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COMMITMENT & INTEGRITY DRIVE RESULTS

HULL WATER POLLUTION CONTROL FACILITY

September
2022

MONTHLY OPERATING REPORT



NPDES NO. MA0101231

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1 EXECUTIVE SUMMARY

This Monthly Operating Report provides a summary of the pertinent information and activities that occurred at Hull WPCF during the month of September 2022.

- No lost-time incidents for the month of September
- Continuing Covid-19 awareness- adhering to W&C, Town of Hull, and CDC guidelines and sharing any updates.
- There were 145 effluent samples taken in the month of September- details on page 11. There was one effluent permit violation on September 14th for fecal coliform.
- There were no alarm calls afterhours for W&C staff to respond.
- There were some odor complaints, as higher H₂S levels were seen due to very low flows, higher loading, and late summer warm sewage temperatures. More Bioxide feed was added. Ongoing remote monitoring continued with the Vapor-Link for the H₂S levels.
- The Asset Management Accounts summaries for contract year #8 is attached. Latest revision date: 11/1/22.
- There were 2 E-One grinder pump calls in September.
- W&C's O&M continued its efforts to support the various ongoing engineering projects and upgrades at the plant- see the projects section.
- The weekly Bio Bot Covid-19 wastewater sampling & monitoring program continued with W&C staff assisting Brian Kiley of the HSD when needed.

***Mike Sullivan – Plant Manager
Town of Hull WPCF
11/10/2022***

Woodard & Curran strives to deliver a high-quality operations service and is responsive to our customers concerns. Please feel free to request any modifications to the format or content of this report.

2 FLOWS AND LOADINGS



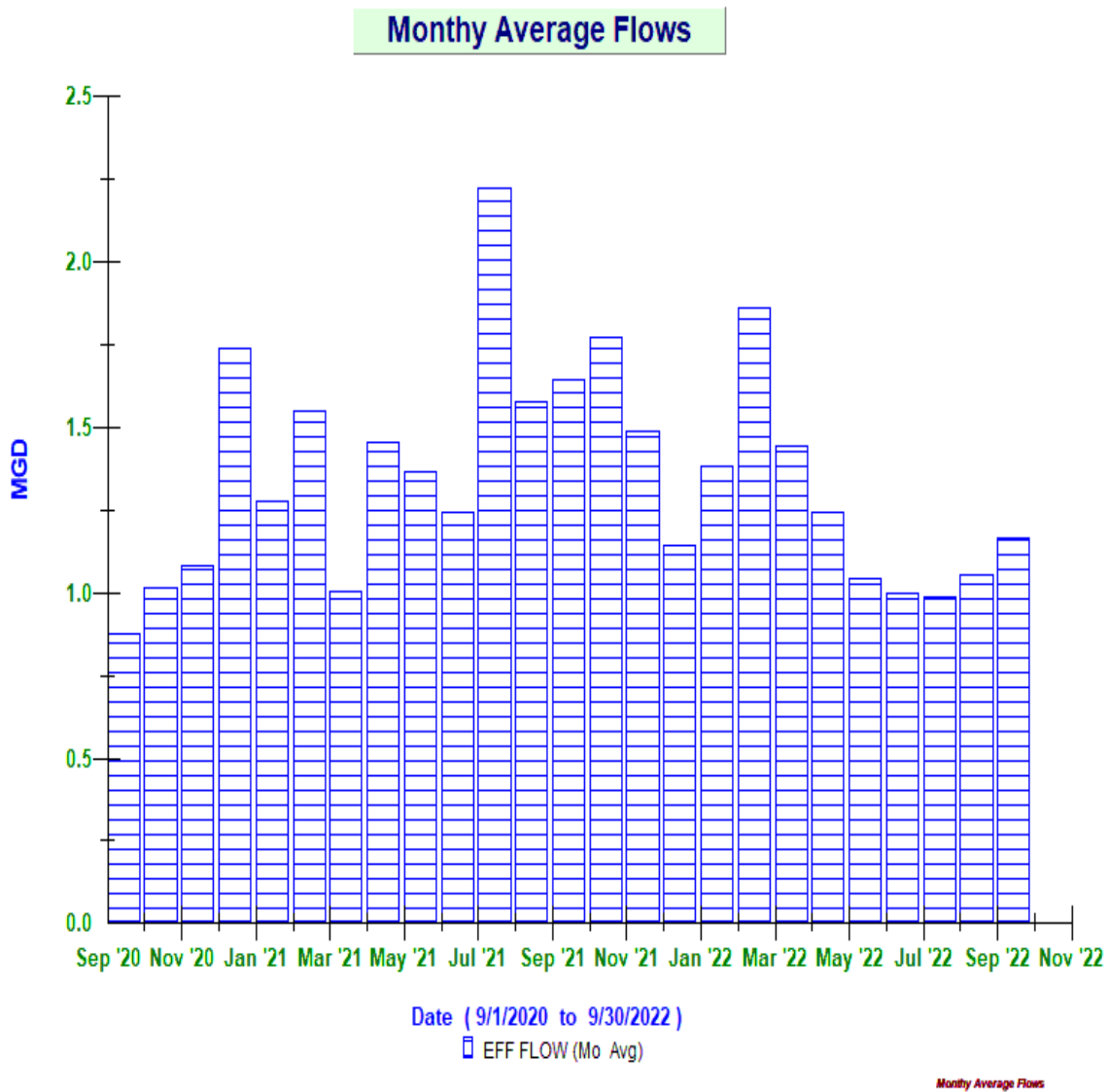
Average Daily Flows and Loadings for September

Month / Year	Eff Flow	Inf Flow	Inf BOD	Inf TSS	Eff BOD	EFF TSS
	MGD	MDG	LBS	LBS	LBS	LBS
Sep '20	0.88	0.88	1,774.92	3,065.70	51.66	128.15
Sep '21	1.65	1.61	2,548.75	3,743.35	167.97	84.06
Sep '22	1.17	1.26	1,417.38	2,516.80	82.18	221.29

* On-Going -the existing influent flow meters are strap-on doppler flow meters, and the existing pipe condition prevents getting a strong signal. An area velocity meter in the aeration tank inlet channel is used as well as the headworks influent Parshall Flume meter to monitor influent flows. All reported loadings are based on the effluent flow meter [new mag meter April 2021]. All meters are tied into the Scada system so that influent flows can be monitored.

