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COMMITMENT & INTEGRITY DRIVE RESULTS

HULL WATER POLLUTION CONTROL FACILITY

March
2019

MONTHLY OPERATING REPORT



NPDES NO. MA0101231

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Cover pictures: View from operations building – March 3rd winter storm
W&C assisting with manhole frame and cover replacement

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 March 2019.

- No lost-time incidents for the month of March.
- There were 140 effluent samples taken in the month of March. Please see page (8) for details.
- There were no effluent permit violations.
- Plant average flows were typical for this time of year. There were a several days of moderate rainfall during the month, but nothing that caused any significant issues for the facility. The dates were spread out enough, and the impact on plant flows was low to moderate. The average daily flow for the month was 1.72 MGD, and the peak day was on 3/22/19 with a flow total of 2.75 MGD. 1.32" of rainfall fell on 3/22-23/19. 3.45 inches of rainfall was recorded for the month.
- As noted last month, plant and collection system odors were low for this time of year. The Bioxide system at PS 3 remained off for the season.
- Asset Management Accounts checkbook for tracking of expenses is ongoing weekly for year #4. A summary of year-to-date totals for [04M]. Review of account status between W&C and Hull Sewer Dept. is on-going. A copy of latest account status is attached.
- There was 1 grinder pump call outs during the month of March that the staff responded to and corrected.
- In March, Fellows Electrical continued the electrical conduit and wiring work related to the new AST. The 10-gallon fuel overflow tank was delivered, set up and tested. The AST fuel was transferred from the temporary tank, and an additional 1500 gallons were delivered to fill the AST.
- W&C O&M working with engineering and HSD on the development of the "Critical Equipment" needs list for the SRF funded account.
- The disposal of the old media from the scrubber media replacement project is pending approval for proper disposal.
- The Energy "Gap" work was completed and all that remains is programming/set up for the air flow meter into Scada.

