12 December 2022

Mr. Scott Sokolowski
Remedial Project Manager
Naval Facilities Engineering Systems Command, Mid-Atlantic
9324 Virginia Avenue, Building Z-144
Norfolk, VA 23511-3095

Subject: **November 2022 Monthly Operating Report**
Full Scale Liquid-Phase Granular Activated Carbon Treatment System
Liberty New York Water, Seamans Neck Road Water Plant
NWIRP Bethpage, New York
Contract No. N40085-16-D-2288, Task Order N4008518F5125

Dear Mr. Sokolowski,

The Full Scale Liquid-Phase Granulated Activated Carbon (GAC) Treatment System is located at the Liberty New York Water (LNYW) Seamans Neck Road Water Plant in Levittown, NY. The GAC System was installed at the effluent of the potable water plant and consists of six GAC vessels operating in parallel to remove low levels of trichloroethene (TCE) from Well No. 3S and Well No. 4S. After processing through the GAC units, the water is treated with sodium hypochlorite and sodium tripolyphosphate before distribution. Startup of the GAC Treatment System occurred on 8 January 2015 by CH2MHill. KOMAN Government Solutions, LLC (KGS) began operation and maintenance (O&M) activities in March 2015.

In May 2018, production Well No. 3S was decommissioned and has been replaced with a new production well designated as Well No. 3A. Well No. 4S is normally in operation during the entire month, while well No. 3A is operated infrequently, typically during the periods of higher water demand.

This report documents the routine operation and maintenance of the GAC System performed during the month of November 2022. **Attachment 1** presents the field logs detailing system operating data as recorded during the month. These readings include flow rate and total flows of the overall GAC System and each GAC unit, pressures across the GAC System, effluent chlorine residual and pH values, chemical usage levels of sodium hypochlorite and sodium tripolyphosphate for each chemical tank, and chemical metering pump settings and pressures.

Electricity use is not monitored and recorded using the on-site Leviton Series 2000 Multiple Meter Unit. Summary energy consumption reports are provided separately to the Navy Remedial Project Manager.

A summary of the system operating data recorded in November 2022 is presented below in **Table 1**.

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Table 1 - ***System Operating Data for November 2022***

