

2024 ANNUAL REPORT

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4)

Registration No. GSM000023

for

*Town of Waterford, CT
15 Rope Ferry Road
Waterford, CT 06385*



Prepared By:

**Barton
& Loguidice**

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Glastonbury, CT 06033
T: 860.633.8770
bartonandloguidice.com**



**Connecticut Department of
Energy & Environmental Protection**
Bureau of Materials Management & Compliance Assurance
Water Permitting & Enforcement Division

MS4 Annual Report Transmittal Form

For the General Permit to Discharge Stormwater from Small Municipal Separate Storm Sewer Systems (MS4)

Print or type unless otherwise noted. Please submit this completed transmittal form, fee, and the MS4 Annual Report as indicated at the end of this form.

CPPU USE ONLY

App #: _____

Doc #: _____

Check #: _____

Program: Stormwater Permits

Part I: Annual Report General Information

1. Reporting Period (Calendar Year): 2024
2. Provide the registration number for the existing general permit registration: GSM000023

3. Registrant Type (check one):	Fees
<input type="checkbox"/> state institution/agency	\$375.00 <u>713</u>
<input type="checkbox"/> federal institution/agency	\$375.00 <u>713</u>
<input checked="" type="checkbox"/> municipality	\$187.50 <u>713</u>

4. Municipality name or Municipality name where institution is located: Town of Waterford

The annual report will not be processed without the fee. The fee shall be non-refundable and shall be paid by check or money order to the Department of Energy and Environmental Protection (DEEP) or by such other method as the commissioner may allow.

Part II: Registrant Information

1. Registrant (Name of Municipality or State or Federal Institution/Agency): Town of Waterford

Mailing Address: 15 Rope Ferry Road

City/Town: Waterford

State: CT Zip Code: 06385

Business Phone: (860) 444-5834

ext.:

Contact Person: Gary Schneider

Phone: 860-444-5864 ext.

*E-mail: gschneider@waterfordct.org

*By providing this e-mail address you are agreeing to receive official correspondence from DEEP, at this electronic address, concerning the subject registration. Please remember to check your security settings to be sure you can receive e-mails from "ct.gov" addresses. Also, please notify DEEP if your e-mail address changes.

Part II: Registrant Information (continued)

2. Billing contact, if different than the registrant.

Name:

Mailing Address:

City/Town:

State:

Zip Code:

Business Phone:

ext.:

Contact Person:

Phone:

ext.

E-mail:

3. Primary contact for departmental correspondence and inquiries, if different than the registrant.

Name:

Mailing Address:

City/Town:

State:

Zip Code:

Business Phone:

ext.:

Contact Person:

Phone:

ext.

*E-mail:

*By providing this e-mail address you are agreeing to receive official correspondence from DEEP, at this electronic address, concerning the subject registration. Please remember to check your security settings to be sure you can receive e-mails from "ct.gov" addresses. Also, please notify DEEP if your e-mail address changes.

4. Engineer(s) or other consultant(s) employed or retained to assist in preparing the annual report.

Check here if additional sheets are necessary, and label and attach them to this sheet.

Name: **Barton & Loguidice, LLC**

Mailing Address: 855 Winding Brook Drive 2nd Floor

City/Town: Glastonbury

State: CT

Zip Code: 06333

Business Phone: 860-633-8770

ext.:

Contact Person: T.J. Therriault

Phone: 860-633-8770 ext.

E-mail: tjt@bartonandloguidice.com

Service Provided: **Report preparation**

5. Check here if there are adjacent towns or other entities with which implementation of the Stormwater Management Plan is coordinated for a portion of the subject MS4. If so, provide the names of such towns or entities: _____

Part III: Registrant Certification

The registrant and the individual(s) responsible for actually preparing the annual report must sign this part. [If the registrant is the preparer, please mark N/A in the spaces provided for the preparer.]

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief.

I certify that this annual report transmittal is on complete and accurate forms as prescribed by the commissioner without alteration of the text.

I certify that the following public notice requirements have been met.

Annual Report Availability: At least forty-five (45) days prior to submission of each Annual Report to DEEP, pursuant to Section 4(d)(3) of the MS4 General Permit, each permittee shall make available for public review and comment a draft copy of the complete Annual Report. Comments on the Annual Report may be made to the permittee and are *not* submitted to DEEP. Reasonable efforts to inform the public of this document shall be undertaken by the permittee. Such draft copies shall be made available electronically on the permittee's website for public inspection and copying, consistent with the federal and state Freedom of Information Acts, and shall be made available, at a minimum, at one of the following locations: the permittee's main office or other designated municipal or institution office, a local library or other central publicly available location. Following submission of the Annual Report to DEEP, a copy of the final report shall be made available for public inspection during regular business hours.

I understand that a false statement in the submitted information may be punishable as a criminal offense, in accordance with section 22a-6 of the General Statutes, pursuant to section 53a-157b of the General Statutes, and in accordance with any other applicable statute.

I also certify that the signature of the registrant, or a duly authorized representative, being submitted herewith complies with section 22a-430-3(b)(2)(B) of the Regulations of Connecticut State Agencies.



Signature of Chief Elected official or Principal Executive Officer



Date

Robert J. Brule

Printed Name of Chief Elected official or Principal Executive Officer



Signature of Preparer (if different than above)

T.J. Therriault - Barton & Loguidice, LLC

Printed Name of Preparer

First Selectman

Title (if applicable)

3/26/2025

Date

Associate

Title (if applicable)

Note: Please submit 1) this completed Transmittal Form and the Fee to:

CENTRAL PERMIT PROCESSING UNIT
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

2) a copy of this completed Transmittal Form and the Annual Report electronically to the following email address: DEEP.StormwaterStaff@ct.gov.

Refer to www.ct.gov/deep/municipalstormwater for information on Annual Report Templates or other additional information concerning the MS4 General Permit.

In the event that electronic submission is not available or possible, please contact the Stormwater Section at 860-424-3025.

MS4 General Permit

Town of Waterford 2024 Annual Report

Existing MS4 Permittee

Permit Number GSM000023

January 1, 2024 – December 31, 2024

Primary MS4 Contact: Gary J. Schneider; Director of Public Works; (860) 444-5864; gschneider@waterfordct.org

This report documents the Town of Waterford's efforts to comply with the conditions of the MS4 General Permit to the maximum extent practicable (MEP) from January 1, 2024 to December 31, 2024.

Executive Summary

Submission of this report by the Town Waterford maintains compliance with the reporting requirements and registration (no. GSM000023) under the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4), submitted to the State of Connecticut Department of Energy and Environmental Protection ('CT DEEP') Commissioner for activities located within the Town of Waterford. The Town of Waterford certifies by this report that the terms and conditions of the General Permit are being met to the maximum extent practicable (MEP).

The Town of Waterford, hired a Professional Engineering Consultant, Barton & Loguidice, LLC (B&L), who has completed much of the dry weather screening and sampling of the Town's existing and newly identified outfalls (428 municipally-owned, an increase from 376 in 2022). Through the efforts of B&L, the Town continues working toward the completion of all dry weather outfall Illicit Discharge Detection and Elimination (IDDE) screening and sampling, and wet weather impaired outfall sampling efforts for all of the municipally-owned outfalls identified in the Town to the MEP.

From 2021 through 2024, the Town made significant updates to the MS4 system mapping based on street map as-built drawings and field observations made by B&L. Through the field investigation process, large areas of the MS4 system that were previously mapped in GIS were identified as needing significant updates based on actual field conditions. These areas of the Town's system mapping were able to be resolved by adding missing structures and correcting piping to match the true conditions. B&L also identified several large areas in Waterford that were missing mapping entirely and meetings were conducted with the Waterford DPW to locate "as-built" drawings for the missing areas. This is a long and tedious process that exhausts a lot of resources but, large uncertain areas of the Town's system mapping were able to be resolved, missing structures added, and piping corrected to match the true conditions. B&L's efforts assisted in reducing the burden on the Town for mapping locations that could be resolved in the field allowing the Town to focus on other aspects of the MS4 permit. By performing the actions listed above, B&L located approximately 50 new outfalls in 2023 and 2024, including 14 new drop down catch basins (catch basins that discharge directly into a waterway with no other piping connected to the system). These newly identified outfalls have been updated in the databases and catchment ranking tables. In 2024, efforts will continue to be made to complete the delineation of the outfall catchment areas.

B&L's primary focus in 2023 and 2024 was to screen all new outfalls located from 2021 through 2024. B&L screened an additional 190 outfalls during dry weather events in 2023-2024. To date, dry weather screening and sampling efforts were completed at 416 (an increase from 403 in 2024) Town-owned outfalls and a total of

80 samples were collected. Seven outfalls sampled were identified with suspected illicit discharges and were ranked at the top of the high priority category for further investigations.

B&L initiated efforts on the 12 highest priority ranked outfalls for IDDE investigations. During these efforts, two catchments were screened completely, three catchments were partially screened, and seven catchments were unable to be completed because they were dry during the follow-up screening events. More attempts will be made for the incomplete investigations, most likely during the spring season of 2025, when the groundwater levels are higher.

In 2024, B&L continued sampling efforts during wet weather events. In 2024, three additional samples were collected and were identified with suspected illicit discharges. To date, wet weather screening and sampling efforts were completed at 34 of the 62 known impaired outfall locations. The initial number of suspected outfalls discharging to impaired waters was 29, which has been increased to 62 during the mapping updates. Of the 34 outfalls sampled, 24 were identified with suspected illicit discharges and were ranked at the top of the high priority category for further investigations. Due to the limited amount of qualifying storm events, issues experienced out in the field, and the fact that most of the outfalls are tidally influenced, in 2025, B&L will continue its focus on collecting wet weather samples from the remaining outfalls and from the most upgradient structure from the waterbody as possible. B&L will continue to attempt to collect wet weather samples from the impaired outfalls until all known locations are sampled. In addition to continuing to collect initial wet weather samples, B&L was able to collect all six annual outfalls samples in 2024.

In 2024, the Niantic River Watershed Committee tracked high occurrences of bacteria in July and August at selected stormwater outfalls to Niantic River. They then collected samples in November 2024 from Banning Cove and Kiddee's Beach and analyzed with an e/DNA sample kit. The draft results were forwarded to the Town of Waterford on December 20, 2024. Results from the Niantic River Watershed Committee efforts are attached to this report. Follow up on these results are continuing, particularly regarding the detected swine DNA and potential sources of human DNA.

In 2021, B&L conducted baseline inspections at 35 municipal stormwater treatment structures. B&L has since identified five new stormwater treatment structures. B&L will continue to review the existing structures against available mapping to accurately map all known treatment structures for the Town and will update the mapping and list of structures accordingly. In 2021, B&L provided the Town with a spreadsheet of all structures inspected with the conditions of each structure listed and estimated costs for annual maintenance for each of the municipal structure inspected.

In 2021, B&L identified the top 40 Town-owned properties with the greatest amount of impervious area. These sites were then evaluated to determine whether or not runoff from the impervious areas discharge to the MS4. The next phase of the desktop analysis was to confirm the presence of directly connected impervious areas (DCIA) at each site, as well as determine the suitability and capacity of site soils for supporting the implementation of retrofit projects. Many of these sites were ruled out because of low depth to groundwater, they already contained treatment systems, or they were not connected to the MS4. In 2025, the Town will continue working with its consultant to identify and prioritize potential projects for the Retrofit Program to the maximum extent practicable. A new DCIA tracking worksheet was prepared by B&L in 2021 for inclusion in the Town's land development applications. The worksheet would confirm compliance of applicants with site stormwater runoff retainage requirements, as well as determine the total change in site DCIA. The change in site DCIA would then be incorporated into the Town's overall DCIA tracking spreadsheet for determining progress towards the Town's DCIA disconnection goal. The Town is in the process of reviewing and implementing the new DCIA tracking worksheet.

In 2021, B&L identified all industrial and commercial facilities within the Town that likely needed to be registered for CT DEEP's Industrial and Commercial Stormwater General Permits, who are not currently registered. B&L then prepared educational brochures regarding these stormwater permits, which the Town mailed to all of the applicable industrial facilities in 2021 and the Town will be distributing to the commercial facilities.

B&L is in the process of preparing an MS4 Pollution Prevention and Good Housekeeping Protocols document for the Town. This document will optimize some of the best management practices (BMPs) that are currently being carried out by the Department of Public Works to minimize the discharge of pollutants to the Town's MS4 and waters of the State. BMPs for the following protocols are covered in this document: cleaning and maintenance of vehicles and equipment, leaf management, streets and parking lot sweeping, catch basin inspection and cleaning, and snow management.

B&L evaluated the Town's land use regulations with respect to construction stormwater runoff control and post-construction stormwater management. A report was prepared comparing existing regulations to MS4 General Permit requirements. Recommended regulatory revisions were included in this report. The Town will continue to periodically review its stormwater management regulations and makes revisions, if necessary, to meet MS4 general permit requirements.

Part I: Summary of Minimum Control Measure Activities

1. PUBLIC EDUCATION AND OUTREACH (Section 6 (a)(1) / page 19)

1.1 BMP Summary

BMP	Activities in current reporting period	Sources Used (if applicable)	Method of Distribution	Audience (and number of people reached)	Measurable goal	Department/Person Responsible	Additional details
1-1 Implement public education and outreach	<p>Link was created for accessing the Town's Stormwater Regulations website. Links were added discussing Stormwater & Water Quality, Impervious Cover, Urban Runoff, the NPDES Program and Save the Sound. Planning & Development and Recreation & Parks added a webpage link to the Stormwater. Informational material is also present at Town offices.</p> <p>In 2024, the Town provided notices in the Park & Rec booklets that were distributed to residents, including: "Stormwater: Where It Flows, Everything Goes"; "10 Things You Can Do"; & "When It Rains, It Drains".</p>	CT DEEP, NRDC, UConn NEMO, NOFA, NH DES, Clemson Cooperative Extension, Minnesota PCA, Long Island Sound Study, Save the Sound, Connecticut Conservation Districts, EPA	Town Offices and Webpage: https://www.waterfordct.org/426/Stormwater-Regulations	General Public	Continue distributing educational brochures as bill inserts, mailings, and fact sheets at town offices and with building permits, and on the town website.	Department of Public Works	
1-2 Address education/outreach for pollutants of concern*	Weblinks regarding nitrogen, phosphorus, turbidity and bacteria are available on the Town's Stormwater webpage. What residents can do to mitigate these pollutants is also discussed on the Stormwater webpage.	See BMP 1-1	Town Webpage: https://www.waterfordct.org/426/Stormwater-Regulations	General Public	Develop and Distribute Information on Nitrogen and Bacteria Pollution	Department of Public Works	

BMP	Activities in current reporting period	Sources Used (if applicable)	Method of Distribution	Audience (and number of people reached)	Measurable goal	Department/Person Responsible	Additional details
1-3 Town Website	The SMP and draft Annual Report are also available through the Town's website. Public educational documents are available on the Town's Stormwater Regulations webpage (see BMP 1-1 and BMP 1-2). A notification/link for the Construction Stormwater General Permit is also available on the Town's Stormwater Regulations webpage (see BMP 4-6).	See BMP 1-1 / BMP 1-2	Town Webpage: https://www.waterfordct.org/426/Stormwater-Regulations	General Public	Update website to include additional stormwater information.	Department of Public Works	
1-4 Catch Basin Stenciling/Badges	All catch basins have been stenciled. In 2024, the Town continued to re-stencil basins, as needed.	Not Applicable	Not Applicable	General Public	Continue an on-going stenciling program in which basins in Town are prioritized and stenciled.	Department of Public Works	The Town will continue its catch basin stenciling program, as needed.
1-5 Household Hazardous Waste Collection Days	HHW Collections Days in 2024 were conducted on 4/6, 5/4, 6/15, 7/6, 7/20, 8/3, 9/14, 10/5 and 11/2.	Southeastern Connecticut Regional Resources Recovery Authority (SCRRRA)	Town Webpage: www.waterfordct.org/418/Hazardous-Household-Waste-Paper-Shredding SCRRRA provided fliers.	General Public	Continue program in an effort to remove household hazardous waste safely from the waste stream using a Qualifying Local Program	Department of Public Works	