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

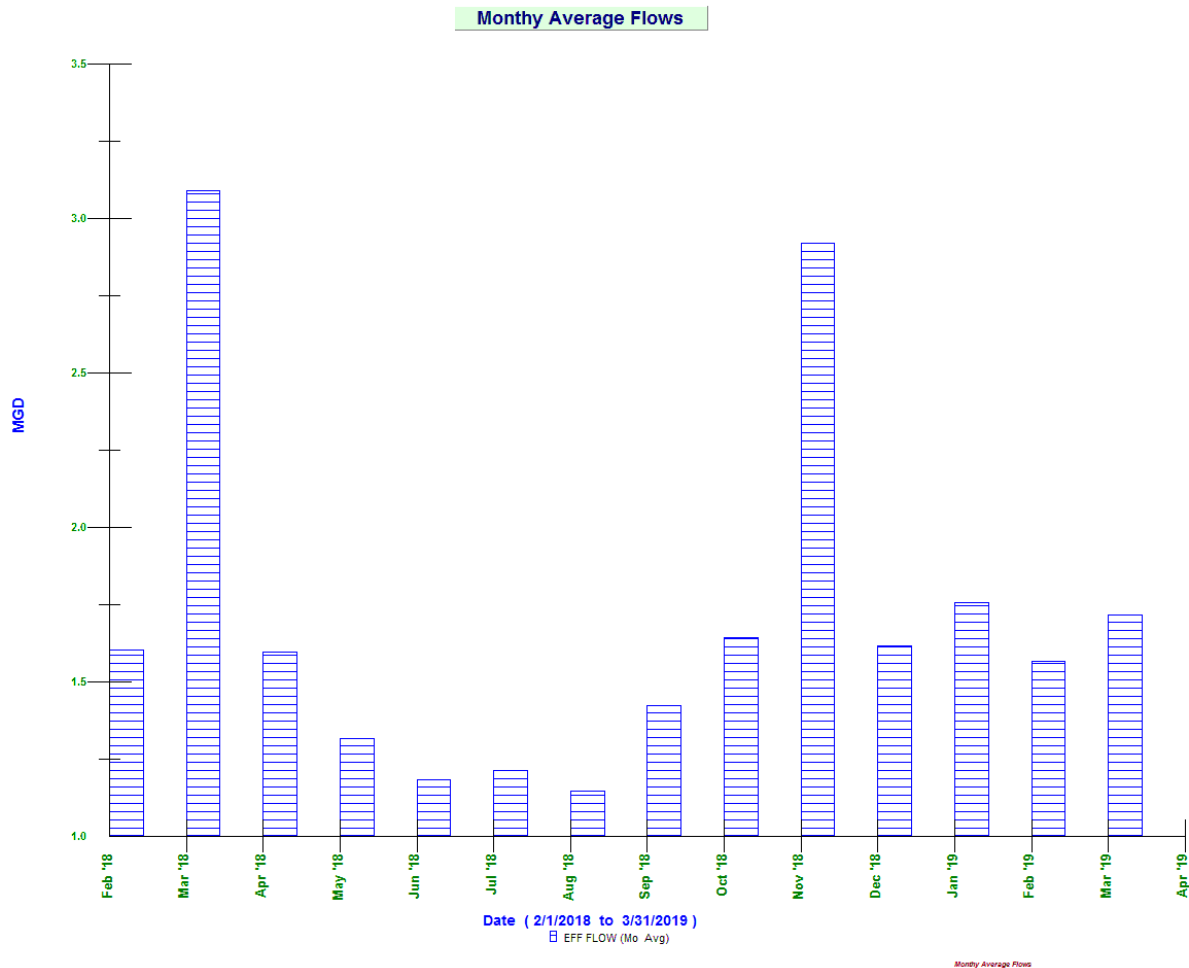


Average Daily Flows and Loadings for the Month:

	Eff Flow MGD	Inf Flow MGD	Inf BOD LBS	Inf TSS LBS	Eff BOD LBS	EFF TSS LBS
Mar 2017	1.579	1.485 *	3296	3845	48	225
Mar 2018	3.091	3.214 *	1762	2533	281	521
Mar 2019	1.715	2.010 *	919	1750	54	117

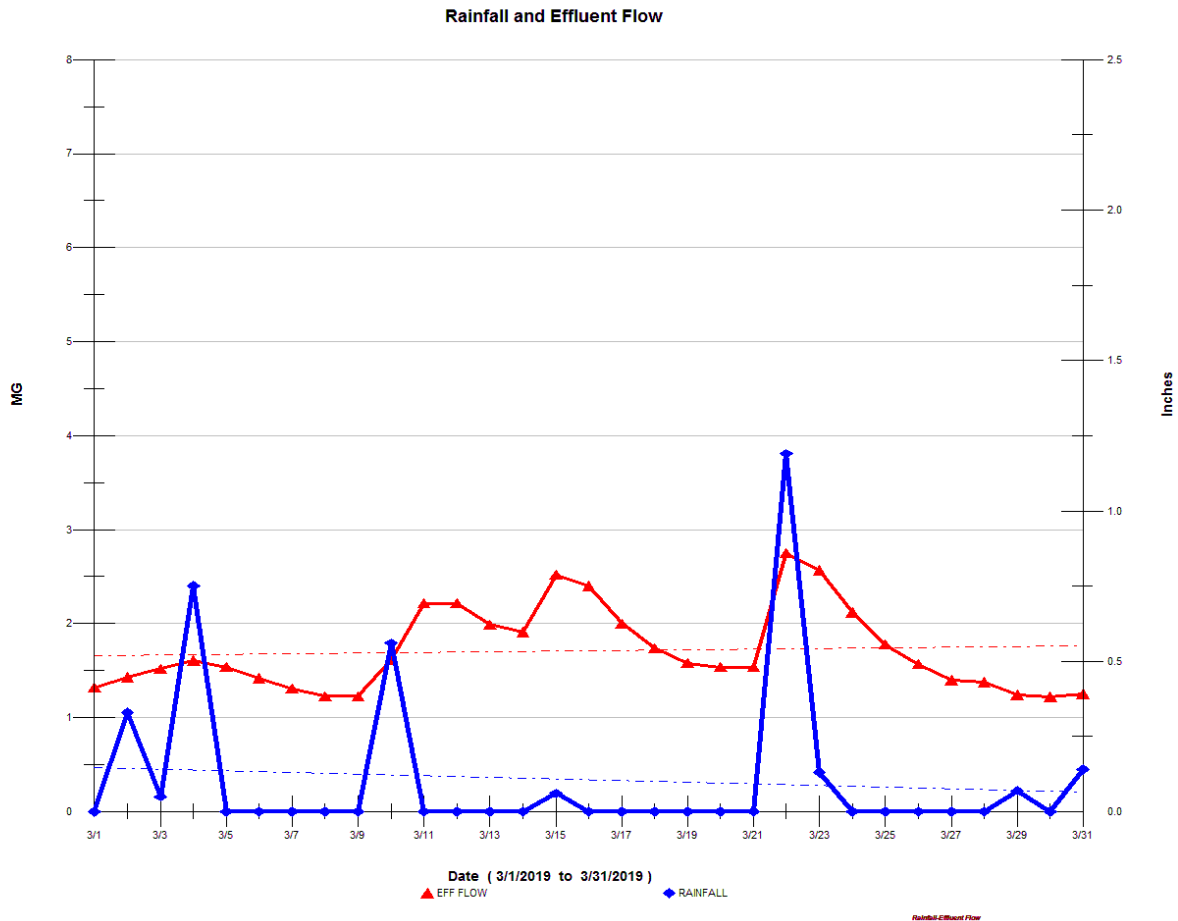
* Meter drift – influent flow meters are strap on doppler flow meters and the internal pipe condition prevents getting a strong signal. The staff adjusts accordingly and utilizes the area velocity meter in the aeration tank inlet channel as needed. All loadings are based on the effluent flow meter.

