Maryland Department of Environment
Water and Science Administration
Compliance Program
1800 Washington Blvd, Suite 420
Baltimore, MD 21230-1719
410- 537-3510

Inspector: Wendy Huang
AI ID: 3076

Site Name: Patapsco WWTP
Facility Address: 3501 Asiatic Ave, Curtis Bay, MD 21226
County: Baltimore City

Start Date/Time: March 30, 2023, 09:10 AM
End Date /Time: March 30, 2023, 02:30 PM

Media Type(s): NPDES Municipal Major Surface Water

Contact(s): Neal Jackson- Plant Manager of Patapsco WWTP
Andrea Buie- Branam- Environmental Compliance Manager of Baltimore City DPW
Kevin Mc Fadden- Operation Supervisor II of Patapsco WWTP
Chris Saunders- Senior Associate of Hazen and Sawyers
Samantha Coffman- MDE Inspector

NPDES Municipal Major Surface Water

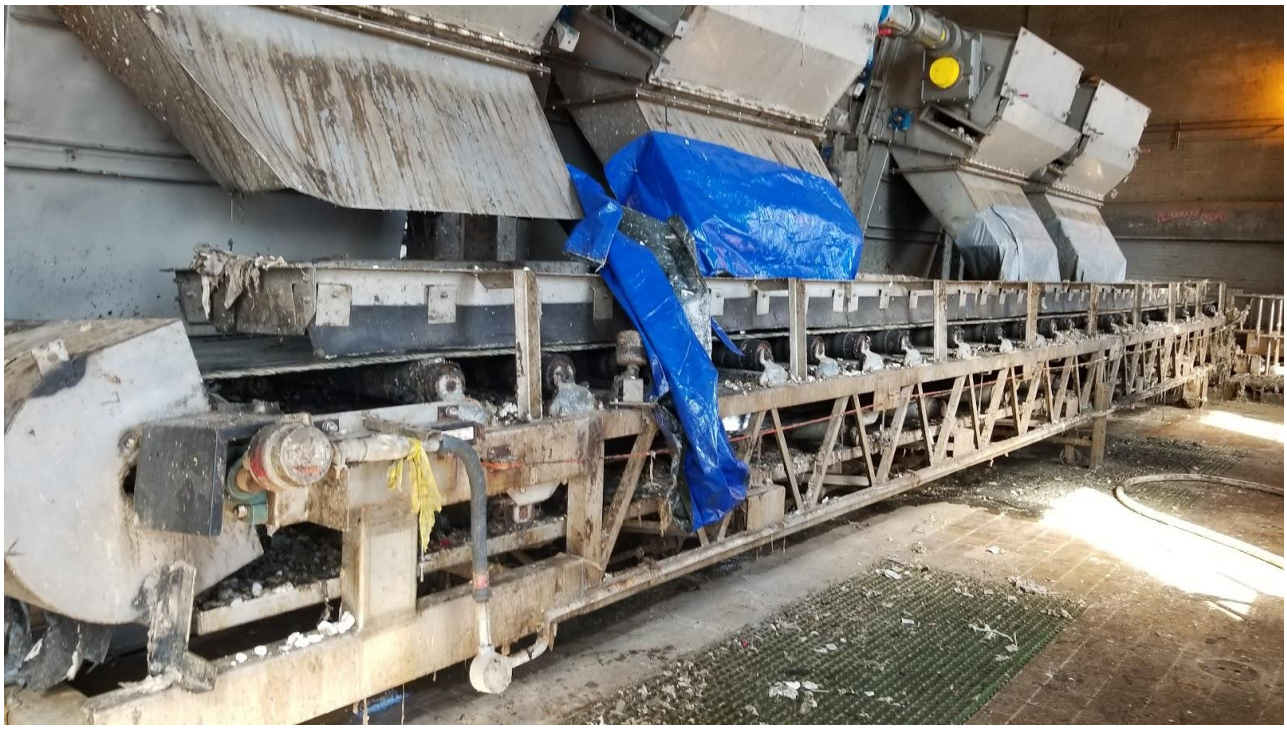
Permit / Approval Numbers: 15DP0580
NPDES Numbers: MD0021601
Inspection Reason: Follow-up (Non-Compliance)
Site Status: Active
Compliance Status: Noncompliance
Recommended Action: Continue Routine Inspection, Additional Investigation Required
Evidence Collected: Photos or Videos Taken, Record Review, Visual Observation
Delivery Method: Email
Weather: Sunny and clear

Inspection Findings:
An inspection was conducted on this day at the Patapsco Wastewater Treatment Plant (WWTP). The receiving water is the Patapsco River and is designated as Use II waters protected for estuarine and marine aquatic life. MDE inspectors met with the above-listed contacts during the time of this inspection. The Patapsco WWTP is a 73 MGD capacity activated sludge wastewater treatment plant with ferric chloride for removal of phosphorus. Mr. Neal Jackson and Mr. Chris Saunders provided an overview of this wastewater treatment plant.

Industrial Plant Influent Low Level Interceptor (IPI)
The pump and blower/ IPI building has two bar screens. One of the bar screens was turned off during the time of this inspection. Industrial influent enters the wastewater treatment plant via this building. This building has approximately 2-3 MGD capacity.

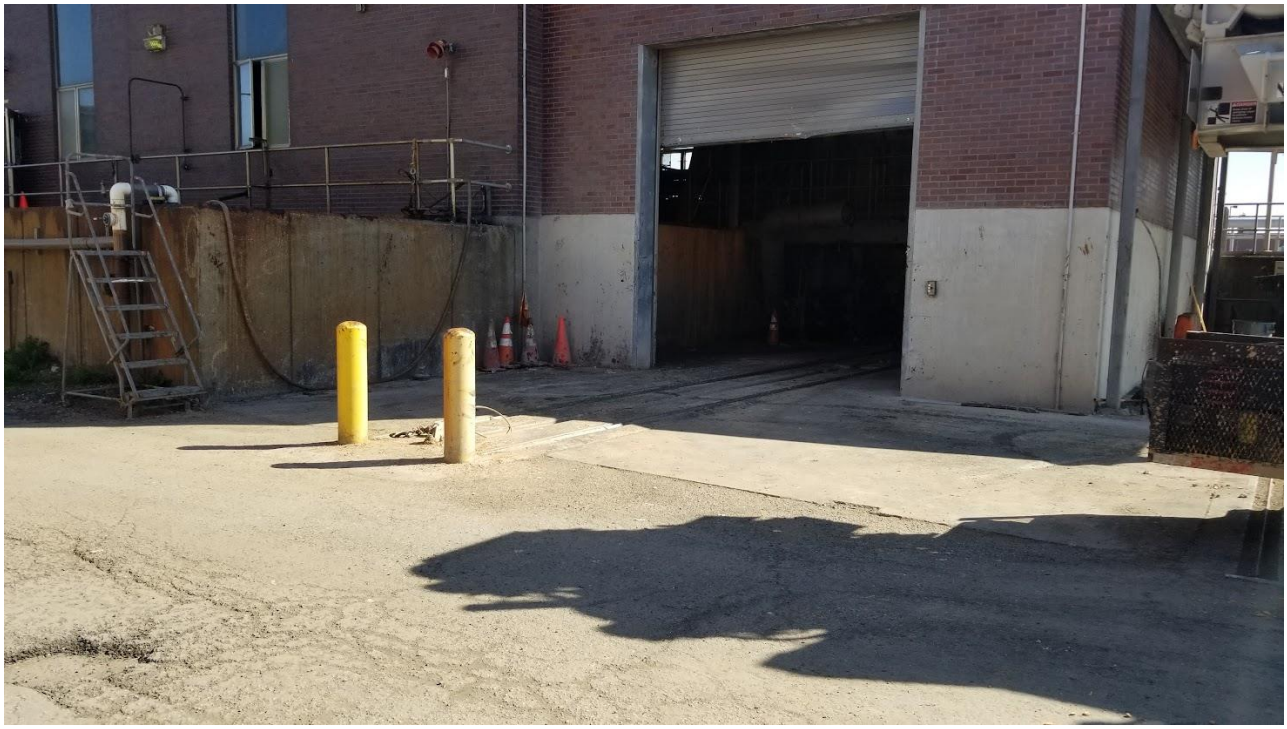
Combined Influent Building:

Domestic sewage and industrial influent enter this building. Solids are removed from sewage with fine screens. During the time of this inspection, the fine screens were being cleaned, maintained, or installed. Tarps were observed at the opening side of the fine screen where solids are mechanically dropped onto the belts (picture shown below).



There are grit and debris on the ground within the combined influent building. Remove all debris and grit from the ground routinely.

Multiple puddles of brown liquid were observed outside of the combined influent building during the time of the previous inspection on 2/27/2023. During the time of this inspection, there were no liquids outside of the combined influent building (picture shown next page). Mr. Neal Jackson informed me that the site unclogged a drain within the combined influent building after the last inspection, which contributed to the reduction in liquids leaving the building.



Transfer Station
Grease and grit are stored in the transfer station. The transfer station has a roof, walls on three sides, and trench drains on the ground. Liquids from the grit flow into the trench drain and back into the gravity sludge thickener (GST). Dried grit that is currently stored at the transfer station will be taken to the Quarantine Road Municipal Landfill for disposal.

