



# HULL WATER POLLUTION CONTROL FACILITY

January  
2018

## MONTHLY OPERATING REPORT



[woodardcurran.com](http://woodardcurran.com)

COMMITMENT & INTEGRITY DRIVE RESULTS



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 the Hull WPCF during the month of January 2018**

- No lost-time incidents for the month of January
- The limited indoor air quality assessment that was performed on Sept. 27<sup>th</sup> and follow up report with recommendations was provided to the Sewer Dept. in November for their considerations. To date, no additional actions. Plan is to have new O&M safety person Andy Rowe review.
- There were 153 effluent samples taken in the month of January with two [2] NPDES Permit exceedances. Please see page (11) for details.
- Storm event occurred on January 4<sup>th</sup> with elevated plant flows, due to limited rain and mostly high tides. High Flow Management preparations. [flood doors, sandbagging, 24/7 coverage]. This period was then followed by extreme cold, which caused freeze up in secondary clarifier #2.
- A second high flow event occurred on Jan 11<sup>th</sup>-13<sup>th</sup> due to rain with I&I.
- Could not maintain operation of secondary clarifier #2 on 1/6/18, due to icing and jams at skimmer beach plate. Clarifier was left on line with flow through it and limited RAS for 2 days. Aeration system was shut down to retain biomass solids.
- The Bioxide equipment remains on site at PS 3 until further direction from Sewer Dept. and discussions of plan for 2018. A draft preliminary report was submitted for review.
- Asset Management Accounts checkbook for improved tracking of expenses in ongoing. A weekly review of account status between W&C and Hull Sewer Dept. is on-going and with modifications to the checkbook. Monthly meeting with sewer dept to discuss status of accounts in Jan.
- No Sanitary System Overflows [SSO] reported for January.
- Installation of upgraded controls for the influent and effluent pump back-up control systems still in progress by Pioneer Electrical. Testing by SCADA group to occur when installation is completed.
- Additional SCADA programming for influent gate and plant generators on-going. Upgraded software needed to add additional ID tags for components to be monitored.
- There were 3 grinder pump call outs during the month of January.
- Underground Storage Tank for fuel oil storage – work on remediation plan for tank removal, temporary fuel storage tank, and long-term storage plan. Working on finalization of quote for rental of above ground tank.
- “Mini-warehouses” storage containers moved to different locations on the property to make way for the temporary AST for fuel.
- Weather conditions – frigid cold temperatures causing for icing up in clarifier, various operations building water pipes, unit heater issues.

**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

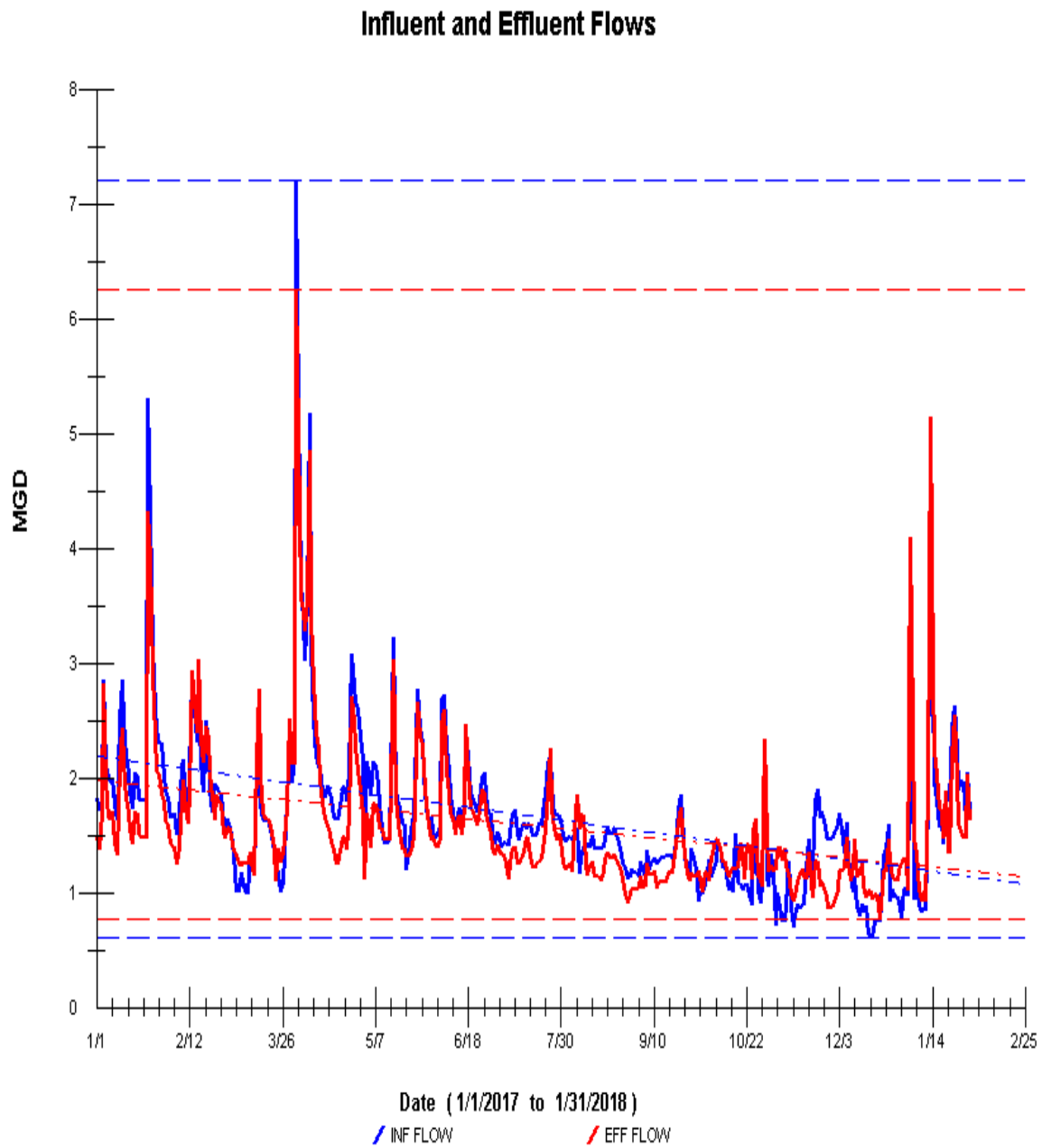


### Average Daily Flows and Loadings for the Month:

	Eff Flow MGD	Inf Flow MGD	Inf BOD LBS	Inf TSS LBS	Eff BOD LBS	EFF TSS LBS
Jan. 2016	1.745	1.641	2,119	3,794	70	167
Jan. 2017	1.967	2.295	1,664	4,324	170	410
Jan. 2018	1.845	1.794	2,518	2,553	201	299