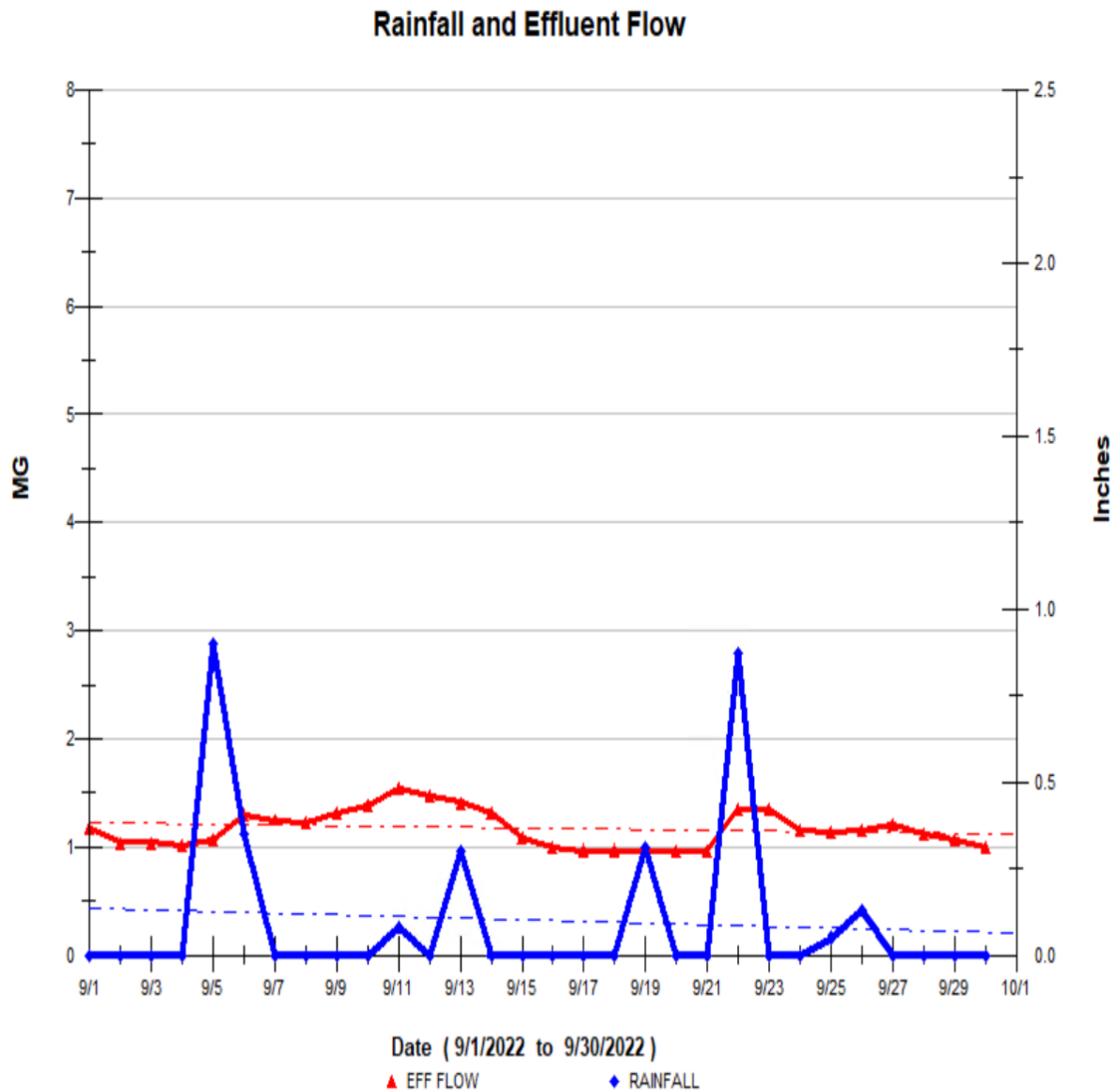
A. AVERAGE EFFLUENT MONTHLY FLOWS – 2+ YEAR COMPARISON

The monthly average flow for September was 1.17 MGD, slightly higher than 1.05 MGD in August. Total precipitation for September was 2.99 inches, more than August's 2.39 inches, but still no impact on plant flow, due to the very dry conditions. The graph shows the 2-plus year summary of the monthly average flows.



B. TWO MONTH SUMMARY OF RAINFALL AND THE INFLUENCE ON EFFLUENT FLOWS

This graph shows the days where precipitation occurred [rainfall] [Blue Peaks].