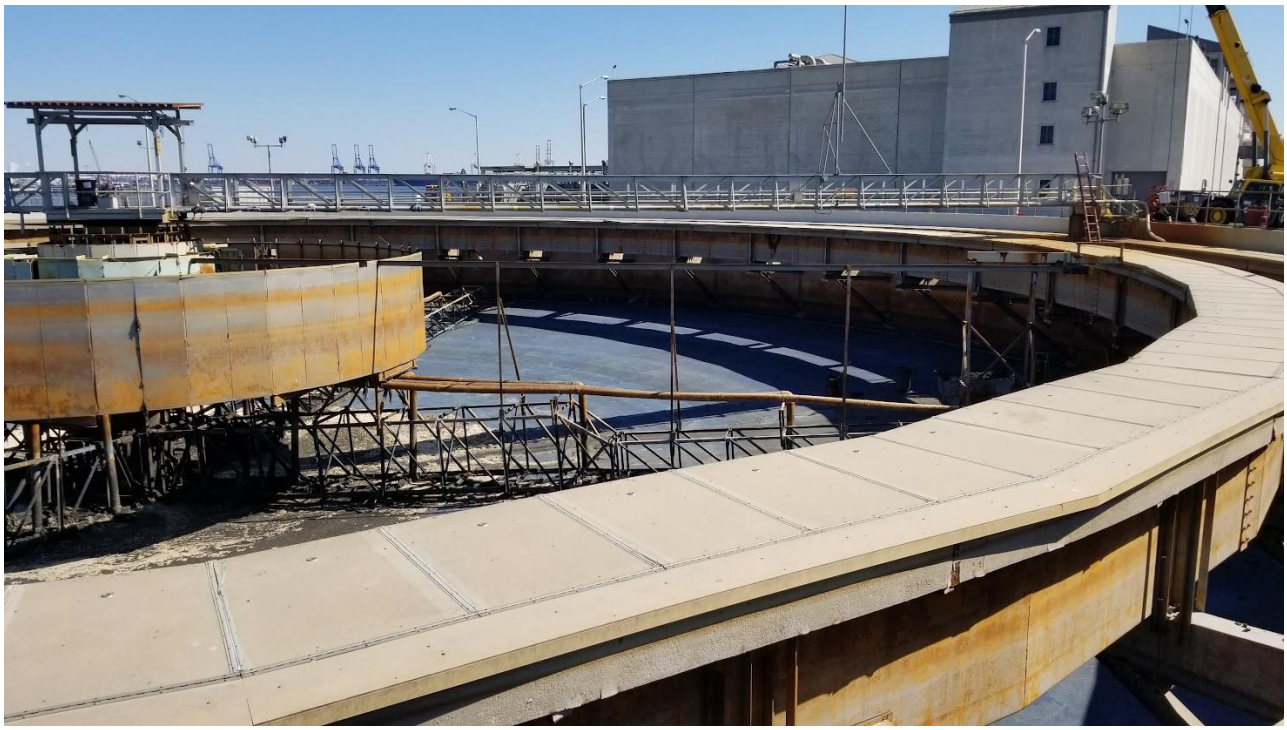
GSTs
The facility has three GSTs (GSTs #1, 2, and 4). GSTs #1 and 2 were inspected. At the time of this inspection, water was being sprayed on the water surface of both GSTs. The GSTs had an accumulation of sludge, and sludge was observed at the surface of the GSTs and outside of the V- notch weirs. Mr. Neal Jackson informed me that there was a power failure the weekend before this inspection, resulting in the GSTs accumulating an excessive amount of sludge.

GST # 4 is currently not operating and is being fixed. Mr. Chris Saunders informed me that GST #4 will be operational again soon. Within 30 days of receipt of this inspection report, Baltimore City DPW or Patapsco WWTP should provide an estimate of when GST #4 will be fixed and operational to MDE.

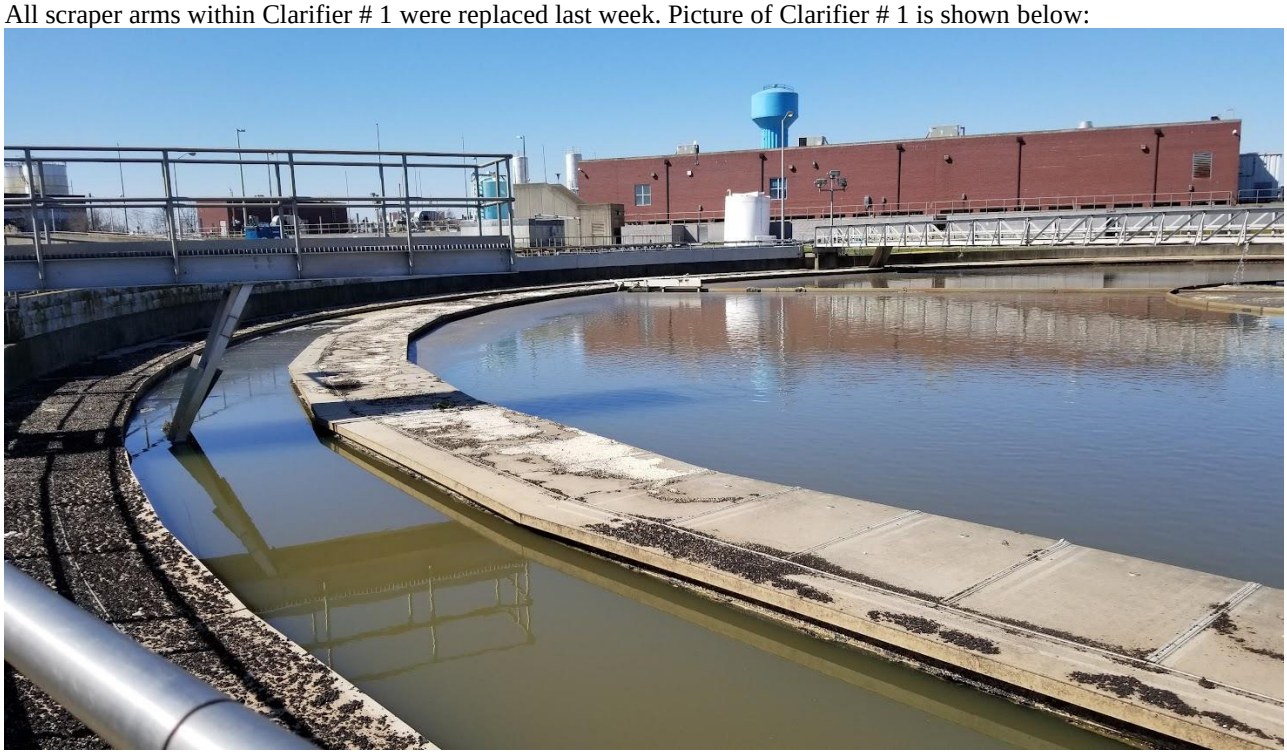
Primary Settling Tanks (PSTs)
At the time of this inspection, PSTs # 3- 6 were in service. PST #1 was in the process of being drained and taken out of service. PST # 2 was in the process of being put back in service. A scum collection pit for the PSTs was observed. I was informed by Mr. Neal Jackson that KES will remove scum from the pit.

Liquid Oxygen/ LOX Plant:
Liquid oxygen is used to feed the pure oxygen reactors for BOD removal. Mr. Neal Jackson informed me that the LOX plant is currently using a redundancy back-up system as the main system is currently being repaired by Johnson Control. I was also informed by Mr. Neal Jackson that the facility has recently replaced two compressors.

Secondary Clarifiers
The facility has eight clarifiers. Inspection of all eight clarifiers was conducted (clarifiers # 1- 4, 5a, 5b, 6a, and 6b). The surfaces of the clarifiers that are in operation were being sprayed with water to further break up the scum. Clarifier #3 was not operational and was being used as a mud well to contain backwash water from the denitrification filters. Wastewater from Clarifier #3 flows back into the PST. Clarifier #2 was turned off for maintenance (picture shown next page):



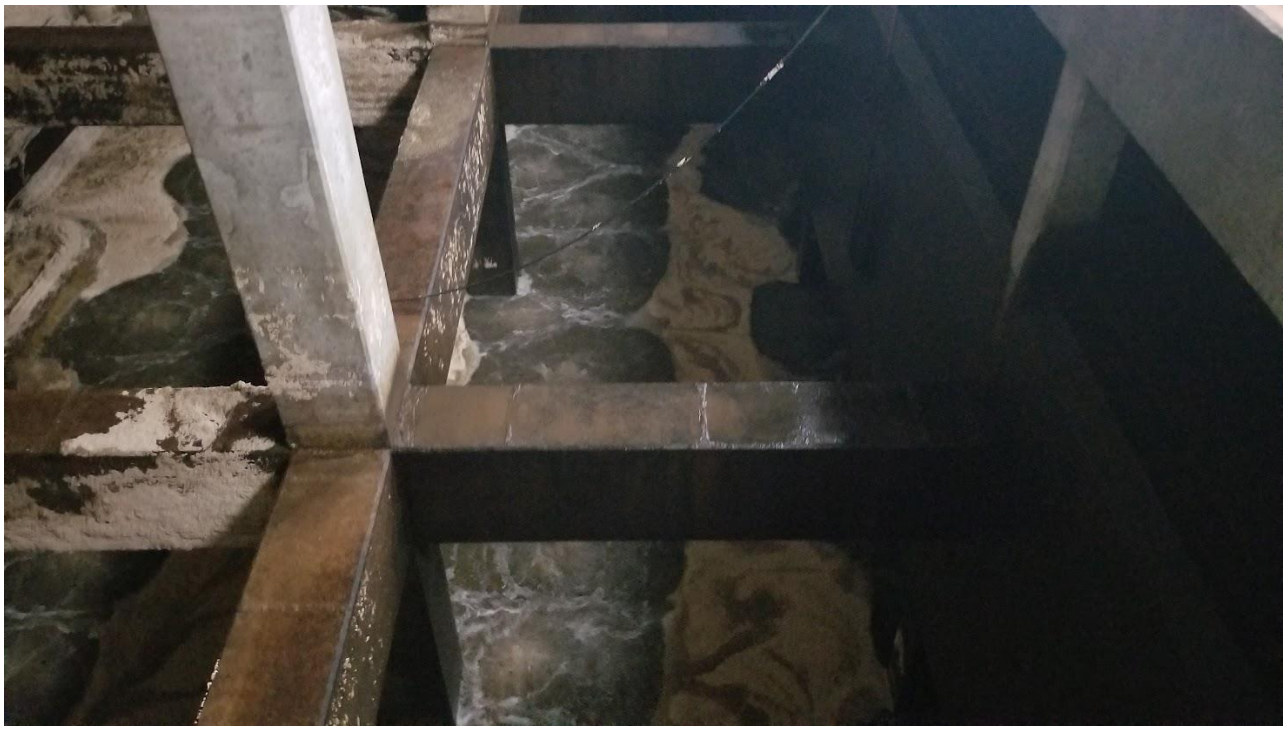
All scraper arms within Clarifier # 1 were replaced last week. Picture of Clarifier # 1 is shown below:



