3 June 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: **May 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 Treatment Plant in Levittown, NY. The GAC System was installed at the effluent of the potable water treatment 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 May 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 no longer monitored and recorded using the Leviton Series 2000 Multiple Meter Unit. Summary energy consumption reports will be provided separately to the Navy representative.

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

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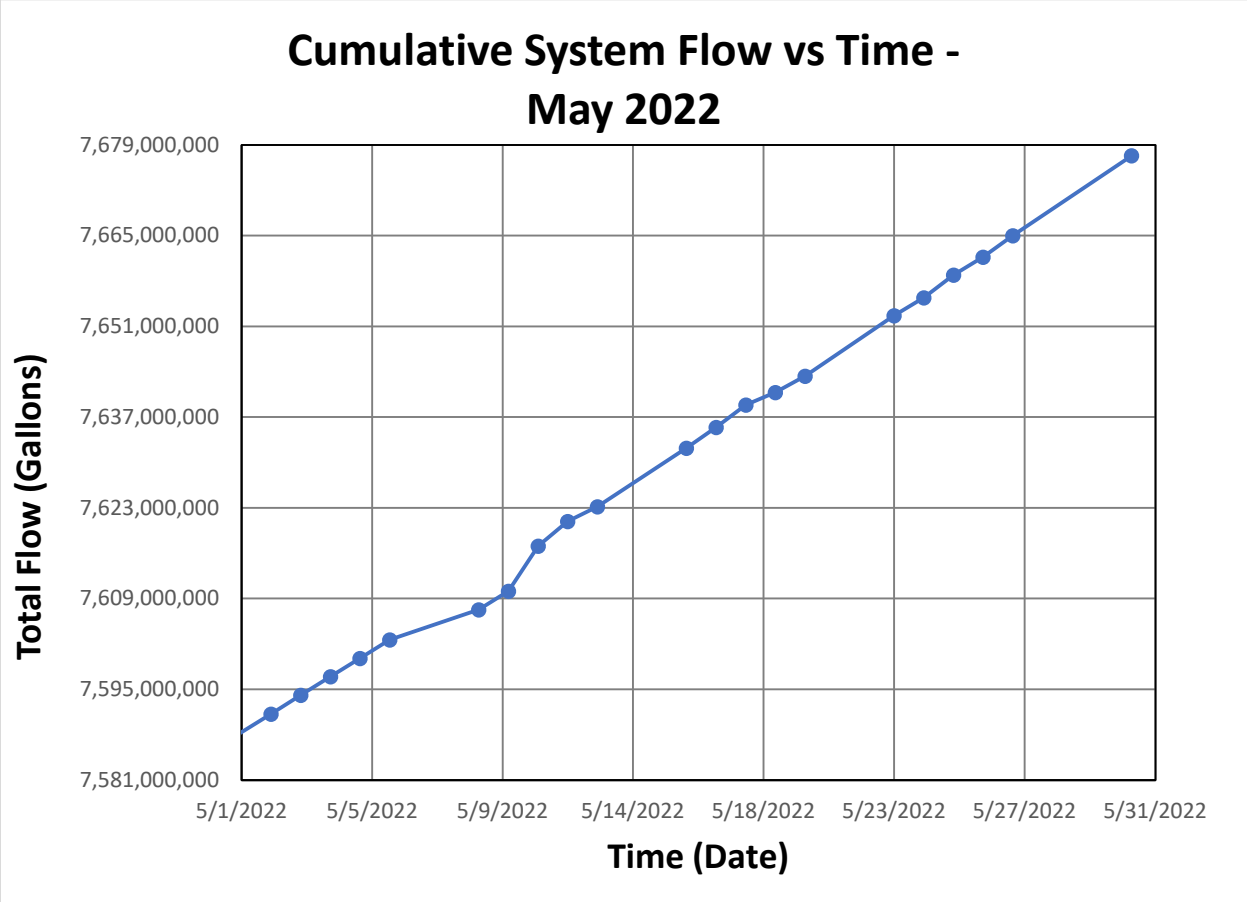
Table 1 - *System Operating Data for May 2022*

