

MS4 General Permit
Town of Wallingford 2021 Annual Report
Permit Number GSM 00050
January 1, 2021 – December 31, 2021

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This report documents the Town of Wallingford's efforts to comply with the conditions of the MS4 General Permit to the maximum extent practicable (MEP) from January 1, 2021 to December 31, 2021.

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	<i>The Town utilizes its website to post links related to the Stormwater Management Plan, as well as other links relating to polluted runoff, rain barrel utilization, and vegetated riparian buffers.</i>	<i>Stormwater and You:</i> https://www.wallingford.ct.us/government/departments/public-works/stormwater-and-you/	<i>Website</i>	<i>~1,000</i>	<i>Provide public access to stormwater literature.</i>	<i>Department of Public Works, Engineering, Wetlands, Planning & Zoning</i>	
1-2 Address education/ outreach for pollutants of concern	<i>The Town has posted a brochure on the Stormwater management page relating to pet waste management. This brochure details</i>	<i>Pet Care Fact Sheet:</i> https://www.wallingford.ct.us/Customer-Content/www/CMIS/files/EngPetCare	<i>Website</i>	<i>~1,000</i>	<i>Educate and provide pet waste management to the public.</i>	<i>Water Pollution Control Authority</i>	

	<i>the importance of cleaning up after a pet as well as waterfowl pollutants.</i>	FactSheet121120.pdf					
Additional BMP: 1-3 Hazardous Waste Collection	<i>The Town of Wallingford provides hazardous waste collection in association with the Regional Water Authority in New Haven. Wallingford residents can dispose of their hazardous wastes at this location Saturday Mornings from mid-May to the end of October.</i>	<i>Waste Disposal Center for Wallingford Residents:</i> https://www.wallingford.ct.us/residents/recycling-composting-and-waste-disposal/waste-disposal-center/	<i>Website.</i>	<i>~1,000</i>	<i>Educate and provide hazardous waste collections.</i>	<i>Town Planning Committee</i>	

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

1. Continue with Hazardous Waste collection days.
2. The Town plans to set up a display at the Town Hall, near the Engineering Department. Stormwater information is currently posted in the Engineering Department.

2. Public Involvement/Participation (Section 6(a)(2) / page 21)

2.1 BMP Summary

BMP	Status (Complete, Ongoing, In Progress, or Not started)	Activities in current reporting period	Measurable Goal	Department / Person Responsible	Date completed or projected completion date (include the start date for anything that is 'in progress')	Location Posted	Additional details
2-1 Final Stormwater Management Plan publicly available	Completed	<i>The Stormwater Management Plan is currently located on the Town's "Stormwater and You" page.</i>	<i>Provide notice and access to the Stormwater Management Plan</i>	Engineering	April 1, 2017	Stormwater Management Plan: https://www.wallingford.ct.us/content/www/CMS/files/StormwaterMgmtPlanFinal33017.pdf	
2-2 Comply with public notice requirements for Annual Reports (annually by 2/15)	Completed Annually	<i>The public notice is posted via the Town website on an annual basis for public review and comments.</i>	<i>Provide notice and access to the Annual Report</i>	Law Department, Engineering, and Department of Public Works	Annually-by Feb. 15 th	Annual Report: https://www.wallingford.ct.us/government/departments/public-works/stormwater-and-you/	
Additional BMP: 2-3 Hazardous Waste Collection	Completed Annually	<i>The Town of Wallingford provides hazardous waste collection in association with the Regional Water Authority in New Haven. Wallingford residents can dispose of their hazardous wastes at this location Saturday Mornings from mid-May to the end of October.</i>	<i>Provide Hazardous Waste Collections or access to collections</i>	Regional Water Authority	Annually-mid-May through the end of October	Waste Disposal Center for Wallingford Residents: https://www.wallingford.ct.us/residents/recycling-and-waste-disposal/waste-disposal-center/	
Additional BMP: 2-4 Composting	Completed Annually	<i>The Town of Wallingford provides disposal for</i>	<i>Provide disposal for organic debris.</i>	Compost Center	Yearly	Compost Center: https://www.wallingford.ct.us/re	

		<i>leaves and other organic debris for Town residents at the local compost center.</i>				<u>sidents/recycling-composting-and-waste-disposal/compost-center-for-residents/</u>	
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2.2 Describe any Public Involvement/Participation activities planned for the next year, if applicable.

1. The Town of Wallingford anticipates a booth containing stormwater information at "Celebrate Wallingford".
2. Brochures to be distributed on the Stormwater Retrofit Program.

**It should be noted that all future activities are COVID-dependent, and may result in less participation or cancellation.*

3. Illicit Discharge Detection and Elimination (Section 6(a)(3) and Appendix B / page 22)

3.1 BMP Summary

BMP	Status (Complete, Ongoing, In Progress, or Not started)	Activities in current reporting period	Measurable Goal	Department / Person Responsible	Date completed or projected completion date (include the start date for anything that is 'in progress')	Additional details
3-1 Develop written IDDE program (Due 7/1/19)	Completed	The Town finalized an IDDE program in September of 2019.	Develop written plan of IDDE program	Law Departemnt, Department of Public Works, Engineering	September 2019	
3-2 Develop list and maps of all MS4 stormwater outfalls in priority areas (Due 7/1/20)	Completed	The Town developed a list and maps of all MS4 stormwater outfalls in priority areas through CAD technology. With assistance from Atlas, the Town has since mapped all MS4 stormwater outfalls through a GIS technology, and continues a QA/QC process of reviewing the GIS/CAD systems, and editing as necessary.	Map all outfalls.			
3-3 Implement citizen reporting program (Ongoing)	Completed	The Town has implemented an illicit discharge reporting form, which is available on the Town website. Citizen reporting is maintained through the Engineering Department.	Provide a reporting mechanism and log.	Engineering Department	April 1, 2017.	Citizen Reporting Form: https://www.wallingford.ct.us/Customer-Content/www/CMS/files/EngSvcReqRepForm012820.pdf
3-4 Establish legal authority to prohibit illicit discharges (Due 7/1/19)	Completed	The Town wrote and adoped a Stormwater Connection Ordinance, which was adopted in 2018.	Adopt ordinance	Law Department, Engineering	March 14, 2018	Ordinance No. 621: https://ecode360.com/33393542

3-5 Develop record keeping system for IDDE tracking (Due 7/1/17)	<i>Completed</i>		<i>Maintain list.</i>	<i>Engineering Department</i>	<i>April 1, 2017</i>	
3-6 Address IDDE in areas with pollutants of concern	<i>Ongoing</i>	<i>Dry weather screening was conducted at 24 outfalls in 2021,</i> <i>Wet weather screening was conducted at six (6) priority outfalls.</i> <i>Catchment Rankings have been completed. SSOs are under investigation.</i>	<i>Wet weather testing and additional investigation as necessary.</i>	<i>Engineering Department</i>	<i>Ongoing-Started in 2018</i>	

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

1. *Continue Wet Weather sampling at priority outfalls discharging to impaired waters.*
2. *Continue follow-up dry-weather screening/testing.*
3. *Respond to any illicit discharge complaints*
4. *Continue SSO investigations*

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. Illicit discharges are any unpermitted discharge to waters of the state that do not consist entirely of stormwater or uncontaminated groundwater except those discharges identified in Section 3(a)(2) of the MS4 general permit when such non-stormwater discharges are not significant contributors of pollution to a discharge from an identified MS4.

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)
<i>Nicholas Road</i>	<i>7/13/2018</i>	<i>Catch Basin on Nicholas Road</i>	<i>Unknown</i>	<i>A resident utilizing an RV was found to have been dumping the RV waste tank into the storm drain.</i>	<i>DEEP was contacted, as well as the Town. The resident was instructed that further dumping would result in fines. The resident was also provided a list of authorized RV waste dumping sites.</i>	<i>None.</i>

<i>Old Gate Road.</i>	<i>9/2/2019</i>	<i>Catch basin on Old Gate Road</i>	<i>Unknown</i>	<i>A septic system pipe was found to have been illegally connected to the MS4 system, and was discharging to the storm drain.</i>	<i>The homeowner was instructed to and completed a capping of a 4" diameter PVC pipe that had been found discharging sanitary sewage into the Town's catch basin.</i>	<i>None.</i>
<i>Durham Road</i>	<i>4/24/2020</i>	<i>Asmund Brook</i>	<i>Unknown</i>	<i>A retention pond utilized by a facility for washing quarried stone was found to have insufficient runoff controls. This in turn caused runoff to enter into the Asmund Brook, causing a distinct green discoloration of the water.</i>	<i>Based on the location of the discharge (Wallingford and Durham), this illicit discharge falls under the jurisdiction of Durham, and is currently under investigation.</i>	<i>Elevated concentrations of chromium, copper, nickel, zinc, and total suspended solids were found.</i>
<i>Unknown</i>	<i>6/1/2020</i>	<i>--</i>	<i>--</i>	<i>Residential property-potential septic failure.</i>	<i>The Town completed an investigation, and determined that the discharge was groundwater from a nearby sump pump. No further action necessary.</i>	<i>None.</i>
<i>530 South Cherry Street</i>						
<i>37 Country Way</i>						
<i>33 Summerwood Drive</i>						

3.4 Provide a summary of actions taken to address septic failures 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
<i>The Farmington Valley Health District (FVHD) received and maintains records of septic failures along with actions taken. All sanitary sewer connections and system extensions are managed by the Town Health Department. The Town will begin to formally coordinate with FVHD regarding records of septic failures. In coordination with Atlas, the Town is currently investigating any septic repairs and/or failures through the FVHD as well.</i>				

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

Residents of the Town can report illicit discharges to the Engineering Department through an online reporting form, which is available at <https://www.wallingford.ct.us/government/departments/public-works/stormwater-and-you/>. The Town then conducts follow-up investigations of reported IDDEs, and implements and/or enforces the discharge elimination.

3.6 IDDE reporting metrics

Metrics	
Estimated or actual number of MS4 outfalls	1,113
Estimated or actual number of interconnections	37
Outfall mapping complete	95% (ongoing updates throughout permit lifetime.
Interconnection mapping complete	80% (Mapping of the CTDOT interconnections and several other surrounding towns has been completed. Interconnection screenings are still under investigation.
System-wide mapping complete (detailed MS4 infrastructure)	95% (Ongoing updates

	<i>throughout permit lifetime).</i>
Outfall assessment and priority ranking	<i>95% (The majority of outfalls to impaired waterbodies have been inspected and sampled. Six (6) priority outfalls have been chosen. Priority rankings have also been mapped, and may change throughout the permit lifetime based on future data.</i>
Dry weather screening of all High and Low priority outfalls complete	<i>70% (The majority of dry weather screening at outfalls in high priority outfalls and discharging to impaired waterbodies have been investigated. Outfalls throughout the entirety of the Town are continually being investigated.</i>
Catchment investigations complete	<i>90%. All catchments (utilizing basins for assessment purposes), have been ranked and prioritized. Due to the lengthy time needed to investigate all</i>

	<i>septic repairs and/or failures, refer to Appendix III for the compelled Catchment Investigations.</i>
Estimated percentage of MS4 catchment area investigated	45%

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 it is given (minimum once per year).

Annual training is generally provided to all Department of Public Works staff to recognize and report illicit discharges. Due to Covid-19 concerns, annual training was not provided to all Department of Public Works staff. Several meetings were held in coordination with Atlas and pertinent engineering and Department of Public Works staff pertaining to the MS4 permit. An annual training for all Department of Public Works is scheduled for spring of 2022.

4. Construction Site Runoff Control (Section 6(a)(4) / page 25)

4.1 BMP Summary

BMP	Status (Complete, Ongoing, In Progress, or Not started)	Activities in current reporting period	Measurable Goal	Department / Person Responsible	Date completed or projected completion date (include the start date for anything that is 'in progress')	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)	<i>Completed.</i>	<i>The Town has revised specific zoning and wetlands regulations to meet the needs for stormwater management as it pertains to construction.</i>	<i>Revise land-use regulations</i>	<i>Planning and Zoning, Wetlands.</i>	<i>July 1, 2017.</i>	<i>Ordinance No. 621: https://ecode360.com/33393542</i>
4-2 Develop/Implement plan for interdepartmental coordination in site plan review and approval (Ongoing)	<i>Completed</i>	<i>Site plan reviews are completed by applicable departments.</i>	<i>Utilize interdepartmental coordination in site plan review and approval, as it pertains to the MS4 permit.</i>	<i>Planning and Zoning, Wetlands</i>	<i>June 30, 2018-ongoing throughout permit lifetime.</i>	
4-3 Review site plans for stormwater quality concerns (Ongoing)	<i>Completed</i>	<i>Site plans are reviewed for compliance with the contractor's Stormwater Management Plan.</i>	<i>Review revised plans for MS4 compliance, and issue review comments.</i>	<i>Planning and Zoning, Wetlands.</i>	<i>July 1, 2017- ongoing throughout permit lifetime.</i>	<i>Projects that fall under the Planning and Zoning department are reviewed for compliance with the CTDOT drainage manual. The Town is also working towards modifying zoning ordinances in an effort to improve stormwater quality in priority areas, and within the Watershed Protection District.</i>
4-4 Conduct site inspections (Ongoing)			<i>Document inspections and actions.</i>			

4-5 Implement procedure to allow public comment on site development (Ongoing)	<i>Completed</i>	<i>Site inspections are completed on an as-needed basis.</i>	<i>Provide an opportunity for public comment/involvement.</i>	<i>Planning and Zoning, Wetlands</i>	<i>July 1, 2017-ongoing throughout permit lifetime.</i>	
4-6 Implement procedure to notify developers about DEEP construction stormwater permit (Ongoing)	<i>Completed</i>	<i>Brochures and fliers are posted throughout applicable departments pertaining to the DEEP construction stormwater permit.</i>	<i>Include comments to applications.</i>	<i>Planning and Zoning, Wetlands</i>	<i>July 1, 2017-ongoing throughout permit lifetime.</i>	<i>The Town is looking to add this requirement to future applications for the Planning and Zoning department, as well as the wetlands department.</i>
Additional BMP: 4-7 Require Waste Control onsite			<i>Notify developers about DEEP permitting obligations.</i>		<i>July 31, 2019-ongoing throughout permit lifetime.</i>	

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

The Commission has hired a peer reviewer for proposed soil erosion and sediment control measures. as well as site inspections during construction. Most, if not all, permitted construction projects are subject to a Soil Erosion Bond with the Planning & Zoning Office, as well as site inspections of which observe soil erosion and sediment control measures throughout construction.

5. Post-construction Stormwater Management (Section 6(a)(5) / page 27)

5.1 BMP Summary

BMP	Status (Complete, Ongoing, In Progress, or Not started)	Activities in current reporting period	Measurable Goal	Department / Person Responsible	Date completed or projected completion date (include the start date for anything that is 'in progress')	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)	Ongoing	Currently, regulations exist and are utilized for the enforcement of runoff reduction. The Town is looking to strengthen these regulations.	Adopt BMPs for any activity, operation, or facility which may cause or contribute to the pollution or contamination of stormwater, the storm drain system, or waters of the U.S.	Planning and Zoning, Wetlands.	July 1, 2020-ongoing	
5-2 Enforce LID/runoff reduction requirements for development and redevelopment projects (Due 7/1/22)	Completed	A Stormwater Maintenance Plan is required for any area that is equal to or greater than 1 acre of disturbance.	Enforce regulations and guidelines of LID and runoff reductions.	Planning and Zoning	July 1, 2019-ongoing throughout permit lifetime.	
5-3 Identify retention and detention ponds in priority areas (Due 7/1/20)	Completed	All detention, retention, and sediment basins have been identified for the Town. Inspections are completed annually and cleaned where basins are found to have 50% of sediment in excess.	Compile a list and complete mapping of Town-owned detention basins.	Engineering	July 1, 2019-ongoing throughout permit lifetime.	
5-4 Implement long-term maintenance plan for stormwater basins and treatment structures (Ongoing)	Completed	The Department of Public Works and Engineering department coordinate inspections of basins on an annual basis, and facilitate maintenance on an as-needed basis.	Annually inspect and maintain facilities.	Engineering, Department of Public Works.	July 1, 2019-ongoing throughout permit lifetime.	

5-5 DCIA mapping (Due 7/1/20)	Completed	The Town's DCIA was calculated with assistance from Nathan L Jacobson & Associates. Atlas has mapped all DCIA areas through a GIS system.	Provide an understanding of the Town's overall DCIA to the MS4 infrastructure.	Engineering, Nathan L. Jacobson & Associates, Atlas.	June 2019	
5-6 Address post-construction issues in areas with pollutants of concern	Completed	In post-construction areas, if erosion or high accumulation of sedimentation are found during the annual inspections conducted under the long-term maintenance plan, the Town will prioritize these areas for DCIA retrofit projects.	Address post-construction areas where erosion or high accumulation of sedimentation are found during annual inspections.	Engineering	July 1, 2020-ongoing throughout permit lifetime.	

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

1. The Town will continue to monitor, clean, and repair settling/silting basins, catch basins, outfalls, swales, etc.
2. Develop process for annual inspections of Post-Construction Stormwater Management activities

5.3 Post-Construction Stormwater Management reporting metrics

For details on this requirement, visit <https://nemo.uconn.edu/ms4/tasks/post-construction.htm>. Scroll down to the DCIA section.

Metrics	
Baseline (2012) Directly Connected Impervious Area (DCIA)	573.76 acres
DCIA disconnected (redevelopment plus retrofits)	acres this year (TBD) / acres total (TBD)
Retrofit projects completed	Under development
DCIA disconnected	% this year (TBD) / % total since 2012 (TBD)
Estimated cost of retrofits	\$TBD
Detention or retention ponds identified	17 this year /17 total

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

The DCIA Mapping was conducted in substantial accordance with the methodologies presented in the October 25, 2017 UConn CLEAR Webinar entitled CT MS4 Mapping Details, Clarifications and Tools, the October 19, 2018 UConn CLEAR Workshop entitled CT MS4 Mapping Workshop as well

as information contained in the EPA reference entitled Estimating Change in Impervious Area (IA) and Directly Connected Impervious Area (DCIA) for Massachusetts Small MS4 Permit utilizing Sutherland equations.

The DCIA computations were prepared utilizing Connecticut Environmental Conditions Online MS4 base mapping prepared by UConn CLEAR.

Impaired waters were determined from the report entitled 2018 Integrated Water Quality Report, dated August 01, 2019, prepared by the State of Connecticut Department of Energy and Environmental protection.

The method to determine the 2012 baseline DCIA was to first compile the CT DEEP drainage basin characteristics in a Microsoft Excel spreadsheet. Information on the Connecticut Environmental Conditions Online MS4 Mapping was used to determine the impervious area breakdown as Buildings, Roads and Other. For CT DEEP drainage basins that fell in two or more municipalities the advanced mapping tab of Connecticut Environmental Conditions Online was used to delineate and determine the applicable town CT DEEP basin area. It was assumed that the entire drainage basin characteristics were directly proportional to the applicable town CT DEEP drainage basin area.

In that ConnDOT has a MS4 Stormwater Program which applies to state owned roads and facilities which the town has no control over, it was decided that the impervious state road area would be determined and deducted from the total impervious road area for each CT DEEP drainage basin as the impervious road areas associated with state highways and facilities constitutes a considerable portion of the total town impervious road area.

The ConnDOT state highway, parking lot and facility impervious road areas were then determined for each CT DEEP drainage basin. The ConnDOT state highway, parking lot and facility impervious road areas were then deducted from the total town impervious road area to determine a town owned impervious road area for each CT DEEP drainage basin. Subsequent to the above deduction, the total impervious area in acres and percentage was then recomputed for each CT DEEP drainage basin.

The DCIA formula for each of four development types was then utilized to compute the DCIA. The impervious area in acres was assigned to each of the four Sutherland equations which were modified for the northeastern United State. The Sutherland equation to be utilized was determined using the following methodology:

For impervious percentage less than 6%:

100% of the impervious area was assigned to the slight connectivity Sutherland Equation where $DCIA\% = 0.01 \cdot (IA\%)^{2.0}$

For an impervious area between 6% and 12 %:

50% of the area was assigned to the partial connectivity Sutherland Equation where $DCIA\% = 0.04 \cdot (IA\%)^{1.7}$

and

50% was assigned to the average connectivity Sutherland Equation where $DCIA\% = 0.10 \cdot (IA\%)^{1.5}$

For an impervious area between 12% and 18 %:

50% of the area was assigned to the average connectivity Sutherland Equation where $DCIA\% = 0.10 \cdot (IA\%)^{1.5}$

and

50% was assigned to the high connectivity Sutherland Equation where $DCIA\% = 0.40 \cdot (IA\%)^{1.2}$

For an impervious area of greater than 18 %:

100% of the area was assigned to the high connectivity Sutherland Equation where $DCIA\% = 0.40 \cdot (IA\%)^{1.2}$

The DCIA for each CT DEEP drainage basin was then summed to determine the entire town DCIA. Subsequent to completion of 2012 Baseline DCIA computations, UConn CLEAR Mapping available on Connecticut Environmental Conditions Online (CT ECO) was revised to separate road impervious area into State Road Impervious Area (Acres) and Town Road Impervious Area (Acres).

The original 2012 Baseline DCIA computations were revised utilizing the UConn CLEAR State Road Impervious Area (Acres) and Town Road Impervious Area (Acres).

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

6.1 BMP Summary

BMP	Status (Complete, Ongoing, In Progress, or Not started)	Activities in current reporting period	Measurable Goal	Department / Person Responsible	Date completed or projected completion date (include the start date for anything that is 'in progress')	Additional details
6-1 Develop/implement formal employee training program (Ongoing)	<i>Completed Annually</i>	<i>All Department of Public Works personnel are trained with proper stormwater management procedures and spill control.</i>	<i>Eliminate non-stormwater discharges into the storm sewers.</i>	<i>Department of Public Works</i>	<i>Ongoing throughout permit lifetime</i>	<i>Due to Covid-19, restrictions of training were implemented. An annual training is planned for spring 2022.</i>
6-2 Implement MS4 property and operations maintenance (Ongoing)	<i>Completed</i>	<i>The Town utilizes a Spill Response Team through the local fire department. An SPCC plan is also implemented at the DPW facility.</i>	<i>Eliminates/minimizes spills and/or pollutant releases to the environment and navigable waterways.</i>	<i>Department of Public Works, Local Fire Department</i>	<i>December 31, 2019-ongoing throughout permit lifetime</i>	
6-3 Implement coordination with interconnected MS4s	<i>Completed</i>	<i>Coordination of the MS4 interconnection mapping began in 2019. CTDOT interconnections have been mapped, and coordination between the Town and surrounding areas is ongoing.</i>	<i>Update the GIS system with interconnected locations.</i>	<i>Engineering, Department of Public Works</i>	<i>December 31, 2018-ongoing throughout permit lifetime.</i>	
6-4 Develop/implement program to control other sources of pollutants to the MS4		<i>A Spill Response Team has been developed in the Town utilizing the local fire department.</i>	<i>Reduce other possible pollutants to the MS4.</i>	<i>Department of Public Works, Local Fire Department</i>	<i>Ongoing throughout permit lifetime.</i>	
6-5 Evaluate additional measures for discharges to impaired waters*	<i>Ongoing</i>	<i>Wet weather sampling events have been conducted, and priority outfalls were identified throughout the Town. Dry weather inspections are continuing to be conducted for the entirety of the Town. As catchments are investigated, the Town will coordinate with Atlas on future measures pertaining to the reduction of bacterial discharge to impaired waters.</i>	<i>Pending further investigations, create a program or plan of action to reduce bacterial discharge to impaired waters.</i>	<i>Engineering, Atlas</i>	<i>Ongoing-started in 2021.</i>	

6-6 Track projects that disconnect DCIA (Ongoing)	<i>Ongoing</i>	<i>A Stormwater Retrofit Program has been drafted, and will be utilized as a method of tracking future DCIA disconnects.</i>	<i>Track DCIA disconnects.</i>	<i>Engineering</i>	<i>Ongoing-drafted in 2021</i>	
6-7 Implement infrastructure repair/rehab program (Due 7/1/21)	<i>Ongoing</i>	<i>The Town currently assesses and maintains stormwater structures throughout the Town. The Town implements repairs or rehabilitation on an as-needed basis.</i>	<i>Reduce/eliminate causes or contributions of pollution or contamination of stormwater, the storm drain system, or waters of the U.S.</i>	<i>Department of Public Works, Engineering</i>	<i>Ongoing throughout permit lifetime.</i>	
6-8 Develop/implement plan to identify/prioritize retrofit projects (Due 7/1/20)	<i>Ongoing</i>	<i>A Stormwater Retrofit Program has been drafted. Prioritized areas and/or sites were identified based off of DCIA calculations, impaired waterbodies, current stormwater infrastructure, and the MEP of the Town.</i>	<i>Develop retrofit projects.</i>	<i>Planning and Zoning, Engineering</i>	<i>Ongoing-started in 2021</i>	
6-9 Implement retrofit projects to disconnect 2% of DCIA (Due 7/1/22)	<i>Ongoing</i>	<i>As Retrofit Projects are identified, the Town will utilize the Impervious Cover Tracking Sheet to track and work towards disconnecting 2% of DCIA, or the MEP of the Town.</i>	<i>Track and reduce DCIA impacts.</i>	<i>Planning and Zoning, Engineering</i>	<i>Ongoing-started in 2021</i>	
6-10 Develop/implement street sweeping program (Ongoing)	<i>Completed annually</i>	<i>All streets are swept at least once a year to remove sand and/or other debris.</i>	<i>Track swept lane miles.</i>	<i>Department of Public Works.</i>	<i>Completed Annually.</i>	
6-11 Develop/implement catch basin cleaning program (Ongoing)	<i>Completed</i>	<i>The Town inspects approximately 1,000 catch basins a year. If a catch basin is found to have a sediment load of 50% or greater, then the sediment is removed.</i>	<i>Track material usage, and update plan as needed.</i>	<i>Department of Public Works.</i>	<i>Completed Annually.</i>	
6-12 Develop/implement snow management practices (Due 7/1/18)	<i>Completed</i>	<i>Snow management is implemented on an annual basis. Department of Public Works staff are aware of risks associated with snow distribution as well as the potential effects of runoff. Generally, excess snow is staged at</i>	<i>Track material usage, and update plan as needed.</i>	<i>Department of Public Works</i>	<i>Completed Annually.</i>	

		<i>the property in which it is managed, and/or on the sides of roadways. Excess snow is transported and disposed of at the Town's Pent Road facility.</i>				
Additional BMP: 6-13 New Road Construction Projects	Completed	<i>The Town has implemented the use of sheet flow drainage in an effort to eliminate or reduce the use of catch basins. This sheet flow drainage will be utilized as a BMP when road re-paving is underway.</i>	<i>Reduce pollutants to the MS4, specifically sediment overload.</i>	<i>Department of Public Works</i>	<i>As needed</i>	<i>Reason for addition: Reduce sedimentation of waterways</i>

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

1. The Town will continue to conduct annual stormwater compliance training
2. Assess and implement repairs/rehabilitation as-needed at MS4 basins.

6.3 Pollution Prevention/ Good Housekeeping reporting metrics

Metrics	
Employee training provided for key staff	Covid restricted / Scheduled for Spring 2022
Street sweeping	
Curb miles swept	miles
Volume (or mass) of material collected	lbs or tons
Catch basin cleaning	
Total catch basins in priority areas (value will be less than or equal to total catch basins town or institution-wide)	8,727
Total catch basins town- (or institution-) wide	9,819
Catch basins inspected	#
Catch basins cleaned	#
Volume (or mass) of material removed from all catch basins	lbs or tons
Volume removed from catch basins to impaired waters (if known)	lbs or tons
Snow management	
Type(s) of deicing material used	
Total amount of each deicing material applied	lbs or tons
Type(s) of deicing equipment used	
Lane-miles treated (A lane-mile is a mile of roadway in a single driving lane)	miles
Snow disposal location	

Staff training provided on application methods & equipment	(y/n) / dates(s)
Municipal turf management program actions (for permittee properties in basins with N/P impairments)	
Reduction in application of fertilizers (since start of permit)	lbs or %
Reduction in turf area (since start of permit)	acres
Lands with high potential to contribute bacteria (dog parks, parks with open water, & sites with failing septic systems)	
Cost of mitigation actions/retrofits	\$TBD

6.4 Catch basin cleaning program

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

Approximately 1,000 catch basins are inspected by the Department of Public Works on an annual basis. Catch basins that are found with over a 50% sediment load are cleaned. Catch basins in priority areas as well as catch basins with known historical issues are focuses on. A limited amount of staff and equipment perform this task.

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)

The Stormwater Retrofit Program was drafted by the Town and Atlas in 2021. The Program was designed to provide guidance on implementing LID, runoff reduction measures, or other means to disconnect or improve stormwater quality. To meet the 2% MEP disconnection goal, DCIA calculations, Urbanized areas, Impaired Waterbodies, and Catchment Rankings were utilized in identifying and prioritizing areas and/or projects to be selected for retrofits.

DCIA by Catchment was identified utilizing the the following formulas:

High Connectivity

$$DCIA\% = 0.4 * (IA\%)^{1.2}$$

$$\text{Directly Connected Area} = (DCIA)(IC \text{ Acres})$$

Average Connectivity

$$DCIA\% = 0.1 * (IA\%)^{1.5}$$

$$\text{Directly Connected Area} = (DCIA)(IC \text{ Acres})$$

Partial Connectivity

$$DCIA\% = 0.04 * (IA\%)^{1.7}$$

$$\text{Directly Connected Area} = (DCIA)(IC \text{ Acres})$$

Slight Connectivity

$$DCIA\% = 0.01 * (IA\%)^{2.0}$$

$$\text{Directly Connected Area} = (DCIA)(IC \text{ Acres})$$

The Average Connectivity calculation was utilized in assessing the Town's DCIA connectivity, based on the majority of land use defined as agricultural and/or rural, minor residential communities, and minor-to-moderate commercial or industrialized areas. Based on the Average Connectivity calculations for each catchment, no catchments were identified with a connectivity of 11% or greater.

Catchments were then prioritized utilizing the total urbanized area per catchment. Atlas was provided with a shapefile of the 2010 Urbanized Areas for the Town from the 2010 Census or Urban Classifications, which was imported into ArcGIS for calculation purposes. Utilizing the Overlay-Intersect Tool, Atlas was able to extract the total Urbanized Area acreage per catchment, and then calculate the Urbanized area percentage per catchment utilizing the following formula:

$$\text{Urbanized Area (Ac.)} / \text{Basin Total Acreage} * 100$$

Based on these calculations, 72 catchments were identified with Urbanized Areas.

20 catchments containing impaired waterbodies were identified for the Town.

Catchment Priority Rankings were conducted for all Sub-Basins in the Town. Multiple factors were taken into consideration when scoring each catchment, including but not limited to DCIA calculations, previous screening results, age of development/structures, density of generating sites, nearby sewer repairs, urbanized areas, and impaired waterbodies. 66 catchments were identified as Problem or High Priority.

Specific criteria was utilized in defining priority areas for the implementation of non-municipal retrofit projects. The criteria utilized in defining priority areas of non-municipal retrofit projects included High or Problem catchment priority rankings, catchments containing an impaired waterbody, and catchments identified with an urbanized area. Utilizing ArcGIS, Atlas extracted catchments where two (2) or more of the aforementioned criteria were found. Community outreach or project redevelopment is encouraged in these defined catchments.

Municipal-owned retrofit projects were identified for several schools, and other municipal-owned sites such as the Fire Department, Town Hall, etc. These locations were selected based on location and plausibility of future disconnects. Refer to the attached draft Stormwater Retrofit Program (**Appendix V**) for further information on these projects.

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)

The Stormwater Retrofit Program, included in **Attachment V**, is designed to comply with *Section (6) (B) (ii)* of the CTDEEP 2017-2022 MS4 Permit. The Town of Wallingford will work towards disconnecting existing DCIA. The initial focus of the Stormwater Retrofit Program will first be applied to Town-owned properties, parks, and other facilities, followed by a focus of non-municipal facilities, parks, communities, or other redevelopments. Progress towards the DCIA disconnects will be tracked and continuously updated, with a goal to disconnect one percent (1%) of DCIA or to the MEP each year following the fifth year of the MS4 permit.

Part II: Impaired waters investigation and monitoring

1. Impaired waters investigation and monitoring program

For details on this requirement, visit <https://nemo.uconn.edu/ms4/tasks/monitoring.htm>. Refer to the yellow column of the Monitoring comparison chart and the Impaired waters monitoring flowchart.

1.1 Indicate which stormwater pollutant(s) of concern occur(s) in your municipality or institution. This data is available on the MS4 map viewer: <http://s.uconn.edu/ctms4map>.

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.

To date, 112 outfalls discharging to impaired waterbodies have been investigated, 88 of which have been sampled during wet weather events, including six (6) priority outfalls on an annual basis. Stormwater discharge analytical results are indicative of elevated bacterial concentrations. Outfalls that discharge to impaired waterbodies with "other pollutant of concern" have indicated generally low turbidity, with the exception of select outfalls to Wharton's Brook. Additional sampling and dry-weather screening for remaining outfalls continues.

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

2.1 Screening data

Complete the table below to report data for any wet weather sampling completed for MS4 outfalls that discharge directly to a stormwater impaired waterbody during the reporting period. For details on this requirement, visit www.nemo.uconn.edu/ms4/tasks/monitoring.htm. Refer to the yellow column of the Monitoring comparison chart and the Impaired waters monitoring flowchart.

Each Annual Report will add on to the previous year's data showing a cumulative list of sampling data. **You may also attach an excel spreadsheet with the same data rather than copying it into this table.** If you do attach a spreadsheet, please write "See Attachment" below.