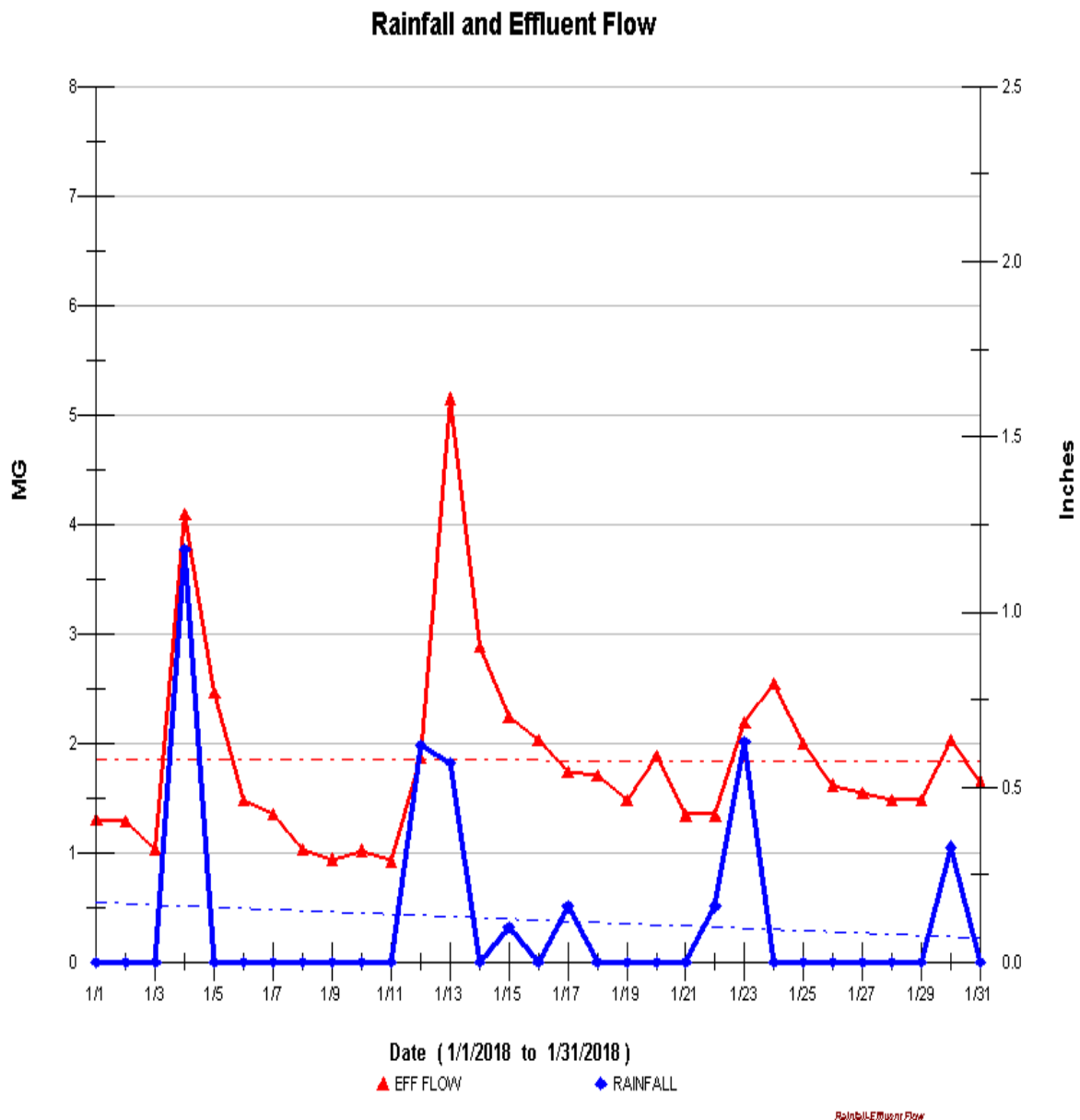
\* Slight deviation on the flow meters – Reflects more coming out of the Facility than what came in. Drift is getting closer and the numbers more accurate as the staff adjust accordingly.

