



**Maryland Department of Environment**  
**Water and Science Administration**  
**Compliance Program**  
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**Inspector:** Christopher Lepadatu  
**AI ID:** 8449

**Site Name:** Back River WWTP  
**Facility Address:** 8201 Eastern Ave, Baltimore, MD 21224  
**County:** Baltimore County

**Start Date/Time:** November 20, 2023 09:30 AM  
**End Date /Time:** November 20, 2023 12:30 PM  
**Media Type(s):** NPDES Municipal Major Surface Water

**Contact(s):** Betty Jacobs – Back River WWTP  
Ronald Turner – Back River WWTP  
Timothy Simmons – Back River WWTP  
Scott Moffatt – Policy Analyst, Baltimore City DPW

## **NPDES Municipal Major Surface Water**

**Permit / Approval Numbers:** 15DP0581  
**NPDES Numbers:** MD0021555  
**Inspection Reason:** Follow-up  
**Site Status:** Active  
**Compliance Status:** Compliance  
**Site Condition:** Additional Investigation Required  
**Recommended Action:** Additional Investigation Required  
**Evidence Collected:** Photos or Videos Taken, Record Review, Visual Observation  
**Delivery Method:** Email  
**Weather:** Calm, Good

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### **Inspection Findings:**

#### **Introduction:**

Back River Wastewater Treatment Plant (WWTP) is operated by Baltimore City DPW. Some areas of the WWTP are subcontracted and operated by ProStart. These areas include the Headworks, Denitrification Building, and Centrifuges. The facility is authorized to discharge treated effluent through Outfalls 001 and 002. Outfall 001 discharges to Back River, a designated Use II waterway. Use II waterways support estuarine and aquatic life and shellfish harvesting. Outfall 002 discharges to Tradepoint Atlantic who then discharge via three (3) outfalls under their industrial discharge permit (#05DP0064) to Bear Creek and the Patapsco River which is also designated as a Use II waterway. Final effluent discharge is split at a junction box and a large portion of the flow (up to 130.0 MGD) goes to Outfall 001 via a step cascading aeration system and the remaining portion (up to 50.0 MGD) goes to Outfall 002.

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The current permit has been administratively extended since it expired on April 30, 2023. A revised permit renewal application (#2DP0581) was received by MDE on May 26, 2023.

Back River WWTP is an activated sludge process sewage treatment plant with biological nutrient removal by Modified Ludzack-Ettinger process, ferric chloride for phosphorous removal, denitrification filters for enhanced nutrient removal (ENR), polishing sand filters, chlorination, and dichlorination.

On this day, I met with the individuals listed above for an opening conference followed by a site walk and closing conference.

#### Opening Conference:

- Status of various plans,
  - Assets Management Plan – in progress, Atkins is handling.
  - Wasting & Sludge Management Plan – in progress, Jacobs is handling.
  - Centrifuge Maintenance Plan – in progress, Jacobs is handling.
  - Operations & Maintenance Manual – in progress.
  - Staffing Plan – in progress, Atkins is handling, Prelim plan shared internally in July.
  - PCB Minimization Plan – submitted to MDE on February 17, 2023.
- Headworks,
  - Operated by ProStart.
  - 8 Influent Pumps
    - 4 dedicated to the WWTP
    - 4 set up for the EQ Tanks or WWTP
  - No issues reported.
- Primary Settling Tanks (PSTs),
  - Eleven (11) total – PSTs 2, 7, 8, 9, & 11 in service.
  - PST 5 is being used as flowthrough.
  - PST 11 is missing a skimmer from one side of the skimmer arm, replacement has been ordered.
  - PSTs 3 & 4 are under construction and expected to be completed by the end of November.
  - PST 10 is undergoing repairs / rehab, expected to be completed by the end of November.
  - PST 9 scum trough was clogged.
  - PST 6 is off-line, long-term, in need of repairs.
  - PST 1 is off-line for a weir replacement, expected to be complete in spring of 2024.
- Activated Sludge Plants (ASP) 2, 3, & 4,
  - DO Monitoring probes are in the process of being installed.
  - ASP 2 –
    - Not inspected during this visit.
  - ASP 3 –
    - Reactor 12 is off-line in need of repairs to the influent gate.
    - Reactor 16 is down due to an issue with rake arms in Clarifiers 16A & 16B.
    - Multiple clarifiers out-of-service. Planned upgrade to ASP 3 next year.
  - ASP 4 –
    - Not inspected during this visit.
- Denitrification (DNF) Building,
  - Operated by ProStart
  - No issues reported. All equipment on-line.

