Maryland Department of Environment
Water and Science Administration
Compliance Program
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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: April 27, 2023, 09:00 AM
End Date /Time: April 27, 2023, 02:00 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 & Sawyers
Marie King- MDE District Manager
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
Evidence Collected: Photos or Videos Taken, 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 representatives 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. The bar screens operate on a rotating basis. Industrial influent enters the wastewater treatment plant via this building. This building has approximately 2-3 MGD capacity for industrial influent.

Combined Influent Building:
Domestic sewage and industrial influent enter this building. Grease and grit are removed from sewage with fine screens. The solids are then dropped onto the conveyor belts where they will be transported into dumpsters. Grease and grit in the dumpsters are then placed in the transfer station for dewatering. During the time of this inspection, all bar screens are operational. Bar screens # 1 and 2 are turned off. Mr. Neal Jackson informed me that not all bar screens need to run at the same time. Tarps are placed at the output side of the bar screens to reduce liquids from being splattered onto the ground. The conveyors are running but there are grit that are stuck to the rollers under the conveyor belt.

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. FOGs on the ground and a leaking hopper with FOG from the combined influent building were observed outdoors by the transfer station and the combined influent building. A staff member of the wastewater treatment plant was working on shoveling the solids from the ground. By the end of this inspection, the FOGs were removed from the ground but the leaking hopper with FOGs was still observed outdoors by the transfer station and the combined influent building.

Gravity sludge thickeners (GSTs):
The facility has three GSTs (GSTs #1, 2, and 4). All GSTs were inspected. At the time of this inspection, water was being sprayed on the water surface of GSTs #1 and 2. One out of the two skimmer arms for GST #2 has been fixed to allow for the skimmer arm to be at the water surface to move additional sludge into the trough. The picture showing a fixed skimmer arm at GST #2 is shown below:

GSTs # 1 and 2 had an accumulation of sludge at the surface of the GSTs and outside of the V- notch weirs. Mr. Neal Jackson informed me that Synagro (the facility that processes sludge for Patapsco WWTP) is doing short term (~ 1 day) maintenance to its facility so, only about half of the usual amount of the solids can be transferred from the wastewater treatment plant to Synagro at the time of this inspection. Mr. Chris Saunders anticipated that Synagro will complete its maintenance by the end of this day.

GST #4 is continuously receiving high pressure effluent water and is idle. Grime was observed at the outer weir of the GST. Mr. Neal Jackson and Mr. Chris Saunders stated that outer weirs will be cleaned before placing them back in service. Picture of GST #4 is shown on the next page.

A picture of GST #4 with grime on the outer weir is shown below:

Water from GST #4 will overflow to the effluent side of the primary settling tank (PST) effluent channel.

PSTs

At the time of this inspection, PSTs # 2 and 4- 6 were in service. PST #2 will be taken out of service for maintenance after PSTs #1 and 3 are completed. PSTs # 1 and 3 are currently out of service for maintenance. Mr. Neal Jackson also informed me that a new wall was installed in PST #3 to comply with the FOG mitigation plan.

Pure Oxygen Reactors and Liquid Oxygen Plant (LOX Plant):

The LOX plant converts air to 95% liquid oxygen. Liquid oxygen will then be used for the pure oxygen reactors for BOD removal. Mr. Neal Jackson stated that the main system at the LOX Plant is currently running, and the backup system is not running at this time. However, if the main system goes down, then the backup system will run automatically. Mr. Neal Jackson informed me that the backup system has four tanks full of liquid oxygen.

The facility has six pure oxygen reactors. The inside of the reactors cannot be observed. Mr. Chris Saunders stated each reactor has three aerators (total of 18 aerators), oxygen reactors # 2, 3, 5, and 6 are in service, and all aerators in all running reactors are in service. Reactors #1 and 4 are not functioning because the aerators in the biological reactors are inoperative. Mr. Chris Saunders informed me that the aerators are checked once each morning by Hazen & Sawyers and checked by Baltimore City during other shifts by inspecting if the shafts are turning and if there is a measurable amount of dissolved oxygen in samples collected from the pure oxygen reactors.