## 2.1 INFLUENT AND EFFLUENT FLOWS



*Influent and Effluent Flows*

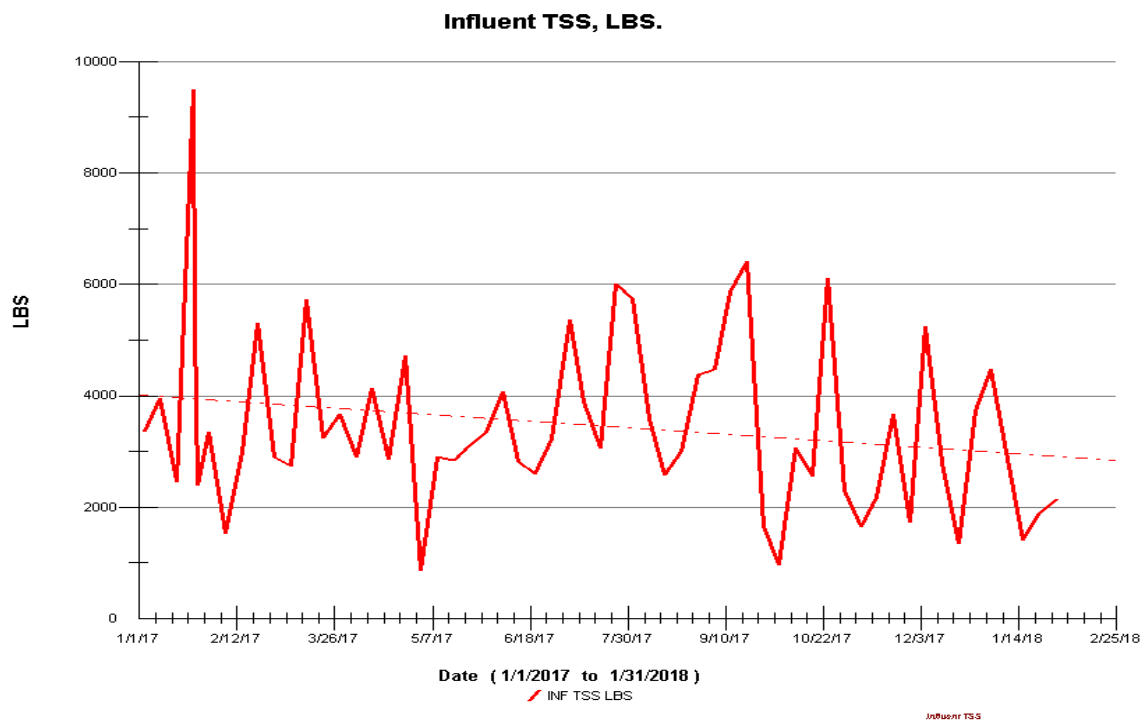
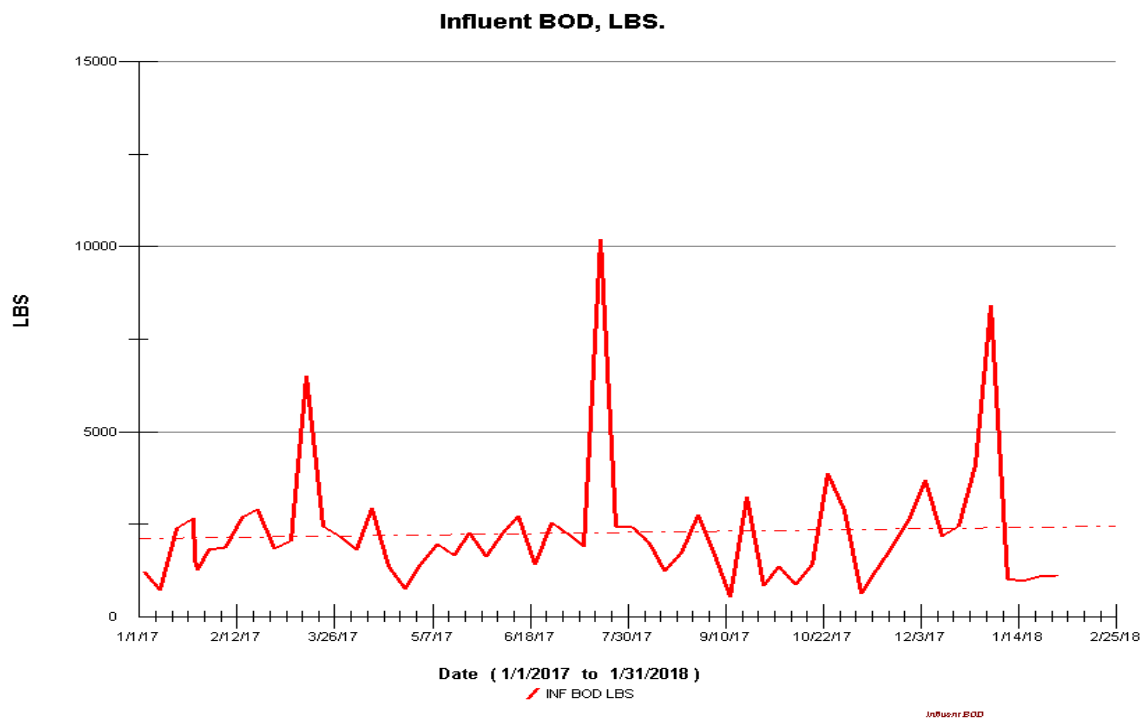
## 2.2 RAINFALL AND EFFLUENT FLOWS



High Flow Management Operations implemented for the Jan 4<sup>th</sup> event and the January 11 to 13<sup>th</sup> event. The high flow event on Jan 4<sup>th</sup> was related to tide influence only, as it ... it happened relatively quickly with the one tidal surge. Peak Effluent flow was 9.76 MGD.

