

Maryland Department of Environment

Water and Science Administration Compliance Program 1800 Washington Blvd, Suite 420 Baltimore, MD 21230-1719 410- 537-3510, 1-800-633-6101

Inspector:	Ronald Wicks
AI ID:	8449
Site Name:	Back River WWTP
Facility Address:	8201 Eastern Ave, Baltimore, MD 21224
County:	Baltimore County
Start Date/Time:	December 14, 2022, 09:00 AM
End Date /Time:	December 21, 2022, 06:02 PM
Complaint Number: Media Type(s):	NPDES Municipal Major Surface Water
Contact(s): Ronald Turner Betty Jacobs Andrea Buie-	

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: Noncompliance Recommended Action: Continue Routine Investigation Evidence Collected: Photos or Videos Taken, Visual Observation Delivery Method: Email Weather: Clear Average

Inspection Findings:

Branum

The Back River Wastewater Treatment Plant (WWTP) is an activated sludge process sewage treatment plant with biological nutrient removal by Modified Ludzack-Ettinger process, ferric chloride for phosphorus removal, denitrification filters for enhance nutrient removal (ENR), sand filters, chlorination, and dechlorination. The flow is split at a junction box and the larger portion of the flow goes to Outfall 001 to the Back River via cascading outfall and the remaining portion of about 20 MGD goes to 002, which is further chlorinated and sent to Tradepoint Atlantic.

The facility's activity code or standard industrial classification (SIC) is 4952 and the North American Industry Classification System (NAICS) is 2213. The receiving water is the Back River for Outfall 001, which is protected for Use II, water contact recreation and the protection of aquatic life and Outfall 002 discharges to the Bear Creek and the Patapsco River also protected for Use II waters.

On December 14, 2022, a follow up compliance evaluation inspection was conducted at the Back River WWTP. I was joined by Yen-Der Cheng Chief, Municipal Surface Discharge Division, Wastewater Pollution Prevention & Reclamation Program (WPPRP) at the Maryland Department of the Environment (MDE/Department) and other members of this program who accompanied me during parts of the site review and opening conference with the facility representatives.

We met Ronald Turner, Plant Manager, Betty Jacobs, Assistant Manager, Rayford McEachern Operation Engineer, and Dan Latova, Operations Engineer, representing the Back River WWTP. I began the inspection with an opening conference where I outlined my plans for this inspection and obtain specific details regarding the treatment processes listed below:

- Headworks (fine and coarse screening and grit removal system)
- Primary settling tanks (PST)
- Reactors
- Secondary clarifiers
- Denitrification filters (DNF)
- Sand filters
- Solids Management

Below is a brief summary of the discussions that occurred during the opening conference:

Headworks

There have been complications with ventilation and the biological wet odor scrubber system in the headworks building that prevented satisfactory control and removal of hydrogen sulfide (H₂S) in the headworks building, The H₂S corroded the silver and copper circuit parts. The ambient concentration of H2S in the headworks building affected electrical conductors and current carrying parts. An independent contractor, ProStart, is currently managing the headworks. Turner contacted Bill Farrell, ProStart manager, who joined the opening conference. Farrell told us that the odor control systems were online and the H₂S sensors are now connected to the SCADA system. Farrell further stated that the H₂S levels were below OSHA standards 20 PPM (parts per million), however H₂S levels are detectable at PPB (parts per billion) levels. The headworks has 3 odor control systems designated A, B and C, however; currently only odor control systems A and B are functional. System C is not functional and according to the Back River WWTP, there are supply chain issues obtaining the parts necessary to make the repairs. I requested that the Back River WWTP provide to the Department the results for ambient air monitoring at the headworks for lower explosive limits (LEL), oxygen (O₂) and H₂S for the 4th quarters of 2022. Turner agreed to supply these results.