Outfall ID	Latitude / Longitude	Sample date	Parameter (Nitrogen, Phosphorus, Bacteria, or Other pollutant of concern)	Results	Name of Laboratory (if used)	Follow-up required? *
LH-2	41.435775/ -72.824375	6/10/2019	Other	Turbidity: <5 NTU	N/A	None.
LH-3	41.434435/ -72.824212	6/10/2019	Other	Turbidity 19.32 NTU	N/A	Yes
LH-6	41.43099/ - 72.820112	6/10/2019	Other	Turbidity 10.67 NTU	N/A	Yes
LH-7	41.430894/ -72.819874	6/10/2019	Other	Turbidity: 9.67 NTU	N/A	Yes
LH-8	41.431369/ -72.817063	6/10/2019	Other	Turbidity: 23.99 NTU	N/A	Yes
LH-9	41.433966/ -72.813953	6/10/2019	Other	Turbidity: 7.32 NTU	N/A	Yes
MR-2	41.406323/ -72.803502	6/10/2019	Other	Turbidity: 0.16 NTU	N/A	No
MR-3	41.406275/ -72.803362	6/10/2019	Other	Turbidity: 0.01 NTU	N/A	No
WB-48	41.432293/ -72.832283	6/10/2019	Other	Turbidity: 0.48 NTU	N/A	No
WB-28	41.450357/ -72.814351	6/10/2019	Other	Turbidity: 5.86 NTU	N/A	Yes

WB-29	41.450074/ -72.81412	6/10/2019	Other	Turbidity: 47.02 NTU	N/A	Yes
WB-30	41.449968/ -72.813939	6/10/2019	Other	Turbidity: 45.02 NTU	N/A	Yes
WB-31		6/10/2019	Other	Turbidity: 16.3 NTU	N/A	Yes
WB-33	41.448559/ -72.815494	6/10/2019	Other	Turbidity: 11.6 NTU	N/A	Yes
QR-11	41.462104/ -72.826282	6/10/2019	Other	Turbidity: 17.59 NTU	N/A	Yes
QR-12	41.459841/ -72.827471	6/10/2019	Other	Turbidity: 6.62 NTU	N/A	Yes
WB-11	41.463681/ -72.795415	6/25/2019	Other	Turbidity: 3.6 NTU	N/A	No
WB-17	41.460981/ -72.797429	6/25/2019	Other	Turbidity 3.1 NTU	N/A	No
WB-18	41.460693/ -72.797471	6/25/2019	Other	Turbidity: 6.8 NTU	N/A	Yes
WB-20	41.459926/ -72.797676	6/25/2019	Other	Turbidity: 6.1 NTU	N/A	Yes
WB-21	41.458646/ -72.798128	6/25/2019	Other	Turbidity: 10.6 NTU	N/A	Yes
WB-22	41.45617/ - 72.803508	6/25/2019	Other	Turbidity: 17.4 NTU	N/A	Yes
WB-23	41.456125/ -72.803435	6/25/2019	Other	Turbidity: 44.1 NTU	N/A	Yes
WB-34	41.448097/ -72.81762	6/25/2019	Other	Turbidity: 61.5 NTU	N/A	Yes
WB-35		6/25/2019	Other	Turbidity: 107.4 NTU	N/A	Yes
QR-13	41.458836/ -72.835459	6/25/2019	Other	Turbidity: 16.2 NTU	N/A	Yes
QR-15	41.458434/ -72.835647	6/25/2019	Other	Turbidity: 14.6 NTU	N/A	Yes
QR-16	41.458395/ -72.835737	6/25/2019	Other	Turbidity: 14.8 NTU	N/A	Yes
QR-17	41.458125/ -72.836198	6/25/2019	Other	Turbidity: 46.8 NTU	N/A	Yes
QR-23	41.432676/ -72.85064	6/25/2019	Other	Turbidity: 44.1 NTU	N/A	Yes
LH-12	41.435807/ -72.808388	6/25/2019	Other	Turbidity: 26.9 NTU	N/A	Yes
WB-1	41.482996/ -72.782988	3/13/2020	Other	Turbidity: 19.48 NTU	N/A	Yes

WB-2	41.479369/ -72.785385	3/13/2020	Other	Turbidity: 13.35 NTU	N/A	Yes
WB-3	41.477169/ -72.785469	3/13/2020	Other	Turbidity: 10.67 NTU	N/A	Yes
WB-4	41.475873/ -72.78748	3/13/2020	Other	Turbidity: 8.67 NTU	N/A	Yes
WB-5	41.472614/ -72.793405	3/13/2020	Other	Turbidity: 12.56 NTU	N/A	Yes
WB-6	41.470504/ -72.794556	3/13/2020	Other	Turbidity: 8.83 NTU	N/A	Yes
WB-7	41.470374/ -72.794619	3/13/2020	Other	Turbidity: 8.83 NTU	N/A	Yes
WB-8	41.469592/ -72.795031	3/13/2020	Other	Turbidity: 9.29 NTU	N/A	Yes
WB-12	41.463192/ -72.795656	3/13/2020	Other	Turbidity: 160.9 NTU	N/A	Yes
WB-13	41.46227/ - 72.796111	3/13/2020	Other	Turbidity: 17.24 NTU	N/A	Yes
WB-14	41.463438/ -72.796459	3/13/2020	Other	Turbidity: 12.06 NTU	N/A	Yes
WB-16	41.461334/ -72.79699	3/13/2020	Other	Turbidity: 24.19 NTU	N/A	Yes
WB-18	41.460693/ -72.797471	3/13/2020	Other	Turbidity: 31.11 NTU	N/A	Yes
WB-20	41.459926/ -72.797676	3/13/2020	Other	Turbidity: 1.61 NTU	N/A	No
WB-21	41.458646/ -72.798128	3/13/2020	Other	Turbidity: 2.19 NTU	N/A	No
WB-22	41.45617/ - 72.803508	3/13/2020	Other	Turbidity: 19.91 NTU	N/A	Yes
WB-23	41.456125/ -72.803435	3/13/2020	Other	Turbidity: 18.63 NTU	N/A	Yes
WB-24	41.453328/ -72.804466	3/13/2020	Other	Turbidity: 11.18 NTU	N/A	Yes
WB-25	41.451907/ -72.813452	3/13/2020	Other	Turbidity: 25.61 NTU	N/A	Yes
WB-26	41.451921/ -72.813353	3/13/2020	Other	Turbidity: 10.61 NTU	N/A	Yes
WB-27	41.45189/ - 72.813288	3/13/2020	Other	Turbidity: 90.81 NTU	N/A	Yes
WB-28	41.450357/ -72.814351	3/13/2020	Other	Turbidity: 11.24 NTU	N/A	Yes
WB-29	41.450074/ -72.81412	3/13/2020	Other	Turbidity: 38.57 NTU	N/A	Yes

WB-30	41.449968/ -72.813939	3/13/2020	Other	Turbidity: 9.16 NTU	N/A	Yes
WB-31		3/13/2020	Other	Turbidity: 25.50 NTU	N/A	Yes
WB-32	41.449435/ -72.815047	3/13/2020	Other	Turbidity: 22.46 NTU	N/A	Yes
WB-33	41.438152/ -72.824277	3/13/2020	Other	Turbidity: 20.65 NTU	N/A	Yes
WB-34	41.448097/ -72.81762	3/13/2020	Other	Turbidity: 20.72 NTU	N/A	Yes
WB-35		3/13/2020	Other	Turbidity: 20.68 NTU	N/A	Yes
WB-36	41.446483/ -72.819608	3/13/2020	Other	Turbidity: 20.44 NTU	N/A	Yes
WB-37	41.444777/ -72.818079	3/13/2020	Other	Turbidity: 10.12 NTU	N/A	Yes
WB-38	41.44401/ - 72.82061	3/13/2020	Other	Turbidity: 15.64 NTU	N/A	Yes
WB-39	41.443093/ -72.818226	3/13/2020	Other	Turbidity: 12.63 NTU	N/A	Yes
WB-41	41.442284/ -72.819275	3/13/2020	Other	Turbidity: 15.96 NTU	N/A	Yes
WB-24	41.453328/ -72.804466	4/21/2020	Other	Turbidity: <5 NTU	N/A	No
WB-25	41.451907/ -72.813452		Other	Outfall destroyed. No samples collected.	N/A	
WB-26	41.451921/ -72.813353	4/21/2020	Other	Turbidity: >5 NTU	N/A	Yes
WB-27	41.45189/ - 72.813288	4/21/2020	Other	Turbidity: >5 NTU	N/A	Yes
QR-1	41.503345/ -72.824605	4/21/2020	Other	Turbidity: >5 NTU	N/A	Yes
QR-3	41.499705/ -72.818617	4/21/2020	Other	Turbidity: >5 NTU	N/A	Yes
QR-5	41.487679/ -72.818601	4/21/2020	Other	Turbidity: >5 NTU	N/A	Yes
QR-7	41.487413/ -72.820477	4/24/2020	Other	Turbidity: <5 NTU	N/A	No
WB-12	41.463192/ -72.795656	4/24/2020	Other	Turbidity: 29.32 NTU	N/A	Yes
WB-13	41.46227/ - 72.796111	4/24/2020	Other	Turbidity: 9.55 NTU	N/A	Yes

WB-32	41.449435/ -72.815047	4/24/2020	Other	Turbidity: 7.89 NTU	N/A	Yes
WB-36	41.446483/ -72.819608	4/24/2020	Other	Turbidity: 8.75 NTU	N/A	Yes
WB-41	41.442284/ -72.819275	4/24/2020	Other	Turbidity: 2.39 NTU	N/A	No
WB-45	41.436769/ -72.831613	4/24/2020	Other	Turbidity: 4.16 NTU	N/A	No
MR-1	41.405734/ -72.804528	04/30/2020	Bacteria, Other	E.coli: 5,790 Total Coliform: >24,200	Phoenix Environmental	Yes
MR-2	41.406323/ -72.803502	9/10/2020	Bacteria, Other	E. coli: 3,870 Total Coliform: >24,200	Phoenix Environmental	Yes
QR-6	41.487533/ -72.820636	04/24/2020	Bacteria, Other	E.coli: 4,610 Total Coliform: >24,200	Phoenix Environmental	Yes
QR-8	41.485489/ -72.822444	04/24/2020	Bacteria, Other	E.coli: 631 Total Coliform: >24,200	Phoenix Environmental	Yes
QR-9	41.46664/ - 72.823797	04/30/2020, 9/10/2020	Bacteria, Other	E.coli: 8,160 Total Coliform: >24,200	Phoenix Environmental	Yes
QR-10	41.46408/ - 72.824739	9/10/2020	Bacteria, Other	E.coli: >24,200 Total Coliform: >24,200	Phoenix Environmental	Yes
QR-11	41.462104/ -72.826282	9/10/2020	Bacteria, Other	E. coli: >24,200 Total Coliform: >24,200	Phoenix Environmental	Yes
QR-17	41.458125/ -72.836198	04/13/2020	Bacteria, Other	E.coli: 3,450 Total Coliform: >24,200	Phoenix Environmental	Yes
AB-1	41.424694/ -72.825552	9/10/2020	Bacteria	E. coli: 24,200 Total Coliform: >24,200	Phoenix Environmental	Yes
AB-2	41.424813/ -72.823668	9/10/2020	Bacteria	E. coli: 3,870 Total Coliform: >24,200	Phoenix Environmental	Yes
AB-3	41.428012/ -72.813003	9/10/2020	Bacteria	E. coli: 880 Total Coliform: >24,200	Phoenix Environmental	Yes
AB-4	41.428283/ -72.811922	9/10/2020	Bacteria	E. coli: 195 Total Coliform: >24,200	Phoenix Environmental	Yes

OF-247	41.49404/ - 72.809227	9/1/2021	Bacteria, Other	E. coli: 97 Total Coliform: >24,200 Turbidity: 11.81 NTU	Phoenix Environmental	Yes
OF-54	41.499899/ -72.818361	9/1/2021	Bacteria, Other	E. coli: 6,870 Total Coliform: >24,200 Phosphorus: 0.207 mg/L	Phoenix Environmental	Yes
OF-269	41.504222/ -72.820081	9/1/2021	Bacteria, Other	E. coli: 6,870 Total Coliform: >24,200 Turbidity: 159.8 NTU	Phoenix Environmental	Yes
OF-270	41.506531/ -72.818521	9/1/2021	Bacteria, Other	E. coli: 19,900 Total Coliform: >24,200 Turbidity: 41.69 NTU	Phoenix Environmental	Yes
QR-6	41.487533/ -72.820636	9/1/2021	Bacteria, Other	E. coli: >24,200 Total Coliform: >24,200 Phosphorus: 0.171 mg/L	Phoenix Environmental	Yes
QR-8	41.485489/ -72.822444	9/1/2021	Bacteria, Other	E. coli: >24,200 Total Coliform: >24,200 Phosphorus: 0.236 mg/L	Phoenix Environmental	Yes
QR-10	41.46664/ - 72.823797	9/1/2021	Bacteria, Other	E. coli: 2,910 Total Coliform: >24,200 Phosphorus: 0.182 mg/L	Phoenix Environmental	Yes
QR-11	41.46408/ - 72.824739	9/1/2021	Bacteria, Other	E. coli: 816 Total Coliform: >24,200 Phosphorus: 0.063 mg/L	Phoenix Environmental	Yes
QR-17	41.462104/ -72.826282	9/1/2021	Bacteria, Other	E. coli: >24,200 Total Coliform: >24,200 Phosphorus: 0.458 mg/L	Phoenix Environmental	Yes

AB-1	41.424694/ -72.825552	9/1/2021	Bacteria	E. coli: 670 Total Coliform: >24,200	Phoenix Environmental	Yes
AB-2	41.424813/ -72.823668	9/1/2021	Bacteria	E. coli: 20 Total Coliform: >24,200	Phoenix Environmental	Yes
AB-3	41.428012/ -72.813003	9/1/2021	Bacteria	E. coli: 3,130 Total Coliform: >24,200	Phoenix Environmental	Yes
AB-4	41.428283/ -72.811922	9/1/2021	Bacteria	E. coli: 1,270 Total Coliform: >24,200	Phoenix Environmental	Yes
MR-1	41.405734/ -72.804528	9/1/2021	Bacteria	E. coli: 11,200 Total Coliform: >24,200	Phoenix Environmental	Yes
MR-2	41.406323/ -72.803502	9/1/2021	Bacteria	E. coli: 3,870 Total Coliform: >24,200	Phoenix Environmental	Yes

Follow-up investigation required (last column) if the following pollutant thresholds are exceeded:

Pollutant of concern	Pollutant threshold
Nitrogen	Total N > 2.5 mg/l
Phosphorus	Total P > 0.3 mg/l
Bacteria (fresh waterbody)	E. coli > 235 col/100ml for swimming areas or 410 col/100ml for all others - Total Coliform > 500 col/100ml
Bacteria (salt waterbody)	- Fecal Coliform > 31 col/100ml for Class SA and > 260 col/100ml for Class SB - Enterococci > 104 col/100ml for swimming areas or 500 col/100 for all others
Other pollutants of concern	Sample turbidity is 5 NTU > in-stream sample

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

Provide the following information for outfalls exceeding the pollutant threshold.

Outfall ID	Status of drainage area investigation	Control measure to address impairment
See above-listed outfalls.	Investigations are being conducted on the surrounding drainage areas, with a focus on surrounding runoff from agricultural land, septic repairs, and septic failures.	Potential measures that may be used in addressing bacterial impairments include aquatic vegetative buffers, control runoff measures implemented. Discussions are

		<i>underway within the Town on how to address potential septic failures or repairs at privately-owned properties.</i>
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4. Prioritized outfall monitoring (Section 6(i)(1)(D) / page 43)

Once outfall sampling 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, 2021. **You may also attach an excel spreadsheet with the same data rather than copying it to this table.** If you do attach a spreadsheet, please write “See Attachment” below.

Outfall	Latitude / Longitude	Sample Date	Parameter(s)	Results	Name of Laboratory (if used)
QR-6	41.487533/ -72.820636	04/24/2020	Bacteria, Other	E.coli: 4,610 Total Coliform: >24,200	Phoenix Environmental
QR-8	41.485489/ -72.822444	04/24/2020	Bacteria, Other	E.coli: 631 Total Coliform: >24,200	Phoenix Environmental
QR-10	41.46664/ -72.823797	04/30/2020, 9/10/2020	Bacteria, Other	E.coli: 8,160 Total Coliform: >24,200	Phoenix Environmental
QR-11	41.46408/ -72.824739	9/10/2020	Bacteria, Other	E.coli: >24,200 Total Coliform: >24,200	Phoenix Environmental
QR-17	41.462104/ -72.826282	9/10/2020	Bacteria, Other	E. coli: >24,200 Total Coliform: >24,200	Phoenix Environmental
AB-1	41.424694/ -72.825552	9/10/2020	Bacteria	E. coli: 24,200 Total Coliform: >24,200	Phoenix Environmental
AB-2	41.424813/ -72.823668	9/10/2020	Bacteria	E. coli: 3,870 Total Coliform: >24,200	Phoenix Environmental
AB-3	41.428012/ -72.813003	9/10/2020	Bacteria	E. coli: 880 Total Coliform: >24,200	Phoenix Environmental
AB-4	41.428283/ -72.811922	9/10/2020	Bacteria	E. coli: 195 Total Coliform: >24,200	Phoenix Environmental
MR-1	41.405734/ -72.804528	04/30/2020	Bacteria, Other	E.coli: 5,790 Total Coliform: >24,200	Phoenix Environmental
MR-2	41.406323/ -72.803502	9/10/2020	Bacteria, Other	E. coli: 3,870 Total Coliform: >24,200	Phoenix Environmental
QR-6	41.487533/ -72.820636	9/1/2021	Bacteria, Other	E. coli: >24,200 Total Coliform: >24,200 Phosphorus: 0.171 mg/L	Phoenix Environmental
QR-8	41.485489/ -72.822444	9/1/2021	Bacteria, Other	E. coli: >24,200 Total Coliform: >24,200 Phosphorus: 0.236 mg/L	Phoenix Environmental
QR-10	41.46664/ -72.823797	9/1/2021	Bacteria, Other	E. coli: 2,910 Total Coliform: >24,200	Phoenix Environmental

				Phosphorus: 0.182 mg/L	
QR-11	41.46408/ -72.824739	9/1/2021	Bacteria, Other	E. coli: 816 Total Coliform: >24,200 Phosphorus: 0.063 mg/L	Phoenix Environmental
QR-17	41.462104/ -72.826282	9/1/2021	Bacteria, Other	E. coli: >24,200 Total Coliform: >24,200 Phosphorus: 0.458 mg/L	Phoenix Environmental
AB-1	41.424694/ -72.825552	9/1/2021	Bacteria	E. coli: 670 Total Coliform: >24,200	Phoenix Environmental
AB-2	41.424813/ -72.823668	9/1/2021	Bacteria	E. coli: 20 Total Coliform: >24,200	Phoenix Environmental
AB-3	41.428012/ -72.813003	9/1/2021	Bacteria	E. coli: 3,130 Total Coliform: >24,200	Phoenix Environmental
AB-4	41.428283/ -72.811922	9/1/2021	Bacteria	E. coli: 1,270 Total Coliform: >24,200	Phoenix Environmental
MR-1	41.405734/ -72.804528	9/1/2021	Bacteria	E. coli: 11,200 Total Coliform: >24,200	Phoenix Environmental
MR-2	41.406323/ -72.803502	9/1/2021	Bacteria	E. coli: 3,870 Total Coliform: >24,200	Phoenix Environmental

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).

1. Catchment ID (DEEP Basin ID)	2. Category	3. Rank
4606-00-1	Low Priority	2
4606-01-1	Low Priority	2
4606-02-1	Low Priority	2
4607-10-1-L1	Low Priority	2
5112-00-2-L1	Problem	7
5112-02-1	Problem	6

5112-02-1-D1	Low Priority	3
5112-02-1-L1	Low Priority	2
5112-03-1	Problem	6
5200-00-4-L3	High Priority	11
5200-00-4-R10	High Priority	13
5200-00-4-R11	Problem	9
5200-00-4-R12	High Priority	11
5200-00-4-R7	High Priority	15
5200-00-4-R8	High Priority	13
5200-10-1	High Priority	11
5200-10-2-R1	High Priority	13
5200-11-1	High Priority	11
5200-12-1	High Priority	12
5200-12-1-L1	High Priority	12
5200-13-1	High Priority	16
5200-14-1	Low Priority	4
5200-14-1-L1	Problem	9
5200-15-1	Problem	9
5200-16-1	Low Priority	2
5200-17-1	Low Priority	4
5200-19-1-L1	Low Priority	5
5204-00-2-L1	Low Priority	5

5204-01-1	Low Priority	3
5204-02-1	Low Priority	5
5206-01-1-L1	Low Priority	4
5206-02-1-L1	High Priority	10
5207-00-1	High Priority	13
5207-00-1-L1	Low Priority	4
5207-00-1-L2	High Priority	12
5207-00-2-R1	High Priority	13
5207-00-2-R2	High Priority	12
5207-01-1	High Priority	13
5207-02-1	Problem	6
5207-02-1-L1	High Priority	13
5208-00-1	Problem	7
5208-00-1-L1	Problem	10
5208-00-2-R1	Problem	7
5208-00-3-L2	Low Priority	5
5208-00-3-L3	High Priority	10
5208-00-3-R1	Problem	9
5208-00-3-R2	High Priority	10
5208-00-3-R3	High Priority	10
5208-00-3-R4	Problem	6
5208-00-3-R5	Problem	6

5208-01-1	Problem	8
5208-02-1	Low Priority	3
5208-02-1-L1	Problem	6
5208-02-2-R1	Problem	8
5208-03-1	Problem	7
5208-04-1	Low Priority	5
5208-04-1-L1	Low Priority	3
5208-05-1	Low Priority	3
5208-05-1-L1	Low Priority	4
5208-06-1	Problem	8
5208-07-1	Low Priority	5
5208-08-1	Problem	8
5208-09-1	Low Priority	3
5302-02-1	Problem	8
5302-04-1-L1	High Priority	11

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

For details on this requirement, visit <https://nemo.uconn.edu/ms4/tasks/monitoring.htm>. Refer to the blue column of the Monitoring comparison chart and the IDDE baseline monitoring flowchart.

Provide sample data for outfalls where flow is observed. Only include Pollutant of concern data for outfalls that discharge into stormwater impaired waterbodies. **You may also attach an excel spreadsheet with the same data rather than copying it to this table.** If you do attach a spreadsheet, please write "See Attachment" below.

Outfall / Interconnection ID	Latitude / Longitude	Screening / sample date	Ammonia	Chlorine	Conductivity	Salinity	E. coli or enterococcus	Surfactants	Water Temp	Pollutant of concern	If required, follow- up actions taken
OF-64		10/20/20 21	-	-	-	-	-	-	-	None	<i>During dry weather screenings, this outfall was found tot have a very slight discharge. Atlas conducted further field investigations, and it was concluded that the discharge was soley that of groundwater influence on the MS4 system, and not of an IDDE.</i>

2.2 Wet weather sample and inspection data

For details on this requirement, visit <https://nemo.uconn.edu/ms4/tasks/monitoring.htm>. Refer to the green column of the Monitoring comparison chart and the IDDE catchment investigation flowchart.

Provide sample data for outfalls and key junction manholes of any catchment area with at least one System Vulnerability Factor. **You may also attach an excel spreadsheet with the same data rather than copying it to this table.** If you do attach a spreadsheet, please write “See Attachment” below.

Outfall / Interconnection ID	Latitude / Longitude	Sample date	Ammonia	Chlorine	Conductivity	Salinity	E. coli or Enterococcus	Surfactants	Water Temp	Pollutant of concern
<i>System Vulnerability Factors are currently under investigation, and will be added to the next annual report. Refer to Section 1: Catchment Investigation Data, 3.1 System Vulnerability Factor Summary for more information.</i>										

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

For details on this requirement, visit www.nemo.uconn.edu/ms4/tasks/monitoring.htm. Refer to the green column of the Monitoring comparison chart and the IDDE catchment investigation flowchart.

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. An example is provided below.

Outfall ID	Receiving Water	System Vulnerability Factors
<i>The Town of Wallingford's sanitary sewer is currently managed by the Town of Wallingford's Water Pollution Control Authority (WPCA). The storm sewer and sanitary sewer have historically been separate, and remain so in the present day. Therefore, SVFs 4, 5, 6, 7, 8, and 9 are not applicable to the Town. Other SVFs are currently under investigation, and will be updated in the next annual report. These investigations include coordination between the WPCF, as well as the (FVDH).</i>		

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

You may also attach an excel spreadsheet with the same data rather than copying it to this table. If you do attach a spreadsheet, please write "See Attachment" below.

Key Junction Manhole ID	Latitude / Longitude	Screening / Sample date	Visual/ olfactory evidence of illicit discharge	Ammonia	Chlorine	Surfactants

3.3 Wet weather investigation outfall sampling data

You may also attach an excel spreadsheet with the same data rather than copying it to this table. If you do attach a spreadsheet, please write “See Attachment” below.

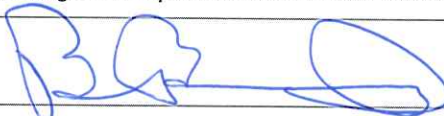
Outfall ID	Latitude / Longitude	Sample date	Ammonia	Chlorine	Surfactants

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

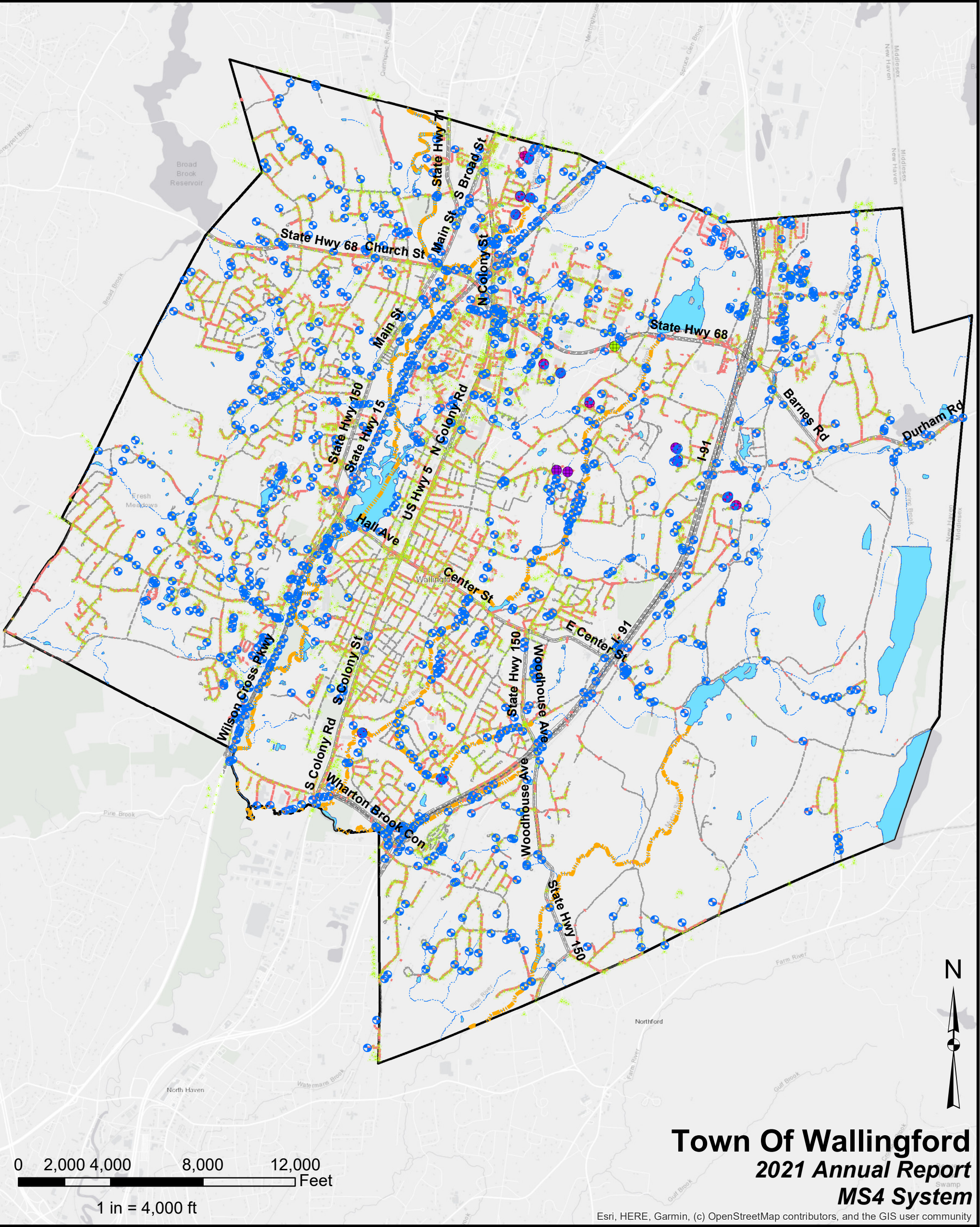
Discharge location	Source location	Discharge description	Method of discovery	Date of discovery	Date of elimination	Mitigation or enforcement action	Estimated volume of flow removed
QR-11	Senior Center	Murky, iridescent	Dry Weather Screening	5-17-2019	N/A	N/A	N/A
OF-64		Clear, no odor, slight trickle	Dry Weather Screening	10-20-2021	N/A	None.	N/A

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 Baltramaitis, P.E. Wallingford Department of Public Works	Print name: Kay Lehoux, Environmental Scientist
Signature / Date:  4/11/22	Signature / Date:  4/1/2022
Email: publicworks@wallingfordct.gov	Email: kay.lehoux@oneatlas.com

FIGURES



Legend

- Outfall
- Detention Basin
- Detention Pond
- Sediment Basin
- Catch Basin
- Gravity Main
- Impaired Waterbody
- Surface Water
- Main Road
- Town Line

Fig No.
1

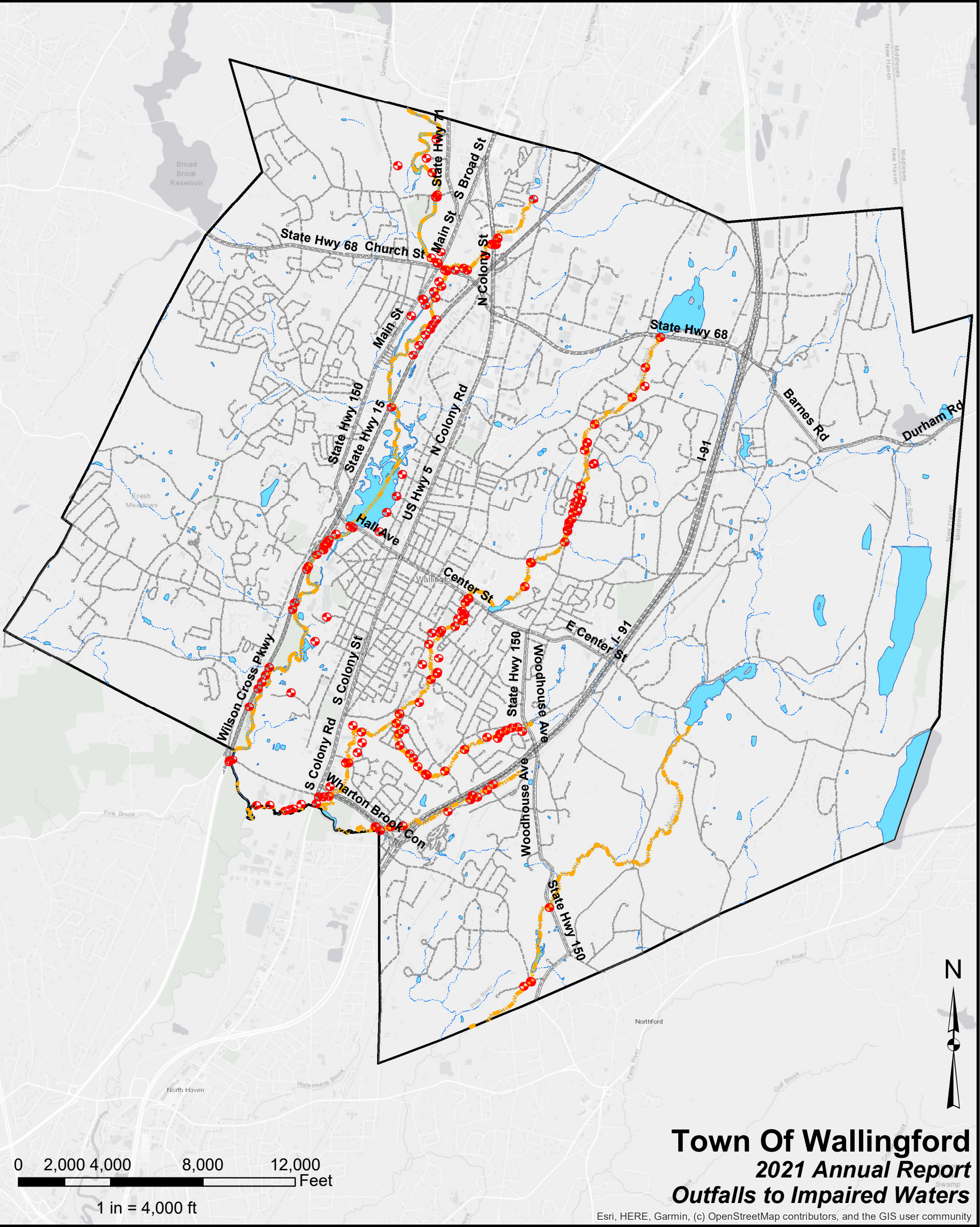
Drawn By: KLL

Checked by: LRW

Date: 2021



290 Roberts Street Suite 301
East Hartford,CT 06108



Legend

Outfall to Impaired Waterbody

Impaired Waterbody

Surface Water

Main Road

Town Line

Fig No.
2

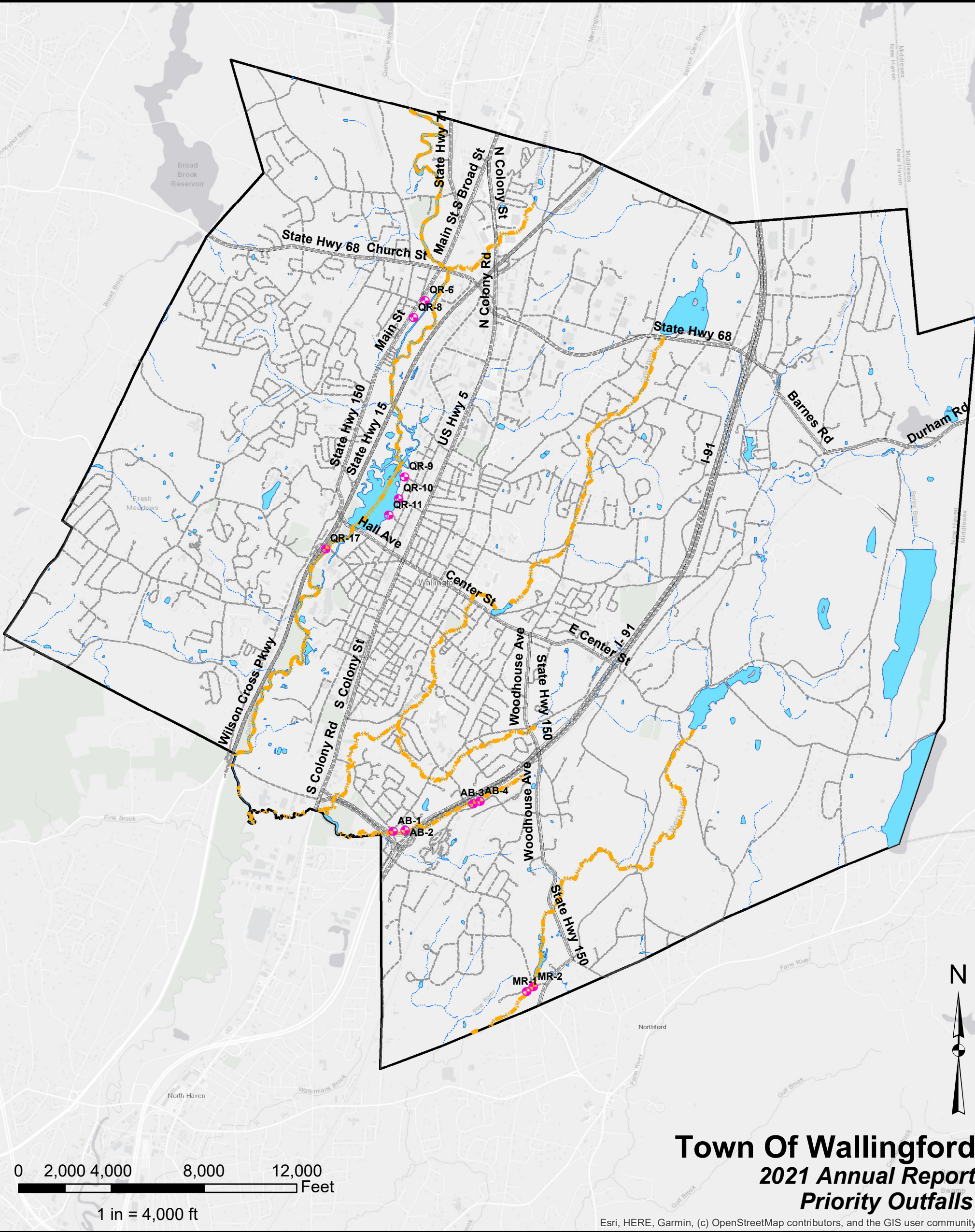
Drawn By: KLL

Checked by: LRW

Date: 2021

ATLAS

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East Hartford,CT 06108



Legend

Priority Outfall

Impaired Waterbody

Surface Water

Main Road

Town Line

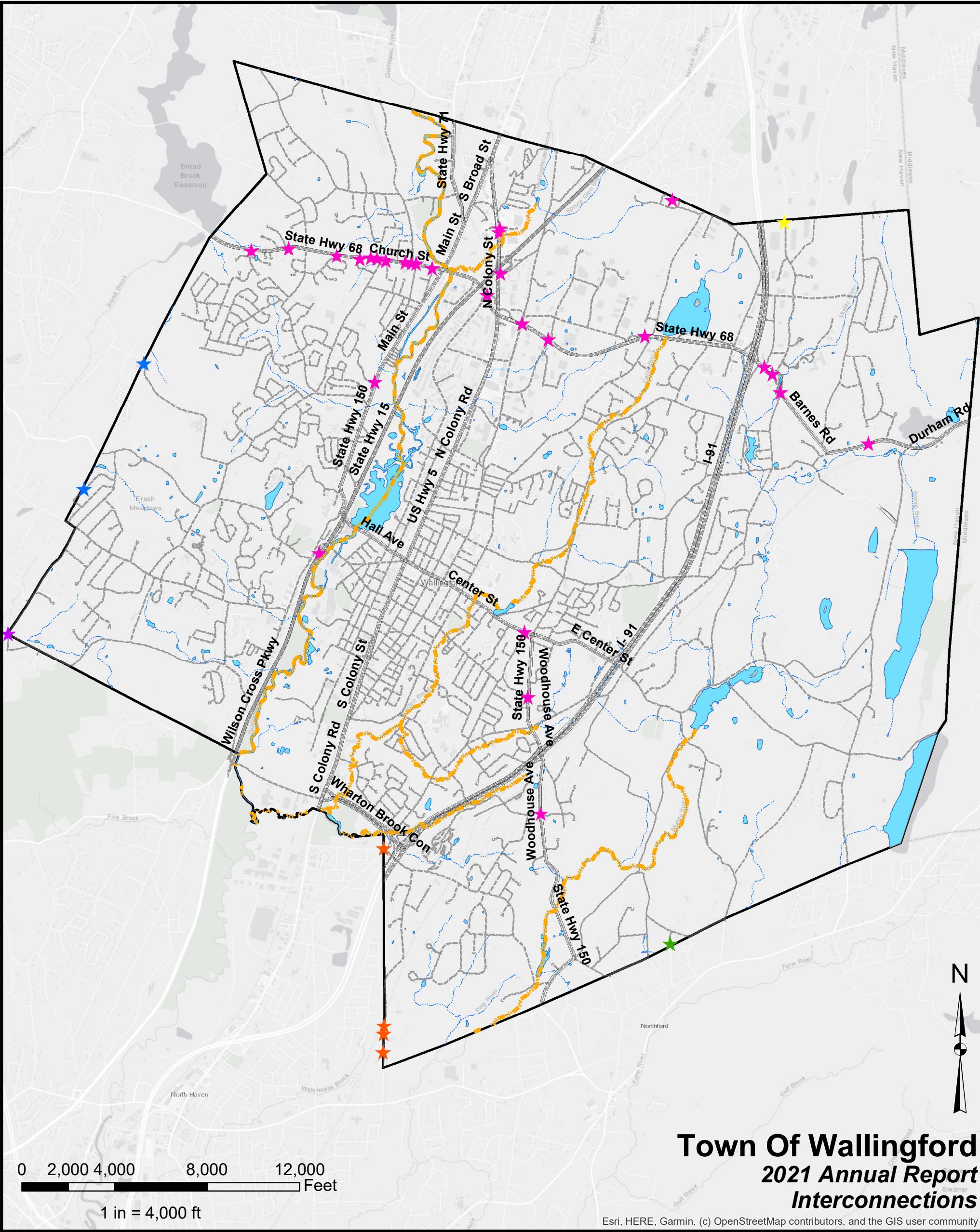
Fig No.
3

Drawn By: KLL

Checked by: LRW

Date: 2021

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Impaired Waterbody

Surface Water

Main Road

Town Line

Interconnections

CTDOT

Cheshire

Hamden

Meriden

North Haven

Northford

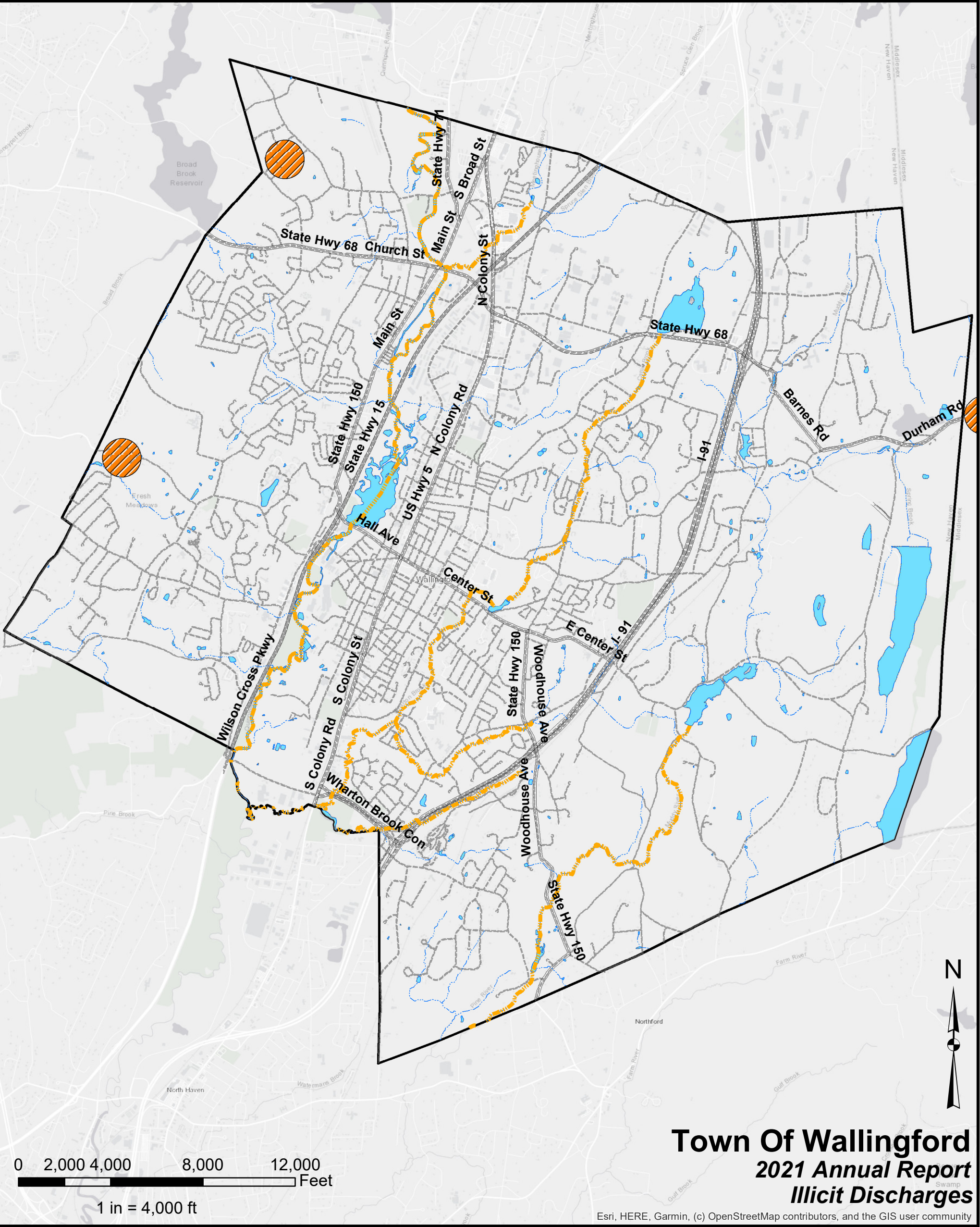
Fig No.
4

Drawn By: KLL

Checked by: LRW

Date: 2021

290 Roberts Street Suite 301
East Hartford,CT 06108



Legend

Illicit Discharge (Enlarged to show location)