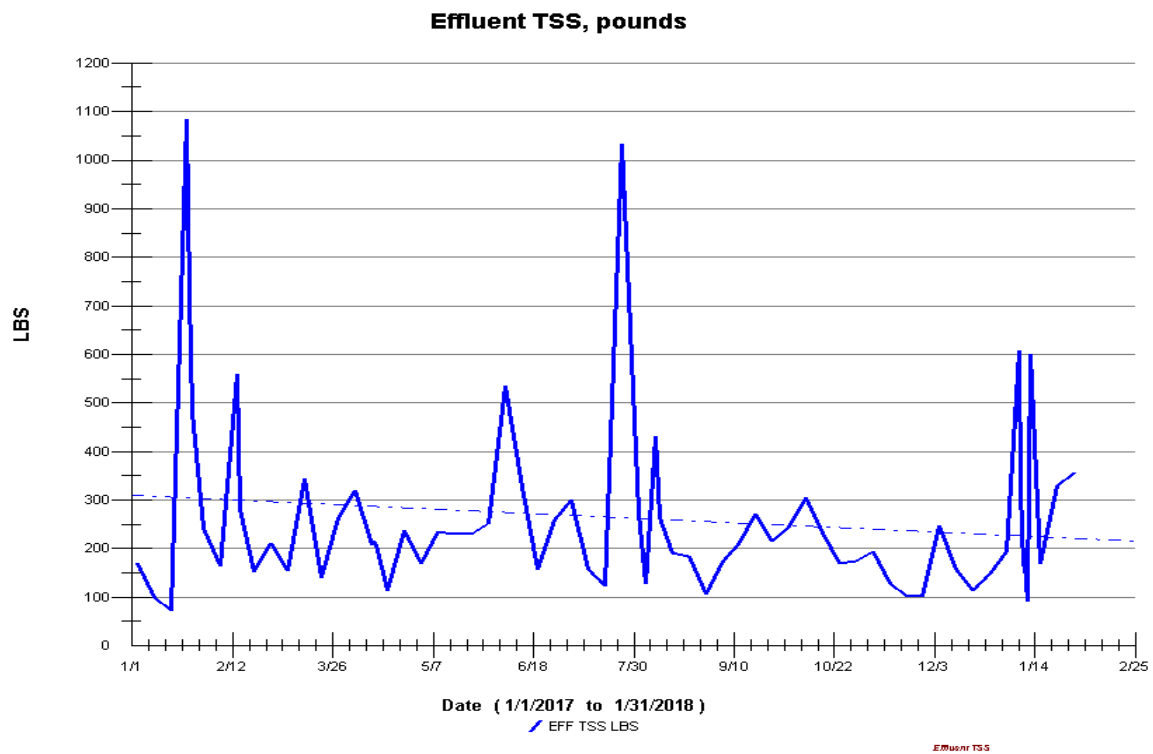
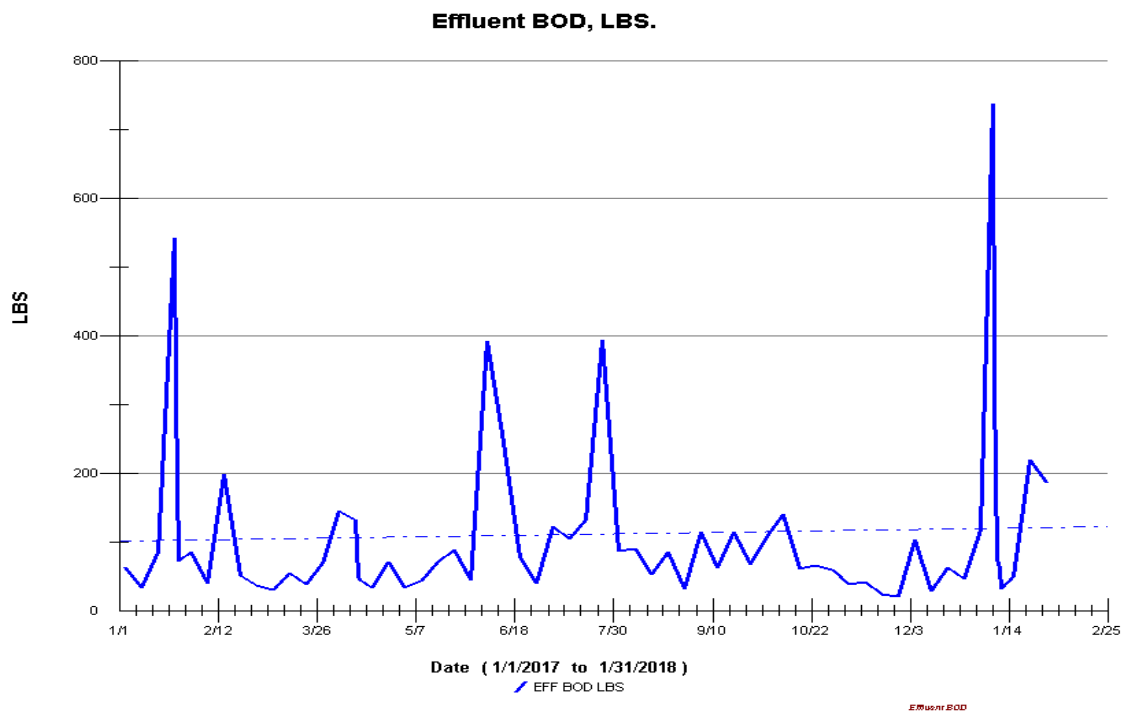
The high flow event on Jan 13<sup>th</sup> was related to rain and snow melt only and it happened very gradually due to snow melt and slow rainfall initially - followed by the heavy rain after. Also, the flow was very steady above 7 MGD for some time.

## 2.3 INFLUENT BOD AND TSS LOADINGS





## 2.4 EFFLUENT BOD AND TSS LOADINGS





### 3 COMPLIANCE



#### ➤ Plant Effluent

- There were two exceedances for the month of January. One daily maximum for effluent TSS and one daily maximum for effluent BOD were exceeded on 1/7/18, due to the shutdown of the secondary clarifier. Weekly and monthly permit limits were met.

The DAILY Permit limit is 50 mg/L for TSS and BOD. Actual results were:

53.5mg/L – TSS

65 mg/L – BOD.

- Plant conditions maintained with variable performance issues with the secondary clarifiers [SC], as there is less efficient RAS removal from the secondary clarifier due to continued non-functioning draft tube systems. There has been an increased amount of floating sludge on the surface of the secondary clarifier, due to process conditions and poor sludge withdrawal that has made it difficult to maintain a clean surface. The extremely low air temperatures have led to ice formation of the floating sludge mass and the ice caused skimmer jam-ups at the scum beach plate/trough. Several off-hours callouts and additional staff coverage was necessary to keep the clarifier running up through Jan 6<sup>th</sup>.
- On Friday Jan 5<sup>th</sup>, attempts to vacuum up the floating sludge using a vactor truck were unsuccessful, since the amount of material was too great, and the truck froze up, due to the sub-zero temps. The clarifier drive operation could not be maintained through the night, and Saturday's weather conditions were also poor. Attempts on Saturday to thaw the ice with rock salt and breaking up of the ice manually were unsuccessful. The clarifier operation was shut down late in the afternoon, since there was no way to keep the unit operational, without jamming up on each rotation. Possible damage to the unit was also possible.