PSTs

On the day of this inspection, 3 of the 11 PSTs are functioning. There have been odor problems associated with one of the PSTs (PST #5). PST #5 is being cleaned and currently the cleaning is almost completed. I discussed the status of the cleaning with Turner during the opening conference. According to Turner, they are almost finished with the cleaning of PST #5 and the cleaning would be completed by the weekend (12/17 -12/18/22). However, I learned later after this inspection that the cleaning was not performed. On the day after this inspection, 12/15/22, a rain event caused an increased volume of flow into the plant. PST #5 was used as a flow-through tank to mitigate the bottleneck at the primary settling process due to an insufficient number of active PSTs. Once the incoming flows are down, the Back River WWTP will drain #5 PST and the cleaning of the tank will continue.

Next, we discussed PST #7, which is scheduled to come online shortly. Turner informed us that the skimmer arm is uneven, the scum trough is at the wrong level and the stilling well is not level. He further stated that they expect PST #7 to come online sometime in January 2023. After this inspection, on 12/21/22, I was notified that the repairs have been made to PST #7 and it will be coming online possibly on 12/22/22. Once online, there will be 4 active PST's. In addition, Turner informed me that PST #9, which has also been used as a flow-through tank is next in line for cleaning and refurbishing.

Activated Sludge Plants

During previous inspection, I observed that some of the mixers in the biological reactors and clarifiers were either not functioning or barely turning at Activated Sludge Plants #2 and #3. The mixers in these areas require maintenance. Some of the mixers in the reactors were not functioning as designed because rags were wound around the mixer shafts impeding operation and the many of the reactor basins need to be cleaned of solids and vegetation. During my discussion with Turner, he informed me that Badger, an independent contractor, is scheduled to remove the vegetation from the reactors. During previous inspections, I observed that many of the mixers were not functioning due to various reasons. I was informed that at the Activated Sludge Plant 2 there were 12 mixers that were out of service, 19 out of service. Today, according to Turner, there are no changes to the status of the condition of the mixers. The Back River WWTP shall continue to keep the Department informed on the status of the mixers.

Secondary Clarifiers

Routine maintenance is not being implemented at the level necessary for satisfactory performance of crucial treatment equipment. During the last inspection only 2 of the 17 secondary clarifiers evaluated had no visible issues. The skimmer arms on several of the clarifiers were missing skimming blades. The scum troughs on many of the clarifiers in operation were clogged, requiring routine maintenance. Because of the blockage, the skimming systems are ineffective in performing their designated function of removing FOG and other floating scum and solids. In addition, phragmites, algae and other types of vegetation were growing around and, on the weirs, blocking

flow causing short circuiting of the weirs. This problem has been reported during previous inspections. Therefore, the majority of the secondary clarifiers were not functioning as designed. I asked Turner about the status of the repairs made to the secondary clarifiers. during the opening conference. Today according to Turner, Badger has cleared vegetation and algae from some of the clarifiers but not all of the clarifiers have been serviced. Turner further stated that it has been a difficult task in removing the vegetation and in some cases the weirs have been damaged during the removal of the vegetation due to the vigorous growth. The root systems and vegetation are intertwined in the equipment making it difficult to remove without damaging the equipment. The Back River WWTP shall continue to keep the Department informed on the status of the vegetation removal and cleaning of the scum troughs.

DNF

The DNFs are also managed by ProStart. There was an electrical issue with Quad 2 that caused a problem earlier in the year. Currently Quad 2 is functioning on a temporary power system. During the opening conference, I asked Farrell, ProStart Manager, when permanent power would be installed to Quad 2. Farrell informed me that Quad 2 is functioning satisfactorily using the temporary power supply, and it is up to Baltimore DPW to make the decision to connect a permanent power supply to Quad 2.

Site Review

Next, I conducted a site review beginning at the headworks accompanied by MDE WPPRP staff and Charmayne Payton and Dana Garris Certified Wastewater Operators at the Back River WWTP. There we met Anthony De Giacomo, who led us on the tour through the headworks.