Secondary Clarifiers:

The facility has eight clarifiers. Inspection of all eight clarifiers (Clarifiers # 1- 4, 5A, 5B, 6A, and 6B) was conducted. 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 and biological activated filters (BAFs). Wastewater from Clarifier #3 flows back into the PST. Clarifier #2 is not running but can be turned on as needed. Since the previous inspection on 3/30/2023, the shrub at the center of clarifier # 6B (instead of clarifier #5A as noted on the 3/30/2023 inspection report) has been removed. The picture of clarifier 6B is shown below:

During the time of this inspection, Clarifier # 5B was turned off for maintenance. A staff member of Patapsco WWTP was actively removing scum from the surface of the clarifier. A picture of Clarifier # 5B is shown on the next page.

FOGs and BAF media were not observed in the clarifiers during the time of this inspection.

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. Mr. Chris Saunders showed me the monitoring device for BAF effluent, with ammonia concentration of 0.18 mg/L. Mud wells #1 and 2 were inspected and foam was observed on the water surface in both mud wells. FOGs BAF media were not observed on the water surface within both mud wells. Picture of mud well # 2 is shown below:

A picture of mudwell #1 is shown below:

Denitrification Filters

The denitrification system has 34 individual filters. During the time of this inspection, filters # 1, 6, 20, 33, and 34 were out of service, not functional, and waiting for repairs to be made. 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. FOGs and BAF media were not observed in all denitrification filters. Water then exits the denitrification filters by flowing through the sand filter. Sand filters are located at the bottom of each individual denitrification filter. The denitrification filters are automatically backwashed every four hours for approximately 46 minutes. There was some water within filter #6 but Mr. Neal Jackson explained that the observed water was from a recent rain event. Filter #3 was actively being backwashed during the time of the site walk through, with water from the filter overflowing back to the concrete weir walls. A picture of filter #3 backwashing is shown on the next page.

Filter #24 was prepping for backwash during the time of the site walk through and a picture of the filter is shown on the next page.

Chlorine Contact Chambers

The wastewater treatment plant has four chlorine contact chamber units, which were all running at the time of this inspection. There is a fifth chlorine contact chamber that is currently not functional but may run in the future after removing the wall between chlorine contact chambers #4 and #5. Some media from the BAF cells were observed on the wall within the chlorine contact chambers but are being contained by containment booms or being caught by troughs. Mr. Kevin McFadden and Mr. Neal Jackson stated that the troughs in each chlorine contact chamber are turned one at a time with a push of a button to allow foams and media to enter the troughs. Clear effluent was observed to be flowing off site and to the Patapsco River. Media were not observed to be leaving the site. FOGs were not observed in the chlorine contact chambers.

Self-Monitoring/ In-House Lab

The following records were reviewed during this inspection:

- daily pH calibration records for 4/1/2023 to 4/27/2023
- daily zero oxygen verification/ dissolved oxygen (DO) calibration for 3/31/2023 to 4/27/2023
- daily composite samplers' temperatures for 2/18/2023, 2/24/2023, and 3/31/2023 to 4/27/2023
- total residual chlorine standards reading/ verification for 3/31/2023 to 4/27/2023

- daily skim log of the chlorine contact chambers for April 2023.

pH calibrations are conducted at least 3 times each day. A zero-oxygen standard is used each time for DO calibrations. During the time period reviewed, the DO concentration for the standard was less than 0.5 mg/L, which is acceptable. 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 3.5°C and 4.5°C, respectively. The temperature of the spare refrigerator was 2°C. The composite samplers and spare refrigerator were less than 6°C and were within the temperature requirement for sample holding/ preservation, according to Table II in CFR 136.3. The daily skim log noted the chlorine contact chambers were skimmed on 4/1, 4/3-4/8, 4/10, 4/12-4/15, 4/19, and 4/23.

Following up on the previous inspection report dated 3/30/2023, the lab reports for nutrient analyses dated 2/18/2023 and 2/24/2023 and the lab report for BOD and TSS analyses dated 2/24/2023 did not have temperatures for the composite sampler documented on the chain of custody forms. After reviewing the composite samplers' temperatures for 2/18/2023 and 2/24/2023, the temperature readings were less than 6℃ and were within the temperature requirement range for sample holding/ preservation, according to Table II in CFR 136.3.

I was informed by Ms. Andrea Buie Branam and Mr. Kevin McFadden that the La Motte chlorine meter at the facility's operator lab is taken to the Patapsco lab once a day to verify accuracy of the meter, that the Patapsco lab uses lab standards as primary standards of known chlorine concentration when verifying the accuracy of the operator lab's chlorine meter, and that the La Motte standards are used for comparison/internal quality assurance. Ms. Andrea Buie Branam further stated that the LaMotte standards are deficient because LaMotte discontinued the production of the standards that are compatible with the plant's current meter, and that the facility is planning to purchase Hach meters.

