2021 Annual Report – MS4 General Permit

Town and Borough of Stonington

Stonington, Connecticut

April 1, 2022

Prepared by:

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Introduction

The following Annual Stormwater Report summarizes achievements made during 2021 by the Town & Borough of Stonington in implementing the goals and recommendations identified in the 2017 Stormwater Management Plan (SWMP). The SWMP was prepared to address the requirements of the CTDEEP General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4). Copies of the SWMP and the Annual Report can be viewed electronically on the Town of Stonington or Borough of Stonington website, or in person at either Town Hall location.

For more detailed stormwater information, please view the SWMP at the following location: https://www.stonington-ct.gov/engineering-floodplain-management/pages/phase-2-stormwater-permitting

contacts provided below:

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MS4 General Permit
Town and Borough of Stonington 2022 Annual Report
Existing MS4 Permittee
Permit Number GSM 000056 (TOS) & 000113 (BOS)
[January 1, 2021 – December 31, 2021]

This report documents the Town of Stonington & Borough of Stonington'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	Status	Activities in current reporting period (if needed, more space available after this table)	Measurable goal	Department / Person Responsible	Due	Date completed or projected completion date	Additional details
1-1 Implement public education and outreach	Ongoing	• Maintained the Town and Borough's Stormwater webpage • Participated in Eastern Connecticut Stormwater Collaborative events • The Town hosted Sarah Ridyard, the author of Mermaid Island, in a virtual visit to a middle school class and read to them on April 23, 2021.	• Update and maintain Town and Borough websites to include educational materials identified in Table 3 of the SWMP and/or available on the CLEAR and CT NEMO MS4 Guide website, CUSH website, or listed in the Connecticut Nonpoint Source Management Program Plan. • Distribute educational materials.	Storm Water Taskforce (SWTF) & Engineering Dept.	Ongoing	Ongoing	

1-2 Address education/ outreach for pollutants of concern*	Ongoing	• Town distributed article in "Stonington Events" magazine regarding Nitrogen & Bacteria. (Attachment 1) • DPW Engineering worked with the Clerk's office to distribute a pet waste flier with dog licenses (Attachment 2), and installed signage at Donahue Park.	Select educational materials appropriate for impaired waters and stormwater pollutants of concern (see Tables 2 and 3 of SMP).	SWTF	Ongoing	Ongoing	The Town of Stonington updated its the Education and Outreach Program in 2021 to enhance stormwater messaging.

Extra space for describing above BMP activities, if needed:

BMP	
1-1	The Stormwater Task Force (SWTF) did not meet in 2021 due to COVID-19. The SWTF intends to meet in 2022 as safety concerns due to COVID-19 decrease. Town and Borough personnel attended 3 Eastern CT Conservation District Quarterly meetings and 1 meeting to discuss the Anguilla Brook Watershed Study. The Study was published in full on the Town's Stormwater webpage. The Highway Department catch basin marking program continued. Although no catch basins were marked in 2021, supplies were acquired and the Town plans to continue marking in 2022. The Town publicized its LID project at the 4th District Voting Hall to install rain gardens and a tidal valve.
1-2	Donahue Park discharges to the Pawcatuck River which is impaired for bacteria. ~2,000 dog licenses were renewed in 2021

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

- The Town intends to distribute at least one stormwater quality article via "Stonington Events" magazine, which is mailed quarterly to all Town residents.
- The Town is working with its consultant to identify new and seasonally appropriate stormwater focused articles and information and publish those materials quarterly in "Stonington Events" magazine and promote them through social media accounts.
- The Town will continue to participate in Eastern Connecticut Stormwater Collaborative Events.
- The Town intends to distribute its revised public education materials in 2022, including new informational flyers and using Facebook and Instagram to better target social media messaging.

1.3 Details of activities implemented to educate the community on stormwater

Program Element/Activity	Audience (and number of people reached)	Topic(s) covered	Pollutant of Concern addressed (if applicable)	Responsible dept. or partner org.
Stonington Events article	Entire Town	General Stormwater quality, Flooding, Green Infrastructure	Fertilizers, pesticides, pet waste	Engineering Department
Updated and maintained the Town and Borough's stormwater website	Entire Town	General Stormwater quality, Nitrogen, Bacteria, fertilizer	Fertilizers, pesticides, detergents, pet waste, nitrogen and bacteria	Engineering Department

Sarah Ridyard classroom visit	Students	General Stormwater quality	Trash	Engineering Department

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

2.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Department / Person Responsible	Due	Date completed or projected completion date	Additional details
2-1 Final Stormwater Management Plan publically available	Completed	The Stormwater Management Plan is maintained on the Town Engineering webpage and the Borough Stormwater Management webpage.	Maintain current notices and copy of latest SMP on Borough and Town websites	Engineering & Borough Warden	Ongoing	April 3, 2017	
2-2 Comply with public notice requirements for Annual Reports	Completed	Applicable public notice is maintained on the Town Engineering webpage and the Borough Stormwater Management webpage.	Maintain current notices and copy of latest Annual Report on Borough and Town websites	Engineering & Borough Warden	Feb 15, 2021	April 1, 2021	
2-3 Establish Stormwater Task Force	Completed	Completed the reformation of the Stormwater Task Force (SWTF) in 2018.	Create SWTF to assist in implementation of MS4 permit requirements	Town Engineer & Borough Warden	March 2018	Summer 2018	

Extra space for describing above BMP activities, if needed:

BMP	
2-1, 2-2	Town and Borough of Stonington SWMP and Annual Report available at: Town of Stonington: https://www.stonington-ct.gov/engineering-floodplain-management/pages/phase-2-stormwater-permitting Borough of Stonington: http://www.Borough.stonington.ct.us/stormwater-management/
2-3	The Stormwater Task Force was on hiatus in 2021 due to COVID-19.

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

- Continue to work with the Eastern CT Conservation District as a Partner in the Eastern Connecticut Stormwater Collaborative to improve regional collaboration between local towns regarding Stormwater Management.
- Continue to work with and support the ECCD in achieving the goals of the Anguilla Brook Watershed Study.
- Work with the Stormwater Task Force to improve public engagement and awareness of stormwater quality issues.

2.3 Public Involvement/Participation reporting metrics

Metrics	Implemented	Date	Posted
Availability of the Stormwater Management Plan to public	yes	March 31, 2017	See above links
Availability of Annual Report announced to public	yes	February 15, 2021	See above links

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

3.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Department / Person Responsible	Due	Date completed or projected completion date	Additional details
3-1 Develop written IDDE program	Completed	The Town previously completed a joint written IDDE program for the Town and Borough.	Develop joint written plan of IDDE program for the Town and the Borough	Engineering & Borough Warden	Jul 1, 2018	Completed December, 2018	
3-2 Develop list and maps of all MS4 stormwater outfalls in priority areas	Completed	The Town/Borough previously contracted with Fuss & O'Neill to identify and map the priority areas in the Town and Borough to identify all MS4 stormwater outfalls in the priority areas. The Town/Borough also contracted with Fuss and O'Neill to complete an analysis of directly connected impervious area (DCIA) for each CT DEEP Local Basin within the Town and Borough. Please see Attachment 4 for the Town's outfall mapping.	Update GIS storm system mapping & Develop a list (database or spreadsheet) of Stormwater outfalls in priority areas including catchment delineations.	Engineering & Planning	Jul 1, 2019	Completed December, 2018	Priority areas were identified to the CT DEEP Local Basin level and were based on urbanized area, catchment areas with DCIA greater than 11%, and catchment areas of outfalls that directly discharge to impaired waters. In 2021, the Town met with CTDOT staff to iclarify outfall ownership in several areas. The Town and borough are committed to continually improving MS4 related mapping.
3-3 Implement citizen reporting program	Completed	The stormwater hotline is still available on the Engineering website for citizens to report concerns regarding stormwater.	Continue to support a citizen reporting 'hotline' and advertise it on the Town and Borough websites	Engineering	Ongoing	Completed June 2017	
3-4 Establish legal authority	Completed	The Town reviewed and updated the IDDE ordinance in 2018 to ensure	Review existing ordinance and revise accordingly.	Engineering	Jul 1, 2018	Completed June 2018	

to prohibit illicit discharges		compliance with the permit. The IDDE Ordinance is posted on the Town website.					
3-5 Develop record keeping system for IDDE tracking	Completed	In 2018 the Town/Borough contracted with Fuss & O'Neill to develop a digital data collection system for tracking and recording data related to dry weather outfall inspections and sampling and wet weather sampling of outfalls that discharge to impaired waters. Dry weather outfall inspections and sampling and wet weather sampling of impaired waters began in 2019.	Develop IDDE tracking recordkeeping system	Engineering & Borough Warden	Jul 1, 2017	Completed January 2019	
3-6 Address IDDE in areas with pollutants of concern	Ongoing	The Town/Borough hired a consulting firm to conduct dry weather outfall inspections and sampling and wet weather sampling of outfalls that discharge to impaired waters in the late winter of 2019.	Conduct dry weather outfall inspection on all outfalls within the priority area and sample as required by the permit. Conduct wet weather outfall sampling on all outfalls that directly discharge to impaired waters. Address identified illicit discharges following the procedures in the written IDDE plan.	Sanitation, Engineering	Not specified	Summer 2022	Initial outfall inspections were started in 2019 and are currently underway with expected completion in 2022. >95% of outfalls have been inspected during dry weather. Impaired outfalls sampling continued in 2021 and has been conducted at >50% of outfalls.
3-7 Assess and prepare a priority ranking of catchments	Completed	The Town/Borough contracted with Fuss & O'Neill to complete catchment ranking and prioritization of outfalls in 2018.	Classify each catchment within priority areas into an excluded, problem, high priority or low priority catchment. Rank catchments within each category (except excluded catchments) based on screening factors found on page 6 & 7 in Appendix B of the Permit	Engineering	July 1, 2019	Completed December 2018	Catchment rankings were completed based on the CT DEEP Local Basins
3-8 Consolidate IDDE tracking spreadsheets	Completed	Compile all the IDDE tracking requirements into one spreadsheet	Create a consolidated spreadsheet	Engineering	-	July 1, 2018	Reason for addition: Make it easier to track all IDDE activities

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

- Maintain master list of any potential Illicit Discharges; monitor, evaluate and address accordingly.
- Complete dry-weather inspection of outfalls. IDDE progress was delayed due to COVID-19 in 2021.
- Continue wet-weather sampling of outfalls discharging directly to impaired waters.
- Conduct annual sampling of 6 "Worst" impaired waters outfalls. Update list as necessary.
- Continue interconnection mapping

3.3 List of citizen reports of suspected illicit discharges received during this reporting period.

Date of Report	Location / suspected source	Response taken
12-16-2021	8 Coogan Blvd	The Town received aware of one complaint, made to CTDEEP (#21-183) and investigated by Ledge Light Health District. A report of the investigation and related correspondence was submitted to DEEP on 12-16-2021. DEEP indicated no further action needed. The Fire Marshal also observed this.

3.4 Provide a record of illicit discharges occurring during the reporting period and SSOs occurring July 2012 through end of reporting period using the following table.

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)
Three SSOs were identified during 2021. An updated SSO inventory is included as Attachment 3						

3.5 Briefly describe the method used to track illicit discharge reports, responses to those reports, and who was responsible for tracking this information.

The Town of Stonington Engineering Department is the lead party responsible for tracking and responding to any known or reported Illicit Discharges. Currently, the Town maintains an Excel spreadsheet with potential Illicit Discharges that require dry weather sampling or other further investigation. In addition to the Engineering Department, the Stonington Water Pollution Control Authority (WPCA) and local health district, Ledge Light Health District, typically field calls related to sewer overflows or sanitation issues and concerns. The Engineering Department has advised these Town departments of their responsibility to record any such SSO and/or Illicit Discharge related information on provided standardized forms and report to the Engineering Department on a yearly basis.

3.6 Provide a summary of actions taken to address septic failures using the table below.

Location and nature of structure with failing septic systems	Actions taken to respond to and address the failures	Impacted waterbody or watershed, if known
Please see Attachment 4 for list of septic system failures and repairs in 2021.		

3.7 IDDE reporting metrics

Metrics	
Estimated or actual number of MS4 outfalls	Town (340) Borough (17)
Estimated or actual number of interconnections	Unknown
Outfall mapping complete	100 %

Interconnection mapping complete	(0%) Begun 11/2021
System-wide mapping complete (detailed MS4 infrastructure)	100%
Outfall assessment and priority ranking	100%
Dry weather screening of all High and Low priority outfalls complete	98%
Catchment investigations complete	0
Estimated percentage of MS4 catchment area investigated	0

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

On February 8, 2019 the Town of Stonington and the Town's sampling consultant received training regarding use of a digital data collection system for dry weather outfall screening and sampling and wet weather sampling of outfalls that discharge to impaired waters. The training included information on how to conduct outfall screening and sampling to meet permit requirements, how to detect an illicit discharge and how to document and record information gathered during screening and sampling.

The Town and Borough have contracted with their consultant to conduct annual MS4 training for Town and Borough employees involved in the MS4 program, especially those with specific roles in the Town and Borough's IDDE program. The Town's Engineering Intern received IDDE training in August 2021.

On December 21, 2017, the Town of Stonington Engineering Department coordinated 2 specific training sessions on the following topics:

- Spill Prevention and Response
- Town wide Stormwater Management Training - MS4

Training was provided for the following facility employees:

- Public Works
- Police Department - Maintenance
- School Facilities – Maintenance
- Water Pollution Control Authority
- Solid Waste/Transfer Station
- Town Dock

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

4.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Department or Person Responsible	Due	Date completed or projected completion date	Additional details
4-1 Implement, upgrade, and enforce land use regulations or other legal authority to meet requirements of MS4 general permit	In Progress	The Town/Borough contracted with Fuss & O'Neill in 2019 to complete a review of the Town and Borough's land use regulations and implementation policies for compliance with the MS4 permit.	Review and update, as necessary, existing land use regulations and implementation policies for compliance with the MS4 General Permit construction site stormwater runoff control requirements.	Town & Borough Land Use Agencies	Jul 1, 2019	July 1, 2021	The Town/Borough's consultant completed a review of legal authority and land use regulations in 2019. Due to staffing changes in the Town and delays due to COVID-19, the process of amending regulations is ongoing.
4-2 Develop and Implement plan for interdepartmental coordination in site plan review and approval	Ongoing	Site plan review & approval processes are followed for all applicable land use applications	Continue to implement interdepartmental coordination procedures as described in Section 5.2 of the Town SWMP	Town & Borough Land Use Agencies	Ongoing	Ongoing throughout entire permit	
4-3 Review site plans for stormwater quality concerns	Ongoing	Reviewed 140 Land development applications in total, including all greater than 1 acre, for compliance with existing stormwater quality regulations in the Town of Stonington. The Borough did not review any site plans for land development in 2021.	Continue to complete site plan reviews for all projects subject to the land use regulations listed in BMP 4-1.	Engineering & Town, Borough Land Use Agencies	Ongoing	Ongoing throughout entire permit	The Town conducted 55 site plan reviews in 2021. No projects requiring review were received by the Borough in 2021.
4-4 Conduct site inspections	Ongoing	The Stonington Zoning Enforcement Officer is tasked with ensuring all erosion and sediment control measures are adequately installed prior to the start of construction.	Continue to conduct inspections and enforcement to assess and ensure the adequacy of the installation, maintenance, operation, and repair of construction and postconstruction control measures.	Town & Borough Land Use Agencies and/or Town staff (Stonington ZEO)	Ongoing	Ongoing throughout entire permit	The Town conducted 39 site inspections in 2021. No projects requiring SESC inspections occurred in the Borough in 2021.

4-5 Implement procedure to allow public comment on site development	Ongoing	Both the Town of Stonington & Borough have a hotline which remains active and up to date.	Continue to post notices of Stonington's "hotline" for stormwater related comments on the municipal stormwater websites	Town & Borough Land Use Agencies	Ongoing	March 31, 2017	No complaints were received in 2021
4-6 Implement procedure to notify developers about DEEP construction stormwater permit	Ongoing	Require qualifying land development projects to register with the CTDEEP and show proof of registration prior to construction	Continue to inform developers/contractors of their obligation to register under the DEEP construction general permit and to provide a copy of the Storm Water Pollution Control Plan to Stonington upon Request, as necessary.	Town & Borough Land Use Agencies / Engineering Department	Ongoing	Ongoing throughout entire permit	

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

- Work with consultant to update and amend, as required, current Town and Borough construction site regulations.
- Continue to monitor construction sites to the best of staff ability.
- Ensure the CTDEEP Construction General Permit is applied for and on file with the Town for applicable projects prior to the start of construction.

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

5.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Department / Person Responsible	Due	Date completed or projected completion date	Additional details
5-1 Establish and/or update legal authority and guidelines regarding LID and runoff reduction in site development planning	Ongoing	The Town/Borough contracted with Fuss & O'Neill in 2019 to complete a review of the Town and Borough's land use regulations, including the Town's Technical Standards. This includes review of the Town's Post-construction regulatory mechanisms and legal authority, as well as identification of regulatory barriers to implementing LID and runoff reduction practices and suggestions for reducing or eliminating those barriers.	Review and update, as necessary, existing land use regulations and implementation policies (including Technical Standards) for compliance with the General Permit postconstruction stormwater management requirements	Town Planning Zoning Commission, Borough Planning Zoning Commission, Engineering, SWTF	Jul 1, 2021	Jul 1, 2023	The Town/Borough's consultant completed a review of legal authority and land use regulations in 2019. Due to staffing changes in the Town, and delays from COVID-19 the process of amending regulations is ongoing. The planning department received funding to begin evaluating regulations and zoning modifications.
5-2 Enforce LID/runoff reduction requirements for development and redevelopment projects	Ongoing	The Town/Borough contracted with Fuss & O'Neill in 2019 to complete a review of the Town and Borough's land use regulations, including the Town's Technical Standards. This includes review of the Town's Post-construction regulatory mechanisms and legal authority, as well as identification of regulatory barriers to implementing LID and runoff reduction practices and suggestions for reducing or eliminating those barriers.	Review and update, as necessary, current regulations to identify, reduce, or eliminate existing regulatory barriers to implementation of LID and runoff reduction practices.	Town Planning Zoning Commission, Borough Planning Zoning Commission, Engineering	Ongoing beginning Jul 1, 2019	Jul 1, 2023	The Town/Borough's consultant completed a review of legal authority and land use regulations in 2019. Due to staffing changes in the Town, and delays from COVID-19 the process of amending regulations is ongoing. The planning department received funding to begin evaluating regulations and zoning modifications.
5-3 Identify retention and detention ponds in priority areas	Ongoing	The Town and Borough have in past years contracted with Fuss & O'Neill to identify additional existing stormwater BMPs throughout the Town and Borough and update this list	Review past permits and known stormwater facilities in an effort to create a comprehensive list of stormwater	Planning Department, Engineering Department, Public Works,	Jul 1, 2019	Ongoing throughout permit term	The Town has undertaken in 2021 to review site plans of private developments to identify private BMPs. To increase capacity, the Town hired a stormwater intern.

		annually. This survey included identification of ownership and maintenance responsibility.	systems within priority areas.	Borough Warden			These efforts, which are ongoing, have identified more than a dozen stormwater treatment structures, and Town-owned drainage easements.
5-4 Implement long-term maintenance plan for stormwater basins and treatment structures	Ongoing	The Engineering Department and Planning Department continue to require maintenance plans for all stormwater infrastructure proposed as part of land-use applications. Follow-up of implementation strategies and measures can be improved upon. The Town conducted 4 maintenance inspections of BMPs in 2022. The Borough conducted 1 maintenance inspection of BMPs in 2022. Grates and gutters were cleaned, vegetation removed, and sediment removed.	Develop a long-term maintenance plan for retention/detention basins and stormwater treatment structures. Implement maintenance plan including annual inspection of retention / detention basins and stormwater treatment structures and removal of accumulated sediment and pollutants.	Planning: Town Planning Department, Borough Planning & Zoning Commission, Engineering Implementation: Engineering, Public Works, Planning Department	Ongoing beginning Jul 1, 2019	Ongoing throughout permit term	The Town/Borough have also contracted with Fuss & O'Neill to develop operation and maintenance procedures for Town-owned or operated stormwater BMPs.
5-5 DCIA mapping	Initial mapping is completed, revisions are ongoing as DCIA is added or removed.	The Town/Borough contracted with Fuss & O'Neill to complete an initial analysis of directly connected impervious area (DCIA) in the Town and Borough's Priority Area for each CT DEEP Local Basin. The Town/Borough have previously contracted with Fuss & O'Neill to complete revisions to DCIA estimates based on development projects completed within 5 years prior to the permit effective date.	Calculate the Directly Connected Impervious Area (DCIA) of outfall catchment areas using guidance provided by DEEP and UConn CLEAR. Revise DCIA estimate as development, redevelopment, or retrofit projects effectively add or remove DCIA.	Engineering & Planning	Jul 1, 2020	Completed December, 2018; updates ongoing throughout permit term.	DCIA was calculated using estimates of total impervious area provided by the UConn NEMO program and literature-based equations relating to total and connected impervious area for various land uses. Records of DCIA-related projects townwide are being updated. (Attachment 5)
5-6 Address post-construction issues in areas with pollutants of concern	Not Started	Not Started	Address erosion and sediment problems noted during inspections conducted under BMP 5-3 through the retrofit program developed under BMP 6-7.	Engineering, Planning, Public Works	Not specified	On or before Jul 1, 2022	

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

- Continue to update stormwater BMP inventory
- Update DCIA disconnection based on site plans from 5 years before the effective permit date through current year, based on updated BMP inventory
- Work with the SWTF and Zoning to determine best means and methods for requiring post-construction stormwater management maintenance and ensuring/tracking/monitoring ongoing maintenance.
- Continue to coordinate with CTDOT staff on DCIA disconnection opportunities

5.3 Post-Construction Stormwater Management reporting metrics

Metrics	
Baseline (2012) Directly Connected Impervious Area (DCIA)	871 acres
DCIA disconnected (redevelopment plus retrofits)	0 acres this year / 0 acres total
Retrofits completed	0
DCIA disconnected	0% this year / 0% total since 2012
Estimated cost of retrofits	0
Detention or retention ponds identified	6

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

DCIA was estimated for each CTDEEP local basin. All local basins were clipped to the geographic extent of the Town and therefore only include areas of the basins within this extent. The 30-meter resolution 2011 National Land Cover Database (NLCD) was used along with the 1-foot resolution 2012 Connecticut Statewide Impervious Surface dataset provided by CTECO to estimate DCIA. Land cover in the basin was separated into four categories that represent varying degrees of development density (Developed, High Intensity; Developed, Medium Intensity; Developed, Low Intensity; and all other classes). Each of these four categories was related to the four levels of basin connectivity as described on the UConn NEMO website ("Wicked Connected," "Moderately Connected," "Sorta Connected," and "Slightly Connected"). The Sutherland equations provided by UConn NEMO that are associated with each of the four connectivity levels were used to convert percent impervious area to percent DCIA. DCIA was estimated for each basin using the following steps:

1. The percent impervious cover was calculated for each 30x30 meter land cover raster cell and the total percentage was summed across all raster cells in the local basin, resulting in a percent impervious cover value for each land cover category.
2. The Sutherland equations were used to convert percent IC across the local basin to percent DCIA for each of the four areas of land cover.
3. The percent DCIA for each land cover category was multiplied by the total area of that category. The four resulting values were added together to find the total local basin DCIA.
4. The total local basin DCIA was divided by the local basin area (within the town boundary) to determine percent DCIA for the local basin.

Step 1 above was performed on a loop for each local basin using GIS and Python, while the remaining steps were performed as spreadsheet calculations. The 1-foot resolution IC raster was resampled to 5-foot resolution in order to reduce computational time. This changed the raster from 18 binary (1 for impervious, 0 for pervious) to non-binary, where the value of each 5x5 foot raster cell is the total square footage of IC within the cell (between 0 and 25 square feet). The DCIA analysis was conducted prior to the decision by CT DEEP that state roads should not be included in DCIA calculations. As such, the Town's calculations represent an overestimate of DCIA. The overestimation will be corrected at a later date as DCIA is tracked in subsequent years.

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

6.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Department / Person Responsible	Due	Date completed or projected completion date	Additional details
6-1 Develop/implement formal employee training program	Ongoing	The Town and Borough contracted with their consultant to do annual MS4 training that was scheduled for spring 2020. The training would have included the following topics: Spill Prevention and Response Town wide Stormwater Management Training (MS4). This training was cancelled due to COVID-19. The Town will look to include MS4 training during the upcoming year. The Town is exploring incorporating recorded MS4 trainings from other states such as an IDDE training done in MA in 2020. https://www.centralmastormwater.org/toolbox/pages/training-presentations On February 8, 2019 the Town of Stonington and the Town's sampling consultant received training regarding use of a digital data collection system for dry weather outfall screening and sampling and wet weather sampling of outfalls that discharge to impaired waters.	Continue to implement joint training program for Town and Borough employees, building on the Town's current program defined in section 7.2 of the SMP	Public Works, Engineering & Borough	Ongoing	Ongoing throughout entire permit	
6-2 Implement MS4 property and operations maintenance	Ongoing	The Department of Public Works has two State certified lawn/turf care applicators of which are directly responsible for the day to day maintenance of athletic fields for the Stonington school district. The care of these athletic fields utilizes current industry BMP standards. Two Town employees attended pesticide/herbicide training in 2019 and one employee attended in 2020. The Town was	• Implement turf/fertilizer management BMPs for parks and open space • Implement pet waste education program and install additional signage, baggies, and disposal receptacles, as needed, in areas where pet walking is common	Town & Borough Public Works Departments	Ongoing beginning Jul 1, 2018	Ongoing throughout entire permit timeframe	

		able to reduce herbicides used on Town properties by 20% in 2019 and 10% in 2020. All other municipal buildings and facilities' grounds are maintained by the Public Works Department. The Town-wide residential leaf collection program was discontinued in 2020. The Town still collects leaves from the public right of way and from areas with poor drainage.	• Implement waterfowl management BMPs in targeted areas as needed • Evaluate municipal buildings and facilities for spill prevention and pollution prevention practices and implement additional BMPs as necessary • Evaluate and modify, as necessary, municipal vehicle and equipment parking, fueling, and maintenance practices • Continue to collect leaf litter from the Town ROW, roadways, Town properties and areas of poor drainage				
6-3 Implement coordination with interconnected MS4s	Ongoing	The Town currently notifies the clerk of any adjoining municipality or subdivision applications for which a significant portion of water drainage will flow through and significantly impact the adjoining municipality. The Town also requires Subdividers to obtain an encroachment permit from CTDOT when a proposed drainage system connects to a state maintained drainage system.	Coordinate with neighboring municipalities, institutions, and DOT regarding stormwater management program activities associated with the adjacent MS4s	Town Public Works, and Borough Highway Department	Not specified	Ongoing	
6-4 Develop/implement program to control other sources of pollutants to the MS4	Ongoing	The Town and Borough continue to control sources of pollution to the MS4 through the existing IDDE program, water quality monitoring, the Town's ordinance related to illicit discharge and illegal connection, and targeted education and outreach to commercial, industrial, municipal, institutional facilities owners/operators.	Control through IDDE program, water quality monitoring, the Town's Illicit Discharge and Illegal Connection Ordinance, and targeted education and outreach to commercial, industrial, municipal, institutional facilities owners/operators (see BMP 1-1 within the SMP).	SWTF	Not specified	Ongoing	

6-5 Evaluate additional measures for discharges to impaired waters*	Not Started	None	Implement the measures and procedures described in Section 7.2 of the SWMP, including those measures to address stormwater pollutants of concern	Town & Borough DPW	Not specified	Summer 2021	
6-6 Track projects that disconnect DCIA	In Progress	The Town/Borough have previously contracted with Fuss & O'Neill to calculate removal of DCIA based on development projects completed within 5 years prior to the permit effective date to the current date.	Annually track total acreage of DCIA that is disconnected as a result of redevelopment or retrofits (see BMPs 5-4 and 6-7 of the SMP)	Town Engineering, Planning	Ongoing	Ongoing throughout entire permit timeframe	
6-7 Implement infrastructure repair/rehab program	Ongoing	In 2021 the Town and Borough completed the following stormwater infrastructure repairs/improvements: - Repaired (30) catch basins in Town - Repaired (15) catch basins in Borough The Engineering Department has initiated or continued work on (3) large-scale capital improvement projects pertaining to existing stormwater conveyance systems: 1. Washington Street Drainage Improvements. The project is in final design. 2. Fourth District Voting Hall. The box culvert was replaced. Rain garden and tide gate construction are waiting on supplies, which are due in Spring 2022. 3. A project to infiltrate stormwater on Allen Street, which has experienced flooding, is out to bid.	Repair, rehabilitate, or retrofit MS4 infrastructure (e.g., conveyances, structures, outfalls) as needed in a timely manner.	Engineering, Public Works	Jul 1, 2021	Ongoing throughout entire permit timeframe	
6-8 Develop/implement plan to identify/prioritize retrofit projects	Not Started	None	Develop retrofit plan and list of priority sites	Engineering, Planning SWTF	Jul 1, 2020	Summer 2022	
6-9 Implement retrofit projects to disconnect 2% of DCIA	Not Started	None	Disconnect 1% per year of Stonington's DCIA from the MS4	Engineering, Planning SWTF	Jul 1, 2022	Summer 2022	

6-10 Develop/implement street sweeping program	Ongoing	Both the Town and the Borough sweep streets on an annual basis. Downtown areas get swept multiple times per year to keep areas clean and prepare for special events.	Continue to inspect and sweep all municipally-owned or –operated streets and parking lots Schedule for completion: a. Priority Areas – annually in spring following the cessation of winter maintenance activities (i.e., sanding, deicing, etc. b. Outside Priority Areas (inc. rural uncurbed streets and parking lots with no catch basins) – in spring or develop and implement an inspection, documentation, and targeted sweeping plan	Town of Stonington & Borough DPW	Ongoing beginning Jul 1, 2017	Ongoing throughout permit timeframe	
6-11 Develop/implement catch basin cleaning program	Ongoing	Both the Town and the Borough clean/vacuum catch basins on an annual basis.	Inspect and clean catch basins as necessary Inspection Schedule: a. 100% within Priority Areas b. 100% of MS4 Develop a plan for optimizing catch basin cleaning (i.e., reduced frequency in certain areas) based on inspection findings, such that no catch basin is more than 50% full	Town of Stonington & Borough DPW	Ongoing beginning Jul 1, 2020	Ongoing throughout permit timeframe	
6-12 Develop/implement snow management practices	Ongoing	The Town of Stonington has 14 designated plow routes. All plow drivers have attended training for salt application and snow removal BMPs in the past. Employees are trained annually on BMPs for snow management. Training was completed in November 2019 during the prewinter operations meeting. Software to manage salt application is installed in all large trucks with built in spreaders. All trucks with spreaders are calibrated prior to the start of any winter event and then are rechecked in	• Calibrate all trucks with spreaders prior to the start of any winter event • Recheck truck calibration again in February • Minimize the use of salt to the extent practicable. • Use treated salt only and apply when road surface is wet to ensure maximum adhesion to the road surface.	Town of Stonington & Borough DPW	Ongoing beginning Jul 1, 2018	Ongoing throughout permit timeframe	

		February. The Town minimizes the use of salt and no sand is used on the Town's road system. The Town uses treated salt only and it is only applied when the road surface is wet to ensure maximum adhesion to the road surface. GPS units were previously installed on all plow trucks within the Town of Stonington DPW Department.	• Provide annual training to staff on snow removal				

Extra space for describing above BMP activities, if needed:

BMP	
	Software was installed on all large trucks with built-in spreaders to track quantity of salt used and the application rate. This information provides the DPW with valuable information necessary to improve and properly manage snow removal operations ensuring each treatment is effective. Two Town employees attended snow removal training in 2019 and two employees attended pesticide/herbicide training in 2019. One employee attended pesticide/herbicide training in 2020. The Town has two licensed Supervisory Level Pesticide Employees that attend annual training to keep the license active. DCIA disconnection projects continued, but were hampered by supply chain disruptions caused by COVID-19. The Town is ~75% complete with updating Standard Operating Procedures for municipal operations related to Parks and open space, Pet waste management, Waterfowl management, Buildings and facilities, Vehicles and Equipment, and Leaf management.