Impaired Waterbody

Surface Water

Main Road

Town Line

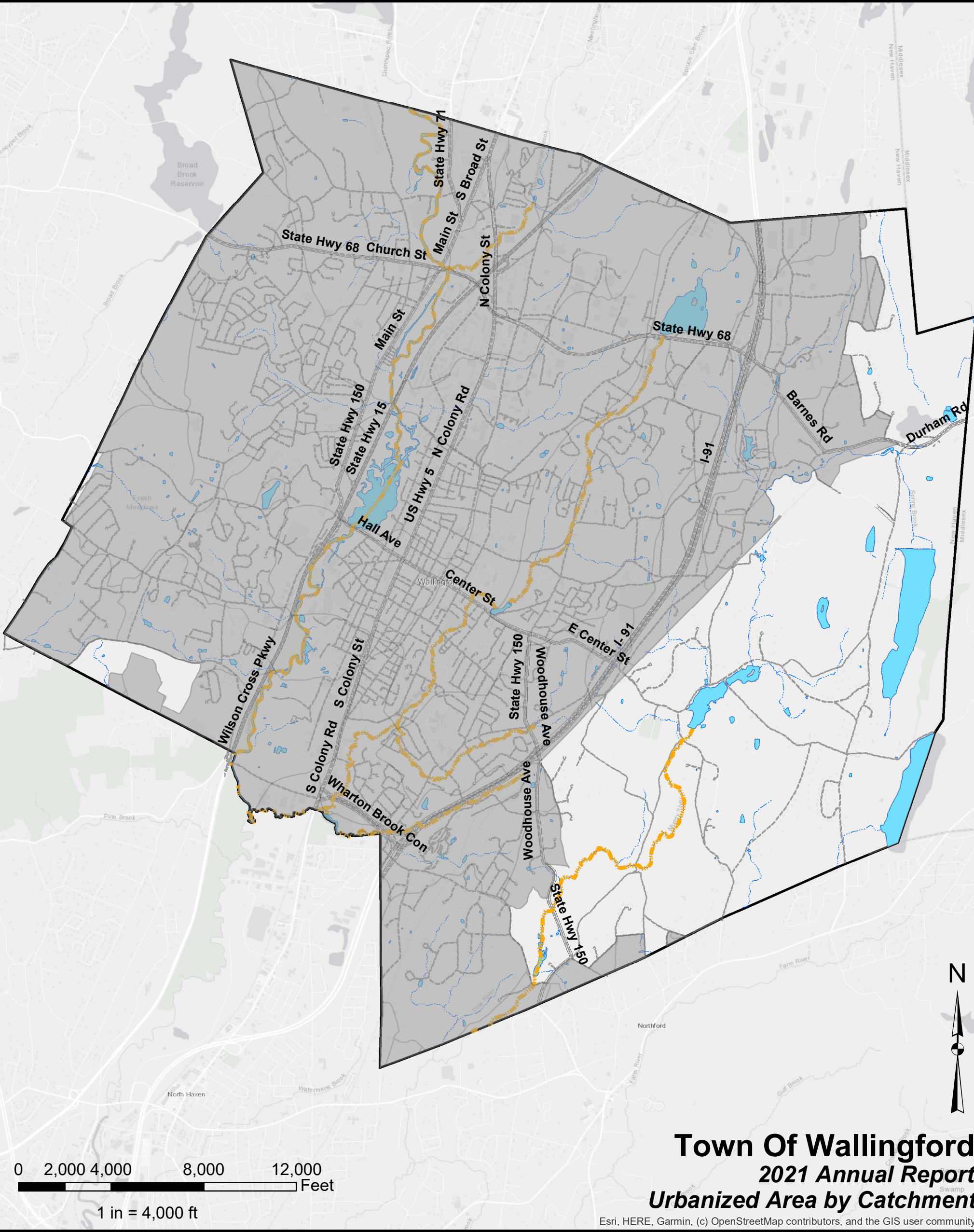
Fig No.
5

Drawn By: KLL

Checked by: LRW

Date: 2021

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East Hartford,CT 06108



Legend

Urbanized Area by Catchment

Impaired Waterbody

Surface Water

Main Road

Town Line

Fig No.
6

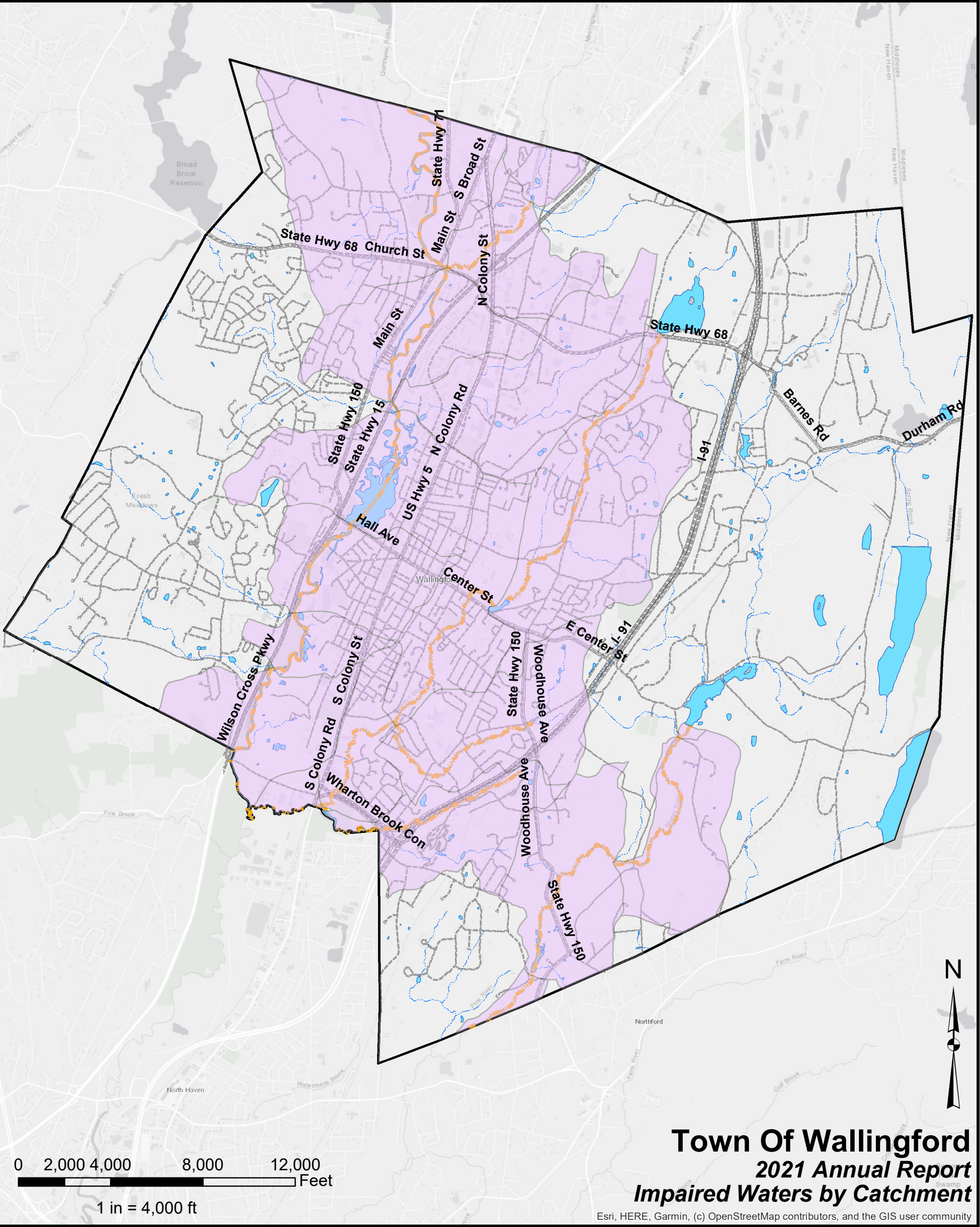
Drawn By: KLL

Checked by: LRW

Date: 2021

ATLAS

290 Roberts Street Suite 301
East Hartford,CT 06108



Legend

Catchments Associated with Impaired Waters

Impaired Waterbody

Surface Water

Main Road

Town Line

Fig No.
7

Drawn By: KLL

Checked by: LRW

Date: 2021



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ATTACHMENT I –Dry Weather Inspections



290 Roberts Street, Suite 301
East Hartford, CT 06108
Telephone 860-282-9924
Fax 737-207-8276
www.oneatlas.com

WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 9:01 AM

OUTFALL ID: OF-270
INSPECTION DATE: OCTOBER 20, 2021

Material	--
Subtype	--
Diameter	--
Condition	--
Erosion Control	--

Notes

Could not locate outfall. Outfall is in the discharge area of a scrapyard. Several swales that conjoin to one larger trench are in the approximate location of outfall. Trenches are highly eroded with rip rap lining the bottom

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 2:00 PM

OUTFALL ID: OF-92
INSPECTION DATE: OCTOBER 20, 2021

Material	Plastic
Subtype	Flared End
Diameter	15"
Condition	Good
Erosion Control	Yes

Notes

Slightly overgrown, standing water in pipe, cut down debris thrown on top of outfall.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 1:54 PM

OUTFALL ID: OF-66
INSPECTION DATE: OCTOBER 20, 2021

Material	Plastic
Subtype	--
Diameter	6"
Condition	Excellent
Erosion Control	Yes

Notes

Outfall pipe is suspended but drainage lands on rip rap, little to no erosion, no trash or other debris.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 1:47 PM

OUTFALL ID: OF-67
INSPECTION DATE: OCTOBER 20, 2021

Material	Plastic
Subtype	Flared End
Diameter	15"
Condition	Excellent
Erosion Control	Yes

Notes

Drains into a closed depression, minimal erosion, some rip rap

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 1:36 PM

OUTFALL ID: OF-68
INSPECTION DATE: OCTOBER 20, 2021

Material	Concrete
Subtype	--
Diameter	12"
Condition	Good
Erosion Control	Unknown

Notes

Outfall goes directly into river, submerged under water, could not determine discharge or condition of opening.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 1:22 PM

OUTFALL ID: OF-73
INSPECTION DATE: OCTOBER 20, 2021

Material	Concrete
Subtype	Flared End
Diameter	
Condition	Poor
Erosion Control	No

Notes

Completely blocked and covered by debris, some rip rap in discharge channel.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 1:21 PM

OUTFALL ID: OF-72
INSPECTION DATE: OCTOBER 20, 2021

Material	Plastic
Subtype	--
Diameter	15"
Condition	Good
Erosion Control	Yes

Notes

Slightly overgrown, trash present in discharge channel.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 1:09 PM

OUTFALL ID: OF-71
INSPECTION DATE: OCTOBER 20, 2021

Material	Plastic
Subtype	Flared End
Diameter	15"
Condition	Good
Erosion Control	Yes

Notes

Metal flared end on plastic, overgrown, some rip rap in discharge channel, minimal erosion

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 1:05 PM

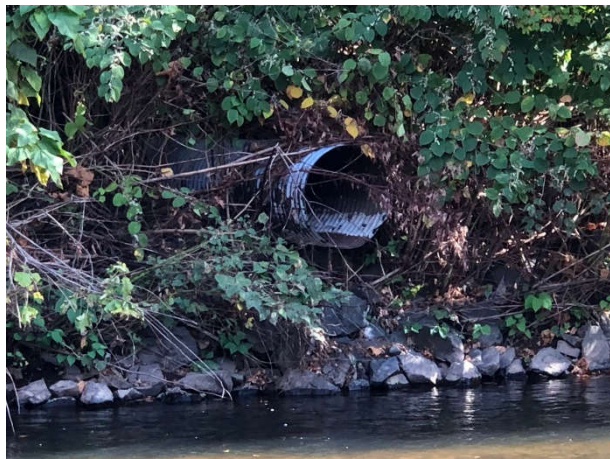
OUTFALL ID: OF-70
INSPECTION DATE: OCTOBER 20, 2021

Material	Metal
Subtype	--
Diameter	36"
Condition	Excellent
Erosion Control	No

Notes

Metal pipe, drains directly into flowing part of river.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 1:03 PM

OUTFALL ID: OF-69
INSPECTION DATE: OCTOBER 20, 2021

Material	Metal
Subtype	--
Diameter	24"
Condition	Good
Erosion Control	No

Notes

Metal pipe, discharging directly into inlet stream, film on top of water at outfall, trash all along inlet stream.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 12:42 PM

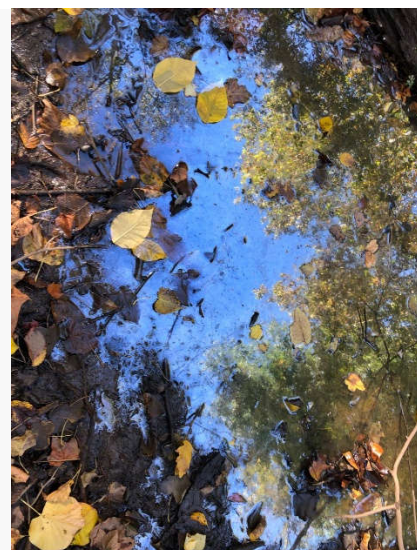
OUTFALL ID: OF-59
INSPECTION DATE: OCTOBER 20, 2021

Material	Concrete
Subtype	Flared End
Diameter	24"
Condition	Good
Erosion Control	Yes

Notes

Debris is opening of pipe likely to block water flow, rip rap in channel leading to river. Oily sheen on water at end of channel

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 12:25 PM

OUTFALL ID:
INSPECTION DATE:

Material	
Subtype	
Diameter	"
Condition	
Erosion Control	

Notes

Could not locate outfall



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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 12:08 PM

OUTFALL ID: OF-65
INSPECTION DATE: OCTOBER 20, 2021

Material	Concrete
Subtype	Other
Diameter	12"
Condition	Good
Erosion Control	Yes

Notes

Eroded sediment in front of outfall has caused a void where water goes rather than flow over rip rap and into river.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 12:05 PM

OUTFALL ID: OF-64
INSPECTION DATE: OCTOBER 20, 2021

Material	Concrete
Subtype	Other
Diameter	36"
Condition	Excellent
Erosion Control	No

Notes

Drains directly into river. Discharge present but was determined to be groundwater, clear and odorless.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 12:03 PM

OUTFALL ID: OF-63
INSPECTION DATE: OCTOBER 20, 2021

Material	Concrete
Subtype	Flared End
Diameter	12"
Condition	Fair
Erosion Control	No

Notes

Eroded depression in front of outfall preventing water from flowing downhill, causing ponding. Rip rap present on hillside down to river.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 11:33 AM

OUTFALL ID: OF-255
INSPECTION DATE: OCTOBER 20, 2021

Material	
Subtype	
Diameter	
Condition	
Erosion Control	

Notes

Could not locate, dense vegetation, significant amounts of rip rap along hillside
down to river



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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 11:04 AM

OUTFALL ID: OF-249
INSPECTION DATE: OCTOBER 20, 2021

Material	Concrete
Subtype	Flared End
Diameter	24"
Condition	Excellent
Erosion Control	Yes

Notes

Excellent condition, no erosion trash or sediment. Rip rap whole way down to river

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 10:56 AM

OUTFALL ID: OF-246
INSPECTION DATE: OCTOBER 20, 2021

Material	Plastic
Subtype	Flared End
Diameter	24"
Condition	Good
Erosion Control	Yes

Notes

Sediment accumulation in base and mouth of pipe, trash present, moderate vegetation, rip rap lining drainage area.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 10:47 AM

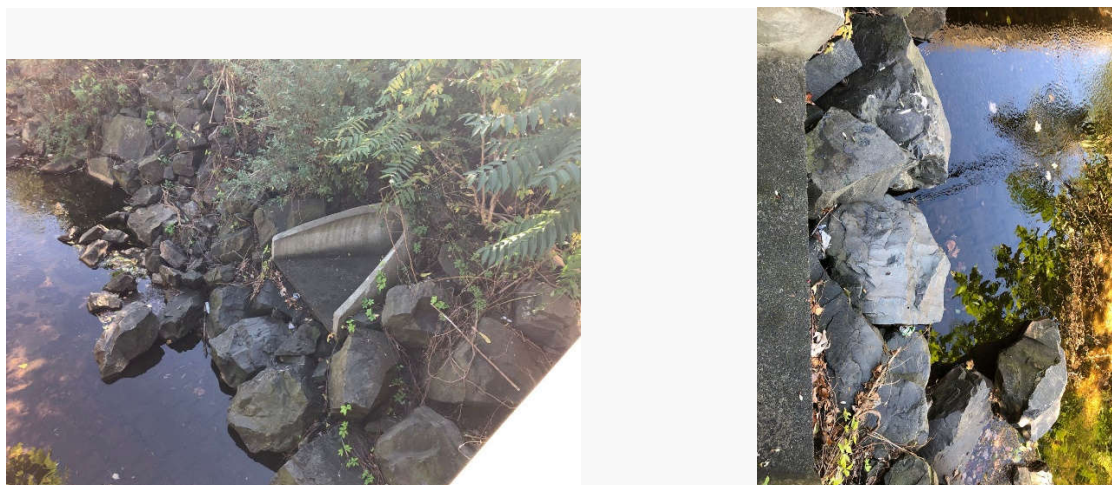
OUTFALL ID: OF-247
INSPECTION DATE: OCTOBER 20, 2021

Material	Precast
Subtype	Flared End
Diameter	36"
Condition	Excellent
Erosion Control	Yes

Notes

Excellent condition, drains directly into stream, located directly across stream from OF-248,

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 10:41 AM

OUTFALL ID: OF-248
INSPECTION DATE: OCTOBER 20, 2021

Material	Precast
Subtype	
Diameter	24"
Condition	Excellent
Erosion Control	Yes

Notes

Excellent condition, located next to gas station, no erosion or trash, drains directly into river.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 10:33 AM

OUTFALL ID: OF-244
INSPECTION DATE: OCTOBER 20, 2021

Material	Plastic
Subtype	--
Diameter	6"
Condition	Good
Erosion Control	No

Notes

Plastic pipe, water falls out onto exposed soil and has moderately eroded discharge channel, some trash present, moderate vegetation, located behind gas station and liquor store.

Outfall:





290 Roberts Street, Suite 301
East Hartford, CT 06108
Telephone 860-282-9924
Fax 737-207-8276
www.oneatlas.com

WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 10:27 AM

OUTFALL ID: OF-245
INSPECTION DATE: OCTOBER 20, 2021

Material	Precast
Subtype	
Diameter	12"
Condition	Good
Erosion Control	No

Notes

Outfall pipe in excellent condition, trash present in discharge channel, located behind gas station and liquor store. No erosion controls in place, channel is moderately eroded down to the river.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 10:14 AM

OUTFALL ID: OF-54
INSPECTION DATE: OCTOBER 20, 2021

Material	Precast
Subtype	Other
Diameter	15"
Condition	Excellent
Erosion Control	Yes

Notes

Excellent condition, minimal vegetation, rip rap leading down to river, no erosion.

Outfall:





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WALLINGFORD DRY WEATHER INSPECTIONS

SUBMITTED BY: ATC GROUP SERVICES, LLC
SUBMITTED TIME: OCTOBER 20, 2021 9:38 AM

OUTFALL ID: OF-269
INSPECTION DATE: OCTOBER 20, 2021

Material	--
Subtype	--
Diameter	--
Condition	Poor
Erosion Control	Yes

Notes

Outfall is completely blocked, cannot determine material or diameter, by overlying asphalt collapse. Standing water present, trash also present around outfall. Rip rap places along discharge channel leading to river, minimal channel erosion.

Outfall:



Town of Wallingford

MS4 Interconnection Inspections

Interconnection ID	MS4	Inspection Date	Material	Condition	Erosion Control	Notes	Discharge	Longitute	Latitude
IC-21	CTDOT	5/17/2021	Unk.	Good	Good	Good condition, no discharge. Some trash/debris present.	No	-72.83775044	41.45765206
IC-20	CTDOT	5/17/2021	Unk.	Good	Fair	Some grass clippings in CB.	No	-72.82897425	41.47793953
IC-13	CTDOT	6/7/2021	Concrete	Good	Excellent	Good condition, no discharge.	No	-72.80576778	41.48488412
IC-14	CTDOT	6/7/2021	Concrete	Good	Good	Good condition, no discharge.	No	-72.80165863	41.48300739
IC-16	CTDOT	6/7/2021	Unk.	Poor	Poor	Last 2 CBs on Thorpe Ave completely silted in. No interconnection possible.	No	-72.76756239	41.47972799
IC-17	CTDOT	6/7/2021	Concrete	Good	Good	Good condition, no discharge.	No	-72.76628566	41.478884
IC-18	CTDOT	6/7/2021	Concrete	Good	Good	Some trash around CB.	No	-72.76505185	41.47676996
IC-15	CTDOT	6/7/2021	Unk.	Good	Fair	Trash/debris around CB.	No	-72.78639418	41.48340524
IC-11	CTDOT	5/17/2021	Unk.	Good	Good	Good condition, no discharge.	No	-72.81997544	41.49142214
IC-10	CTDOT	5/17/2021	Unk.	Poor	Poor	CB heavily silted in; vegetation growing inside CB	No	-72.82250208	41.49196862
IC-9	CTDOT	5/17/2021	Unk.	Good	Good	Good condition, no discharge.	No	-72.82322628	41.49205702
IC-8	CTDOT	5/17/2021	Unk.	Excellent	Good	Good condition, no discharge.	No	-72.82421333	41.49213738
IC-7	CTDOT	5/17/2021	Unk.	Good	Good	Good condition, no discharge.	No	-72.82724959	41.49229409
IC-6	CTDOT	5/17/2021	Unk.	Good	Fair	Some sediment in CB.	No	-72.82860142	41.49257536
IC-5	CTDOT	5/17/2021	Unk.	--	--	Unable to open manhole.	--	-72.82965821	41.49264769
IC-4	CTDOT	5/17/2021	Unk.	Good	Poor	Slight discharge coming from W, along state road, not MS4. Next in-line MS4 CB heavily silted in.	Yes	-72.83134801	41.49252313
IC-3	CTDOT	5/17/2021	Unk.	Good	Good	Good condition, no discharge.	No	-72.83499581	41.49292896
IC-1	CTDOT	5/17/2021	Unk.	Good	Good	Good condition, no discharge.	No	-72.84848732	41.49352364
IC-30	Cheshire/CTDOT	5/17/2021	Unk.	Fair	Fair	CB partially filled with leaves/sediment.	No	-72.86538524	41.48007764
IC-31	Cheshire/CTDOT	5/17/2021	Unk.	Fair	Fair	Moderate amount of sediment in CB.	No	-72.87481588	41.46522191
IC-32	Hamden/CTDOT	5/17/2021	Unk.	Good	Fair	Some sediment in CB.	No	-72.88678927	41.44804676
IC-33	North Haven/CTDOT	5/17/2021	Unk.	Excellent	Good	Good condition, no discharge.	No	-72.82743734	41.40158031
IC-34	North Haven/CTDOT	5/17/2021	Unk.	Good	Good	Good condition, no discharge.	No	-72.82748026	41.40062264
IC-35	North Haven/CTDOT	5/17/2021	Unk.	Excellent	Good	Good condition, no discharge.	No	-72.82757682	41.39844166
IC-36	Northford/CTDOT	5/17/2021	Unk.	Excellent	Good	Good condition, no discharge.	No	-72.7823655	41.4113333
IC-24	CTDOT	5/17/2021	Unk.	Excellent	Good	Good condition, no discharge.	No	-72.80277175	41.42674036
IC-23	CTDOT	5/17/2021	Unk.	Fair	Good	CB partially filled with sediment/leaf debris.	No	-72.80481023	41.44061565
IC-22	CTDOT	5/17/2021	Unk.	Fair	Fair	CB covered with leaf debris	No	-72.80537886	41.44828399
IC-19	CTDOT	6/7/2021	Unk.	Excellent	Good	Inspection completed at last in-line CB on Tammy Hill Rd. Good condition, no discharge. Homeowner had placed garbage cans directly on CB.	No	-72.75116873	41.47071684
IC-25	CTDOT	5/17/2021	Unk.	Good	Good	Good condition, no discharge.	No	-72.80930829	41.49615546
IC-26	CTDOT	5/17/2021	Unk.	Good	Good	Good condition, no discharge.	No	-72.80940485	41.49569741
IC-27	CTDOT	5/17/2021	Unk.	Fair	Fair	Trash/debris in area of CB.	No	-72.80920101	41.49086762
IC-12	CTDOT	5/17/2021	Unk.	Good	Good	Good condition, no discharge.	No	-72.81129313	41.48827176
IC-29	Meriden/CTDOT	6/7/2021	Concrete	Fair	Good	Good condition, no discharge.	No	-72.76441933	41.49692016

:Interconnection of concern

PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name: <i>Town of Wallingford</i>	Site Location: <i>Town of Wallingford</i> <i>Interconnection Screenings</i>	Date: <i>May 17 & June 7, 2021</i>
---	--	--

Interconnection ID	
IC-1	 A photograph showing a close-up view of a concrete structure, likely a wall or floor, with a grid of rebar visible. The rebar is made of metal and is embedded in the concrete. The concrete appears to be a light gray color. The background is dark and out of focus.

Interconnection ID	
IC-3	 A photograph showing a close-up view of a concrete structure, likely a wall or floor, with a grid of rebar visible. The rebar is made of metal and is embedded in the concrete. The concrete appears to be a light gray color. The background is dark and out of focus.

PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

**Interconnection
ID**

IC-4



**Interconnection
ID**

IC-6



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

**Interconnection
ID**

IC-7



**Interconnection
ID**

IC-8



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

Interconnection ID

IC-9



Interconnection ID

IC-10



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



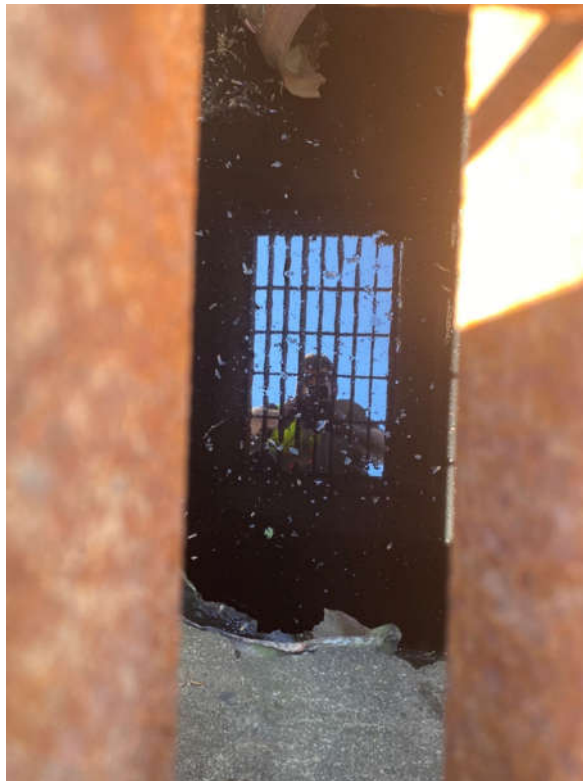
Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

**Interconnection
ID**

IC-12



**Interconnection
ID**

IC-13



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

Interconnection ID

IC-14



Interconnection ID

IC-15



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

**Interconnection
ID**

IC-16



**Interconnection
ID**

IC-17



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

**Interconnection
ID**

IC-18



**Interconnection
ID**

IC-19



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

Interconnection ID

IC-20



Interconnection ID

IC-21



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

Interconnection ID

IC-22



Interconnection ID

IC-23



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

Interconnection ID

IC-24



Interconnection ID

IC-25



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



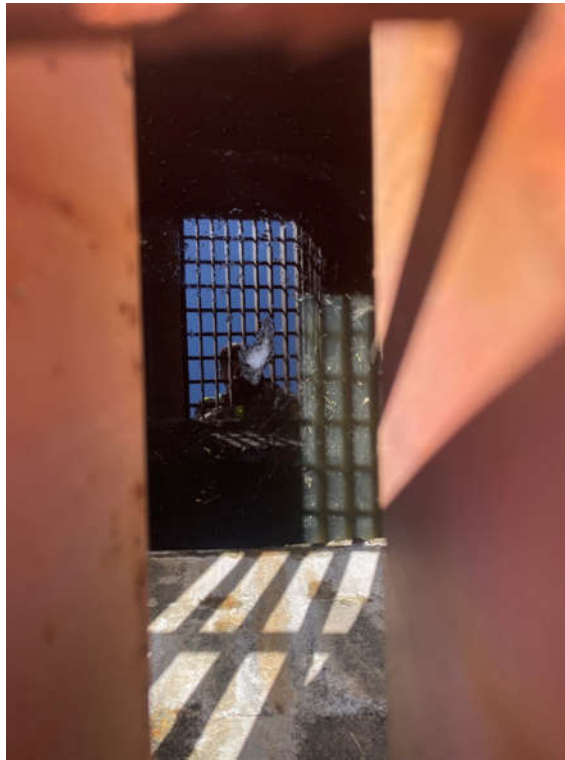
Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

Interconnection ID

IC-26



Interconnection ID

IC-27



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

**Interconnection
ID**

IC-29



**Interconnection
ID**

IC-31



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

Interconnection ID

IC-32



Interconnection ID

IC-33



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

**Interconnection
ID**

IC-34



**Interconnection
ID**

IC-35



PHOTOGRAPHIC LOG

ATC Group Services LLC
290 Roberts Street, Suite 301
East Hartford, CT 06108



Client Name:
Town of Wallingford

Site Location:
Town of Wallingford
Interconnection Screenings

Date:
May 17 & June 7, 2021

**Interconnection
ID**

IC-36



ATTACHMENT II –Wet Weather Inspections

Town of Wallingford
MS4 General Permit
Priority Outfall Sampling

Outfall ID	Inspection Date	Condition	Discharge Visual	Other Parameters	Bacterial	
				Phosphorus (mg/L)	Escheriachia Coli	Total Coliforms
					MPN/100mL	
QR-6	9/1/21	Excellent		0.171	>24,200	>24,200
QR-8	9/1/21	Good		0.236	>24,200	>24,200
QR-10	9/1/21	Good		0.182	2,910	>24,200
QR-11	9/1/21	Excellent		0.053	816	>24,200
QR-17	9/1/21	Good		0.458	>24,200	>24,200
AB-1	9/1/21	Good		--	670	>24,200
AB-2	9/1/21	Good		--	20	>24,200
AB-3	9/1/21	Good		--	3,130	>24,200
AB-4	9/1/21	Good		--	1,270	>24,200
MR-1	9/1/21	Good		--	11,200	>24,200
MR-2	9/1/21	Good		--	3,870	>24,200

Notes:

* All highlighted bacterial concentrations are required for follow-up investigations at

*Highlighting is based on the following criteria;

1. E. Coli >235/100mL for Swimming Areas, and >410 col/100mL for all others.
2. Total Coliform > 500 col/100mL
3. Fecal Coliform >31 col/100 mL for Class SA and >260 col/100mL for Class SB
4. Enterococci >104 col/100mL for Swimming Areas and >500 col/100mL for all others.