2.1 AVERAGE EFFLUENT MONTHLY FLOWS – ONE YEAR COMPARISON



Monthly average flow for March was 1.72 MGD, a typical amount for this year's winter period, and less than March 2018. There was one significant snow event in early March followed by snow melt. Total precipitation was 3.28 inches.

2.2 MONTHLY SUMMARY OF RAINFALL AND THE INFLUENCE ON EFFLUENT FLOWS



This graph shows the days where plant flows were higher due to rainfall [Blue Peaks]. This graph provides a good indication of the influence that rainfall has on the effluent flows. Inflow and Infiltration out in the collection system has been noted with the increased effluent flow values when it rains.

3 COMPLIANCE



➤ Plant Effluent

- There were no exceedances for the month of March.
- Plant process conditions continue to be good & maintaining very well. The clarifier surface was good during the month. Only one secondary clarifier was necessary. Sludge settleability was good and no chlorination of the RAS was needed. The process solids inventory varied depending on plant flows and wasting schedule. All of the primary sludge generated is being pumped to the gravity thickener [GT] and co-settling with the secondary waste activated sludge. Due to lower odors for this time of year, the sludge blanket in the GT was allowed to be higher in order to achieve a higher sludge concentration for pumping to the sludge truck.
- Utilized timed aeration blower mode during the month, due to excessively high dissolved oxygen levels in the aeration tanks. The timed on and off mode saved on some electrical costs.
- Aeration Process mode remains in contact stabilization mode, with varying amounts of flow into aeration tank #1, depending on system inventory and flows. This mode allows for lower solids loading to the secondary clarifiers.
- A Copy of the NPDES report for March 2019 and February Whole Effluent Toxicity NPDES Report were submitted to the DEP and then forwarded to the Hull Sewer Dept.
- Continued working with corporate team [Frank C & Alan F] for Scada to Hach Wims data management computer data export.
- The Drylet Trial continues, and improved secondary effluent quality is very evident, especially during higher flow days. There is still some uncertainty as to the anticipated solids reduction. W&C is

continuing with the program in order to monitor plant performance over a longer period of time. The variable plant flows contribute to the uncertainty of the amount of solids reduction, with the use of this product. The daily dose of product has been lowered due to lower loading and plant flows, in order to optimize use of the product. To date, the facility's biological system continues to operate very well to the supplemental bacteria that is being added daily, and secondary clarifier performance is very good.