January 5-6



January 8th



- The MADEP was contacted on the situation, and adjustments made to the plant process, in order to keep flow going through the facility and adequately disinfect the effluent. Composite sampling was performed during this period of lower treatment to demonstrate plant performance, which was surprisingly good. There were only two daily permit exceedances. The clarifier was returned to regular operation early on Monday January 8<sup>th</sup>, after thawing of ice around the center column of the drive mechanism.
- Copy of the NPDES report for January 2018 was submitted on 2/15/18 and then forwarded to the Hull Sewer Dept.
- Kristina Richards is continuing to work on the 2018 Annual calendar and written compliance plan ("EMCP" – Environmental Monitoring and Compliance Program) for the Hull plant.

- A working draft has been updated in the project file that includes some highlighted items for future review and discussion. Items related to the underground storage tank [UST] to be added to the annual calendar.
- Work initiated on the SPCC plan [Oil Spill Prevention Control and Countermeasure Plan], because the facility will store oil in applicable aboveground tanks, containers, and equipment in quantities exceeding 1,320 gallons.

## 4 KEY PERFORMANCE INDICATORS



### 4.1 WATER QUALITY

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	24.8	10.0	53.5	10	1
Eff TSS	LBS			1152	768	1 X Week	299.4	91.5	606.8		0
% TSS Rem	%		85			1 X Month	88.6				
Eff BOD	MG/L	50		45	30	1 X Week	17.9	3.0	65.0	9	1
Eff BOD	LBS			1152	768	1 X Week	200.8	32.6	737.3		0
% BOD Rem	%		85			1 X Month	91.8				
Eff Chlorine	MG/L	1			0.7	3 X Day	0.59	0.07	0.81	93	0
Eff Fecal	#/100 ML	260			88	1 X Week	10.0	10.0	10.0	5	0
Eff pH	SU	8.5	6.5			1X Daily	7.3	6.9	7.5	31	0
Enterococci	#/100 ML	276			35	1 X Week	10	10	10	5	0

- There were 153 effluent samples taken in the month of January with two NPDES Permit exceedances.

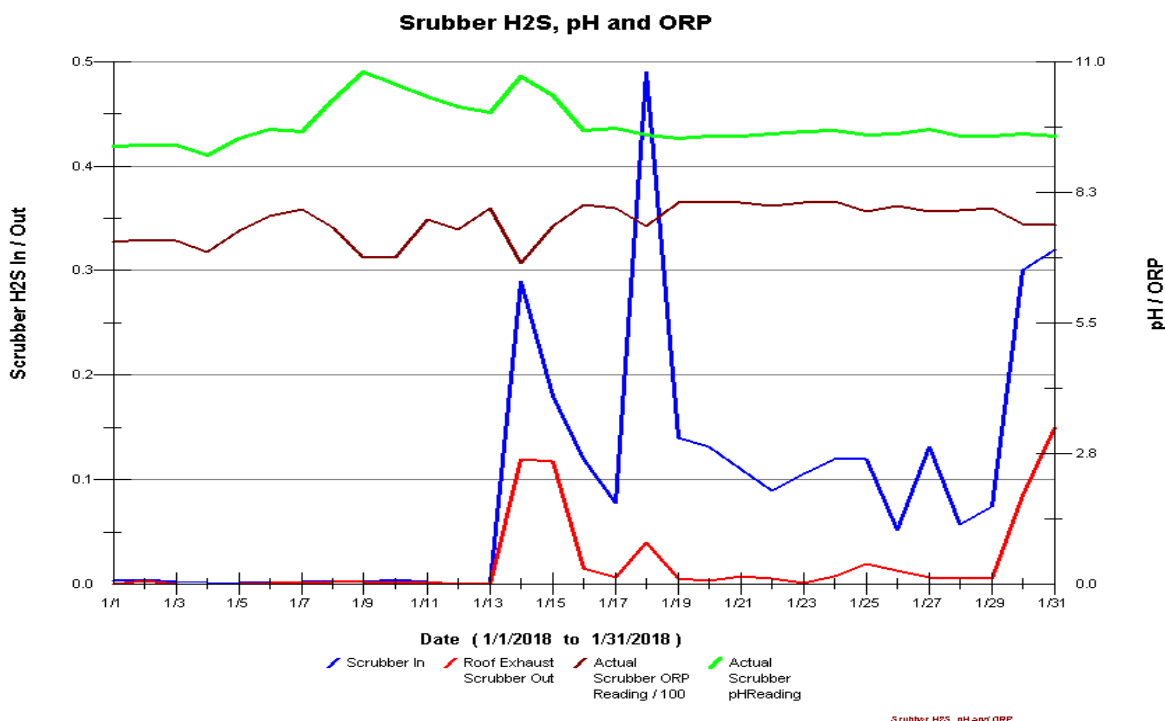
### 4.2 GALLONS TREATED VS SLUDGE DISPOSED

Month	Effluent Treated, MG	Sludge Disposed, Gals
January, 2016	54.10	135,000
January, 2017	60.99	126,000
January, 2018	57.21	135,000

## 5 ODOR CONTROL

There was one call with an odor complaint in January. Robin Wellins of 60 Harborview called and was concerned that for the past couple of weeks, there was a “bad smell” as she drove by the facility. A follow-up call was made to her to discuss recent plant projects, and conditions that contributed to the odors. Much of the odor was due to the gravity thickener [GT] that is on line, and backlog of solids in the GT. Wasting of primary and secondary sludge to GT is necessary due to limited storage tank capacity in the underground holding tanks, and due to the RST thickening unit shut down for winter season.

The scrubber systems have remained on line during this time.