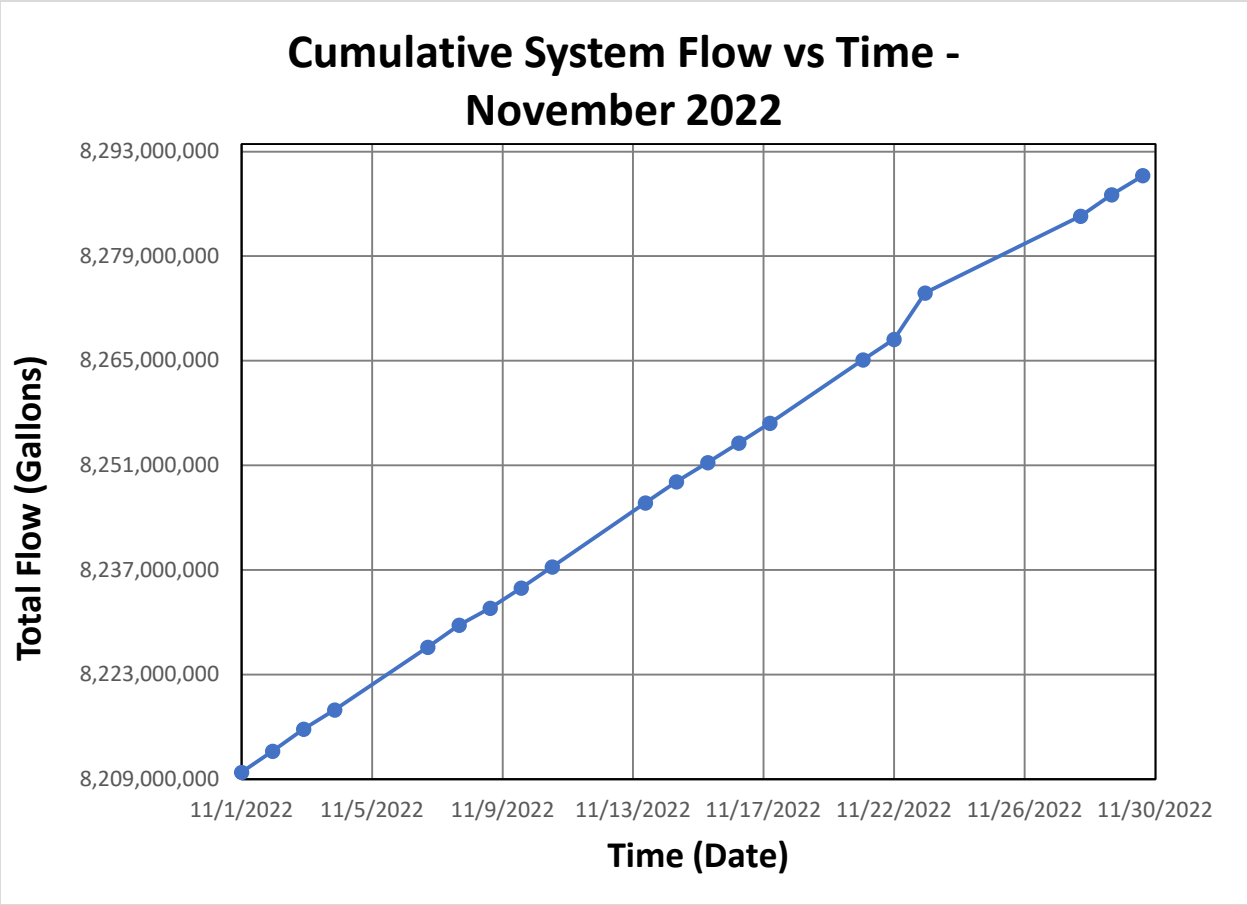
Date	Total Flow	Flow Rate	Influent Pressure	Effluent Pressure	Differential Pressure	Effluent Chlorine Residual	Effluent pH
	(Gallons)	(GPM)	(PSI)	(PSI)	(PSI)	(mg/L)[1]	(SU)[1]
11/1/2022	8,209,938,000	1,925	73	68	4.9	1.84 read 1.94 manual	7.10 read
11/2/2022	8,212,762,000	1,800	78	74	4.6	1.77 read 1.81 manual	7.10 read
11/3/2022	8,215,724,000	1,950	73	68	5.3	1.63 read 1.69 manual	7.00 read
11/4/2022	8,218,269,000	1,950	73	67	5.2	1.79 read 1.83 manual	7.10 read
11/7/2022	8,226,677,000	1,950	73	68	5.6	1.66 read 1.72 manual	7.10 read
11/8/2022	8,229,624,000	1,800	87	81	5.5	1.97 read 2.09 manual	7.00 read
11/9/2022	8,231,923,000	2,250	52	60	6.1	1.66 read 1.73 manual	7.00 read
11/10/2022	8,234,585,000	2,250	48	42	5.9	1.65 read 1.75 manual	7.05 read
11/11/2022	8,237,442,750	1,950	75	70	5.5	1.66 read 7.04 manual	7.10 read
11/14/2022	8,246,016,000	2,050	63	57	6.3	1.51 read 1.63 manual	7.10 read
11/15/2022	8,248,833,000	1,900	79	74	5.9	1.47 read 1.53 manual	7.00 read
11/16/2022	8,251,405,000	1,950	73	68	5.5	1.39 read 1.50 manual	7.00 read
11/17/2022	8,254,012,000	2,050	63	57	6.4	1.33 read 1.40 manual	7.10 read
11/18/2022	8,256,637,000	2,050	64	57	6.7	1.48 read 1.55 manual	7.10 read
11/21/2022	8,265,137,000	1,900	75	70	6.8	1.51 read 1.63 manual	7.00 read
11/22/2022	8,267,897,000	1,875	74	68	6.2	1.55 read 1.63 manual	7.10 read
11/23/2022	8,274,073,000	1,950	75	67	6.4	1.65 read 1.71 manual	7.00 read
11/28/2022	8,284,352,000	1,950	73	67	6.7	1.71 read 1.80 manual	7.00 read
11/29/2022	8,287,216,000	1,900	76	69	6.8	1.68 read 1.74 manual	7.40 read
11/30/2022	8,289,793,000	1,750	85	79	6.6	1.72 read 1.83 manual	7.15 read

(1) Effluent pH and chlorine residual readings are recorded by the in-line pH meter and chlorine analyzer. Chlorine is also checked with a manual chlorine residual meter for comparison, while manual pH is only checked occasionally. Both in-line and manual readings are presented, if collected, as noted above.