Sewage enters the plant at the mechanical screen building where there are four course screening units. There was one unit in service during this inspection. According to De Giacomo, one coarse screening unit is online now a second unit will be automatically activated when the flow reaches 180 million gallons.

The coarse screened sewage flows from the coarse screens to the deep wet wells. There are two deep wet wells that are over 50 feet deep that receive wastewater from the Coarse Screening units. Wastewater travels from the deep wet wells through suction pipes that draw water into the Headworks Influent Pumping Station. The influent headworks pump station has 8 lift pumps. The lift pumps are used to pump the screened sewage from the wet wells to the fine screening system. During this inspection, two of the lift pumps were being used.

During the previous inspection of the coarse screen system, I observed that there was an excessive amount of rags and trash coiled around the racks. At that time, the cutter was not functioning, and the coarse screening units had not been cleaned since the last rain event. During this inspection, no problems were observed with the active coarse screening unit.

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12/14/22 Inside of the functioning coarse screening unit. No problems observed.



12/14/22 Picture shows Pumps #1-4. Today, 2 were being used for the headworks operation. Pumps #1- #4 have pumping capacities of 100 MGD each and pumps #5 - #8 (not shown) have pumping capacities of 120 MGD each.

The headworks is equipped with six fine screening units with a processing flow rate of up to 100 MGD each. The fine screened sewage then travels to the grit removal system. The fine screening units that were checked and appeared to be functioning satisfactorily.

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12/14/22 Fine screening unit in service.

Travelling Bridges remove grit from the waste stream, and this is done at the rectangular tanks. The bridges travel back and forth using submersible pump/suction plate systems, that continuously removes settled grit from the tanks and transfers the grit to the grit dewatering processes consisting of spinning classifiers. The classified grit is dried and then sent off-site for disposal. The sewage flows from the grit removal system to a junction box and then to the PSTs. There are 8 traveling bridges and each is connected to a grit unit. According to De Giacomo bridges #1- #4 are online today with the remaining 4 on standby. The corresponding #1- #4 grit units were online as well.

Before leaving the headworks, we went to the control room to speak with the control room operator. According to the operator, the headworks can handle flows up to 400 MGD. However, bottlenecks downstream, may be an issue with high flows. I questioned the operator about the status of the odor control system. He informed me that he was not involved with the project. He did inform me that only 2 of the 3 odor control systems were online as previously mentioned in this report. There are 3 odor control systems designated A, B and C. Odor control system C was not online because some of the components for the system are not functioning.

Primary Settling Tanks (PST)

Next, area of evaluation was at the PSTs. Today, there were 3 PSTs in operation (#1, #8 and #11) out of the 11 PSTs at the site. PST# 7 is currently being refurbished by GMH and is scheduled to

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be the next PST to come online sometime next month. The issues with PST #7 are detailed above in the opening conference. During my evaluation of PSTs #1, #8 and #11, I found problems with the skimming system on PSTs #1 and #8. The scum collection troughs on both PST #1 and PST#8 were clogged with FOG and floating scum. The scum pit and collection trough must be cleaned out to prevent possible equipment issues and clogging of pipes further downstream.

During the inspection of PST #1, I observed that the sludge blanket was above an acceptable level for this unit. There was a floating layer of sludge and scum that was covering the surface of the water. Solids were floating on the surface and overflowing the weirs sending the solids downstream to the next treatment stage.

The primary settling is the first stage of treatment after the removal of trash and grit in the headworks building. The PSTs are designed to settle and remove the solids or sewage sludge from the wastewater by gravity and remove the floating scum and fats oil and grease (FOG). Typically, PSTs are designed to remove a large percentage of the total suspended solids (TSS) and reduce the biochemical oxygen demand (BOD₅) of the wastewater. Therefore, it is important to maintain the PSTs in good condition at all times.



12/14/22 PST #8 scum collection trough filled. The scum pit requires cleaning.