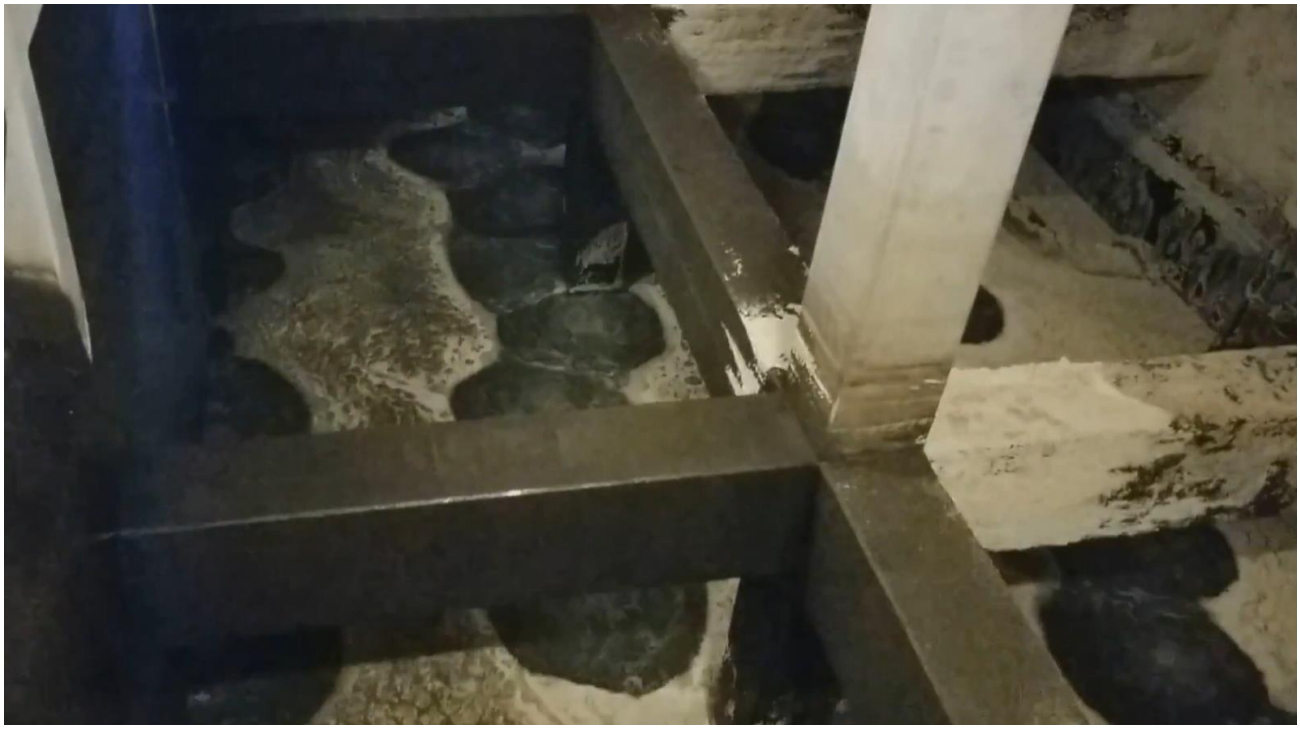
There were dry solids on the launder covers of Clarifier #1. The solids should be removed from the launder covers. The scraper arm within Clarifier #6A has been repaired but the rubber part at the edge of the scraper arm has not been installed yet. One out of the two scraper arms has been installed at Clarifier # 6B.

Biological Activated Filters (BAFs) and mud wells

All BAF cells were active, with air being injected into the water for nitrification and BOD removal. The BAF has 24 individual cells. Mud wells #1 and 2 were inspected and foam was observed on the water surface in both mud wells. Picture of mud well # 2 is shown below:



Picture of mud well #1 is shown below:

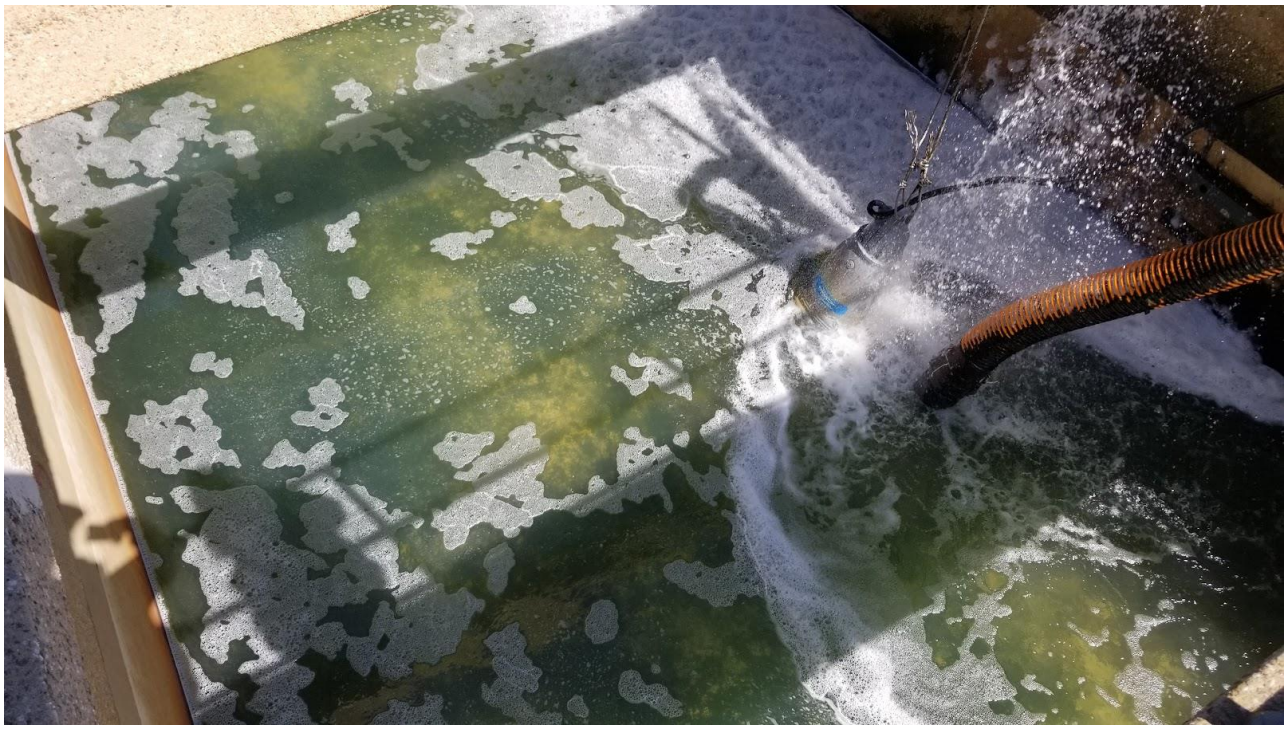


Denitrification Filters

The denitrification system has 34 individual filters. During the time of this inspection, filters # 1, 6, 33, and 34 were out of service. Methanol is added into the water before flowing into the denitrification filters. Water enters the denitrification filters from the top after overflowing the concrete weir walls. Water then exits the denitrification filters by flowing through the sand filter. Sand filters are located at the bottom of each individual denitrification filter. Algae was observed on the sand filter within denitrification filters # 33 and 34. I was informed by Mr. Neal Jackson and Mr. Chris Saunders that the algae will be scraped from the inactive denitrification filters before returning them to service. They also stated that the denitrification filters should have 6 feet of media, and that the depth of the sand/ media is measured occasionally, depending on nitrogen concentrations in the water.

Chlorine Contact Chambers

The wastewater treatment plant has four chlorine contact chamber units, which were all running at the time of this inspection. Some brown foam was observed to be floating on the water surface at the influent side of the chlorine contact chamber; however, most of the chambers appear to have been skimmed earlier. The operator lab maintains daily chlorine contact chamber skim logs. Clear effluent was discharging out of the chlorine contact chamber and into the Patapsco River (picture shown below).



Self-Monitoring/ In-House Lab

The following records were reviewed during this inspection:

- daily pH calibration records for March 2023
- daily zero oxygen verification/ dissolved oxygen (DO) calibration for 1/27/2023 to 3/30/2023
- daily composite samplers' temperatures for March 2023
- total residual chlorine standards reading/ verification for 3/30/2023.