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

- Training staff for advanced snow management techniques such as pretreatment and brine applications will continue in an effort to stay in tune with the leading industry standards.
- The Town/Borough have contracted with Fuss & O'Neill to track DCIA removal estimates based on development projects completed within 5 years prior to the permit effective date to the current date.

6.3 Pollution Prevention/ Good Housekeeping reporting metrics

Metrics	
Employee training provided for key staff	Yes; March 31 and April 7, 2021 (Health and Safety Training) February 8, 2019 (general sw training), November 2019 (snow removal)
Street sweeping	
Curb miles swept	Town: 117 miles Borough: 10 miles

Volume (or mass) of material collected	Town: 150 tons Borough: 46 yds
Catch basin cleaning	
Total catch basins in priority areas	Town: Unknown Borough: 80
Total catch basins in MS4	Town: 1600 Borough: 110
Catch basins inspected	Town: 1497 Borough: 82
Catch basins cleaned	Town: 1497 Borough: 82
Volume (or mass) of material removed from all catch basins	Town: 112 tons Borough: 68 yds
Volume removed from catch basins to impaired waters (if known)	Town: Unknown Borough: Unknown
Snow management	
Type(s) of deicing material used	Morton Blizzard Wizard Road Salt
Total amount of each deicing material applied	Town: 927 tons Borough: 95 yds
Type(s) of deicing equipment used	Town: Compu-Spread by Rexroth Borough: Standard Spreaders
Lane-miles treated	Town: 234 lane miles of road per event Borough: 10 miles per ice/snow event
Snow disposal location	Spellman Park common space
Staff training provided on application methods & equipment	Two Town employees attended snow removal training in 2019
Municipal turf management program actions (for permittee properties in basins with N/P impairments)	
Reduction in application of fertilizers (since start of permit)	The Town of Stonington reduced its pesticide application rate on Town land by approximately 25% in 2018 and reduced herbicide use by approximately 20% in 2019. Herbicide use was reduced another 10% in 2020.
Reduction in turf area (since start of permit)	None
Lands with high potential to contribute bacteria (dog parks, parks with open water, & sites with failing septic systems)	
Cost of mitigation actions/retrofits	The town spent $2,000 on Mutt Mitts at key parks to allow residents to clean up after pets The Town also installed two signs in Donahue Park for $25 Three additional locations were selected for signage in 2022, for waterfowl-related messaging.

6.4 Catch basin cleaning program

Provide any updates or modifications to your catch basin cleaning program
Both the Town and the Borough continue to clean/vacuum catch basins on a yearly basis.

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.
The Town and Borough have started the Retrofit Program to identify and prioritize disconnection opportunities and intends to continue to implement projects. A draft Retrofit Plan has been completed (Attachment 6), and the Town and Borough intend to pursue funding opportunities to complete identified projects.

Describe plans for continuing the Retrofit program and how to achieve a goal of 1% DCIA disconnection in future years.
The Town and Borough have started the Retrofit Program to identify and prioritize disconnection opportunities and intends to continue to implement projects. The Town met with CTDOT to identify and discuss high priority opportunities for removing DCIA in Stonington. The Town and Borough continue to work closely on these projects.

Describe plans for continuing the Retrofit program beyond this permit term with the goal to disconnect 1% DCIA annually over the next 5 years.
The Town and Borough have started the Retrofit Program to identify and prioritize disconnection opportunities and intends to continue to implement projects, and are pursuing funding opportunities to complete disconnection.

Part II: Impaired waters investigation and monitoring

1. Impaired waters investigation and monitoring program

1.1 Indicate which stormwater pollutant(s) of concern occur(s) in your municipality or institution. 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.
Wet Weather impaired waters sampling began in spring of 2019. In 2018 the Town/Borough contracted with Fuss & O'Neill to create a digital data collection system for dry weather outfall screening and sampling and wet weather impaired waters sampling. Wet Weather sampling has been conducted at >50% of outfalls. The results of the sampling are provided in Attachment 7.

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

2.1 Screening data

Complete the table below for any outfalls screened during the reporting period. Each Annual Report will add on to the previous year's screening data showing a cumulative list of outfall screening data.

Outfall ID	Sample date	Parameter (Nitrogen, Phosphorus, Bacteria, or Other pollutant of concern)	Results	Name of Laboratory (if used)	Follow-up required? *
See Attachment 7 for outfall screening results					

2.2 Credit for screening data collected under 2004 permit

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

Outfall	Sample date	Parameter (Nitrogen, Phosphorus, Bacteria, or Other pollutant of concern)	Results	Name of Laboratory (if used)	Follow-up required? *
Nothing to report					

*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	Status of drainage area investigation	Control measure implementation to address impairment
OF-47	Not yet started	
OF-92	Not yet started	
OF-225	Not yet started	
OF-328	Not yet started	
OF-245	Not yet started	
OF-88	Not yet started	
OF-90	Not yet started	
OF-10	Not yet started	
OF-38	Not yet started	
OF-332	Not yet started	
OF-77	Not yet started	
OF-20	Not yet started	
OF-230	Not yet started	
OF-231	Not yet started	
OF-331	Not yet started	

OF-39	Not yet started	
OF-235	Not yet started	
OF-63	Not yet started	
OF-154	Not yet started	
OF-161	Not yet started	
OF-159	Not yet started	
OF-96	Not yet started	
OF-97	Not yet started	
OF-162	Not yet started	
OF-319	Not yet started	
OF-B369	Not yet started	
OF-B50	Not yet started	
OF-B52	Not yet started	

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

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

Outfall	Sample Date	Parameter(s)	Results	Name of Laboratory (if used)
See Attachment 7 for monitoring data				

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
Please see the Attachment 5 for the catchment ranking		

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

2.1 Dry weather screening and sampling data from outfalls and interconnections

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

Outfall / Interconnection ID	Screening / sample date	Ammonia	Chlorine	Conductivity	Salinity	E. coli or enterococcus	Surfactants	Water Temp	Pollutant of concern	If required, follow-up actions taken
See Attachment 7 for screening and sampling data										

2.2 Wet weather sample and inspection data

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

Outfall / Interconnection ID	Sample date	Ammonia	Chlorine	Conductivity	Salinity	E. coli or Enterococcus	Surfactants	Water Temp	Pollutant of concern
See Attachment 7 for sample and inspection data									

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

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
Not yet started.		

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 that 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 that poor owner maintenance).

3.2 Key junction manhole dry weather screening and sampling data

Key Junction Manhole ID	Screening / Sample date	Visual/ olfactory evidence of illicit discharge	Ammonia	Chlorine	Surfactants
Not yet started.					

3.3 Wet weather investigation outfall sampling data

Outfall ID	Sample date	Ammonia	Chlorine	Surfactants
Not yet started.				

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
Not yet started.							

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: Danielle Chesebrough – First Selectman	Print name: William Guenther, MS – Fuss & O'Neill
Signature / Date:	Signature / Date:
Print name: Jeffrey Callahan – Borough Warden	
Signature / Date:	

Attachment 1

Stonington Events Article

Stonington Beautification

The Stonington Beautification Committee volunteers worked on some exciting projects over the summer, including several clean-up events, new planters and the installation of a new pollinating garden in Donahue Park located in Pawcatuck. The committee is always looking for community volunteers of all ages to help water, weed, and clean up many of our flowering pots, parks, and community areas within Stonington. Look for the many holiday decorations through out town including our bridges and war memorials.

Please email us if you would like to be part of this special movement to beautify Stonington. stoningtonbeautification@stonington-ct.gov. If your family or business would like to sponsor any of our Beautification projects including trees, gardens and pots please send donations to: Stonington Beautification c/o Stonington Human Services, 166 South Broad St, Pawcatuck, CT 06379 or visit stonington.recdesk.com





Tax Collector

The 2nd installment of real estate and personal property (business-related) taxes is due between January 1, 2022, delinquent after February 1, 2022. Taxpayers, please remember that we don't rebill for the 2nd installment.

Motor Vehicle Supplemental bills will be mailed out in December and are due January 1, 2022, delinquent after February 1, 2022. This bill is for any vehicle newly registered after October 1, 2020. If you no longer own the vehicle for which you are being billed, please contact the assessor's office at 860-535-5098.



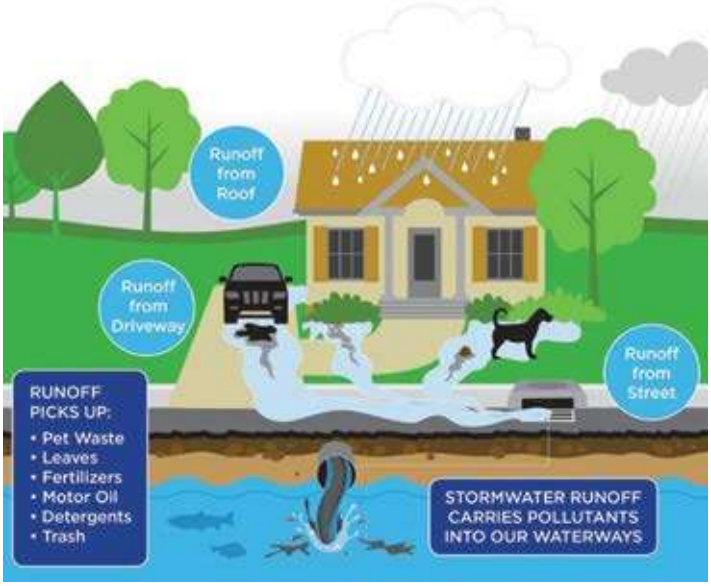
As always, if you have any questions, please call the tax office at 860-535-5080.

Linda Camelio, CCMC, Stonington Tax Collector

Stormwater Awareness

For more information visit the Town of Stonington Website, Engineering Division Webpage:

https://www.stonington-ct.gov/engineering



Attachment 2

Pet Waste Flier

Here is what every responsible pet owner needs to do:

1. Always have a bag with you to clean up after your pet.
2. Clean up after your pet every time, even when no one is looking.
3. Tie the bag closed and toss it in the trash.
4. Patrol your yard weekly, especially before it rains, and clean up after your pet.

Pet waste is a potential public health risk. Help to keep our watershed healthy. Please pick up after your pet.

Eastern Connecticut Conservation District is a non-profit organization created by State Statute. Our mission is soil and water conservation. We serve thirty-six municipalities in eastern Connecticut.

Eastern Connecticut Conservation District, Inc.

238 West Town Street
Norwich, CT 06360
(860)319-8806

https://conservect.org/eastern

Pet Waste, Your Health and Water Quality



This project was funded in part by the CT Department of Energy & Environmental Protection through a US EPA Clean Water Act § 319 Non-point Source Grant.



Image credit: WWW.IMGUR.COM

Dog waste is an environmental pollutant.

In 1991 the US EPA classified dog waste as an Environmental Pollutant. If left on the ground, it is considered a type of non-point source pollution, or NPS. NPS comes from scattered sources, rather than a pipe or smokestack. Once on the ground, the dog waste and the contaminants it contains get picked up by stormwater runoff. This contamination is washed downslope every time it rains. By this manner, it makes its way into your nearby stream, or your lake and eventually down to Long Island Sound.

People who enjoy recreational activities in our streams, lakes and ponds shouldn't be exposed to unnecessary pollution. If you think picking up dog waste is undesirable, think about swimming in it!

According to the US EPA, a dog eliminates between 0.5 and 0.75 pounds of waste every day. That adds up to almost 275 pounds per year! Per dog!



Why is dog waste bad for the environment?

Dog waste contains a mixture of pollutants, including nutrients and pathogens. Nutrient pollution encourages excess plant and algae growth in rivers and lakes, and can lead to low dissolved oxygen in aquatic environments when the plants and algae decay. Lower oxygen concentration can lead to fish kills.

Can people and/or their pets catch diseases from dog waste?

Many different disease-causing organisms and parasites can be found in pet waste.

Parasites	Bacteria	Viruses
Cryptosporidium	Salmonella	Distemper
Giardia	E. Coli	Parvovirus
Hookworms	Campylobacter	Canine hepatitis
Roundworms	Leptospira	
Tapeworms		

Does and Don'ts for pet waste

Do:

Clean up your pet waste, tie the bag shut and dispose of the bag in the trash.

If you prefer to flush the waste down the toilet, dispose of the used bag in the trash.

Don't:

Put your pet waste in a storm drain. That will only cause the pollution to go somewhere else, typically the nearest stream.

Flush bagged pet waste down the toilet.

Compost your dog waste with your regular compost. It won't get hot enough to kill the germs.

Attachment 3

Sanitary Sewer Overflow Inventory

As of 12/31/2021

Sanitary Sewer Overflow Inventory						
Location (include street crossing/address and receiving water)	Discharge to surface water or MS4	Date and duration of occurrence	Estimated SSO volume	Description with known or suspected cause	Corrective measures completed (include dates)	Corrective measures planned (include dates)
End of Cutter Drive	No	4/28/14 <15min	<20 gal	Failure of radio communicatoins between facilities.	Rebooted all radio systems and checked for	
End of Whaler Rd	No	3/29/17 <20min	<50 gal	Failed input terminals on PLC	Replaced inputs and tested alarms for	
Old Mystic Pump Station	No	2021	<500 gal	Leakage of broken force main	Leak contained and bypassed until repaired	
Boulder Pump Station	No	2021	approx 1000 gal	Power Failure	Septage hauler called in, repaired as well	
Shawandasee Pump Station	No	2021	<1000 gal	Water contractor hit force main	Repaired	

Per WPCA
Attn: Doug Nettleton

Most Recent Update:
12/31/21

Attachment 4

Septic System Repairs

LLHD
Ledge Light Health District

Town of Stonington Septic Repairs for the year 2021

Promoting healthy communities

Location and nature of structure with failing septic systems	Actions taken to respond to and address the failures	Impacted waterbody or watershed, if known
Failed system at 82 Riverside Dr. – SFH	New tank filter and leaching system installed with high level overflow d box to existing leaching field	Unknown
Failed system at 33 Nauyaug Point Rd. (SFH)	Full system replacement with pump system	Unknown
Failed leaching at 30 Bradford Rd. (SFH)	Full system replacement	Unknown
Failed system at 17 E. Forest Rd. (SFH)	Full system replacement	Unknown
Failed system at 6 Hickory Ledge (SFH)	Full system replacement	Unknown
Replacement Systems – not due to failures		
366 N. Stonington Rd. – SFH (single family house)	Full repair, upgrade	None
186 S. Anguilla Rd. - SFH	Full Repair, RE Trans (real estate transaction)	None
893 Pequot Trail. – SFH	Full repair, RE Trans	None
183 Masons Island Rd. – SFH	Full repair, upgrade	None
18 Skiff Ln. – SFH	Full repair – B100a, system upgrade	None
544 N. Stonington Rd. – SFH	Full repair – RE Trans	None
1 Country Ln – SFH	Tank replacement only	None
7 Deer Ridge Rd. – SFH	Full repair – RE Trans	None
17 Asher Ave. – SFH	Full repair, upgrade	None
26 Chapman Ln - SFH	Full repair, upgrade	None
6 Rogers Rd. – SFH	Full repair, upgrade	None
242 Flanders Rd. – SFH	Full repair, upgrade	None
18 Roseleah Dr. – SFH	Full repair, upgrade, B100a	None
111 Latimer Dr. – SFH	Full repair, upgrade, DEEP jurisdiction	None
9 Quarry Rd. – SFH	Full repair, upgrade	None
22 Riverbend Dr. – SFH	Tank replacement only	None
237 Taugwonk Rd. – SFH	Tank and D-box replacement only	None
509 Wheeler Rd. – SFH	Full repair, upgrade, B100a	None
14 Pequotsepos Center Rd. – SFH	Full repair, upgrade, B100a	None
30 Montauk Ave. – SFH	Full repair, upgrade	None
217 Elm St. – SFH	Full repair, upgrade	None
22 Burdick Ln. – SFH	Full repair, upgrade	None

LLHD
Ledge Light Health District

Town of Stonington Septic Repairs
for the year 2021

Promoting
healthy
communities

24 Meadow Rd. – SFH	Full repair, upgrade	None
70 Stanton Ln. – SFH	Tank replacement only	None
23 Lane Way – SFH	Full repair, upgrade	None
945 Stonington Rd. – SFH	Full repair, upgrade	None
15 Orchard Hill Dr. – SFH	Full repair, upgrade, B100a	None

Attachment 5

DCIA Tracking Spreadsheet

Town of Stonington MS4
Impervious Area (IA) & Directly Connected Impervious Area (DCIA) Tracking
11/30/2021

Total Watershed Area =	**24,961.94**	**Acres**	From Fuss & O'Neil DCIS Analysis dated November 2, 2018)
Impervious Area (2012 Study) =	**1,953.80**	**Acres**	From Fuss & O'Neil DCIS Analysis dated November 2, 2018)
Baseline DCIA (After Applying Sutherland Equations) =	**870.60**	**Acres**	From Fuss & O'Neil DCIS Analysis dated November 2, 2018)
Impervious Area Added Post 2012 =	**43.17**	**Acres**	From CLA (Combination of Visual Analysis and Town Records)
Total Impervious Area =	**1,996.97**	**Acres**	
DCIA Added to MS4 Post 2012 =	**0.39**	**Acres**	From CLA (Combination of Visual Analysis and Town Records)
Total DCIA added to MS4 =	**870.99**	**Acres**	
DCIA Disconnect Goal (2%) =	**17.42**	**Acres**	

GIS shows as Private Road
Development not complete at time of 2019 Aerial Mapping
Needs additional investigation to determine contributing DCIA

PROJECT INFORMATION					NEW DEVELOPMENT		REDEVELOPMENT		RETROFITS	CHANGE IN IA		CUMULATIVE TOTALS				NOTES & REFERENCES
Ref No.	**Development**	**Address**	**Plans Provided**	**Type of Development**	**Total IA added (ac)**	**DCIA added to MS4 (ac)**	**Total IA added or subtracted (ac)**	**DCIA added or subtracted to MS4 (ac)**	**IA Disconnected from MS4 (ac)**	**Change in Total IA (ac)**	**Change in DCIA to MS4 (ac)**	**Total IA (ac)**	**Total IA (%)**	**DCIA to MS4 (ac)**	**DCIA to MS4 (%)**	**Notes & References**
IMPERVIOUS AREA BASELINE (March 2012)												**1953.80**	**7.83%**	**870.60**	**3.5%**	
1	Olivia Lane	Olivia Lane		New Development	1.49	0.00				1.49	0.00	1955.29	7.83%	870.60	3.5%	Located on State Road
2	716 Al Harvey Rd	716 Al Harvey Rd		New Development	0.27	0.00				0.27	0.00	1955.56	7.83%	870.60	3.5%	
3	613 N Stonington Rd	613 N Stonington Rd		New Development	0.29	0.00				0.29	0.00	1955.85	7.84%	870.60	3.5%	Located on State Road
4	485 New London Tnpk	485 New London Tnpk		New Development	0.55	0.00				0.55	0.00	1956.40	7.84%	870.60	3.5%	Located on State Road
5	443 New London Tnpk	443 New London Tnpk		New Development	0.25	0.00				0.25	0.00	1956.65	7.84%	870.60	3.5%	Located on State Road
6	Old Mystic Estates	Nautilus Way	Y	New Development	0.00					0.00	0.00	1956.65	7.84%	870.60	3.5%	Not complete at time of 2019 Aerial Mapping. This is a large development. Total IA cannot be quantitied until complete. Need to review stormwater management design to determine DCIA.
7	2, 4, 5, 6, 13,41,49, 60, 66, 100, 102 Circle Dr	2, 4, 5, 6, 13,41,49, 60, 66, 100, 102 Circle Dr		New Development	0.58	0.00				0.58	0.00	1957.23	7.84%	870.60	3.5%	GIS shows Private Road. IA quantified. Two catch basins on Stephen Dr. Need to determine ownership. Where does this area drain to?
8	106, 110, 136, 147 Stephen Dr	106, 110, 136, 147 Sthephen Dr		New Development	0.19	0.00				0.19	0.00	1957.42	7.84%	870.60	3.5%	GIS shows Private Road. IA quantified. Two catch basins on Stephen Dr. Need to determine ownership. Where does this area drain to?
9	472 N Anguilla Rd	472 N Anguilla Rd		New Development	0.06	0.00				0.06	0.00	1957.48	7.84%	870.60	3.5%	
10	1-3 Race St	1-3 Race St		New Development	0.18	0.00				0.18	0.00	1957.66	7.84%	870.60	3.5%	
11	61 Robinson St	61 Robinson St		New Development	0.03	0.00				0.03	0.00	1957.69	7.84%	870.60	3.5%	
12	312 River Rd	312 River Rd		New Development	0.13					0.13	0.00	1957.82	7.84%	870.60	3.5%	Does IA from this development enter the MS4 on River Road? Does the outfall from this system directly connect to Waters of the State?
13	Perkins Farm (Harbor Heights)	Jerry Browne Road		New Development	4.60	0.00				4.60	0.00	1962.42	7.86%	870.60	3.5%	
14	Birchwood Farms	126 South Broad Street		New Development	2.00	0.00				2.00	0.00	1964.41	7.87%	870.60	3.5%	IA from Design Plans
15	West Vine St School	17 West Vine Street		Redevelopment	0.00	0.00	3.04			3.04	0.00	1967.45	7.88%	870.60	3.5%	Need to determine if any runoff reduction considered in design
16	3, 5, 7, 9, 11, 13, 15 Damato Dr	3, 5, 7, 9, 11, 13, 15 Damato Dr		New Development	0.33	0.00				0.33	0.00	1967.78	7.88%	870.60	3.5%	
17	118 Rowley Dr	118 Rowley Dr		New Development	0.25	0.00				0.25	0.00	1968.03	7.88%	870.60	3.5%	
18	1215 Pequot Tr	1215 Pequot Tr		New Development	0.24	0.00				0.24	0.00	1968.27	7.89%	870.60	3.5%	Located on State Road
19	305 Pequot Tr	305 Pequot Tr		New Development	0.27	0.00				0.27	0.00	1968.54	7.89%	870.60	3.5%	Located on State Road
20	49 High Rdige Dr	49 High Rdige Dr		New Development	0.10	0.00				0.10	0.00	1968.64	7.89%	870.60	3.5%	
21	138 Liberty St	138 Liberty St		New Development	0.12	0.00				0.12	0.00	1968.76	7.89%	870.60	3.5%	Located on State Road
22	Cedar Grove La/Grandview Farm Dr	Cedar Grove La/Grandview Farm Dr	Y	New Development	1.34					1.34	0.00	1970.10	7.89%	870.60	3.5%	Not complete at time of 2019 Aerial Mapping. Design Plans do not show proposed buildout. Is development fully built out? Need to determine stormwater management. NO DCIA if no runoff to MS4 on Faitview Dr.
23	Masonicare Senior Living	45 Clara Dr	Y	New Development	6.20					6.20	0.00	1976.30	7.92%	870.60	3.5%	Need to determine if any runoff reduction. Does any runoff enter MS4 on Clara Dr?
24	21 Williams St	21 Williams St		New Development	0.11					0.11	0.00	1976.41	7.92%	870.60	3.5%	Cannot determine DCIA from Site Plan. Does any IA runoff enter MS4 on Williams Street
25	14/16 Cutter Dr	14/16 Cutter Dr	Y	New Development	0.17	**0.12**				0.17	0.12	1976.58	7.92%	870.72	3.5%	
26	132 Hewitt Rd	132 Hewitt Rd		New Development	0.06	0.00				0.06	0.00	1976.64	7.92%	870.72	3.5%	
27	1189 Pequot Tr	1189 Pequot Tr		New Development	0.79	0.00				0.79	0.00	1977.43	7.92%	870.72	3.5%	
28	19/23 Pequotsepos Ctr Rd	19/23 Pequotsepos Ctr Rd		New Development	0.22	0.00				0.22	0.00	1977.65	7.92%	870.72	3.5%	
29	271 Montauk Ave	271 Montauk Ave		New Development	0.11	0.00				0.11	0.00	1977.76	7.92%	870.72	3.5%	
30	Deans Mill School	35 Deans Mill Road	Y	Redevelopment	0.00					0.00	0.00	1977.76	7.92%	870.72	3.5%	Not complete at time of 2019 Aerial Mapping. Need to understand Stormwater Management.
31	214 Flanders Rd	214 Flanders Rd		New Development	0.10	0.00				0.10	0.00	1977.86	7.92%	870.72	3.5%	
32	396 N Main St	396 N Main St		New Development	0.16	0.00				0.16	0.00	1978.02	7.92%	870.72	3.5%	
33	36 Stanton La	36 Stanton La	Y	New Development	0.16	0.00				0.16	0.00	1978.18	7.92%	870.72	3.5%	
34	132 Farmholme Rd	132 Farmholme Rd		New Development	0.25	0.00				0.25	0.00	1978.43	7.93%	870.72	3.5%	
35	52/54 Barnes Rd	52/54 Barnes Rd		New Development	0.14	0.00				0.14	0.00	1978.57	7.93%	870.72	3.5%	
36	491 Pequot Trail	491 Pequot Trail	Y	New Development	0.00	0.00				0.00	0.00	1978.57	7.93%	870.72	3.5%	Design Plan does not confirm as-built driveway
37	30/40 Extrusion Drive	30/40 Extrusion Drive		New Development	1.88	0.00				1.88	0.00	1980.45	7.93%	870.72	3.5%	
38	30 N Broad St	30 N Broad St	Y	New Development	0.12					0.12	0.00	1980.57	7.93%	870.72	3.5%	Cannot determine DCIA from Site Plan. Does any IA runoff enter MS4 on N Broad Street?

