



REGION 3

PHILADELPHIA, PA 19103

Report Title: Clean Water Act Compliance Inspection Report
Inspection Dates: 09/25/2023 _To_ 09/26/2023
Regulatory Program: National Pollutant Discharge Elimination System (NPDES)
Type of Activity: NPDES Compliance Inspection
Site/Facility Name: Smithsonian Environmental Research Center
Permittee: Smithsonian Institution
Site/Facility Operator: Smithsonian Institution
Site/Facility Address: 647 Contees Wharf Road,
Edgewater, MD 21037
Latitude: 38.890147 **Longitude:** -76.548991
County/Parish: Anne Arundel
Permit Numbers: MD3562B06/20DP3562 and MD0070327/18DP3639
NAICS Code: 541715 **SIC:** 0921, 8733
Unique Project #: 3E23WN113A

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I. Introduction

On September 25 and 26, 2023, an inspection team composed of a staff person from the U.S. Environmental Protection Agency (EPA) Region 3, a contractor for the EPA, and an inspector from the Maryland Department of the Environment (MDE) (hereinafter, “EPA Inspection Team”) conducted a National Pollutant Discharge Elimination System (NPDES) Compliance Inspection of the Smithsonian Environmental Research Center (SERC) facility (hereinafter, “the facility”). The purpose of the inspection was to observe compliance with the Clean Water Act (CWA) and to verify compliance with the facility’s National Pollutant Discharge Elimination System (NPDES) Permits [Permit No. MD3562B06/20DP3562 (hereinafter, the “Municipal Groundwater Discharge Permit”) and Permit No. MD0070327/18DP3639 (hereinafter, the “Wet Lab Discharge Permit”)] and applicable State and Federal regulations.

A. Inspection Opening Conference

The EPA Inspection Team arrived at the facility on September 25 at about 1:00 PM for the inspection. The inspectors met with the following facility representatives:

Table 1: Inspection Attendee List

Name	Affiliation	Telephone	Email
EPA Region III Inspectors and Contractors			
Monica Crosby	EPA Region III	410-305-2930	crosby.monica@epa.gov
Michael Prescott	Abt Associates Consultant	703-727-7517	Mkprescott7@gmail.com
Facility Representatives			
Jacob Bradd	SERC	443-482-2319	braddj@si.edu
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Keira Heggie	SERC	443-482-2280	
Chandra Singh	Singh Operational Services Inc.	717-278-5315	
Chris Gee	Singh Operational Services Inc.	717-314-8553	
State or County Representatives			

Christopher Lepadata	MDE	717-503-9002	
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Monica Crosby and Michael Prescott displayed their credentials to the facility representatives at the outset of the inspection, and explained the purpose of the inspection was to observe compliance with the facility's two CWA Permits. Copies of the Permits are provided in Attachment 1. The EPA Inspection Team informed the facility representatives that any information that the Facility deemed to be confidential business information (CBI) should be identified to EPA representatives during the inspection and it would be handled as CBI according to EPA's CBI procedures.

Most of the facility representatives listed in the table above were present at the Opening Conference which then continued with introductions of all personnel and their responsibilities. Next, various representatives provided details on the activities and facilities at SERC and their procedures for complying with the two CWA Permits.

The staff for the contractor that operates the Domestic Sewage Wastewater Treatment System (WWTS) for the Municipal Groundwater Discharge, Singh Operational Services Inc. (SOS), also discussed past noncompliance/exceedances and problems with the WWTS. They then described the timeline and corrective actions that were taken over the last two years to try to get back into and maintain compliance.

The Team then went over the tentative schedule and plan for the inspection which extended into the next day (Tuesday, September 26), followed by requests for records and review of the records (which are discussed below in the Records Review section).

B. Weather and Precipitation Conditions

During both days of the inspection, the weather was cloudy and cool with a light drizzle of rain some of the time. National Oceanic and Atmospheric Administration (NOAA) National Weather Service precipitation data for the dates of the inspection and the 5 days prior are provided in Table 2 below:

Table 2. Precipitation Data

Station Name	Date	Precipitation Amount (inches) ¹
Annapolis 1.2 S.E., MD	9/20/23	0
Annapolis 1.2 S.E., MD	9/21/23	0

¹ Source: NOAA National Climatic Data Center (<http://www.ncdc.noaa.gov/>).

