.8288	49	2.35	1.41
4	1.22	B & Z	1	A	119	0	6	8.0	0.9310	48	2.03	1.63
9			1	A	111	0	6	9.0	0.9268	50	2.12	1.56
10			1	A	87	0	6	7.0	0.9898	53	2.13	1.57
11			1	A	96	0	6	8.0	1.0038	59	2.31	1.51
12	2.49	City Hall	1	A	79	1	5	7.0	1.0234	63	2.45	1.49
12	1.46	Wolfs	1	A	64	0	5	7.0	1.0808	59	2.17	1.53
12	1.59	B & Z	1	A	26	0	5	7.0	0.9366	55	2.30	0.00
12	1.52	Bait Shed	1	A	49	1	4	7.0	0.9240	60	2.57	1.50
12	1.32	Sunny Spot	1	A	61	1	4	5.5	0.9828	58	2.33	1.54
17			1	A	113	0	4	5.5	0.9884	59	2.36	1.57
18	1.60	City Hall	1	A	139	1	5	5.0	0.8820	62	2.76	1.61
18	1.41	Wolfs	1	A	156	0	4	5.0	0.9828	21	0.84	1.44
18	1.52	Bait Shed	1	A	108	0	3	5.0	0.8694	50	2.26	1.62
18	1.52	Sunny Spot	1	A	101	0	4	6.0	0.8484	53	2.47	1.52
18	1.36	B & Z	1	A	146	1	4	6.0	0.9072	45	1.98	1.54
23			1	A	28	0	4	5.0	0.9366	48	2.01	1.47
24			1	A	61	2	4	6.0	0.9842	51	2.07	1.42
25			1	A	57	0	4	4.5	0.8302	49	2.32	1.53
26	1.31	City Hall	1	A	45	0	5	4.5	0.8890	53	2.35	1.68
26	1.30	Wolfs	1	A	41	0	4.7	5.0	0.9450	45	1.88	1.27
26	1.51	Bait Shed	1	A	72	0	5.5	5.5	0.9296	49	2.10	1.55
26	1.52	Sunny Spot	1	A	58	1	5.5	5.5	0.9002	50	2.18	1.61
26	1.30	B & Z	1	A	65	0	6.0	7.0	0.9576	47	1.94	1.47
31			1		46	0	5.0	6.0	0.8778	53	2.37	1.51
Totals									28.9968	1564.7		
AVG.	1.49		1	A	95	0	5	6	0.9354	50.5	2.13	1.47
Max	2.49				178	2	7	9	1.0808	63.3	2.76	1.68
Min	1.22				26	0	3	5	0.7882	20.9	0.84	0.00

DISTRIBUTION SYSTEM MONITORING WSSN 0600 December-19

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4	1.25		1.18	0.91			0.92			
5										
6										
7										
8										
9										
10										
11										
12	1.26		1.21	1.08	0.96		0.99			
13										
14										
15										
16										
17										
18	1.03		1.12	1.26	1.12		0.63			
19										
20										
21										
22										
23										
24										
25										
26	1.57		1.58	1.34	1.55		0.78			
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

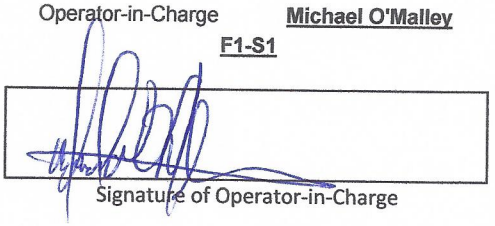
Total number of routine distribution samples analyzed	0600	19		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.14	1.58	0.63
Total number of check samples	0600			
Total number of positive check samples	0600			

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** **F1-S1**



Signature of Operator-in-Charge

Month/Year **February-20** **F1-S2**

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.2575	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	149.50	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.02	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.15	Gallons Per Square Feet per Minute
Average Wash Water Use:	1.43%	Percent of Treated Water

Chemical Data

Chlorine on hand:	38885	lb.	Est. supply:	424	days
Primary Coagulant (Alum (Al3+)) on hand:	93330	lb.	Est. supply:	129	days
Cost of All Chemicals per Million Gallons:	$65.32	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	87
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? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
0.5 NTU in two consecutive measurements taken 15 minutes apart after 4 hours of operation? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
1.0 NTU in two consecutive measurements taken 15 minutes apart for 3 consecutive months? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
2.0 NTU in two consecutive measurements taken 15 minutes apart for 2 consecutive months? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
Was continuous (every 15 minutes) filter monitoring equipment off-line during the month? **If yes**, indicate date(s), duration, and individual filter grab sampling frequency on a separate sheet.	NO
Did POE disinfectant residual fall below 0.2 ppm during the month? **If yes**, indicate date(s) and duration on a separate sheet.	NO
Was minimum C*T credit achieved for the entire month? **If no**, indicate on a separate sheet the date(s) not achieved.	YES
Was continuous POE chlorine residual monitoring equipment off-line during the month? **If yes**, indicate date(s) and duration on a separate sheet.	NO

Distribution	Total	27.124642	Avg	0.9680086	Max	1.084577	Min	0.878279

Remarks. We have begun to feed a new and more effective Orthopolyphosphate (OPP) 90 /10 Carus 32% February 21, 2020 Flow Meter is in full service at this time.
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **February-20**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.52	0.41	0.82		0	0.00	221	3.48	27	0.43	248	3.91	2.06	1.68	1.85
2	0.55	0.35	0.85		0	0.00	201	3.32	10	0.17	211	3.30	1.61	1.53	1.69
3	0.53	0.28	0.80		0	0.00	248	3.51	102	1.44	350	4.82	0.56	4.07	4.26
4	0.42	0.36	0.92		0	0.00	203	3.31	20	0.33	223	3.46	1.62	1.67	1.84
5	0.52	0.33	0.90		0	0.00	226	3.30	36	0.53	262	3.81	1.59	2.03	2.22
6	0.55	0.45	0.82		0	0.00	196	3.19	24	0.39	220	3.69	1.76	1.74	1.93
7	0.54	0.22	0.77		0	0.00	206	3.09	24	0.36	230	3.42	1.65	1.60	1.77
8	0.47	0.27	0.79		0	0.00	209	3.10	33	0.49	242	3.59	1.64	1.70	1.95
9	0.55	0.38	0.83		0	0.00	236	3.17	33	0.44	269	4.12	2.09	1.73	2.03
10	0.51	0.38	0.76		0	0.00	235	3.32	32	0.45	267	3.82	1.99	1.67	1.83
11	0.54	0.39	0.83		0	0.00	201	3.22	23	0.37	224	3.77	2.10	1.50	1.67
12	0.61	0.41	0.89	0.77	0	0.00	224	3.34	27	0.40	251	3.71	2.00	1.55	1.71
13	0.48	0.37	0.84		0	0.00	228	3.23	31	0.44	259	3.88	2.11	1.64	1.77
14	0.55	0.32	0.86		0	0.00	173	3.05	27	0.48	200	3.40	1.69	1.54	1.71
15	0.61	0.34	0.92		0	0.00	213	3.26	42	0.64	255	4.20	1.90	2.02	2.30
16	0.45	0.36	0.84		0	0.00	225	3.28	44	0.64	269	4.21	2.31	1.69	1.90
17	0.52	0.36	0.81		0	0.00	243	3.27	43	0.58	286	4.53	2.63	1.63	1.90
18	0.45	0.36	0.74		0	0.00	231	3.21	38	0.53	269	4.14	2.17	1.75	1.97
19	0.52	0.38	0.80	0.66	0	0.00	237	3.24	33	0.45	270	4.26	2.31	1.82	1.95
20	0.48	0.31	0.80		0	0.00	197	2.92	12	0.18	209	3.34	0.64	2.50	2.70
21	0.49	0.39	0.88		0	0.00	185	2.91	16	0.25	201	3.10	1.18	1.74	1.92
22	0.52	0.28	0.80		0	0.00	184	2.91	15	0.24	199	3.17	1.24	1.76	1.93
23	0.56	0.23	0.83		0	0.00	206	2.92	16	0.23	222	3.51	1.69	1.65	1.82
24	0.45	0.29	0.75		0	0.00	220	2.61	29	0.34	249	3.59	1.81	1.56	1.78
25	0.47	0.33	0.69		0	0.00	228	3.02	25	0.33	253	4.04	2.22	1.69	1.82
26	0.53	0.31	0.78		0	0.00	214	3.05	23	0.33	237	3.56	1.63	1.72	1.93
27	0.50	0.38	0.83		0	0.00	208	3.05	23	0.34	231	3.61	1.64	1.79	1.97
28	0.51	0.26	0.87		0	0.00	206	3.02	21	0.31	227	3.30	1.21	1.90	2.09
29	0.53	0.24	0.84		0	0.00	215	3.06	19	0.27	234	3.64	1.81	1.66	1.83
30															
31															
Tot.							5,998		821		7,067				
Avg.	0.51	0.34	0.82	0.72	0.00	0.00	214.45	3.15	29.24	0.43	243.69	3.76	1.75	1.81	2.00
Max	0.61	0.45	0.92	0.77	0.00	0.00	248.00	3.51	102.00	1.44	350.00	4.82	2.63	4.07	4.26
Min.	0.42	0.22	0.69	0.66	0.00	0.00	173.00	2.61	10.00	0.17	199.00	3.10	0.56	1.50	1.67

WSSN 0600 City of Benton Harbor Month/Year February-20

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	0.9475	280.00	1.55	5.50	9.70	1.40	3	0.10	0.11	3	0.08	0.10	6	0	0
2	0.9025	269.00	1.57	8.40	13.80	1.00	3	0.10	0.14	3	0.08	0.10	6	0	0
3	1.0550	323.00	1.61	7.90	15.20	1.20	3	0.10	0.12	3	0.08	0.09	6	0	0
4	0.9150	273.00	1.57	4.90	5.10	1.00	3	0.12	0.15	3	0.08	0.08	6	0	0
5	1.0225	380.00	1.96	7.20	10.70	1.30	3	0.15	0.18	3	0.07	0.08	6	0	0
6	0.9175	346.00	2.18	6.00	9.50	1.30	3	0.15	0.15	3	0.09	0.10	6	0	0
7	0.9950	349.00	1.85	5.70	9.90	1.50	3	0.12	0.18	3	0.11	0.14	6	0	0
8	1.0075	393.00	2.05	7.40	12.90	1.60	3	0.09	0.12	3	0.11	0.13	6	0	0
9	1.1125	435.00	2.06	5.60	8.00	1.60	3	0.11	0.13	3	0.11	0.12	6	0	0
10	1.0575	345.00	1.72	7.30	9.90	1.50	3	0.13	0.17	3	0.12	0.16	6	0	0
11	0.9325	302.00	1.70	6.70	11.70	1.80	3	0.13	0.16	3	0.08	0.09	6	0	0
12	1.0025	295.00	1.55	7.80	12.90	1.70	3	0.15	0.19	3	0.12	0.16	6	0	0
13	1.0525	335.00	1.67	6.30	8.50	1.50	3	0.12	0.15	3	0.11	0.13	6	0	0
14	0.8475	273.00	1.69	11.20	11.50	2.10	3	0.12	0.16	3	0.15	0.17	6	0	0
15	0.9750	304.00	1.64	10.60	11.90	3.40	3	0.14	0.15	3	0.25	0.31	6	0	0
16	1.0250	329.00	1.69	6.30	7.20	2.90	3	0.13	0.15	3	0.29	0.33	6	0	0
17	1.1100	357.00	1.69	5.00	5.90	2.00	3	0.11	0.14	3	0.11	0.16	6	0	0
18	1.0750	321.00	1.57	7.70	8.60	1.80	3	0.10	0.12	3	0.08	0.09	6	0	0
19	1.0925	320.00	1.54	7.50	10.50	1.70	3	0.09	0.10	3	0.10	0.16	6	0	0
20	1.0075	302.00	1.58	8.50	9.10	1.40	3	0.07	0.07	3	0.07	0.08	6	0	0
21	0.9500	285.00	1.58	6.70	8.40	1.40	3	0.08	0.10	3	0.08	0.08	6	0	0
22	0.9450	290.00	1.61	7.90	13.80	1.50	3	0.12	0.15	3	0.08	0.09	6	0	0
23	1.0525	316.00	1.58	4.90	7.00	2.20	3	0.08	0.08	3	0.08	0.11	6	0	0
24	1.2575	324.00	1.36	5.40	8.30	1.60	3	0.08	0.09	3	0.08	0.09	6	0	0
25	1.1275	338.00	1.58	4.70	6.00	1.40	3	0.07	0.07	3	0.09	0.10	6	0	0
26	1.0475	317.00	1.58	5.30	6.70	1.50	3	0.07	0.08	3	0.08	0.09	6	0	0
27	1.0175	309.00	1.60	5.40	7.40	1.50	3	0.07	0.08	3	0.07	0.07	6	0	0
28	1.0175	307.00	1.59	13.50	14.30	2.70	3	0.08	0.08	3	0.08	0.08	6	0	0
29	1.0475	308.00	1.55	13.80	22.70	2.90	3	0.08	0.08	3	0.12	0.14	6	0	0
30															
31															
Total	29.5150	9325.00					87			87			174	0	0
Avg.	1.0178	321.55	1.67	7.28	10.24	1.74		0.11	0.13		0.11		Total	Total	Total
Max	1.2575	435.00	2.18	13.80	22.70	3.40		0.15	0.19		0.29	0.33	6	0	0
Min.	0.8475	269.00	1.36	4.70	5.10	1.00		0.07	0.07		0.07				

CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.0	192	188	129	125	63	63	47	46	18	17		
2	8.0	8.0	198	188	131	113	67	75	47	45	19	18		
3	8.0	8.1	196	182	141	123	55	59	50	47	17	16	20.5	24.5
4	8.0	8.1	188	182	127	121	61	61	46	45	18	17		
5	8.1	7.9	158	160	111	127	47	33	43	47	12	10	20.5	23.0
6	8.0	7.9	174	170	118	104	56	66	42	43	17	15		
7	7.9	7.9	168	164	115	109	53	55	41	42	16	15		
8	8.1	8.0	186	152	141	113	45	39	59	51	10	6		
9	8.0	8.0	174	164	133	116	41	48	55	52	9	8		
10	8.0	8.1	194	188	141	121	53	67	47	49	18	16		
11	8.0	8.1	192	196	124	126	68	70	48	50	17	17		
12	8.0	8.0	218	184	156	123	62	61	58	51	18	14		
13	8.0	8.0	206	190	152	130	54	60	50	52	20	15	19.0	26.0
14	7.9	7.9	178	186	117	129	61	57	46	47	16	17		
15	8.2	8.1	182	164	148	126	34	38	59	51	8	9		
16	7.9	7.9	174	176	149	135	25	41	58	59	7	7		
17	8.0	7.9	152	168	120	135	32	33	51	63	6	3	21.0	24.5
18	8.0	8.0	152	168	112	129	40	39	47	52	8	9		
19	7.9	8.0	176	180	116	121	60	59	42	44	17	17		
20	7.9	7.9	166	174	115	117	51	57	43	46	14	15		
21	7.9	7.8	164	170	113	110	51	60	42	45	14	14		
22	8.0	7.9	180	152	134	108	46	44	45	38	17	14		
23	8.0	8.0	180	172	125	115	55	57	45	46	17	14	23.5	26.0
24	8.0	8.0	162	158	120	116	42	42	49	50	10	8	21.5	23.5
25	8.0	7.9	152	152	119	122	33	30	46	46	9	9		
26	8.0	7.9	152	158	115	119	37	39	39	44	13	12		
27	8.1	7.9	142	148	121	117	21	31	46	50	6	6		
28	8.2	8.1	166	156	128	111	38	45	50	51	10	7		
29	8.0	7.9	174	164	126	115	48	49	43	40	16	16		
30														
31														
Avg.	8.0	8.0	175.7	170.8	127.5	119.9	48.2	51.0	47.7	48.0	13.7	12.4	21.0	24.6
Max	8.2	8.1	218.0	196.0	156.0	135.0	68.0	75.0	59.0	63.0	20.0	18.0	23.5	26.0
Min.	7.9	7.8	142.0	148.0	111.0	104.0	21.0	30.0	39.0	38.0	6.0	3.0	19.0	23.0

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1			1	A	81	0	3	3.5	0.9476	54	2.25	1.53
2			1	A	65	0	3	3.5	0.9547	57	2.37	1.55
3			1	A	51	0	4	3.5	1.0846	59	2.14	1.54
4			1	A	75	1	4	4.0	0.9626	57	2.35	1.52
5			1	A	81	1	4	5.0	1.0256	59	2.29	1.66
6			1	A	79	2	3	4.0	0.9092	65	2.82	1.95
7			1	A	68	0	3	3.5	1.0041	46	1.82	1.53
8			1	A	61	0	3	5.0	1.0052	49	1.93	1.56
9			1	A	59	1	4	5.0	0.9741	54	2.19	1.53
10			1	A	62	0	3	3.5	1.0439	48	1.83	1.78
11			1	A	66	2	3	3.5	0.9065	54	2.35	0.87
12	1.53	City Hall	1	A	89	0	4	3.5	1.0096	52	2.02	1.57
13	1.52	Wolfs	1	A	98	3	3	4.0	0.9967	59	2.33	1.55
14	1.38	Bait Shed	1	A	65	0	3	4.0	0.8991	36	1.58	1.58
15	1.50	Sunny Spot	1	A	99	0	3	4.5	0.9068	50	2.19	1.52
16	1.34	B & Z	1	A	61	0	3	5.0	0.9541	54	2.22	1.56
17			1	A	70	0	3	4.0	0.9430	53	2.24	1.49
18			1	A	67	1	3	4.0	0.9697	64	2.62	1.54
19	1.53	City Hall	1	A	60	1	3	3.0	0.9459	65	2.73	1.43
20	1.46	Wolfs	1	A	72	0	2	2.5	0.9334	58	2.47	1.41
21	1.51	Bait Shed	1	A	54	0	2	3.0	0.9942	91	3.63	2.93
22	1.65	Sunny Spot	1	A	71	0	2	2.5	0.9375	89	3.76	3.30
23	1.48	B & Z	1	A	66	0	2	2.5	0.9444	81	3.41	2.49
24			1	A	80	1	3	4.0	1.0242	77	2.97	2.65
25	2.47	City Hall	1	A	94	0	3	4.0	0.9347	79	3.34	2.80
26	2.42	Sunny Spot	1	A	58	0	3	4.0	0.9936	92	3.67	2.94
27	1.98	B & Z	1	A	52	0	2.5	3.5	0.9256	96	4.10	2.77
28	2.48	Wolfs	1	A	47	0	9.0	12.0	1.0256	94	3.63	2.62
29	2.27	Bait Shed	1	A	84	0	8.7	8.5	0.9590	83	3.41	2.95
30												
31												
Totals									28.1153	1875.3		
AVG.	1.77		1	A	70	0	3	4	0.9695	64.7	2.66	1.95
Max	2.48				99	3	9	12	1.0846	95.9	4.10	3.30
Min	1.34				47	0	2	3	0.8991	35.9	1.58	0.87

MI 0600 Distribution Monitoring Report MI 0600 DMR

DISTRIBUTION SYSTEM MONITORING WSSN 0600 February-20

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12	1.20		1.10	1.11	1.32		0.95			
13										
14										
15										
16										
17										
18										
19	0.85		1.14	1.02	1.19		0.85			
20										
21										
22										
23										
24										
25										
26	1.10		1.17	1.04	1.29		0.76			
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	15	
Total number of positive routine distribution samples	0600		
Total number of routine distribution samples required	0600	10	Max / Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.07	1.32 / 0.76
Total number of check samples	0600		
Total number of positive check samples	0600		

MI0600 Benton Harbor MOR for March 2020

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

SUPPLY NAME: CITY OF BENTON HARBOR

WSSN:600

Operator-in-Charge **Michael O'Malley** F1-S1

Signature of Operator-in-Charge

Month/Year **March-20** F1-S2

Water Plant Classification

Berrien County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.1375	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	180.00	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.99	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.94	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.82%	Percent of Treated Water

Chemical Data

Chlorine on hand:	53530	lb.	Est. supply:	356	days
Primary Coagulant (Alum (Al3+)) on hand:	77444	lb.	Est. supply:	174	days
Cost of All Chemicals per Million Gallons:	$63.61	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:	93	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? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
0.5 NTU in two consecutive measurements taken 15 minutes apart after 4 hours of operation? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
1.0 NTU in two consecutive measurements taken 15 minutes apart for 3 consecutive months? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
2.0 NTU in two consecutive measurements taken 15 minutes apart for 2 consecutive months? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
Was continuous (every 15 minutes) filter monitoring equipment off-line during the month? **If yes**, indicate date(s), duration, and individual filter grab sampling frequency on a separate sheet.	NO
Did POE disinfectant residual fall below 0.2 ppm during the month? **If yes**, indicate date(s) and duration on a separate sheet.	NO
Was minimum C*T credit achieved for the entire month? **If no**, indicate on a separate sheet the date(s) not achieved.	YES
Was continuous POE chlorine residual monitoring equipment off-line during the month? **If yes**, indicate date(s) and duration on a separate sheet.	NO

Distribution	Total	37.3951	Avg	1.2459774	Max	1.4139	Min	0.997

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **March-20**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.37	0.27	0.76		0	0.00	184	2.97	16	0.26	200	2.43	0.63	1.64	1.80
2	0.52	0.33	0.83		0	0.00	231	3.14	20	0.27	251	2.72	1.02	1.56	1.70
3	0.40	0.34	0.82		0	0.00	238	3.84	17	0.27	255	2.81	1.01	1.63	1.80
4	0.50	0.29	0.77	0.80	0	0.00	227	3.11	21	0.29	248	2.71	0.68	1.83	2.03
5	0.51	0.40	0.87		0	0.00	198	3.09	13	0.20	211	2.91	1.10	1.63	1.81
6	0.55	0.36	0.83		0	0.00	206	3.06	98	1.46	304	3.71	1.48	2.06	2.23
7	0.72	0.22	0.76		0	0.00	213	3.08	27	0.39	240	2.91	0.87	1.76	2.04
8	0.50	0.19	0.87		0	0.00	214	3.07	24	0.34	238	2.73	0.77	1.76	1.96
9	0.55	0.33	0.90		0	0.00	201	3.20	19	0.30	220	2.42	0.64	1.61	1.78
10	0.52	0.33	0.90		0	0.00	218	3.08	18	0.25	236	2.65	0.98	1.50	1.67
11	0.53	0.37	0.85	0.78	0	0.00	206	2.91	22	0.31	228	2.68	1.00	1.52	1.68
12	0.58	0.35	0.83		0	0.00	188	3.03	20	0.32	208	2.31	0.47	1.68	1.84
13	0.47	0.44	0.89		0	0.00	207	2.91	21	0.30	228	2.42	0.69	1.56	1.73
14	0.51	0.41	0.85		0	0.00	181	2.84	20	0.31	201	2.39	0.66	1.57	1.73
15	0.51	0.28	0.76		0	0.00	201	2.78	23	0.32	224	2.37	0.62	1.59	1.75
16	0.52	0.37	0.71		0	0.00	214	3.00	39	0.55	253	2.93	0.95	1.83	1.98
17	0.54	0.41	0.88		0	0.00	211	3.01	31	0.44	242	2.81	1.03	1.64	1.78
18	0.48	0.52	0.90		0	0.00	192	3.08	28	0.45	220	2.57	0.68	1.73	1.89
19	0.61	0.34	0.87	0.83	0	0.00	166	2.72	22	0.36	188	2.07	0.12	1.75	1.95
20	0.49	0.39	0.85		0	0.00	182	2.70	21	0.31	203	2.41	0.37	1.67	2.04
21	0.47	0.30	0.91		0	0.00	204	2.75	27	0.36	231	3.03	1.04	1.79	1.99
22	0.55	0.38	0.94		0	0.00	214	2.81	35	0.46	249	2.94	0.96	1.79	1.98
23	0.48	0.26	0.97		0	0.00	161	2.84	28	0.49	189	2.38	0.42	1.78	1.96
24	0.50	0.36	0.87		0	0.00	206	2.78	33	0.44	239	2.71	0.90	1.61	1.81
25	0.55	0.31	0.98		0	0.00	177	2.82	27	0.43	204	2.70	0.63	1.91	2.07
26	0.52	0.32	0.75		0	0.00	173	2.80	24	0.39	197	2.58	0.70	1.64	1.88
27	0.47	0.27	0.81		0	0.00	179	2.80	25	0.39	204	2.67	0.81	1.64	1.86
28	0.51	0.43	0.92		0	0.00	189	2.99	29	0.46	218	3.01	1.47	1.41	1.54
29	0.61	0.35	0.91		0	0.00	156	2.96	21	0.40	177	2.65	1.04	1.45	1.61
30	0.51	0.32	0.85		0	0.00	189	3.08	26	0.42	215	3.09	1.49	1.45	1.60
31	0.48	0.24	0.85		0	0.00	195	3.22	29	0.48	224	2.81	1.07	1.58	1.74
Tot.							5,937		808		6,945				
Avg.	0.52	0.34	0.85	0.80	0.00	0.00	197.53	2.97	26.50	0.40	224.03	2.69	0.84	1.67	1.85
Max	0.72	0.52	0.98	0.83	0.00	0.00	238.00	3.84	98.00	1.46	304.00	3.71	1.49	2.06	2.23
Min.	0.37	0.19	0.71	0.78	0.00	0.00	156.00	2.70	13.00	0.20	177.00	2.07	0.12	1.41	1.54

WSSN 0600 City of Benton Harbor Month/Year March-20

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	0.9250	284.00	1.62	16.30	25.40	3.10	3	0.10	0.11	3	0.08	0.09	6	0	0
2	1.0975	336.00	1.61	11.40	20.10	2.80	3	0.10	0.11	3	0.08	0.09	6	0	0
3	0.9250	301.00	1.71	10.00	18.00	2.40	3	0.10	0.12	3	0.07	0.08	6	0	0
4	1.0900	363.00	1.75	6.80	10.70	1.50	3	0.08	0.09	3	0.06	0.06	6	0	0
5	0.9575	325.00	1.79	5.00	5.70	1.90	3	0.10	0.12	3	0.09	0.09	6	0	0
6	1.0050	312.00	1.70	10.00	11.70	1.70	3	0.09	0.10	3	0.07	0.07	6	0	0
7	1.0325	325.00	1.66	21.20	24.50	3.30	3	0.10	0.11	3	0.09	0.10	6	0	0
8	1.0400	339.00	1.71	14.20	18.20	3.20	3	0.08	0.09	3	0.08	0.09	6	0	0
9	0.9375	287.00	1.61	16.80	21.30	3.10	3	0.12	0.13	3	0.08	0.09	6	0	0
10	1.0550	346.00	1.73	17.10	20.60	2.50	3	0.08	0.11	3	0.08	0.09	6	0	0
11	1.0550	330.00	1.65	16.20	22.70	2.10	3	0.07	0.08	3	0.08	0.10	6	0	0
12	0.9275	291.00	1.65	14.20	26.20	1.90	3	0.08	0.09	3	0.07	0.08	6	0	0
13	1.0625	318.00	1.57	11.60	15.50	1.70	3	0.11	0.15	3	0.08	0.10	6	0	0
14	0.9500	303.00	1.68	10.00	16.60	1.60	3	0.06	0.07	3	0.09	0.09	6	0	0
15	1.0775	343.00	1.67	10.10	14.50	1.60	3	0.07	0.08	3	0.07	0.08	6	0	0
16	1.0650	338.00	1.67	8.90	11.30	1.50	3	0.07	0.08	3	0.10	0.11	6	0	0
17	1.0475	358.00	1.80	6.80	10.00	1.40	3	0.08	0.09	3	0.08	0.08	6	0	0
18	0.9300	293.00	1.66	7.90	13.30	1.60	3	0.09	0.10	3	0.12	0.13	6	0	0
19	0.9125	280.00	1.61	10.50	21.90	1.60	3	0.08	0.10	3	0.12	0.16	6	0	0
20	1.0075	301.00	1.57	6.70	8.50	1.50	3	0.08	0.08	3	0.08	0.09	6	0	0
21	1.1075	331.00	1.57	12.00	12.80	1.80	3	0.07	0.08	3	0.12	0.18	6	0	0
22	1.1375	352.00	1.63	10.90	12.20	2.10	3	0.07	0.08	3	0.16	0.18	6	0	0
23	0.8475	262.00	1.63	10.00	13.90	1.80	3	0.07	0.09	3	0.13	0.15	6	0	0
24	1.1075	341.00	1.62	6.70	7.30	1.40	3	0.08	0.09	3	0.18	0.19	6	0	0
25	0.9375	288.00	1.62	6.80	9.20	1.40	3	0.08	0.09	3	0.16	0.17	6	0	0
26	0.9225	280.00	1.62	4.90	5.90	1.40	3	0.08	0.08	3	0.15	0.16	6	0	0
27	0.9550	285.00	1.57	5.50	6.70	1.30	3	0.08	0.10	3	0.15	0.16	6	0	0
28	0.9450	275.00	1.53	6.50	11.10	1.40	3	0.10	0.13	3	0.13	0.16	6	0	0
29	0.7875	228.00	1.52	11.50	17.40	1.40	3	0.12	0.14	3	0.12	0.15	6	0	0
30	0.9175	269.00	1.54	13.50	19.20	1.70	3	0.10	0.12	3	0.14	0.17	6	0	0
31	0.9050	279.00	1.62	10.10	17.20	1.40	3	0.08	0.09	3	0.13	0.16	6	0	0
Total	30.6700	9563.00					93			93			186	0	0
Avg.	0.9894	308.48	1.64	10.65	15.15	1.91		0.09	0.10		0.10		Total	Total	Total
Max	1.1375	363.00	1.80	21.20	26.20	3.30		0.12	0.15		0.18	0.19	6	0	0
Min.	0.7875	228.00	1.52	4.90	5.70	1.30		0.06	0.07		0.06				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.0	7.9	206	162	142	116	64	46	54	42	17	14		
2	8.1	8.0	198	184	153	120	45	64	44	46	21	17		
3	8.0	7.9	194	180	141	130	53	50	46	43	19	17	22.0	26.5
4	8.1	8.0	158	168	130	121	28	47	45	45	11	14		
5	8.0	8.0	188	180	139	126	49	54	46	51	18	13		
6	8.1	8.0	180	176	134	122	46	54	44	46	17	15		
7	8.1	8.1	152	158	123	125	29	33	43	46	11	10		
8	8.3	7.9	176	166	143	121	33	45	55	49	9	11		
9	8.1	8.2	192	184	138	121	54	63	51	46	16	17		
10	8.0	8.0	184	196	119	128	65	68	46	51	17	17	19.5	23.5
11	7.9	8.0	196	170	156	122	40	48	41	45	23	14		
12	8.1	8.1	194	176	137	117	57	59	46	46	19	15		
13	8.1	8.1	180	172	126	117	54	55	45	46	17	14		
14	8.1	8.1	180	170	129	120	51	50	48	46	15	14		
15	8.0	8.0	182	172	124	117	58	55	46	45	16	15		
16	8.2	7.9	146	154	116	121	30	33	43	47	9	9	21.0	22.5
17	8.2	8.1	164	158	133	117	31	41	49	51	10	7		
18	8.0	8.0	190	172	130	113	60	59	48	45	17	15		
19	8.0	8.1	178	170	127	118	51	52	46	42	16	16		
20	8.3	8.3	178	166	138	121	40	45	52	46	12	12		
21	8.1	8.3	146	156	119	121	27	35	46	53	7	6		
22	8.1	8.0	178	166	141	123	37	43	58	57	8	6		
23	8.1	8.1	168	162	130	121	38	41	46	45	13	12	22.0	23.0
24	8.2	8.2	148	170	115	119	33	51	44	55	9	8		
25	8.1	8.1	148	150	109	123	39	27	42	46	11	9		
26	8.3	8.2	180	156	147	114	33	42	58	51	9	7		
27	8.2	8.2	176	154	147	122	29	32	52	46	11	9		
28	8.1	8.1	182	172	134	124	48	48	44	42	17	16		
29	8.1	8.0	196	188	132	124	64	64	49	46	18	17		
30	8.1	8.0	196	184	132	123	64	61	49	46	18	17	21.5	24.5
31	8.0	8.1	196	180	144	125	52	55	48	46	18	16		
Avg.	8.1	8.1	177.8	169.7	132.8	120.9	45.0	48.8	47.5	47.0	14.4	12.8	21.2	24.0
Max	8.3	8.3	206.0	196.0	156.0	130.0	65.0	68.0	58.0	57.0	23.0	17.0	22.0	26.5
Min.	7.9	7.9	146.0	150.0	109.0	113.0	27.0	27.0	41.0	42.0	7.0	6.0	19.5	22.5

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1		0	1	A	108	0	2	2.5	0.9436	83	3.46	2.74
2		0	1	A	77	0	2	2.5	1.0651	87	3.25	2.95
3		0	1	A	98	0	3	2.5	1.0201	46	1.78	2.47
4	2.06	City Hall	1	A	46	1	3	4.0	1.0256	96	3.70	3.06
4	1.29	Wolfs	1	A	29	0	3	3.0	0.9190	90	3.89	2.99
4	1.58	Bait Shed	1	A	49	1	3	3.5	0.9945	84	3.35	3.01
4	2.72	Sunny Spot	1	A	93	0	3	5.0	0.9846	67	2.70	3.08
4	2.46	B & Z	1	A	91	0	4	5.0	0.9499	84	3.49	3.09
9		0	1	A	82	0	5	3.5	1.0003	82	3.24	2.99
10		0	1	A	87	0	4	5.0	1.0048	82	3.23	3.05
11	2.90	City Hall	1	A	127	0	4	5.5	0.9446	100	4.21	3.00
11	2.89	Wolfs	1	A	78	0	4	4.5	1.0273	92	3.54	2.82
11	2.82	Bait Shed	1	A	91	0	4	5.0	1.0761	86	3.17	3.23
11	2.85	Sunny Spot	1	A	88	0	4	5.1	0.9306	97	4.14	3.19
11	2.43	B & Z	1	A	78	0	4	4.5	1.0662	64	2.36	0.59
16		0	1	A	16	0	4	6.0	0.9614	71	2.92	3.02
17		0	1	A	31	0	5	5.0	1.0010	92	3.62	2.94
18		0	1	A	32	0	5	4.5	0.9713	83	3.37	2.83
19	2.72	City Hall	1	A	46	0	4	4.5	1.0271	85	3.27	2.81
19	2.81	Wolfs	1	A	58	0	5	7.0	0.9800	89	3.59	2.89
19	2.54	Bait Shed	1	A	27	0	4	6.0	0.8992	63	2.76	3.03
19	2.60	Sunny Spot	1	A	32	0	5	6.0	0.9842	62	2.48	2.85
19	2.25	B & Z	1	A	47	0	5	6.0	0.8789	83	3.74	2.98
24		0	1	A	16	0	5	6.0	1.0177	80	3.09	3.18
25		0	1	A	38	0	5	6.0	0.8329	91	4.33	3.23
26		0	1	A	58	1	6	6.0	0.8512	99	4.60	3.12
27		0	1	A	15	1	6.0	7.0	0.9134	81	3.51	3.08
28		0	1	A	123	0	9.0	12.0	0.8263	57	2.72	3.08
29		0	1	A	44	0	8.7	8.5	0.7592	82	4.29	2.94
30		0	1	A	149	1	8.5	9.5	0.8649	74	3.40	3.08
31		0	1	A	84	0	6.3	6.5	0.9270	71	3.01	3.17
Totals									29.6479	2501.2		
AVG.	2.46		1	A	64	0	5	6	0.9564	80.7	3.36	2.93
Max	2.90				149	1	9	12	1.0761	100.4	4.60	3.23
Min	1.29				15	0	2	3	0.7592	45.8	1.78	0.59

MI 0600 Distribution Monitoring Report MI 0600 DMR

DISTRIBUTION SYSTEM MONITORING WSSN 0600 March-20

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4	1.44		1.40	1.19	1.30		1.14			
5										
6										
7										
8										
9										
10										
11	1.21		1.20	1.36	1.59		1.36			
12										
13										
14										
15										
16										
17										
18										
19	0.79		1.01	1.49	1.49		1.01			
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	15		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.27	1.59	0.79
Total number of check samples	0600			
Total number of positive check samples	0600			

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

SUPPLY NAME: CITY OF BENTON HARBOR

WSSN:600

Operator-in-Charge **Michael O'Malley** F1-S1

Signature of Operator-in-Charge

Month/Year **January-19** F1-S2

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.4059	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	273.00	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.06	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.40	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.39%	Percent of Treated Water

Chemical Data

Chlorine on hand:	38380	lb.	Est. supply:	102 days
Primary Coagulant (Alum (Al3+)) on hand:	32566	lb.	Est. supply:	116 days
Cost of All Chemicals per Million Gallons:	$70.97	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:	93	5
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? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
0.5 NTU in two consecutive measurements taken 15 minutes apart after 4 hours of operation? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
1.0 NTU in two consecutive measurements taken 15 minutes apart for 3 consecutive months? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
2.0 NTU in two consecutive measurements taken 15 minutes apart for 2 consecutive months? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
Was continuous (every 15 minutes) filter monitoring equipment off-line during the month? **If yes**, indicate date(s), duration, and individual filter grab sampling frequency on a separate sheet.	NO
Did POE disinfectant residual fall below 0.2 ppm during the month? **If yes**, indicate date(s) and duration on a separate sheet.	NO
Was minimum C*T credit achieved for the entire month? **If no**, indicate on a separate sheet the date(s) not achieved.	YES
Was continuous POE chlorine residual monitoring equipment off-line during the month? **If yes**, indicate date(s) and duration on a separate sheet.	NO

Distribution

Total	30.48468	Avg	1.0162826	Max	1.39556	Min	0.82812

Remarks: Data developed to re-determine Water Distributed to System Max days during water main break of 4" about 7 days.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **January-19**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.49	0.31	0.62		0	0.00	216	3.72	48	0.83	264	3.86	2.06	1.61	1.80
2	0.52	0.24	0.41		0	0.00	257	4.06	49	0.77	306	4.90	3.01	1.65	1.89
3	0.62	0.32	0.56		0	0.00	268	4.81	44	0.79	312	5.62	3.74	1.58	1.88
4	0.54	0.29	0.56		0	0.00	301	4.75	50	0.79	351	5.05	3.13	1.68	1.92
5	0.57	0.13	0.60		0	0.00	250	4.12	52	0.86	302	5.36	3.51	1.67	1.85
6	0.58	0.34	0.65		0	0.00	282	4.01	51	0.73	333	5.00	3.20	1.62	1.80
7	0.54	0.19	0.62		0	0.00	307	4.36	52	0.74	359	5.63	3.62	1.81	2.01
8	0.67	0.22	0.66		0	0.00	275	4.53	48	0.79	323	5.58	3.62	1.77	1.96
9	0.42	0.29	0.61	0.63	0	0.00	275	3.90	56	0.79	331	5.31	2.80	2.30	2.51
10	0.44	0.33	0.57		0	0.00	263	4.03	47	0.72	310	5.11	2.92	1.99	2.19
11	0.49	0.18	0.60		0	0.00	255	4.43	47	0.82	302	4.78	2.72	1.81	2.06
12	0.48	0.28	0.56		0	0.00	267	4.04	47	0.71	314	5.13	2.91	1.95	2.22
13	0.48	0.26	0.64		0	0.00	229	4.13	44	0.79	273	4.54	2.51	1.77	2.03
14	0.39	0.36	0.65		0	0.00	272	3.85	55	0.78	327	4.92	2.81	1.92	2.11
15	0.51	0.38	0.70		0	0.00	282	3.99	52	0.74	334	5.64	3.63	1.83	2.01
16	0.55	0.30	0.73		0	0.00	271	3.81	53	0.75	324	5.22	3.40	1.63	1.82
17	0.59	0.44	0.83		0	0.00	278	4.55	59	0.97	337	5.71	4.00	1.53	1.71
18	0.65	0.42	0.82		0	0.00	315	4.45	50	0.71	365	5.14	3.36	1.61	1.78
19	0.44	0.21	0.70		0	0.00	273	4.38	47	0.75	320	5.38	3.31	1.79	2.07
20	0.44	0.25	0.71		0	0.00	296	4.36	42	0.62	338	5.35	3.35	1.80	2.00
21	0.54	0.33	0.68		0	0.00	277	4.25	43	0.66	320	5.34	3.18	1.95	2.16
22	0.45	0.27	0.65		0	0.00	316	4.76	43	0.65	359	5.62	3.56	1.85	2.06
23	0.66	0.45	0.73	0.68	0	0.00	323	4.44	47	0.65	370	5.11	2.81	2.10	2.30
24	0.54	0.37	0.77		0	0.00	367	3.95	54	0.58	421	4.50	2.26	2.03	2.24
25	0.48	0.34	0.67		0	0.00	339	3.60	55	0.58	394	4.51	2.25	2.04	2.26
26	0.45	0.22	0.61		0	0.00	321	3.46	49	0.53	370	4.73	2.30	2.21	2.43
27	0.59	0.39	0.70		0	0.00	240	3.32	43	0.60	283	3.53	1.10	2.22	2.43
28	0.53	0.25	0.70		0	0.00	298	3.17	12	0.13	310	3.41	1.38	1.78	2.03
29	0.00	0.20	0.56	0.54	0	0.00	264	3.23	27	0.33	291	3.68	1.61	1.73	2.07
30	0.00	0.18	0.46		0	0.00	273	3.18	29	0.34	302	3.78	1.72	1.95	2.06
31	0.00	0.21	0.51		0	0.00	285	3.36	23	0.27	308	4.01	1.67	2.05	2.34
Tot.							8,519		1,370		10,153				
Avg.	0.49	0.29	0.64	0.62	0.00	0.00	281.67	4.06	46.50	0.68	328.17	4.91	2.86	1.84	2.06
Max	0.67	0.45	0.83	0.68	0.00	0.00	367.00	4.81	59.00	0.97	421.00	5.71	4.00	2.30	2.51
Min.	0.00	0.13	0.41	0.54	0.00	0.00	216.00	3.17	12.00	0.13	264.00	3.41	1.10	1.53	1.71

WSSN 0600 City of Benton Harbor Month/Year January-19

COAGULATION PARAMETERS

D A T E	MIL. GAL. TREAT.	Dry AI2(SO3)4 Pounds Add	ALUM as Al3+ mg/l	TURBIDITY UNITS RAW Avg.	RAW Max.	Applied Avg.	# ample	FILTERED NORTH Avg.	FILTERED NORTH Max.	# Samples	FILTERED SOUTH Avg.	FILTERED SOUTH Max.	2 Hour Compliance Periods # of Periods	#of Periods >.30NTU North	#of Periods >.30NTU South
1	0.8675	289.00	1.75	6.90	7.40	0.30	3	0.06	0.07	3	0.06	0.07	6	0	0
2	0.9450	308.00	1.71	8.20	10.10	0.34	3	0.06	0.07	2	0.07	0.08	5	0	0
3	0.8312	270.00	1.71	7.50	7.70	0.79	3	0.08	0.09	0	0.07	0.07	3	0	0
4	0.9450	337.00	1.88	8.20	8.70	0.77	3	0.06	0.06	0	0.09	0.10	3	0	0
5	0.9051	293.00	1.70	9.00	14.10	0.66	3	0.08	0.08	0	0.07	0.07	3	0	0
6	1.0500	333.00	1.47	7.60	8.40	0.69	3	0.07	0.08	0	0.06	0.07	3	0	0
7	1.0500	341.00	1.71	7.10	8.50	0.64	3	0.08	0.10	0	0.07	0.07	3	0	0
8	0.9071	310.00	1.80	7.20	10.60	0.50	3	0.07	0.08	0	0.07	0.08	3	0	0
9	1.0519	299.00	1.50	7.20	7.70	0.42	3	0.08	0.08	0	0.06	0.07	3	0	0
10	0.9750	327.00	1.76	8.30	9.20	0.55	3	0.07	0.08	0	0.06	0.06	3	0	0
11	0.8600	268.00	1.64	7.30	7.90	0.63	3	0.07	0.08	0	0.07	0.09	3	0	0
12	0.9870	297.00	1.58	6.40	9.50	0.55	3	0.07	0.08	0	0.07	0.08	3	0	0
13	0.8280	277.00	1.76	6.40	9.50	0.42	3	0.06	0.06	0	0.06	0.07	3	0	0
14	1.0560	352.00	1.75	5.80	7.60	0.46	3	0.07	0.09	0	0.07	0.08	3	0	0
15	1.0550	321.00	1.60	7.00	9.10	0.81	3	0.07	0.07	0	0.07	0.08	3	0	0
16	1.0612	340.00	1.69	8.30	11.60	0.63	3	0.06	0.07	0	0.07	0.07	3	0	0
17	0.9114	295.00	1.70	5.00	5.50	0.48	3	0.07	0.08	0	0.08	0.09	3	0	0
18	1.0556	350.00	1.74	8.30	12.00	0.57	3	0.07	0.07	0	0.07	0.08	3	0	0
19	0.9300	252.00	1.43	7.40	7.50	0.66	3	0.07	0.09	0	0.07	0.07	3	0	0
20	1.0125	313.00	1.63	8.70	11.60	0.55	3	0.07	0.07	0	0.07	0.08	3	0	0
21	0.9720	303.00	1.64	6.60	6.90	0.59	3	0.07	0.07	0	0.07	0.08	3	0	0
22	0.9900	330.00	1.75	8.00	10.90	0.72	3	0.07	0.09	0	0.07	0.08	3	0	0
23	1.0858	324.00	1.57	10.00	18.50	0.66	3	0.07	0.08	0	0.08	0.09	3	0	0
24	1.3860	485.00	1.84	14.70	20.60	1.40	3	0.10	0.14	0	0.10	0.13	3	0	0
25	1.4059	341.00	1.28	12.40	12.70	0.13	3	0.07	0.08	0	0.08	0.09	3	0	0
26	1.3839	457.00	1.28	10.20	15.40	0.93	3	0.07	0.08	0	0.11	0.14	3	0	0
27	1.0777	353.00	1.72	7.00	8.30	0.60	3	0.07	0.07	0	0.09	0.12	3	0	0
28	1.4014	431.00	1.62	7.90	9.50	1.00	3	0.07	0.08	0	0.12	0.16	3	0	0
29	1.2195	384.00	1.66	13.10	15.50	1.00	3	0.07	0.07	0	0.18	0.29	3	0	0
30	1.2820	353.00	1.45	14.40	21.60	1.10	3	0.07	0.08	0	0.11	0.14	3	0	0
31	1.2678	356.00	1.48	5.70	6.60	1.50	3	0.06	0.07	0	0.11	0.15	3	0	0
Total	32.7565	10289.00					93			5			98	0	0
Avg.	1.0567	331.90	1.64	8.32	10.67	0.68	93	0.07	0.08		0.08		Total	Total	Total
Max	1.4059	485.00	1.88	14.70	21.60	1.50		0.10	0.14		0.18	0.29	6	0	0
Min.	0.8280	252.00	1.28	5.00	5.50	0.13		0.06	0.06		0.06				

WSSN 0600

MONTH/YEAR January-19

CITY OF BENTON HARBOR CHEMICAL ANALYSES

			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	
D	pH													
A														
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	7.9	7.9	170	174	113	119	57	55	51	46	11	15		
2	7.9	7.8	162	164	133	118	29	46	55	53	6	8		
3	8.1	8.0	178	154	129	121	49	33	55	50	10	7		
4	8.0	8.0	192	168	129	124	63	44	63	53	9	9		
5	8.0	8.0	186	178	125	118	61	60	46	43	17	17		
6	8.0	8.0	186	176	125	118	61	58	51	47	14	14		
7	7.9	7.9	180	168	127	116	53	52	43	42	17	16		
8	7.8	7.8	178	168	123	116	55	52	45	42	17	16	24.5	26.5
9	7.9	7.8	168	158	112	106	56	52	45	43	14	12		
10	7.9	7.9	168	160	122	113	46	47	43	44	15	12		
11	7.9	7.9	162	164	120	117	42	47	47	50	11	10		
12	8.1	7.7	172	164	132	116	40	48	47	45	13	13	17.0	21.0
13	7.9	7.9	148	154	111	114	37	40	47	46	7	9		
14	7.9	7.8	166	158	119	109	47	49	43	43	14	12		
15	7.9	7.8	210	160	145	107	65	53	55	42	18	14		
16	7.9	7.9	190	184	137	122	53	62	45	43	19	18		
17	7.9	7.7	184	180	116	123	68	57	44	45	18	17		
18	7.9	8.0	184	190	127	122	57	68	44	45	18	19	19.5	22.5
19	7.9	7.9	154	156	119	123	35	33	45	44	10	11	20.5	24.0
20	7.9	7.9	176	172	114	119	62	53	46	46	15	14		
21	7.8	7.8	168	170	112	117	56	53	47	49	12	12		
22	7.9	7.8	164	152	134	112	30	40	55	51	6	6		
23	7.8	7.7	180	166	132	115	48	51	50	45	14	13		
24	7.8	7.8	176	172	120	121	56	51	46	45	15	15		
25	8.0	7.9	174	168	124	118	50	50	45	43	15	15		
26	7.9	7.9	170	164	128	118	42	46	41	44	17	13		
27	8.0	7.9	184	168	127	117	57	51	45	42	17	16	21.5	24.0
28	7.9	7.9	158	156	118	114	40	42	47	46	10	10	23.0	24.5
29	7.9	7.8	172	162	127	121	45	41	51	46	11	12		
30	7.9	7.8	146	142	109	116	37	26	49	47	6	6		
31	7.9	7.7	148	152	119	109	29	43	49	49	6	7		
Avg.	7.9	7.9	173.5	165.7	123.6	117.0	49.9	48.7	47.9	45.7	13.2	12.7	21.0	23.8
Max	8.1	8.0	210.0	190.0	145.0	124.0	68.0	68.0	63.0	53.0	19.0	19.0	24.5	26.5
Min.	7.8	7.7	146.0	142.0	109.0	106.0	29.0	26.0	41.0	42.0	6.0	6.0	17.0	21.0

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS

D	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
A	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.	___True		___Cold	
T	Samples	P/A	Samples	P/A			'C	'C	___Appar.		___60'C	
E					Raw	Tap			Raw	Tap	Raw	Tap
1			1	A	53	0	4	5.5				
2			1	A	93	0	5	8.0				
3			1	A	218	1	4	9.0				
4			1	A	156	0	5	8.0				
5			1	A	119	0	4	5.5				
6			1	A	114	0	5	5.5				
7			1	A	90	0	5	5.5				
8			1	A	82	0	5	5.5				
9			1	A	80	0	4	5.5				
10			1	A	67	0	4	5.5				
11			1	A	54	0	4	7.0				
12			1	A	56	0	4	7.0				
13			1	A	290	13	4	7.0				
14			1	A	110	0	3	4.5				
15			1	A	65	0	3	4.6				
16			1	A	85	0	4	4.5				
17			1	A	83	0	3	4.5				
18			1	A	58	0	3	4.5				
19			1	A	38	0	3	6.0				
20			1	A	34	20	3	6.0				
21			1	A	81	1	2	5.0				
22			1	A	341	2	2	4.5				
23			1	A	76	1	2	3.0				
24			1	A	77	0	2	2.5				
25			1	A	72	0	2	2.5				
26			1	A	61	0	2	2.5				
27			1	A	60	0	1.7	2.5				
28			1	A	46	0	9.0	12.0				
29			1	A	30	0	8.7	8.5				
30			1	A	55	0	8.5	9.5				
31			1	A	131	0	3.0	5.0				
AVG.			1	A	96	1	4	6				
Max					341	20	9	12				
Min					30	0	2	3				

DISTRIBUTION SYSTEM MONITORING

WSSN 0600

January-19

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6										
7										
8										
9	1.21		1.34	1.01	0.89		1.10			
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	1.17		1.41	1.72	1.27		0.72			
24										
25										
26										
27										
28										
29	0.93		1.23	1.36	1.45		1.39			
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

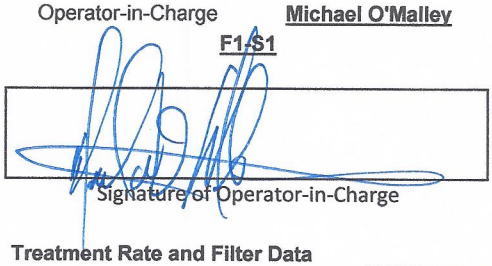
Total number of routine distribution samples analyzed	0600	15	
Total number of positive routine distribution samples	0600		
Total number of routine distribution samples required	0600	10	Max / Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.21	1.72 / 0.72
Total number of check samples	0600		
Total number of positive check samples	0600		

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** **F1-S1**



Signature of Operator-in-Charge

Month/Year **January-20** **F1-S2**

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.1225	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	180.83	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.02	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.21	Gallons Per Square Feet per Minute
Average Wash Water Use:	1.23%	Percent of Treated Water