- “In-Pipe” bacteria addition continues with 24 dosing stations operational. No additional actions taken for headworks sulfide reduction plan proposed by “In-Pipe. Dosing stations visited on 1/23-24/18 to inspect and install new bacteria bottles.
- On-going - frequent pumping of the secondary scum wells.
- Report from Evoqua that provided monitoring results for the BIOXIDE trial provided some recommendations for future odor and corrosion control. This report needs to be further vetted to help determine options for the system odor control program for 2018.
- Mixing systems/aerators all functional at the pump stations, except for pump station #3. The installation of another mixing system at PS 3 is still on hold.



## 6 MAINTENANCE SUMMARY



- Monthly work order summary for January compiled and a report summary can be found on page 23
- Met with New England Pump & Valve to review project performance and to discuss remaining punch list items from December project. Re-locate pipe support on influent pump #3



- On hold - W&C reviewed the sluice gate supports for the inlet gates to primary clarifiers at the D-box. As noted, the supports have lifted away from the concrete and there is also cracked concrete under the supports. Plans for the repairs are being discussed, and quotes for the repair will be solicited, once the repair plan is finalized.



- There were 3 grinder pump call outs during the month of January. The locations for the replaced units were as follows:
  1. 32 Richards Rd. also had failed isolation valve from the grinder chamber that needed to be replaced. Rosano-Davis assisted with the repair.
  2. 61 Wyola Rd. – Electrician assistance also needed since alarm mode not functioning. New control board needed.
  3. 30 Pond St. – also groundwater infiltrating into pump chamber

The failed pumps are sent out to FR Mahony for evaluation and all units were found to be repairable.



61 Wyola – failed discharge isolation valve [frozen]

- The 6-inch plug valve and chain operator that failed in the secondary pump room is scheduled to be replaced. A new 6-inch knife-gate valve was received, with plans in process for installation.
- The planned project work to install new RST feed [Vaughan Chopper] sludge pump [unit #2] remains on hold. The new valve and replacement piping is on site, and the project is expected to be completed during the winter shutdown of the RST unit and above ground storage tank. The rotating assembly for the 2<sup>nd</sup> sludge transfer pump that pumps sludge to the tanker truck was removed in January, since the assembly had seized up and had a seal leak. IPS – Industrial Pump of RI is repairing the piece.



- The repair of the corroded/leaking sludge piping that feeds the RST via the first-floor incinerator room is planned during the winter shutdown of the RST. New PVC piping will be inserted in those affected areas. The materials for this repair are on site, and work will be completed by W&C staff before April 1<sup>st</sup>.



- The plant water system in the Operations building had issues during the month with cold temperatures and a major blockage was found that affected all of the plant water feed in the building. While the problem was being investigated, the scrubber system and seal water to the influent pumps were put on Town water.



Blockage in header pipe from plant water pump discharge [in sub-basement]

- Rebuilding of secondary scum pump #2 is underway. Being done by in-house staff.
- Town owned fork truck maintenance PM service performed by W.D. Matthews on 1/10/18.
- On-going Dig-Safe mark outs completed, mostly emergencies, and responded various rattling manhole covers, sunken manholes covers/rims, and broken covers/rims due to winter snow plows. All work that W&C completed is documented on the monthly Work Order Report.
- Pump Station 4 – The planned isolation valves replacement work still on hold. Structural issues at the station currently being discussed and have delayed the work. Also, the confined space work plan and JSA are not completed. Work is underway for the detailed work plan so that quotes to perform the work can be obtained.
- The new #4 effluent submersible pump was installed in the effluent wetwell on January 12<sup>th</sup>, ahead of higher anticipated flows due to rain and snowmelt. Pioneer Electric installed electrically with seal protection relay.
- Hull Scada group continued work on the recently installed PLC for the SCADA system so that operating data from the primary generator can be monitored. Also, continued work on the power monitor with trending and data to scada, & re-span of transducer for interceptor by PS 6.
- On hold – repairs to the no. 1 influent pump. The pump was inspected in early November during the headworks bypass/shutdown. There is a bearing issue with this pump. The inspection of the volute and impeller indicates some wear on these items. The rotating assembly will need to be rebuilt and pump casing wear ring replaced. This work has not been scheduled currently.
- De-rag both pumps at pump station 3 on 1/16/18. Both pumps were clogged, and capability reduced by nearly 75%.



Pump #1



Pump #2

- Commence installation of new strap-on flow meters at pump stations – PS 1, PS A, PS 4, PS 5, PS 9.
- On-going inspections for all influent pumps with focus on coupling hubs and drive couplings to make sure pump performance is maximized with anticipated higher flows.



Worn coupling & hubs



New coupling and hubs



- Many on-going issues related to the extremely low temperatures – Building heaters not working, breakers in sub-panels tripping, minor freezing of water pipes. Insulated various areas, by sealing off duct work to HVAC system not in use. A lot of cold air is infiltrating the operations building from these fresh air intakes. Some separation of unit heaters onto different circuits required, since breakers were tripping in a few of the electrical panels.
- Grit chamber – flow to tank resumed on 1/30/18. New connecting bolts for the grit crew were installed. Also, new packing installed with new lag bolts for the packing gland ring.
- On-going generator service calls for plant main generator – various coolant leaks, block heater issues.
- Plant Water Pumps: Update – As reported last month, both plant water pumps were in poor or failed condition. One unit had failed due to a disintegrated impeller. An immediate repair was needed. A new liquid end was installed after the motor was rebuilt. The repaired unit was returned to service. The second pump was sent out for similar repairs and found to be not repairable. A new complete replacement was necessary.



- Start work at PS A – replacement of discharge valves and check valves. Work being done by W&C plant and support staff.

**OLD [before]**



**NEW [after]**



## 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 January
- Updating of Hazcom – Safety Data Sheets, site specific PPE Hazard Assessment. Pure safety module completed – Hazcom.
- Monthly staff safety meeting conducted on 1/31/18 [see above]
- Completed company mandated "Safety Stand-down" discussion on 1/31/18. Topic: Safe Work Practices
- Post OSHA log 300 form
- Send outstanding semi-annual fire alarm system reports to Captain Gary Twombly on 1/25/18.