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]
5/2/2022	7,591,215,000	1,900	80	75	4.9	1.89 read 1.87 manual	6.40 read
5/3/2022	7,594,123,000	2,200	56	50	5.3	1.45 read 1.44 manual	6.50 read
5/4/2022	7,596,985,000	2,200	57	51	5.4	1.40 read 1.38 manual	6.50 read
5/5/2022	7,599,779,000	2,050	65	60	5.0	1.52 read 1.51 manual	6.50 read
5/6/2022	7,602,637,000	2,100	65	60	5.2	1.48 read 1.46 manual	6.40 read
5/9/2022	7,607,302,000	2,250	67	61	5.8	1.51 read 1.50 manual	6.50 read
5/10/2022	7,610,132,000	2,300	64	59	5.8	1.57 read 1.55 manual	6.60 read
5/11/2022	7,617,129,000	2,000	77	72	5.5	1.50 read 1.48 manual	6.40 read
5/12/2022	7,620,917,000	2,200	58	52	5.5	1.47 read 1.45 manual	6.40 read
5/13/2022	7,623,213,000	2,000	77	72	5.3	1.63 read 1.61 manual	6.30 read
5/16/2022	7,632,232,000	2,250	70	61	9.1	1.47 read 1.45 manual	6.30 read
5/17/2022	7,635,439,000	2,300	74	63	9.5	1.51 read 1.50 manual	6.40 read
5/18/2022	7,638,887,000	2,100	58	50	7.1	2.00 read 2.00 manual	6.90 read
5/19/2022	7,640,806,000	1,900	60	56	5.7	2.00 read 1.90 manual	6.90 read
5/20/2022	7,643,356,000	1,850	57	53	4.1	2.00 read 2.00 manual	7.00 read
5/23/2022	7,652,666,000	2,300	59	52	7.1	1.87 read 1.92 manual	6.70 read
5/24/2022	7,655,442,000	2,150	58	52	7.0	1.97 read 1.99 manual	6.70 read
5/25/2022	7,658,912,000	200	59	52	7.3	1.94 read 1.92 manual	6.60 read
5/26/2022	7,661,681,000	2,300	59	56	3.1	1.76 read 1.74 manual	6.70 read
5/27/2022	7,664,994,000	2,300	60	57	3.1	1.84 read 1.82 manual	6.50 read
5/31/2022	7,677,343,000	3,200	81	74	8.1	1.40 read 1.42 manual	6.30 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 May 2022. Over 88.9 million gallons of water were treated in May 2022, bringing the total cumulative volume of water treated since startup to over 7.67 billion gallons.