ATTACHMENT III- Catchment Assessment and Priority Ranking Matrix

Town of Wallingford MS4 General Permit
Catchment Assessment and Priority Ranking

Catchment ID	Outfalls Included	Receiving Water(s)	Previous Screening Results Indicate Likely Sewer Input? ¹	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	Sewer Repair Nearby?	Urbanized Area	DCIA >11%	Impaired Waterbody	Score	Priority Ranking 0-5: Low Priority 6-9: Problem ≥: 10 high Priority
Information Source			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 Storm System Maps	Other	Municipal Staff, GIS Maps	CLEAR	Nathan L Jacobson & Associates	CLEAR		
Scoring Criteria			Yes = 3 (Problem Catchment) No = 0	Yes = 3 No = 0	Frequent = 3 Occasional = 2 None = 0	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	Description	Yes=2 No=0	Yes =1 No = 0	Yes =1 No = 0	Yes =1 No = 0		
4606-00-1	0	None		0		0	1	1	0		0	Wooded		0	0	0	2	Low Priority
4606-01-1	0	None		0		0	1	1	0		0	Wooded		0	0	0	2	Low Priority
4606-02-1	0	Unnamed Stream		0		0	1	1	0		0	Wooded		0	0	0	2	Low Priority
4607-10-1-L1	0	None		0		0	1	1	0		0	Wooded		0	0	0	2	Low Priority
5112-00-2-L1	2	Unnamed Stream		0		0	1	2	0		3	Wooded, some residential housing, light agricultural land		1	0	0	7	Problem
5112-02-1	4	Unnamed Stream		0		0	1	2	0		3	Wooded, cleared land, light residential housing		0	0	0	6	Problem
5112-02-1-D1	0	None		0		0	1	2	0		0	Wooded, agricultural land		0	0	0	3	Low Priority
5112-02-1-L1	0	Unnamed Stream		0		0	1	1	0		0	Wooded and Pitsapaug Pond		0	0	0	2	Low Priority
5112-03-1	1	Unnamed Stream		0		0	1	2	0		3	Wooded, cleared land, some agricultural land and residential housing		0	0	0	6	Problem
5200-00-4-L3	49	Quinnipiac River, Community Lake		0		3	3	2	0		0	Wooded, some commercial and residential housing		1	1	1	11	High Priority
5200-00-4-R10	45	Quinnipiac River		0		2	3	2	0		3	Commercial development, some residential housing and wooded areas		1	1	1	13	High Priority
5200-00-4-R11	20	Quinnipiac River		0		2	2	2	0		0	Wooded and commercial, some residential housing		1	1	1	9	Problem
5200-00-4-R12	27	Quinnipiac River		0		2	2	1	0		3	Wooded, some agricultural land and commercial, light residential		1	1	1	11	High Priority

Town of Wallingford MS4 General Permit
Catchment Assessment and Priority Ranking

Catchment ID	Outfalls Included	Receiving Water(s)	Previous Screening Results Indicate Likely Sewer Input? ¹	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	Sewer Repair Nearby?	Urbanized Area	DCIA >11%	Impaired Waterbody	Score	Priority Ranking 0-5: Low Priority 6-9: Problem ≥: 10 high Priority
Information Source			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 Storm System Maps	Other	Municipal Staff, GIS Maps	CLEAR	Nathan L Jacobson & Associates	CLEAR		
Scoring Criteria			Yes = 3 (Problem Catchment) No = 0	Yes = 3 No = 0	Frequent = 3 Occasional = 2 None = 0	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	Description	Yes=2 No=0	Yes =1 No = 0	Yes =1 No = 0	Yes =1 No = 0		
5200-00-4-R7	84	Quinnipiac River		3		2	2	2	0		3	Commercial, some residential housing, light wooded areas		1	1	1	15	High Priority
5200-00-4-R8	81	Quinnipiac River		3		2	3	2	0		0	Commercial and residential housing, light wooded areas		1	1	1	13	High Priority
5200-10-1	14	Meetinghouse Brook		3		0	2	1	0		3	Residential housing, some commercial and wooded areas		1	1	0	11	High Priority
5200-10-2-R1	69	Meetinghouse Brook		3		0	3	2	0		3	Commercial, light residential housing and wooded, highway		1	1	0	13	High Priority
5200-11-1	15	Spruce Glen Brook		3		0	2	2	0		3	Residential housing, some wooded, light agricultural land, highway		1	0	0	11	High Priority
5200-12-1	2	Unnamed Stream		3		0	2	2	0		3	Commercial, some wooded		1	1	0	12	High Priority
5200-12-1-L1	49	Unnamed Stream		3		0	2	2	0		3	Wooded, some residential housing, light commercial and athletic fields		1	1	0	12	High Priority
5200-13-1	62	Padens Brook		3		2	3	2	0		3	Commercial, some residential housing, light wooded and agricultural land		1	1	1	16	High Priority
5200-14-1	38	Unnamed Pond		0		0	1	1	0		0	Pond, light wooded and residential		1	1	0	4	Low Priority
5200-14-1-L1	3	Unnamed Stream		0		0	2	2	0		3	Some wooded and residential housing		1	1	0	9	Problem
5200-15-1	34	Unnamed Streams, Peanuts Pond, Farms Pond, Fergusons Pond		0		0	3	2	0		3	Residential housing, some agricultural land, light wooded		1	0	0	9	Problem
5200-16-1	0	None		0		0	1	1	0		0	Wooded		0	0	0	2	Low Priority
5200-17-1	0	None		0		0	1	2	0		0	Light residential housing		1	0	0	4	Low Priority
5200-19-1-L1	0	None		0		0	1	2	0		0	Light residential housing		1	1	0	5	Low Priority
5204-00-2-L1	10	Broad Brook		0		0	2	2	0		0	Wooded, some residential housing		1	0	0	5	Low Priority
5204-01-1	0	Broad Brook		0		0	1	1	0		0	Wooded		1	0	0	3	Low Priority
5204-02-1	4	Broad Brook		0		0	2	2	0		0	Wooded, some residential housing		1	0	0	5	Low Priority

Town of Wallingford MS4 General Permit
Catchment Assessment and Priority Ranking

Catchment ID	Outfalls Included	Receiving Water(s)	Previous Screening Results Indicate Likely Sewer Input? ¹	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	Sewer Repair Nearby?	Urbanized Area	DCIA >11%	Impaired Waterbody	Score	Priority Ranking 0-5: Low Priority 6-9: Problem ≥: 10 high Priority
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Scoring Criteria			Yes = 3 (Problem Catchment) No = 0	Yes = 3 No = 0	Frequent = 3 Occasional = 2 None = 0	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	Description	Yes=2 No=0	Yes =1 No = 0	Yes =1 No = 0	Yes =1 No = 0		
5206-01-1-L1	0	High Hill Pond		0		0	1	2	0		0	Wooded area with a small cleared portion for overhead electrical lines.		1	0	0	4	Low Priority
5206-02-1-L1	6	North Farms Reservoir into Wharton Brook		0		2	3	2	0		0	Developed with commercial or industrial sites. High impermeable areas. Lightly wooded areas		1	1	1	10	High Priority
5207-00-1	44	Wharton Brook		0		2	3	2	0		3	Residential housng, some cleared land		1	1	1	13	High Priority
5207-00-1-L1	17	North Farms Reservoir		0		0	1	2	0		0	Some commercial, wooded, agricultural land, light residential		1	0	0	4	Low Priority
5207-00-1-L2	66	Wharton Brook, Catlin Brook		0		2	3	2	0		3	Residential housing, some wooded and agricultural land		1	0	1	12	High Priority
5207-00-2-R1	11	Wharton Brook		0		2	3	2	0		3	Residential housing, some commecial, light wooded		1	1	1	13	High Priority
5207-00-2-R2	9	Wharton Brook		0		2	2	2	0		3	Commercial, light wooded		1	1	1	12	High Priority
5207-01-1	46	Unnamed Stream		0		2	3	2	0		3	Residential housng, commercial, golf course		1	1	1	13	High Priority
5207-02-1	0	Unnamed Stream		0		2	1	1	0		0	Wooded		1	0	1	6	Problem
5207-02-1-L1	47	Allen Brook		0		2	3	2	0		3	Commercial and residential housing, highway, golf course		1	1	1	13	High Priority
5208-00-1	1	Unnamed Stream		0		0	1	2	0		3	Wooded, light residential housing		1	0	0	7	Problem
5208-00-1-L1	74	Muddy River		0		2	2	1	0		3	Wooded and commercial, light residential housing		1	0	1	10	Problem
5208-00-2-R1	5	Unnamed Stream		0		0	1	2	0		3	Wooded and residential housing		1	0	0	7	Problem

Town of Wallingford MS4 General Permit
Catchment Assessment and Priority Ranking

Catchment ID	Outfalls Included	Receiving Water(s)	Previous Screening Results Indicate Likely Sewer Input? ¹	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	Sewer Repair Nearby?	Urbanized Area	DCIA >11%	Impaired Waterbody	Score	Priority Ranking 0-5: Low Priority 6-9: Problem ≥: 10 high Priority
Information Source			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 Storm System Maps	Other	Municipal Staff, GIS Maps	CLEAR	Nathan L Jacobson & Associates	CLEAR		
Scoring Criteria			Yes = 3 (Problem Catchment) No = 0	Yes = 3 No = 0	Frequent = 3 Occasional = 2 None = 0	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	Description	Yes=2 No=0	Yes =1 No = 0	Yes =1 No = 0	Yes =1 No = 0		
5208-00-3-L2	11	Mackenzie Reservoir,Unnamed Stream		0		0	2	2	0		0	Agricultural land, some wooded and residential housng		1	0	0	5	Low Priority
5208-00-3-L3	11	Muddy River		0		2	1	2	0		3	Wooded, light residential housing and cleared land		1	0	1	10	High Priority
5208-00-3-R1	0	Muddy River		0		2	1	2	0		3	Wooded, light residential housing		0	0	1	9	Problem
5208-00-3-R2	3	Muddy River		0		2	2	2	0		3	Wooded and agricultural land, some residential housing		0	0	1	10	High Priority
5208-00-3-R3	3	Muddy River		0		2	1	2	0		3	Wooded and some residential housng		1	0	1	10	High Priority
5208-00-3-R4	0	Muddy River		0		2	1	1	0		0	Wooded		1	0	1	6	Problem
5208-00-3-R5	0	Muddy River		0		2	1	1	0		0	Wooded and cleared land		1	0	1	6	Problem
5208-01-1	8	Unnamed Stream		0		0	2	2	0		3	Commercial and wooded, some residential housing, highway		1	0	0	8	Problem
5208-02-1	4	Spring Brook		0		0	1	2	0		0	Wooded, some commercial, light residential housing and agricultural land		0	0	0	3	Low Priority
5208-02-1-L1	1	Ulbrich Reservoir, Spring Brook		0		0	1	2	0		3	Reservoir, some wooded and agricultural land, light residential housing		0	0	0	6	Problem
5208-02-2-R1	10	Spring Brook		0		0	2	2	0		3	Residential housing and wooded		1	0	0	8	Problem
5208-03-1	11	Unnamed Stream		0		0	1	2	0		3	Wooded and residential housing, light commercial		1	0	0	7	Problem
5208-04-1	9	Unnamed Stream		0		0	1	1	0		3	Pond		0	0	0	5	Low Priority
5208-04-1-L1	0	Scards Pond		0		0	1	2	0		0	Wooded, agricultural land, light residential housing		0	0	0	3	Low Priority
5208-05-1	0	Mackenzie Reservoir		0		0	1	1	0		0	Wooded, reservoir		0	1	0	3	Low Priority
5208-05-1-L1	25	Unnamed Streams		0		0	1	2	0		0	Wooded, some residential housing and agricultural land, highway		1	0	0	4	Low Priority

Town of Wallingford MS4 General Permit

Catchment Assessment and Priority Ranking

Catchment ID	Outfalls Included	Receiving Water(s)	Previous Screening Results Indicate Likely Sewer Input? ¹	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	Sewer Repair Nearby?	Urbanized Area	DCIA >11%	Impaired Waterbody	Score	Priority Ranking 0-5: Low Priority 6-9: Problem ≥: 10 high Priority
Information Source			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 Storm System Maps	Other	Municipal Staff, GIS Maps	CLEAR	Nathan L Jacobson & Associates	CLEAR		
Scoring Criteria			Yes = 3 (Problem Catchment) No = 0	Yes = 3 No = 0	Frequent = 3 Occasional = 2 None = 0	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	Description	Yes=2 No=0	Yes =1 No = 0	Yes =1 No = 0	Yes =1 No = 0		
5208-06-1	25	Unnamed Stream		0		0	2	2	0		3	Agricultural land, some residential, highway		1	0	0	8	Problem
5208-07-1	0	Unnamed Stream		0		0	1	1	0		3	Wooded		0	0	0	5	Low Priority
5208-08-1	23	Pine River, Unnamed Streams		0		0	2	2	0		3	Wooded with residential housing, light cleared land		1	0	0	8	Problem
5208-09-1	0	None		0		0	1	1	0		0	Wooded		1	0	0	3	Low Priority
5302-02-1	0	Unnamed Stream		0		0	2	2	0		3	Residential housing, some wooded areas and marsh, golf course		1	0	0	8	Problem
5302-04-1-L1	16	Butterwoth Brook		3		0	2	2	0		3	Wooded with residential housing		1	0	0	11	High Priority

Scoring Criteria:

- ¹ Previous screening results indicate likely sewer input if any of the following are true:
 - Olfactory 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 beds
- ³ 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.
- ⁹ Based off of CT NEMO DCIA Calculations

Pending investigation

ATTACHMENT IV- Stormwater Retrofit Program



STORMWATER RETROFIT PROGRAM

TOWN OF WALLINGFORD

PREPARED FOR:

Town of Wallingford

PREPARED BY:

Atlas
290 Roberts Street-Suite 301
East Hartford, Connecticut 06108

February 2, 2022



6280 Riverdale Street
San Diego, CA 92120
(877) 215-4321 | oneatlas.com

December 2021

Project No. 2419022001

MR. ROBERT BALTRAMAITIS
TOWN OF WALLINGFORD
CONNECTICUT 06492

**Subject: Stormwater Retrofit Program
Town of Wallingford**

Dear Mr. Baltramaitis,

Atlas is pleased to present this Stormwater Retrofit Program
If you have any questions, please call us at (860) 608-8576.

Respectfully submitted,
Atlas

A handwritten signature in blue ink, appearing to read "Luke Whitehouse".

Name: Luke Whitehouse
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Title: Environmental Scientist
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EXECUTIVE SUMMARY

The goal of this Stormwater Retrofit Program is to comply with *Section (6) (B) (ii)* of the Connecticut Department of Energy and Environmental Protection (CTDEEP) 2017-2022 General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4 Permit). Specifically, the Town of Wallingford (Town) will work towards disconnecting existing Directly Connected Impervious Areas (DCIA). According to the MS4 Permit, “an area of DCIA is considered disconnected when the appropriate portion of the Water Quality Volume has been retained in accordance with the requirements of Section 6(a)(5)(B)(i) or (ii) of this general permit” (CTDEEP, 2017). For clarification, the MS4 Permit defines the following:

A Retrofit Project is “One that modifies an existing developed site for the primary purpose of disconnecting DCIA. The DCIA calculation performed pursuant to Section 6(a)(5)(C) shall serve as the baseline for the retrofit Program required in this section” (NEMO, 2021).

A Low Impact Development (LID) is defined as a means “to maintain, mimic, or replicates pre-development hydrology through the use of numerous site design principles and small-scale treatment practices distributed throughout a site to manage runoff volume and water quality at the source” (NEMO, 2021).

To accomplish the disconnecting of DCIA, LID, runoff reduction measures, or any other means by which stormwater is infiltrated into the ground or reused for other purposes without a surface or storm sewer discharge may be implemented (CTDEEP, 2017).

The following document provides guidance on implementing LID, runoff reduction measures, or other means to disconnect or improve stormwater quality. It should be noted that the following programs or practices in this document are considered a Retrofit Project *only* if it disconnects an area, whether it be commercial, residential, or industrial, that was *directly connected to the MS4*. Areas that implement the following programs or practices, as provided for guidance in this document or otherwise, that are not directly connected to the Town’s MS4 system (while still beneficial in other ways) *cannot be counted towards the Town’s disconnect percentage*.

Retrofit Projects will be clearly defined throughout this document, easily accessible, and clearly defined henceforth with **bolded and underlined text**. Important factors pertaining to LID, runoff reduction measures, or other means by which stormwater is infiltrated have been italicized throughout this document, with the exception of quoted, referenced material.

1. OBJECTIVES AND BENEFITS OF STORMWATER RETROFITS

The objective of a stormwater retrofit program, according to the CTDEEP, is

“...To remedy problems associated with, and improve water quality-mitigation functions of, older, poorly designed or poorly maintained stormwater management. The incorporation of stormwater retrofits into existing developed sites or redevelopment projects can reduce adverse impacts of uncontrolled stormwater runoff systems.

Stormwater retrofits can also remedy local nuisance conditions and maintenance problems in older areas, as well as improve the appearance of existing facilities” (CTDEEP, 2004).

2. WHEN IS RETROFITTING APPROPRIATE?

Site constraints may exist, and are common in developed areas. Site constraints can often limit the type of stormwater Retrofit Projects that are possible, as well as their overall effectiveness. Specific factors, such as location of existing utilities, buildings, wetlands, maintenance access, and adjacent land uses may affect the retrofitting of an existing stormwater management facility. Stormwater should not be infiltrated in Aquifer Protection Areas where there is a high pollutant load, sites with existing subsurface contamination, or a drinking water wellhead area (UCONN, 2020). *Consider the following site-specific factors to determine the appropriateness of stormwater Retrofit Project implementation:*

Table 1 – Site Considerations for Determining the Appropriateness of Stormwater Retrofits

Factor	Consideration
Retrofit Purpose	What are the primary and secondary (if any) purposes of the retrofit project? Are the retrofits designed primarily for stormwater quantity control, quality control, or a combination of both?
Construction/Maintenance Access	Does the site have adequate construction and maintenance access and sufficient construction staging area? Are maintenance responsibilities for the retrofits clearly defined?
Subsurface Conditions	Are the subsurface conditions at the site (soil permeability and depth to groundwater/bedrock) consistent with the proposed retrofit regarding subsurface infiltration capacity and constructability?
Utilities	Do the locations of existing utilities present conflicts with the proposed retrofits, require relocation, or design modifications?
Conflicting Land Uses	Are the retrofits compatible with adjacent land uses of nearby properties?
Wetlands, Sensitive Water Bodies, and Vegetation	How do the retrofits affect adjacent or downgradient wetlands, sensitive receiving waters, and vegetation? Do the retrofits minimize or mitigate impacts where possible?
Complementary Restoration Projects	Are there opportunities to combine stormwater retrofits with complementary projects such as stream stabilization, habitat restoration, or wetland restoration/mitigation?
Permits and Approvals	Which local, state, and federal regulatory agencies have jurisdiction over the proposed retrofit project, and can regulatory approvals be obtained for the retrofits?
Public Safety	Does the retrofit increase the risk to public health and safety?
Cost	What are the capital and long-term maintenance costs associated with the stormwater retrofits? Are the retrofits cost-effective in terms of anticipated benefits?

Source: NEMO (N.D)

3. STORMWATER RETROFIT OPTIONS

3.1 Low Impact Development (LID) Management Practices

LID practices include natural or fabricated swales, depressions, and/or vegetated areas that are designed to capture, filter, and infiltrate stormwater runoff utilizing soils and vegetation (USEPA, 2014). The implementation of LID Practices lower long-term life cycles costs, perform better, and provide additional benefits such as improved aesthetics and enhanced property values. *While LID practices generally require a lower initial investment, they may require continuous maintenance of established vegetation.* However, established LID practices may be maintained in the same manner as landscaping. LID Practices should follow the following rules:

1. *Is it safe, both environmentally and for human health?*
2. *Aesthetically pleasing*
3. *Compliant with the Connecticut Department of Energy and Environmental Protection applicable and local regulations (UCONN, 2021).*

3.1.1 Bioretention and Infiltration Basins

Many towns, communities, and commercial or industrial facilities utilize bioretention or infiltration basins as a means to infiltrate pollutants of concerns (POC), reduce peak flow or total water volume, as well as adding an aesthetically pleasing area to the location.

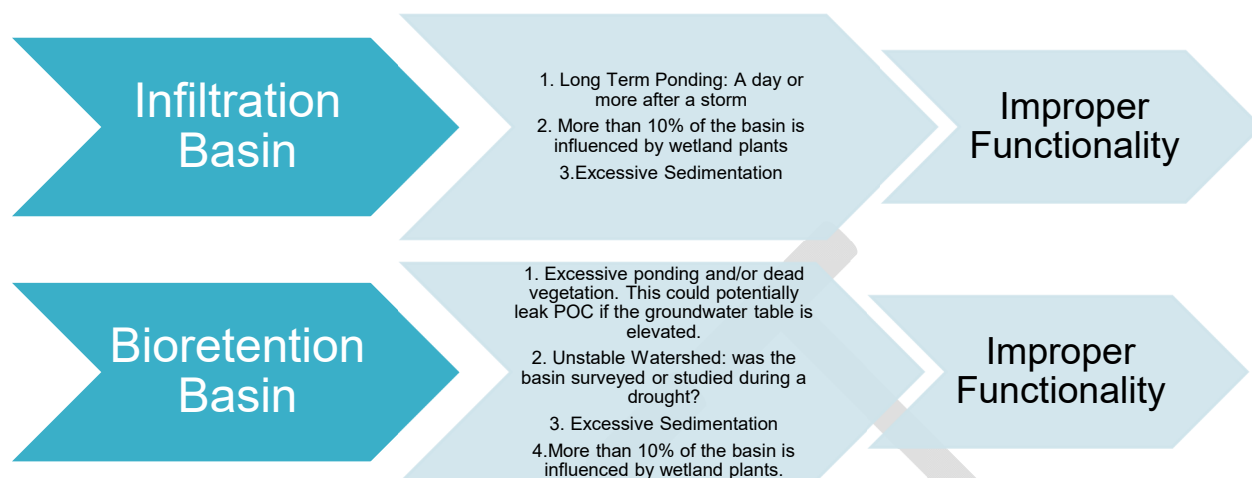
Typically, an infiltration basin has more potential in reducing peak flow or total water volume, as well as removing POC. Infiltration basins often have an increased advantage of phosphorus and nitrogen uptake, as well as some anaerobic conditions for bacterial removal (UCONN, 2021). *Infiltration basins can be utilized for the less frequent large-storm events that may exceed the capacity of upgradient practices.*

Bioretention basins create habitat, nutrient cycling, and aesthetics, and are often preferred for the reduced installation and maintenance costs. *Bioretention basins are generally utilized on a smaller scale, and are designed for typical storm events.* Bioretention basins are more likely to be maintained if aesthetically pleasing, therefore; considerations should be made to provide suitable plant species of which will create environmentally friendly habitats while maintaining public support or interest (PCA, 2020).

Properly Functioning Bioretention or Infiltration Basins

Bioretention or infiltration basins (while an excellent addition to stormwater infrastructure) must function properly in order to meet regulation criteria, reduce POC, and provide a safe and healthy environment for the surrounding area. **Graphic 1** provides examples of bioretention or infiltration basins that are considered poorly functioning.

Graphic 1: Improper Functionality of Bioretention or Infiltration Basins



Source: Created by Atlas Technical Consultants (2021).

Considerations on the Rehabilitation of Bioretention or Infiltration Basins

When working towards disconnection goals, several factors should be considered when identifying if a basin should be rehabbed or retrofitted, and are as follows:

Table 2 –Considerations on the Rehabilitation of a Bioretention or Infiltration Basins

Factor	Consideration
Regulatory Standards	Does it still meet the applicable regulatory criteria?
Financial Incentives	What will it cost to rehabilitate (removal of sedimentation, etc.) or retrofit?
Human Health	Is this in an area where it can affect human health? For example, will it create a mosquito breeding ground near schools or public areas?
Water Table	Is the water table greatly influencing the filtration of this Bioretention Pond?
Outlet Structure	What type of outlet structure is being utilized, and again, what are the costs for rehab or retrofit?

Source: Created by Atlas Technical Consultants (2021)

3.1.2 Bioretention and Infiltration Basins Variations

CONVENTIONAL BIORETENTION BASIN

A conventional bioretention basin, often referred to as a *detention basin*, typically consists of stormwater discharge into the basin, the temporary storage of unfiltered stormwater, and the eventual discharge to a designed outfall location. An underdrain typically lines the basin, allowing for stormwater, which has infiltrated the surficial material, to discharge to a designed outfall. An overflow is generally added in the event of a large storm. Some woody materials (trees, small bushes) may be present, which allows for the uptake of infiltrated stormwater in the evapotranspiration zone, decreasing the amount of discharged stormwater (UCONN, 2021).

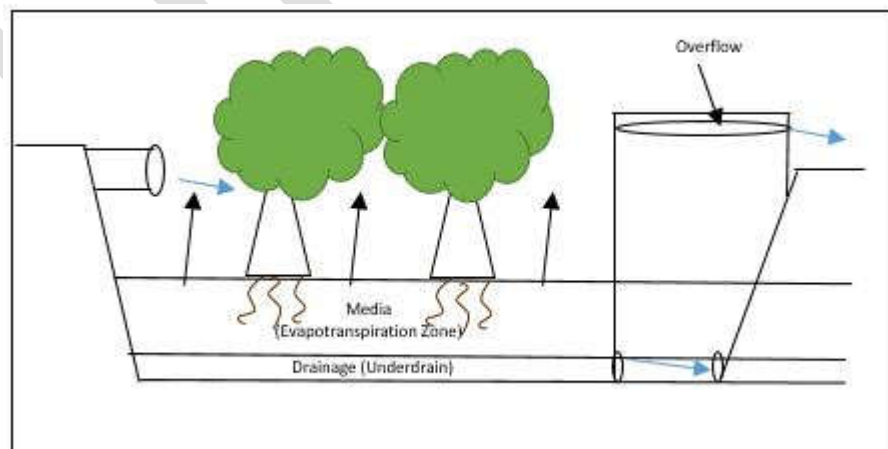
Graphic 2 summarizes modifications to existing Bioretention basins for improved water quality mitigation. **If the following modifications are made to a basin that is directly connected to the MS4 System, then it can be considered a Retrofit Project.**

Graphic 2: Bioretention Basin Retrofit Projects for Improved Water Quality Mitigation



Source: Adapted from Claytor, Center for Watershed Protection, 2000; Pennsylvania Association of Conservation Districts et al., 1998; and NJDEP, 2000.

Graphic 3: Conventional Bioretention Basin



Source: Created by Atlas Technical Consultants (2021),

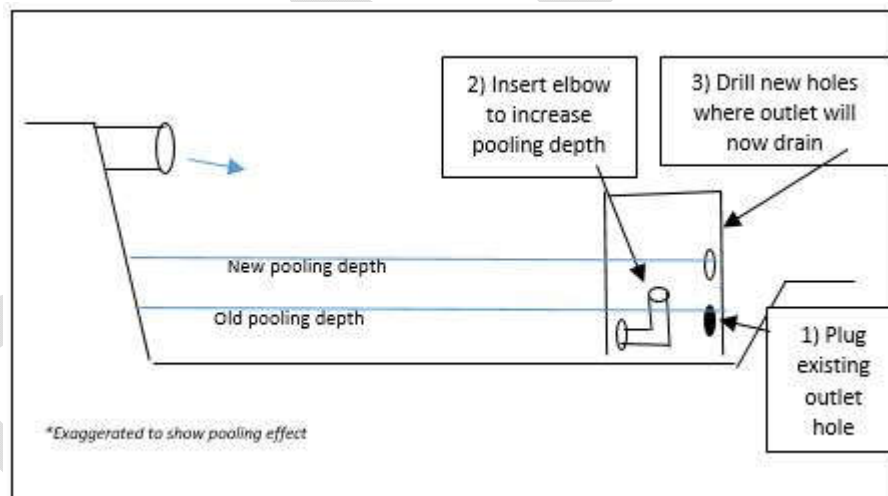
SOGGY BIORETENTION BASINS

If a bioretention basin is continuously found soggy, then retrofitting the basin into a wetland or detention basin may be the best option. Converting a bioretention basin into a wetlands area or detention basin will provide higher peak flow rate and water volume reduction than other Retrofit Projects, however, *it will not increase the amount of POC removed.*

For a converted bioretention basin or detention basin to be considered a Retrofit Project, first, determine if this basin is directly connected to the MS4 System. Then, install an elbow into the basin to increase pooling, which in turn will increase the peak flow and total water volume that is contained within the basin. A “T” can be installed rather than an elbow, if it is decided that the original outlet should remain in the event of a large storm and/or heavy soil saturation.

An attempt can be made to introduce wetland plants; however, based on soil type (for example, heavy infiltrative), they may not survive. As pooling depths increase, so too does the chance of potential safety concerns for the public (i.e. drowning). A fence should always be installed to surround the basin.

Graphic 4: From Bioretention to Wetlands or Detention Basins



Source: Created by Atlas Technical Consultants (2021),

NATURALIZED BASIN

A familiar sight in bioretention or infiltration basins is an abundance of woody material in the form of trees or small bushes. While some basins may have poor functionality with woody material growth, there are potential benefits of maintaining woody systems in a bioretention or infiltration basin. **Prior to shifting maintenance techniques or implementing other modifications to encourage woody growth, determine if this basin directly discharges to the Town’s MS4 System. If directly connected, it can be considered a Retrofit Project.**

Woody systems (naturalized basin) allow for a higher rate of water volume to be infiltrated. Based on this higher rate of infiltrated stormwater, the POC load removed is greater than bioretention or

infiltration basins functioning normally. Trees will occupy approximately 1% of water uptake in bioretention or infiltration basins, as opposed to no woody vegetation (UCONN, 2021). Other benefits include less maintenance and lower costs. There is a high potential of attracting mosquito populations for naturalized basins. *It is recommended that naturalized basins not be constructed within 500 feet (ft.) of a public area.*

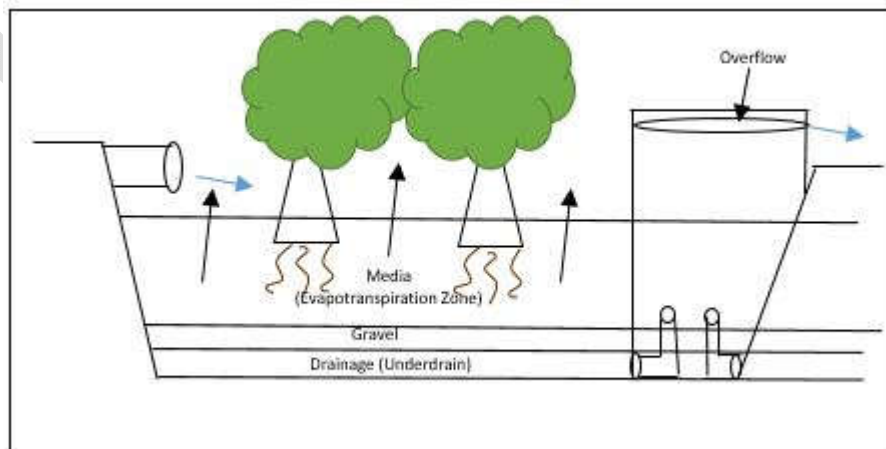
Studies have not been conducted on whether old woody growth or new woody growth is more beneficial in the uptake of POC or water. In theory, newer growth would promote soil movement due to root growth, and would increase the surface area for higher rates of infiltration (UCONN, 2021).

INTERNAL WATER STORAGE (IWS)

A conventional bioretention or infiltration basin may not always meet the needs of a site or community, particularly in areas of high stormwater volume. An internal water storage (IWS), if created properly, will reduce volume output by approximately 35%, as well as increasing the evapotranspiration rate. This system can also remove approximately 58% of nitrogen input (UCONN, 2021). **To be considered a Retrofit Project; first determine if this basin directly discharges to the Town's MS4 system.**

As with a conventional bioretention or infiltration basins, an underdrain will line the bottom of the basin. The underdrain will be followed by gravel. *It should be noted that processed gravel should NOT be utilized.* The sedimentation caused by processed/fine gravel does not allow for ponding or storage area of infiltrated water, and will reduce the peak flow intercepted. An elbow is then installed into the underdrain, forcing the water to pond internally. A total of 18-inches only should be the increase in internal ponding. This internal ponding will preserve the filtration system, and improve peak flow and total water volume, with the exception of soil group 'D' (UCONN, 2021)..

Graphic 5: Internal Water Storage



Source: Created by Atlas Technical Consultants (2021),

FOREBAYS

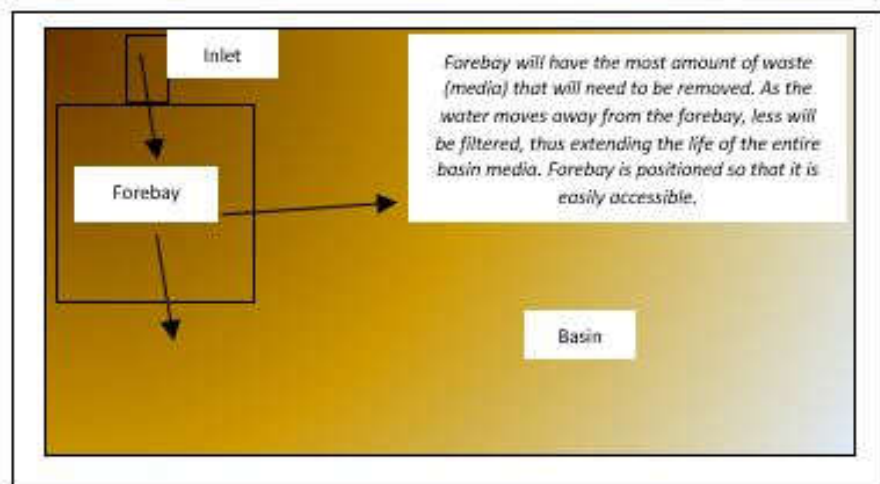
Forebays are designed and utilized to slow stormwater runoff, as well as provide pretreatment of runoff and facilitate the separation of suspended solids (MADEP, N.D). Advantages include the following:

“Provides pretreatment of runoff before delivery to other best management practices (BMPs), slows velocities of incoming stormwater, easily accessed for sediment removal, longevity is high with proper maintenance, relatively inexpensive compared to other BMPs, and a greater detention time than proprietary separators” (MADEP, N.D.).

With the implementation of a forebay, media life expectancy can be extended up to approximately 500-years. The implementation of a forebay allows for the removal of phosphorus, nitrogen, metals, and sediment. **The implementation of a forebay can only be considered a Retrofit Project if the basin, pond, etc., directly discharges to the MS4 system.**

Disadvantages of a forebay include the removal of only coarse sediment fractions; therefore, soluble pollutants will remain and potentially discharge to the entirety of the basin. There is also no recharge to groundwater in a forebay, as well as no control of the volume of runoff. *Frequent maintenance is essential* (MADEP. N.D.).

Graphic 6: Forebays



Source: Created by Atlas Technical Consultants (2021).

Graphic 7: Forebay Implementation



Source: MADEP. No Date. Sediment Forebays.

MEDIA AMENDMENTS FOR AGEING SYSTEMS

Soils are part of fundamental design characteristics of most construction practices, including those of stormwater practices. Properly functioning media provide rapid infiltration rates, attenuate POC, and generally allow for plant growth (PCA, 2021). *Thus, as basins age, so too does the media.* Several amendments, including compost, woodchips, or the by-products of water treatment (water treatment residuals) for drinking water can be applied to increase infiltration, attenuate POC, and promote healthy plant growth. Water treatment residuals, as defined by the Minnesota Pollution Control Agency, are primarily sediment, metals (aluminum, iron, or calcium), oxide/hydroxides, activated carbon, and lime removed during purification processes of raw water (PCA, 2021). **In order to be considered a Retrofit Project, media amendments should be made to basins, forebays, IWS, etc. that are directly connected to the MS4 system.**

Table 3– Media Amendments

Media	Benefits	POC Potentially Attenuated	Considerations
Compost	❖ Increases soil infiltration rate ❖ Reduces runoff ❖ Improves soil porosity ❖ Increases soil moisture holding capacity ❖ Reduces maintenance needs ❖ Alleviates compaction from construction activities	❖ Hydrocarbons ❖ Solvents ❖ Heavy metals	❖ Unstable composts may utilize available nitrogen and stunt plant growth ❖ Compost from bio solids and/or animal manure may contain unwanted nutrients. ❖ Ages relatively rapidly
Woodchips	❖ Slowly release nutrients if maintained properly ❖ Effectively retain and slowly release moisture ❖ Provide weed control ❖ Relatively cheap ❖ Resists compaction	❖ Nitrogen ❖ Oil & Grease ❖ Carbon source in the degradation of nitrate, sulphate, ammonia, and ammonium ❖ Some heavy metals	❖ Leachate from fresh woodchips is acidic, which may produce chemical oxygen demand (COD) and release unwanted nutrients. ❖ Negative aquatic response to leachate has been observed near wood chipping facilities

			❖ Woodchips from recycled wood may contain creosote, dyes, or other toxic materials.
Spent Lime	❖ Reduces the impact of phosphorus to receiving waters.	❖ Dissolved Phosphorus	❖ Due to spent lime's absorptive properties, there is a potential to contain chemicals that may be of an environmental concern.
Aluminum and Iron Water Treatment Residuals (WTR)	❖ Improves plant growth	❖ Phosphorus retention, particularly dissolved ❖ Several studies show AL- and Fe-WTR are effective at retaining nitrogen when nitrogen is found in high amounts.	❖ Potential of leaching, thus damaging aquatic environments ❖ Leaching potential is dependent on soil pH.
Alum	❖ Reduces soil pH ❖ Reduces Turbidity/ Total Suspended Solids ❖ No restrictions for use as fill material or cover	❖ Nitrogen ❖ Phosphorus ❖ Metals ❖ Bacteria	❖ Studies have not been conducted on PCBs or PFAS additives of Alum-treated soils ❖ Extensive study is necessary of the discharge watershed area. (Harper. N.D)

Source: Created by Atlas Technical Consultants (2021), Adapted from PCA, 2021, and Harper, N.D.

3.1.3 Bioretention or Infiltration Basin Inspections

Maintenance of bioretention or infiltration basins is essential in preserving the functionality of basins and promoting high quality stormwater discharge. The following checklist can be utilized in performing bioretention or infiltration basin inspections:

Table 4– Bioretention or Infiltration Basin Checklist

Factor	Consideration	Observations	Maintenance Performed
Bed Surface	Is there excessive sediment, caking, trash, or moldy mulch?		
Evidence of Underdrainage or Observation Wells	Is this system functioning properly? Is there excessive sediment or clogging?		
Mulch/Media	Does the media need replaced? Is there standing water that is not infiltrating?		
Bed Drainage	Time your bed drainage: Is water ponding for longer than a day?		
Outlet Structure	Is there evidence of clogging or outflow release velocities that are great than the designed flow?		

Source: Created by Atlas Technical Consultants (2021), adapted from MADEP and UCONN NEMO.

3.1.4 Rain Gardens

Rain gardens are a relatively easy and aesthetic Retrofit Project option for small communities or homes. According to NEMO, a rain garden is “a depression (about 6 inches deep), that collects stormwater runoff from a roof, driveway, or yard, and allows it to infiltrate into the ground” (CLEAR, 2021.). Typically, a residential rain garden is 50 to 100 square feet, and includes a variety of native shrubs and plants. *A rain garden should never be installed in a low area or an area that is wet; it is not a water garden or wetland.*

Graphic 8: Rain Garden Retrofit Benefits



Source: Created by Atlas Technical Consultants (2021)

Promoting the installation of rain gardens is easy; encourage the utilization of the [Rain Garden Application](#), created by the CT NEMO Program. Once a community or home has installed a rain garden, encourage citizen reporting to track disconnects and retrofits. **To track these Retrofit Projects, communities considering the implementation of a rain garden should be defined internally as to whether it is directly connected to the MS4 system.**

3.2 Rainwater Harvesting/Stormwater Reuse & Rain Barrel Programs

Managing stormwater in areas of tight spaces, highly commercialized or industrial areas, as well as intensely residential communities can pose issues with volume control, increased flooding and erosion, and an increase in non-point source pollution. The implementation of a rainwater harvesting/ stormwater reuse and rain barrel program can greatly reduce the aforementioned issues related to stormwater in these area types, as well as reducing the cost of potable water, promote potable water resource conservation, remove 100% of solids, nutrients, metals, pathogens, and toxins, and increase soil moisture for urban greenery (PCA. 2021). **Areas that implement a Rainwater Harvesting/Stormwater Reuse & Rain Barrel Programs of which are directly connected to the Town’s MS4 system can be considered a Retrofit Project.**

Data compiled from the Neighborhood Rain Barrel Partnership Project indicated, “...the average 50-gallon rain barrel could capture a 0.26-inch precipitation event, or 64 percent of the 28 precipitation events monitored” (EPA, 2008). The implementation of such a program could greatly increase the quality of stormwater, as well as involve the community in protecting the Town’s navigable waterways.

Potentially, with the utilization of ordinances or other legal means, the Town could require rain harvesting of an agreed upon percentage for commercial developments. Other considerations include historical land uses, facilities, or industrial uses may contaminate rainwater harvesting (PCA, 2021). **Table 5** describes the implementation, applications, and considerations of executing such a program.

Table 5– Rainwater Harvesting/Stormwater Reuse & Rain Barrel Programs

Program	Implementation	Application	Considerations
Rain Barrels	❖ Rain Barrels are typically small scale (25-100-gallons). ❖ Install at the downspout of a gutter system. ❖ Gravity is the simplest method of delivery; complex systems can be designed to deliver water from several barrels. ❖ Town may want to offer an agreed upon rebate residents or businesses that purchase specified rain barrels.	❖ Collects and store rainwater for watering landscapes and gardens ❖ Cumulative effect includes volume reduction over entire watershed area ❖ Removes 100% of 100% of solids, nutrients, metals, pathogens, & toxins that would have potentially reached MS4 system.	❖ Typical costs range from \$50 to \$230 for a 55-gallon drum. ❖ Plastic, food-grade 55-gallon drums range from \$15 to \$20. ❖ Barrel should include overflow deflection ❖ Routing features should be installed to keep water away from structure foundations ❖ Not to be utilized for tar & gravel, asbestos shingle, or treated cedar shake roof types. ❖ A fine screen over all openings or emptying of barrels should be conducted to prevent mosquito breeding. ❖ Disconnected in the winter to prevent deformation of the system
Cisterns	❖ Greater storage capacity ❖ Stored above or below ground ❖ Delivered utilized a pump system ❖ A surface stormwater pond (Bioretention or infiltration basin) could be designed to overflow into the cistern as well.	❖ Typically utilized to irrigate landscapes, gardens, and ballparks on a regular basis ❖ Reduces strain on municipal water supplies during peak summer months. ❖ Potential for use in non-potable services (toilets, urinal flushing)	❖ Typical costs range from \$200 to \$10,000 based on size, materials, and structural requirements ❖ Often complex system that requires continuous maintenance ❖ Designed overflow from a basin may need treatment prior to use for irrigation purposes.