Town of Stonington MS4
Impervious Area (IA) & Directly Connected Impervious Area (DCIA) Tracking
11/30/2021

Total Watershed Area =	**24,961.94**	**Acres**	From Fuss & O'Neil DCIS Analysis dated November 2, 2018)
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Total Impervious Area =	**1,996.97**	**Acres**	
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Total DCIA added to MS4 =	**870.99**	**Acres**	
DCIA Disconnect Goal (2%) =	**17.42**	**Acres**	

GIS shows as Private Road
Development not complete at time of 2019 Aerial Mapping
Needs additional investigation to determine contributing DCIA

PROJECT INFORMATION					NEW DEVELOPMENT		REDEVELOPMENT		RETROFITS	CHANGE IN IA		CUMULATIVE TOTALS				NOTES & REFERENCES
Ref No.	Development	Address	Plans Provided	Type of Development	Total IA added (ac)	DCIA added to MS4 (ac)	Total IA added or subtracted (ac)	DCIA added or subtracted to MS4 (ac)	IA Disconnected from MS4 (ac)	Change in Total IA (ac)	Change in DCIA to MS4 (ac)	Total IA (ac)	Total IA (%)	DCIA to MS4 (ac)	DCIA to MS4 (%)	Notes & References
39	45 Lathrop Ave	45 Lathrop Ave	Y	New Development	0.12	0.00				0.12	0.00	1980.69	7.93%	870.72	3.5%	
40	59 Parkwood Dr/3 Shea Dr	59 Parkwood Dr/3 Shea Dr		New Development	0.13	**0.13**				0.13	0.13	1980.82	7.94%	870.85	3.5%	
41	235 Greenhaven Rd	234 Greenhaven Rd		New Development	0.15	0.00				0.15	0.00	1980.97	7.94%	870.85	3.5%	
42	51 Mary Hall Rd	51 Mary Hall Rd	Y	New Development	0.07	**0.04**				0.07	0.04	1981.04	7.94%	870.89	3.5%	
43	583 Greenhaven Rd	583 Greenhaven Rd		New Development	0.08	0.00				0.08	0.00	1981.12	7.94%	870.89	3.5%	
44	267 Osbrook Pt	267 Osbrook Pt		New Development	0.20	0.00				0.20	0.00	1981.32	7.94%	870.89	3.5%	
45	Flemmings Feed	786 Stonington Rd		Addition	1.26	0.00				1.26	0.00	1982.58	7.94%	870.89	3.5%	Located on State Road
46	45 Cutler St	45 Cutler St		New Development	0.15	0.00				0.15	0.00	1982.73	7.94%	870.89	3.5%	
47	21 Oak Dr	21 Oak Dr	Y	New Development	0.11					0.11	0.00	1982.84	7.94%	870.89	3.5%	Cannot determine DCIA from Site Plan. Does any IA runoff enter MS4 on Oak Dr?
48	29 Maple St LP	29 Maple St LP		New Development	0.09	0.00				0.09	0.00	1982.93	7.94%	870.89	3.5%	
49	12 Lambs Way	12 Lambs Way	Y	New Development	0.18	0.00				0.18	0.00	1983.11	7.94%	870.89	3.5%	
50	44 Cove Rd	44 Cove Rd	Y	New Development	0.13	0.00				0.13	0.00	1983.24	7.95%	870.89	3.5%	
51	48 Hewitt Rd	48 Hewitt Rd	Y	New Development	0.11	**0.07**				0.11	0.07	1983.35	7.95%	870.96	3.5%	
52	Brustolon Buick GMC	47 Stonington Rd		Parking Addition	0.49	0.00				0.49	0.00	1983.84	7.95%	870.96	3.5%	Located on State Road
53	8 Latimer Pt Rd	8 Latimer Pt Rd		New Development	0.31	0.00				0.31	0.00	1984.15	7.95%	870.96	3.5%	
54	51 Latimer Pt Rd	51 Latimer Pt Rd		New Development	0.28	0.00				0.28	0.00	1984.43	7.95%	870.96	3.5%	
55	1 Harry Austin Dr	1 Harry Austin Dr		Parking Addition	0.74	0.00				0.74	0.00	1985.17	7.95%	870.96	3.5%	
56	Mystic Pt La	Mystic Pt La		New Development	0.36	0.00				0.36	0.00	1985.53	7.95%	870.96	3.5%	
57	1 Orchard Hill Dr	1 Orchard Hill Dr		New Development	0.05	0.00				0.05	0.00	1985.58	7.95%	870.96	3.5%	
58	33 Old North Rd	33 Old North Rd		New Development	0.11	0.00				0.11	0.00	1985.69	7.95%	870.96	3.5%	
59	3 Niles Rd	3 Niles Rd	Y	New Development	0.10	**0.04**				0.10	0.04	1985.79	7.96%	870.99	3.5%	
60	5 Egret Rd	5 Egret Rd		New Development	0.15	0.00				0.15	0.00	1985.94	7.96%	870.99	3.5%	
61	22 Cormorant Rd	22 Cormorant Rd		New Development	0.13	0.00				0.13	0.00	1986.07	7.96%	870.99	3.5%	
62	193 Masons Island Rd	193 Masons Island Rd		New Development	0.12	0.00				0.12	0.00	1986.19	7.96%	870.99	3.5%	
63	4 Cormorant Rd	4 Cormorant Rd		New Development	0.08	0.00				0.08	0.00	1986.27	7.96%	870.99	3.5%	
64	3 Chippechaug Tr	3 Chippechaug Tr		New Development	0.13	0.00				0.13	0.00	1986.40	7.96%	870.99	3.5%	
65	110 S Broad St	110 S Broad St		Redevelopment	0.00	0.00	(0.01)	0.00		(0.01)	0.00	1986.39	7.96%	870.99	3.5%	Located on State Road
66	Spruce Ridge	88/86 S Broad St	Y	Redevelopment	0.00	0.00	1.61	0.00		1.61	0.00	1988.21	7.96%	870.99	3.5%	Appears to drain into 100 S Broad Street
67		118 S Broad St		Redevelopment	0.00	0.00	0.21	0.00		0.21	0.00	1986.60	7.96%	870.99	3.5%	Located on State Road
68	Spruce Meadows LLC	100 S Broad Street		Redevelopment	0.00	0.00	1.46	0.00		1.46	0.00	1989.67	7.97%	870.99	3.5%	Where is the Discharge Location?
69	Hartford Healthcare	Jerry Browne Road	Y	New Development	3.57	0.00				3.57	0.00	1993.25	7.99%	870.99	3.5%	
70	Perkins Fam Campus	Jerry Browne Road	Y	New Development	3.33	0.00				3.33	0.00	1996.57	8.00%	870.99	3.5%	
71	116 S Broad St	116 S Broad St		Redevelopment	0.00		0.39	0.00		0.39	0.00	1996.97	8.00%	870.99	3.5%	
72	Latimer Point Condo	39 East Shore Rd	Y	Redevelopment	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
73	GPP Bachman	62 Voluntown Rd	Y	Redevelopment	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
74	George B Dunnington	12 Jerome Ave	Y	Redevelopment	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
75	Alamoe	19 Old Stonington Rd	Y	Redevelopment	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
76	Mitchel & Regina Strand	18 Skiff Lane	Y	Redevelopment	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
77	Mystic Seaport	50 Greenmanville Ave	Y	New Development	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
78	Coastal Wealth Management	56 Williams Ave	Y	New Development	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
79	A G Trust	40 Masons Island Rd	Y	New Development	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
80	Michael Norcia	17,19,21 Oakwood Ave	Y	New Development	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
81	Stonington Country Club	394 Taugwonk Rd	Y	New Development	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
82	Winn Development	27 West Broad St	Y	Redevelopment	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
83	G Development	32 Broadway Ave	Y	Redevelopment	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
84	Garden Homes Derby	77 Fair Acres Cir	Y	New Development	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
85	Brian J Stafford	3 Roseleah Dr	Y	New Development	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
86	Whalers Inn	1-3 Haley St	Y	Redevelopment	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
87	Ocean Breeze Land	7 Williams Ave	Y	Redevelopment	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	
88	Masons Island Co.	Great Marsh Road	Y	New Development	0.00					0.00	0.00	1996.97	8.00%	870.99	3.5%	

Town of Stonington MS4
Impervious Area (IA) & Directly Connected Impervious Area (DCIA) Tracking
11/30/2021

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GIS shows as Private Road

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PROJECT INFORMATION					NEW DEVELOPMENT		REDEVELOPMENT		RETROFITS	CHANGE IN IA		CUMULATIVE TOTALS				NOTES & REFERENCES
Ref No.	Development	Address	Plans Provided	Type of Development	Total IA added (ac)	DCIA added to MS4 (ac)	Total IA added or subtracted (ac)	DCIA added or subtracted to MS4 (ac)	IA Disconnected from MS4 (ac)	Change in Total IA (ac)	Change in DCIA to MS4 (ac)	Total IA (ac)	Total IA (%)	DCIA to MS4 (ac)	DCIA to MS4 (%)	Notes & References
					36.46	0.39	6.70	0.00	0.00	43.17	0.39	1996.97	8.00%	870.99	3.5%	

Attachment 6

DCIA Retrofit Plan (Draft)

FUSS & O'NEILL

DRAFT

MEMORANDUM

TO: Chris Greenlaw, PE; Barbara McKrell, PE
Town of Stonington

FROM: William Guenther, MS; Stefan Bengtson, MS

DATE: September 9, 2021

RE: Town of Stonington Stormwater Retrofit Plan

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1. Introduction

The Post-Construction Stormwater Management minimum control measure of the Connecticut MS4 General Permit (MS4 General Permit) requires that municipalities implement a retrofit program to track and disconnect Directly Connected Impervious Area (DCIA). Fuss and O'Neill performed a screening-level assessment of potential retrofit opportunities throughout the Town of Stonington to address the retrofit program requirements of the MS4 General Permit. This memorandum serves as the Town's plan (i.e., Retrofit Plan) to implement retrofit projects with the goal of "disconnecting" existing DCIA.

DCIA is the impervious area that transports stormwater directly into a waterbody or into stormwater drainage infrastructure that transports runoff directly into waterbodies. DCIA is "disconnected" when impervious surfaces are converted to pervious surfaces, or when impervious areas are retrofitted (or redeveloped) with structural stormwater controls that retain the appropriate portion of the Water Quality Volume as outlined in the MS4 Permit.

The Town is required to track and prioritize the disconnection of 1% DCIA Town-wide in years four (4) and five (5) of the permit, or 2% overall disconnection of DCIA by year five (5), to the Maximum Extent Practicable, with a continuing goal of one percent per year thereafter. The DCIA disconnection goal for the Town is approximately 17.4 acres by the end of the 5-year permit, or 8.7 acres per year in Years 4 and 5. Implementing retrofit projects that disconnect DCIA will improve or protect water quality by reducing pollutant loads to receiving waters, as well as increase flood resiliency by reducing runoff volumes and peak flows.

In the context of this retrofit plan, the terms "stormwater retrofit," "Low Impact Development (LID)," and "Green Infrastructure" are used interchangeably to refer to systems and practices that reduce surface water runoff through the use of vegetation, soils, and natural processes to manage water and create healthier urban and suburban environments (EPA, 2014). Stormwater retrofits can include a variety of stormwater management practices such as bioretention/rain gardens, engineered wetland systems, permeable pavement, green roofs, green streets, infiltration planters, tree boxes, and rainwater harvesting. These practices capture, manage, and/or reuse rainfall close to where it falls, thereby reducing stormwater runoff and keeping it out of drainage systems and receiving waters.

In addition to reducing polluted runoff and improving water quality, stormwater retrofits that rely on green infrastructure techniques can help protect surface and groundwater drinking water supplies and improve flow conditions in rivers and streams by infiltrating water into the ground. When applied throughout a watershed, green infrastructure can also mitigate flooding and increase climate resiliency. At a smaller scale, green infrastructure retrofits can also reduce erosive velocities and streambank erosion.

Finally, green infrastructure has been shown to provide other social and economic benefits relative to reduced energy consumption, improved air quality, carbon reduction and sequestration, improved property values, recreational opportunities, overall economic vitality, and adaptation to climate change.

2. Assessment Methods and Findings

The overall LID assessment consists of three major tasks:

1. Screening-level assessment to quickly identify areas within both the Town and Borough with the greatest feasibility for and potential benefits from stormwater retrofits
2. Field inventories of the most promising stormwater retrofit opportunities identified from the screening step
3. Development of stormwater retrofit concepts for selected GI retrofit sites, including anticipated reductions in DCIA and planning level costs.

This retrofit plan documents the methods and findings of the screening-level assessment, as well as field inventories and concepts for selected retrofit sites.

2.1 Site Screening Evaluation

Sites were selected and analyzed using Geographic Information System (GIS) mapping and associated geospatial data. GIS allows for rapid evaluation of specific land-based attributes that are important for assessing the feasibility of stormwater retrofit practices. The assessment used the following site evaluation criteria[1] and data sources. Each candidate parcel was given a ranking for all criteria below.

- Land Ownership – Publicly owned (e.g., municipal) sites are most favorable because they avoid the cost of land acquisition and provide direct control over LID construction, maintenance, and monitoring by the municipality. Other publicly-owned sites such as schools, Town right-of-ways, and state-owned and federally owned land are also potential LID candidates, but may require additional effort in design and construction. A list of 161 publicly-owned candidate parcels, identified from the Town's parcel data, were scored, with Town-owned parcels receiving the highest score, followed by public ROW, State or Federally owned parcels, and privately owned parcels Land owned by the Aquarion Water Company around Mystic Reservoir and Deans Reservoir were also included for consideration.
- Subsurface Conditions – Subsurface conditions are key considerations for infiltration-based LID retrofits. Soil infiltration capacity, depth to groundwater, depth to restrictive layers (bedrock, dense till), soil bulk density, and inundation of soils due to flooding are important characteristics that can affect the feasibility of infiltration-based LID retrofits. For the purposes of this screening

[1] Other site-specific factors such as available land area, drainage area, subsurface utilities, subsurface contamination, and storm drainage system capacity are also important considerations for stormwater retrofits.

evaluation, Natural Resources Conservation Services (NRCS) soil classifications and the Soil Survey Geographic (SSURGO) database were used to assess the feasibility of infiltration practices at a given site.

  - Hydrologic Soil Groups (HSGs) mapped by NRCS provide an initial estimate of infiltration and storage capacity of soils on a site. Group A soils have the lowest runoff potential (highest infiltration rates) and Group D soils have the highest runoff potential (lowest infiltration rates) when thoroughly wet. Soils with higher drainage capabilities are generally better suited for LID and received higher criteria scores. While HSG mapping provides an initial estimate of infiltration potential, field investigations are necessary to verify soil conditions for final feasibility determinations and design purposes. For this screening-level analysis, sites where the dominant soil condition (by area) is mapped as Group A received the highest score, followed by B, C, and D. In areas with a history of development, the natural soil condition has often been so modified and is so variable that classification into a HSG is not appropriate. Sites in these areas were ranked between Groups B and C.

- National Flood Hazard Layer Floodplain – Practices installed in areas with a 1%- and a 0.2%-annual-chance of flooding can be more likely to fail due to inundation during large floods or sea-level rise. For this screening-level analysis, sites outside of the mapped 0.2%-annual-chance floodplain were ranked highest followed by those within the 0.2%-annual-chance, 1%-annual-chance floodplain, and regulatory floodway. Parcels spanning more than one flood hazard zone were assigned scores manually and reflect the predominant flood hazard zone where development is located on the parcel. For example, if the majority of a parcel's development were located in a minimal-flood hazard area, but a corner of the parcel was covered by the 0.2%-annual-chance area, the entire parcel was considered to be in the minimal-flood-hazard area.
- Impervious Cover – Water quality is typically degraded in drainage basins which have a high degree of impervious cover. Sites with higher amounts of impervious cover generate more runoff and have greater potential for runoff reduction through the use of GI retrofits. Areas with a high degree of development and impervious surfaces are generally considered high priority for green infrastructure implementation. For this screening-level analysis, sites with impervious coverage of over 30% of site area scored highest, followed by those with between 20% and 30%, 10% and 20%, and less than 10%, respectively.
- Impaired Waters and Urbanized Area – In order to locate green infrastructure where it will have the greatest benefit to water quality, sites in close proximity to impaired waters were favored. Impaired waters are those surface waters that do not meet current water quality standards for specific uses such as recreation and aquatic life. For this screening-level analysis, sites discharging directly to an impaired water received the highest score, followed by sites discharging indirectly (i.e. greater than 300 feet overland), sites discharging to tributaries of impaired waters, and sites not located within the Town's Priority Area.

2.2 *Site Screening Results*

Out of the 161 candidate parcels, a total of 57 sites were identified based on the GIS screening evaluation. Site aerials were reviewed to identify additional site constraints such as available space and subsurface utility conflicts, reducing the number of potential sites to 38. These 38 sites were reviewed with Town staff to incorporate institutional knowledge, particularly related to already-planned or recently-completed LID projects, to identify a list of parcels for site visits. A subset of 17 were selected for site visits to confirm feasibility of potential LID, which occurred on April 20, 2021 (Table 1 and Figure 1).

Table 1. Potential low impact design retrofit sites selected for field investigation.

Site Number	Site Name/Description	Address	Ownership
1	Liberty Street Park and Ride	321 Liberty Street	CT DOT
2	West Vine Street School	17 West Vine Street	Town of Stonington
3	Lester Avenue/Palmer Street/Moss Street	31 Moss Ave	Town of Stonington ROW
4	Stonington Housing Authority	45 Sisk Drive	Town of Stonington
5	Pawcatuck Middle School	40 Field Street	Town of Stonington
6	Stonington High School/Human Services	Spellman Drive	Town of Stonington
7	Stonington Police Department	173 South Broad Street	Town of Stonington
8	Wimpheimer Park	36 Meadow Avenue	Borough of Stonington
9	Town Hall and Public Works Facility	152 Elm Street/Alpha Ave	Town of Stonington
10	Alpha Avenue and Trumbull Avenue	Alpha Avenue	Town of Stonington ROW
11	Stonington Free Library	20 High Street	Town of Stonington
12	Main Street	Main Street	Borough of Stonington ROW
13	Elm Street Extension	36 Elm Street	Borough of Stonington ROW
14	Stonington Middle School	204 Mistuxet Avenue	Town of Stonington
15	Mystic Little League	41 Rossie Pentway	Private
16	North Stonington Elementary School	49 North Stonington Road	Town of Stonington
17	Taugwonk Road Park and Ride	15 Taugwonk Road	CT DOT

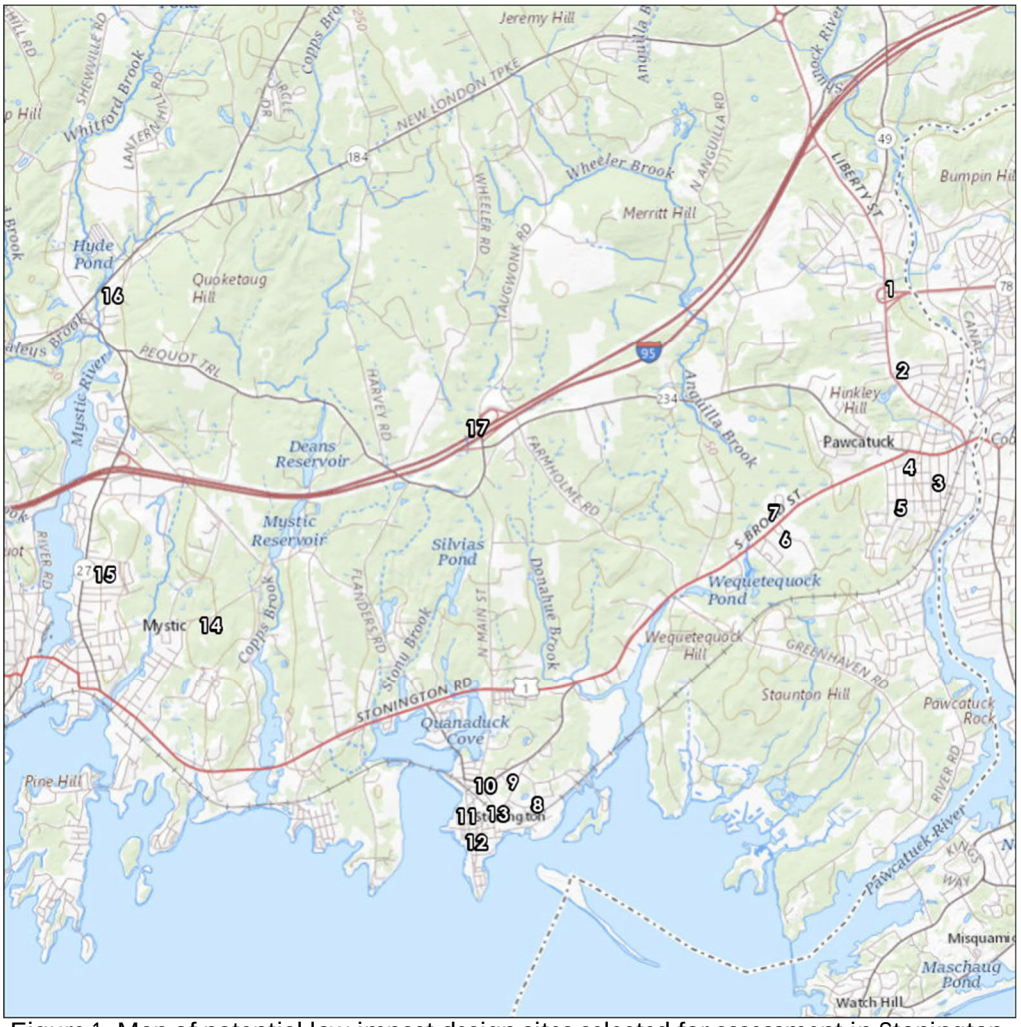


Figure 1. Map of potential low impact design sites selected for assessment in Stonington.

3. Field Inventories, Site Selection, and Conceptual Designs

3.1 Field Inventories

Field visits were conducted at the selected sites on April 20, 2021. The sites and adjacent street areas were walked and visually inspected for potential LID retrofit opportunities (i.e., impervious surfaces connected to the on-site drainage system, available space to accommodate new LID practices, and drainage features that could be enhanced or improved) and physical site characteristics such as site configuration, drainage patterns, current use, slope, landscaping, subsurface utilities, design complexity, and maintenance access considerations. Site visit notes and photographs for potential LID retrofit sites were recorded electronically at each location (Attachment A). These electronic notes followed standard "Retrofit Reconnaissance Investigation" forms developed by the Center for Watershed Protection.

The types of LID retrofits with potential applicability in both communities include:

- Infiltration Basins, located in areas where native soils may have sufficient capacity to infiltrate stormwater
- Bioretention basins, typically located in areas with limited groundwater separation and including an underdrain
- Pavement removal
- Belowground infiltration systems, including linear infiltration systems.
- Permeable pavement

3.2 Sites Selected for Concept Designs

Based on the findings of the field inventories, LID retrofit opportunities were identified at most of the sites visited. Twelve of these sites were chosen for development of concept designs consistent with the project scope and available budget for this task. These sites were selected because they: (1) have the greatest feasibility for LID retrofits and (2) provide the best opportunities to infiltrate (i.e., reduce) or filter runoff. Many of the sites are also in highly visible, public locations and so can also provide good demonstration value. The 12 sites are listed in Table 2.

Table 2. Sites selected for development of low impact design concepts.

Site Number	Site Name	Low Impact Design BMP Types	Project Cost Estimate[1]	DCIA Acres Disconnected
1	Liberty Street Park and Ride	Infiltration Basin	$70,000	1.39
		Pavement Removal	$105,000	1.32
2	West Vine Street School	Rain Garden	$10,000	0.11
3	Moss Street	Two Bioswales	$42,000	0.08
5	School Administration Building	Infiltration Basin	$25,000	0.45
		Subsurface Infiltration	$240,000	0.77
6	Stonington High School Stonington Human Services Spellman Recreation Complex	Infiltration Basin	$125,000	3.30
		Six Bioretention Basins	$325,000	2.51
		Bioretention and Parking Lot Reconfiguration	$125,000	0.72
7	Stonington Police Department	Bioretention	$40,000	0.25
8	Wimpheimer Park	Bioretention	$160,000	1.84
9	Town Hall and Public Works Facility	Infiltration Basin	$140,000	3.01
10	Alpha Avenue and Trumbull Avenue	Infiltration Basin	$20,000	0.19
12	Main Street	Seven Tree Filters	$154,000	0.27
13	Elm Street Extension	Pavement Removal	$5,000	0.03
14	Stonington Middle School	Infiltration Basin	$85,000	1.52
		Tree Filter	$17,000	0.11
		Total	$1,688,000	17.8

[1] Planning level opinion of cost. Includes estimated costs for engineering design, permitting, and construction. Excludes operation and maintenance costs.

3.3 Retrofit Concepts

Retrofit design concepts were prepared for the selected sites. The concepts reflect opportunities for infiltration and/or water quality treatment at each site. Opportunities were also evaluated to manage additional runoff from on-site and off-site drainage areas. Retrofits were sited to capture and infiltrate/treat the full Water Quality Volume (WQ_V), where feasible.

At some of the selected sites, there is sufficient physical space to build a practice that would treat larger storms. Given the increasing frequency of heavy precipitation events associated with climate change impacts, the Town may wish to consider taking advantage of available space to implement retrofits with additional retention capacity to manage runoff from larger storms and thereby address other goals such as mitigating flooding and increasing climate resilience. Note that this approach would increase implementation costs, although these increases are often more favorable than a 1:1 ratio of increased size to cost due to economies of scale.

The retrofit concepts, including planning-level costs and estimated reduction in DCIA, are presented on the concept sheets in Attachment B. Each concept sheet includes a general site description, the proposed retrofit concepts, field images, and example images of similar installed retrofits (where available) or typical details of the retrofit practices. Sizing calculations for the proposed retrofits are provided in Attachment C.

Preliminary, planning-level costs were estimated for the site-specific concepts based upon unit costs derived from published sources, engineering experience, and the proposed design concepts. A 30% contingency is used to account for the costs of design and permitting. A more detailed breakdown of estimated costs, including operation and maintenance costs and total annualized costs based on the anticipated design life of each practice, is provided in Attachment D. Final costs will be determined during the design phase, and must take into consideration more detailed, site-specific data gathering, especially related to soils and the location of utilities.

The LID retrofit concepts presented in this technical memorandum provide potential on-the-ground projects for future implementation. They also serve as examples of the types of projects that could be implemented at similar sites throughout the Town. In addition, the Town and school district have recently completed LID projects at West Vine Street School and Deans Mill School, for which the Town may be able to claim DCIA credit. The Town may further be able to take DCIA credit for private retrofit development. For the Town to take credit for past projects, they must have been implemented since July 1, 2012.

The stormwater retrofit concepts presented in this retrofit plan provide potential on-the-ground projects for future implementation. They also serve as examples of the types of projects that could be implemented at similar sites throughout the Town. It is important to emphasize that these design concepts are not detailed designs. Individual project proponents (e.g., the Town and school district) are responsible for evaluating the ultimate feasibility of, as well as design and permitting for, these and similar site-specific concepts.

3.4 Retrofit Implementation

Based on Stonington's initial DCIA analysis, the Town has a disconnection goal of approximately 17.4 acres (2 percent of existing DCIA) by the end of the 5-year permit, and 8.7 acres (1 percent of existing DCIA) annually thereafter. Based on the estimated DCIA reduction associated with each of the proposed retrofit concepts, the following approach is proposed to meet these goals (Table 3).

Year 5

The retrofits at the High School, Human Services, and Spellman Recreation Complex are recommended as the initial Year 5 project because this complex of sites provides the largest DCIA disconnection of any retrofit project. The project also has the benefit of being highly visible, incorporating aesthetic elements that will enhance the landscape, and providing a multitude of curricular opportunities along with quantifiable stormwater benefits. Given the project location within the Anguilla Brook basin, the Town may consider applying for Section 319 grant funding to partially or completely offset project costs.

Year 6

Similarly, retrofits at Town Hall, West Vine Street School, and along Main Street serve multiple goals of stormwater management, MS4 permit compliance, and enhancement of a public green space to increase its aesthetic value and functionality for the community. The proposed retrofit concepts were designed to integrate with other planning concepts for this space.

Table 3. Proposed retrofit implementation schedule to meet DCIA disconnection goals.

Site Name	Proposed Installation Timeline	Estimated DCIA Reduction	Project Cost Estimate[1]
Stonington High School Stonington Human Services Spellman Recreation Complex	• Year 5	6.53 acres	$575,000
West Vine Street School Town Hall Main Street Moss Street	• Year 6	3.47 acres	$346,000
Route 2 Park and Ride Stonington Middle School School Administration Building	• Year 7	5.56 acres	$542,000
Remaining sites as needed	• Year 8 and beyond	2.32 acres	$225,000
TOTAL ACREAGE OF DCIA DISCONNECTED		17.8 acres	$1,688,000

[1] Planning level opinion of cost. Includes estimated costs for engineering design, permitting, and construction. Excludes operation and maintenance costs.

Year 7 and Beyond

Retrofits at the Park and Ride, Stonington Middle School, and School Administration building will result in smaller DCIA reductions per project and may face additional constraints. For example, the Park and Ride is owned by CTDOT, so the proposed retrofits will require the cooperation of additional project partners. Collectively, these practices treat approximately 7.95 acres of drainage area. Additional project recommendations from Table 2 can be further developed to meet the Year 6 disconnection goal and beyond.