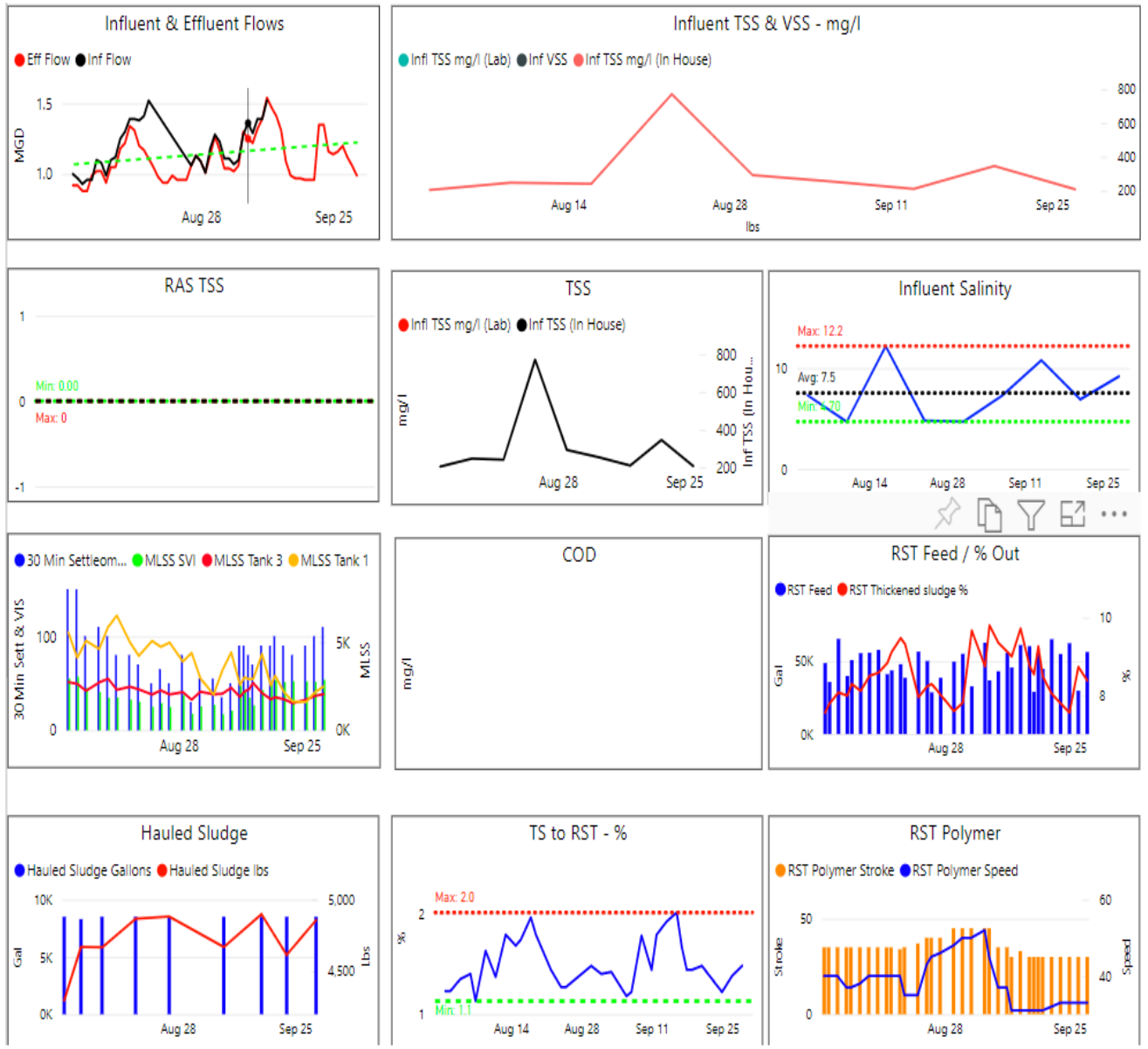


3 COMPLIANCE



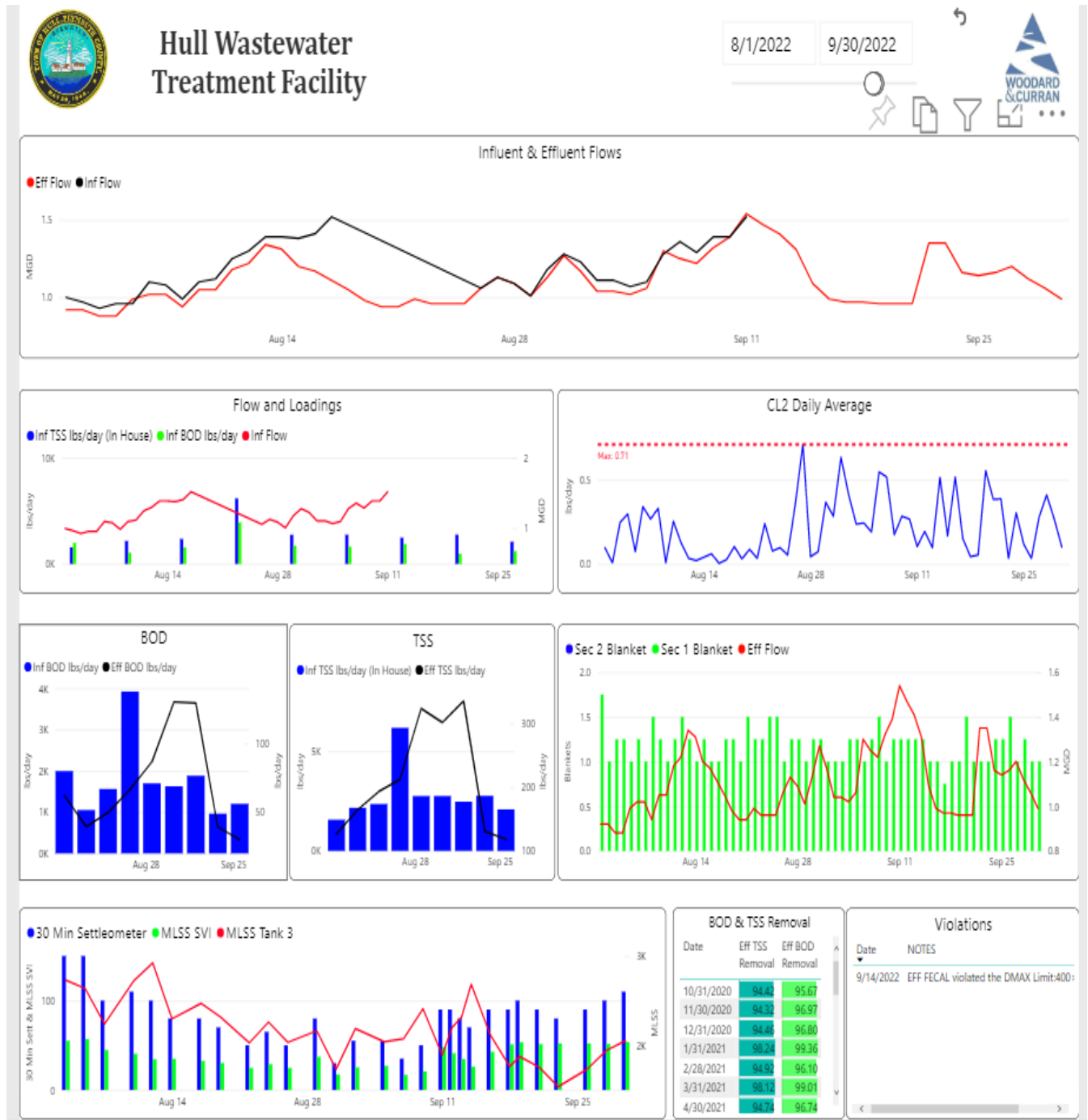
➤ Plant Effluent

- There was one permit violation - the weekly effluent grab sample collected and tested for fecal coliform on Wednesday September 14th - result was >260 CFU/ 100ml. Upon notification from the contract lab, the effluent was re-sampled on that Friday the 9/16 and the fecal coliform test result was within compliance, <10 CFU/ 100 ml. We suspect that the higher effluent turbidity was a factor in disinfection. Plant process conditions indicated an “Old Sludge” which tends to settle very fast and is a result of very low plant loading and high sludge age. A lot of cloudiness is left behind. A notification letter/email was sent out to all of the required agencies.
- Plant process conditions in September indicated that the turbidity levels (NTU) were rising over the course of the month. The tank configuration was changed early in the month to a “Plug Flow” pattern, where all of the influent sewage (INF) and return activated sludge (RAS) both flows directly into Aeration Tank #1, and then subsequently flow into AT #3. Improvement in the effluent quality and lower turbidity levels was seen gradually within 3-4 weeks with no other effluent fecal violations. The process was then changed back to the former Contact Stabilization on Oct 13, where about 20% of the INF goes into AT #1 and the other 80% goes into AT #3.
- A Copy of the monthly NPDES report for September 2022 was submitted to the EPA, the DEP, and the Hull Sewer Dept.



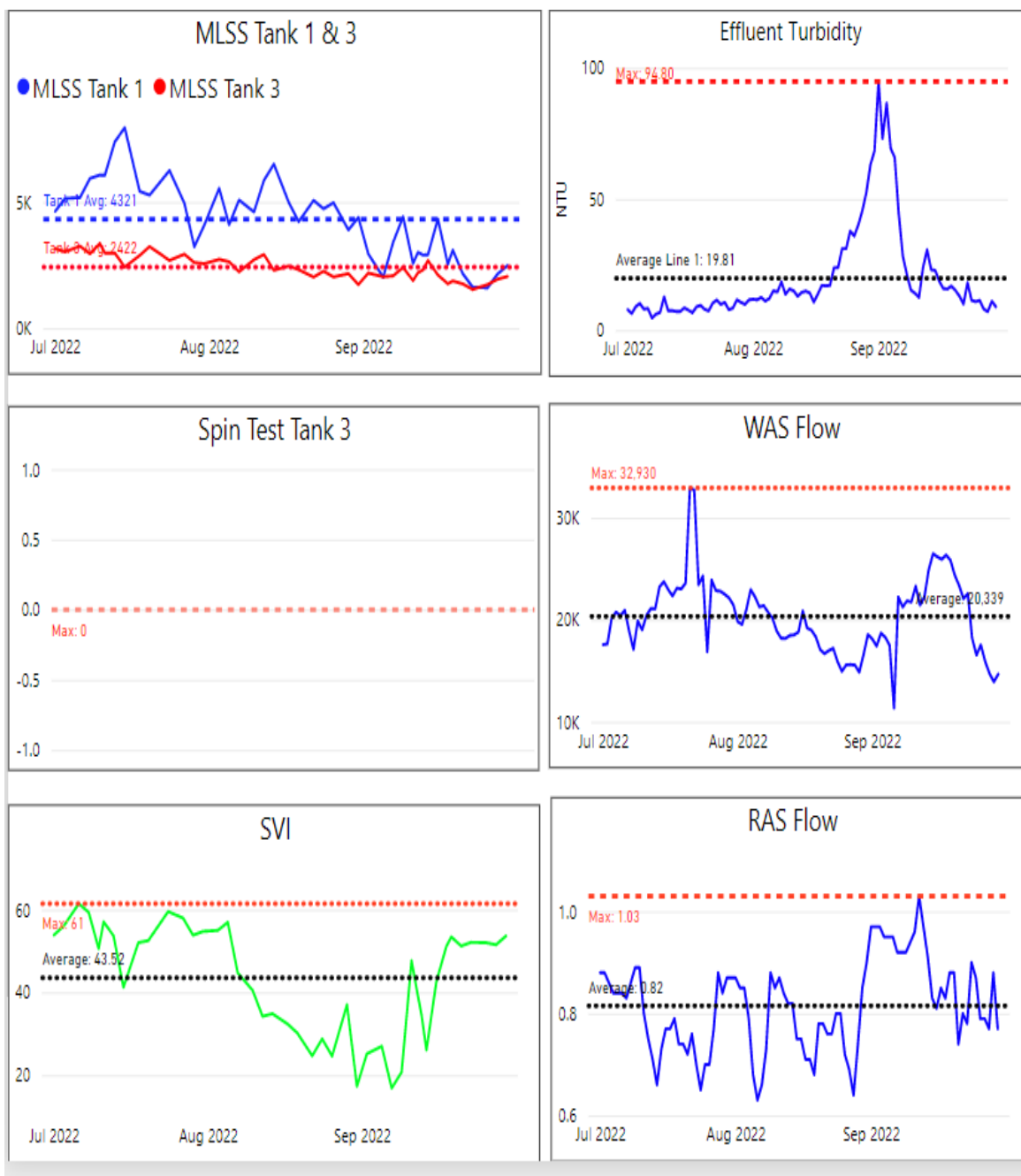
Monthly Process Summary graphs from power BI – August-September 2022

