4 November 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: **October 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 October 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 October 2022 is presented below in **Table 1**.

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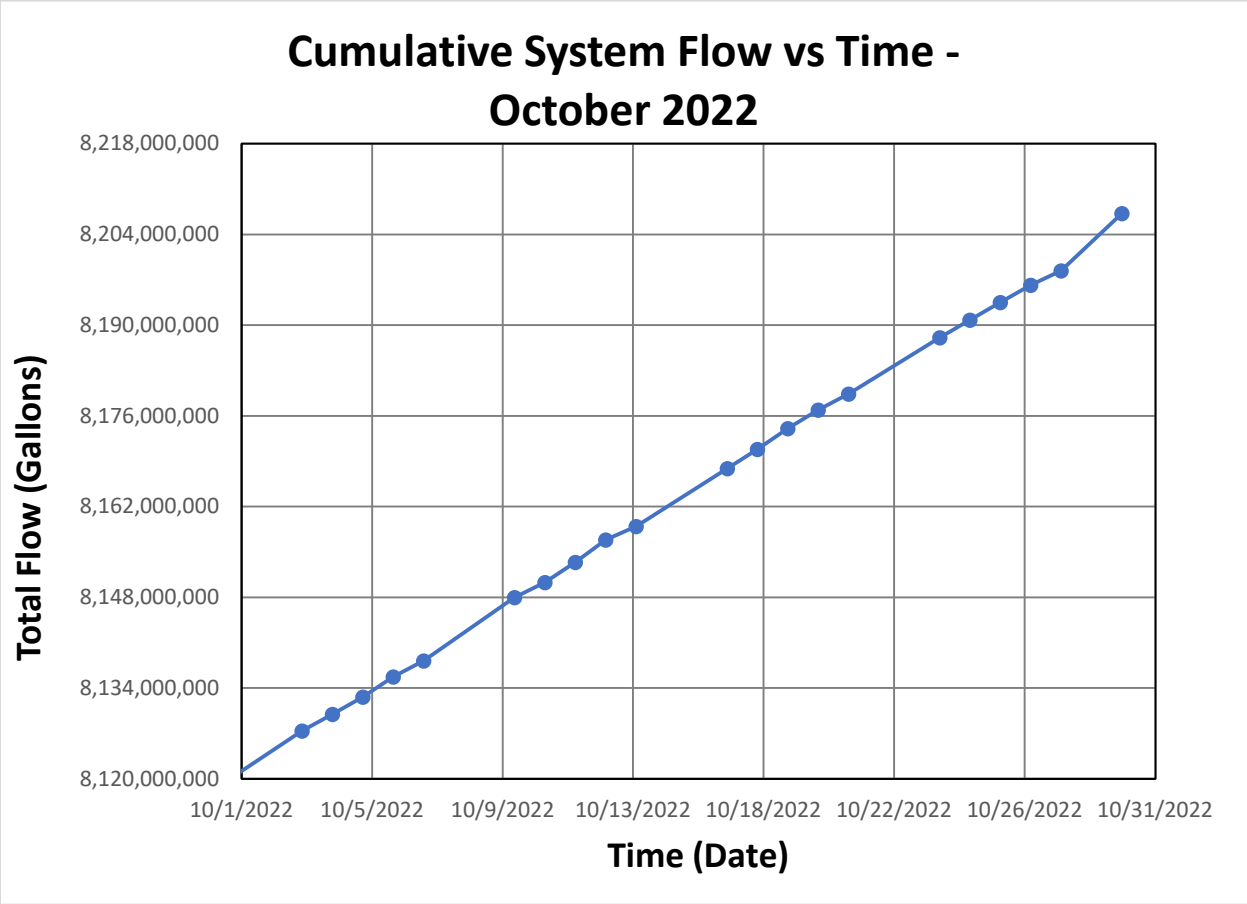
Table 1 - *System Operating Data for October 2022*