3.5 Conclusion

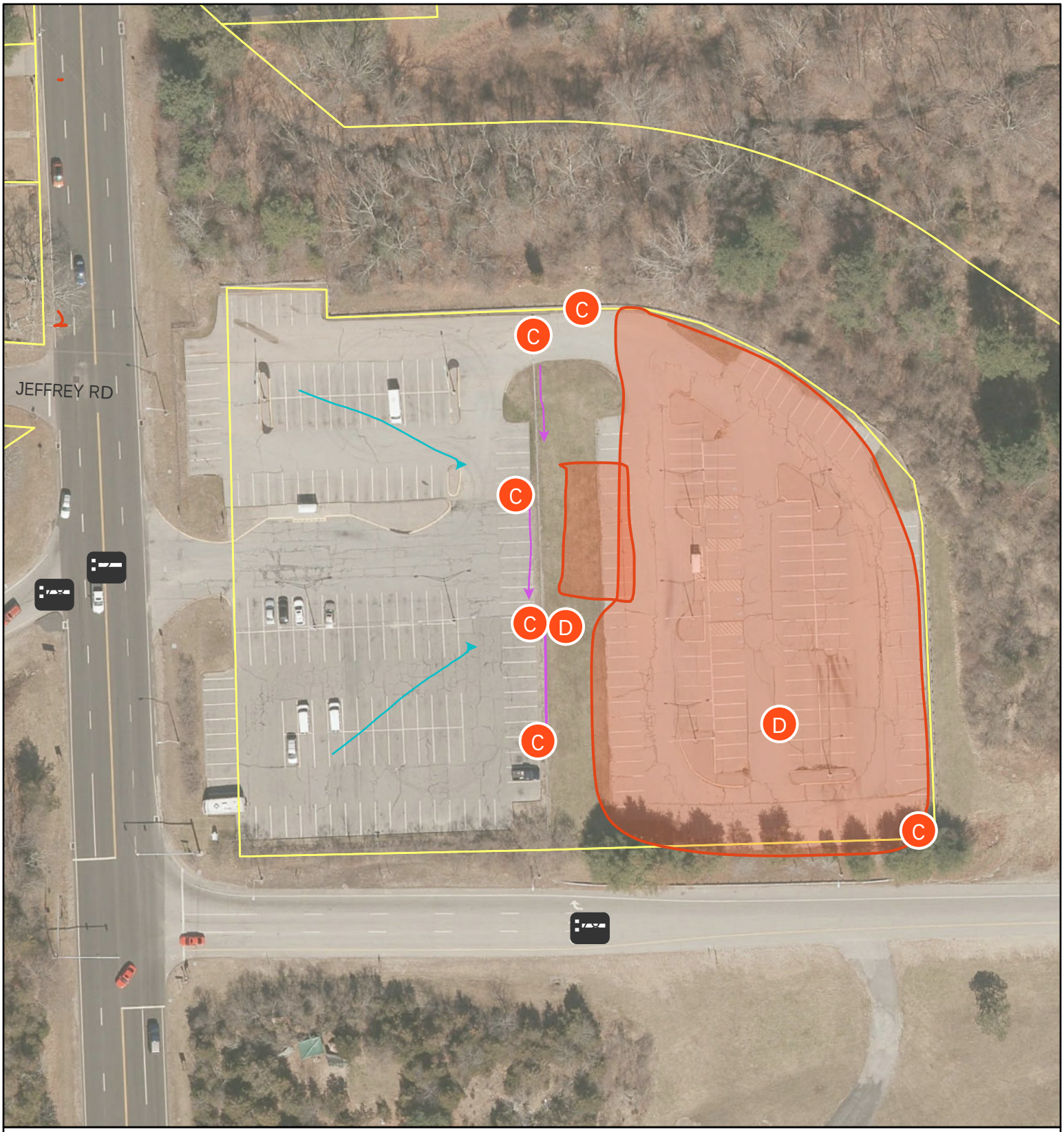
Compliance with the Year 4 and Year 5 DCIA disconnection goals is proposed to be met through implementation of 12 retrofit projects. The recommended initial retrofit projects are estimated to cost approximately $575,000. A number of additional project recommendations have been identified through this retrofit plan that can be further developed into detailed project concepts as the Town continues to work toward meeting its DCIA disconnection goals.

Attachments: Attachment A: Site Visit Notes and Photographs
Attachment B: Retrofit Design Concepts
Attachment C: LID Sizing Calculations
Attachment D: Planning Level Cost Estimates

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Attachment A

Site Visit Notes



Town of Stonington

DCIA Retrofit Plan

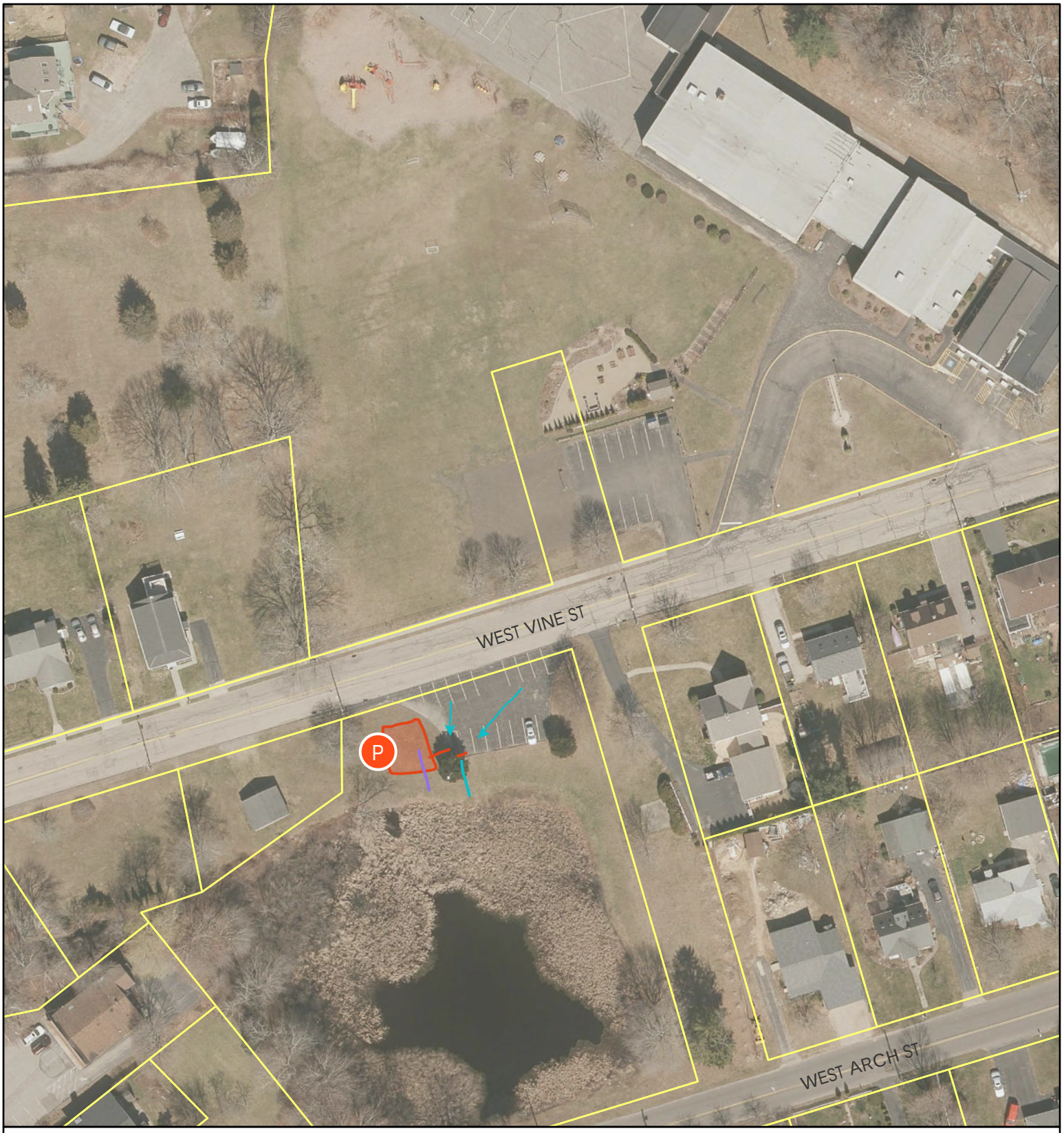
Rt 2 Park and Ride

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Feet

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Town of Stonington

DCIA Retrofit Plan

West Vine Street School

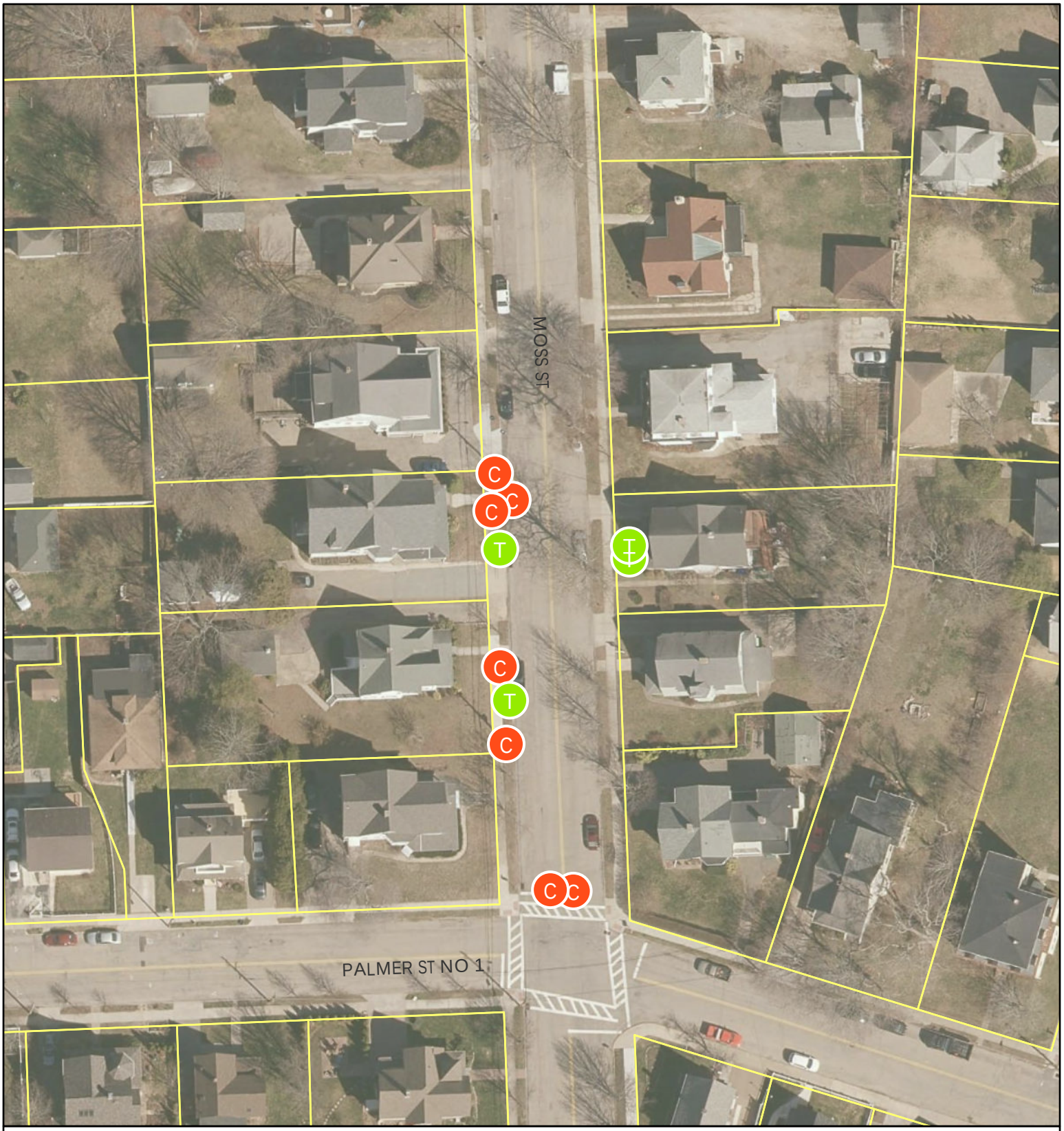
Alternate Parking Area

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Town of Stonington

DCIA Retrofit Plan

Moss St at Palmer St

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Town of Stonington

DCIA Retrofit Plan

Stonington High School

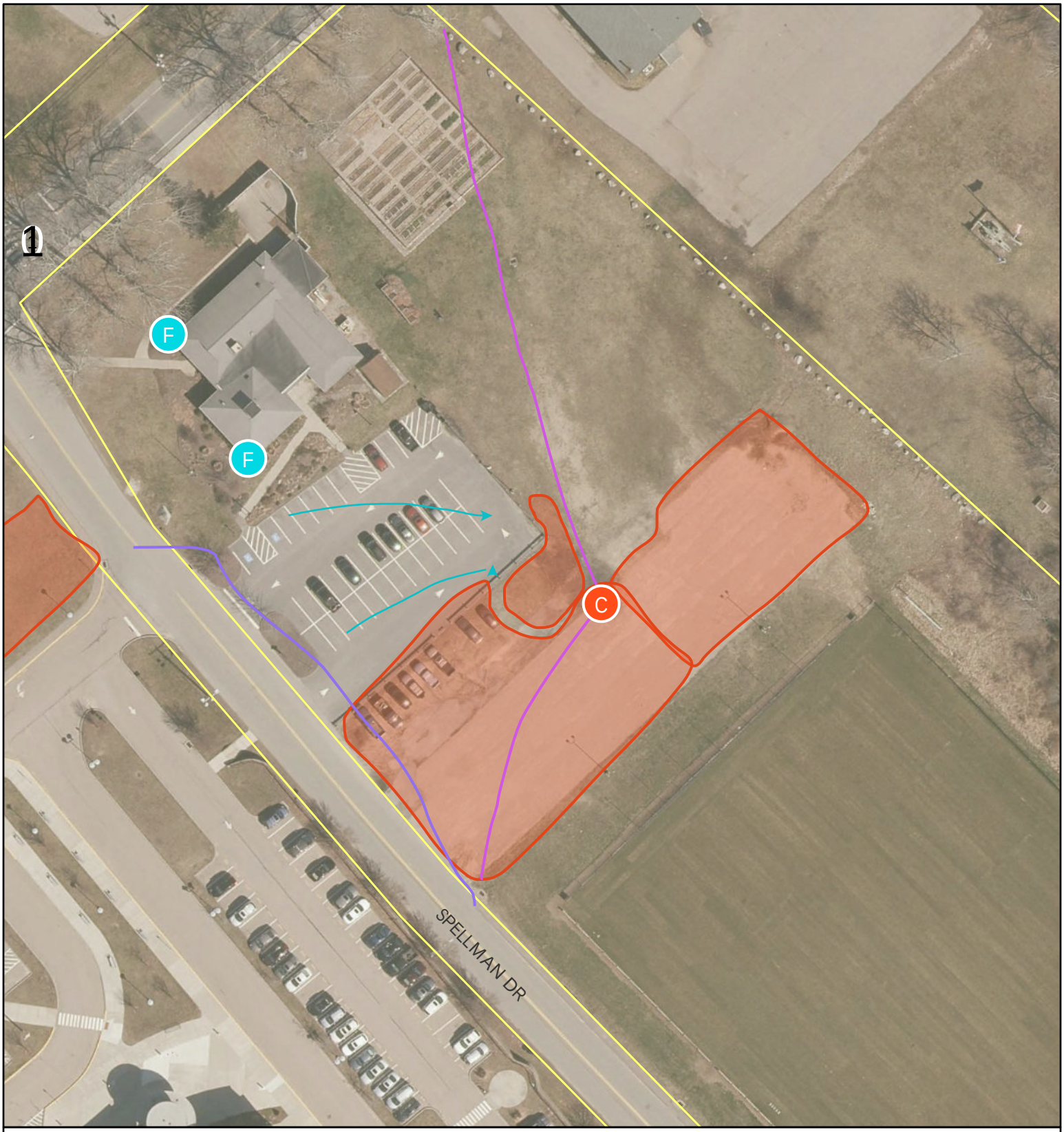
North Parking Lot

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Town of Stonington

DCIA Retrofit Plan

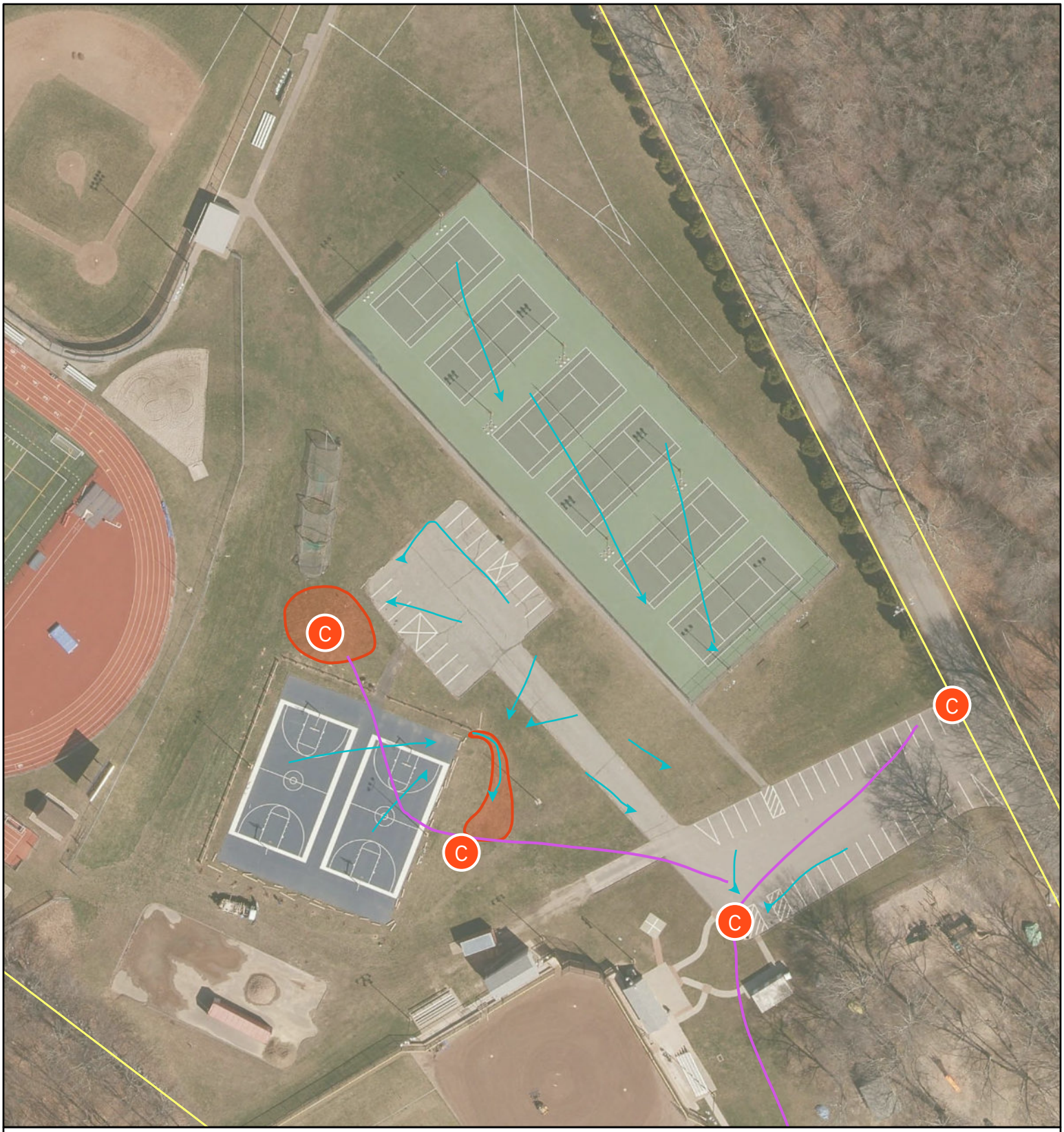
Stonington Human Services

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Town of Stonington

DCIA Retrofit Plan

Stonington High School

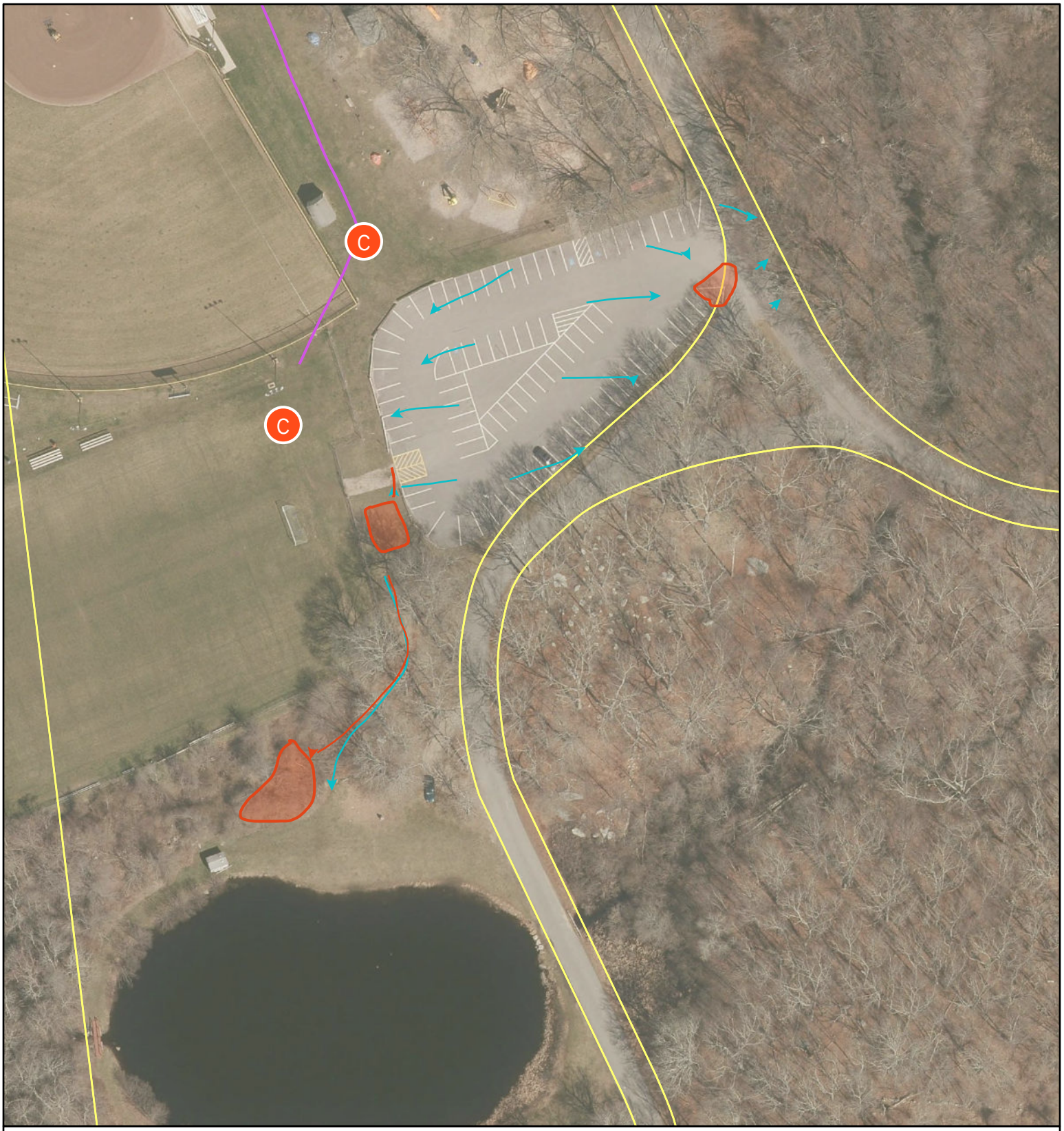
Tennis Court

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Town of Stonington

DCIA Retrofit Plan

Stonington High School

South Parking Lot

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Town of Stonington

DCIA Retrofit Plan

School Administration Building

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Town of Stonington

DCIA Retrofit Plan

Velvet Mill

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Town of Stonington

DCIA Retrofit Plan

Town Hall and Public Works

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Town of Stonington

DCIA Retrofit Plan

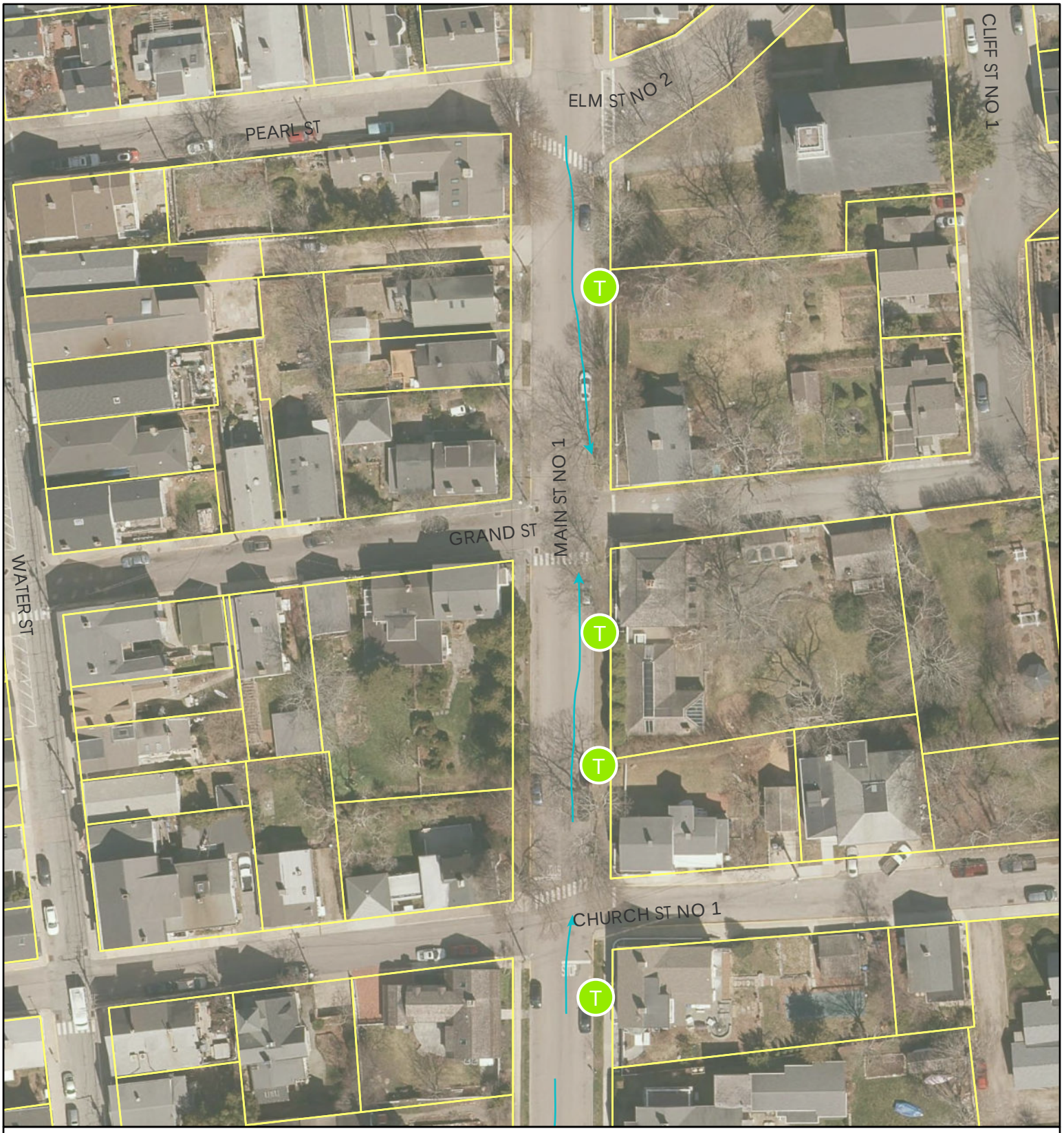
Alpha Ave at Trumbull Ave

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Town of Stonington

DCIA Retrofit Plan

Main St
Elm St to Church St

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Town of Stonington

DCIA Retrofit Plan

Main St
Church St to Wall St

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Town of Stonington

DCIA Retrofit Plan

Stonington Middle School

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Town of Stonington

DCIA Retrofit Plan

Stonington Police Station

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Attachment B

Retrofit Design Concepts

Route 2 Park and Ride
Infiltration Basin and Pavement Removal
321 Liberty Street, Stonington, Connecticut

Site Description

An approximately 2-acre park and ride facility is located at the intersection of Route 2 and the Westerly Bypass. The east parking lot appears to not be in use, with a locked gate preventing commuter access and access to the existing bus shelter. Pavement in the eastern lot is in poor condition, with tall weeds growing through the severe cracks. Runoff from the western parking lot flows to three catch basins along the eastern edge, flowing under the eastern parking lot, and discharging overland to the Pawcatuck River. The two parking lots are separated by a grassed median approximately 30 feet wide. This site is located in the impaired Pawcatuck River basin.



Image 1: Poor condition asphalt in the east parking lot. The locked gate is visible in the background (yellow circle).

Retrofit Concept Summary

Impervious Area Treated: 2.71 acres
Design Storage Volume: 9,738 ft^3
Required WQV for Disconnection: 9,338 ft^3

Runoff Capture Depth
Infiltration Basin: 1.03 inches
Pavement Removal: 1.0 inches

Disconnected DCIA: 2.71 acres
Infiltration Basin: 1.39 acres
Pavement Removal: 1.32 acres

Estimated Cost: $175,000
Infiltration Basin: $70,000
Pavement Removal: $105,000

Proposed Concept

- Construct an infiltration basin in the existing grass area between the parking lots. Replace the existing manhole which conveys flow from the western parking lot with a weir or similar diversion structure to divert the WQv to the practice.
- Remove pavement, sidewalk, curbing, and utilities from the eastern parking lot, which is unused, gated, and overgrown.