Lab reports, MORs, and DMRs:
Lab reports and the MOR for March 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, PCB congeners, volatile organics, and metals were reviewed. Calculation discrepancies/ reporting for nutrients, metals, Enterococci, PCBs, TSS, BOD, pH, total residual chlorine, cyanide, flow, and volatile organics were not observed on netDMR.

The following were observed while reviewing the MOR:
The minimum weekly average DO concentration for March 2023 was reported as the lowest weekly average DO concentration after calculating the average of the daily average DO concentrations of Sunday to Saturday for each week. For example, the averages of the daily average DO concentrations for 2/26- 3/4, 3/5- 3/11, 3/12- 3/18, 3/19- 3/25, and 3/26- 4/1 were calculated. These values were then used to calculate the weekly average DO concentrations. For 2/26- 3/4, 3/5- 3/11, 3/12- 3/18, 3/19- 3/25, and 3/26- 4/1, the weekly average DO concentrations were calculated to be 10.1, 10.4, 10.4, 10.5, and 10.2 mg/L respectively; and the minimum weekly average DO concentration was reported to be 10.1 mg/L on netDMR.

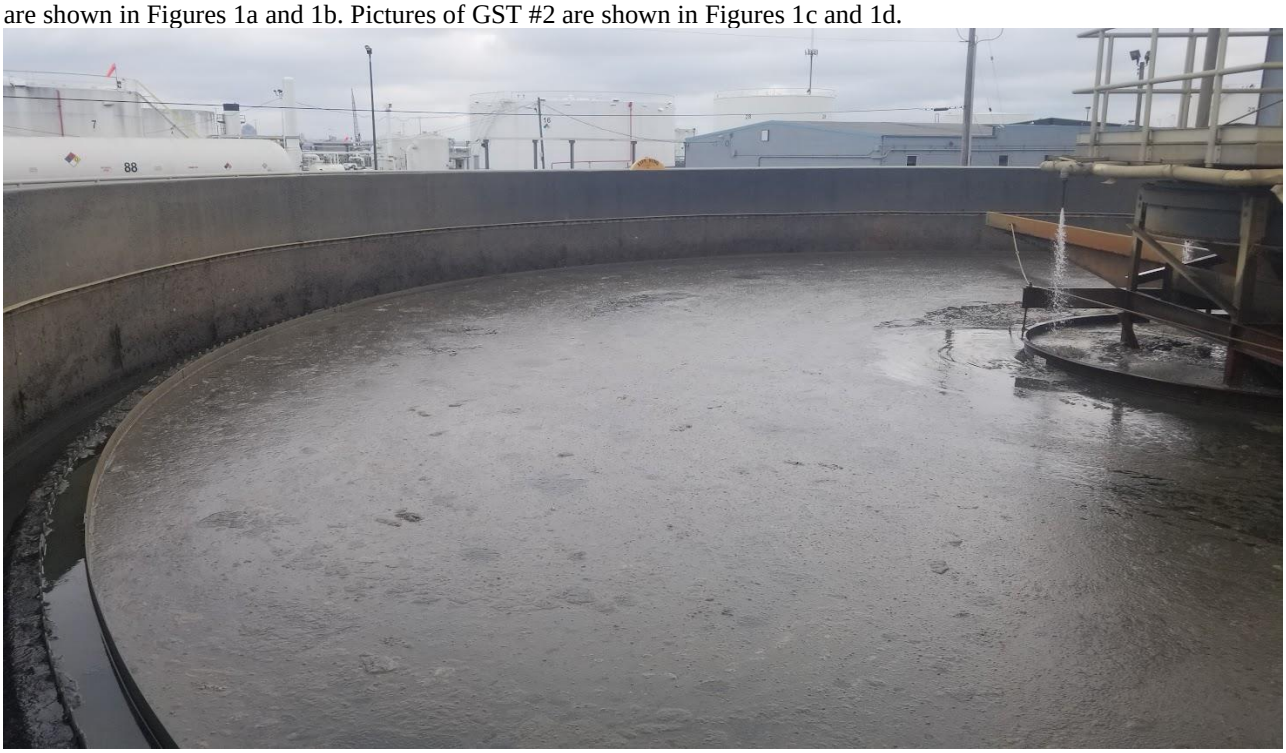
According to Definitions H.2 of the permit (Page 2), weekly average minimum is the lowest "allowable average of daily discharges over a calendar week… each of the following 7- day periods is defined as a calendar week: week 1 is days 1-7 of the month; week 2 is days 8-14; week 3 is days 15- 21; week 4 is days 22-28… for weekly minimum if the daily discharge on days 29, 30, or 31 is lower than the weekly average discharge limitation, MDE may elect to evaluate the last 7 days of the month as week 4 instead of days 22-28."

