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

Contact(s): Betty Jacobs – Back River WWTP
Ronald Turner – Back River WWTP
Rayford McEachern – Back River WWTP
Andrea Buie – Chief of ERCS, Baltimore City DPW
Scott Moffatt – Policy Analyst, Baltimore City DPW

NPDES Municipal Major Surface Water

Permit / Approval Numbers: 15DP0581
NPDES Numbers: MD0021555
Inspection Reason: Follow-up (Non-Compliance)
Site Status: Active
Compliance Status: Noncompliance
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

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.

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 1, 2, 7, 9, & 11 in service.
    - PST 8 is out of service, sludge pump went out today, will drain if unable to repair today.
    - 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 end of November.
    - PST 5 is being used as flowthrough.
    - PST 9 sludge trough was clogged.
    - PST 6 is off-line, long-term, in need of repairs.

- Activated Sludge Plants (ASP) 2, 3, & 4,
    - ASP 2 –
        - Reactors 6 & 9 are out of service.
        - Clarifier 10B, not in service, used for backwash.
        - Clarifier 6A & 6B, 9B, off-line.
    - ASP 3 –
        - Reactor 13 is off-line because two mixers are broken.
        - Reactor 16 is down due to an issue with rake arms in Clarifiers 16A & 16B.
        - Clarifier 12B is out of service due to an issue with a bent rake arm.
        - Clarifier 13A has a bent rake arm.
        - Clarifier 14A missing skimmer arm.
    - ASP 4 –
        - All reactors and clarifiers are on-line.

- Denitrification (DNF) Building,
  - Operated by ProStart
  - No issues reported. All equipment on-line.

- Sand Filtration Building,
  - 36 of the 48 sand filters are operational.
  - Filters 6, 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 1, 3, & 5 are in service.
  - 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 with pump issues.
  - GST 7 is out of service in need of rewiring.

- Gravity Belt Thickeners (GBTs),
  - 8 GBTs in total.
  - 3 are currently in service, #1, #2, and #3.
  - GBT #6, #7, and #8 are operational and on standby.
  - GBT #4 in need of a scraper blade replacement.
  - GBT #5 is down long-term for a gearbox replacement.

- 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.
    - Three (3) are online and operating.
    - #4 is being rebuilt.
  - Two (2) portable centrifuges are in place, on standby, not currently in operation.

<u>Site Walkthrough:</u>

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.

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. Grit channel 5 was out of service for repairs. 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.

During this site inspection, we reviewed the equalization (EQ) tanks. The area around the EQ tanks were observed to be clean. The exterior walls of the EQ tanks were also clean. In discussions concerning the operation of the EQ tanks, the WWTP uses the EQ tanks to divert excess flow during periods of high flow normally associated with rain events.

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 in operation, no issues observed or reported.
- 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 which is scheduled to be repaired after PST 2 is back in service.
- 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 out of service, sludge pump went out today, will drain if unable to repair today.
- 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.

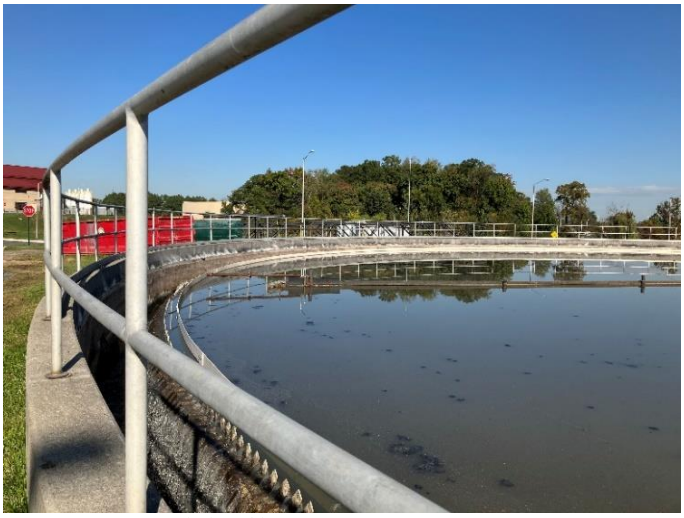

Image 01: PST #11, Missing skimmer.

Sludge Handling / Processing

GSTs 1, 3, and 5 were in service. GSTs 6 and 8 are out of service with pump issues. GST 7 is out of service due to a rewiring issue. GST 4 is being used as a holding tank. GST 2 is in the process of being converted to a mixing clarifier. No violations were observed or reported.