SECONDARY PROCESSES – POWER BI GRAPHS



2-month period ending on 9/30/22.

Additional Power BI Graphs showing trends of various processes – July 1- September 2022



As wasting was increased in September, there was a decrease in the system solids, and eventual improvement in the effluent quality.

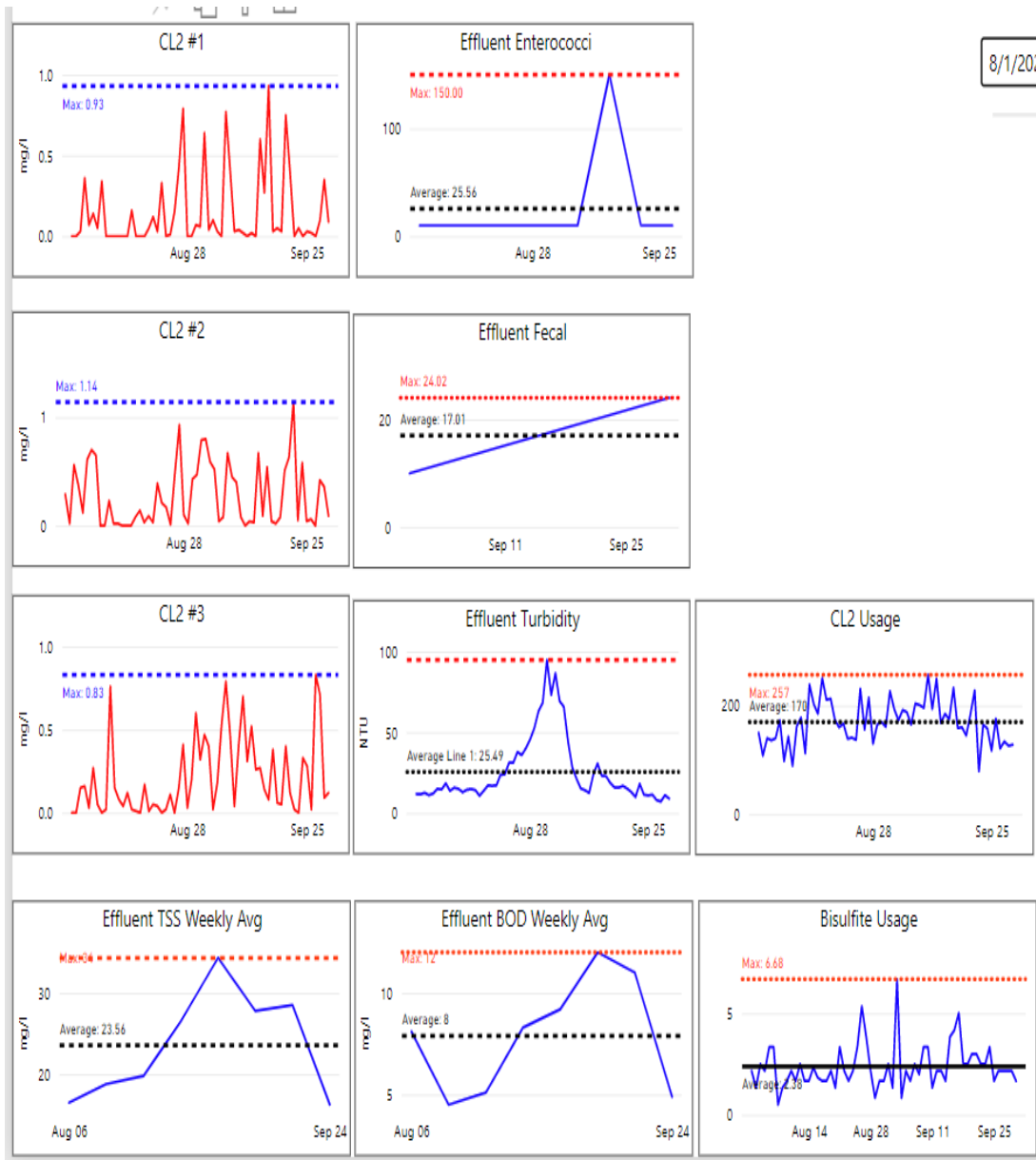
4 KEY PERFORMANCE INDICATORS



<u>Permit Compliance</u>												
Parameter Info			Permit Requirements					Results				
Parameter	Hach WIMS Variable #	Units	Daily Max	Daily Min	Weekly Avg Max	Monthly Avg Max	Freq	Period Avg	Period Min	Period Max	# of Samples	# of Violations
Eff TSS	104 / 999081	MG/L	50		45	30	1 X Week	21.1	11.8	28.5	4	0
Eff TSS	184	LBS			1152	768	1 X Week	221.3	118.1	335.1	4	0
% TSS Rem	208	%		85			1 X Month	91.7			1	0
Eff BOD	108	MG/L	50		45	30	1 X Week	7.7	3.0	12.0	4	0
Eff BOD	185	LBS			1152	768	1 X Week	82.2	30.0	130.1	4	0
% BOD Rem	207	%		85			1 X Month	94.4			1	0
Eff Chlorine	142	MG/L	1			0.7	3 X Day	0.27	0.03	0.63	90	0
Eff Fecal	111	#/100 ML	260			88	1 X Week	90.0	10.0	400.0	5	1
Eff pH	136	SU	8.5	6.5			1X Daily	6.8	6.5	7.4	30	0
Enterococci	255	#/100 ML	276			35	1 X Week	20	10	150	4	0
Totals											145	1

There were 145 effluent samples taken in September.