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]
10/3/2022	8,127,379,000	1,950	67	57	10.9	1.83 read 1.91 manual	6.90 read
10/4/2022	8,129,978,000	1,800	80	75	4.1	1.99 read 2.09 manual	6.90 read
10/5/2022	8,132,651,000	1,950	75	70	4.1	1.98 read 2.08 manual	6.90 read
10/6/2022	8,135,740,000	2,200	57	52	5.0	1.79 read 1.86 manual	7.10 read
10/7/2022	8,138,202,000	2,150	57	51	5.3	1.78 read 1.83 manual	7.05 read
10/10/2022	8,147,979,000	2,050	73	61	9.7	2.03 read 2.11 manual	7.15 read
10/11/2022	8,150,305,000	2,250	60	52	8.2	2.00 read 2.13 manual	7.00 read
10/12/2022	8,153,399,000	1,900	73	69	3.2	2.05 read 2.11 manual	7.00 read
10/13/2022	8,156,869,000	1,950	71	67	3.6	2.07 read 2.19 manual	7.00 read
10/14/2022	8,158,934,000	2,050	67	63	3.7	1.68 read 1.73 manual	7.00 read
10/17/2022	8,167,884,000	2,850	82	74	7.1	2.14 read 2.23 manual	7.00 read
10/18/2022	8,170,857,000	2,050	80	76	4.0	1.73 read 1.78 manual	7.00 read
10/19/2022	8,174,058,000	2,000	73	70	4.0	1.74 read 1.81 manual	7.00 read
10/20/2022	8,176,923,000	2,200	51	47	5.0	1.75 read 1.81 manual	7.00 read
10/21/2022	8,179,386,000	2,250	65	60	4.8	1.78 read 1.84 manual	7.00 read
10/24/2022	8,188,103,000	2,200	56	51	5.0	1.61 read 1.67 manual	7.10 read
10/25/2022	8,190,800,000	2,100	74	70	4.2	1.89 read 1.93 manual	7.10 read
10/26/2022	8,193,499,500	1,900	73	69	4.3	1.80 read 1.87 manual	7.00 read
10/27/2022	8,196,199,000	2,000	72	68	4.4	1.83 read 1.89 manual	7.05 read
10/28/2022	8,198,381,000	1,950	74	70	4.6	1.93 read 1.98 manual	7.05 read
10/30/2022	8,207,257,000	1,900	75	70	4.9	1.93 read 2.04 manual	7.10 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 October 2022. Over 91.7 million gallons of water were treated in October 2022, bringing the total cumulative volume of water treated since startup to over 8.20 billion gallons.

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



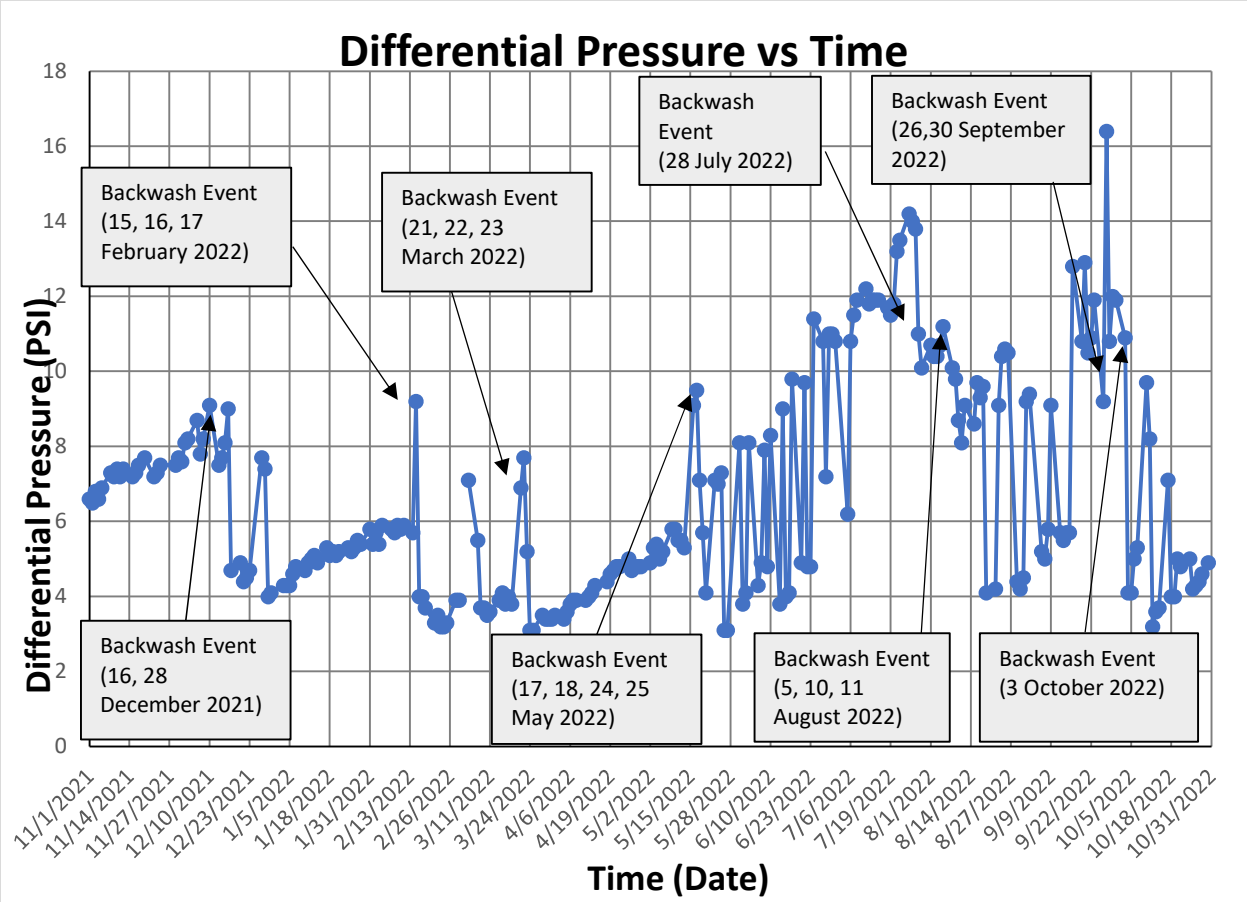
In general, differential pressure increases as the system continues to operate, and decreases after a backwashing event. The increasing trend then continues until the next backwashing event is performed. Also, lower differential pressures are observed during times of low water demand (e.g., typically over the winter months). **Figure 2,** below, depicts the pressure loss across the GAC System and subsequent backwashing dates, from November 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 ran concurrently with Well 4S on 17 October.