Figure 1, below, illustrates the volume of water treated by the GAC System since system startup, with the increment for the month of November 2022. Over 79.8 million gallons of water were

treated in November 2022, bringing the total cumulative volume of water treated since startup to over 8.28 billion gallons.

Figure 1 - ***Volume of Water Treated through Full Scale GAC System (November 2022)***



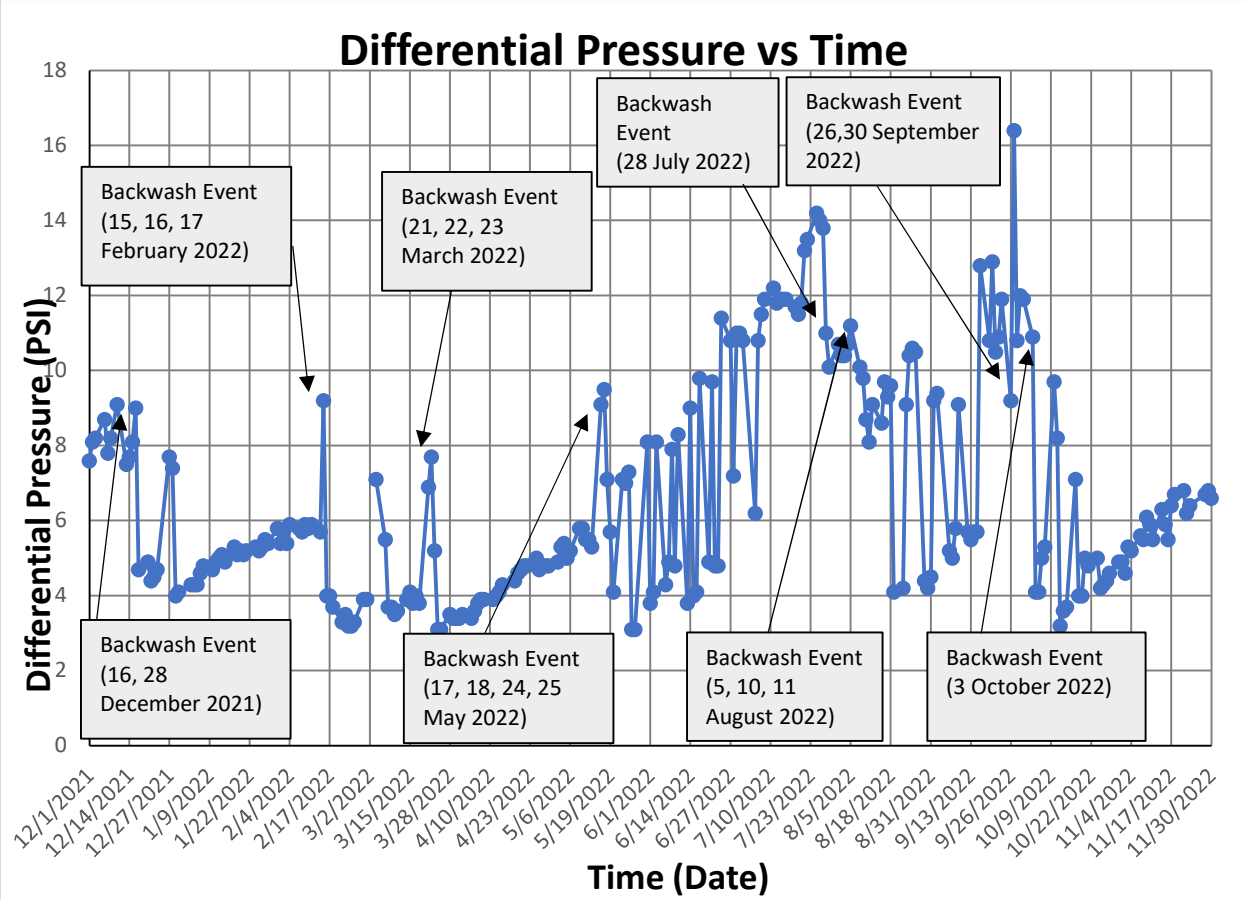
In general, differential pressure increases as the system continues to operate, and decreases after a backwashing event. The increasing trend then continues until the next backwashing event is performed. Also, lower differential pressures are observed during times of low water demand (e.g., typically over the winter months). **Figure 2,** below, depicts the pressure loss across the GAC System and subsequent backwashing dates, from December 2021 through the current reporting period.