1.2 Describe any Public Education and Outreach activities planned for the next year, if applicable

- Continue to update the Town's Stormwater webpage with new/updated stormwater related information
- Continue distributing educational brochures
- Attempt to coordinate efforts with local schools for presentation on stormwater management
- Continue the catch basin stenciling/badges program, as needed
- Continue to coordinate HHW program

2. PUBLIC INVOLVEMENT/PARTICIPATION (Section 6(a)(2) / page 21)

2.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Department/Person Responsible	Date completed/projected	Location Posted	Additional details
2-1a Final Stormwater Management Plan publicly available	Complete	Notice of the SMP was published in The Day newspaper and on Town's Stormwater website.	Notify public of published SMP and document comments received.	Department of Public Works	April 1, 2017	The Day, Planning & Development and Town Clerk's Offices, Department of Public Works Complex, the Library and https://www.waterfordct.org/426/Stormwater-Regulations	The Stormwater Management Plan will be reviewed periodically and updated, as necessary.
2-1b Comply with public notice requirements for Annual Reports (annually by 2/15)	Complete	Notice of the draft 2023 Annual Report was posted on the Town's website on 2/1/24 and the report was available on the Town's website from 2/15/24 through 3/26/24.	Notify public of draft Annual Report and document comments received.	Department of Public Works	2023 Report: Feb 15, 2024 2024 Report: Feb 15, 2025	Planning & Development and Town Clerk's Offices, Department of Public Works Complex, the Library and https://www.waterfordct.org/411/Public-Works	Notice of the draft 2024 Annual Report was posted in The Day newspaper on 1/15/25 and the report was available on the Town's website from 2/13/25 through 3/25/25.
2-2 Community Group Engagement	Complete	The Planning Department and Public Works department continue to work with the Niantic River Watershed Committee in implementation of educational programs, and installation of LID measures within the Niantic Watershed.	Identify and reach out to local organizations that may want to participate in review and implementation of this SMP.	Department of Public Works	On-going		
2-3 Interagency Meetings	Complete	Meetings were held throughout the year with Public Works and Planning & Development.	Continue to facilitate a panel of staff and volunteers.	Department of Public Works	On-going	Not Applicable	

2.2 Describe any Public Involvement/Participation activities planned for the next year, if applicable.

- Continue to provide notice of updated SMPs and draft Annual Reports
- Continue to engage Community Groups
- Continue interagency meetings

3. ILLICIT DISCHARGE DETECTION AND ELIMINATION (Section 6(a)(3) and Appendix B / page 22)

3.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Department/ Person Responsible	Date completed/ projected	Additional details
3-1 Develop written IDDE program (Due 7/1/19)	Complete	The Town finalized its IDDE program.	Development and implement an IDDE Program	Department of Public Works	Apr 29, 2020	
3-2 Develop list and maps of all MS4 stormwater outfalls in priority areas (Due 7/1/20)	Substantially Complete	From 2021 through 2024, with assistance from the Town's consultant, Barton & Loguidice, the Town conducted significant efforts to confirm and locate additional outfalls in priority areas that were either incorrect or not previously identified.	Finalize mapping of all MS4 Outfalls	Department of Public works	Substantially Complete December 2024	In 2025, the Town will continue to update its mapping as new information is gathered.
3-3 Implement citizen reporting program (On-going)	In Progress/ On-going	Currently, citizens can call the Department of Public Works to report any activities.	Develop an online method for citizens to report spills and illicit dischargers	Department of Public Works	February 2025	The Town is adding an email and phone contact on the stormwater page for reporting illicit discharges.
3-4 Establish legal authority to prohibit illicit discharges (Due 7/1/19)	Substantial Complete	Current ordinance generally meets requirements. The Town reviewed its ordinance against the template provided by UConn CLEAR and may make slight changes to be more consistent with the template.	Review and update ordinances.	Department of Public Works	December 2024	
3-5 Develop record keeping system for IDDE tracking (Due 7/1/17)	Complete	The Town currently uses excel and access spreadsheets, along with GIS, for IDDE tracking.	Record illicit discharge abatement activities. Develop and maintain an SSO inventory.	Department of Public Works	Jul 1, 2017 On-going	
3-6 Address IDDE in areas with pollutants of concern	In Progress	From 2021 through 2024, B&L continued IDDE investigations for catchment areas that discharge to impaired waters. It is anticipated that B&L will complete the initial investigations started and will continue to investigate additional suspected illicit discharges in 2025 to the maximum extent practicable.	Identify which areas in Town are most likely to contribute nitrogen phosphorous, and bacteria to the MS4 (IDDEs).	Department of Public Works	On-going	The Town continues to identify structures that are not connected to the sanitary sewer system which are located near the MS4.

BMP	Status	Activities in current reporting period	Measurable goal	Department/ Person Responsible	Date completed/ projected	Additional details
3-7 Map MS4 System in Priority Areas	Substantially Complete	From 2021 through 2024, with assistance from B&L, the Town conducted significant efforts to confirm and locate additional outfalls in priority areas that were either not mapped correctly or were not previously identified. The Town also conducted efforts for updating the mapping for catch basins, piping and stormwater structures in priority areas.	Map Priority Areas	Department of Public Works	Substantially Complete December 2024	In 2025, the Town will continue to update its mapping as new information is gathered.

3.2 Describe any IDDE activities planned for the next year, if applicable.

- Post IDDE Program to the Stormwater webpage and include link in next year's Annual Report
- Post an Illicit Discharge Reporting link on the Stormwater webpage
- Continue updating the MS4 outfall and system mapping
- Maintain master IDDE tracking system
- Continue to investigate illicit discharges in areas with pollutants of concern

3.3 Provide a record of all citizen reports of suspected illicit discharges and other illicit discharges occurring during the reporting period and SSOs occurring July 2017 through end of reporting period using the following table.

No citizen reports of suspected illicit discharges were reported during 2024.

No other illicit discharges were reported during 2024.

<u>The following SSOs were reported from 2017 through 2024</u>						
Location (Lat long/ street crossing /address and receiving water)	Date and duration of occurrence	Discharge to MS4 or surface water	Estimated volume discharged	Known or suspected cause / Responsible party	Corrective measures planned and completed (include dates)	Sampling data (if applicable)
Magonk Point Road						
	Started 8/31/21 Ended 9/1/21	No	51-500 gallons	Pump station equipment failure (reported by neighbor) / Utility Commission Office	Force main was drained, tanker was used to by-pass the pump station, and staff/contractor repaired the pipe.	N/A
Cross Road	Started 9/26/21 Ended 9/27/21	No	51-500 gallons	Sewer Line Blockage – A spill out a manhole located on a large grass area outside BJs in Waterford was reported by BJs property manager.	Cleared the backup and cleaned the pipe. It appears that non-flushable materials are being discharged into the collection system.	N/A

Location (Lat long/ street crossing /address and receiving water)	Date and duration of occurrence	Discharge to MS4 or surface water	Estimated volume discharged	Known or suspected cause / Responsible party	Corrective measures planned and completed (include dates)	Sampling data (if applicable)
SMH 15-18A located at the corner of Uncas Ave and Rt 32	Started 8/23/24 Ended 8/23/24	Yes – majority of discharge went to the ground	~1000 gallons	Blockage prohibiting discharge from surrounding properties including fats, oils and grease and rags/wipes.	Cleared the clog with jet rodder. Conduct aggressive preventative maintenance program cleaning and camera'ing 10-20% of the system annually, including areas of low slope. Increasing FOG awareness literature and creating a marketing campaign surrounding it for all users.	N/A

3.4 Provide a summary of actions taken to address septic failures during the Reporting Period using the table below.

Method used to track illicit discharge reports	Location and nature of structure with failing septic systems	Actions taken to respond to and address the failures	Impacted waterbody or watershed, if known	Dept. / Person responsible
Septic Installation Log	985 Vauxhall St. Ext. Failing septic system	Repair entire system	Unknown	Ledge Light Health District
Septic Installation Log	18 Maple Rd. Failing septic system	Repair 3 bedroom home w/ tank and leaching field	Unknown	Ledge Light Health District
Septic Installation Log	49 Gilead Rd Failing septic system	New tank & d box no failure	Unknown	Ledge Light Health District
Septic Installation Log	123 Bloomingdale Rd Failing septic system	Tank and leaching field repair for 2 BR home	Unknown	Ledge Light Health District
Septic Installation Log	46 Gurley Rd. Failing septic system	Repair tank only	Unknown	Ledge Light Health District
Septic Installation Log	2 Mary Butler Dr Failing septic system	Tank replacement only	Unknown	Ledge Light Health District
Septic Installation Log	88 Dayton Rd Failing septic system	Leaching field replacement only	Unknown	Ledge Light Health District
Septic Installation Log	114 Dayton Rd Failing septic system	10 bedroom multi-family home repair	Unknown	Ledge Light Health District
Septic Installation Log	102 Bloomingdale Rd Failing septic system	Tank replacement only	Unknown	Ledge Light Health District
Septic Installation Log	102 Bloomingdale Rd Failing septic system	Repair -Tank only	Unknown	Ledge Light Health District
Septic Installation Log	7 Doyle Rd Failing septic system	Tank only replacement	Unknown	Ledge Light Health District

3.5 Briefly describe the method and effectiveness of said method used to track illicit discharge reports.

Currently, phone calls and emails are received by the Department of Public Works from citizen's reporting possible illicit discharges. The Town will continue tracking illicit discharges using an excel table.

3.6 IDDE reporting metrics

Metrics	
Estimated or actual number of MS4 outfalls	428
Estimated or actual number of interconnections	21
Outfall mapping complete	~99% - Substantially complete
Interconnection mapping complete	~99% - Substantially complete
System-wide mapping complete (detailed MS4 infrastructure)	~99% - Substantially complete
Outfall assessment and priority ranking	428 outfalls have initial rankings
Dry weather screening of all High and Low priority outfalls complete	416 of 428
Catchment investigations complete	10 investigations were initiated and are on-going
Estimated percentage of MS4 catchment area investigated	Approximately 5%

3.7 Briefly describe the IDDE training for employees involved in carrying out IDDE tasks including what type of training is provided and how often is it given (minimum once per year).

An MS4 and IDDE training program was developed for presentation to all Town personnel that may come into contact with stormwater or that may review applications and plans that impact stormwater quality. Typically, this training is conducted on an annual basis for members of Public Utility, Board of Education, Department of Public Works, Parks and Recreation, Police Department, and Fire Department. Many IDDE topics are discussed during the Town's annual SPCC and SWPPP training events. B&L provided an in-person training event with members of Public Utility, Department of Public Works, and Parks & Recreation on the general topics of the MS4 and IDDE program and the annual SPCC and SWPPP on December 17, 2024.

4. CONSTRUCTION SITE RUNOFF CONTROL (Section 6(a)(4) / page 25)

4.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Department/ Person Responsible	Date completed/ projected	Additional details
4-1 Implement, upgrade, and enforce land use regulations or other legal authority to meet requirements of MS4 general permit (Due 7/1/20)	Complete	P&Z updated the Subdivision and Zoning Regulations to incorporate LID, green infrastructure, and stormwater design requirements. B&L, the Town's consultant, evaluated the Town's land use regulations and provided recommended updates.	Review and update the regulations to be consistent with the requirements of the permit.	Planning	April 2018	The Town periodically reviews its stormwater management regulations and makes revisions, if necessary, to meet MS4 general permit requirements.
4-2 Develop/Implement plan for interdepartmental coordination in site plan review and approval (On-going)	Complete	Site applications are forwarded to Town Officials for review and comment during application process. Plans are not signed by commission until all departments have signed off on project plan.	Document Current Procedure	Planning	Jul 1, 2017 On-going	
4-3 Review site plans for stormwater quality concerns (On-going)	Complete	Commercial and residential site plans involving greater than 0.5 acre of land disturbance were reviewed for stormwater quality control measures.	Continue to review all design plans for consistency with town and state guidelines for erosion and sediment control.	Planning	Jul 1, 2017 On-going	Application review checklists have been revised to include stormwater management regulation requirements
4-4 Conduct site inspections (On-going)	Complete	Zoning and Inland Wetland enforcement staff verify site development practices are in accordance with approved plans. Planning staff employ an inspection checklist to document compliance and to identify measures requiring repair/additional control measures. Inspections occur after every significant rainfall event.	Document Inspections Performed Continue existing program of construction inspections.	Planning	Jul 1, 2017 On-going	

BMP	Status	Activities in current reporting period	Measurable goal	Department/ Person Responsible	Date completed/ projected	Additional details
4-5 Implement procedure to allow public comment on site development (On-going)	Complete	All agendas and minutes are noticed in compliance with State requirements for public notice. Public hearings announced in newspaper. Complaints regarding land-disturbance are forwarded to Planning and Development Department.	Document Public Comments	Planning	Jul 1, 2017	
4-6 Implement procedure to notify developers about DEEP construction stormwater permit (On-going)	Complete	Town agencies notify developers of stormwater requirements. When applicable, developers submit notification of registration to State. P&Z application checklist was revised to require applicant's determination if a Construction Stormwater GP is required.	Update application forms to include determining if Construction Stormwater GP is required. Updated webpage.	Planning	Jul 1, 2019	A note was added to the website regarding need for a Construction Stormwater GP: https://www.waterfordct.org/426/Stormwater-Regulations

4.2 Describe any Construction Site Runoff Control activities planned for the next year, if applicable.

- Continue to update land use regulations to improve compliance with MS4 General Permit.
- Continue to review all design plans for consistency with Town and State guidelines for erosion and sediment control.
- Continue existing program for construction inspections.
- Continue to follow all State public notice and hearing requirements and follow up on all comments and complaints received.

5. POST-CONSTRUCTION STORMWATER MANAGEMENT (Section 6(a)(5) / page 27)

5.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Department/ Person Responsible	Date completed/ projected	Additional details
5-1 Establish and/or update legal authority and guidelines regarding LID and runoff reduction in site development planning (Due 7/1/22)	Complete	P&Z updated the Subdivision and Zoning Regulations to incorporate LID, green infrastructure, and stormwater design requirements. B&L, the Town's consultant, evaluated the Town's land use regulations and provided recommended updates.	Review and update the regulations to be consistent with the requirements of the Permit.	Planning	April 2018	The Town periodically reviews its stormwater management regulations for effective LID implementation and runoff reduction.
5-2 Enforce LID/runoff reduction requirements for development and redevelopment projects (Due 7/1/22)	Complete	Section 25.6 Stormwater Management regulations require LID, run-off control and stormwater treatment to the maximum extent practicable for all new development >0.5 acre. B&L, the Town's consultant, evaluated the Town's LID/runoff reduction requirements and provided recommended updates.	Review current regulations to identify and, where appropriate, reduce or eliminate existing regulatory barriers to implementation of LID and runoff reduction practices to the MEP.	Planning	April 2018 On-Going	The Town periodically reviews its regulations requiring run-off reduction for development and redevelopment projects and revises requirements affecting impervious surface area, as needed.
5-3 Identify retention and detention ponds in priority areas (Due 7/1/20)	Substantially Complete	Known ponds under the control of the Town have been mapped. In 2021 through 2024, B&L continued to review the mapping and made updates to the ponds, as necessary.	Inventory Town retention/detention ponds	Department of Public Works	Mar 23, 2018	

BMP	Status	Activities in current reporting period	Measurable goal	Department/ Person Responsible	Date completed/ projected	Additional details
5-4 Implement long-term maintenance plan for stormwater basins and treatment structures (On-going)	Complete/ On-going	Inspection reports and water quality monitoring for stormwater and treatment basins continue to be completed. Town maintains an inventory of required stormwater management control practices for completed site developments. Documentation of inspection and maintenance of stormwater treatment is requested as part of land use and building permit approvals. Town employees receive instruction on maintenance for rain gardens, stormwater detention /treatment systems. All basins and structures are inspected and maintained at least annually.	Develop a maintenance plan for retention/ detention ponds and stormwater treatment structures that it owns or over which it holds an easement or other authority and that are located in the Permittee's priority areas to ensure their long-term effectiveness.	Planning	Feb 15, 2018 On-going	A plan for routine inspections and maintenance for the Town's basins and structures is in place. In 2021, B&L conducted stormwater structure inspections for all ~40 stormwater treatment structures identified. Based on the inspections conducted, B&L provided the Town with a cost spreadsheet for budgeting annual maintenance.
5-5 DCIA mapping (Due 7/1/20)	Substantially Completed	The DCIA for the priority areas have been calculated using the available impervious cover layers.	Calculate DCIA	Department of Public Works	Jul 1, 2020 On-going	The DCIA mapping will be updated, as necessary, to include retrofit, development and development projects.
5-6 Address post-construction issues in areas with pollutants of concern	Not Started	None	Document issues identified and address. Prioritize areas for the DCIA retrofit program under MCM-6	Department of Public Works	On-going	

5.2 Describe any Post-Construction Stormwater Management activities planned for the next year, if applicable.

- Continue to periodically review and update land use regulations for compliance with MS4 General Permit.
- Continue to enforce LID/runoff reduction requirements for development and redevelopment projects.
- Review Stormwater Structures Management Plan for areas of optimization.
- Continue to conduct inspections and water quality monitoring for stormwater and treatment basins.
- Continue updating the DCIA mapping, as necessary.