EFFLUENT COMPLIANCE POWER BI GRAPHS

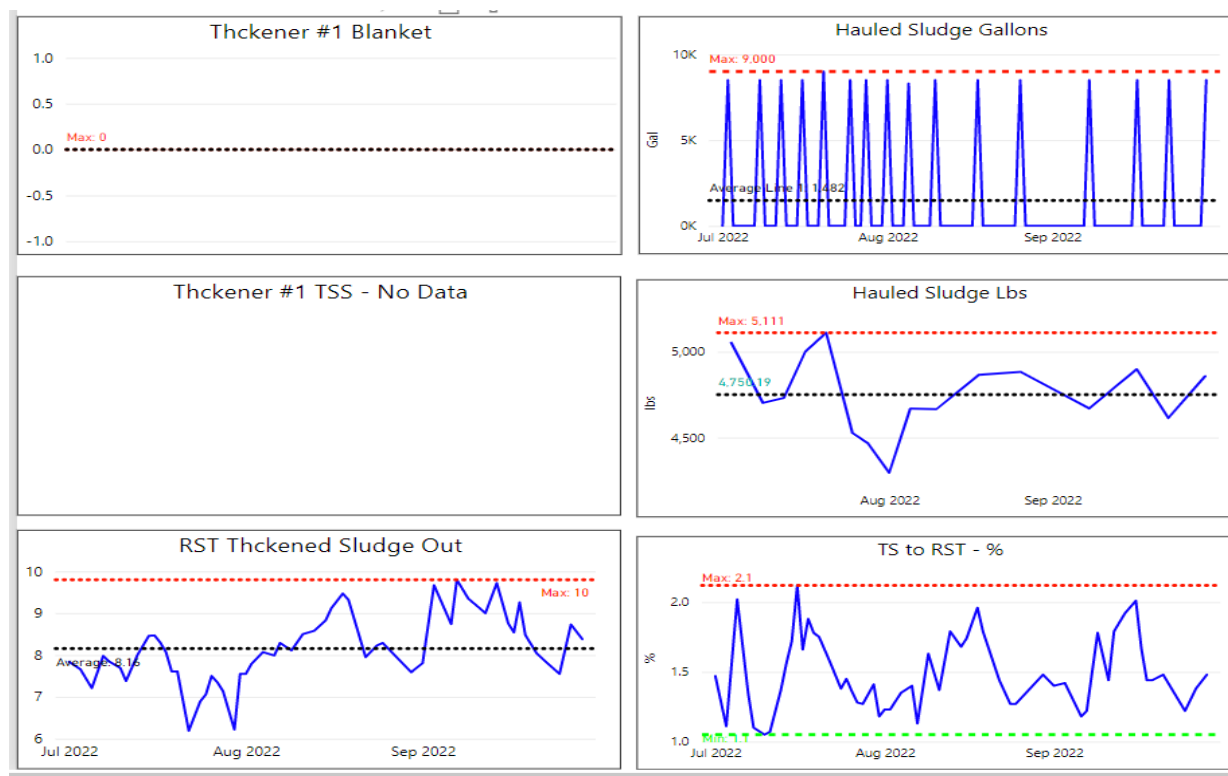


Quality of the effluent was satisfactory, but the turbidity trended higher early in month, and trended back to normal after the change to the Plug Flow process.

Sewage Gallons Treated vs Sludge Disposed

Month	Effluent Treated, MG	Sludge Disposed, Gals
September 2020	26.28	52,000
September 2021	49.35	85,500
September 2022	34.97	34,000

Additional Power BI graphs for sludge solids for 3-month period ending 9/30/22. The gravity thickener is still offline.



5 ODOR CONTROL

There were several sewage odor complaint calls received in early September. A few were anonymous calls- with no contact information or address given, and just the area of the odors. Some calls came in from the area northwest of the plant, towards the Jacobs Elementary School. W&C staff always went to the areas of concern, but significant H₂S levels were not always detected, as likely due to the often fluctuating winds here in Hull. At that time the collection system flows had been very low, there had been very little rain, and it was still seasonably warm- all potentially contributing to hydrogen sulfide gas forming in the collection system lines. The Bioxide feed rate was increased at its source, Pump Station #3, but the Bioxide may possibly be less effective as the sewage flow moves towards the plant. W&C and Evoqua Technologies are exploring putting an additional Bioxide source for the collection system at Pump Station #6.

Several complaints also came in from the Village neighborhood- Crest St, Lafayette Rd, Willow St, and the end of Spring St. In the course of investigating that area and the H₂S levels recorded, W&C staff decided it to clean out some of that area's collection system sewer lines which were showing significant H₂S levels. A Next Level Vactor truck was onsite the next day, September 2, to jet & clean the area sewer lines. No further complaints were reported from that area subsequently.

Another odor complaint was called in at 3:15 pm upon September 7, but the smell was detected by the resident at 3 am, much earlier in the day. W&C staff checked out the area around the home at that time but detected no H₂S with the Jerome meter at that time.

Some complaints came in on September 8th from the Nantasket Avenue about the Yacht Club area, and W&C staff did agree, as some smelled the odors in traveling through the area. Seaweed at the low tide may have contributed, however, the sewer line to the plant there has not been jetted & cleaned in about 4 years, and there may be some accumulation of solids in the line periodically releasing H₂S gases.

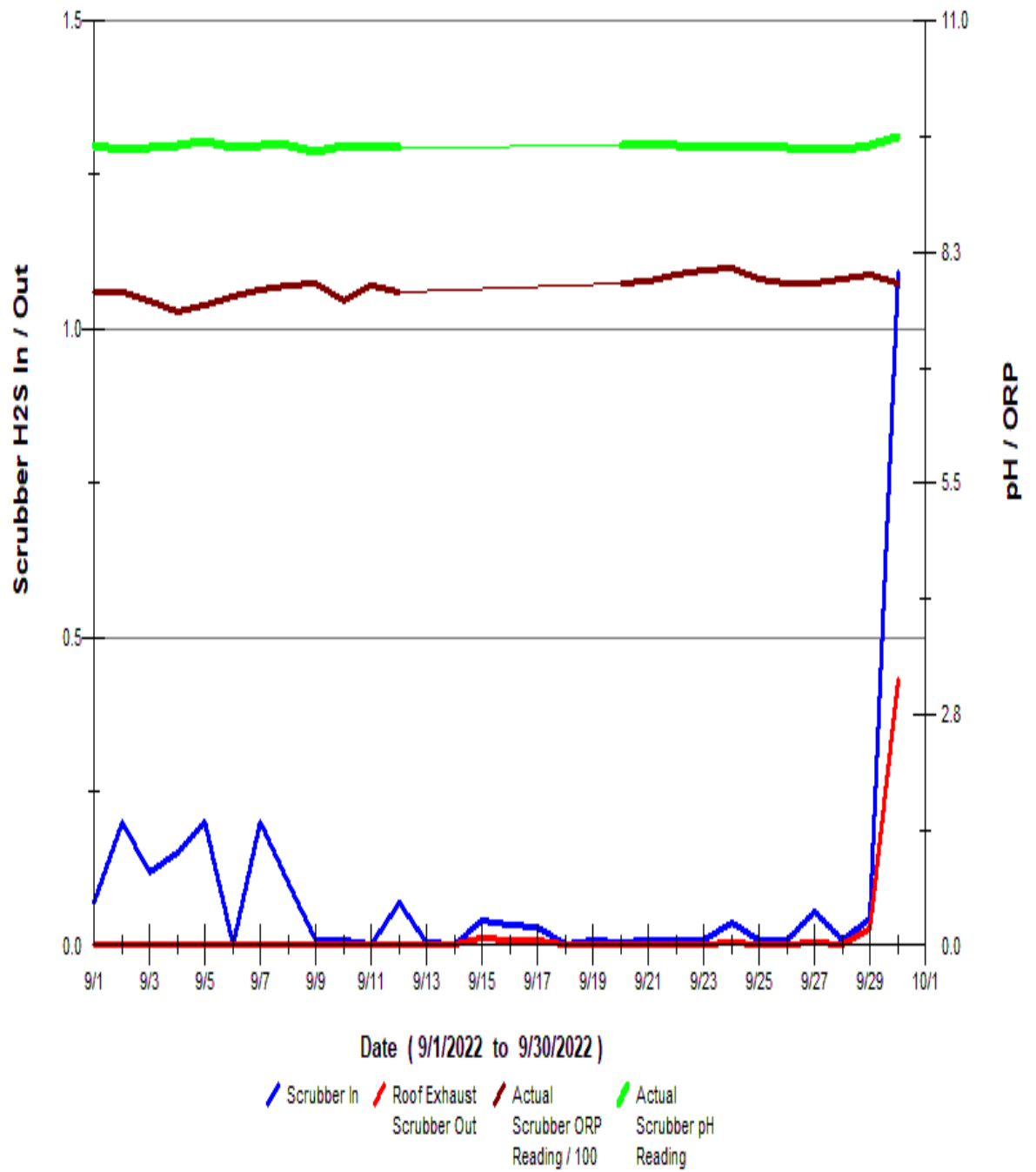
On September 9, a complaint was called in for the beach area at Channel Street. W&C staff did Jerome meter readings there and registered no hydrogen sulfides- was likely aging seaweed at low tide.