Source: Created by Atlas Technical Consultants (2021), resourced from the Minnesota Pollution Control Agency (PCA) Pollution Prevention & the MS4 Program.

3.3 Credit Trading Program

Stormwater POC have long afflicted navigable waterways, with negative effects including algae blooms, resource degradation, toxicity, and even an increase in drinking water treatment costs. Options in reducing stormwater POC often include LID-implementation, community participation, ordinances, and legal action. However, these practices may not always have the desired effect, particularly in areas of high industrial or commercialized infrastructure (point sources). A Credit

Trading Program may be the solution, as it holds businesses accountable for stormwater pollution and promotes the increased quality of stormwater discharge.

To find a successful Trading Credit Program, one need not look far. The Connecticut and New York Credit Trading Program (known as the Nitrogen Control Program for Long Island Sound) has been found to be incredibly effective in the reduction of nitrogen discharged to the Sound. The reduction of nitrogen input into the Sound was achieved by first achieving the total maximum daily load (TMDL) of nitrogen that could be discharged, and the implementation of an initiative nitrogen-trading program among sewage treatment plants located throughout the state. Established in 2002, by 2014 65 percent of nitrogen loading from sewage treatment plants had been reduced (CTDEEP, 2020).

To reduce the amount of the POC discharged, participating developers purchase credits from the Town. **Developers directly connected to the MS4 system that participate in this program can be considered a Retrofit Project, as it pertains specifically to the area of previously connected surface that was disconnected.** The amount of credits purchased is the equivalent of the POC in mass. Developers would then pay a fee on a per/lb. basis over a 30-year reduction period, for example. Developers then create and/or monitor POC removal from the stormwater infrastructure. The removal of the POC would be reported in mass. *Developers that remove over the standards for their specific POC removal goal can sell credits to other developers who cannot meet their POC removal goal.* **Table 6** demonstrates the annual re-evaluation of developers of trading versus treating.

Table 6 – Performance of the NCE, 2002-2009

Trading Year	Credit Prices (Dollars)	Purchased (Dollars)	Sold (Dollars)	Purchased (1,000 Credits)	Sold (1,000 Credits)
2002	\$1.65	\$1,317,223	\$2,357,323	798	1,429
2003	\$2.14	\$2,116,875	\$2,428,636	989	1,135
2004	\$1.90	\$1,786,736	\$2,659,804	940	1,400
2005	\$2.11	\$2,467,757	\$1,315,392	1,170	623
2006	\$3.40	\$3,828,114	\$2,394,956	1,126	704
2007	\$4.36	\$5,159,019	\$2,072,001	1,183	475
2008	\$4.50	\$6,148,327	\$2,660,688	1,366	591
2009	\$4.54	\$4,390,023	\$2,835,447	967	625
Total		\$27,214,074	\$18,724,247	8,539	6,982

Source: CTDEEP, 2020.

The implementation of a Credit Trading Program may create economic activity within the Town, motivate developers through monetary incentive, and create an annual re-evaluation on treating versus trading based on annual increases or decreases in credit costs. Considerations should be made in the potential buy back of credits - *if all developers meet the POC removal goal within the threshold (ex. 30-years), the Town will be liable for buying back all credits.* Funding may be available through the Clean Water State Revolving Fund (CWSRF) (EPA, 2021).

3.4 Buffer Ordinance

A buffer can be defined as “small areas or strips of land in permanent vegetation, designed to intercept pollutants and manage other environmental concerns” (PCA, N.D.). *Buffers present numerous advantages, including POC removal, erosion reduction, restore the integrity of water resources, contribute organic matter to aquatic ecosystems, provide riparian wildlife habitat, and bring scenic or recreational opportunity to the area* (EPA, 2002). **Buffers implemented in areas directly connected to the Town’s MS4 system can be considered a Retrofit Project, as it pertains specifically to the area of previously connected surface that was disconnected.**

The United States Environmental Protection Agency (EPA) has created a model buffer ordinance, with suggested language or guidance in creating buffer ordinances, and is included in **Appendix III**. Design standards of a buffer ordinance, at a minimum, should include the following:

Table 7 – Buffer Ordinance Design Standards

Standard	Considerations
Establish minimum width to apply to all buffers.	Customize requirements according to functions, values, and water body size.
Determine how areas are to be calculated.	Identify flexibility in standard (using an average buffer width, etc.) Should allow changes to be made to adjust for slope, soils, encroaching land uses, or water utilization.
Vegetative Specifications	Vegetative mixes based on soils, slope, region.
Signage	Specify minimum spacing of signage to identify buffer and prevent encroachment

Source: Created by Atlas Technical Consultants (2021). Adapted from PCA Pollution Prevention and the MS4 Program.

Following the implementation of a buffer ordinance, a Town-wide campaign can be utilized to inform developers and property owners of the benefits of a vegetated buffer. To reach the desired audience, brochures, signage at municipal locations, workshops, or seminars can be provided by the Town (PCA, N.D.).

Maintenance of buffers will generally consist of mowing, removal of refuse or debris, inspections for erosion and infiltration, and the replacement of damaged or dead plants. The installation of a vegetated buffer is estimated at \$0.50 per square foot, as well as costs relating to labor or maintenance supplies (PCA, N.D.). Applications of a vegetated buffer can include natural drainage in residential areas, along roads in place of curbing, parking lot islands, low-flow conveyance in place of structural conveyance, pretreatment prior to discharge to open water, provide aesthetic appeal, and provide a natural habitat within urbanized areas (PCA, N.D.).

3.5 Additional Disconnect Strategies

3.5.1 Curbless Streets

Curbless streets, or streets that are sloped to vegetative areas, allow stormwater to drain into permeable areas adjacent to the property. By eliminating curbs or gutters, there are fewer infrastructure costs and higher infiltration rates (PCA, 2021). *If curbs cannot be eliminated, then they can sometimes be slotted to re-route runoff to vegetated areas.* Existing stormwater infrastructure should be evaluated and expanded if needed (NEMO, 2004). **Curbs or gutters that are eliminated in areas that discharge directly to the MS4 system can be considered a Retrofit Project.**

3.5.2 Permeable Pavement

As the Town continues to maintain its properties, permeable paving materials can be utilized during upgrades. *Examples of permeable materials include modular concrete paving blocks, modular concrete, plastic lattice, cast-in-place concrete grids, and/or designed permeable pavement.* Considerations pertaining to site-specific factors should include “traffic volumes, soil permeability, maintenance, sediment loads, and land use...” (NEMO, 2004). **Sites that implement permeable pavements of which were previously directly connected to the Town’s MS4 system can be considered a Retrofit Project.**

4. STORMWATER DISCONNECT TRACKING

4.1 Directly Connected Impervious Areas (DCIA)

Under the Pollution Prevention/Good Housekeeping portion of the general permit, the Town must develop a retrofit program to disconnect existing DCIA by 1% per year, or a total of 2% to the maximum extent practicable (MEP). *Previous disconnections going back to 2012 can be counted toward this disconnection requirement.*

According to the MS4 General Permit, the Town must make a serious attempt to comply with DCIA disconnects. However, based on attenuating factors, including MS4 size, the ability to finance, the capacity to perform operations and maintenance, and local conditions, the MEP may be less than a total of 2% disconnected for the Town. (CTDEEP, 2017)

For the purpose of maximum extent practicable (MEP) for the Town, an investigation was conducted by Nathan L. Jacobson & Associates on DCIA for each catchment in the Town. Catchments were defined by utilizing the Town Sub-Basins. High Connectivity, Average Connectivity, Partial Connectivity, and Slight Connectivity were calculated utilizing the following:

High Connectivity

$$DCIA\% = 0.4 * (IA\%)^{1.2}$$

$$Directly\ Connected\ Area = (DCIA)(IC\ Acres)$$

Average Connectivity

$$DCIA\% = 0.1 * (IA\%)^{1.5}$$

$$Directly\ Connected\ Area = (DCIA)(IC\ Acres)$$

Partial Connectivity

$$DCIA\% = 0.04 * (IA\%)^{1.7}$$

$$Directly\ Connected\ Area = (DCIA)(IC\ Acres)$$

Slight Connectivity

$$DCIA\% = 0.01 * (IA\%)^{2.0}$$

$$Directly\ Connected\ Area = (DCIA)(IC\ Acres)$$

The High Connectivity calculation was utilized in assessing the Town's DCIA connectivity based on the majority of land utilization defined as commercialized or industrial and moderate residential communities,. Based on the calculations provided, the following catchments have a connectivity of 11% or greater. Refer to **Appendix IV** for the Town's complete DCIA Computations.

Please note that in all tables henceforth, catchments are organized by drainage waterbodies. Refer to *Section 4.3* for information regarding impaired waters in the Town. **Figures** pertaining to all future sections are located in **Appendix II**.

Table 8 – DCIA

Catchment ID	Basin Total Acreage (Ac.)	Town Impervious Area Acreage (Ac)	Town Impervious Area Percentage (%)	DCIA Acreage (High Connectivity) (Ac)	DCIA Percentage (High Connectivity) (%)
Sawmill Brook					
4606-00-1	659.5	0.00	0.00	0.00	0.00
4606-01-1	491.8	0.00	0.00	0.00	0.00
4606-02-1	1,134.6	0.00	0.00	0.00	0.00
Coginchaug River					
4607-10-1-L1	1,311.6	0.00	0.00	0.00	0.00
Farm River					
5112-00-2-L1	344.90	3.24	2.03	0.00	0.00
5112-02-1	376.5	6.61	4.28	0.00	0.00
5112-02-1-D1	138.8	7.91	5.70	0.00	0.00
5112-02-1-L1	455.1	7.94	9.93	0.00	0.00
5112-03-1	619.4	15.92	3.09	0.00	0.00
Quinnipiac River					
5200-00-4-L3	934.4	233.87	25.03	44.58	19.06
5200-00-4-R10	675.6	253.40	37.51	78.49	30.97
5200-00-4-R11	274.4	87.51	31.89	22.31	25.50
5200-00-4-R12	737.8	113.38	16.96	11.95	6.77
5200-00-4-R7	2,322.3	235.74	14.87	12.03	10.21
5200-00-4-R8	766.4	263.37	34.36	73.44	27.89
5200-10-1	1,214.3	26.14	16.35	1.49	11.43
5200-10-2-R1	528.6	176.15	33.32	47.34	26.88
5200-11-1	993.9	33.01	7.20	0.00	0.00
5200-12-1	30.7	8.31	27.07	1.74	20.94
5200-12-1-L1	1,118.1	209.04	18.70	28.08	13.43
5200-13-1	1,121.2	319.74	28.52	71.28	22.29
5200-14-1	416.3	84.79	20.37	12.62	14.89
5200-14-1-L1	26.4	5.93	22.46	0.99	16.74
5200-15-1	606.2	12.57	2.09	0.00	0.00
5200-16-1	1,059.3	0.01	1.33	0.00	0.00
5200-17-1	1,112.8	1.44	11.09	0.00	0.00

Catchment ID	Basin Total Acreage (Ac.)	Town Impervious Area Acreage (Ac)	Town Impervious Area Percentage (%)	DCIA Acreage (High Connectivity) (Ac)	DCIA Percentage (High Connectivity) (%)
5200-19-1-L1	896.3	6.55	18.28	0.86	13.07
Broad Brook					
5204-00-2-L1	1,884.7	29.16	8.64	0.00	0.00
5204-01-1	268.5	4.37	6.93	0.23	10.53
5204-02-1	289.2	15.66	15.26	0.00	0.00
Harbor Brook					
5206-01-1-L1	65.30	0.08	3.08	0.00	0.00
5206-02-1-L1	681.40	49.26	25.47	9.59	19.47
Wharton Brook					
5207-00-1	736.5	197.50	26.82	40.90	20.71
5207-00-1-L1	488.1	46.48	9.68	0.00	0.00
5207-00-1-L2	1,397.1	206.41	14.77	10.45	10.13
5207-00-2-R1	380.8	100.30	26.34	20.33	20.27
5207-00-2-R2	161.2	35.31	38.63	11.33	32.09
5207-01-1	906.2	157.28	17.36	9.66	12.29
5207-02-1	2.4	0.28	20.00	0.04	14.56
5207-02-1-L1	822.4	136.05	20.66	20.60	15.14
Muddy River					
5208-00-1	26.0	3.70	14.23	0.18	9.68
5208-00-1-L1	858.7	123.95	14.49	6.13	9.90
5208-00-2-R1	54.7	7.98	14.59	0.40	9.97
5208-00-3-L2	891.4	47.21	5.30	0.00	0.00
5208-00-3-L3	881.4	36.85	4.40	0.00	0.00
5208-00-3-R1	12.4	0.89	7.18	0.00	0.00
5208-00-3-R2	701.2	26.46	3.81	0.00	0.00
5208-00-3-R3	167.2	4.92	6.72	0.00	0.00
5208-00-3-R4	28.1	0.00	0.00	0.00	0.00
5208-00-3-R5	198.4	0.15	0.67	0.00	0.00
5208-01-1	305.5	46.19	15.12	2.40	10.41
5208-02-1	510.9	8.67	1.80	0.00	0.00
5208-02-1-L1	664.2	15.25	2.31	0.00	0.00
5208-02-2-R1	592.0	41.49	7.01	0.00	0.00
5208-03-1	717.1	36.78	6.19	0.00	0.00
5208-04-1	479.6	20.43	4.26	0.00	0.00

Catchment ID	Basin Total Acreage (Ac.)	Town Impervious Area Acreage (Ac)	Town Impervious Area Percentage (%)	DCIA Acreage (High Connectivity) (Ac)	DCIA Percentage (High Connectivity) (%)
5208-05-1-L1	540.1	56.16	10.40	0.05	17.10
5208-06-1	444.9	28.13	6.32	0.00	0.00
5208-07-1	137.2	1.83	1.33	0.00	0.00
5208-08-1	840.9	73.69	8.98	0.00	0.00
5208-09-1	536.0	0.15	1.73	0.00	0.77
Mill River					
5302-02-1	1,077.6	64.39	9.44	0.00	0.00
5302-04-1-L1	1,521.3	48.01	10.26	0.00	0.00
Source: Created by Atlas Technical Consultants (2021). Referenced from Nathan L. Jacobson & Associates DCIA Calculations.					

4.1.1 Impervious Cover Tracking

Existing DCIA by 1% per year, or a total of 2% disconnect to the maximum extent practicable (MEP) is required under the MS4 Permit. A disconnect is defined as infiltrating the first inch of rain. Previous disconnections going back to 2012 can be counted toward this disconnection requirement. Stormwater should not be infiltrated in Aquifer Protection Areas where there is a high pollutant load, at sites with existing subsurface contamination, or a drinking water wellhead area (UConn, 2020).

UConn, along with CT NEMO, have provided a tool- the Impervious Cover Disconnection Spreadsheet-that is useful for DCIA disconnection tracking purposes. Included in the Disconnection Spreadsheet is Project Information, New Developments, Redevelopments, Retrofits, Change, and Cumulative Totals. This spreadsheet will allow the Town to easily track and compute disconnects from the MS4 system during redevelopment or retrofitting, or connections to the MS4 system with new developments. **Graphic 9** provides an example of disconnection tracking. This spreadsheet is included in **Appendix V**.

Graphic 9: Impervious Cover Disconnection Spreadsheet

Town

Ucoasopolis

Town area (ac):

20,000

Example Impervious Cover Tracking Spreadsheet



PROJECT INFORMATION				NEW DEVELOPMENT		REDEVELOPMENT		RETROFIT		CHANGE			CUMULATIVE TOTALS				NOTES & REFERENCES	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
date	practice	project	practice	Total IC added (ac)	Connected IC added	Total IC added or	Connected IC added or	IC disconnected (ac)	Change in Total IC (ac)	Change in Connected IC (ac)	Net change (ac)	TOWN TOTAL IC	TOWN TOTAL IC (%)	TOWN CONNECTED IC	TOWN CONNECTED IC (%)	Notes & References		
1-Jun-12		Townwide BASELINE										3500.0	17.5%	1800.0	9.00%	from baseline report [note: total town area is 20,000 acres]		
21-Jul-15	15-1-A	Town Hall parking renovation	porous asphalt					(6.0)	0.0	(6.0)	(6.0)	3500.0	17.5%	1794.0	8.97%	replaced old asphalt lot, see file for plans and photos		
21-Jul-15	15-1-B	Town Hall demonstration project (rain gardens)	rain gardens (2)					(0.5)	0.0	(0.5)	(0.5)	3500.0	17.5%	1793.5	8.97%	downspout disconnects on N/W and S/W corner of building, draining to RGs		
12-Oct-15	15-2	Dickson Park basketball courts		2.0	1.0				2.0	1.0	3.0	3502.0	17.5%	1794.5	8.97%	new courts in Stocker Park; western half drains to lawn		
30-Nov-15	15-3	Bosack Building expansion & redevelopment	green roof, bioretention cell			1.5	(5.0)		1.5	(5.0)	(3.5)	3503.5	17.5%	1789.5	8.95%	Section 319 grant for LID upgrade		
30-Nov-15	15-4	Dixie Auto Parts store improvements (walkways and parking lot)	permeable interlocking concrete pavers					(1.0)	0.0	(1.0)	(1.0)	3503.5	17.5%	1788.5	8.94%	front walkway and sidewalk; paid for by owner to get stormwater fee reduction		
2-Apr-16	16-1	Downtown streetscaping	permeable interlocking concrete pavers					(5.5)	0.0	(5.5)	(5.5)	3503.5	17.5%	1783.0	8.92%	downtown walking mall renovation, see file for plans and photos		
16-May-16	16-2	Chadwick Courts subdivision	bioretention, porous asphalt parking stalls	12.0	3.0				12.0	3.0	15.0	3515.5	17.6%	1786.0	8.93%	planning commission required LID to treat 75% of runoff		
14-May-16	16-3	Hoffhaus Estates Apt. renovation	rear loading zone eliminated; rain gardens (3); permeable concrete parking area, bioretention			(1.0)	(21.0)		(1.0)	(21.0)	(22.0)	3514.5	17.6%	1765.0	8.83%	major renovation by new owner; disconnected entire site (applying for LEED Silver) & removed 1 ac pavement in back		
3-Sep-16	16-4	Center stormwater retrofit	parking lot bioretention cells (6)					(15.0)	0.0	(15.0)	(15.0)	3514.5	17.6%	1750.0	8.75%	agreement with developer to treat half of all runoff with bioretention		
2/18/2017	17-1	Burch Blvd sidewalk (new)	porous concrete	4.0	0.0				4.0	0.0	4.0	3518.5	17.6%	1750.0	8.75%	sidewalk part is as per Downtown Revitalization Plan, porous concrete (see		
											0.0	0.0%	1750.0	8.75%				
											0.0	0.0%	1750.0	8.75%				
												(31.5)						
												NET	(31.5)	acres disconnected	1.8	% disconnected		

OVERALL NOTES

1 This is just our take on it. Feel free to change and tailor as you see fit.

2 Area unit used is acres but could be anything.

COLUMNS

1 date of completion

2 any identifying system will do

3 overall description of project

4 overview of LID practices used

5 for new development, total acres of IC added

6 sum of #5 above that are connected

7 for redevelopment projects: total ic after project minus total ic before project

8 for redevelopment projects: connected ic after project minus connected ic before project

9 for retrofits of existing development, total acres IC disconnected (from plans and observation)

10 change in total IC after project completion

11 change in connected IC after project completion

12 cumulative total of IC in town, acres

13 cumulative total of IC in town, %

14 cumulative total of connected IC in town, acres

15 cumulative total of connected IC in town, %

16 notes, referrals to other files, plans, photos, folders, etc.

NEMO Project

Center for Land Use Education and Research (CLEAR)

University of Connecticut

clear@uconn.edu

4.2 Urbanized Areas

The 2010 Census of Urban Classification defines an Urban Area as “densely developed territory, and encompass [es] residential, commercial, and other non-residential urban land use (Census. 2010)”. There are two clearly defined Urban Area types: an Urbanized Area must contain 50,000 or more people, and an Urban Cluster must contain at least 2,500 and less than 50,000 people. (Census. 2010) For purposes of the Stormwater Retrofit Program, data pertaining to an Urbanized Area was utilized.

Atlas was provided with a shapefile of the 2010 Urbanized Areas for the Town, which was imported into ArcGIS for calculation purposes. Utilizing the Overlay-Intersect tool, Atlas was able to extract the total Urbanized Area acreage per catchment, and then calculate the Urbanized Area percentage per catchment utilizing the following formula:

$$\text{Urbanized Area (Ac)/Basin Total Acreage} \times 100$$

Table 9 includes catchments found to contain Urbanized Areas only, as well as the results of the Urbanized Area Acreage extraction and Urbanized Area Percentage results. **Figure 1** depicts the Urbanized Areas and corresponding catchments.

Table 9 – Urbanized Areas by Catchment

Catchment ID	Basin Total Acreage (Ac.)	Urbanized Area (Ac)	Urbanized Area Percentage (%)
Farm River			
5112-00-2-L1	344.90	39.02	11.31
5112-02-1	376.5	0.20	0.05
5112-02-1-L1	455.1	0.14	0.03
Quinnipiac River			
5200-00-4-L3	934.4	934.37	100.00
5200-00-4-R10	675.6	675.64	100.01
5200-00-4-R11	274.4	274.36	99.99
5200-00-4-R12	737.8	635.86	86.18
5200-00-4-R7	2,322.3	1,572.75	67.72
5200-00-4-R8	766.4	766.45	100.01
5200-10-1	1,214.3	157.46	12.97
5200-10-2-R1	528.6	528.60	100.00
5200-11-1	993.9	459.38	46.22
5200-12-1	30.7	30.69	99.97
5200-12-1-L1	1,118.1	1,118.05	100.00
5200-13-1	1,121.2	1,121.18	100.00
5200-14-1	416.3	416.32	100.00
5200-14-1-L1	26.4	26.43	100.11
5200-15-1	606.2	526.82	86.91
5200-16-1	1,059.3	0.64	0.06
5200-17-1	1,112.8	12.24	1.10
5200-19-1-L1	896.3	374.92	41.83
Broad Brook			
5204-00-2-L1	1,884.7	342.66	18.18
5204-01-1	268.5	28.13	10.48
5204-02-1	289.2	230.32	79.64
Harbor Brook			
5206-01-1-L1	65.30	2.73	4.18
5206-02-1-L1	681.40	189.83	27.86
Wharton Brook			
5207-00-1	736.5	736.49	100.00
5207-00-1-L1	488.1	484.20	99.20
5207-00-1-L2	1,397.1	1,397.11	100.00
5207-00-2-R1	380.8	380.84	100.01

Catchment ID	Basin Total Acreage (Ac.)	Urbanized Area (Ac)	Urbanized Area Percentage (%)
5207-00-2-R2	161.2	89.59	55.58
5207-01-1	906.2	819.99	90.49
5207-02-1	2.4	1.39	57.92
5207-02-1-L1	822.4	651.76	79.25
Muddy River			
5208-00-1	26.0	25.97	99.88
5208-00-1-L1	858.7	810.15	94.35
5208-00-2-R1	54.7	54.71	100.02
5208-00-3-L2	891.4	148.75	16.69
5208-00-3-L3	881.4	219.21	24.87
5208-00-3-R2	701.2	2.99	0.43
5208-00-3-R3	167.2	67.25	40.22
5208-00-3-R4	28.1	0.88	3.13
5208-00-3-R5	198.4	22.60	11.39
5208-01-1	305.5	305.50	100.00
5208-02-2-R1	592.0	347.38	58.68
5208-03-1	717.1	38.25	5.33
5208-05-1-L1	540.1	323.32	59.86
5208-06-1	444.9	129.99	29.22
5208-08-1	840.9	794.03	94.43
5208-09-1	536.0	7.49	1.40
Mill River			
5302-02-1	1,077.6	670.90	62.26
5302-04-1-L1	1,521.3	393.13	25.84

4.3 Impaired Waterbodies

CT ECO, a partnership between the CTDEEP and UConn, has based the state's impaired waters on the following specifications; waters listed as impaired by the EPA and waters that were listed as having adopted a Total Maximum Daily Load (TMDL) for either one or all of the following: phosphorus, nitrogen, bacteria, or mercury. These were then combined into a Stormwater Impaired Waters layer through CT ECO for the use in a GIS system.

Utilizing the 2020 CT Stormwater Impaired Waters shapefile, Atlas was able to identify impaired waters that directly flow through the Town. The Quinnipiac River, Meetinghouse Brook, Wharton Brook, an unnamed tributary to Wharton Brook, and the Muddy River were all identified with impairments. Catchments containing the aforementioned impaired waters are listed in **Table 10**, below. **Figure 2** depicts the locations of the impaired waters and associated catchments.

Table 10 –Catchments Containing Impaired Waterbodies

Catchment ID	Basin Total Acreage (Ac.)	Town Impervious Acreage (AC)	Town Impervious Area Percentage (%)	Impaired Waterbody	Location
Quinnipiac River					
5200-00-4-L3	934.4	233.87	25.03	Quinnipiac River (North Haven/Meriden)-02	Toelles Road crossing (head of tide, just east Route 15), Wallingford/North Haven town border, US to Hanover Pond outlet dam, Meriden. (Segment includes Community Lake portion)
5200-00-4-R10	675.6	253.40	37.51	Quinnipiac River (North Haven/Meriden)-02	Toelles Road crossing (head of tide, just east Route 15), Wallingford/North Haven town border, US to Hanover Pond outlet dam, Meriden. (Segment includes Community Lake portion)
5200-00-4-R11	274.4	87.51	31.89	Quinnipiac River (North Haven/Meriden)-02	Toelles Road crossing (head of tide, just east Route 15), Wallingford/North Haven town border, US to Hanover Pond outlet dam, Meriden. (Segment includes Community Lake portion)
5200-00-4-R12	737.8	113.38	16.96	Quinnipiac River (North Haven/Meriden)-02	Toelles Road crossing (head of tide, just east Route 15), Wallingford/North Haven town border, US to Hanover Pond outlet dam, Meriden. (Segment includes Community Lake portion)
5200-00-4-R7	2,322.3	235.74	14.87	Quinnipiac River (North Haven/Meriden)-02	Toelles Road crossing (head of tide, just east Route 15), Wallingford/North Haven town border, US to Hanover Pond outlet dam, Meriden. (Segment includes Community Lake portion)
5200-00-4-R8	766.4	263.37	34.36	Quinnipiac River (North Haven/Meriden)-02	Toelles Road crossing (head of tide, just east Route 15), Wallingford/North Haven town border, US to Hanover Pond outlet dam, Meriden. (Segment includes Community Lake portion)
5200-00-4-R9				Quinnipiac River (North Haven/Meriden)-02	Toelles Road crossing (head of tide, just east Route 15), Wallingford/North Haven town border, US to Hanover Pond outlet dam, Meriden. (Segment includes Community Lake portion)
5200-10-1	1,214.3	26.14	16.35	Meetinghouse Brook (Wallingford)-01	Mouth on Quinnipiac River, at Route 68 crossing, US to confluence with Spruce Glen

Catchment ID	Basin Total Acreage (Ac.)	Town Impervious Acreage (AC)	Town Impervious Area Percentage (%)	Impaired Waterbody	Location
					Brook, parallel to Route 15, Wallingford.
5200-10-2-R1	528.6	176.15	33.32	Meetinghouse Brook (Wallingford)-01	Mouth on Quinnipiac River, at Route 68 crossing, US to confluence with Spruce Glen Brook, parallel to Route 15, Wallingford.
5200-13-1	1,121.2	319.74	28.52	Quinnipiac River (North Haven/Meriden)-02	Toelles Road crossing (head of tide, just east Route 15), Wallingford/North Haven town border, US to Hanover Pond outlet dam, Meriden. (Segment includes Community Lake portion)
Wharton Brook					
5207-00-1	736.5	197.50	26.82	Wharton Brook-01	From mouth at confluence with Quinnipiac River (DS of Route 5 and Railroad crossing), Wallingford/North Haven town borders, US to Simpson Pond outlet dam (US of Center Street (Route 150) crossing), Wallingford.
5207-00-1-L2	1,397.1	206.41	14.77	Wharton Brook-02	From inlet to Simpson Pond, US to North Farms Reservoir outlet dam (just US of Church Street (Route 68) crossing), Wallingford.
5207-00-2-R1	380.8	100.30	26.34	Wharton Brook-01	From mouth at confluence with Quinnipiac River (DS of Route 5 and Railroad crossing), Wallingford/North Haven town borders, US to Simpson Pond outlet dam (US of Center Street (Route 150) crossing), Wallingford.
5207-00-2-R2	161.2	35.31	38.63	Wharton Brook-01	From mouth at confluence with Quinnipiac River (DS of Route 5 and Railroad crossing), Wallingford/North Haven town borders, US to Simpson Pond outlet dam (US of Center Street (Route 150) crossing), Wallingford.
5207-01-1	906.2	157.28	17.36	Unnamed Tributary to Wharton Brook (Wallingford)-01	Mouth at confluence with Wharton Brook, just DS of Reskin Drive crossing (off of Pond Hill Road), US to confluence with another unnamed trib, just US of Route 150 crossing and between Airline Road and I91, Wallingford.
5207-02-1-L1	822.4	136.05	20.66	Allen Brook (Wallingford)-02	Inlet to Allen Brook Pond in Wharton Brook State Park which includes swimming area

Catchment ID	Basin Total Acreage (Ac.)	Town Impervious Acreage (AC)	Town Impervious Area Percentage (%)	Impaired Waterbody	Location
					(south exit 13 on/off ramp, I91), Wallingford/North Haven town border, US to HW (under I91, parallel along east side of I91 and west side RR track), Wallingford.
Muddy River					
5208-00-3-L3	881.4	36.85	4.40	Muddy River (North Haven)-02a	Muddy River Pond inlet (east side of I91), North Haven, US to confluence with unnamed tributary (outlet for Tamarac Swamp), just DS of Tyler Mill Road crossing, Wallingford.
5208-00-3-R1	12.4	0.89	7.18	Muddy River (Wallingford)-02b	From confluence with unnamed tributary (outlet for Tamarac Swamp), just DS of Tyler Mill Road crossing, Wallingford, US to MacKenzie Reservoir outlet dam (US of Northford Road crossing), Wallingford.
5208-00-3-R2	701.2	26.46	3.81	Muddy River (Wallingford)-02b	From confluence with unnamed tributary (outlet for Tamarac Swamp), just DS of Tyler Mill Road crossing, Wallingford, US to MacKenzie Reservoir outlet dam (US of Northford Road crossing), Wallingford.
5208-00-3-R3	167.2	4.92	6.72	Muddy River (North Haven)-02a	Muddy River Pond inlet (east side of I91), North Haven, US to confluence with unnamed tributary (outlet for Tamarac Swamp), just DS of Tyler Mill Road crossing, Wallingford.

Source: Created by Atlas (2021).

4.4 Catchment Priority Rankings

Based on current investigatory results, High Priority areas are focused along the western and southwestern side of the Town, extending eastwards. One “finger”-like High Priority protrusion extends from the central portion to the northeastern edge of the Town. The High Priority areas in the Town are a mixture of residential, industrial or commercial, and some agricultural land. Most High Priority areas in the Town include several outfalls, however not all discharge to impaired waterbodies.

Multiple factors were taken into consideration when scoring each catchment, including but not limited to DCIA calculations, previous screening results, age of development/structures, density of generating sites, nearby sewer repairs, urbanized areas, and impaired waterbodies. Refer to

Table 11 below for a list of the Town's High and Problem catchments.* **Figure 3** depicts the location of the Town's High, Problem, and Low Priority Catchment Ranking.

Table 11 – High Priority and Problem Catchments

Catchment ID	Number of Outfalls Included	Priority Ranking <i>Low Priority: 0-5</i> <i>Problem: 6-9</i> <i>High Priority: ≥10</i>
Farm River		
5112-00-2-L1	2	Problem
5112-02-1	4	Problem
5112-02-1-D1	0	Low Priority
5112-02-1-L1	0	Low Priority
5112-03-1	1	Problem
Quinnipiac River		
5200-00-4-L3	49	Problem
5200-00-4-R10	45	High Priority
5200-00-4-R11	20	Problem
5200-00-4-R12	27	High Priority
5200-00-4-R7	84	High Priority
5200-00-4-R8	81	High Priority
5200-10-1	14	High Priority
5200-10-2-R1	69	High Priority
5200-11-1	15	High Priority
5200-12-1	2	High Priority
5200-12-1-L1	49	High Priority
5200-13-1	62	High Priority
5200-14-1-L1	3	Problem
5200-15-1	34	Problem
Harbor Brook		
5206-02-1-L1	6	High Priority
Wharton Brook		
5207-00-1	44	High Priority
5207-00-1-L2	66	High Priority
5207-00-2-R1	11	High Priority
5207-00-2-R2	9	High Priority
5207-01-1	46	High Priority
5207-02-1	0	Problem
5207-02-1-L1	47	High Priority
Muddy River		

Catchment ID	Number of Outfalls Included	Priority Ranking <i>Low Priority: 0-5</i> <i>Problem: 6-9</i> <i>High Priority: ≥10</i>
5208-00-1	1	Problem
5208-00-1-L1	74	Problem
5208-00-2-R1	5	Problem
5208-00-3-L3	11	High Priority
5208-00-3-R2	0	Problem
5208-00-3-R3	3	High Priority
5208-00-3-R4	3	High Priority
5208-00-3-R5	0	Problem
5208-01-1	0	Problem
5208-02-2-R1	8	Problem
5208-05-1-L1	1	Problem
5208-06-1	10	Problem
5208-08-1	11	Problem
Mill River		
5302-02-1	0	Problem
5302-04-1-L1	16	High Priority

Source: Created by Atlas Technical Consultants (2021)

Exempt and Low Priority Catchments are not included in this table. For a complete list of the Priority Catchment Rankings and factors applied in scoring, refer to **Appendix VI.*

5. RETROFIT PLANNING

According to the MS4 General Permit,

“By the end of this permit term, the permittee shall commence the implementation of the retrofit projects identified in subparagraph (b)...with a goal of disconnecting one percent (1%) per year of the permittee’s DCIA for the fourth and fifth years of this general permit, or a total of 2%, to the MEP. The two percent (2%) goal may be achieved by compiling the total disconnected DCIA tracked...or the retrofit projects designated...or a combination of the two” (CTDEEP. 2017).

If the two percent (2%) goal will not be met, then the MEP standard shall be utilized. The Town must make a serious attempt to comply with DCIA disconnects. However, based on attenuating factors, including MS4 size, the ability to finance, the capacity to perform operations and maintenance, and local conditions, the MEP may be less than a total of 2% disconnected for the Town. (CTDEEP, 2017). Following the fifth year of the MS4 Permit, the Town will continue the Retrofit Program with a goal to disconnect one percent (1%) of DCIA each year thereafter (CTDEEP, 2017). *Section 5.1* details Town-owned facilities, as well as parks and conservation areas located through the Town. **Figure 4** depicts the location of the aforementioned locations.

5.1 Municipal Owned Facilities and Parks

Town owned or operated properties, parks, and other facilities are the recommended focus for the initial Retrofit Project planning. By controlling the point or non-point source pollutions at municipal-owned properties, the Town can implement control practices and pollution prevention, most of which are non-structural and require minimal or no land area. In addition, by implementing control practices and pollution prevention, the Town will contribute to public education and outreach (UCONN, 2004).

As specified in Section 6 (H)(ii) in the MS4 Permit, for impaired waters where bacteria is a POC, the Town shall develop, fund, implement, and prioritize a Retrofit Project to correct bacterial contribution to impaired waterbodies. Atlas will continue to investigate and develop recommendations for Retrofit Projects pertaining to dog parks, parks with open water, sites with failing septic systems, etc., that will contribute to source management of bacterial contribution.

Table 12 details Town-owned facilities, parks, and/or conservation areas owned by other investors. Locations shaded brown signify sites under investigation. As these sites are investigated, Atlas will submit addendums to the Town pertaining to the updated information.