Mr. Neal Jackson sent me the daily pH calibration logs via email on 4/5/2023 for January and February 2023. From January to March 2023, pH calibrations were conducted at least 3 times each day. A zero-oxygen standard (label noting DO concentration is to be less than 0.5 mg/L) was used each time for DO calibrations. The DO for the standard was recorded to be less than 0.5 mg/L. The zero-oxygen standard will expire in November 2023.

The facility's operator lab for the outfall has two composite samplers and a spare refrigerator to store samples. The temperatures of composite samplers # 1 and 2 were 4.5℃ and 5.25℃, respectively. The temperature of the spare

refrigerator was 1℃. The composite samplers were less than 6℃ and were within the temperature requirement for sample holding/ preservation, according to Table II in CFR 136.3.

As a follow up to the inspection report dated 2/27/2023, I inquired about the reason for why the total residual chlorine concentrations of the standards measured by the chlorine meter on 2/27/2023 were out of range when compared to the total residual chlorine numbers noted on the standards' label. Mr. Kevin Mc Fadden and Ms. Andrea Buie Branam informed me that the standards that belong to the Patapsco analysis lab were used, and that the total residual chlorine concentration measured with the operator lab's chlorine meter matches with the standards' label. The operator lab is currently waiting for a new set of standards. During the time of this inspection, the total residual chlorine readings for 3/30/2023 are within the range when compared to the total residual chlorine numbers on the standards' label.

Lab reports, MORs, and DMRs:
Lab reports and MORs for January and February 2023 were sent to me via email by Mr. Robert Lombardi (Wastewater Division Operations Engineer of Patapsco WWTP). Lab results for 5- day biological oxygen demand (BOD), total suspended solids (TSS), ammonia, nitrate plus nitrite, total phosphorus (TP), ortho- phosphate, Enterococci, cyanide, and metals were reviewed. There were no discrepancies in the average loading rates and concentration calculations.

All quality control lab reports for nitrate plus nitrite noted that some of the matrix spikes were outside the range of 90-110% recovery and/ or that some of the duplicates were above the relative percent difference (RPD) of 10. One example, the lab report dated 1/25/2023, noted the following:

- Page 14 of the lab report noted the RPD to be 12.80 for duplicate 3618160.
- Page 15 of the lab report noted the RPD to be 1400 for duplicate 3618164.
- Page 17 of the lab report noted matrix spike 3618184 to have 40.3% recovery.

There were no lab control standard results reported in any of the lab reports for nitrate plus nitrite. The lab uses EPA Method 353.2 for nitrate plus nitrite analysis. EPA Method 353.2 requires at least one Laboratory Fortified Blank (LFB) to be analyzed for each batch of samples. An LFB is a solution with a known quantity of a parameter to be analyzed. Baltimore City DPW should contact the lab to provide the lab control standard results for all daily nitrate plus nitrite analyses and provide these results to MDE within 30 days of receipt of this report.

Lab reports for nutrient analyses dated 2/18/2023 and 2/24/2023 and lab report for BOD and TSS analyses dated 2/24/2023 did not have temperature documented on the chain of custody forms. Additional investigation is needed.

TSS was analyzed by ALS (contracted lab for Patapsco WWTP) more than 7 days after the sampling date for effluent samples collected from 2/5/2023 to 2/7/2023. As a result, these TSS results are not valid and were not included in loading and average concentration calculations in the MOR. Baltimore City DPW sent a noncompliance letter for failing to collect valid TSS results for 2/5/2023 to 2/7/2023 to MDE on 3/28/2023 via email.

A lab report for BOD dated 1/29/2023 has been flagged due to the sample having exceeded the allowable incubation time (5 days ± 6 hours) by 1 hour. The BOD lab result for 1/29/2023 was not included in the loading and average concentration calculations in the MOR.

With respect to the above MDE authorization the following violations of Environment Article 9 by the Patapsco WWTP were observed on this date, with corrections (in bold text) needed immediately:

1) The GSTs are overloaded with sludge and solids and are not able to function as designed. The function of the GST is to allow for most of the biosolids to be at the bottom of the GST and for a relatively solids-free supernatant to be at the top. The high concentrations of biosolids in GST effluent can negatively impact the pure oxygen reactors' ability to remove BOD and can cause nitrification issues within the plant. Pictures of GST #1 are shown in Figures 1a to 1c. Pictures of GST #2 are shown in Figures 1d and 1e.

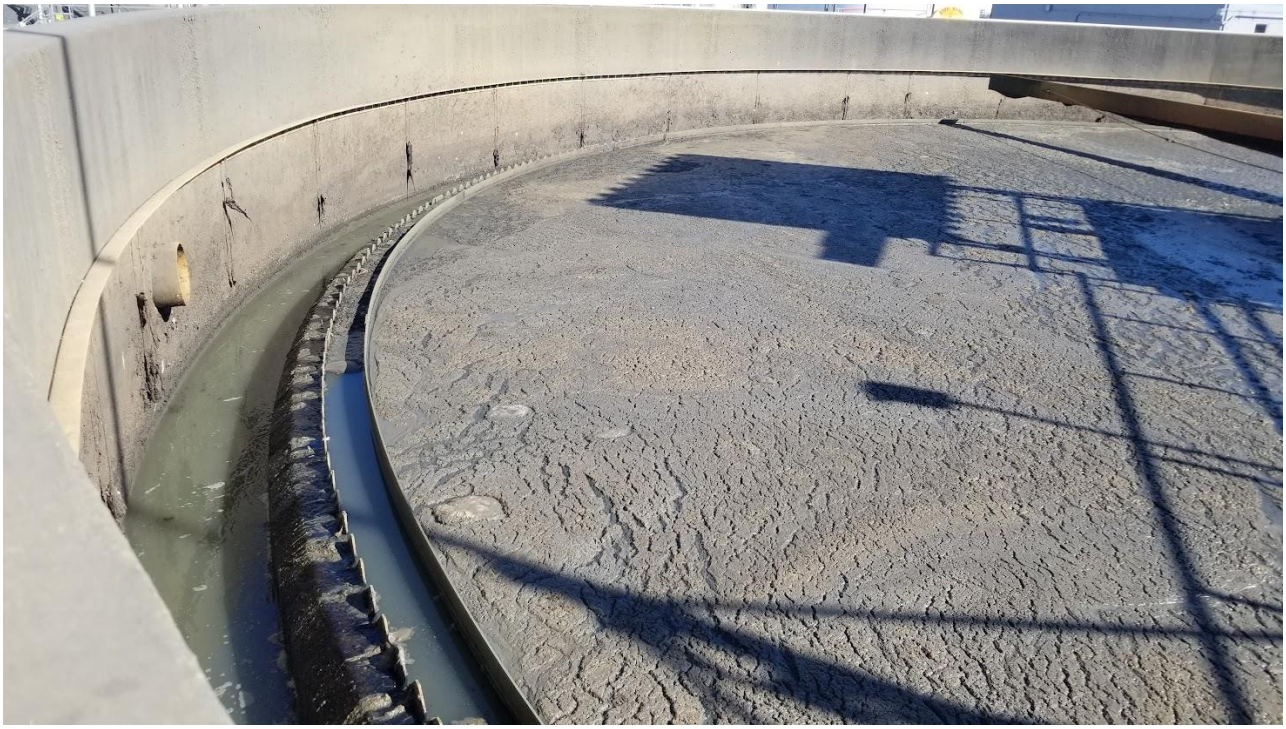


Figure 1a: Sludge next to the V- notch weir and on the surface of GST #1. The skimmer arm is above the water surface level.

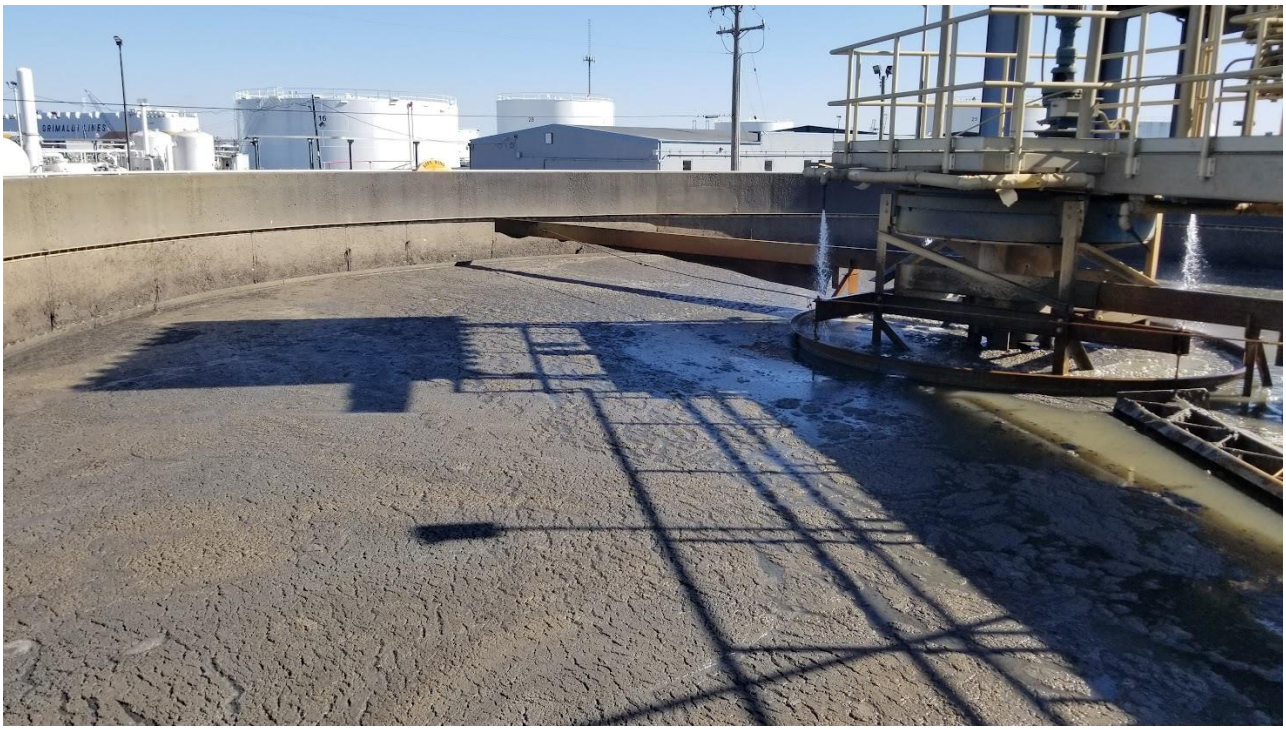


Figure 1b: Skimmer arm above the water surface of GST# 1.