## 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:**

- Monthly staff Safety training – completed – Pure Safety Topic – Cold Stress
- Operational updates and process control discussions, especially cold weather operations
- Daily safety briefing/tailgate safety discussions.
- W&C “near-miss” incidents at all projects for January discussed.
- Bill B. attended monthly Mass Wastewater Management Training Program Session
- Bill B. and Aram V. & Kate R. attended the NEWEA conference in Boston, MA on January 23, 2018.
- Kate R was a moderator at one of the NEWEA training session.
- Kate R provided staff training on Jan 25, 2018 – Sanitary System Overflow [SSO] reporting, information necessary, plant requirements, use of “do-Form”

### **Staffing related items:**

- Summer interns - Jacen Kurciviez and Cody Piepenbrink continued to work part-time at the facility, especially during the Holiday break period, depending on their school schedules. [if available - on weekends]. Cody scheduled for several the week-ends.
- Vacant O&M technician 1 position is still posted. Continued to review potential candidates, however, the tentative plan is to hold the position for Cody Piepenbrink, when he graduates from college. Cody was reclassified as an “Operator Trainee”. Continued supplementing staff with additional O&M support – Jim Gagliard and Jody St. George. Additional weekend coverage also provided as needed by Roger Boltrushek, Cody P., and staff OT.
- MA Maritime intern Brett Aguiar started internship on January 14<sup>th</sup>. His internship will last approximately 7-8 weeks. He will supplement the O&M team in Hull, working full-time.

## 9 COLLECTION SYSTEM

### 9.1 WET WELL CLEANING

The actual schedule for wet well cleaning: May 2017 to April 2018:

Frequency of cleaning	Pump Station							
	A	1	3	4	5	6	9	D
May, 2017	1	1	1	1	1	1	1	1 -*1
June, 2017	1	1	1 -*2	1	1	-	1	1
July, 2017			1					
Aug., 2017	1	1		1	1			1
Sept. 2017	*3							
Oct., 2017	*4				1			
Nov, 2017	*5							
Dec., 2017	*6							
Jan., 2018					*7			

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

- \*1 Inspected but did not need to be cleaned
- \*2 Very extensive cleaning during the Emergency Pump Repair work
- \*3 All station wet wells inspected on 9/7. No cleaning done in Sept. **Mixer/aerators have greatly reduced the need and frequency of cleaning.**
- \*4 All station wet wells inspected on 10/3. Station #5 was cleaned on 10/31. **Mixer/aerators have greatly reduced the need and frequency of cleaning.**
- \*5 No cleaning done in November - **Mixer/aerators have greatly reduced the need and frequency of cleaning.**
- \*6 No cleaning done in December - **Mixer/aerators have greatly reduced the need and frequency of cleaning.**
- \*7 All station wet wells inspected in January - Station #5 was cleaned on 1/16/2018.

# 10 PROJECT MANAGEMENT & ADMINISTRATION



## 10.1 ON-GOING PROJECTS AND SUPPORT ITEMS

- Asset management checkbook for improved tracking of expenses. A weekly review of account status between W&C and Hull Sewer Dept. is on-going with modifications and improvements to the checkbook. Additional items added for planned/proposed work and the estimated costs to determine priority and if feasible to consider in current contract year.
- January - continue to work on High Flow Management Plan & bypass pumping SOP's for the pump stations using portable trash pumps, outside valve identification and conditions. Working to develop contingency plans with several pump/equipment rental companies; i.e. Godwin, United, Baker. Proposals under review. Review storms, HFMP outline revisions, brainstorming & ideas,
- Responded and involved with many "Situational Awareness" Updates to the Hull Sewer Dept. due to weather conditions, and anticipated storms in the month of January. Reported directly to John Struzziery updates involving plant equipment status, pump station status, portable equipment availability, staffing, sub-contractors and compliance.
- 7 Meade Ave: A number of trips were made to inspect sewers on Meade Ave, Maple Way, and Valley Beach Rd to determine why homeowner had issues with blocked service. Once the snow had melted, an above ground sewer line was found, an exposed 6-inch diameter cast, or ductile iron pipe exposed about 8' before a concrete transition then placed directly on ledge. This pipe had frozen, causing the blockage.





- Per the Town's request, W&C is developing a scope of work to decommission the existing underground storage tank [UST], install a rental above ground storage tank [AST] for temporary generator fuel, and design a permanent above ground storage tank [AST] above the plant design flood elevation. Working with COMM Tank [sub-contractor] to finalize a scope of work for the temporary system. The min-warehouses were moved in January to new locations on the plant site, so that they would be out of the area where a temporary tank would be placed.



- Effluent Pumps: Continued Effluent Pump Room Floodproofing research and preliminary design memo. Raising of electrical junction boxes, addressing seal probe circuits, pump deficiencies, SCADA upgrade & tie-in. Evaluate condition of spare 60HP Flygt effluent pump. We were able to free up, since the impeller was rusted to backing plate. Overall condition of the pump – severely corroded/worn. Electrical items reviewed for final determination of 3-phase disconnect locations:
  - E Stops not required – no rotating or other safety hazards in effluent pump room as pumps are submersible and below floor level
  - Junction box - install about 5-6 feet above grade at entrance to Pump Room
  - Conduit should be aluminum or PVC coated rigid.
  - Have proposal from Pioneer Electric for electrical conduits and cable tray for submersible pumps.