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- Sand Filtration Building,
  - 36 of the 48 sand filters are operational.
  - Filters 4, 18, 22, 28, 30, 35, 37, 40, 44, 45, 46, and 47 are out of service.
- Chlorination / Dichlorination / Outfalls,
  - No issues reported.
- Gravity Sludge Thickeners (GSTs),
  - GSTs 3 & 7 are in service.
  - GST 5 is on standby.
  - GST 2 is being converted from a holding tank to a mixing clarifier.
  - GST 4 is being used as a holding tank.
  - GST 6 and 8 are out of service.
  - GST 1 is out of service, working on pump repairs today.
- Gravity Belt Thickeners (GBTs),
  - 8 GBTs in total.
  - 3 are currently in service, #1, #3, and #5.
  - GBT #4 is operational and on standby.
  - GBT #7 & #8 are down due to a rotor / stator issue.
  - GBT #2 is out of service / down for repairs.
- Dissolved Air Flotation Units (DAFs),
  - 1 & 2 are in service.
  - 3 & 4 are out of service for repairs / refurbishment.
- Centrifuges,
  - Back River WWTP has four (4) centrifuges.
    - #2 and #3 are operating.
    - #1 is on standby.
    - #4 is being rebuilt.
  - Two (2) portable centrifuges are in place, on standby, not currently in operation.

#### Site Walkthrough:

After the opening conference, we toured the facility beginning with the headworks.

#### *Headworks*

Raw sewage enters the plant at the mechanical screen building where there are four (4) coarse screening units. Each unit is rated for flows up to 200 million gallons per day (MGD). During normal flows, one coarse screening unit is sufficient to treat the average daily flow. In general, they rotate which coarse screening unit is in operation every week.

Effluent from coarse screening flows into two (2) deep wet wells that are over 50 feet deep. The headworks influent pumping station has eight (8) lift pumps installed to pump the screened wastewater from the wet wells to the Fine Screening System. During periods of high flow, screened wastewater can be pumped to two (2) above ground storage tanks each with a capacity of 18 million gallons. The two tanks are connected by two 14- to 16-inch pipes near the top of the tanks to allow one to overflow into the other as needed.

The Fine Screening System features six (6) fine screening units rated for flows up to 100 MGD each. No issues were reported with the fine screening units.

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Effluent from the fine screening system travels to the Grit Removal System. Eight (8) grit channels equipped with traveling bridges remove grit from the fine-screened wastewater. Each grit channel and traveling bridge has an 80 MGD capacity. Under normal flow conditions, two grit channels are necessary for satisfactory grit removal. The traveling bridges move back and forth along the grit channel using a submersible pump / suction plate system to remove settled grit from the channels and transfer the grit to classifiers for further dewatering. The classified grit is then dried and transported off-site for disposal. No issues were reported with the grit removal system.

Odor control systems A, B, and C were reported to be in service with no issues.

### *Primary Settling*

Effluent from the Grit Removal System flows to a junction box then to the Primary Settling Tanks (PSTs). Primary Settling is the first stage of treatment where solids and sludge are allowed to settle by gravity and any floating scum or fats, oils, and grease (FOG) is removed. Generally, PSTs are designed to remove a large percentage of the total suspended solids (TSS) and reduce the biochemical oxygen demand (BOD) of the wastewater.

There are eleven (11) PSTs at the facility. During the site inspection, the following observations were made:

- PST 1 is undergoing a weir replacement project, expected to be complete in Spring 2024.
- PST 2 is in operation, no issues observed or reported.
- PST 3 & 4 are under construction and are expected to be completed by the end of November.
- PST 5 is operating as a flow through, there is an issue with the center ring, repair will begin after other PST repairs are completed – depends on capacity.
- PST 6 is out of service, long-term. The clarifier needs to be cleaned out and have a new center mount and catwalk installed, potentially next year.
- PST 7 is in service, no issues observed or reported.
- PST 8 is in service, no issues observed or reported.
- PST 9 is in service. The scum trough was observed to be clogged and not functional.
- PST 10 is undergoing repairs / rehab, expected to be completed by the end of November.
- PST 11 is in operation, it was observed as missing a skimmer from one side of the skimmer arm, replacement was reportedly ordered.



Image 01: PST #11, Missing skimmer flap.

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### *Sludge Handling / Processing*

GSTs 3 and 7 were in service. GST 5 is on standby. GSTs 6 and 8 are out of service with pump issues. GST 4 is being used as a holding tank. GST 2 is in the process of being converted to a mixing clarifier. GST 1 is out of service; pump repairs were reportedly in progress at the time of the site visit.

GBTs use gravity and a porous drainage belt to dewater and thicken sludge. The WWTP has 8 GBTs in total. This area was not inspected during this site visit. It was reported that GBTs #1, #3, and #5 were online and in service. GBT #4 is operational but on standby. GBT #7 and #8 are down due to rotor / stator issues. GBT #2 is out of service – down for repairs.