Image 2 (right): Location of proposed infiltration basin below west parking lot. Pavement removal is shown in gray. Infiltration basin area assumes pavement removal.



Image 3 (left): Example infiltration basin. Planting basin with grass reduces the maintenance burden. (credit: StormwaterPartners)



Route 2 Park and Ride

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Feet

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West Vine Street School Parking Lot
Bioretention/Rain Garden
17 West Vine Street, Stonington, Connecticut

Site Description

A small, 14-space overflow parking lot is located across the street from West Vine Street School. During a site visit, the parking lot uses included material storage and student drop-off. Runoff from the parking lot discharges directly to a small pond via a paved swale. Runoff from West Vine Street and a portion of the school discharge to the pond via storm drains located approximately 50 feet from the west edge of the parking lot. This site is located in the impaired Pawcatuck River basin.

Proposed Concept

- Construct an infiltration basin in the grassy area west of the parking area across the street from the school. Abandon existing paved swale to wetland, diverting flows to practice via a filter strip, which can serve as pretreatment. Convey water in excess of design volume to wetland via a level spreader, or to existing storm drain via doghouse manhole.
- Including educational signage will provide additonal benefit to this retrofit.



Image 1: Site conditions in parking lot during student drop-off. Note gravel piles and construction equipment.

Retrofit Concept Summary

Impervious Area Treated: 0.11 acres
Design Storage Volume: 400 ft^3
Runoff Capture Depth: 0.98 inches
Required WQV for Disconnection: 389 ft^3

Disconnected DCIA: 0.11 acres
Rain Garden

Estimated Cost: $10,000



Image 2: Proposed bioretention/rain garden in open space. A filter strip from a curb cut in the parking lot near the existing paved swale provides pretreatment.



Image 3: Example bioretention/rain garden in a visible location with educational signage.



West Vine Street School

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Feet

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Moss Street at Palmer Street
Curb Inlet Bioswales
29-33 Moss Street, Stonington, Connecticut

Site Description

Moss Street north of its intersection with Palmer Street is a residential street with on-street parking rows along both travel lans. The road is crowned. A 5-foot-wide road verge exists between the sidewalk and curb. Various species of mature trees are irregularly spaced along both sides of the street. Water, sewer, and gas laterals were found during a site visit, but did not appear to be located such that they would limit design. Catch basins on the west side of the street collect runoff, discharging to Palmer Street to the south. This site is located in the impaired Pawcatuck River basin.

Proposed Concept

- In the road verge on Moss Streen north of Palmer Street, install two curb inlet bioswales upstream of the existing catch basin to intercept the WQv. Stormwater in excess of the design volume should bypass the bioswales and be conveyed as currently to the existing catch basin.
- Installing educational signage will provide additional educational benefits in a walkable neighborhood. This type of retrofit can be customized to fit other locations throughout Stonington.



Image 1: Proposed bioswale location between Moss Street and existing sidewalk. Curb cuts would allow stormwater to enter the swale from the roadway.

Retrofit Concept Summary

Impervious Area Treated: 0.08 acres
Design Storage Volume: 317 ft^3
Required WQV for Disconnection: 289 ft^3

Runoff Capture Depth
Bioswale 1: 1.07 inches
Bioswale 2: 1.00 inches

Disconnected DCIA: 0.08 acres

Estimated Cost: $42,000
Each Planter: $21,000

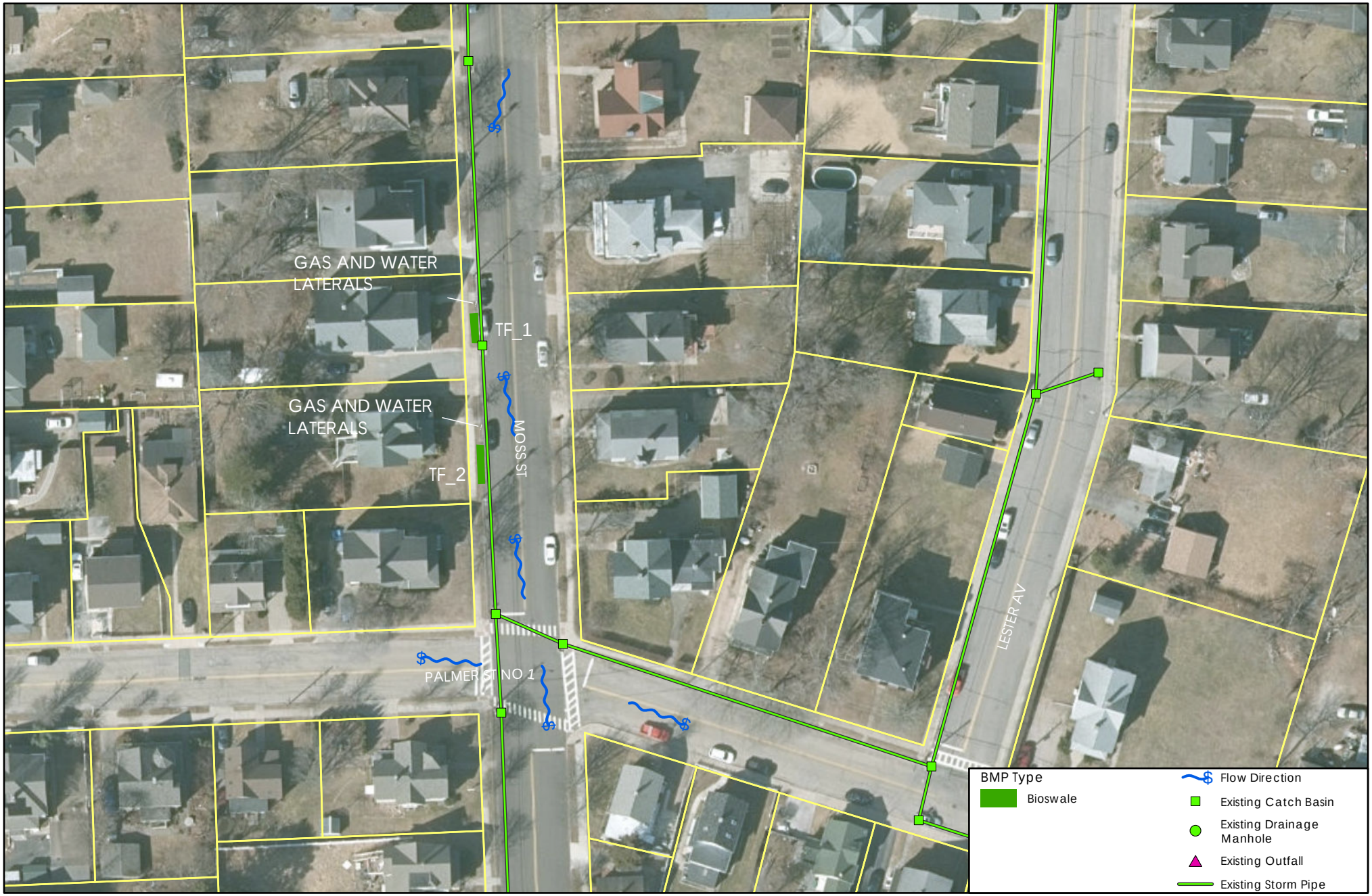


Image 2: Proposed bioswale location between Moss Street and existing sidewalk





Images 3 and 4: Example bioswales in New Haven, CT and South Kingstown, RI.



Moss St at Palmer St

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School Administration Building
Infiltration Basin and Subsurface Infiltration Chambers
40 Field Street, Stonington, Connecticut

Site Description

The former Pawcatuck Middle School site, recently used as the School Department's administration building, is located at the top of a hill on Field Street. Most of the eastern parking lot discharges to the east down Field Street, ultimately discharging to the impaired Pawcatuck River. Roof leaders are buried, and appear to all connect to two catch basins in the western parking lot. The roof western parking lot, and a portion of the eastern parking lot discharge to the southwest in the impaired Anguilla Brook basin.



Image 1: Example of buried roof downspouts connected to subsurface infiltration chambers.

Retrofit Concept Summary

Impervious Area Treated: 1.22 acres
Design Storage Volume: 4,667 ft^3
Required WQV for Disconnection: 4,212 ft^3

Runoff Capture Depth
Infiltration Basin: 1.11 inches
Subsurface Infiltration: 1.02 inches

Disconnected DCIA: 1.22 acres
Infiltration Basin: 0.45 acres
Subsurface Infiltration: 0.77 acres

Estimated Cost: $260,000
Infiltration Basin: $25,000
Subsurface Infiltration: $240,000

Proposed Concept

- Construct infiltration basin in open area east of the school entrance. Divert flow from the existing storm drain catchment to this practice via a diversion structure. The invert elevation of the existing pipe drain may need to be raised to maximize DCIA disconnection at this practice.
- Install subsurface infiltration chambers under the existing parking area to infiltrate roof drains. Convey water in excess of design capacity to existing pipe. If the location of existing drainage allows, it may be possible to install the practice in the grassy area south of the rear parking area, which would decrease maintenance and replacement costs.



Image 2: Example infiltration basin



Image 3 and 4 (Above, Left): Site conditions and proposed location of infiltration basin



School Administration

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Stonington High School and Human Services
Infiltration and Bioretention Basin, Reinforced Grass Parking, Pavement Removal
176 South Broad Street, Stonington, Connecticut

Site Description

Stonington High School, north parking lot, Stonington Human Services and associated parking and overflow parking lots, and a playing field drain to a wetland complex south of the site. A CTDOT storm drain passes under the site, collecting runoff from the high school via a series of catch basins. This site is in the impaired Anguilla Brook basin.

Proposed Concept

- Construct an infiltration basin in the open area north of the school between Route 1 and the entrance to the main parking lot. Retrofit the upstream catch basin to a diversion weir to convey the water quality volume to the basin. Reset the inlet pipe from the single catch basin to flow into proposed practice. A sediment forebay may be the most appropriate pretreatment structure. Because a catch basin is located downstream of the weir, install an overflow structure connecting to the catch basin on Spellman Drive.
- Construct a bioretention basin in the open space east of the Human Services parking lot. Include a sediment forebay for pretreatment. Convey stormwater in excess of the design volume to the existing nearby CTDOT pipe with a doghouse manhole.
- Reconfigure and replace the existing overflow parking lot to include two 36-space bays of 45° parking spaces to maximize the available space for a proposed bioretention basin between bays. Removing additional pavement and formalizing the traffic pattern will ensure that no loss of parking spaces will be associated with the proposed practice. Convey stormwater in excess of the design volume to the existing storm drains under the parking lot via overflow structures.
- Including educational material can provide additional benefits to these retrofit practices for students and parents. Consider partnering with the school and parent-teacher organization to enhance maintenance.



Image 1: Proposed location of the infiltration basin at the front of the high school



Image 2: Example of an installed bioretention area between parking bays in South Windsor, CT.

Retrofit Concept Summary

Impervious Area Treated: 4.36 acres
Total Design Storage Volume: 13,188 ft^3
Total Required WQV for Disconnection: 15,023 ft^3

Runoff Capture Depth
Infiltration Basin: 0.75”
Human Services Bioretention: 1.39”
Parking Row Bioretention: 0.96”

Disconnected DCIA: 4.36 acres
Infiltration Basin: 3.30 acres
Human Services Parking Bioretention: 0.34 acres
Parking Row Bioretention: 0.72

Estimated Cost: $295,000
Infiltration Basin: $125,000
Human Services Parking Bioretention: $45,000
Parking Row Bioretention: $125,000

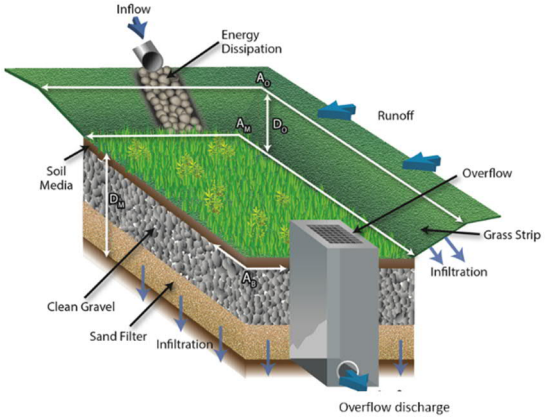
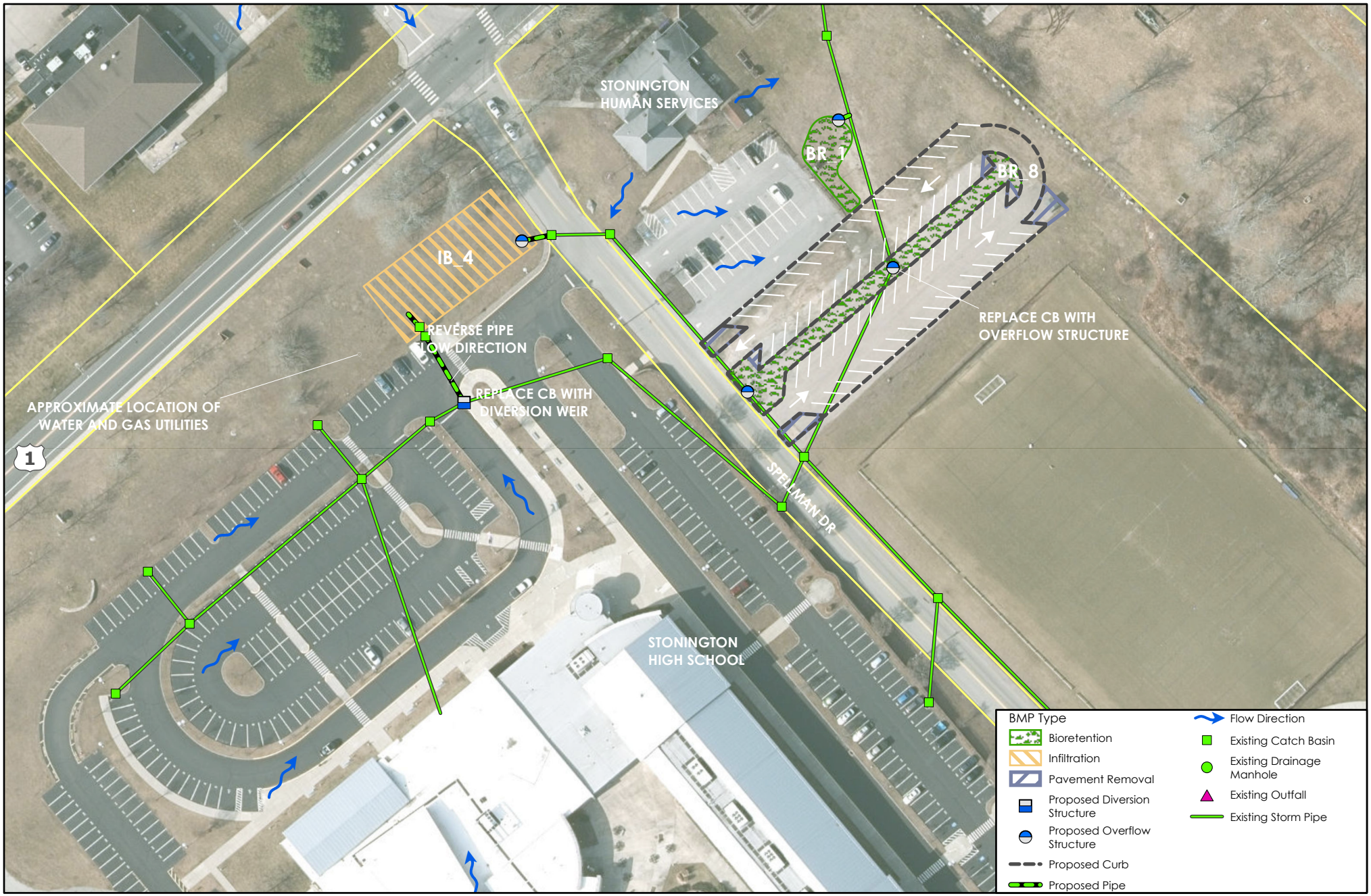


Image 3: Infiltration basin schematic



Stonington High School

0 50 100
Feet

N

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Spellman Recreation Complex
Bioretention Basins
Spellman Drive, Stonington, Connecticut

Site Description

The tennis and basketball courts, baseball field, playground, and associated parking areas drain both overland and through storms drains to the south and east to a wetland complex and pond. This site is in the impaired Anguilla Brook basin.

Proposed Concept

- Construct a bioretention basin north of the basketball courts. Convey stormwater runoff from the northern third of the tennis court parking lot to the practice via a filter strip, which can serve as pretreatment. Include an underdrain connected to the nearby catch basin to mitigate groundwater separation issues.
- Construct a bioretention basin south of the basketball courts. Stormwater runoff from the tennis courts, which currently appears to sheet flow toward the location of the proposed practice. Convey stormwater from the tennis courts to the practice via a filter strip, which can serve as pretreatment. Include an underdrain connected to the nearby catch basin to mitigate groundwater separation issues.
- Construct a bioretention basin at the eastern end of the south parking in the existing striped area. Stormwater from the eastern half of the parking lot naturally flows to this area. A sediment forebay may be the most appropriate pretreatment structure. Convey stormwater in excess of the design volume to the wetland to the east via an overflow structure or underdrain.
- Construct a bioretention basin north of the pond, receiving stormwater from the western half of the south parking lot. Install a sediment forebay pretreatment structure adjacent to the parking lot. Direct stormwater to the water ponding area via a riprap channel, because existing flows from the parking lot are erosive. Convey stormwater in excess of the design volume to the pond via a level spreader or overflow pipe.
- Remove excess pavement from the south parking lot.







Images 1, 2, and 3 (left): Proposed bioretention retrofits receiving runoff from the basketball court (top) and the east half (middle) and west half (bottom) of the south parking lot. In each instance, the proposed retrofit follows and incorporates existing landscape features to simplify design.

Retrofit Concept Summary

Impervious Area Treated: 2.17 acres
Design Storage Volume: 8,000 ft^3
Required WQV for Disconnection: 7,488 ft^3

Runoff Capture Depth
Basketball Court Bioretention: 1.13”
Tennis Parking Bioretention: 1.05”
Tennis Court Bioretention: 0.98”
South Parking East Bioretention: 0.88”
South Parking West Bioretention: 1.07”

Disconnected DCIA: 2.17 acres
Basketball Court Bioretention: 0.46 acres
Tennis Parking Bioretention: 0.16 acres
Tennis Court Bioretention: 0.88 acres
South Parking East Bioretention: 0.35 acres
South Parking West Bioretention: 0.32 acres

Estimated Cost: $280,000
Basketball Court Bioretention: $65,000
Tennis Parking Bioretention: $25,000
Tennis Court Bioretention: $105,000
South Parking East Bioretention: $40,000
South Parking West Bioretention: $45,000

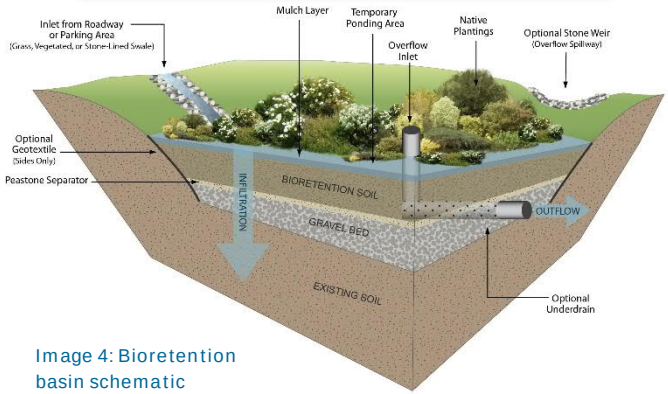


Image 4: Bioretention basin schematic

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Spellman Recreation Complex

0 50
Feet

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Stonington High School

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Stonington Police Department
Infiltration Basin
173 South Broad Street, Stonington, Connecticut

Site Description

Spellman Drive north of Route 1 and part of the police station parking lot drain toward a catch basin at the south end of a traffic island between Spellman Drive and a strip mall at 163 South Broad Street. Existing parcel mapping indicates the traffic island is owned by the Town. Two catch basins at the north and south end of the island are connected, conveying runoff to a wetland north of the police station. This site is located in the impaired Anguilla Brook basin.

Proposed Concept

- Construct an infiltration basin in the traffic island between the police station access road and the strip mall parking lot. Convert the existing catch basin at the south end of the traffic island to an inlet structure, with sediment forebay.
- Convey stormwater in excess of the design volume to the catch basin at the north end of the traffic island via an overflow structure.



Image 1: Existing conditions in traffic island at police station, with catch basin replaced by curb cut as inlet



Image 2: Example traffic island infiltration basin with sedimetn forebay

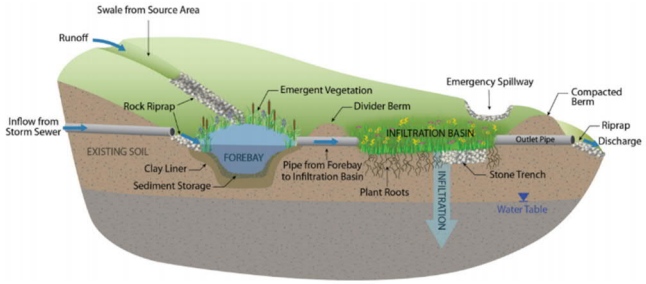


Image 3: Infiltration basin schematic

Retrofit Concept Summary

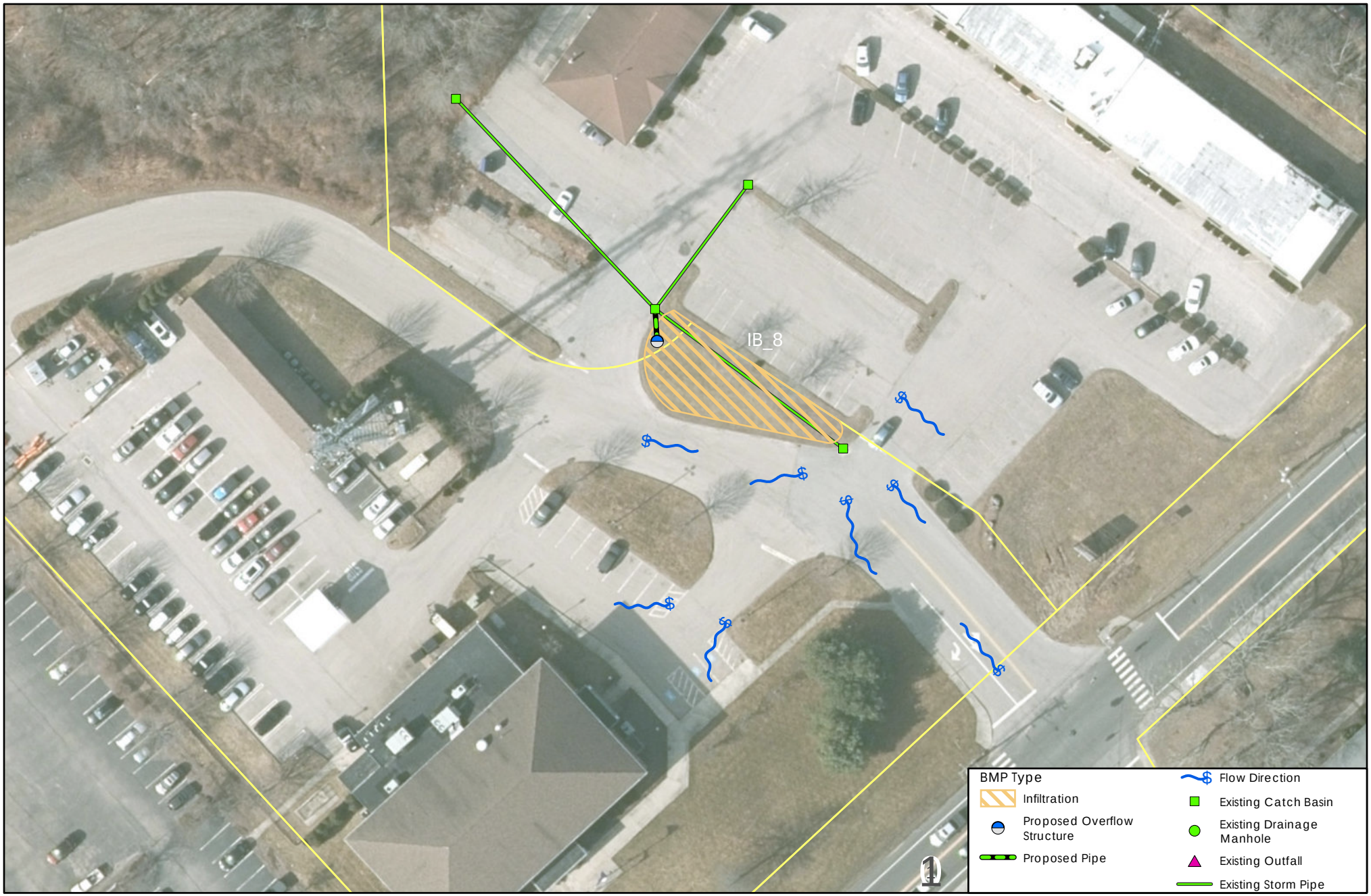
Impervious Area Treated: 0.25 acres
Design Storage Volume: 1,000 ft^3
Runoff Capture Depth: 1.09 inches
Required WQV for Disconnection: 868 ft^3

Disconnected DCIA: 0.25 acres
Infiltration Basin

Estimated Cost: $40,000



Image 4: Example traffic island infiltration basin with overflow structure



Stonington Police Department

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Feet

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Wimpheimer Park
Bioretention Basin
36 Meadow Ave, Stonington, Connecticut

Site Description

The eastern portion of the Velvet Mill complex, as well as a portion of Meadow Avenue, Bayview Avenue, and Chesebro Lane drain south to two catch basins at the intersection of Meadow Avenue and Bayview Avenue. These catch basins discharge to a wetland east of the park owned by the Borough of Stonington. The northern section of the park appears to have bedrock or boulders, and various art installations are present.

Proposed Concept

- Construct a bioretention basin in the existing low area at the south end of Wimpheimer Park. Replace the catch basin at the southeast corner of the intersection of Meadow and Bayview with a diversion structure to convey WQv to practice via a rip rap channel. A sediment forebay may be the most appropriate pretreatment structure.
- Direct runoff in excess of the design storage volume to the existing outfall east of the park.
- Relocation of some art installations may be necessary to accommodate this practice.



Image 2: Example bioretention basin in a public park in Providence, RI



Image 1: Existing conditions in the retrofit catchment. Retrofit the southeast catch basin (yellow circle) to a diversion structure.



Image 3: Site conditions at proposed location of bioretention basin. Two metal art pieces are visible at image center.

Retrofit Concept Summary

Impervious Area Treated: 1.84 acres
Design Storage Volume: 6,446 ft^3
Runoff Capture Depth: 0.96 inches
Required WQV for Disconnection: 6,350 ft^3

Disconnected DCIA: 1.84 acres
Bioretention

Estimated Cost: $160,000

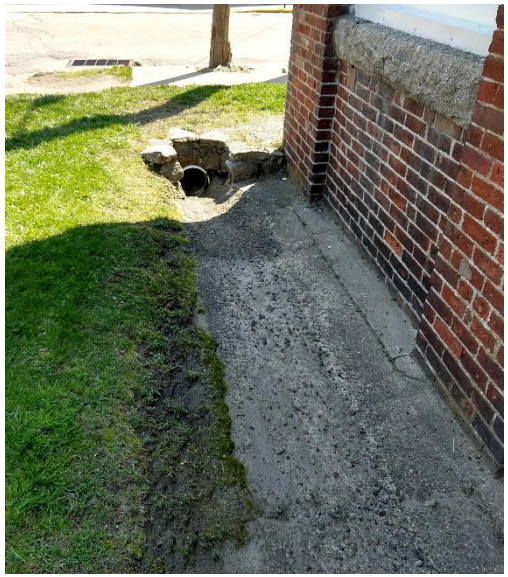


Image 4: Flow from the mill roof and Meadow Ave enters the catch basin via a pipe inlet at the intersection.



Velvet Mill

0 50 100 150
Feet

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Town Hall and Public Works Complex
Infiltration Basin
152 Elm Street, Stonington, Connecticut

Site Description
The entire Stonington Town Hall and Public Works complex drains northeast to southwest in one drainage catchment discharging at the west of the site. A half-acre unpaved and grassy open space between the main Public Works building and Alpha Avenue is used for employee parking, and storage of street sweeping and catch basin cleaning spoils.

Proposed Concept
Construct an infiltration basin in the grassy area between Alpha Avenue and the Public Works hall. Replace the junction catch basin with a diversion structure or weir to convey the WQv to the practice. Site use may require an oil/grease separator in the pretreatment chain.



Retrofit Concept Summary
Impervious Area Treated: 3.01 acres
Design Storage Volume: 10,313 ft^3
Runoff Capture Depth: 0.95 inches
Required WQV for Disconnection: 10,366 ft^3

Disconnected DCIA: 3.01 acres
Infiltration Basin

Estimated Cost: $140,000

Image 1: Site conditions at location of proposed infiltration basin. Junction catch basin is located behind utility pole at image right.