Annapolis 1.2 S.E., MD	9/22/23	0
Annapolis 1.2 S.E., MD	9/23/23	.68
Annapolis 1.2 S.E., MD	9/24/23	.84
Annapolis 1.2 S.E., MD	9/25/23	.15
Annapolis 1.2 S.E., MD	9/26/23	.13

C. Summary of the Facility

The facility is a Smithsonian Institution facility that encompasses over 2,600 acres of land and includes historic and recreational facilities for visitors, as well as office, research, and laboratory activities, in multiple buildings. There are also maintenance buildings, a WWTS for domestic sewage, and large open areas with trails, meadows, and wetlands.

II. Site Activity

According to the SERC Wet Lab Guide, the facility is a Smithsonian Institution facility that encompasses over 2,600 acres of land along the Rhode River, a sub-estuary of the Chesapeake Bay. Researchers at SERC have access to Wet Lab facilities for their experiments and may conduct fieldwork along the coastal, marsh, and aquatic habitats of the Rhode River. The facility includes historic and recreational facilities for visitors, as well as office, research, and laboratory activities, in multiple buildings. There are also maintenance buildings, a WWTS for domestic sewage, and large open areas with trails, meadows, and wetlands.

Photographs were taken during the inspection by Michael Prescott and are provided in the Photograph Log in Attachment 2. During the inspection, the EPA Inspection Team observed many of the above buildings and areas and the discharges regulated by the two NPDES Permits. Permit No. MD3562B06 regulates discharges from the Facility's Domestic Sewage WWTS through Outfall 001A, absorption trenches, and Outfall 002A, effluent for reuse. Flow enters the WWTS via a dual pump lift station (Attachment 2, Photos 1 and 2). The flow then enters a distribution box for directing influent to treatment trains A, B, and C (Attachment 2, Photo 3). Each treatment train is composed of two (2) tanks that each have two (2) chambers (Attachment 2, Photos 4–7). The first tanks serve as an aerated holding tank. The first chamber of the second tank is equipped with a baffle wall (Attachment 2, Photo 6), and the second chamber serves as a settling basin (Attachment 2, Photo 7). Sludge is transferred to an aerated holding tank, which runs on an aeration schedule of 2-hours on, 2-hours off (Attachment 2, Photo 8). The WWTS is equipped with a chemical feed pump that feeds MicroC into each treatment train (Attachment 2, Photo 9). Treated wastewater is then pumped to the groundwater absorption trenches (Attachment 2, Photos 10 and 11).

Permit No. MD0070327 regulates discharge from the Facility's Wet Lab via Outfall 001 to Rhode River, a designated Use II water body under COMAR 26.08.02.02 protected for water contact recreation, fishing, aquatic life, wildlife, and support of shellfish harvesting. Influent is pumped from the Rhode River, where it passes through a strainer and fills two (2) headtanks. From the headtanks, water is fed into the Wet Lab's holding tanks, where aquaculture studies take place (Attachment 2, Photo 14). No chemicals are used. Flow is carried from the holding tanks to Outfall 001 via floor drains (Attachment 2, Photos 13-15).

The inspection observations were made pursuant to the requirements of the Permits. The observations from the inspection are described in detail below in the Observations section.

III. Records Review

Prior to the inspection, Ms. Crosby obtained the following documentation from MDE and forwarded it to Mr. Prescott for review:

1. Monthly Electronic Discharge Monitoring Reports (eDMRs) for January 2022 – August 2023.
2. Reports of WWTS effluent violations to the groundwater absorption trenches submitted by the WWTS contractor, SOS, for the months from March 2020 to May 2023 when there were violations.
3. Reports of MDE inspections on 3/3/21 and 10/18/21.
4. Correspondence, primarily emails, following up on the inspections conducted by MDE and the noncompliance identified by the facility.