Photos below show the current conditions as a result of lowering the sludge inventory and changing of process flow mode. The spray water that is usually on, was shut off during the very cold periods in March to prevent the freezing of the clarifier rake arm.

- Kristina Richards [KR] worked on Tier II annual reporting for the facility for certain chemical stored at the facility in 2018. Report submitted before March 1st.
- KR also assisting with questions and updates needed for the permanent above ground storage tank (AST) and Spill Prevention and Containment Control (SPCC) plan and decommissioning of the temporary AST when the time comes.
- SPCC: Plan for monitoring fuel stored at the facility. Regular inspections of the temporary AST, new AST and fuel day tank, as well at container storage of waste oil. Updated file.
- Waste oil that is consolidated in 55-gallon drums and stored in the garage was picked up by Cyn Environmental Services. [100 gallons]

4 KEY PERFORMANCE INDICATORS



4.1 WATER QUALITY – MARCH 2019

Parameter Info		Permit Requirements					Results				
Parameter	Units	Daily Max	Daily Min	Weekly Avg. Max	Monthly Avg. Max	Freq	Period Avg.	Period Min	Period Max	# of Samples	# of Violations
Eff TSS	MG/L	50		45	30	1 X Week	8.0	6.0	11.0	4	0
Eff TSS	LBS			1152	768	1 X Week	116.7	77.1	166.6		0
% TSS Rem	%		85			1 X Month	93.5				0
Eff BOD	MG/L	50		45	30	1 X Week	3.8	3.0	6.3	4	0
Eff BOD	LBS			1152	768	1 X Week	54.1	38.5	83.0		0
% BOD Rem	%		85			1 X Month	94.4				0
Eff Chlorine	MG/L	1.0			0.7	3 X Day	0.20	0.03	0.57	93	0
Eff Fecal	#/100 ML	260			88	1 X Week	10	10	10	4	0
Eff pH	SU	8.5	6.5			1X Daily	7.2	6.9	7.5	31	0
Enterococci	#/100 ML	276			35	1 X Week	13	10	20	4	0

- There were 140 effluent samples taken in the month of March with zero [0] NPDES Permit exceedances.

Gallons Treated vs Sludge Disposed

Month	Effluent Treated, MG	Sludge Disposed, Gals
March 2017	48.94	126,000
March 2018	95.82	104,000
March 2019	53.17	114,500