12/14/22 PST #1 shows heavy scum layer on the surface along with floating solids.

As previously reported, I observed that PSTs #8 and #11 were both operational. However, they must treat solids or sludge loads beyond their capacity. The Back River WWTP must consider this load when determining and conducting routine preventative maintenance tasks and tank cleanings.



12/14/22 PST #1 solid masses overflowing the weir

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12/14/22 PST #1 scum collection trough clogged. Scum pit requires cleaning

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12/14/22 PST #1 another view of scum trough

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12/14/22 PST #5 is in the process of being cleaned. There is still some sludge remaining with a septic odor. This PST was used on the following day, 12/15/22, as a flow through tank due to a rain event that caused a hydraulic overload.

Next, we traveled to the next stage of treatment, Activated Sludge Plant #4. After primary settling, the wastewater flows to the flow distribution building and from there the wastewater flows to the Activated Sludge Plants #2, #3 and #4 containing a series of biological reactors for nitrogen removal. Each plant has six reactors. Activated Sludge Plants #2 and #3 have a three-pass train designated A, B and C for each reactor and #4 is a two-pass system. Activated Sludge Plant # 4 is a newly constructed addition to the secondary biological treatment. Construction was initiated during the ENR upgrades to the Back River WWTP covered under Contract 882 of the previous consent agreement. Each Activated Sludge Plant has 6 secondary clarifiers for settling and scum removal.

During the next phase of this evaluation, I inspected the Activated Sludge Plant #3. Reactor # 6 was drained and offline for repairs. The problems previously observed and reported are still an issue. The reactors tanks require maintenance. Some of the mixers in the reactors were not functioning as designed because rags were wound around the mixer shafts impeding operation and the many of the reactor basins need to be cleaned of solids.



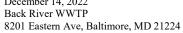
12/14/22 Activated Sludge Plant 3 – Secondary clarifier 16A out of service due to broken mixer



12/14/22 16 A broken mixer- The mixer fell off the assembly and cracked.

Denitrification Filters (DNF)

The next stop in the site review was the DNF building. The DNF are being maintained by an independent contractor, ProStart. Baltimore City has a contract with ProStart to operate and maintain the DNF system. There are four filter quads, and each quad contains 13 Tetra Dentification Filters with 52 total filters. Initially, I went to the control room to discuss the operation with the operator. There, I met Ed Williams, the control room operator. Williams informed me that there were no immediate problems and 51 of the 52 filters were online. He further stated that filter #11 on Quad 3 was not functioning due to a control issue with the air valve for the filters. I inspected the filters and observed no visible issues. Based on my observations 51 of the filters were online. The filters were in better condition than observed during my 8/16/22 inspection where I found problems with the operation of many of the filters.





12/14/22 DNF during a "bump" cycle used to release nitrogen gas trapped in the filter causing temporary foaming during the process.

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12/14/22 effluent clear well for the DNF. There is some foaming due to microbiological activity

Chlorine Contact Chambers (CCC)

After leaving the DNF building, I traveled to the chlorine contact chambers. The Back River WWTP installed floating booms upstream of the final overflow at the request of the Department to prevent floating scum and solids from discharging. The booms were all in place and there was no evidence of floating material breaching the booms during this evaluation.

Next, I inspected the final effluent at the step aeration system and at the sampling station. During an evaluation of the final effluent, I observed that the effluent was clear with no visible particulates. During the last inspection, I observed that the sample collection trough on the automatic sampler needed to be cleaned. Today, I found that the sampler had been cleaned and was in better condition than I found previously.

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12/14/22 The floating boom at the left channel CCC used to prevent floating solids from entering the final discharge canal.

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12/14/22 Final effluent at the step aeration discharge configuration

After the site review, I met Turner, Jacobs, McEachern and Latova for an exit conference to discuss my findings. We were joined by Andrea Buie-Branam, Chief, Environmental Regulatory Compliance. Below is a list of the main concerns from today's observations.