Table 12 – Municipal Owned

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	98 NICHOLAS RD	0.26		MUNICIPAL M96		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	1448 TUTTLE AVE	1.88		MUNICIPAL M96		
	4 SCHOOLHOUSE RD	2.02		MUNI LAND M00		
	131 CHESHIRE RD	19.9		MUNI LAND M00		
	136 CHESHIRE RD	29.8		MUNI LAND M00		
	CHESHIRE RD	16.74		MUNI LAND M00		
	291 HALL AVE	11.6		MUNI LAND M00		
Wallingford Fire Marshall	75 MASONIC AVE	2.6	TBD	MUN FIRE	Stormwater across this site is generally flat, with a slope towards the east-northeast. A catch basin is located on the eastern side of the site, connecting to the MS4. It is presumed that due to the flat roof on the main building, drains are utilized and directly connected to the MS4. It is also presumed that stormwater runoff from the other outbuildings runs off the pitched roofs and directly onto paved areas. The neighboring site to the west is steeply sloped an agricultural.	Roof drains, catch basins, unknown if there is an oil water separator located onsite.
Wallingford Compost Center	157 JOHN ST		TBD	TBD	The site is relatively flat, with slopes towards the west-	Slope, catch basins

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
					southwest. Stormwater is either infiltrated into the ground, or directed through catch basins or impermeable material to an outfall.	
Wallingford Recycling Center	25 PENT RD		TBD	TBD	Topography at the site is relatively flat, with a slope towards the north-northeast. Stormwater is directed to catch basins through slope and/or gutters.	Catch basins, gutters
	287 HALL AVE	175.88		MUNI LAND M00		
	115 HOSFORD ST	0.17		MUNI LAND M00		
	302 WASHINGTON ST	4.94		MUNICIPAL M94		
	320 WASHINGTON ST	2.03		MIXED USE M96		
	12 LAKE ST	1.65		MUNICIPAL M01		
	590 NORTH MAIN ST	0.48		MUNI LAND M00		
	79 MAPLEWOOD AVE	0.56		MUNI LAND M00		
	42 SUNRISE CIR	2.93		MUNICIPAL M96		
	FARM HILL RD	0.06		MUNICIPAL M96		
	HILLHOUSE AVE	1.03		MUNI LAND M00		
	WILLIAMS RD REAR	1.43		MUNICIPAL M96		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	491 WILLIAMS RD	35		MUNI LAND M00		
	DIBBLE EDGE RD	10.83		MUNI LAND M00		
	114 DIBBLE EDGE RD	2.77		MUNI LAND M00		
	118 DIBBLE EDGE RD	2.74		MUNI LAND M00		
	112 DIBBLE EDGE RD	3.13		MUNI LAND M00		
Cook Hill Elementary School	57 HALL RD	0		MUN FIRE	Topography across the site is generally flat, with the property sloping towards the southeast, east, and north. Stormwater on buildings is presumed to flow into roof drains and directly to the MS4 system. Stormwater is expected to flow across paved areas, where curbing directs stormwater into catch basins.	Roof drains, catch basins
	5 DOUGLAS CT	0.1		MUNI LAND M00		
	128 ALGONQUIN DR	0.34		MUNI LAND M00		
	345 QUINNIPIAC ST	13.96		INDUSTRIAL M96		
	358 HALL AVE	13.96		INDUSTRIAL M96		
	358 HALL AVE	13.96		INDUSTRIAL M96		
	10 CHESHIRE RD	45.23		MUNICIPAL M96		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	33 NORTH CHERRY ST	0.33		REST/CLUBS M94		
	120 HALL AVE	0.45		MUNI LAND M00		
	87 QUINNIPIAC ST	0.53		MUNI LAND M00		
	51 QUINNIPIAC ST	0.67		MUNICIPAL M94		
	20 WILLIAM ST	0.16		MUNI LAND M00		
	15 MEADOW ST	0.36		MUNI LAND M00		
	6 MEADOW ST	0.21		MUNI LAND M00		
	200 NORTH MAIN ST	3.61		MUNICIPAL M94		
Moses Y Beach Elementary School	340 NORTH MAIN ST	7.16		MUN PUB SC M94	Topography across the site slopes towards the southwest and west. Curbed, paved areas direct stormwater runoff into catch basins located throughout the site. It is presumed that roof drains direct stormwater into the MS4 system.	Roof drains, catch basins
	105 NORTH BRANFORD RD	378.68		MUNI LAND M00		
	105 NORTH BRANFORD RD	378.68		MUNI LAND M00		
	237 COOK HILL RD	0.53		MUNI LAND M00		
	154 COOK HILL RD	0.06		MUNICIPAL M96		
	4 SOUTH ST	9.29		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	260 QUINNIPIAC ST	1.41		MUNI LAND M00		
	45 SOUTH MAIN ST	2.13		MUNICIPAL M94		
	23 NORTH ORCHARD ST	0.17		MUNI LAND M00		
	1 CENTER ST	9.69		MUNICIPAL M96		
	37 WASHINGTON ST	0.63		MUNI LAND M00		
	390 CENTER ST	0.12		MUNI LAND M00		
	11 WALLACE AVE	0.1		MUNI LAND M00		
	29 WALLACE AVE	0.54		MUNI LAND M00		
	45 WALLACE AVE	0.72		MUNI LAND M00		
	135 NORTH MAIN ST	0.57		MUNI LAND M00		
	43 WALLACE AVE	1		MUNICIPAL M94		
	95 NORTH MAIN ST	0.26		MUN FIRE		
	121 NORTH MAIN ST	0.82		MUN POLICE		
	BURKE HEIGHTS DR	0.06		MUNI LAND M00		
	9 OLD ROCK HILL RD	43.01		MUNI LAND M00		
	910 OLD ROCK HILL RD	14.72		MUN PUB SC M94		
	14 CHERYL AVE	0.24		Single Family		
	300 NORTH BRANFORD RD	34.88		MUNI LAND M00		
	1 ASHLEY LN	0.94		Mun Pump Hse		
	90 APPLE TREE LN	0.32		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	84 SOUTH TURNPIKE RD	0.14		MUNI LAND M00		
	51 JOHN ST	1.07		MUNICIPAL M96		
	228 EAST ST	0.12		MUNI LAND M00		
	100 JOHN ST	2.94		MUNICIPAL M94		
	78 SOUTH ELM ST	14.24		MUNI LAND M00		
	78 SOUTH ELM ST	14.24		MUNI LAND M00		
	748 CENTER ST	0.29		MUNI LAND M00		
	CENTER ST	0.41		MUNI LAND M00		
	CENTER ST	0.44		MUNI LAND M00		
	37 BURKE HEIGHTS DR	5.31		HSNG AUTH M94		
	1222 OLD COLONY RD	0.35		Mun Res Lnd		
	296 NORTH BRANFORD RD	0.21		MUNI LAND M00		
	75 NORTH BRANFORD RD	57.3		MUNICIPAL M96		
	129 SOUTH TURNPIKE RD	0.3		MUNICIPAL M96		
	13 MANSION RD	3.44		MUNI LAND M00		
	3 OLIVER CREEK RD	20		MUNI LAND M00		
	5 PENT RD	0.23		MUNICIPAL M96		
	349 SOUTH ELM ST	0.03		MUNI LAND M00		
	23 TREMPER DR	0.25		Single Family		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	3 LONDONDERRY DR			Unknown		
	995C EAST CENTER ST	93.72		MUNI LAND M00		
	EAST CENTER ST	45.02		MUNI LAND M00		
	1070 EAST CENTER ST	10.92		MUNI LAND M00		
	1299 SCARD RD	26.15		MUNI LAND M00		
	WHIRLWIND HILL RD	2.88		MUNI LAND M00		
	1200 SCARD RD	4.49		MUNI LAND M00		
	1250 SCARD RD	0.78		MUNI LAND M00		
	1351 SCARD RD	12.79		MUNI LAND M00		
	1364 SCARD RD	37.75		MUNI LAND M00		
	40 GEORGE WASHINGTON TRL	9.31		MUNI LAND M00		
	80 WHARTON BROOK DR	3.11		MUNI LAND M00		
	36 RESKIN DR	2.88		MUNI LAND M00		
	611 SOUTH ELM ST	6.2		MUNI LAND M00		
	97 KONDRACKI LN	1.83		MUNI LAND M00		
	EAST CENTER ST	116.27		MUNI LAND M00		
	EAST CENTER ST	38.82		MUNI LAND M00		
	70 TYLER MILL RD	0.06		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	11 NORTHFORD RD	0.42		MUNI LAND M00		
	32 NORTHFORD RD	57.92		MUNICIPAL M96		
	EAST CENTER ST	0.95		MUNI LAND M00		
	1390 WHIRLWIND HILL RD	63.41		MUNICIPAL M01		
	28A CARDINAL DR	3		MUNI LAND M00		
	14A POGMORE DR	1.06		MUN PUB SC M00		
	35 TAMARAC SWAMP RD	28.58		MUNI LAND M00		
	70 TAMARAC SWAMP RD	25.22		MUNI LAND M00		
	22 TAMARAC SWAMP RD	2.6		MUNI LAND M00		
	21 TYLER MILL RD	6.69		MUNI LAND M00		
	1675 WHIRLWIND HILL RD	192		MUNICIPAL M96		
	15 BIRCH DR	3.49		MUNI LAND M00		
	TYLER MILL RD	0		Unknown		
	75 TYLER MILL RD	2.64		Single Family		
	80 TYLER MILL RD	3.05		MUN PUB SC M00		
	41 TYLER MILL RD	4.64		MUNI LAND M00		
	63 TYLER MILL RD	8.45		MUNI LAND M00		
	31 TYLER MILL RD	5.73		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	COOKE RD	80		MUNI LAND M00		
	237R POND HILL RD			Unknown		
Pond Hill Elementary School	299 POND HILL RD	9.44		MUN PUB SC M94	Topography slopes to the southeast at this site, with steep slopes on the northeast, northwest, and southeast corners. Stormwater in contact with buildings is presumed to flow into roof drains connected to the MS4. Stormwater runs along paved areas and curbing into catch basins throughout the site.	Roof drains, catch basins
	14 HAYLEDGE CT	1.97		MUNI LAND M00		
	TYLER MILL RD	0		Unknown		
	200 NORTHFORD RD	105.1		MUNI LAND M00		
	116 WEST DAYTON HILL RD	73.73		MUNI LAND M00		
	549 WOODHOUSE AVE	723.38		MUNI LAND M00		
	WILDLIFE DR	0.4		MUNICIPAL M96		
	TYLER MILL RD	0		Unknown		
	118 WEST DAYTON HILL RD	2.2		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	37 OAK ST YALES	29.31		MUNICIPAL M96		
	50 OAK ST YALES	0.41		MUNI LAND M00		
	15 OLD COLONY RD	3.02		MUNICIPAL M96		
	1110 YALE AVE	0.5		MUNI LAND M00		
	13 PARTRIDGE RUN	0.74		MUNI LAND M00		
	SHARON DR (REAR)	0.17		MUNICIPAL M96		
	415 CHURCH ST YALESVILLE	6.84		MUN PUB SC M94		
	980 NORTH MAIN ST EXT	0.55		MUNICIPAL M96		
	TOWER DR	0.91		Mun Pump Hse		
	130 THORPE AVE	1.67		MUNICIPAL M96		
	16 DONAT DR	8		MUNI LAND M00		
	21 RIDGEFIELD RD	0.14		MUNI LAND M00		
	141 HOPE HILL RD	40.31		MUN PUB SC M94		
	143 HOPE HILL RD	0.92		MUN FIRE		
	140 HOPE HILL RD	44.46		MUN PUB SC M94		
	200 HIGHLAND AVE	13.99		MUN PUB SC M94		
	326 MAIN ST	0.16		MUNI LAND M00		
	MAIN ST	13.23		MUNI LAND M00		
	361 MAIN ST	0.07		MUNI LAND M00		
	MAIN ST	9.32		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	6 FAIRFIELD BLVD	3.79		MUNICIPAL M94		
	3 CARPENTER LN	1		MUNI LAND M00		
	218 HIGH HILL RD	94.2		MUNI LAND M00		
	30 RIDGENOLL RD	3.73		MUNI LAND M00		
	33 RIDGENOLL RD	0.23		MUNI LAND M00		
	58 RIDGEFIELD RD	5.54		MUNI LAND M00		
	101 RIDGEWOOD RD	0.08		MUNI LAND M00		
	67 RIDGEWOOD RD	3.62		MUNI LAND M00		
	11 RIDGELAND RD	0.09		MUNI LAND M00		
	75 JENNA RD	4.96		MUNI LAND M00		
	205 MAIN ST	20.16		MUNI LAND M00		
	202 MAIN ST	28.69		MUNI LAND M00		
	864 NORTH FARMS RD	10.29		MUNI LAND M00		
	1211 BARNES RD	2.44		MUNI LAND M00		
	CT ROUTE 68	0.26		MUNI LAND M00		
	WISK-KEY WIND RD	5.42		MUNI LAND M00		
	162 HIGH HILL RD	53.1		MUNI LAND M00		
	GAYLORD FARM RD	2.4		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	30 PARKER FARMS RD	20		MUN PUB SC M94		
	60 PARKER FARMS RD	1		Vacant Unb Lnd		
	99 NORTH TURNPIKE RD	0.44		MUNI LAND M00		
	91 NORTH TURNPIKE RD	18.43		MUNI LAND M00		
	109 NORTH TURNPIKE RD	0.07		MUNI LAND M00		
	107 NORTH TURNPIKE RD	1.86		MUNICIPAL M96		
	155 GRIEB RD	7.19		MUNI LAND M00		
	2 CATLIN RD	0.91		MUNI LAND M00		
	243 GRIEB RD	0.39		MUNI LAND M00		
	1 GRIEB RD	0.59		MUNICIPAL M96		
	1300 BARNES RD	2.25		MUNI LAND M00		
	159 CHESHIRE RD	21		MUNI LAND M00		
	TUTTLE AVE	0.46		MUNI LAND M00		
	18 MOHICAN LN	4.04		MUNI LAND M00		
	29 TOWN FARM RD	7.05		MUNICIPAL M94		
	700 NORTH MAIN ST EXT	15.44		MUNI LAND M00		
	739 NORTH MAIN ST EXT	7.1		MUNICIPAL M96		
	1207 DURHAM RD	0.06		MUNI LAND M00		
	47 GRIEB TRL	0.1		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	14 CARTER TRL	0.31		MUNI LAND M00		
	531 NORTH BRANFORD RD	67.78		MUNI LAND M00		
	98 NICHOLAS RD			MUNICIPAL M96		
	98 NICHOLAS RD	0.26		MUNICIPAL M96		
	1448 TUTTLE AVE	1.88		MUNI LAND M00		
	4 SCHOOLHOUSE RD	2.02		MUNI LAND M00		
	131 CHESHIRE RD	19.9		MUNI LAND M00		
	136 CHESHIRE RD	29.8		MUNI LAND M00		
	CHESHIRE RD	16.74		MUNI LAND M00		
	291 HALL AVE	11.6		MUN FIRE		
	75 MASONIC AVE	2.6		MUNI LAND M00		
	287 HALL AVE	175.88		MUNI LAND M00		
	287 HALL AVE	175.88		MUNI LAND M00		
	287 HALL AVE	175.88		MUNI LAND M00		
	115 HOSFORD ST	0.17		Unknown		
	302 WASHINGTON ST			MUNICIPAL M94		
	302 WASHINGTON ST	4.94		Unknown		
	302 WASHINGTON ST	0		MIXED USE M96		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	320 WASHINGTON ST	2.03		MUNICIPAL M01		
	12 LAKE ST	1.65		MUNI LAND M00		
	590 NORTH MAIN ST	0.48		MUNI LAND M00		
	79 MAPLEWOOD AVE	0.56		MUNICIPAL M96		
	42 SUNRISE CIR	2.93		MUNICIPAL M96		
	FARM HILL RD	0.06		MUNI LAND M00		
	HILLHOUSE AVE	1.03		MUNICIPAL M96		
	WILLIAMS RD REAR	1.43		MUNI LAND M00		
	491 WILLIAMS RD	35		MUNI LAND M00		
	DIBBLE EDGE RD	10.83		MUNI LAND M00		
	114 DIBBLE EDGE RD	2.77		MUNI LAND M00		
	118 DIBBLE EDGE RD	2.74		MUNI LAND M00		
	112 DIBBLE EDGE RD	3.13		MUN FIRE		
	37 HALL RD	0		MUNI LAND M00		
	5 DOUGLAS CT	0.1		MUNI LAND M00		
	128 ALGONQUIN DR	0.34		INDUSTRIAL M96		
	345 QUINNIPIAC ST	13.96		INDUSTRIAL M96		
	358 HALL AVE	13.96		INDUSTRIAL M96		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	358 HALL AVE	13.96		MUNICIPAL M96		
	10 CHESHIRE RD	45.23		REST/CLUBS M94		
	33 NORTH CHERRY ST	0.33		MUNI LAND M00		
	120 HALL AVE	0.45		MUNI LAND M00		
	87 QUINNIPIAC ST	0.53		MUNICIPAL M94		
	51 QUINNIPIAC ST	0.67		MUNI LAND M00		
	20 WILLIAM ST	0.16		MUNI LAND M00		
	15 MEADOW ST	0.36		MUNI LAND M00		
	6 MEADOW ST	0.21		MUNICIPAL M94		
	200 NORTH MAIN ST	3.61		MUN PUB SC M94		
	340 NORTH MAIN ST	7.16		MUNI LAND M00		
	105 NORTH BRANFORD RD	378.68		MUNI LAND M00		
	105 NORTH BRANFORD RD	378.68		MUNI LAND M00		
	237 COOK HILL RD	0.53		MUNICIPAL M96		
	154 COOK HILL RD	0.06		MUNI LAND M00		
	4 SOUTH ST	9.29		MUNI LAND M00		
	260 QUINNIPIAC ST	1.41		MUNICIPAL M94		
	45 SOUTH MAIN ST	2.13		MUNI LAND M00		
	23 NORTH ORCHARD ST	0.17		MUNICIPAL M96		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	1 CENTER ST	9.69		MUNI LAND M00		
	37 WASHINGTON ST	0.63		MUNI LAND M00		
	390 CENTER ST	0.12		MUNI LAND M00		
	11 WALLACE AVE	0.1		MUNI LAND M00		
	29 WALLACE AVE	0.54		MUNI LAND M00		
	45 WALLACE AVE	0.72		MUNI LAND M00		
	135 NORTH MAIN ST	0.57		MUNICIPAL M94		
	43 WALLACE AVE	1		MUN FIRE		
	95 NORTH MAIN ST	0.26		MUN POLICE		
	121 NORTH MAIN ST	0.82		MUNI LAND M00		
	BURKE HEIGHTS DR	0.06		MUNI LAND M00		
	9 OLD ROCK HILL RD	43.01		MUN PUB SC M94		
	910 OLD ROCK HILL RD	14.72		Single Family		
	14 CHERYL AVE	0.24		MUNI LAND M00		
	300 NORTH BRANFORD RD	34.88		Mun Pump Hse		
	1 ASHLEY LN	0.94		MUNI LAND M00		
	90 APPLE TREE LN	0.32		MUNI LAND M00		
	84 SOUTH TURNPIKE RD	0.14		MUNICIPAL M96		
	51 JOHN ST	1.07		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	228 EAST ST	0.12		MUNICIPAL M94		
	100 JOHN ST	2.94		MUNI LAND M00		
	78 SOUTH ELM ST	14.24		MUNI LAND M00		
	78 SOUTH ELM ST	14.24		MUNI LAND M00		
	748 CENTER ST	0.29		MUNI LAND M00		
	CENTER ST	0.41		MUNI LAND M00		
	CENTER ST	0.44		HSNG AUTH M94		
	37 BURKE HEIGHTS DR	5.31		Mun Res Lnd		
	1222 OLD COLONY RD	0.35		MUNI LAND M00		
	296 NORTH BRANFORD RD	0.21		MUNICIPAL M96		
	75 NORTH BRANFORD RD	57.3		MUNICIPAL M96		
	129 SOUTH TURNPIKE RD	0.3		MUNI LAND M00		
	13 MANSION RD	3.44		MUNI LAND M00		
	3 OLIVER CREEK RD	20		MUNICIPAL M96		
	5 PENT RD	0.23		MUNI LAND M00		
	349 SOUTH ELM ST	0.03		Single Family		
	23 TREMPER DR	0.25		Unknown		
	3 LONDONDERRY DR			MUNI LAND M00		
	995C EAST CENTER ST	93.72		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	EAST CENTER ST	45.02		MUNI LAND M00		
	1070 EAST CENTER ST	10.92		MUNI LAND M00		
	1299 SCARD RD	26.15		MUNI LAND M00		
	WHIRLWIND HILL RD	2.88		MUNI LAND M00		
	1200 SCARD RD	4.49		MUNI LAND M00		
	1250 SCARD RD	0.78		MUNI LAND M00		
	1351 SCARD RD	12.79		MUNI LAND M00		
	1364 SCARD RD	37.75		MUNI LAND M00		
	40 GEORGE WASHINGTON TRL	9.31		MUNI LAND M00		
	80 WHARTON BROOK DR	3.11		MUNI LAND M00		
	36 RESKIN DR	2.88		MUNI LAND M00		
	611 SOUTH ELM ST	6.2		MUNI LAND M00		
	97 KONDRACKI LN	1.83		MUNI LAND M00		
	EAST CENTER ST	116.27		MUNI LAND M00		
	EAST CENTER ST	38.82		MUNI LAND M00		
	70 TYLER MILL RD	0.06		MUNI LAND M00		
	11 NORTHFORD RD	0.42		MUNICIPAL M96		
	32 NORTHFORD RD	57.92		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	EAST CENTER ST	0.95		MUNICIPAL M01		
	1390 WHIRLWIND HILL RD	63.41		MUNI LAND M00		
	28A CARDINAL DR	3		MUN PUB SC M00		
	14A POGMORE DR	1.06		MUNI LAND M00		
	35 TAMARAC SWAMP RD	28.58		MUNI LAND M00		
	70 TAMARAC SWAMP RD	25.22		MUNI LAND M00		
	22 TAMARAC SWAMP RD	2.6		MUNI LAND M00		
	21 TYLER MILL RD	6.69		MUNICIPAL M96		
	1675 WHIRLWIND HILL RD	192		MUNI LAND M00		
	15 BIRCH DR	3.49		Unknown		
	TYLER MILL RD	0		Single Family		
	75 TYLER MILL RD	2.64		MUN PUB SC M00		
	80 TYLER MILL RD	3.05		MUNI LAND M00		
	41 TYLER MILL RD	4.64		MUNI LAND M00		
	63 TYLER MILL RD	8.45		MUNI LAND M00		
	31 TYLER MILL RD	5.73		MUNI LAND M00		
	COOKE RD	80		Unknown		
	237R POND HILL RD			MUN PUB SC M94		
	299 POND HILL RD	9.44		MUNI LAND M00		
	14 HAYLEDGE CT	1.97		Unknown		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	TYLER MILL RD	0		MUNI LAND M00		
	200 NORTHFORD RD	105.1		MUNI LAND M00		
	116 WEST DAYTON HILL RD	73.73		MUNI LAND M00		
	549 WOODHOUSE AVE	723.38		MUNICIPAL M96		
	WILDLIFE DR	0.4		Unknown		
	TYLER MILL RD	0		MUNI LAND M00		
	118 WEST DAYTON HILL RD	2.2		MUNICIPAL M96		
	37 OAK ST YALES	29.31		MUNI LAND M00		
	50 OAK ST YALES	0.41		MUNICIPAL M96		
	15 OLD COLONY RD	3.02		MUNI LAND M00		
	1110 YALE AVE	0.5		MUNI LAND M00		
	13 PARTRIDGE RUN	0.74		MUNICIPAL M96		
	SHARON DR (REAR)	0.17		MUN PUB SC M94		
	415 CHURCH ST YALESVILLE	6.84		MUNICIPAL M96		
	980 NORTH MAIN ST EXT	0.55		Mun Pump Hse		
	TOWER DR	0.91		MUNICIPAL M96		
	130 THORPE AVE	1.67		MUNI LAND M00		
	16 DONAT DR	8		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	21 RIDGEFIELD RD	0.14		MUN PUB SC M94		
	141 HOPE HILL RD	40.31		MUN FIRE		
	143 HOPE HILL RD	0.92		MUN PUB SC M94		
	140 HOPE HILL RD	44.46		MUN PUB SC M94		
	200 HIGHLAND AVE	13.99		MUNI LAND M00		
	326 MAIN ST	0.16		MUNI LAND M00		
	MAIN ST	13.23		MUNI LAND M00		
	361 MAIN ST	0.07		MUNI LAND M00		
	MAIN ST	9.32		MUNICIPAL M94		
	6 FAIRFIELD BLVD	3.79		MUNI LAND M00		
	3 CARPENTER LN	1		MUNI LAND M00		
	218 HIGH HILL RD	94.2		MUNI LAND M00		
	30 RIDGENOLL RD	3.73		MUNI LAND M00		
	33 RIDGENOLL RD	0.23		MUNI LAND M00		
	58 RIDGEFIELD RD	5.54		MUNI LAND M00		
	101 RIDGEWOOD RD	0.08		MUNI LAND M00		
	67 RIDGEWOOD RD	3.62		MUNI LAND M00		
	11 RIDGELAND RD	0.09		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	75 JENNA RD	4.96		MUNI LAND M00		
	205 MAIN ST	20.16		MUNI LAND M00		
	202 MAIN ST	28.69		MUNI LAND M00		
	864 NORTH FARMS RD	10.29		MUNI LAND M00		
	1211 BARNES RD	2.44		MUNI LAND M00		
	CT ROUTE 68	0.26		MUNI LAND M00		
	WISK-KEY WIND RD	5.42		MUNI LAND M00		
	162 HIGH HILL RD	53.1		MUNI LAND M00		
	GAYLORD FARM RD	2.4		MUN PUB SC M94		
	30 PARKER FARMS RD	20		Vacant Unb Lnd		
	60 PARKER FARMS RD	1		MUNI LAND M00		
	99 NORTH TURNPIKE RD	0.44		MUNI LAND M00		
	91 NORTH TURNPIKE RD	18.43		MUNI LAND M00		
	109 NORTH TURNPIKE RD	0.07		MUNICIPAL M96		
	107 NORTH TURNPIKE RD	1.86		MUNI LAND M00		
	155 GRIEB RD	7.19		MUNI LAND M00		
	2 CATLIN RD	0.91		MUNI LAND M00		
	243 GRIEB RD	0.39		MUNICIPAL M96		
	1 GRIEB RD	0.59		MUNI LAND M00		

Title	Location	Acres	Year Built	Utilization or Land Class	Stormwater Flow ¹	Current Infrastructures
	1300 BARNES RD	2.25		MUNI LAND M00		
	159 CHESHIRE RD	21		MUNI LAND M00		
	TUTTLE AVE	0.46		MUNI LAND M00		
	18 MOHICAN LN	4.04		MUNICIPAL M94		
Department of Public Works	29 TOWN FARM RD	7.05		MUNI LAND M00	Topography across the site is generally flat, with a gentle slope in a north-northeasterly direction. Stormwater runoff is directed to catch basins, where it eventually discharges to an unnamed stream to the north.	Oil/Water Separator, catch basins.
	700 NORTH MAIN ST EXT	15.44		MUNICIPAL M96		
	739 NORTH MAIN ST EXT	7.1		MUNI LAND M00		
	1207 DURHAM RD	0.06		MUNI LAND M00		
	47 GRIEB TRL	0.1		MUNI LAND M00		
	14 CARTER TRL	0.31		MUNI LAND M00		
	531 NORTH BRANFORD RD	67.78		MUNICIPAL M96		

Source: Created by Atlas (2021).

5.2 Non-Municipal Retrofitting

Retrofit Projects can be applied to non-municipal facilities, parks, communities, or other developments, and be counted towards the Town's disconnect percentage. Atlas recommends applying ordinances, post-construction maintenance plans, or other legal regulations associated with the construction, upgrade, and/or rehabilitation of non-Town owned properties to achieve retrofitting.

Specific criteria was utilized in defining priority areas for the implementation of non-municipal Retrofit Projects. The criteria utilized in defining priority areas of non-municipal Retrofit Projects included High or Problem catchment priority rankings, catchments containing an impaired waterbody, and catchments identified with an urbanized area. Utilizing ArcGIS, Atlas extracted catchments where two (2) or more of the aforementioned criteria were found. **Table 13** details these catchments, and may act as a guide for the Town to focus non-municipal retrofitting efforts. **Figure 5** depicts the location of the extracted catchments prioritized for non-municipal Retrofit Projects.

Table 13 – Non-Municipal Retrofitting

Catchment ID	Total Acres (Ac.)	Priority Ranking	Impaired Waterbody	Urbanized Area Percentage (%)
Quinnipiac River				
5200-00-4-L3	934.4	Problem	Quinnipiac River (North Haven/Meriden)-02	100.00
5200-00-4-R10	675.6	High Priority	Quinnipiac River (North Haven/Meriden)-02	100.00
5200-00-4-R11	274.4	Problem	Quinnipiac River (North Haven/Meriden)-02	99.99
5200-00-4-R12	737.8	High Priority	Quinnipiac River (North Haven/Wallingford)-01	86.18
5200-00-4-R7	2,322.3	High Priority	Quinnipiac River (North Haven/Meriden)-02	67.72
5200-00-4-R8	766.4	High Priority	Quinnipiac River (North Haven/Meriden)-02	100.00
5200-10-1	1,214.3	High Priority	Meetinghouse Brook (Wallingford)-01	12.97
5200-10-2-R1	528.6	High Priority	Meetinghouse Brook (Wallingford)-01	100.00
5200-13-1	1,121.2	High Priority	Quinnipiac River (North Haven/Meriden)-02	100.00
Wharton Brook				
5207-00-1	736.5	High Priority	Unnamed Tributary to Wharton Brook (Wallingford)-01	100.00
5207-00-1-L1	488.1	Low Priority	Wharton Brook-02	99.20
5207-00-1-L2	1,397.1	High Priority	Wharton Brook-02	100.00
5207-00-2-R1	380.8	High Priority	Allen Brook (Wallingford/North Haven)-01	100.00

Catchment ID	Total Acres (Ac.)	Priority Ranking	Impaired Waterbody	Urbanized Area Percentage (%)
5207-00-2-R2	161.2	High Priority	Meetinghouse Brook (Wallingford)-01	55.58
5207-01-1	906.2	High Priority	Unnamed Tributary to Wharton Brook (Wallingford)-01	90.49
5207-02-1	2.4	Problem	Allen Brook (Wallingford/North Haven)-01	57.92
5207-02-1-L1	822.4	High Priority	Allen Brook (Wallingford)-02	79.25
Muddy River				
5208-00-3-L2	891.4	Low Priority	Muddy River (North Haven)-02a	16.69
5208-00-3-L3	881.4	High Priority	Muddy River (North Haven)-02a	24.87
5208-00-3-R2	701.2	Problem	Muddy River (North Haven)-02a	0.43
5208-00-3-R3	167.2	High Priority	Muddy River (North Haven)-02a	40.22

Source: Created by Atlas Technical Consultants (2021)

5.3 Retrofit Planning

The following Retrofit Projects are recommended for implementation by the Town. This Program is ongoing, and is dependent on available information, costs, installation periods, and town-wide discussions. As Retrofit Projects are implemented, the Town should update the Impervious Cover Tracking Spreadsheet, located in **Appendix V**. Atlas will continue to assess and recommend Retrofit Projects for the Town's municipal sites. As these sites are assessed, addendums to **Table 14** will be submitted to the Town.

Table 14 – Retrofit Planning

Title	Location(s)	Retrofit(s) Recommended	Projected Disconnected Area (Ac.)	Cost Analysis	Projected Implementation Date
Department of Public Works	29 TOWN FARM RD	Install rain barrels to catch roof runoff. Utilize runoff to irrigate neighboring baseball fields.	1.15	Refer to Section 3.2.	2022-2025
Pond Hill Elementary School	299 POND HILL RD	Install rain barrels or cistern to catch roof runoff. Utilize runoff to water the site's grassy areas.	0.91	Refer to Section 3.2	2022-2025
		Remove or slot curbing to allow for stormwater infiltration into grassy areas.	1.64	Refer to Section 3.5.1	2022-2025
Wallingford Fire Marshall	75 MASONIC AVE	Install rain barrels to catch roof runoff. Utilize runoff to water grassy areas.	0.33	Refer to Section 3.2.	2022-2025
		Remove or slot curbing to allow for stormwater infiltration into grassy areas.	1.45	Refer to Section 3.5.1	2022-2025
		During repaving, redirect MS4 catch basins and associated piping to a bioretention or infiltration basin.	1.78	Refer to Section 3.1.3	2022-2025
Wallingford Recycling Center	25 PENT RD	Remove or slot curbing to allow for stormwater infiltration into grassy areas.	1.36	Refer to Section 3.5.1	2022-2025
		During repaving, redirect MS4 catch basins and associated piping to a bioretention or infiltration basin.	1.42	Refer to Section 3.1.3	2022-2025

Title	Location(s)	Retrofit(s) Recommended	Projected Disconnected Area (Ac.)	Cost Analysis	Projected Implementation Date
Cook Hill Elementary School	57 HALL RD	During repaving, redirect MS4 catch basins and associated piping to a bioretention or infiltration basin.	3.37	Refer to Section 3.1.3	2022-2025
		Remove or slot curbing to allow for stormwater infiltration into grassy areas.	1.91	Refer to Section 3.5.1	2022-2025
		Install rain barrels to catch roof runoff. Utilize runoff to water grassy areas.	1.46	Refer to Section 3.2	2022-2025
Moses Y Beach Elementary School	340 NORTH MAIN ST	Remove or slot curbing to allow for stormwater infiltration into grassy areas.	1.28	Refer to Section 3.5.1	2022-2025
		Reroute roof runoff to constructed rain gardens.	1.03	Refer to Section 3.1.4	2022-2025
		Install rain barrels to catch roof runoff. Utilize runoff to water grassy areas or the neighboring baseball field.	1.03	Refer to Section 3.2	2022-2025

Source: Created by Atlas 2021.

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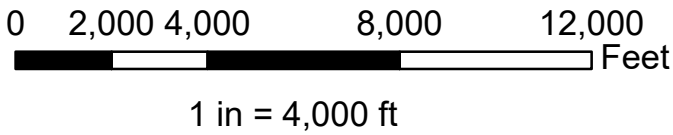
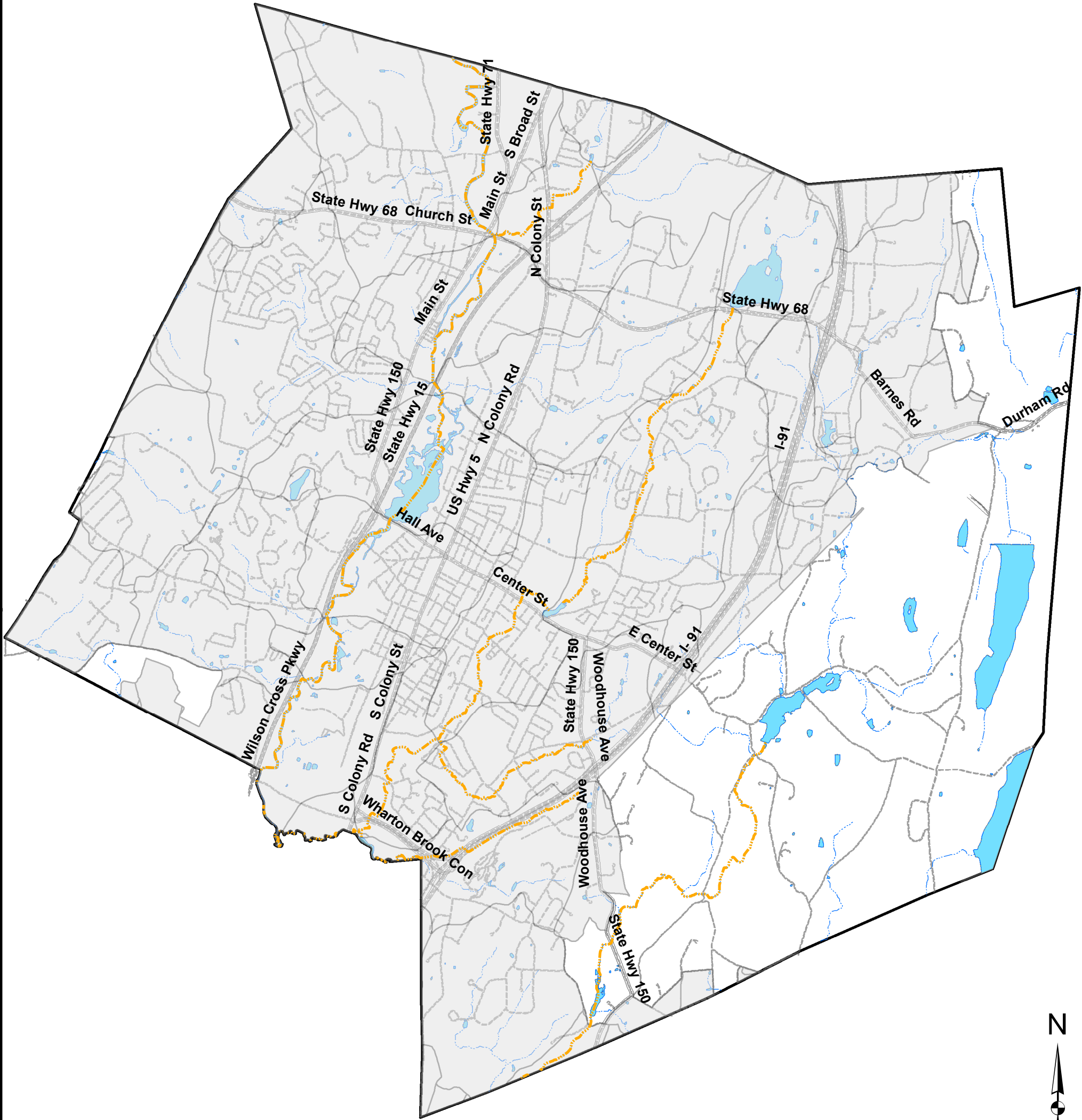
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APPENDIX II FIGURES



Town Of Wallingford
Stormwater Retrofit Program
Urbanized Areas by Catchment

Legend

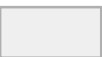
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-  Surface Water
-  Urbanized Area by Catchment
-  Town Line
-  Main Road

Fig No.
1

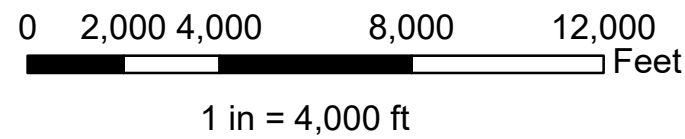
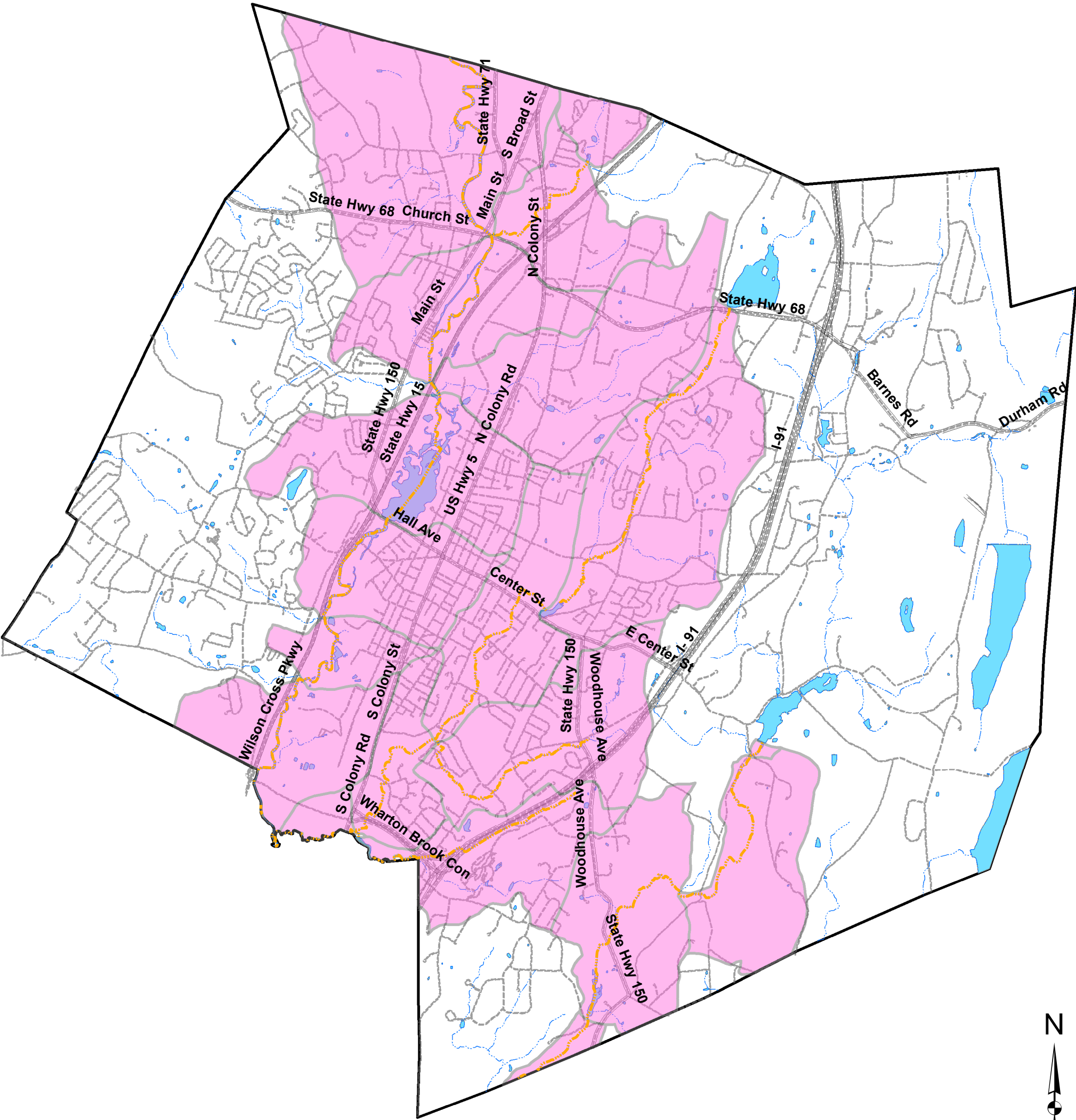
Drawn By: KLL