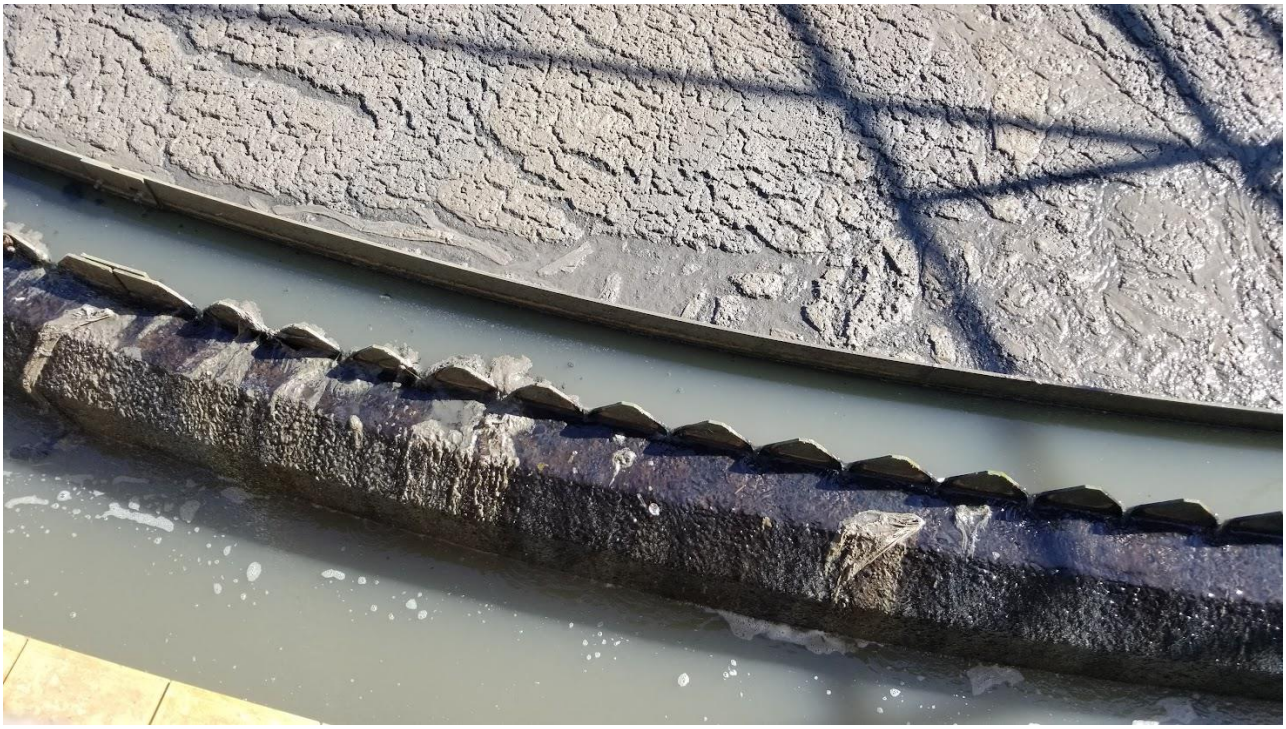


Figure 1c: Close up view of GST #1, with some rags stuck to the V- notch weir.

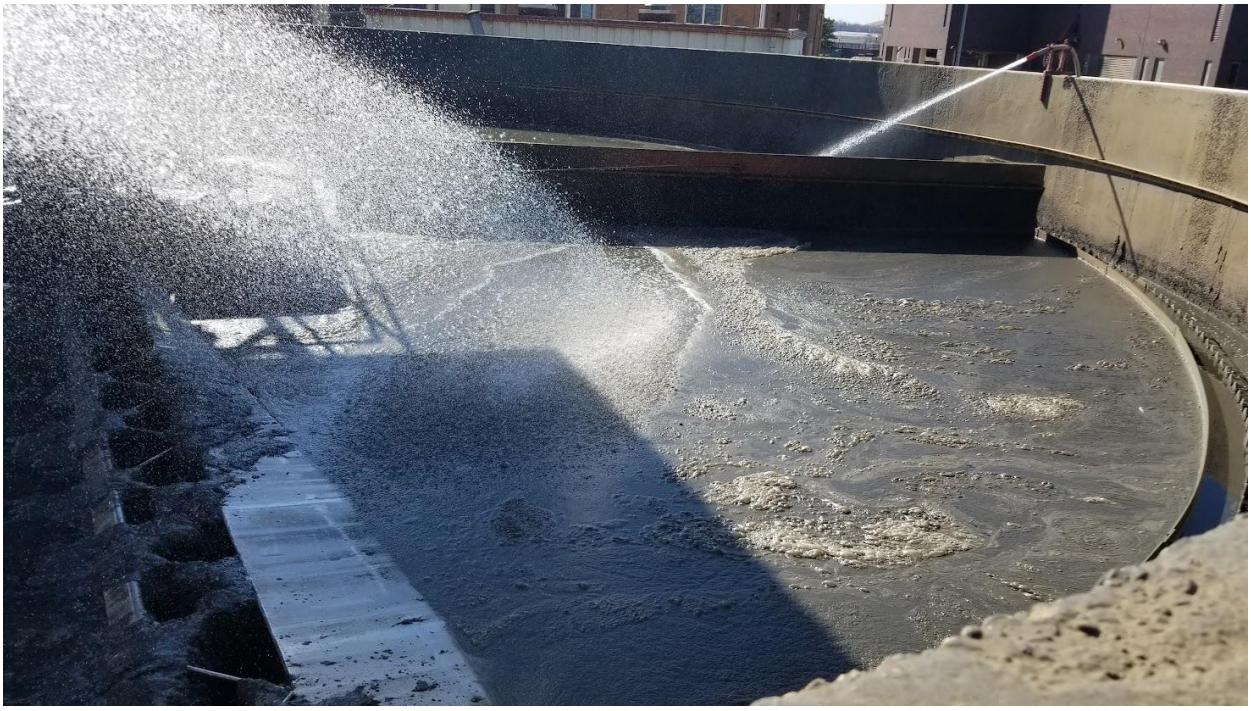


Figure 1d: Sludge on the surface of GST #2.

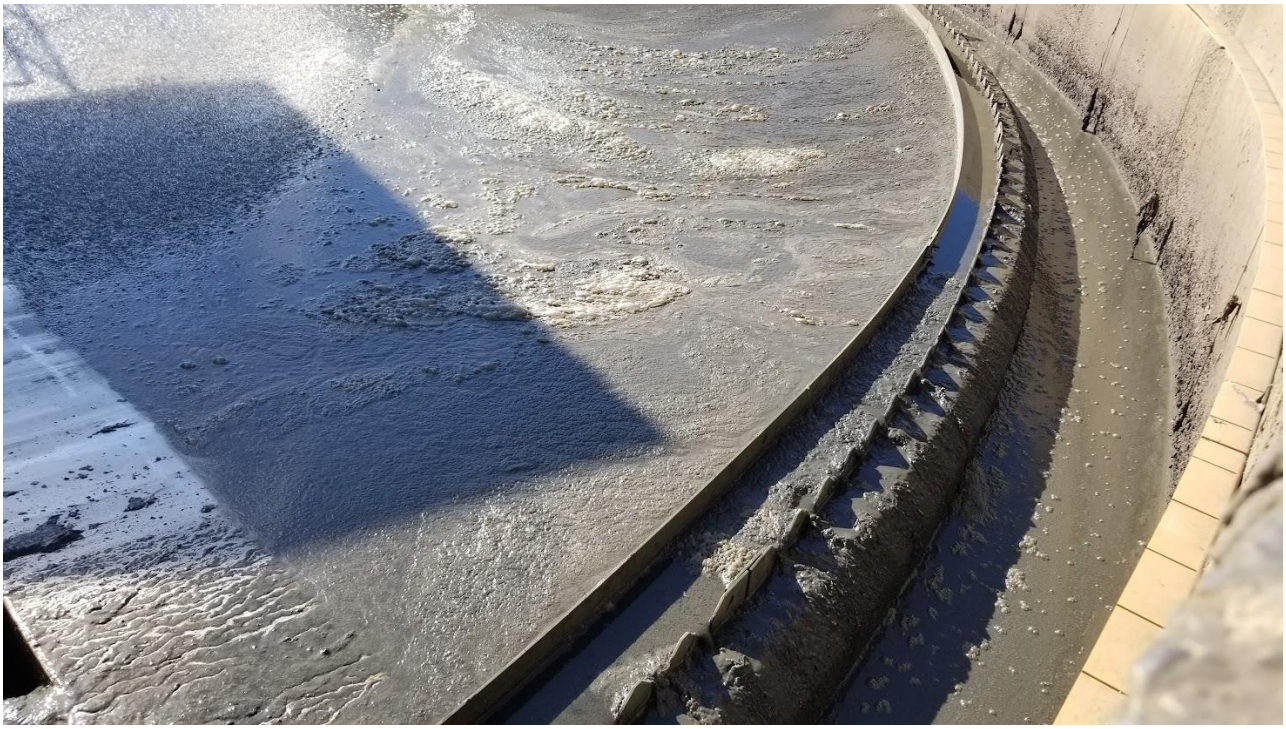


Figure 1e: Sludge next to the V- notch weir at GST #2.