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



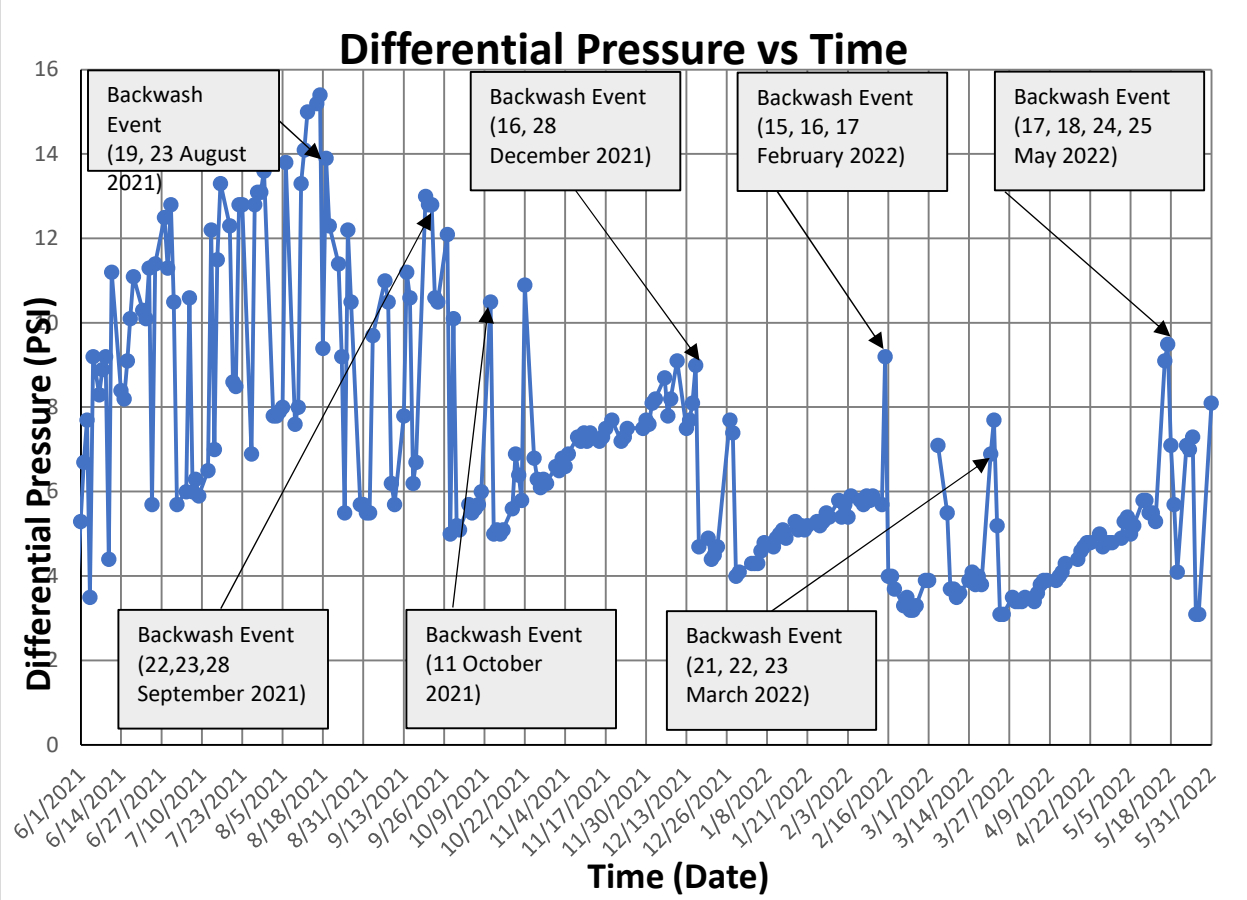
In general, differential pressure increases as the system continues to operate, and decreases after a backwashing event. The increasing trend then continues until the next backwashing event is performed. Also, lower differential pressures are observed during times of low water demand (e.g., typically over the winter months). **Figure 2,** below, depicts the pressure loss across the GAC System and subsequent backwashing dates, from June 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 bacteria 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 NCDOH 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 by NYAW; Well 3A ran in place of Well 4S from 18 through 23 May 2022, and concurrently with Well 4S on 31 May 2022.

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

- 17 May – GACs #100 and #200 were backwashed following the bacteria sampling event.
- 18 May – GACs #500 and #600 were backwashed following the bacteria sampling event.
- 24 May – GACs #300 and #400 were backwashed following the bacteria sampling event.
- 25 May – GACs #300 and #400 were backwashed again due to heavy iron buildup.