Checked by: LRW

Date: 2021



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Town Of Wallingford
Stormwater Retrofit Program
Impaired Waterbodies by Catchment

Legend

Impaired Waterbody

Main Road

Surface Water

Town Line

Impaired Waters by Catchment

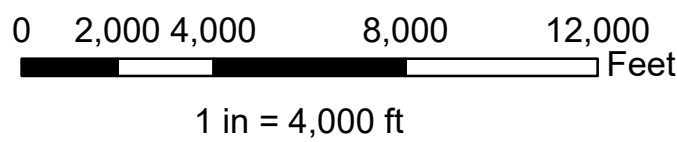
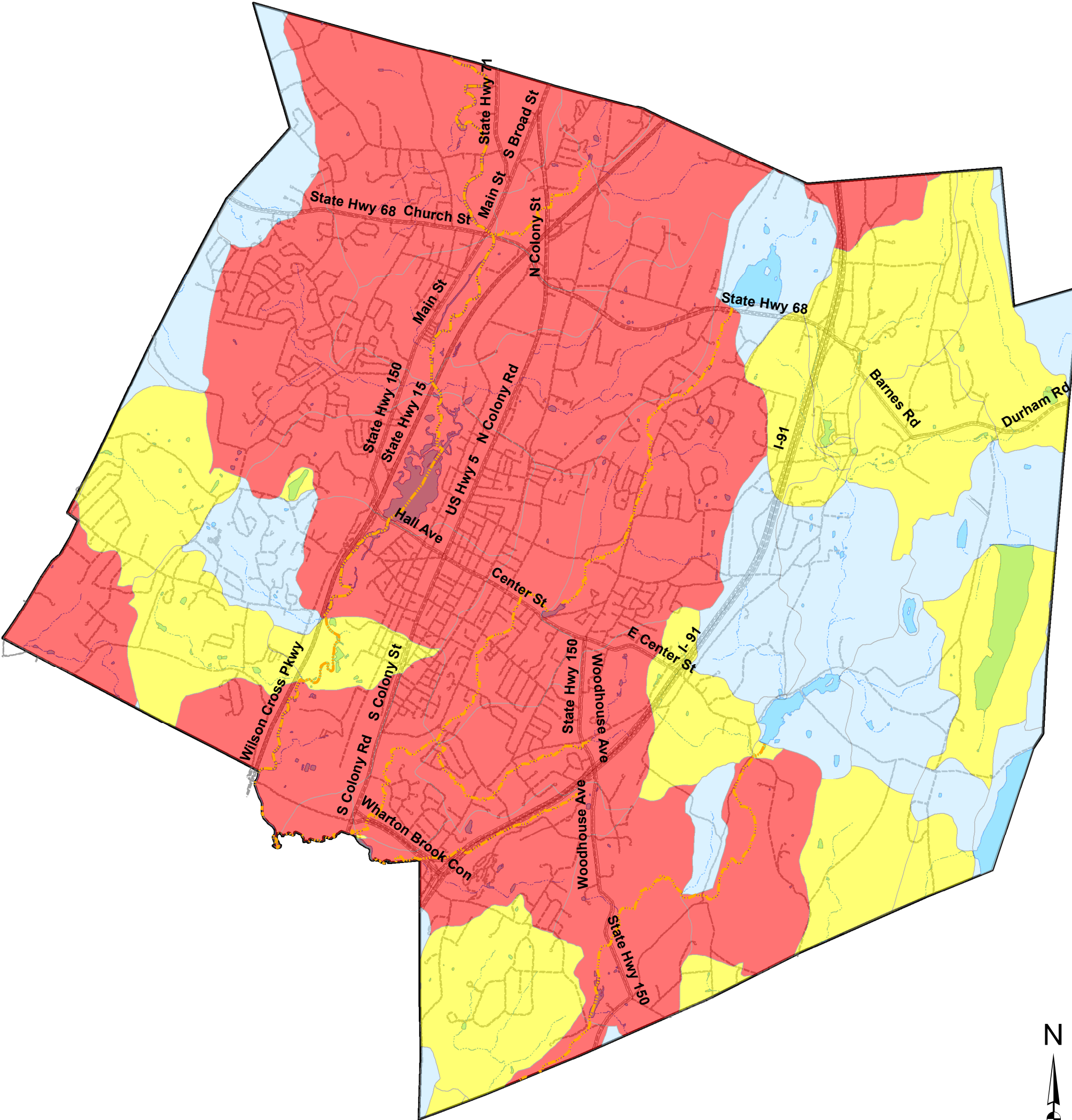
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Town Of Wallingford
Stormwater Retrofit Program
Catchment Rankings

Legend

Impaired Waterbody

Main Road

Surface Water

Town Line

High Priority

Problem

Low Priority

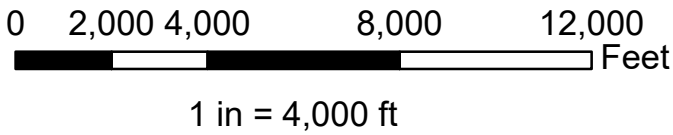
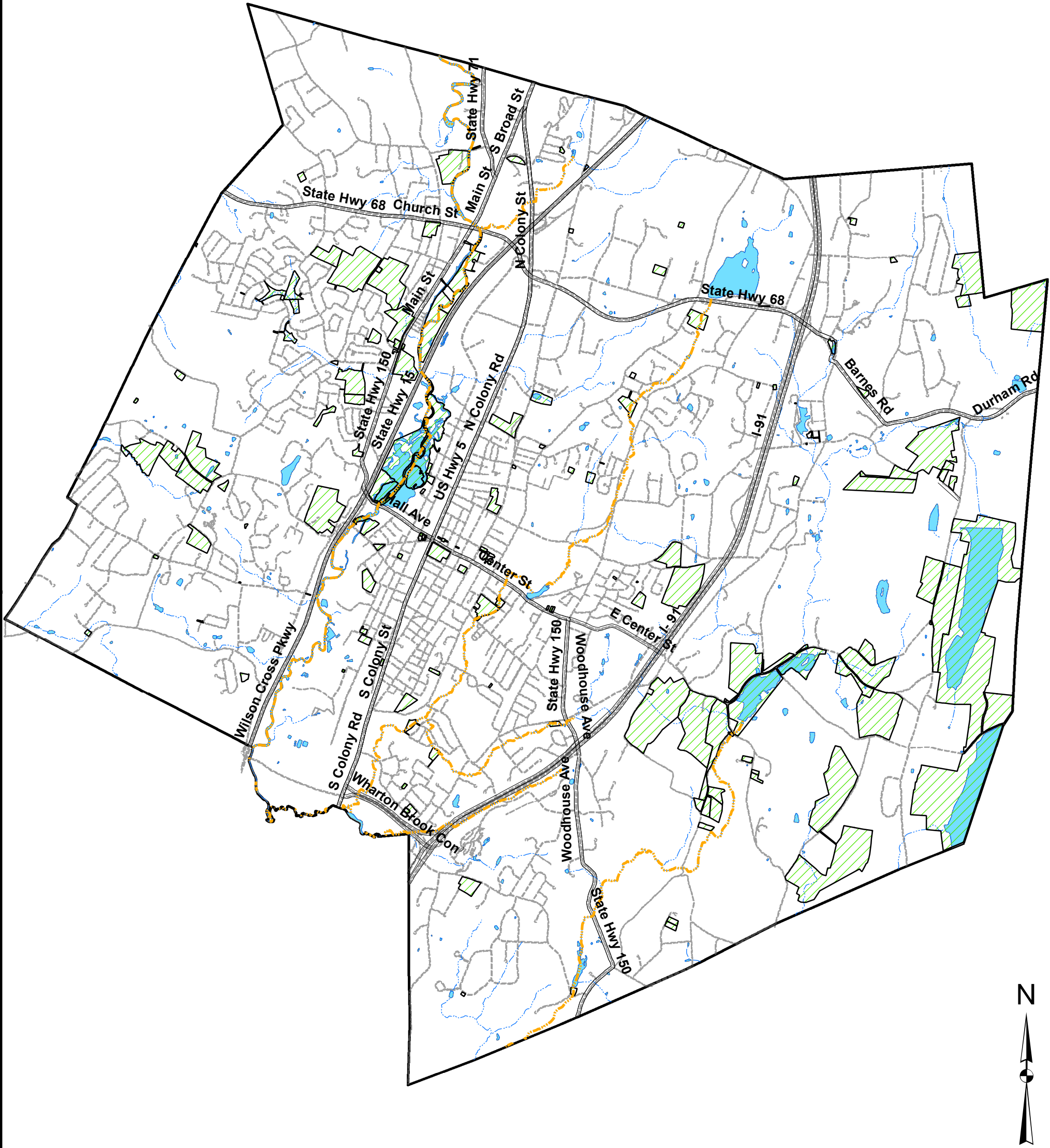
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Town Of Wallingford

Stormwater Retrofit Program

Municipal Owned Facilities and Parks

Legend

- Impaired Waterbody
- Main Road
- Surface Water
- Town Line
- Municipal Owned

Fig No.
4

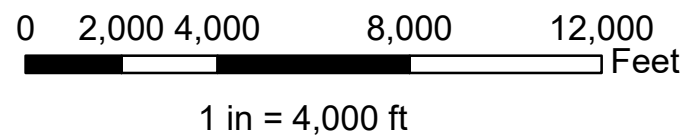
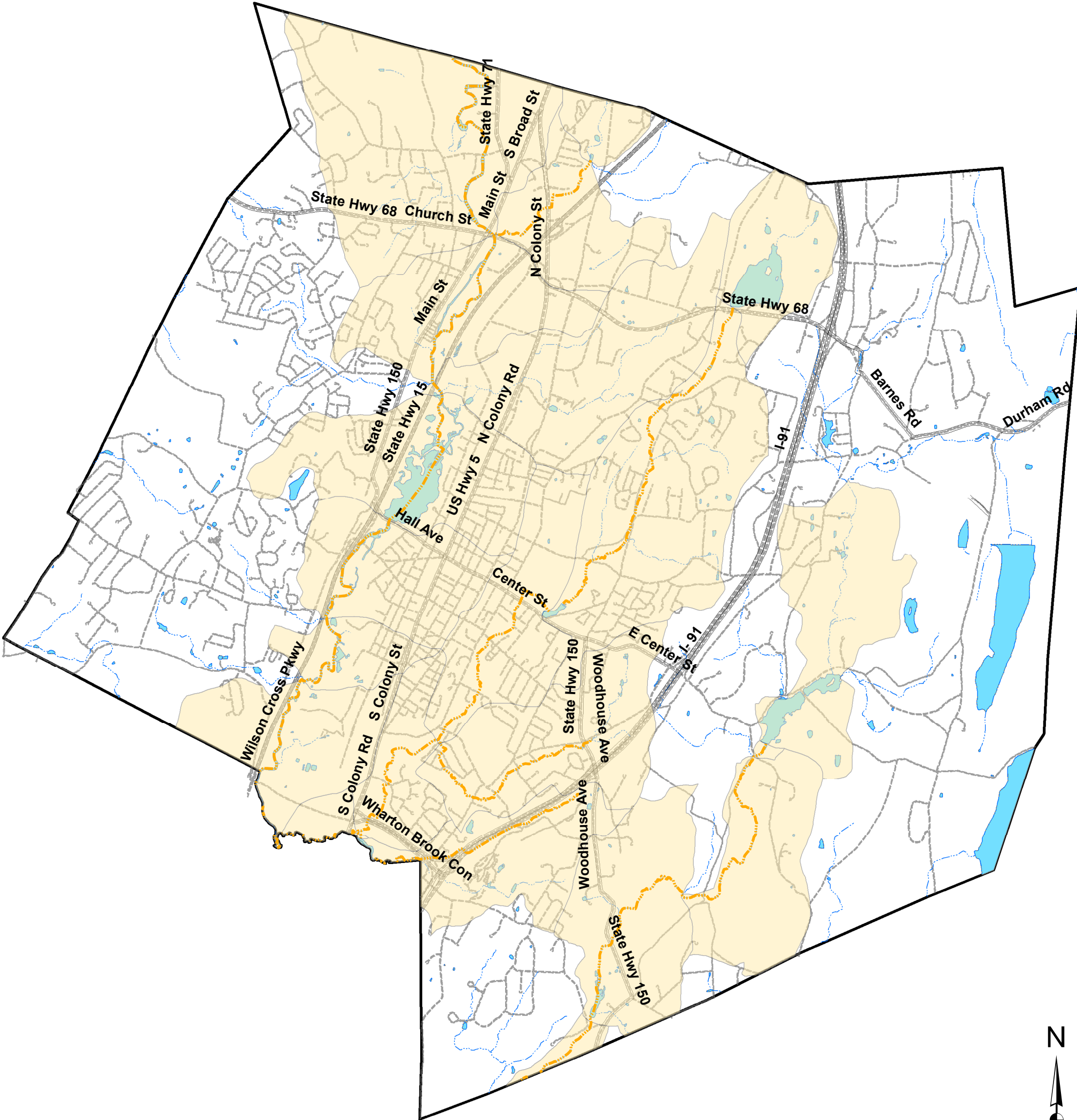
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Date: 2021



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Town Of Wallingford
Stormwater Retrofit Program
Non-Municipal Retrofitting by Catchment

Legend

 Impaired Waterbody

 Prioritized Non-Municipal Retrofit by Catchment

 Main Road

 Surface Water

 Town Line

Fig No.
5

Drawn By: KLL

Checked by: LRW

Date: 2021



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APPENDIX III
BUFFER ORDINANCE TEMPLATE

Aquatic Buffer Model Ordinance



This ordinance focuses primarily on stream buffers. Communities creating coastal buffers may wish to incorporate additional features. For an example of a coastal buffer ordinance, see the Rhode Island ordinance.

Section I. Background

Buffers adjacent to stream systems and coastal areas provide numerous environmental protection and resource management benefits that can include the following:

- 1) Restoring and maintaining the chemical, physical, and biological integrity of the water resources
- 2) Removing pollutants delivered from urban stormwater
- 3) Reducing erosion and sediment entering the stream
- 4) Stabilizing stream banks
- 5) Providing infiltration of stormwater runoff
- 6) Maintaining base flow of streams
- 7) Contributing the organic matter that is a source of food and energy for the aquatic ecosystem
- 8) Providing tree canopy to shade streams and promote desirable aquatic organisms



This benefit applies primarily to forested buffer systems. In some communities, such as prairie settings, the native vegetation may not be forest. See the example ordinance from Omaha, Nebraska, for an example.

- 9) Providing riparian wildlife habitat
- 10) Furnishing scenic value and recreational opportunity

It is the desire of the _____ (Natural Resources or Planning Agency) to protect and maintain the native vegetation in riparian and wetland areas by implementing specifications for the establishment, protection, and maintenance of vegetation along all stream systems and/or coastal zones within our jurisdictional authority.

Section II. Intent

The purpose of this ordinance is to establish minimal acceptable requirements for the design of buffers to protect the streams, wetlands, and floodplains of _____ (jurisdiction); to protect the water quality of watercourses, reservoirs, lakes, and other significant water resources within _____ (jurisdiction); to protect _____'s (Jurisdiction's) riparian and aquatic ecosystems; and to provide for the environmentally sound use of _____'s (jurisdiction's) land resources.

Section III. Definitions

Active Channel	The area of the stream channel that is subject to frequent flows (approximately once per one and a half years) and that includes the portion of the channel below the floodplain.
Best Management Practices (BMPs)	Conservation practices or management measures that control soil loss and reduce water quality degradation caused by nutrients, animal wastes, toxics, sediment, and runoff.

Buffer	A vegetated area, including trees, shrubs, and herbaceous vegetation, that exists or is established to protect a stream system, lake, reservoir, or coastal estuarine area. Alteration of this natural area is strictly limited.
Development	1) The improvement of property for any purpose involving building 2) Subdivision or the division of a tract or parcel of land into two or more parcels 3) The combination of any two or more lots, tracts, or parcels of property for any purpose 4) The preparation of land for any of the above purposes
Nontidal Wetlands	Those areas not influenced by tidal fluctuations that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.
	<i>The definition of "nontidal wetland" here is adapted from the definition of "wetland" used by the USEPA and the US Army Corps of Engineers.</i>
Nonpoint Source Pollution	Pollution that is generated by various land use activities rather than from an identifiable or discrete source and is conveyed to waterways through natural processes, such as rainfall, stormwater runoff, or groundwater seepage rather than direct discharges.
One Hundred-Year Floodplain	The area of land adjacent to a stream that is subject to inundation during a storm event that has a recurrence interval of 100 years.
Pollution	Any contamination or alteration of the physical, chemical, or biological properties of any waters that will render the waters harmful or detrimental to 1) Public health, safety, or welfare 2) Domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses 3) Livestock, wild animals, or birds 4) Fish or other aquatic life
Stream Channel	Part of a watercourse either naturally or artificially created that contains an intermittent or perennial base flow of groundwater origin. Base flows of groundwater origin can be distinguished by any of the following physical indicators: 1) Hydrophytic vegetation, hydric soil, or other hydrologic indicators in the area(s) where groundwater enters the stream channel in the vicinity of the stream headwaters, channel bed, or channel banks 2) Flowing water not directly related to a storm event 3) Historical records of a local high groundwater table, such as well and stream gauge records.
Stream Order	A classification system for streams based on stream hierarchy. The smaller the stream, the lower its numerical classification. For example, a first-order stream

does not have tributaries and normally originates from springs and/or seeps.
(See Figure 1.)

Stream System	A stream channel together with one or both of the following: 1) 100-year floodplain 2) Hydrologically related nontidal wetland
Streams	Perennial and intermittent watercourses identified through site inspection and US Geological Survey (USGS) maps. Perennial streams are those which are depicted on a USGS map with a solid blue line. Intermittent streams are those which are depicted on a USGS map with a dotted blue line.



Defining the term “stream” is perhaps the most contentious issue in the definition of stream buffers. This term determines the origin and the length of the stream buffer. Although some jurisdictions restrict the buffer to perennial or “blue line” streams, others include both perennial and intermittent streams in the stream buffer program. Some communities do not rely on USGS maps and instead prepare local maps of all stream systems that require a buffer.

Water Pollution	A land use or activity that causes a relatively high risk of potential water pollution.
-----------------	---

Hazard

Section IV. Applications

- A) This ordinance shall apply to all proposed development except for that development which meets waiver or variance criteria as outlined in Section IX of this regulation.
- B) This ordinance shall apply to all timber harvesting activities, except those timber harvesting operations which are implementing a forest management plan that has been deemed to be in compliance with the regulations of the buffer ordinance and has received approval from _____(state forestry agency).
- C) This ordinance shall apply to surface mining operations except that the design standards shall not apply to active surface mining operations that are operating in compliance with an approved _____(state or federal agency) surface mining permit.
- D) The ordinance shall not apply to agricultural operations that are covered by an approved Natural Resources Conservation Service (NRCS) conservation plan that includes the application of BMPs.



Communities should carefully consider whether exempt agricultural operations from the buffer ordinance because buffer regulations may take land out of production and impose a financial burden on family farms. Many communities exempt agricultural operations if they have an approved NRCS conservation plan. In some regions, agricultural buffers may be funded through the Conservation Reserve Program (CRP). For further information, consult the Conservation Technology Information Center (CTIC) at www.ctic.perdue.edu.



Livestock operations near and around streams may be regulated by communities. Livestock can significantly degrade the stream system and accelerate streambank erosion. The King County Livestock Management Ordinance is one example of a local livestock ordinance. For more information, contact the King County Department of Development and Environmental Services at (206) 296-6602.

- E) Except as provided in Section IX, this ordinance shall apply to all parcels of land, structures, and activities that are causing or contributing to

- 1) Pollution, including nonpoint source pollution, of the waters of the jurisdiction adopting this ordinance
- 2) Erosion or sedimentation of stream channels
- 3) Degradation of aquatic or riparian habitat

Section V. Plan Requirements

- A) In accordance with Section IV of this ordinance, a plan approved by the appropriate agency is required for all development, forest harvesting operations, surface mining operations, and agricultural operations.
- B) The plan shall set forth an informative, conceptual, and schematic representation of the proposed activity by means of maps, graphs, charts, or other written or drawn documents so as to enable the agency an opportunity to make a reasonably informed decision regarding the proposed activity.
- C) The plan shall contain the following information:



The ordinance can identify the scale of maps to be included with the analyses in items 2) through 7). A 1"=50' to 1"=100' scale will generally provide sufficient detail.

- 1) A location or vicinity map
- 2) Field-delineated and surveyed streams, springs, seeps, bodies of water, and wetlands (include a minimum of 200 feet into adjacent properties)
- 3) Field delineated and surveyed forest buffers
- 4) Limits of the ultimate 100-year floodplain



The limits of the ultimate floodplain (i.e., the floodplain under "built-out" conditions) might not be available in all locations.

- 5) Hydric soils mapped in accordance with the NRCS soil survey of the site area
- 6) Steep slopes greater than 15 percent for areas adjacent to and within 200 feet of streams, wetlands, or other waterbodies



The ordinance may also explicitly define how slopes are measured. For example, the buffer may be divided into sections of a specific width (e.g., 25 feet) and the slope for each segment reported. Alternatively, slopes can be reported in segments divided by breaks in slope.

- 7) A narrative of the species and distribution of existing vegetation within the buffer
- D) The buffer plan shall be submitted in conjunction with the required grading plan for any development, and the forest buffer should be clearly delineated on the final grading plan.
- E) Permanent boundary markers, in the form of signage approved by _____ (natural resources or planning agency), shall be installed prior to final approval of the required clearing and grading plan. Signs shall be placed at the edge of the middle zone (See Section VI.I).

Section VI. Design Standards for Forest Buffers

- A) A forest buffer for a stream system shall consist of a forested strip of land extending along both sides of a stream and its adjacent wetlands, floodplains, or slopes. The forest buffer width shall be adjusted to include contiguous sensitive areas, such as steep slopes or erodible soils, where development or disturbance may adversely affect water quality, streams, wetlands, or other waterbodies.

- B) The forest buffer shall begin at the edge of the stream bank of the active channel.
- C) The required width for all forest buffers (i.e., the base width) shall be a minimum of 100 feet, with the requirement to expand the buffer depending on
 - 1) Stream order
 - 2) Percent slope
 - 3) 100-year floodplain
 - 4) Wetlands or critical areas



The width of the stream buffer varies from 20 feet to 200 feet in ordinances throughout the United States (Heraty, 1993). The width chosen by a jurisdiction will depend on the sensitivity and characteristics of the resource being protected and the political realities in the community.

- B) In third-order and higher streams, 25 feet shall be added to the base width of the forest buffer.
- C) The forest buffer width shall be modified if steep slopes are within close proximity to the stream and drain into the stream system. In those cases, the forest buffer width may be adjusted.



Several methods may be used to adjust buffer width for steep slopes. Two examples ifollow:

Method A

Percent	Width of Buffer
15%-17%	add 10 feet
18%-20%	add 30 feet
21%-23%	add 50 feet
24%-25%	add 60 feet

Method B

Percent Slope	Type of Stream Use	
	Water Contact Recreational Use	Sensitive Stream Habitat
0% to 14%	no change	add 50 feet
15% to 25%	add 25 feet	add 75 feet
Greater than 25%	add 50 feet	add 100 feet

- D) Forest buffers shall be extended to encompass the entire 100-year floodplain and a zone with a minimum width of 25 feet beyond the edge of the floodplain.
- E) When wetland or critical areas extend beyond the edge of the required buffer width, the buffer shall be adjusted so that the buffer consists of the extent of the wetland plus a 25-foot zone extending beyond the wetland edge.
- H) Water Pollution Hazards
The following land uses and/or activities are designated as potential water pollution hazards

and must be set back from any stream or waterbody by the distance indicated below:

- 1) Storage of hazardous substances—(150 feet)
- 2) Aboveground or underground petroleum storage facilities—(150 feet)
- 3) Drainfields from onsite sewage disposal and treatment systems (i.e., septic systems)—(100 feet)
- 4) Raised septic systems—(250 feet)
- 5) Solid waste landfills or junkyards—(300 feet)
- 6) Confined animal feedlot operations—(250 feet)
- 7) Subsurface discharges from a wastewater treatment plant—(100 feet)
- 8) Land application of biosolids—(100 feet)



For surface water supplies, the setbacks should be doubled.



A community should carefully consider which activities or land uses should be designated as potential water pollution hazards. The list of potential hazards shown above is not exhaustive, and others may need to be added depending on the major pollutants of concern and the uses of water.

- l) The forest buffer shall be composed of three distinct zones, with each zone having its own set of allowable uses and vegetative targets as specified in this ordinance. (See Figure 2.)



Although a three-zone buffer system is highly recommended, the widths and specific uses allowed in each zone may vary between jurisdictions.

- l) Zone 1, Streamside Zone
 - a) Protects the physical and ecological integrity of the stream ecosystem.
 - b) Begins at the edge of the stream bank of the active channel and extends a minimum of 25 feet from the top of the bank.
 - c) Allowable uses within this zone are highly restricted to
 - i) Flood control structures
 - ii) Utility right of ways
 - iii) Footpaths
 - iv) Road crossings, where permitted
 - d) Target for the streamside zone is undisturbed native vegetation.



This ordinance assumes that the native vegetation in the stream corridor is forest. In some regions of the United States, other vegetation such as prairie may be native. See the Omaha, Nebraska, buffer ordinance for an example of a stream buffer ordinance that protects nonforested systems.

- 2) Zone 2, Middle Zone
 - a) Protects key components of the stream and provides distance between upland development and the streamside zone.
 - b) Begins at the outer edge of the streamside zone and extends a minimum of 50 feet plus any additional buffer width as specified in this section.
 - c) Allowable uses within the middle zone are restricted to
 - i) Biking or hiking paths
 - ii) Stormwater management facilities, with the approval of _____ (local agency responsible for stormwater).

- iii) Recreational uses as approved by _____ (*planning agency*).
 - iv) Limited tree clearing with approval from _____ (*forestry agency or planning agency*).
- d) Targets mature native vegetation adapted to the region.
- 3) Zone 3, Outer Zone
 - a) Prevents encroachment into the forest buffer and filters runoff from residential and commercial development.
 - b) Begins at the outward edge of the middle zone and provide a minimum width of 25 feet between Zone 2 and the nearest permanent structure.
 - c) Restricts septic systems, permanent structures, or impervious cover, with the exception of paths.
 - d) Encourages the planting of native vegetation to increase the total width of the buffer.

Section VII. Buffer Management and Maintenance

- A) The forest buffer, including wetlands and floodplains, shall be managed to enhance and maximize the unique value of these resources. Management includes specific limitations on alteration of the natural conditions of these resources. The following practices and activities are restricted within Zones 1 and 2 of the forest buffer, except with approval by _____ (*forestry, planning or natural resources agency*)
 - 1) Clearing of existing vegetation
 - 2) Soil disturbance by grading, stripping, or other practices
 - 3) Filling or dumping
 - 4) Drainage by ditching, underdrains, or other systems
 - 5) Use, storage, or application of pesticides, except for spot spraying of noxious weeds or non-native species consistent with recommendations of _____ (*forestry agency*)
 - 6) Housing, grazing, or other maintenance of livestock
 - 7) Storage or operation of motorized vehicles, except for maintenance and emergency use approved by _____ (*forestry, planning, or natural resources agency*)
- B) The following structures, practices, and activities are permitted in the forest buffer, with specific design or maintenance features, subject to the review of _____ (*forestry, planning, or natural resources agency*):
 - 1) Roads, bridges, paths, and utilities:
 - a) An analysis needs to be conducted to ensure that no economically feasible alternative is available.
 - b) The right-of-way should be the minimum width needed to allow for maintenance access and installation.
 - c) The angle of the crossing shall be perpendicular to the stream or buffer to minimize clearing requirements
 - d) The minimum number of road crossings should be used within each subdivision, and no more than one fairway crossing is allowed for every 1,000 feet of buffer.
 - 2) Stormwater management:
 - e) An analysis needs to be conducted to ensure that no economically feasible alternative is available and that the project either is necessary for flood control or significantly improves the water quality or habitat in the stream.
 - f) In new developments, onsite and nonstructural alternatives will be preferred over larger facilities within the stream buffer.

- g) When constructing stormwater management facilities (i.e., BMPs), the area cleared will be limited to the area required for construction and adequate maintenance access as outlined in the most recent edition of _____ (refer to *stormwater manual*).



Rather than placing specific stormwater BMP design criteria in an ordinance, it is often preferable to reference a manual. With this approach, specific design information can be changed over time without going through the formal process needed to change ordinance language.



The Maryland Stormwater Design Manual is one example of an up-to-date stormwater design manual. For more information, go to www.mde.state.md.us. Under topics, choose "Stormwater Design Manual."

- h) Material dredged or otherwise removed from a BMP shall be stored outside the buffer.
- 3) Stream restoration projects, facilities, and activities approved by _____ (forestry, planning, or natural resources agency) are permitted within the forest buffer.
- 4) Water quality monitoring and stream gauging are permitted within the forest buffer, as approved by _____ (forestry, planning or natural resources agency):.
- 5) Individual trees within the forest buffer that are in danger of falling, causing damage to dwellings or other structures, or causing blockage of the stream may be removed.
- 6) Other timber cutting techniques approved by the agency may be undertaken within the forest buffer under the advice and guidance of _____ (state or federal forestry agency) if necessary to preserve the forest from extensive pest infestation, disease infestation, or threat from fire.
- C) All plans prepared for recording and all right-of-way plans shall clearly
- 1) Show the extent of any forest buffer on the subject property
- 2) Label the forest buffer
- 3) Provide a note to reference any forest buffer stating: "There shall be no clearing, grading, construction or disturbance of vegetation except as permitted by the agency."
- 4) Provide a note to reference any protective covenants governing all forest buffer areas stating: "Any forest buffer shown hereon is subject to protective covenants that may be found in the land records and that restrict disturbance and use of these areas."
- D) All forest buffer areas shall be maintained through a declaration of protective covenant, which is required to be submitted for approval by _____ (planning board or agency). The covenant shall be recorded in the land records and shall run with the land and continue in perpetuity.



This protective covenant can be kept either by the local government agency responsible for management of environmental resources or by an approved nonprofit organization. An example conservation easement is included later in this section.

- E) All lease agreements must contain a notation regarding the presence and location of protective covenants for forest buffer areas and shall contain information on the management and maintenance requirements for the new property owner.
- F) An offer of dedication of a forest buffer area to the agency shall not be interpreted to mean that this automatically conveys to the general public the right of access to this area.
- G) _____ (responsible individual or group) shall inspect the buffer annually and immediately following severe storms for evidence of sediment deposition, erosion, or concentrated flow channels and corrective actions taken to ensure the integrity and functions

of the forest buffer.



A local ordinance will need to designate the individual or group responsible for buffer maintenance. Often, the responsible party will be identified in protective covenants associated with the property.

- H) Forest buffer areas may be allowed to grow into their vegetative target state naturally, but methods to enhance the successional process such as active reforestation may be used when deemed necessary by _____ (natural resources or forestry agency) to ensure the preservation and propagation of the buffer area. Forest buffer areas may also be enhanced through reforestation or other growth techniques as a form of mitigation for achieving buffer preservation requirements.



Explicit forestry management criteria are often included in a forestry or natural resources conservation ordinance. An example forest conservation ordinance from Frederick County, Maryland is included in the miscellaneous ordinances section of this site.

Section VIII. Enforcement Procedures

- A) _____ (director of responsible agency) or his/her designee is authorized and empowered to enforce the requirements of this ordinance in accordance with the procedures of this section.
- B) If, upon inspection or investigation, the director or his/her designee is of the opinion that any person has violated any provision of this ordinance, he/she shall with reasonable promptness issue a correction notice to the person. Each such notice shall be in writing and shall describe the nature of the violation, including a reference to the provision within this ordinance that has been violated. In addition, the notice shall set a reasonable time for the abatement and correction of the violation.
- C) If it is determined that the violation or violations continue after the time fixed for abatement and correction has expired, the director shall issue a citation by certified mail to the person who is in violation. Each such notice shall be in writing and shall describe the nature of the violation, including a reference to the provision within this ordinance that has been violated and what penalty, if any, is proposed to be assessed. The person charged has 30 days within which to contest the citation or proposed assessment of penalty and to file a request for a hearing with the director or his/her designee. At the conclusion of this hearing, the director or his/her designee will issue a final order, subject to appeal to the appropriate authority. If, within 30 days from the receipt of the citation issued by the director, the person fails to contest the citation or proposed assessment of penalty, the citation or proposed assessment of penalty shall be deemed the final order of the director.
- B) Any person who violates any provision of this ordinance may be liable for any cost or expenses incurred as a result thereof by the agency.
- C) Penalties that may be assessed for those deemed to be in violation may include the following:
- 1) A civil penalty not to exceed \$1,000.00 for each violation. Every day that such violation(s) continue will be considered a separate offense.
 - 2) A criminal penalty in the form of a fine of not more than \$1,000.00 for each violation, imprisonment for not more than 90 days, or both. Every day that such violation(s) continue will be considered a separate offense.
 - 3) Anyone who knowingly makes any false statements in any application, record, or plan required by this ordinance shall upon conviction be punished by a fine of not more than \$1,000.00 for each violation, imprisonment for not more than 30 days, or both.



Specific penalties will vary between communities, and should reflect realistically enforceable penalties given the political realities of a jurisdiction.

- F) In addition to any other sanctions listed in this ordinance, a person who fails to comply with the provisions of this buffer ordinance shall be liable to the agency in a civil action for damages in an amount equal to twice the cost of restoring the buffer. Damages that are recovered in accordance with this action shall be used for the restoration of buffer systems or for the administration of programs for the protection and restoration of water quality, streams, wetlands, and floodplains.

Section IX. Waivers/Variances

- A) This ordinance shall apply to all proposed development except for activities that were completed prior to the effective date of this ordinance and had received the following:
 - 1) A valid, unexpired permit in accordance with development regulations
 - 2) A current, executed public works agreement
 - 3) A valid, unexpired building permit
 - 4) A waiver in accordance with current development regulations.
- B) The director of the agency may grant a variance for the following:
 - 1) Those projects or activities for which it can be demonstrated that strict compliance with the ordinance would result in a practical difficulty or financial hardship
 - 2) Those projects or activities serving a public need where no feasible alternative is available
 - 3) The repair and maintenance of public improvements where avoidance and minimization of adverse impacts to nontidal wetlands and associated aquatic ecosystems have been addressed
 - 4) Those developments which have had buffers applied in conformance with previously issued requirements
- C) Waivers for development may also be granted in two additional forms, if deemed appropriate by the director:
 - 1) The buffer width may be reduced at some points as long as the average width of the buffer meets the minimum requirement. This averaging of the buffer may be used to allow for the presence of an existing structure or to recover a lost lot, as long as the streamside zone (Zone I) is not disturbed by the reduction and no new structures are built within the 100-year floodplain.
 - 2) _____ (*planning agency*) may offer credit for additional density elsewhere on the site in compensation for the loss of developable land due to the requirements of this ordinance. This compensation may increase the total number of dwelling units on the site up to the amount permitted under the base zoning.
- D) The applicant shall submit a written request for a variance to the director of the agency. The application shall include specific reasons justifying the variance and any other information necessary to evaluate the proposed variance request. The agency may require an alternative analysis that clearly demonstrates that no other feasible alternatives exist and that minimal impact will occur as a result of the project or development.
- E) In granting a request for a variance, the director of the agency may require site design, landscape planting, fencing, signs, and water quality best management practices to reduce adverse impacts on water quality, streams, wetlands, and floodplains.

Section X. Conflict With Other Regulations

Where the standards and management requirements of this buffer ordinance are in conflict with other laws, regulations, and policies regarding streams, steep slopes, erodible soils, wetlands, floodplains, timber harvesting, land disturbance activities, or other environmental protective measures, the more restrictive shall apply.

