



**Maryland Department of Environment**  
**Water and Science Administration**  
**Compliance Program**  
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**Inspector:** Christopher Lepadatu  
**AI ID:** 3076

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

**Start Date/Time:** January 25, 2024 09:30 AM  
**End Date /Time:** January 25, 2024 11:30 AM  
**Media Type(s):** NPDES Municipal Major Surface Water

**Contact(s):** Neal Jackson – Plant Manager, Patapsco WWTP  
Chris Saunders – Senior Associate of Hazen & Sawyers  
Scott Moffatt – Policy Analyst, Baltimore City DPW  
Andrea Buie – Chief of ERCS, Baltimore City DPW

## **NPDES Municipal Major Surface Water**

**Permit / Approval Numbers:** 15DP0850  
**NPDES Numbers:** MD0021601  
**Inspection Reason:** Follow-up  
**Site Status:** Active  
**Compliance Status:** Compliance  
**Site Condition:** Additional Investigation Required  
**Recommended Action:** Continue Routine Inspection  
**Evidence Collected:** Photos or Videos Taken, Record Review, Visual Observation  
**Delivery Method:** Email  
**Weather:** Drizzle, Average

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### **Inspection Findings:**

#### **Introduction:**

The Patapsco Wastewater Treatment Plant (WWTP) is permitted to discharge to the Patapsco River which is designated as Use II waters protected for estuarine and marine aquatic life. The Patapsco WWTP features advanced treatment processes to achieve enhanced nutrient removal (ENR), chlorination and de-chlorination. The Patapsco WWTP is rated to treat an average daily flow of up to 73 MGD.

The treatment system includes preliminary treatment (grit removal and fine screening), primary treatment (primary settling tanks (PSTs)), secondary treatment (biological nutrient removal activated sludge process and additional filter nitrification), tertiary treatment (denitrification filters for enhanced nutrient removal) and disinfection (chlorination).

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Primary sludge (PS) and waste activated sludge (WAS) produced by the primary treatment and secondary treatment process is thickened on-site. The solids thickening process consists of Gravity Sludge Thickeners (GSTs) and dissolved air flotation tanks. The thickened sludge is stored in a sludge blend tank and then conveyed to the drying facility on-site which is operated by a third-party, Synagro.

On this day, I inspected the WWTP with the contacts listed above.

Consent Decree:

As of November 2023, Baltimore City and the Department signed a Consent Decree, Case No. 24-C-22-00386, which establishes specific goals and objectives related to the operations and maintenance of the Patapsco WWTP. As a result, maintenance items observed during the site inspection will be noted in the relevant areas of the inspection report and not itemized in the Violation(s) section as in previous inspection reports. The goals and objectives in the Consent Decree are noted below for monitoring and tracking progress.