5.3 Post-Construction Stormwater Management reporting metrics

Metrics		
Baseline (2012) Directly Connected Impervious Area (DCIA)	240	acres
DCIA disconnected (redevelopment plus retrofits)	Unknown	acres this year / acres total
Retrofits completed	Unknown	#
DCIA disconnected	TBD	% this year / % total since 2012
Estimated cost of retrofits	Unknown	\$
Stormwater treatment structures identified (including detention/retention ponds, oil water separators, hydrodynamic separators, green infrastructure, etc.)	56 total treatment structures 16 retention/detention ponds	# total

5.4 Briefly describe the method to be used to determine baseline DCIA.

To calculate the baseline DCIA for the Town of Waterford, the Town used the process found on the CT NEMO website. CT NEMO developed 5 formulas to calculate the DCIA and Impervious Cover (IC) independently for each basin in the Town using the percent DCIA for the basin with the state DCIA removed from the equation. The Town took the formulas and created a bell curve to input the calculated percent of DCIA for each basin and calculate the total DCIA and IC amounts for the Town. Each basin value was added together to create the baseline for the DCIA and IC for the Town.

6. Pollution Prevention/Good Housekeeping (Section 6(a)(6) / page 31)

6.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Department/Person Responsible	Date completed/projected	Additional details
6-1 Develop/implement formal employee training program (On-going)	Complete/On-going	A training program has been developed. B&L provided an in-person training event with members of Public Utility, Department of Public Works, and Parks & Recreation on the general topics of the MS4 and IDDE program and the annual SPCC and SWPPP on December 17, 2024.	Track Town employee training	DPW, Parks and Rec., Utility Commission, Waterford Buildings and Grounds, and Waterford BOE.	On-going	
6-2 Implement MS4 property and operations maintenance (On-going)	Complete/On-going	Salt piles are stored under cover and on impervious surfaces. Town industrial stormwater discharges are monitored. Vehicle maintenance is performed undercover.	Continue the pattern of MS4 property and operations maintenance in accordance with the Permit.	Depart of Public Works, Police Depart, Fire Depart, Board of Ed, Parks and Rec	Jul 1, 2017 On-going	The Town periodically reviews current practices and looking for areas for optimization.

BMP	Status	Activities in current reporting period	Measurable goal	Department/Person Responsible	Date completed/projected	Additional details
6-3 Implement coordination with interconnected MS4s	In Progress	Through the outfall identification process, the Town has identified several interconnections with the neighboring towns/cities & the DOT.	Coordinate pollution prevention activities with interconnected MS4s.	Department of Public Works	On-going	As new data is collected at interconnections, the Town will provide that data to the neighboring towns/cities & the DOT.
6-4 Develop/implement program to control other sources of pollutants to the MS4	Substantially Complete	The Town has identified industrial and commercial facilities not registered under DEEP's Industrial Stormwater General Permit and Commercial Stormwater General Permit, respectively. Educational brochures were mailed to the industrial facilities in 2021, notifying them of their potential obligation to register.	Develop and implement a program to control the contribution of pollutants to the MS4.	Department of Public Works	Aug 2021 Spring 2022	Commercial brochures will be mailed to facilities, notifying them of their potential obligation to register.
6-5 Evaluate additional measures for discharges to impaired waters*	On-going	The Town prohibits the feeding of waterfowl to help manage populations at Town ponds.	Identify potential project locations.	Department of Public Works	N/A	
6-6 Track projects that disconnect DCIA (On-going)	In Progress	A table was created for tracking disconnected DCIA. The Town continues filling out the DCIA tracking table with completed development projects dating back to 2012. B&L reviewed all Town approved projects since 2012 to identify all potential projects completed during that time. B&L created a DCIA tracking form that is to be completed for each new project.	Annually track acreage of DCIA disconnected as a result of redevelopment/retrofit projects within the Town.	Department of Public Works	Jul 1, 2019 On-going	The Town will continue to maintain records of all disconnected DCIA projects.
6-7 Implement infrastructure repair/rehab program (Due 7/1/21)	On-going	In 2024, new catch basin tops were installed at various locations in the Mackenzie Road Neighborhood prior to paving. Additionally, new catch basin tops were installed at Quarry Rd, Leary Drive and Goshen Road Prior to paving.	Identify MS4 structures to repair, rehabilitate, or upgrade to reduce pollutant discharge.	Department of Public Works	December 2022 On-going	The Town periodically reviews current practices and to identify areas for optimization.

BMP	Status	Activities in current reporting period	Measurable goal	Department/Person Responsible	Date completed/projected	Additional details
6-8 Develop/implement plan to identify/prioritize retrofit projects (Due 7/1/20)	In Progress	With the assistance of B&L, Town-owned sites with the greatest amount of impervious area were identified as potential candidates for retrofit projects.	Develop a retrofit project plan to identify and prioritize DCIA connection projects	Department of Public Works	December 2023 On-going	The Town will continue to identify and prioritize potential projects for the Retrofit Program to the maximum extent practicable.
6-9 Implement retrofit projects to disconnect 2% of DCIA (Due 7/1/22)	In Progress	With the assistance of B&L, Town-owned sites with the greatest amount of impervious area were identified as potential candidates for retrofit projects.	Implement retrofit projects	Planning	Jul 1, 2023 On-going	The Town will continue to identify and prioritize potential projects for the Retrofit Program to the maximum extent practicable.
6-10 Develop/ implement street sweeping program (On-going)	Complete/ On-going	Typically, all Town-owned roads are swept every year, starting after the last snow melt. In 2024, the Town continued their typical sweeping program.	Continue sweeping all streets at least once per year, as soon as possible after snowmelt.	Department of Public Works	Jul 1, 2017 On-going	The Town periodically reviews current practices to identify areas for optimization.
6-11 Develop/ implement catch basin cleaning program (On-going)	Complete/ On-going	The Town cleans approximately 1/3 of all of the catch basins annually.	Continue current maintenance program in accordance with the Permit.	Department of Public Works	Jul 1, 2019 On-going	The Town periodically reviews current practices to identify areas for optimization.
6-12 Develop/ implement snow management practices (Due 7/1/18)	Complete/ On-going	The Town follows the DEEP Guidelines on snow management, to the maximum extent practicable. The Town streets and municipal lots were plowed, as necessary. Roads were treated with salt (no sand), as necessary.	Develop/implement snow management practices	Department of Public Works	Jul 1, 2017 On-going	The Town periodically reviews current practices to identify areas for optimization.

6.2 Describe any Pollution Prevention/Good Housekeeping activities planned for the next year, if applicable.

- Conduct annual MS4 training events.
- Continue to periodically review MS4 property and operations maintenance practices for areas of optimization.
- Notify commercial facilities of their requirements to register under the Industrial Stormwater GP.
- Continue tracking disconnected DCIA using the table created.
- Continue efforts to identify and prioritize potential projects for the Retrofit Program to the maximum extent practicable.
- Continue street sweeping, catch basin cleansing and snow management practices.

6.3 Pollution Prevention/ Good Housekeeping reporting metrics

Metrics	
Employee training provided for key staff	Yes – 12/17/24
Street sweeping	
Curb miles swept	~200 miles were swept in 2024
Volume (or mass) of material collected	~100 CY
Catch basin cleaning	
Total catch basins in priority areas	~3,000
Total catch basins in MS4	~3,000
Catch basins inspected	800
Catch basins cleaned	800
Volume (or mass) of material removed from all catch basins	~125 CY
Volume removed from catch basins to impaired waters (if known)	Unknown
Snow management	
Type(s) of deicing material used	Salt
Total amount of each deicing material applied	~1,150 tons
Type(s) of deicing equipment used	Truck/spreader
Lane-miles treated	242 miles
Snow disposal location	N/A
Staff training provided on application methods & equipment	Yes – as necessary
Municipal turf management program actions (for permittee properties in basins with N/P impairments)	
Reduction in application of fertilizers (since start of permit)	Unknown
Reduction in turf area (since start of permit)	Unknown
Lands with high potential to contribute bacteria (dog parks, parks with open water, & sites with failing septic systems)	
Cost of mitigation actions/retrofits	N/A

6.4 Catch basin cleaning program

Provide any updates or modifications to your catch basin cleaning program.

Catch basins have been inspected and cleaned out and the sums have been measured. The Town continues to clean and inspect approximately 1/3 of all of the catch basins annually, and the amount of material removed is recorded. A list will be generated and the catch basins with the most material present will be put on a more frequent cleaning schedule to ensure that the 50% design capacity for the sump is not exceeded.

6.5 Retrofit program

Briefly describe the Retrofit Program identification and prioritization process, the projects selected for implementation, the rationale for the selection of those projects and the total DCIA to be disconnected upon completion of each project. (Due 7/1/20)

It should be noted that many of the Town of Waterford's impervious areas already had stormwater treatment systems installed prior to the issuance of the 2017 MS4 General Permit and the Town continues to identify new projects and retrofit projects to the maximum extent practicable. With the assistance of B&L, Town-owned sites with the greatest amount of impervious area were identified for potential retrofit projects. Many of these sites were ruled out because of low depth to groundwater, they already contained treatment systems, or they were not connected to the MS4.

In 2022, as part of the Niantic River Watershed 4-Town Bio-Infiltration, Filtration & Water Collection Project, in cooperation with the Eastern CT Conservation District and funded by a Section 319 grant, the Town of Waterford installed 20 catch basin smart sponge inserts (storm drain filters) in the neighborhood around the avenues east of Niantic River and 2 tree filters were installed on Scenic View Drive, all to treat run-off draining to Niantic River. Operation & Maintenance Plans were also created for both the storm drain filters and for the tree filters (wells) to assist with the inspection and maintenance of the filters. The catch basin filter inserts that were installed were specially designed and installed to capture and filter stormwater runoff from impervious surfaces in the neighborhood around the avenues east of Niantic River to protect and improve water quality in an un-named brook and Niantic River. These catch basin filter inserts provide the following benefits: reduces the frequency of maintenance required for BMPs downstream of the storm drain filters; captures trash, debris, and sediment, as well as removes fine sediment (TSS); removes phosphorous, hydrocarbons and oil; and, some filter media can remove heavy metals as well. These catch basin filter inserts will filter stormwater runoff from the roadway and parking lots, removing up to 99% of common NPS pollution, prior to its discharge to Niantic River. The tree wells installed are a Low Impact Development (LID) bio-retention practice that is used to capture and infiltrate stormwater. The tree well plants absorb some of the water that flows into the unit and utilize some of the nutrients as well. The top soil contains micro-organisms that are capable of breaking down a wide variety of common contaminants including hydrocarbons, fecal bacteria, pesticides, herbicides and fertilizer. The bark mulch provides carbon-rich organic material for both soil biota and the tree well plants. The 2 tree well systems installed on Scenic View Drive intercept stormwater runoff from the roadway. The Scenic View Drive tree wells are designed to infiltrate stormwater, preventing contaminated runoff from entering Niantic River and Bay via storm drain discharge. Native ornamental grass (PANICUM VIRGATUM 'RUBY RIBBONS') was installed in the tree wells, which are drought-tolerant.

In 2021, an area at the Town's Transfer Station was redirected to a vegetated swale prior to discharge to the system at 1000 Hartford Turnpike. This system then discharges to Jordan Brook. An approximate impervious area of 70,000 sqft is now treated.

In 2021, improvements were made to the pond at the Town's civic triangle included constructing a 2,500 sq. ft. forebay to pre-treat stormwater discharging from Rt 1 and adjacent homes and businesses. The drainage calculations indicates 3.2 acres of impervious area north of Rt 1 is collected by the forebay. The forebay holds 1,200 cuft. The Town Hall roof leaders discharge below ground and much of parking lot catch basins are dry wells in this area.

The Town continues reviewing sites for potential projects. In 2025, the Town will continue working with its consultants to identify and prioritize potential projects for the Retrofit Program to the maximum extent practicable.

Describe plans for continuing the Retrofit program and how to achieve a goal of 1% DCIA disconnection annually in future years. (Due 7/1/22)

With the assistance of B&L, Town-owned sites with the greatest amount of impervious area were identified for potential retrofit projects. Many of these sites were ruled out because of low depth to groundwater, they already contained treatment systems, or they were not connected to the MS4. In 2025, the Town will continue working with its consultant to identify and prioritize potential projects for the Retrofit Program to the maximum extent practicable.

Part II: Impaired waters investigation and monitoring

1. Impaired waters investigation and monitoring program

1.1 Indicate which stormwater pollutant(s) of concern occur(s) in your municipality or institution.

Nitrogen/ Phosphorus Bacteria Mercury Other Pollutant of Concern

1.2 Describe program status.

Discuss 1) the status of monitoring work completed, 2) a summary of the results and any notable findings, and 3) any changes to the Stormwater Management Plan based on monitoring results.

Barton & Loguidice, LLC, the Town's consultant, attempted to collect samples during multiple rain events during 2020, 2021, 2022, and again during 2023. Due to the impaired outfalls proximity to the coast, most of the outfalls in the Town are impacted by tide levels and storm surges. To date, wet weather samples were collected from 31 of the known 62 outfalls that discharge to impaired waters. Previously, there were 29 outfalls directly discharging to impaired waters and as part of the mapping updates made, B&L has now located a total of 62 outfalls discharging to impaired waters. Of the 31 outfall samples collected during wet weather events, 19 samples exceeded pollutant thresholds and require follow-up investigations. Due to the limited number of qualifying storm events and the fact that most of the outfalls are tidally influenced, in 2024, B&L will continue focusing on collecting wet weather samples from the remaining outfalls and from upgradient structures closest to the outfalls to the maximum extent practicable. B&L will continue to attempt to collect wet weather samples from the impaired outfalls until all known locations are sampled. Once the remaining impaired wet weather samples are collected, B&L will focus on the wet weather investigation samples. Coordination with the tide schedule, storm surges and qualifying rain events will continue to be conducted for future monitoring events. Weather conditions such as constant floods during 2023 did not allow B&L to gain much progress towards wet weather sampling; however, other local efforts resulted in the refinement of the Town's list of outfalls to impaired waters. In 2023, B&L was able to collect all of the 6 annual priority wet weather samples, and will continue to attempt to collect these during 2024. No additional changes have been made to the Stormwater Management Plan at this time.