- Emergency Call tree - between the Sewer Department, W&C, and phone system provider to review emergency notification procedures during weekends and off hours. System issues still exist & need to be worked out with RM Systems [system supplier]. Calls are being forwarded as they come in via the call tree to the staff's cell phones.
- Met with various coatings Mfr Rep's to discuss protective and repair coatings for the concrete structures – i.e. pump stations, headworks, outside tanks.
- Assisting Sewer Department with their requests for information regarding the 2013 building/flood incident. Plant flows, equipment operation, salinity, alarms, looking in trailer for stored items.
- Continued work on WM-16 closeout for the influent gate replacement/re-installation.
- Still pending: take down of Aeration Tank #1 for tank inspection and evaluation of the return sludge [RAS] line that runs through the tank [has a leak]. A plan to take aeration tank #1 out of service is scheduled be drafted. A temporary RAS line from the secondary gallery back to the aeration tanks will need to be set up. Inspection of the RAS line to aeration tank #3 will need to be inspected and prepare a quote to replace the RAS piping in the #3 aeration tank. Target Spring 2018.
- To date no additional dialogue. Duperon bar screen corrosion issues still being tracked, with updated pictures sent in late April 2017. A response from Duperon received and they want to work with the Town to passivate/clean the corrosion on the unit. However, they do indicate that the higher levels of H<sub>2</sub>S in the headworks are a major contributor to the rust and corrosion. Their response mentions corrections/improvements necessary to the atmospheric conditions in the room. The copper portion of the plant water feed line to the wash compactor is still intact but needs replacement due to corrosion. Presently considering PVC piping.
- On-going electrical work – wiring for influent and effluent pump back up level controls. When completed SCADA verification of programming and pump sequencing to be done. Continue work to resolve flow meter issues for influent flows and pump station flows. Poor pipe condition is making it difficult to get strong enough signal strength. PS 1, A, & 4 plans being worked on.
- We will be scheduling meetings with WINDRIVER, National Water Main, and maybe other collection system vendors - to review our Contract Collection System Quota work, as well as our experience in Hull so far, to try to better provide collection system subcontractor support moving forward.
- Met internally to discuss review and updating of Project Work Plan. In original proposal, we indicated three years to get the facility going in the right direction, but with large number of mechanical issues and equipment breakdowns, additional scope items, this is taking a much longer time. We will be looking to refocus priorities.
- Set up meeting to discuss on-going hydrogen sulfide issues and ways to mitigate - adding oxygen into the wastewater stream – Peroxygensystems – on-site oxygen generation for use at pump stations. Met with representatives in January 2018.

# 11 WORK ORDER SUMMARY

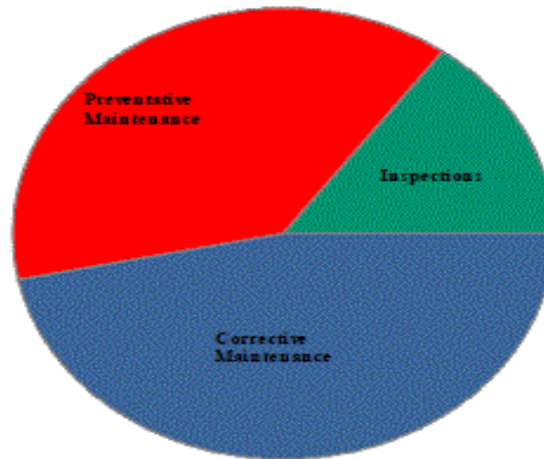


## Maintenance History Report Hull Wastewater

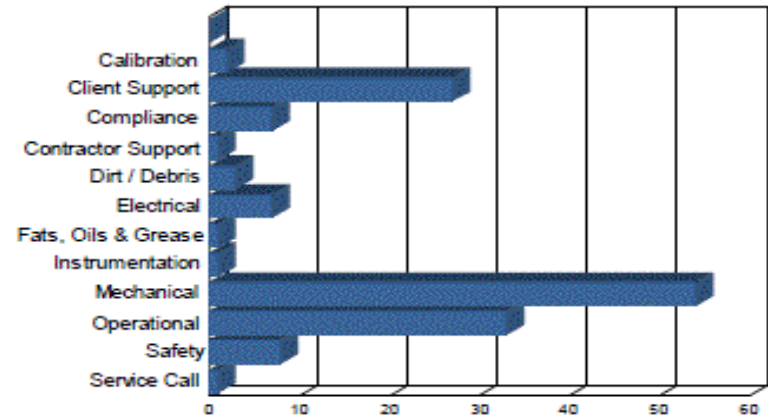
Start Date: 1/1/2018  
End Date: 1/31/2018

Corrective Maintenance	68
Inspections	22
Preventative Maintenance	56
<b>Total Work Orders</b>	<b>148</b>

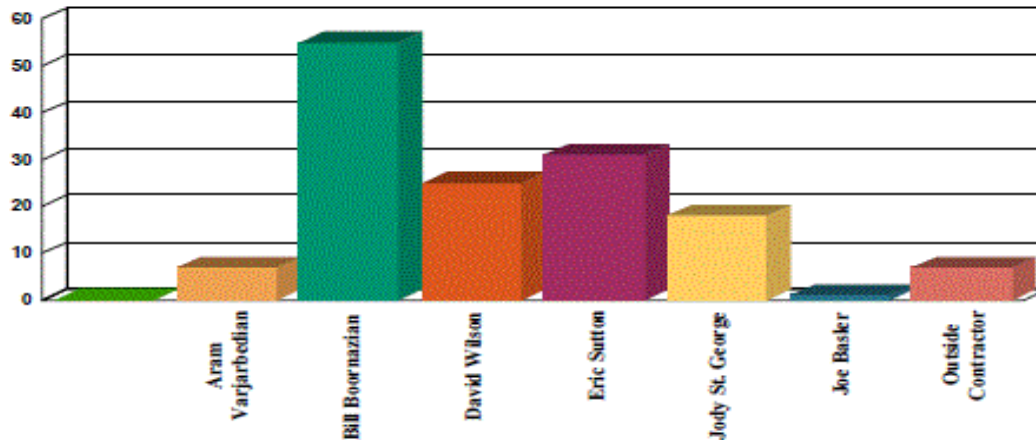
Work Order History By Type



Work Order History by Reason



Work Order History By Employee



Employee	WO Count	Labor Hours
Aram Varjarbedian	7	12
Bill Boornazian	55	644
David Wilson	25	60
Eric Sutton	31	25
Jody St. George	18	54
Joe Bagler	1	2
Outside Contractor	7	24
Unassigned	2	2
<b>Totals</b>	<b>146</b>	<b>822</b>