Patapsco WWTP Consent Decree (CD) Overall Progress Tracking Summary				
CD Paragraph Reference	Activity	CD Deadline	Actual Date Completed	Compliance Status (11/25/23)
147-PAT	Provide the Dryer Facility with access to, and control of, GST thickened sludge pumps to automate sludge withdrawal from the GSTs until the existing stored sludge from the SBTs is removed and the SBTs are returned to normal operating mode. * <b>Reportedly complete</b>	11/15/2023	October 2023	Complete
148-PAT	Have and maintain contracts for on-call hauling services to serve as back-up to the Dryer Facility.	Ongoing		Compliant
149-PAT	Complete replacement or rehabilitation of the grit facility, which includes provision for odor control and proper ventilation. Workers entering the grit facility to comply with Grit Facility SOPs.	4/30/2024 (RFP) 12/31/2027 (Complete Rehabilitation or Replacement)		10% 0%
150-PAT	Repair or refurbish Industrial Plant Influent Facility (IPI) screens and pumps and replace or fully rehabilitate the IPI Facility to operate as designed.	6/30/2024		90%
151-PAT	Repair all non-functional screens in the Fine Screen Facility, increase screen opening size for three screens, and install new conveyors, northern screen compactors, and curtains from the screen chutes to the belt.	6/30/2024		20%
152-PAT	Repair and upgrade scum trough actuators associated with the PSTs to allow for automatic operation of the scum removal system, and upgrade mechanisms of clarifiers #1-3 to provide automatic operation.	6/30/2024	10/23/2023	Complete
153-PAT	Ensure all six PSTs are fully functional and operating as designed. * <b>All 6 PSTs operational</b>	12/15/2023	12/21/2023	100%
154(a)-PAT	Repair all RAS/WAS pumps for secondary clarifier #6a to operate as designed. * <b>Reportedly complete</b>	11/25/2023	8/16/2023	Complete
154(b)-PAT	Replace missing skimmer sections to increase scraper effectiveness. * <b>Waiting on parts</b>	11/25/2023	9/22/2023	Complete
154(c)-PAT	Remove BAF media from secondary clarifier influent and BAF mudwells. * <b>Reportedly complete, no BAF media observed</b>	11/25/2023	11/18/2023	Complete
155(a)-PAT	Complete evaluation of need for secondary clarifier #3. Within 10 days of evaluation: Request approval to discontinue or alter use of clarifier.	4/1/2024 (Complete Evaluation) 5/1/2024 (Request Approval to Discontinue / Alter)		20% 0%
155(b)-PAT	Submit a plan for Department approval to improve the clarifier #3 (Clarifier #3 Improvement Plan) and implement immediately upon approval	5/1/2024		0%
156-PAT	Investigate Biological Aerated Filter Facility ("BAF") media state	12/15/2023	March 2023	Complete
157-PAT	Submit a plan and schedule to address BAF media loss and prohibit any discharge of media to waters of the State	1/14/2023	11/25/2023	Complete
158-PAT	Automate time scum log operation of the Chlorine Contact Tank (CCT)	1/31/2025		50%
159-PAT	Ensure staff are present at all times during each shift to maintain manual skimming of FOGs or floating solids at the CCTs until 158-PAT is complete.	Upon Automation of		10%

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		Timed Scum Log Operation of Chlorine Tank		
160-PAT	Rehabilitate GST #4 and associated pumps. * GST #4 operational	3/14/2024	2/10/2023	Complete
161-PAT	Ensure all GSTs are fully functional and operating as designed. Baltimore City shall notify Plaintiffs upon receipt of parts. * Parts ordered for GST 1 and 2	11/25/2023	11/25/2023	Complete
162-PAT	Submit a PCB Minimization Plan	12/15/2023	11/25/2023	Complete
163-PAT	Complete investigation into flow meter and complete root cause analysis of the discrepancy between influent and effluent flow volume.	12/15/2023	11/25/2023	Complete
164-PAT	Submit a revised FOG Mitigation Plan	11/25/2023	11/25/2023	Complete
165-PAT	Submit a Staffing Report and Staffing Plan	12/31/2023	8/1/2023	Complete
166-PAT	Have, maintain, and make available to the Department Patapsco WWTP SOP	6/30/2024		45%
167-PAT	Submit a report that identifies what processes at the Patapsco WWTP are currently automated, and conduct a feasibility study for the automation of additional processes, with a plan and schedule for future automation.	5/13/2024		10%
168-PAT	Have, maintain, and update a Computerized Maintenance Management System (CMMS) as functional work order system to ensure that the plant and its equipment and components operate as designed.	Ongoing		Compliant
169-PAT	Complete a condition assessment and inventory of existing assets in order to develop an asset management program, and within 90 days of the completion of the assessment and inventory, begin implementing the asset management program.	11/15/2024 (Completion of assessment)		75%
		2/13/2025 (Commence Implementation)		0%

The table above will be updated during future facility inspections.

Site Walkthrough:

The Industrial Plant Influent (IPI) contains two (2) fine screens and four (4) pumps for conveying flow to the primary clarifiers. The IPI building has approximately 2-3 MGD capacity for industrial influent. The two (2) fine screens in the IPI building receive flow by means of individual channels and gates for flow control. The gate for Bar screen #1 is not functional and needs maintenance. Screened and raked material is discharged into rolling dumpsters, one for each fine screen. The dumpsters rest in a concrete channel where they can be winched to the exterior of the IPI building for waste collection.