2. Screening data for outfalls to impaired waterbodies (Section 6(i)(1) / page 41)

2.1 Screening data collected under 2017 permit

Table 2.1a - Class SA & SB Impaired Waterbody Samples

Outfall ID	Latitude	Longitude	Sample Date	Outfall Turbidity (NTU)	Turbidity Upstream (NTU)	Fecal Coliform (col/100mL)	Enterococcus (col/100mL)	Nitrogen (mg/L)	Phosphorous (mg/L)	Lab	Investigation Required
4TH-1	41.326394	-72.175706	3/14/2023	2.97	2.28	10	86	1.21	0.085	Phoenix	YES
BALD-1	41.336172	-72.144587	4/13/2020	n/a	n/a	20	187	n/a	n/a	Phoenix	NO
BALD-2	41.3350363	-72.14569031	4/13/2020	n/a	n/a	< 10	97	n/a	n/a	Phoenix	NO
BLOOM-2	41.4010613	-72.1207251	9/25/2018	3.34	6.07	n/a	n/a	n/a	n/a	Phoenix	NO
BOLL-1	41.40244964	-72.10653702	12/11/2024	*	*	86	4880	0.37	0.087	Phoenix	YES
COVE-1	41.39844555	-72.10702004	12/11/2024	*	*	109	3080	0.57	0.1	Phoenix	YES
EWHARF-1	41.327666	-72.1740938	9/18/2023	1.77	2.5	1730	6590	0.91	0.112	Phoenix	YES

Table 2.1a - Class SA & SB Impaired Waterbody Samples

Outfall ID	Latitude	Longitude	Sample Date	Outfall Turbidity (NTU)	Turbidity Upstream (NTU)	Fecal Coliform (col/100mL)	Enterococcus (col/100mL)	Nitrogen (mg/L)	Phosphorous (mg/L)	Lab	Investigation Required
GLEN-1	41.3172803	-72.1037312	4/24/2020	n/a	n/a	< 10	96	n/a	n/a	Phoenix	YES
JORCIR-1	41.31817856	-72.15100011	9/18/2023	n/a	n/a	10500	19900	n/a	n/a	Phoenix	YES
JORCIR-2	41.31693296	-72.15186244	3/14/2023	n/a	n/a	10	< 10	n/a	n/a	Phoenix	NO
NIARIV-1	41.35634543	-72.17600201	4/13/2020	6.33	0	31	437	0.73	0.046	Phoenix	YES
NIARIV-2	41.3532664	-72.1762042	4/13/2020	0	2.11	74	512	0.56	0.051	Phoenix	YES
NIARIV-5	41.34061	-72.17339	12/30/2019	15.5	0	< 10	292	0.79	0.163	Phoenix	YES
NIARIV-6	41.3392626	-72.1736651	12/30/2019	9.47	0	52	393	0.42	0.05	Phoenix	YES
NIARIV-7	41.3359644	-72.1740182	12/30/2019	1.97	18.8	20	171	0.57	0.082	Phoenix	NO
NIARIV-8	41.3284041	-72.1740437	12/11/2024	*	*	554	5480	0.88	0.131	Phoenix	YES
OIL-1	41.36996625	-72.1922495	12/16/2022	0.59	0	41	187	0.64	0.021	Phoenix	YES
OIL-2	41.37059465	-72.1924246	12/16/2022	2.59	0	96	341	0.38	0.022	Phoenix	YES
OLDMIL-2	41.4002874	-72.1150245	9/25/2018	7.54	3.4	n/a	n/a	n/a	n/a	Phoenix	NO
OLDNOR-3	41.4031439	-72.112051	3/14/2023	n/a	n/a	134	3650	1.49	0.058	Phoenix	YES
OLDNOR-4	41.40117677	-72.11190543	4/24/2020	n/a	n/a	31	10	0.34	0.033	Phoenix	NO
OLDNOR-5	41.3996828	-72.1116347	9/25/2018	4.98	2.44	n/a	n/a	n/a	n/a	Phoenix	NO
OSWE-1	41.36369605	-72.18850386	3/14/2023	2.72	2.31	63	520	1.12	0.12	Phoenix	YES
OSWE-5	41.355933	-72.1772576	4/13/2020	0	1.14	< 10	537	0.75	0.046	Phoenix	YES
OSWE-8	41.3636961	-72.18850386	3/14/2023	2.98	2.73	97	305	0.93	0.061	Phoenix	YES
PARK-1	41.3502878	-72.1858535	4/13/2020	2.71	0.71	75	1310	0.62	0.046	Phoenix	YES
RIVSI-2	41.3524954	-72.1870468	4/13/2020	0	2.14	301	2600	0.62	0.051	Phoenix	YES
SHAW-1	41.3497751	-72.1817401	4/13/2020	8.14	4.76	52	1500	1.78	0.117	Phoenix	YES
STAN-1	41.35766326	-72.1877547	12/16/2022	3.04	0	6490	5790	0.54	0.144	Phoenix	YES
WINDW-1	41.3169534	-72.1568046	3/14/2023	n/a	n/a	20	10	n/a	n/a	Phoenix	YES
WINT-1	41.4009492	-72.1114224	9/18/2023	*	*	2760	13000	0.59	0.037	Phoenix	YES
WINT-2	41.40077	-72.10806	9/25/2018	11.46	7.08	1500	2250	0.43	0.046	Phoenix	YES

Notes:

n/a - Not Applicable

* = Parameter missed during sampling

Table 2.1b - Class A & B Impaired Waterbody Samples

Outfall ID	Latitude	Longitude	Sample Date	E. Coli (col/100mL)	Lab	Investigation Required
OSWE-6	41.3567635	-72.1761815	4/13/2020	10	Phoenix	NO
OSWE-7	41.3567781	-72.1761586	12/30/2019	20	Phoenix	NO

2.2 Credit for screening data collected under 2004 permit

If any outfalls to impaired waters were sampled under the 2004 MS4 permit, that data can count towards the monitoring requirements under the modified 2017 MS4 permit. Complete the table below to record sampling data for any outfalls to impaired waters under the 2004 MS4 permit.

Outfall	Sample date	Parameter (Nitrogen, Phosphorus, Bacteria, or Other pollutant of concern)	Results	Name of Laboratory (if used)	Follow-up required?
N/A					

3. Follow-up investigations (Section 6(i)(1)(D) / page 43)

Provide the following information for outfalls exceeding the pollutant threshold.

Outfall	Status of drainage area investigation	Control measure implementation to address impairment
Due to the limited number of qualifying storm events and the fact that most of the outfalls are tidally influenced, in 2025, B&L is focusing on collecting wet weather samples from the upgradient structures closest to the outfalls to the maximum extent practicable. B&L will continue to attempt to collect wet weather samples from the impaired outfalls until all known locations are sampled. Once the remaining impaired wet weather samples are collected, B&L will focus on the wet weather follow-up investigations.		

4. Prioritized outfall monitoring (Section 6(i)(1)(D) / page 43)

Once outfall screening has been completed for at least 50% of outfalls to impaired waters, identify 6 of the highest contributors of any pollutants of concern. Begin monitoring these outfalls on an annual basis by July 1, 2020.

Outfall ID	Latitude	Longitude	Sample Date	Outfall Turbidity (NTU)	Turbidity Upstream (NTU)	Fecal Coliform (col/100mL)	Enterococcus (col/100mL)	Nitrogen (mg/L)	Phosphorous (mg/L)	Lab
4TH-1	41.326394	-72.175706	4/13/2020	5.57	7.52	1190	1170	0.72	0.094	Phoenix
			9/1/2021	3.37	3.56	238	175	0.94	0.172	Phoenix
			3/14/2023	2.97	2.28	< 10	86	1.21	0.085	Phoenix
			12/11/2024	*	*	393	2360	0.78	0.289	Phoenix
EWHARF-1	41.327666	-72.1740938	9/28/2018	4.74	0.24	*	3870	5.58	0.058	Phoenix
			9/1/2021	1.46	1.88	738	3870	3.47	<0.010	Phoenix
			9/18/2023	1.77	2.5	1730	6590	0.91	0.112	Phoenix
			12/11/2024	*	*	146	985	0.53	0.052	Phoenix
JORCIR-1	41.3181786	-72.1510001	12/30/2019	n/a	n/a	*	933	n/a	n/a	Phoenix
			9/18/2023			10500	19900			Phoenix
			12/11/2024			173	9210			Phoenix

Outfall ID	Latitude	Longitude	Sample Date	Outfall Turbidity (NTU)	Turbidity Upstream (NTU)	Fecal Coliform (col/100mL)	Enterococcus (col/100mL)	Nitrogen (mg/L)	Phosphorous (mg/L)	Lab
OLDNOR-3	41.4031439	-72.112051	9/25/2018	n/a	n/a	3260	8160	0.52	0.117	Phoenix
			3/14/2023			134	3650	1.49	0.058	Phoenix
			12/11/2024			96	2380	0.84	0.106	Phoenix
WINDW-1	41.3169534	-72.1568046	4/13/2020	n/a	n/a	882	3650	n/a	n/a	Phoenix
			3/14/2023			20	< 10			Phoenix
			12/11/2024			30	1040			Phoenix
WINT-1	41.4009492	-72.1114224	9/25/2018	18.79	13.59	11200	4610	0.4	0.09	Phoenix
			9/18/2023	n/a	n/a	2760	13000	0.59	0.037	Phoenix
			12/11/2024			20	1860	0.43	0.059	Phoenix

Notes:

n/a - Not Applicable

* = Parameter missed during sampling

Part III: Additional IDDE Program Data

1. Assessment and Priority Ranking of Catchments data (Appendix B (A)(7)(c) / page 5)

Provide a list of all catchments with ranking results (DEEP basins may be used instead of manual catchment delineations).

See attachment provided with this report.

2. Outfall and Interconnection Screening and Sampling data (Appendix B (A)(7)(d) / page 7)

2.1 Dry weather screening and sampling data from outfalls and interconnections

Provide sample data for outfalls where flow is observed. Only include Pollutant of concern data for outfalls that discharge into stormwater impaired waterbodies.

Table 2.1a - Non-Impaired Waterbody Samples

Outfall ID	Latitude	Longitude	Sample Date	Ammonia (mg/L)	Chlorine (mg/L)	Conductivity (umhos/cm)	Salinity (g/kg)	Temp (oC)	MBAs (mg/L)	E. Coli (col/100ml)	Lab	Investigation Required
ALMO-1	41.35523994	-72.13116195	4/1/2020	1	0	94.1	0.0424	10.3	0.25	< 10	Phoenix	NO
AVERY-1	41.34467066	-72.13721082	4/1/2020	0	0.02	259	0.126	12.3	0.25	20	Phoenix	NO
AVERY-2	41.3439838	-72.1380138	6/20/2018	0.25	0.07	675	0.33	20.85	0.25	63	Phoenix	NO
BLN-1	41.339836	-72.1454662	10/24/2019	0	0.06	139	0.0663	12.4	0.25	< 10	Phoenix	NO
BRAM-2	41.31948893	-72.11532803	5/5/2020	0	0.02	140	0.0663	14	0.25	< 10	Phoenix	NO
BUTLER-3	41.4114047	-72.20122141	3/22/2023	0	0	96.5	0.0461	8.1	0.77	<10	Phoenix	NO

Table 2.1a - Non-Impaired Waterbody Samples

Outfall ID	Latitude	Longitude	Sample Date	Ammonia (mg/L)	Chlorine (mg/L)	Conductivity (umhos/cm)	Salinity (g/kg)	Temp (oC)	MBAs (mg/L)	E. Coli (col/100ml)	Lab	Investigation Required
BUTLER-4	41.4114047	-72.20122141	9/7/2023	0	0	132	0.062	22	0.03	10	Phoenix	NO
CHAP-1	41.3767821	-72.1225643	2/20/2020	0.5	0.13	319	0.155	6.2	0.5	< 10	Phoenix	YES
CHAP-3	41.3757661	-72.1271063	6/18/2018	0	0.02	758	0.39	22.46	0.25	< 10	Phoenix	NO
COLL-1	41.3831457	-72.1109513	7/21/2020	3	0	807	0.391	27.1	>3	>24200	Phoenix	YES
CROYD-1	41.32934221	-72.17129389	5/5/2020	0	0	514	0.229	13.3	0.25	< 10	Phoenix	NO
DIMM-1	41.31183406	-72.11450904	5/12/2020	0.25	0	147	0.698	12.7	0.25	< 10	Phoenix	NO
DOUG-4	41.3934797	-72.14870492	5/12/2023	0	0.04	117	0.084	20.9	0.01	210	Phoenix	NO
DOYLE-1	41.348095	-72.1709064	7/21/2020	0.25	0.03	217	0.102	20.2	0.25	41	Phoenix	NO
ELLENWAR-1	41.346743	-72.148469	5/17/2023	0	0.03	209	0.0907	14.6	0.04	<10	Phoenix	NO
FOG-4	41.35787701	-72.13547607	5/17/2023	0	0.06	122	0.0576	17.2	0.03	<10	Phoenix	NO
FOG-6	41.35128265	-72.144252	5/17/2023	0	0.04	0.04	0.0482	15	0.01	<10	Phoenix	NO
FULM-1E	41.352156	-72.174253	5/12/2020	0	0.01	172	0.07	12.7	0.25	85	Phoenix	NO
FULM-2	41.3524608	-72.1741223	6/20/2018	0.5	0.11	360	0.17	16.89	0.5	393	Phoenix	YES
GIOV-2	41.35813313	-72.13251373	5/17/2023	0	0.07	136	0.0633	16.3	0.05	<10	Phoenix	NO
GOUN-1	41.31748414	-72.11950585	5/5/2020	0.25	0.11	125	0.0596	13.4	0	10	Phoenix	NO
GRTREE-1	41.39454989	-72.14264007	5/12/2023	0	0.06	550	0.246	20.7	0.05	<10	Phoenix	NO
HART-2	41.39191937	-72.16366371	3/22/2023	0	0	114	0.0543	13.8	1.11	63	Phoenix	NO
HICK-1	41.384342	-72.143777	1/15/2020	0	0.16	177	0.0834	10.4	0.25	< 10	Phoenix	NO
HIGRID-1	41.33065358	-72.17053702	1/22/2020	0.25	0.06	156	0.0748	8.5	0.25	10	Phoenix	NO
HUNTS-1	41.41020822	-72.15227112	2/15/2023	0	0.03	97.4	0.0464	8.4	0.23	<10	Phoenix	NO
HUNTS-2	41.41154134	-72.15306429	2/15/2023	0	0.01	74.4	0.0345	10.3	0.14	<10	Phoenix	NO
INA-1	41.34965252	-72.16770836	4/1/2020	1	0.01	197	0.0952	7.7	0.25	< 10	Phoenix	NO
INDUS-2	41.40061198	-72.16169465	5/12/2023	0	0	735	0.356	18	0.41	<10	Phoenix	NO
LAKES-2	41.405711	-72.18499	3/22/2023	0	0	125	0.0596	10.7	1.59	<10	Phoenix	NO
LAUCRE-1	41.32994152	-72.13502453	1/29/2020	0.25	0	204	0.0942	7.8	0.25	< 10	Phoenix	NO
LAUCRE-2	41.3299966	-72.1294099	1/29/2020	0	0	187	0.0887	9.6	0.25	< 10	Phoenix	NO
LONG-1	41.34282613	-72.15100461	3/10/2020	0	0.16	229.4	0.11	7.3	0.25	< 10	Phoenix	NO
MAYF-1	41.31768494	-72.11817612	5/5/2020	0.25	0.44	201	0.096	14.5	1	< 10	Phoenix	NO
OIL-3	41.39174883	-72.17637879	3/22/2023	0	0.3	158	0.0759	10.7	0.11	<10	Phoenix	NO
OLDCOL-1	41.4210875	-72.132232	8/27/2018	0.25	0.39	344	0.16	23.45	0.25	< 10	Phoenix	NO
PAULA-2	41.34746905	-72.17292955	3/22/2023	0	0.08	357	0.172	13.3	0.2	<10	Phoenix	NO
PEPP-1	41.33037816	-72.11475368	5/5/2020	0.25	0	355	0.171	14.4	0.25	< 10	Phoenix	NO
PILG-1	41.3770728	-72.1226691	6/18/2018	0.25	0.05	210	0.11	21.34	0.25	< 10	Phoenix	NO
POND-1	41.38986574	-72.1398288	1/15/2020	0	0.05	231	0.111	9.9	0	30	Phoenix	NO
QUIN-1	41.39884705	-72.14270279	3/31/2023	0	0	281	0.186	9.7	0.61	<10	Phoenix	NO
ROSEMA-3	41.40898287	-72.10866464	4/6/2023	0	0	118	0.0847	12.6	0.23	5170	Phoenix	NO
SAVI-3	41.34686361	-72.13492299	5/18/2023	0	0.19	119	0.0561	16.5	0.04	<10	Phoenix	NO