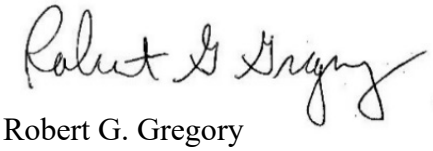
In addition, the following non-routine activities or operation issues occurred during the October 2022 reporting period:

- On 3 October, GACs #500 and #600 were backwashed following the 2022 Q3 MIC sampling event.
- On 17 October, Eagle Controls onsite, pH sensor for auto recording unit requires replacement.
- On 30 October, a leak in the chlorine tubing was repaired.

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 – OCTOBER 2022

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	10 3 2022	10.4.2022	10.5.2022	10.6.2022	10.7.2022	10.10.22
System Flow Rate	GPM	1950	1800	1950	2200	2150	2050
Total System Flow	Gallons	8211251	8213850	8216523	8219612	8222074	8231851
Well 3 Status	ON OR OFF	ON	OFF	OFF	OFF	OFF	OFF
Well 4 Status	ON OR OFF	OFF	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	500	250	300	300	300	450
Tank 200 Flow Rate	GPM	500	250	250	300	300	400
Tank 300 Flow Rate	GPM	500	250	250	300	300	o/c
Tank 400 Flow Rate	GPM	450	300	250	250	250	o/c
Tank 500 Flow Rate	GPM	o/c	350	350	350	350	550
Tank 600 Flow Rate	GPM	o/c	300	350	350	300	500
Tank 100 Total Flow	Gallons	27,784,000	28,360,000	28,748,000	29,183,000	29,533,000	30,961,000
Tank 200 Total Flow	Gallons	66,700,000	67,276,000	67,649,000	68,081,000	68,420,000	69,794,000
Tank 300 Total Flow	Gallons	68,353,000	68,957,000	69,310,000	69,719,000	70,039,000	71,232,000
Tank 400 Total Flow	Gallons	52,549,000	53,083,000	53,438,000	53,814,000	54,161,000	55,354,000
Tank 500 Total Flow	Gallons	88,643,000	88,856,000	89,405,000	90,044,000	90,551,000	92,547,000
Tank 600 Total Flow	Gallons	37,479,000	37,663,000	38,140,000	38,693,000	39,130,000	40,699,000
System Influent Pressure	PSI	67	80	75	57	57	73
System Effluent Pressure	PSI	57	75	70	52	51	61
System Differential Pressure	PSI	10.9	4.1	4.1	5.0	5.3	9.7
Chlorine Analyzer: Free Chlorine Residual - inline	PPM	1.83	1.99	1.98	1.79	1.78	2.03
Effluent Water pH - inline	Units	6.90	6.90	6.90	7.10	7.05	7.15
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.91	2.09	2.08	1.86	1.83	2.11
Manual pH check (ex: Hanna)	Units	-					