Backwashing events during the summer and fall are performed more often because of the higher demand during that time of year. The exchange of carbon in each of the six GAC vessels with virgin coconut shell carbon was completed in August 2020 and the Seamans Neck Road facility is able to operate at full capacity. In support of the 2020 Fourth Quarter microbiological (MIC) sampling conducted in December 2020, it was identified that each vessel required additional backwashing and/or flushing prior to returning to service to address a colored water issue attributable to the remobilization of iron-impacted materials released when flow through the vessels was stopped for a mandatory 12-hour period prior to bacteria sampling, per Nassau

County Department of Health (NCDH) requirements. The additional backwashing/flushing events have been incorporated into the standard process for bacteria sampling.

The facility is operating at full design capacity and pressure loss across the overall GAC System is monitored regularly, and it is expected that backwashing events will occur on a periodic basis as needed. In addition, it is expected that backwashing of each vessel will be conducted following each quarterly bacteria sampling event to address potential colored water issues and to ensure the timely return to service for each vessel.

Figure 2 - S*ystem Differential Pressure vs. Time*



System Maintenance

Routine maintenance of the GAC System during this reporting period consisted of:

- General monitoring of the system flow rates, totalized flows, influent and effluent pressures, differential pressure, chlorine residual, and pH readings.
- Changing paper for the chlorine/pH chart recorder and flow/differential pressure chart recorder on a weekly basis.
- Calibration of the pH meter on a weekly basis.

- Periodic running of Well 3A in place of or concurrently with Well 4S had previously been initiated; Well 3A was not operated during the November 2022 reporting period.

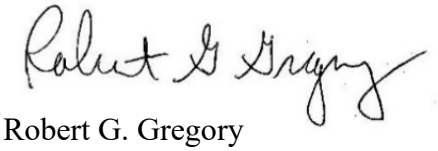
In addition, the following non-routine activities or operation issues occurred during the November 2022 reporting period:

- On 15 November, GenServe was onsite to inspect the generator and replace the battery backup unit.
- On 29 November, Eagle Control was onsite to replace the in-line pH meter.

Please contact me at 610-400-0636 or rgregory@komangs.com with any questions or concerns regarding this report.

Sincerely,

KOMAN Government Solutions, LLC



Robert G. Gregory
Project Manager

Cc: C. Shukis - NAVFAC
V. Varricchio - NWIRP Bethpage Facilities Management
R. Kern - LNYW
N. Niola – LNYW
J. Palmer - LNYW
P. Schauble - KGS
R. Hoffmaster – KGS
D. Brayack - Tetra Tech
J. Pelton – NYSDEC
K. Granzen – NYSDEC
M. Travis – NYSDEC