There were no more odor complaints for September.

The Bioxide system was on, and the feed rates were raised up to meet the higher hydrogen sulfide (H₂S) generation in the system as necessary. The changes and adjustments were made according to data seen at Nantasket/Water MH and XYZ/Nantasket MH. Warm late summer temperatures and lower flows were having a significant impact on H₂S formation in the collection system. The monthly graphs are attached below, the daily average Bioxide use for September was 178 gallons per day.

- The "In-Pipe" bacteria containers in collection system were changed out on September 6th & 24th
- Slight changes - Hydrogen sulfide (H₂S) monitoring units were recording and trending on the odor scrubber. [inlet and outlet]. Increased scrubber fan speed slightly. See graph below

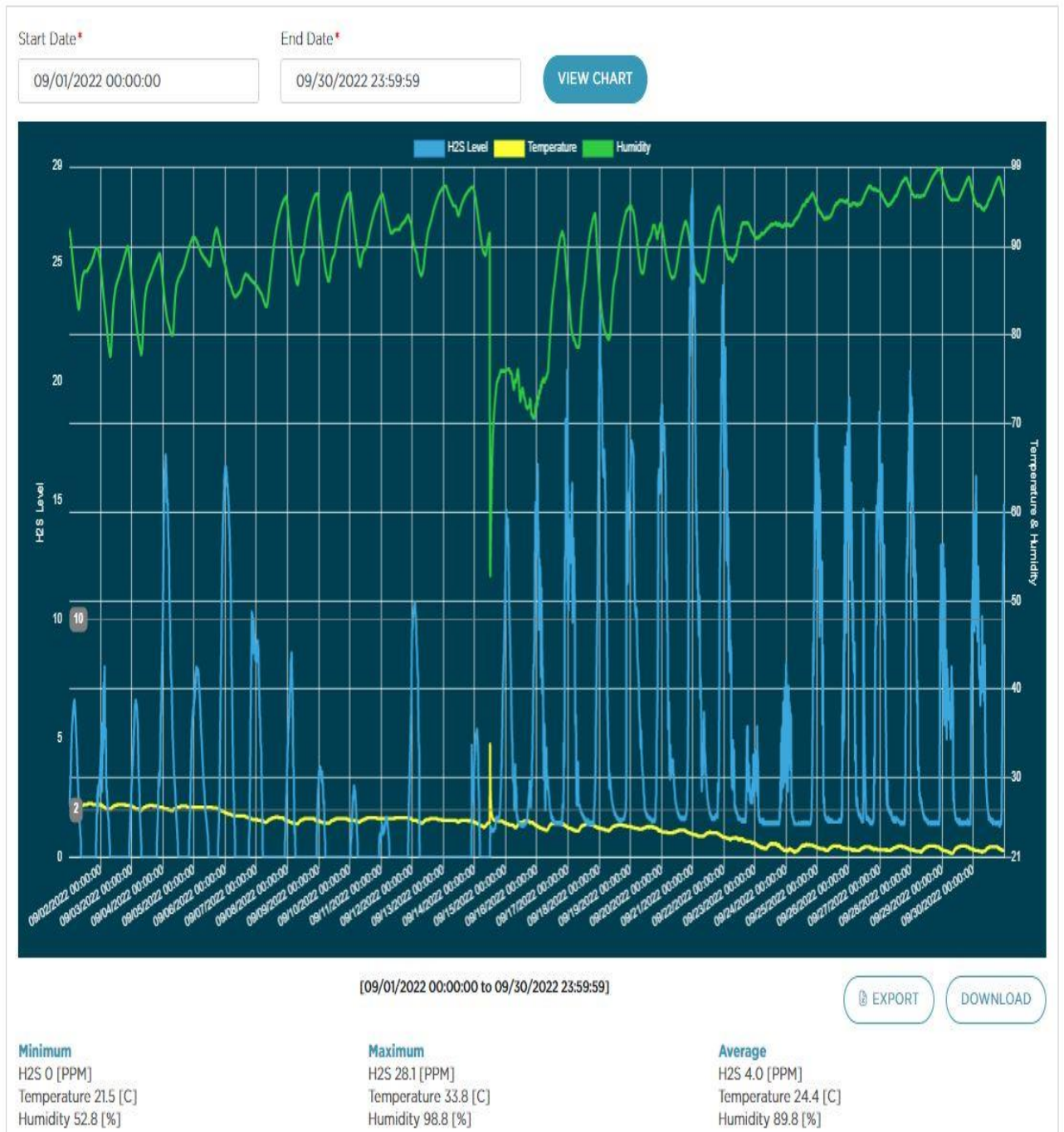
Scrubber H2S, pH and ORP



Scrubber H2S, pH and ORP

[pictured below: Scrubber trend and trending graphs for H2S levels recorded from the vapor link system cellular at XYZ Street/Nantasket Ave and Nantasket Ave/Water Street manholes.