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	10·3·2022	10·4·2022	10·5·2022	10·6·2022	10·7·2022	10.10.2022
Tank 900A Hypochlorite Level	Gallons	139	136	136	121	143	109
Tank 900B Hypochlorite Level	Gallons	141	90	51	132	141	85
Tank 900C Hypochlorite Level	Gallons	143	143	143	20	139	70
Tank 900A Polyphosphate Level	Gallons	150	131	116	94	71	91
Tank 900B Polyphosphate Level	Gallons	160	160	160	166	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	184.3	184.3	184.3	184.3	184.7	184.7
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		Shut off - GAC's 5&6 10·2·2022 Bact. Samp 10.3.2022 Backwashing Cl2 Delv Phos. Delv.	Monthly Sampling 1,4 Dio x voc's			Changed Flow/PA charts Cl Delv.	Shut off GAC's 3&4 for Sampling

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	10.11.2022	10.12.2022	10.13.2022	10.14.2022	10.17.2022	10.18.2022
System Flow Rate	GPM	2250	1900	1950	2050	2850	2050
Total System Flow	Gallons	8234177	8237271	8240741	8242806	8251756	8254729
Well 3 Status	ON OR OFF	OFF	OFF	OFF	OFF	ON	OFF
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	450	250	250	250	350	250
Tank 200 Flow Rate	GPM	450	250	250	250	350	250
Tank 300 Flow Rate	GPM	O/C	350	350	350	500	250
Tank 400 Flow Rate	GPM	O/C	350	350	300	450	400
Tank 500 Flow Rate	GPM	550	350	350	350	550	350
Tank 600 Flow Rate	GPM	500	250	250	250	450	300
Tank 100 Total Flow	Gallons	31,423,000	31,930,000	32,271,000	32,579,000	33,651,000	34,071,000
Tank 200 Total Flow	Gallons	70,215,000	70,677,000	71,040,000	71,327,000	72,475,000	72,817,000
Tank 300 Total Flow	Gallons	O/C	71,523,000	71,873,000	72,193,000	74,175,000	74,705,000
Tank 400 Total Flow	Gallons	O/C	55,624,000	55,929,000	56,428,000	58,245,000	58,775,000
Tank 500 Total Flow	Gallons	93,257,000	93,960,000	94,451,000	94,984,000	96,620,000	97,125,000
Tank 600 Total Flow	Gallons	41,428,000	42,021,000	42,388,000	42,811,000	44,323,000	44,784,000
System Influent Pressure	PSI	60	73	71	67	82	80
System Effluent Pressure	PSI	52	69	67	63	74	76
System Differential Pressure	PSI	8.2	3.2	3.6	3.7	7.1	4.0
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	2.00	2.05	2.07	1.68	2.14	1.73
Effluent Water pH - Inline	Units	7.0	7.0	7.0	7.0	7.0	7.0
Manual Chlorine Reading (ex: Hach Kit)	PPM	2.13	2.11	2.19	1.73	2.23	1.78
Manual pH check (ex: Hanna)	Units	—					

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	10-11-2022	10-12-2022	10.13.2022	10.14.2022	10.17-2022	10.18-22
Tank 900A Hypochlorite Level	Gallons	148	121	90	110	50	121
Tank 900B Hypochlorite Level	Gallons	145	141	120	100	40	130
Tank 900C Hypochlorite Level	Gallons	150	150	150	50	50	147
Tank 900A Polyphosphate Level	Gallons	71	61	161	124	74	51
Tank 900B Polyphosphate Level	Gallons	160	151	151	151	151	151
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	184.7	184.7	184.7	185.0	185.0	185.0
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)			Put GAC's 384 back in Service	Phos. Delv	Changed flow/PH charts	Eagle Contractor on site Must order new ph Sensor for Cabinet.	Cl Delv