The Fine Screen facility contains eight (8) fine screens divided into two groups of four. Each group of screens has a conveyor and compactor associated with it to carry screened material to the compactor before discharging it to waste dumpsters. At the time of the site visit, all eight (8) fine screens were observed to be in operation. A project for replacing the compactors and conveyor belts for both groups of screens is in process. Fats, oils, and grease (FOG) is an ongoing issue for the facility.

Transfer Station:

The transfer station has a roof, low wall on three sides, and trench drains in its concrete floor. Grease and grit from the preliminary treatment systems (screening) are stored in the transfer station. Liquid that drains into the trench drains of the transfer station is pumped back into the gravity sludge thickeners (GSTs). Dried waste and grit are taken to the Quarantine Road Municipal Landfill for disposal.

Gravity Sludge Thickeners (GSTs):

There are three (3) 65-ft diameter gravity sludge thickeners (GSTs) in the sludge handling area of the plant. The GSTs are numbered #1, #2, and #4. GSTs #1 and #2 are built on grade and GST #4 is elevated above grade. The skimming arms of GST #1 and #2 are missing significant portions of the rubber flaps which should extend down to the liquid surface to effectively remove surface scum. Currently, staff spray water on the surface of GST #1 and #2 in order to manually remove surface scum. Repairs for the skimming arms are reportedly planned and a vendor has been selected to complete the repairs.

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Image 01: GST #2

At the time of the site inspection, GSTs #1 and #2 were observed as having a thin film of floating scum on the surface reportedly due to excessive influent conditions caused by heavy rainfall. It was reported that Synagro’s sludge processing operations has been keeping up with the plant’s sludge production. The vertical sludge storage tanks are empty and Synagro is pulling directly from GST’s #1 and #2. The scum troughs on GST #1 and GST #2 were clear and operational. GST #4 was observed to be ¼ of the way full with wastewater but was not in operation.

Sludge Processing to Synagro

Sludge processing data is provided in the monthly MOR submitted with the netDMR submissions. The data provided for the month of December 2023 is organized in the table below.

Sludge Processing to Synagro, December 2023				
Date	KGAL Feed Sludge	%Total Solids in Feed Sludge	Feed Sludge, Dry Tons	Synagro Pellet Production, Dry Tons
12/1/23	487.923	3.57	72.64	103.48
12/2/23	605.675	3.36	84.86	71.59
12/3/23	633.213	3.37	88.98	0.00
12/4/23	647.833	3.02	81.58	91.39
12/5/23	533.879	3.72	82.82	68.48
12/6/23	390.329	3.37	54.85	64.63
12/7/23	274.654	3.98	45.58	92.85
12/8/23	616.097	3.47	89.15	91.88
12/9/23	584.362	2.77	67.50	46.47
12/10/23	523.059	3.08	67.18	24.08
12/11/23	311.359	3.27	42.46	92.40
12/12/23	321.053	3.68	49.27	69.24
12/13/23	192.370	5.99	48.05	69.45
12/14/23	262.477	5.40	59.10	45.15
12/15/23	532.294	3.84	85.24	69.15
12/16/23	636.003	3.47	92.03	0.00
12/17/23	425.229	3.89	68.98	0.00
12/18/23	332.878	3.56	49.42	112.72
12/19/23	329.007	2.75	37.73	58.63
12/20/23	369.689	2.96	45.63	91.55
12/21/23	113.949	2.43	11.55	91.03
12/22/23	192.947	3.01	24.22	46.53
12/23/23	494.258	2.79	57.50	0.00
12/24/23	396.024	2.92	48.22	0.00
12/25/23	135.940	3.87	21.94	0.00
12/26/23	372.868	3.21	49.91	46.31
12/27/23	408.008	3.04	51.72	46.08

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12/28/23	228.137	3.38	32.15	68.27
12/29/23	501.573	2.81	58.77	90.81
12/30/23	661.349	2.58	71.15	0.00
12/31/23	140.054	3.37	19.68	0.00
Total	12654.49	105.93	1759.86	1652.17
Average	408.209	3.42	56.77	53.30

Primary Treatment:

The primary treatment system consists of six (6) large, rectangular Primary Settling Tanks (PSTs), each equipped with a chain and flight sludge conveyance mechanism, scum logs, and screw sludge collector.