The WWTP has four (4) Dissolved Air Flotation Units (DAFs) installed. A DAF unit is designed to remove TSS, FOG, and BOD from wastewater. DAFs are ideal for processing particles and floc that are of neutral density, slow-settling, or buoyant. DAF 1 and 2 are in service. DAF 3 and 4 are drawn down and out of service for repairs / refurbishment.

From the GSTs, GBTs, and DAF units, sludge is transferred to sludge holding tanks #1 or #26 which are located near the centrifuge building and drying facility.

The facility has four (4) centrifuges in total, three (3) of which are operational. The fourth unit is down and in the process of being rebuilt. No issues were observed or reported.

### *Activated Sludge Plants (ASPs)*

Effluent from Primary Settling flows to a flow distribution building to one (1) of three (3) Activated Sludge Plants (ASPs) numbered 2, 3, and 4. The ASPs each contain six (6) biological reactors for nitrogen removal. ASPs 2 and 3 have a three-pass train designated A, B, and C for each reactor while ASP 4 is a two-pass system. There are twelve (12) secondary clarifiers associated with each ASP for a total of thirty-six (36) secondary clarifiers at the facility.

Only ASP #3 was observed during this inspection. Reactors 11, 13, 14, and 15 were observed to be on and in service. Reactor 12 was off and out of service due to repairs needed to the influent gate. Reactor 16 was out of service for repairs to the associated clarifiers.



Image 02: ASP 3, Reactor 14.

The secondary clarifiers associated with ASP #3 were observed during this inspection. The following observations were made on the clarifiers. Four (4) clarifiers were observed to be in service (Clarifiers 11B, 13B, 15B, and 15A). Clarifiers 16A, 16B, 14A, 14B, 12A, 12B, 11A, 13A, and 14A, were observed to be out of service or on standby. It was

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reported that the facility has a capital improvement project planned for the next year to take ASP #3 out of service for repairs and upgrades. It was reported that the capacity of ASP #4 and ASP #2 is enough to take ASP #3 offline long-term for improvements.

#### *Denitrification Filters (DNFs)*

At the DNF building, there are four filter quads with each quad containing 13 Tetra Denitrification Filters with a total of 52 filters. It was reported that all 52 filters were functional and in operation at the time of the site inspection. No issues were reported.

#### *Sand Filters*

The sand filters at the facility are used to polish the wastewater coming from the DNF building. There are 48 total filters. 36 filters were observed to be in service at the time of the site inspection. The leaking pipe observed during the last inspection was repaired.

#### *Chlorination / De-chlorination Facility and Final Outfalls*

The final effluent at the step aeration system was observed to be clear and without any noticeable foam, solids, or odor. No visible floating scum or solids were observed in the chlorine contact chambers at the facility. The temperature of the composite sampler for Outfall 001 was observed to be 5°C. The temperature of the composite sampler for Outfall 002 was observed to be 5°C.



Image 03: Step Aeration system, final effluent.

I reviewed the lab located at the Chlorination / De-chlorination Facility. All pH buffers were current. No violations were observed with the logbooks. Copies of the pH and DO calibration records were provided to me for review.

#### Closing Conference:

After the Chlorination / Dichlorination Facility, we returned to the administration building for an exit conference.

#### Records Review:

Following the site inspection, laboratory reports and calibration records were reviewed. DMRs for September 2023 were reviewed. No violations were observed in the DMR submission, pH, and DO calibration records. No violations were observed in the laboratory analysis reports.

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*Non-Compliance Report(s)*

On 10/13/2023, MDE received a report that a fresh water line broke on 10/12/2023. A 5-day report was received on 10/17/2023 and a follow-up, amended letter was received on 10/18/2023. The amended letter clarified that the release was not due to a broken fresh water line, but an overflow of the Pelletech flushing water pit from the Bethlehem Steel effluent discharge line (Outfall 002).

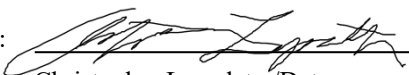
On 10/20/2023, MDE received a letter describing a stormwater overflow event that occurred on Tuesday, October 17, 2023 at 1:24 pm. It was reported that stormwater from the empty #2 Sludge Lagoon overflowed the sump pit near #1 Sludge Lagoon's westward side. The sump pit contains two (2) pumps which convey water into the #2 Elutriation Tank. It was determined that one of the pumps had become clogged and was not operating effectively. They estimated that 2,000 gallons of stormwater discharged from the pit into the storm drain entering a tributary to Bread and Cheese Creek. It was reported that the clogged pump was cleared and a broken line on the second pump was replaced. To prevent future occurrences, they reported that operators will be tasked with checking the sump pit area.

I reviewed the areas associated with the two non-compliance reports above, no violations were observed.

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 Back River 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:  11/26/23 Received by: \_\_\_\_\_  
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