ATTACHMENT 1

O&M LOGS – NOVEMBER 2022

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	10·27·2022	10·28·2022	10·31·2022	11·1·2022	11·2·2022	11·3·2022
System Flow Rate	GPM	2000	1950	1900	1925	1800	1950
Total System Flow	Gallons	8280071	8282253	8288129	8293810	8296634	8299596
Well 3 Status	ON OR OFF	OFF	OFF	OFF	OFF	OFF	OFF
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	250	250	250	250	225	250
Tank 200 Flow Rate	GPM	250	250	250	250	250	250
Tank 300 Flow Rate	GPM	350	350	350	350	300	300
Tank 400 Flow Rate	GPM	300	350	350	300	350	350
Tank 500 Flow Rate	GPM	350	350	350	350	325	350
Tank 600 Flow Rate	GPM	300	250	250	250	250	225
Tank 100 Total Flow	Gallons	37,004,000	37,258,000	38,330,000	38,650,000	38,977,000	39,331,000
Tank 200 Total Flow	Gallons	75,971,000	76,237,000	77,328,000	77,661,000	78,005,000	78,372,000
Tank 300 Total Flow	Gallons	79,331,000	79,724,000	81,337,000	81,830,000	82,325,000	82,861,000
Tank 400 Total Flow	Gallons	63,401,000	63,799,000	65,454,000	65,915,000	66,432,000	66,975,000
Tank 500 Total Flow	Gallons	01,779,000	02,179,000	03,785,000	64,241,000	04,778,000	05,319,000
Tank 600 Total Flow	Gallons	48,806,000	49,148,000	50,549,000	50,969,000	51,410,000	51,879,000
System Influent Pressure	PSI	72	74	75	73	78	73
System Effluent Pressure	PSI	68	70	70	68	74	68
System Differential Pressure	PSI	4.4	4.6	4.9	4.9	4.6	5.3
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.83	1.92	1.93	1.84	1.77	1.62
Effluent Water pH - Inline	Units	7.05	7.05	7.10	7.10	7.10	7.0
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.89	1.98	2.04	1.94	1.81	1.69
Manual pH check (ex: Hanna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	10-27-2022	10-28-2022	10-31-2022	11-1-2022	11-2-2022	11-3-2022
Tank 505A Hypochlorite Level	Gallons	97	143	109	145	80	100
Tank 505B Hypochlorite Level	Gallons	131	144	100	143	140	110
Tank 505C Hypochlorite Level	Gallons	100	150	80	150	150	80
Tank 506A Polyphosphate Level	Gallons	91	74	26	159	122	106
Tank 506B Polyphosphate Level	Gallons	150	150	150	160	160	160
Metering Pump 505A: Hypochlorite Output Pressure	PSI						
Metering Pump 505B: Hypochlorite Output Pressure	PSI						
Metering Pump 506A: Phosphate Output Pressure	PSI						
Metering Pump 506B: Phosphate Output Pressure	PSI						
Metering Pump 505A: Stroke/Speed	Units						
Metering Pump 505B: Stroke/Speed	Units						
Metering Pump 506A: Stroke/Speed	Units						
Metering Pump 506B: Stroke/Speed	Units						
Generator Operating Hours	Hours	185.4	185.8	185.8	185.8	185.8	185.8
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)			Changed Flow / PSI chart at Delv.	Fixed leak in Cl Tubing 10.30.2022	Cl Delv Phos. Delv. Security Camera on Site		