- 1. High sludge blanket at PST #1
- 2. Scum pits at PST #1 and #8 require pumping out
- 3. Remaining sludge in PST#5

I recommended that the Back River WWTP waste more of the sludge from PST #1 to reduce the sludge blanket to an acceptable level. According to Turner, their goal is 3 feet or less, however currently they are not able to process additional sludge. He further stated that they are currently running 4 of the 8 gravity belt thickeners (GBTs) and 4 is the minimal needed, however 6 would be better.

During our discussing regarding solids processing, I asked Turner about the status of Centrifuge #4 that was recently refurbished by the manufacturer, Flottweg, located in Germany. According to

Turner, there is still a mechanical issue due to problems with the shaft on the centrifuge and the Back River WWTP is having problems communicating with Flottweg.

I discussed the problem with the scum pits and was informed that resources have been allocated to address these issues.

Since there has been an odor problem associated with PST#5, I asked Turner why the cleaning of PST #5 had not been completed. According to Turner, the cleaning of PST #9 took priority over the cleaning of PST#5, but it is now next on the list to be cleaned. As of 12/21/22, PST #5 has not been cleaned and according to the MES daily report for 12/21/22, PST #5 is still full of raw sewage from the last storm event, and it appears that there is a thicker sludge layer forming on the surface of the water in PST #5 since an inspection two days earlier.

The following violations were observed under Environment Article Title 9 for the Back River WWTP:

- 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. The PST scum troughs and pits require cleaning. 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:
 - Facilities shall be operated efficiently to minimize upsets and discharges of excessive pollutants.
 - The permittee shall provide an adequate operating staff qualified to carry out operation, maintenance and testing functions required to ensure compliance with this permit.
- 2. The Back River WWTP has not provided adequate records and monitoring data to confirm satisfactory air quality at the headworks building.
- 3. Excess solids are being discharged from PST #1 due to a high sludge blanket. Sludge is not being processed at the quantity necessary to maintain PST sludge blankets at an acceptable level. This is a violation of General Condition B3 a and b of the NPDES permit.
- 4. The scum troughs on PST #1 and #8 are clogged with scum and require routine maintenance. This is a violation of General Condition B3 of the NPDES permit. This condition has been observed and reported during previous inspections.
- 5. An independent contractor has cleared vegetation and algae from some of the secondary clarifiers, but the vegetation has not been removed from all of the clarifiers and weirs. Therefore, not all of the secondary clarifiers are functioning as designed for optimal and efficient wastewater treatment. This is a violation of General Condition B3 of the NPDES permit.

6. The Back River WWTP has not completed the cleaning of the sludge from PST #5, which has been responsible for citizen odors complaints.

To bring this site into compliance with Environment Article Title 9, the Back River WWTP shall make the following corrections:

- **A.** With respect to item #1 above, the Back River WWTP shall immediately comply with the requirements under General Condition B3 of the NPDES permit and adequately operate and maintain the treatment works.
- B. With respect to item #2 above, within 15 days of the receipt of this report, the Back River WWTP shall provide to the Department the results for ambient air monitoring at the headworks for lower explosive limits (LEL), oxygen (O₂) and H₂S for the 4th quarters of 2022.
- **C.** With respect to item #3 above, to comply with the requirements under General Condition B3a of the permit, the Back River WWTP shall process sludge at the rate necessary to maintain the sludge blankets in the PSTs at acceptable levels. General Condition B3a, specifies that facilities shall be operated efficiently to minimize upsets and discharges of excessive pollutants.
- D. With respect to item #4 above, the Back River WWTP shall immediately maintain the PSTs as required to keep them functioning properly. Within 30 days of the receipt of this report, the scum pits shall be pumped out and the scum trough shall be cleaned. Going forward, the scum troughs on the PST shall be routinely inspected and the scum pits pumped out as necessary to keep the scum trough openings clear.
- **E.** With respect to item #5 above, all vegetation shall be removed from the secondary clarifiers and routine maintenance shall 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. The Back River WWTP shall continue to provide 30-day updates on the progress in achieving the goal of removing all vegetation from the secondary clarifiers and reactors.
- **F.** With respect to item #6 above, the Back River WWTP shall complete the cleaning of the sludge from PST #5.