Chemical Data

Chlorine on hand:	29795	lb.	Est. supply:	406	days
Primary Coagulant (Alum (Al3+)) on hand:	99685	lb.	Est. supply:	94	days
Cost of All Chemicals per Million Gallons:	$65.46	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:	93	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.	
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	29.0181	Avg	0.9657619	Max	1.23554	Min	0.68451

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.
BH Water Recieved an Action Level Exceedance for Lead in mid January. Recieved Load Alum in January.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **January-20**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.46	0.38	0.77	0.70		0.00	207	3.09	12	0.18	219	3.55	1.68	1.69	1.87
2	0.49	0.28	0.72		0	0.00	216	3.07	12	0.17	228	3.63	1.78	1.63	1.85
3	0.53	0.37	0.76		0	0.00	199	3.14	12	0.19	211	3.48	1.75	1.57	1.73
4	0.43	0.43	0.87		0	0.00	241	3.37	35	0.49	276	3.55	1.84	1.56	1.71
5	0.57	0.40	0.86		0	0.00	223	3.36	29	0.44	252	4.39	2.58	1.64	1.81
6	0.47	0.33	0.91		0	0.00	218	2.93	35	0.47	253	4.09	2.39	1.54	1.70
7	0.61	0.42	0.85		0	0.00	231	3.25	38	0.53	269	4.19	2.22	1.80	1.97
8	0.49	0.29	0.79	0.80	0	0.00	245	3.29	38	0.51	283	4.42	2.38	1.86	2.04
9	0.52	0.48	0.99		0	0.00	232	3.22	32	0.44	264	4.25	2.25	1.82	2.00
10	0.51	0.32	0.81		0	0.00	200	3.23	18	0.29	218	3.75	1.86	1.66	1.89
11	0.50	0.27	0.78		0	0.00	219	3.24	12	0.18	231	3.71	1.89	1.56	1.82
12	0.44	0.34	0.91		0	0.00	232	3.18	13	0.18	245	3.96	2.20	1.53	1.76
13	0.40	0.27	0.87		0	0.00	219	3.52	15	0.24	234	3.51	1.57	1.79	1.94
14	0.59	0.39	0.75		0	0.00	250	3.77	18	0.27	268	4.16	2.34	1.66	1.82
15	0.52	0.28	0.85	0.76	0	0.00	229	3.52	28	0.43	257	3.87	2.04	1.66	1.83
16	0.40	0.41	0.83		0	0.00	197	3.26	29	0.48	226	3.39	1.11	2.10	2.28
17	0.42	0.50	0.80		0	0.00	189	3.05	28	0.45	217	3.44	1.30	1.97	2.14
18	0.50				0	0.00	219	3.10	33	0.47	252	3.85	1.72	1.90	2.13
19	0.49	0.30	0.76		0	0.00	200	3.13	21	0.33	221	3.84	2.08	1.57	1.76
20	0.50	0.21	0.77		0	0.00	198	3.11	21	0.33	219	4.78	2.94	1.67	1.84
21	0.46	0.25	0.73		0	0.00	208	3.27	23	0.36	231	3.80	1.91	1.64	1.89
22	0.49	0.39	0.84	0.74	0	0.00	242	3.48	20	0.29	262	4.08	2.47	1.45	1.61
23	0.41	0.40	0.80		0	0.00	214	3.49	20	0.33	234	3.54	1.75	1.62	1.79
24	0.52	0.28	0.83		0	0.00	247	3.50	23	0.33	270	3.79	1.88	1.67	1.91
25	0.38	0.28	0.70		0	0.00	252	3.46	41	0.56	293	3.54	1.43	1.95	2.11
26	0.37	0.35	0.73		0	0.00	298	3.96	23	0.31	321	3.95	1.77	1.97	2.18
27	0.51	0.27	0.75		0	0.00	295	4.06	22	0.30	317	4.02	2.34	1.37	1.68
28	0.55	0.30	0.68		0	0.00	261	3.50	21	0.28	282	4.68	2.88	1.65	1.80
29	0.45	0.42	0.86	0.66	0	0.00	251	3.55	16	0.23	267	4.21	2.33	1.67	1.88
30	0.51	0.43	0.86		0	0.00	218	3.55	17	0.28	235	3.92	1.74	2.01	2.18
31	0.49	0.40	0.82		0	0.00	265	3.64	10	0.14	275	4.15	2.39	1.61	1.76
Tot.							6,908		703		7,830				
Avg.	0.48	0.35	0.81	0.73	0.00	0.00	228.33	3.35	23.50	0.34	251.83	3.91	2.01	1.71	1.90
Max	0.61	0.50	0.99	0.80	0.00	0.00	298.00	4.06	41.00	0.56	321.00	4.78	2.94	2.10	2.28
Min.	0.37	0.21	0.68	0.66	0.00	0.00	189.00	2.93	12.00	0.17	211.00	3.39	1.11	1.37	1.61

WSSN 0600 City of Benton Harbor Month/Year January-20

COAGULATION PARAMETERS

D A T E	MIL. GAL. TREAT.	Dry Al2(SO3)4 Pounds Add	ALUM as Al3+ mg/l	TURBIDITY UNITS RAW Avg.	RAW Max.	Applied Avg.	# ample	FILTERED NORTH Avg.	FILTERED NORTH Max.	# Samples	FILTERED SOUTH Avg.	FILTERED SOUTH Max.	2 Hour Compliance Periods # of Periods	#of Periods >.30NTU North	#of Periods >.30NTU South
1	1.0000	311.00	1.64	4.50	5.30	1.30	3	0.08	0.10	3	0.13	0.14	6	0	0
2	1.0500	316.00	1.58	4.30	5.00	0.97	3	0.08	0.08	3	0.12	0.14	6	0	0
3	0.9475	289.00	1.60	3.90	4.10	1.30	3	0.09	0.10	3	0.11	0.12	6	0	0
4	1.0675	313.00	1.54	5.60	6.50	1.50	3	0.11	0.13	3	0.10	0.12	6	0	0
5	0.9900	301.00	1.60	4.90	6.90	1.30	3	0.09	0.10	3	0.10	0.11	6	0	0
6	1.1125	290.00	1.42	5.80	9.90	1.50	3	0.10	0.11	3	0.09	0.10	6	0	0
7	1.0625	330.00	1.63	4.20	7.00	1.10	3	0.11	0.13	3	0.10	0.10	6	0	0
8	1.1100	338.00	1.60	2.90	4.20	0.81	3	0.08	0.08	3	0.10	0.10	6	0	0
9	1.0750	329.00	1.61	6.20	6.40	1.40	3	0.08	0.12	3	0.10	0.10	6	0	0
10	0.9250	286.00	1.63	4.00	5.70	1.30	3	0.13	0.16	3	0.10	0.13	6	0	0
11	1.0100	310.00	1.61	5.90	6.90	1.40	3	0.12	0.13	3	0.11	0.13	6	0	0
12	1.0875	333.00	1.61	4.70	5.40	1.30	3	0.13	0.14	3	0.09	0.11	6	0	0
13	0.9300	279.00	1.58	18.90	21.90	2.80	3	0.12	0.14	3	0.09	0.17	6	0	0
14	0.9900	305.00	1.62	14.20	23.70	4.10	3	0.16	0.17	3	0.15	0.19	6	0	0
15	0.9700	319.00	1.73	8.70	9.50	1.80	3	0.09	0.11	3	0.09	0.09	6	0	0
16	0.9025	262.00	1.53	10.40	11.60	1.90	3	0.08	0.09	3	0.09	0.09	6	0	0
17	0.9250	283.00	1.61	12.30	17.30	1.60	3	0.08	0.08	3	0.08	0.09	6	0	0
18	1.0550	323.00	1.61	6.10	7.20	2.10	3	0.07	0.09	3	0.09	0.12	6	0	0
19	0.9550	296.00	1.63	7.30	8.20	1.30	3	0.08	0.09	3	0.11	0.12	6	0	0
20	0.9500	301.00	1.67	17.30	19.70	3.60	3	0.06	0.07	3	0.07	0.09	6	0	0
21	0.9500	295.00	1.63	10.00	13.10	3.60	3	0.15	0.18	3	0.10	0.10	6	0	0
22	1.0375	320.00	1.62	12.20	13.40	3.60	3	0.09	0.10	3	0.11	0.12	6	0	0
23	0.9150	293.00	1.68	9.70	13.70	3.60	3	0.12	0.14	3	0.14	0.17	6	0	0
24	1.0550	370.00	1.85	9.40	14.30	2.10	3	0.09	0.10	3	0.12	0.12	6	0	0
25	1.0875	361.00	1.75	9.90	18.30	1.90	3	0.12	0.15	3	0.12	0.16	6	0	0
26	1.1225	433.00	1.75	15.10	18.90	4.90	3	0.17	0.27	3	0.16	0.26	6	0	0
27	1.0850	409.00	1.98	7.50	9.50	1.90	3	0.11	0.11	3	0.12	0.13	6	0	0
28	1.1125	321.00	1.52	5.50	7.90	1.00	3	0.08	0.09	3	0.08	0.08	6	0	0
29	1.0550	302.00	1.51	4.80	5.30	0.95	3	0.09	0.11	3	0.07	0.07	6	0	0
30	0.9175	266.00	1.53	7.40	11.40	1.80	3	0.10	0.11	3	0.09	0.09	6	0	0
31	1.0875	313.00	1.51	6.20	12.00	1.50	3	0.11	0.13	3	0.08	0.09	6	0	0
Total	31.5400	9797.00					93			93			186	0	0
Avg.	1.0174	316.03	1.63	8.06	10.65	1.98		0.10	0.12		0.10		Total	Total	Total
Max	1.1225	433.00	1.98	18.90	23.70	4.90		0.17	0.27		0.16	0.26	6	0	0
Min.	0.9025	262.00	1.42	2.90	4.10	0.81		0.06	0.07		0.07				

WSSN 0600 | MONTH/YEAR | January-20 |

CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness							
D	pH		as CaCO3		as CaCO3		as CaCO3		Calcium as Ca++		Magnesium as Mg++		Chloride as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.2	8.0	178	156	140	113	38	43	59	51	8	7		
2	8.1	7.9	162	148	129	114	33	34	46	43	11	10		
3	8.1	8.0	168	162	126	118	42	44	54	51	8	8		
4	8.0	8.0	212	178	145	120	67	58	53	45	19	16		
5	8.0	8.1	190	186	118	124	72	62	51	49	16	16	20.0	22.5
6	8.0	8.0	188	192	144	126	44	66	40	42	21	21		
7	7.9	7.9	192	186	131	126	61	60	50	47	17	17		
8	7.9	8.0	146	162	113	124	33	38	45	48	8	10	21.5	24.0
9	8.0	7.9	188	182	121	117	67	65	50	48	16	15	19.0	22.5
10	8.1	8.1	162	158	123	117	39	41	53	55	7	5		
11	8.2	8.0	172	156	130	112	42	44	57	49	7	8		
12	8.2	8.2	158	156	116	117	42	39	49	51	9	7		
13	8.0	7.9	182	168	131	114	51	54	46	42	17	16		
14	7.9	8.0	192	168	133	114	59	54	49	42	17	15		
15	8.0	7.9	176	180	115	120	61	60	45	46	16	16		
16	8.0	7.9	180	176	117	112	63	64	44	45	17	16	19.5	23.0
17	8.0	7.9	182	174	117	112	65	62	43	41	18	17		
18	8.0	8.0	148	146	117	114	31	32	47	48	7	6		
19	8.0	7.8	140	154	106	112	34	42	43	51	8	7		
20	8.0	7.8	162	154	128	110	34	44	51	51	8	7		
21	8.0	8.0	160	154	119	109	41	45	51	46	8	9	20.5	22.0
22	7.9	7.7	192	172	132	112	60	60	47	42	18	17	21.5	24.5
23	8.1	8.0	188	178	129	116	59	62	46	48	17	14		
24	8.1	7.9	160	158	117	122	43	36	51	50	8	8		
25	7.9	7.8	172	176	114	115	58	61	45	46	15	15		
26	8.0	8.0	214	172	146	110	68	62	53	45	20	15		
27	8.0	8.1	166	168	121	126	45	42	49	51	11	10	23.0	24.5
28	8.2	8.1	152	178	119	120	33	58	54	55	4	10		
29	8.1	8.1	148	150	124	127	24	23	47	48	7	7		
30	8.0	8.0	214	188	143	116	71	72	53	45	20	18		
31	7.9	8.0	188	178	129	121	59	57	47	43	17	17		
Avg.	8.0	8.0	174.8	167.9	125.5	117.0	49.3	50.9	49.0	47.4	12.8	12.1	20.7	23.3
Max	8.2	8.2	214.0	192.0	146.0	127.0	72.0	72.0	59.0	55.0	21.0	21.0	23.0	24.5
Min.	7.9	7.7	140.0	146.0	106.0	109.0	24.0	23.0	40.0	41.0	4.0	5.0	19.0	22.0

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1		0	1	A	65	0	4	7.0	0.9203	47	2.01	1.56
2	1.77	City Hall	1	A	49	0	5	6.0	0.9363	49	2.08	1.57
2	1.51	Wolfs	1	A	78	1	5	6.0	0.9053	59	2.57	1.52
2	1.46	Bait Shed	1	A	118	1	5	6.0	1.1615	56	1.92	1.49
2	1.38	Sunny Spot	1	A	48	0	5	5.6	0.8574	53	2.46	1.53
2	1.31	B & Z	1	A	74	0	4	5.5	0.9236	54	2.31	1.62
7		0	1	A	75	0	5	5.0	0.9585	56	2.30	1.50
8	1.77	City Hall	1	A	77	0	5	7.0	0.9554	45	1.86	1.57
8	1.67	Wolfs	1	A	105	0	4	4.5	0.9277	54	2.28	1.74
8	1.64	Bait Shed	1	A	111	0	4	6.0	0.8667	56	2.57	0.00
8	1.56	Sunny Spot	1	A	78	0	0	0.0	0.9286	50	2.11	1.61
8	1.51	B & Z	1	A	93	0	4	6.0	0.9226	55	2.34	1.53
13		0	1	A	118	0	5	4.5	0.9937	50	1.98	1.57
14		0	1	A	185	1	4	5.0	0.9617	40	1.63	0.33
15	1.54	City Hall	1	A	108	1	4	4.5	0.9915	50	2.01	1.61
15	1.59	Wolfs	1	A	85	1	4	4.5	0.9951	52	2.06	1.57
15	1.52	Bait Shed	1	A	103	0	4	4.5	0.9419	58	2.42	1.56
15	1.38	Sunny Spot	1	A	80	0	4	6.0	0.9756	55	2.24	1.48
15	1.35	B & Z	1	A	81	0	4	5.0	0.8577	58	2.66	1.46
20		0	1	A	96	0	3	5.0	0.6844	64	3.67	1.52
21		0	1	A	86	1	3	4.5	0.9064	64	2.79	1.54
22	1.68	City Hall	1	A	97	1	2	3.5	0.9575	63	2.59	1.69
22	2.17	Wolfs	1	A	100	0	2	3.5	0.9855	61	2.44	1.82
22	1.71	Bait Shed	1	A	112	0	3	4.0	1.0631	35	1.29	1.84
22	1.73	Sunny Spot	1	A	93	2	3	3.0	1.2352	87	2.79	1.65
22	1.43	B & Z	1	A	53	0	3	3.0	1.2130	88	2.88	1.54
27	1.54	City Hall	1	A	86	0	3.0	4.0	1.1758	48	1.63	1.54
27	1.67	Wolfs	1	A	75	0	9.0	12.0	0.8992	50	2.19	1.54
27	1.56	Bait Shed	1	A	53	1	8.7	8.5	0.9466	47	1.96	
27	1.75	Sunny Spot	1	A	120	0	8.5	9.5	0.8946	50	2.20	1.60
27	1.45	B & Z	1	A	96	0	3.2	3.5	0.9883	53	2.13	1.57
Totals									29.9307	1703.8		
AVG.	1.59		1	A	91	0	4	5	0.9655	55.0	2.28	1.49
Max	2.17				185	2	9	12	1.2352	88.2	3.67	1.84
Min	1.31				48	0	0	0	0.6844	34.7	1.29	0.00

DISTRIBUTION SYSTEM MONITORING WSSN 0600 January-20

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1	1.03		0.76	1.34	0.92		0.80			
2										
3										
4										
5										
6										
7										
8	1.10		1.27	0.89	1.17		0.80			
9										
10										
11										
12										
13										
14										
15	1.24		1.08	0.90	1.19		0.49			
16										
17										
18										
19										
20										
21										
22	0.96		1.13	1.11	1.22		0.96			
23										
24										
25										
26										
27										
28										
29	1.08		1.03		1.02		0.74			
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	24		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.01	1.34	0.49
Total number of check samples	0600			
Total number of positive check samples	0600			

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** — **F1-S1**

Signature of ~~Operator-in-Charge~~

Month/Year **July-18** — **F1-S2**

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.7095	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	263.00	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.15	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.09	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.45%	Percent of Treated Water

Chemical Data

Chlorine on hand:	17423	lb.	Est. supply:	166	days
Primary Coagulant (Alum (Al3+)) on hand:	57984	lb.	Est. supply:	53	days
Cost of All Chemicals per Million Gallons:	$67.62	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:	93	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? 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.

Remarks:

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **July-18**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		SETTLED		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.49	0.24	0.65		0	0.00	251	3.50	25	0.35	276	9.70	8.45	1.06	1.25
2	0.43	0.00	0.45		0	0.00	241	3.44	20	0.29	261	8.92	7.39	1.26	1.53
3	0.54	0.14	0.40		0	0.00	255	3.39	30	0.40	285	11.38	10.00	1.18	1.38
4	0.53	0.26	0.59		0	0.00	257	3.63	27	0.38	284	10.97	9.68	1.13	1.29
5	0.47	0.08	0.37		0	0.00	301	4.04	35	0.47	336	13.70	12.30	1.29	1.40
6	0.53	0.21	0.52	0.58	0	0.00	289	4.32	35	0.52	324	13.50	12.00	1.34	1.50
7	0.47	0.19	0.55		0	0.00	286	4.10	36	0.52	322	11.32	9.74	1.41	1.58
8	0.38	0.25	0.60		0	0.00	272	3.97	36	0.53	308	10.77	9.07	1.45	1.70
9	0.47	0.11	0.51		0	0.00	289	3.91	39	0.53	328	10.03	7.98	1.90	2.05
10	0.49	0.05	0.56		0	0.00	267	3.89	35	0.51	302	11.48	9.22	1.93	2.26
11	0.57	0.27	0.64	0.67	0	0.00	301	3.92	35	0.46	336	10.58	8.67	1.76	1.91
12	0.40	0.19	0.57		0	0.00	302	4.00	37	0.49	339	15.56	13.72	1.68	1.84
13	0.41	0.17	0.76		0	0.00	289	3.82	37	0.49	326	11.00	9.15	1.67	1.85
14	0.53	0.16	0.66		0	0.00	318	3.56	31	0.35	349	11.88	10.04	1.64	1.84
15	0.58	0.21	0.60		0	0.00	295	4.01	40	0.54	335	10.80	9.32	1.33	1.48
16	0.52	0.11	0.49		0	0.00	294	3.80	42	0.54	336	10.16	8.45	1.45	1.71
17	0.48	0.20	0.62		0	0.00	294	3.85	41	0.54	335	8.53	6.73	1.40	1.80
18	0.43	0.26	0.68		0	0.00	414	3.81	43	0.40	457	9.71	7.79	1.53	1.92
19	0.56	0.33	0.65		0	0.00	277	4.14	40	0.60	317	12.86	11.09	1.56	1.77
20	0.44	0.25	0.62		0	0.00	327	4.02	49	0.60	376	10.78	8.80	1.61	1.98
21	0.47	0.13	0.61		0	0.00	288	4.00	44	0.61	332	12.99	11.09	1.74	1.90
22	0.41	0.19	0.50		0	0.00	261	3.71	39	0.55	300	9.94	8.02	1.75	1.92
23	0.45	0.20	0.61		0	0.00	322	4.30	40	0.53	362	11.52	9.71	1.65	1.81
24	0.48	0.20	0.66		0	0.00	353	4.75	46	0.62	399	15.41	13.79	1.46	1.62
25	0.47	0.14	0.60	0.65	0	0.00	354	4.68	45	0.59	399	15.71	13.96	1.49	1.75
26	0.56	0.21	0.70		0	0.00	435	4.67	38	0.41	473	26.51	25.06	1.31	1.45
27	0.36	0.22	0.66		0	0.00	430	4.83	43	0.48	473	14.52	12.97	1.38	1.55
28	0.47	0.28	0.71		0	0.00	500	4.37	45	0.39	545	12.58	11.10	1.35	1.48
29	0.47	0.17	0.64		0	0.00	354	5.20	49	0.72	403	16.46	15.18	1.17	1.28
30	0.55	0.21	0.63		0	0.00	331	5.12	54	0.84	385	12.39	11.13	1.04	1.26
31	0.43	0.11	0.59		0	0.00	436	5.81	72	0.96	508	14.30	12.96	1.12	1.34
Tot.	14.39						9,632		1,203		11,111	385.97			
Avg.	0.48	0.19	0.59	0.63	0.00	0.00	314.90	4.09	38.53	0.51	353.43	12.39	10.72	1.46	1.67
Max	0.58	0.33	0.76	0.67	0.00	0.00	500.00	5.20	54.00	0.84	545.00	26.51	25.06	1.93	2.26
Min.	0.36	0.00	0.37	0.58	0.00	0.00	241.00	3.39	20.00	0.29	261.00	8.53	6.73	1.04	1.25

WSSN 0600 City of Benton Harbor Month/Year July-18

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	1.0705	318.00	1.56	1.20	1.60	0.13	3	0.07	0.07	3	0.06	0.06	6	0	0
2	1.0454	254.00	1.28	1.30	2.10	0.28	3	0.08	0.09	3	0.09	0.12	6	0	0
3	1.1232	307.00	1.44	0.93	1.30	0.20	3	0.07	0.08	3	0.07	0.08	6	0	0
4	1.0577	308.00	1.53	0.80	1.00	0.15	3	0.06	0.06	3	0.06	0.06	6	0	0
5	1.1117	308.00	1.46	1.10	1.40	0.16	3	0.07	0.09	3	0.08	0.10	6	0	0
6	0.9986	283.00	1.62	4.40	11.60	0.24	3	0.07	0.08	3	0.08	0.09	6	0	0
7	1.0409	306.00	1.55	1.10	1.30	0.13	3	0.06	0.06	3	0.05	0.06	6	0	0
8	1.0220	300.00	1.54	0.78	1.00	0.12	3	0.06	0.06	3	0.06	0.06	6	0	0
9	1.1042	326.00	1.55	1.00	1.40	0.12	3	0.06	0.06	3	0.06	0.06	6	0	0
10	1.0243	302.00	1.55	0.88	1.20	0.13	3	0.06	0.07	3	0.06	0.07	6	0	0
11	1.1472	329.00	1.51	1.20	1.40	0.14	3	0.07	0.07	3	0.08	0.09	6	0	0
12	1.1258	327.00	1.53	1.20	1.70	0.15	3	0.07	0.07	3	0.06	0.06	6	0	0
13	1.1306	321.00	1.49	0.90	1.10	0.14	3	0.06	0.06	3	0.06	0.07	6	0	0
14	1.3321	435.00	1.72	3.40	3.70	0.23	3	0.06	0.06	3	0.08	0.09	6	0	0
15	1.0979	319.00	1.53	1.20	1.30	0.18	3	0.07	0.07	3	0.07	0.07	6	0	0
16	1.1559	328.00	1.49	0.61	0.76	0.12	3	0.06	0.06	3	0.06	0.06	6	0	0
17	1.1410	327.00	1.51	0.89	1.30	0.17	3	0.07	0.09	3	0.07	0.08	6	0	0
18	1.6218	435.00	1.41	2.50	3.30	0.19	3	0.06	0.07	3	0.07	0.08	6	0	0
19	0.9990	293.00	1.54	0.81	1.10	0.12	3	0.05	0.06	3	0.05	0.06	6	0	0
20	1.2139	348.00	1.51	0.96	1.30	0.13	3	0.07	0.09	3	0.07	0.08	6	0	0
21	1.0737	312.00	1.53	1.80	3.00	0.16	3	0.07	0.07	3	0.07	0.07	6	0	0
22	1.0504	278.00	1.39	3.30	4.50	0.17	3	0.06	0.07	3	0.06	0.06	6	0	0
23	1.1178	321.00	1.51	3.40	3.70	0.17	3	0.07	0.07	3	0.07	0.07	6	0	0
24	1.1098	319.00	1.51	2.60	2.90	0.17	3	0.06	0.07	3	0.07	0.07	6	0	0
25	1.1293	325.00	1.51	1.60	1.80	0.18	3	0.07	0.08	3	0.07	0.07	6	0	0
26	1.3895	423.00	1.51	5.00	5.70	0.22	3	0.07	0.07	3	0.07	0.07	6	0	0
27	1.3278	393.00	1.56	3.90	7.70	0.22	3	0.07	0.08	3	0.06	0.07	6	0	0
28	1.7095	441.00	1.36	4.00	4.10	0.25	3	0.08	0.09	3	0.08	0.08	6	0	0
29	1.0159	300.00	1.55	1.00	1.10	0.18	3	0.07	0.08	3	0.06	0.06	6	0	0
30	0.9645	281.00	1.53	1.00	1.10	0.19	3	0.07	0.08	3	0.08	0.09	6	0	0
31	1.1193	336.00	1.58	1.00	1.40	0.17	3	0.08	0.09	3	0.07	0.07	6	0	0
Total	35.5712	10203.00					93			93			186	0	0
Avg.	1.1475	329.13	1.51	1.80	2.51	0.17	93	0.07	0.07		0.07		Total	Total	Total
Max	1.7095	441.00	1.72	5.00	11.60	0.28		0.08	0.09		0.09	0.12	6	0	0
Min.	0.9645	254.00	1.28	0.61	0.76	0.12		0.05	0.06		0.05				

WSSN 0600 MONTH/YEAR July-18

CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.2	8.0	138	132	107	103	31	29	41	39	9	8		
2	8.0	8.0	134	142	104	98	30	44	40	38	8	11		
3	8.1	8.1	140	150	103	102	37	48	36	37	12	13		
4	8.2	7.8	142	132	108	104	34	28	43	39	8	8		
5	8.1	8.0	142	140	105	98	37	42	39	36	11	12		
6	8.1	8.1	138	146	104	100	34	46	38	33	10	16		
7	8.2	8.0	136	134	107	106	29	28	42	41	7	8		
8	8.1	8.1	134	130	104	99	30	31	43	40	6	7		
9	8.2	8.1	140	136	109	103	31	33	39	38	10	10		
10	8.1	8.0	158	126	106	100	52	26	42	33	13	11		
11	8.0	7.9	134	130	106	101	28	29	40	38	9	9		
12	8.2	8.0	148	144	106	103	42	41	39	38	12	12	18.5	21.5
13	8.2	8.0	148	142	112	102	36	40	34	40	15			
14	8.2	8.1	146	138	111	104	35	34	39	37	12	11		
15	8.2	8.1	150	140	114	104	36	36	35	34	15	13		
16	8.2	7.7	138	136	106	107	32	29	39	38	10	10	17.0	21.0
17	8.3	8.1	148	140	108	103	40	37	39	40	12	9		
18	8.1	8.0	154	148	102	101	52	47	35	37	16	13		
19	8.1	8.0	138	136	110	106	28	30	39	38	10	10		
20	8.1	8.1	150	148	105	98	45	50	35	32	15	16		
21	8.1	7.9	152	142	110	102	42	40	38	36	14	13	17.5	20.5
22	8.2	8.0	150	142	108	103	42	39	36	35	15	14		
23	8.1	8.1	154	142	113	103	41	39	37	36	15	13		
24	8.2	8.1	156	142	116	103	40	39	38	38	15	12		
25	8.2	8.1	142	152	109	103	33	49	40	36	10	14	17.0	21.0
26	8.3	8.2	144	146	108	112	36	34	42	39	9	12		
27	8.2	8.1	138	126	125	109	13	17	45	39	6	7		
28	8.4	8.2	144	136	127	114	17	22	45	38	8	10		
29	8.3	8.2	140	146	110	116	30	30	42	43	9	9		
30	8.2	8.1	152	148	110	115	42	33	40	43	12	9		
31	8.0	8.0	134	156	109	108	25	48	38	35	9	16		
Avg.	8.2	8.0	144.3	139.7	109.1	104.1	35.2	35.7	39.3	37.6	11.1	11.0	17.5	21.0
Max	8.4	8.2	158.0	152.0	127.0	116.0	52.0	50.0	45.0	43.0	16.0	16.0	18.5	21.5
Min.	8.0	7.7	134.0	126.0	102.0	98.0	13.0	17.0	34.0	32.0	6.0	7.0	17.0	20.5

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.	___True		___Cold	
A	Samples	P/A	Samples	P/A			'C	'C	___Appar.		___60'C	
T					Raw	Tap			Raw	Tap	Raw	Tap
E												
1			1	A	22	1	20	18.0				
2			1	A	56	0	20	19.0				
3			1	A	42	0	21	20.0				
4			1	A	20	0	17	21.0				
5			1	A	34	0	23	20.0				
6			1	A	44	0	14	19.8				
7			1	A	30	0	10	20.0				
8			1	A	15	1	12	18.0				
9			1	A	13	1	13	17.0				
10			1	A	48	0	14	16.0				
11			1	A	24	1	12	14.0				
12			1	A	25	0	15	14.0				
13			1	A	66	0	17	14.5				
14			1	A	67	0	17	18.0				
15			1	A	33	0	16	16.5				
16			1	A	30	0	14	18.0				
17			1	A	60	0	18	17.0				
18			1	A	66	2	11	17.0				
19			1	A	278	3	11	17.0				
20			1	A	36	0	14	16.0				
21			1	A	41	0	15	13.5				
22			1	A	56	0	15	13.5				
23			1	A	54	1	17	14.5				
24			1	A	60	0	20	16.0				
25			1	A	31	0	22	18.0				
26			1	A	40	0	22	20.0				
27			1	A	30	0	22.0	23.0				
28			1	A	63	1	9.0	12.0				
29			1	A	75	0	8.7	8.5				
30			1	A	174	1	8.5	9.5				
31			1	A	305	1	21.0	22.0				
AVG.			1	A	63	0	16	17				
Max					305	3	23	23				
Min					13	0	9	9				

DISTRIBUTION SYSTEM MONITORING WSSN 0600 July-18

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6	0.83	0.00	0.98	0.45	0.48		0.47			
7										
8										
9										
10										
11	0.42	0.00	0.99	0.73	0.84		0.79			
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25	0.67	0.00	0.79	0.33	0.65		0.70			
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	15		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.56	0.99	0.00
Total number of check samples	0600			
Total number of positive check samples	0600			

MI 0600 Benton Harbor MOR JUL 2020

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** — Month/Year **July-20**

F1-S1 **F1-S2**

Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.2832	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	215.67	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.04	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.53	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.91%	Percent of Treated Water

Chemical Data

Chlorine on hand:	17170	lb.	Est. supply:	2360	days
Primary Coagulant (Alum (Al3+)) on hand:	884850	lb.	Est. supply:	50	days
Cost of All Chemicals per Million Gallons:	$78.91	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:	93	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.

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	29.090186	Avg	0.9719165	Max	1.0796	Min	0.8418

Orthopolyphosphate Lead corrosion Inhibitor started March 26, 2019: Total Days 495 **Orthopolyphosphate Lead corrosion Inhibitor Changed February 21, 2020** Total Days 162

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CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **July-20**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.52	0.28	0.87	0.79	0	0.00	262	3.61	52	0.72	314	4.51	3.00	1.35	1.51
2	0.55	0.27	0.89		0	0.00	260	3.68	64	0.91	324	4.98	3.44	1.38	1.54
3	0.58	0.26	0.77		0	0.00	231	3.60	51	0.80	282	4.63	3.01	1.46	1.62
4	0.64	0.32	0.66		0	0.00	257	3.78	52	0.76	309	4.75	2.76	1.86	1.99
5	0.56	0.18	0.72		0	0.00	270	3.89	56	0.81	326	5.19	3.09	1.91	2.10
6	0.43	0.30	0.69		0	0.00	273	3.79	53	0.74	326	4.93	2.69	2.02	2.24
7	0.55	0.22	0.67		0	0.00	276	3.74	52	0.70	328	4.92	2.79	1.96	2.13
8	0.57	0.30	0.77		0	0.00	281	3.86	53	0.73	334	4.84	2.94	1.73	1.90
9	0.54	0.21	0.75	0.74	0	0.00	291	3.88	54	0.72	345	4.94	3.12	1.66	1.82
10	0.20	0.28	0.81		0	0.00	280	3.90	120	1.67	400	5.65	3.84	1.63	1.81
11	0.52	0.34	0.70		0	0.00	304	4.09	45	0.61	349	5.64	3.94	1.53	1.70
12	0.56	0.22	0.76		0	0.00	267	4.23	47	0.74	314	5.44	3.79	1.49	1.65
~~13~~	~~0.57~~	~~0.29~~	~~0.71~~		~~0~~	~~0.00~~	~~311~~	~~4.33~~	~~48~~	~~0.67~~	~~359~~	~~5.25~~	~~3.31~~	~~1.76~~	~~1.94~~
14	0.59	0.25	0.66		0	0.00	299	4.32	48	0.69	347	5.33	3.57	1.61	1.76
15	0.58	0.11	0.75	0.67	0	0.00	295	4.34	48	0.71	343	5.18	3.28	1.73	1.90
16	0.57	0.24	0.81		0	0.00	329	4.60	53	0.74	382	5.65	3.60	1.87	2.05
17	0.55	0.31	0.80		0	0.00	299	4.30	49	0.71	348	5.81	3.67	1.82	2.14
18	0.60	0.28	0.91		0	0.00	290	4.31	47	0.70	337	5.05	3.29	1.51	1.76
19	0.47	0.14	0.81		0	0.00	274	4.28	45	0.70	319	5.55	3.74	1.63	1.81
20	0.50	0.20	0.90		0	0.00	324	4.80	56	0.83	380	5.66	4.07	1.43	1.59
21	0.61	0.24	0.82	0.80	0	0.00	333	5.19	61	0.95	394	6.21	4.88	1.18	1.33
22	0.54	0.15	0.80		0	0.00	412	5.93	64	0.92	476	7.14	5.66	1.34	1.48
23	0.56	0.18	0.64		0	0.00	352	5.11	62	0.90	414	6.45	4.46	1.87	1.99
24	0.56	0.21	0.74		0	0.00	353	5.49	67	1.04	420	7.13	5.80	1.18	1.33
25	0.66	0.32	0.83		0	0.00	365	5.63	76	1.17	441	6.73	5.32	1.28	1.41
26	0.53	0.19	0.81		0	0.00	377	5.59	80	1.19	457	7.32	5.74	1.43	1.58
27	0.61	0.21	0.73		0	0.00	411	5.83	88	1.25	499	7.41	5.50	1.76	1.91
28	0.58	0.29	0.87		0	0.00	422	6.07	85	1.22	507	7.01	5.06	1.79	1.95
29	0.55	0.28	0.76		0	0.00	382	6.18	76	1.23	458	6.40	4.52	1.72	1.88
30	0.49	0.20	0.75		0	0.00	438	6.15	72	1.01	510	7.75	5.92	1.68	1.83
31	0.46	0.30	0.71		0	0.00	519	6.04	78	0.91	597	10.59	8.70	1.73	1.89
Tot.							9,775		1,850		11,939				
Avg.	0.55	0.24	0.77	0.75	0.00	0.00	317.27	4.62	60.80	0.88	378.07	5.78	3.99	1.62	1.79
Max	0.66	0.34	0.91	0.80	0.00	0.00	438.00	6.18	120.00	1.67	510.00	7.75	5.92	2.02	2.24
Min.	0.20	0.11	0.64	0.67	0.00	0.00	231.00	3.60	45.00	0.61	282.00	4.51	2.69	1.18	1.33

WSSN 0600 City of Benton Harbor Month/Year July-20

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
Y		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	1.0825	321.00	1.56	3.20	4.50	0.30	3	0.08	0.09	3	0.09	0.09	6	0	0
2	1.0550	310.00	1.55	3.50	5.50	0.32	3	0.10	0.12	3	0.10	0.11	6	0	0
3	0.9575	284.00	1.56	4.40	7.60	0.34	3	0.09	0.11	3	0.09	0.09	6	0	0
4	1.0150	297.00	1.54	1.90	2.20	0.27	3	0.08	0.09	3	0.07	0.08	6	0	0
5	1.0350	309.00	1.57	2.30	2.50	0.27	3	0.08	0.08	3	0.07	0.07	6	0	0
6	1.0750	312.00	1.51	2.50	3.00	0.32	3	0.09	0.10	3	0.08	0.09	6	0	0
7	1.1025	421.00	2.01	2.20	2.40	0.48	3	0.07	0.07	3	0.07	0.07	6	0	0
8	1.0875	345.00	1.67	2.50	2.60	0.41	3	0.09	0.09	3	0.08	0.10	6	0	0
9	1.1200	392.00	1.84	3.00	3.70	0.39	3	0.07	0.08	3	0.08	0.09	6	0	0
10	1.0725	368.00	1.81	3.20	3.20	0.48	3	0.07	0.08	3	0.08	0.09	6	0	0
11	1.1100	373.00	1.77	5.80	7.40	0.51	3	0.08	0.08	3	0.09	0.10	6	0	0
12	0.9425	317.00	1.77	4.60	7.70	0.72	3	0.08	0.08	3	0.08	0.09	6	0	0
13	1.0725	347.00	1.70	4.80	5.70	0.55	3	0.09	0.09	3	0.08	0.09	6	0	0
14	1.0325	348.00	1.77	2.50	2.90	0.48	3	0.07	0.07	3	0.08	0.08	6	0	0
15	1.0150	320.00	1.66	3.30	3.70	0.55	3	0.08	0.08	3	0.08	0.08	6	0	0
16	1.0675	349.00	1.72	2.60	2.90	0.47	3	0.08	0.10	3	0.07	0.07	6	0	0
17	1.0375	287.00	1.46	2.70	3.10	0.58	3	0.08	0.10	3	0.08	0.09	6	0	0
18	1.0050	274.00	1.43	2.40	2.70	0.51	3	0.07	0.08	3	0.08	0.10	6	0	0
19	0.9550	283.00	1.56	2.20	2.60	0.66	3	0.07	0.07	3	0.08	0.09	6	0	0
20	1.0075	294.00	1.54	3.00	3.80	0.64	3	0.08	0.09	3	0.10	0.11	6	0	0
21	0.9575	294.00	1.62	2.90	4.70	0.47	3	0.08	0.08	3	0.07	0.08	6	0	0
22	1.0375	294.00	1.49	1.80	2.00	0.47	3	0.07	0.07	3	0.08	0.09	6	0	0
23	1.0275	332.00	1.70	1.60	1.80	0.41	3	0.07	0.08	3	0.08	0.08	6	0	0
24	0.9600	282.00	1.55	2.90	3.50	0.58	3	0.09	0.12	3	0.08	0.08	6	0	0
25	0.9675	293.00	1.59	2.50	4.60	0.42	3	0.08	0.10	3	0.08	0.08	6	0	0
26	1.0075	311.00	1.59	2.00	3.10	0.48	3	0.08	0.09	3	0.08	0.09	6	0	0
27	1.0525	327.00	1.63	1.90	2.60	0.40	3	0.09	0.10	3	0.09	0.10	6	0	0
28	1.0375	329.00	1.67	1.70	2.30	0.46	3	0.08	0.10	3	0.08	0.08	6	0	0
29	0.9225	337.00	1.66	2.80	3.90	0.36	3	0.08	0.08	3	0.08	0.10	6	0	0
30	1.0625	428.00	2.12	2.00	2.40	0.48	3	0.09	0.09	3	0.09	0.12	6	0	0
31	1.2832	602.00	2.47	8.90	13.00	1.50	3	0.09	0.10	3	0.10	0.11	6	0	0
Total	32.1632	10580.00					93			93			186	0	0
Avg.	1.0375	341.29	1.73	3.02	3.99	0.49		0.08	0.09		0.08		Total	Total	Total
Max.	1.2832	602.00	2.47	8.90	13.00	1.50		0.10	0.12		0.10	0.12	6	0	0
Min.	0.9225	274.00	1.43	1.60	1.80	0.27		0.07	0.07		0.07				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			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	
DAY	pH													
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
TEST	29.	30.	31.	32.	33.	34.	35.	36.	37	38	39	40	41	42
1	8.2	8.2	156	148	112	103	44	45	38	37	15	14	19.0	23.0
2	8.1	8.1	154	146	107	101	47	45	38	36	15	14	18.5	23.0
3	8.1	8.1	160	154	109	103	51	51	38	37	16	15	18.8	22.5
4	8.2	8.0	156	150	109	104	47	46	44	46	11	8		
5	8.1	8.2	154	146	111	105	43	41	42	42	12	10		
6	8.3	8.1	146	140	109	103	37	37	41	42	11	9	22.5	23.5
7	8.3	8.2	148	142	112	104	36	38	41	41	11	10		
8	8.2	8.0	152	148	109	102	43	46	41	42	12	11	18.5	22.5
9	8.1	8.1	162	144	112	97	50	47	40	37	15	13	18.5	22.5
10	8.2	8.1	164	150	117	102	47	48	38	37	17	14	18.5	22.5
11	8.3	8.2	164	152	124	103	40	49	37	35	17	16	19.0	23.0
12	8.2	8.1	168	156	113	104	55	52	42	40	15	14	19.5	23.0
13	8.3	8.2	148	140	120	103	28	37	42	40	11	10	22.0	25.5
14	8.4	8.2	140	142	115	109	25	33	40	42	10	9		
15	8.3	8.2	142	140	118	108	24	32	46	47	6	5		
16	8.2	8.2	142	138	113	109	29	29	42	42	9	8		
17	8.2	8.1	140	142	109	107	31	35	41	42	9	9		
18	8.2	8.2	142	140	110	108	32	32	42	45	9	7		
19	8.3	8.2	154	146	109	103	45	43	43	42	11	10		
20	8.2	8.1	176	158	121	105	55	53	42	39	17	15	18.0	22.0
21	8.3	8.1	158	154	115	112	43	42	38	38	15	15	19.0	23.0
22	8.2	8.2	140	142	112	114	28	28	41	42	9	9		
23	8.3	8.2	152	144	123	113	29	31	41	38	12	12		
24	8.2	8.0	166	160	111	110	55	50	42	40	15	15	19.0	25.5
25	8.0	8.1	164	162	110	110	54	52	40	39	16	16	19.5	24.5
26	8.2	8.2	164	160	114	107	50	53	39	40	16	15	18.0	23.0
27	8.3	8.0	162	150	116	107	46	43	39	37	16	14	19.0	24.5
28	8.3	8.2	162	154	118	108	44	46	37	36	17	16	19.0	24.5
29	8.2	8.2	162	156	118	108	44	48	38	37	16	16		
30	8.3	8.0	164	156	116	106	48	50	39	37	16	16	19.5	25.0
31	8.1	8.2	166	160	110	106	56	54	41	38	15	16	18.0	23.5
Avg.	8.2	8.1	155.4	148.7	113.7	105.9	41.7	42.7	40.4	39.8	13.2	12.2	19.2	23.5
Max	8.4	8.2	176.0	162.0	124.0	114.0	55.0	53.0	46.0	47.0	17.0	16.0	22.5	25.5
Min.	8.0	8.0	140.0	138.0	107.0	97.0	24.0	28.0	37.0	35.0	6.0	5.0	18.0	22.0

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1	2.54	CH	1	A	83	0	15	18.0	1.0392	115	4.37	2.53
1	2.46	wolfs	1	A	37	0	14	16.5	0.9710	110	4.49	2.52
1	2.48	Bait	1	A	76	0	14	16.0	0.9096	96	4.17	3.05
1	2.54	Sunny	1	A	61	0	11	16.0	0.9709	85	3.45	3.02
1	2.33	B & Z	1	A	95	0	11	16.0	0.9375	93	3.94	3.08
6			1	A	67	3	14	15.0	0.9866	95	3.81	3.02
7			1	A	95	1	14	15.0	0.9948	97	3.87	2.96
8			1	A	33	0	13	14.0	1.0299	95	3.63	3.07
9	3.01	CH	1	A	37	0	14	14.0	1.0421	98	3.73	3.05
9	3.12	wolfs	1	A	86	1	19	15.0	1.0561	89	3.32	3.06
9	2.69	Bait	1	A	76	0	17	17.0	0.9235	88	3.78	3.01
9	2.41	Sunny	1	A	66	0	19	17.0	0.8620	89	4.10	2.97
9	2.72	BZ	1	A	88	0	15	18.0	1.0212	92	3.57	3.05
14			1	A	40	1	13	16.0	0.9723	95	3.88	2.98
15	2.88	CH	1	A	66	0	17	20.0	0.9878	91	3.64	2.97
15	2.98	wolfs	1	A	78	0	16	17.0	1.0098	89	3.47	2.91
15	3.29	Bait	1	A	60	0	13	16.0	0.8937	86	3.81	3.01
15	2.90	Sunny	1	A	43	0	14	16.0	0.9954	97	3.85	2.91
15	2.86	BZ	1	A	31	1	18	16.0	0.8574	101	4.65	2.97
20			1	A	57	0	23	15.5	1.0024	105	4.13	2.97
21	2.75	CH	1	A	29	0	22	19.5	0.9467	104	4.36	2.93
21	2.93	wolfs	1	A	168	1	19	21.0	0.9956	85	3.36	2.89
21	2.80	Bait	1	A	112	1	24	21.0	0.9582	95	3.91	3.01
21	2.75	Sunny	1	A	119	0	15	21.5	0.9055	84	3.67	1.79
21	2.46	BZ	1	A	132	0	14	19.5	1.0176	106	4.10	
28			1	A	168	0	21	18.0	0.9610	101	4.15	2.68
29	2.95	CH	1	A	128	0	20.5	19.0	1.0334	106	4.07	2.87
29	2.96	wolfs	1	A	132	0	9.0	12.0	1.1195	113	3.99	
29	2.96	Bait	1	A	219	0	8.7	8.5	1.0960	130	4.69	
29	2.83	Sunny	1	A	142	0	8.5	9.5	0.9823	96	3.85	3.28
29	2.55	BZ	1	A	119	0	13.7	22.5	0.8714	89	4.03	2.89
Totals									30.3503	3012.6		
AVG.	2.78		1	A	89	0	15	17	0.9790	97.2	3.92	2.92
Max	3.29				219	3	24	23	1.1195	129.8	4.69	3.28
Min	2.33				29	0	9	9	0.8574	83.9	3.32	1.79

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DISTRIBUTION SYSTEM MONITORING WSSN 0600 July-20

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1	0.85		1.01	1.05	0.89		0.77			
2										
3										
4										
5										
6										
7										
8										
9	1.12		1.21	1.02	0.92		1.01			
10										
11										
12										
13										
14										
15	0.96		1.03	1.00	0.85		0.91			
16										
17										
18										
19										
20										
21	1.04		1.04	1.14	1.14		0.59			
22										
23										
24										
25										
26										
27										
28										
29	1.25		1.42	1.45	1.06		1.11			
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

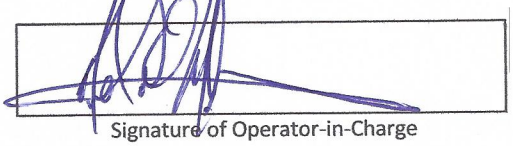
Total number of routine distribution samples analyzed	0600	25		
Total number of positive routine distribution samples	0600	0		
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.03	1.45	0.59
Total number of check samples	0600	0		
Total number of positive check samples	0600	0		

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** **F1-S1**



Signature of Operator-in-Charge

Month/Year **June-18** **F1-S2**

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.1758	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	275.25	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.04	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.11	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.60%	Percent of Treated Water

Chemical Data

Chlorine on hand:	29795	lb.	Est. supply:	274 days
Primary Coagulant (Alum (Al3+)) on hand:	69501	lb.	Est. supply:	100 days
Cost of All Chemicals per Million Gallons:	$64.48	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:	90	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? 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.