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	11-4-2022	11-7-2022	11-8-2022	11-9-2027	11-10-8022	11-11-2022
System Flow Rate	GPM	1950	1950	1800	2250	2250	1950
Total System Flow	Gallons	8302141	8310549	8313496	8315795	8318457	
Well 3 Status	ON OR OFF	OFF	OFF	OFF	OFF	OFF	OFF
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	250	250	225	250	250	250
Tank 200 Flow Rate	GPM	250	250	250	250	250	250
Tank 300 Flow Rate	GPM	350	350	350	350	350	350
Tank 400 Flow Rate	GPM	350	350	300	350	350	350
Tank 500 Flow Rate	GPM	350	350	300	350	300	300
Tank 600 Flow Rate	GPM	250	300	250	300	300	250
Tank 100 Total Flow	Gallons	39,645,000	40,662,000	41,013,000	41,297,000	41,626,000	41,961,000
Tank 200 Total Flow	Gallons	78,689,000	79,733,000	80,057,000	80,393,000	80,716,000	81,510,000
Tank 300 Total Flow	Gallons	83,315,000	84,818,000	85,337,000	85,716,000	86,217,000	86,693,000
Tank 400 Total Flow	Gallons	67,441,000	68,982,000	69,523,000	69,945,000	70,472,000	70,927,000
Tank 500 Total Flow	Gallons	05,779,000	07,305,000	07,836,000	08,253,000	08,736,000	09,227,000
Tank 600 Total Flow	Gallons	52,678,000	53,594,000	54,052,000	54,413,000	54,828,000	55,250,000
System Influent Pressure	PSI	73	73	87	52	48	75
System Effluent Pressure	PSI	67	68	81	60	42	70
System Differential Pressure	PSI	5.2	5.6	5.5	6.1	5.9	5.5
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.79	1.66	1.97	1.66	1.65	1.66
Effluent Water pH - Inline	Units	7.10	7.10	7.0	7.0	7.05	7.0
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.83	1.72	2.09	1.73	1.75	2.04
Manual pH check (ex: Hanna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	11-4-2022	11-7-2022	11-8-2022	11-9-2022	11-10-2022	11-11-2022
Tank 900A Hypochlorite Level	Gallons	140	80	50	120	87	143
Tank 900B Hypochlorite Level	Gallons	143	121	120	125	120	145
Tank 900C Hypochlorite Level	Gallons	145	145	145	40	40	145
Tank 900A Polyphosphate Level	Gallons	87	100	65	51	138	108
Tank 900B Polyphosphate Level	Gallons	160	160	160	150	160	166
Metering Pump 900A: Hypochlorite Output Pressure	PSI						
Metering Pump 900B: Hypochlorite Output Pressure	PSI						
Metering Pump 900A: Phosphate Output Pressure	PSI						
Metering Pump 900B: Phosphate Output Pressure	PSI						
Metering Pump 900A: Stroke/Speed	Units						
Metering Pump 900B: Stroke/Speed	Units						
Metering Pump 900A: Stroke/Speed	Units						
Metering Pump 900B: Stroke/Speed	Units						
Generator Operating Hours	Hours	185.8	185.8	185.8	185.8	185.8	185.9
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		CL Delv. changed flow/PH charts	Monthly Sampling 1,4/DOC IOC Sampling Fe Sampling.			Phos. Delv	CL Delv.

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	11.14.2022	11.15.2022	11.16.2022	11.17.2022	11.18.2022	11.21.2022
System Flow Rate	GPM	2050	1900	1950	2050	2050	1900
Total System Flow	Gallons	8329888	8332705	8335277	8337884	8340509	8349009
Well 3 Status	ON OR OFF	OFF	OFF	OFF	OFF	OFF	OFF
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	250	250	225	250	250	250
Tank 200 Flow Rate	GPM	250	250	250	250	250	250
Tank 300 Flow Rate	GPM	350	300	350	350	350	350
Tank 400 Flow Rate	GPM	350	350	350	350	350	300
Tank 500 Flow Rate	GPM	350	350	350	350	300	300
Tank 600 Flow Rate	GPM	300	250	250	300	300	250
Tank 100 Total Flow	Gallons	43,850,000	44,210,000	44,509,000	44,797,000	44,978,000	45,418,000
Tank 200 Total Flow	Gallons	82,149,000	82,505,000	82,823,000	83,151,000	83,450,000	84,579,000
Tank 300 Total Flow	Gallons	88,236,000	88,732,000	89,178,000	89,633,000	90,092,000	91,569,000
Tank 400 Total Flow	Gallons	72,332,000	73,049,000	73,523,000	74,001,000	74,484,000	76,038,000
Tank 500 Total Flow	Gallons	10,820,000	11,338,000	11,805,000	12,279,000	12,690,000	14,898,000
Tank 600 Total Flow	Gallons	56,616,000	57,059,000	57,458,000	57,787,000	58,170,000	59,585,000
System Influent Pressure	PSI	63	79	73	63	64	75
System Effluent Pressure	PSI	57	74	68	57	57	70
System Differential Pressure	PSI	6.3	5.9	5.5	6.4	6.7	6.6
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.51	1.47	1.39	1.33	1.48	1.51
Effluent Water pH - Inline	Units	7.10	7.0	7.0	7.10	7.10	7.0
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.63	1.53	1.50	1.40	1.55	1.63
Manual pH check (ex: Hanna)	Units	—					