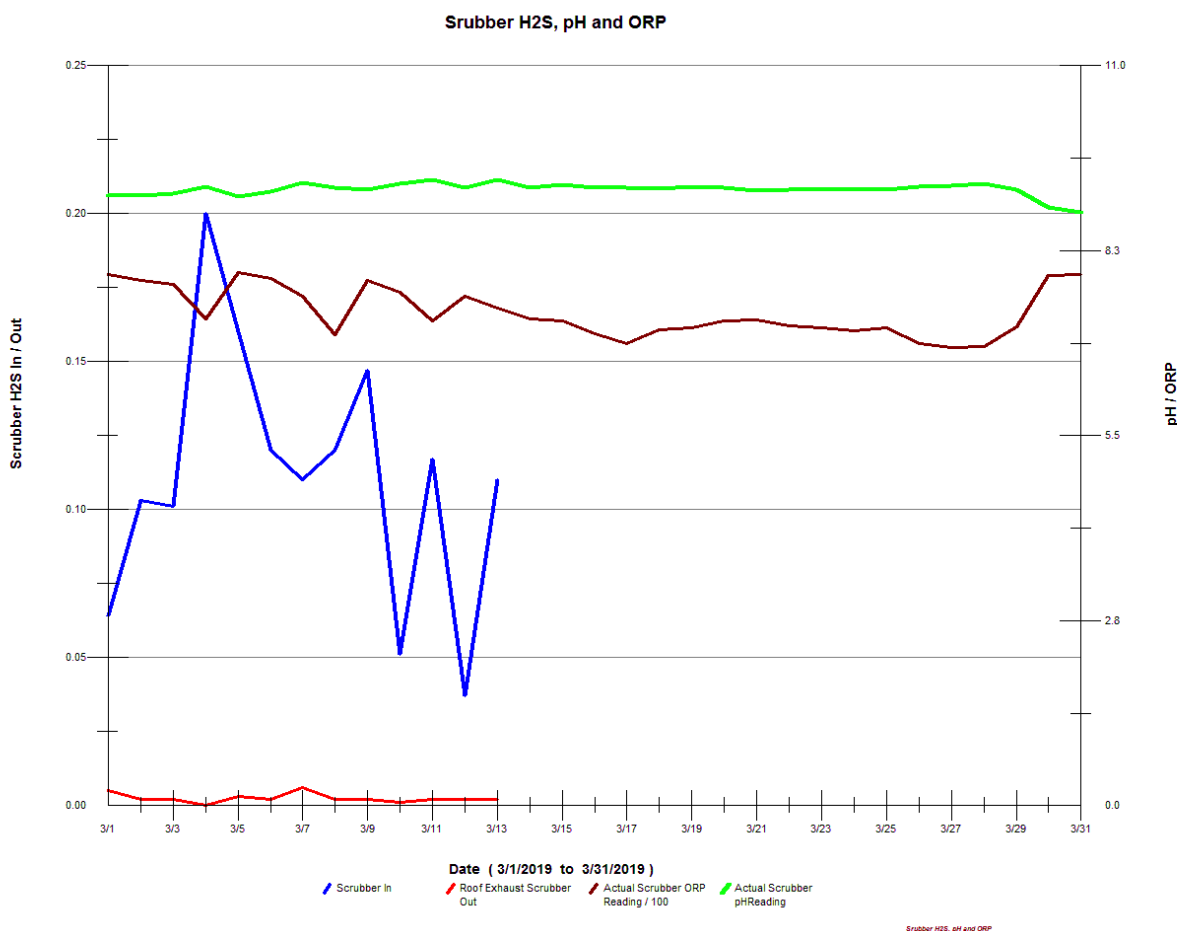
5 ODOR CONTROL

There were no odor complaints reported in March 2019.

The gravity thickener and primary clarifier were on for the month of March. It is necessary to keep these process units on line, since these unit processes allow for thickening and collection of sludge. The waste activated sludge is pumped to the gravity thickener via the blend box. The above ground sludge storage tank is off line, since the tank cannot be used in the winter months, due to freezing temperatures. Aeration tank troughs are being flushed to minimize build-up of odors.

The odor scrubber system was on line for entire the month. The scrubber fan speed was lowered due to less hydrogen sulfide production, and electrical savings are possible with the lower energy needed to run the fan.

The spent scrubber media is currently on site and waiting for approval for disposal. The six tote containers of spent material are covered, while being stored outside. W&C is working with Graham Waste for an approved disposal location and transport off site.



Graph shows some small peaks for H2S to the scrubber, but these are all below 1.0 ppm. These [low blue] peaks are primarily due to the H2S generated in the primary sludge or gravity thickened sludge when sludge is pumped to the bulk sludge truck, and then the lines are drained to the headworks to prevent freezing until the next truck is scheduled to return and pump sludge. The portable H2S meter was not operational from 3/13 through the end of the month. A loaner unit is planned, while the facility's unit is being evaluated.

- “In-Pipe” bacteria addition continued with all 24 dosing stations operational. No additional actions taken for headworks sulfide reduction plan proposed by “In-Pipe. The inspection/replacement with full bottles took place on 03/14/19. All work being tracked on the Utility Cloud [UC]. In-Pipe’s technician assisted with the dosing station bottle changeouts, inspection of the dosing units, provided feedback on various maintenance tasks associated with the dosing stations.
- Continued the bi-weekly change outs of the bacteria bottles at three lift stations Microbe Dosing Stations (MDU’s) with installation just in front of the three largest pump stations [in the wet wells or manhole just prior to the station. [PS 3, PS 5, PS 9] The re-load plan is delivering an additional 5.4 liters per month in total (1.8 liters x 3 locations). The goal is to see if we get a step change and reduce odors, while at the same time potentially reducing sludge. This change is being monitored closely over the summer months, for pump stations and at the plant.
- On-going – frequent pumping of the secondary scum wells. Tank cleaning performed quickly and as needed.
- No [Bioxide] product added, system off for the winter period.
- Mixing systems/aerators all functional at the pump stations, except for pump station #3. New Medora Gridbee mixing system for PS 3 not installed yet. Mixer/Aerators at PS 4 & PS 6 are on timed control through SCADA. The plan is to add additional station mixers to timed control in the near future.
- Still in Progress – as requested discussing options for headworks area to reduce corrosion and odors with Tighe and Bond’s HVAC evaluation/upgrade. Attached pictures show current matting and covered aerated grit chamber and intake flex piping on top of floor grating to minimize and contain odors.