Remarks:

WSSN 0600 City of Benton Harbor Month/Year June-18

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	1.0580	301.00	1.50	1.70	2.40	0.21	3	0.07	0.08	3	0.08	0.09	6	0	0
2	0.9962	295.00	1.56	6.40	8.10	0.19	3	0.07	0.07	3	0.07	0.07	6	0	0
3	0.8473	258.00	1.60	5.10	7.90	0.21	3	0.07	0.08	3	0.06	0.07	6	0	0
4	1.0101	294.00	1.53	2.10	2.70	0.20	3	0.06	0.07	3	0.06	0.06	6	0	0
5	1.0072	293.00	1.53	3.20	5.00	0.18	3	0.07	0.07	3	0.07	0.07	6	0	0
6	1.0172	297.00	1.52	2.20	2.50	0.17	3	0.06	0.06	3	0.06	0.06	6	0	0
7	1.1542	344.00	1.57	1.80	2.20	0.16	3	0.06	0.06	3	0.07	0.08	6	0	0
8	1.0949	332.00	1.60	1.50	1.60	0.16	3	0.07	0.08	3	0.07	0.08	6	0	0
9	1.0208	308.00	1.59	1.20	1.40	0.15	3	0.06	0.07	3	0.07	0.08	6	0	0
10	0.9521	287.00	1.59	2.40	5.10	0.13	3	0.06	0.07	3	0.05	0.06	6	0	0
11	0.9658	291.00	1.59	1.60	3.20	0.12	3	0.06	0.07	3	0.06	0.06	6	0	0
12	1.0264	308.00	1.58	1.20	1.70	0.14	3	0.06	0.06	3	0.06	0.07	6	0	0
13	1.0671	322.00	1.59	1.40	1.90	0.13	3	0.07	0.08	3	0.07	0.08	6	0	0
14	0.9449	276.00	1.54	1.50	2.40	0.16	3	0.06	0.06	3	0.07	0.08	6	0	0
15	1.1397	341.00	1.57	1.00	1.20	0.16	3	0.07	0.08	3	0.07	0.08	6	0	0
16	1.0190	307.00	1.59	2.00	3.90	0.11	3	0.08	0.09	3	0.06	0.06	6	0	0
17	1.1131	333.00	1.57	1.20	1.40	0.15	3	0.08	0.09	3	0.07	0.07	6	0	0
18	1.1128	322.00	1.52	1.20	1.60	0.14	3	0.07	0.08	3	0.07	0.08	6	0	0
19	1.0305	297.00	1.52	1.60	1.70	0.15	3	0.08	0.09	3	0.08	0.09	6	0	0
20	1.1758	339.00	1.52	1.10	1.30	0.16	3	0.07	0.08	3	0.07	0.08	6	0	0
21	1.1378	329.00	1.52	1.40	1.60	0.13	3	0.06	0.07	3	0.07	0.08	6	0	0
22	1.0396	300.00	1.52	0.97	1.30	0.14	3	0.07	0.08	3	0.06	0.07	6	0	0
23	1.0290	338.00	1.73	1.10	1.40	0.22	3	0.07	0.08	3	0.08	0.09	6	0	0
24	1.1059	319.00	1.52	1.10	1.30	0.17	3	0.07	0.07	3	0.07	0.08	6	0	0
25	1.0083	297.00	1.55	1.00	1.20	0.14	3	0.06	0.06	3	0.06	0.07	6	0	0
26	1.0509	311.00	1.55	0.80	1.30	0.14	3	0.06	0.07	3	0.07	0.08	6	0	0
27	0.9505	279.00	1.54	1.10	1.30	0.14	3	0.07	0.07	3	0.06	0.06	6	0	0
28	1.0173	298.00	1.54	1.10	1.40	0.13	3	0.07	0.09	3	0.08	0.09	6	0	0
29	1.0270	301.00	1.54	4.20	11.00	0.13	3	0.08	0.09	3	0.07	0.09	6	0	0
30	1.0581	311.00	1.55	1.30	1.70	0.14	3	0.07	0.07	3	0.06	0.06	6	0	0
31															
Total	31.1775	9228.00					90			90			180	0	0
Avg.	1.0393	307.60	1.56	1.85	2.76	0.15	90	0.07	0.07		0.07		Total	Total	Total
Max	1.1758	344.00	1.73	6.40	11.00	0.22		0.08	0.09		0.08	0.09	6	0	0
Min.	0.8473	258.00	1.50	0.80	1.20	0.11		0.06	0.06		0.05				

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **June-18**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		SETTLED		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	4.49	0.06	0.62				223	3.15	29	0.41	252	12.42	10.57	1.67	1.85
2	4.56	0.26	0.73				219	3.28	27	0.40	246	8.93	7.20	1.56	1.73
3	4.61	0.23	0.75				193	3.40	29	0.51	222	13.42	11.90	1.36	1.52
4	3.94	0.27	0.71				231	3.41	32	0.47	263	9.95	8.33	1.45	1.62
5	5.65	0.24	0.73				234	3.47	29	0.43	263	11.38	9.65	1.56	1.73
6	4.49	0.22	0.81	0.55			238	3.49	32	0.47	270	9.33	7.53	1.72	1.80
7	5.74	0.19	0.60				270	3.49	35	0.45	305	12.40	10.71	1.47	1.69
8	4.62	0.31	0.59				255	3.48	34	0.46	289	12.17	10.40	1.62	1.77
9	4.69	0.29	0.56				240	3.51	33	0.48	273	9.73	8.07	1.59	1.66
10	4.84	0.22	0.66				223	3.50	30	0.47	253	11.86	10.29	1.44	1.57
11	4.26	0.13	0.49				228	3.52	32	0.49	260	10.69	9.01	1.56	1.68
12	4.54	0.42	0.70				241	3.51	34	0.49	275	10.44	8.32	1.76	2.12
13	5.25	0.29	0.67				313	4.38	38	0.53	351	12.19	10.21	1.71	1.98
14	5.07	0.20	0.36				217	3.43	33	0.52	250	12.13	10.23	1.66	1.90
15	4.70	0.10	0.60				267	3.50	40	0.52	307	17.15	15.32	1.63	1.83
16	4.66	0.17	0.58				242	3.55	35	0.51	277	10.70	8.82	1.69	1.88
17	5.58	0.00	0.00				261	3.50	34	0.46	295	9.48	7.76	1.49	1.72
18	4.39	0.30	0.47				255	3.42	33	0.44	288	8.55	6.63	1.62	1.92
19	4.28	0.22	0.52	0.52			232	3.36	30	0.43	262	14.47	12.91	1.39	1.56
20	4.42	0.08	0.59				268	3.40	36	0.46	304	10.39	8.68	1.54	1.71
21	3.10	0.29	0.55				255	3.35	37	0.49	292	9.59	7.96	1.37	1.63
22	4.80	0.29	0.60				235	3.37	31	0.45	266	10.39	8.68	1.49	1.71
23	5.80	0.20	0.55				237	3.44	34	0.49	271	10.57	8.87	1.55	1.70
24	4.93	0.20	0.56				251	3.39	35	0.47	286	13.77	11.95	1.65	1.82
25	4.91	0.22	0.58				229	3.39	29	0.43	258	18.93	16.87	1.79	2.06
26	4.39	0.05	0.55				233	3.31	22	0.31	255	9.79	8.01	1.45	1.78
27	6.54	0.10	0.33	0.54			208	3.27	18	0.28	226	10.59	8.77	1.56	1.82
28	4.71	0.12	0.64				214	3.14	22	0.32	236	8.47	6.62	1.53	1.85
29	4.49	0.08	0.56				227	3.30	23	0.33	250	9.45	7.76	1.40	1.69
30	5.57	0.22	0.60				238	3.36	23	0.32	261	9.49	8.15	1.20	1.34
31															
Tot.	144.01						6,954		900		8,106	338.82			
Avg.	4.80	0.20	0.58	0.54			239.23	3.44	30.97	0.44	270.20	11.29	9.54	1.55	1.75
Max	6.54	0.42	0.81	0.55			313.00	4.38	40.00	0.53	351.00	18.93	16.87	1.79	2.12
Min.	3.10	0.00	0.00	0.52			193.00	3.14	18.00	0.28	222.00	8.47	6.62	1.20	1.34

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.2	8.1	156	146	111	103	45	43	40	38	14	12		
2	8.0	8.0	156	150	109	105	47	45	41	40	13	12		
3	8.1	8.0	150	144	108	103	42	41	38	37	13	13		
4	8.1	8.1	158	146	116	104	42	42	40	38	14	13		
5	8.2	8.1	152	144	109	103	43	41	38	37	14	13		
6	8.1	8.1	148	142	107	103	41	39	39	37	12	12		
7	8.1	7.7	134	130	105	99	29	31	46	42	4	6		
8	8.0	8.0	144	132	106	99	38	33	45	45	8	5		
9	8.2	7.8	136	132	105	105	31	27	46	45	5	5	20.0	22.5
10	8.2	8.0	140	128	108	103	32	25	47	45	5	4		
11	8.1	8.0	132	130	104	101	28	29	42	42	6	6		
12	8.0	8.1	134	136	105	93	29	43	43	33	6	13		
13	8.2	8.2	132	128	103	96	29	32	40	39	8	7		
14	8.3	8.1	146	144	112	96	34	48	34	31	14	16	19.5	21.5
15	8.2	8.1	142	148	106	98	36	50	32	34	11	8		
16	8.2	8.0	132	130	108	106	24	24	39	38	8	9		
17	8.1	7.8	142	138	106	103	36	35	43	40	8	9		
18	8.1	8.1	160	134	104	98	56	36	43	38	12	9		
19	8.2	8.1	154	142	109	105	45	37	40	38	13	11		
20	8.2	8.1	148	144	109	106	39	38	37	35	13	14	18.0	21.5
21	8.4	8.1	132	156	115	108	17	48	43	38	6	14		
22	8.2	8.0	142	144	102	85	40	59	39	34	11	14		
23	8.2	8.0	146	140	108	103	38	37	35	34	14	14		
24	8.2	8.1	148	140	108	100	40	40	36	35	14	13		
25	8.1	7.9	138	122	103	97	35	25	36	34	12	9	18.5	21.5
26	8.3	8.1	132	160	103	100	29	60	32	33	13	19		
27	8.1	7.9	164	140	105	98	59	42	38	44	17	7		
28	8.1	8.0	154	138	103	95	51	43	38	38	14	11		
29	8.1	8.0	160	132	105	96	55	36	38	37	15	9		
30	8.1	8.0	142	136	111	104	31	32	42	41	9	8		
Avg.	8.2	8.0	145.1	139.2	107.1	100.5	38.0	38.7	39.7	38.0	10.9	10.5	19.0	21.8
Max	8.4	8.2	164.0	160.0	116.0	108.0	59.0	60.0	47.0	45.0	17.0	19.0	20.0	22.5
Min.	8.0	7.7	132.0	122.0	102.0	85.0	17.0	24.0	32.0	31.0	4.0	4.0	18.0	21.5

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.	___True		___Cold	
A	Samples	P/A	Samples	P/A			'C	'C	___Appar.		___60'C	
T					Raw	Tap			Raw	Tap	Raw	Tap
E												
1			1	A	51	0	15	16.5				
2			1	A	102	0	11	11.5				
3			1	A	143	0	15	17.0				
4			1	A	86	0	18	18.0				
5			1	A	60	1	18	14.5				
6			1	A	79	1	13	15.5				
7			1	A	67	0	14	17.0				
8			1	A	79	0	14	17.0				
9			1	A	33	0	13	17.0				
10			1	A	13	1	13	17.0				
11			1	A	20	0	14	16.0				
12			1	A	10	0	13	17.0				
13			1	A	12	1	14	15.0				
14			1	A	89	0	16	15.0				
15			1	A	125	1	15	16.0				
16			1	A	46	0	14	16.0				
17			1	A	15	0	16	17.0				
18			1	A	77	1	16	17.0				
19			1	A	21	1	16	16.0				
20			1	A	14	1	15	16.0				
21			1	A	56	1	18	17.0				
22			1	A	207	1	14	16.5				
23			1	A	64	1	12	15.5				
24			1	A	134	5	12	14.5				
25			1	A	14	0	14	16.0				
26			1	A	20	1	13	15.0				
27			1	A	38	2	14.0	15.0				
28			1	A	46	0	14.0	15.0				
29			1	A	60	0	18.0	16.0				
30			1	A	39	0	19.0	18.0				
AVG.			1	A	61	1	15	16				
Max					207	5	19	18				
Min					10	0	11	12				

DISTRIBUTION SYSTEM MONITORING WSSN 0600 June-18

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6	0.64		0.57	0.66	0.62		0.56			
7										
8										
9										
10										
11										
12										
13										
14	1.01		1.36	0.85	1.05		1.00			
15										
16										
17										
18										
19	0.52		1.07	0.45	0.82		0.89			
20										
21										
22										
23										
24										
25										
26										
27	0.73		0.73	0.59	0.34		0.54			
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	20		
Total number of positive routine distribution samples	0600	0		
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.75	1.36	0.34
Total number of check samples	0600			
Total number of positive check samples	0600			

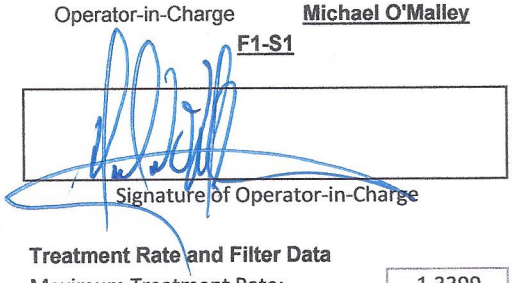
MONTHLY OPERATION REPORT OF
THE CITY OF BENTON HARBOR WATER TREATMENT PLANT

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **June-19**

F1-S1 **F1-S2**



Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.3399	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	245.00	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.04	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.91	Gallons Per Square Feet per Minute
Average Wash Water Use:	12.40%	Percent of Treated Water

Chemical Data

Chlorine on hand:	49490	lb.	Est. supply:	246	days
Primary Coagulant (Alum (Al3+)) on hand:	65133	lb.	Est. supply:	163	days
Cost of All Chemicals per Million Gallons:	$66.09	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:	90	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?	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	29.15056	Avg	1.002112	Max	1.14064	Min	0.90952

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **June-19**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l											TAP	
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use				
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.57	0.31	0.77		0	0.00	239	3.64	27	0.41	266	4.35	2.25	1.91	2.10
2	0.67	0.23	0.84		0	0.00	232	3.65	25	0.39	257	4.16	2.27	1.73	1.89
3	0.52	0.32	0.73		0	0.00	237	3.56	54	0.81	291	4.66	2.51	1.96	2.15
4	0.48	0.26	0.76		0	0.00	228	3.45	22	0.33	250	3.79	2.05	1.54	1.74
5	0.57	0.19	0.65	0.78	0	0.00	236	3.52	32	0.48	268	3.93	2.20	1.54	1.73
6	0.67	0.26	0.81		0	0.00	241	3.54	58	0.85	299	4.37	2.33	1.85	2.04
7	0.54	0.33	0.82		0	0.00	247	3.53	51	0.73	298	4.20	2.41	1.60	1.79
8	0.56	0.24	0.79		0	0.00	229	3.47	36	0.55	265	4.08	2.22	1.67	1.86
9	0.61	0.41	0.77		0	0.00	226	3.45	28	0.43	254	4.14	2.54	1.42	1.60
10	0.50	0.33	0.81		0	0.00	226	3.52	24	0.37	250	4.00	2.10	1.71	1.90
11	0.62	0.36	0.76		0	0.00	242	3.50	28	0.40	270	4.13	2.33	1.59	1.80
12	0.57	0.31	0.72		0	0.00	248	3.50	27	0.38	275	4.10	1.87	2.01	2.23
13	0.55	0.28	0.69	0.67	0	0.00	248	3.52	23	0.33	271	4.22	2.52	1.56	1.70
14	0.54	0.32	0.75		0	0.00	275	3.82	28	0.39	303	4.73	3.06	1.52	1.67
15	0.58	0.30	0.81		0	0.00	280	3.85	29	0.40	309	4.49	2.82	1.52	1.67
16	0.65	0.34	0.86		0	0.00	294	4.04	29	0.40	323	5.30	3.84	1.28	1.46
17	0.54	0.23	0.80		0	0.00	274	4.03	36	0.53	310	4.45	2.65	1.59	1.80
18	0.51	0.29	0.81		0	0.00	276	3.91	46	0.65	322	4.56	2.38	1.98	2.18
19	0.58	0.19	0.68	0.77	0	0.00	275	3.91	63	0.90	338	4.86	2.43	2.24	2.43
20	0.45	0.36	0.82		0	0.00	260	3.72	28	0.40	288	4.00	2.21	1.63	1.79
21	0.58	0.34	0.80		0	0.00	256	3.61	29	0.41	285	4.29	2.36	1.74	1.93
22	0.38	0.35	0.78		0	0.00	252	3.59	26	0.37	278	3.93	2.09	1.65	1.84
23	0.51	0.37	0.72		0	0.00	229	3.51	53	0.81	282	4.17	1.50	2.47	2.67
24	0.56	0.47	0.73		0	0.00	248	3.45	13	0.18	261	3.75	2.08	1.51	1.67
25	0.43	0.42	0.75		0	0.00	244	3.53	20	0.29	264	3.83	1.97	1.72	1.86
26	0.45	0.34	0.84		0	0.00	247	3.49	21	0.30	268	4.07	2.42	1.47	1.65
27	0.57	0.46	0.76		0	0.00	251	3.48	22	0.30	273	3.80	2.03	1.55	1.77
28	0.39	0.30	0.83		0	0.00	306	3.41	25	0.28	331	4.33	2.57	1.55	1.76
29	0.58	0.27	0.75		0	0.00	263	3.61	9	0.12	272	3.74	2.10	1.47	1.64
30	0.58	0.37	0.77		0	0.00	234	3.43	17	0.25	251	3.93	2.18	1.59	1.75
31															
Tot.							7,304		902		8,472				
Avg.	0.54	0.32	0.77	0.74	0.00	0.00	251.43	3.61	30.97	0.45	282.40	4.21	2.34	1.69	1.87
Max	0.67	0.47	0.86	0.78	0.00	0.00	306.00	4.04	63.00	0.90	338.00	5.30	3.84	2.47	2.67
Min.	0.38	0.19	0.65	0.67	0.00	0.00	226.00	3.41	9.00	0.12	250.00	3.74	1.50	1.28	1.46

WSSN 0600 City of Benton Harbor Month/Year June-19

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS												
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	0.9800	308.00	1.65	1.40	1.70	0.16	3	0.02	0.02	3	0.02	0.02	6	0	0
2	0.9500	296.00	1.64	1.20	1.70	0.13	3	0.03	0.04	3	0.02	0.02	6	0	0
3	0.9925	307.00	1.63	2.20	3.20	0.21	3	0.04	0.07	3	0.05	0.06	6	0	0
4	0.9875	296.00	1.58	1.30	2.40	0.17	3	0.06	0.07	3	0.05	0.05	6	0	0
5	1.0000	302.00	1.59	1.80	2.90	0.23	3	0.05	0.06	3	0.05	0.06	6	0	0
6	1.0150	305.00	1.57	1.90	2.70	0.29	3	0.05	0.05	3	0.04	0.05	6	0	0
7	1.0450	311.00	1.57	2.40	4.40	0.20	3	0.04	0.05	3	0.05	0.07	6	0	0
8	0.9850	268.00	1.43	2.00	3.00	0.16	3	0.05	0.06	3	0.05	0.05	6	0	0
9	0.9775	288.00	1.55	1.20	1.70	0.25	3	0.05	0.06	3	0.05	0.07	6	0	0
10	0.9575	290.00	1.59	1.80	2.90	0.18	3	0.03	0.04	3	0.02	0.03	6	0	0
11	1.0325	309.00	1.57	1.80	2.70	0.15	3	0.02	0.03	3	0.03	0.03	6	0	0
12	1.0575	317.00	1.58	2.20	2.50	0.21	3	0.03	0.04	3	0.02	0.02	6	0	0
13	1.0525	320.00	1.60	5.80	8.70	0.21	3	0.02	0.02	3	0.03	0.02	6	0	0
14	1.0750	324.00	1.59	6.50	7.90	0.22	3	0.02	0.03	3	0.03	0.03	6	0	0
15	1.0850	326.00	1.58	6.50	7.40	0.45	3	0.02	0.03	3	0.03	0.04	6	0	0
16	1.0875	328.00	1.59	2.30	2.50	0.20	3	0.02	0.02	3	0.03	0.05	6	0	0
17	1.0150	305.00	1.58	3.10	4.90	0.20	3	0.05	0.06	3	0.06	0.06	6	0	0
18	1.0550	313.00	1.56	2.90	5.10	0.20	3	0.04	0.05	3	0.04	0.05	6	0	0
19	1.0500	316.00	1.58	3.20	5.20	0.15	3	0.03	0.03	3	0.03	0.04	6	0	0
20	1.0425	311.00	1.57	2.50	4.60	0.14	3	0.04	0.04	3	0.03	0.04	6	0	0
21	1.0600	320.00	1.59	2.40	2.70	0.21	3	0.04	0.04	3	0.03	0.04	6	0	0
22	1.0475	316.00	1.59	2.60	4.60	0.16	3	0.03	0.04	3	0.03	0.04	6	0	0
23	0.9750	290.00	1.56	2.00	3.10	0.16	3	0.03	0.04	3	0.03	0.03	6	0	0
24	1.0725	328.00	1.61	1.50	1.90	0.14	3	0.03	0.03	3	0.03	0.03	6	0	0
25	1.0325	321.00	1.64	2.10	2.80	0.17	3	0.03	0.03	3	0.03	0.03	6	0	0
26	1.0575	322.00	1.64	1.30	1.90	0.12	3	0.03	0.03	3	0.02	0.02	6	0	0
27	1.0775	328.00	1.60	1.30	1.50	0.12	3	0.03	0.03	3	0.02	0.02	6	0	0
28	1.3399	406.00	1.59	5.00	7.60	0.21	3	0.03	0.03	3	0.02	0.02	6	0	0
29	1.0875	341.00	1.65	1.80	3.20	0.13	3	0.03	0.04	3	0.03	0.04	6	0	0
30	1.0175	301.00	1.56	1.50	2.50	0.14	3	0.02	0.03	3	0.02	0.02	6	0	0
31															
Total	31.2099	9413.00					90			90			180	0	0
Avg.	1.0403	313.77	1.59	2.52	3.66	0.19		0.03	0.04		0.03		Total	Total	Total
Max	1.3399	406.00	1.65	6.50	8.70	0.45		0.06	0.07		0.06	0.07	6	0	0
Min.	0.9500	268.00	1.43	1.20	1.50	0.12		0.02	0.02		0.02				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness							
									Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.0	8.1	150	142	116	109	34	33	44	41	10	10		
2	8.1	8.1	136	138	114	113	22	25	42	42	7	8		
3	8.0	8.1	164	154	115	106	49	48	41	39	15	14		
4	7.9	8.1	162	152	117	108	45	44	40	38	15	14		
5	8.0	8.0	166	150	117	105	49	45	43	39	14	13		
6	8.1	8.1	168	152	123	109	45	43	42	39	15	13		
7	7.9	8.0	168	160	120	113	48	47	42	39	16	15	18.0	21.5
8	8.0	8.0	158	154	113	111	45	43	39	38	15	15		
9	8.0	8.1	160	154	114	110	46	44	39	38	15	16		
10	8.1	7.9	136	134	114	112	22	22	46	45	5	5	20.5	22.0
11	8.1	8.1	152	146	113	112	39	34	43	41	11	11		
12	8.2	8.2	148	146	124	110	24	36	45	43	9	9		
13	8.2	8.1	148	144	117	112	31	32	42	40	11	11		
14	8.2	8.1	156	146	121	113	35	33	42	41	12	11		
15	8.2	8.1	168	150	131	115	37	35	46	46	13	9		
16	8.2	8.3	150	156	110	119	40	37	38	43	13	12		
17	8.0	8.1	152	154	107	111	45	43	38	39	14	14	21.0	24.0
18	8.0	8.1	154	148	115	106	39	42	37	38	15	13		
19	8.0	8.0	152	148	108	105	44	43	38	38	14	13		
20	8.0	8.0	156	150	110	105	46	45	37	36	16	15		
21	8.0	8.1	154	146	109	102	45	44	38	37	14	13		
22	8.1	8.1	158	146	111	101	47	45	37	36	16	14		
23	8.1	8.1	148	144	110	104	38	40	36	37	14	13	19.0	23.0
24	8.1	8.1	142	138	117	106	25	32	41	38	10	10	19.5	22.0
25	8.1	8.1	138	136	113	104	25	32	42	39	8	6		
26	8.1	8.0	134	142	108	107	26	35	38	46	9	7		
27	8.1	8.1	142	136	106	103	36	33	37	36	12	11		
28	8.1	8.1	130	126	108	103	22	23	38	38	9	7		
29	8.2	8.1	138	132	108	101	30	31	39	36	10	10		
30	8.2	8.0	136	136	109	102	27	34	41	44	8	6		
31														
Avg.	8.1	8.1	150.8	145.3	113.9	107.9	36.9	37.4	40.4	39.7	12.2	11.3	19.6	22.5
Max	8.2	8.3	168.0	160.0	131.0	119.0	49.0	48.0	46.0	46.0	16.0	16.0	21.0	24.0
Min.	7.9	7.9	130.0	126.0	106.0	101.0	22.0	22.0	36.0	36.0	5.0	5.0	18.0	21.5

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				Tap
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1			1	A	70	1	15	14.0	0.9128	38	1.65	1.32
2			1	A	29	2	14	14.0	0.9212	39	1.65	1.27
3			1	A	28	0	10	13.5	0.9324	39	1.64	1.29
4			1	A	30	0	10	12.5	0.9856	41	1.63	1.31
5	0.92	CH	1	A	0	0	13	12.0	1.0178	41	1.60	1.35
6	1.18	CH	1	A	40	1	13	12.5	1.0220	39	1.53	1.33
7	1.08	bt	1	A	44	2	12	13.0	1.0598	41	1.52	1.26
8	1.25	SS	1	A	35	0	11	12.5	0.9702	38	1.55	1.44
9	0.84	BZ	1	A	51	0	11	12.0	0.9156	38	1.62	1.19
10			1	A	69	0	13	14.5	0.9324	15	0.62	1.32
11			1	A	64	0	11	14.0	0.9758	43	1.74	1.22
12	1.08	CH	1	A	79	0	14	14.0	1.0024	43	1.69	1.28
13	1.06	CH	1	A	97	0	16	14.0	0.9576	45	1.84	1.24
14	1.21	W	1	A	48	0	15	14.0	0.9562	46	1.90	1.31
15	0.75	BS	1	A	75	3	17	16.0	1.0276	40	1.56	1.32
16	1.09	SS	1	A	32	2	17	16.0	0.9095	42	1.81	1.48
17	0.79	BZ	1	A	61	0	16	15.5	1.0392	51	1.93	1.18
18			1	A	52	0	16	16.5	1.0538	35	1.33	1.71
19	1.17	W	1	A	47	1	16	16.0	1.0384	53	2.01	1.30
20	1.18	CH	1	A	34	1	15	16.0	1.0758	53	1.94	1.05
21	1.49	BS	1	A	51	1	14	15.5	0.9923	48	1.89	1.38
22	1.22	BZ	1	A	62	3	14	15.0	1.0546	45	1.70	1.67
23	1.37	SS	1	A	73	1	14	14.5	1.0086	20	0.78	0.18
24			1	A	50	0	15	16.0	1.0392	52	1.96	0.37
25			1	A	41	0	17	16.0	1.0297	51	1.95	1.30
26			1	A	80	1	18	17.0	0.9826	44	1.78	1.76
27			1	A	26	0	17.0	17.0	1.0713	56	2.07	1.34
28			1	A	45	0	9.0	12.0	1.1406	40	1.38	1.34
29			1	A	74	0	8.7	8.5	1.0854	49	1.79	1.43
30			1	A	39	0	8.5	9.5	0.9528	45	1.88	1.43
31												
Total									30.0634	1,266.4		
AVG.	1.11		1	A	51	1	14	14	1.0021	42	1.66	1.28
Max	1.49				97	3	18	17	1.1406	56	2.07	1.76
Min	0.75				0	0	9	9	0.9095	15	0.62	0.18

DISTRIBUTION SYSTEM MONITORING WSSN 0600 June-19

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5	0.97		1.10	0.87	1.18		1.72			
6										
7										
8										
9										
10										
11										
12										
13	0.56		1.07	0.84	0.80		0.45			
14										
15										
16										
17										
18										
19	0.81		0.95	0.48	0.71		0.80			
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	15		
Total number of positive routine distribution samples	0600	0		
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.89	1.72	0.45
Total number of check samples	0600	0		
Total number of positive check samples	0600	0		

MI 0600 Benton Harbor MOR June 2020

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

SUPPLY NAME: CITY OF BENTON HARBOR

WSSN:600

Operator-in-Charge: Michael O'Malley (F1-S1)

Signature of Operator-in-Charge

Month/Year: June-20 (F1-S2)

Water Plant Classification: Berrien County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.105	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	170.00	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.99	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.96	Gallons Per Square Feet per Minute
Average Wash Water Use:	18.10%	Percent of Treated Water

Chemical Data

Chlorine on hand:	38885	lb.	Est. supply: 348	days
Primary Coagulant (Alum (Al3+)) on hand:	84593	lb.	Est. supply: 129	days
Cost of All Chemicals per Million Gallons:	$67.61	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:	90	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? **If yes,** attach specific filter(s) information and indicate required follow-up status.	NO
0.5 NTU in two consecutive measurements taken 15 minutes apart after 4 hours of operation? **If yes,** attach specific filter(s) information and indicate required follow-up status.	NO
1.0 NTU in two consecutive measurements taken 15 minutes apart for 3 consecutive months? **If yes,** attach specific filter(s) information and indicate required follow-up status.	NO
2.0 NTU in two consecutive measurements taken 15 minutes apart for 2 consecutive months? **If yes,** attach specific filter(s) information and indicate required follow-up status.	NO
Was continuous (every 15 minutes) filter monitoring equipment off-line during the month? *If yes, indicate date(s), duration, and individual filter grab sampling frequency on a separate sheet.*	NO
Did POE disinfectant residual fall below 0.2 ppm during the month? **If yes,** indicate date(s) and duration on a separate sheet.	NO
Was minimum C*T credit achieved for the entire month? **If no,** indicate on a separate sheet the date(s) not achieved.	YES
Was continuous POE chlorine residual monitoring equipment off-line during the month? **If yes,** indicate date(s) and duration on a separate sheet.	NO

Distribution	Total	27.7093	Avg	0.9554356	Max	1.015611	Min	0.87387

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
Changed OPP to 90/10 Carus Aquadene SK7661 and raise dose to 3.0 mg/L February 21, 2020
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

WSSN 0600 City of Benton Harbor Month/Year June-20

COAGULATION PARAMETERS

DAY	MIL. GAL. TREAT.	Dry Al2(SO3)4 Pounds Add	ALUM as Al3+ mg/l	TURBIDITY UNITS RAW Avg.	RAW Max.	Applied Avg.	# sample	FILTERED NORTH Avg.	FILTERED NORTH Max.	# Samples	FILTERED SOUTH Avg.	FILTERED SOUTH Max.	2 Hour Compliance Periods # of Periods	#of Periods >.30NTU North	#of Periods >.30NTU South
1	0.9525	347.00	1.92	3.30	6.30	0.69	3	0.09	0.10	3	0.08	0.11	6	0	0
2	0.8675	283.00	1.72	4.50	5.80	0.32	3	0.09	0.11	3	0.08	0.09	6	0	0
3	0.8875	324.00	1.92	5.30	8.30	0.45	3	0.07	0.07	3	0.09	0.10	6	0	0
4	1.1050	391.00	1.86	5.20	10.40	0.35	3	0.09	0.10	3	0.11	0.12	6	0	0
5	0.9400	252.00	1.41	4.40	7.20	0.38	3	0.09	0.10	3	0.09	0.11	6	0	0
6	0.9350	290.00	1.42	2.30	2.60	0.47	3	0.08	0.09	3	0.10	0.11	6	0	0
7	1.0125	313.00	1.63	3.60	6.10	0.44	3	0.08	0.09	3	0.09	0.10	6	0	0
8	0.9875	306.00	1.63	2.00	2.50	0.30	3	0.07	0.07	3	0.08	0.09	6	0	0
9	1.0900	336.00	1.62	3.20	3.60	0.39	3	0.08	0.10	3	0.08	0.09	6	0	0
10	0.9000	277.00	1.62	6.50	8.00	0.66	3	0.11	0.13	3	0.12	0.15	6	0	0
11	0.9600	338.00	1.85	5.60	6.50	0.33	3	0.09	0.10	3	0.08	0.09	6	0	0
12	0.9300	326.00	1.84	6.60	12.10	0.45	3	0.08	0.09	3	0.08	0.09	6	0	0
13	0.9275	324.00	1.84	6.20	8.50	0.32	3	0.11	0.13	3	0.10	0.11	6	0	0
14	0.9050	365.00	2.12	4.30	8.50	0.34	3	0.10	0.11	3	0.08	0.09	6	0	0
15	0.9700	299.00	1.62	2.00	2.80	0.29	3	0.08	0.08	3	0.08	0.09	6	0	0
16	1.0775	333.00	1.63	1.70	2.40	0.31	3	0.07	0.08	3	0.08	0.09	6	0	0
17	0.9850	300.00	1.60	1.70	2.80	0.34	3	0.07	0.07	3	0.08	0.09	6	0	0
18	0.9700	295.00	1.60	1.70	2.20	0.35	3	0.08	0.08	3	0.07	0.07	6	0	0
19	1.0450	320.00	1.61	2.60	3.70	0.29	3	0.07	0.08	3	0.07	0.07	6	0	0
20	1.0550	314.00	1.57	4.70	8.30	0.38	3	0.10	0.11	3	0.10	0.11	6	0	0
21	1.0275	307.00	1.57	4.60	8.00	0.33	3	0.10	0.10	3	0.10	0.10	6	0	0
22	0.9850	299.00	1.60	4.40	7.40	0.29	3	0.09	0.11	3	0.09	0.11	6	0	0
23	0.9550	289.00	1.59	5.60	10.90	0.35	3	0.08	0.09	3	0.09	0.09	6	0	0
24	1.0225	309.00	1.59	2.90	3.70	0.37	3	0.08	0.09	3	0.08	0.08	6	0	0
25	1.0550	317.00	1.58	3.80	4.10	0.36	3	0.08	0.08	3	0.08	0.08	6	0	0
26	1.0275	315.00	1.58	2.90	3.50	0.26	3	0.08	0.09	3	0.08	0.09	6	0	0
27	0.9175	281.00	1.61	3.60	4.80	0.33	3	0.08	0.09	3	0.08	0.09	6	0	0
28	0.9875	290.00	1.55	2.90	3.10	0.33	3	0.08	0.09	3	0.07	0.07	6	0	0
29	1.0200	310.00	1.60	5.60	10.30	0.36	3	0.08	0.09	3	0.09	0.10	6	0	0
30	1.0200	304.00	1.57	4.20	7.00	0.34	3	0.07	0.08	3	0.09	0.11	6	0	0
31															
Total	29.5200	9354.00					90			90			180	0	0
Avg.	0.9840	311.80	1.66	3.93	6.05	0.37		0.08	0.09		0.09		Total	Total	Total
Max.	1.1050	391.00	2.12	6.60	12.10	0.69		0.11	0.13		0.12	0.15	6	0	0
Min.	0.8675	252.00	1.41	1.70	2.20	0.26		0.07	0.07		0.07				

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **June-20**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.55	0.30	0.84		0	0.00	203	3.18	42	0.66	245	3.83	1.99	1.68	1.84
2	0.42	0.15	0.73		0	0.00	175	3.01	34	0.59	209	3.46	1.50	1.80	1.96
3	0.26	0.12	0.76		0	0.00	202	3.40	38	0.64	240	3.64	1.80	1.68	1.84
4	0.55	0.19	0.69		0	0.00	265	3.58	47	0.63	312	5.13	3.41	1.56	1.72
5	0.48	0.19	0.65		0	0.00	219	3.48	39	0.62	258	4.41	2.46	1.79	1.95
6	0.55	0.24	0.69		0	0.00	216	3.45	37	0.59	253	4.11	2.01	1.95	2.10
7	0.57	0.19	0.72		0	0.00	232	3.42	41	0.60	273	4.07	2.22	1.72	1.85
8	0.49	0.21	0.67		0	0.00	220	3.33	23	0.35	243	3.69	1.72	1.76	1.97
9	0.55	0.15	0.71		0	0.00	231	3.16	39	0.53	270	4.13	1.84	2.06	2.29
10	0.47	0.18	0.84		0	0.00	192	3.18	30	0.50	222	3.41	1.51	1.75	1.90
11	0.49	0.18	0.75		0	0.00	218	3.39	35	0.54	253	4.07	2.21	1.70	1.86
12	0.52	0.18	0.74		0	0.00	206	3.31	34	0.55	240	3.60	1.91	1.53	1.69
13	0.56	0.13	0.72		0	0.00	201	3.24	34	0.55	235	3.84	1.99	1.70	1.85
14	0.60	0.16	0.65		0	0.00	199	3.28	35	0.58	234	3.83	2.04	1.64	1.79
15	0.42	0.16	0.67		0	0.00	211	3.25	38	0.58	249	3.84	2.09	1.55	1.75
16	0.55	0.27	0.74		0	0.00	234	3.24	43	0.60	277	4.19	2.36	1.63	1.83
17	0.58	0.24	0.71		0	0.00	214	3.24	38	0.58	252	3.98	2.01	1.78	1.97
18	0.50	0.17	0.72		0	0.00	211	3.25	39	0.60	250	3.80	1.76	1.79	2.04
19	0.53	0.17	0.74		0	0.00	227	3.24	41	0.59	268	3.94	1.66	2.05	2.28
20	0.46	0.27	0.72		0	0.00	237	3.35	37	0.52	274	4.13	1.92	2.05	2.21
21	0.58	0.13	0.69		0	0.00	231	3.36	38	0.55	269	4.14	2.40	1.57	1.74
22	0.53	0.14	0.71		0	0.00	219	3.32	35	0.53	254	3.95	2.23	1.55	1.72
23	0.51	0.41	0.84		0	0.00	220	3.44	34	0.53	254	3.95	2.27	1.52	1.68
24	0.49	0.19	0.81	0.76	0	0.00	240	3.50	36	0.53	276	4.19	2.14	1.86	2.05
25	0.53	0.28	0.79		0	0.00	250	3.54	40	0.57	290	4.43	2.59	1.71	1.84
26	0.54	0.15	0.74		0	0.00	242	3.52	39	0.57	281	4.35	2.60	1.60	1.75
27	0.56	0.25	0.79		0	0.00	217	3.53	35	0.57	252	4.22	2.57	1.50	1.65
28	0.62	0.13	0.77		0	0.00	225	3.40	37	0.56	262	4.41	2.84	1.46	1.57
29	0.54	0.18	0.81		0	0.00	248	3.63	43	0.63	291	4.54	3.13	1.25	1.41
30	0.59	0.06	0.75		0	0.00	243	3.56	46	0.67	289	4.32	2.88	1.29	1.44
31															
Tot.							6,445		1,085		7,775				
Avg.	0.52	0.19	0.74	0.76	0.00	0.00	221.60	3.36	37.57	0.57	259.17	4.05	2.20	1.68	1.85
Max	0.62	0.41	0.84	0.76	0.00	0.00	265.00	3.63	47.00	0.67	312.00	5.13	3.41	2.06	2.29
Min.	0.26	0.06	0.65	0.76	0.00	0.00	175.00	3.01	23.00	0.35	209.00	3.41	1.50	1.25	1.41

WSSN 0600 | MONTH/YEAR | June-20 |

CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness as CaCO3		Total Alkalinity as CaCO3		Non-Carb. Hardness as CaCO3		Calcium as Ca++		Magnesium as Mg++		Chloride as Cl-	
D	pH													
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.0	156	150	109	102	47	48	38	37	15	14	18.0	20.5
2	8.1	7.9	160	152	117	100	43	52	38	37	16	15	18.5	21.0
3	8.1	8.1	168	156	125	104	43	52	40	42	17	13	18.0	21.0
4	8.1	8.2	168	158	124	108	44	50	38	36	18	17	18.5	21.0
5	8.2	8.2	166	156	120	111	46	45	40	39	16	14	18.0	20.5
6	8.1	8.2	154	150	113	114	41	36	43	39	11	13	26.0	27.0
7	8.3	8.2	140	146	109	114	31	32	42	46	8	8		
8	8.2	8.2	146	146	108	109	38	37	43	44	9	9	23.5	25.5
9	8.2	8.2	136	136	109	110	27	26	41	43	8	7		
10	8.2	8.2	156	148	111	105	45	43	37	37	16	14	20.0	23.0
11	8.1	8.1	158	150	114	105	44	45	38	37	16	14	19.0	22.5
12	8.3	8.2	158	152	112	106	46	46	41	39	14	13	18.5	21.5
13	8.2	8.2	156	148	112	104	44	44	38	36	15	14	18.5	22.5
14	8.2	8.1	156	148	112	104	44	44	38	36	15	14	18.5	22.0
15	8.1	8.2	136	136	108	106	28	30	39	40	9	9	24.0	25.5
16	8.1	8.2	140	144	108	113	32	31	40	42	10	9		
17	8.0	8.0	136	132	107	100	29	32	41	42	8	6		
18	8.0	8.1	138	136	110	103	28	33	42	43	8	7		
19	8.0	7.9	142	138	113	106	29	32	37	41	12	9		
20	8.0	8.1	156	146	111	100	45	46	35	34	17	15	18.5	22.0
21	8.0	8.0	156	148	110	103	46	45	37	35	16	15	17.5	21.5
22	8.1	8.1	160	152	112	103	48	49	37	36	17	15	18.5	22.0
23	8.1	8.1	162	156	115	105	47	51	37	35	17	17	19.5	22.0
24	8.3	8.2	138	136	113	105	25	31	37	39	11	9	22.5	23.5
25	8.3	8.2	142	138	115	106	27	32	38	38	12	10		
26	8.1	8.2	138	136	110	106	28	30	35	35	12	12		
27	8.3	8.2	136	134	107	105	29	29	37	37	11	10		
28	8.3	8.3	138	136	114	109	24	27	38	37	11	11		
29	8.2	8.0	160	154	111	102	49	52	39	38	15	15	19.0	23.0
30	8.1	8.1	154	148	110	104	44	44	39	37	14	13	19.0	22.5
31														
Avg.	8.1	8.1	150.3	145.5	112.3	105.7	38.0	39.8	38.8	38.6	13.1	12.0	19.7	22.5
Max	8.3	8.3	168.0	158.0	125.0	114.0	49.0	52.0	43.0	46.0	18.0	17.0	26.0	27.0
Min.	8.0	7.9	136.0	132.0	107.0	100.0	24.0	26.0	35.0	34.0	8.0	6.0	17.5	20.5

DISTRIBUTION SYSTEM MONITORING WSSN 0600 June-20

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3			06/05/2020	Bait Shed Positive Coliform						
4	0.52		1.26	1.31	1.46		0.84			
5	Up Stream	0.74		0.93	Down Str	0.70				
6	Up Stream	0.77		0.36	Down Str	0.45				
7										
8										
9										
10	1.23		1.60	1.05	1.10		0.96			
11										
12										
13										
14										
15										
16										
17	1.26		1.34	1.39	1.34		1.26			
18										
19										
20										
21										
22										
23										
24	1.06		1.12	0.97	1.16		1.07			
25										
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	32		
Total number of positive routine distribution samples	0600	1		
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.05	1.60	0.36
Total number of check samples	0600	6		
Total number of positive check samples	0600	0		

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A					High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap	'C	'C	To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1			1	A	66	1	9	10.0	0.9538	86	3.57	2.76
2			1	A	125	2	11	10.0	0.9029	76	3.33	3.03
3			1	A	28	0	14	10.5	0.9841	71	2.84	2.74
4	2.84	CH	1	A	56	0	13	12.5	0.9087	78	3.39	3.11
4	3.34	wolfs	1	A	29	0	13	13.0	0.8739	113	5.10	3.12
4	2.89	Bait	1	A	30	0	15	14.0	0.9180	79	3.41	3.09
4	2.76	Sunny	1	A	37	0	14	15.0	1.0012	79	3.14	3.13
4	2.52	BZ	1	A	44	0	11	14.0	0.9819	82	3.31	3.22
9			1	A	81	0	11	13.0	0.9762	82	3.31	3.03
10	2.73	CH	1	A	185	0	14	12.0	0.9730	70	2.85	3.13
10	2.87	wolfs	1	A	107	1	15	13.0	0.9284	28	1.18	3.05
10	3.05	Bait	1	A	53	0	16	14.0	0.9963	58	2.31	3.09
10	2.93	Sunny	1	A	31	0	15	14.5	0.9143	59	2.56	3.06
10	2.64	BZ	1	A	60	0	12	15.0	0.9729	78	3.38	3.05
15			1	A	33	0	11	16.0	0.9675	83	3.38	2.97
16			1	A	36	0	10	13.0	0.9869	83	3.34	3.00
17			1	A	52	0	11	14.0	0.9448	84	3.51	2.91
18			1	A	10	4	10	12.0	0.9815	86	3.47	2.74
19			1	A	42	1	13	13.0	1.0156	91	3.56	2.99
20			1	A	114	0	14	11.5	0.9905	45	1.81	2.73
21			1	A	78	0	14	12.5	0.9703	75	3.04	3.12
22			1	A	83	0	15	13.5	0.9596	86	3.56	3.27
23			1	A	55	0	18	14.0	0.9610	81	3.34	3.17
24	3.05	CH	1	A	68	0	20	17.0	0.9831	75	3.02	3.19
24	3.00	wolfs	1	A	77	0	20	18.0	0.9775	82	3.30	3.13
24	2.97	Bait	1	A	45	0	18	19.0	0.9637	82	3.38	2.91
24	2.96	Sunny	1	A	139	0	20.0	19.0	0.8924	47	2.09	2.68
24	2.65	BZ	1	A	17	1	9.0	12.0	0.8866	84	3.75	2.55
29			1	A	28	0	8.7	8.5	0.9578	94	3.89	
30			1	A	62	0	8.5	9.5	0.9986	104	4.11	2.42
31												
Totals									28.6631	2320.5		
AVG.	2.88		1	A	62	0	14	14	0.9554	77.4	3.19	2.99
Max	3.34				185	4	20	19	1.0156	112.6	5.10	3.27
Min	2.52				10	0	9	9	0.8739	27.7	1.18	2.42

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **March-19**

F1-S1 **F1-S2**

Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.2664	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	199.75	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.07	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.93	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.76%	Percent of Treated Water

Chemical Data

Chlorine on hand:	31815	lb.	Est. supply:	168	days
Primary Coagulant (Alum (Al3+)) on hand:	42495	lb.	Est. supply:	92	days
Cost of All Chemicals per Million Gallons:	$66.79	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:	92	88
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.

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	30.70932	Avg	1.0343368	Max	1.24356	Min	0.82712

Fluoride resumed 3/5/2019 after the Saturator to Day Tank Pump was fixed 3/4/2019
Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
I do not have this report ready for details of OPP treatment. I should soon.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **March-19**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l											TAP	
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use				
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.00	0.00	0.00		0	0.00	340	4.12	21	0.25	361	3.98	2.12	1.58	1.86
2	0.00	0.00	0.00		0	0.00	304	3.94	48	0.62	352	4.37	1.92	2.20	2.45
3	0.00	0.00	0.00		0	0.00	229	3.26	31	0.44	260	4.19	2.31	1.68	1.88
4	0.00	0.00	0.00		0	0.00	213	3.58	21	0.35	234	3.34	1.41	1.73	1.93
5	0.51	0.31	0.27		0	0.00	265	3.61	41	0.56	306	3.67	1.57	1.91	2.10
6	0.66	0.39	0.53		0	0.00	248	3.43	27	0.37	275	3.57	1.73	1.69	1.84
7	0.64	0.49	0.58		0	0.00	242	2.97	37	0.45	279	3.73	1.69	1.84	2.04
8	0.57	0.59	0.75		0	0.00	248	3.31	59	0.79	307	4.36	1.64	2.50	2.72
9	0.50	0.46	0.69		0	0.00	265	3.43	24	0.31	289	3.94	2.24	1.51	1.70
10	0.63	0.43	0.67		0	0.00	237	3.48	32	0.47	269	3.91	2.11	1.60	1.80
11	0.58	0.42	0.63		0	0.00	227	3.18	27	0.38	254	3.83	2.10	1.53	1.73
12	0.65	0.43	0.64		0	0.00	231	3.07	36	0.48	267	3.24	1.30	1.74	1.94
13	0.56	0.44	0.59	0.54	0	0.00	229	2.95	35	0.45	264	3.56	1.69	1.67	1.87
14	0.39				0	0.00	254	2.99	21	0.25	275	3.70	1.82	1.66	1.88
15	0.40	0.25	0.40		0	0.00	241	3.23	14	0.19	255	3.37	1.75	1.33	1.62
16	0.48	0.26	0.55		0	0.00	251	3.22	27	0.35	278	4.00	2.31	1.51	1.69
17	0.36	0.31	0.55		0	0.00	212	3.18	25	0.38	237	3.77	2.25	1.24	1.52
18	0.53	0.33	0.57		0	0.00	255	3.51	35	0.48	290	4.18	2.44	1.48	1.74
19	0.39	0.24	0.64		0	0.00	257	3.47	32	0.43	289	4.25	2.24	1.81	2.01
20	0.42	0.25	0.55	0.45	0	0.00	251	3.32	26	0.34	277	3.77	1.88	1.67	1.89
21	0.58	0.20	0.60		0	0.00	236	3.36	23	0.33	259	4.22	2.33	1.68	1.89
22	0.65	0.30	0.62		0	0.00	216	3.07	70	1.00	286	4.29	1.92	2.14	2.37
23	0.60	0.39	0.74		0	0.00	185	2.86	30	0.46	215	3.58	1.49	1.88	2.09
24	0.66	0.42	0.75		0	0.00	170	2.74	33	0.53	203	3.66	1.56	1.88	2.10
25	0.46	0.31	0.67		0	0.00	196	2.84	20	0.29	216	3.20	0.42	2.59	2.78
26	0.56	0.27	0.66		0	0.00	217	2.85	21	0.28	238	3.65	1.98	1.53	1.67
27	0.44	0.30	0.60		0	0.00	216	3.10	27	0.39	243	3.96	2.02	1.72	1.94
28	0.39	0.29	0.63		0	0.00	235	3.19	25	0.34	260	4.06	2.18	1.72	1.88
29	0.40	0.25	0.60		0	0.00	202	2.99	22	0.33	224	3.61	1.72	1.63	1.89
30	0.59	0.34	0.59		0	0.00	183	3.06	29	0.49	212	3.79	2.02	1.51	1.77
31	0.60	0.28	0.59		0	0.00	190	2.93	38	0.59	228	3.72	1.52	1.97	2.20
Tot.							6,905		936		8,202				
Avg.	0.45	0.30	0.52	0.50	0.00	0.00	235.17	3.24	30.63	0.43	265.80	3.83	1.87	1.74	1.95
Max	0.66	0.59	0.75	0.54	0.00	0.00	340.00	4.12	70.00	1.00	361.00	4.37	2.44	2.59	2.78
Min.	0.00	0.00	0.00	0.45	0.00	0.00	170.00	2.74	14.00	0.19	203.00	3.20	0.42	1.24	1.52

Pumpstat F feed reading

WSSN 0600 City of Benton Harbor Month/Year March-19

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	1.2311	355.00	1.52	6.20	6.40	2.20	3	0.10	0.13	3	0.11	0.13	6	0	0
2	1.1512	471.00	2.15	6.80	10.30	1.30	3	0.10	0.11	2	0.09	0.10	5	0	0
3	1.0500	331.00	1.66	6.60	8.60	0.64	3	0.10	0.12	0	0.10	0.13	3	0	0
4	0.8875	340.00	2.02	9.20	13.70	0.78	3	0.10	0.12	3	0.09	0.11	6	0	0
5	1.0950	341.00	1.64	3.60	4.00	0.71	3	0.10	0.11	3	0.09	0.09	6	0	0
6	1.0800	384.00	1.66	4.30	7.40	0.56	3	0.11	0.12	3	0.10	0.12	6	0	0
7	1.2166	486.00	2.10	3.20	3.40	0.55	3	0.11	0.13	3	0.10	0.14	6	0	0
8	1.1200	325.00	1.53	2.70	3.10	0.68	3	0.09	0.10	3	0.09	0.10	6	0	0
9	1.1541	370.00	1.69	2.70	4.20	0.93	3	0.14	0.17	3	0.16	0.18	6	0	0
10	1.0180	338.00	1.75	2.60	2.90	0.53	3	0.11	0.12	3	0.11	0.15	6	0	0
11	1.0650	340.00	1.68	1.90	3.00	0.47	3	0.08	0.09	3	0.13	0.15	6	0	0
12	1.1250	369.00	1.73	2.60	4.80	0.50	3	0.07	0.07	3	0.11	0.15	6	0	0
13	1.1600	360.00	1.63	1.40	2.50	0.38	3	0.08	0.10	3	0.13	0.14	6	0	0
14	1.2664	403.00	1.67	2.80	3.90	1.10	3	0.09	0.13	3	0.19	0.23	6	0	0
15	1.1130	315.00	1.49	4.50	5.50	1.30	3	0.08	0.11	3	0.22	0.23	6	0	0
16	1.1619	362.00	1.64	4.20	4.70	0.94	3	0.09	0.09	3	0.08	0.08	6	0	0
17	0.9950	319.00	1.69	1.70	2.10	0.46	3	0.06	0.07	3	0.07	0.08	6	0	0
18	1.0850	345.00	1.67	2.00	2.70	0.48	3	0.06	0.07	3	0.07	0.08	6	0	0
19	1.1050	353.00	1.68	2.90	3.60	0.64	3	0.06	0.06	3	0.08	0.08	6	0	0
20	1.1300	359.00	1.67	3.40	5.50	0.52	3	0.07	0.07	3	0.07	0.08	6	0	0
21	1.0475	329.00	1.65	2.40	4.00	0.51	3	0.07	0.07	3	0.07	0.07	6	0	0
22	1.0500	321.00	1.61	1.50	1.80	0.44	3	0.06	0.07	3	0.07	0.07	6	0	0
23	0.9650	291.00	1.59	1.70	2.10	0.41	3	0.07	0.08	3	0.06	0.07	6	0	0
24	0.9263	285.00	1.62	3.10	4.20	0.47	3	0.07	0.08	3	0.08	0.09	6	0	0
25	1.0300	325.00	1.66	2.80	3.60	0.44	3	0.08	0.09	3	0.08	0.10	6	0	0
26	1.1375	345.00	1.66	1.80	1.80	0.29	3	0.06	0.07	3	0.06	0.07	6	0	0
27	1.0400	325.00	1.64	2.70	2.90	0.54	3	0.08	0.08	3	0.08	0.09	6	0	0
28	1.1000	343.00	1.64	3.10	3.80	0.56	3	0.07	0.08	3	0.07	0.08	6	0	0
29	1.0100	319.00	1.66	1.80	1.80	0.40	3	0.10	0.10	2	0.10	0.10	4	0	0
30	0.8925	283.00	1.67	1.80	3.20	0.37	3	0.08	0.09	3	0.09	0.12	6	0	0
31	0.9675	300.00	1.63	1.60	2.20	0.32	3	0.08	0.08	3	0.07	0.08	6	0	0
Total	33.3761	10732.00					93			88			180	0	0
Avg.	1.0766	346.19	1.69	3.21	4.31	0.66		0.08	0.10		0.10		Total	Total	Total
Max	1.2664	486.00	2.15	9.20	13.70	2.20		0.14	0.17		0.22	0.23	6	0	0
Min.	0.8875	283.00	1.49	1.40	1.80	0.29		0.06	0.06		0.06				

WSSN 0600 MONTH/YEAR March-19

CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	7.9	7.9	182	142	151	107	31	35	55	39	11	11		
2	7.9	8.0	184	172	136	123	48	49	46	44	17	15		
3	8.1	8.0	176	190	123	126	53	64	46	49	15	17		
4	7.9	7.9	168	184	112	119	56	65	42	48	15	16	46.5	27.5
5	8.0	7.9	188	168	130	114	58	54	49	43	16	15		
6	7.9	7.9	188	178	135	124	53	54	50	47	16	15		
7	7.9	7.9	184	180	116	125	68	55	49	47	15	15		
8	7.9	7.8	206	174	127	116	79	58	59	49	15	13		
9	8.0	8.0	194	180	139	124	55	56	50	46	17	16		
10	7.9	7.9	208	210	128	129	80	81	58	55	16	18		
11	7.9	7.9	188	184	122	125	66	59	50	48	16	16		
12	7.9	7.9	188	190	124	125	64	65	51	52	15	15		
13	7.8	7.8	176	186	115	119	61	67	44	47	16	17		
14	7.9	7.8	174	170	130	119	44	51	57	50	8	11	29.0	25.5
15	7.9	7.8	164	168	119	124	45	44	51	53	9	9		
16	7.9	7.9	174	176	121	122	53	54	54	52	10	11		
17	7.8	7.9	166	172	130	118	36	54	55	51	7	11	19.0	21.5
18	8.1	7.7	182	178	124	125	58	53	47	49	15	14		
19	8.0	0.0	190	182	122	119	68	63	63	58	8	9		
20	8.0	8.0	194	190	132	126	62	64	49	48	17	17		
21	7.9	7.8	192	178	133	123	59	55	51	47	16	15		
22	7.9	7.9	186	178	129	127	57	51	49	46	16	15		
23	8.0	8.0	172	186	117	125	55	61	45	49	15	16	21.0	24.0
24	8.0	8.0	188	174	125	118	63	56	51	46	15	14		
25	8.1	7.8	146	156	112	119	34	37	46	49	7	8		
26	8.0	7.9	158	166	106	116	52	50	46	48	10	11	18.5	22.0
27	8.0	8.0	206	158	145	112	61	46	62	59	13	4		
28	8.0	8.0	174	162	133	123	41	39	47	46	14	11		
29	7.9	7.9	166	172	117	120	49	52	47	50	12	12		
30	8.0	8.0	172	182	119	128	53	54	44	48	15	15		
31	8.0	8.0	160	180	116	121	44	59	40	47	15	15		
Avg.	7.9	7.6	181.1	176.2	125.7	121.3	55.4	54.9	50.4	48.8	13.6	13.4	26.8	24.1
Max	8.1	8.0	208.0	210.0	151.0	129.0	80.0	81.0	63.0	59.0	17.0	18.0	46.5	27.5
Min.	7.8	0.0	146.0	142.0	106.0	107.0	31.0	35.0	42.0	39.0	7.0	4.0	18.5	21.5