Table 2.1a - Non-Impaired Waterbody Samples

Outfall ID	Latitude	Longitude	Sample Date	Ammonia (mg/L)	Chlorine (mg/L)	Conductivity (umhos/cm)	Salinity (g/kg)	Temp (oC)	MBAs (mg/L)	E. Coli (col/100ml)	Lab	Investigation Required
SHORD-4	41.315372	-72.146904	6/28/2019	0.25	0.03	215	0.12	18.21	0.25	520	Phoenix	NO
SHORD-6	41.3095762	-72.1440754	10/24/2019	0.25	0	228	0.105	18	0.25	530	Phoenix	NO
SPIT-1	41.33415	-72.159783	4/11/2023	0	0.1	244	0.116	15.6	0.05	<10	Phoenix	NO
STOHEI-3	41.35058433	-72.15958435	4/1/2020	0	0.01	222	0.106	10.7	0.25	< 10	Phoenix	NO
STOHEI-4	41.35009308	-72.15906959	3/9/2020	0	0.22	279.9	0.13	7.4	0	< 10	Phoenix	NO
SUSA-1	41.31990528	-72.1254505	5/12/2020	0.25	0.04	69	0.0323	13.5	0.25	10	Phoenix	NO
SUSA-2	41.31910337	-72.12539084	5/5/2020	0.25	0.16	86.6	0.0404	11.1	0.25	< 10	Phoenix	NO
SUSA-6	41.31570628	-72.12510139	5/5/2020	0.25	0.05	130	0.0615	14.2	0.25	< 10	Phoenix	NO
TANGLE-2	41.4052925	-72.1158648	6/18/2018	0.25	0.19	81	0.04	25.12	0.5	598	Phoenix	NO
TOTO-1	41.3901968	-72.1115598	10/25/2019	0.25	0.01	59	0.03	24.04	0.5	10	Phoenix	NO
TWINHA-1	41.366985	-72.132366	3/9/2020	0	0	404.9	0.19	6.7	0.25	< 10	Phoenix	NO
TWINLA-1	41.390183	-72.141697	1/15/2020	0.25	0	78.1	0.037	10.3	0.25	< 10	Phoenix	NO
TWINLA-2	41.387082	-72.1361025	6/18/2018	0.25	0.51	190	0.09	23.69	0	< 10	Phoenix	NO
TWINLA-3	41.38603	-72.137506	1/3/2020	0	0.02	118	0.089	2.8	0.25	< 10	Phoenix	NO
VAUX-15	41.40871495	-72.15833596	2/15/2023	0	0.05	485	0.213	9.6	0	<10	Phoenix	NO
VAUX-8	41.38816462	-72.1399747	3/27/2023	0	0	98.2	0.0634	11.2	0.67	<10	Phoenix	NO
VAUX-9	41.38939997	-72.1406787	3/27/2023	0	0	314	0.184	12.3	0.84	<10	Phoenix	NO
VILL-1	41.33200058	-72.1340978	3/10/2020	0.25	0	305	0.148	7.3	0.75	< 10	Phoenix	NO
VILL-2	41.33200059	-72.1340979	1/29/2020	3	0	243	0.116	14	0.25	< 10	Phoenix	NO
WESTW-1	41.3104625	-72.1243861	8/24/2018	0	0.06	537	0.26	27.5	0.25	84	Phoenix	NO
WhOAK-1	41.39790865	-72.1533232	2/15/2023	0	0	389	0.189	9.5	0.31	<10	Phoenix	NO
WINRID-1	41.35631863	-72.1307051	4/1/2020	0.5	0.52	328	0.158	11.8	0.25	20	Phoenix	YES

Table 2.1b - Class SA & SB Impaired Waterbody Samples

Outfall ID	Latitude	Longitude	Sample Date	Turbidity (NTU)	Turbidity Upstream (NTU)	Enterococcus (col/100mL)	Nitrogen (mg/L)	Phosphorous (mg/L)	Lab	Investigation Required
4TH-1	41.326394	-72.175706	4/25/2019	1.09	0	< 10	1.31	0.056	Phoenix	NO
ALEW-1	41.31653	-72.1034217	10/25/2019	n/a	n/a	51	n/a	n/a	Phoenix	NO
BALD-1	41.336172	-72.144587	1/29/2020	n/a	n/a	< 10	n/a	n/a	Phoenix	NO
EWHARF-1	41.327666	-72.1740938	4/25/2019	0.02	0	< 10	4.68	10	Phoenix	YES
JORCIR-2	41.316541	-72.151863	5/5/2020	n/a	n/a	496	n/a	n/a	Phoenix	NO
NIARIV-1	41.35634543	-72.17600201	4/1/2020	0.84	0.86	< 10	2.93	< 0.01	Phoenix	YES
NIARIV-2	41.3532664	-72.1762042	4/25/2019	0.22	0.3	< 10	0.46	0.039	Phoenix	NO
NIARIV-8	41.3284041	-72.1740437	2/5/2019	2.81	2.75	107	2.63	0.252	Phoenix	YES
OIL-1	41.3699747	-72.1922504	10/25/2019	4.04	3.1	73	0.77	0.032	Phoenix	NO
OLDNOR-3	41.4031439	-72.112051	8/24/2018	n/a	n/a	173	1.5	0.105	Phoenix	NO

Table 2.1b - Class SA & SB Impaired Waterbody Samples

Outfall ID	Latitude	Longitude	Sample Date	Turbidity (NTU)	Turbidity Upstream (NTU)	Enterococcus (col/100mL)	Nitrogen (mg/L)	Phosphorous (mg/L)	Lab	Investigation Required
SHORD-3S	41.3175383	-72.1472038	10/24/2019	n/a	n/a	30	n/a	n/a	Phoenix	NO
WINDW-3	41.3131931	-72.1603927	10/25/2019	n/a	n/a	< 10	n/a	n/a	Phoenix	NO

Notes:
n/a - Not Applicable
TANGLE-2 is no longer an impaired outfall so it is reported with the non-impaired data table

2.2 Wet weather sample and inspection data

Provide sample data for outfalls and key junction manholes of any catchment area with at least one System Vulnerability Factor.

Outfall / Interconnection ID	Sample date	Ammonia	Chlorine	Conductivity	Salinity	E. coli or Enterococcus	Surfactants	Water Temp	Pollutant of concern
Due to the limited number of qualifying storm events and the fact that most of the outfalls are tidally influenced, in 2025, B&L is focusing on collecting wet weather samples from the upgradient structures closest to the outfalls to the maximum extent practicable. B&L will continue to attempt to collect wet weather samples from the impaired outfalls until all known locations are sampled. Once the remaining impaired wet weather samples are collected, B&L will focus on the wet weather investigation samples.									

3. Catchment Investigation data (Appendix B (A)(7)(e) / page 9)

In 2024, the Niantic River Watershed Committee tracked high occurrences of bacteria in July and August at selected stormwater outfalls to Niantic River. They then collected samples in November 2024 from Banning Cove and Kiddee's Beach and analyzed with an e/DNA sample kit. The draft results were forwarded to the Town of Waterford on December 20, 2024. Results from the Niantic River Watershed Committee efforts are attached to this report. Follow up on these results are continuing, particularly regarding the detected swine DNA and potential sources of human DNA.

3.1 System Vulnerability Factor Summary

For those catchments being investigated for illicit discharges (i.e. categorized as high priority, low priority, or problem) document the presence or absence of System Vulnerability Factors (SVF). If present, report which SVF's were identified.

Outfall ID	Receiving Water	System Vulnerability Factors
CHAP-1	Thames River Basin	Sanitary and Storm Drain Infrastructure >40 years Old
EWHARF-1	LIS EB Inner - Niantic River(mouth), Niantic	Sanitary and Storm Drain Infrastructure >40 years Old; Septic with Poor Soils or Water Table Separation
FULM-2	Niantic River Basin	Sanitary and Storm Drain Infrastructure >40 years Old; Septic with Poor Soils or Water Table Separation
JORCIR-1	LIS EB Inner - Jordan Cove, Waterford	Sanitary and Storm Drain Infrastructure >40 years Old; Septic with Poor Soils or Water Table Separation
NIARIV-5	LIS EB Inner - Niantic River(mouth), Niantic	Sanitary and Storm Drain Infrastructure >40 years Old; Septic with Poor Soils or Water Table Separation
NIARIV-6	LIS EB Inner - Niantic River(mouth), Niantic	Sanitary and Storm Drain Infrastructure >40 years Old; Septic with Poor Soils or Water Table Separation
NIARIV-8	LIS EB Inner - Niantic River(mouth), Niantic	Sanitary and Storm Drain Infrastructure >40 years Old; Septic with Poor Soils or Water Table Separation
OIL-1	LIS EB Inner - Niantic River(mouth), Niantic	Sanitary and Storm Drain Infrastructure >40 years Old; Septic with Poor Soils or Water Table Separation
OLDNOR-3	LIS EB Inner – Thames River (middle)	Sanitary and Storm Drain Infrastructure >40 years Old; Septic with Poor Soils or Water Table Separation
OSWE-2	LIS EB Inner - Niantic River(mouth), Niantic	Sanitary and Storm Drain Infrastructure >40 years Old; Septic with Poor Soils or Water Table Separation
SHORD-3	Southeast Shoreline Basin	Sanitary and Storm Drain Infrastructure >40 years Old; Septic with Poor Soils or Water Table Separation
VILL-2	Southeast Shoreline Basin	Septic with Poor Soils or Water Table Separation
WINT-1	LIS EB Inner – Thames River (middle)	Sanitary and Storm Drain Infrastructure >40 years Old; Septic with Poor Soils or Water Table Separation
WINT-2	LIS EB Inner – Thames River (middle)	Sanitary and Storm Drain Infrastructure >40 years Old; Septic with Poor Soils or Water Table Separation

Where SVFs are:

1. History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages.
2. Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs.
3. Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints.
4. Common or twin-invert manholes serving storm and sanitary sewer alignments.
5. Common trench construction serving both storm and sanitary sewer alignments.
6. Crossings of storm and sanitary sewer alignments.
7. Sanitary sewer alignments known or suspected to have been constructed with an underdrain system;
8. Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations.
9. Areas formerly served by combined sewer systems.
10. Any sanitary sewer and storm drain infrastructure greater than 40 years old in medium and densely developed areas.
11. Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance).
12. History of multiple local health department or sanitarian actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance).

3.2 Key junction manhole dry weather screening and sampling data

Pipe ID	Outfall ID	Structure Type	Sample Date	Outfall Turbidity (NTU)	Turbidity Upstream (NTU)	Ammonia (mg/L)	Chlorine (mg/L)	Surfactants (mg/L)	Ecoli (col/100ml)	Enterococcus (col/100mL)	Fecal Coliform (col/100mL)	Nitrogen (mg/L)	Phosphorous (mg/L)	Lab
OLDNOR-3	OLDNOR-3	Outfall	5/21/2021	n/a	n/a	0	0.12	1.8	n/a	235	74	5.2	0.827	Phoenix
CB2490-OLDNOR-3		Catch Basin	12/13/2024*	-	-	-	-	-	-	-	-	-	-	-
DMH19-1- NIARIV-8	NIARIV-8	Outfall	5/21/2021	0.27	0.93	0	0.01	0.58	n/a	31	41	1.61	0.046	Phoenix
CB3804-DMH486		Manhole	5/21/2021	2.2	0.93	0	0.04	0.18	n/a	<10	<10	4.9	0.638	Phoenix
CB3806-DMH486		Manhole	5/21/2021	11.8	0.93	0	0.04	0.1	n/a	302	20	4.32	0.094	Phoenix
CB3795-CB3757		Catch Basin	5/21/2021	0.24	0.93	0	0.07	0.1	n/a	20	<10	3.22	0.052	Phoenix
CB3756-CB3757		Catch Basin	5/21/2021	0.44	0.93	0	0.01	0.07	n/a	110	86	0.89	0.016	Phoenix
EWHARF-1	EWHARF-1	Outfall	5/13/2021	1.2	1.2	0	0.02	0.08	n/a	10	<10	3.81	0.013	Phoenix
UNK-5-CB3892		Catch Basin	5/13/2021	0.95	1.2	0	0.05	0.08	n/a	<10	<10	3.96	<0.010	Phoenix
CB3817-CB3799		Manhole	5/13/2021	3.83	1.2	0	0.01	0.27	n/a	174	<10	4.44	0.183	Phoenix
COLL-1	COLL-1	Outfall	5/13/2021	n/a	n/a	0	0	0.23	6870	n/a	n/a	n/a	n/a	Phoenix
Inlet-1-CB2342		Catch Basin	5/13/2021	n/a	n/a	0	0.29	0.16	2600	n/a	n/a	n/a	n/a	Phoenix
4TH-1	4TH-1	Outfall	5/13/2021	0.68	3.75	0.25	0.18	0.28	n/a	<10	<10	0.71	0.128	Phoenix
CB1664- DMH434		Manhole	5/13/2021	2.94	3.75	0	0.02	0.23	n/a	<10	<10	0.38	0.089	Phoenix
DMH436- DMH437		Manhole	5/13/2021	1.85	3.75	0	0	0.39	n/a	10	<10	0.83	0.057	Phoenix
NIARIV-1	NIARIV-1	Outfall	12/13/2024	-	-	-	-	-	-	-	-	-	-	-
JORCIR-1	JORCIR-1	Outfall	12/13/2024*	-	-	-	-	-	-	-	-	-	-	-
CB4631-JORCIR-1		Catch Basin	12/13/2024*	-	-	-	-	-	-	-	-	-	-	-
CHAP-1	CHAP_1	Outfall	12/13/2024	-	-	-	-	-	-	-	-	-	-	-
CB2909-DMH626	WINRID-1	Catch Basin	12/13/2024	-	-	-	-	-	-	-	-	-	-	-
FULM-2	FULM-2	Outfall	12/13/2024	n/a	n/a	0	0.01	0.14	110	n/a	n/a	n/a	n/a	Phoenix
CB1A-CB1		Catch Basin	12/13/2024	n/a	n/a	0	0.00	0.21	98	n/a	n/a	n/a	n/a	Phoenix

Notes:

n/a - Not Applicable

* - Structure showed evidence of discharge (damp, staining, stagnant water, etc.) but had no flow to sample

3.3 Wet weather investigation outfall sampling data

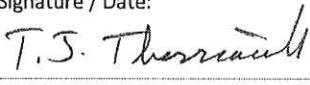
Outfall ID	Sample date	Ammonia	Chlorine	Surfactants
It is anticipated that this will be initiated in 2025 and will be completed to the maximum extent practicable. B&L is focusing wet weather sampling efforts on impaired outfalls and the annual priority outfalls prior to conducting wet weather investigations.				