6 MAINTENANCE SUMMARY

6.1 TASKS COMPLETED THIS MONTH

The SEMS monthly work order summary for March is compiled and attached as a pdf file for review.

Key items of note are listed below.

- 1) The De-ragger unit at PS6 continues to function very well with no issues. To date, the #1 pump has not needed any cleaning. An additional de-ragger unit was ordered in March for pump #2, and the unit will be installed in mid-April by the supplier.
- 2) In-Pipe units – battery change out and circuit board troubleshooting and replacement as needed.
- 3) Grinder Pumps replaced: 87 Rockaway
- 4) On-going issue – the need to add oil to sec clarifier gear boxes and the GT gear boxes. All of the units have leaks [lower gear box seals are no good]. We are using a flowable grease product that is heavier to lessen the amount of leakage. The estimated use of product is 2.5 gallons per week.
- 5) Working on roof exhaust fans for operations building – rebuild unit #2 and new motors needed for each fan, since the existing motors had bearing issues and not cost-effective to repair.
- 6) Weekly exercise without loads and Monthly load tests completed on all generators including the portable generator and pump stations. Transfer switches for generator operation annual PM scheduled for early April.
- 7) Assisted Town's potential insurance company [Travelers] to tour facility and inspect assets On 3/7/19.
- 8) Modifications to above ground sludge storage tank feed/inlet piping – eliminate piping restrictions and set up for spray-wash hose hook up.



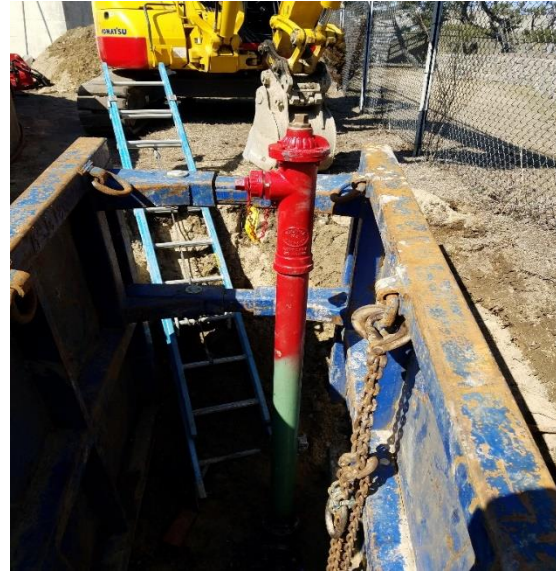
- 9) Visits to D Street stormwater station as needed to ready/prime portable trash pump for back-up use. With the cold weather conditions, the trash pump “readiness” also involved draining the pump on the extreme cold days, and re-priming when tides were expected to be high during the heaviest rainfall periods. Both of the 4-inch submersible pumps were operational.
- 10) A significant number of Dig-Safe mark outs completed, due to emergencies, upcoming paving projects, water main replacement work. Responded to all calls regarding rattling manhole covers, broken manhole covers/rims, sunken manholes covers/rims. All work that W&C completed is documented in the monthly Work Order Report and utility cloud.
- 11) Replace failed 6-inch suction valve plug on waste pump #1.
- 12) PS 5 and primary scum tank at plant cleaned, assisted by J Hoadley vac truck. Decanted water and residuals disposed of at Town landfill designated area. Frozen ground and wet weather limited residuals disposal at landfill and remained had to be handled at the “pit” at the plant.
- 13) The #1 hypochlorite storage tank was cleaned out. Assisted by J Hoadley’s vactor truck.