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS

D	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
							TEMP.	TEMP.	___True		___Cold	
A	No. of Samples	Colilert P/A	No. of Samples	Colilert P/A			'C	'C	___Appar.		___60'C	
T					Raw	Tap			Raw	Tap	Raw	Tap
E												
1			1	A	131	0	2	4.0				
2			1	A	43	1	2	3.0				
3			1	A	28	1	2	3.5				
4			1	A	44	1	2	2.5				
5			1	A	89	0	2	2.5				
6			1	A	69	0	2	2.5				
7			1	A	90	0	2	2.0				
8			1	A	56	0	2	2.0				
9			1	A	75	0	2	2.5				
10			1	A	72	1	2	3.0				
11			1	A	33	0	2	2.5				
12			1	A	17	1	2	2.5				
13			1	A	29	0	2	3.5				
14			1	A	20	0	4	5.0				
15			1	A	57	0	4	5.0				
16			1	A	59	0	4	7.0				
17			1	A	43	0	4	6.0				
18			1	A	77	1	4	5.0				
19			1	A	72	1	5	6.0				
20			1	A	38	0	4	4.5				
21			1	A	82	0	4	5.0				
22			1	A	37	1	4	5.0				
23			1	A	36	1	3	0.0				
24			1	A	16	0	4	4.0				
25			1	A	46	0	3	6.0				
26			1	A	29	1	3	5.5				
27			1	A	39	0	5.0	6.0				
28			1	A	56	6	9.0	12.0				
29			1	A	54	29	8.7	8.5				
30			1	A	61	2	8.5	9.5				
31			1	A	46	1	3.2	5.5				
AVG.			1	A	53	2	3	5				
Max					131	29	9	12				
Min					16	0	2	0				

DISTRIBUTION SYSTEM MONITORING WSSN 0600 March-19

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13	1.18		1.07	1.19	0.94		0.93			
14										
15										
16										
17										
18										
19										
20	0.93		1.15	0.34	0.96		1.00			
21										
22										
23										
24										
25										
26										
27	1.19		1.21	1.15	1.15		1.59			
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	15		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.07	1.59	0.34
Total number of check samples	0600			
Total number of positive check samples	0600			

MI 0600 Benton Harbor May 2020 MOR 6/4/20

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** **F1-S1**

Signature of Operator-in-Charge

Month/Year **May-20** **F1-S2**

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.0925	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	171.25	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.93	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.94	Gallons Per Square Feet per Minute
Average Wash Water Use:	9.55%	Percent of Treated Water

Chemical Data

Chlorine on hand:	38885	lb.	Est. supply:	127	days
Primary Coagulant (Alum (Al3+)) on hand:	27403	lb.	Est. supply:	136	days
Sodium Fluoride (NaF) on hand	2250	lb.	Est. supply:	51	days
Orthopolyphosphate on Hand (SK7661)	4703	lb.	Est. supply:	268	days
Cost of All Chemicals per Million Gallons:	$64.41	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:	92	92
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.~~

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	26.191698	Avg	0.8767278	Max	0.996586	Min	0.77845

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
Changed OPP to 90/10 Carus Aquadene SK7661 and raise dose to 3.0 mg/L February 21, 2020
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **May-20**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
DATE	Fluoride Applied as Fmg/l	Raw mg/l	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	0.56	0.25	0.81		0	0.00	204	3.12	29	0.44	233	3.52	1.80	1.56	1.72
2	0.51	0.20	0.92		0	0.00	191	3.26	36	0.61	227	4.20	2.22	1.74	1.98
3	0.53	0.29	0.86		0	0.00	201	3.17	32	0.50	233	3.84	1.88	1.71	1.96
4	0.52	0.26	0.96		0	0.00	243	3.32	35	0.48	278	4.25	2.61	1.49	1.64
5	0.52	0.22	0.87		0	0.00	197	3.17	31	0.50	228	3.97	2.27	1.55	1.70
6	0.45	0.18	0.86		0	0.00	191	2.95	30	0.46	221	3.51	1.69	1.66	1.82
7	0.56	0.34	0.84		0	0.00	173	2.94	29	0.49	202	3.69	1.84	1.69	1.85
8	0.54	0.27	0.87		0	0.00	208	2.94	31	0.44	239	4.15	2.31	1.68	1.84
9	0.58	0.31	0.89		0	0.00	189	3.09	38	0.62	227	3.75	2.25	1.39	1.50
10	0.40	0.33	0.84		0	0.00	195	3.02	35	0.54	230	4.22	2.20	1.85	2.02
11	0.54	0.19	0.83		0	0.00	205	3.02	36	0.53	241	4.30	2.36	1.73	1.94
12	0.35	0.24	0.81		0	0.00	172	3.04	27	0.48	199	3.56	1.86	1.58	1.70
13	0.58	0.29	0.94	0.81	0	0.00	211	3.32	33	0.52	244	3.74	1.90	1.69	1.84
14	0.51	0.27	0.85		0	0.00	196	3.18	33	0.54	229	4.19	2.25	1.77	1.94
15	0.56	0.25	0.89		0	0.00	168	3.13	28	0.52	196	3.48	1.53	1.78	1.95
16	0.59	0.28	0.91		0	0.00	166	3.05	28	0.51	194	3.44	1.56	1.73	1.88
17	0.50	0.29	0.84		0	0.00	171	2.87	30	0.50	201	3.19	1.76	1.28	1.43
18	0.51	0.31	0.87		0	0.00	193	3.04	39	0.61	232	4.08	1.80	2.10	2.28
19	0.52	0.36	0.89		0	0.00	191	2.99	33	0.52	224	3.79	1.91	1.66	1.88
20	0.50	0.35	0.88		0	0.00	193	3.01	35	0.55	228	3.85	1.86	1.85	1.99
21	0.58	0.27	0.88	0.81	0	0.00	184	2.99	31	0.50	215	4.12	1.87	1.96	2.25
22	0.53				0	0.00	170	2.92	29	0.50	199	3.53	1.73	1.63	1.80
23	0.42	0.39	0.89		0	0.00	142	2.27	31	0.50	173	2.98	1.15	1.68	1.83
24	0.54	0.30	0.86		0	0.00	161	3.03	30	0.57	191	3.37	1.59	1.62	1.78
25	0.44	0.37	0.85		0	0.00	188	2.99	39	0.62	227	3.40	1.51	1.75	1.89
26	0.61	0.21	0.85		0	0.00	189	3.11	38	0.63	227	3.77	1.64	1.96	2.13
27	0.53	0.28	0.85		0	0.00	198	3.03	41	0.63	239	3.72	1.46	2.08	2.26
28	0.60	0.33	0.86		0	0.00	182	2.92	35	0.56	217	3.58	1.39	1.99	2.19
29	0.56	0.36	0.89		0	0.00	182	2.93	36	0.58	218	3.73	1.52	2.21	2.21
30	0.55	0.40	0.92		0	0.00	167	2.76	110	1.82	277	5.31	3.19	1.98	2.12
31	0.53	0.34	0.88		0	0.00	179	2.82	35	0.55	214	3.68	1.62	1.85	2.06
Tot.							5,596		1,074		6,903				
Avg.	0.52	0.29	0.87	0.81	0.00	0.00	187.37	3.02	35.60	0.58	222.97	3.81	1.90	1.75	1.91
Max	0.61	0.40	0.96	0.81	0.00	0.00	243.00	3.32	110.00	1.82	278.00	5.31	3.19	2.21	2.28
Min.	0.35	0.18	0.81	0.81	0.00	0.00	142.00	2.27	27.00	0.44	173.00	2.98	1.15	1.28	1.43

WSSN 0600 City of Benton Harbor Month/Year May-20

COAGULATION PARAMETERS

DAY	MIL. GAL. TREAT.	Dry Al2(SO3)4 Pounds Add	ALUM as Al3+ mg/l	TURBIDITY UNITS RAW Avg.	RAW Max.	Applied Avg.	# sample	FILTERED NORTH Avg.	FILTERED NORTH Max.	# Samples	FILTERED SOUTH Avg.	FILTERED SOUTH Max.	2 Hour Compliance Periods # of Periods	#of Periods >.30NTU North	#of Periods >.30NTU South
1	0.9775	303.00	1.63	16.20	26.50	2.00	3	0.09	0.10	3	0.10	0.10	6	0	0
2	0.8750	266.00	1.60	7.10	7.30	1.00	3	0.07	0.08	3	0.08	0.10	6	0	0
3	0.9475	294.00	1.63	9.20	12.10	1.00	3	0.08	0.09	3	0.08	0.09	6	0	0
4	1.0925	310.00	1.49	10.90	12.70	1.40	3	0.08	0.09	3	0.12	0.15	6	0	0
5	0.9275	292.00	1.66	10.50	14.80	1.00	3	0.08	0.10	3	0.09	0.10	6	0	0
6	0.9675	253.00	1.59	10.80	14.90	2.30	3	0.10	0.13	3	0.17	0.26	6	0	0
7	0.8775	339.00	2.03	9.00	14.70	0.57	3	0.09	0.11	3	0.11	0.12	6	0	0
8	1.0550	318.00	1.59	8.20	10.00	0.63	3	0.10	0.11	3	0.10	0.14	6	0	0
9	0.9125	266.00	1.53	11.60	15.10	0.63	3	0.09	0.10	3	0.09	0.09	6	0	0
10	0.9625	296.00	1.62	14.80	16.30	1.10	3	0.10	0.10	3	0.11	0.12	6	0	0
11	1.0150	312.00	1.62	13.10	13.90	0.96	3	0.10	0.11	3	0.10	0.11	6	0	0
12	0.8450	264.00	1.64	15.00	16.40	1.00	2	0.09	0.09	2	0.10	0.11	4	0	0
13	0.9500	266.00	1.47	12.80	20.20	1.50	3	0.14	0.21	3	0.13	0.19	6	0	0
14	0.9200	283.00	1.62	8.20	11.60	0.75	3	0.09	0.11	3	0.08	0.08	6	0	0
15	0.8000	252.00	1.66	14.00	21.10	0.88	3	0.09	0.10	3	0.09	0.11	6	0	0
16	0.8125	266.00	1.72	7.40	13.60	0.72	3	0.09	0.10	3	0.09	0.09	6	0	0
17	0.8900	272.00	1.61	7.00	12.50	0.50	3	0.11	0.12	3	0.08	0.09	6	0	0
18	0.9475	298.00	1.65	4.90	7.00	0.49	3	0.08	0.09	3	0.08	0.08	6	0	0
19	0.9550	304.00	1.67	4.90	6.00	0.49	3	0.07	0.07	3	0.08	0.09	6	0	0
20	0.9575	299.00	1.64	5.60	8.20	0.62	3	0.07	0.08	3	0.08	0.10	6	0	0
21	0.9175	233.00	1.34	4.70	6.30	1.20	3	0.09	0.09	3	0.08	0.09	6	0	0
22	0.8700	274.00	1.66	4.90	6.70	0.56	3	0.07	0.08	3	0.08	0.09	6	0	0
23	0.9325	292.00	1.65	3.90	6.20	0.54	3	0.10	0.11	3	0.08	0.09	6	0	0
24	0.7925	243.00	1.61	8.40	11.40	0.42	3	0.10	0.11	3	0.09	0.10	6	0	0
25	0.9375	281.00	1.58	3.60	5.40	0.55	3	0.10	0.10	3	0.08	0.09	6	0	0
26	0.9075	318.00	1.58	4.20	5.60	0.42	3	0.11	0.13	3	0.10	0.12	6	0	0
27	0.9750	307.00	1.66	1.90	2.30	0.32	3	0.08	0.09	3	0.07	0.08	6	0	0
28	0.9300	288.00	1.63	2.00	2.20	0.37	3	0.08	0.09	3	0.09	0.10	6	0	0
29	0.9275	286.00	1.62	2.70	4.30	0.30	3	0.07	0.08	3	0.08	0.08	6	0	0
30	0.9025	278.00	1.62	2.50	3.90	0.30	3	0.07	0.07	3	0.08	0.09	6	0	0
31	0.9475	292.00	1.62	2.20	2.80	0.29	3	0.07	0.07	3	0.08	0.09	6	0	0
Total	28.7275	8845.00					92			92			184	0	0
Avg.	0.9267	285.32	1.62	7.81	10.71	0.80		0.09	0.10		0.09		Total	Total	Total
Max	1.0925	339.00	2.03	16.20	26.50	2.30		0.14	0.21		0.17	0.26	6	0	0
Min.	0.7925	233.00	1.34	1.90	2.20	0.29		0.07	0.07		0.07				

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1		0	1	A	43	0	9	9.5	0.9869	75	3.02	2.64
2		0	1	A	64	0	9	10.5	0.8220	83	4.00	
3		0	1	A	65	0	11	10.0	0.9067	85	3.72	2.80
4		0	1	A	51	0	10	10.0	0.9762	81	3.29	2.77
5		0	1	A	81	0	10	10.0	0.8581	66	3.03	2.58
6		0	1	A	63	0	10	10.0	0.9389	80	3.39	2.86
7		0	1	A	52	0	11	10.5	0.8163	87	4.23	2.87
8		0	1	A	28	0	10	10.5	0.8607	85	3.92	3.27
9		0	1	A	64	0	10	12.0	0.9036	72	3.14	3.12
10		0	1	A	28	0	10	10.5	0.8134	89	4.33	3.18
11		0	1	A	83	0	12	12.0	0.8373	77	3.65	3.03
12		0	1	A	102	0	11	12.0	0.8344	70	3.32	2.88
13	2.88	City Hall	1	A	79	0	10	10.0	0.9727	79	3.21	2.93
13	2.67	Wolfs	1	A	63	0	10	10.5	0.8167	75	3.55	3.20
13	2.86	Bait Shed	1	A	66	0	10	10.5	0.8402	70	3.29	3.03
13	2.91	Sunny Spot	1	A	60	0	11	10.5	0.8416	77	3.62	3.13
13	2.78	B & Z	1	A	39	0	10	11.5	0.9393	72	3.05	2.97
18		0	1	A	49	0	11	12.0	0.8486	77	3.57	3.13
19		0	1	A	83	0	10	12.0	0.8818	76	3.43	3.25
20		0	1	A	58	0	10	12.0	0.8847	75	3.35	3.15
21	2.74	City Hall	1	A	54	0	10	11.5	0.7785	82	4.15	2.98
21	1.79	Wolfs	1	A	71	4	11	12.0	0.8419	78	3.64	3.03
21	2.51	Bait Shed	1	A	59	1	10	10.5	0.8666	81	3.69	3.20
21	2.62	Sunny Spot	1	A	78	1	11	10.5	0.8471	89	4.16	3.25
21	2.77	B & Z	1	A	70	0	12	11.0	0.9966	85	3.38	2.86
26		0	1	A	45	3	11	11.5	0.8988	87	3.83	3.22
27		0	1	A	54	0	12.0	13.0	0.9585	93	3.84	3.20
28		0	1	A	66	0	9.0	12.0	0.9247	90	3.86	
29		0	1	A	35	0	8.7	8.5	0.8728	38	1.73	
30		0	1	A	15	0	8.5	9.5	0.7794	93	4.71	2.94
31		0	1	A	31	0	10.0	13.0	0.8677	85	3.89	3.00
Totals									27.2126	2451.1		
AVG.	2.65		1	A	59	0	10	11	0.8778	79.1	3.60	3.03
Max	2.91				102	4	12	13	0.9966	93.0	4.71	3.27
Min	1.79				15	0	9	9	0.7785	38.1	1.73	2.58

DISTRIBUTION SYSTEM MONITORING WSSN 0600 May-20

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13	1.09		0.49	1.17	1.27		1.03			
14										
15										
16										
17										
18										
19										
20										
21	1.42		0.22	1.20	1.32		1.02			
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	10		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.02	1.42	0.22
Total number of check samples	0600			
Total number of positive check samples	0600			

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** **F1-S1**

Signature of Operator-in-Charge

Month/Year **November-19** **F1-S2**

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.0975	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	196.00	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.01	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.95	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.78%	Percent of Treated Water

Chemical Data

Chlorine on hand:	37875	lb.	Est. supply:	257 days
Primary Coagulant (Alum (Al3+)) on hand:	66324	lb.	Est. supply:	125 days
Cost of All Chemicals per Million Gallons:	$67.75	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:	90	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?	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	27.6451	Avg	0.95333	Max	1.1354	Min	0.7336

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

WSSN 0600 City of Benton Harbor Month/Year November-19

COAGULATION PARAMETERS

D A T E	MIL. GAL. TREAT.	Dry Al2(SO3)4 Pounds Add	ALUM as Al3+ mg/l	TURBIDITY UNITS RAW Avg.	RAW Max.	Applied Avg.	# ample	FILTERED NORTH Avg.	FILTERED NORTH Max.	# Samples	FILTERED SOUTH Avg.	FILTERED SOUTH Max.	2 Hour Compliance Periods # of Periods	#of Periods >.30NTU North	#of Periods >.30NTU South
1	0.9525	314.00	1.73	12.30	18.30	0.62	3	0.06	0.08	3	0.06	0.07	6	0	0
2	0.7550	230.00	1.60	18.50	20.00	1.30	3	0.07	0.07	3	0.08	0.08	6	0	0
3	1.0825	352.00	1.71	17.10	25.50	1.20	3	0.08	0.09	3	0.08	0.10	6	0	0
4	0.9775	325.00	1.75	13.30	14.10	1.10	3	0.10	0.12	3	0.10	0.12	6	0	0
5	0.9975	349.00	1.84	11.20	13.90	1.10	3	0.07	0.08	3	0.10	0.11	6	0	0
6	1.0100	313.00	1.82	8.90	11.00	1.00	3	0.10	0.11	3	0.10	0.11	6	0	0
7	1.0275	323.00	1.65	9.60	11.80	0.92	3	0.09	0.10	3	0.12	0.13	6	0	0
8	0.9675	290.00	1.58	8.80	9.40	0.88	3	0.08	0.08	3	0.09	0.10	6	0	0
9	1.0075	305.00	1.59	10.90	19.30	1.10	3	0.09	0.10	3	0.11	0.13	6	0	0
10	0.8750	277.00	1.67	7.60	11.90	1.10	3	0.09	0.10	3	0.06	0.08	6	0	0
11	1.0075	312.00	1.63	5.80	7.00	0.84	3	0.07	0.07	3	0.07	0.08	6	0	0
12	0.9500	301.00	1.67	10.10	16.20	0.84	3	0.07	0.07	3	0.07	0.07	6	0	0
13	1.0275	321.00	1.64	13.00	15.50	1.60	3	0.08	0.10	3	0.06	0.08	6	0	0
14	1.0500	322.00	1.61	13.40	26.20	2.00	3	0.12	0.12	3	0.08	0.08	6	0	0
15	1.0650	323.00	1.60	10.90	15.70	1.40	3	0.10	0.12	3	0.07	0.07	6	0	0
16	1.0800	339.00	1.65	5.20	5.60	1.20	3	0.11	0.13	3	0.08	0.08	6	0	0
17	1.0375	326.00	1.65	5.50	7.60	1.20	3	0.14	0.15	3	0.08	0.09	6	0	0
18	1.0625	322.00	1.59	4.20	4.40	1.30	3	0.12	0.13	3	0.08	0.08	6	0	0
19	0.9250	287.00	1.63	7.20	13.80	0.97	3	0.10	0.12	3	0.08	0.08	6	0	0
20	1.0975	337.00	1.62	5.90	11.40	0.99	3	0.08	0.09	3	0.07	0.09	6	0	0
21	1.0775	326.00	1.59	3.60	4.30	1.00	3	0.10	0.14	3	0.08	0.08	6	0	0
22	1.0950	333.00	1.60	7.70	9.40	0.89	3	0.08	0.08	3	0.08	0.08	6	0	0
23	1.0650	308.00	1.52	6.00	7.40	0.87	3	0.06	0.07	3	0.08	0.08	6	0	0
24	0.9875	297.00	1.58	4.90	5.00	0.66	3	0.06	0.06	3	0.08	0.09	6	0	0
25	0.9975	300.00	1.58	4.00	5.40	0.59	3	0.06	0.07	3	0.07	0.07	6	0	0
26	1.0900	322.00	1.58	3.40	4.70	0.56	3	0.06	0.07	3	0.07	0.08	6	0	0
27	1.0425	318.00	1.60	4.70	5.90	1.00	3	0.07	0.08	3	0.07	0.08	6	0	0
28	0.9350	310.00	1.74	10.60	14.40	0.80	3	0.06	0.07	3	0.05	0.06	6	0	0
29	0.9250	276.00	1.57	27.90	33.70	2.30	3	0.07	0.07	3	0.07	0.08	6	0	0
30	0.9275	314.00	1.78	19.00	26.60	2.60	3	0.08	0.09	3	0.08	0.08	6	0	0
31														0	0
Total	30.0975	9372.00					90			90			180	0	0
Avg.	1.0033	312.40	1.65	9.71	13.18	1.13		0.08	0.09		0.08		Total	Total	Total
Max	1.0975	352.00	1.84	27.90	33.70	2.60		0.14	0.15		0.12	0.13	6	0	0
Min.	0.7550	230.00	1.52	3.40	4.30	0.56		0.06	0.06		0.05				

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **November-19**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l											TAP	
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use				
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.47	0.14	0.77		0	0.00	210	3.29	21	0.33	231	3.61	1.75	1.70	1.86
2	0.43	0.39	0.79		0	0.00	172	3.40	14	0.28	186	3.78	2.03	1.59	1.75
3	0.51	0.27	0.78		0	0.00	266	3.67	32	0.44	298	4.16	2.49	1.51	1.67
4	0.61	0.29	0.79		0	0.00	261	3.99	40	0.61	301	4.78	3.00	1.58	1.78
5	0.44	0.25	0.76		0	0.00	285	4.27	41	0.61	326	5.31	3.64	1.51	1.67
6	0.59	0.48	0.82	0.85	0	0.00	267	3.95	25	0.37	292	4.59	2.85	1.57	1.74
7	0.48	0.29	0.85		0	0.00	282	4.10	31	0.45	313	4.73	2.68	1.91	2.05
8	0.56	0.33	0.82		0	0.00	264	4.07	18	0.28	282	4.51	2.90	1.46	1.61
9	0.51	0.29	0.80		0	0.00	263	3.90	23	0.34	286	4.50	2.65	1.66	1.85
10	0.60	0.29	0.82		0	0.00	245	4.18	33	0.56	278	4.85	2.90	1.76	1.95
11	0.40	0.27	0.81		0	0.00	250	3.70	52	0.77	302	4.59	2.50	1.91	2.09
12	0.55	0.29	0.82	0.78	0	0.00	227	3.57	38	0.60	265	4.07	2.02	1.86	2.05
13	0.50	0.26	0.79		0	0.00	235	3.41	31	0.45	266	3.92	1.98	1.77	1.94
14	0.53	0.18	0.76		0	0.00	254	3.61	34	0.48	288	4.14	2.36	1.55	1.78
15	0.60	0.16	0.71		0	0.00	261	3.66	30	0.42	291	4.16	2.36	1.58	1.80
16	0.43	0.17	0.76		0	0.00	264	3.65	36	0.50	300	4.55	2.44	1.91	2.11
17	0.55	0.23	0.71		0	0.00	254	3.65	21	0.30	275	4.26	2.49	1.58	1.77
18	0.56	0.24	0.64		0	0.00	263	3.70	55	0.77	318	4.71	2.61	1.93	2.10
19	0.52	0.15	0.63		0	0.00	222	3.58	26	0.42	248	4.13	2.14	1.81	1.99
20	0.66	0.34	0.78	0.78	0	0.00	258	3.51	28	0.38	286	3.76	1.73	1.84	2.03
21	0.50	0.39	0.85		0	0.00	254	3.52	27	0.37	281	4.53	2.53	1.82	2.00
22	0.49	0.29	0.83		0	0.00	251	3.42	28	0.38	279	4.28	2.45	1.66	1.83
23	0.50	0.36	0.87		0	0.00	244	3.42	37	0.52	281	4.54	2.56	1.75	1.98
24	0.49	0.39	0.74		0	0.00	233	3.52	19	0.29	252	3.73	2.02	1.46	1.71
25	0.47	0.40	0.79		0	0.00	236	3.53	28	0.42	264	4.07	2.12	1.79	1.95
26	0.51	0.53	0.86		0	0.00	254	3.48	25	0.34	279	4.21	2.63	1.38	1.58
27	0.52	0.24	0.78		0	0.00	249	3.57	28	0.40	277	4.27	2.73	1.38	1.54
28	0.47	0.33	0.79		0	0.00	215	3.43	14	0.22	229	3.98	2.28	1.53	1.70
29	0.50	0.17	0.82		0	0.00	209	3.37	19	0.31	228	4.12	2.20	1.75	1.92
30	0.56	0.24	0.82		0	0.00	209	3.36	21	0.34	230	4.13	2.21	1.75	1.92
Tot.							7,147		854		8,232				
Avg.	0.52	0.29	0.79	0.80	0.00	0.00	245.23	3.65	29.17	0.43	274.40	4.30	2.44	1.68	1.86
Max	0.66	0.53	0.87	0.85	0.00	0.00	285.00	4.27	55.00	0.77	326.00	5.31	3.64	1.93	2.11
Min.	0.40	0.14	0.63	0.78	0.00	0.00	172.00	3.29	14.00	0.22	186.00	3.61	1.73	1.38	1.54

WSSN 0600

MONTH/YEAR November-19

CITY OF BENTON HARBOR CHEMICAL ANALYSES

			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	
D A T E	pH Raw 29.	pH Tap 30.	Raw 31.	Tap 32.	Raw 33.	Tap 34.	Raw 35.	Tap 36.	Raw 37	Tap 38	Raw 39	Tap 40	Raw 41	Tap 42
1	7.9	7.9	162	156	112	106	50	50	41	40	15	14	18.0	21.5
2	8.1	8.1	176	160	137	106	39	54	40	38	18	16		
3	8.1	8.1	196	178	131	111	65	67	54	49	15	14		
4	8.1	8.1	170	150	137	116	33	34	54	47	9	8	24.0	25.5
5	8.0	8.1	172	162	131	125	41	37	49	51	12	9		
6	8.1	7.8	186	178	123	119	63	59	45	43	18	17		
7	8.0	8.1	168	162	134	122	34	40	52	51	9	9		
8	8.1	8.1	144	146	115	119	29	27	45	46	8	8		
9	8.1	8.0	192	174	128	112	64	62	46	42	19	17		
10	8.0	8.0	184	166	138	114	46	52	44	42	18	15		
11	8.1	8.1	176	186	115	119	61	67	46	49	15	16		
12	8.0	8.1	176	180	113	114	63	66	46	49	15	14		
13	8.0	8.0	184	174	117	112	67	62	50	42	15	17		
14	8.2	7.9	182	152	154	121	28	31	63	52	6	5	23.5	24.0
15	8.1	7.9	148	158	116	119	32	39	51	52	5	7		
16	8.0	8.1	154	152	122	116	32	36	47	45	9	10		
17	8.1	8.1	168	160	129	121	39	39	51	49	10	9		
18	7.9	8.1	190	170	133	115	57	55	46	43	18	15		
19	8.0	8.1	172	176	122	120	50	56	45	48	15	16		
20	8.1	8.1	186	178	127	118	59	60	46	45	17	16		
21	8.0	8.1	196	180	138	117	58	63	51	46	17	16		
22	8.3	8.2	178	184	132	122	46	62	45	48	16	16	19.0	23.0
23	8.1	8.0	142	156	117	124	25	32	42	46	9	10		
24	8.1	8.1	162	158	122	121	40	37	47	46	11	10		
25	8.0	7.9	162	164	126	127	36	37	50	50	9	8	19.5	25.5
26	8.1	8.2	170	166	143	127	27	39	55	55	8	7		
27	8.1	8.1	198	178	138	120	60	58	51	46	17	15	19.0	23.5
28	8.0	8.1	176	188	111	120	65	68	49	51	13	15		
29	8.0	8.0	174	178	114	109	60	69	42	46	17	16		
30	7.9	8.0	170	174	115	107	55	67	41	45	17	15		
31														
Avg.	8.1	8.1	173.8	168.1	126.3	117.3	47.5	50.8	47.8	46.7	13.3	12.7	20.5	23.8
Max	8.3	8.2	198.0	188.0	154.0	127.0	67.0	69.0	63.0	55.0	19.0	17.0	24.0	25.5
Min.	7.9	7.8	142.0	146.0	111.0	106.0	25.0	27.0	40.0	38.0	5.0	5.0	18.0	21.5

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1			1	A	75	0	11	12.5	0.9548	46	1.91	1.54
2			1	A	93	0	11	12.5	0.7336	50	2.68	1.45
3			1	A	119	0	11	12.0	1.0696	47	1.73	1.46
4			1	A	119	9	10	11.5	0.9394	45	1.87	1.37
5			1	A	108	0	10	12.0	0.9170	50	2.16	1.62
6	1.47	City Hall	1	A	102	0	10	10.5	0.9492	49	2.03	1.55
6	1.39	Wolfs	1	A	97	0	10	11.0	0.9884	51	2.02	1.54
6	1.58	Bait Shed	1	A	164	0	10	11.0	0.9338	53	2.24	1.48
6	1.57	Sunny Spot	1	A	95	1	8	10.0	0.9478	45	1.88	1.51
6	1.33	B & Z	1	A	102	0	8	9.5	0.8554	52	2.41	0.00
11			1	A	111	0	8	9.0	0.9828	51	2.03	1.48
12	1.52	City Hall	1	A	168	0	8	9.0	0.9716	36	1.45	1.47
12	1.34	Wolfs	1	A	109	1	7	8.5	1.0136	54	2.11	1.46
12	1.45	Bait Shed	1	A	152	0	7	9.0	1.0374	60	2.28	1.56
12	1.40	Sunny Spot	1	A	146	0	7	8.0	1.0430	54	2.05	1.56
12	1.25	B & Z	1	A	50	2	6	8.5	0.9842	58	2.32	1.47
17			1	A	74	4	7	8.0	0.9639	59	2.43	1.53
18			1	A	58	0	7	7.0	1.0080	56	2.21	1.50
19			1	A	79	0	6	6.5	0.8960	58	2.54	1.57
20	1.66	City Hall	1	A	86	0	6	7.0	1.1354	56	1.94	1.50
20	1.47	Wolfs	1	A	98	1	6	6.5	0.9268	57	2.44	1.41
20	1.51	Bait Shed	1	A	85	0	7	7.5	0.9730	19	0.79	1.47
20	1.45	Sunny Spot	1	A	98	0	7	8.0	0.9240	58	2.48	1.51
20	1.24	B & Z	1	A	72	0	7	8.0	1.0080	65	2.54	1.56
25			1	A	58	0	7	8.0	0.9688	39	1.60	1.45
26			1	A	45	12	7	8.0	0.9898	52	2.07	1.49
27			1	A	153	0	7.2	7.5	0.9688	50	2.05	1.47
28			1	A	163	0	9.0	12.0	0.8582	46	2.11	1.52
29			1	A	236	0	8.7	8.5	0.8260	44	2.11	1.52
30			1	A	95	0	8.5	9.5	0.8316	46	2.20	1.48
			1									
Totals									28.5999	1502.5		
AVG.	1.44		1	A	108	1	8	9	0.9533	50.1	2.10	1.45
Max	1.66				236	12		13	1.1354	64.6	2.68	1.62
Min	1.24				45	0	6	7	0.7336	19.4	0.79	0.00

DISTRIBUTION SYSTEM MONITORING WSSN 0600 November-19

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6	1.47		1.15	1.00	1.06		0.53			
7										
8										
9										
10										
11										
12	1.26		1.16	0.88	1.37		0.99			
13										
14										
15										
16										
17										
18										
19										
20	1.28		1.15	1.26	1.11		0.98			
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	15	
Total number of positive routine distribution samples	0600		
Total number of routine distribution samples required	0600	10	Max Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.11	1.47 0.53
Total number of check samples	0600		
Total number of positive check samples	0600		

BNI 0600 Benton Harbor MOR October 2019 11/7/19

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

SUPPLY NAME: CITY OF BENTON HARBOR

WSSN:600

Operator-in-Charge **Michael O'Malley** F1-S1

Signature of Operator-in-Charge

Month/Year **October-19** F1-S2

Water Plant Classification

Berrien County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.1552	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	193.75	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.99	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.97	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.73%	Percent of Treated Water

Chemical Data

Chlorine on hand:	47470	lb.	Est. supply:	234 days
Primary Coagulant (Alum (Al3+)) on hand:	92933	lb.	Est. supply:	155 days
Cost of All Chemicals per Million Gallons:	$79.34	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:	93	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.	
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	27.692576	Avg	0.923167	Max	1.0796	Min	0.7748

Remarks. We have been feeding Orthopolyphosphate (OPP) 70/30 Carus 8600 33% since March 25, 2019
Averaging about 2,200 lbs per month: 221 Days so far. Started 2nd Round of Lead and Copper Sampling.

WSSN 0600 City of Benton Harbor Month/Year October-19

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS												
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	1.0075	292.00	1.52	2.90	3.30	0.26	3	0.06	0.06	3	0.07	0.07	6	0	0
2	0.9550	337.00	1.86	2.70	4.10	0.33	3	0.08	0.08	3	0.07	0.08	6	0	0
3	1.0425	427.00	2.15	3.80	5.70	0.25	3	0.08	0.08	3	0.08	0.08	6	0	0
4	0.9475	311.00	1.73	3.30	3.80	0.29	3	0.08	0.08	3	0.06	0.07	6	0	0
5	1.0150	313.00	1.62	2.50	2.60	0.34	3	0.08	0.09	3	0.06	0.07	6	0	0
6	1.0200	302.00	1.61	4.30	5.20	0.54	3	0.09	0.10	3	0.07	0.08	6	0	0
7	1.0825	363.00	1.76	4.60	5.80	0.54	3	0.09	0.10	3	0.07	0.08	6	0	0
8	1.0400	352.00	1.78	4.10	5.50	0.43	3	0.08	0.09	3	0.07	0.08	6	0	0
9	1.0475	321.00	1.61	3.80	4.70	0.44	3	0.08	0.09	3	0.07	0.08	6	0	0
10	1.0275	278.00	1.42	3.50	4.50	0.34	3	0.07	0.08	3	0.07	0.07	6	0	0
11	1.0575	329.00	1.64	2.80	4.40	0.30	3	0.07	0.08	3	0.07	0.08	6	0	0
12	1.0450	324.00	1.63	8.60	9.90	0.37	3	0.07	0.07	3	0.07	0.07	6	0	0
13	0.9725	296.00	1.60	4.70	6.70	0.42	3	0.06	0.07	3	0.07	0.07	6	0	0
14	1.1552	320.00	1.46	4.60	6.50	0.30	3	0.07	0.08	3	0.09	0.11	6	0	0
15	0.9750	312.00	1.68	4.50	8.80	0.24	3	0.07	0.08	3	0.08	0.08	6	0	0
16	1.0400	315.00	1.59	4.50	4.70	0.32	3	0.08	0.09	3	0.07	0.08	6	0	0
17	0.8825	280.00	1.67	11.90	16.10	0.51	3	0.09	0.10	3	0.08	0.09	6	0	0
18	1.0025	340.00	1.78	8.90	12.70	0.56	3	0.07	0.07	3	0.08	0.09	6	0	0
19	0.8800	190.00	1.14	6.50	7.70	0.61	3	0.07	0.08	3	0.08	0.08	6	0	0
20	0.9825	328.00	1.76	6.90	11.10	0.40	3	0.08	0.09	3	0.08	0.08	6	0	0
21	0.9525	295.00	1.63	5.90	8.80	0.34	3	0.07	0.07	3	0.08	0.08	6	0	0
22	0.9550	247.00	1.36	9.70	12.20	1.40	3	0.09	0.10	3	0.10	0.12	6	0	0
23	1.0575	352.00	1.75	7.20	9.90	0.35	3	0.08	0.10	3	0.08	0.08	6	0	0
24	0.9300	295.00	1.67	11.90	16.70	0.27	3	0.08	0.08	3	0.08	0.08	6	0	0
25	0.9250	284.00	1.62	6.00	10.10	0.38	3	0.07	0.08	3	0.08	0.09	6	0	0
26	0.8700	268.00	1.62	5.70	10.10	0.40	3	0.07	0.08	3	0.07	0.08	6	0	0
27	1.0700	275.00	1.35	7.60	12.40	0.80	3	0.08	0.08	3	0.08	0.09	6	0	0
28	0.9800	295.00	1.58	4.80	5.30	0.51	3	0.07	0.09	3	0.07	0.08	6	0	0
29	0.9775	290.00	1.56	4.50	5.20	0.51	3	0.08	0.09	3	0.08	0.09	6	0	0
30	0.9975	295.00	1.56	5.70	9.90	0.40	3	0.07	0.08	3	0.07	0.08	6	0	0
31	0.9475	282.00	1.57	5.00	6.20	0.41	3	0.06	0.07	3	0.07	0.07	6	0	0
Total	30.8402	9508.00					93			93			186	0	0
Avg.	0.9948	306.71	1.62	5.59	7.76	0.44		0.08	0.08		0.07		Total	Total	Total
Max	1.1552	427.00	2.15	11.90	16.70	1.40		0.09	0.10		0.10	0.12	6	0	0
Min.	0.8700	190.00	1.14	2.50	2.60	0.24		0.06	0.06		0.06				

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **October-19**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l											TAP	
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use				
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.47	0.23	0.81		0	0.00	420	6.22	40	0.59	460	7.42	5.74	1.47	1.68
2	0.60	0.26	0.75		0	0.00	416	6.50	60	0.94	476	7.80	5.83	1.77	1.97
3	0.57	0.15	0.71		0	0.00	433	6.20	61	0.87	494	6.99	4.99	1.83	2.00
4	0.53	0.25	0.78		0	0.00	321	5.06	47	0.74	368	5.68	3.86	1.63	1.82
5	0.50	0.29	0.80		0	0.00	418	6.15	43	0.63	461	7.30	5.57	1.60	1.73
6	0.52	0.30	0.79		0	0.00	424	6.21	27	0.40	451	7.74	6.12	1.52	1.62
7	0.63	0.46	0.78		0	0.00	490	6.76	47	0.65	537	8.98	7.43	1.41	1.55
8	0.60	0.30	0.81		0	0.00	536	7.69	93	1.33	629	9.47	8.04	1.30	1.43
9	0.54	0.32	0.81	0.82	0	0.00	584	8.32	117	1.67	701	9.69	7.74	1.75	1.95
10	0.39	0.26	0.81		0	0.00	555	8.06	68	0.99	623	10.54	8.70	1.66	1.84
11	0.52	0.31	0.77		0	0.00	504	7.11	1	0.01	505	7.67	6.23	1.30	1.44
12	0.56	0.25	0.81		0	0.00	545	7.79	0	0.00	545	8.94	7.11	1.67	1.83
13	0.57	0.26	0.81		0	0.00	512	7.86	33	0.51	545	10.50	8.60	1.78	1.90
14	0.47	0.29	0.77		0	0.00	540	6.98	81	1.05	621	9.36	6.82	2.36	2.54
15	0.52	0.29	0.80		0	0.00	487	7.46	39	0.60	526	9.06	6.94	1.92	2.12
16	0.56	0.27	0.79		0	0.00	474	6.80	19	0.27	493	7.85	5.78	1.92	2.07
17	0.50	0.22	0.84	0.71	0	0.00	404	6.83	17	0.29	421	7.72	5.79	1.78	1.93
18	0.55	0.28	0.80		0	0.00	527	7.85	26	0.39	553	9.42	7.43	1.89	1.99
19	0.55	0.05	0.66		0	0.00	266	4.51	39	0.66	305	5.36	2.76	2.40	2.60
20	0.51	0.30	0.63		0	0.00	255	3.87	19	0.29	274	4.46	2.18	2.09	2.28
21	0.55	0.19	0.72		0	0.00	238	3.73	16	0.25	254	4.12	1.98	1.95	2.14
22	0.57	0.24	0.62		0	0.00	234	3.66	16	0.25	250	4.17	2.10	1.88	2.07
23	0.56	0.26	0.64	0.66	0	0.00	252	3.56	38	0.54	290	4.32	1.70	2.42	2.62
24	0.59	0.24	0.82		0	0.00	216	3.47	38	0.61	254	4.29	2.02	2.10	2.27
25	0.52	0.18	0.61		0	0.00	205	3.31	32	0.52	237	3.86	1.71	1.99	2.15
26	0.76	0.32	0.69		0	0.00	184	3.16	19	0.33	203	3.50	1.63	1.69	1.87
27	0.58	0.27	0.68		0	0.00	223	3.11	16	0.22	239	3.79	1.95	1.64	1.84
28	0.47	0.27	0.75		0	0.00	218	3.32	23	0.35	241	3.78	2.12	1.49	1.66
29	0.62	0.30	0.78		0	0.00	226	3.45	21	0.32	247	4.07	2.56	1.37	1.51
30	0.51	0.34	0.74		0	0.00	233	3.49	60	0.90	293	4.44	2.57	1.71	1.87
31	0.49	0.33	0.76		0	0.00	282	4.44	15	0.24	297	4.85	3.10	1.60	1.75
Tot.							11,202		1,131		12,793				
Avg.	0.55	0.27	0.75	0.73	0.00	0.00	378.00	5.62	38.53	0.57	416.53	6.74	4.80	1.78	1.94
Max	0.76	0.46	0.84	0.82	0.00	0.00	584.00	8.32	117.00	1.67	701.00	10.54	8.70	2.42	2.62
Min.	0.39	0.05	0.61	0.66	0.00	0.00	184.00	3.11	0.00	0.00	203.00	3.50	1.63	1.30	1.43

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CITY OF BENTON HARBOR 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	
A														
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	8.2	8.1	152	146	109	107	43	39	41	40	12	11		
2	8.0	8.1	156	148	110	105	46	43	39	38	14	13		
3	8.0	7.9	154	148	107	104	47	44	38	37	14	14		
4	8.2	8.1	164	158	118	117	46	41	40	38	16	15		
5	7.9	8.0	138	140	111	106	27	34	39	42	10	9		
6	8.2	8.2	156	142	127	104	29	38	47	42	9	9		
7	8.0	8.1	178	148	138	109	40	39	51	43	12	10		
8	8.0	8.1	172	158	136	117	36	41	51	49	11	9	19.0	19.5
9	8.1	8.0	158	162	124	120	34	42	45	46	11	12		
10	8.0	8.2	156	164	117	124	39	40	47	51	9	9		
11	8.1	8.1	144	162	113	122	31	40	42	46	10	11		
12	8.1	8.1	144	150	118	114	26	36	45	46	8	8		
13	8.1	7.9	146	148	112	112	34	36	42	45	10	9		
14	8.3	8.1	164	158	121	111	43	47	40	42	16	13		
15	8.1	7.9	164	158	112	107	52	51	42	41	14	14	20.0	24.5
16	8.1	8.1	146	140	116	107	30	33	44	45	9	7	21.0	24.0
17	8.2	8.1	152	142	121	109	31	33	42	44	11	8		
18	8.0	8.0	150	146	111	108	39	38	45	42	9	10		
19	8.1	8.0	166	154	114	106	52	48	40	38	16	14		
20	8.0	8.1	162	156	113	106	49	50	38	37	17	16	19.5	23.5
21	8.1	7.9	154	148	110	105	44	43	38	38	14	13		
22	8.2	7.9	194	154	145	115	49	39	46	38	19	15		
23	8.0	8.1	160	162	110	100	50	62	38	42	16	14		
24	8.1	7.9	162	152	114	103	48	49	42	41	14	12		
25	8.1	8.0	162	150	111	103	51	47	41	40	15	12		
26	8.1	8.1	172	152	119	103	53	49	42	39	17	13		
27	8.2	8.0	184	154	130	104	54	50	44	39	18	14		
28	8.1	8.0	162	156	128	105	34	51	47	46	11	10	21.5	23.0
29	8.2	8.1	152	154	121	111	31	43	46	46	9	9		
30	8.1	8.0	162	156	115	110	47	46	42	41	14	13		
31	8.0	8.1	170	162	110	107	60	55	43	42	15	14		
Avg.	8.1	8.0	159.5	152.2	118.4	109.1	41.2	43.1	42.8	42.1	12.8	11.5	20.2	22.9
Max	8.3	8.2	194.0	164.0	145.0	124.0	54.0	62.0	51.0	51.0	19.0	16.0	21.5	24.5
Min.	7.9	7.9	138.0	140.0	107.0	100.0	26.0	33.0	38.0	37.0	8.0	7.0	19.0	19.5

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1		0	1	A	66	0	18	19.0	0.9692	56	2.29	1.88
2			1	A	30	0	18	17.5	0.9540	41	1.72	1.40
3			1	A	54	1	18	18.0	1.1162	27	0.96	1.10
4			1	A	24	0	19	18.5	0.9694	46	1.86	1.39
5			1	A	83	0	14	19.0	0.9970	44	1.73	1.91
6			1	A	93	1	17	18.0	0.9173	42	1.82	1.29
7			1	A	134	0	18	17.0	0.9413	45	1.91	0.00
8			1	A	100	0	17	18.0	1.0320	45	1.71	1.25
9	1.52	City Hall	1	A	100	0	17	18.0	1.1290	41	1.43	1.33
9	1.28	Wolfs	1	A	85	1	17	18.0	0.9298	47	1.98	1.34
9	1.29	Bait Shed	1	A	58	0	16	17.0	1.0431	51	1.93	1.38
9	1.27	Sunny Spot	1	A	48	0	16	17.0	0.9615	48	1.97	1.63
9	1.40	B&Z	1	A	64	12	16	17.0	0.8060	47	2.30	1.89
14			1	A	78	1	15	17.5	1.0518	45	1.70	1.31
15			1	A	58	0	15	15.5	0.9144	44	1.92	0.00
16			1	A	122	0	16	17.0	0.9913	54	2.15	1.53
17	1.55	Bait Shed	1	A	44	2	14	16.0	0.8539	41	1.91	0.00
17	1.77	Wolfs	1	A	46	1	14	15.3	0.9278	52	2.20	1.32
17	1.71	City Hall	1	A	29	0	14	14.5	0.8942	43	1.92	1.51
17	1.56	Sunny Spot	1	A	133	0	14	14.3	0.9701	53	2.17	0.77
17	1.42	B&Z	1	A	67	0	15	14.5	0.9711	49	1.99	1.51
21			1	A	132	0	14	14.5	0.9442	49	2.04	1.59
22	1.44	City Hall	1	A	41	0	13	14.5	1.0643	49	1.82	1.50
22	1.29	Wolfs	1	A	24	0	13	14.0	0.9383	47	1.97	2.82
22	1.36	Bait Shed	1	A	77	1	13	13.5	1.2009	55	1.80	1.89
22	1.39	Sunny Spot	1	A	94	0	13	13.0	1.1464	59	2.04	1.85
22	1.19	B&Z	1	A	78	0	12.5	13.0	1.2206	54	1.74	2.01
27	0.78	City Hall	1	A	471	0	9.0	12.0	1.2580	47	1.47	1.22
27	1.19	Wolfs	1	A	43	1	8.7	8.5	1.2118	26	0.85	1.23
27	1.48	Bait Shed	1	A	48	0	8.5	9.5	1.2915	45	1.38	1.41
27	1.34	Sunny Spot	1	A	76	1	12.5	13.0	1.2133	47	1.53	1.46
Totals									31.8296	1436.7		
AVG.	1.38		1	A	84	1	14	15	1.0268	46.3	1.80	1.36
Max	1.77				471	12	19	19	1.2915	59.0	2.30	2.82
Min	0.78				24	0	9	9	0.8060	26.1	0.85	0.00

DISTRIBUTION SYSTEM MONITORING WSSN 0600 October-19

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1	1.07		0.78	0.54	0.73		0.69			
2										
3										
4										
5										
6										
7										
8										
9	0.79		0.70	0.87	0.42		0.60			
10										
11										
12										
13										
14										
15										
16										
17	1.49		0.79	0.62	0.94		0.59			
18										
19										
20										
21										
22										
23	0.25		1.19	1.03	1.08		0.85			
24										
25										
26										
27										
28										
29										
30	1.10		1.01	0.92	1.04		0.72			
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

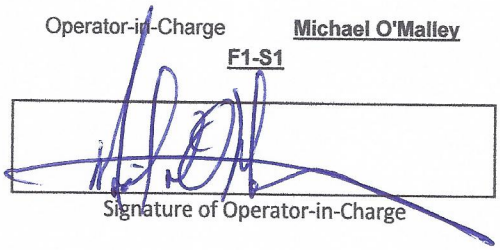
Total number of routine distribution samples analyzed	0600	25		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.83	1.49	0.25
Total number of check samples	0600			
Total number of positive check samples	0600			

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** **F1-S1**



Signature of Operator-in-Charge

Month/Year **September-18** **F1-S2**

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.3039	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	257.50	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.07	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.06	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.81%	Percent of Treated Water

Chemical Data

Chlorine on hand:	10605	lb.	Est. supply:	143	days
Primary Coagulant (Alum (Al3+)) on hand:	45672	lb.	Est. supply:	35	days
Cost of All Chemicals per Million Gallons:	$68.94	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:	90	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? 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.