The Patapsco WWTP should operate and process sludge in the GSTs in a manner consistent with the function and design of the equipment. Rags and solids should be removed from the GSTs regularly.

2) The secondary clarifiers are not operating as designed. Scraper arms are missing in Clarifiers # 4, 5A, and 5B. A scraper arm within Clarifier # 6A has been replaced but, the rubber part at the edge of the scraper arm is missing. One of the two scraper arms at Clarifier #6B has not been replaced. The purpose of the scraper is to skim off any solids that have accumulated on the water surface and push the solids into a trough. Mr. Neal Jackson and Mr. Chris Saunders explained to me that the reason for all the scraper arms not being replaced is due to a supply chain issue. The facility is struggling to get the parts needed to fix all scrapers. The problem is compounded by the fact that each scraper arm is different and requires different parts. Solids were observed next to the outer side of the launder covers within Clarifiers # 6A and 6B. In addition, woody vegetation was observed at the center of Clarifier #5A. Vegetation growth can damage the clarifier and reduce its ability to function properly. A picture of Clarifier # 4 is shown in Figure 2a. Pictures of Clarifier # 6A are shown in Figures 2b and 2c. A picture of Clarifier # 6B is shown in Figure 2d. A picture of Clarifier # 5B is shown in Figure 2e. Pictures of Clarifier # 5A are shown in Figures 2f and 2g.

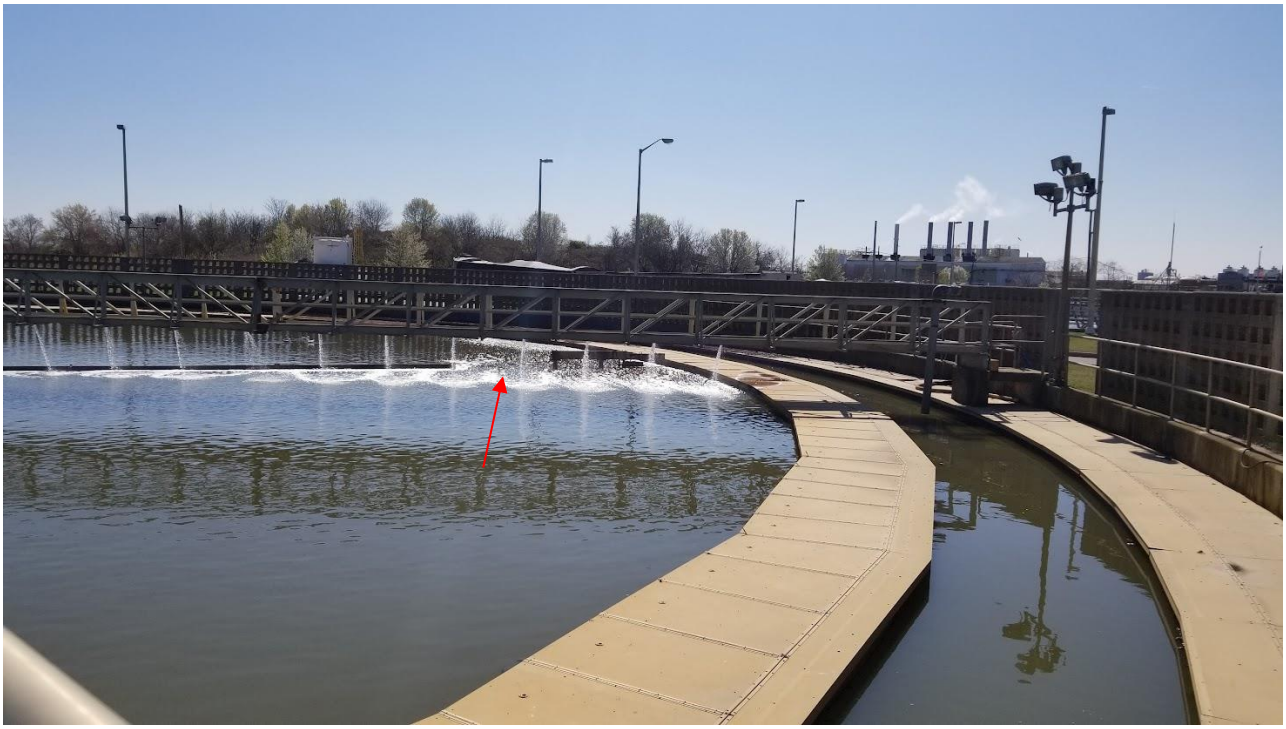


Figure 2a: Scraper arm of Clarifier #4 is missing. The red arrow shows the gap between scum skimmer and the weir.

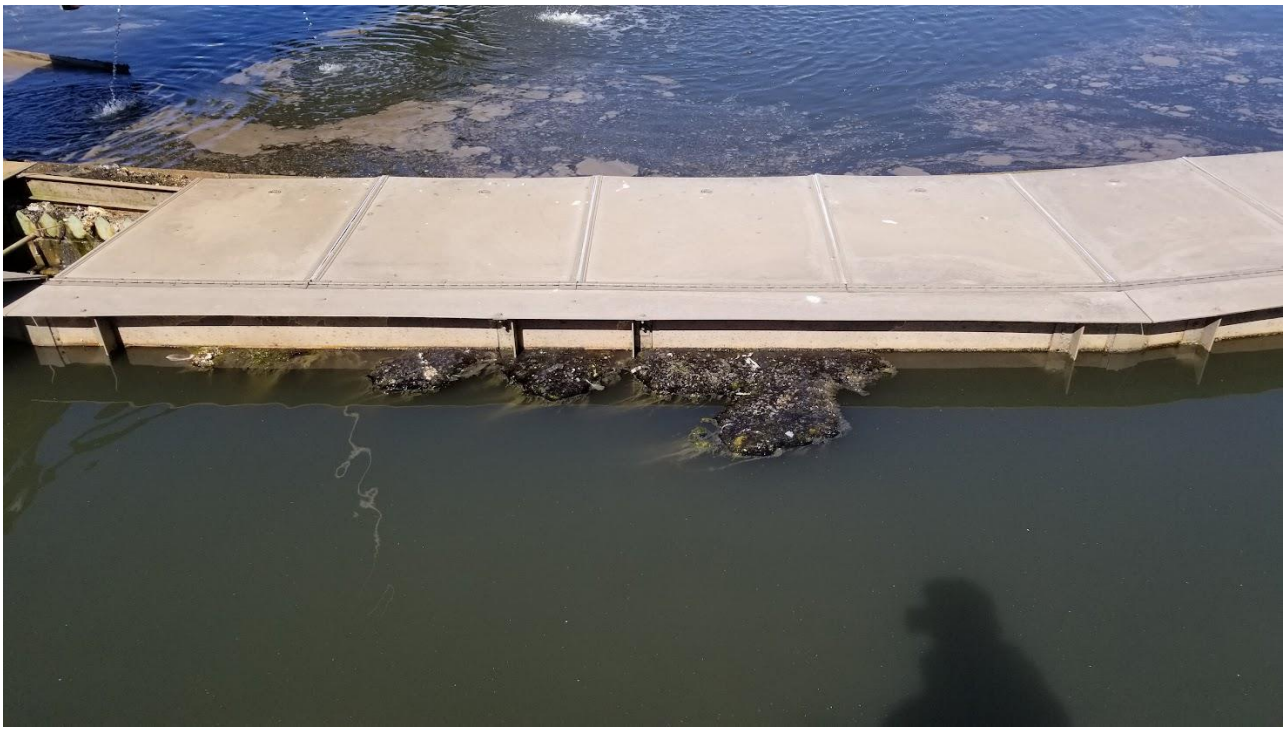


Figure 2b: Solids on the water surface in Clarifier #6A at two sides of the launder cover.