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
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ATTACHMENT 1

O&M LOGS – MAY 2022

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	4.29.2022	5.2.2022	5.3.2022	5.4.2022	5.5.2022	5.6.2022
System Flow Rate	GPM	1900	1900	2200	2200	2050	2100
Total System Flow	Gallons	7666582	7675087	7677995	7680857	7683651	7686509
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	300	300	300	300
Tank 200 Flow Rate	GPM	250	250	300	300	250	300
Tank 300 Flow Rate	GPM	350	300	400	400	350	350
Tank 400 Flow Rate	GPM	350	350	350	350	350	350
Tank 500 Flow Rate	GPM	350	350	350	350	350	350
Tank 600 Flow Rate	GPM	250	300	300	300	250	300
Tank 100 Total Flow	Gallons	50,164,000	51,344,000	51,745,000	52,135,000	52,527,000	52,948,000
Tank 200 Total Flow	Gallons	91,425,000	92,887,000	93,280,000	93,664,000	94,045,000	94,437,000
Tank 300 Total Flow	Gallons	72,510,000	73,987,000	74,451,000	74,955,000	75,484,000	75,993,000
Tank 400 Total Flow	Gallons	62,568,000	63,975,000	64,454,000	64,922,000	65,387,000	65,868,000
Tank 500 Total Flow	Gallons	84,478,000	86,085,000	86,590,000	87,117,000	87,632,000	88,171,000
Tank 600 Total Flow	Gallons	55,675,000	56,865,000	57,265,000	57,671,000	58,068,000	58,483,000
System Influent Pressure	PSI	82	80	56	57	65	65
System Effluent Pressure	PSI	77	75	50	51	60	60
System Differential Pressure	PSI	4.8	4.9	53	5.4	5.0	5.2
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.90	1.89	1.45	1.40	152	1.48
Effluent Water pH - Inline	Units	6.45	6.4	6.5	6.5	6.5	6.4
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.88	1.87	1.44	1.38	151	1.46
Manual pH check (ex: Hanna)	Units		—				

Daily Readings
Granular Activated Carbon Treatment System

Description	Data	4.29.2022	5.2.2022	5.3.2022	5.4.2022	5.5.2022	5.6.2022
Tank 900A Hypochlorite Level	Gallons	121	30	10	10	145	145
Tank 900B Hypochlorite Level	Gallons	143	143	112	80	145	104
Tank 900C Hypochlorite Level	Gallons	145	107	101	100	145	145
Tank 900A Polyphosphate Level	Gallons	72	21	94	78	61	45
Tank 900B Polyphosphate Level	Gallons	142	142	142	142	142	142
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	174.9	174.9	174.9	174.9	174.9	175.2
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		Changed flow / PH charts changed light bulbs		Monthly Sampling		Changed flow / pH charts CL Delv.	

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	5.9.2022	5.10.2022	5.11.2022	5.12.2022	5.13.2022	5.16.2022
System Flow Rate	GPM	2250	2300	2000	2200	2000	2250
Total System Flow	Gallons	7691174	7694004	7701001	7704789	7707085	7716104
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	300	300	300	300	250	—
Tank 200 Flow Rate	GPM	330	350	300	350	300	—
Tank 300 Flow Rate	GPM	350	350	350	350	350	500
Tank 400 Flow Rate	GPM	400	400	350	400	350	550
Tank 500 Flow Rate	GPM	350	350	350	350	350	600
Tank 600 Flow Rate	GPM	300	300	250	300	250	450
Tank 100 Total Flow	Gallons	53,545,000	53,821,000	55,037,000	55,475,000	55,898,000	57,183,000
Tank 200 Total Flow	Gallons	97,928,000	98,223,000	96,411,000	98,728,000	98,997,000	98,987,000
Tank 300 Total Flow	Gallons	76,811,000	77,264,000	78,384,000	79,090,000	79,585,000	81,181,000
Tank 400 Total Flow	Gallons	66,793,000	67,182,000	67,887,000	68,621,000	69,210,000	70,827,000
Tank 500 Total Flow	Gallons	88,804,000	89,409,000	90,507,000	90,973,000	92,013,000	93,738,000
Tank 600 Total Flow	Gallons	58,823,000	59,112,000	59,578,000	60,004,000	60,311,000	62,389,000
System Influent Pressure	PSI	67	64	77	58	77	70
System Effluent Pressure	PSI	61	59	72	52	72	61
System Differential Pressure	PSI	5.8	5.8	5.5	5.5	5.3	9.1
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.51	1.57	1.50	1.47	1.63	1.47
Effluent Water pH - Inline	Units	6.5	6.6	6.4	6.4	6.3	6.3
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.50	1.55	1.48	1.45	1.61	1.45
Manual pH check (ex: Henna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	5.9.2022	5.10.2022	5.11.2022	5.12.2022	5.13.2022	5.16.2022
Tank 900A Hypochlorite Level	Gallons	92	69	46	145	119	62
Tank 900B Hypochlorite Level	Gallons	141	110	74	143	143	143
Tank 900C Hypochlorite Level	Gallons	145	145	145	145	145	78
Tank 900A Polyphosphate Level	Gallons	20	20	85	73	150	131
Tank 900B Polyphosphate Level	Gallons	121	98	143	143	153	153
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	175.2	175.2	175.2	175.2	176.1	176.1
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)				Phos. Delv	Cl. Delv	Phos. Delv	