3.4 Data for each illicit discharge source confirmed through the catchment investigation procedure

Discharge location (Outfall ID)	Source Location(s) (Address)	Discharge Description	Method of Discovery	Date of Discovery	Date of Elimination	Mitigation or Enforcement Action	Estimated Volume of Flow Removed
COLL-1	7 College Ct	Outfall location looks to be discharging sewage from septic tank/leaching field located at 7 College Ct. Homeowner even noted they installed the system themselves.	Visually in field and field/lab testing	7/21/2020 and 5/13/21			
EWHARF-1	5-13 E Wharf Rd and 4-7 High Ridge Dr	Pipes from CB3814 is discharging high levels of nitrogen likely coming from 5 E Wharf Rd. Pipes from 6 to 13 E Wharf Rd discharge is exceeding levels of chlorine, surfactants, and nitrogen. Lateral pipe that's likely coming from 7 High Ridge Dr discharge is exceeding levels of chlorine and nitrogen	Visually in field and field/lab testing	5/13/2021			
OLDNOR-3		Investigation was initiated but was unable to be completed because the system was completely dry. This area will be reviewed during spring of 2025 when the water table levels are higher.	Visually in field and field/lab testing				
NIARIV-8		Investigation was initiated but was unable to be completed because a branch of the system was not yet fully mapped. This area will be reviewed during spring of 2025.	Visually in field and field/lab testing				
4TH-1		Investigation was initiated but was unable to be completed because a manhole cover could not be lifted for inspection. This area will be reviewed during spring of 2025 to further complete the investigation	Visually in field and field/lab testing				
NIARIV-1		Investigation was initiated but was unable to be completed because the system was completely dry. This area will be reviewed during spring of 2025 when the water table levels are higher.	Visually in field and field/lab testing				
JORCIR-1		Investigation was initiated but was unable to be completed because the system was completely dry. This area will be reviewed during spring of 2025 when the water table levels are higher.	Visually in field and field/lab testing				
CHAP_1		Investigation was initiated but was unable to be completed because the system was completely dry. This area will be reviewed during spring of 2025 when the water table levels are higher.	Visually in field and field/lab testing				
WINRID-1		Investigation was initiated but was unable to be completed because the system was completely dry. This area will be reviewed during spring of 2025 when the water table levels are higher.	Visually in field and field/lab testing				
FULM-2		Investigation was initiated. This area will be reviewed during spring of 2025 when the water table levels are higher.	Visually in field and field/lab testing				

Part IV: Certification

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

Chief Elected Official or Principal Executive Officer	Document Prepared by
Print name: Robert J. Brule First Selectman	Print name: T.J. Therriault Barton & Loguidice, LLC
Signature / Date: 	Signature / Date:  3/26/2025
Email: firstsel@waterfordct.org	Email: tjt@bartonandloguidice.com

Catchment ID	Receiving Water	Wet Sampling Results Indicate Likely Illicit Discharge?	Dry Screening Results Indicate Likely Illicit Discharge?	Discharging to Area of Concern to Public Health?	Frequency of Past Discharge Complaints	Receiving Water Quality	Density of Generating Sites ⁴	Age of Development/ Infrastructure ⁵	Historic Combined Sewers or Septic? ⁶	Aging Septic? ⁷	Culverted Streams? ⁸	Additional Characteristics	Sample Score	Total Score	Priority Ranking
		1	1a	2	3	4									
New Catchment ID	Information Source	Catchment inspections and sample results	Catchment inspections and sample results	GIS Maps	Municipal Staff	Impaired Waters List	Land Use/GIS Maps, Aerial Photography	Land Use Information, Visual Observation	Municipal Staff, GIS Maps	Land Use, Municipal Staff	GIS and Stormwater system Maps	Other	TBD		
	See Note	Score is determined using an extrapolated formula based on the results	Yes = 3 No = 0	Frequent = 3 Occasional = 2	Poor = 3 Fair = 2 Good = 0	High = 3 Medium = 2 Low = 1	High = 3 Medium = 2 Low = 1	Yes = 3 No = 0	Yes = 3 No = 0	Yes = 3 No = 0	Yes = 3 No = 0				
JORCIR-1	LIS EB Inner - Jordan Cove, Waterford	24	0	0		3	1	3			0		24	31	High
OLDNOR-3	LIS EB Inner - Thames River (middle)	8	14	0		2	2	3			0		22	29	High
EWHARF-1	LIS EB Inner - Niantic River(mouth), Niantic	11	9	0		3	1	3			0		20	27	High
STAN-1	LIS EB Inner - Niantic River(mouth), Niantic	17	0	0		3	1	3			0		17	24	High
4TH-1	LIS EB Inner - Niantic River(mouth), Niantic	9	4	3		3	1	3			0		13	23	High
JORCIR-2	LIS EB Inner - Jordan Cove, Waterford	0	13	0		3	1	3			0		13	20	High
COLL-1	Thames River Basin	n/a	16	0		0		3			0		16	19	High
ALEW-1	LIS EB Inner - Alewife Cove, Waterford/New London	NS	11	0		3	1	3			0		11	18	High
WINDW-1	LIS EB Inner - Jordan Cove, Waterford	8	NS	3		3		2			0		8	16	High
WINT-1	LIS EB Inner - Thames River (middle)	10	0	0		2		3			0		10	15	High
NIARIV-8	LIS EB Inner - Niantic River(mouth), Niantic	NS	7	0		3	1	3			0		7	14	High
NIARIV-1	LIS EB Inner - Niantic River(mouth), Niantic	2	5	0		3		3			0		7	13	High
OIL-1	LIS EB Inner - Niantic River(mouth), Niantic	1	4	0		3	1	3			0		5	12	High
NIARIV-2	LIS EB Inner - Niantic River(mouth), Niantic	3	2	0		3		3			0		5	11	High
NIARIV-6	LIS EB Inner - Niantic River(mouth), Niantic	3	0	0		3	2	3			0		3	11	Low
OSWE-8	LIS EB Inner - Niantic River(mouth), Niantic	2	0	3		3		3			0		2	11	High
RIVS1-2	LIS EB Inner - Niantic River(mouth), Niantic	5	0	0		3		3			0		5	11	High
PARK-1	LIS EB Inner - Niantic River(mouth), Niantic	4	0	0		3		3			0		4	10	High
BALD-1	LIS EB Inner - Jordan Cove Waterford	0	3	0		3		3			0		3	9	Low
MAYF-1	Southeast Shoreline Basin	n/a	6	0		0		3			0		6	9	Low
NIARIV-5	LIS EB Inner - Niantic River(mouth), Niantic	2	0	0		3	1	3			0		2	9	Low
OIL-2	LIS EB Inner - Niantic River(mouth), Niantic	2	NS	0		3	1	3			0		2	9	Low
SHAW-1	LIS EB Inner - Niantic River(mouth), Niantic	3	0	0		3		3			0		3	9	Low
WINT-2	LIS EB Inner - Thames River (middle)	4	0	0		2		3			0		4	9	Low
CHAP-2	Thames River Basin	n/a	5	0		0		3			0		5	8	Low
FULM-2	Niantic River Basin	n/a	5	0		0		3			0		5	8	Low
NIARIV-4	LIS EB Inner - Niantic River(mouth), Niantic	NS	0	0		3	2	3			0		0	8	Low
NIARIV-7	LIS EB Inner - Niantic River(mouth), Niantic	0	0	0		3	2	3			0		0	8	Low
OLDCOL-1	Sandy Brook	n/a	5	0		0		3			0		5	8	Low
OSWE-1	LIS EB Inner - Niantic River (mouth), Niantic	2	0	0		3		3			0		2	8	Low
ROSEMA-3	Hunts Brook Basin	n/a	5	0		0		3			0		5	8	Low
TANGLE-2	Hunts Brook Basin	n/a	5	0		0		3			0		5	8	Low
TWINL-2	Thames River Basin	n/a	4	0		0	1	3			0		4	8	Low
VILL-2	Southeast Shoreline Basin	n/a	6	0		0		2			0		6	8	Low
WINRID-1	Jordan Brook Basin	n/a	6	0		0		2			0		6	8	Low
ALMO-1	Jordan Brook Basin	n/a	4	0		0		3			0		4	7	Low
MAGO-1	LIS EB Inner - Niantic River(mouth), Niantic	NS	0	0		3	1	3			0		0	7	Low
OSWE-5	LIS EB Inner - Niantic River (mouth) Niantic	1	0	0		3		3			0		1	7	Low
SHORD-4	Southeast Shoreline Basin	n/a	4	0		0		3			0		4	7	Low
SUSA-2	Southeast Shoreline Basin	n/a	4	0		0		3			0		4	7	Low
2ND-2	LIS EB Inner - Niantic River(mouth), Niantic	NS	0	0		3		3			0		0	6	Low
2ND-3	LIS EB Inner - Niantic River(mouth), Niantic	NS	0	0		3		3			0		0	6	Low
AVERY-2	Jordan Brook Basin	n/a	3	0		0		3			0		3	6	Low
BALD-2	LIS EB Inner - Jordan Cove Waterford	0	0	0		3		3			0		0	6	Low
BEACH-1	LIS EB Shore - Outer Jordan Cove Waterford	NS	0	0		3		3			0		0	6	Low
CLARLN-1	Fenger Brook (Waterford)-01	NS	0	0		3		3			0		0	6	Low
DIV1-1	LIS EB Inner - Jordan Cove, Waterford	NS	0	0		3		3			0		0	6	Low
GLEN-1	LIS EB Inner - Alewife Cove, Waterford/New London	0	0	0		3		3			0		0	6	Low
GrTREE-1	Hunts Brook Basin	n/a	1	0		0	2	3			0		1	6	Low
HICK-1	Thames River Basin	n/a	3	0		0		3			0		3	6	Low
HIGRID-1	Niantic River Basin	n/a	3	0		0		3			0		3	6	Low
INA-1	Niantic River Basin	n/a	4	0		0		2			0		4	6	Low
JORRD-2	LIS EB Inner - Jordan Cove Waterford	NS	0	0		3		3			0		0	6	Low
LAKES-2	Oil Mill Brook Basin	n/a	3	0		0		3			0		3	6	Low
LAMP-1	LIS EB Inner - Jordan Cove Waterford	NS	0	0		3		3			0		0	6	Low
LINC-1	LIS EB Inner - Jordan Cove Waterford	NS	0	0		3		3			0		0	6	Low
LONG-1	Jordan Brook Basin	n/a	3	0		0		3			0		3	6	Low
MINER-2	Southeast Shoreline Basin	n/a	0	3		0		3			0		0	6	Low
OIL-3	Oil Mill Brook	n/a	3	0		0		3			0		3	6	Low
PARK-2	LIS EB Inner - Niantic River (mouth) Niantic	NS	0	0		3		3			0		0	6	Low
PILG-1	Thames River Basin	n/a	3	0		0		3			0		3	6	Low
PINE-1	Fenger Brook (Waterford)-01	NS	NS	0		3		3			0	</td			

Catchment ID	Receiving Water	Wet Sampling Results Indicate Likely Illicit Discharge?	Dry Screening Results Indicate Likely Illicit Discharge?	Discharging to Area of Concern to Public Health?	Frequency of Past Discharge Complaints	Receiving Water Quality	Density of Generating Sites ⁴	Age of Development/ Infrastructure ⁵	Historic Combined Sewers or Septic? ⁶	Aging Septic? ⁷	Culverted Streams? ⁸	Additional Characteristics	Sample Score	Total Score	Priority Ranking	
		1	1a	2	2	3										
New Catchment ID	Information Source	Catchment inspections and sample results	Catchment inspections and sample results	GIS Maps	Municipal Staff	Impaired Waters List	Land Use/GIS Maps, Aerial Photography	Land Use Information, Visual Observation	Municipal Staff, GIS Maps	Land Use, Municipal Staff	GIS and Stormwater system Maps	Other	TBD	Sample Score	Total Score	Priority Ranking
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7TH-2	Niantic River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
ALBA-1	Southeast Shoreline Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
AVERY-3	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
AVERY-4	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
BLOOM-1	Hunts Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
BLOOM-3	Hunts Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
BLOOM-4	Hunts Brook Basin	n/a	NS	0	0	0	3	3	0	0	0	0	0	3	Low	
BLOOM-5	Hunts Brook Basin	n/a	NS	0	0	0	3	3	0	0	0	0	0	3	Low	
BRAM-1	Hunts Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
BRAM-3	Hunts Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
BRAM-4	Hunts Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
BRIAR-1	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
BROOK-1	Niantic River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
BURL-1	Hunts Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
BURL-2	Hunts Brook Basin	n/a	NS	0	0	0	3	3	0	0	0	0	0	3	Low	
BUTLER-1	Polly Brook	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
BUTLER-2	Oil Mill Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
BUTLER-4	Latimer Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CASE-1	Niantic River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CASE-2	Niantic River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CENTER-1	Niantic River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CHAP-5	Lake Brandegee	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CIRC-1	Niantic River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CLARKMS-1	Southeast Shoreline Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CLARKMS-2	Southeast Shoreline Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CLARLN-2	Southeast Shoreline Basin	n/a	NS	0	0	0	3	3	0	0	0	0	0	3	Low	
CLARLN-3	Southeast Shoreline Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CLARP-1	Hunts Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
COLO-1	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
COLO-2	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
COLO-3	Southeast Shoreline Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
COTT-1	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
COUCLU-1	Southeast Shoreline Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CROSDR-1	Jordan Mill Pond	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CROSDR-1	Niantic River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CROSDR-10	Niantic River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CROSDR-2	Niantic River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CROSDR-3	Niantic River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CROSDR-6	Niantic River Basin	n/a	NS	0	0	0	3	3	0	0	0	0	0	3	Low	
CROSDR-7	Niantic River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
CROSDR-8	Niantic River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DANIEL-1	Niantic River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DAVID-1	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DAY-1	Thames River Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-AVERY-1	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-AVERY-2	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-AVERY-3	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-AVERY-4	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-AVERY-5	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-BRAM-1	Southeast Shoreline Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-BUTLER-1	Latimer Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-GTREE-1	Hunts Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-GTREE-2	Hunts Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-GTREE-3	Hunts Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-GTREE-4	Hunts Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-LOGHIL-1	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-LOGHIL-2	Jordan Brook Basin	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-LONGVIEW-1	Southeast Shoreline	n/a	0	0	0	0	3	3	0	0	0	0	0	3	Low	
DDCB-LONGVIEW-2	Southeast Shoreline	n/a	0	0	0	0	3	3	0	0	0	0	0			