STATE LAW PROVIDES FOR PENALTIES FOR VIOLATIONS OF MARYLAND

ENVIRONMENT ARTICLE TITLE 9 FOR EACH DAY THE VIOLATION CONTINUES. THE DEPARTMENT MAY SEEK PENALTIES FOR THE AFOREMENTIONED VIOLATIONS OF TITLE 9 ON THIS SITE FOR EACH DAY THE VIOLATION CONTINUES.

Inspection Item	Status	Comments
Does the facility have a discharge permit?	No Violations Observed	
Is the discharge permit current?	No Violations Observed	
If the permit is not current, has facility applied for renewal?	No Violations Observed	
Does the facility operate as authorized by their current permit?	No Violations Observed	
Has the Permitee exceeded the permitted capacity of the WWTP?	No Violations Observed	
Is the number and location of discharge points as described in the	No Violations Observed	
discharge permit?		
Has permittee submitted correct name and address of receiving	No Violations Observed	
waters?		
Is the permittee meeting the compliance schedule per permit	No Violations Observed	
requirements?		
Has the operator or superintendent been certified by the Board in	No Violations Observed	
the appropriate classification for the facility?		
Has the permittee submitted the monitoring results on the proper	No Violations Observed	
Discharge Monitoring Report form?		
Is the facility being properly operated and maintained including:(a)	Out of Compliance	See narrative
stand-by power or equivalent provisions available, (b) adequate		
alarm system for power or equipment failure available, (c) all		
treatments units are in service,		
Is sewage sludge managed correctly per permit requirements?	No Violations Observed	
If a by-pass occurred since last inspection, has the permittee	No Violations Observed	
submitted notice of the by-pass within the allotted time?		
If a non-complying discharge occurred since the last inspection,	No Violations Observed	
was the regulatory agency notified within the allotted time?		
If applicable, has the permitee complied with all special conditions	Out of Compliance	See previous reports and
of their permit?		narrative in the report
Are discharge monitoring points adequate for representative	No Violations Observed	
sampling?		
Do parameters and sampling frequency meet the minimum	No Violations Observed	
requirements?		
Does the permittee use the method of sample collection required by	No Violations Observed	
the permit?		
Are analytical testing procedures used approved by EPA?	No Violations Observed	
If alternate analytical procedures are being used, has proper	No Violations Observed	
approval been obtained?		
Has the permittee notified the Department of the name and address	No Violations Observed	
of the commercial laboratory?		

NPDES Municipal Major Surface Water - Inspection Checklist

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Inspection Item	Status	Comments
Were discharges observed at the authorized outfalls?	No Violations Observed	
If discharges were observed, do the discharges or receiving waters	No Violations Observed	
have any visible pollutants observed?		
Does this facility have coverage under a NPDES stormwater	No Violations Observed	
discharge permit?		
Are the permit conditions being met?	Out of Compliance	See narrative

Inspector:

Royald Wicks 12/21/22

Ron Wicks /Date ron.wicks@maryland.gov 410-537-3510 Received by:

Signature/Date

Print Name

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NPDES Municipal Major Surface Water - Inspection Checklist

Inspection Item	Status	Comments
Were discharges observed at the authorized outfalls?	No Violations Observed	
If discharges were observed, do the discharges or receiving waters have any visible pollutants observed?	No Violations Observed	
Does this facility have coverage under a NPDES stormwater discharge permit?	No Violations Observed	
Are the permit conditions being met?	Out of Compliance	See narrative

Inspector: Royald Wichs 12/21/22

Received by:

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Signature/Date

Print Name

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