Daily Readings
Granular Activated Carbon Treatment System

Description	Data	5-17-2022	5-18-2022	5-19-2022	5-20-2022	5-23-2022	5-24-2022
System Flow Rate	GPM	2300	2100	1900	1850	2300	2150
Total System Flow	Gallons	7719311	7722759	7724678	7727228	7736538	7739314
Well 3 Status	ON OR OFF	OFF	ON	ON	ON	ON	OFF
Well 4 Status	ON OR OFF	ON	OFF	OFF	OFF	OFF	ON
Tank 100 Flow Rate	GPM	500	500	300	300	500	500
Tank 200 Flow Rate	GPM	550	500	300	300	550	450
Tank 300 Flow Rate	GPM	600	500	300	300	o/c	o/c
Tank 400 Flow Rate	GPM	550	500	300	300	o/c	o/c
Tank 500 Flow Rate	GPM	o/c	o/c	350	350	600	550
Tank 600 Flow Rate	GPM	o/c	o/c	300	300	550	450
Tank 100 Total Flow	Gallons	57,293,000	57,611,000	58,144,000	58,530,000	59993,000	60,582,000
Tank 200 Total Flow	Gallons	,018,000	1,411,000	1,807,000	01,168,000	03 179,000	01,236,000
Tank 300 Total Flow	Gallons	81,511,000	82,630,000	83,197,000	83,558,000	84,844,000	84,844,000
Tank 400 Total Flow	Gallons	71,244,000	72,107,000	72,680,000	72,945,000	74,181,000	74,181,000
Tank 500 Total Flow	Gallons	94,311,000	94,938,000	95,370,000	95,760,000	97,593,000	98,314,000
Tank 600 Total Flow	Gallons	62,784,000	63,210,000	63,666,000	64,198,00	65,854,00	66,462,000
System Influent Pressure	PSI	74	58	60	57	59	58
System Effluent Pressure	PSI	63	50	56	53	52	52
System Differential Pressure	PSI	9.5	7.1	5.7	4.1	7.1	7.0
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.51	2.0	2.0	2.0	1.87	1.97
Effluent Water pH - Inline	Units	6.41	6.9	6.9	7.0	6.70	6.7
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.50	2.0	1.9	2.0	1.92	1.99
Manual pH check (ex: Hanna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	5.17.2022	5.18.2022	5.19.2022	5.20.2021	5.23.22	5.24.2022
Tank 550A Hypochlorite Level	Gallons	410	100	141	108	131	141
Tank 550B Hypochlorite Level	Gallons	135	111	141	141	18	143
Tank 550C Hypochlorite Level	Gallons	78	5	143	143	89	143
Tank 560A Polyphosphate Level	Gallons	112	91	91	91	54	70
Tank 560B Polyphosphate Level	Gallons	153	141	126	113	113	130
Metering Pump 550A: Hypochlorite Output Pressure	PSI						
Metering Pump 550B: Hypochlorite Output Pressure	PSI						
Metering Pump 560A: Phosphate Output Pressure	PSI						
Metering Pump 560B: Phosphate Output Pressure	PSI						
Metering Pump 550A: Stroke/Speed	Units						
Metering Pump 550B: Stroke/Speed	Units						
Metering Pump 560A: Stroke/Speed	Units						
Metering Pump 560B: Stroke/Speed	Units						
Generator Operating Hours	Hours			176.4	176.4	176.8	176.8
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		Sampled GAC's 100, 200, Well 3 Backwashed GAC's 100, 200	Sampled GAC's 500, 600, Well 4 Backwashed GAC's 500, 600	CL Delv.	Changed flow/pH charts	Shut off GAC's #3 & #4 for Sampling 5.24.22	Sampled GAC #3 & #4 Backwashed GAC 5 & 3 & 2 Phos. Delv. CL Delv.