Remarks:

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **September-18**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		SETTLED		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.41	0.27	0.64		0	0.00	441	6.23	70	0.99	511	18.55	16.78	1.64	1.77
2	0.43	0.30	0.64		0	0.00	403	6.10	67	1.01	470	20.65	18.54	1.93	2.11
3	0.43	0.21	0.66		0	0.00	406	6.04	69	1.03	475	19.83	17.97	1.74	1.86
4	0.55	0.25	0.68		0	0.00	413	6.02	68	0.99	481	25.20	23.55	1.49	1.65
5	0.49	0.19	0.73	0.59	0	0.00	474	6.34	74	0.99	548	16.37	14.37	1.82	2.00
6	0.43	0.19	0.60		0	0.00	527	6.03	73	0.84	600	20.29	18.42	1.70	1.87
7	0.48	0.35	0.68		0	0.00	339	4.74	67	0.94	406	13.41	11.43	1.80	1.98
8	0.54	0.29	0.77		0	0.00	313	4.25	70	0.95	383	12.24	9.79	2.27	2.45
9	0.56	0.27	0.74		0	0.00	253	4.18	57	0.94	310	13.89	12.06	1.66	1.83
10	0.49	0.33	1.01		0	0.00	307	4.54	67	0.99	374	15.69	13.32	2.13	2.37
11	0.46	0.34	0.65		0	0.00	283	3.89	48	0.66	331	10.99	8.44	2.32	2.55
12	0.42	0.40	0.66	0.57	0	0.00	276	3.67	44	0.59	320	9.85	7.65	2.02	2.20
13	0.50	0.40	0.73		0	0.00	275	3.53	40	0.51	315	15.74	13.48	2.03	2.26
14	0.40	0.32	0.67		0	0.00	269	3.46	38	0.49	307	8.65	6.54	1.87	2.11
15	0.51	0.28	0.64		0	0.00	265	3.54	37	0.49	302	11.07	8.98	1.91	2.09
16	0.58	0.30	0.72		0	0.00	264	3.61	35	0.48	299	9.63	7.54	1.91	2.09
17	0.55	0.25	0.74		0	0.00	237	3.31	32	0.45	269	8.53	6.36	1.98	2.17
18	0.55	0.20	0.74		0	0.00	241	3.21	31	0.41	272	8.53	6.43	1.93	2.10
19	0.43	0.40	0.82		0	0.00	223	3.24	21	0.31	244	12.21	10.54	1.47	1.67
20	0.35	0.27	0.70		0	0.00	224	3.20	23	0.33	247	9.22	7.70	1.41	1.52
21	0.47	0.35	0.70		0	0.00	240	3.28	37	0.51	277	17.03	15.04	1.82	1.99
22	0.41	0.32	0.65		0	0.00	240	3.29	23	0.32	263	8.08	6.43	1.48	1.65
23	0.56	0.29	0.68		0	0.00	252	3.38	31	0.42	283	8.66	7.03	1.47	1.63
24	0.56	0.26	0.65		0	0.00	273	3.55	39	0.51	312	8.92	7.47	1.29	1.45
25	0.58	0.24	0.67	0.68	0	0.00	280	3.78	45	0.61	325	10.18	8.48	1.53	1.70
26	0.48	0.25	0.74		0	0.00	256	3.70	45	0.65	301	11.96	10.23	1.56	1.73
27	0.66	0.10	0.56		0	0.00	266	4.01	43	0.65	309	11.33	9.54	1.61	1.79
28	0.47	0.23	0.72		0	0.00	279	4.09	49	0.72	328	12.57	11.04	1.37	1.53
29	0.35	0.25	0.75		0	0.00	247	3.81	44	0.68	291	11.39	9.50	1.71	1.89
30	0.42	0.24	0.68		0	0.00	247	3.80	43	0.66	290	12.85	11.02	1.67	1.83
31															
Tot.	14.50						8,572		1,360		10,443	393.51			
Avg.	0.48	0.28	0.70	0.61	0.00	0.00	300.43	4.19	47.67	0.67	348.10	13.12	11.19	1.75	1.93
Max	0.66	0.40	1.01	0.68	0.00	0.00	527.00	6.34	74.00	1.03	600.00	25.20	23.55	2.32	2.55
Min.	0.35	0.10	0.56	0.57	0.00	0.00	223.00	3.20	21.00	0.31	244.00	8.08	6.36	1.29	1.45

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CITY OF BENTON HARBOR 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	
A T E	Raw 29.	Tap 30.	Raw 31.	Tap 32.	Raw 33.	Tap 34.	Raw 35.	Tap 36.	Raw 37	Tap 38	Raw 39	Tap 40	Raw 41	Tap 42
1	8.0	7.8	146	142	106	104	40	38	41	40	11	10	23.0	26.5
2	7.9	8.0	144	138	104	105	40	33	44	39	8	10		
3	8.0	7.9	138	132	108	101	30	31	43	39	7	8		
4	8.0	7.8	144	146	105	105	39	41	42	39	10	12		
5	8.3	8.1	168	146	117	101	51	45	38	36	17	14		
6	8.2	8.0	150	146	110	105	40	41	36	35	15	14		
7	8.0	8.0	150	142	109	103	41	39	37	36	14	13		
8	8.1	8.1	152	148	108	104	44	44	37	35	15	15	18.0	20.5
9	8.1	8.0	150	142	108	101	42	41	37	36	14	13		
10	7.8	7.6	148	136	106	103	42	33	46	39	8	9	16.5	20.5
11	7.7	7.5	138	134	106	98	32	36	42	38	8	9		
12	7.7	7.7	142	138	104	99	38	39	41	39	10	10		
13	7.7	7.6	142	138	110	100	32	38	43	42	8	8		
14	7.9	7.7	144	140	105	99	39	41	38	37	12	12		
15	8.0	8.0	144	140	108	101	36	39	35	36	14	12		
16	8.2	7.9	146	138	108	99	38	39	36	35	14	12		
17	8.1	7.9	146	138	108	101	38	37	37	35	13	12		
18	8.2	7.9	146	140	107	102	39	38	36	35	14	13	17.5	19.5
19	8.1	7.7	136	138	108	102	28	36	39	38	9	10	19.0	21.5
20	8.1	7.9	144	136	109	105	35	31	41	39	10	9		
21	8.1	7.9	142	138	108	102	34	36	41	38	10	10		
22	8.1	7.9	142	134	110	103	32	31	42	38	9	9		
23	8.0	7.9	152	134	117	102	35	32	44	40	10	8		
24	8.1	8.0	152	148	109	106	43	42	38	37	14	14		
25	8.1	7.9	154	146	112	106	42	40	38	37	14	13		
26	8.2	8.1	162	152	118	104	44	48	40	39	15	13		
27	8.1	8.0	184	152	133	108	51	44	46	39	17	13	17.5	22.5
28	8.1	8.2	166	154	126	112	40	42	38	37	17	15		
29	8.2	7.9	136	146	118	116	18	30	41	42	8	10	19.0	22.0
30	8.1	7.9	148	138	109	116	39	22	43	42	10	3		
Avg.	8.0	7.9	148.5	141.3	110.5	103.8	38.1	37.6	40.0	37.9	11.8	11.1	18.6	21.9
Max	8.3	8.2	184.0	154.0	133.0	116.0	51.0	48.0	46.0	42.0	17.0	15.0	23.0	26.5
Min.	7.7	7.5	136.0	132.0	104.0	98.0	18.0	22.0	35.0	35.0	7.0	3.0	16.5	19.5

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.	True		Cold	
A	Samples	P/A	Samples	P/A			'C	'C	Appar.		60'C	
T					Raw	Tap			Raw	Tap	Raw	Tap
E												
1			1	A	104	0	20	21.0				
2			1	A	78	0	15	20.0				
3			1	A	262	1	22	20.0				
4			1	A	137	1	21	19.0				
5			1	A	67	0	19	18.5				
6			1	A	53	0	19	19.0				
7			1	A	154	0	13	19.5				
8			1	A	110	0	13	18.0				
9			1	A	113	0	11	16.0				
10			1	A	81	0	10	17.0				
11			1	A	51	0	10	15.0				
12			1	A	36	0	11	15.0				
13			1	A	131	1	13	15.0				
14			1	A	16	2	15	14.0				
15			1	A	40	0	15	13.0				
16			1	A	71	0	14	13.5				
17			1	A	25	0	16	14.0				
18			1	A	34	0	15	14.5				
19			1	A	30	0	15	16.0				
20			1	A	49	0	15	17.0				
21			1	A	32	0	18	17.0				
22			1	A	158	0	19	17.0				
23			1	A	62	1	18	18.0				
24			1	A	85	0	17	17.0				
25			1	A	54	0	18	17.5				
26			1	A	73	0	19	18.5				
27			1	A	55	0	19.0	17.5				
28			1	A	74	0	9.0	12.0				
29			1	A	91	0	8.7	8.5				
30			1	A	90	0	8.5	9.5				
AVG.			1	A	81	0	15	16				
Max					262	2	22	21				
Min					16	0	9	9				

Bento Water Distribution Monthly Distribution Residual Monitoring and Bacteriological Report

DISTRIBUTION SYSTEM MONITORING WSSN 0600 September-18

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5	0.74		0.86	0.90	0.69		0.47			
6										
7										
8										
9										
10										
11										
12	0.87		1.28	1.10	1.01		1.19			
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25	0.72		0.89	0.67	0.69		0.86			
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	12		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.86	1.28	0.47
Total number of check samples	0600			
Total number of positive check samples	0600			

MI0600 Benton Harbor MOR September 2020

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** **F1-S1**

Signature of Operator-in-Charge 10/9/20

Month/Year **September-20** **F1-S2**

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.1225	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	195.50	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.94	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.12	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.35%	Percent of Treated Water

Chemical Data

Chlorine on hand:	47470	lb.	Est. supply:	144 days
Primary Coagulant (Alum (Al3+)) on hand:	39318	lb.	Est. supply:	171 days
Cost of All Chemicals per Million Gallons:	$71.05	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:	90	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? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
0.5 NTU in two consecutive measurements taken 15 minutes apart after 4 hours of operation? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
1.0 NTU in two consecutive measurements taken 15 minutes apart for 3 consecutive months? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
2.0 NTU in two consecutive measurements taken 15 minutes apart for 2 consecutive months? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
Was continuous (every 15 minutes) filter monitoring equipment off-line during the month? ***If yes**, indicate date(s), duration, and individual filter grab sampling frequency on a separate sheet.*	NO
Did POE disinfectant residual fall below 0.2 ppm during the month? **If yes**, indicate date(s) and duration on a separate sheet.	NO
Was minimum C*T credit achieved for the entire month? **If no**, indicate on a separate sheet the date(s) not achieved.	YES
Was continuous POE chlorine residual monitoring equipment off-line during the month? **If yes**, indicate date(s) and duration on a separate sheet.	NO

Distribution Total 26.779661 Avg 0.924192 Max 1.139716 Min 0.799648

Remarks

Orthopolyphosphate Lead corrosion Inhibitor started March 26, 2019: Total Days 556

Orthopolyphosphate Lead corrosion Inhibitor started Feburary 20 2020: Total Days 223

The bacteria Page includes Tap Water Metering and OPP data for the month.

MI0600 BHNW MoR Sept 20

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **September-20**

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FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l											TAP	
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use				
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.46	0.23	0.75		0	0.00	456	6.91	74	1.12	530	8.36	6.07	2.07	2.29
2	0.47	0.24	0.77		0	0.00	435	6.96	77	1.23	512	8.10	6.20	1.75	1.90
3	0.57	0.19	0.73	0.78	0	0.00	418	6.80	76	1.24	494	8.43	6.56	1.72	1.87
4	0.55	0.23	0.76		0	0.00	285	4.51	73	1.16	358	5.36	3.11	2.11	2.25
5	0.77	0.14	0.78		0	0.00	256	4.05	72	1.14	328	5.17	3.03	1.98	2.14
6	0.59	0.09	0.79		0	0.00	243	4.02	70	1.16	313	5.46	3.20	2.10	2.26
7	0.55	0.23	0.83		0	0.00	249	4.04	64	1.04	313	4.78	2.06	2.44	2.72
8	0.55	0.23	0.76		0	0.00	244	3.83	33	0.52	277	4.40	2.47	1.78	1.93
9	0.54	0.20	0.77		0	0.00	240	3.80	32	0.51	272	4.80	3.11	1.53	1.69
10	0.33	0.21	0.83	0.80	0	0.00	208	3.78	24	0.44	232	4.33	2.76	1.40	1.57
11	0.62	0.23	0.83		0	0.00	260	3.85	32	0.47	292	4.50	2.94	1.42	1.56
12	0.53	0.15	0.78		0	0.00	224	3.80	97	1.65	321	5.61	3.11	2.33	2.50
13	*0.55*	*0.20*	*0.77*		*0*	*0.00*	*224*	*3.79*	*34*	*0.58*	*258*	*4.65*	*2.81*	*1.67*	*1.84*
14	0.67	0.18	0.79		0	0.00	224	3.73	98	1.63	322	5.08	2.44	2.46	2.64
15	0.53	0.22	0.80		0	0.00	248	3.74	42	0.63	290	4.50	2.56	1.77	1.94
16	0.53	0.21	0.83		0	0.00	230	3.68	34	0.54	264	4.23	2.57	1.49	1.66
17	0.53	0.20	0.74	0.92	0	0.00	273	3.63	43	0.57	316	4.14	2.00	1.87	2.14
18	0.62	0.26	0.75		0	0.00	240	3.60	35	0.53	275	4.27	2.14	1.97	2.13
19	0.72	0.23	0.77		0	0.00	220	3.70	34	0.57	254	4.25	2.42	1.69	1.83
20	0.56	0.34	0.65		0	0.00	242	3.75	37	0.57	279	4.72	2.98	1.56	1.74
21	0.56	0.36	0.74		0	0.00	228	3.68	34	0.55	262	3.98	2.01	1.80	1.97
22	0.73	0.19	0.67		0	0.00	242	3.61	36	0.54	278	4.12	2.29	1.67	1.83
23	0.66	0.29	0.64	0.73	0	0.00	237	3.72	37	0.58	274	4.50	2.53	1.80	1.97
24	0.59	0.23	0.58		0	0.00	222	3.48	39	0.61	261	4.38	2.19	2.02	2.19
25	0.58	0.23	0.54		0	0.00	211	3.43	36	0.59	247	3.59	1.43	1.99	2.16
26	0.58	0.23	0.64		0	0.00	205	3.35	29	0.47	234	4.05	2.04	1.85	2.01
27	0.60	0.29	0.68		0	0.00	195	3.32	21	0.36	216	3.78	2.11	1.56	1.67
28	0.57	0.27	0.69		0	0.00	203	3.31	36	0.59	239	4.16	1.95	1.92	2.21
29	0.44	0.28	0.69		0	0.00	207	3.02	19	0.28	226	3.62	2.10	1.31	1.52
30	0.55	0.26	0.73		0	0.00	215	3.51	33	0.54	248	4.06	2.30	1.59	1.76
31															
Tot.							7,128		1,327		8,985				
Avg.	0.57	0.23	0.74	0.81	0.00	0.00	252.80	4.01	46.70	0.75	299.50	4.85	2.85	1.82	2.00
Max	0.77	0.36	0.83	0.92	0.00	0.00	456.00	6.96	98.00	1.65	530.00	8.43	6.56	2.46	2.72
Min.	0.33	0.09	0.54	0.73	0.00	0.00	195.00	3.02	19.00	0.28	216.00	3.59	1.43	1.31	1.52

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COAGULATION PARAMETERS

D A T E	MIL. GAL. TREAT.	Dry Al2(SO3)4 Pounds Add	ALUM as Al3+ mg/l	TURBIDITY UNITS RAW Avg.	RAW Max.	Applied Avg.	# ample	FILTERED NORTH Avg.	FILTERED NORTH Max.	# Samples	FILTERED SOUTH Avg.	FILTERED SOUTH Max.	2 Hour Compliance Periods # of Periods	#of Periods >.30NTU North	#of Periods >.30NTU South
1	0.9850	297.00	1.59	2.70	3.20	0.29	3	0.10	0.11	3	0.07	0.08	6	0	0
2	0.9325	284.00	1.60	3.60	4.70	0.36	3	0.11	0.13	3	0.09	0.10	6	0	0
3	0.9175	282.00	1.62	3.00	3.50	0.38	3	0.08	0.09	3	0.08	0.08	6	0	0
4	0.9425	288.00	1.61	4.00	5.00	0.36	3	0.09	0.10	3	0.09	0.10	6	0	0
5	0.9425	292.00	1.63	5.50	6.90	0.39	3	0.10	0.10	3	0.07	0.07	6	0	0
6	0.9025	277.00	1.70	4.50	6.20	0.35	3	0.09	0.10	3	0.07	0.08	6	0	0
7	0.9200	287.00	1.64	3.40	4.50	0.33	3	0.10	0.11	3	0.09	0.09	6	0	0
8	0.9500	298.00	1.65	5.10	5.90	0.35	3	0.10	0.11	3	0.09	0.10	6	0	0
9	0.9425	291.00	1.62	4.90	6.20	0.30	3	0.09	0.10	3	0.09	0.09	6	0	0
10	0.8225	258.00	1.65	5.30	5.70	0.39	3	0.09	0.11	3	0.08	0.09	6	0	0
11	1.0075	311.00	1.62	4.10	4.30	0.31	3	0.11	0.12	3	0.07	0.08	6	0	0
12	0.8800	256.00	1.53	4.30	5.20	0.41	3	0.08	0.10	3	0.08	0.09	6	0	0
13	0.8825	265.00	1.58	2.80	4.00	0.33	3	0.09	0.11	3	0.08	0.09	6	0	0
14	0.8975	272.00	1.59	3.90	6.20	0.29	3	0.09	0.09	3	0.08	0.10	6	0	0
15	0.9900	300.00	1.59	3.50	5.20	0.33	3	0.08	0.09	3	0.08	0.09	6	0	0
16	0.9325	277.00	1.56	2.20	2.40	0.27	3	0.08	0.08	3	0.08	0.08	6	0	0
17	1.1225	330.00	1.55	2.40	3.00	0.26	3	0.08	0.08	3	0.09	0.10	6	0	0
18	0.9950	294.00	1.55	2.20	2.70	0.28	3	0.09	0.09	3	0.08	0.08	6	0	0
19	0.8875	259.00	1.54	1.20	1.30	0.27	3	0.08	0.09	3	0.09	0.10	6	0	0
20	0.9625	289.00	1.58	1.40	1.50	0.26	3	0.09	0.09	3	0.08	0.09	6	0	0
21	0.9250	260.00	1.48	1.70	2.80	0.40	3	0.09	0.11	3	0.10	0.11	6	0	0
22	1.0000	296.00	1.56	2.00	3.80	0.27	3	0.10	0.14	3	0.10	0.11	6	0	0
23	0.9500	298.00	1.65	2.50	4.00	0.33	3	0.07	0.09	3	0.10	0.11	6	0	0
24	0.9525	298.00	1.65	2.90	5.20	0.28	3	0.09	0.10	3	0.09	0.10	6	0	0
25	0.9175	283.00	1.62	2.40	3.70	0.30	3	0.08	0.09	3	0.09	0.10	6	0	0
26	0.9125	299.00	1.62	2.00	2.20	0.29	3	0.08	0.08	3	0.08	0.09	6	0	0
27	0.8775	278.00	1.67	2.60	2.90	0.33	3	0.08	0.08	3	0.08	0.08	6	0	0
28	0.9150	290.00	1.67	2.30	3.00	0.33	3	0.08	0.08	3	0.08	0.09	6	0	0
29	1.0225	302.00	1.55	3.50	3.80	0.30	3	0.08	0.09	3	0.09	0.09	6	0	0
30	0.9150	286.00	1.64	2.80	3.50	0.32	3	0.07	0.08	3	0.10	0.11	6	0	0
31															
Total	28.2025	8597.00					90			90			180	0	0
Avg.	0.9401	286.57	1.60	3.16	4.08	0.32		0.09	0.10		0.08		Total	Total	Total
Max	1.1225	330.00	1.70	5.50	6.90	0.41		0.11	0.14		0.10	0.11	6	0	0
Min.	0.8225	256.00	1.48	1.20	1.30	0.26		0.07	0.08		0.07				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

DAY	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
	29.	30.	31.	32.	33.	34.	35.	36.	37	38	39	40	41	42
1	8.3	8.3	144	138	118	110	26	28	40	42	11	8		
2	8.2	8.2	162	158	113	107	49	51	38	37	17	16	21.0	27.5
3	8.3	8.2	156	150	113	109	43	41	38	36	15	15	22.0	27.0
4	8.2	8.2			123	108								
5	8.2	8.2	174	166	123	117	51	49	41	39	17	17	21.5	28.0
6	8.2	8.2	170	160	130	123	40	37	38	36	18	17	20.5	26.5
7	8.4	8.2	146	148	122	124	24	24	38	41	13	11	23.0	29.0
8	8.3	8.2	176	164	126	112	50	52	41	39	18	16	21.5	26.5
9	8.2	8.3	166	162	126	119	40	43	38	39	17	16	19.5	24.5
10	8.3	8.0	140	138	124	119	16	19	38	41	9	9		
11	8.3	8.3	146	140	125	119	21	21	39	40	12	10		
12	8.2	8.2	172	164	129	120	43	44	38	37	18	17	19.5	24.5
13	8.2	8.3	168	160	127	120	41	40	38	37	18	17	19.5	25.5
14	8.1	8.1	168	158	126	118	42	40	40	38	17	15	22.0	27.5
15	8.2	8.2	172	160	131	121	41	39	40	38	17	16	20.5	25.5
16	8.3	8.3	142	142	125	124	17	18	39	40	11	10	23.5	24.5
17	8.4	8.3	144	142	129	124	15	18	38	39	12	11		
18	8.3	8.3	140	146	127	124	13	22	40	43	10	9		
19	8.0	8.1	140	144	122	121	18	23	41	43	9	9		
20	8.0	8.1	144	138	125	120	19	18	39	40	11	9		
21	8.2	8.2	166	158	123	116	43	42	40	39	16	15	20.5	25.5
22	8.1	8.1	168	160	121	116	47	44	37	36	18	17	19.0	24.0
23	8.1	8.1	158	152	117	115	41	37	38	37	15	15	19.0	24.0
24	8.0	8.1	162	152	120	113	42	39	38	37	16	15	20.0	25.0
25	8.2	8.1	172	156	128	114	44	42	39	37	18	16	20.5	25.5
26	8.2	7.9	138	142	120	120	18	22	37	39	11	11		
27	8.4	8.3	146	148	125	117	21	31	39	43	12	10		
28	8.4	8.2	148	142	124	116	24	26	40	39	12	11	23.5	25.5
29	8.4	8.3	142	140	122	118	20	22	39	39	11	10		
30	8.3	8.0	164	156	124	117	40	39	38	37	17	16	20.5	25.0
31														
Avg.	8.2	8.2	156.3	151.2	123.6	117.4	32.7	33.5	38.9	38.9	14.3	13.2	20.9	25.8
Max	8.4	8.3	176.0	166.0	131.0	124.0	51.0	52.0	41.0	43.0	18.0	17.0	23.5	29.0
Min.	8.0	7.9	138.0	138.0	113.0	107.0	13.0	18.0	37.0	36.0	9.0	8.0	19.0	24.0

MI 0600 BHWW MOR Sept 2020

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MI 0600 Distribution Monitoring Report MI 0600 DMR

DISTRIBUTION SYSTEM MONITORING WSSN 0600 September-20

Chlorine Residual at Bacteriological Monitoring Stations mg/l

CITY OF BENTON HARBOR

DATE	1	2	3	4	5	6 blu water	7 B&Z
1							
2	1.03		1.22	1.38	1.11		0.85
3							
4							
5							
6							
7							
8							
9							
10	1.06		1.39	0.72	0.83		0.76
11							
12							
13							
14							
15							
16							
17	0.81		0.87	0.88	0.87		0.69
18							
19							
20							
21							
22							
23	1.46		1.43	1.62	1.18		1.17
24							
25							
26							
27							
28							
29							
30			0.91	0.61	1.05		1.19
31							

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	24	
Total number of positive routine distribution samples	0600		
Total number of routine distribution samples required	0600	10	Max / Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.05	1.62 / 0.61
Total number of check samples	0600	6	
Total number of positive check samples	0600	0	

MI 0600 BHWW MOR Sept 2020

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

DATE	Ortho P System System Ortho P Residual mg/L	Ortho P System Location	PLANT TAP No. of Samples	PLANT TAP Colilert P/A	Standard Plate Count Raw	Standard Plate Count Tap	Raw TEMP. 'C	Tap TEMP. 'C	Distrubution flow and Corrosion Treatment High Lift To Distribution	Lbs PO4	PO4 Treatment mg/L	Ortho P Residual mg/L
1			1	A	96	0	23	22.0	0.9468	82	3.44	2.89
2	2.92	CityHall	1	A	109	1	21	21.5	0.9432	80	3.37	2.99
2	2.36	Wolfs	1	A	143	0	22	21.5	0.8750	86	3.88	3.13
2	2.84	BaitShed	1	A	92	0	22	22.0	0.9977	86	3.41	3.01
2	2.51	SunnySpot	1	A	105	0	22	22.5	0.9476	84	3.51	3.09
2	2.54	B&Z	1	A	154	0	22	22.5	0.8557	84	3.87	3.01
7			1	A	134	3	22	23.0	0.9775	89	3.60	3.14
8			1	A	165	0	22	22.5	0.9404	85	3.59	2.74
9			1	A	158	0	17	22.0	0.8455	85	3.97	2.81
10	2.78	CityHall	1	A	93	1	18	22.0	0.8000	88	4.33	2.67
10	2.53	Wolfs	1	A	175	1	20	20.0	0.9687	80	3.27	2.84
10	1.96	BaitShed	1	A	97	0	20	19.5	0.8538	86	3.99	2.84
10	2.75	SunnySpot	1	A	155	0	20	19.5	0.8291	77	3.67	3.00
10	2.54	B&Z	1	A	150	1	20	19.5	0.9460	76	3.19	2.89
15			1	A	164	0	20	20.5	0.9615	74	3.03	3.13
16			1	A	136	0	21	21.0	0.9326	90	3.82	3.28
17	2.86	CityHall	1	A	139	0	21	21.0	1.1392	63	2.17	3.10
17	2.82	Wolfs	1	A	104	0	14	16.0	0.9609	69	2.85	3.05
17	2.96	BaitShed	1	A	42	0	12	20.0	0.8921	66	2.95	3.06
17	3.01	SunnySpot	1	A	51	1	13	18.0	0.8816	74	3.31	
17	2.69	B&Z	1	A	45	0	12	15.5	0.9837	87	3.50	2.85
22			1	A	34	0	12	14.5	1.0079	81	3.19	3.02
23	2.93	CityHall	1	A	55	0	13	14.0	0.9085	82	3.56	3.05
23	2.98	Wolfs	1	A	85	0	15	13.5	0.8889	91	4.03	3.04
23	2.84	BaitShed	1	A	71	0	16	14.0	1.0273	81	3.11	2.95
23	2.77	SunnySpot	1	A	96	0	17	16.0	0.8626	69	3.17	2.95
23	2.61	B&Z	1	A	98	0	18.0	16.0	0.8517	79	3.67	3.28
30	2.59	CityHall	1	A	105	0	18.0	17.0	0.8575	73	3.39	2.73
30	2.88	Wolfs	1	A	65	0	18.0	19.0	0.9323	70	2.96	3.06
30	2.90	BaitShed	1	A	55	0	17.7	17.5	0.9111	74	3.21	3.10
30	2.79	SunnySpot										
30	2.91	B&Z										
Totals									27.7263	2390.7		
AVG.	2.73		1	A	106	0	18	19	0.9242	79.7	3.43	2.99
Max	3.01				175	3	22	23	1.1392	90.6	4.33	3.28
Min	1.96				34	0	12	14	0.8000	62.6	2.17	2.67

MI 0600 Correction MOR NOV 2019

ORP & Meter ON Modified Bacti Page

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1			1	A	75	0	11	12.5	0.9548	46	1.91	1.54
2			1	A	93	0	11	12.5	0.7336	50	2.68	1.45
3			1	A	119	0	11	12.0	1.0696	47	1.73	1.46
4			1	A	119	9	10	11.5	0.9394	45	1.87	1.37
5			1	A	108	0	10	12.0	0.9170	50	2.16	1.62
6	1.47	City Hall	1	A	102	0	10	10.5	0.9492	49	2.03	1.55
6	1.39	Wolfs	1	A	97	0	10	11.0	0.9884	51	2.02	1.54
6	1.58	Bait Shed	1	A	164	0	10	11.0	0.9338	53	2.24	1.48
6	1.57	Sunny Spot	1	A	95	1	8	10.0	0.9478	45	1.88	1.51
6	1.33	B & Z	1	A	102	0	8	9.5	0.8554	52	2.41	0.81
11			1	A	111	0	8	9.0	0.9828	51	2.03	1.48
12	1.52	City Hall	1	A	168	0	8	9.0	0.9716	36	1.45	1.47
12	1.34	Wolfs	1	A	109	1	7	8.5	1.0136	54	2.11	1.46
12	1.45	Bait Shed	1	A	152	0	7	9.0	1.0374	60	2.28	1.56
12	1.40	Sunny Spot	1	A	146	0	7	8.0	1.0430	54	2.05	1.56
12	1.25	B & Z	1	A	50	2	6	8.5	0.9842	58	2.32	1.47
17			1	A	74	4	7	8.0	0.9639	59	2.43	1.53
18			1	A	58	0	7	7.0	1.0080	56	2.21	1.50
19			1	A	79	0	6	6.5	0.8960	58	2.54	1.57
20	1.66	City Hall	1	A	86	0	6	7.0	1.1354	56	1.94	1.50
20	1.47	Wolfs	1	A	98	1	6	6.5	0.9268	57	2.44	1.41
20	1.51	Bait Shed	1	A	85	0	7	7.5	0.9730	19	0.79	1.47
20	1.45	Sunny Spot	1	A	98	0	7	8.0	0.9240	58	2.48	1.51
20	1.24	B & Z	1	A	72	0	7	8.0	1.0080	65	2.54	1.56
25			1	A	58	0	7	8.0	0.9688	39	1.60	1.45
26			1	A	45	12	7	8.0	0.9898	52	2.07	1.49
27			1	A	153	0	7.2	7.5	0.9688	50	2.05	1.47
28			1	A	163	0	9.0	12.0	0.8582	46	2.11	1.52
29			1	A	236	0	8.7	8.5	0.8260	44	2.11	1.52
30			1	A	95	0	8.5	9.5	0.8316	46	2.20	1.48
			0									
Totals									28.5999	1502.5		
AVG.	1.44		1	A	108	1	8	9	0.9533	50.1	2.10	1.47
Max	1.66				236	12		13	1.1354	64.6	2.68	1.62
Min	1.24				45	0	6	7	0.7336	19.4	0.79	0.81

TYPO was not included in original MOR Sorry Mike

There was trouble w/ the ORP Barrel on Sunday 11/10/19

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **September-19**

F1-S1 **F1-S2**

Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.2224	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	257.00	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.07	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.13	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.70%	Percent of Treated Water

Chemical Data

Chlorine on hand:	22220	lb.	Est. supply:	8731 days
Primary Coagulant (Alum (Al3+)) on hand:	3649411	lb.	Est. supply:	68 days
Cost of All Chemicals per Million Gallons:	$80.35	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:	90	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?	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	29.1331	Avg	0.9975833	Max	1.2046	Min	0.8386

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals. There was a Chlorine solution leak . It was fixed quickly and the post filter feed was increased as a safeguard. There was a question

Chlorine leak Appendix 1
Alum concern Appendix 2

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **September-19**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.55	0.22	0.59		0	0.00	353	5.61	12	0.19	365	6.86	5.23	1.50	1.63
2	0.62	0.26	0.62		0	0.00	359	5.60	10	0.16	369	6.57	4.92	1.50	1.65
3	0.51	0.29	0.57		0	0.00	413	5.62	16	0.22	429	6.25	4.44	1.67	1.81
4	0.58	0.15	0.63	0.63	0	0.00	409	5.61	28	0.38	437	6.28	4.35	1.75	1.93
5	0.66	0.32	0.75		0	0.00	415	5.66	46	0.63	461	6.17	4.31	1.68	1.86
6	0.55	0.32	0.75		0	0.00	414	5.62	42	0.57	456	6.62	4.60	1.84	2.02
7	0.53	0.28	0.73		0	0.00	456	5.57	49	0.60	505	7.00	4.87	1.94	2.13
8	0.54	0.31	0.61		0	0.00	393	5.59	32	0.45	425	6.36	4.55	1.64	1.81
9	0.53	0.36	0.77		0	0.00	399	5.52	48	0.66	447	5.54	3.67	1.70	1.87
10	0.56	0.33	0.82		0	0.00	414	5.42	22	0.29	436	6.41	4.38	1.81	2.03
11	0.60	0.38	0.83	0.67	0	0.00	389	5.52	15	0.21	404	6.20	4.31	1.72	1.89
12	0.56	0.31	0.88		0	0.00	418	5.53	14	0.19	432	5.89	4.15	1.58	1.74
13	0.66	0.31	0.84		0	0.00	426	5.49	20	0.26	446	6.07	4.36	1.57	1.71
14	0.54	0.19	0.75		0	0.00	396	5.63	42	0.60	438	7.18	5.37	1.63	1.81
15	0.43	0.22	0.74		0	0.00	376	4.84	75	0.97	451	7.14	5.39	1.57	1.75
16	0.56	0.22	0.69		0	0.00	401	5.50	31	0.43	432	6.65	4.97	1.50	1.68
17	0.69	0.15	0.62		0	0.00	370	5.52	69	1.03	439	6.90	5.36	1.37	1.54
18	0.47	0.19	0.61	0.69	0	0.00	418	5.66	35	0.47	453	6.73	4.90	1.67	1.83
19	0.60	0.23	0.65		0	0.00	410	5.64	18	0.25	428	6.81	5.35	1.27	1.46
20	0.64	0.31	0.61		0	0.00	391	5.84	31	0.46	422	6.59	4.70	1.64	1.89
21	0.57	0.30	0.52		0	0.00	451	5.88	36	0.47	487	7.01	5.35	1.52	1.66
22	0.57	0.25	0.51		0	0.00	380	5.91	30	0.47	410	7.04	5.11	1.72	1.93
23	0.69	0.28	0.59		0	0.00	438	5.94	44	0.60	482	6.88	5.20	1.51	1.68
24	0.53	0.18	0.68		0	0.00	410	5.97	33	0.48	443	6.68	4.96	1.54	1.72
25	0.61	0.18	0.60		0	0.00	426	5.92	40	0.56	466	7.93	6.31	1.42	1.62
26	0.57	0.29	0.74		0	0.00	418	5.93	52	0.74	470	6.38	4.61	1.59	1.77
27	0.58	0.27	0.83		0	0.00	421	5.78	72	0.99	493	6.69	4.91	1.61	1.78
28	0.52	0.23	0.71		0	0.00	399	6.14	47	0.72	446	6.92	5.41	1.42	1.51
29	0.55	0.24	0.79		0	0.00	412	6.17	44	0.66	456	7.11	5.62	1.32	1.49
30	0.47	0.31	0.67		0	0.00	442	6.14	53	0.74	495	7.29	5.50	1.62	1.79
31															
Tot.							11,864		1,094		13,323				
Avg.	0.57	0.26	0.69	0.66	0.00	0.00	407.23	5.69	36.87	0.51	444.10	6.67	4.90	1.59	1.77
Max	0.69	0.38	0.88	0.69	0.00	0.00	456.00	6.17	75.00	1.03	505.00	7.93	6.31	1.94	2.13
Min.	0.43	0.15	0.51	0.63	0.00	0.00	353.00	4.84	10.00	0.16	365.00	5.54	3.67	1.27	1.46

WSSN 0600 City of Benton Harbor Month/Year September-19

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	0.9400	282.00	1.58	0.99	1.10	0.17	3	0.07	0.08	3	0.07	0.08	6	0	0
2	0.9575	288.00	1.58	0.96	1.20	0.17	3	0.06	0.06	3	0.06	0.07	6	0	0
3	1.0975	331.00	1.59	0.86	0.97	0.17	3	0.06	0.07	3	0.06	0.06	6	0	0
4	1.0875	325.00	1.57	2.00	2.60	0.28	3	0.07	0.08	3	0.07	0.08	6	0	0
5	1.0950	324.00	1.56	1.80	1.90	0.22	3	0.07	0.07	3	0.06	0.07	6	0	0
6	1.1000	324.00	1.55	2.50	4.40	0.26	3	0.06	0.07	3	0.06	0.06	6	0	0
7	1.2224	405.00	1.74	7.20	10.10	0.27	3	0.08	0.08	3	0.06	0.07	6	0	0
8	1.0500	309.00	1.55	1.60	2.50	0.28	3	0.07	0.08	3	0.06	0.06	6	0	0
9	1.0800	317.00	1.54	1.70	2.10	0.22	3	0.07	0.08	3	0.07	0.07	6	0	0
10	1.1400	335.00	1.55	1.60	1.60	0.16	3	0.08	0.09	3	0.08	0.08	6	0	0
11	1.0525	314.00	1.57	2.00	2.10	0.19	3	0.08	0.09	3	0.07	0.08	6	0	0
12	1.1275	392.00	1.83	1.60	1.90	0.30	3	0.08	0.09	3	0.07	0.07	6	0	0
13	1.1575	332.00	1.51	1.40	1.50	0.29	3	0.07	0.08	3	0.07	0.09	6	0	0
14	1.0500	309.00	1.55	2.20	3.10	0.22	3	0.06	0.07	3	0.07	0.07	6	0	0
15	1.1600	297.00	1.35	1.90	2.00	0.19	3	0.07	0.07	3	0.07	0.07	6	0	0
16	1.0875	319.00	1.54	2.50	4.10	0.19	3	0.07	0.07	3	0.07	0.07	6	0	0
17	1.0000	296.00	1.56	1.90	3.30	0.17	3	0.07	0.08	3	0.06	0.07	6	0	0
18	1.1025	253.00	1.21	1.70	2.60	0.59	3	0.09	0.11	3	0.08	0.10	6	0	0
19	1.0850	552.00	2.68	1.50	2.10	0.28	3	0.08	0.10	3	0.09	0.14	6	0	0
20	1.0000	337.00	1.77	1.20	1.60	0.18	3	0.07	0.08	3	0.06	0.06	6	0	0
21	1.1450	345.00	1.59	1.00	1.40	0.17	3	0.06	0.06	3	0.06	0.06	6	0	0
22	0.9600	287.00	1.57	1.30	1.50	0.29	3	0.07	0.07	3	0.06	0.06	6	0	0
23	1.1000	206.00	0.99	1.50	1.70	0.33	3	0.08	0.08	3	0.07	0.07	6	0	0
24	1.0250	668.00	3.43	1.60	2.20	0.20	3	0.07	0.07	3	0.06	0.07	6	0	0
25	1.0750	457.00	2.24	2.80	3.30	0.19	3	0.06	0.07	3	0.07	0.07	6	0	0
26	1.0525	316.00	2.24	5.00	7.00	0.28	3	0.06	0.07	3	0.07	0.07	6	0	0
27	1.0875	284.00	1.37	3.10	4.60	0.26	3	0.07	0.08	3	0.07	0.08	6	0	0
28	0.9700	301.00	1.63	2.60	2.80	0.26	3	0.07	0.07	3	0.07	0.08	6	0	0
29	0.9975	288.00	1.52	3.40	3.90	0.25	3	0.06	0.06	3	0.08	0.08	6	0	0
30	1.0750	308.00	1.51	2.10	2.80	0.23	3	0.06	0.06	3	0.08	0.09	6	0	0
31															
Total	32.0799	10101.00					90			90			180	0	0
Avg.	1.0693	336.70	1.68	2.12	2.80	0.24		0.07	0.08		0.07		Total	Total	Total
Max	1.2224	668.00	3.43	7.20	10.10	0.59		0.09	0.11		0.09	0.14	6	0	0
Min.	0.9400	206.00	0.99	0.86	0.97	0.16		0.06	0.06		0.06				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness							
D	pH		as CaCO3		as CaCO3		as CaCO3		Calcium as Ca++		Magnesium as Mg++		Chloride as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.3	8.3	146	146	114	109	32	37	41	44	11	9		
2	8.1	8.0	146	148	107	105	39	43	43	44	9	9		
3	8.0	8.1	146	148	106	105	40	43	45	47	8	7		
4	8.2	8.1	164	156	111	102	53	54	42	41	14	13		
5	8.2	8.1	164	154	111	104	53	50	42	41	14	13	21.0	27.0
6	8.0	7.9	156	150	107	104	49	46	38	37	15	14		
7	8.1	8.1	162	154	107	103	55	51	42	40	14	13		
8	8.1	8.0	158	152	106	105	52	47	41	40	14	13		
9	8.0	8.1	158	152	107	103	51	49	42	40	13	13		
10	8.2	7.9	146	144	107	105	39	39	42	41	10	10		
11	8.0	8.2	150	146	113	101	37	45	43	42	10	10	21.5	23.0
12	8.0	8.2	146	146	110	106	36	40	45	46	8	8		
13	8.3	8.1	154	148	112	105	42	43	43	43	11	10		
14	8.2	8.1	160	150	115	106	45	44	40	39	12	13		
15	8.1	8.0	162	152	112	104	50	48	41	39	15	13		
16	8.0	8.1	164	158	110	106	54	52	41	40	15	14		
17	8.1	8.1	158	152	109	106	49	46	40	39	14	13		
18	8.1	8.2	158	150	110	105	48	45	40	39	14	13		
19	8.1	8.1	142	138	111	109	31	29	42	42	9	8	20.5	23.0
20	8.1	8.1	144	140	109	103	35	37	43	44	9	7		
21	8.1	8.1	136	136	106	103	30	33	46	42	5	7		
22	8.2	8.1	138	136	109	103	29	33	43	45	7	6		
23	8.1	8.2	154	148	113	101	41	47	39	38	14	13		
24	8.1	8.1	154	146	110	103	44	43	38	36	15	14		
25	8.2	8.2	154	148	113	104	41	44	38	38	14	13		
26	8.1	8.2	162	154	110	101	52	53	40	41	15	13		
27	8.1	8.2	170	152	110	104	60	48	51	42	11	12	19.0	23.5
28	8.2	8.1	154	148	121	105	33	43	46	41	10	11	20.5	22.0
29	8.3	8.2	150	148	117	108	33	40	42	42	11	10		
30	8.1	8.0	144	148	112	109	32	39	39	39	11	12		
31											0	0		
Avg.	8.1	8.1	153.3	148.3	110.5	104.6	42.8	43.7	41.9	41.1	11.7	11.1	20.5	23.7
Max	8.3	8.3	170.0	158.0	121.0	109.0	60.0	54.0	51.0	47.0	15.0	14.0	21.5	27.0
Min.	8.0	7.9	136.0	136.0	106.0	101.0	29.0	29.0	38.0	36.0	5.0	6.0	19.0	22.0

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1			1	A	60	0	13	19.0	1.0238	37	1.43	1.56
2			1	A	37	1	13	18.0	0.8865	44	1.96	1.29
3			1	A	24	3	12	17.0	1.0817	54	1.98	1.29
4	1.36	city hall	1	A	21	0	17	14.0	0.9943	55	2.20	1.70
4	1.02	wolfs	1	A	48	0	17	16.0	1.1656	49	1.66	1.46
4	1.33	bait shed	1	A	29	0	13	16.0	1.0912	55	1.99	1.94
4	1.27	sunny spot	1	A	45	0	12	15.5	1.1261	45	1.58	0.52
4	1.26	b&z	1	A	60	0	12	14.5	1.0585	54	2.01	1.09
			1	A	30	1	11	13.5	1.2730	56	1.74	0.00
			1	A	48	0	12	14.0	1.0787	54	2.00	1.51
			1	A	41	0	16	14.0	1.0156	49	1.92	1.32
			1	A	55	1	17	15.0	1.1444	54	1.87	0.00
			1	A	60	2	14	16.0	1.1473	48	1.65	1.29
			1	A	27	0	17	15.0	0.9596	51	2.09	1.30
			1	A	74	0	19	16.0	0.9952	47	1.85	1.95
			1	A	38	0	19	16.5	1.0306	35	1.35	1.37
			1	A	60	0	17	18.0	1.0057	48	1.87	1.56
16	1.34	city hall	1	A	23	0	17	17.5	1.0690	39	1.43	1.31
16	1.15	wolfs	1	A	48	0	14	18.0	0.9875	59	2.37	1.51
16	1.45	bait shed	1	A	37	0	14	17.0	1.0058	30	1.19	1.27
16	1.15	sunny spot	1	A	26	2	16	17.0	1.0800	36	1.32	1.29
16	0.63	b&z	1	A	30	1	20	18.0	0.9173	45	1.96	1.31
			1	A	21	0	20	16.5	1.0953	41	1.47	1.25
			1	A	16	0	19	18.0	1.0518	43	1.61	1.14
			1	A	25	0	20	18.5	0.9259	46	1.96	1.32
			1	A	59	0	19	19.5	1.1624	49	1.66	1.82
			1	A	33	0	19.3	19.5	1.1624	41	1.39	1.51
			1	A	42	0	9.0	12.0	1.0097	43	1.68	1.36
			1	A	19	0	8.7	8.5	1.0162	47	1.82	1.45
			1	A	57	5	8.5	9.5	1.0758	67	2.47	1.12
Totals									31.6369	1419.5		
AVG.	1.20		1	A	39	1	15	16	1.0546	47.3	1.79	1.28
Max	1.45				74	5	20	20	1.2730	67.2	2.47	1.95
Min	0.63				16	0	9	9	0.8865	30.2	1.19	0.00

DISTRIBUTION SYSTEM MONITORING WSSN 0600 September-19

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4	1.05		1.01	0.46	0.67		0.60			
5										
6										
7										
8										
9										
10										
11	0.43		1.24	0.69	1.13		0.63			
12										
13										
14										
15										
16										
17										
18	0.72		0.47	0.51	0.32		0.40			
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	15		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.69	1.24	0.32
Total number of check samples	0600			
Total number of positive check samples	0600			

MI 0600 Benton Harbor DRINKING WATER treatment EMERGENCY REPORT 09 25 2019_ CI2

The Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the Administrative Rules promulgated thereunder (Act 399), Rule 2304 (2) requires that a written report be filed by the supply within ninety days after an emergency.

Please Complete and Return to :

Mr. Ernie Sarkipato
Grand Rapids District / Drinking Water and Municipal Assistance
Michigan Department of Environmental Quality
sarkipatoe@michigan.gov

Water Supply:	Benton Harbor Water Plant
WSSN:	0600
County:	Berrien
Address:	601 Ridgeway
City:	St. Joseph
State/Zip:	MI 49085
Report Prepared Date:	9/25/2019
Report Prepared By:	Mike O'Malley

Briefly describe the following. Attach additional pages as necessary.

1.	Discovery of the emergency

The operator Doug, found a liquid Chlorine leak in the feed room. Shut the plant down and came to get Mike O'Malley for help. 9/18/2019 12:30 pm

2.	Cause of the emergency

Peristaltic pump had a pin hole in it. This pump feeds to the Pre-treatment point.
May have reduced the amount of Chlorine going into treatment.

3.	Area of the system effected by the emergency

Chlorine feed room. No impact seen to the treated water.

4.	Duration of the emergency

15 minutes. About ½ inch on the floor.

5.	Procedures by which the public was notified
Public was not notified. Spill contained in plant. Treatment water was stopped, and the post Chlorine treatment was increased, just in case.	

6.	Corrective actions taken during the emergency
Mike replaced the hose. Then Mike and the gang cleaned up the spill.	
7.	Steps that will be taken by the supply to prevent future emergencies
Spare hoses are kept in the Liquid Chlorine Feed Room for quick and routine replacement.	

Appendix 2 pg 1-2

MI 0600 Benton Harbor DRINKING WATER treatment EMERGENCY REPORT 09 25 2019_Alum

The Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the Administrative Rules promulgated thereunder (Act 399), Rule 2304 (2) requires that a written report be filed by the supply within ninety days after an emergency.

Please Complete and Return to :

Mr. Ernie Sarkipato
Grand Rapids District / Drinking Water and Municipal Assistance
Michigan Department of Environmental Quality
sarkipatoe@michigan.gov

Water Supply:	Benton Harbor Water Plant
WSSN:	0600
County:	Berrien
Address:	601 Ridgeway
City:	St. Joseph
State/Zip:	MI 49085
Report Prepared Date:	9/25/2019
Report Prepared By:	Mike O'Malley

Briefly describe the following. Attach additional pages as necessary.

1.	Discovery of the emergency

The operator Doug, reported to me that the Alum Pump to the new Rapid Mixer was not working properly. He shut the plant down. 9/19/2019 2:00 pm.
This was a non-emergency. None of the water of concern ever went any further into the treatment sequence.

2.	Cause of the emergency

Alum pump failed

3.	Area of the system effected by the emergency

Plate Settler in the treatment train.

4.	Duration of the emergency

Very short period of time maybe 2-hours, since last operator tour of plant.
Treatment issues are caught quickly. 1st response is to shut plant down. This way it is contained within the plant and does NOT go to the Public Drinking Water Supply.

5.	Procedures by which the public was notified

Public was not notified. I left a note for the operators advising them what action to take when they arrive for their shift in the morning.

6.	Corrective actions taken during the emergency

Mike dumped a great deal of water in the treatment chain into the lagoon. I showed Doug how it is done and then let him go home.
Denny and Doug at 7:00 am made up all of the water lost during dumping and filled it in with the right treatment and continued. No Turbidity issue was involved.

7.	Steps that will be taken by the supply to prevent future emergencies

The alum pump is new. I will get it repaired or replaced by the supplier.
The other alum pump works fine, operation continues with that pump.

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **May-18**

F1-S1 **F1-S2**

Water Plant Classification

Berrien

Signature of Operator-in-Charge County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.0994	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	221.50	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.97	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.96	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.79%	Percent of Treated Water

Chemical Data

Chlorine on hand:	53025	lb.	Est. supply:	368	days
Primary Coagulant (Alum (Al3+)) on hand:	85784	lb.	Est. supply:	227	days
Cost of All Chemicals per Million Gallons:	$64.18	dollars			
Total Power Cost per Million Gallons:		dollars			

Remarks

Number of filter confluence samples > 0.3 NTU:	0	FILTERS
Number of filter confluence samples collected:	174	CFE
Percent of filter confluence samples > 0.3 NTU:	0%	
Number of filter confluence samples > 1 NTU	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.

Remarks: Laboratory Drying Oven Failed. Ordered new one. In the mean time, no glassware could be properly sterilized, so NO Standard Plate Counts were run for RAW or TAP.