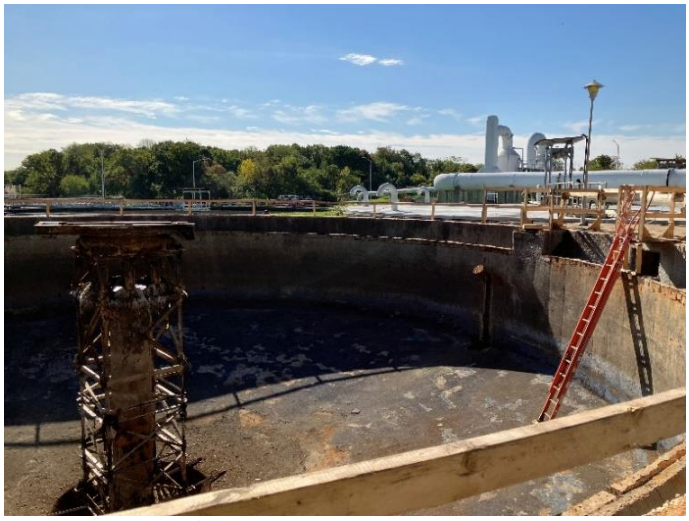

Image 02: GBT #2, Under construction.

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, #2, and #3 were online and in service. GBTs #6, #7, and #8 are operational but on standby. GBT #4 was down in need of a scraper blade replacement and GBT #5 is down long-term for a gearbox replacement.

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. Sludge levels in DAF 1 and 2 were observed to be normal. No issues were observed or reported.

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. Two (2) portable centrifuges provided by Synagro are located at the rear of the building and are on standby. On the day of the inspection, the centrifuges were not operating due to a low volume of sludge available for processing. 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 #4 was observed during this inspection. All treatment trains were in service. Vegetative growth was observed in small areas of the reactor trains, especially in the trough at Reactor 22 pass B. Vegetative growth should be removed from the treatment trains and the trains should be maintained free of vegetation in order to prevent the accumulation of sediment which could inhibit treatment processes.

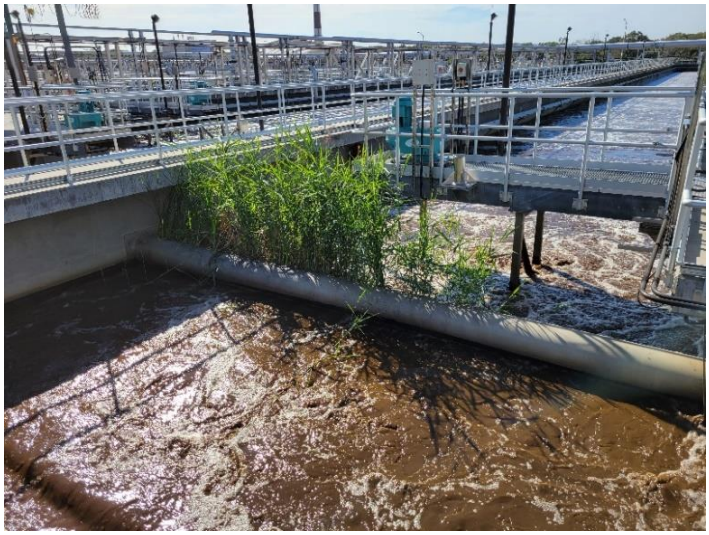

Image 03: ASP 4, Reactor 22, Pass B, Vegetative growth.

The twelve (12) secondary clarifiers associated with ASP #4 were observed during this inspection. The following observations were made on the clarifiers. The clarifiers were observed to be in good operating condition; however, many of the secondary clarifiers had significant vegetative growth particularly Clarifiers 22B and 22A. The vegetative growth should be removed from the secondary clarifiers and the clarifiers should be maintained free of vegetation.

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. A leak was observed in a water line between filters #34 and #36. Contractors were completing repairs in the facility at the time of the inspection. It was not known by those present if this leak was part of the repairs; however, it was reported that the leak would be repaired by the end of the day.

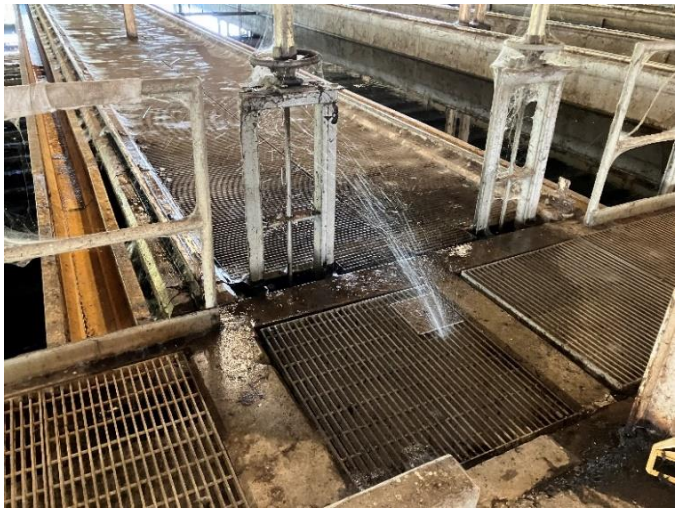

Image 04: Sand Filters, Leak between filters #34 and #36.

Chlorination / Dichlorination 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 4°C.