Image 2: Site conditions at location of proposed infiltration basin. Fueling station is visible in background.



Image 3: Example infiltration basin



Town Hall and Public Works

0 50 100 150
Feet

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Right-of-Way, Alpha Avenue and Trumbull Avenue
Infiltration Basin
65 Alpha Avenue, Stonington, Connecticut

Site Description

Available parcel mapping indicates an approximately 40-foot-wide right-of-way north of the intersection of Alpha Avenue and Trumbull Avenue. The right-of-way space east of Alpha Avenue receives storm flows from the intersection and Alpha Avenue, flowing overland to a double catch basin, before discharging to a wetland.

Proposed Concept

- Formalize the existing pattern of stormwater runoff through the right-of-way along the informal, eroded path. In the open space, constuct an infiltration basin.
- Install curbing along Alpha Avenue to direct storm flows to a single pretreatment structure from both the intersection and Alpha Avenue.
- Use the existing catch basin as an overflow structure.
- The auto repair garage in the background of the images may necessitate additional pretreatment to prevent groundwater contamination.



Retrofit Concept Summary

Impervious Area Treated: 0.19 acres
Design Storage Volume: 800 ft^3
Runoff Capture Depth: 1.13 inches
Required WQV for Disconnection: 671 ft^3

Disconnected DCIA: 0.19 acres
Infiltration Basin

Estimated Cost: $20,000

Image 1: Site conditions at proposed retrofit location include a wide right-of-way. An auto repair facility is visible in the background of the image.



Image 2: Intersection of Alpha Avenue (foreground to background) and Trumbull Avenue (left to right). The catchment includes the northbound travel lane of Alpha Avenue.

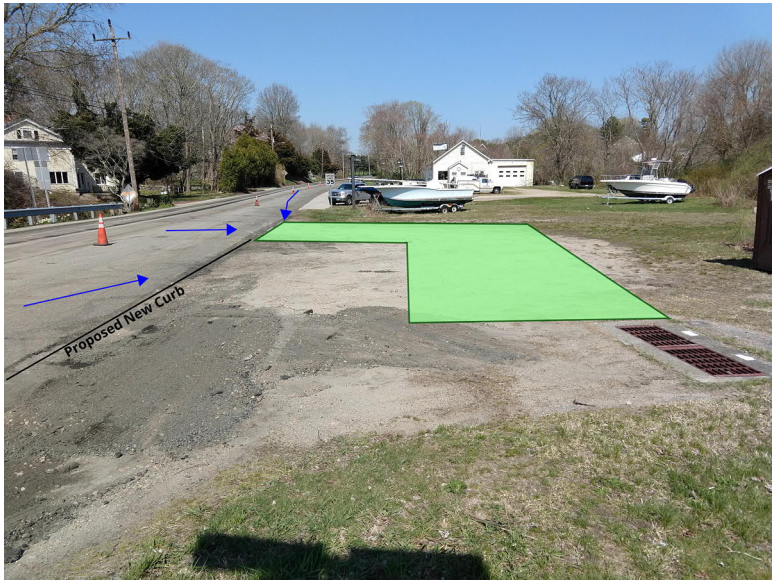


Image 3: Proposed infiltration basin to be located in right-of-way.



Alpha Ave at Trumbull Ave

0 50
Feet

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Main Street from Elm Street to Union Street
Bioretention/Rain Garden and Vegetated Swales
Main Street, Borough of Stonington, Connecticut

Site Description

Main Street from Elm Street to Union Street is a residential street with many historic homes and on-street parking rows along both travel lanes. The road is crowned. A 4- to 6-foot wide road verge exists between the sidewalk and curb. Various species of mature trees are irregularly spaced along both sides of the street. Water, sewer, and gas laterals are present. Catch basins in intersections collect runoff, discharging to the west. Sidewalk materials include asphalt, concrete, and paving stones.

Proposed Concept

In the road verge, install a series of tree boxes upstream of existing catch basins to intercept the design storage volume. Stormwater in excess of the design volume should bypass the tree boxes and be conveyed as currently to the existing storm drainage network. Additional storage may be possible where sufficient space exists, by installing additional subsurface chambers.



Image 4: Tree filter at Hole in the Wall Beach in East Lyme, CT (credit: Judy Rondeau)



Image 1: Tree filter on Pennsylvania Avenue in East Lyme, CT

Retrofit Concept Summary

Impervious Area Treated: 0.27 acres
Design Storage Volume: 699 ft^3
Runoff Capture Depth: 0.75 inches
Required WQV for Disconnection: 939 ft^3

Disconnected DCIA: 0.27 acres
7 Tree Filters

Estimated Cost: $154,000
Each Tree Filter: $22,000





Images 2 and 3 (left): Existing site conditions along Main Street

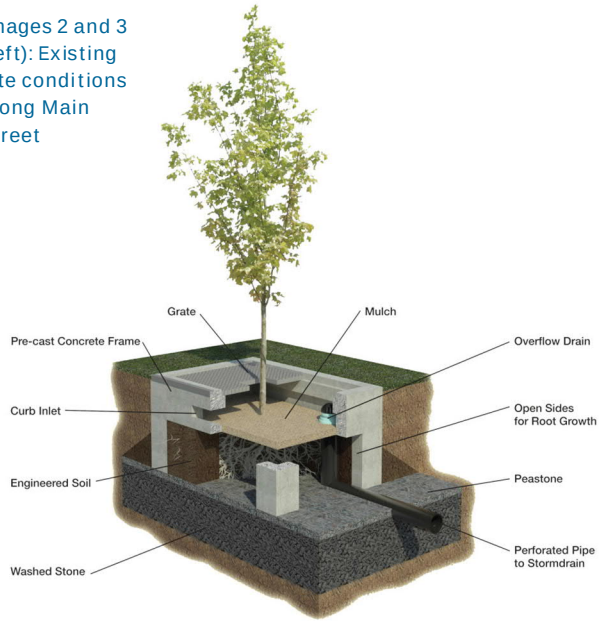
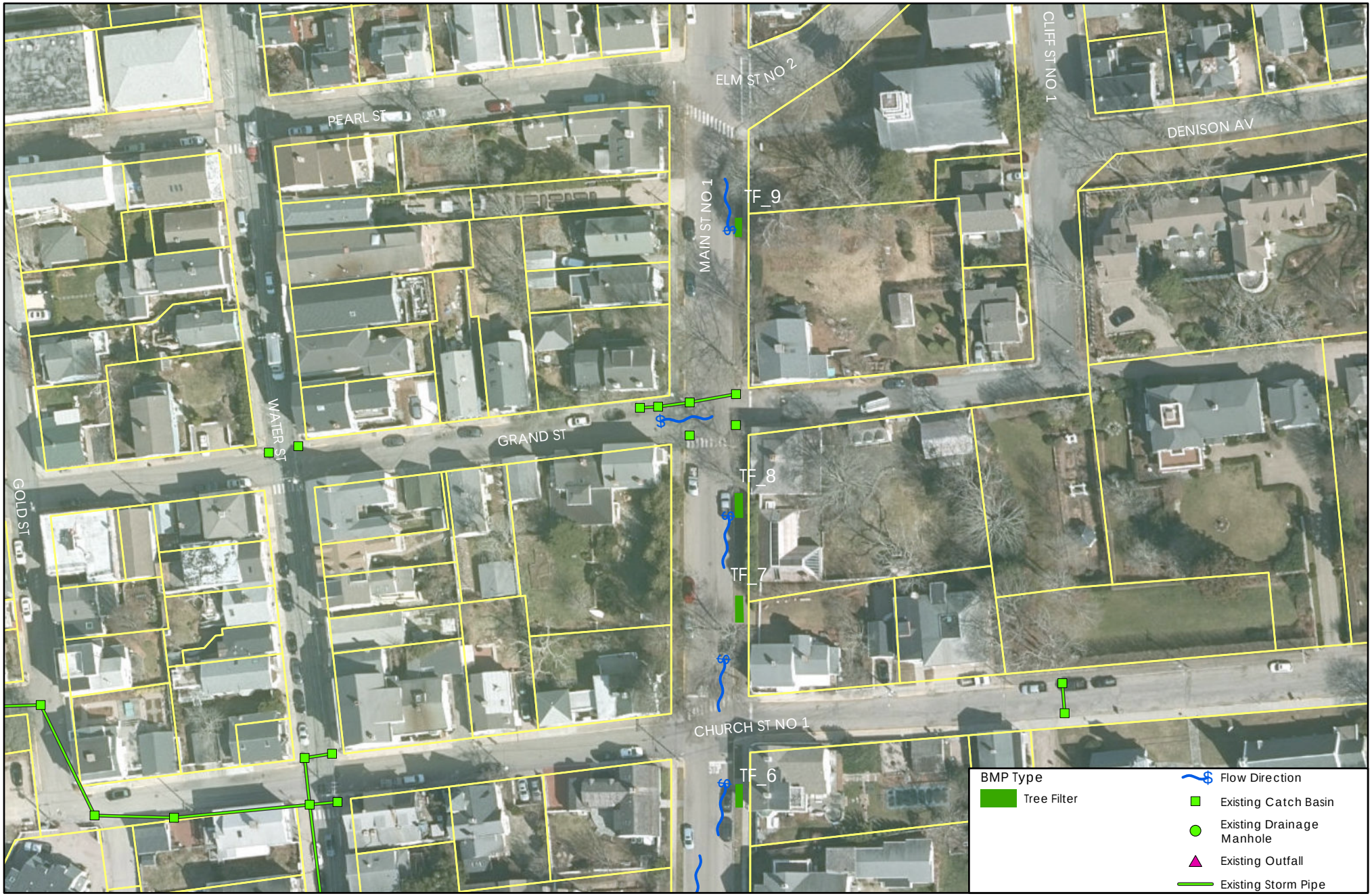


Image 5: Tree filter schematic (Niantic River Watershed Committee)



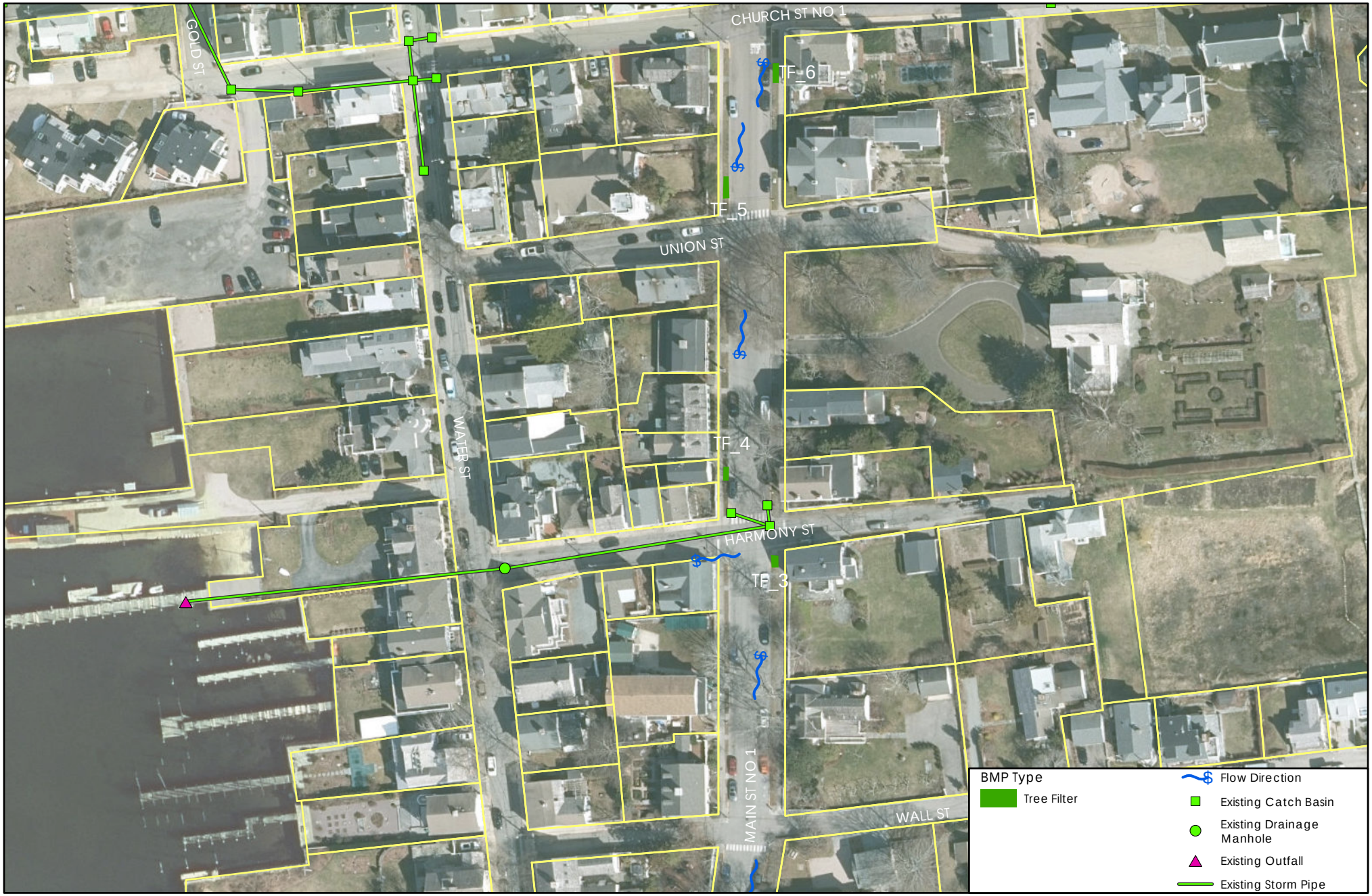
Main St

0 50 100
Feet

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Main St

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Elm Street at Amtrak Line
Pavement Removal
36 Elm Street, Stonington, Connecticut

Site Description
The Amtrak Acela upgrades to this rail line removed the railroad crossing at Elm Street. A pedestrian bridge maintains access across the tracks but the road no longer connects north to south. The paved area extends to the rail right-of-way, used for residential parking to the south. A fence blocks vehicle access to the north. A water valve was located in the north portion of the street and an unknown utility pipe is raised above the tracks.

Proposed Concept
Remove the pavement of Elm Street on either side of the Amtrak tracks not accessible by cars. Maintain utility access, pedestrian access, limited parking space for homes at the intersection of Elm Street and Hyde Street, and space to reverse out of the home at 36 Elm Street.



Image 1: 2019 aerial imagery shows where residents park, at the end of the southern section of Elm Street.

Retrofit Concept Summary
Impervious Area Treated: 0.03 acres
Design Storage Volume: 94 ft^3
Runoff Capture Depth: 1 inch
Required WQV for Disconnection: 94 ft^3

Disconnected DCIA: 0.03 acres
Pavement Removal

Estimated Cost: $5,000



Image 2: Proposed pavement removal north of the Amtrak line. Stairs to the pedestrian bridge are visible at center of image.



Image 3: Proposed pavement removal south of Amtrak line. Maintaining space for residential parking and backing out of the driveway of 36 Elm Street is shown.



Elm Street

0 50

Feet

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Stonington Middle School
Infiltration Basin and Tree Filter
204 Mistuxet Avenue, Stonington, Connecticut

Site Description

Stonington Middle School is set on a north-facing slope with the school building, most of the parking area, and bus drop-off circle draining to an outfall north of the school exit. 7,000-square foot of open space is present in front of the school along Mistuxet Avenue, with the school sign and minor trees located nearby.

Proposed Concept

- Construct an infiltration basin in the existing natural depression at the front of the school along Mistuxet Avenue. Retrofit the upstream catch basin with a diversion structure or weir to convey the water quality volume to the practice. A sediment forebay may be the most appropriate pretreatment structure. Convey stormwater in excess of the design volume to the existing pipe under Mistuxet Avenue via an overflow structure.
- In the bus drop off circle upstream of the existing catch basin, install a tree box to intercept the WQv. Stormwater in excess of the design volume should bypass the tree boxes and be conveyed as currently to the existing catch basin.
- Install educational signage to provide additional benefits to students and parents. Consider a partnership with the school, parent-teacher organization to provide maintenance of the proposed retrofits.



Image 1: Example tree filter behind curb in East Lyme, CT. Note catch basin which receives excess runoff, at right of image. (credit: Niantic River Watershed Committee)

Retrofit Concept Summary

Impervious Area Treated: 1.63 acres
Design Storage Volume: 6,233 ft^3
Required WQV for Disconnection: 5,612 ft^3

Runoff Capture Depth
Infiltration Basin: 1.09 inches
Tree Filter: 0.59 inches

Disconnected DCIA: 1.63 acres
Infiltration Basin: 1.52 acres
Tree Filter: 0.11 acres

Estimated Cost: $102,000
Infiltration Basin: $85,000
Tree Filter: $17,000



Image 2: Existing conditions at front of school where the infiltration basin is proposed.



Image 3: Example infiltration basin with plantings at a sports complex.



Stonington Middle School

0 50 100
Feet

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Attachment C

Retrofit Sizing Calculations

Attachment C
Retrofit Sizing Calculations

Retrofit Site	BMP Description	Impervious Cover in Drainage Area (Sq Ft)	DCIA (Acres)	Water Quality Volume* (CF)	Design Storage Volume (CF)	Runoff Capture Depth (inches)
Rt 2 and 78 Park and Ride	Infiltration Basin	60,613	1.39	4,799	5,200	1.03
West Vine Street School	Bioretention/Rain Garden	4,908	0.11	389	400	0.98
	Infiltration Basin	143,782	3.30	11,383	9,000	0.75
	Parking Row Bioretention	31,350	0.72	2,482	2,500	0.96
	Human Services Bioretention	14,622	0.34	1,158	1,250	1.03
	Basketball Court Bioretention	19,828	0.46	1,570	1,875	1.13
Stonington High School	Tennis Parking Bioretention	7,175	0.16	568	625	1.05
	Tennis Courts Bioretention	38,158	0.88	3,021	3,125	0.98
	South Parking East Bioretention	15,376	0.35	1,217	1,125	0.88
	South Parking West Bioretention	14,045	0.32	1,112	1,250	1.07
School Administration	Infiltration Basin	19,535	0.45	1,547	1,800	1.11
Building	Subsurface Infiltration	33,665	0.77	2,665	2,867	1.02
Moss Street	Bioswale	2,222	0.05	176	198	1.07
	Bioswale	1,428	0.03	113	119	1.00
Velvet Mill	Bioretention	80,214	1.84	6,350	6,446	0.96
Town Hall and DPW	Infiltration Basin	130,940	3.01	10,366	10,313	0.95
Alpha Ave & Trumbull Ave	Infiltration Basin	8,470	0.19	671	800	1.13
	Tree Box	2,953	0.07	234	116	0.47
	Tree Box	3,131	0.07	248	116	0.45
	Tree Box	785	0.02	62	58	0.89
Main Street	Tree Box	615	0.01	49	58	1.14
	Tree Box	2,049	0.05	162	116	0.68
	Tree Box	1,045	0.02	83	116	1.34
	Tree Box	1,288	0.03	102	116	1.09
Stonington Police Station	Infiltration Basin	10,961	0.25	868	1,000	1.09
Stonington	Infiltration Basin	66,115	1.52	5,234	6,000	1.09
Middle School	Tree Box	4,776	0.11	378	233	0.59

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Attachment D

Planning-Level Cost Estimates

Attatchment D
Planning-Level Cost Estimates

Order of Magnitude Cost Range																	
Site Number	Location and BMP Type			Construction					Planning and Design		Cost Range			Life Cycle				
				Unit Cost	Adjustment Factors	Unit	Quantity		Allowance	Cost	Total Cost	-30%	50%	Lifespan (yrs.)	Annual Cost Over Lifespan	O&M (% Cost)	O&M ($/yr.)	Total Capitalized Cost/Year Over Lifespan
1	Rt 2 and 78 Park and Ride	IB_1	Surface Infiltration Practice	$10.29	Developed Area	cf storage volume	5,200	$53,503	30%	$16,050	$70,000	$49,000	$105,000	20	$5,150	4%	$2,800	$7,950
		PR_1	Pavement Removal (>1,000 sy)	$12.62	Undeveloped Area	sy	6,369	$80,375	30%	$24,110	$105,000	$74,000	$158,000	100	$4,280	0%	$0	$4,280
										Subtotal	$175,000						$2,800	
2	West Vine Street School	IB_2	Rain Garden	$16.69	Developed Area	sf	400	$6,674	30%	$2,000	$9,000	$6,000	$14,000	20	$660	4%	$400	$1,060
3	Stonington High School	IB_4	Surface Infiltration Practice	$10.29	Developed Area	cf storage volume	9,167	$94,316	30%	$28,290	$123,000	$86,000	$185,000	20	$9,050	4%	$4,900	$13,950
		BR_1	Bioretention	$25.49	Developed Area	cf storage volume	1,250	$31,865	30%	$9,560	$42,000	$29,000	$63,000	20	$3,090	4%	$1,700	$4,790
		BR_4	Bioretention	$25.49	Developed Area	cf storage volume	3,125	$79,662	30%	$23,900	$104,000	$73,000	$156,000	20	$7,650	4%	$4,200	$11,850
		BR_2	Bioretention	$25.49	Developed Area	cf storage volume	1,875	$47,797	30%	$14,340	$63,000	$44,000	$95,000	20	$4,640	4%	$2,500	$7,140
		BR_3	Bioretention	$25.49	Developed Area	cf storage volume	625	$15,932	30%	$4,780	$21,000	$15,000	$32,000	20	$1,550	4%	$800	$2,350
		BR_5	Bioretention	$25.49	Developed Area	cf storage volume	1,125	$28,678	30%	$8,600	$38,000	$27,000	$57,000	20	$2,800	4%	$1,500	$4,300
		BR_6	Bioretention	$25.49	Developed Area	cf storage volume	1,250	$31,865	30%	$9,560	$42,000	$29,000	$63,000	20	$3,090	4%	$1,700	$4,790
		BR_8	Bioretention	$38.24	Highly Disturbed	cf storage volume	2,500	$95,594	30%	$28,680	$125,000	$88,000	$188,000	20	$9,200	4%	$5,000	$14,200
										Subtotal	$558,000						$22,300	
4	School Administration Building	IB_3	Surface Infiltration Practice	$10.29	Developed Area	cf storage volume	1,800	$18,520	30%	$5,560	$25,000	$18,000	$38,000	20	$1,840	4%	$1,000	$2,840
		SS_1	Subsurface Infiltration	$63.30	Highly Disturbed	cf of runoff treated	2,867	$181,481	30%	$54,440	$236,000	$165,000	$354,000	75	$9,970	4%	$9,400	$19,370
										Subtotal	$261,000						$10,400	
5	Moss Street & Palmer Street	TF_1	Bioswale	$16,000	Developed Area	ea	1	$16,000	30%	$4,800	$21,000	$15,000	$32,000	#N/A	#N/A	4%	$800	N/A
		TF_2	Bioswale	$16,000	Developed Area	ea	1	$16,000	30%	$4,800	$21,000	$15,000	$32,000	#N/A	#N/A	4%	$800	N/A
										Subtotal	$42,000						$1,600	
6	Velvet Mill	BR_7	Bioretention	$19.12	Partially Developed Area	cf storage volume	6,446	$123,240	30%	$36,970	$161,000	$113,000	$242,000	20	$11,850	4%	$6,400	$18,250
7	Town Hall and DPW	IB_5	Surface Infiltration Practice	$10.29	Developed Area	cf storage volume	10,313	$106,111	30%	$31,830	$138,000	$97,000	$207,000	20	$10,150	4%	$5,500	$15,650
8	Alpha Ave & Trumbull Ave	IB_6	Surface Infiltration Practice	$10.29	Developed Area	cf storage volume	800	$8,231	30%	$2,470	$11,000	$8,000	$17,000	20	$810	4%	$400	$1,210
9	Main Street	TF_3	Tree Filter	$16,814	Developed Area	ea	1	$16,814	30%	$5,040	$22,000	$15,000	$33,000	25	$1,410	4%	$900	$2,310
		TF_4	Tree Filter	$16,814	Developed Area	ea	1	$16,814	30%	$5,040	$22,000	$15,000	$33,000	25	$1,410	1%	$200	$1,610
		TF_5	Tree Filter	$16,814	Developed Area	ea	1	$16,814	30%	$5,040	$22,000	$15,000	$33,000	25	$1,410	4%	$900	$2,310
		TF_6	Tree Filter	$16,814	Developed Area	ea	1	$16,814	30%	$5,040	$22,000	$15,000	$33,000	25	$1,410	4%	$900	$2,310
		TF_7	Tree Filter	$16,814	Developed Area	ea	1	$16,814	30%	$5,040	$22,000	$15,000	$33,000	25	$1,410	4%	$900	$2,310
		TF_8	Tree Filter	$16,814	Developed Area	ea	1	$16,814	30%	$5,040	$22,000	$15,000	$33,000	25	$1,410	4%	$900	$2,310
		TF_9	Tree Filter	$16,814	Developed Area	ea	1	$16,814	30%	$5,040	$22,000	$15,000	$33,000	25	$1,410	4%	$900	$2,310
										Subtotal	$154,000						$5,600	
10	Stonington Middle School	TF_10	Tree Filter	$12,611	Partially Developed Area	ea	1	$12,611	30%	$3,780	$17,000	$12,000	$26,000	25	$1,090	4%	$700	$1,790
		IB_7	Surface Infiltration Practice	$10.29	Developed Area	cf storage volume	6,000	$61,734	30%	$18,520	$81,000	$57,000	$122,000	20	$5,960	4%	$3,200	$9,160
										Subtotal	$98,000						$3,900	
11	Stonington Police Station	IB_8	Bioretention	$25.49	Developed Area	cf storage volume	1,000	$25,492	30%	$7,650	$34,000	$24,000	$51,000	20	$2,500	4%	$1,400	$3,900
12	Elm Street	PR_3	Pavement Removal (<1,000 sy)	$24.75	Partially Developed Area	sy	125	$3,094	30%	$930	$5,000	$4,000	$8,000	#N/A	#N/A	4%	$200	N/A
										Total	***$1,641,000***	***$1,149,000***	***$2,468,000***				***$60,700***	***$164,300***

Notes:
Rate of Inflation used = 2%
Interest (discount) rate used = 6%

Costs are based on screening-level evaluations of site characteristics and should be used for planning purposes only. Construction costs could vary significantly.