WSSN 0600 City of Benton Harbor Month/Year May-18

COAGULATION PARAMETERS

	MIL.	ALUM	ALUM	TURBIDITY UNITS			FILTERED (CFE) NORTH		#	FILTERED (CFE) SOUTH		#	2-hrs Compliance Peroids	
D	GAL.	Dry	as Al3+	RAW		Applied	Avg.	Max.	Samples	Avg.	Max.	Samples	#of	#of
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.			Taken			Taken	Periods	Periods
T		Pounds							North			South	>.30NTU	>.30NTU
E		Add											North	South
1	0.9221	257.00	1.47	3.10	4.80	0.26	0.07	0.08	3	0.07	0.07	3	0	0
2	1.0128	311.00	1.62	3.10	4.80	0.28	0.07	0.08	3	0.08	0.08	3	0	0
3	0.9402	288.00	1.61	2.40	2.40	0.24	0.07	0.08	3	0.10	0.12	3	0	0
4	1.0141	306.00	1.59	4.60	6.30	0.31	0.08	0.09	3	0.06	0.07	3	0	0
5	0.8900	278.00	1.64	7.80	10.00	0.30	0.08	0.08	3	0.07	0.07	3	0	0
6	0.8646	264.00	1.69	2.80	3.60	0.26	0.05	0.07	3	0.07	0.07	3	0	0
7	1.0037	312.00	1.64	3.60	7.40	0.25	0.07	0.07	3	0.07	0.08	3	0	0
8	0.9662	298.00	1.62	2.10	2.20	0.26	0.07	0.08	3	0.08	0.09	3	0	0
9	0.9521	292.00	1.61	8.00	17.20	0.26	0.07	0.08	3	0.08	0.08	3	0	0
10	0.9525	290.00	1.60	2.30	3.70	0.21	0.08	0.08	3	0.08	0.08	3	0	0
11	0.9765	293.00	1.58	1.90	2.40	0.20	0.07	0.08	3	0.07	0.08	3	0	0
12	1.0183	310.00	1.60	1.60	2.20	0.20	0.07	0.07	3	0.07	0.07	3	0	0
13	0.8296	247.00	1.57	2.10	3.80	0.18	0.07	0.08	3	0.06	0.07	3	0	0
14	0.9270	278.00	1.58	2.00	3.90	0.20	0.08	0.09	3	0.07	0.08	3	0	0
15	0.9301	281.00	1.59	1.30	2.00	0.18	0.09	0.11	3	0.07	0.08	3	0	0
16	0.9851	296.00	1.58	1.70	2.80	0.21	0.07	0.07	3	0.07	0.07	3	0	0
17	0.9395	280.00	1.57	5.80	13.30	0.18	0.07	0.07	3	0.07	0.08	3	0	0
18	0.9740	287.00	1.55	2.00	3.50	0.15	0.07	0.08	3	0.07	0.08	3	0	0
19	0.8764	258.00	1.55	1.50	1.90	0.16	0.08	0.09	3	0.07	0.08	3	0	0
20	0.9549	276.00	1.52	2.30	4.60	0.18	0.07	0.07	3	0.07	0.07	3	0	0
21	0.9627	278.00	1.52	2.10	4.30	0.19	0.08	0.08	3	0.08	0.09	3	0	0
22	1.0107	297.00	1.55	2.00	3.30	0.17	0.07	0.08	3	0.08	0.08	3	0	0
23	1.0707	318.00	1.56	1.40	1.60	0.24	0.07	0.07	3	0.07	0.08	3	0	0
24	0.8116	321.00	2.08	1.10	1.50	0.17	0.08	0.08	3	0.07	0.08	3	0	0
25	1.0994	320.00	1.53	2.40	4.90	0.19	0.07	0.08	3	0.08	0.09	3	0	0
26	0.9838	289.00	1.53	1.80	2.50	0.24	0.08	0.08	3	0.07	0.08	3	0	0
27	0.9927	291.00	1.54	2.00	3.30	0.20	0.08	0.08	3	0.07	0.08	3	0	0
28	1.0469	307.00	1.54	2.10	3.90	0.20	0.08	0.08	3	0.08	0.08	3	0	0
29	1.0532	309.00	1.54	1.30	2.20	0.20	0.08	0.08	3	0.08	0.08	3	0	0
30	0.9881	313.00	1.67	1.50	2.90	0.19	0.06	0.06	3	0.06	0.08	3	0	0
31	1.0273	309.00	1.58	1.80	3.20	0.15	0.07	0.08	3	0.07	0.08	3	0	0
Total	29.9768	9054.00						# N CFE take	93		# S CFE take	93	#N > .3	#S > .3
Avg.	0.9670	292.06	1.59	2.63	4.40	0.21	0.07	0.08	0.08	0.07	0.08		Total	Total
Max	1.0994	321.00	2.08	8.00	17.20	0.31	0.09	0.11	0.11	0.10	0.12	# > 0.3	0	0
Min.	0.8116	247.00	1.47	1.10	1.50	0.15	0.05	0.06	0.06	0.06	0.07	% Comp	1.00	1.00

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **May-18**

FLUORIDATION AND CHLORINATION

		Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D		Fluoride		mg/l								New addition Total Chlorine Used				
A	Pounds	Applied				INTAKE		After Wetwell		FILTERED		Total NaOCl Use			TAP	
T	NaF	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E							mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	243	0.58	0.43	0.66				197	3.19	24	0.39	221	9.77	7.64	1.96	2.13
2	238	0.52	0.25	0.72				220	3.24	26	0.38	246	8.60	6.79	1.63	1.81
3	222	0.52	0.29	0.74				203	3.22	23	0.37	226	11.63	9.76	1.62	1.87
4	267	0.58	0.33	0.63				223	3.28	29	0.43	252	9.47	7.68	1.62	1.79
5	225	0.56	0.24	0.79				201	3.37	28	0.47	229	8.59	7.04	1.41	1.55
6	208	0.53	0.23	0.71				198	3.42	29	0.50	227	13.59	12.03	1.40	1.56
7	211	0.46	0.36	0.88				230	3.42	35	0.52	265	9.49	7.31	1.97	2.18
8	245	0.56	0.18	0.64				221	3.41	35	0.54	256	11.32	9.59	1.58	1.73
9	251	0.58	0.35	0.63	0.70			202	3.17	32	0.50	234	12.59	10.64	1.78	1.95
10	277	0.64	0.31	0.76				204	3.20	33	0.52	237	26.15	24.19	1.63	1.96
11	211	0.48	0.25	0.66				204	3.12	29	0.44	233	8.34	6.26	1.69	2.08
12	265	0.57	0.22	0.66				217	3.18	32	0.47	249	18.73	16.93	1.53	1.80
13	154	0.41	0.29	0.72				175	3.15	27	0.49	202	15.40	13.86	1.38	1.54
14	283	0.67	0.20	0.61				197	3.17	29	0.47	226	11.01	9.27	1.55	1.74
15	183	0.43	0.09	0.34				190	3.05	30	0.48	220	11.09	8.91	1.94	2.18
16	232	0.52	0.19	0.61				202	3.06	32	0.48	234	8.80	6.76	1.73	2.04
17	218	0.51	0.33	0.70				188	2.99	30	0.48	218	10.55	8.57	1.81	1.98
18	241	0.55	0.29	0.82	0.69			194	2.97	30	0.46	224	10.36	8.46	1.72	1.90
19	220	0.55	0.23	0.59				173	2.95	25	0.43	198	10.80	8.95	1.70	1.85
20	229	0.53	0.19	0.67				181	2.83	26	0.41	207	10.10	8.34	1.53	1.76
21	191	0.44	0.10	0.52	0.63			184	2.85	27	0.42	211	8.67	6.76	1.63	1.91
22	300	0.65	0.10	0.72				199	2.94	30	0.44	229	8.37	6.36	1.73	2.01
23	268	0.55	0.31	0.65	0.65			219	3.05	32	0.45	251	8.99	7.24	1.50	1.75
24	235	0.64	0.29	0.87				195	3.59	33	0.61	228	7.43	5.78	1.99	1.65
25	255	0.51	0.25	0.80				220	2.99	33	0.45	253	9.28	7.67	1.45	1.61
26	233	0.52	0.32	0.96				200	3.03	32	0.49	232	9.03	7.35	1.51	1.68
27	191	0.42	0.00	0.00				200	3.01	32	0.48	232	9.58	7.91	1.55	1.67
28	212	0.45	0.35	0.80				209	2.98	32	0.46	241	8.65	7.00	1.48	1.65
29	178	0.37	0.14	0.77				215	3.05	31	0.44	246	8.70	6.92	1.61	1.78
30	292	0.65	0.13	0.47				223	3.37	37	0.56	260	12.66	10.49	1.89	2.17
31	198	0.43	0.30	0.87				215	3.12	32	0.47	247	14.95	13.08	1.53	1.87
Tot.	7176							6299		935		7234				
Avg.	231.48	0.53	0.24	0.68	0.67			203.19	3.14	30.16	0.47	233.35	11.05	9.21	1.65	1.84
Max	300.00	0.67	0.43	0.96	0.70			230.00	3.59	37.00	0.61	265.00	26.15	24.19	1.99	2.18
Min.	154.00	0.37	0.00	0.00	0.63			173.00	2.83	23.00	0.37	198.00	7.43	5.78	1.38	1.54

WSSN 0600 | MONTH/YEAR | May-18 |

CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.0	168	158	125	115	43	43	39	38	17	16		
2	8.2	7.7	144	138	129	112	15	26	51	46	4	5		
3	8.3	7.9	172	156	128	117	44	39	49	46	12	10		
4	8.2	7.9	186	168	130	120	56	48	47	44	17	14		
5	7.9	8.0	182	166	132	117	50	49	45	43	17	14		
6	8.1	8.0	174	166	128	121	46	45	44	43	16	14		
7	8.2	8.0	154	152	124	118	30	34	47	49	9	7		
8	8.2	8.1	176	168	122	119	54	49	47	46	14	14		
9	8.1	7.9	166	162	119	117	47	45	44	43	14	13		
10	8.1	7.9	146	142	117	112	29	30	49	47	6	6		
11	8.2	7.9	146	136	114	112	32	24	55	54	2	1		
12	8.1	7.8	156	142	114	112	42	30	50	46	8	6		
13	8.1	7.7	154	152	110	109	44	43	45	45	10	10		
14	7.9	8.0	148	138	115	109	33	29	46	41	8	8		
15	8.0	8.0	140	124	102	106	38	18	40	40	8	6		
16	8.1	8.0	156	152	109	106	47	46	42	40	13	13		
17	8.0	8.0	156	150	110	106	46	44	41	39	13	13		
18	8.0	8.0	138	138	106	101	32	37	38	40	10	9	21.5	23.0
19	8.0	7.9	152	146	107	104	45	42	47	46	8	8		
20	8.0	7.9	152	148	114	103	38	45	50	49	7	6		
21	8.0	8.1	142	140	110	98	32	42	39	40	10	9		
22	7.9	8.0	146	148	110	101	36	47	40	38	11	10		
23	8.0	7.9	148	144	114	107	34	37	47	45	7	8		
24	8.0	7.9	164	154	114	107	50	47	42	40	14	13		
25	8.0	7.9	158	152	110	107	48	45	40	38	14	14		
26	8.1	8.0	158	154	111	108	47	46	42	40	14	13		
27	7.9	8.1	158	152	109	106	49	46	41	40	14	13		
28	8.1	7.9	152	146	114	104	38	42	38	37	14	13		
29	8.1	8.0	156	146	114	105	42	41	38	37	15	13		
30	7.9	8.0	144	152	106	103	38	49	37	36	12	15		
31	8.1	8.0	134	132	107	105	27	27	50	46	3	4	20.0	24.0
Avg.	8.1	7.9	156.4	149.7	115.6	109.4	40.8	40.3	44.0	42.5	11.3	10.5	21.5	23.0
Max	8.3	8.1	186.0	168.0	132.0	121.0	56.0	49.0	55.0	54.0	17.0	16.0	21.5	23.0
Min.	7.9	7.7	138.0	124.0	102.0	98.0	15.0	18.0	37.0	36.0	2.0	1.0	21.5	23.0

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.	___True		___Cold	
A	Samples	P/A	Samples	P/A			'C	'C	___Appar.		___60'C	
T					Raw	Tap			Raw	Tap	Raw	Tap
E												
1			1	A	Plate Count		8	8				
2			1	A	Not used		10	11				
3			1	A	Drying Oven Failed		11	11				
4			1	A	Cannot Sterilize		11	10				
5			1	A	Glass Ware.		11	10				
6			1	A			11	11				
7			1	A			10	12				
8			1	A			10	11				
9			1	A			10	11				
10			1	A			13	13				
11			1	A			13	13				
12			1	A			10	9				
13			1	A			10	14				
14			1	A			11	13				
15			1	A			10	13				
16			1	A			9	11				
17			1	A			9	10				
18			1	A			10	12				
19			1	A			10	13				
20			1	A			10	12				
21			1	A			10	12				
22			1	A			11	10				
23			1	A			11	13				
24			1	A			11	11				
25			1	A			11	11				
26			1	A			12	11				
27			1	A			11	11				
28			1	A			11	12				
29			1	A			10	12				
30			1	A			10	14				
31			1	A	16	0	12	14				
AVG.			1	A	16	0	10	11				
Max					16	0	13	14				
Min					16	0	8	8				

City of Benton Harbor MI Disinfection Monitoring Report DMR May-18

DISTRIBUTION SYSTEM MONITORING WSSN 0600 May-18

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3	0.55		0.80	0.46	0.55		0.50			
4										
5										
6										
7										
8										
9	0.72		0.62	0.96	0.51		0.54			
10										
11										
12										
13										
14										
15										
16										
17										
18	0.96		0.98	0.67	0.80					
19										
20										
21						0.34	0.27			
22										
23	1.05		1.20	1.08	0.81		0.93			
24										
25										
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES – BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	21		
Total number of positive routine distribution samples	0600	0		
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals, mg/L	0600	0.73	1.20	0.27
Total number of check samples	0600			
Total number of positive check samples	0600			

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** **F1-S1**

Signature of Operator-in-Charge

Month/Year **December-18** **F1-S2**

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.1521	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	302.25	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.01	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.08	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.99%	Percent of Treated Water

Chemical Data

Chlorine on hand:	16160	lb.	Est. supply:	132 days
Primary Coagulant (Alum (Al3+)) on hand:	42495	lb.	Est. supply:	54 days
Cost of All Chemicals per Million Gallons:	$70.45	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:	93	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.

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.

Remarks: Sent out 6th and last Public Notice of Violation this month.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **December-18**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l											TAP	
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use				
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.57	0.39	0.58		0	0.00	269	4.21	54	0.85	323	13.15	11.07	1.90	2.08
2	0.55	0.30	0.56		0	0.00	303	4.05	46	0.61	349	10.09	7.62	2.28	2.47
3	0.44	0.24	0.51		0	0.00	274	3.99	45	0.66	319	12.08	10.23	1.66	1.85
4	0.54	0.46	0.57		0	0.00	330	4.85	50	0.74	380	16.69	14.99	1.52	1.70
5	0.58	0.44	0.67		0	0.00	314	4.64	43	0.64	357	14.60	12.99	1.43	1.61
6	0.41	0.43	0.76		0	0.00	281	4.06	52	0.75	333	11.87	9.87	1.80	2.00
7	0.59	0.12	0.44		0	0.00	277	4.00	34	0.49	311	12.00	10.37	1.47	1.63
8	0.59	0.44	0.67		0	0.00	275	4.16	39	0.59	314	12.11	10.72	1.22	1.39
9	0.54	0.41	0.70		0	0.00	299	4.82	48	0.77	347	15.16	13.22	1.76	1.94
10	0.39	0.49	0.80		0	0.00	319	4.56	45	0.64	364	13.63	12.00	1.45	1.63
11	0.61	0.15	0.61		0	0.00	296	4.29	54	0.78	350	13.21	11.53	1.51	1.68
12	0.45	0.32	0.64	0.52	0	0.00	325	4.21	40	0.52	365	24.76	23.07	1.46	1.69
13	0.51	0.27	0.66		0	0.00	312	4.14	47	0.62	359	11.73	9.83	1.73	1.90
14	0.37	0.20	0.53		0	0.00	268	3.99	48	0.72	316	12.78	10.62	1.97	2.16
15	0.43	0.29	0.56		0	0.00	260	4.03	52	0.81	312	13.40	11.55	1.68	1.85
16	0.58	0.34	0.58		0	0.00	261	4.21	58	0.94	319	15.34	13.57	1.54	1.77
17	0.59	0.36	0.72		0	0.00	275	3.97	67	0.97	342	13.08	11.08	1.81	2.00
18	0.56	0.47	0.73		0	0.00	299	4.36	47	0.69	346	12.16	10.08	1.88	2.08
19	0.47	0.51	0.79	0.57	0	0.00	304	4.19	59	0.81	363	12.93	11.06	1.67	1.87
20	0.58	0.25	0.67		0	0.00	274	3.92	51	0.73	325	12.21	10.09	1.93	2.12
21	0.39	0.31	0.63		0	0.00	276	3.87	40	0.56	316	11.23	9.51	1.61	1.72
22	0.43	0.29	0.61		0	0.00	229	3.58	46	0.72	275	11.15	9.36	1.65	1.79
23	0.47	0.16	0.44		0	0.00	246	3.59	141	2.06	387	42.70	40.84	1.71	1.86
24	0.46	0.16	0.42		0	0.00	266	3.83	39	0.56	305	10.44	8.79	1.45	1.65
25	0.62	0.28	0.53		0	0.00	227	3.72	65	1.07	292	15.62	13.56	1.86	2.06
26	0.55	0.24	0.64	0.62	0	0.00	297	4.27	59	0.85	356	12.57	10.45	1.92	2.12
27	0.58	0.30	0.73		0	0.00	292	4.36	54	0.81	346	12.93	11.37	1.38	1.56
28	0.54	0.36	0.75		0	0.00	264	3.96	45	0.68	309	11.73	10.03	1.52	1.70
29	0.51	0.23	0.65		0	0.00	283	4.76	56	0.94	339	18.70	16.91	1.61	1.79
30	0.41	0.26	0.75		0	0.00	252	3.93	43	0.67	295	11.89	9.98	1.72	1.91
31	0.45	0.22	0.59		0	0.00	254	3.89	25	0.38	279	12.41	10.63	1.49	1.78
Tot.							8,432		1,538		10,293				
Avg.	0.51	0.32	0.63	0.57	0.00	0.00	281.57	4.15	52.23	0.77	333.80	14.40	12.55	1.67	1.85
Max	0.62	0.51	0.80	0.62	0.00	0.00	330.00	4.85	141.00	2.06	387.00	42.70	40.84	2.28	2.47
Min.	0.37	0.12	0.42	0.52	0.00	0.00	227.00	3.58	34.00	0.49	275.00	10.09	7.62	1.22	1.39

WSSN 0600 City of Benton Harbor Month/Year December-18

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	0.9528	292.00	1.61	4.20	4.70	0.32	3	0.06	0.06	3	0.06	0.06	6	0	0
2	1.1172	334.00	1.57	6.20	12.70	0.29	3	0.06	0.07	3	0.07	0.07	6	0	0
3	1.0252	268.00	1.38	8.30	8.90	0.36	3	0.07	0.09	3	0.09	0.11	6	0	0
4	1.0154	289.00	1.50	6.80	8.70	0.47	3	0.07	0.08	3	0.11	0.12	6	0	0
5	1.0099	308.00	1.60	6.70	7.30	0.58	3	0.08	0.10	3	0.08	0.09	6	0	0
6	1.0344	291.00	1.57	7.50	9.30	0.48	3	0.09	0.09	3	0.08	0.10	6	0	0
7	1.0338	302.00	1.54	6.10	6.90	0.31	3	0.08	0.11	3	0.08	0.08	6	0	0
8	0.9862	298.00	1.59	6.20	7.60	0.36	3	0.07	0.07	3	0.06	0.07	6	0	0
9	0.9269	278.00	1.58	7.40	11.80	0.42	3	0.07	0.08	3	0.07	0.07	6	0	0
10	1.0452	314.00	1.58	5.70	7.40	0.46	3	0.08	0.09	3	0.08	0.07	6	0	0
11	1.0303	309.00	1.58	8.00	12.00	0.31	3	0.07	0.08	3	0.07	0.07	6	0	0
12	1.1521	308.00	1.41	5.20	5.70	0.36	3	0.07	0.08	3	0.08	0.09	6	0	0
13	1.1253	330.00	1.54	6.80	8.60	0.36	3	0.08	0.10	3	0.07	0.08	6	0	0
14	1.0021	284.00	1.49	5.90	8.90	0.44	3	0.07	0.08	3	0.07	0.08	6	0	0
15	0.9632	291.00	1.59	4.60	6.50	0.38	3	0.07	0.07	3	0.08	0.09	6	0	0
16	0.9258	269.00	1.53	5.60	9.00	0.29	3	0.08	0.09	3	0.07	0.08	6	0	0
17	1.0351	321.00	1.63	9.70	11.60	0.33	3	0.09	0.10	3	0.08	0.08	6	0	0
18	1.0238	309.00	1.59	6.80	9.90	0.35	3	0.07	0.08	3	0.07	0.08	6	0	0
19	1.0825	374.00	1.82	7.30	12.30	0.32	3	0.07	0.07	3	0.08	0.09	6	0	0
20	1.0447	362.00	1.82	6.00	9.80	0.29	3	0.06	0.07	3	0.06	0.07	6	0	0
21	1.0633	304.00	1.50	6.70	7.20	0.45	3	0.08	0.08	3	0.06	0.07	6	0	0
22	0.9539	281.00	1.55	7.60	13.10	0.24	3	0.07	0.07	3	0.07	0.08	6	0	0
23	1.0226	160.00	0.82	8.20	9.90	0.36	3	0.06	0.07	3	0.06	0.07	6	0	0
24	1.0365	402.00	2.04	8.00	8.20	0.37	3	0.06	0.07	3	0.07	0.07	6	0	0
25	0.9105	278.00	1.61	6.20	7.30	0.38	3	0.06	0.06	3	0.07	0.07	6	0	0
26	1.0372	340.00	1.61	7.40	10.80	0.36	3	0.07	0.08	3	0.06	0.07	6	0	0
27	1.0006	283.00	1.49	5.90	8.30	0.39	3	0.06	0.06	3	0.06	0.07	6	0	0
28	0.9944	322.00	1.70	5.90	8.70	0.33	3	0.06	0.07	3	0.06	0.06	6	0	0
29	0.8870	271.00	1.61	9.00	13.40	0.32	3	0.06	0.07	3	0.06	0.06	6	0	0
30	0.9561	309.00	1.70	7.00	7.80	0.27	3	0.06	0.06	3	0.06	0.07	6	0	0
31	0.9737	280.00	1.51	6.00	8.50	0.35	3	0.08	0.08	3	0.06	0.07	6	0	0
Total	31.3677	9361.00					93			93			186	0	0
Avg.	1.0119	301.97	1.57	6.74	9.12	0.36	93	0.07	0.08		0.07		Total	Total	Total
Max	1.1521	402.00	2.04	9.70	13.40	0.58		0.09	0.11		0.11	0.12	6	0	0
Min.	0.8870	160.00	0.82	4.20	4.70	0.24		0.06	0.06		0.06				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.0	8.0	180	168	127	116	53	52	50	46	14	13		
2	8.0	8.0	178	168	125	115	53	53	46	44	15	14		
3	7.8	7.8	184	164	134	123	50	41	55	46	11	12		
4	8.0	7.9	205	168	139	118	66	50	53	45	18	14		
5	8.0	8.0	190	180	142	129	48	51	46	48	18	15		
6	7.9	7.6	182	164	147	124	35	40	65	57	5	5		
7	7.9	7.9	158	164	119	132	39	32	46	50	10	10	22.5	24.0
8	7.9	7.8	188	176	131	116	57	60	51	49	15	13		
9	7.9	7.9	214	170	155	121	59	49	56	42	18	16		
10	8.0	7.9	196	172	146	123	50	49	46	44	19	15		
11	8.0	7.9	182	202	124	133	58	69	46	51	17	18	21.5	26.0
12	7.8	7.8	168	170	122	127	46	43	51	51	10	11		
13	7.8	7.7	164	168	119	120	45	48	53	52	8	9		
14	7.9	7.7	208	176	173	119	35	57	65	51	11	12	23.0	24.5
15	7.9	7.9	172	162	136	120	36	42	49	48	12	10		
16	8.0	8.0	158	178	119	131	39	47	46	47	11	14		
17	7.9	7.9	192	194	121	128	71	66	50	51	17	16		
18	7.8	7.9	170	174	120	121	50	53	42	44	16	16		
19	7.9	7.9	188	170	127	118	61	52	46	43	18	15		
20	7.9	8.0	180	170	130	117	50	53	46	46	16	14		
21	7.9	7.8	166	164	117	119	49	45	50	47	10	11		
22	8.0	7.9	148	146	116	114	32	32	46	45	8	8	22.0	23.5
23	8.0	7.9	182	164	143	114	39	50	54	51	12	9		
24	7.9	7.9	158	152	128	125	30	27	46	46	10	9		
25	8.1	8.0	176	164	141	122	35	42	50	46	13	12		
26	7.9	7.9	184	170	135	119	49	51	46	45	17	14		
27	8.0	8.0	184	170	136	123	48	47	46	46	17	14		
28	7.9	7.9	184	176	128	123	56	53	50	46	15	15	28.0	25.0
29	7.9	7.9	180	172	125	122	55	50	49	46	14	14		
30	8.0	8.0	168	182	112	122	56	60	45	49	14	15		
31	7.9	7.9	162	154	124	115	38	39	46	44	12	11	21.5	23.5
Avg.	7.9	7.9	179.6	170.6	131.2	121.8	48.3	48.8	49.7	47.4	13.6	12.8	23.4	24.6
Max	8.1	8.0	214.0	202.0	173.0	133.0	71.0	69.0	65.0	57.0	19.0	18.0	28.0	26.0
Min.	7.8	7.6	148.0	146.0	112.0	114.0	30.0	27.0	42.0	42.0	5.0	5.0	21.5	23.5

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.	___True		____Cold	
A	Samples	P/A	Samples	P/A			'C	'C	___Appar.		____60'C	
T					Raw	Tap			Raw	Tap	Raw	Tap
E												
1			1	A	36	0	6	7.5				
2			1	A	60	1	6	7.5				
3			1	A	168	0	6	9.0				
4			1	A	98	4	5	6.5				
5			1	A	55	17	6	7.0				
6			1	A	154	2	6	9.0				
7			1	A	137	1	6	9.0				
8			1	A	81	1	5	6.5				
9			1	A	116	0	4	6.5				
10			1	A	90	1	5	6.5				
11			1	A	91	0	5	6.0				
12			1	A	69	0	5	8.0				
13			1	A	46	0	6	9.0				
14			1	A	34	0	6	8.0				
15			1	A	65	1	5	7.5				
16			1	A	41	1	5	8.0				
17			1	A	41	0	4	5.5				
18			1	A	58	0	4	5.0				
19			1	A	37	1	4	6.0				
20			1	A	47	0	4	5.5				
21			1	A	32	0	5	9.0				
22			1	A	48	0	5	8.0				
23			1	A	44	0	5	8.0				
24			1	A	103	1	4	7.0				
25			1	A	64	1	5	8.0				
26			1	A	65	1	5	5.5				
27			1	A	62	0	4.8	5.5				
28			1	A	142	0	9.0	12.0				
29			1	A	85	0	8.7	8.5				
30			1	A	49	0	8.5	9.5				
31			1	A	52	0	5.0	11.0				
AVG.			1	A	73	1	5	8				
Max					168	17	9	12				
Min					32	0	4	5				

DISTRIBUTION SYSTEM MONITORING WSSN 0600 December-18

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1	1.30		1.05	0.70	1.11		1.08			
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12	0.58		1.14	1.13	0.91		1.00			
13										
14										
15										
16										
17										
18										
19	0.42		0.93	0.52	1.08		0.99			
20										
21										
22										
23										
24										
25										
26	0.23		1.12	0.44	0.66		1.17			
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	20		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	**0.88**	1.30	0.23
Total number of check samples	0600			
Total number of positive check samples	0600			

Benton Harbor Water Filtration Plant
601 Ridgeway
St. Joseph, Mi. 49085

MONTHLY REPORT | December-18

DISTRIBUTION:	MGD	
Total Gallons	11.1105	MG
Average Day	0.3702	MG
Maximum Day	0.5161	MG
Minimum Day	0.1353	MG

TREATMENT:		
Total Low Service MG	30.4149	MG
Wash Water Gals. MG	0.2970	MG
Wash Water %	0.98%	
Plant Use to Sanitary MG	0.0066	MG
Total Plant Use MG	1.2358	MG
Total Plant Use to Lagoon MG	1.2292	MG
Total Plant Use %	4.06%	

FILTRATION:		
Ave. Filter Run	302.3	hours
Ave. Filter Rate	1.81	gal/sqft/min

LABORATORY REPORT

Average of	*Raw*	*Tap*
Chlorides mg/L	23.1	24.4
Fluoride mg/L	0.31	0.63
Alkalinity mg/L	131	122
Hardness mg/L	179	170
pH	7.9	7.8
Calcium mg/L	50	47
Magnesium mg/L	14	13
Turbidity NTU	6.82	0.08
Temperature C	5.00	7.15
Temperature F	41.00	44.87
Color		

Chlorine Residual		*mg/L Free*
Mixing Basin		2.09
Applied		1.62
Tap		1.84
Distribution		0.82

Treatment Chemical Summary:

CHEMICAL	Applied mg/L ION	Total Lbs. chem.	Cost chem	Inventory (lbs.)	Days Supply
Alum (Al3+)	1.57	9,361	$1,282.46	42,495	132
Chlorine (Cl2) pre	14.33	9,361	$860.41	16,160	54
Chlorine (Cl2) post	4.14				
Fluoride (F2)	0.51	6,681	$25.92	1,900	213

Total Cost of all Chemicals			$2,142.87
Chemical Cost per Million Gallons Treated			$70.45
Chemical Cost per Million Gallons Delivered			

Remarks:

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **Feburary 2019**

F1-S1 **F1-S2**

Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.7439	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	188.13	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.40	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.98	Gallons Per Square Feet per Minute
Average Wash Water Use:	1.84%	Percent of Treated Water

Chemical Data

Chlorine on hand:	37370	lb.	Est. supply:	202 days
Primary Coagulant (Alum (Al3+)) on hand:	59573	lb.	Est. supply:	81 days
Cost of All Chemicals per Million Gallons:	$72.36	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:	83	82
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.	
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	37.91904	Avg	1.3914114	Max	1.63784	Min	1.24444

Remarks: Data developed to re-determine Water Distributed to System
The Sodium Fluoride transfer pump broke late in January, took until March for parts to arrive.
During, February, analysis of F-ion was susspended for convience.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **Feburary 2019**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l											TAP	
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use				
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.00	0.32	0.31				306	3.89	49	0.62	355	5.09	2.59	2.29	2.50
2	0.00	0.27	0.28				293	3.01	38	0.39	331	3.68	1.16	2.31	2.52
3	0.00	0.36	0.38				271	2.71	28	0.28	299	3.44	0.86	2.36	2.58
4	0.00	0.32	0.29				310	2.95	41	0.39	351	3.81	1.63	1.97	2.18
5	0.00	0.36	0.36				328	3.44	17	0.18	345	3.71	1.80	1.71	1.91
6	0.00	0.30	0.36	0.40			298	2.65	24	0.21	322	3.29	1.34	1.68	1.95
7	0.00	0.30	0.35				285	3.04	24	0.26	309	3.23	1.00	1.83	2.23
8	0.00	0.31	0.36				289	2.93	29	0.29	318	3.38	1.15	2.02	2.23
9	0.00	0.27	0.32				308	2.79	19	0.17	327	3.11	1.16	1.73	1.95
10	0.00						331	3.05	32	0.29	363	4.04	2.27	1.50	1.77
11	0.00	0.38	0.29				370	3.17	88	0.75	458	4.36	1.79	2.35	2.57
12	0.00	0.40	0.35				291	2.84	27	0.26	318	3.33	1.23	1.87	2.10
13	0.00	0.42	0.37	0.35			270	2.57	24	0.23	294	3.23	1.14	1.87	2.09
14	0.00	0.27	0.30				311	3.11	64	0.64	375	3.81	1.34	2.22	2.47
15	0.00	0.35	0.33				358	3.87	21	0.23	379	4.13	2.23	1.71	1.90
16	0.00						334	3.66	27	0.30	361	4.15	2.19	1.70	1.96
17	0.00						300	3.06	15	0.15	315	3.78	1.79	1.74	1.99
18	0.00						298	3.51	28	0.33	326	3.22	1.12	1.81	2.10
19	0.00						297	3.32	17	0.19	314	3.01	1.13	1.64	1.88
20	0.00						356	3.95	19	0.21	375	3.42	1.64	1.61	1.78
21	0.00						345	3.85	19	0.21	364	3.70	1.99	1.53	1.71
22	0.00						349	3.77	20	0.22	369	3.78	1.94	1.67	1.84
23	0.00	0.33	0.33				350	4.04	47	0.54	397	4.48	2.68	1.61	1.80
24	0.00	0.44	0.37				289	3.94	35	0.48	324	3.82	1.91	1.71	1.91
25	0.00			0.21			301	3.78	28	0.35	329	3.59	1.54	1.82	2.05
26	0.00						289	3.66	26	0.33	315	3.57	1.42	1.96	2.15
27	0.00						278	3.57	24	0.31	302	3.22	1.02	2.06	2.20
28	0.00						262	4.03	16	0.25	278	3.26	1.41	1.55	1.85
Tot.	NaF Transfer Pump broken took a long time for 1 part						8,361		797		9,513				
Avg.	0.00	0.34	0.33	0.32			309.54	3.36	30.21	0.32	339.75	3.67	1.59	1.85	2.08
Max	0.00	0.44	0.38	0.40			370.00	4.04	88.00	0.75	458.00	5.09	2.68	2.36	2.58
Min.	0.00	0.27	0.28	0.21			262.00	2.57	15.00	0.15	278.00	3.01	0.86	1.50	1.71

WSSN 0600 City of Benton Harbor

Month/Year Feburary 2019

COAGULATION PARAMETERS

D A T E	MIL. GAL. TREAT.	Dry Al2(SO3)4 Pounds Add	ALUM as Al3+ mg/l	TURBIDITY UNITS RAW Avg.	RAW Max.	Applied Avg.	# ample	FILTERED NORTH Avg.	FILTERED NORTH Max.	# Samples	FILTERED SOUTH Avg.	FILTERED SOUTH Max.	2 Hour Compliance Periods # of Periods	#of Periods >.30NTU North	#of Periods >.30NTU South
1	1.1746	346.00	1.55	2.40	3.20	0.57	3	0.08	0.08	3	0.16	0.22	6	0	0
2	1.4532	411.00	1.49	4.80	7.10	0.76	3	0.07	0.07	2	0.10	0.12	5	0	0
3	1.4920	402.00	1.42	10.60	22.90	0.54	3	0.07	0.07	3	0.11	0.12	6	0	0
4	1.5664	414.00	1.39	2.20	4.00	0.72	3	0.07	0.08	3	0.09	0.13	6	0	0
5	1.4216	415.00	1.54	3.30	5.10	0.60	3	0.08	0.08	3	0.12	0.15	6	0	0
6	1.6807	421.00	1.30	3.10	3.70	0.89	3	0.08	0.09	3	0.10	0.10	6	0	0
7	1.3994	533.00	2.00	2.70	3.40	0.56	3	0.09	0.11	3	0.07	0.09	6	0	0
8	1.4700	519.00	1.86	4.70	5.40	0.62	3	0.07	0.08	3	0.07	0.08	6	0	0
9	1.6452	516.00	1.65	10.00	10.40	2.60	3	0.08	0.10	3	0.09	0.10	6	0	0
10	1.6222	533.00	1.73	4.50	5.00	1.40	3	0.08	0.09	3	0.09	0.10	6	0	0
11	1.7439	731.00	2.21	5.60	7.30	0.82	3	0.07	0.08	3	0.08	0.09	6	0	0
12	1.5314	506.00	1.74	2.20	2.60	0.99	3	0.07	0.08	3	0.09	0.12	6	0	0
13	1.5653	453.00	1.52	10.00	12.80	1.00	3	0.07	0.09	3	0.06	0.07	6	0	0
14	1.4909	500.00	1.76	7.70	10.40	1.90	3	0.11	0.15	3	0.09	0.12	6	0	0
15	1.3825	518.00	1.97	8.50	9.80	1.60	3	0.07	0.08	3	0.08	0.08	6	0	0
16	1.3614	519.00	2.01	4.60	5.10	0.75	3	0.09	0.11	3	0.08	0.10	6	0	0
17	1.4645	960.00	3.45	3.90	4.80	2.90	3	0.11	0.16	3	0.12	0.18	6	0	0
18	1.2678	639.00	2.65	4.60	5.90	0.86	3	0.10	0.13	3	0.12	0.19	6	0	0
19	1.3371	575.00	2.26	4.70	5.50	0.74	3	0.06	0.07	3	0.07	0.07	6	0	0
20	1.3470	633.00	2.47	4.30	5.50	1.80	3	0.08	0.09	3	0.10	0.11	6	0	0
21	1.3383	482.00	1.89	5.50	5.90	1.50	3	0.06	0.07	3	0.08	0.09	6	0	0
22	1.3825	531.00	2.02	3.90	4.90	1.80	3	0.07	0.08	3	0.07	0.07	6	0	0
23	1.2936	523.00	2.13	4.70	9.40	1.10	3	0.09	0.10	3	0.08	0.08	6	0	0
24	1.0952	476.00	2.29	2.90	3.60	0.80	3	0.08	0.10	3	0.07	0.07	6	0	0
25	1.1893	508.00	2.25	12.60	13.30	0.87	3	0.07	0.09	3	0.07	0.07	6	0	0
26	1.1775	433.00	2.25	7.00	8.50	1.20	3	0.06	0.06	3	0.07	0.07	6	0	0
27	1.1613	400.00	1.81	6.90	7.50	1.30	3	0.07	0.07	3	0.07	0.08	6	0	0
28	0.9713	326.00	1.77	8.10	8.40	1.70	3	0.09	0.09	2	0.09	0.09	4	0	0
Total	39.0261	14223.00					84	Samples N		82	Samples S		165	0	0
Avg.	1.3938	507.96	1.94	5.57	7.19	1.17	83	0.08	0.09		0.09		Total	Total	Total
Max	1.7439	960.00	3.45	12.60	22.90	2.90		0.11	0.16		0.16	0.19	6	0	0
Min.	0.9713	326.00	1.30	2.20	2.60	0.54		0.06	0.06		0.06		4	0	0

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			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	
DAY	pH Raw	pH Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
	29.	30.	31.	32.	33.	34.	35.	36.	37	38	39	40	41	42
1	8.0	7.9	174	162	126	112	48	50	45	43	15	13		
2	7.8	7.7	168	170	115	119	53	51	41	42	16	16		
3	7.9	7.8	170	164	114	110	56	54	44	40	15	16		
4	7.9	7.8	190	166	137	112	53	54	47	42	17	15		
5	7.8	7.8	188	194	126	121	62	73	48	51	17	17		
6	7.9	7.8	148	144	114	117	34	27	47	46	7	7	14.5	18.0
7	7.9	7.9	160	148	111	112	49	36	50	47	9	7		
8	7.9	7.9	154	148	105	107	49	41	46	43	10	10		
9	8.0	7.7	182	148	132	103	50	45	62	45	7	9		
10	7.9	7.9	166	156	123	116	43	40	47	46	12	10		
11	7.9	7.9	176	172	114	113	62	59	45	41	15	17		
12	7.8	7.8	168	162	112	107	56	55	42	40	16	15		
13	7.8	7.7	160	152	114	105	46	47	40	41	15	12		
14	7.8	7.8	204	166	134	104	70	62	55	42	17	15		
15	7.8	7.9	180	168	131	117	49	51	48	42	15	16	23.0	26.5
16	7.9	7.8	150	172	117	129	33	43	50	51	6	11		
17	7.9	7.8	170	158	119	113	51	45	49	47	12	10		
18	7.9	7.9	164	156	120	109	44	47	47	48	11	8		
19	7.8	7.7	142	144	109	105	33	39	42	43	9	9	18.5	26.0
20	7.9	7.9	186	146	131	121	55	25	56	44	11	9		
21	7.9	7.9	168	178	124	131	44	47	55	61	8	6		
22	7.9	7.7	176	162	134	125	42	37	55	55	9	6		
23	8.0	8.0	186	170	132	125	54	45	48	44	16	15		
24	8.0	8.0	194	176	153	125	41	51	43	46	21	15	17.5	24.5
25	7.8	7.8	152	158	108	119	44	39	47	53	8	6	19.5	22.0
26	7.8	7.8	148	152	108	111	40	41	46	46	8	9		
27	8.2	8.0	168	148	114	111	54	37	46	43	13	10		
28	7.8	7.9	162	148	111	102	51	46	46	45	11	9		
Avg.	7.9	7.8	169.8	160.3	121.0	114.3	48.8	46.0	47.8	45.6	12.4	11.4	18.6	23.4
Max	8.2	8.0	204.0	194.0	153.0	131.0	70.0	73.0	62.0	61.0	21.0	17.0	23.0	26.5
Min.	7.8	7.7	142.0	144.0	105.0	102.0	33.0	25.0	40.0	40.0	6.0	6.0	14.5	18.0

WSSN 0600 MONTH/YEAR Feburary 2019

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.	___True		___Cold	
A	Samples	P/A	Samples	P/A			'C	'C	___Appar.		___60'C	
T					Raw	Tap			Raw	Tap	Raw	Tap
E												
1			1	A	86	0	2	2.5				
2			1	A	49	0	2	2.0				
3			1	A	39	0	2	2.5				
4			1	A	48	2	2	2.5				
5			1	A	28	0	2	2.5				
6			1	A	33	0	3	4.0				
7			1	A	30	0	2	3.8				
8			1	A	27	0	2	3.3				
9			1	A	176	3	3	5.0				
10			1	A	551	2	2	4.0				
11			1	A	45	0	2	2.5				
12			1	A	47	0	2	2.5				
13			1	A	30	0	2	2.0				
14			1	A	65	0	2	2.5				
15			1	A	101	1	2	2.5				
16			1	A	118	0	2	5.0				
17			1	A	83	0	2	5.0				
18			1	A	45	0	2	4.0				
19			1	A	38	0	2	6.0				
20			1	A	63	0	2	4.0				
21			1	A	71	1	2	4.0				
22			1	A	71	1	2	4.0				
23			1	A	90	1	2	3.0				
24			1	A	90	0	3	3.5				
25			1	A	38	0	2	5.0				
26			1	A	54	0	2	5.0				
27			1	A	38	0	2.0	4.0				
28			1	A	24	0	9.0	12.0				
AVG.			1	A	78	0	2	4				
Max					551	3	9	12				
Min					24	0	2	2				

DISTRIBUTION SYSTEM MONITORING DMR WSSN 0600 Feburary 2019

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6	1.04		1.31	0.00	0.93		0.89			
7										
8										
9										
10										
11										
12										
13	0.90		1.02	0.65	1.21		2.05			
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25	1.13			0.93	1.08		1.28			
26			1.00				1.20			
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	16	
Total number of positive routine distribution samples	0600		
Total number of routine distribution samples required	0600	10	Max Min
Average Chlorine Residuals by WSSN, mg/L	0600	**1.04**	2.05 0.00
Total number of check samples	0600		
Total number of positive check samples	0600		

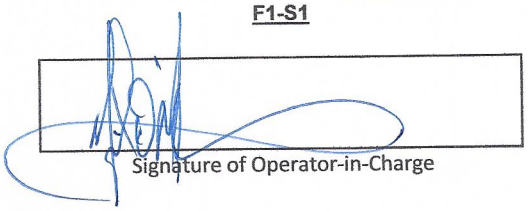
MONTHLY OPERATION REPORT OF
THE CITY OF BENTON HARBOR WATER TREATMENT PLANT

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley**

F1-S1



Signature of Operator-in-Charge

Month/Year **October-18**

F1-S2

Water Plant Classification

Berrien

County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.1719	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	306.00	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.98	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.33	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.39%	Percent of Treated Water

Chemical Data

Chlorine on hand:	36360	lb.	Est. supply:	259 days
Primary Coagulant (Alum (Al3+)) on hand:	81416	lb.	Est. supply:	127 days
Cost of All Chemicals per Million Gallons:	$70.20	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:	93	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? 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.

Remarks: Lead and Copper results come in early in October. The Lead Action Level is exceeded. 90th percentile value is 22 ppb. There were 8 samples out of 30 that exceeded 15ppb.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **October-18**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l											TAP	
A	Applied				INTAKE		SETTLED		FILTERED		Total NaOCl Use				
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.53	0.18	0.54		0	0.00	236	3.75	41	0.65	277	11.64	9.79	1.71	1.85
2	0.45	0.26	0.64		0	0.00	281	3.84	51	0.70	332	11.54	9.67	1.74	1.87
3	0.47	0.24	0.58		0	0.00	266	4.06	47	0.72	313	11.93	10.35	1.43	1.58
4	0.42	0.12	0.59	0.58	0	0.00	275	4.21	45	0.69	320	12.20	10.61	1.33	1.59
5	0.47	0.12	0.58		0	0.00	267	4.09	47	0.72	314	13.00	11.28	1.55	1.72
6	0.45	0.20	0.57		0	0.00	245	3.83	9	0.14	254	11.80	10.33	1.19	1.47
7	0.49	0.18	0.65		0	0.00	210	3.84	10	0.18	220	13.83	12.46	1.19	1.37
8	0.61	0.28	0.67		0	0.00	299	4.22	99	1.40	398	14.56	12.71	1.69	1.85
9	0.54	0.19	0.67		0	0.00	280	4.16	13	0.19	293	11.43	9.96	1.22	1.47
10	0.44	0.27	0.70	0.68	0	0.00	267	4.19	24	0.38	291	11.86	10.62	1.11	1.24
11	0.35	0.30	0.74		0	0.00	305	4.55	24	0.36	329	13.44	12.30	0.84	1.14
12	0.42	0.24	0.66		0	0.00	338	4.77	26	0.37	364	13.74	12.62	1.00	1.12
13	0.61	0.26	0.64		0	0.00	257	4.38	34	0.58	291	15.68	14.50	1.03	1.18
14	0.48	0.25	0.63		0	0.00	273	4.53	35	0.58	308	16.19	14.74	1.29	1.45
15	0.59	0.14	0.56		0	0.00	300	4.43	46	0.68	346	12.51	11.06	1.28	1.45
16	0.59	0.06	0.66		0	0.00	281	4.15	52	0.77	333	13.68	12.32	1.21	1.36
17	0.54	0.25	0.72		0	0.00	290	4.64	44	0.70	334	15.04	13.26	1.61	1.78
18	0.59	0.26	0.72		0	0.00	295	4.61	50	0.78	345	15.95	14.35	1.44	1.60
19	0.66	0.21	0.71		0	0.00	299	4.54	56	0.85	355	13.87	12.14	1.58	1.73
20	0.59	0.11	0.70		0	0.00	296	4.51	56	0.85	352	15.65	13.66	1.82	1.99
21	0.46	0.44	0.74		0	0.00	251	4.41	45	0.79	296	17.77	16.15	1.45	1.62
22	0.68	0.31	0.71		0	0.00	307	4.59	55	0.82	362	14.72	13.05	1.50	1.67
23	0.58	0.21	0.68		0	0.00	276	4.35	48	0.76	324	13.96	12.06	1.73	1.90
24	0.61	0.21	0.65		0	0.00	300	4.37	58	0.84	358	13.48	11.48	1.82	2.00
25	0.62	0.23	0.60		0	0.00	274	4.20	49	0.75	323	12.33	10.45	1.71	1.88
26	0.72	0.23	0.53		0	0.00	270	4.30	56	0.89	326	18.97	17.25	1.57	1.72
27	0.31	0.20	0.61		0	0.00	323	4.11	64	0.82	387	18.73	16.58	1.96	2.15
28	0.44	0.23	0.54		0	0.00	249	4.11	47	0.78	296	14.57	12.81	1.68	1.76
29	0.33	0.17	0.59		0	0.00	275	4.10	54	0.81	329	12.79	10.73	1.88	2.06
30	0.42	0.29	0.63		0	0.00	250	4.08	51	0.83	301	17.54	15.29	2.08	2.25
31	0.61	0.28	0.65	0.59	0	0.00	299	4.05	57	0.77	356	12.94	10.97	1.80	1.97
Tot.	15.45						8,398		1,352		10,027	437.32			
Avg.	0.52	0.22	0.64	0.63	0.00	0.00	277.83	4.26	44.53	0.68	322.37	14.15	12.49	1.49	1.66
Max	0.72	0.44	0.74	0.68	0.00	0.00	338.00	4.77	99.00	1.40	398.00	18.97	17.25	2.08	2.25
Min.	0.31	0.06	0.53	0.58	0.00	0.00	210.00	3.75	9.00	0.14	220.00	11.43	9.67	0.84	1.12

WSSN 0600 City of Benton Harbor Month/Year ########

COAGULATION PARAMETERS

D A T E	MIL. GAL. TREAT.	Dry Al2(SO3)4 Pounds Add	ALUM as Al3+ mg/l	TURBIDITY UNITS RAW Avg.	RAW Max.	Applied Avg.	# ample	FILTERED NORTH Avg.	FILTERED NORTH Max.	# Samples	FILTERED SOUTH Avg.	FILTERED SOUTH Max.	2 Hour Compliance Periods # of Periods	#of Periods >.30NTU North	#of Periods >.30NTU South
1	0.9406	265.00	1.48	1.90	2.10	0.14	3	0.07	0.07	3	0.06	0.06	6	0	0
2	1.0921	320.00	1.54	2.10	2.30	0.13	3	0.06	0.06	3	0.06	0.06	6	0	0
3	0.9782	285.00	1.53	2.00	2.10	0.18	3	0.06	0.07	3	0.07	0.07	6	0	0
4	0.9752	284.00	1.53	4.20	5.10	0.21	3	0.06	0.07	3	0.06	0.07	6	0	0
5	0.9755	278.00	1.50	4.20	5.90	0.18	3	0.06	0.06	3	0.06	0.07	6	0	0
6	0.9537	277.00	1.53	2.60	2.70	0.14	3	0.07	0.08	3	0.06	0.06	6	0	0
7	0.8174	240.00	1.54	2.60	2.70	0.15	3	0.07	0.07	3	0.06	0.06	6	0	0
8	1.0580	309.00	1.54	3.20	3.40	0.20	3	0.08	0.09	3	0.07	0.07	6	0	0
9	1.0051	297.00	1.55	2.10	2.90	0.22	3	0.07	0.08	3	0.08	0.09	6	0	0
10	0.9518	281.00	1.55	2.00	2.10	0.19	3	0.06	0.06	3	0.07	0.07	6	0	0
11	1.0011	286.00	1.50	6.70	8.20	0.17	3	0.06	0.07	3	0.07	0.07	6	0	0
12	1.0581	299.00	1.49	5.00	5.20	0.17	3	0.05	0.06	3	0.07	0.07	6	0	0
13	0.8761	254.00	1.53	5.00	5.50	0.20	3	0.31	0.06	3	0.08	0.08	6	0	0
14	0.8988	264.00	1.55	5.10	5.30	0.19	3	0.06	0.06	3	0.07	0.07	6	0	0
15	1.0116	294.00	1.53	4.80	7.00	0.18	3	0.06	0.07	3	0.07	0.07	6	0	0
16	1.0109	294.00	1.53	3.80	4.30	0.21	3	0.06	0.07	3	0.07	0.07	6	0	0
17	0.9322	279.00	1.57	4.90	6.40	0.18	3	0.06	0.07	3	0.07	0.07	6	0	0
18	0.9547	287.00	1.58	6.20	7.80	0.22	3	0.06	0.07	3	0.06	0.07	6	0	0
19	0.9836	290.00	1.55	4.30	4.80	0.21	3	0.07	0.07	3	0.06	0.07	6	0	0
20	0.9792	290.00	1.56	5.10	6.30	0.21	3	0.07	0.07	3	0.07	0.07	6	0	0
21	0.8499	248.00	1.54	6.90	7.60	0.23	3	0.06	0.06	3	0.06	0.06	6	0	0
22	0.9988	294.00	1.55	7.00	8.50	0.26	3	0.06	0.07	3	0.06	0.06	6	0	0
23	0.9471	279.00	1.55	7.30	9.50	0.29	3	0.07	0.07	3	0.07	0.07	6	0	0
24	1.0258	296.00	1.52	6.30	8.50	0.23	3	0.07	0.07	3	0.06	0.06	6	0	0
25	0.9744	288.00	1.56	5.20	5.80	0.23	3	0.07	0.07	3	0.06	0.06	6	0	0
26	0.9372	287.00	1.56	4.80	5.70	0.26	3	0.06	0.06	3	0.06	0.06	6	0	0
27	1.1719	338.00	1.52	3.90	4.30	0.21	3	0.07	0.07	3	0.07	0.07	6	0	0
28	0.9047	259.00	1.51	2.90	3.00	0.16	3	0.07	0.07	3	0.07	0.08	6	0	0
29	1.0009	299.00	1.57	4.90	6.20	0.15	3	0.06	0.07	3	0.06	0.07	6	0	0
30	0.9138	269.00	1.55	4.90	5.20	0.17	3	0.07	0.07	3	0.07	0.08	6	0	0
31	1.1025	363.00	1.73	4.20	6.00	0.33	3	0.07	0.07	3	0.07	0.08	6	0	0
Total	30.2809	8893.00					93			93			186	0	0
Avg.	0.9768	286.87	1.54	4.39	5.24	0.20	93	0.07	0.07		0.07		Total	Total	Total
Max	1.1719	363.00	1.73	7.30	9.50	0.33		0.31	0.09		0.08	0.09	6	0	0
Min.	0.8174	240.00	1.48	1.90	2.10	0.13		0.05	0.06		0.06				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness		Total Alkalinity		Non-Carb. Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	7.7	144	146	109	113	35	33	41	42	10	10		
2	8.1	7.8	144	136	113	109	31	27	46	41	7	8		
3	8.2	8.0	172	160	120	110	52	50	42	41	16	14	16.0	20.0
4	8.2	8.1	158	154	112	110	46	44	40	38	14	14		
5	8.0	8.1	152	160	109	115	43	45	38	41	14	14		
6	8.1	7.7	172	144	126	109	46	35	47	40	13	11		
7	8.1	7.8	158	148	117	109	41	39	46	42	10	10		
8	8.1	8.0	212	160	131	112	81	48	55	43	18	13		
9	8.0	7.9	192	154	146	114	46	40	59	47	11	9		
10	8.0	7.9	178	172	136	125	42	47	51	46	12	14	20.5	26.5
11	8.1	8.0	148	172	108	131	40	41	39	49	12	12		
12	8.1	7.9	158	174	111	129	47	45	43	51	12	12		
13	8.1	8.0	154	164	110	116	44	48	40	44	13	13		
14	7.9	7.9	168	162	116	114	52	48	45	43	14	13	18.0	22.0
15	8.1	8.0	166	160	113	112	53	48	46	44	13	15		
16	8.0	8.0	158	148	115	106	43	42	40	38	14	13		
17	8.1	8.0	160	154	114	108	46	46	41	40	14	13	18.5	23.0
18	8.1	8.0	162	150	116	105	46	45	41	39	15	13		
19	8.0	8.0	172	154	124	108	48	46	45	43	15	11		
20	8.1	8.1	160	152	117	110	43	42	41	40	14	13		
21	8.1	8.1	156	154	115	111	41	43	39	40	14	13		
22	8.1	8.0	164	154	118	111	46	43	42	40	14	13		
23	8.1	8.0	162	152	117	108	45	44	41	39	15	13	18.0	22.0
24	8.0	8.0	158	152	117	112	41	40	39	38	15	14		
25	8.0	8.0	158	152	113	110	45	42	41	39	14	13		
26	8.0	8.1	156	152	109	108	47	44	41	39	13	13		
27	8.0	7.8	144	146	108	109	36	37	41	42	10	10	17.0	21.0
28	8.1	7.9	144	146	108	107	36	39	42	44	9	9		
29	8.0	7.9	146	150	106	104	40	46	43	41	9	12		
30	8.3	7.9	162	138	135	104	27	34	43	40	13	9		
31	8.1	8.0	152	146	113	108	39	38	37	36	15	14		
Avg.	8.1	8.0	161.3	154.0	117.0	111.6	44.3	42.4	43.3	41.8	12.9	12.1	18.0	22.4
Max	8.3	8.1	212.0	174.0	146.0	131.0	81.0	50.0	59.0	51.0	18.0	15.0	20.5	26.5
Min.	7.9	7.7	144.0	136.0	106.0	104.0	27.0	27.0	38.0	38.0	7.0	8.0	16.0	20.0

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	RAW		PLANT TAP		Standard Plate Count		Raw	Tap	COLOR		ODOR	
D	No. of	Colilert	No. of	Colilert			TEMP.	TEMP.	___True		___Cold	
A	Samples	P/A	Samples	P/A			'C	'C	___Appar.		___60'C	
T					Raw	Tap			Raw	Tap	Raw	Tap
E												
1			1	A	77	1	18	19.0				
2			1	A	42	0	18	19.0				
3			1	A	173	0	18	17.5				
4			1	A	101	0	19	18.0				
5			1	A	70	2	16	18.0				
6			1	A	164	1	18	19.0				
7			1	A	130	0	17	19.0				
8			1	A	30	0	17	17.0				
9			1	A	127	0	19	18.0				
10			1	A	83	0	19	21.0				
11			1	A	78	0	19	19.0				
12			1	A	126	1	18	19.0				
13			1	A	100	0	17	18.0				
14			1	A	79	0	17	17.5				
15			1	A	101	1	17	17.5				
16			1	A	61	0	16	17.0				
17			1	A	51	0	16	17.0				
18			1	A	66	0	15	16.5				
19			1	A	88	0	15	16.0				
20			1	A	81	0	15	15.5				
21			1	A	102	0	13	15.5				
22			1	A	170	0	13	15.0				
23			1	A	81	1	13	14.5				
24			1	A	16	0	13	14.0				
25			1	A	49	0	13	14.0				
26			1	A	85	5	12	13.5				
27			1	A	52	0	13.0	14.0				
28			1	A	69	0	9.0	12.0				
29			1	A	51	4	8.7	8.5				
30			1	A	21	2	8.5	9.5				
31			1	A	37	0	12.5	13.0				
AVG.			1	A	83	1	15	16				
Max					173	5	19	21				
Min					16	0	9	9				

DISTRIBUTION SYSTEM MONITORING WSSN 0600 October-18

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4	0.76		0.86	0.53	0.79		0.88			
5										
6										
7										
8										
9										
10	0.38		0.63	0.57	0.86		1.23			
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31	0.59		0.62	0.96						

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	13	
Total number of positive routine distribution samples	0600		
Total number of routine distribution samples required	0600	10	Max / Min
Average Chlorine Residuals by WSSN, mg/L	0600	0.74	1.23 / 0.38
Total number of check samples	0600		
Total number of positive check samples	0600		

MI 0600 Benton Harbor MOR April 2020

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** Month/Year **April-20**

F1-S1 **F1-S2**

Signature of Operator-in-Charge

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.1125	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	191.75	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.89	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.96	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.78%	Percent of Treated Water

Chemical Data

Chlorine on hand:	38885	lb.	Est. supply:	204	days
Primary Coagulant (Alum (Al3+)) on hand:	42495	lb.	Est. supply:	142	days
Cost of All Chemicals per Million Gallons:	$64.24	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:	92	92
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.