Figure 1: Stream Order (Source: Schueler, 1995)

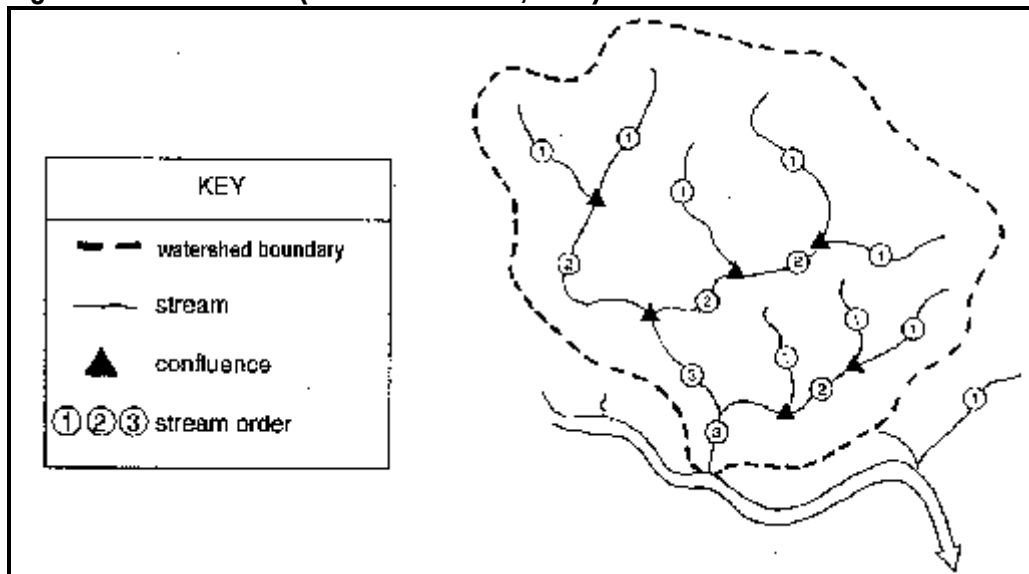
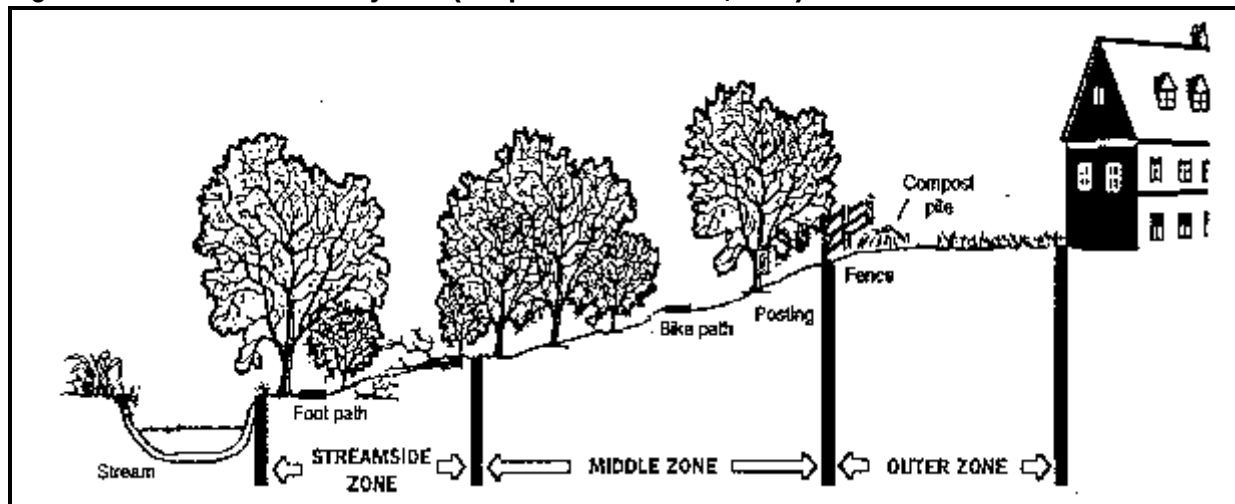


Figure 2: Three Zone Buffer System (Adapted from Welsch, 1991)



References

Heraty, M. 1993. Riparian buffer programs: a guide to developing and implementing a riparian buffer program as an urban best management practice. Metropolitan Washington Council of Governments, USEPA Office of Wetlands, Oceans and Watersheds. Washington, DC.

Schueler, T. 1995. Site planning for urban stream protection. Metropolitan Washington Council of Governments, USEPA Office of Wetlands, Oceans and Watersheds. Washington, DC.

Welsch, D. 1991. Riparian forest buffers. FS Pub. No. NA-PR-07-91. US Department of Agriculture, Forest Service. Forest Resources Management, Radnor, PA.

APPENDIX IV

DCIA CALCULATIONS

CT DEEP MS4 General Permit													
Drainage Basin Area, Drainage Sub-Basin Area and Impervious Area (IA) Tabulations and Directly Connected Impervious Area (DCIA) Computations													
Wallingford - GSM000050													
										CT ECO			CT ECO
	CT DEEP	Town		Total						State	Town	Town	Town
	Regional	Basin	CT DEEP	Basin						Road	Imp.	Imp.	Road
Town Area	Drainage	Area	Drainage	Area	Impervious Area (Ac)					Imp. Area	Area	Area	Imp. Area
Acres	Basin No.	Acres	Sub-Basin No.	Ac.	Buildings	Roads	Other	Total	%	Ac.	Ac.	%	Ac.
25,821.30	Uconn CLEAR Website				1088.52	1040.91	1938.86	4,068.29	15.76	272.59			768.32
25,822	NEMO Website												
9,414.1	5200	9,419.58	Quinnipiac River										
Check	Clipped Basin	458.26	5200-11-1	993.9	13.93	11.24	14.58	39.76	8.68	6.75	33.01	7.20	4.49
	Clipped Basin	159.92	5200-10-1	1,214.3	7.53	7.80	10.82	26.14	16.35	0.00	26.14	16.35	7.80
	Clipped Basin	1,584.95	5200-00-4-R7	2,322.3	64.35	54.11	134.91	253.36	15.99	17.62	235.74	14.87	36.49
		528.6	5200-10-2-R1	528.6	46.50	33.38	113.89	193.78	36.66	17.63	176.15	33.32	15.76
		766.4	5200-00-4-R8	766.4	77.06	44.06	160.93	282.05	36.80	18.68	263.37	34.36	25.37
		1,118.1	5200-12-1-L1	1,118.1	66.65	60.26	83.33	210.24	18.80	1.20	209.04	18.70	59.06
		1,121.2	5200-13-1	1,121.2	95.76	59.29	177.81	332.86	29.69	13.12	319.74	28.52	46.17
		30.7	5200-12-1	30.7	2.37	2.20	4.99	9.56	31.14	1.25	8.31	27.07	0.95
		934.4	5200-00-4-L3	934.4	69.75	60.06	121.83	251.64	26.93	17.77	233.87	25.03	42.29
		26.4	5200-14-1-L1	26.4	3.34	0.57	2.01	5.93	22.46	0.00	5.93	22.46	0.57
		416.3	5200-14-1	416.3	26.52	22.90	35.56	84.98	20.41	0.19	84.79	20.37	22.71
		675.6	5200-00-4-R10	675.6	87.91	59.49	126.35	273.76	40.52	20.36	253.40	37.51	39.13
		274.4	5200-00-4-R11	274.4	18.74	15.55	58.01	92.31	33.64	4.80	87.51	31.89	10.75
	Clipped Basin	600.71	5200-15-1	606.2	26.30	21.94	31.18	13.22	2.20	0.65	12.57	2.09	21.29
	Clipped Basin	668.60	5200-00-4-R12	737.8	24.86	20.37	77.34	122.50	18.32	9.12	113.38	16.96	11.25
	Clipped Basin	35.84	5200-19-1-L1	896.3	1.33	1.22	4.00	6.55	18.28	0.00	6.55	18.28	1.22
	Clipped Basin	12.99	5200-17-1	1,112.8	0.35	0.54	0.73	1.62	12.47	0.18	1.44	11.09	0.36
	Clipped Basin	0.75	5200-16-1	1,059.3	0.00	0.00	0.01	0.01	1.33	0.00	0.01	1.33	0.00
8,534.1	5208	8,563.18	Muddy River										
Check	Clipped Basin	820.65	5208-08-1	840.9	20.01	21.81	31.87	73.69	8.98	0.00	73.69	8.98	21.81
	Clipped Basin	73.25	5208-00-3-R3	167.2	1.27	1.83	2.41	5.51	7.52	0.59	4.92	6.72	1.24
	Clipped Basin	837.62	5208-00-3-L3	881.4	9.04	14.15	18.71	41.89	5.00	5.04	36.85	4.40	9.11
	Clipped Basin	694.39	5208-00-3-R2	701.2	6.02	9.28	11.16	26.46	3.81	0.00	26.46	3.81	9.28
		137.2	5208-07-1	137.2	0.03	1.73	0.06	1.83	1.33	0.00	1.83	1.33	1.73
		444.9	5208-06-1	444.9	6.83	18.71	12.14	37.69	8.47	9.56	28.13	6.32	9.16
		540.1	5208-05-1-L1	540.1	12.10	32.23	28.12	72.46	13.42	16.30	56.16	10.40	15.94
3/11/2020	Last Revised Date												

CT DEEP MS4 General Permit

Drainage Basin Area, Drainage Sub-Basin Area and Impervious Area (IA) Tabulations and Directly Connected Impervious Area (DCIA) Computations

Wallingford - GSM000050

CT DEEP	Town		Total	Town	High Connectivity			Average Connectivity			Partial Connectivity			Slight Connectivity			
Drainage	Basin	CT DEEP	Imp.	Imp.	DCIA% = 0.4*(IA%)^1.2			DCIA% = 0.1*(IA%)^1.5			DCIA% = 0.04*(IA%)^1.7			DCIA% = 0.01*(IA%)^2.0			
Sub-Basin	Area	Drainage	Area	Area	Imp.	DCIA	DCIA	Imp.	DCIA	DCIA	Imp.	DCIA	DCIA	Imp.	DCIA	DCIA	DCIA
No.	Acres	Sub-Basin No.	Ac.	%	Ac.	%	Ac.	Ac.	%	Ac.	Ac.	%	Ac.	Ac.	%	Ac.	Ac.
					HDR			MDR	Comm.	Ind.	LDR			Forest	Ag.		
								Urban Public/Institutional									
								Open Land									
5200	9,419.58	Quinnipiac River															
	458.3	5200-11-1	33.01	7.20	0.00	0.00	0.00	16.51	1.93	0.32	16.51	1.15	0.19	0.00	0.00	0.00	0.51
	159.9	5200-10-1	26.14	16.35	13.07	11.43	1.49	13.07	6.61	0.86	0.00	0.00	0.00	0.00	0.00	0.00	2.36
	1,585.0	5200-00-4-R7	235.74	14.87	117.87	10.21	12.03	117.87	5.74	6.76	0.00	0.00	0.00	0.00	0.00	0.00	18.79
	528.6	5200-10-2-R1	176.15	33.32	176.15	26.88	47.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.34
	766.4	5200-00-4-R8	263.37	34.36	263.37	27.89	73.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	73.44
	1,118.1	5200-12-1-L1	209.04	18.70	209.04	13.43	28.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.08
	1,121.2	5200-13-1	319.74	28.52	319.74	22.29	71.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.28
	30.7	5200-12-1	8.31	27.07	8.31	20.94	1.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.74
	934.4	5200-00-4-L3	233.87	25.03	233.87	19.06	44.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.58
	26.4	5200-14-1-L1	5.93	22.46	5.93	16.74	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99
	416.3	5200-14-1	84.79	20.37	84.79	14.89	12.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.62
	675.6	5200-00-4-R10	253.40	37.51	253.40	30.97	78.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	78.49
	274.4	5200-00-4-R11	87.51	31.89	87.51	25.50	22.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.31
	600.7	5200-15-1	12.57	2.09	0.00	0.00	0.00	0.00	0.00	0.00	12.57	0.14	0.02	0.00	0.00	0.00	0.02
	668.6	5200-00-4-R12	113.38	16.96	56.69	11.95	6.77	56.69	6.98	3.96	0.00	0.00	0.00	0.00	0.00	0.00	10.73
	35.8	5200-19-1-L1	6.55	18.28	6.55	13.07	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.86
	13.0	5200-17-1	1.44	11.09	0.00	0.00	0.00	0.72	3.69	0.03	0.72	2.39	0.02	0.00	0.00	0.00	0.04
	0.8	5200-16-1	0.01	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.00	0.00	0.00	0.00	0.00
5208	8,563.18	Muddy River															
	820.7	5208-08-1	73.69	8.98	0.00	0.00	0.00	36.85	2.69	0.99	36.85	1.67	0.62	0.00	0.00	0.00	1.61
	73.3	5208-00-3-R3	4.92	6.72	0.00	0.00	0.00	2.46	1.74	0.04	2.46	1.02	0.03	0.00	0.00	0.00	0.07
	837.6	5208-00-3-L3	36.85	4.40	0.00	0.00	0.00	0.00	0.00	0.00	36.85	0.50	0.18	0.00	0.00	0.00	0.18
	694.4	5208-00-3-R2	26.46	3.81	0.00	0.00	0.00	0.00	0.00	0.00	26.46	0.39	0.10	0.00	0.00	0.00	0.10
	137.2	5208-07-1	1.83	1.33	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.07	0.00	0.00	0.00	0.00	0.00
	444.9	5208-06-1	28.13	6.32	0.00	0.00	0.00	14.07	1.59	0.22	14.07	0.92	0.13	0.00	0.00	0.00	0.35
	540.1	5208-05-1-L1	56.16	10.40	0.00	0.00	0.00	28.08	3.35	0.94	28.08	2.14	0.60	0.00	0.00	0.00	1.54
03/11/20	Last Revised Date															NLJA No. 0854-0003	

CT DEEP MS4 General Permit													
Drainage Basin Area, Drainage Sub-Basin Area and Impervious Area (IA) Tabulations and Directly Connected Impervious Area (DCIA) Computations													
Wallingford - GSM000050													
										CT ECO			CT ECO
	CT DEEP	Town		Total						State	Town	Town	Town
	Regional	Basin	CT DEEP	Basin						Road	Imp.	Imp.	Road
Town Area	Drainage	Area	Drainage	Area	Impervious Area (Ac)					Imp. Area	Area	Area	Imp. Area
Acres	Basin No.	Acres	Sub-Basin No.	Ac.	Buildings	Roads	Other	Total	%	Ac.	Ac.	%	Ac.
			Muddy River (Continued)										
		891.4	5208-00-3-L2	891.4	11.00	14.36	21.84	47.21	5.30	0.00	47.21	5.30	14.36
		1.4	5208-05-1	1.4	0.00	0.32	0.00	0.32	22.86	0.00	0.32	22.86	0.32
		12.4	5208-00-3-R1	12.4	0.21	0.22	0.46	0.89	7.18	0.00	0.89	7.18	0.22
		479.6	5208-04-1	479.6	4.03	8.24	8.15	20.43	4.26	0.00	20.43	4.26	8.24
	Clipped Basin	660.46	5208-02-1-L1	664.2	2.91	5.85	6.48	15.25	2.31	0.00	15.25	2.31	5.85
	Clipped Basin	481.10	5208-02-1	510.9	0.93	3.01	4.72	8.67	1.80	0.00	8.67	1.80	3.01
		592.0	5208-02-2-R1	592.0	10.67	12.89	22.45	46.01	7.77	4.52	41.49	7.01	8.36
	Clipped Basin	594.22	5208-03-1	717.1	7.09	10.13	22.69	39.90	6.71	3.12	36.78	6.19	7.00
	Clipped Basin	855.20	5208-00-1-L1	858.7	27.82	49.76	68.65	146.23	17.10	22.28	123.95	14.49	27.48
		305.5	5208-01-1	305.5	10.23	21.27	27.53	59.04	19.33	12.85	46.19	15.12	8.42
		26.0	5208-00-1	26.0	0.92	1.59	1.19	3.70	14.23	0.00	3.70	14.23	1.59
		54.7	5208-00-2-R1	54.7	1.85	2.48	3.64	7.98	14.59	0.00	7.98	14.59	2.48
	Clipped Basin	22.43	5208-00-3-R5	198.4	0.00	0.00	0.15	0.15	0.67	0.00	0.15	0.67	0.00
	Clipped Basin	8.69	5208-09-1	536.0	0.05	0.00	0.10	0.15	1.73	0.00	0.15	1.73	0.00
	Clipped Basin	0.91	5208-00-3-R4	28.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,652.0	5207	4,654.02	Wharton Brook										
Check	Clipped Basin	658.6	5207-02-1-L1	822.4	27.10	48.18	35.99	159.68	24.25	23.63	136.05	20.66	24.55
	Clipped Basin	91.4	5207-00-2-R2	161.2	11.87	2.37	18.24	36.35	39.77	1.04	35.31	38.63	1.33
	Clipped Basin	1.4	5207-02-1	2.4	0.02	0.00	0.19	0.28	20.00	0.00	0.28	20.00	0.00
	Clipped Basin	480.0	5207-00-1-L1	488.1	12.53	11.72	22.59	49.17	10.24	2.69	46.48	9.68	9.03
		1,397.1	5207-00-1-L2	1,397.1	59.98	65.49	84.74	210.21	15.05	3.80	206.41	14.77	61.69
		736.5	5207-00-1	736.5	63.14	44.99	91.85	199.98	27.15	2.48	197.50	26.82	42.51
		906.2	5207-01-1	906.2	48.35	55.97	70.60	174.92	19.30	17.64	157.28	17.36	38.33
		380.8	5207-00-2-R1	380.8	29.14	27.71	51.25	108.09	28.38	7.79	100.30	26.34	19.92
1,149.7	5302	1,149.37	Mill River										
Check	Clipped Basin	681.93	5302-02-1	1,077.6	16.26	19.29	28.84	64.39	9.44	0.00	64.39	9.44	19.29
	Clipped Basin	467.77	5302-04-1-L1	1,521.3	12.65	15.92	19.44	48.01	10.26	0.00	48.01	10.26	15.92
03/11/20	Last Revised Date												

CT DEEP MS4 General Permit

Drainage Basin Area, Drainage Sub-Basin Area and Impervious Area (IA) Tabulations and Directly Connected Impervious Area (DCIA) Computations

Wallingford - GSM000050

CT DEEP	Town		Total	Town	High Connectivity			Average Connectivity			Partial Connectivity			Slight Connectivity			
Drainage	Basin	CT DEEP	Imp.	Imp.	DCIA% = 0.4*(IA%)^1.2			DCIA% = 0.1*(IA%)^1.5			DCIA% = 0.04*(IA%)^1.7			DCIA% = 0.01*(IA%)^2.0			
Sub-Basin	Area	Drainage	Area	Area	Imp.	DCIA	DCIA	Imp.	DCIA	DCIA	Imp.	DCIA	DCIA	Imp.	DCIA	DCIA	DCIA
No.	Acres	Sub-Basin No.	Ac.	%	Ac.	%	Ac.	Ac.	%	Ac.	Ac.	%	Ac.	Ac.	%	Ac.	Ac.
		Muddy River (Continued)															
	891.4	5208-00-3-L2	47.21	5.30	0.00	0.00	0.00	0.00	0.00	0.00	47.21	0.68	0.32	0.00	0.00	0.00	0.32
	1.4	5208-05-1	0.32	22.86	0.32	17.10	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
	12.4	5208-00-3-R1	0.89	7.18	0.00	0.00	0.00	0.45	1.92	0.01	0.45	1.14	0.01	0.00	0.00	0.00	0.01
	479.6	5208-04-1	20.43	4.26	0.00	0.00	0.00	0.00	0.00	0.00	20.43	0.47	0.10	0.00	0.00	0.00	0.10
	660.5	5208-02-1-L1	15.25	2.31	0.00	0.00	0.00	0.00	0.00	0.00	15.25	0.17	0.03	0.00	0.00	0.00	0.03
	481.1	5208-02-1	8.67	1.80	0.00	0.00	0.00	0.00	0.00	0.00	8.67	0.11	0.01	0.00	0.00	0.00	0.01
	592.0	5208-02-2-R1	41.49	7.01	0.00	0.00	0.00	20.75	1.86	0.38	20.75	1.10	0.23	0.00	0.00	0.00	0.61
	594.2	5208-03-1	36.78	6.19	0.00	0.00	0.00	18.39	1.54	0.28	18.39	0.89	0.16	0.00	0.00	0.00	0.45
	855.2	5208-00-1-L1	123.95	14.49	61.98	9.90	6.13	61.98	5.52	3.42	0.00	0.00	0.00	0.00	0.00	0.00	9.55
	305.5	5208-01-1	46.19	15.12	23.10	10.41	2.40	23.10	5.88	1.36	0.00	0.00	0.00	0.00	0.00	0.00	3.76
	26.0	5208-00-1	3.70	14.23	1.85	9.68	0.18	1.85	5.37	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.28
	54.7	5208-00-2-R1	7.98	14.59	3.99	9.97	0.40	3.99	5.57	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.62
	22.4	5208-00-3-R5	0.15	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.02	0.00	0.00	0.00	0.00	0.00
	8.7	5208-09-1	0.15	1.73	0.08	0.77	0.00	0.00	0.00	0.00	0.15	0.10	0.00	0.00	0.00	0.00	0.00
	0.9	5208-00-3-R4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5207	4,654.02	Wharton Brook															
	658.6	5207-02-1-L1	136.05	20.66	136.05	15.14	20.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.60
	91.4	5207-00-2-R2	35.31	38.63	35.31	32.09	11.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.33
	1.4	5207-02-1	0.28	20.00	0.28	14.56	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
	480.0	5207-00-1-L1	46.48	9.68	0.00	0.00	0.00	23.24	3.01	0.70	23.24	1.90	0.44	0.00	0.00	0.00	1.14
	1,397.1	5207-00-1-L2	206.41	14.77	103.21	10.13	10.45	103.21	5.68	5.86	0.00	0.00	0.00	0.00	0.00	0.00	16.31
	736.5	5207-00-1	197.50	26.82	197.50	20.71	40.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.90
	906.2	5207-01-1	157.28	17.36	78.64	12.29	9.66	78.64	7.23	5.69	0.00	0.00	0.00	0.00	0.00	0.00	15.35
	380.8	5207-00-2-R1	100.30	26.34	100.30	20.27	20.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.33
5302	1,149.37	Mill River															
	681.9	5302-02-1	64.39	9.44	0.00	0.00	0.00	32.20	2.90	0.93	32.20	1.82	0.59	0.00	0.00	0.00	1.52
	467.8	5302-04-1-L1	48.01	10.26	0.00	0.00	0.00	24.01	3.29	0.79	24.01	2.10	0.50	0.00	0.00	0.00	1.29
03/11/20	Last Revised Date																

CT DEEP MS4 General Permit													
Drainage Basin Area, Drainage Sub-Basin Area and Impervious Area (IA) Tabulations and Directly Connected Impervious Area (DCIA) Computations													
Wallingford - GSM000050													
										CT ECO			CT ECO
	CT DEEP	Town		Total						State	Town	Town	Town
	Regional	Basin	CT DEEP	Basin						Road	Imp.	Imp.	Road
Town Area	Drainage	Area	Drainage	Area	Impervious Area (Ac)					Imp. Area	Area	Area	Imp. Area
Acres	Basin No.	Acres	Sub-Basin No.	Ac.	Buildings	Roads	Other	Total	%	Ac.	Ac.	%	Ac.
1,048.6	5112	1048.83	Farm River										
Check	Clipped Basin	159.69	5112-02-1-L1	344.90	0.50	1.63	1.12	3.24	2.03	0.00	3.24	2.03	1.63
		138.8	5112-02-1-D1	138.8	1.87	3.01	3.03	7.91	5.70	0.00	7.91	5.70	3.01
	Clipped Basin	154.51	5112-02-1	376.5	1.31	2.36	2.94	6.61	4.28	0.00	6.61	4.28	2.36
	Clipped Basin	515.63	5112-03-1	619.4	3.59	4.00	8.33	15.92	3.09	0.00	15.92	3.09	4.00
	Clipped Basin	79.95	5112-00-2-L1	455.1	2.07	2.06	3.81	7.94	9.93	0.00	7.94	9.93	2.06
592.1	5204	591.47	Broad Brook										
Check	Clipped Basin	337.32	5204-00-2-L1	1,884.7	8.4	10.75	13.01	32.16	9.53	3.00	29.16	8.64	7.75
	Clipped Basin	226.1	5204-02-1	289.2	3.37	5.71	6.58	15.66	6.93	0.00	15.66	6.93	5.71
	Clipped Basin	28.63	5204-01-1	268.5	1.55	1.93	0.88	4.37	15.26	0.00	4.37	15.26	1.93
196.0	5206	195.91	Harbor Brook										
Check	Clipped Basin	193.40	5206-02-1-L1	681.40	18.56	12.20	24.65	55.41	28.65	6.15	49.26	25.47	6.04
	Clipped Basin	2.60	5206-01-1-L1	65.30	0.00	0.00	0.08	0.08	3.08	0.00	0.08	3.08	0.00
194.3	4606	194.28	Sawmill Brook										
Check	Clipped Basin	156.03	4606-02-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Clipped Basin	0.96	4606-01-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Clipped Basin	37.29	4606-00-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.5	4607	5.53	Coginchaug River										
Check	Clipped Basin	5.53	4607-10-1-L1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/11/20	Last Revised Date												

APPENDIX V
IMPERVIOUS COVER TRACKING SPREADSHEET

Town	Wallingford
Town area (ac):	25,821.30

NET	0.0	acres disconnected
%	#DIV/0!	% disconnected

1 *This is just our take on it. Feel free to change and tailor as you see fit.*
2 Area unit used is acres but could be anything

- 1 date of completion
- 2 any identifying system will do
- 3 overall description of project
- 4 overview of IUD practices used
- 5 for new development, total acres of IC added
- 6 acres of #5 above that are connected
- 7 for redevelopment projects: total ic after project minus total ic before project
- 8 for redevelopment projects: connected ic after project minus connected ic before project
- 9 for retrofits of existing development, total acres IC disconnected (from plans and observation)
- 10 change in total IC after project completion
- 11 change in connected IC after project completion
- 12 cumulative total of IC in town, acres
- 13 cumulative total of IC in town, %
- 14 cumulative total of connected IC in town, acres
- 15 cumulative total of connected IC in town, %
- 16 notes, referrals to other files, plans, photos, folders, etc.

NEMO Project
Center for Land Use Education and Research (CLEAR)
University of Connecticut
clear@uconn.edu

APPENDIX VI CATCHMENT RANKINGS

Town of Wallingford MS4 General Permit
Catchment Assessment and Priority Ranking

Catchment ID	Outfalls Included	Receiving Water(s)	Previous Screening Results Indicate Likely Sewer Input? ¹	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	Sewer Repair Nearby?	Urbanized Area	DCIA >11%	Impaired Waterbody	Score	Priority Ranking 0-5: Low Priority 6-9: Problem ≥: 10 high Priority
Information Source			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 Storm System Maps	Other	Municipal Staff, GIS Maps	CLEAR	Nathan L Jacobson & Associates	CLEAR		
Scoring Criteria			Yes = 3 (Problem Catchment) No = 0	Yes = 3 No = 0	Frequent = 3 Occasional = 2 None = 0	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	Description	Yes=2 No=0	Yes =1 No = 0	Yes =1 No = 0	Yes =1 No = 0		
4606-00-1	0	None		0		0	1	1	0		0	Wooded		0	0	0	2	Low Priority
4606-01-1	0	None		0		0	1	1	0		0	Wooded		0	0	0	2	Low Priority
4606-02-1	0	Unnamed Stream		0		0	1	1	0		0	Wooded		0	0	0	2	Low Priority
4607-10-1-L1	0	None		0		0	1	1	0		0	Wooded		0	0	0	2	Low Priority
5112-00-2-L1	2	Unnamed Stream		0		0	1	2	0		3	Wooded, some residential housing, light agricultural land		1	0	0	7	Problem
5112-02-1	4	Unnamed Stream		0		0	1	2	0		3	Wooded, cleared land, light residential housing		0	0	0	6	Problem
5112-02-1-D1	0	None		0		0	1	2	0		0	Wooded, agricultural land		0	0	0	3	Low Priority
5112-02-1-L1	0	Unnamed Stream		0		0	1	1	0		0	Wooded and Pitsapaug Pond		0	0	0	2	Low Priority
5112-03-1	1	Unnamed Stream		0		0	1	2	0		3	Wooded, cleared land, some agricultural land and residential housing		0	0	0	6	Problem
5200-00-4-L3	49	Quinnipiac River, Community Lake		0		3	3	2	0		0	Wooded, some commercial and residential housing		1	1	1	11	High Priority
5200-00-4-R10	45	Quinnipiac River		0		2	3	2	0		3	Commercial development, some residential housing and wooded areas		1	1	1	13	High Priority
5200-00-4-R11	20	Quinnipiac River		0		2	2	2	0		0	Wooded and commercial, some residential housing		1	1	1	9	Problem
5200-00-4-R12	27	Quinnipiac River		0		2	2	1	0		3	Wooded, some agricultural land and commercial, light residential		1	1	1	11	High Priority

Town of Wallingford MS4 General Permit Catchment Assessment and Priority Ranking																		
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Information Source			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 Storm System Maps	Other	Municipal Staff, GIS Maps	CLEAR	Nathan L Jacobson & Associates	CLEAR		
Scoring Criteria			Yes = 3 (Problem Catchment) No = 0	Yes = 3 No = 0	Frequent = 3 Occasional = 2 None = 0	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	Description	Yes=2 No=0	Yes =1 No = 0	Yes =1 No = 0	Yes =1 No = 0		
5200-00-4-R7	84	Quinnipiac River		3		2	2	2	0		3	Commercial, some residential housing, light wooded areas		1	1	1	15	High Priority
5200-00-4-R8	81	Quinnipiac River		3		2	3	2	0		0	Commercial and residential housing, light wooded areas		1	1	1	13	High Priority
5200-10-1	14	Meetinghouse Brook		3		0	2	1	0		3	Residential housing, some commercial and wooded areas		1	1	0	11	High Priority
5200-10-2-R1	69	Meetinghouse Brook		3		0	3	2	0		3	Commercial, light residential housing and wooded, highway		1	1	0	13	High Priority
5200-11-1	15	Spruce Glen Brook		3		0	2	2	0		3	Residential housing, some wooded, light agricultural land, highway		1	0	0	11	High Priority
5200-12-1	2	Unnamed Stream		3		0	2	2	0		3	Commercial, some wooded		1	1	0	12	High Priority
5200-12-1-L1	49	Unnamed Stream		3		0	2	2	0		3	Wooded, some residential housing, light commercial and athletic fields		1	1	0	12	High Priority
5200-13-1	62	Padens Brook		3		2	3	2	0		3	Commercial, some residential housing, light wooded and agricultural land		1	1	1	16	High Priority
5200-14-1	38	Unnamed Pond		0		0	1	1	0		0	Pond, light wooded and residential		1	1	0	4	Low Priority
5200-14-1-L1	3	Unnamed Stream		0		0	2	2	0		3	Some wooded and residential housing		1	1	0	9	Problem
5200-15-1	34	Unnamed Streams, Peanuts Pond, Farms Pond, Fergusons Pond		0		0	3	2	0		3	Residential housing, some agricultural land, light wooded		1	0	0	9	Problem
5200-16-1	0	None		0		0	1	1	0		0	Wooded		0	0	0	2	Low Priority
5200-17-1	0	None		0		0	1	2	0		0	Light residential housing		1	0	0	4	Low Priority
5200-19-1-L1	0	None		0		0	1	2	0		0	Light residential housing		1	1	0	5	Low Priority
5204-00-2-L1	10	Broad Brook		0		0	2	2	0		0	Wooded, some residential housing		1	0	0	5	Low Priority
5204-01-1	0	Broad Brook		0		0	1	1	0		0	Wooded		1	0	0	3	Low Priority
5204-02-1	4	Broad Brook		0		0	2	2	0		0	Wooded, some residential housing		1	0	0	5	Low Priority

Town of Wallingford MS4 General Permit
Catchment Assessment and Priority Ranking

Catchment ID	Outfalls Included	Receiving Water(s)	Previous Screening Results Indicate Likely Sewer Input? ¹	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	Sewer Repair Nearby?	Urbanized Area	DCIA >11%	Impaired Waterbody	Score	Priority Ranking 0-5: Low Priority 6-9: Problem ≥: 10 high Priority
Information Source			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 Storm System Maps	Other	Municipal Staff, GIS Maps	CLEAR	Nathan L Jacobson & Associates	CLEAR		
Scoring Criteria			Yes = 3 (Problem Catchment) No = 0	Yes = 3 No = 0	Frequent = 3 Occasional = 2 None = 0	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	Description	Yes=2 No=0	Yes =1 No = 0	Yes =1 No = 0	Yes =1 No = 0		
5206-01-1-L1	0	High Hill Pond		0		0	1	2	0		0	Wooded area with a small cleared portion for overhead electrical lines.		1	0	0	4	Low Priority
5206-02-1-L1	6	North Farms Reservoir into Wharton Brook		0		2	3	2	0		0	Developed with commercial or industrial sites. High impermeable areas. Lightly wooded areas		1	1	1	10	High Priority
5207-00-1	44	Wharton Brook		0		2	3	2	0		3	Residential housng, some cleared land		1	1	1	13	High Priority
5207-00-1-L1	17	North Farms Reservoir		0		0	1	2	0		0	Some commercial, wooded, agricultural land, light residential		1	0	0	4	Low Priority
5207-00-1-L2	66	Wharton Brook, Catlin Brook		0		2	3	2	0		3	Residential housing, some wooded and agricultural land		1	0	1	12	High Priority
5207-00-2-R1	11	Wharton Brook		0		2	3	2	0		3	Residential housing, some commecial, light wooded		1	1	1	13	High Priority
5207-00-2-R2	9	Wharton Brook		0		2	2	2	0		3	Commercial, light wooded		1	1	1	12	High Priority
5207-01-1	46	Unnamed Stream		0		2	3	2	0		3	Residential housng, commercial, golf course		1	1	1	13	High Priority
5207-02-1	0	Unnamed Stream		0		2	1	1	0		0	Wooded		1	0	1	6	Problem
5207-02-1-L1	47	Allen Brook		0		2	3	2	0		3	Commercial and residential housing, highway, golf course		1	1	1	13	High Priority
5208-00-1	1	Unnamed Stream		0		0	1	2	0		3	Wooded, light residential housing		1	0	0	7	Problem
5208-00-1-L1	74	Muddy River		0		2	2	1	0		3	Wooded and commercial, light residential housing		1	0	1	10	Problem
5208-00-2-R1	5	Unnamed Stream		0		0	1	2	0		3	Wooded and residential housing		1	0	0	7	Problem

Town of Wallingford MS4 General Permit Catchment Assessment and Priority Ranking																		
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Scoring Criteria			Yes = 3 (Problem Catchment) No = 0	Yes = 3 No = 0	Frequent = 3 Occasional = 2 None = 0	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	Description	Yes=2 No=0	Yes =1 No = 0	Yes =1 No = 0	Yes =1 No = 0		
5208-00-3-L2	11	Mackenzie Reservoir,Unnamed Stream		0		0	2	2	0		0	Agricultural land, some wooded and residential housng		1	0	0	5	Low Priority
5208-00-3-L3	11	Muddy River		0		2	1	2	0		3	Wooded, light residential housing and cleared land		1	0	1	10	High Priority
5208-00-3-R1	0	Muddy River		0		2	1	2	0		3	Wooded, light residential housing		0	0	1	9	Problem
5208-00-3-R2	3	Muddy River		0		2	2	2	0		3	Wooded and agricultural land, some residential housing		0	0	1	10	High Priority
5208-00-3-R3	3	Muddy River		0		2	1	2	0		3	Wooded and some residential housng		1	0	1	10	High Priority
5208-00-3-R4	0	Muddy River		0		2	1	1	0		0	Wooded		1	0	1	6	Problem
5208-00-3-R5	0	Muddy River		0		2	1	1	0		0	Wooded and cleared land		1	0	1	6	Problem
5208-01-1	8	Unnamed Stream		0		0	2	2	0		3	Commercial and wooded, some residential housing, highway		1	0	0	8	Problem
5208-02-1	4	Spring Brook		0		0	1	2	0		0	Wooded, some commercial, light residential housing and agricultural land		0	0	0	3	Low Priority
5208-02-1-L1	1	Ulbrich Reservoir, Spring Brook		0		0	1	2	0		3	Reservoir, some wooded and agricultural land, light residential housing		0	0	0	6	Problem
5208-02-2-R1	10	Spring Brook		0		0	2	2	0		3	Residential housing and wooded		1	0	0	8	Problem
5208-03-1	11	Unnamed Stream		0		0	1	2	0		3	Wooded and residential housing, light commercial		1	0	0	7	Problem
5208-04-1	9	Unnamed Stream		0		0	1	1	0		3	Pond		0	0	0	5	Low Priority
5208-04-1-L1	0	Scards Pond		0		0	1	2	0		0	Wooded, agricultural land, light residential housing		0	0	0	3	Low Priority
5208-05-1	0	Mackenzie Reservoir		0		0	1	1	0		0	Wooded, reservoir		0	1	0	3	Low Priority
5208-05-1-L1	25	Unnamed Streams		0		0	1	2	0		0	Wooded, some residential housing and agricultural land, highway		1	0	0	4	Low Priority

Town of Wallingford MS4 General Permit

Catchment Assessment and Priority Ranking

Catchment ID	Outfalls Included	Receiving Water(s)	Previous Screening Results Indicate Likely Sewer Input? ¹	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	Sewer Repair Nearby?	Urbanized Area	DCIA >11%	Impaired Waterbody	Score	Priority Ranking 0-5: Low Priority 6-9: Problem ≥: 10 high Priority
Information Source			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 Storm System Maps	Other	Municipal Staff, GIS Maps	CLEAR	Nathan L Jacobson & Associates	CLEAR		
Scoring Criteria			Yes = 3 (Problem Catchment) No = 0	Yes = 3 No = 0	Frequent = 3 Occasional = 2 None = 0	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	Description	Yes=2 No=0	Yes =1 No = 0	Yes =1 No = 0	Yes =1 No = 0		
5208-06-1	25	Unnamed Stream		0		0	2	2	0		3	Agricultural land, some residential, highway		1	0	0	8	Problem
5208-07-1	0	Unnamed Stream		0		0	1	1	0		3	Wooded		0	0	0	5	Low Priority
5208-08-1	23	Pine River, Unnamed Streams		0		0	2	2	0		3	Wooded with residential housing, light cleared land		1	0	0	8	Problem
5208-09-1	0	None		0		0	1	1	0		0	Wooded		1	0	0	3	Low Priority
5302-02-1	0	Unnamed Stream		0		0	2	2	0		3	Residential housing, some wooded areas and marsh, golf course		1	0	0	8	Problem
5302-04-1-L1	16	Butterwoth Brook		3		0	2	2	0		3	Wooded with residential housing		1	0	0	11	High Priority

Scoring Criteria:

- ¹ Previous screening results indicate likely sewer input if any of the following are true:
 - Olfactory 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 beds
- ³ 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.
- ⁹ Based off of CT NEMO DCIA Calculations

Pending investigation