Image 02: PST # 5, Effluent.

At the time of the site inspection, all PSTs were in service with PST #6 operating as the primary treatment PST. Following a major rain event, the facility utilized all six (6) PSTs in an attempt to keep up with the excess influent flow volume. Additionally, the excess flow volume exceeded the flow capacity of the headworks requiring the facility to bypass the headworks and allow unscreened material in the PSTs. The facility will now drain each PST one-by-one to clear and clean the PST and return it to normal service.

*High Purity Oxygen Aeration Reactors and Liquid Oxygen Plant (LOX Plant):*

The LOX Plant converts air to 95% liquid oxygen. Liquid oxygen is used for the pure oxygen reactors for BOD removal. The main system at the LOX Plant is currently running. The High Purity Oxygen Aeration facility has six (6) pure oxygen reactors. The reactors are enclosed, rectangular tanks where the inside cannot be observed.

Reactors #2, #3, #5, and #6 were in service at the time of the inspection. Reactor #1 is operating as flow-thru and reactor #4 is down while two of its mixers are being rebuilt.

Secondary Treatment:

The facility is equipped with eight (8) secondary clarifiers. Secondary clarifier #3 is not operational and is being used as a mudwell to contain backwash water from the denitrification filters and biological aeration filters (BAF). Wastewater from secondary clarifier #3 is pumped back to the PST influent via the temporary pump from United Rental.

Secondary clarifier #4 was observed as having a section of the skimmer arm missing. No other issues were observed or reported with the remaining clarifiers.

BAFs and Mud Wells:

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Inside the Biological Aeration Filter (BAF) facility there are 22 filter cells and associated blowers. Fourteen (14) filter cells are necessary for design average daily flow. Cells 19 and 21 were reportedly down with a valve issue. No other issues were observed or reported with the BAF system or Mud Wells.

#### Denitrification Filters:

The denitrification filter (DNF) facility contains 34 gravity filters and support systems such as backwash pumps and blowers. 28 filters were in service at the time of the inspection. Filters #6, #21, #32, and #33 are out of service for mechanical issues related to air valves. Filters #34 and #1 are maintained in standby and used only for emergencies. 24 filters are necessary for design average daily flow. The DNF filters are automatically backwashed every four hours for approximately 46 minutes.

#### Chlorine Contact Chambers:

The wastewater treatment plant has four (4) chlorine contact chambers with scum troughs and mixers. All four (4) chlorine contact chambers were operating at the time of the site inspection. No issues were reported or observed.

#### Outfall 001:

Foam was observed on the surface of the final discharge channel which appeared to disperse rapidly. BAF media and FOGs were not observed to be leaving the site via the effluent channel.



Image 03: Final effluent.

#### Self-Monitoring / In-House Lab:

The following records were reviewed:

- Daily pH calibration records from 1/1/24 to 1/25/24.
- Daily zero oxygen verification / dissolved oxygen (DO) calibration from 1/1/24 to 1/25/24.
- Daily composite samplers' temperatures from 1/1/24 to 1/25/24.
- Total residual chlorine standards reading / verification for 1/1/24 to 1/25/24.

pH calibrations are conducted 5 times per shift per day. No violations were observed with the pH calibration records. A zero-oxygen standard is used each time for DO calibrations. No violations were observed with the DO calibration records.

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The facility's operator lab for the outfall has two composite samplers. The temperatures of the composite samplers #1 and #2 were 5.25°C and 3.0°C, respectively. The composite samplers were less than or equal to 6°C which is within the temperature requirement for sample holding / preservation, according to Table II in CFR 136.3.

Calibration records for the HACH DR300 CL2 Colorimeter were reviewed for the period from 1/1/24 to 1/25/24 and no violations were observed.

#### Lab Reports, MORs, and DMRs:

Lab reports and MORs for December 2023 were provided for review. Lab reports for 5-day biological oxygen demand (BOD), total suspended solids (TSS), ammonia, nitrate plus nitrite, total phosphorous (TP), ortho-phosphate, Enterococci, cyanide, and metals were reviewed. No issues or violations were observed in the lab reports or MORs. No issues or violations were observed or reported in the netDMR submission for December 2023.