- 14) Aqualine Utility on site for 3 days to replace 4 failed yard hydrants and the 8-inch gravity thickener overflow line valve. Plant staff assisted with plant water shut down and isolation, changeovers to potable water, and other process changes to allow for work to be completed.



New isolation valve for hydrant



New hydrant installation by SC #1

6.2 ON GOING PROJECT UPDATES



- Drylet bacterial process enhancement trial continued in March. [See effluent/compliance section].
- Still looking at an alternative use for one of the existing primary clarifiers, especially the #1 PC, since the drive unit has extensive damage. Conversion to a mixed tank and floating aerator are being considered. This would allow for hydraulic flow into the tank, and not restrict flow at the D-box, which is currently a concern, as having the primary tanks off line in the warmer months eliminates many of the odors around the facility. This item is being considered under the SFR Critical needs equipment. A couple of budgetary quotes have been received.

- Pump Station #1 – The new pumps are currently operating normally. Output flows from each pump are being investigated to determine how higher capacities could be reached. Pressure tests and drawdowns / flow testing was completed in January and found slightly higher pressures are contributing to lower outputs than the original design points. The pump assemblies were checked in March and found to be clear of any debris. In review of prior reports and investigations it was determined that the pump capacities were always lower than the designed points, going back to the 1980's. It was also found that the motors are not reaching their full load amps and have approximately 25% more available amps that handle an increase in flows if the impellers are upsized. Aram & Bill are working on summarizing the findings and evaluating larger impeller trim sizes to take advantage of the existing available motor power.
- The Horizon energy grant work was completed in February with a final automated actuator and flow meter installed and now programmed through SCADA. This modification and plan are working well at the present time and saving the electricity equivalent of a **20-horsepower motor**. With the scrubber fan VFD installed and with new scrubber media replacement, W&C was able to decrease the VFD speed by approximately 25%, providing electrical cost savings. W&C is working to get the electrical data tracked.
- The co-ordination with Duperon for a site visit to inspect the influent channel flex rake is still being pursued. They have not had an available technician scheduled for our area. They were booked through the winter months and had no scheduled area visits planned.
- Pump Station 9 [PS 9] – Currently operational, but both pumps have leaking mechanical seals. One of the pump assemblies was replaced with a used one for the short-term, while service is being done on the removed pump assembly. There is also a check valve and pump isolation valve that need to be replaced. Plans are underway to obtain these items. PS 9 structural and overall station condition is part of the larger structural project being discussed.

Please see the attached summary of the Asset Management accounts for contract year (4)

7 SAFETY



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

- No lost-time incidents for the month of March
- Ongoing - Daily safety briefing meetings, review site safety policies with sub-contractors, safety tailgate topics.
- Pure Safety topic– March – “Hearing Conservation”
- New sensors & calibration of the facility's 4-gas personal gas meters. Various sensors and rechargeable batteries installed. Jim Gagliard – O&M Specialist is completing these repairs.
- Monthly staff safety meeting conducted on 3/29/19
 - Natural gas safety
 - Reminder – OSHA 300A form is posted
 - Ladder safety
 - Lessons Learned from February 2019 - Near misses and incidents from other company projects.
 - Employee assistance program – “Ways to improve your numbers”
 - Virgin Pulse – Core-Source – “your Care”.
- Storm Readiness updates provided as requested.
- Annual Host & Crane inspections being planned for late April/early May.

8 STAFF DEVELOPMENT

Training is an important part of any operation to ensure employee health and safety is assured, quality standards are maintained, 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:

- W&C intern Ryan Holman completed his internship that had started on 1/7/19. He assisted operations and maintenance with various projects. He still remains on staff in a part-time role, coming to the facility for one day every 2 weeks for various projects.
- Monthly staff Safety training – completed – Pure Safety and monthly safety meeting.
- Operational updates and process control discussions, especially with recent electrical issues and plant shut-downs, pump station operations, odor issues, dig-safes, etc.
- W&C “near-miss” incidents at all projects for March discussed.
- Jim G continues to work with staff on various SEMS updates – work order management & scheduling.
- Company mandated “Diversity” training completed by all staff.
- Joe Basler and Cody Piepenbrink attended 1-day seminar hosted by Woodard & Curran for “Qualified Electrical” training.
- Various staff members signed up for spring training seminars to prepare for wastewater certification exams and continuing education training hours for license renewal.