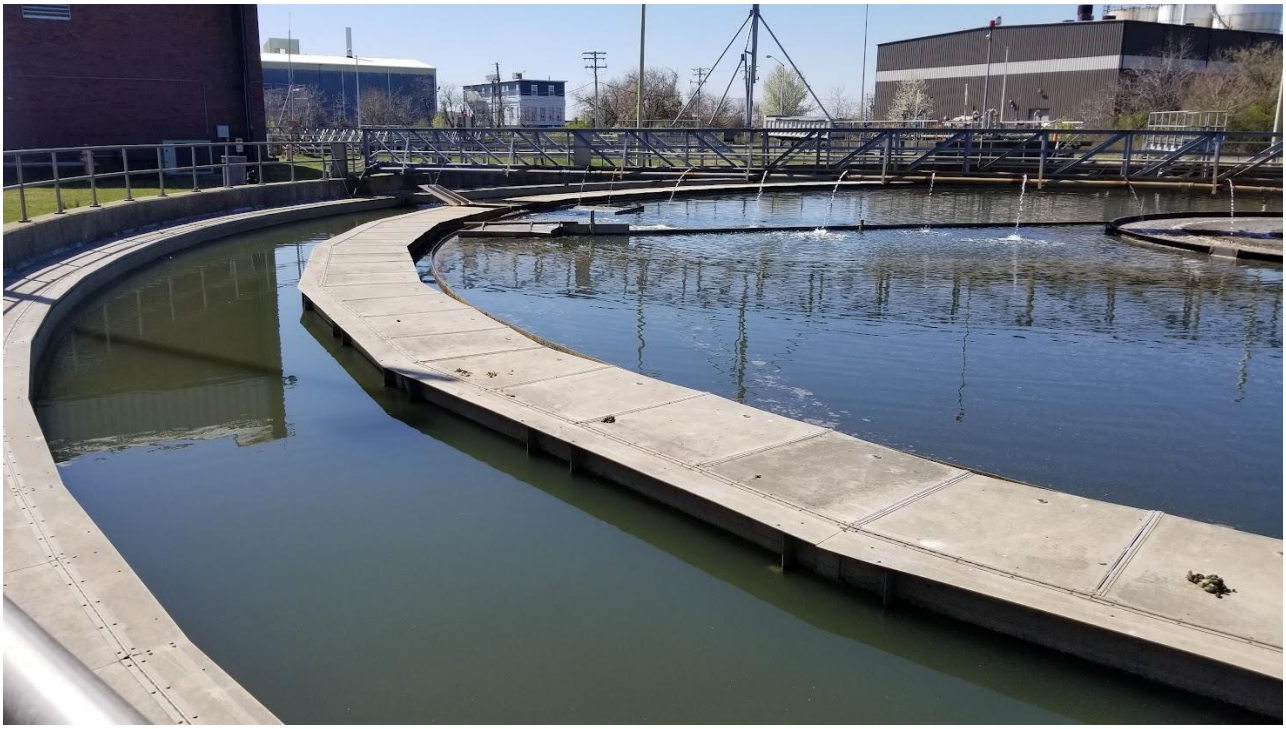


Figure 2c: Rubber part of the scraper arm in Clarifier #6A is missing.

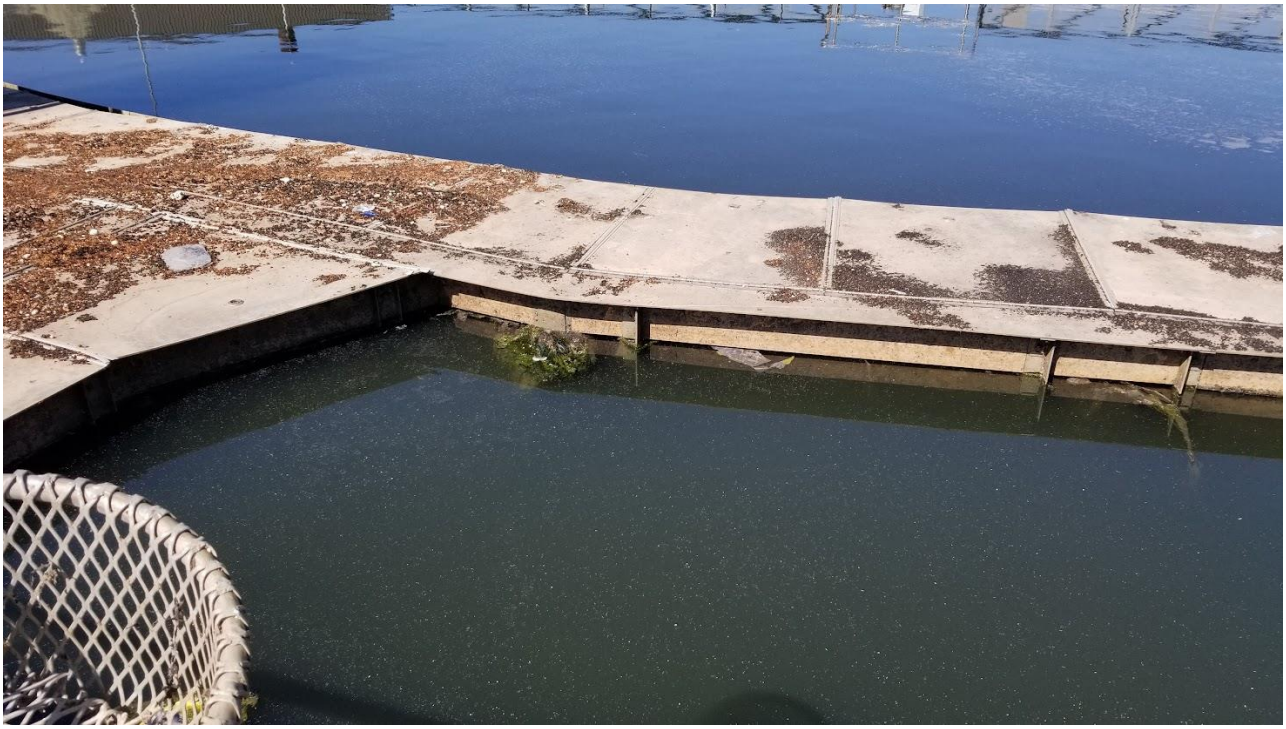


Figure 2d: Solids outside of launder cover within Clarifier # 6B.

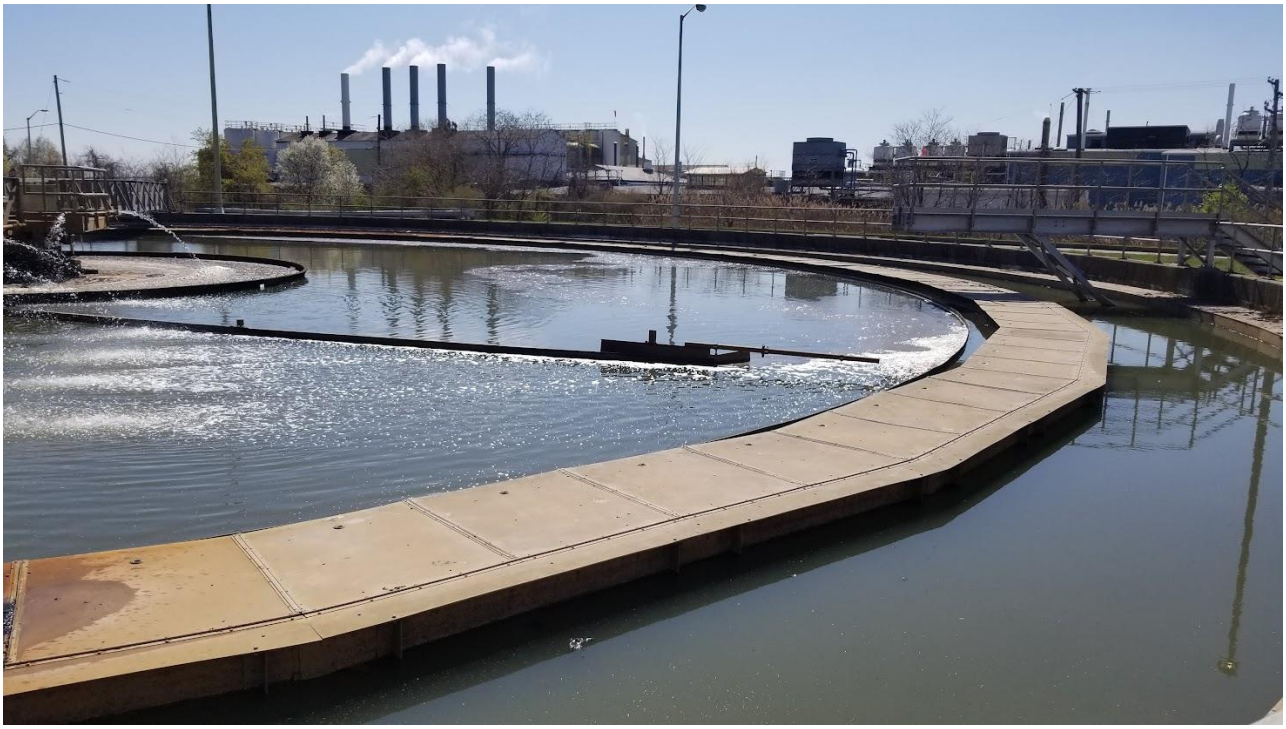


Figure 2e: Scraper arm in Clarifier # 5B is missing.