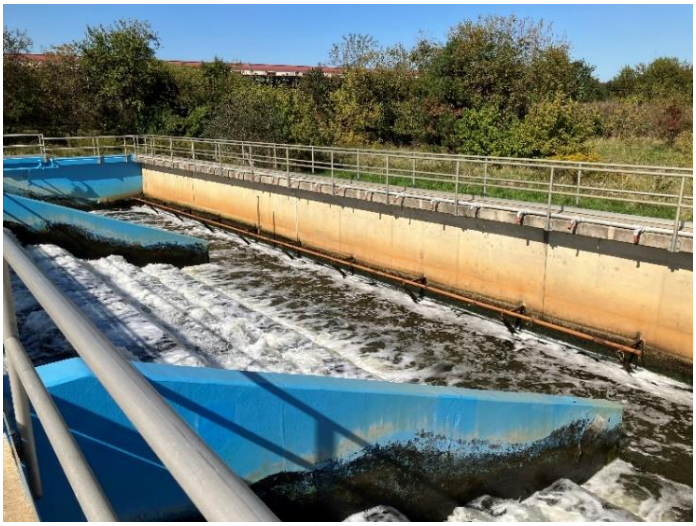

Image 05: Step Aeration system, final effluent.

I reviewed the lab located at the Chlorination / Dichlorination 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 August 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.

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). Below is an excerpt from the letter.

“The pit was overflowing and causing the water to travel through the gravel underground. This overflow gave the appearance of the water line breakage. After the determination was confirmed, at 1:30pm the gate to the flushing water pit was closed causing the water to stop. The event lasted approximately 5 days. During this event period, the water pooled in the parking lot and roadway near the rapid sludge area of the plant. Since the leakage was an underground event, it was difficult to determine the amount, but it is estimated that 1,500 gallons per day, approximately 9,000 gallons total for the period of the leak, escaped from the pit. An unknown amount of the discharge flowed through the road culvert crossing into a forested area.”

It was reported that they are continuing to investigate the ultimate cause of the overflow using the Root Cause Analysis (RCA) procedure.

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.

These areas will be reviewed during the next inspection.

Violation(s):

With respect to the above authorization, the following violations of Environment Article Title 9 by Baltimore City DPW were observed on this date with corrections needed immediately:

1. Crucial equipment maintenance and repairs are not being performed by the Back River WWTP at the level necessary to efficiently operate and maintain the treatment works as detailed in this report. The Back River WWTP has failed to provide enough qualified staff to adequately operate and maintain the WWTP. This is a violation of General Condition B3a and b of the NPDES permit, which specifies the following:
    a. Facilities shall be operated efficiently to minimize upsets and discharges of excessive pollutants.
    b. The permittee shall provide an adequate operating staff qualified to carry out operation, maintenance, and testing functions required to ensure compliance with this permit.

    CORRECTION: The Back River WWTP should immediately comply with the requirements under General Condition B3 of the NPDES permit and adequately operate and maintain the treatment works.

2. There has not been adequate long-term planning for staff replacement and system upgrades and changes at the Back River WWTP. A staffing plan is necessary to determine the gap between current staffing levels and required levels to comply with General Condition B3a and b of the NPDES permit. **CORRECTION: The Back River WWTP should immediately submit to the Department a comprehensive staffing plan. The plan should be implemented by the date of submission to the Department to ensure that there is sufficient staff to comply with the requirements of General Condition B3b of the NPDES permit.**

3. The DO monitoring probes used to continuously monitor DO in the biological reactors are not functional. The DO monitoring probes and other associated equipment have been ordered and Back River WWTP staff are waiting for parts. The parts are expected to ship on 10/25/2023. It was reported that the installation would be coordinated once the parts arrive. **CORRECTION: The Back River WWTP should keep the Department informed monthly on the status of the replacement of the DO sensors and associated equipment necessary to automatically monitor and control DO in the reactors at the activated sludge plants. All equipment necessary for treatment should be kept in satisfactory condition in order to comply with the requirements of General Condition B3 of the NPDES permit.**

4. The scum trough on PST #9 was clogged with scum. This is a violation of General Condition B3 of the NPDES permit. **CORRECTION: The Back River WWTP should maintain the PSTs and Clarifiers as required to keep them functioning properly to comply with the requirements under General Condition B3 of the NPDES permit. The scum troughs should be cleared and the pumps repaired or replaced as needed.**

5. Significant vegetation growth was observed in ASP #4 Clarifiers #22A and #22B. Excessive vegetation growth can negatively affect a clarifier's performance and efficiency for wastewater treatment. This is a violation of General Condition B3 of the NPDES permit. **CORRECTION: All vegetation should be removed from the secondary clarifiers and routine maintenance should be performed to prevent the recurrence of the problem to minimize upsets and discharges of excessive pollutants as required under General Condition B3 a and b of the permit.**

Monthly inspections will continue.

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 frame above, you should continue to advise the Inspector, at least every 30 days, of the status of the measures taken to complete the corrective actions. If you have any questions, need assistance, or to request a re-inspection, please contact this Inspector by phone, 410-537-3521, or email, christopher.lepadatu@maryland.gov.

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.

Inspector: 10/25/2023

Christopher Lepadatu /Date
christopher.lepadatu@maryland.gov
410-537-3521

Received by: 11/7/2023

Signature/Date
Michael Hallmen

Print Name