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	25.258464	Avg	0.871259	Max	0.988736	Min	0.748013

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019. Then changed under EGLE orders to a 90/10 blend and double the dose on February 21, 2020

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **April-20**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.51	0.32	0.87		0	0.00	190	3.11	32	0.52	222	3.77	1.95	1.66	1.82
2	0.59	0.32	0.88		0	0.00	196	2.90	31	0.46	227	3.69	1.78	1.75	1.91
3	0.50	0.27	0.76		0	0.00	178	3.03	30	0.51	208	3.72	1.67	1.86	2.05
4	0.50	0.39	0.88		0	0.00	188	3.02	29	0.47	217	3.66	1.85	1.66	1.81
5	0.55	0.35	0.78		0	0.00	203	3.04	38	0.57	241	3.92	1.97	1.73	1.95
6	0.50	0.34	0.86		0	0.00	181	3.00	35	0.58	216	3.60	1.80	1.64	1.80
7	0.53	0.38	0.82	0.68	0	0.00	162	2.80	30	0.52	192	3.19	1.23	1.79	1.96
8	0.52	0.38	0.89		0	0.00	210	2.87	36	0.49	246	3.72	1.81	1.75	1.91
9	0.47	0.24	0.87		0	0.00	162	2.95	26	0.47	188	3.75	1.91	1.67	1.84
10	0.49	0.23	0.86		0	0.00	200	3.18	32	0.51	232	3.72	2.10	1.46	1.62
11	0.51	0.24	0.82		0	0.00	197	3.38	41	0.70	238	4.24	2.50	1.61	1.74
12	0.60	0.35	0.83		0	0.00	221	3.27	39	0.58	260	4.31	2.02	2.06	2.29
~~13~~	~~0.41~~	~~0.22~~	~~0.83~~		~~0~~	~~0.00~~	~~186~~	~~3.22~~	~~28~~	~~0.48~~	~~214~~	~~4.02~~	~~2.23~~	~~1.59~~	~~1.79~~
14	0.53	0.26	0.74		0	0.00	231	3.10	35	0.47	266	4.43	2.84	1.39	1.59
15	0.57	0.33	0.80		0	0.00	179	3.16	31	0.55	210	4.19	2.40	1.69	1.79
16	0.56	0.26	0.74		0	0.00	174	3.23	27	0.50	201	3.22	1.52	1.55	1.70
17	0.52	0.25	0.62	0.73	0	0.00	188	3.09	30	0.49	218	3.43	1.52	1.76	1.91
18	0.64	0.24	0.62		0	0.00	201	3.32	46	0.76	247	4.71	2.96	1.60	1.75
19	0.58	0.29	0.52		0	0.00	192	3.19	47	0.78	239	3.61	1.80	1.65	1.81
20	0.63	0.21	0.63		0	0.00	200	3.30	36	0.59	236	4.23	2.36	1.72	1.87
21	0.55	0.22	0.71		0	0.00	190	3.13	26	0.43	216	3.75	2.10	1.51	1.65
22	0.51	0.28	0.73	0.62	0	0.00	208	3.14	31	0.47	239	3.99	2.10	1.74	1.89
23	0.50	0.28	0.84		0	0.00	181	3.17	29	0.51	210	4.06	2.48	1.41	1.58
24	0.53	0.31	0.72		0	0.00	220	3.12	30	0.43	250	4.07	2.51	1.36	1.56
25	0.59	0.23	0.66		0	0.00	186	3.30	25	0.44	211	3.93	2.17	1.61	1.76
26	0.54	0.23	0.70		0	0.00	177	2.96	25	0.42	202	3.32	1.56	1.60	1.76
27	0.48	0.32	0.76		0	0.00	177	2.77	32	0.50	209	3.39	1.40	1.83	1.99
28	0.55	0.34	0.68		0	0.00	164	2.71	27	0.45	191	3.53	1.55	1.82	1.98
29	0.60	0.29	0.71	0.74	0	0.00	206	3.07	36	0.54	242	4.25	2.26	1.86	1.99
30	0.52	0.20	0.84		0	0.00	174	3.09	28	0.50	202	3.53	1.84	1.50	1.69
31															
Tot.							5,532		936		6,690				
Avg.	0.54	0.29	0.77	0.69	0.00	0.00	190.73	3.09	32.27	0.52	223.00	3.83	2.01	1.66	1.83
Max	0.64	0.39	0.89	0.74	0.00	0.00	231.00	3.38	47.00	0.78	266.00	4.71	2.96	2.06	2.29
Min.	0.41	0.20	0.52	0.62	0.00	0.00	162.00	2.71	25.00	0.42	188.00	3.19	1.23	1.36	1.56

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total Hardness as CaCO3		Total Alkalinity as CaCO3		Non-Carb. Hardness as CaCO3		Calcium as Ca++		Magnesium as Mg++		Chloride as Cl-	
D	pH													
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.0	7.9	178	192	118	128	60	64	43	48	17	17		
2	8.1	8.0	196	188	129	123	67	65	50	46	18	17		
3	8.0	8.0	178	172	133	119	45	53	43	42	17	17		
4	8.1	8.1	166	170	123	126	43	44	51	52	9	10		
5	8.3	7.9	160	158	132	129	28	29	47	47	10	10		
6	8.1	8.1	182	174	121	121	61	53	44	42	17	17	20.5	23.5
7	8.1	8.0	192	178	130	115	62	63	46	44	18	17		
8	8.0	8.0	196	172	143	110	53	62	49	45	18	15		
9	8.1	8.1	194	176	131	120	63	56	47	46	18	15		
10	8.1	8.0	202	190	146	124	56	66	50	47	19	17		
11	8.1	9.1	164	166	136	130	28	36	50	53	10	8		
12	8.1	8.1	178	172	144	133	34	39	54	55	11	9		
13	8.2	8.1	182	176	148	136	34	40	59	56	9	9		
14	8.2	8.2	170	178	124	138	46	40	49	52	12	12	21.0	23.0
15	8.2	8.1	168	172	131	132	37	40	50	55	11	9		
16	8.1	8.2	198	188	145	125	53	63	49	46	18	18	22.5	26.0
17	8.3	8.1	232	194	168	126	64	68	51	46	26	19	23.5	25.0
18	8.1	8.2	208	194	144	135	64	59	52	50	19	17	22.0	26.0
19	8.1	8.1	196	192	143	138	53	54	46	48	19	17	22.5	25.0
20	8.3	8.2	152	174	119	138	33	36	40	59	13	7	24.0	25.5
21	8.3	8.2	148	168	118	134	30	34	44	58	9	6		
22	8.3	8.2	172	168	129	131	43	37	52	55	10	7		
23	8.3	8.3	190	174	143	133	47	41	63	50	8	12		
24	8.2	8.2	172	178	134	134	38	44	47	49	13	14		
25	8.2	8.1	184	200	115	129	69	71	46	51	17	18		
26	8.0	8.0	170	182	118	122	52	60	43	49	15	15		
27	8.1	8.1	166	158	115	114	51	44	42	41	15	14	19.0	23.0
28	8.1	8.2	186	164	131	114	55	50	46	41	17	15	20.5	23.5
29	8.3	8.2	170	152	142	119	28	33	47	48	13	8	24.5	25.5
30	8.3	8.1	166	164	140	128	26	36	52	51	9	9		
31														
Avg.	8.2	8.1	180.5	176.1	133.1	126.8	47.4	49.3	48.4	49.1	14.5	13.2	22.0	24.6
Max	8.3	9.1	232.0	200.0	168.0	138.0	69.0	71.0	63.0	59.0	26.0	19.0	24.5	26.0
Min.	8.0	7.9	148.0	152.0	115.0	110.0	26.0	29.0	40.0	41.0	8.0	6.0	19.0	23.0

WSSN 0600 City of Benton Harbor Month/Year April-20

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	0.9125	292.00	1.68	9.50	14.00	1.10	3	0.09	0.12	3	0.17	0.19	6	0	0
2	1.0075	321.00	1.68	10.90	17.80	1.30	3	0.08	0.10	3	0.19	0.24	6	0	0
3	0.8775	268.00	1.61	5.90	7.60	1.30	3	0.11	0.13	3	0.15	0.18	6	0	0
4	0.9300	293.00	1.66	5.10	6.00	1.20	3	0.08	0.09	3	0.17	0.18	6	0	0
5	0.9975	309.00	1.63	7.30	7.70	1.50	3	0.08	0.09	3	0.10	0.11	6	0	0
6	0.9000	284.00	1.81	8.10	12.50	0.99	3	0.07	0.08	3	0.10	0.12	6	0	0
7	0.8625	294.00	1.79	8.20	14.10	1.80	3	0.09	0.10	3	0.09	0.10	6	0	0
8	1.0925	337.00	1.62	6.50	8.60	1.40	3	0.09	0.10	3	0.08	0.09	6	0	0
9	0.8200	251.00	1.61	11.70	14.90	1.20	3	0.09	0.10	3	0.09	0.10	6	0	0
10	0.9375	291.00	1.63	13.40	18.70	1.50	3	0.11	0.14	3	0.08	0.09	6	0	0
11	0.8700	273.00	1.65	7.30	7.60	1.10	3	0.14	0.19	3	0.08	0.08	6	0	0
12	1.0075	318.00	1.66	6.40	6.70	1.20	3	0.17	0.20	3	0.07	0.09	6	0	0
13	0.8625	270.00	1.65	10.60	10.70	1.50	3	0.11	0.12	3	0.08	0.09	6	0	0
14	1.1125	350.00	1.66	13.10	14.50	1.10	3	0.09	0.10	3	0.12	0.16	6	0	0
15	0.8450	261.00	1.63	8.50	12.20	0.94	3	0.08	0.09	3	0.08	0.08	6	0	0
16	0.8050	239.00	1.56	7.50	11.20	1.10	3	0.11	0.11	3	0.10	0.09	6	0	0
17	0.9075	286.00	1.66	5.70	7.90	0.94	3	0.13	0.16	3	0.11	0.14	6	0	0
18	0.9050	280.00	1.63	9.70	13.60	0.97	3	0.12	0.14	3	0.10	0.11	6	0	0
19	0.8975	277.00	1.62	7.30	12.20	0.88	3	0.12	0.13	3	0.09	0.10	6	0	0
20	0.9050	262.00	1.52	4.90	6.50	0.73	3	0.14	0.15	3	0.09	0.09	6	0	0
21	0.9075	271.00	1.57	7.10	8.80	0.89	3	0.11	0.14	3	0.09	0.11	6	0	0
22	0.9900	299.00	1.59	6.60	7.20	0.92	3	0.13	0.17	3	0.09	0.11	6	0	0
23	0.8525	254.00	1.57	6.70	10.80	0.89	3	0.12	0.15	3	0.08	0.09	6	0	0
24	1.0525	310.00	1.55	4.10	4.90	1.00	3	0.15	0.17	3	0.08	0.10	6	0	0
25	0.8425	242.00	1.51	4.20	6.50	0.96	3	0.13	0.15	3	0.09	0.11	6	0	0
26	0.8925	261.00	1.51	3.20	3.50	0.66	3	0.13	0.14	3	0.09	0.10	6	0	0
27	0.9525	281.00	1.55	4.90	7.80	0.70	3	0.14	0.15	3	0.07	0.07	6	0	0
28	0.9050	266.00	1.55	4.30	6.80	0.73	3	0.12	0.17	3	0.08	0.09	6	0	0
29	1.0025	292.00	1.53	4.30	7.30	0.80	3	0.10	0.11	3	0.09	0.09	6	0	0
30	0.8400	250.00	1.57	23.90	26.40	1.80	2	0.08	0.09	2	0.10	0.10	4	0	0
31															
Total	27.6925	8482.00					89			89			178	0	0
Avg.	0.9231	282.73	1.62	7.90	10.50	1.10		0.11	0.13		0.10		Total	Total	Total
Max	1.1125	350.00	1.81	23.90	26.40	1.80		0.17	0.20		0.19	0.24	6	0	0
Min.	0.8050	239.00	1.51	3.20	3.50	0.66		0.07	0.08		0.07				

WSSN 0600 MONTH/YEAR April-20 PAGE 6

BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
D	System	System	No. of	Colilert			TEMP.	TEMP.				
A	Ortho P	Ortho P	Samples	P/A			'C	'C	High Lift		PO4	Ortho P
T	Residual	Residual			Raw	Tap			To	Lbs PO4	Treatment	Residual
E	mg/L	Location							Distribution		mg/L	mg/L
1			1	A	110	0	6	6.5	0.8793	94	4.24	3.12
2			1	A	132	0	6	6.5	0.9188	80	3.43	3.10
3			1	A	86	0	7	6.5	0.8479	84	3.92	
4			1	A	90	1	7	8.0	0.8840	68	3.06	3.02
5			1	A	55	1	7	8.0	0.9182	96	4.14	3.05
6			1	A	88	0	6	7.0	0.8947	89	3.94	2.99
7	2.73	City Hall	1	A	44	0	7	7.0	0.8975	120	5.28	3.04
7	2.86	Bait Shed	1	A	88	0	7	7.0	0.9869	40	0.00	2.94
7	3.07	SunnySpot	1	A	51	1	8	7.5	0.7480	66	3.48	3.10
7	2.85	B & Z	1	A	67	0	8	7.5	0.9304	71	3.00	3.30
11			1	A	36	0	8	9.0	0.8387	83	3.91	2.78
12			1	A	78	0	8	9.0	0.9003	85	3.73	2.90
13			1	A	79	0	9	10.0	0.7955	89	4.40	2.90
14			*1*	*A*	*63*	*1*	*9*	*10.0*	*0.8963*	*52*	*2.28*	*2.87*
15	2.59	City Hall	1	A	44	0	9	10.0	0.7480	85	4.49	3.23
15	3.30	Bait Shed	1	A	96	1	9	9.0	0.9327	68	2.88	3.11
15	2.89	SunnySpot	1	A	56	1	9	9.5	0.9479	74	3.08	3.18
15	2.98	B & Z	1	A	37	1	8	9.5	0.7830	83	4.18	3.10
19			1	A	57	0	9	9.5	0.9887	66	2.65	3.10
20			1	A	37	1	9	10.0	0.8332	77	3.63	3.15
21	2.97	City Hall	1	A	35	0	9	10.0	0.8595	107	4.92	3.10
21	3.02	Bait Shed	1	A	58	0	9	10.0	0.8933	61	2.69	3.30
21	3.00	SunnySpot	1	A	55	0	10	10.0	0.7716	90	4.61	3.10
21	2.66	B & Z	1	A	81	0	9	10.5	0.9175	74	3.20	3.22
25			1	A	39	1	8	9.0	0.8010	32	0.00	3.17
26			1	A	44	1	8	9.0	0.9074	57	2.49	3.01
27	2.77	City Hall	1	A	39	0	7.5	8.5	0.9198	76	3.26	3.18
27	2.97	Bait Shed	1	A	41	0	9.0	12.0	0.8068	81	3.96	2.96
27	2.93	SunnySpot	1	A	37	0	8.7	8.5	0.8500	103	4.79	2.74
27	3.30	B & Z	1	A	58	0	8.5	9.5	0.8539	60	2.79	2.95
31												
Totals									26.1510	2307.2		
AVG.	2.93		1	A	61	0	8	9	0.8717	76.9	3.39	3.06
Max	3.30				132	1	10	12	0.9887	119.7	5.28	3.30
Min	2.59				35	0	6	7	0.7480	31.8	0.00	2.74

DISTRIBUTION SYSTEM MONITORING WSSN 0600 April-20

DATE	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4										
5										
6										
7	1.01			0.90	1.20		0.79			
8										
9										
10										
11										
12										
13										
14										
15										
16										
17	1.14			0.95	1.13		0.94			
18										
19										
20										
21										
22	0.77			1.20	1.01		0.52			
23										
24										
25										
26										
27										
28										
29	1.25			1.08	1.33		1.11			
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	16		
Total number of positive routine distribution samples	0600			
Total number of routine distribution samples required	0600	10	Max	Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.02	1.33	0.52
Total number of check samples	0600			
Total number of positive check samples	0600			

MI 0600 Benton Harbor Water MOR Cover sheet Revised @ 02/11/19

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

SUPPLY NAME: CITY OF BENTON HARBOR

WSSN:600

Operator-in-Charge **Michael O'Malley** F1-S1

Signature of Operator-in-Charge

Month/Year **January-19** F1-S2

Water Plant Classification

Berrien County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.4059	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	273.00	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.06	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.40	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.39%	Percent of Treated Water

Chemical Data

Chlorine on hand:	38380	lb.	Est. supply:	102 days
Primary Coagulant (Alum (Al3+)) on hand:	32566	lb.	Est. supply:	116 days
Cost of All Chemicals per Million Gallons:	$70.97	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:	93	93
Percent of filter confluence samples > 0.3 NTU:	0%	0%
Number of filter confluence samples > 1 NTU	0	0

← Revised to be correct

Did any individual filter exceed:

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

Distribution	Total	30.48468	Avg	1.0162826	Max	1.39556	Min	0.82812

Remarks: Data developed to re-determine Water Distributed to System Max days during water main break of 4" about 7 days.

MI 0600 Benton Harbor Water MOR Revised pg 2/11/19

Missed these

WSSN 0600 City of Benton Harbor Month/Year January-19

COAGULATION PARAMETERS

D A T E	MIL. GAL. TREAT.	Dry Al2(SO3)4 Pounds Add	ALUM as Al3+ mg/l	TURBIDITY UNITS RAW Avg.	RAW Max.	Applied Avg.	# ample	FILTERED NORTH Avg.	FILTERED NORTH Max.	# Samples	FILTERED SOUTH Avg.	FILTERED SOUTH Max.	2 Hour Compliance Periods # of Periods	#of Periods >.30NTU North	#of Periods >.30NTU South
1	0.8675	289.00	1.75	6.90	7.40	0.30	3	0.06	0.07	3	0.06	0.07	6	0	0
2	0.9450	308.00	1.71	8.20	10.10	0.34	3	0.06	0.07	3	0.07	0.08	6	0	0
3	0.8312	270.00	1.71	7.50	7.70	0.79	3	0.08	0.09	3	0.07	0.07	6	0	0
4	0.9450	337.00	1.88	8.20	8.70	0.77	3	0.06	0.06	3	0.09	0.10	6	0	0
5	0.9051	293.00	1.70	9.00	14.10	0.66	3	0.08	0.08	3	0.07	0.07	6	0	0
6	1.0500	333.00	1.47	7.60	8.40	0.69	3	0.07	0.08	3	0.06	0.07	6	0	0
7	1.0500	341.00	1.71	7.10	8.50	0.64	3	0.08	0.10	3	0.07	0.07	6	0	0
8	0.9071	310.00	1.80	7.20	10.60	0.50	3	0.07	0.08	3	0.07	0.08	6	0	0
9	1.0519	299.00	1.50	7.20	7.70	0.42	3	0.08	0.08	3	0.06	0.07	6	0	0
10	0.9750	327.00	1.76	8.30	9.20	0.55	3	0.07	0.08	3	0.06	0.06	6	0	0
11	0.8600	268.00	1.64	7.30	7.90	0.63	3	0.07	0.08	3	0.07	0.09	6	0	0
12	0.9870	297.00	1.58	6.40	9.50	0.55	3	0.07	0.08	3	0.07	0.08	6	0	0
13	0.8280	277.00	1.76	6.40	9.50	0.42	3	0.06	0.06	3	0.06	0.07	6	0	0
14	1.0560	352.00	1.75	5.80	7.60	0.46	3	0.07	0.09	3	0.07	0.08	6	0	0
15	1.0550	321.00	1.60	7.00	9.10	0.81	3	0.07	0.07	3	0.07	0.08	6	0	0
16	1.0612	340.00	1.69	8.30	11.60	0.63	3	0.06	0.07	3	0.07	0.07	6	0	0
17	0.9114	295.00	1.70	5.00	5.50	0.48	3	0.07	0.08	3	0.08	0.09	6	0	0
18	1.0556	350.00	1.74	8.30	12.00	0.57	3	0.07	0.07	3	0.07	0.08	6	0	0
19	0.9300	252.00	1.43	7.40	7.50	0.66	3	0.07	0.09	3	0.07	0.07	6	0	0
20	1.0125	313.00	1.63	8.70	11.60	0.55	3	0.07	0.07	3	0.07	0.08	6	0	0
21	0.9720	303.00	1.64	6.60	6.90	0.59	3	0.07	0.07	3	0.07	0.08	6	0	0
22	0.9900	330.00	1.75	8.00	10.90	0.72	3	0.07	0.09	3	0.07	0.08	6	0	0
23	1.0858	324.00	1.57	10.00	18.50	0.66	3	0.07	0.08	3	0.08	0.09	6	0	0
24	1.3860	485.00	1.84	14.70	20.60	1.40	3	0.10	0.14	3	0.10	0.13	6	0	0
25	1.4059	341.00	1.28	12.40	12.70	0.13	3	0.07	0.08	3	0.08	0.09	6	0	0
26	1.3839	457.00	1.28	10.20	15.40	0.93	3	0.07	0.08	3	0.11	0.14	6	0	0
27	1.0777	353.00	1.72	7.00	8.30	0.60	3	0.07	0.07	3	0.09	0.12	6	0	0
28	1.4014	431.00	1.62	7.90	9.50	1.00	3	0.07	0.08	3	0.12	0.16	6	0	0
29	1.2195	384.00	1.66	13.10	15.50	1.00	3	0.07	0.07	3	0.18	0.29	6	0	0
30	1.2820	353.00	1.45	14.40	21.60	1.10	3	0.07	0.08	3	0.11	0.14	6	0	0
31	1.2678	356.00	1.48	5.70	6.60	1.50	3	0.06	0.07	3	0.11	0.15	6	0	0
Total	32.7565	10289.00					93			93			186	0	0
Avg.	1.0567	331.90	1.64	8.32	10.67	0.68	93	0.07	0.08		0.08		Total	Total	Total
Max	1.4059	485.00	1.88	14.70	21.60	1.50		0.10	0.14		0.18	0.29	6	0	0
Min.	0.8280	252.00	1.28	5.00	5.50	0.13		0.06	0.06		0.06				

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? 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	26.495952	Avg	0.9172796	Max	1.333876	Min	0.733097

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

WSSN 0600 CITY OF BENTON HARBOR Month/Year **April-21**

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30 NTU	>.30 NTU
														North	South
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				

WSSN 0600 CITY OF BENTON HARBOR MONTH/YEAR **April-21**

CHEMICAL ANALYSES

			Total		Total		Non-Carb.								WQP	
			Hardness		Alkalinity		Hardness		Calcium		Magnesium		Chloride		Conductivity	Sulfate
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-			
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		umhos	mg/l
T	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Tap	Tap
E	29.	30.	31.	32.	33.	34.	35.	36.	37	38	39	40	41	42		
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

		Fluoride Analysis			Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	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

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MONTH/YEAR April-21

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	PLANT TAP		Standard Plate Count		Raw	Tap
D	No. of	Colilert			TEMP.	TEMP.
A	Samples	P/A			'C	'C
T			Raw	Tap		
E						
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

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MONTH/YEAR **April-21**

Distrubution Flow and Corrosion Treatment

	Ortho P System					Distrubution flow and Corrosion Treatment			
D	City Hall	Wolfs	Bait Shed	Sunny Spot	B&Z				
A	Ortho P	Ortho P	Ortho P	Ortho P	Ortho P	High Lift		PO4	Ortho P
T	Residual	Residual	Residual	Residual	Residual	To	Lbs PO4	Treatment	Residual
E	mg/L	mg/L	mg/L	mg/L	mg/L	Distribution		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									
Totals						17.6429	2920.0		
AVG.	3.15	2.88	3.09	2.73	2.94	0.5881	97.3	6.83	3.35
Max	3.30	3.10	3.29	3.15	3.14	0.9394	137.0	10.35	4.44
Min	2.93	2.54	2.60	1.59	2.57	0.4620	59.0	4.14	2.93

CITY OF BENTON HARBOR PAGE 7

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

	Avg.	Max.	Min.
Chlorine Residuals, mg/L	**1.04**	1.61	0.44
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	**0**		

MI 0600 Benton Harbor October 2020 MOR 1 of 6

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **Michael O'Malley** **F1-S1**

Signature of Operator-in-Charge

Month/Year **October-20** **F1-S2**

Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.097	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	190.00	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.92	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.91	Gallons Per Square Feet per Minute
Average Wash Water Use:	12.70%	Percent of Treated Water

Chemical Data

Chlorine on hand:	38885	lb.	Est. supply:	221	days
Primary Coagulant (Alum (Al3+)) on hand:	56792	lb.	Est. supply:	134	days
Cost of All Chemicals per Million Gallons:	$69.74	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:	93	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? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
0.5 NTU in two consecutive measurements taken 15 minutes apart after 4 hours of operation? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
1.0 NTU in two consecutive measurements taken 15 minutes apart for 3 consecutive months? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
2.0 NTU in two consecutive measurements taken 15 minutes apart for 2 consecutive months? **If yes**, attach specific filter(s) information and indicate required follow-up status.	NO
Was continuous (every 15 minutes) filter monitoring equipment off-line during the month? ***If yes**, indicate date(s), duration, and individual filter grab sampling frequency on a separate sheet.*	NO
Did POE disinfectant residual fall below 0.2 ppm during the month? **If yes**, indicate date(s) and duration on a separate sheet.	NO
Was minimum C*T credit achieved for the entire month? **If no**, indicate on a separate sheet the date(s) not achieved.	YES
Was continuous POE chlorine residual monitoring equipment off-line during the month? **If yes**, indicate date(s) and duration on a separate sheet.	NO

Distribution	Total	27.261596	Avg	0.9086145	Max	1.137601	Min	0.692453

Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR October-20

FLUORIDATION AND CHLORINATION

The chorine section could be formatted more clearly. I assume that everything but the tap is applied chlorine and not measured residuals, but it's not very clear.

DATE	Fluoride Analysis: Fluoride Applied as Fmg/l	Fluoride Analysis: mg/l Raw	Fluoride Analysis: mg/l Tap	Fluoride Analysis: mg/l Dist.	Chlorine Application And Chlorine Residual in mg/L: INTAKE PPD	INTAKE Free mg/l	Pre Treat Raw Line PPD	Pre Treat Raw Line Free mg/l	FILTERED PPD	FILTERED Free mg/l	Total NaOCl Use PPD	Total NaOCl Use Free mg/l	Demand mg/L	TAP Free mg/l	TAP Total mg/l
1	0.59	0.25	0.80		0	0.00	267	3.63	47	0.64	314	5.18	3.33	1.67	1.85
2	0.55	0.25	0.78		0	0.00	218	3.58	39	0.64	257	4.91	3.22	1.52	1.69
3	0.50	0.24	0.86		0	0.00	198	3.69	34	0.63	232	4.19	2.38	1.63	1.81
4	0.53	0.22	0.81		0	0.00	200	3.82	33	0.63	233	4.35	2.66	1.51	1.69
5	0.49	0.17	0.79		0	0.00	259	3.62	48	0.67	307	4.20	2.29	1.73	1.91
6	0.53	0.19	0.78		0	0.00	202	3.62	34	0.61	236	3.89	1.96	1.76	1.93
7	0.54	0.35	0.78	0.72	0	0.00	256	3.71	43	0.62	299	4.58	2.72	1.71	1.86
8	0.60	0.23	0.77		0	0.00	212	3.72	33	0.58	245	3.59	1.52	1.90	2.07
9	0.67	0.30	0.78		0	0.00	264	3.72	41	0.58	305	4.59	2.41	1.97	2.18
10	0.59	0.28	0.79		0	0.00	196	3.70	27	0.51	223	4.81	2.83	1.78	1.98
11	0.59	0.29	0.69		0	0.00	217	3.79	22	0.38	239	4.38	2.79	1.42	1.59
12	0.68	0.31	0.60		0	0.00	241	3.81	29	0.46	270	4.23	2.55	1.50	1.68
13	0.60	0.20	0.62		0	0.00	214	3.67	32	0.55	246	4.46	2.48	1.81	1.98
14	0.55	0.21	0.69		0	0.00	220	3.66	36	0.60	256	4.51	2.37	2.01	2.14
15	0.53	0.18	0.80		0	0.00	237	3.63	35	0.54	272	4.61	2.62	1.74	1.99
16	0.55	0.17	0.75		0	0.00	229	3.65	23	0.37	252	4.05	2.49	1.42	1.56
17	0.63	0.24	0.82		0	0.00	211	3.66	32	0.56	243	4.04	2.42	1.41	1.62
18	0.52	0.23	0.70		0	0.00	199	3.66	32	0.59	231	4.29	2.53	1.59	1.76
19	0.53	0.33	0.77		0	0.00	267	3.68	42	0.58	309	4.47	2.53	1.77	1.94
20	0.55	0.19	0.77		0	0.00	226	3.64	34	0.55	260	4.18	2.38	1.63	1.80
21	0.63	0.18	0.73	0.59	0	0.00	260	3.64	39	0.55	299	4.35	2.53	1.64	1.82
22	0.51	0.22	0.70		0	0.00	228	3.72	32	0.52	260	4.30	2.42	1.71	1.88
23	0.52	0.21	0.67		0	0.00	231	3.82	33	0.55	264	4.94	3.03	1.73	1.91
24	0.65	0.24	0.64		0	0.00	245	3.94	39	0.63	284	4.11	2.07	1.86	2.04
25	0.60	0.24	0.61		0	0.00	237	4.07	36	0.62	273	4.79	2.87	1.74	1.92
26	0.57	0.29	0.74		0	0.00	267	4.04	46	0.70	313	4.80	2.70	2.32	2.10
27	0.61	0.25	0.61		0	0.00	238	3.90	39	0.64	277	5.12	2.71	2.30	2.41
28	0.68	0.27	0.52	0.65	0	0.00	240	3.85	30	0.48	270	3.77	1.55	2.06	2.22
29	0.61	0.24	0.55		0	0.00	269	3.76	62	0.87	331	4.34	1.99	2.17	2.35
30	0.52	0.26	0.56		0	0.00	230	3.69	31	0.50	261	4.79	2.90	1.72	1.89
31	0.57	0.21	0.56		0	0.00	196	3.68	31	0.58	227	3.97	1.99	1.81	1.98
Tot.							6,907		1,067		8,288				
Avg.	0.57	0.24	0.72	0.65	0.00	0.00	232.60	3.74	36.10	0.58	268.70	4.43	2.51	1.76	1.92
Max	0.68	0.35	0.86	0.72	0.00	0.00	269.00	4.07	62.00	0.87	331.00	5.18	3.33	2.32	2.41
Min.	0.49	0.17	0.52	0.59	0.00	0.00	196.00	3.58	22.00	0.37	223.00	3.59	1.52	1.41	1.56

It is helpful to me when the avg, max and min are boxed off from the daily values or bolded or a different color or something - also, do we really need a total row here?

This should be the first page after the cover sheet

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WSSN 0600 City of Benton Harbor Month/Year October-20

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of Periods	#of Periods >.30NTU	#of Periods >.30NTU
T		Pounds													
E		Add													
														North	South
1	1.0970	347.00	1.66	7.10	7.90	0.41	3	0.08	0.09	3	0.09	0.10	6	0	0
2	0.9100	284.00	1.64	6.60	9.40	0.43	3	0.09	0.09	3	0.10	0.12	6	0	0
3	0.8000	253.00	1.66	7.40	9.30	0.38	3	0.09	0.11	3	0.10	0.10	6	0	0
4	0.7825	249.00	1.67	7.10	12.10	0.42	3	0.08	0.09	3	0.09	0.10	6	0	0
5	1.0675	324.00	1.60	8.10	9.90	0.43	3	0.09	0.09	3	0.10	0.11	6	0	0
6	0.8325	265.00	2.05	10.20	15.50	0.48	3	0.10	0.11	3	0.08	0.09	6	0	0
7	1.0300	314.00	1.60	4.70	4.70	0.40	3	0.08	0.09	3	0.09	0.09	6	0	0
8	0.8500	272.00	1.68	5.20	5.60	0.32	3	0.10	0.12	3	0.09	0.12	6	0	0
9	1.0600	333.00	1.65	4.00	4.10	0.31	3	0.09	0.09	3	0.08	0.09	6	0	0
10	0.7900	243.00	1.62	3.70	3.80	0.41	3	0.10	0.10	3	0.08	0.09	6	0	0
11	0.8550	273.00	1.68	5.40	6.40	0.34	3	0.09	0.12	3	0.10	0.12	6	0	0
12	0.9450	282.00	1.57	5.90	10.20	0.33	3	0.08	0.09	3	0.09	0.09	6	0	0
13	0.8700	275.00	1.66	5.10	5.90	0.33	3	0.09	0.10	3	0.09	0.10	6	0	0
14	0.8975	276.00	1.62	4.30	4.60	0.35	3	0.08	0.08	3	0.10	0.12	6	0	0
15	0.9750	306.00	1.65	6.20	8.00	0.41	3	0.07	0.08	3	0.09	0.10	6	0	0
16	0.9375	297.00	1.67	8.00	8.20	0.37	3	0.08	0.10	3	0.08	0.08	6	0	0
17	0.8600	250.00	1.53	5.90	6.30	0.37	3	0.09	0.09	3	0.10	0.11	6	0	0
18	0.8125	256.00	1.66	4.90	5.30	0.39	3	0.09	0.09	3	0.10	0.11	6	0	0
19	1.0825	335.00	1.63	5.30	7.90	0.45	3	0.09	0.11	3	0.09	0.10	6	0	0
20	0.9275	294.00	1.67	6.00	8.30	0.39	3	0.09	0.10	3	0.08	0.09	6	0	0
21	1.0650	335.00	1.65	6.50	7.80	0.47	3	0.08	0.08	3	0.08	0.08	6	0	0
22	0.9150	294.00	1.69	4.90	7.90	0.47	3	0.09	0.09	3	0.09	0.10	6	0	0
23	0.9025	291.00	1.70	4.10	5.80	0.49	3	0.09	0.11	3	0.08	0.11	6	0	0
24	0.9275	294.00	1.67	4.80	5.20	0.49	3	0.08	0.10	3	0.09	0.10	6	0	0
25	0.8700	309.00	1.87	8.60	12.20	0.53	3	0.10	0.10	3	0.09	0.10	6	0	0
26	0.9875	314.00	1.87	8.40	9.00	0.62	3	0.08	0.09	3	0.08	0.09	6	0	0
27	0.9100	267.00	1.54	8.80	10.20	0.52	3	0.09	0.10	3	0.09	0.09	6	0	0
28	0.9300	289.00	1.63	8.80	11.80	0.81	3	0.10	0.11	3	0.09	0.10	6	0	0
29	1.0675	345.00	1.70	5.10	6.00	0.48	3	0.08	0.09	3	0.09	0.10	6	0	0
30	0.9300	298.00	1.69	8.20	11.80	0.53	3	0.09	0.10	3	0.10	0.10	6	0	0
31	0.7950	256.00	1.69	8.80	9.90	0.64	3	0.09	0.09	3	0.08	0.09	6	0	0
Total	28.6820	9020.00					93			93			186	0	0
Avg.	0.9252	290.97	1.67	6.39	8.10	0.44		0.09	0.10		0.09		Total	Total	Total
Max	1.0970	347.00	2.05	10.20	15.50	0.81		0.10	0.12		0.10	0.12	6	0	0
Min.	0.7825	243.00	1.53	3.70	3.80	0.31		0.07	0.08		0.08				

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CITY OF BENTON HARBOR CHEMICAL ANALYSES

			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	
DAY	pH Raw	pH Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap
TEST	29.	30.	31.	32.	33.	34.	35.	36.	37	38	39	40	41	42
1	8.2	8.2	166	156	124	117	42	39	38	37	17	16	19.5	24.5
2	8.3	8.1	176	162	136	118	40	44	39	40	19	15	20.5	25.0
3	8.2	8.1	166	158	125	119	41	39	38	37	17	16	19.0	24.0
4	8.2	8.2	168	162	122	117	46	45	39	38	17	17	19.0	24.0
5	8.3	8.0	166	158	123	116	43	42	39	38	17	16	19.5	24.0
6	8.2	8.0	166	154	124	117	42	37	39	37	17	15	19.5	24.0
7	8.4	8.3	152	144	131	118	21	26	43	42	11	10		
8	8.4	8.2	144	142	127	121	17	21	40	40	10	10		
9	8.4	8.2	142	140	124	121	18	19	39	40	11	10		
10	8.5	8.3	152	148	134	122	18	26	41	40	12	12		
11	8.5	8.4	152	148	131	119	21	29	41	42	12	11		
12	8.3	8.2	166	158	125	117	41	41	38	38	17	16	19.0	24.0
13	8.2	8.1	162	156	123	119	39	37	37	36	17	16	19.5	24.0
14	8.3	8.3	142	140	128	122	14	18	42	41	9	9		
15	8.4	8.1	154	150	130	118	24	32	43	43	11	10		
16	8.4	8.2	144	146	122	124	22	22	40	41	11	11		
17	8.3	8.3	142	144	122	121	20	23	42	44	9	8		
18	8.2	8.2	148	146	129	122	19	24	43	43	10	9		
19	8.2	8.1	174	164	128	121	46	43	41	39	17	16	18.5	23.5
20	8.1	8.0	174	168	126	118	48	50	41	42	17	16	19.5	24.5
21	8.2	8.2	172	168	124	117	48	51	43	41	17	16	19.5	24.0
22	8.2	8.1	174	166	128	117	46	49	40	41	18	16	20.0	24.5
23	8.2	8.2	176	164	129	118	47	46	39	38	19	17	21.5	25.5
24	8.1	8.2	178	162	135	119	43	43	41	38	18	16	19.5	24.5
25	8.1	8.1	178	174	125	118	53	56	39	40	19	18	19.5	24.0
26	8.0	8.1	144	146	126	121	18	25	38	40	12	11	22.0	24.0
27	8.3	8.0	138	142	121	119	17	23	41	43	9	8		
28	8.1	8.2	182	158	139	117	43	41	41	37	19	16	21.0	25.5
29	8.1	8.2	172	164	127	122	45	42	41	40	17	16	19.5	24.0
30	8.1	8.1	172	162	128	119	44	43	40	39	17	16	19.0	24.0
31	8.1	8.0	182	170	130	119	52	51	42	40	19	17	21.0	25.5
Avg.	8.2	8.2	161.4	155.0	127.2	119.1	34.2	35.9	40.2	39.8	14.8	13.6	19.7	24.3
Max	8.5	8.4	182.0	174.0	139.0	124.0	53.0	56.0	43.0	44.0	19.0	18.0	22.0	25.5
Min.	8.0	8.0	138.0	140.0	121.0	116.0	14.0	18.0	37.0	36.0	9.0	8.0	18.5	23.5

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BACTERIOLOGICAL AND PHYSICAL PARAMETERS and Distrubution Flow and Corrosion Treatment

DATE	Ortho P System		PLANT TAP		Standard Plate Count		Raw	Tap	Distrubution flow and Corrosion Treatment			
	System Ortho P Residual mg/L	System Ortho P Residual Location	No. of Samples	Colilert P/A	Raw	Tap	TEMP. 'C	TEMP. 'C	High Lift To Distribution	Lbs PO4	PO4 Treatment mg/L	Ortho P Residual mg/L
1		0	1	A	62	0	18	17.5	0.9055	76	3.31	3.1
2		0	1	A	89	0	17	17.5	0.7817	66	3.34	3.0
3		0	1	A	57	0	17	17.5	0.8263	68	3.27	3.0
4		0	1	A	51	0	17	17.5	0.8000	78	3.86	3.1
5		0	1	A	35	0	16	17.5	1.0921	65	2.36	2.9
6		0	1	A	15	0	16	16.5	0.9055	82	3.57	3.1
7	2.87	City Hall	1	A	33	0	17	18.0	0.9751	74	3.01	2.8
7	2.87	Wolfs	1	A	48	0	17	18.0	1.0211	83	3.20	3.2
7	2.88	BaitShed	1	A	22	0	17	18.0	0.9907	74	2.94	2.9
7	2.91	SunnySpot	1	A	23	1	17	18.0	0.6925	80	4.57	2.92
7	2.75	B&Z	1	A	40	0	17	18.0	0.8136	58	2.80	0.00
12		0	1	A	29	0	16	16.5	0.9534	71	2.93	3.04
13		0	1	A	19	0	16	16.5	0.8234	69	3.31	2.98
14	2.84	City Hall	1	A	32	0	16	18.0	0.8489	66	3.08	2.81
14	2.85	Wolfs	1	A	21	0	17	18.0	0.8816	68	3.03	2.90
14	2.92	BaitShed	1	A	15	0	15	16.0	0.9287	73	3.10	3.25
14	2.22	SunnySpot	1	A	37	1	16	17.0	0.8979	58	2.57	3.28
14	2.68	B&Z	1	A	32	2	15	17.0	0.8038	67	3.32	2.91
19		0	1	A	49	0	14	15.5	1.0313	53	2.02	2.99
20		0	1	A	30	0	14	15.0	0.9279	59	2.52	2.96
21	2.95	City Hall	1	A	55	1	14	15.0	1.0269	94	3.62	2.91
21	2.88	Wolfs	1	A	45	1	14	14.5	0.9032	81	3.55	2.90
21	2.86	BaitShed	1	A	99	0	14	14.5	0.7975	88	4.38	2.94
21	2.77	SunnySpot	1	A	53	0	14	14.5	1.0303	81	3.10	3.05
21	2.67	B&Z	1	A	86	0	14	14.5	0.8506	77	3.59	3.01
26		0	1	A	64	0	14	15.0	0.9744	83	3.35	2.96
27	2.78	City Hall	1	A	97	0	13.0	15.0	0.8080	94	4.59	3.05
27	2.84	Wolfs	1	A	134	0	12.5	13.5	1.0704	94	3.49	3.10
27	2.87	BaitShed	1	A	43	0	12.5	13.5	1.1376	93	3.23	
27	2.77	SunnySpot	1	A	58	0	12.3	13.0	0.8141	77	3.72	3.05
27	2.65	B&Z	1	A	126	0	11.8	13.0	0.8541	88	4.07	3.09
Totals									28.1679	2334.9		
AVG.	2.79	0.00				0	15	16	0.9086	75.3	3.32	2.92
Max	2.95	0.00				2	17	18	1.1376	94.4	4.59	3.28
Min	2.22	0.00				0	12	13	0.6925	52.6	2.02	0.00

The phosphate data should either have its own page or be grouped with the other chemical addition data, not squeezed into the extra space ont he bacti page, and we would prefer to have it in order of applied, tap residual, distribution residuals. Additionally, if samples are not taken on a day, please leave that cell blank instead of putting a zero there, as that can mess up the averages.

The distribution PO4 data shouldn't have multiple rows for the same day. If possible, it should be formatted more like the distro chlorine data (could even be put on the same page).

MI 0600 Distribution Monitoring Report MI 0600 DMR

DISTRIBUTION SYSTEM MONITORING WSSN 0600 October-20

Chlorine Residual at Bacteriological Monitoring Stations mg/l

CITY OF BENTON HARBOR

DATE	1	2	3	4	5	6 (blu water)	7 (B&Z)
1							
2							
3							
4							
5							
6							
7	1.14		1.22	1.44	1.55		1.09
8							
9							
10							
11							
12							
13							
14	1.55		1.43	1.13	1.65		0.80
15							
16							
17							
18							
19							
20							
21	1.45		1.17	1.03	1.46		0.99
22							
23							
24							
25							
26							
27							
28	1.30		1.23	1.13	1.42		0.64
29							
30							
31							

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed	0600	20	
Total number of positive routine distribution samples	0600		
Total number of routine distribution samples required	0600	10	Max / Min
Average Chlorine Residuals by WSSN, mg/L	0600	1.24	1.65 / 0.64
Total number of check samples	0600	0	
Total number of positive check samples	0600	0	

This bottom area is formatted "by WSSN" because they used to have customers. IT could be cleaned up to look better now.

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

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **H. George Regan** Month/Year **November-20**

F1-S2 **F1-S2**

H. George Regan

Signature of Operator-in-Charge

Water Plant Classification

Berrien

County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.5828	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	176.33	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.96	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.96	Gallons Per Square Feet per Minute
Average Wash Water Use:	1.00%	Percent of Treated Water

Chemical Data

Chlorine on hand:	22725	lb.	Est. supply:	290	days
Primary Coagulant (Alum (Al3+)) on hand:	77841	lb.	Est. supply:	73	days
Cost of All Chemicals per Million Gallons:	$72.70	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	87
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.