Cost Estimate Sources (non-Fuss & O'Neill)
Mataleska, Karen, "MS4 Resource: BMP Cost Estimates" (2016). UNH Stormwater Center. 32.
RIDOT Project Management Portal Weighted Average Unit Prices
East Lyme, CT
RIDEM, RI Stormwater Solutions

FUSS & O'NEILL

Attachment 7

Municipal Training Agenda and Sign-in Sheets

AGENDA

HAZWOPER FIRST RESPONDER AWARENESS LEVEL TRAINING
FOR
TOWN OF STONINGTON HIGHWAY GARAGE

March 31, 2021
Highway Garage
Stonington, Connecticut

Instructor: Matt Reiser
Project No.: 2016-049

TOPICS

1. Hazard Communication
2. Flammable and Combustible Liquids
3. Hazard Awareness
4. Personal Protective Equipment

67 HALL ROAD
STURBRIDGE, MA 01566

PHONE (774) 241-0901
FAX (774) 241-0906

ENVIRONMENTAL SERVICES

CMG EST. 2002

ENGINEERING SERVICES

SIGN-IN SHEET

Course Name: H+S Training	Date: 3-31-21
Location: Stonington Highway Garage	Time: 7:15a-
Instructor Name: Matt Reiser	CMG ID: 2016-049

	Name (Please Print)	Signature
1.	Steven Burdick	Steven Burdick
2.	Paul Thomas	
3.	Patrick Keene	
4.	Barbara McKell	
5.	Steve Turisi	
6.	Nate Miceli	
7.	Joe Balestracci	
8.	Tim Gourin	
9.	Tim Keena	
10.	Mike Dennis	
11.	Dan Oliverio	
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

67 HALL ROAD
STURBRIDGE, MA 01566

PHONE (774) 241-0901
FAX (774) 241-0906

ENVIRONMENTAL SERVICES

CMG EST. 2002

ENGINEERING SERVICES

SIGN-IN SHEET

Course Name: Health + Safety Training	Date: 4-7-21
Location: Stonington Highway Garage	Time: 7a-
Instructor Name: Matt Reiser	CMG ID: 2016-049

	Name (Please Print)	Signature
1.	Rob Hersh	
2.	Steve McVay	
3.	Joe Ferraro	
4.	Adam Brown	
5.	Kevin Simmons	
6.	James Granatelli	
7.	Kim Lilly	
8.	Victor Lima	
9.	Bruce Bogue	
10.	Thomas Curioso	
11.	Mike Russell	
12.	Chris Greenlaw	
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

67 HALL ROAD
STURBRIDGE, MA 01566

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FAX (774) 241-0906

FUSS & O'NEILL

Attachment 8

IDDE Screening and Sampling Results

OBJECTID_	OBJECTID	USERID	DRNSYSKEY	DNODETYP	TYPE	DIAMETER	COMMENT	STREET	DATE_REC	CONDITIO	OF_SHAPE	DESCRIPT	MATERIAL	WIDTH	HEIGHT	PHOTO	OF_ID	DISCHARG	DISCOLOR	TIDAL	FARPHOTO
1	4	61	23	IN	UNKNOWN	UNK	CANNOT FI	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
2	46	102A	449	IN	UNKNOWN	UNK	CANNOT A	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
3	75	17A	736	IN	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
4	104	S52	976	IN	UNKNOWN	UNK	CANNOT FI	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
5	113	S126	1038		UNKNOWN	UNK	CULVERT	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
6	219	8A	3	OUT	UNKNOWN		(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
7	220	124A	6	OUT		UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
8																					
9	255	2	124	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
10																					
11	262	621A	205	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
12																					
13																					
14	275	58A	239	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
15	277	53A	241	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
16	286	705	293	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
17	288	515A	295	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
18																					
19																					
20																					
21	302	51	362	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
22	303	53	363	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
23	304	77A	364	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
24																					
25	316	105	456	OUT	UNKNOWN	UNK	CANNOT FI	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
26	319	88A	479	OUT	UNKNOWN	UNK	CANNOT FI	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
27	320	107A	480	OUT	UNKNOWN	UNK	CANNOT FI	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
28	336	40	590	OUT	UNKNOWN	UNK	CANNOT A	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
29																					
30	366	51A	737	OUT	UNKNOWN	UNK	possibly ur	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
31	367	16A	738	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
32	408	78	849	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
33																					
34	427	80A	992	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
35	433	7	1007	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
36	434	2A	1008	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
37	441	222	1043	OUT	UNKNOWN	UNK	CANNOT FI	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
38	452	70A	1054	OUT	UNKNOWN	UNK	INACCESSII	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
39																					
40	498	4A	1523	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
41	0		0	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
42																					
43	227	S43	34	OUT	UNKNOWN	UNK	CULVERT	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
44	321		481	OUT	UNKNOWN	UNK	CANNOT FI	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
45	54	S14	597	IN	UNKNOWN	UNK	CANNOT FI	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
46	226	6F	33	OUT	UNKNOWN	UNK	CANNOT FI	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
47	231	3	52		UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
48	322	92A	482	OUT	UNKNOWN	UNK	CANNOT FI	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
49																					
50	0		0		STRUCTUR	CHECK	BURIED HA	TRUMBULL	########		HEAD WAL	PIPE	CONCRETE	83"	UNK	0116Z	118	NO	NO	YES	0117Z
51	0		0		STRUCTUR	18"	CANT MEA	SOUNDVIE	########		HEAD WAL	PIPE	CONCRETE	87"	UNK	0262Z	1964	No	No	No	0263Z
52	0		0		STRUCTUR	15"	DISCHARGI	SOUNDVIE	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0264Z	1965	Yes	No	No	0265Z
53	0		0		NONSTRUC	15"	(none)	ELM RIDGE	########		F.E.U.	PIPE	CMP	UNK	UNK	0266Z	9	No	No	Yes	0267Z
54	0		0		STRUCTUR	CHECK	WIDTH TAI	MARIE AVE	########		F.E.U.	PIPE	CONCRETE	34.5"	16"	0258Z	1563	No	No	No	0259Z
55	0		0		NONSTRUC	15"	(none)	WAMPHAS	########		F.E.U.	PIPE	PVC	UNK	UNK	0155Z	236	Yes	No	No	0156Z
56	0		0		STRUCTUR	24"	CANNOT M	ROASE LA	########		HEAD WAL	PIPE	CONCRETE	83.5"	UNK	0157Z	237	No	No	No	0158Z
57	0		0		NONSTRUC	UNK	STREAM C(	ROASE LA	########		OTHER	DITCH	OTHER	UNK	UNK	0159Z	230	Yes	No	No	0160Z
58	0		0		NONSTRUC	CHECK	CANNOT M	BRADFORD	########		CIRCULAR	PIPE	CMP	UNK	UNK	0164Z	238	Yes	No	No	0165Z
59	0		0		NONSTRUC	8"	FLOWS IN	MONTAUK	########		CIRCULAR	PIPE	STEEL	UNK	UNK	0162Z	229	No	No	No	0163Z
60	0		0		STRUCTUR	15"	DISCHARGI	FINDLAY W	########		HEAD WAL	PIPE	CONCRETE	71"	34"	0166Z	231	Yes	No	No	0167Z
61																					
62	0		0		STRUCTUR	15"	(none)	COLLINS RI	########		HEAD WAL	PIPE	CONCRETE	64"	36"	0170Z	235	No	No	No	0171Z
63	0		0		NONSTRUC	15"	(none)	FLANDERS	########		CIRCULAR	PIPE	CMP	UNK	UNK	0172Z	697	No	No	No	0173Z
64	0		0		STRUCTUR	15"	(none)	FLANDERS	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0174Z	702	No	No	No	0175Z
65																					
66	0		0		STRUCTUR	CHECK	CANNOT M	LORDS HILL	########		HEAD WAL	PIPE	CONCRETE	77"	UNK	0128Z	266	No	No	No	0129Z
67	0		0		STRUCTUR	18"	(none)	COVE RD	########		HEAD WAL	PIPE	VERIFY	94"	46"	0132Z	303	No	No	Yes	0133Z
68	0		0		STRUCTUR	24"	(none)	COVE RD	########		CIRCULAR	PIPE	CMP	UNK	UNK	0178Z	304	No	Yes	No	0179Z
69	0		0		STRUCTUR	12"	FLOWS IN	MISTUXET	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0180Z	739	No	No	No	0181Z
70	0		0		STRUCTUR	18"	CANNOT TI	MISTUXET	########		HEAD WAL	PIPE	CONCRETE	UNK	23"	0182Z	740	No	No	No	0183Z
71	0		0		STRUCTUR	12"	(none)	MISTUXET	########		HEAD WAL	PIPE	CONCRETE	51"	20"	0184Z	741	No	No	No	0185Z
72	0		0		NONSTRUC	CHECK	DITCH OF \	PEQUOTSE	########		OTHER	DITCH	OTHER	UNK	UNK	0186Z	735	No	Yes	No	0187Z
73	0		0		STRUCTUR	24"	DISCHARGI	EDGEMON	########		CIRCULAR	PIPE	PVC	UNK	UNK	0198Z	400	Yes	No	Yes	0199Z
74	0		0		STRUCTUR	12"	(none)	HARRY AU	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0135Z	365	No	No	No	0136Z
75	0		0		STRUCTUR	CHECK	CANNOT M	HEWITT RI	########		ELLIPTICAL	PIPE	CONCRETE	UNK	UNK	0137Z	342	No	No	No	0138Z
76	0		0		STRUCTUR	CHECK	CANNOT M	HEWITT RI	########		FEU	PIPE	CONCRETE	73"	29"	0139Z	347	No	No	No	0140Z
77	0		0		STRUCTUR	27"	(none)	HATCH ST	########		HEAD WAL	PIPE	CONCRETE	127"	47"	0141Z	375	No	No	No	0142Z
78	0		0		STRUCTUR	27"	DISCHARGI	HATCH ST	########		HEAD WAL	PIPE	CONCRETE	can't	42"	0143Z	374	Yes	No	No	0144Z
79	0		0		STRUCTUR	18"	(none)	MEADOWI	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0145Z	745	No	No	Yes	0146Z
80	0		0		STRUCTUR	CHECK	CANNOT M	RICHMONI	########		HEAD WAL	PIPE	CONCRETE	106"	56"	0147Z	746	Yes	No	No	0148Z
81	0		0		STRUCTUR	18"	(none)	GOLDEN RI	########		FEU	PIPE	PVC	UNK	UNK	0192Z	747	Yes	Yes	No	0193Z
82	0		0		STRUCTUR	15"	PIPE COME	MISTUXET	########		HEAD WAL	PIPE	PVC	UNK	UNK	0194Z	855	Yes	No	No	0195Z
83	0		0		STRUCTUR	18"	OLD SMALI	BORODELL	########		CIRCULAR	PIPE	CMP	40"	10"	0212Z	854	Yes	No	No	0213Z
84	0		0		STRUCTUR	CHECK	U SHAPED	BORODELL	########		HEAD WAL	PIPE	CMP	72"	37"	0214Z	839	Yes	No	No	0215Z
85	0		0		NONSTRUC	CHECK	COMES OU	EAST MAIN	########		CIRCULAR	PIPE	CMP	UNK	UNK	0217Z	852	No	No	No	0218Z
86	0		0		NONSTRUC	CHECK	CANNOT M	WASHINGT	########		CIRCULAR	PIPE	CMP	UNK	UNK	0200Z	27	No	No	No	0201Z
87	0		0		STRUCTUR	15"	(none)	NORTH WA	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0230Z	UNK	No	Yes	Yes	0231Z
88	0		0		STRUCTUR	15"	(none)	NORTH WA	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0232Z	UNK	No	No	Yes	0233Z
89	0		0		STRUCTUR	15"	(none)	TIPPING RC	########		HEADWALL	PIPE	CONCRETE	UNK	UNK	0236Z	UNK	No	No	No	0237Z
90	0		0		STRUCTUR	CHECK	CANNOT G	LIBERTY ST	########		FEU	PIPE	CONCRETE	34.5"	18.5"	0260Z	UNK	No	No	No	0261Z
91	0		0		STRUCTUR	CHECK	CANNOT M	STILLMAN	########		OTHER	DITCH	CONCRETE	UNK	UNK	0254Z	1037	Yes	No	No	0255Z
92	0		0		STRUCTUR	42"	WATER IS	STILLMAN	########		CIRCULAR	PIPE	PVC	UNK	UNK	0256Z	1036	Yes	Yes	No	0257Z
93	0		0		STRUCTUR	42"	CANNOT M	MISTUXET	########		HEADWALL	ARCH PIPE	CMP	UNK	80"	0188Z	758	Inlet	No	No	0189Z
94	0		0		STRUCTUR	15"	(none)	WILLOW S	########		FEU	FEU	PVC	UNK	UNK	0204Z	850	No	No	Yes	0205Z
95	0		0		NONSTRUC	UNK	(none)	WASHINGT	########		OTHER	DITCH	OTHER	UNK	UNK	0202Z	851	No	Yes	Yes	0203Z
96	0		0		STRUCTUR	15"	TIDAL IS FF	HOLMES S	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0206Z	847	No	No	Yes	0207C
97	0		0			CHECK	DIAMETER	HOLMES S	########		CIRCULAR	PIPE	CMP	UNK	UNK	0208Z	846	No	No	Yes	0209Z
98	0		0			24"	DOUBLE PI	WILLIAMS	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0221Z	844	No	Yes	Yes	0222Z
99	0		0		STRUCTUR	CHECK	DOUBLE PI	ALDEN ST	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0219Z	845	No	Yes	Yes	0220Z
100	0		0		STRUCTUR	CHECK	OLD L SHAI	WILLOW S	########		OTHER	OTHER	CONCRETE	UNK	UNK	0210Z	848	No	Yes	Yes	0211Z
101	0		0		STRUCTUR	CHECK	PIPE INACC	MISTUXET	########		CIRCULAR	PIPE	CMP	UNK	UNK	0190Z	772	Yes	No	No	0191Z
102	0		0		STRUCTUR	CHECK	CANNOT M	RIVERSIDE	########		HEADWALL	PIPE	CONCRETE	130"	64"	163	997	No	No	Yes	164
103	0		0		STRUCTUR	CHECK	DIAMETER	MEADOW	########		CIRCULAR	PIPE	CMP	UNK	UNK	001B	121	No	No	No	002B
104																					
105	0		0		STRUCTUR	CHECK	WIDTH TAI	ALPHA AVE	########		FEU	PIPE	CONCRETE	42"	22.5"	0118Z	UNK	No	No	No	0119Z
106	0		0		UNKNOWN	CHECK	COULD BE	GRANDVIE	########		OTHER	UNKNOWN	UNKNOWN	UNK	UNK	0242Z	UNK	No	No	No	0243Z
107	0		0		STRUCTUR	18"	NO STREET	LINDSEY LA	########		FEU	PIPE	PVC	UNK	UNK	0252Z	UNK	No	No	No	0253Z
108	0		0		STRUCTUR	12"	DOUBLE PI	PEQUOTSE	########		CIRCULAR	PIPE	CMP	UNK	UNK	011B	437	Yes	Yes	No	012B
109	0		0		STRUCTUR	24"	(none)	DEER RIDG	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	013B	1443	Yes	Yes	No	014B
110	0		0		STRUCTUR	54"	DIAMETER	DEER RIDG	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	015B	1447	Yes	No	Yes	016B
111	0		0		STRUCTUR	15"	CANNOT M	MISTUXET	########		HEADWALL	PIPE	CONCRETE	UNK	42"	017C	748	Yes	Yes	No	018C
112	0		0		STRUCTUR	15"	(none)	MISTUXET	########		CIRCULAR	PIPE	CMP	UNK	UNK	019C	744	No	No	No	020C
113	0		0		NONSTRUC	CHECK	WATER HA	MISTUXET	########		OTHER	DITCH	OTHER	UNK	UNK	021C	743	Yes	Yes	No	022C
114	0		0		STRUCTUR	CHECK	CANNOT M	STONINGT	########		CIRCULAR	PIPE	CMP	UNK	UNK	023C	UNK	No	Yes	No	024C
115	0		0		STRUCTUR	CHECK	NO DIAME	STONINGT	########		FEU	PIPE	CONCRETE	35"	20.5"	025C	UNK	No	No	No	026C
116	0		0		STRUCTUR	CHECK	DIAMETER	AVERY ST	########		CIRCULAR	PIPE	PVC	UNK	UNK	027C	UNK	No	No	Yes	028C
117	0		0		STRUCTUR	CHECK	CANNOT M	MISTUXET	########		HEADWALL	PIPE	CMP	UNK	UNK	029C	UNK	Yes	No	No	030C
118	0		0		STRUCTUR	CHECK	DISCHARGI	MISTUXET	########		CIRCULAR	PIPE	PVC	UNK	UNK	031C	742	INLET	No	No	032C
119	0		0		STRUCTUR	CHECK	CANNOT TI	COOGAN E	########		FEU	PIPE	CONCRETE	53"	29"	033C	1446	No	No	No	034C
120	0		0		STRUCTUR	15"	L SHAPED E	JERRY BRO	########		HEADWALL	OTHER	CONCRETE	UNK	23"	035C	991	No	Yes	Yes	036C
121	0		0		STRUCTUR	CHECK	LARGE CON	JERRY BRO	########		HEADWALL	ARCHED PI	CONCRETE	UNK	51"	037C	1420	Yes	No	No	038C
122	0		0		STRUCTUR	CHECK	LARGE CON	JERRY BRO	########		HEADWALL	ARCHED PI	CONCRETE	UNK	57"	039C	1422	Yes	No	No	040C
123	0		0		STRUCTUR	CHECK	DIAMETER	JERRY BRO	########		HEADWALL	ARCHED PI	CONCRETE	153" ROUG	32"	041C	1419	No	Yes	No	042C
124	0		0		STRUCTUR	15"	VERY SLIGH	JERRY BRO	########		HEADWALL	PIPE	CMP	66"	40"	043C	1438	Yes	Yes	No	044C
125	0		0		STRUCTUR	18"	(none)	RIVER BEN	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	047C	1526	No	No	No	048C
126	0		0		UNKNOWN	CHECK	POSSIBLY A	RIVER BEN	########		OTHER	UNKNOWN	UNKNOWN	UNK	UNK	049C	1525	Yes	No	Yes	050C
127	0		0		UNKNOWN	UNK	NEW, INAC	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
128	0		0		UNKNOWN	UNK	NEW	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
129	0		0		UNKNOWN	UNK	NEW	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
130	0		0		STRUCTUR	CHECK	NEW IN DF	UNK	########		FEU	PIPE	PVC	UNK	FENCED IN	0737Z	UNK	No	No	No	0738Z
131																					
132																					
133	0		0		UNKNOWN	UNK	NEW	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
134	55	S51	598	IN	UNKNOWN	UNK	CULVERT	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
135	56	S7	677	IN	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
136	118	S9	1313	IN	UNKNOWN	UNK	CULVERT	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
137	351	S7	676	OUT	UNKNOWN	UNK	CULVERT	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
138	460	S9	1314	OUT	UNKNOWN	UNK	CULVERT	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
139	473	13A	1390	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
140	489	27A	1444	OUT	UNKNOWN	UNK	(none)	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
141	230		51	OUT	STRUCTUR	15"	ACROSS ST	DAVIS AVE	########		CIRCULAR	PIPE	CMP	UNK	UNK	0739Z	51	No	No	No	0740Z
142	0		0		STRUCTUR	15"	(none)	SHAWNON	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0176Z	687	No	No	No	0177Z
143	0		0		STRUCTUR	CHECK	DIAMETER	PELLEGRIN	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	001C	1392	No	No	No	002C
144	0		0		STRUCTUR	33"	PIPE IS OV	PELLEGRIN	########		ELLIPTICAL	PIPE	CMP	UNK	UNK	003C	708	Yes	Yes	No	004C
145	0		0		STRUCTUR	15"	(none)	PELLEGRIN	########		CIRCULAR	PIPE	CMP	UNK	UNK	005C	707	Yes	Yes	No	006C
146	0		0		STRUCTUR	15"	DIAMETER	DEANS MIL	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	007C	690	No	No	No	008C
147	0		0		STRUCTUR	27"	(none)	DEANS MIL	########		HEADWALL	PIPE	CONCRETE	113"	28"	009C	689	Yes	No	No	010C
148	0		0		STRUCTUR	18"	CANT MEA	DEANS MIL	########		HEADWALL	PIPE	CONCRETE	UNK	32"	011C	684	No	No	No	012C
149	0		0		NONSTRUC	CHECK	WATER FL	DEANS MIL	########		OTHER	DITCH	OTHER	UNK	UNK	013C	686	Yes	No	No	014C
150	0		0		STRUCTUR	21"	WATER FL	DEANS MIL	########		HEADWALL	PIPE	CONCRETE	94"	45"	015C	685	INLET	No	No	016C
151	0		0		UNKNOWN	UNK	NEW	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
152	0		0		STRUCTUR	15"	CANNOT M	HARBOR V	########		HEADWALL	PIPE	CONCRETE	66"	UNK	102	0153Z	UNK	UNK	UNK	0154Z
153	0		0		STRUCTUR	CHECK	PIPE IS DEE	HARBOR V	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	101	0151Z	UNK	UNK	Yes	0152Z
154	0		0		STRUCTUR	15"	(none)	HARBOR V	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0149Z	227	UNK	UNK	Yes	0150Z
155	0		0		STRUCTUR	15"	structure is	NORTH MA	########		HEADWALL	PIPE	CONCRETE	62.5"	UNK	0238Z	123	UNK	UNK	No	0239Z
156	0		0		NONSTRUC	CHECK	PIPE IS BUF	QUANADU	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0226Z	202	UNK	UNK	UNK	0227Z
157	0		0		NONSTRUC	18"	(none)	QUANADU	########		FEU	PVC	PVC	UNK	UNK	0223Z	204	UNK	UNK	Yes	0224Z
158																					
159	0		0		NONSTRUC	15"	COMES OU	LAMBERTS	########		CIRCULAR	PIPE	CMP	UNK	UNK	91	0228Z	UNK	UNK	Yes	0229Z
160	0		0		NONSTRUC	CHECK	PIPE IS RUS	PALMER ST	########		CIRCULAR	PIPE	CMP	UNK	UNK	0234Z	165	UNK	UNK	Yes	0235Z
161	0		0		NONSTRUC	12"	(none)	ELM ST	########		CIRCULAR	PIPE	STEEL	UNK	UNK	0124Z	122	No	No	No	0125Z
162	0		0		STRUCTUR	15"	PIPE COME	ELM ST	########		HEADWALL	PIPE	CONCRETE	endless	44"	0122Z	119	Yes	No	No	0123Z
163	0		0		STRUCTUR	CHECK	cant meas	ELM ST	########		ELLIPTICAL	BOX CULVE	CONCRETE	104"	45"	99	0240Z	Yes	No	No	0241Z
164	0		0		UNKNOWN	UNK	NEW	UNK	########		UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto
165	0		0		STRUCTUR	CHECK	(none)	PALMER NI	########		HEADWALL	PIPE	CONCRETE	73"	35"	0244Z	22	No	No	No	0245Z
166																					
167																					
168	0		0		STRUCTUR	18"	(none)	CARNOT C	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0250Z	566	Yes	No	No	0251Z
169	0		0		STRUCTUR	18"	(none)	WEST VINE	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0001X	1557	Yes	No	No	0002X
170	0		0		STRUCTUR	CHECK	OLD ROCK	LIBERTY ST	########		HEADWALL	OTHER	OTHER	95"	46"	0003X	1556	Yes	Yes	No	0004X
171	0		0		STRUCTUR	36"	DISCHARGI	ASHER AVE	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0005X	1559	Yes	No	No	0006X
172	0		0		STRUCTUR	CHECK	DIAMETER	WEST ARC	########		HEADWALL	PIPE	CONCRETE	93"	36"	0007X	1558	Yes	No	No	0008X
173	0		0		STRUCTUR	CHECK	DIAMETER	STILLMAN	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0009X	1560	No	No	No	0010X
174	0		0		STRUCTUR	18"	(none)	WALNUT S	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0011X	1051	No	No	No	0012X
175	0		0		STRUCTUR	CHECK	DIAMETER	NOYES AVE	########		CIRCULAR	PIPE	CMP	UNK	UNK	0013X	1050	No	No	No	0014X
176	0		0		STRUCTUR	CHECK	(none)	LOUDEN S	########		UNK	DITCH	CONCRETE	75"	38"	0015X	1031	Yes	No	No	0016X
177	0		0		STRUCTUR	CHECK	CANNOT M	ASHER AVE	########		FEU	PIPE	PVC	UNK	UNK	0017X	1057	Yes	No	No	0018X
178	0		0		STRUCTUR	CHECK	OLD STONE	MORGAN S	########		HEADWALL	BOX CULVE	CONCRETE	UNK	UNK	0019X	1033	Yes	No	No	0020X
179	0		0		STRUCTUR	CHECK	DIAMETER	MORGAN S	########		HEADWALL	PIPE	CONCRETE	103"	39"	0021X	1032	No	No	No	0022X
180	0		0		STRUCTUR	18"	(none)	MAPLE ST	########		CIRCULAR	PIPE	PVC	UNK	UNK	0023X	1052	No	No	No	0024X
181	0		0		NONSTRUC	CHECK	STREAM FL	MECHANIC	########		HEADWALL	OTHER	OTHER	UNK	UNK	0025X	1053	Yes	No	Yes	0026X
182	0		0		NONSTRUC	15"	(none)	COGGSWE	########		FEU	PIPE	PVC	UNK	UNK	0027X	NEW	No	Yes	No	0028X
183	0		0		STRUCTUR	15"	(none)	GARDEN S	########		CIRCULAR	PIPE	CMP	UNK	UNK	0029X	1047	No	No	No	0030X
184	0		0		STRUCTUR	15"	(none)	SMITH ST	########		CIRCULAR	PIPE	CMP	UNK	UNK	0031X	1555	No	No	No	0032X
185	0		0		STRUCTUR	15"	(none)	WEST ARC	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0033X	977	No	No	No	0034X
186	0		0		STRUCTUR	CHECK	PIPE IS TO(	DOWNER S	########		HEADWALL	PIPE	CMP	UNK	UNK	0035X	1049	No	No	No	0036X
187	0		0		STRUCTUR	CHECK	LARGE OB	ROBINSON	########		BOX ARCH	BOX CULVE	BRICK	UNK	UNK	0037X	1035	Yes	Yes	No	0038X
188	0		0		STRUCTUR	30"	(none)	WEST ARC	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0039X	1048	Yes	No	No	0049X
189	0		0		STRUCTUR	18"	(none)	DEER RIDG	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0041X	1442	Yes	No	No	0042X
190	0		0		STRUCTUR	36"	(none)	PHEASANT	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0043X	970	Yes	Yes	No	0044X
191	0		0		STRUCTUR	36"	DISCHARGI	PHEASANT	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0045X	971	Inlet	No	No	0046X
192	0		0		STRUCTUR	CHECK	CANT MEA	PHEASANT	########		CIRCULAR	PIPE	CONCRETE	UNK	UNK	0047X	972	Yes	Yes	No	0048X
193	0		0		STRUCTUR	CHECK	CANNOT M	HIGH RIDG	########		FEU	PIPE	CONCRETE	UNK	UNK	0079X	1718	Yes	No	No	0080X
194																					
195	0		0		STRUCTUR	CHECK	NO DIAME	WOODLAN	########		FEU	PIPE	CONCRETE	33"	18"	0083X	1715	No	No	No	0084X