Staffing related items:

- Continued involvement with Mass Maritime [MM] internship program/career fair for future interns. Corporate human resources department leading the effort for future intern for summer months. Some selected candidates to be interviewed in the coming weeks for the summer internship.
- Sunday rotation schedule in place with Jim Gagliard working every other Sunday, and remaining weekends being filled by Roger B., Aram V., and Bill B. When Bill is not scheduled for a Sunday, he will be on a Monday-Friday schedule.
- Supplementing staff needs with O&M tech support where needed. Jim G and Jody S providing coverage when staff levels are lower due to sickness, vacation, or training.

9 COLLECTION SYSTEM

9.1 WET WELL CLEANING

The actual schedule for wet well cleaning: May 2018 to April 2019:

(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, 2018		X			*1	*1		
June, 2018					X	X		
July, 2018					*2			
Aug., 2018					X			
Sept. 2018				#3	#3		#3	
Oct., 2018	X	X	X	X	X		X	
Nov, 2018	#4	#4		#4	#4	#4		
Dec., 2018					X			
Jan., 2019								
Feb., 2019								
March 2019					X			
April 2019								

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

- *1 Inspected and needs to be cleaned in June**
- *2 Inspected and needs to be cleaned in August**
- *3 Inspected and needs to be cleaned in October**
- #4 Wet wells were not inspected this month**



PS 5 Wetwell before cleaning

9.2 COLLECTION SYSTEM MAINTENANCE

Woodard & Curran assisted/conducted camera work in the Hull collection system at the following areas during the month of March.

- Harborview Blockage – camera work and cleaning
- Allerton Hill & Nantasket Ave – camera work to find laterals since no tie cards
- Beacon Rd.
- Nantasket Ave by DCU bath house
- Assist with Drawdown tests at PS 4 & 5 to get estimated flows for CMOM report

Manholes:

- Staff responded to various rattling manhole covers, broken manhole covers/rims and sunken manholes covers/rims.
- Flagged & replaced a number of manhole covers where requested/notified.

Dig Safe mark outs:

- Numerous Dig-Safe mark outs were completed throughout the Town of Hull in order to assist/facilitate the Town's paving project and the emergency repairs of the broken water lines, broken sewer laterals due to gas main work.
- After-hours dig-safe mark-outs for various water emergencies were conducted as requested.

Collection system work is being documented and tracked in Utility Cloud and a summarized report for the month of March has been included as an attachment with the Monthly Operating Report.

10 PROJECT MANAGEMENT & ADMINISTRATION



10.1 ON-GOING PROJECTS AND SUPPORT ITEMS

- Asset management checkbook for tracking of expenses. Review of account status between W&C and Hull Sewer Dept. is on-going. [04M]. The report information is available to the Sewer Department and located in the shared file location. **The current snapshot of the account status as of 4/11/19 is included as an attached pdf file with this report.**
- All AST work is now complete, and the new tank and system was online during the month of March. Two punch list items remain including a shelf for the battery backup system for the 10-gallon overflow and W&C has requested that Comm Tank come back and fix some “tacky” paint issues in areas where the paint did not set up properly on new fuel piping that was installed.
- Utility Cloud was fully operational during the month of March with more and more work being tracked through the GIS / asset management / cloud-based program. Work is intended to grow each month as the staff works with Bill and Andy Crawford on specific work flow usage in Hull. **A copy of the UC printout for March is attached.**
- Second floor storage area equipment relocation and improvements originally so the AST fuel lines could be installed along the building wall. All stored equipment, supplies, and records were moved out so welding of pipes could be completed. New pallet rack shelving set up and plans underway to re-organize stored materials & equipment, prepare a list of equipment to be classified as surplus for removal from the plant, and install larger racks for storage.
- Reached out to Industrial Pump Services from Tiverton, RI for some options/ideas on removal of the existing vertical turbine pump at the D Street Stormwater Pump Station without removal of the roof, and other submersible pump options. To date, some proposals have been made, and currently under review.