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	11.14.2022	11.15.2022	11.16.2022	11.17.2022	11.18.2022	11.21.2022
Tank 900A Hypochlorite Level	Gallons	130	90	50	146	131	80
Tank 900B Hypochlorite Level	Gallons	100	90	20	145	140	90
Tank 900C Hypochlorite Level	Gallons	50	50	50	141	144	50
Tank 900A Polyphosphate Level	Gallons	158	134	116	102	81	106
Tank 900B Polyphosphate Level	Gallons	160	160	160	160	160	160
Metering Pump 900A: Hypochlorite Output Pressure	PSI						
Metering Pump 900B: Hypochlorite Output Pressure	PSI						
Metering Pump 900A: Phosphate Output Pressure	PSI						
Metering Pump 900B: Phosphate Output Pressure	PSI						
Metering Pump 900A: Stroke/Speed	Units						
Metering Pump 900B: Stroke/Speed	Units						
Metering Pump 900A: Stroke/Speed	Units						
Metering Pump 900B: Stroke/Speed	Units						
Generator Operating Hours	Hours	185.9	185.9	185.9	185.9	185.9	185.9
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		Phos. Delv Alarm on Generator Did not run test!	Generv on Site looking @ generator		Changed ph/flow charts Cl Delv.	Pot heaters on	Fc Sampling GAC 3 Cl IN F/ Eff.

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	11.22.2022	11.25.2022	11.28.2022	11.29.2022	11.30.2022	
System Flow Rate	GPM	1875	1950	1950	1900	1750	
Total System Flow	Gallons	8351769	8357945	8368224	8371088	8373665	
Well 3 Status	ON OR OFF	OFF	OFF	OFF	OFF	OFF	
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	
Tank 100 Flow Rate	GPM	225	250	225	225	225	
Tank 200 Flow Rate	GPM	250	225	250	225	225	
Tank 300 Flow Rate	GPM	325	350	350	350	300	
Tank 400 Flow Rate	GPM	325	325	350	300	300	
Tank 500 Flow Rate	GPM	350	350	350	350	350	
Tank 600 Flow Rate	GPM	250	300	300	300	250	
Tank 100 Total Flow	Gallons	45,760,000	46,786,000	47,830,000	48,197,000	48,521,000	
Tank 200 Total Flow	Gallons	84,932,000	85,936,000	87,070,000	87,945,000	88,211,000	
Tank 300 Total Flow	Gallons	92,040,000	93,465,000	94,894,000	95,938,000	96,193,000	
Tank 400 Total Flow	Gallons	76,546,000	78,044,000	79,560,000	80,085,000	80,487,000	
Tank 500 Total Flow	Gallons	14,801,000	16,286,000	17,790,000	18,314,000	18,781,000	
Tank 600 Total Flow	Gallons	60,014,000	61,281,000	62,564,000	63,007,000	63,389,000	
System Influent Pressure	PSI	74	75	73	76	75	
System Effluent Pressure	PSI	68	67	67	69	69	
System Differential Pressure	PSI	6.2	6.4	6.7	6.8	6.6	
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.55	1.65	1.71	1.68	1.72	
Effluent Water pH - Inline	Units	7.10	7.0	7.0	7.4	7.15	
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.63	1.71	1.80	1.74	1.83	
Manual pH check (ex: Henna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	11.22.2022	11.25.2022	11.28.2022	11.29.2022	11.30.2022	
Tank 508A Hypochlorite Level	Gallons	141	130	145	105	75	
Tank 508B Hypochlorite Level	Gallons	143	50	143	130	125	
Tank 508C Hypochlorite Level	Gallons	150	90	147	147	145	
Tank 509A Polyphosphate Level	Gallons	79	80	40	100	89	
Tank 509B Polyphosphate Level	Gallons	160	110	105	85	64	
Metering Pump 508A: Hypochlorite Output Pressure	PSI						
Metering Pump 508B: Hypochlorite Output Pressure	PSI						
Metering Pump 509A: Phosphate Output Pressure	PSI						
Metering Pump 509B: Phosphate Output Pressure	PSI						
Metering Pump 508A: Stroke/Speed	Units						
Metering Pump 508B: Stroke/Speed	Units						
Metering Pump 509A: Stroke/Speed	Units						
Metering Pump 509B: Stroke/Speed	Units						
Generator Operating Hours	Hours	185.9	185.9	186.4	186.4	186.4	
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		cl Delv.		cl Delv.	Eagle Control Replace PH meter		