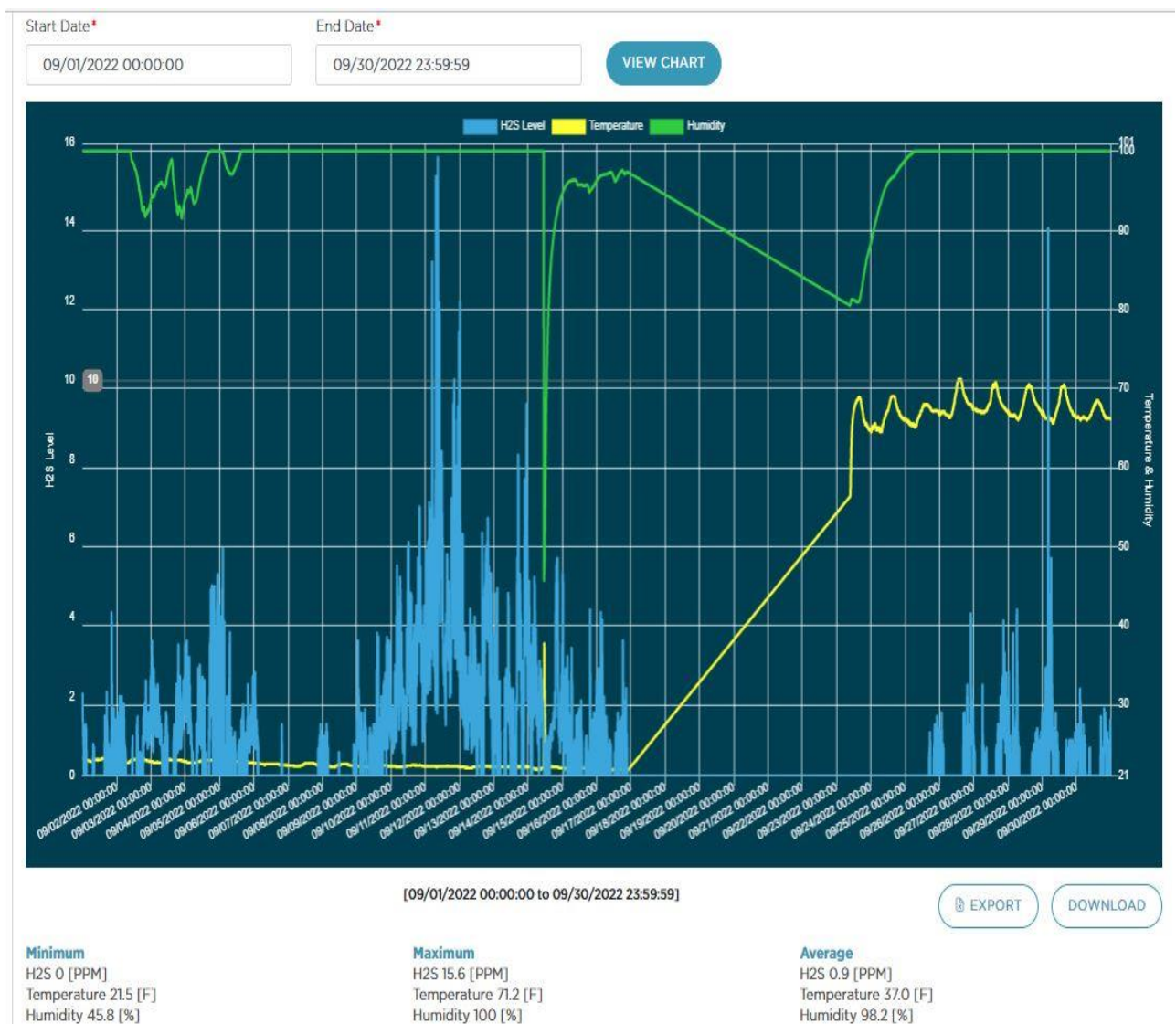
XYZ – Nantasket Ave [closest to plant]



The odor data logging unit at XYZ monitoring the overall H2S levels close to the plant. From the graph, the daily pattern of H2S levels see a rise in the mid afternoon until late evening/early AM.

Nantasket Ave/Water Street [at end of PS 3 force main and PS 4 discharge]

Pump station #3 - H2S is monitored at the end of the force main at the MH at Nantasket Ave & Water Street. Bioxide is added to allow excess nitrate in the sewage system to treat the additional H2S added from other parts the system – such as PS #4, contributions from lines feeding the interceptor - PS #5, PS #6, PS #9, Spinnaker Island, etc., all the way to the wastewater plant. H2S levels in September continued to be high and adjustments for more Bioxide feed were made increasingly over the course of the month to try and have excess chemical in the system to treat H2S closer to the plant. There was a communication issue at this monitoring site from 9/18-26.



6 MAINTENANCE SUMMARY



Maintenance History Report

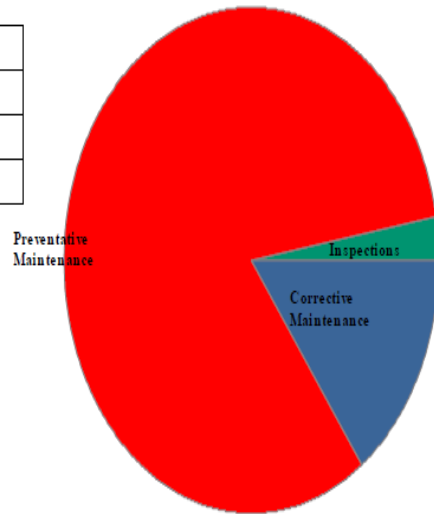
Hull Wastewater

Start Date: 9/1/2022

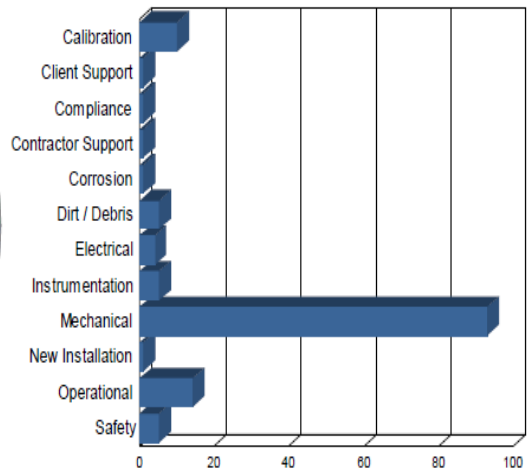
End Date: 9/30/2022

Work Order History By Type

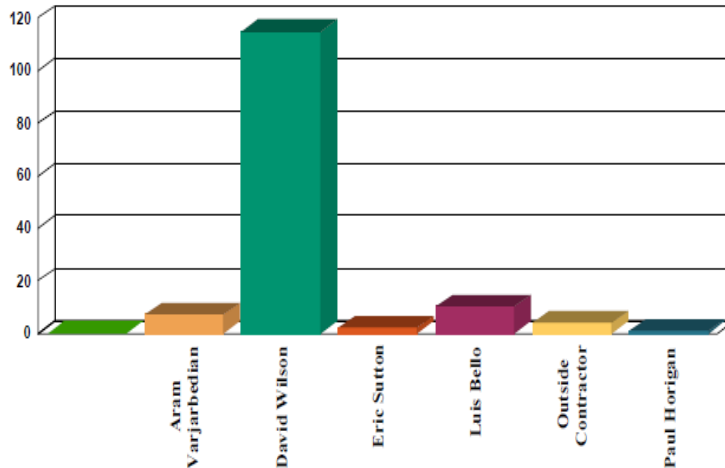
Corrective Maintenance	21
Inspections	4
Preventative Maintenance	116
Total Work Orders	141



Work Order History by Reason



Work Order History By Employee



Employee	WO Count	Labor Hours
Aram Varjarbedian	7	1
David Wilson	115	20
Eric Sutton	2	1
Luis Bello	10	0
Outside Contractor	4	11
Paul Horigan	1	4
Unassigned	2	2
Totals	141	39

A. TASKS COMPLETED THIS MONTH

The SEMS monthly work order summary for September is attached for review.