Additionally, during the inspection the facility representatives provided the following documents:

1. Monthly eDMRs for January 2020 – August 2023 and associated lab reports.
2. WWTS Operation and Maintenance Manual.
3. WWTS Drawings and Standard Operating Procedures.
4. Wet Lab Guide.
5. Wet Lab Management Plan.
6. Wet Lab Activity Logs for 2021 – 2023.

Observations from review of these documents are provided below in the next section. Copies of the Permits are provided in Attachment 1.

IV. Observations

A. Municipal Groundwater Discharge Permit

Failure to Comply with Permit Effluent Limits

Part A1.3. of the Municipal Groundwater Discharge Permit states:

"A1. Wastewater Limitations – Outfall 001A

3. Prior to discharge to the absorption trenches, all wastewaters shall be treated to produce an effluent that does not exceed the following maximum limitations..." [listed in the Permit in Attachment 1].

Observation #1

The facility has had several exceedances of the Total Nitrogen (TN), Biochemical Oxygen Demand (BOD), and Total Suspended Solids (TSS) limits in the Permit as shown in the DMRs provided by the facility back to the beginning of 2020. Exceedances were also identified in the reports of effluent violations submitted to MDE by the WWTS contractor, SOS.

According to SOS representatives, there were various problems with the WWTS which caused exceedances of the permit limitations. Over the two-year period leading up to December 2021, they replaced the chemical feed pumps, the Programmable Logic Controller (PLC), and other parts and equipment. After all these changes were made, it then took about 6 months to fine tune the WWTS so that it was operating optimally. Consequently, the exceedances appeared to trail off after June 2022, except for the recent exceedance in May 2023 for TSS of 33.5 mg/l versus the limit of 30 mg/l.

Note: Mr. Bradd reported the facility has not and does not reuse the treated wastewater from the WWTS. The facility will be studying the feasibility of reusing the treated wastewater in the future.

Mr. Prescott also identified incorrect data reporting for Total Kjeldahl Nitrogen (TKN) for the months of December 2022, October 2022, and July 2023. The numbers reported in the DMRs did not match the analytical results from the lab.

Failure to Develop an Updated Manual of Operation and Maintenance

Part B.7 of the Municipal Groundwater Discharge Permit states:

"7. The Permittee shall develop a "Manual of Operation and Maintenance." The manual

shall clearly state how the entire treatment facility shall be managed to ensure satisfactory treatment and operation. The manual shall include:

- a. operating and maintenance procedures involving the sewage treatment facility and disposal trenches;
- b. testing procedures to determine acceptable maximum application rates and cycles;
- c. monitoring and sampling procedures as required in this permit; and
- d. personnel requirements.

The operator shall inspect and check the treatment facility and disposal trenches weekly to determine efficiency and adequacy of the system.

The manual shall be submitted to the Department for approval three (3) months after the issuance date of this permit.”

Observation #2

The facility did not develop an updated Operation and Maintenance (O&M) Manual for the WWTS and submit it three months after the current permit was issued. The O&M Manual provided by the facility was dated July 2009 and there have been many changes to the WWTS and its operation (see Attachment 3 for a copy of this O&M Manual). The O&M Manual does not describe the current WWTS and its operating and maintenance procedures, as well as the current sampling and monitoring procedures and personnel requirements.

B. Wet Lab Discharge Permit

Failure to Provide a Description of the Methodology Used to Estimate Flow

Part I.G. of the Wet Lab Discharge Permit states:

“G. FLOW MONITORING

In lieu of providing measured flow (defined under Special Conditions in section B above) at Outfall 001 the permittee may estimate flows and submit the following information when submitting the initial discharge monitoring report and/or upon any change in methodology:

1. A description of the methodology used to estimate flow at each outfall where flow measurement equipment is not present.

2. Documentation appropriate to the methodology utilized which provides information to support the validity of the reported flow estimate. If actual measurements or observations are made, a description of typical sampling times, locations, and persons performing the measurements/observations must also be provided.
3. A description of factors (e.g., batch discharges, intermittent operation, etc.) which caused flow at the outfall to fluctuate significantly from the previously provided estimate."