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	26.206314	Avg	0.9078745	Max	1.527494	Min	0.705196

A Treatment Technique viloation occurred 11/4/20. Failure to add Alum at the plant's initial start-up
Remarks. We have begun to feed Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

WSSN 0600 CITY OF BENTON HARBOR Month/Year **November-20**

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	Samples	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	0.9575	302.00	1.66	13.80	15.70	0.69	3	0.09	0.10	3	0.08	0.09	6	0	0
2	0.9900	307.00	1.63	20.20	30.60	0.67	3	0.09	0.10	3	0.08	0.09	6	0	0
3	1.0750	308.00	1.51	17.80	22.70	1.20	3	0.09	0.10	3	0.12	0.15	6	0	0
4	0.7728	166.00	1.13	15.90	16.20	7.00	1	0.13	0.16	1	0.18	0.23	2	0	0
5	1.2575	396.00	1.66	18.80	27.00	1.30	3	0.12	0.13	3	0.16	0.18	6	0	0
6	1.5828	502.00	1.67	16.70	19.60	2.00	3	0.10	0.11	3	0.12	0.16	6	0	0
7	0.9275	315.00	1.79	5.10	6.00	0.72	3	0.10	0.12	3	0.08	0.09	6	0	0
8	1.0500	338.00	1.69	4.80	5.60	0.59	3	0.10	0.10	3	0.09	0.10	6	0	0
9	1.0850	340.00	1.65	3.40	3.60	0.63	3	0.09	0.10	3	0.11	0.14	6	0	0
10	0.7850	244.00	1.64	3.50	3.70	0.64	3	0.09	0.10	3	0.09	0.10	6	0	0
11	1.0850	328.00	1.59	6.70	7.90	0.62	3	0.09	0.10	3	0.09	0.10	6	0	0
12	0.8525	267.00	1.65	5.60	6.80	0.64	3	0.08	0.09	3	0.09	0.10	6	0	0
13	0.9825	317.00	1.70	6.70	8.00	0.62	3	0.09	0.09	3	0.09	0.09	6	0	0
14	0.8250	260.00	1.66	7.70	9.90	0.54	2	0.09	0.09	2	0.09	0.09	4	0	0
15	0.9575	295.00	1.62	9.00	10.60	0.49	3	0.09	0.10	3	0.08	0.09	6	0	0
16	0.8100	338.00	2.20	9.90	11.50	0.67	3	0.09	0.09	3	0.09	0.10	6	0	0
17	1.2933	581.00	2.36	11.10	18.30	0.64	3	0.09	0.10	3	0.08	0.09	6	0	0
18	1.1708	707.00	3.18	13.10	15.90	0.53	3	0.07	0.09	3	0.08	0.08	6	0	0
19	0.8200	376.00	2.41	7.70	10.90	0.58	3	0.10	0.11	3	0.08	0.09	6	0	0
20	0.9050	276.00	1.60	8.00	12.80	0.55	3	0.08	0.08	3	0.09	0.10	6	0	0
21	0.8975	271.00	1.59	7.20	11.50	0.46	3	0.10	0.10	3	0.10	0.11	6	0	0
22	1.1350	328.00	1.52	3.80	4.20	0.49	3	0.10	0.11	3	0.10	0.11	6	0	0
23	0.8400	251.00	1.57	6.50	10.10	0.46	3	0.08	0.09	3	0.09	0.10	6	0	0
24	0.9875	295.00	1.57	4.60	5.30	0.46	3	0.09	0.12	3	0.09	0.09	6	0	0
25	0.8950	258.00	1.52	5.20	6.40	0.53	3	0.09	0.10	3	0.08	0.09	6	0	0
26	0.7925	244.00	1.52	4.00	5.40	0.58	3	0.07	0.09	3	0.09	0.11	6	0	0
27	0.8150	249.00	1.61	6.50	12.00	0.54	3	0.08	0.09	3	0.11	0.12	6	0	0
28	0.7600	239.00	1.65	4.80	7.00	0.65	3	0.09	0.10	3	0.09	0.10	6	0	0
29	0.8300	254.00	1.61	4.20	6.40	0.52	3	0.08	0.09	3	0.07	0.08	6	0	0
30	0.7825	239.00	1.61	5.10	8.30	0.49	3	0.10	0.11	3	0.09	0.10	6	0	0
31															
Total	28.9197	9591.00					87			87			174	0	0
Avg.	0.9640	319.70	1.73	8.58	11.33	0.88		0.09	0.10		0.10				
Max	1.5828	707.00	3.18	20.20	30.60	7.00		0.13	0.16		0.18	0.23	6	0	0
Min.	0.7600	166.00	1.13	3.40	3.60	0.46		0.07	0.08		0.07				

CITY OF BENTON HARBOR CHEMICAL ANALYSES

			Total		Total		Non-Carb.							
			Hardness		Alkalinity		Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.2	176	166	130	121	46	45	41	39	18	17	19.0	24.5
2	8.1	8.0	174	166	128	120	46	46	40	39	18	17		
3	8.2	8.1	150	148	126	121	24	27	39	42	13	10	23.5	24.5
4														
5	7.9	7.8	156	152	133	121	23	31	46	45	10	10		
6	8.2	8.1	152	150	139	134	13	16	47	48	8	7		
7	8.2	8.0	164	160	144	134	20	26	51	52	9	7		
8	8.3	8.2	162	156	143	133	19	23	52	49	8	8		
9	8.1	8.0	174	170	128	126	46	44	42	40	17	17		
10	8.2	8.2	186	170	139	125	47	45	44	42	18	17		
11	8.4	8.4	142	146	119	128	23	18	41	45	10	8	21.5	23.0
12	8.3	8.2	146	148	128	127	18	21	38	39	13	12		
13	8.2	8.2	146	150	123	124	23	26	39	43	12	10		
14	8.2	8.1	148	152	127	122	21	30	41	46	11	9		
15	8.2	8.1	156	152	135	119	21	33	44	49	11	7		
16	8.2	8.1	162	156	124	122	38	34	36	34	17	17		
17	8.1	8.1	168	164	120	117	48	47	38	37	17	17		
18	8.0	8.0	164	158	124	116	40	42	38	38	17	15	19.5	24.0
19	8.1	8.0	172	158	128	115	44	43	41	38	17	15	20.5	24.0
20	8.1	8.1	174	160	132	116	42	44	39	40	18	15	20.5	25.0
21	8.3	8.1	152	148	128	116	24	32	44	43	10	10	23.0	24.5
22	8.3	8.2	152	150	124	118	28	32	39	42	13	11		
23	8.2	8.2	152	150	126	116	26	34	42	43	11	10		
24	8.3	8.2	154	150	127	117	27	33	44	46	11	8		
25	8.1	8.0	172	162	125	116	47	46	41	40	17	15	19.5	24.0
26	8.1	8.1	172	162	125	118	47	44	39	38	18	17	19.0	24.0
27	8.1	8.0	178	166	132	117	46	49	38	38	20	18	19.5	24.5
28	8.2	8.2	204	166	154	118	50	48	46	39	22	17	21.0	25.5
29	8.1	8.1	178	166	134	124	44	42	39	38	19	17	20.0	24.5
30	8.2	8.2	172	178	130	126	42	52	38	41	19	18	19.0	23.5
31														
Avg.	8.2	8.1	164.1	157.9	130.2	121.6	33.9	36.3	41.6	41.8	14.6	13.0	20.4	24.3
Max	8.4	8.4	204.0	178.0	154.0	134.0	50.0	52.0	52.0	52.0	22.0	18.0	23.5	25.5
Min.	7.9	7.8	142.0	146.0	119.0	115.0	13.0	16.0	36.0	34.0	8.0	7.0	19.0	23.0

WSSN 0600 MONTH/YEAR **November-20**

FLUORIDATION AND CHLORINATION

	Fluoride Analysis				Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.58	0.08	0.65		0	0.00	226	3.52	27	0.42	253	3.67	1.75	1.75	1.92
2	0.56	0.22	0.81		0	0.00	244	3.68	32	0.48	276	4.56	2.71	1.68	1.85
3	0.57	0.19	0.75		0	0.00	266	3.69	25	0.35	291	4.65	2.92	1.63	1.73
4	0.49			0.62	0	0.00	192	3.71	33	0.64	225	3.21	1.73	1.35	1.48
5	0.60	0.23	0.69		0	0.00	329	3.91	37	0.44	366	5.01	3.23	1.68	1.78
6	0.39	0.22	0.78		0	0.00	455	4.29	50	0.47	505	8.03	6.07	1.82	1.96
7	0.57	0.33	0.73		0	0.00	290	4.67	52	0.84	342	5.85	3.61	2.24	2.24
8	0.61	0.34	0.72		0	0.00	349	4.96	54	0.77	403	6.76	4.55	2.15	2.21
9	0.50	0.29	0.69		0	0.00	343	4.72	33	0.45	376	5.63	3.51	1.95	2.12
10	0.47	0.31	0.69		0	0.00	205	3.90	17	0.32	222	4.43	2.21	2.05	2.22
11	0.55	0.25	0.67		0	0.00	280	3.85	42	0.58	322	4.67	2.39	2.20	2.28
12	0.58	0.17	0.72	0.60	0	0.00	223	3.90	35	0.61	258	5.03	2.96	1.94	2.07
13	0.52	0.15	0.66		0	0.00	259	3.94	36	0.55	295	4.48	2.59	1.75	1.89
14	0.57	0.26	0.69		0	0.00	223	4.04	25	0.45	248	4.91	3.08	1.67	1.83
15	0.57	0.17	0.76		0	0.00	256	3.99	33	0.51	289	4.85	2.87	1.81	1.98
16	0.65	0.28	0.80		0	0.00	229	4.22	69	1.27	298	5.95	3.74	2.04	2.21
17	0.54	0.16	0.75		0	0.00	336	3.88	44	0.51	380	3.71	1.45	2.09	2.26
18	0.57	0.18	0.81		0	0.00	308	3.93	34	0.43	342	5.24	3.21	1.86	2.03
19	0.65	0.27	0.71		0	0.00	204	3.71	30	0.55	234	4.61	2.49	1.95	2.12
20	0.54	0.26	0.78		0	0.00	221	3.65	34	0.56	255	4.17	1.88	2.11	2.29
21	0.65	0.22	0.73		0	0.00	216	3.59	25	0.42	241	4.05	1.93	1.81	2.12
22	0.51	0.33	0.82		0	0.00	273	3.59	42	0.55	315	4.11	1.87	2.00	2.24
23	0.53	0.28	0.75		0	0.00	204	3.63	19	0.34	223	3.89	2.14	1.54	1.75
24	0.53	0.28	0.73		0	0.00	236	3.57	30	0.45	266	4.30	2.27	1.85	2.03
25	0.52	0.26	0.71		0	0.00	226	3.77	20	0.33	246	4.27	2.42	1.68	1.85
26	0.85	0.26	0.78		0	0.00	193	3.64	24	0.45	217	4.27	2.32	1.78	1.95
27	0.55	0.30	0.82		0	0.00	198	3.63	19	0.35	217	4.07	2.20	1.71	1.87
28	0.55	0.29	0.86		0	0.00	188	3.69	25	0.49	213	4.51	2.63	1.70	1.88
29	0.60	0.24	0.82		0	0.00	204	3.67	25	0.45	229	4.40	2.51	1.72	1.89
30	0.55	0.30	0.84		0	0.00	185	3.53	51	0.97	236	4.79	2.88	1.75	1.91
31															
Avg.	0.56	0.25	0.75	0.61	0.00	0.00	252.03	3.88	34.07	0.53	286.10	4.74	2.74	1.84	2.00
Max	**0.85**	**0.34**	**0.86**	**0.62**	**0.00**	**0.00**	**455.00**	**4.96**	**69.00**	**1.27**	**505.00**	**8.03**	**6.07**	**2.24**	**2.29**
Min.	**0.39**	**0.08**	**0.65**	**0.60**	**0.00**	**0.00**	**185.00**	**3.52**	**17.00**	**0.32**	**213.00**	**3.21**	**1.45**	**1.35**	**1.48**

CITY OF BENTON HARBOR

WSSN 0600 MONTH/YEAR **November-20**

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	PLANT TAP		Standard Plate Count		Raw	Tap
D	No. of	Colilert			TEMP.	TEMP.
A	Samples	P/A			'C	'C
T			Raw	Tap		
E						
1	1	A	79	0	12	13.0
2	1	A	71	0	11	12.5
3	1	A	99	0	11	13.0
4	1	A	74	0	11	13.0
5	1	A	75	0	12	13.0
6	1	A	40	0	12	13.0
7	1	A	63	1	12	13.0
8	1	A	14	0	12	13.0
9	1	A	40	0	12	12.0
10	1	A	37	0	13	12.5
11	1	A	41	0	13	13.0
12	1	A	28	0	12	13.0
13	1	A	50	0	12	13.0
14	1	A	42	2	12	13.0
15	1	A	51	0	12	11.0
16	1	A	56	0	10	12.0
17	1	A	49	0	10	12.0
18	1	A	54	0	9	10.5
19	1	A	46	0	9	10.0
20	1	A	14	0	10	10.0
21	1	A	20	0	9	10.0
22	1	A	15	0	10	12.0
23	1	A	10	0	10	12.0
24	1	A	38	1	10	13.0
24	1	A	23	0	9	9.5
24	1	A	28	0	9	9.5
24	1	A	63	1	8.8	9.5
24	1	A	49	0	9.2	9.5
29	1	A	47	0	8.8	9.5
30	1	A	14	0	8.8	9.5
31						
Totals						
AVG.	1	A	43	0	11	12
Max			99	2	13	13
Min			10	0	9	10

CITY OF BENTON HARBOR

WSSN 0600

MONTH/YEAR **November-20**

DISTRIBUTION FLOW AND CORROSION TREATMENT

					Distribution System Locations				
D					City Hall	Wolfs	Bait Shed	Sunny Spot	B&Z
A	High Lift		PO4	Ortho P	Ortho P	Ortho P	Ortho P	Ortho P	Ortho P
T	To	Lbs PO4	Treatment	Residual	Residual	Residual	Residual	Residual	Residual
E	Distribution		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1	0.6160	88	5.65	2.99					
2	0.5698	84	5.81	3.05					
3	0.5236	66	4.96	3.09					
4	0.7084	91	5.11	0.00	1.91	1.3	2.73	2.77	2.8
4	0.6006	102	6.69	3.24					
4	0.5544	85	6.05	2.98					
4	0.4928	83	6.69	3.01					
4	0.4928	94	7.56	2.91					
9	0.4774	97	8.04	2.94					
10	0.4928	87	6.97	2.87					
10	0.5852	86	5.84	2.97					
10	0.5082	71	5.50	3.02	2.93	3.24	2.92	3.06	2.92
10	0.5698	79	5.47	3.05					
10	0.5390	63	4.62	2.94					
15	0.5082	76	5.90	3.02					
16	0.5236	99	7.51	3.04					
17	1.1858	17	0.57	2.93	3.01	2.27	2.77	2.85	2.66
18	0.6468	133	8.11	2.98					
19	0.5082	47	3.64	2.99					
20	0.5698	87	6.05	3.04					
21	0.4774	84	6.94	2.99					
22	0.9394	58	2.43	3.01					
23	0.4620	69	5.88	2.94					
24	0.6006	67	4.38	2.97					
24	0.4928	82	6.55	3.02					
24	0.5082	69	5.40	2.85					
24	0.4928	73	5.82	2.96					
24	0.4774	67	5.51	2.87					
29	0.4774	72	6.00						
30	0.4620	80	6.87	2.91					
31									
Totals	17.0632	2352.7							
AVG.	0.5688	78.4	5.75	2.88	2.62	2.27	2.81	2.89	2.79
Max	1.1858	132.6	8.11	3.24	3.01	3.24	2.92	3.06	2.92
Min	0.4620	17.2	0.57	0.00	1.91	1.30	2.73	2.77	2.66

CITY OF BENTON HARBOR

DISTRIBUTION SYSTEM MONITORING WSSN 0600 November-20

DAT E	Chlorine Residual at Bacteriological Monitoring Stations mg/l									
	CITY OF BENTON HARBOR					blu water	B&Z			
	1	2	3	4	5	6	7			
1										
2										
3										
4	1.25		1.19	1.07	0.39		0.88			
5										
6										
7										
8										
9										
10										
11										
12	1.48		1.60	1.37	1.34		1.41			
13										
14										
15										
16										
17	1.33		1.40	1.47	1.40		0.86			
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

	Avg.	Max	Min
Chlorine Residual, mg/L	1.23	1.60	0.39
Total number of routine distribution samples analyzed	**15**		
Total number of positive routine distribution samples	0		
Total number of routine distribution samples required	**10**		
Total number of check samples	6		
Total number of positive check samples	0		

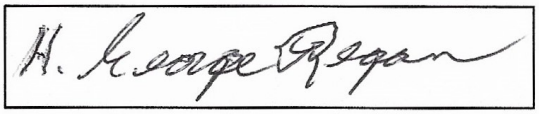
MONTHLY OPERATION REPORT OF
THE CITY OF BENTON HARBOR WATER TREATMENT PLANT

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **H. George Regan** **F1-S2**

Month/Year **December 2020**



Signature of Operator-in-Charge

F1-S2
Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.654	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	193.17	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.87	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	3.04	Gallons Per Square Feet per Minute
Average Wash Water Use:	1.13%	Percent of Treated Water

Chemical Data

Chlorine on hand:	37118	lb.	Est. supply:	426	days
Primary Coagulant (Alum (Al3+)) on hand:	90153	lb.	Est. supply:	140	days
Cost of All Chemicals per Million Gallons:	$64.92	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	87
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.

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	22.491763	Avg	0.75585161	Max	0.982333	Min	0.534407

Remarks:
The fluoride chemical feed system was taken out of service on December 18, 2020 due to issues with the granular chemical mixing tank transfer pump. A replacement pump has been ordered.
A tap pH value was not recorded on the laboratory bench sheet on December 10, 2020.
A raw temperature value was not recorded on the laboratory bench sheet on December 30, 2020.

WSSN 0600 CITY OF BENTON HARBOR Month/Year **December 2020**

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	0.9675	299.00	1.63	6.70	7.10	0.64	3	0.09	0.10	3	0.10	0.13	6	0	0
2	0.8725	265.00	1.60	7.70	8.60	0.69	3	0.08	0.09	3	0.09	0.09	6	0	0
3	0.7925	240.00	1.59	10.30	11.60	0.99	3	0.10	0.10	3	0.09	0.10	6	0	0
4	0.8588	263.00	1.61	12.70	13.30	1.00	3	0.10	0.12	3	0.09	0.11	6	0	0
5	0.9150	283.00	1.63	12.30	13.60	0.96	3	0.09	0.10	3	0.09	0.09	6	0	0
6	0.7600	235.00	1.96	6.90	7.10	0.84	3	0.09	0.10	2	0.10	0.10	4	0	0
7	0.8950	285.00	1.68	5.70	5.90	1.13	3	0.11	0.13	3	0.11	0.12	6	0	0
8	0.9725	298.00	1.61	5.10	6.90	0.75	3	0.08	0.08	3	0.08	0.08	6	0	0
9	0.8775	274.00	1.64	8.80	11.30	0.91	3	0.09	0.09	3	0.09	0.10	6	0	0
10	0.8650	262.00	1.59	6.10	7.90	0.76	3	0.09	0.10	3	0.08	0.09	6	0	0
11	0.8300	255.00	1.62	5.60	8.30	0.78	3	0.09	0.10	3	0.09	0.11	6	0	0
12	0.7400	225.00	1.60	8.80	9.30	0.78	3	0.08	0.08	2	0.08	0.10	4	0	0
13	0.8425	246.00	1.54	14.10	23.50	0.97	3	0.07	0.08	3	0.09	0.11	6	0	0
14	0.7975	227.00	1.50	16.10	14.30	1.20	3	0.09	0.09	3	0.07	0.08	6	0	0
15	0.9550	303.00	1.67	9.90	12.60	1.10	3	0.09	0.10	3	0.09	0.11	6	0	0
16	0.7875	252.00	1.68	9.50	16.30	0.84	3	0.08	0.09	3	0.09	0.09	6	0	0
17	0.7875	253.00	1.69	9.20	17.50	1.00	3	0.08	0.09	3	0.08	0.10	6	0	0
18	0.7875	253.00	1.69	7.70	12.80	1.00	3	0.09	0.11	3	0.10	0.10	6	0	0
19	0.7550	228.00	1.59	10.50	13.50	1.20	3	0.09	0.10	2	0.10	0.10	4	0	0
20	0.7975	252.00	1.66	6.70	8.40	1.00	3	0.10	0.10	2	0.10	0.10	4	0	0
21	1.0075	314.00	1.64	6.40	7.80	0.97	3	0.11	0.12	3	0.10	0.10	6	0	0
22	0.8075	254.00	1.65	8.50	8.90	1.10	3	0.07	0.07	2	0.09	0.09	4	0	0
23	1.6540	289.00	0.92	17.80	35.90	0.96	3	0.09	0.10	3	0.10	0.11	6	0	0
24	0.7500	237.00	1.66	7.90	8.80	1.10	3	0.08	0.11	3	0.09	0.09	6	0	0
25	0.8825	295.00	1.76	8.80	12.50	1.00	3	0.09	0.10	3	0.09	0.10	6	0	0
26	0.7125	246.00	1.76	8.90	11.90	1.00	3	0.09	0.12	3	0.09	0.10	6	0	0
27	0.6900	232.00	1.77	6.80	7.80	1.00	3	0.09	0.10	3	0.10	0.11	6	0	0
28	0.9325	310.00	1.75	8.10	10.50	1.00	3	0.08	0.09	3	0.10	0.12	6	0	0
29	0.8075	243.00	1.58	7.50	8.20	1.30	3	0.07	0.07	2	0.10	0.10	4	0	0
30	0.9350	286.00	1.61	5.90	6.60	1.50	3	0.09	0.10	3	0.11	0.12	6	0	0
31	0.9900	307.00	1.63	5.30	5.40	1.00	3	0.11	0.12	3	0.12	0.13	6	0	0
Total	27.0253	8211.00					93			87			174	0	0
Avg.	0.8718	264.87	1.63	8.78	11.42	0.98		0.09	0.10		0.09		Total	Total	Total
Max	1.6540	314.00	1.96	17.80	35.90	1.50		0.11	0.13		0.12	0.13	6	0	0
Min.	0.6900	225.00	0.92	5.10	5.40	0.64		0.07	0.07		0.07				

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CHEMICAL ANALYSES

			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	
D	pH													
A														
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	8.2	8.1	156	154	128	129	28	25	46	47	10	9		
2	8.2	8.2	158	156	125	124	33	32	46	49	10	8	23.0	24.5
3	8.0	7.9	156	150	131	123	25	27	45	47	11	8		
4	8.1	7.9	152	146	125	123	27	23	44	46	10	8		
5	8.2	8.2	158	154	132	127	26	27	46	49	10	8		
6	8.2	8.1	144	146	124	127	20	19	42	43	10	9		
7	8.2	7.9	162	154	141	124	21	30	50	42	9	12	22.5	25.5
8	8.2	8.2	160	156	136	131	24	25	47	47	10	9		
9	8.2	8.2	164	160	143	133	21	27	51	49	9	9	23.0	26.0
10	8.2		164	168	138	129	26	39	47	50	11	11		
11	8.3	8.3	158	160	137	134	21	26	51	53	8	7		
12	8.2	8.2	152	156	126	130	26	26	41	46	12	10		
13	8.2	8.2	156	154	131	128	25	26	46	46	10	10		
14	8.1	8.0	198	174	135	124	63	50	57	41	14	17	20.0	24.0
15	8.1	8.0	184	174	134	123	50	51	40	39	20	18	19.5	24.0
16	8.1	8.0	182	176	129	124	53	52	41	40	19	18	18.5	23.5
17	8.1	8.0	178	170	128	121	50	49	40	39	19	17	19.5	24.0
18	8.1	7.9	204	172	151	122	53	50	42	38	24	18	20.0	24.0
19	8.1	8.0	168	158	143	127	25	31	49	47	11	10		
20	8.1	8.1	162	158	136	127	26	31	51	50	9	8		
21	8.1	8.1	164	162	142	136	22	26	51	53	9	7	23.0	24.5
22	8.1	8.0	164	162	136	134	28	28	51	51	9	9		
23	8.1	8.0	196	188	126	128	70	60	55	51	15	15		
24	8.1	8.1	184	178	128	125	56	53	42	42	19	18	17.5	22.5
25	8.1	8.2	188	182	126	126	62	56	45	43	18	18	20.0	24.5
26	8.1	8.1	182	176	127	121	55	55	44	43	17	17	18.5	23.0
27	8.1	8.1	192	174	148	124	44	50	42	41	21	17	19.0	23.5
28	8.1	7.8	182	168	134	124	48	44	44	42	17	16	19.5	24.0
29	8.0	7.9	162	160	132	123	30	37	53	52	7	7		
30	8.2	8.1	172	164	153	125	19	39	55	54	9	7		
31	8.1	8.0	166	162	123	132	43	30	47	57	12	5		
Avg.	8.1	8.1	170.1	163.7	134.2	126.5	35.9	37.1	46.8	46.0	12.9	11.8	20.3	24.1
Max	8.3	8.3	204.0	188.0	153.0	136.0	70.0	60.0	57.0	54.0	24.0	18.0	23.0	26.0
Min.	8.0	7.8	144.0	146.0	124.0	121.0	19.0	19.0	40.0	38.0	7.0	7.0	17.5	22.5

MONTH/YEAR **December 2020**

FLUORIDATION AND CHLORINATION

		Fluoride Analysis			Chlorine Application									Chlorine Residual mg/L	
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as F mg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1	0.56	0.34	0.85		0	0.00	231	3.56	20	0.31	251	3.99	2.32	1.53	1.67
2	0.57	0.35	0.78		0	0.00	207	3.54	35	0.60	242	4.38	2.12	2.10	2.26
3	0.67	0.26	0.79		0	0.00	189	3.56	33	0.62	222	4.32	2.15	1.94	2.17
4	0.49	0.16	0.74		0	0.00	203	3.53	36	0.63	239	5.12	2.88	2.04	2.24
5	0.56	0.30	0.77		0	0.00	218	3.56	25	0.41	243	5.11	3.36	1.54	1.75
6	0.77	0.28	0.86		0	0.00	181	3.56	17	0.33	198	4.30	2.73	1.43	1.57
7	0.57	0.30	0.77		0	0.00	218	3.64	24	0.40	242	4.10	2.36	1.66	1.74
8	0.56	0.31	0.81		0	0.00	233	3.58	41	0.63	274	5.45	3.38	1.89	2.07
9	0.64	0.36	0.85	0.88	0	0.00	218	3.71	40	0.68	258	5.16	2.93	2.05	2.23
10	0.69	0.40	0.88		0	0.00	213	3.68	29	0.50	242	4.36	2.79	1.38	1.57
11	0.57	0.40	0.79		0	0.00	200	3.60	36	0.65	236	4.86	2.74	1.93	2.12
12	0.56	0.37	0.78		0	0.00	178	3.59	7	0.14	185	4.11	2.38	1.60	1.73
13	0.61	0.43	0.78		0	0.00	201	3.56	27	0.48	228	4.45	2.46	1.86	1.99
14	0.50	0.35	0.75		0	0.00	196	3.67	34	0.64	230	4.69	2.87	1.66	1.82
15	0.60	0.24	0.79	0.72	0	0.00	228	3.56	42	0.66	270	5.24	3.65	1.42	1.59
16	0.46	0.23	0.76		0	0.00	185	3.51	26	0.49	211	4.31	2.34	1.81	1.97
17	0.45	0.29	0.77		0	0.00	178	3.37	25	0.47	203	3.97	1.89	1.93	2.08
18	0.40	0.25	0.72		0	0.00	169	3.20	23	0.44	192	3.82	1.72	1.95	2.10
19	0.00	0.20	0.76		0	0.00	160	3.16	28	0.55	188	4.21	1.93	2.11	2.28
20	0.00	0.36	0.72		0	0.00	170	3.18	28	0.52	198	3.78	1.81	1.91	1.97
21	0.00	0.33	0.67	0.62	0	0.00	218	3.23	26	0.39	244	5.59	3.75	1.63	1.84
22	0.00	0.34	0.57		0	0.00	151	2.79	30	0.55	181	5.06	3.33	1.59	1.73
23	0.00	0.10	0.47		0	0.00	199	1.80	31	0.28	230	4.80	2.98	1.67	1.82
24	0.00	0.27	0.41		0	0.00	164	3.26	20	0.40	184	3.98	2.03	1.80	1.95
25	0.00	0.27	0.48		0	0.00	179	3.03	46	0.78	225	3.42	0.94	2.31	2.48
26	0.00	0.22	0.44		0	0.00	146	3.06	18	0.38	164	3.67	1.83	1.68	1.84
27	0.00	0.23	0.42		0	0.00	141	3.05	21	0.45	162	3.54	1.65	1.74	1.89
28	0.00	0.31	0.42		0	0.00	187	2.99	28	0.45	215	3.42	1.46	1.81	1.96
29	0.00	0.26	0.46	0.38	0	0.00	167	3.09	32	0.59	199	3.79	1.69	1.99	2.10
30	0.00	0.37	0.52		0	0.00	194	3.10	12	0.19	206	3.88	2.25	1.54	1.63
31	0.00	0.27	0.44		0	0.00	217	3.27	39	0.59	256	4.73	2.71	1.88	2.02
Avg.	0.34	0.30	0.69	0.65	0.00	0.00	190.73	3.32	28.00	0.49	218.73	4.36	2.42	1.78	1.94
Max	0.77	0.43	0.88	0.88	0.00	0.00	233.00	3.71	46.00	0.78	274.00	5.59	3.75	2.31	2.48
Min.	0.00	0.10	0.41	0.38	0.00	0.00	141.00	1.80	7.00	0.14	162.00	3.42	0.94	1.38	1.57

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MONTH/YEAR **December 2020**

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	PLANT TAP		Standard Plate Count		Raw	Tap
D	No. of	Colilert			TEMP.	TEMP.
A	Samples	P/A			'C	'C
T			Raw	Tap		
E						
1	1	A	29	0	8.0	11.0
2	1	A	30	0	8.0	10.0
3	1	A	14	0	8.0	10.0
4	1	A	18	0	8.0	10.0
5	1	A	12	0	8.0	10.0
6	1	A	11	0	8.0	9.0
7	1	A	11	0	7.0	9.0
8	1	A	14	0	8.0	9.0
9	1	A	12	0	8.0	9.0
10	1	A	15	0	8.0	9.0
11	1	A	10	1	8.0	9.0
12	1	A	10	0	8.0	10.0
13	1	A	31	1	7.0	8.0
14	1	A	54	1	6.7	8.0
15	1	A	56	0	6.2	6.5
16	1	A	106	1	6.3	7.5
17	1	A	18	0	5.8	7.5
18	1	A	14	0	5.5	7.0
19	1	A	17	0	7.0	9.0
20	1	A	31	0	6.0	8.0
21	1	A	39	0	6.0	7.0
22	1	A	19	0	6.0	8.0
23	1	A	51	0	6.3	6.5
24	1	A	49	0	5.7	7.0
25	1	A	48	0	4.8	6.5
26	1	A	27	0	3.5	6.0
27	1	A	24	0	3.8	6.5
28	1	A	19	0	3.8	5.5
29	1	A	26	0	4.0	7.0
30	1	A	25	0		7.0
31	1	A	20	0	4.0	5.0
AVG.	1	A	28	0	6	8
Max			106	1	8	10
Min			10	0	4	5

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MONTH/YEAR **December 2020**

Distrubution Flow and Corrosion Treatment

	Ortho P Distribution System					Distribution flow and Corrosion Treatment			
D A T E	City Hall Ortho P Residual mg/L	Wolfs Ortho P Residual mg/L	Bait Shed Ortho P Residual mg/L	Sunny Spot Ortho P Residual mg/L	B&Z Ortho P Residual mg/L	High Lift To Distribution	Lbs PO4	PO4 Treatment mg/L	Ortho P Residual mg/L
1						0.6160	74	4.78	2.89
2						0.4928	37	2.93	2.94
3						0.4774	34	2.82	2.93
4						0.4312	87	7.97	2.99
5						0.4158	86	8.20	2.99
6						0.4466	84	7.44	3.02
7						0.5236	93	7.05	3.05
8						0.4312	92	8.44	2.90
9	3.19			2.87	2.93	0.4451	88	7.84	3.07
10						0.4928	82	6.60	3.10
11						0.4466	75	6.65	3.08
12						0.4004	75	7.41	3.02
13						0.4774	77	6.37	3.23
14						0.4774	77	6.35	3.14
15	2.96	3.02	2.80	2.60	2.86	0.5544	73	5.17	3.14
16						0.4620	73	6.23	3.12
17						0.4620	77	6.58	3.09
18						0.4774	81	6.71	3.10
19						0.4774	40	3.32	3.04
20						0.5390	66	4.87	3.09
21	3.07	2.86	2.17	2.92	2.56	0.4312	83	7.57	3.14
22						0.3080	71	9.15	3.21
23						0.4774	82	6.80	3.28
24						0.4620	80	6.81	3.08
25						0.5698	77	5.31	3.06
26						0.4466	66	5.83	3.10
27						0.4620	73	6.28	3.08
28						0.6622	65	3.88	3.19
29	2.98	2.60	3.01	3.01	3.68	0.4774	72	5.98	3.03
30						0.4312	79	7.22	3.06
31						0.4620	77	6.55	3.15
Totals						14.7363	2293.5		
AVG.	3.05	2.83	2.66	2.85	3.01	0.4754	74.0	6.34	3.08
Max	3.19	3.02	3.01	3.01	3.68	0.6622	93.3	9.15	3.28
Min	2.96	2.60	2.17	2.60	2.56	0.3080	34.0	2.82	2.89

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DISTRIBUTION SYSTEM MONITORING WSSN 0600 December 2020

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							
8							
9	0.91		1.10	0.92	1.14		0.96
10							
11							
12							
13							
14							
15	1.21		1.31	1.08	1.57		1.18
16							
17							
18							
19							
20							
21	1.11		1.23	1.13	1.26		0.81
22							
23							
24							
25							
26							
27							
28							
29	1.64		1.36	1.56	1.26		0.80
30							
31							

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

	Avg.	Max.	Min.
Chlorine Residuals, mg/L	1.18	1.64	0.80
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	0		

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** Month/Year **April-21**

F1-S1 **F1-S2**

Catherine A. Winn 5/10/21

Signature of Operator-in-Charge

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? 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	26.495952	Avg	0.9172796	Max	1.333876	Min	0.733097

Remarks:

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

WSSN 0600 CITY OF BENTON HARBOR Month/Year **April-21**

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS												
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30 NTU	>.30 NTU
														North	South
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	0.18	6	0	0
Min.	0.7625	215.00	1.44	1.80	1.90	0.38		0.00	0.00		0.00				

WSSN 0600 CITY OF BENTON HARBOR MONTH/YEAR **April-21**

CHEMICAL ANALYSES

			Total		Total		Non-Carb.								WQP	
			Hardness		Alkalinity		Hardness		Calcium		Magnesium		Chloride		Conductivity	Sulfate
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-			
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		umhos	mg/l
T	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Tap	Tap
E	29.	30.	31.	32.	33.	34.	35.	36.	37	38	39	40	41	42		
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	436	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	60.0	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	436.0	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

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MONTH/YEAR **April-21**

FLUORIDATION AND CHLORINATION

		Fluoride Analysis			Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	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

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MONTH/YEAR April-21

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	PLANT TAP		Standard Plate Count		Raw	Tap
D	No. of	Colilert			TEMP.	TEMP.
A	Samples	P/A			'C	'C
T			Raw	Tap		
E						
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

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MONTH/YEAR **April-21**

Distrubution Flow and Corrosion Treatment

	Ortho P System					Distrubution flow and Corrosion Treatment			
D	City Hall	Wolfs	Bait Shed	Sunny Spot	B&Z				
A	Ortho P	Ortho P	Ortho P	Ortho P	Ortho P	High Lift		PO4	Ortho P
T	Residual	Residual	Residual	Residual	Residual	To	Lbs PO4	Treatment	Residual
E	mg/L	mg/L	mg/L	mg/L	mg/L	Distribution		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									
Totals						17.6429	2920.0		
AVG.	3.15	2.88	3.09	2.73	2.94	0.5881	97.3	6.83	3.35
Max	3.30	3.10	3.29	3.15	3.14	0.9394	137.0	10.35	4.44
Min	2.93	2.54	2.60	1.59	2.57	0.4620	59.0	4.14	2.93

CITY OF BENTON HARBOR PAGE 7

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

	Avg.	Max.	Min.
Chlorine Residuals, mg/L	**1.04**	1.61	0.44
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	**6**		
Total number of positive check samples	**0**		

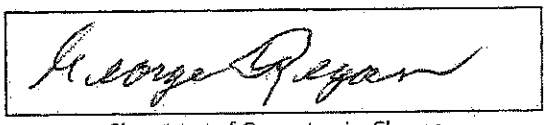
MONTHLY OPERATION REPORT OF
THE CITY OF BENTON HARBOR WATER TREATMENT PLANT

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

	North Filter	South Filter
Number of filter confluence samples > 0.3 NTU:	0	0
Number of filter confluence samples collected:	81	81
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.

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

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 Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

WSSN 0600 CITY OF BENTON HARBOR Month/Year **February 2021**

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	Samples	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30 NTU	>.30 NTU
														North	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		

WSSN 0600 CITY OF BENTON HARBOR MONTH/YEAR **February 2021**

CHEMICAL ANALYSES

			Total		Total		Non-Carb.							
			Hardness		Alkalinity		Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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

		Fluoride Analysis			Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	mg/L	PPD	mg/L	PPD	mg/L	PPD	mg/L	Demand	Free	Total
E													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

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MONTH/YEAR **February 2021**

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	PLANT TAP		Standard Plate Count		Raw	Tap
D	No. of	Colilert			TEMP.	TEMP.
A	Samples	P/A			'C	'C
T			Raw	Tap		
E						
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

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MONTH/YEAR **February 2021**

Distrubution Flow and Corrosion Treatment

	Ortho P System					Distrubution flow and Corrosion Treatment			
D	City Hall	Wolfs	Bait Shed	Sunny Spot	B&Z				
A	Ortho P	Ortho P	Ortho P	Ortho P	Ortho P	High Lift		PO4	Ortho P
T	Residual	Residual	Residual	Residual	Residual	To	Lbs PO4	Treatment	Residual
E	mg/L	mg/L	mg/L	mg/L	mg/L	Distribution		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

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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

	Avg.	Max.	Min.
Chlorine Residuals, mg/L	**1.54**	2.09	1.16
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	**0**		

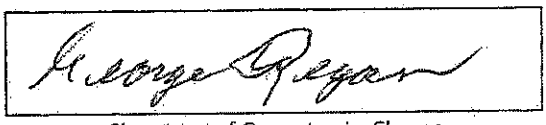
MONTHLY OPERATION REPORT OF
THE CITY OF BENTON HARBOR WATER TREATMENT PLANT

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

	North Filter	South Filter
Number of filter confluence samples > 0.3 NTU:	0	0
Number of filter confluence samples collected:	81	81
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.

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

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 Orthopolyphosphate (OPP) 70/30 Carus 8600 33% March 25, 2019
This report has an updated Bacteria Page for Metered flow and OPP treat and residuals.

WSSN 0600 CITY OF BENTON HARBOR Month/Year **February 2021**

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	Samples	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30 NTU	>.30 NTU
														North	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		

WSSN 0600 CITY OF BENTON HARBOR MONTH/YEAR **February 2021**

CHEMICAL ANALYSES

			Total		Total		Non-Carb.							
			Hardness		Alkalinity		Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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

		Fluoride Analysis			Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	mg/L	PPD	mg/L	PPD	mg/L	PPD	mg/L	Demand	Free	Total
E													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

ave

What is cau
Change in

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MONTH/YEAR **February 2021**

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	PLANT TAP		Standard Plate Count		Raw	Tap
D	No. of	Colilert			TEMP.	TEMP.
A	Samples	P/A			'C	'C
T			Raw	Tap		
E						
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

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MONTH/YEAR **February 2021**

Distrubution Flow and Corrosion Treatment

	Ortho P System					Distrubution flow and Corrosion Treatment			
D	City Hall	Wolfs	Bait Shed	Sunny Spot	B&Z				
A	Ortho P	Ortho P	Ortho P	Ortho P	Ortho P	High Lift		PO4	Ortho P
T	Residual	Residual	Residual	Residual	Residual	To	Lbs PO4	Treatment	Residual
E	mg/L	mg/L	mg/L	mg/L	mg/L	Distribution		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

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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

	Avg.	Max.	Min.
Chlorine Residuals, mg/L	**1.54**	2.09	1.16
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	**0**		

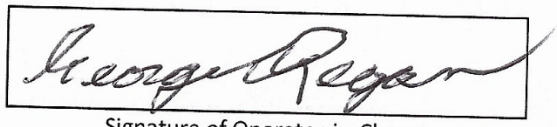
MONTHLY OPERATION REPORT OF
THE CITY OF BENTON HARBOR WATER TREATMENT PLANT

SUPPLY NAME: **CITY OF BENTON HARBOR**

WSSN:600

Operator-in-Charge **George Regan** **F1-S2**

Month/Year **January 2021**



Signature of Operator-in-Charge

F1-S2
Water Plant Classification

Berrien
County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.0925	Million Gallons per Day
Rated Plant Capacity:	12	Million Gallons per Day
Average Filter Run:	180.25	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	0.85	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	1.89	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.71%	Percent of Treated Water

Chemical Data

Chlorine on hand:	74740	lb.	Est. supply:	308	days
Primary Coagulant (Alum (Al3+)) on hand:	59573	lb.	Est. supply:	279	days
Cost of All Chemicals per Million Gallons:	$64.51	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:	85	85
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.

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	24.531959	Avg	0.8158492	Max	1.243107	Min	0.673007

George Regan is OIC for final data review only.
Fluoride chemical feed system was off-line from December 18, 2020 to January 24, 2021 due to issues with the transfer pump.
No Plant Tap ortho-phosphorus value was recorded on the bench sheet for January 17, 2021.

WSSN 0600 CITY OF BENTON HARBOR Month/Year **January 2021**

COAGULATION PARAMETERS

	MIL.		ALUM	TURBIDITY UNITS											
D	GAL.	Dry	as Al3+	RAW		Applied	#	FILTERED NORTH		#	FILTERED SOUTH		2 Hour Compliance Periods		
A	TREAT.	Al2(SO3)4	mg/l	Avg.	Max.	Avg.	ample	Avg.	Max.	Samples	Avg.	Max.	# of	#of	#of
T		Pounds											Periods	Periods	Periods
E		Add												>.30NTU	>.30NTU
														North	South
1	0.8300	262.00	1.66	4.20	4.70	1.30	3	0.08	0.09	2	0.08	0.09	4	0	0
2	0.9125	262.00	1.51	6.10	9.50	0.87	3	0.07	0.10	3	0.07	0.08	6	0	0
3	0.8125	249.00	1.61	5.90	8.80	1.00	3	0.08	0.08	3	0.07	0.08	6	0	0
4	0.9025	278.00	1.62	4.10	6.30	1.54	3	0.08	0.10	3	0.10	0.11	6	0	0
5	0.8525	274.00	1.69	4.50	7.70	1.10	3	0.09	0.10	3	0.09	0.09	6	0	0
6	0.7750	225.00	1.86	2.70	3.40	0.99	3	0.08	0.09	3	0.09	0.10	6	0	0
7	0.9550	314.00	1.73	3.40	6.00	0.85	3	0.07	0.08	3	0.08	0.08	6	0	0
8	0.7475	245.00	1.72	3.00	5.00	1.00	3	0.08	0.09	3	0.08	0.09	6	0	0
9	1.0150	323.00	1.67	3.30	3.60	1.20	3	0.07	0.07	3	0.07	0.07	6	0	0
10	0.7400	243.00	1.73	3.50	4.40	1.10	3	0.08	0.08	2	0.09	0.09	4	0	0
11	1.0800	338.00	1.65	4.00	6.60	1.20	3	0.08	0.09	3	0.07	0.08	6	0	0
12	1.0850	349.00	1.69	4.00	6.30	0.97	3	0.08	0.08	3	0.08	0.08	6	0	0
13	1.0925	347.00	1.67	4.20	7.90	1.20	3	0.08	0.08	3	0.08	0.09	6	0	0
14	0.9300	302.00	1.71	2.30	3.30	1.00	3	0.07	0.08	3	0.09	0.10	6	0	0
15	0.7275	240.00	1.74	2.90	5.60	1.10	3	0.08	0.11	3	0.09	0.11	6	0	0
16	0.7700	231.00	1.58	2.40	2.80	0.85	3	0.08	0.08	2	0.08	0.08	4	0	0
17	0.9050	284.00	1.65	2.90	3.40	0.95	3	0.08	0.08	3	0.09	0.11	6	0	0
18	0.8675	291.00	1.76	2.80	5.30	0.82	3	0.08	0.08	3	0.08	0.09	6	0	0
19	0.7700	256.00	1.75	2.50	2.90	0.76	3	0.08	0.09	2	0.08	0.09	4	0	0
20	0.8400	262.00	1.64	3.70	5.00	0.76	3	0.09	0.10	2	0.11	0.12	4	0	0
21	0.8175	249.00	1.60	4.00	4.00	1.00	3	0.08	0.08	2	0.08	0.09	4	0	0
22	0.7900	234.00	1.56	4.90	6.70	1.10	3	0.07	0.07	2	0.08	0.08	4	0	0
23	0.7350	216.00	1.55	6.00	6.20	1.10	3	0.08	0.10	3	0.09	0.11	6	0	0
24	0.7900	246.00	1.64	3.40	5.20	1.40	3	0.08	0.09	3	0.09	0.10	6	0	0
25	0.8850	275.00	1.63	3.60	7.20	0.88	3	0.09	0.10	3	0.08	0.09	6	0	0
26	0.7200	210.00	1.63	4.30	5.60	0.96	3	0.09	0.10	3	0.09	0.12	6	0	0
27	0.8300	273.00	1.73	4.90	9.10	1.00	3	0.08	0.08	3	0.07	0.08	6	0	0
28	0.7800	235.00	1.59	4.90	5.90	0.99	3	0.09	0.09	2	0.07	0.07	4	0	0
29	0.7850	252.00	1.69	5.10	5.90	1.80	3	0.09	0.10	3	0.10	0.12	6	0	0
30	0.7825	228.00	1.53	4.00	5.90	1.30	3	0.08	0.09	3	0.09	0.12	6	0	0
31	0.9300	297.00	1.68	3.30	4.50	1.30	3	0.08	0.09	3	0.08	0.09	6	0	0
Total	26.4550	8290.00					93			85			170	0	0
Avg.	0.8534	267.42	1.66	3.90	5.64	1.08		0.08	0.09		0.08	0.09	Total	Total	Total
Max	1.0925	349.00	1.86	6.10	9.50	1.80		0.09	0.11		0.11	0.12	6	0	0
Min.	0.7200	210.00	1.51	2.30	2.80	0.76		0.07	0.07		0.07	0.07			

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CHEMICAL ANALYSES

			Total		Total		Non-Carb.							
			Hardness		Alkalinity		Hardness		Calcium		Magnesium		Chloride	
D	pH		as CaCO3		as CaCO3		as CaCO3		as Ca++		as Mg++		as Cl-	
A			mg/l		mg/l		mg/l		mg/l		mg/l		mg/l	
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	8.0	7.9	184	170	153	134	31	36	59	51	9	10		
2	8.1	7.9	178	170	130	126	48	44	43	42	17	16		
3	8.1	8.1	196	178	127	129	69	49	51	45	17	16	21.5	26.5
4	8.0	8.0	218	179	165	132	53	47	52	43	21	17	19.5	24.0
5	8.1	7.9	194	188	143	135	51	53	49	46	17	17	20.5	25.0
6	8.0	8.0	196	192	137	132	59	60	46	47	19	18	20.0	24.5
7	8.1	7.9	196	182	145	129	51	53	46	43	19	18	22.5	25.5
8	8.2	7.9	194	186	137	132	57	54	46	45	19	18		
9	8.1	7.8	152	156	123	136	29	20	45	49	10	8	21.0	25.5
10	8.1	7.9	172	166	143	133	29	33	50	49	12	11		
11	8.2	8.0	198	176	152	126	46	50	41	45	23	16		
12	8.0	7.8	178	192	121	130	57	62	41	46	18	18	19.0	23.5
13	8.0	7.8	192	178	132	122	60	56	46	43	19	17		
14	8.0	8.0	184	174	131	123	53	51	44	42	18	17		
15	8.1	7.9	182	188	127	125	55	63	41	44	19	19	18.0	22.5
16	8.1	8.0	164	156	134	132	30	24	53	48	8	8		
17	8.0	7.9	152	150	131	123	21	27	47	49	8	7	21.5	23.0
18	8.0	7.9	152	150	132	116	20	34	48	51	8	5		
19	8.1	8.0	148	152	119	122	29	30	46	47	8	8		
20	8.2	7.8	142	146	115	117	27	29	47	49	6	6		
21	8.0	8.0	146	144	111	109	35	35	42	42	10	9		
22	8.0	7.8	146	142	105	103	41	39	43	42	9	9		
23	8.1	7.9	168	156	119	98	49	58	43	39	15	15		
24	8.1	8.1	182	178	127	121	55	57	43	40	18	19		
25	8.0	8.0	154	152	86	84	68	68	46	45	10	10	23.0	26.0
26	8.0	7.9	182	172	132	122	50	50	46	45	17	15	19.0	24.0
27	8.0	7.8	176	172	123	120	53	52	42	41	17	17	19.0	24.0
28	8.2	8.2	156	152	125	118	31	34	43	46	12	9		
29	8.1	8.1	150	148	127	122	23	26	43	42	10	10		
30	8.0	8.0	186	176	131	119	55	57	43	42	19	17		
31	8.0	7.9	178	176	128	119	50	57	41	40	18	18	18.5	23.5
Avg.	8.1	7.9	173.9	167.4	129.4	122.3	44.5	45.0	45.8	44.9	14.4	13.3	20.4	24.5
Max	8.2	8.2	218.0	192.0	165.0	136.0	69.0	68.0	59.0	51.0	23.0	19.0	23.0	26.5
Min.	8.0	7.8	142.0	142.0	86.0	84.0	20.0	20.0	41.0	39.0	6.0	5.0	18.0	22.5

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MONTH/YEAR **January 2021**

FLUORIDATION AND CHLORINATION

		Fluoride Analysis			Chlorine Application And Chlorine Residual in mg/L										
D	Fluoride		mg/l												
A	Applied				INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use			TAP	
T	as Fmg/l	Raw	Tap	Dist.	PPD	Free	PPD	Free	PPD	Free	PPD	Free	Demand	Free	Total
E						mg/l		mg/l		mg/l		mg/l	mg/L	mg/l	mg/l
1		0.31	0.48		0	0.00	180	3.24	30	0.54	210	4.13	1.69	2.30	2.44
2		0.29	0.45		0	0.00	197	3.22	32	0.52	229	3.68	1.83	1.69	1.85
3		0.36	0.44		0	0.00	164	3.01	23	0.42	187	3.76	1.77	1.84	1.99
4		0.34	0.38		0	0.00	182	3.01	47	0.78	229	3.75	0.64	2.94	3.11
5		0.29	0.41		0	0.00	167	2.92	17	0.30	184	3.45	1.41	1.88	2.04
6		0.28	0.39		0	0.00	161	3.10	33	0.64	194	3.69	1.66	1.88	2.03
7		0.34	0.49		0	0.00	186	2.91	28	0.44	214	3.25	1.33	1.76	1.92
8		0.34	0.44		0	0.00	146	2.92	73	1.46	219	4.70	2.37	2.18	2.33
9		0.36	0.52		0	0.00	195	2.87	26	0.38	221	4.41	2.46	1.74	1.95
10		0.39	0.51		0	0.00	150	3.03	25	0.50	175	3.76	1.72	1.81	2.04
11		0.26	0.46		0	0.00	214	2.96	32	0.44	246	2.95	1.14	1.68	1.81
12		0.29	0.38	0.44	0	0.00	205	2.82	68	0.94	273	4.05	1.61	2.27	2.44
13		0.22	0.42		0	0.00	215	2.94	37	0.51	252	3.50	1.51	1.84	1.99
14		0.30	0.44		0	0.00	177	2.84	29	0.47	206	3.67	1.54	1.97	2.13
15		0.33	0.42		0	0.00	138	2.83	21	0.43	159	3.39	1.48	1.76	1.91
16		0.31	0.42		0	0.00	149	2.89	19	0.37	168	3.73	2.10	1.43	1.63
17		0.33	0.55		0	0.00	180	2.97	16	0.26	196	3.35	1.64	1.44	1.71
18		0.25	0.45		0	0.00	177	3.05	9	0.15	186	3.88	2.15	1.50	1.73
19		0.33	0.49		0	0.00	154	2.99	7	0.14	161	3.10	1.49	1.46	1.61
20		0.38	0.49		0	0.00	167	2.97	20	0.36	187	3.55	1.71	1.70	1.84
21		0.41	0.46		0	0.00	163	2.98	33	0.60	196	3.92	1.74	1.98	2.18
22		0.37	0.52		0	0.00	155	2.93	28	0.53	183	3.79	1.62	2.00	2.17
23		0.27	0.39		0	0.00	155	3.15	32	0.65	187	4.14	2.09	1.90	2.05
24	0.78	0.32	0.48		0	0.00	158	2.99	26	0.49	184	3.21	1.17	1.88	2.04
25	0.68	0.24	0.55		0	0.00	181	3.05	34	0.57	215	3.91	1.59	2.09	2.32
26	0.56	0.30	0.48		0	0.00	146	3.03	89	1.85	235	5.21	1.84	3.20	3.37
27	0.53	0.28	0.50		0	0.00	156	2.81	23	0.41	179	2.91	0.71	2.04	2.20
28	0.62	0.40	0.63	0.43	0	0.00	148	2.83	22	0.42	170	3.20	1.42	1.57	1.78
29	0.60	0.40	0.63		0	0.00	148	2.81	12	0.23	160	2.98	1.31	1.55	1.67
30	0.81	0.28	0.50		0	0.00	153	2.92	29	0.55	182	3.89	2.01	1.73	1.88
31	0.59	0.31	0.54		0	0.00	181	2.91	37	0.59	218	3.80	1.89	1.76	1.91
Avg.	0.65	0.32	0.47	0.44	0.00	0.00	168.90	2.97	30.67	0.54	199.57	3.70	1.62	1.90	2.07
Max	0.81	0.41	0.63	0.44	0.00	0.00	215.00	3.24	89.00	1.85	273.00	5.21	2.46	3.20	3.37
Min.	0.00	0.22	0.38	0.43	0.00	0.00	138.00	2.81	7.00	0.14	159.00	2.91	0.64	1.43	1.61

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MONTH/YEAR **January 2021**

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

	PLANT TAP		Standard Plate Count		Raw	Tap
D	No. of	Colilert			TEMP.	TEMP.
A	Samples	P/A			'C	'C
T			Raw	Tap		
E						
1	1	A	71	0	4.0	6.0
2	1	A	25	0	3.8	4.5
3	1	A	72	0	3.7	4.5
4	1	A	27	0	3.5	4.5
5	1	A	33	0	3.7	4.5
6	1	A	41	0	3.7	4.5
7	1	A	23	0	3.7	4.5
8	1	A	38	0	3.7	4.5
9	1	A	19	0	5.0	6.0
10	1	A	41	0	4.0	5.0
11	1	A	27	0	3.8	4.5
12	1	A	32	0	3.7	4.5
13	1	A	34	0	3.2	4.5
14	1	A	19	0	3.7	4.5
15	1	A	49	0	3.7	4.5
16	1	A	21	0	4.0	5.0
17	1	A	19	0	4.0	5.0
18	1	A	50	0	4.0	5.5
19	1	A	19	0	4.0	5.0
20	1	A	36	0	4.0	5.5
21	1	A	49	1	3.0	5.0
22	1	A	21	0	3.0	5.0
23	1	A	28	0	2.8	4.0
24	1	A	47	0	3.0	4.0
25	1	A	16	2	3.0	5.0
26	1	A	29	0	2.5	4.0
27	1	A	27	0	2.8	3.5
28	1	A	26	1	2.5	4.0
29	1	A	30	0	3.0	4.0
30	1	A	23	0	2.3	3.5
31	1	A	27	0	2.2	3.0
AVG.	1	A	32	0	3.4	4.5
Max			72	2	5.0	6.0
Min			16	0	2.2	3.0

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MONTH/YEAR **January 2021**

Distrubution Flow and Corrosion Treatment

	Ortho P System					Distrubution flow and Corrosion Treatment			
D	City Hall	Wolfs	Bait Shed	Sunny Spot	B&Z				
A	Ortho P	Ortho P	Ortho P	Ortho P	Ortho P	High Lift		PO4	Ortho P
T	Residual	Residual	Residual	Residual	Residual	To	Lbs PO4	Treatment	Residual
E	mg/L	mg/L	mg/L	mg/L	mg/L	Distribution		mg/L	mg/L
1						0.7594	78	4.06	3.08
2						0.9294	67	2.85	3.13
3						0.7429	79	4.23	3.12
4						0.9116	79	3.43	3.00
5						0.7955	83	4.13	3.04
6	3.14	3.18	2.71	2.81	2.36	0.7846	86	4.34	3.25
7						0.9844	77	3.08	3.14
8						0.6954	74	4.22	3.03
9						0.7474	84	4.45	3.09
10						0.6940	118	6.75	3.03
11						1.2431	109	3.46	3.28
12	2.96	2.87	2.92	2.41	2.59	1.0063	135	5.33	3.25
13						1.0759	82	3.02	3.19
14						0.8387	89	4.21	2.94
15						0.7010	76	4.25	2.88
16						0.6731	83	4.88	3.16
17						0.8726	77	3.48	
18						0.7159	87	4.82	3.22
19						0.7758	94	4.79	3.24
20	3.20	3.14	3.26	2.89	2.55	0.7861	89	4.45	3.21
21						0.7466	88	4.54	3.24
22						0.7204	83	4.56	3.24
23						0.6743	90	5.30	3.17
24						0.8558	71	3.29	3.11
25						0.8206	68	3.29	3.25
26						0.6730	89	5.26	3.08
27						0.9186	86	3.69	3.09
28	3.29	2.75	3.14	2.85	2.87	0.7928	89	4.43	3.14
29						0.8014	86	4.22	3.27
30						0.6981	89	5.06	3.11
31						0.8565	78	3.61	3.01
Totals						23.1535	2663.3		
AVG.	3.15	2.99	3.01	2.74	2.59	0.7469	85.9	4.25	3.13
Max	3.29	3.18	3.26	2.89	2.87	2.6026	135.4	6.75	3.28
Min	2.96	2.75	2.71	2.41	2.36	0.6730	67.1	2.85	2.88

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DISTRIBUTION SYSTEM MONITORING WSSN 0600 January 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							
4							
5							
6	1.21		1.65	1.67	1.73		2.20
7							
8							
9							
10							
11							
12	1.56		1.71	1.13	2.20		1.36
13							
14							
15							
16							
17							
18							
19							
20	1.30		1.26	1.22	1.02		1.10
21							
22							
23							
24							
25							
26							
27							
28	1.58		1.76	1.65	2.20		1.35
29							
30							
31							

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

	Avg.	Max.	Min.
Chlorine Residuals, mg/L	1.54	2.20	1.02
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	0		