Additional key items of note are listed below:

- The Plant Water System (PWS) line was extended into the sludge transfer room from the existing 2-inch spur line located in the basement outside of the grit blower room. The sludge transfer room now has 3 garden hose bibs for cleaning in the room and priming the sludge transfer pumps, and one 1.5-inch line for backflushing the sludge lines when required.
- Seacoast was onsite 9/13 to commission newly rebuilt RAS pump #2 rotating assembly with a new buffer tank & cartridge seal water system.
- During a daily inspection and weekly no-load testing of the Emergency Generator at PS #5 the engine would not start. It was determined that the alternator had failed- upon replacement the battery was fully charged up to start the emergency generator and the system was deemed OK.
- Per request of the HSD W&C inspected three manholes on Cadish Avenue, at the D, C, & B Street intersections. The covers were found to be fused due to weathering and could not be opened. The DPW used a backhoe to break the manhole covers apart so they could be replaced.
- Hi-Voltage removed the old chorine room gaseous leak detection system that was no longer in use. All related wires and junction boxes for the system from outside of the Hypo room.
- The aeration blower roof exhaust fan # 2 got new pillow blocks and new fan & shroud installed. WC staff and O&M Support assisted with the project.
- Upon daily inspection the grit classifier, the collection trough was found to be leaking on 9/21 from the lower bearing housing. The necessary replacement parts were on hand and a new shaft seal and bushing assembly were installed to stop the leak.
- During the monthly inspection at Pump Station #9 the sump pump in the lower-level pump room was discovered to be failed. A new, larger ½ HP sump pump was installed along with larger diameter schedule 80 pvc lines.

B. ASSET MANAGEMENT ACCOUNTS

- **Please see the attached summary totals and planned expenditures for the Asset Management accounts for contract year (8). Most recent through 11/1/22**

6 SAFETY



It is Woodard & Curran's policy to maintain a safe and healthy work environment for every employee and to comply with all applicable occupational health & safety regulations.

- No lost time incidents reported for September.
- Monthly PM's - emergency eyewash and shower inspections, fire extinguishers, and emergency lighting inspections completed.
- Monthly calibrations were performed on all MX4 & Max XT11 gas meters.
- On-going Covid-19 Pandemic awareness with daily review and as needed. Keeping in daily contact with all contractors regarding Hull and W&C covid-19 protocols. W&C's Pure Safety topic was walking/working surfaces.
- The monthly W&C staff safety meeting was held on 9/29- topics discussed were PPE, plant & jobsite cleanliness, the current confined space inventory, and Lessons Learned from September.
- Monthly safety inspection checklist for the plant was completed.

7 STAFF DEVELOPMENT

Training is an important part of any operation to ensure employee health and safety is assured, quality standards are supported, staff skills are improved, career opportunities become available, and higher productivity is achieved.

Listed is a general outline of training that the staff received over the course of the month:

- All staff completed W&C's Pure Safety training and the monthly safety meeting was held on September 29. Topics discussed were PPE, worksite cleanliness, confined space inventory, and reviewing the "near-miss" incidents at all the W&C projects occurring in August.
- Regular, usually daily- operational updates and process control discussions, pump station operations, Dig Safes, and the HVAC construction project work scope ongoing at the plant. Daily safety briefings and Covid-19 protocol updates if necessary.

Staffing related items:

- Plant continued to have Sunday licensed coverage supplemented with part-time staffer Roger Boltrushek in addition to Aram and Mike.
- O&M Specialist Paul Horigan continues to assist with plant O&M projects and Jody St. George was onsite to tie in the plant water system to the sludge transfer room.

8 COLLECTION SYSTEM

A. WET WELL CLEANING

The actual schedule for wet well cleaning: May 2022 to June 2023:

(X-Cleaned) - (Orange – Inspected) - (Green – See notes) - (blank – no work done)

Frequency of cleaning	Pump Station							
	A	1	3	4	5	6	9	D
May, 2022								
June, 2022	X			X				
July, 2022								
Aug., 2022								
Sept. 2022								
Oct., 2022								
Nov, 2022								
Dec., 2023								
Jan., 2023								
Feb., 2023								
March 2023								
April 2023								

All pump stations except for Pump Station 3 and Station D have an aerator/mixer in the wet wells.

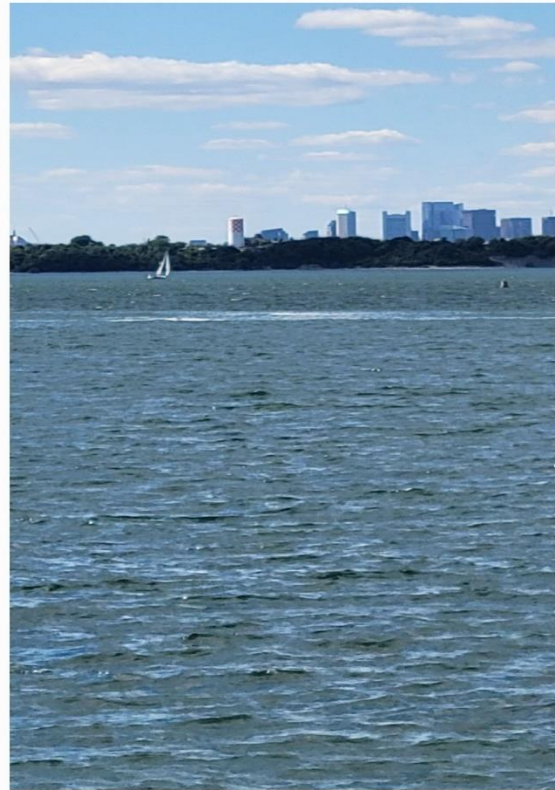
B. COLLECTION SYSTEM MAINTENANCE

Collection system work is being documented and tracked in Utility Cloud [UC] and a summarized report for September has been included as an attachment with the Monthly Operating Report.

Woodard & Curran assisted/conducted camera work and sewer system support in the Hull collection system at the following areas during the month of September. Ongoing backup and blockage call outs requiring an increase in labor and time to support. Below summarizes W&C's efforts at the various call out locations.

- There were 2 calls for E-One Grinder pump service: – see UC summary. One of the calls wound up being a blockage inside the house requiring the homeowner to call on a plumber to address.
- Two sewer line blockages were called in to the plant. One was called by The Parrot Restaurant- the up and downstream manholes on Hull Shore Drive were removed and steady sewage flow was seen, the restaurant was advised to call a plumber.

- The other blockage call came in from 44 Point Allerton Road, as the homeowner's washing machine was not draining. Flow was seen in both the upstream and downstream manholes. However, a dye test was also conducted to assure the homeowner that the blockage was indeed within their house, and they were advised to call a plumber.
- Pump station emergency generator testing consists of weekly no load runs and monthly loaded runs.
- All Pump station wet wells were inspected in September- monthly inspections are completed and combined with the monthly station PM's.
- Upload new/updated tie-cards to the UC as required.
- Dig-Safe mark outs are completed throughout the Town of Hull as needed to assist and facilitate scheduled and emergency gas repairs, broken water mains, roadway paving projects, and other residential and town projects. All are listed in the UC summary.



9 PROJECT MANAGEMENT & ADMINISTRATION



A. ON-GOING PROJECTS AND SUPPORT ITEMS

September updates:

- Ongoing construction work continued in many areas of the operations building for the HVAC project. W&C staff work closely with the contractors- moving equipment & items as needed in the working areas to allow for the renovation work to continue. W&C staff check in with the general contractor supervisor daily and join the monthly meeting with Tighe & Bond and all the project sub-contractors.
- Mike S. and Aram V. continue to meet with John S. and Brian K. weekly to discuss Sewer Department operations, any treatment plant issues, the collection system, and any upcoming projects.