Observation #3

The facility does not measure the flow at Outfall 001; instead, the flow is estimated to meet the Permit's monitoring requirements. However, the facility did not provide a description of the methodology used to estimate the flow and the related documentation required by the Permit, as appropriate.

Failure to Maintain a Facility Management Plan

Part I.P. of the Wet Lab Discharge Permit states:

"P. AQUACULTURE CONSIDERATIONS

The permittee shall maintain a Facility Management Plan to address BMPs for aquaculture facilities, which must include, at a minimum, those outlined below. The initial plan shall be provided to the Department within 6 months of the effective date of this permit. Updated copies should be made available to Department personnel upon request.

1. Solids Control Management - The permittee shall employ efficient feed strategies that limit feed input to the minimum necessary to achieve production goals and sustain targeted rates of shellfish growth. The permittee shall identify and implement procedures to minimize discharge of accumulated solids to surface waters.
2. Structural Maintenance - The permittee shall routinely inspect and maintain the production and wastewater treatment systems and repair as needed.
3. Training - The permittee shall train staff on the proper operation and maintenance of production and wastewater treatment systems, and feeding procedures.
4. Recordkeeping - The permittee shall document in an organized format the feed amounts, discharge flow, cleaning, chemicals, inspections, maintenance, and repairs. Annually, by the end of the first quarter of the following year, the permittee shall compile a report of previous year's

information. This report shall be available on site for inspection by the Department. Specifically, the report shall contain the following details:

- a. Feed - The amount of feed used (in pounds).
- b. Flow - The annual average flow discharged via 001 (in gallons per day).
- c. Cleaning - The dates and brief descriptions of any cleaning done at the facility that might impact the discharge.
- d. Chemicals & Additives -
 - i. The name, usage dates, amounts used and a brief description of how and any chemicals or additives, that might end up in the discharge, were used.
 - ii. Give the total amounts used of each chemical and or additive.
- e. Inspections - The dates and a brief description of each inspection that might impact the discharge.
- f. Repairs & Maintenance - The dates and a brief description of any repair and/or maintenance performed that might impact the discharge.”

Observation #4

The facility did not maintain a Facility Management Plan that addressed all the permit requirements. Facility representatives provided a Wet Lab Management Plan (WLMP) and Activity Logs for 2021 - 2023 (see Attachment 4 for copies of these documents). The WLMP does not address requirements for Solids Control Management, nor does it address training staff on the proper O&M of the Wet Lab Systems and feeding procedures. The WLMP does cover some aspects of routine inspection and maintenance of the Wet Lab System, although the procedures could be more clearly detailed and organized.

For the Recordkeeping Section of the Facility Management Plan required by the Permit, facility staff provided Annual Activity Logs for 2021 – 2023 which were not part of the WLMP. These activity logs appear to list most of the details required by the Permit, except for the annual average flow discharged via 001 in gallons per day. However, the information in the Activity Logs could be better organized to provide the required information, per the Permit requirements for Recordkeeping to “document in an organized format the feed amounts, discharge flow, cleaning, chemicals, inspections, maintenance and repairs”.

V. Closing Conference

After the facility walk on September 26, the EPA Inspection Team met with the available facility representatives for a closing conference which included Mr. Bradd and Mr. Sparks. The EPA Inspection Team shared preliminary observations with the facility. The EPA Inspection Team

reiterated to the facility representatives that all preliminary observations discussed were not compliance determinations. Any and all preliminary observations shared were subject to further investigation by EPA upon the additional review of records and documentation. Additional observations may be contained in this inspection report that were not identified at the time of the closing conference after EPA reviewed additional materials following the inspection.

The inspection concluded at about 2:45 PM on September 26.

VI. List of Attachments

Attachment 1: Municipal Groundwater Discharge Permit and Wet Lab Discharge Permit

Attachment 2: Photograph Log

Attachment 3: Wastewater Treatment System Operation and Maintenance Manual

Attachment 4: Wet Lab Management Plan and Activity Logs