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		Catchment inspections and sample results	Catchment inspections and sample results	GIS Maps	Municipal Staff	Impaired Waters List									
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MARLIN-1	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
MARY-1	Jordan Brook Basin	n/a	0	0	0	3				0			0	3	Low
MEAD-1	Thames River Basin	n/a	0	0	0	3				0			0	3	Low
MEAD-2	Thames River Basin	n/a	0	0	0	3				0			0	3	Low
MEAD-3	Thames River Basin	n/a	0	0	0	3				0			0	3	Low
MILLW-1	Niantic River Basin	n/a	0	0	0	3				0			0	3	Low
MILT-1	Thames River Basin	n/a	NS	0	0	3				0			0	3	Low
MILT-2	Thames River Basin	n/a	0	0	0	3				0			0	3	Low
MINER-1	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
MONR-1	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
MULHIL-1	Jordan Brook Basin	n/a	0	0	0	3				0			0	3	Low
MULHIL-2	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
MULHIL-3	Jordan Brook Basin	n/a	0	0	0	3				0			0	3	Low
MYRO-1	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
NEWSHO-1	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
NIARIV-10	Niantic River Basin	n/a	0	0	0	3				0			0	3	Low
NIARIV-9	Niantic River Basin	n/a	0	0	0	3				0			0	3	Low
NICH-1	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
NICH-2	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
NICH-3	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
NILHIL-1	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
NILHIL-2	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
NORTH-1	Jordan Brook Basin	n/a	0	0	0	3				0			0	3	Low
NORTH-2	Jordan Brook Basin	n/a	0	0	0	3				0			0	3	Low
NORTH-3	Jordan Brook Basin	n/a	0	0	0	3				0			0	3	Low
NORTH-4	Jordan Brook Basin	n/a	0	0	0	3				0			0	3	Low
NORWOD-1	Hunts Brook Basin	n/a	0	0	0	3				0			0	3	Low
OIL-4	Oil Mill Brook	n/a	0	0	0	3				0			0	3	Low
OIL-5	Oil Mill Brook	n/a	0	0	0	3				0			0	3	Low
OLDBAR-1	Hunts Brook Basin	n/a	0	0	0	3				0			0	3	Low
OLDBAR-2	Hunts Brook Basin	n/a	0	0	0	3				0			0	3	Low
OLDCOL-2	Hunts Brook Basin	n/a	0	0	0	3				0			0	3	Low
OLDCOL-3	Hunts Brook Basin	n/a	0	0	0	3				0			0	3	Low
OLDMIL-1	Hunts Brook Basin	n/a	0	0	0	3				0			0	3	Low
OLDNOR-1	Hunts Brook Basin	n/a	0	0	0	3				0			0	3	Low
OLDNOR-11	Hunts Brook Basin	n/a	0	0	0	3				0			0	3	Low
OLDNOR-12	Church Brook	n/a	0	0	0	3				0			0	3	Low
OLDNOR-13	Hunts Brook Basin	n/a	0	0	0	3				0			0	3	Low
OLDNOR-6	Church Brook	n/a	0	0	0	3				0			0	3	Low
OLDNOR-7	Thames River Basin	n/a	0	0	0	3				0			0	3	Low
OLDNOR-8	Thames River Basin	n/a	0	0	0	3				0			0	3	Low
OSWE-10	Niantic River Basin	n/a	0	0	0	3				0			0	3	Low
OSWE-4	Niantic River Basin	n/a	0	0	0	3				0			0	3	Low
OSWE-9	Niantic River Basin	n/a	0	0	0	3				0			0	3	Low
OVER-1	Jordan Brook Basin	n/a	NS	0	0	3				0			0	3	Low
PALM-1	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
PAULA-1	Niantic River Basin	n/a	0	0	0	3				0			0	3	Low
PAULA-3	Niantic River Basin	n/a	0	0	0	3				0			0	3	Low
PENN-1	Hunts Brook Basin	n/a	0	0	0	3				0			0	3	Low
PENN-2	Hunts Brook Basin	n/a	0	0	0	3				0			0	3	Low
QUARRY-1	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
QUARRY-2	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
RIDG-1	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
RIVSI-1	LIS EB Inner - Niantic River(mouth), Niantic	NS	0	0	0	3				0			0	3	Low
ROBHIL-1	Jordan Brook Basin	n/a	0	0	0	3				0			0	3	Low
ROBHIL-2	Jordan Brook Basin	n/a	0	0	0	3				0			0	3	Low
ROCK-1	Jordan Brook Basin	n/a	0	0	0	3				0			0	3	Low
ROCK-2	Jordan Brook Basin	n/a	0	0	0	3				0			0	3	Low
ROCK-3	Jordan Brook Basin	n/a	0	0	0	3				0			0	3	Low
ROCRID-1	Jordan Brook Basin	n/a	0	0	0	3				0			0	3	Low
ROGHIL-1	Hunts Brook Basin	n/a	NS	0	0	3				0			0	3	Low
ROPER-11	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
ROPER-7	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
ROPER-8	Southeast Shoreline Basin	n/a	0	0	0	3				0			0	3	Low
ROSELE-1	Thames River Basin	n/a	0	0	0	3				0			0	3	Low
ROSEMA-1	Hunts Brook Basin														

Catchment ID	Receiving Water	Wet Sampling Results Indicate Likely Illicit Discharge? ¹	Dry Screening Results Indicate Likely Illicit Discharge? ^{1a}	Discharging to Area of Concern to Public Health? ²	Frequency of Past Discharge Complaints	Receiving Water Quality ³	Density of Generating Sites ⁴	Age of Development/ Infrastructure ⁵	Historic Combined Sewers or Septic? ⁶	Aging Septic? ⁷	Culverted Streams? ⁸	Additional Characteristics	Sample Score	Total Score	Priority Ranking
		Catchment inspections and sample results	Catchment inspections and sample results	GIS Maps	Municipal Staff	Impaired Waters List									
New Catchment ID	Information Source														
	See Note	Score is determined using an extrapolated formula based on the results	Yes = 3 No = 0	Frequent = 3 Occasional = 2	Poor = 3 Fair = 2 Good = 0	High = 3 Medium = 2 Low = 1	Land Use/GIS Maps, Aerial Photography	Land Use Information, Visual Observation	Municipal Staff, GIS Maps	Land Use, Municipal Staff	GIS and Stormwater system Maps	Other	TBD		
ELAKE-1	Lake Brandegee	n/a	0	0	0	2				0		0	0	2	Low
GIOV-1	Jordan Brook Basin	n/a	0	0	0	2				0		0	0	2	Low
GIOV-3	Jordan Brook Basin	n/a	0	0	0	2				0		0	0	2	Low
HICK-2	Thames River Basin	n/a	0	0	0	2				0		0	0	2	Low
HICK-3	Thames River Basin	n/a	0	0	0	2				0		0	0	2	Low
LLOYD-1	Southeast Shoreline Basin	n/a	0	0	0	2				0		0	0	2	Low
MELA-1	Southeast Shoreline Basin	n/a	0	0	0	2				0		0	0	2	Low
MEMO-1	Southeast Shoreline Basin	n/a	0	0	0	2				0		0	0	2	Low
MEMO-2	Southeast Shoreline Basin	n/a	0	0	0	2				0		0	0	2	Low
PADG-1	Thames River Basin	n/a	0	0	0	2				0		0	0	2	Low
PEPP-2	Southeast Shoreline Basin	n/a	0	0	0	2				0		0	0	2	Low
PEPP-3	Southeast Shoreline Basin	n/a	0	0	0	2				0		0	0	2	Low
PEPP-4	Southeast Shoreline Basin	n/a	NS	0	0	2				0		0	0	2	Low
RAIN-1	Hunts Brook Basin	n/a	0	0	0	2				0		0	0	2	Low
WINDW-2	Southeast Shoreline Basin	n/a	0	0	0	2				0		0	0	2	Low
YORK-1	Jordan Brook Basin	n/a	0	0	0	2				0		0	0	2	Low
YORK-2	Jordan Brook	n/a	0	0	0	2				0		0	0	2	Low
YORK-3	Jordan Brook Basin	n/a	0	0	0	2				0		0	0	2	Low
YORK-4	Jordan Brook Basin	n/a	0	0	0	2				0		0	0	2	Low
YORK-5	Jordan Brook Basin	n/a	0	0	0	2				0		0	0	2	Low
CONSH-1	Hunts Brook Basin	n/a	0	0	0	1				0		0	0	1	Low
HART-1	Jordan Brook Basin	n/a	0	0	0	1				0		0	0	1	Low
KATH-1	Southeast Shoreline Basin	n/a	0	0	0	1				0		0	0	1	Low
ONEIL-1	Southeast Shoreline Basin	n/a	0	0	0	1				0		0	0	1	Low
PERFAR-1	Southeast Shoreline Basin	n/a	0	0	0	1				0		0	0	1	Low
PERFAR-2	Southeast Shoreline Basin	n/a	0	0	0	1				0		0	0	1	Low

Impaired Waterbodies

n/a = Not Applicable

NS = Not Sampled or Screened

Scoring Criteria:

If there's no waterbody feature identified the receiving body source will be the name of the subregional basin the outfall resides in

¹ Previous wet weather screening results indicate impacts to impaired waters including:

Total Nitrogen >2.5 mg/L, Total Phosphorous >0.3 mg/L,

E. Coli >235col/100 ml for swimming areas and >40 col/100 ml for all others or,

Total Coliform >500 col/100 ml, or Fecal coliform >31 col/100ml for Class SA and >260 Col/100ml for Class SB, or

Enterococcus >104 col/100ml for swimming areas and >500 col/100ml for all others, or

Turbidity at outfall is more than 5 NTU greater than the in-stream sample.

^{1a} Previous dry weather screening results indicate likely sewer input if any of the following are true:

Offactory or visual evidence of sewage,

Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or

Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine

² Catchments that discharge to or in the vicinity of any of the following areas: public beaches, recreational areas, drinking water supplies, or shellfish beds³ Receiving water quality based on latest version of State of Connecticut Integrated Water Quality Report.

Poor = Waters with approved TMDLs (Category 4a Waters) where illicit discharges have the potential to contain the pollutant identified as the cause of the impairment

Fair = Water quality limited waterbodies that receive a discharge from the MS4 (Category 5 Waters)

Good = No water quality impairments

⁴ Generating sites are institutional, municipal, commercial, or industrial sites with a potential to contribute to illicit discharges (e.g., car dealers, car washes, gas stations, garden centers, industrial manufacturing, etc.)⁵ Age of development and infrastructure:

High = Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old

Medium = Developments 20-40 years old

Low = Developments less than 20 years old

⁶ Areas once served by combined sewers and but have been separated, or areas once served by septic systems but have been converted to sanitary sewers.⁷ Aging septic systems are septic systems 30 years or older in residential areas.⁸ Any river or stream that is culverted for distance greater than a simple roadway crossing.

2024 Bacteria Sampling in Niantic River Storm Drains and Estuary

Samples collected by the Vaudrey Lab, 2024.

Followed the methods used by the Pathogen Monitoring Network for collecting and transporting samples (QAPP is available).

Samples were analyzed using the IDEXX Colilert and IDEXX Enterolert methods in the Vaudrey lab. The Vaudrey lab is not certified by any State or National agencies for bacteria analysis. But methods employed by Harbor Watch were followed.

Quality control measure included:

- A dye test was used to confirm the sealer was working properly.
- A blank was run for each sample day.
- A trypticase soy broth was run on the first day, to confirm sterility of the reagents and sample containers.
- For dilutions and blanks, a commercially prepared sterile container of 90mL of deionized water was used (Hardy Diagnostics, Cat no. D090, DiluLok™ Deionized Water, 90ml, Dilution Bottle with Hinged Flip Top)
- Pipettes (10mL) were sterile and used only once.

Contact:

Jamie Vaudrey, Ph.D.
Department of Marine Sciences
University of Connecticut
1080 Shennecossett Road
Groton, CT 06357
jamie.vaudrey@uconn.edu

unify trash from sites

<https://preview.climate.gov/maps-data/dataset/past-weather-zip-code>

NOAA NCEI data for Niantic (06357)

Standard units (inches of rain)

	inches	cumulative	
	inches		
6/28/2024	0.03	2.62	10 day prior
6/29/2024	0.00	2.59	9 day prior
6/30/2024	0.07	2.59	8 day prior
7/1/2024	1.49	2.52	7 day prior
7/2/2024	0.00	1.03	6 day prior
7/3/2024	0.00	1.03	5 day prior
7/4/2024	0.00	1.03	4 day prior
7/5/2024	0.07	1.03	3 day prior
7/6/2024	0.91	0.96	2 day prior
7/7/2024	0.05	0.05	1 day prior
7/8/2024	0.00		

	inches	cumulative	
	inches		
8/10/2024	0.29	1.48	10 day prior
8/11/2024	0.00	1.19	9 day prior
8/12/2024	0.00	1.19	8 day prior
8/13/2024	0.12	1.19	7 day prior
8/14/2024	0.00	1.07	6 day prior
8/15/2024	0.00	1.07	5 day prior
8/16/2024	0.12	1.07	4 day prior
8/17/2024	0.00	0.95	3 day prior
8/18/2024	0.28	0.95	2 day prior
8/19/2024	0.67	0.67	1 day prior
8/20/2024	0.33		

July 8, 2024 sampling

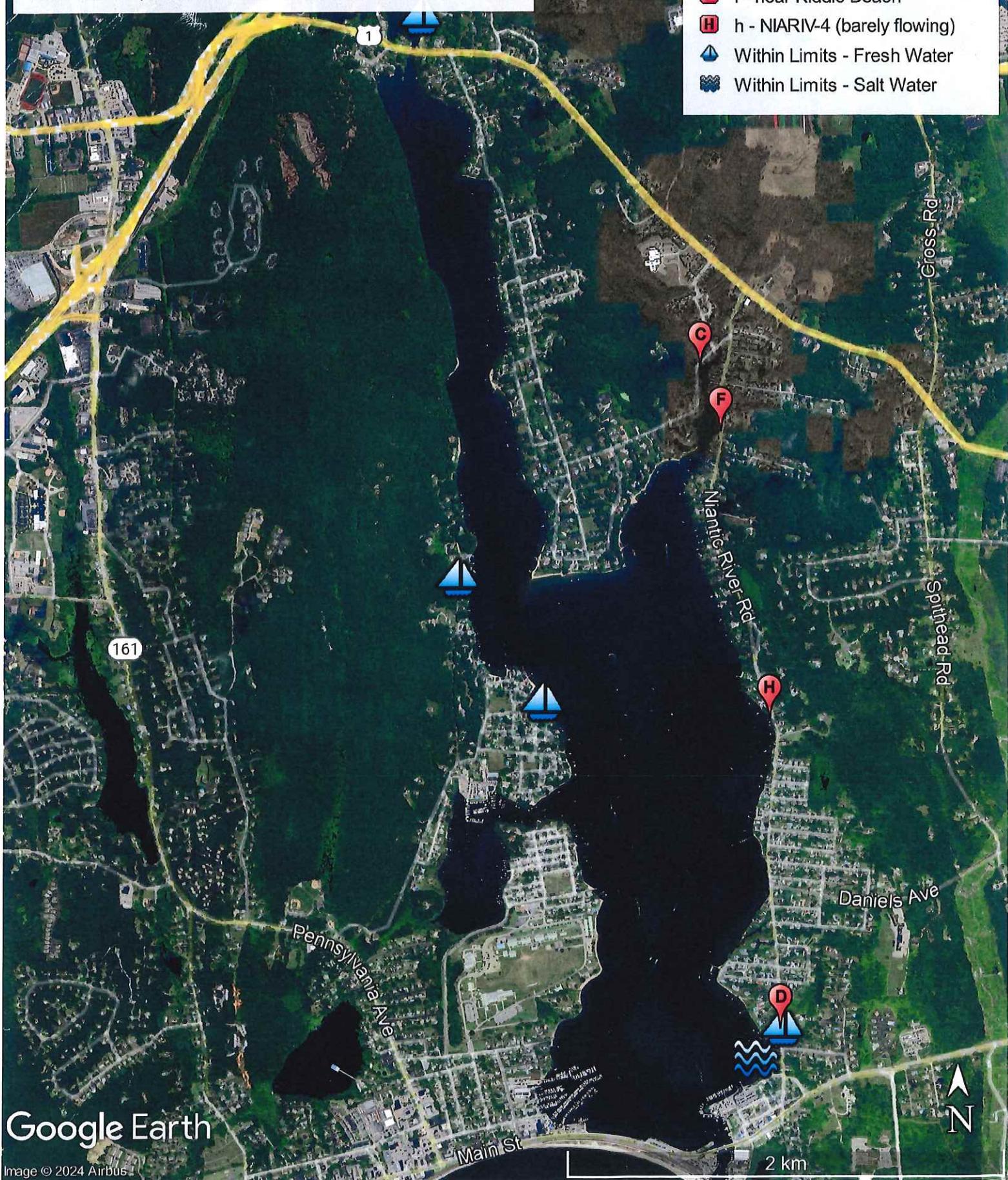
Bacteria tested:

Escherichia (salt or fresh water) & E. coli (fresh water)

Total coliform (all stations over the limit, legend does not apply)

Legend

- C c - OWSE-5 (stagnant)
- D d - River Rd x n of E Wharf Rd
- F f - near Kiddie Beach
- H h - NIARIV-4 (barely flowing)
- A Within Limits - Fresh Water
- W Within Limits - Salt Water