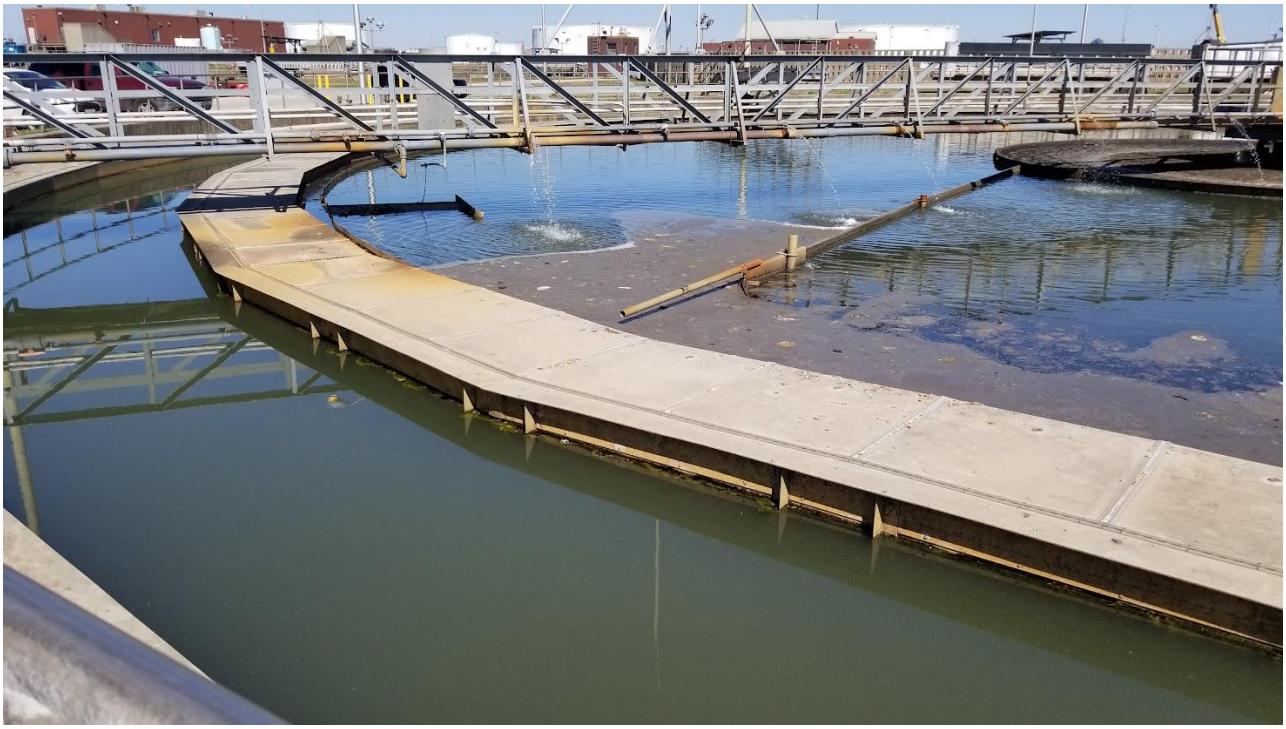


Figure 2f: Scraper arm in Clarifier # 5A is missing.

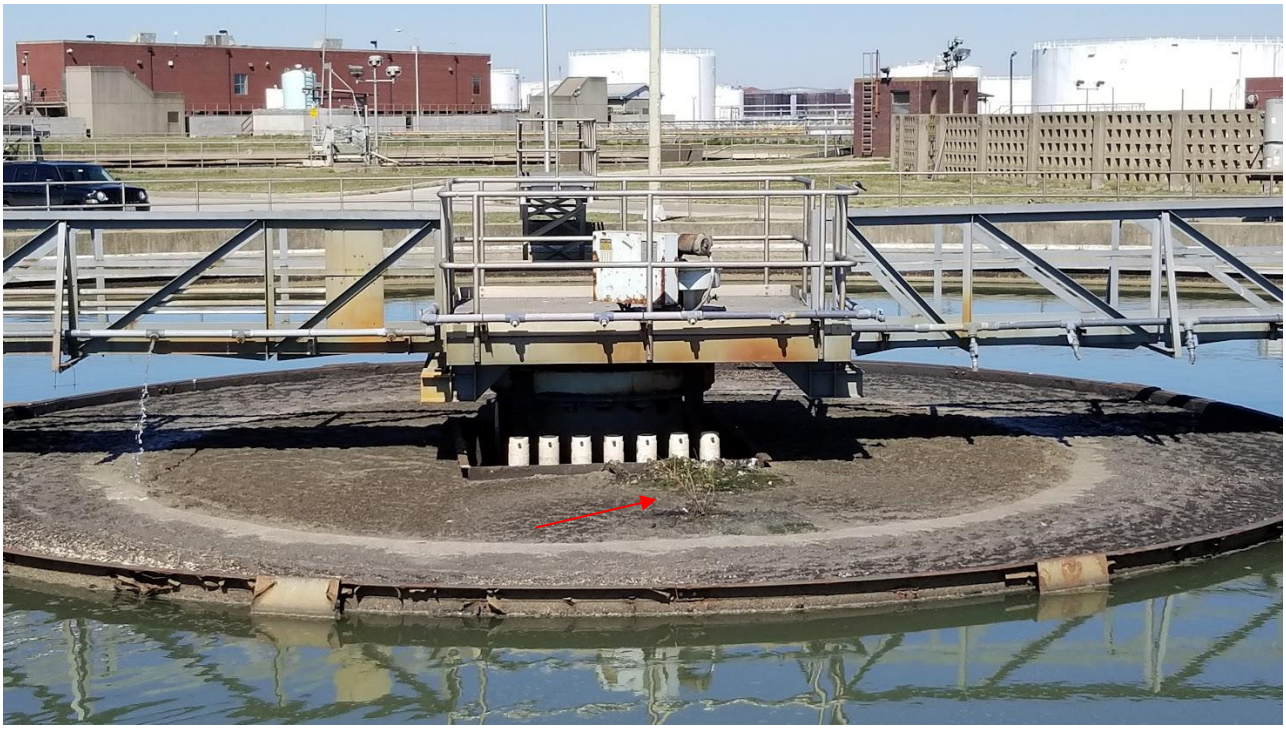


Figure 2g: Woody vegetation in the center of Clarifier # 5A (pointed out with a red arrow).

Repair and maintain the clarifiers to ensure that they are functioning per design. Install scraper arms to all clarifiers immediately, once the parts are received. Remove vegetation from the center of Clarifier #5A.

3) FOGs were observed to be backflowing into the outflow side of the PST/ inflow side of the pure oxygen reactors. Media from the BAF cells were observed to be comingled with the floating FOGs (shown in Figures 3a and 3b).

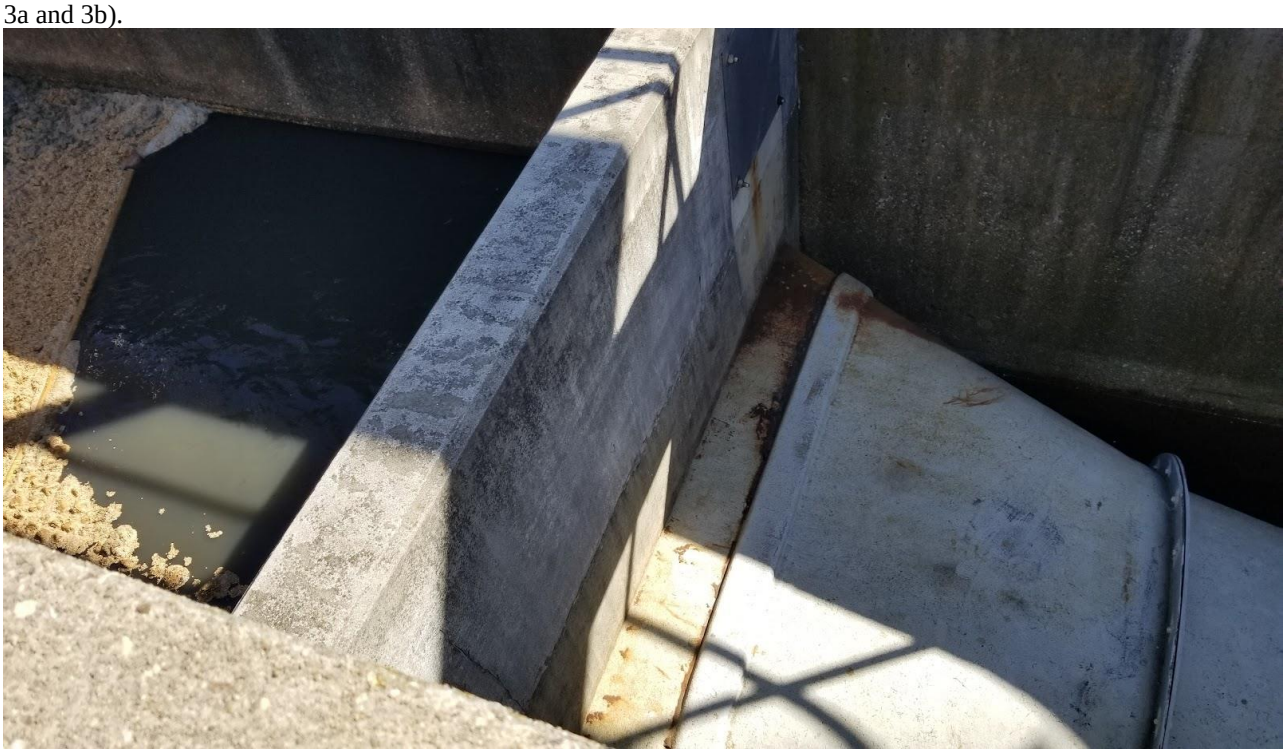


Figure 3a: FOG backflowing into the outflow side of PST and inflow side of the pure oxygen reactors.

Figure 3b: Close up view of the FOGs comingled with media from the BAF cells. This floating FOG is also shown at the left side of the picture shown in Figure 3a.

This section of the wastewater treatment plant should be maintained to prevent the accumulation of escaped media from the BAF.

4) Failure to obtain valid TSS lab results for 2/5/2023 to 2/7/2023 and BOD lab result for 1/29/2023.

State law provides for penalties for violations of Maryland Environment Article Title 9 for each day the violation continues. The Maryland Department of the Environment may seek penalties for the aforementioned violations of Title 9 on this site for each day the violation continues.

Contact this inspector upon implementation of the requested corrective actions, reasonably necessary to bring this site into compliance. If the corrective actions cannot be completed within the prescribed time frames above, you should continue to advise this inspector at least every 30 days of the status of the measures taken to complete the corrective actions. If you have any questions, needed assistance, or to request a re- inspection, please contact this inspector at wendy.huang@maryland.gov.

Inspector: 4/21/2023

Wendy Huang /Date
wendy.huang@maryland.gov
410-537-3526

Received by: 4/25/2023

Signature/Date

Neal Jackson
Print Name