Based on the permit's definition of weekly average minimum, weekly average minimum DO concentration for March 2023 was calculated to be 10.2 mg/L instead of 10.1 mg/L. Weekly average DO concentration for March 2023 should be updated on netDMR and all future weekly average minimum DO concentrations for 2/1 to 5/31 each year (based on the effluent limits table) should be calculated in accordance with Definitions H.2 of this permit.

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 and 1b. Pictures of GST #2 are shown in Figures 1c and 1d.



1a: Excessive amounts of sludge at the surface of GST #1. The skimmer arm is above the water surface level.

Figure 1b: Close up view of sludge next to the V- notch weir within GST #1.

Figure 1c: Sludge at the surface of GST #2. One of the skimmer arms has not been fixed yet and is partially above the water surface level.

Figure 1d: Close up view of rags and solids next to the V- notch weir (pointed with a red arrow) of 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) Hoppers that contain FOGs were observed to be leaking onto the ground outdoors and outside of containment. These hoppers are located next to the west side of the combined influent building. The FOGs can contaminate stormwater. Pictures of the leaking hoppers are shown in Figures 2a and 2b.

Figure 1a: A leaking hopper with FOGs by the transfer station and the northwest side of the combined influent building.

Figure 2b: A leaking hopper by the southwest side of the combined influent building. FOGs are on the ground surface.

All leaking containers should be placed in containment. FOGs that were previously leaked onto the ground should be shoveled and placed into the transfer station or into a leak proof container that is clean on the surface.

3) FOGs are stuck on the belt press tarp that is placed at the output side of bar screen #8. Mr. Neal Jackson explained that the clog is due to a high volume of FOGs entering the system. A picture of FOGs being stuck to the tarp at bar screen #8 is shown below:

In addition, the floor around the belt press is covered in FOGs liquid and residue, making it slippery.

Readjust the tarp to ensure that FOGs and grit are not stuck/ clogged at the conveyor belt. Implement routine housekeeping to ensure that the conveyor is running smoothly and the floor in the combined influent building has a minimal amount of FOGs residue and liquid.

4) Solids were observed on the ground outside next to the hoppers and the IPI building. A picture of solids on the ground by the hoppers is shown on the next page.

Remove all solids from the ground and place them into a leakproof container, under cover.

5) The secondary clarifiers are not operating as designed. Both scraper arms are missing in Clarifiers # 5A and 5B. All scraper arms within Clarifiers # 1 and 6A have been replaced but, the rubber part at the edge of one of the two scraper arms within both clarifiers are missing. One of the two scraper arms at Clarifier #6B has not been replaced yet. Clarifier #4 has one of the two scraper arms that has been replaced but the rubber part at the edge of the fixed scraper arm has not been replaced yet. 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. The purpose of the rubber part at the edge of the scraper is to scrape off any accumulated solids from the weir of the clarifier. Mr. Neal Jackson and Mr. Chris Saunders explained to me that the reason for all the scraper arms and rubber parts not being replaced is due to a supply chain issue. The facility is struggling to get the parts needed to fix all scrapers.

   In addition, woody vegetation was observed at the center of the clarifier and grass was observed to be growing between the weir and launder cover of Clarifier #6A. Grass 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 # 1 is shown in Figure 5a. Pictures of Clarifier # 4 are shown in Figures 5b to 5d. Pictures of Clarifier # 6A are shown in Figures 5e and 5f. A picture of Clarifier # 6B is shown in Figure 5g. A picture of Clarifier # 5B is shown in Figure 5h. Pictures of Clarifier #5A are shown in Figures 5i and 5j.

Figure 5a: Rubber part missing at the edge of the scraper arm of Clarifier # 1

Figure 5b: Rubber piece missing at the edge of one of the scraper arms in Clarifier # 4

Figure 5c: Algae outside of the launder cover of Clarifier # 4

Figure 5d: One of the two scraper arms in Clarifier # 4 is missing.