Google Earth

Image © 2024 Airbus

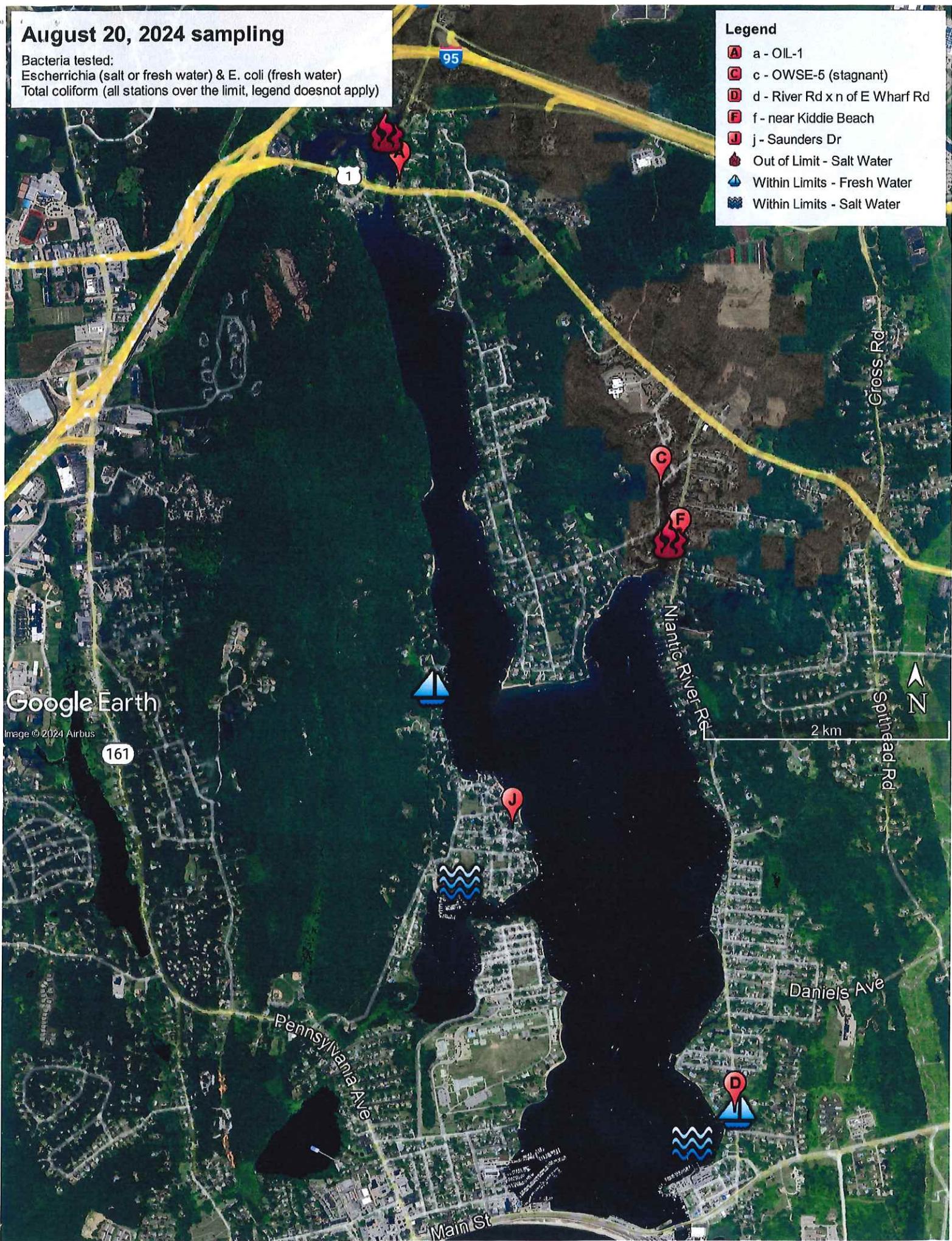
Sampling Date: 7/8/24
analyzed in Vaudrey lab

August 20, 2024 sampling

Bacteria tested:

Escherichia (salt or fresh water) & E. coli (fresh water)

Total coliform (all stations over the limit, legend does not apply)



Sampling Date: 8/20/24
analyzed in Vaudrey lab

all samples were diluted 1:10mL
sample + 90mL water. Values
include impact of dilution.

matrix	GPS	map name	location	flowing?	Sample ID	salt water standards		Fecal Coliform > 31 col/100ml for Class Sa and > 260 col/100ml for Class SB		does not apply		> 104 col/100ml for swimming areas or 500 col/100 for all others	
						Total Coliform	MPN	Average MPN	MPN	Average MPN	MPN	Average MPN	MPN
salt water	41.32677 -72.17725	EWHARF1?	Waterford - north end of Keeney Cove	saltwater	b b								
fresh water	41.32890 -72.17329	storm drain River Road, north of E Wharf Road	Waterford	flowing	d	24196	24196	987	987	1576	1576		
fresh water	41.35595 -72.17725	OSWE-5	Waterford	stagnant	c	24196	24196	430	430	1638	1638		
fresh water	41.36934 -72.19224	OIL-1	Waterford - Banning Cove	flowing	a	12997	12997	441	441	19863	19863		
fresh water	41.34840 -72.19060	near 59 Quarry Dock Rd	EastLyme - just south of Oswe. Hills	flowing	i	10462	10462	138	138	435	435		
fresh water	41.34132 -72.18606	Saunders Dr	EastLyme - NE section of Saunders Pt.	flowing	j	>24196	>24196	>24196	>24196			>24196	
fresh water	41.35528 -72.17617	near Kiddie Beach	Waterford - just north of Kiddie Beach	flowing	f	>24196	>24196	428	428	1246	1246		
fresh water	41.34152 -72.17369	NIARIV-4	Waterford	barely flowing - had mosquito larvae	h								
fresh water	41.32793 -72.17312	storm drain River Road x E Wharf Road	Waterford	flowing	g g	>24196	>24196	246	246	1039	1039		
saltwater	41.338366 -72.189119	Three Belles/Smith Cove	EastLyme	estuary	1	2282	NA in saltwater	204	NA in saltwater	20	20		
saltwater	41.336654 -72.175780	State Boat Launch	Waterford	estuary	2	1354	NA in saltwater	168	NA in saltwater	10	10		
saltwater	41.370544 -72.192520	Banning Cove	Waterford	estuary	3	13531	NA in saltwater	464	NA in saltwater	3604	3604		
saltwater	41.352767 -72.176718	Kiddies Beach	Waterford	estuary	4	>24196	NA in saltwater	>24196	NA in saltwater	>24196	>24196		
fresh water						Trypticase Soy Broth	<1	<1	<1	<1	<1	<1	
fresh water						blank	<1	<1	<1	<1	<1	<1	

bold italics - samples out of compliance in July sampling

From: Vaudrey, Jamie <jamie.vaudrey@uconn.edu>
Sent: Friday, December 20, 2024 6:14 PM
To: Chris Tomichek; abcfish@atlanticbb.net; Gonzalez, Susan; 'Don landers'; 'David Turner'; 'Harris, Peter'; acabanis211@gmail.com; 'Bezanson, Melissa'; jim@paganetti.com; jamie.vaudrey; Nate Hermann; Fred Wise
Cc: Maureen Fitzgerald; 'Dan Mullins'; Streich, Kelly; Deb Moshier-Dunn; Karen Bishop; Heather Strother; megan.trujillo@conservect.org
Subject: sneak peak at eDNA results...
Attachments: JVB4384-report_Nov2024.pdf

CAUTION: This email originated from outside of the organization.

Do not click links or open attachments unless you recognize the sender's email address and know the content is safe.

Hello all,

I couldn't wait until our next meeting to share the eDNA results!

The pdf of the report is attached.

For information about how to interpret your results [click here](#).

Summary –

Kiddie Beach showed high levels of swine (1276 copies /100mL), followed by humans (639 copies /100mL), E. coli (138 copies /100mL), Canada goose (64 copies /100mL) and dog (27 copies /100mL).

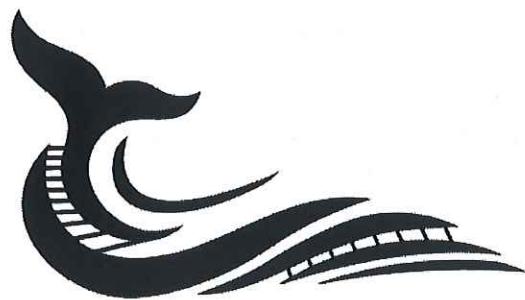
Banning Cove had no evidence of swine (0 copies / 100mL). In order of highest to lowest, Banning Cove showed evidence of humans (473 copies /100mL), E. coli (129 copies /100mL), Canada goose (66 copies /100mL) and dog (47 copies /100mL).

Neither site showed evidence of bovine, poultry, or sheep (0 copies / 100mL).

Best regards,
--Jamie



Jamie Vaudrey, Ph.D.
jamie.vaudrey@uconn.edu
Research Coordinator, CT National
Estuarine Research Reserve
Associate Research Professor,
Department of Marine Sciences
pronouns: she/her



JONAH VENTURES

KNOWLEDGE IN SEQUENCE

December 19 2024

For more information go to www.jonahventures.com

info@jonahventures.com

Report prepared for jamie.vaudrey@uconn.edu

BatchId = JVB4384

Number of samples analyzed = 2

Percent of replicates above detection limit

This table provides data on what percentage of the replicates that were run were above the detection limit. The detection limit is as high as the lowest positive on the calibration curve, but can be up to an order of magnitude lower. For example, a calibration curve might generate a positive at 100 copies and no positive for 10 copies, but the actual detection limit would be 11 copies. See the next section for the range of copy numbers estimated for each assay.

SampleId	E.Coli01	Human01	Swine01	Bovine01
08V6O5ZV	100	100	100	0
JA6KS2J0	100	100	0	0

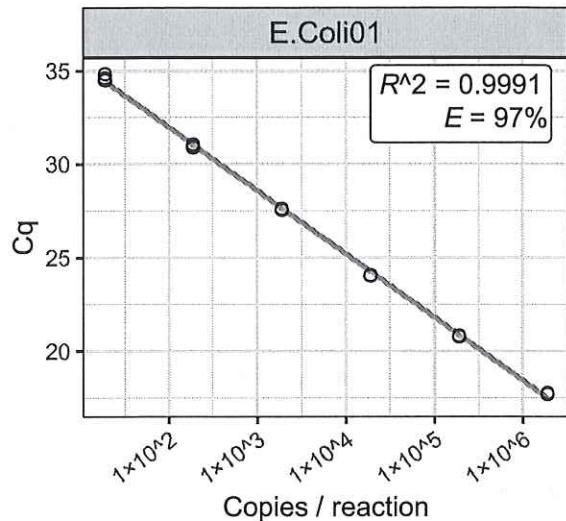
SampleId	Poultry01	Sheep01	Dog01	CanadianGoose01
08V6O5ZV	0	0	100	100
JA6KS2J0	0	0	100	100

Sample metadata

SampleId	Lat	Long	Volume Water (ml)
08V6O5ZV	41.3535	-72.1765	374
JA6KS2J0	41.3702	-72.1936	332

SampleId	SiteName	Note
08V6O5ZV	Kiddie Beach	not submitting
JA6KS2J0	Banning Cove	

RunID: JVQ0560



Forward primer: 5' CAATGGTGATGTCAGCGTT 3'

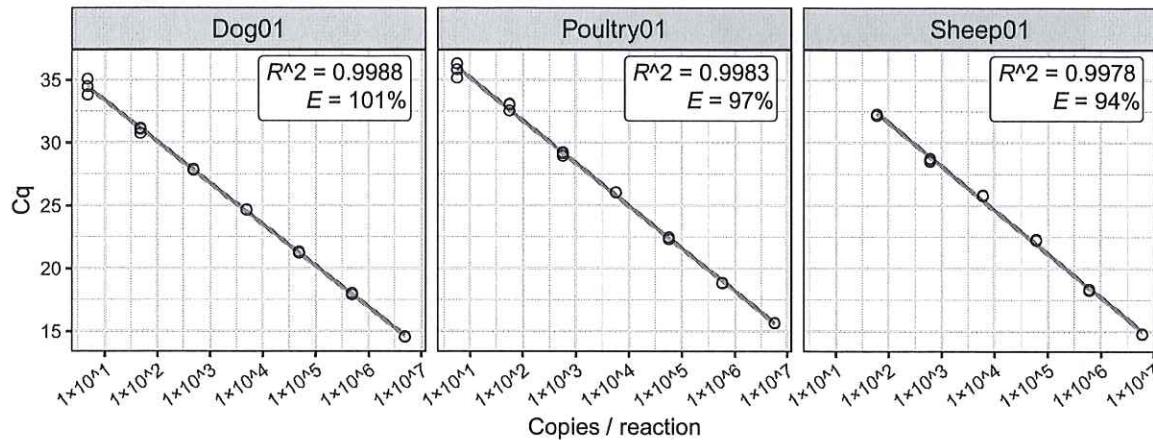
Reverse primer: 5' ACACTCTGTCCGGCTTTG 3'

Probe: 5' /56-FAM/TTGCAACTG/ZEN/GACAAGGCACCAGC/3IABkFQ/ 3'

Primer/probe reference: Srinivasan et al., 2011

An amplicon from the uidA gene was amplified via qPCR from genomic DNA samples using E. coli FWD and REV primers and probe. A standard curve was generated for each run to correspond to targeted region of the E. coli, uidA gene. Each qPCR reaction is run in triplicate and contains 8.0 uL of QuantaBio PerfeCTa qPCR ToughMix Low ROX (Catalog Number 97065-966), 500 nM of each primer, 300 nM of probe, 4.0 uL of gDNA, and 4.8 uL of Nuclease-free H2O for a total reaction volume of 20 uL. qPCR amplification was carried out on the QuantStudio 5 qPCR instrument with the following thermal profile conditions: 1 cycle of initial denaturation for 5 minutes at 95 C; followed by 50 cycles of 15 seconds at 95 C and 1 minute at 60 C.

RunID: JVQ0600



Dog Forward primer: 5' CACATCTAACCAACCGCAGCATAA 3'

Dog Reverse primer: 5' AGATCGGCGACTAAAAGTCAGAA 3'

Dog Probe: 5' /5HEX/TCCGGCCCC/ZEN/TTAGCCAATGCC/3IABkFQ/ 3'

Poultry Forward primer: 5' CGTYATCACAAACCTATTCTCAGCAAT 3'

Poultry Reverse primer: 5' TTGGGTTGTCGACTGAAAATCC 3'

Poultry Probe: 5' /5Cy5/CCCTACATY/TAO/GGACAMACCCTAGTAGAGTGAGCC/3IAbRQSp/ 3'

Sheep Forward primer: 5' GCAATACACTATACACCTGACACAACAA 3'

Sheep Reverse primer: 5' CAGATAAAAAATATTGATGCCCGTTG 3'

Sheep Probe: 5' /56-FAM/CTCCTCTGT/ZEN/AACCCACATTGCCGAGA/3IABkFQ/ 3'

Primer/probe reference: Dancer et al., 2014

Amplicons from the Cytochrome b (Cytb) gene were amplified via qPCR from genomic DNA samples using the Cytb FWD and Cytb REV primers, and Cytb Probes corresponding to dog, poultry, and sheep. A standard curve was generated for each run to correspond to targeted regions of each of the Cytb genes. qPCR reactions contain 4.0 μ L of QuantaBio PerfeCTa Multiplex qPCR ToughMix Low ROX (Catalog Number 89497-290), 500 nM of each primer, 300 nM of each probe, 4.0 μ L of gDNA (or 1.33 μ L of each gBlock for standard curve wells), and 2.4 μ L of Nuclease-free H₂O for a total reaction volume of 20 μ L. qPCR amplification was carried out on the Agilent AriaMx qPCR instrument with the following thermal profile conditions: 1 cycle of initial denaturation for 5 minutes at 95 C; followed by 50 cycles of 15 seconds at 95 C and 1 minute at 60 C.