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	10.19.2022	10-20-22	10.21.22	10.24.2022	10.25.2022	10.26.2022
System Flow Rate	GPM	2000	2200	2250	2200	2100	1906
Total System Flow	Gallons	8257930	8260795	8263250	8271975	8274672	8277528
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	250	250
Tank 200 Flow Rate	GPM	250	250	250	250	250	250
Tank 300 Flow Rate	GPM	350	350	350	400	350	300
Tank 400 Flow Rate	GPM	350	350	350	350	400	350
Tank 500 Flow Rate	GPM	350	400	350	350	350	350
Tank 600 Flow Rate	GPM	300	300	350	300	300	300
Tank 100 Total Flow	Gallons	34397,000	34,735,000	35,045,000	36,061,000	36,370,000	36,679,000
Tank 200 Total Flow	Gallons	73,243,000	73,594,000	73,905,000	74,987,000	75,313,000	75639,000
Tank 300 Total Flow	Gallons	75,308,000	75,817,000	76,269,000	77,860,000	78,353,000	78,835,000
Tank 400 Total Flow	Gallons	59,865,000	59,879,000	60,329,000	61,922,000	62,413,000	62,984,000
Tank 500 Total Flow	Gallons	97,758,000	98,271,000	98,725,000	00,312,000	00,804,000	01,287,000
Tank 600 Total Flow	Gallons	45,780,000	46,755,000	46,148,000	47,520,000	47,957,000	48,377,000
System Influent Pressure	PSI	73	51	65	56	74	73
System Effluent Pressure	PSI	70	47	60	51	70	69
System Differential Pressure	PSI	4.0	5.0	4.8	5.0	4.2	4.3
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.74	1.75	1.78	1.61	1.89	1.80
Effluent Water pH - Inline	Units	7.0	7.0	7.0	7.1	7.1	7.0
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.81	181	1.84	1.67	1.93	1.87
Manual pH check (ex: Hanna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	10.19.2022	10.20.22	10.21.22	10.24.22	10.25.2022	10.26.2022
Tank 900A Hypochlorite Level	Gallons	100	150	140	143	148	124
Tank 900B Hypochlorite Level	Gallons	80	148	105	130	147	140
Tank 900C Hypochlorite Level	Gallons	145	148	148	10	150	150
Tank 900A Polyphosphate Level	Gallons	159	123	93	51	123	107
Tank 900B Polyphosphate Level	Gallons	160	160	160	152	152	151
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	185.0	185.4	185.4	185.4	185.4	185.4
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		Phos. Delv	cl Delv.	changed flow / PH Sheets		cl Delv. Phos Delv.	

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	10.27.2022	10.28.2022	10.31.2022			
System Flow Rate	GPM	2000	1950	1900			
Total System Flow	Gallons	8280071	8282253	8297129			
Well 3 Status	ON OR OFF	OFF	OFF	OFF			
Well 4 Status	ON OR OFF	ON	ON	ON			
Tank 100 Flow Rate	GPM	250	250	250			
Tank 200 Flow Rate	GPM	250	250	250			
Tank 300 Flow Rate	GPM	350	350	350			
Tank 400 Flow Rate	GPM	300	350	350			
Tank 500 Flow Rate	GPM	350	350	350			
Tank 600 Flow Rate	GPM	300	250	250			
Tank 100 Total Flow	Gallons	37,004,000	37,258,000	38,730,000			
Tank 200 Total Flow	Gallons	75971,000	76,237,000	77,328,000			
Tank 300 Total Flow	Gallons	79331,000	79,724,000	81,337,000			
Tank 400 Total Flow	Gallons	63,401,000	63,799,000	65,454,000			
Tank 500 Total Flow	Gallons	01779,000	02,179,000	03,785,000			
Tank 600 Total Flow	Gallons	48,806,000	49,148,000	50,549,000			
System Influent Pressure	PSI	72	74	75			
System Effluent Pressure	PSI	68	70	70			
System Differential Pressure	PSI	4.4	4.6	4.9			
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.83	1.92	1.93			
Effluent Water pH - Inline	Units	7.05	7.05	7.10			
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.89	1.98	2.04			
Manual pH check (ex: Hanna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	10.27.2022	10.28.2022	10.31.2022			
Tank 616A Hypochlorite Level	Gallons	97	143	109			
Tank 616B Hypochlorite Level	Gallons	131	144	100			
Tank 616C Hypochlorite Level	Gallons	100	150	80			
Tank 618A Polyphosphate Level	Gallons	91	74	26			
Tank 618B Polyphosphate Level	Gallons	150	150	150			
Metering Pump 620A: Hypochlorite Output Pressure	PSI						
Metering Pump 620B: Hypochlorite Output Pressure	PSI						
Metering Pump 622A: Phosphate Output Pressure	PSI						
Metering Pump 622B: Phosphate Output Pressure	PSI						
Metering Pump 620A: Stroke/Speed	Units						
Metering Pump 620B: Stroke/Speed	Units						
Metering Pump 622A: Stroke/Speed	Units						
Metering Pump 622B: Stroke/Speed	Units						
Generator Operating Hours	Hours	185.4	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			