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	5.25.2022	5.26.2022	5.27.2022	5.31.2022		
System Flow Rate	GPM	2200	2300	2300	3200		
Total System Flow	Gallons	7742784	7745553	7748866	7761215		
Well 3 Status	ON OR OFF	OFF	OFF	OFF	ON		
Well 4 Status	ON OR OFF	ON	ON	ON	ON		
Tank 100 Flow Rate	GPM	550	300	300	500		
Tank 200 Flow Rate	GPM	500	250	300	450		
Tank 300 Flow Rate	GPM	o/c	300	350	600		
Tank 400 Flow Rate	GPM	o/c	350	400	500		
Tank 500 Flow Rate	GPM	450	350	300	550		
Tank 600 Flow Rate	GPM	500	250	250	500		
Tank 100 Total Flow	Gallons	60,938,000	61,209,000	61,586,000	64,015,000		
Tank 200 Total Flow	Gallons	01,518,000	01,730,000	02,618,000	05,230,000		
Tank 300 Total Flow	Gallons	84,814,000	84,007,000	84,700,000	87,920,000		
Tank 400 Total Flow	Gallons	74,181,000	74,387,000	74,789,000	77,123,000		
Tank 500 Total Flow	Gallons	98,607,000	98,947,000	99,821,000	02,628,000		
Tank 600 Total Flow	Gallons	66,814,000	66,993,000	68,001,000	70,135,000		
System Influent Pressure	PSI	59	59	60	81		
System Effluent Pressure	PSI	52	56	57	74		
System Differential Pressure	PSI	7.3	3.1	3.1	5.1		
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.94	1.76	1.84	1.40		
Effluent Water pH - Inline	Units	6.6	6.7	6.5	6.3		
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.92	1.74	1.82	1.42		
Manual pH check (ex: Henna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	5-25-2022	5-26-2022	5-27-2022	5-31-2022		
Tank 800A Hypochlorite Level	Gallons	80	70	141	125		
Tank 800B Hypochlorite Level	Gallons	133	100	150	81		
Tank 800C Hypochlorite Level	Gallons	143	143	152	10		
Tank 800A Polyphosphate Level	Gallons	51	150	127	641		
Tank 800B Polyphosphate Level	Gallons	130	130	130	125		
Metering Pump 800A: Hypochlorite Output Pressure	PSI						
Metering Pump 800B: Hypochlorite Output Pressure	PSI						
Metering Pump 800A: Phosphate Output Pressure	PSI						
Metering Pump 800B: Phosphate Output Pressure	PSI						
Metering Pump 800A: Stroke/Speed	Units						
Metering Pump 800B: Stroke/Speed	Units						
Metering Pump 800A: Stroke/Speed	Units						
Metering Pump 800B: Stroke/Speed	Units						
Generator Operating Hours	Hours	176.8	176.8	177.2	177.2		
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		Having trouble with Iron Backwash again (Brown water) Put 3 of GACs back in service	Phos. Delv.	CL Delv.			