#### Non-compliance Report / Bypass Event:

On December 27, 2023, the Department received a follow-up letter regarding a sanitary sewer overflow (SSO) event at the Patapsco WWTP on December 26, 2023. The contents of the letter included the following:

“On December 26, 2023, from approximately 12:30pm to 12:45pm there was a small sewage sludge overflow at the Patapsco WWTP, at the scum pit located behind the transfer station. A maintenance crew was dewatering a gravity sludge thickener when the discharge hose from the dewatering pump came out of the pit it was pumping into. In the 15 minutes that the discharge went to the ground approximately 700 gallons of thickened sludge were released. The plant staff used a vacuum truck to recover approximately 500 gallons of the release and covered the permeable surfaces with lime. The unrecoverable portion is estimated at 200 gallons.”

I reviewed the area where the overflow occurred. No residual sludge was observed.

On January 10, 2024, the Department received notification of a bypass of the ENR treatment processes at the facility. The contents of a follow-up letter received on January 11, 2024, included the following:

“The heavy rain caused high influent flows to the PWWTP from 1/9/2024 through 1/11/2024. The high flows exceeded the design capacity of the Enhanced Nutrient Removal (ENR) processes which caused two partial bypasses to occur.”

The Biological Aerated Filter (BAF) process was bypassed starting at 4:15pm on 1/9/24 and lasting until 12:15pm on 1/10/24. The Denitrifying Filter (DNF) process was bypassed starting at approximately 4:15pm on 1/9/24 and lasting until 4:15pm on 1/10/24. The letter details that the two bypasses resulted in an estimated Total Nitrogen (TN) concentration for 1/9/24 of 7.4 mg/L and an estimated TN concentration on 1/10/24 of 5.16 mg/L. It reported that the final confirmed laboratory results will be submitted with the DMR report for January.

On January 10, 2024, the Department received notification of two Sanitary Sewer Overflows (SSOs) at the facility. The contents of a follow-up letter received on January 11, 2024, included the following:

“The heavy rain...high flows caused the plant to reach its hydraulic maximum in two places which resulting in sanitary sewer overflows. The first overflow was from the Gravity Settling Tanks (GST) 1 and 2 effluent boxes. Due to plant-wide elevated water levels from the high flows, the effluent flow from the GST's was forced out of the effluent chamber and onto the ground. The SSO was intermittent from 9:15pm on 1/9/24 to 5:30am on 1/10/24. It is estimated that approximately 5,000 gallons were released during this period and ultimately discharged through the storm water outfall to the Patapsco River.

The second overflow was from the Southwest Diversion (SWD) junction chamber which is the main conduit for influent flow to the plant. Due to high influent flows the SWD pipe segment reached its maximum hydraulic capacity and started to surcharge within the pipe. As the water backed up it rose and came out of the junction chamber just prior to the plant's headworks facility. The overflow started at approximately 9:15pm on 1/9/24 and flowed continuously

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until 3:30am on 1/10/24. It is estimated that approximately 44,000 gallons were released and ultimately discharged through the stormwater outfall to the Patapsco River.”

I reviewed the areas associated with the SSOs reported above. No residual material was observed. See images below.



Image 04: Effluent box for GST 1.

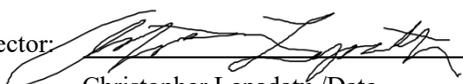


Image 05: Southwest Diversion (SWD) junction, normal flow conditions.

As of November 2023, Baltimore City and the Department have signed a Consent Decree – Case No. 24-C-22-00386 which establishes specific goals and objectives related to the operations and maintenance of the Patapsco WWTP. As a result, maintenance items observed during the site inspection will be notated in the relevant areas above and not itemized in the Violation(s) section as in previous inspection reports.

**Regular inspections will continue.**

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Inspector:  2/9/24  
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410-537-3521

Received by: \_\_\_\_\_  
Signature/Date

\_\_\_\_\_  
Print Name