Figure 5e: Woody vegetation growing at the center/ influent side of Clarifier # 6A (pointed to with a red arrow)

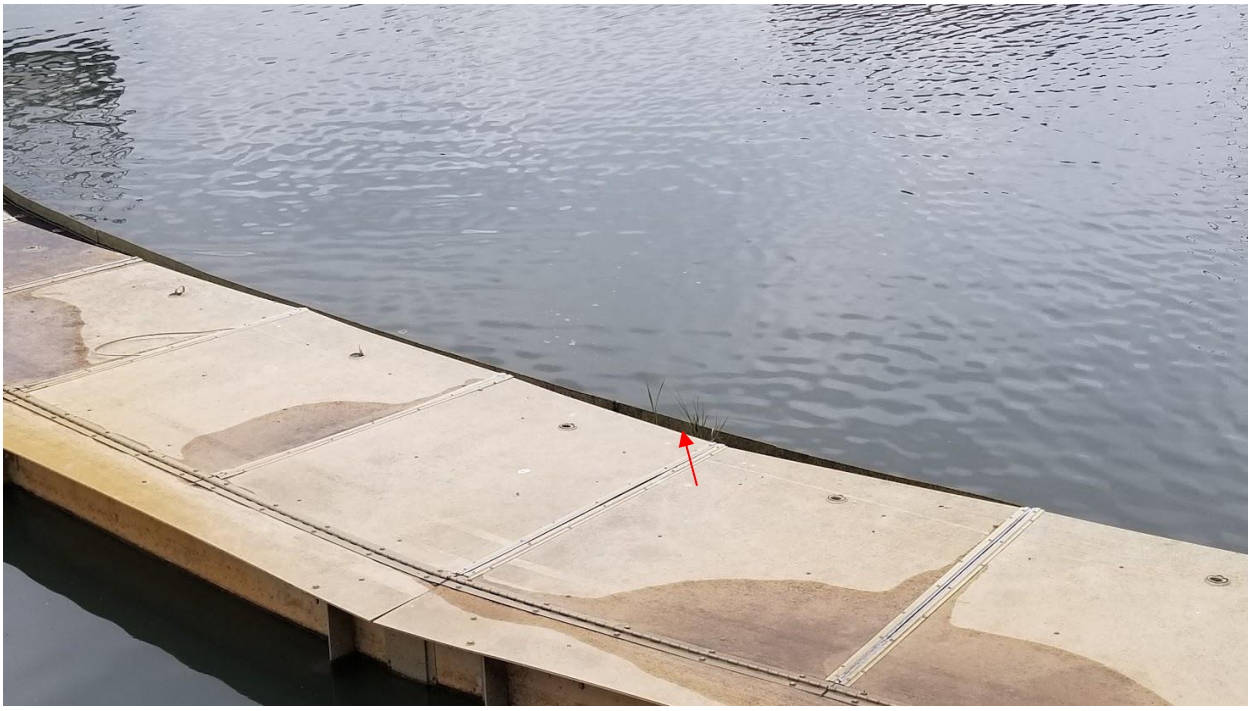


Figure 5f: Grass growing between the weir and launder cover of Clarifier # 6A (pointed to with a red arrow)

Figure 5g: One of the scraper arms in Clarifier # 6B is missing.

Figure 5h: Scraper arm in Clarifier # 5B. Clarifier # 5B is turned off for maintenance.

Figure 5i: Grass at the center/ influent side of Clarifier # 5A (pointed to with a red arrow)

Figure 5j: A scraper arm in Clarifier # 5A is missing.

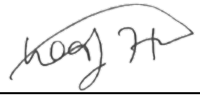
Repair and maintain the clarifiers to ensure that they are functioning per design. Install scraper arms and rubber parts to all clarifiers immediately, once the parts are received. Remove vegetation from the aforementioned clarifiers.

6) The total residual chlorine concentrations of the standards taken by the chlorine meter on 3/31, 4/13-4/18, and 4/23 are out of range, compared to the total residual chlorine numbers for the primary standards from the

Patapsco lab with a known concentration of 1±0.03 mg/L. Chlorine concentrations taken by the meter on 4/13, 4/15-4/18, and 4/23 noted 0.96 mg/L (-0.04 mg/L difference). Chlorine concentrations taken by the meter on 3/31 and 4/14 noted 0.95 mg/L (-0.05 mg/L difference). **Investigate the reason for the above noted discrepancies/ out of range readings of total residual chlorine.**

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:  6/8/2023

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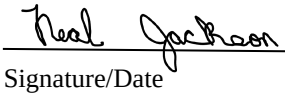
Received by:  6/8/2023

Signature/Date

Neal Jackson

Print Name