196																					
197	0		0		STRUCTUR	CHECK	NO DIAME	FAIRWAY (	########	FEU	PIPE	CONCRETE	UNK	15"	0087X	1720	Yes	Yes	No	0088X	COMPLETE
198	0		0		STRUCTUR	12"	DISCHARGI	FAIRWAY (	########	CIRCULAR	PIPE	PVC	UNK	UNK	0089X	1714	Yes	No	No	0090X	COMPLETE
199	0		0		STRUCTUR	18"	(none)	PEQUOT C'	########	FEU	PIPE	PVC	UNK	UNK	0099X	UNK	Yes	No	No	0100X	COMPLETE
200	0		0		STRUCTUR	15"	(none)	PEQUOT C'	########	FEU	PIPE	PVC	UNK	UNK	0101X	UNK	No	No	No	0102X	COMPLETE
201	0		0		STRUCTUR	CHECK	DIAMETER	CASTLE HIL	########	FEU	PIPE	PVC	UNK	UNK	0103X	UNK	Yes	No	No	0103X	COMPLETE
202	0		0		STRUCTUR	CHECK	CANNOT R	MAIN ST	########	HEADWALL	PIPE	CMP	UNK	UNK	0105X	1902	Yes	No	No	0106X	COMPLETE
203	0		0		STRUCTUR	CHECK	NO DIAME	WHITEHAL	########	FEU	PIPE	CONCRETE	42"	22"	0107X	UNK	No	No	No	0108X	COMPLETE
204	0		0		STRUCTUR	18"	OLD STONI	WILCOX RD	########	HEADWALL	PIPE	VERIFY	71"	33"	0109X	300	No	No	No	0110X	COMPLETE
205	0		0		STRUCTUR	CHECK	PIPE OLD A	WILCOX RD	########	CIRCULAR	PIPE	CMP	UNK	UNK	0111X	302	No	No	No	0112X	COMPLETE
206	0		0		STRUCTUR	CHECK	(none)	WILCOX RD	########	CIRCULAR	PIPE	CMP	UNK	UNK	0113X	UNK	No	No	No	0114X	COMPLETE
207	0		0		STRUCTUR	CHECK	CANNOT M	NOYES AVE	########	FEU	PIPE	CONCRETE	UNK	UNK	0115X	296	No	No	No	0116X	COMPLETE
208																					
209	0		0		STRUCTUR	CHECK	CANT REA(	BOULDER /	########	CIRCULAR	PIPE	PVC	UNK	UNK	0119X	1009	No	No	Yes	0120X	COMPLETE
210	0		0		STRUCTUR	18"	DISCHARGI	NORTH AN	########	HEADWALL	PIPE	CMP	UNK	UNK	0121X	1707	Yes	No	No	0122X	COMPLETE
211	0		0		STRUCTUR	CHECK	NO DIAME	EAST NECK	########	FEU	PIPE	CONCRETE	38"	20"	0126X	240	No	No	No	0127X	COMPLETE
212	0		0		STRUCTUR	CHECK	CANNOT M	SKIPPER ST	########	CIRCULAR	PIPE	CONCRETE	UNK	UNK	0001A	1006	No	No	Yes	0002A	COMPLETE
213	0		0		STRUCTUR	CHECK	MOVE TOV	CHARLES S	########	CIRCULAR	PIPE	CONCRETE	UNK	UNK	0003A	1004	No	Yes	Yes	0004A	COMPLETE
214	0		0		STRUCTUR	CHECK	NO DIAME	CHARLES S	########	FEU	PIPE	CONCRETE	40"	22"	0005A	1003	No	No	No	0006A	COMPLETE
215	0		0		STRUCTUR	CHECK	CANNOT M	ASHWORT	########	FEU	PIPE	CONCRETE	UNK	UNK	0007A	1005	No	No	No	0008A	COMPLETE
216	0		0		STRUCTUR	CHECK	NO DIAME	ROSSIE ST	########	FEU	PIPE	CONCRETE	35"	19"	0009A	856	Yes	No	No	0010A	COMPLETE
217	0		0		STRUCTUR	18"	(none)	CUTTER DF	########	CIRCULAR	PIPE	CONCRETE	UNK	UNK	0011A	857	Yes	No	No	0012A	COMPLETE
218	0		0		STRUCTUR	CHECK	NO DIAME	GREENMAI	########	FEU	PIPE	PVC	UNK	UNK	0013A	838	No	No	Yes	0014A	COMPLETE
219	0		0		STRUCTUR	CHECK	CANNOT M	CLARA DR	########	FEU	PIPE	CONCRETE	UNK	UNK	0015A	1445	No	No	No	0016A	COMPLETE
220	0		0		STRUCTUR	CHECK	DUAL PIPES	CLARA DR	########	FEU	PIPE	CONCRETE	UNK	UNK	0017A	1453	No	No	No	0018A	COMPLETE
221	0		0		STRUCTUR	CHECK	NO DIAME	CLARA DR	########	FEU	PIPE	CONCRETE	80"	42"	0019A	1441	Yes	No	Yes	0020A	COMPLETE
222	0		0		STRUCTUR	15"	(none)	RIVER BEN	########	CIRCULAR	PIPE	CONCRETE	UNK	UNK	0045C	UNK	No	No	No	0046C	COMPLETE
223	0		0		STRUCTUR	CHECK	(none)	GREENHAV	########	HEADWALL	PIPE	CMP	UNK	UNK	0345Z	600	Yes	No	No	0346Z	COMPLETE
224	0		0		STRUCTUR	12"	(none)	STANTON I	########	HEADWALL	PIPE	PVC	48"	19"	0347Z	UNK	No	No	Yes	0348Z	COMPLETE
225	0		0		STRUCTUR	CHECK	(none)	STONINGT	########	HEADWALL	PIPE	CONCRETE	97"	52"	0349Z	NEW OF 0(	No	No	No	0350Z	COMPLETE
226	0		0		STRUCTUR	18"	(none)	SOUTH AN	########	CIRCULAR	PIPE	CMP	UNK	UNK	0351Z	599	No	No	No	0352Z	COMPLETE
227	0		0		STRUCTUR	CHECK	BEHIND AD	WREN ST	########	CIRCULAR	PIPE	CONCRETE	UNK	UNK	0671Z	591	No	No	No	0672Z	COMPLETE
228	0		0		STRUCTUR	CHECK	ACROSS ST	SPELLMAN	########	FEU	PIPE	CONCRETE	34.5"	BURIED	0673Z	1	No	No	No	0674Z	COMPLETE
229	0		0		STRUCTUR	CHECK	ON SIDE OI	MECHANIC	########	FEU	PIPE	CONCRETE	79"	41"	0675Z	1039	Yes	No	Yes	0676Z	COMPLETE
230	0		0		STRUCTUR	12"	CULVERT	MECHANIC	########	CIRCULAR	PIPE	CONCRETE	UNK	UNK	0677Z	UNK	No	No	Yes	0678Z	COMPLETE
231	0		0		STRUCTUR	12"	ACROSS ST	MECHANIC	########	CIRCULAR	PIPE	PVC	UNK	UNK	0679Z	UNK	No	No	Yes	0680Z	COMPLETE
232	0		0		STRUCTUR	CHECK	ACROSS ST	MECHANIC	########	ELLIPTICAL	PIPE	CONCRETE	UNK	CANNOT A	0681Z	UNK	Yes	No	Yes	0682Z	COMPLETE
233	0		0		STRUCTUR	15"	(none)	MECHANIC	########	HEADWALL	PIPE	CONCRETE	UNK	UNK	0683Z	UNK	No	No	Yes	0684Z	COMPLETE
234	0		0		STRUCTUR	24"	IN LINE WI	MECHANIC	########	CIRCULAR	PIPE	CONCRETE	UNK	UNK	0685Z	451	No	No	Yes	0686Z	COMPLETE
235	0		0		STRUCTUR	15"	ACROSS ST	MECHANIC	########	HEADWALL	PIPE	CONCRETE	63"	BURIED	0687Z	483	No	No	Yes	0688Z	COMPLETE
236	0		0		STRUCTUR	12"	ACROSS ST	BURDICK L	########	CIRCULAR	PIPE	PVC	UNK	UNK	0694Z	985	No	No	No	0695Z	COMPLETE
237	0		0		STRUCTUR	CHECK	ON ADDRE	EAST ENTE	########	HEADWALL	PIPE	CONCRETE	66"	BURIED	0696Z	1045	No	No	No	0697Z	COMPLETE
238																					
239	0		0		STRUCTUR	21"	BACKYARD	EAST ENTE	########	CIRCULAR	PIPE	CONCRETE	UNK	UNK	0701Z	1044	Yes	No	No	0702Z	COMPLETE
240																					
241																					
242	0		0		STRUCTUR	15"	ACROSS ST	SOUTH BR(	########	HEADWALL	PIPE	VERIFY	BROKEN	37.5"	0707Z	UNK	INLET	Yes	No	0708Z	COMPLETE
243	0		0		STRUCTUR	15"	ACROSS ST	SOUTH BR(	########	HEADWALL	PIPE	VERIFY	93.5"	38"	0709Z	UNK	INLET	Yes	No	0710Z	COMPLETE
244	0		0		STRUCTUR	CHECK	DOUBLE PI	UNK	########	CIRCULAR	PIPE	VERIFY	UNK	CANNOT A	NoPhoto	UNK	Yes	Yes	No	NoPhoto	COMPLETE
245	0		0		STRUCTUR	CHECK	NEXT TO A	MARK ST	########	HEADWALL	PIPE	CONCRETE	UNK	CANNOT A	0711Z	513	No	No	No	0712Z	COMPLETE
246	0		0		STRUCTUR	15"	BEHIND AD	PONDVIEW	########	CIRCULAR	PIPE	CMP	UNK	UNK	0713Z	514	Yes	No	No	0714Z	COMPLETE
247	0		0		STRUCTUR	CHECK	BEHIND AD	ELAINE ST	########	HEADWALL	PIPE	CONCRETE	UNK	CANNOT A	0715Z	516	No	Yes	No	0716Z	COMPLETE
248	0		0		STRUCTUR	CHECK	BEHIND AD	ELAINE ST	########	HEADWALL	PIPE	VERIFY	TOO WIDE	48"	0717Z	UNK	No	No	No	0718Z	COMPLETE
249	0		0		STRUCTUR	CHECK	NEXT TO W	RIVER RD	########	FEU	PIPE	CONCRETE	UNK	BURIED	0719Z	555	Yes	No	Yes	0720Z	COMPLETE
250	0		0		STRUCTUR	CHECK	ACROSS FR	RIVER RD	########	CIRCULAR	PIPE	CMP	UNK	UNK	0721Z	554	No	No	Yes	0722Z	COMPLETE
251	0		0		STRUCTUR	12"	ACROSS ST	RIVER RD	########	CIRCULAR	PIPE	CMP	UNK	UNK	0723Z	553	No	No	Yes	0724Z	COMPLETE
252	0		0		STRUCTUR	CHECK	ON SIDE OI	MARY HAL	########	HEADWALL	PIPE	CONCRETE	BURIED BU	BURIED	0725Z	91	INLET	No	No	0726Z	COMPLETE
253	0		0		STRUCTUR	15"	NEXT TO A	MARY HAL	########	HEADWALL	PIPE	VERIFY	BURIED	BURIED	0727Z	UNK	INLET	No	No	0728Z	COMPLETE
254																					
255	0		0		STRUCTUR	12"	ACROSS ST	SUNSET AV	########	HEADWALL	PIPE	CONCRETE	BURIED	BURIED	0733Z	32	INLET	No	No	0734Z	COMPLETE
256	0		0		STRUCTUR	CHECK	ACROSS ST	RIVER RD	########	CIRCULAR	PIPE	CMP	UNK	UNK	0735Z	15	Yes	No	No	0736Z	COMPLETE
257	507	120A	1561	OUT	UNKNOWN	UNK	COULD NO	UNK	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
258	589	9K	2085	OUT	UNKNOWN	UNK	CANNOT FI	UNK	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
259	0		0		UNKNOWN	UNK	NEW CANN	UNK	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
260	0		0		UNKNOWN	UNK	NEW CANN	UNK	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
261	0		0		UNKNOWN	UNK	NEW CANN	UNK	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
262	0		0		STRUCTUR	CHECK	NEXT TO B	NORTH ST(	########	HEADWALL	PIPE	CONCRETE	UNK	CANNOT A	0775Z	UNK	No	No	No	0776Z	COMPLETE
263	0		0		STRUCTUR	CHECK	IN FRONT (	WHITTAKE	########	FEU	PIPE	CONCRETE	53.5"	BURIED	0781Z	UNK	No	No	No	0782Z	COMPLETE
264	0		0		STRUCTUR	CHECK	ON RIGHT	VOLUTOW	########	FEU	PIPE	CONCRETE	BURIED	BURIED	0787Z	UNK	No	No	No	0788Z	COMPLETE
265	0		0		UNKNOWN	CHECK	ACROSS ST	WHITE RO	########	HEADWALL	PIPE	CONCRETE	TOO BIG	64"	0789Z	UNK	No	No	Yes	0790Z	COMPLETE
266	0		0		STRUCTUR	CHECK	IN WOODS	CAVENDISH	########	FEU	PIPE	CONCRETE	35"	19"	0791Z	UNK	No	No	No	0792Z	COMPLETE
267	0		0		STRUCTUR	CHECK	IN WOODS	SOMERSET	########	HEADWALL	3 PIPES	CONCRETE	TOO BIG	72"	0793Z	UNK	Yes	No	No	0794Z	COMPLETE
268	0		0		NONSTRUC	CHECK	DITCH FLO	GREENHAV	########	UNK	DITCH	UNK	UNK	UNK	NoPhoto	692	UNK	UNK	No	NoPhoto	COMPLETE
269	0		0		STRUCTUR	CHECK	WIDTH TAI	WEQUETE(	########	FEU	PIPE	CONCRETE	50.5	25"	0246Z	593	UNK	UNK	No	0247Z	COMPLETE
270	0		0		STRUCTUR	15"	DISCHARGI	DEER RIDG	########	CIRCULAR	PIPE	CONCRETE	UNK	UNK	0049X	1429	Yes	No	No	0050X	COMPLETE
271	0		0		STRUCTUR	CHECK	OLD STONI	PEQUOT TI	########	HEADWALL	PIPE	OTHER	87"	21"	0051X	1448	Yes	No	No	0052X	COMPLETE
272	0		0		STRUCTUR	CHECK	NO DIAME	BACK ACRE	########	FEU	PIPE	CONCRETE	42"	22"	0053X	1450	Yes	No	No	0054X	COMPLETE
273	0		0		STRUCTUR	CHECK	NO DIAME	BACK ACRE	########	FEU	PIPE	CONCRETE	42"	21"	0055X	1449	No	No	No	0056X	COMPLETE
274	0		0		STRUCTUR	15"	(none)	WHEELER I	########	HEADWALL	PIPE	CONCRETE	66"	43"	0059X	1393	No	No	No	0060X	COMPLETE
275	0		0		STRUCTUR	15"	(none)	TAUGWAN	########	HEADWALL	PIPE	CONCRETE	67"	38"	0061X	1369	No	No	No	0062X	COMPLETE
276	0		0		STRUCTUR	15"	(none)	TAUGWON	########	HEADWALL	PIPE	CMP	66"	36"	0063X	975	No	Yes	No	0064X	COMPLETE
277	0		0		STRUCTUR	CHECK	(none)	TAUGWON	########	HEADWALL	PIPE	CMP	58"	41"	0065X	1828	Yes	No	No	0066X	COMPLETE
278	0		0		STRUCTUR	12"	(none)	WHEELER I	########	HEADWALL	PIPE	CONCRETE	91"	44"	0067X	NEW	No	Yes	No	0068X	COMPLETE
279	0		0		STRUCTUR	CHECK	CANT MEA	WHEELER I	########	HEADWALL	PIPE	VERIFY	UNK	UNK	0069X	1391	No	No	No	0070X	COMPLETE
280	0		0		STRUCTUR	CHECK	CANNOT M	ANGUILLA	########	HEADWALL	OTHER	VERIFY	UNK	UNK	0071X	1311	No	No	No	0072X	COMPLETE
281	0		0		STRUCTUR	CHECK	CANNOT M	ANGUILLA	########	HEADWALL	OTHER	CONCRETE	UNK	UNK	0073X	1309	No	No	No	0074X	COMPLETE
282	0		0		STRUCTUR	UNK	JUST A BRI	SOUTH AN	########	UNK	OTHER	CONCRETE	UNK	UNK	0075X	1312	Yes	No	No	0076X	COMPLETE
283	0		0		STRUCTUR	CHECK	(none)	SOUTH AN	########	CIRCULAR	PIPE	CMP	22"	24"	0077X	1315	Yes	No	No	0078X	COMPLETE
284	0		0		STRUCTUR	CHECK	NO DIAME	HIGH RIDG	########	FEU	PIPE	CONCRETE	54"	26"	0091X	1721	Yes	No	No	0092X	COMPLETE
285	0		0		STRUCTUR	CHECK	(none)	HIGH RIDG	########	CIRCULAR	PIPE	CONCRETE	UNK	UNK	0093X	1316	No	No	No	0094X	COMPLETE
286	0		0		STRUCTUR	CHECK	CANT MEA	HIGH RIDG	########	FEU	PIPE	CONCRETE	UNK	UNK	0095X	1722	No	No	No	0096X	COMPLETE
287	0		0		NONSTRUC	24"	(none)	PEQUOT TI	########	HEADWALL	PIPE	CONCRETE	UNK	UNK	0097X	UNK	Yes	Yes	No	0098X	COMPLETE
288	0		0		STRUCTUR	18"	CANNOT R	NORTH AN	########	CIRCULAR	PIPE	CMP	UNK	UNK	0123X	1695	Yes	No	No	0124X	COMPLETE
289	0		0		STRUCTUR	15"	(none)	NORTH MA	########	HEADWALL	PIPE	PVC	UNK	UNK	0331Z	677	No	No	No	0332Z	COMPLETE
290	0		0		STRUCTUR	CHECK	CANNOT R	FARM HOL	########	HEADWALL	PIPE	CMP	UNK	UNK	0335Z	671	No	No	No	0336Z	COMPLETE
291	0		0		STRUCTUR	CHECK	CANNOT R	FARM HOL	########	HEADWALL	PIPE	CMP	UNK	UNK	0333Z	679	No	No	No	0334Z	COMPLETE
292	0		0		STRUCTUR	CHECK	(none)	HERITAGE	########	CIRCULAR	PIPE	PVC	UNK	UNK	0337Z	NEW OF 0(	Yes	No	No	0338Z	COMPLETE
293	0		0		STRUCTUR	24"	BEHIND BA	FLANDERS	########	HEADWALL	PIPE	CONCRETE	UNK	CAN'T	0341Z	1378	No	No	No	0342Z	COMPLETE
294	0		0		STRUCTUR	24"	(none)	FLANDERS	########	HEADWALL	PIPE	CONCRETE	103"	39"	0339Z	1379	No	No	No	0340Z	COMPLETE
295	0		0		STRUCTUR	CHECK	(none)	SHAWNON	########	HEADWALL	PIPE	CONCRETE	BROKEN	19"	0343Z	688	No	No	No	0344Z	COMPLETE
296	528	17A	1719	OUT	UNKNOWN	UNK	CANNOT FI	UNK	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
297	574	135A	2006	OUT	UNKNOWN	UNK	CANNOT A	UNK	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
298	590	9A	2086	OUT		UNK	CANNOT A	UNK	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
299	0		0		STRUCTUR	15"	COMES OU	NORTH ST(	########	HEADWALL	PIPE	PVC	UNK	UNK	0777Z	UNK	No	No	No	0778Z	COMPLETE
300	0		0		STRUCTUR	15"	NEXT TO C	LANTERN H	########	CIRCULAR	PIPE	CMP	UNK	UNK	0779Z	UNK	Yes	No	No	0780Z	COMPLETE
301	0		0		STRUCTUR	15"	NEXT TO C	AL HARVEY	########	CIRCULAR	PIPE	CMP	UNK	UNK	0783Z	UNK	Yes	No	No	0784Z	COMPLETE
302	0		0		STRUCTUR	18"	NEXT TO C	TAUGWAN	########	CIRCULAR	PIPE	PVC	UNK	UNK	0785Z	UNK	Yes	No	No	0786Z	COMPLETE
303	0		0		STRUCTUR	CHECK	NEXT TO A	CANTERBU	########	HEADWALL	3 PIPES	CONCRETE	230"	54.5"	0795Z	UNK	Yes	No	No	0796Z	COMPLETE
304	0		0		STRUCTUR	CHECK	ACROSS ST	FAIRVIEW	########	HEADWALL	2 PIPES	CONCRETE	181.5"	60"	0797Z	UNK	Yes	No	No	0798Z	COMPLETE
305	0		0		STRUCTUR	18"	CANNOT TI	MISTUXET	########	HEADWALL	PIPE	CONCRETE	UNK	23"	0182Z	740	No	No	No	0183Z	COMPLETE
306	0		0		UNKNOWN	UNK	CANNOT A	UNK	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
307																					
308																					
309	0		0		UNKNOWN	UNK	(none)	UNK	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
310	0		0		UNKNOWN	UNK	(none)	UNK	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
311	0		0		STRUCTUR	UNK	IN FRONT (	NORTH MA	########	CIRCULAR	PIPE	CMP	UNK	UNK	2917	UNK	No	No	No	2918	COMPLETE
312	0		0		STRUCTUR	15"		NORTH AN	########	CIRCULAR	PIPE	CMP	UNK	UNK	2919	UNK	Yes	No	No	2920	COMPLETE
313	0		0		UNKNOWN	UNK	CANNOT A	GREENHAV	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
314	0		0			15	NEXT TO A	NORTH ST(	########			RCP	60.5	UNK	2869		No	No	No	2870	COMPLETED
315	0		0			32	hw	GREENMAI	########	circle		RCP	72	120	2871		Yes	No	Yes	2872	COMPLETED
316	0		0			21	hw 2 pipe	GREENMAI	########				32	52.5	2873		No	No	No	2874	COMPLETED
317	0		0			15	15 ccmp	PEQUOTSE	########						2889		No	No	No	2890	COMPLETED
318	0		0			15	(none)	BOULDER /	########						2891		No	No	Yes	2892	COMPLETED
319	0		0			15	(none)	WILCOX RD	########						2893		No	No	Yes	2894	COMPLETED
320	0		0			24	ON WESTE	PHEASANT	########						2899		No	No	Yes	2901	COMPLETED
321	0		0			15	pipe	WHITEHAL	########						2902		No	No	No	2903	COMPLETED
322	0		0				dpond	WHITEHAL	########												
323	0		0			15	(none)	BAYBERRY	########				70	40	2904		No	No	No	2905	COMPLETED
324	0		0		STRUCTUR	UNK	ON WATER	GREENMAI	########	CIRCULAR	PIPE	CMP	UNK	UNK	2924	UNK	No	No	No	2925	COMPLETE
325	0		0		STRUCTUR	12'	IN WOODS	COLLINS RD	########	CIRCULAR	PIPE	CMP	UNK	UNK	2926	UNK	NO	NO	NO	2927	COMPLETE
326																					
327																					
328			0		UNKNOWN	UNK	NEW	SUMMIT S'	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
329							Aerial Capt	ELIHU ST													
330							Approx Lo(	BAYVIEW AVE													
331																					
332																					
333							Aerial Capt	FRONT ST													
334							Aerial Capt	NORTHWEST ST													
335							Aerial Capt	WATER ST													
336							Two Outfa	STONINGTON COMMONS													
337							Aerial Capt	MAIN ST													
338																					
339							Aerial Capt	DIVING ST													
340							Aerial Capt	HANCOX ST													
341							Aerial Capt	OMEGA ST													
342							Aerial Capt	WATER ST													
343																					
344																					
345	0		0		STRUCTUR	15"	OLD STONI	NORTH AN	########	HEADWALL	OTHER	OTHER	BROKEN	35"	0799Z	UNK	INLET	No	No	0800Z	COMPLETE
346	0		0		STRUCTUR	15"	IN FRONT (	NORTH AN	########	CIRCULAR	PIPE	CMP	UNK	UNK	0801Z	UNK	Yes	No	No	0802Z	COMPLETE
347	0		0		STRUCTUR	CHECK	STRAIGHT	SHERWOO	########	FEU	PIPE	CONCRETE	BURIED	BURIED	0803Z	UNK	No	No	Yes	0804Z	COMPLETE
348	0		0		STRUCTUR	CHECK	IN LINE WI	D AMATO	########	FEU	PIPE	CONCRETE	UNK	CANNOT A	0805Z	UNK	Yes	No	No	0806Z	COMPLETE
349	0		0		STRUCTUR	15"	ON SIDE OI	STONY BR(	########	HEADWALL	PIPE	CMP	UNK	UNK	0807Z	UNK	No	No	No	0808Z	COMPLETE
350	0		0			CHECK	ACROSS ST	LANTERN H	########	HEADWALL	PIPE	CONCRETE	UNK	POISON IV	0812Z	UNK	No	No	No	0813Z	COMPLETE
351	0		0		UNKNOWN	UNK	CANNOT A	AL HARVEY	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
352	0		0		UNKNOWN	UNK	CANNOT A	NORTH AN	########	UNK	UNK	UNK	UNK	UNK	NoPhoto	UNK	UNK	UNK	UNK	NoPhoto	CAN'T FIND
353	0		0				cb		########												
354	0		0				of new	TAUGWON	########				24	24	2867		No	No	No	2868	COMPLETED
355	0		0		STRUCTUR	15	(none)	JUNIPER LA	########	ELLIPTICAL	PIPE	CONCRETE	36	19	2895		No	No	No	2896	COMPLETE
356	0		0			15	treeaacher	AL HARVEY	########						2897		No	No	No	2898	COMPLETED
357	0		0				inlet	AL HARVEY	########												
358																					
359																					
362																					

objectid	ParentID	created_us	created_da	last_edited	last_edited	Sample_Lo	Outfall_Sul	Dry_Flow_I	Visual_Evic	Olfactory_I	Temperatu	Conductivi	Salinity (pp	Chlorine (n	Ammonia (	E. coli (MP	E. coli Sam	Enterococc	Enterococc	Total Phos	Total Nitro	Total Phos	Total Nitro	Flow Descr	globalid_1	Last Rain D	Last Rain A	Freshwater	Sample TP	Sample TN	Sample Tin	Sample Sta	Sample En	Last Edited	Last Edited	Sample Sul	Sampler	Sampling L	Notes	GUID	CreationDa	Creator	EditDate	Editor	Surfactants (mg/L)
1	7eb49a14-	SBengtson_	########	SBengtson_	########		0		none	none														dr	9ce6f814-C	########	7	Salt	N	N		########	########	########	SBengtson_	########	CMG1			7eb49a14-4e70-411f-925a-bfae539f86b9				
2	{6D33E0AC	SBengtson_	########	SBengtson_	########		0		none	none														dr	4f51f3b9-3	########	8	Salt	Y	Y		########	########	########	SBengtson_	########	CMG3		Test	6d33e0ad-e02c-4e6a-a4dd-dda58c22cff6				
3	{6D33E0AC	SBengtson_	########	SBengtson_	########		0		none	none														dr	82d48844-	########	47	Salt	Y	Y		########	########	########	SBengtson_	########	CMG2		Test	6d33e0ad-e02c-4e6a-a4dd-dda58c22cff6				
4	{6D33E0AC	SBengtson_	########	SBengtson_	########		0		none	none														dr	3cbf2bf2-c	########	145	Salt	Y	Y		########	########	########	STONINGTI	########	CMG2		Test	6d33e0ad-e02c-4e6a-a4dd-dda58c22cff6				
5	{6D33E0AC	SBengtson_	########	SBengtson_	########		0		none	none														dr	2971cc4d-;	########	147	Salt	Y	Y		########	########	########	STONINGTI	########	CMG3		Test	6d33e0ad-e02c-4e6a-a4dd-dda58c22cff6				
6	{6D33E0AC	STONINGTI	########	STONINGTI	########		0		none	none														dr	f65d6a2b-;	########	147	Salt	Y	Y		########	########	########	STONINGTI	########	CMG2		Test	6d33e0ad-e02c-4e6a-a4dd-dda58c22cff6				
7	{6D33E0AC	STONINGTI	########	STONINGTI	########		0		none	none														dr	053483b6-	########	147	Salt	Y	Y		########	########	########	STONINGTI	########	CMG1		Test	6d33e0ad-e02c-4e6a-a4dd-dda58c22cff6				
8	{ADA00ECE	STONINGTI	########	SBengtson_	########	mh	1		none	none			7.5		6	449				2	0	dfa		dr	59b4c390-I	########	47	Salt		22	22	########	########	########	STONINGTI	########	CMG3	Test	Test	ada00ec6-67e5-4950-8aa5-1e9859a538f8				
9	{DCB76B3A	STONINGTI	########	STONINGTI	########		0		none	none	22.8	0	0.1	0	0.31	OF 113	10	0.285	2.93					t	f0bc2f85-4	########	1.31	Fresh	N	N		########	########	########	STONINGTI	########	CMG1			dcb76b3a-87b0-4db4-8765-9ced40cb35ea				0.05
10	{4F677B77	STONINGTI	########	STONINGTI	########		0		foam	none	20	124	0.1	0	0.38	OF 71	10	0.019	0.68					t	0f2c63cb-2	########	1.31	Fresh	N	N		########	########	########	STONINGTI	########	CMG1		Rust colore	4f677b77-e706-468f-8b19-3a492af94b89				0.08
11	{DCB76B3A	STONINGTI	########	STONINGTI	########		0		none	none	22.8	0	22.6	0		OF 113								t	e607d10d-	########	1.31	Fresh	N	N		########	########	########	STONINGTI	########	CMG1			dcb76b3a-87b0-4db4-8765-9ced40cb35ea				
12	{4F677B77	STONINGTI	########	STONINGTI	########		0		none	none	20	124	0.1	0	0.38	10	OF 71							m	0736aae4-	########	0.47	Fresh	N	N		########	########	########	STONINGTI	########	CMG1		Rust colore	4f677b77-e706-468f-8b19-3a492af94b89				0.08
13	{6D33E0AC	STONINGTI	########	STONINGTI	########	cb	1		none	none														d	db92112b-	########	145	Salt	Y	Y		########	########	########	STONINGTI	########	other	Test	I am a test	6d33e0ad-e02c-4e6a-a4dd-dda58c22cff6				

objectId	GUID	ParentID	created_us	created_da	last_edited	last_edited	Field	Sample_Lo	Outfall_Sul	Fecal coliform	Fecal coliform	Total coliform	Total coliform	E. coli (MPN	E. coli Sam	Enterococci	Enterococci	Total Phos	Total Phos	Total Nitro	Total Nitro	globalid	Sample TP	Sample TN	LastRainDa	Last Rain A	Sample Sta	Sample En	LastEdited	LastEdited	Impairmen	Rain Event	Event Tota	air_temp	Sample Sul	Duplicate T	Temperatu	Freshwater	Saltwater E	Latitude	Longitude	Sampler Na	Sampling L	Notes	CreationDa	Creator	EditDate	Editor	Turbidity (N	Turbitidy su	sample_turbid	
1	6d33e0ad-	{6D33E0AE	SBengtson_	########	SBengtson_	########			0													126cf76a-f374-4aba-8	Y		########	145	########	########	SBengtson_	########	########																			
2	6151638b-	{6151638B	SBengtson_	########	SBengtson_	########			0													f706ac8c-b32a-46c7-a984-f5625ecfe217			########	147	########	########			########	2	12	########	2							Other	I am a test									
3	6151638b-	{6151638B	SBengtson_	########	SBengtson_	########			0													5b1d9090-c993-454b-a980-5ad65d19f045			########	12	########	########	SBengtson_	########	########	12	45	########	15							Other	I am a test									
4	9e00ebcc-	{9e00ebcc-	SBengtson_	########	SBengtson_	########			0	Test		Test								Test		ef4de622-b13c-48b5-l	Y		########	1	########	########	SBengtson_	########	########	125	99	########	2	N	Y					Other	Test				4444	Test	Y		
5	d046a0b3-	{D046A0B3	STONINGT	########	STONINGT	########			0	20	OF 47					581	OF 47					8f4424a4-92bc-4ee5-(	N	N	########	0.11	########	########	STONINGT	########	########	0.91	54	########	15.6	N	Y					CMG1									
6	38f9854d-	{38F9854D	STONINGT	########	STONINGT	########			0	51	OF 92					50	OF 92	3.21	2.43	OF 92	OF 92	d22f0351-a8cc-4973-(	Y		########	0.11	########	########	STONINGT	########	########	0.91	54	########	14.2	N	Y					CMG1									
7	c4e18eaf-	{C4E18EAF	STONINGT	########	STONINGT	########			0	2050	OF 225					5790	OF 225					b96490c0-7f95-4997-(	N	N	########	0.11	########	########	STONINGT	########	########	0.91	54	########	14.5	N	Y					CMG1									
8	350d52ae-	{350D52AE	STONINGT	########	STONINGT	########			0	583	OF 328					2280	OF 328					940897a7-d2cf-42a2-l	N	N	########	0.11	########	########	STONINGT	########	########		54	########	15.1	N	Y					CMG1									
9	8de1375b-	{8DE1375E	STONINGT	########	STONINGT	########			0	2360	OF 245					7270	OF 245					61c5d4d4-4bf8-49e1-(	N	N	########	0.11	########	########	STONINGT	########	########	0.91	54	########	13.4	N	Y					CMG1									
10	350d52ae-	{350D52AE	STONINGT	########	STONINGT	########			0	583	OF 328					2280	OF 328					1a9c6c1f-d9d1-4b1d-(	N	N	########	0.11	########	########	STONINGT	########	########		54	########	15.1	N	Y					CMG1									
11	4298e5ec-	{4298E5EC	STONINGT	########	STONINGT	########		mh	1	41	OF-10					1110	OF-10					31a812b3-61ca-4157-	N	N	########	0.7	########	########	STONINGT	########	########	1.22	51	########	11.9	N	Y					CMG1	xy41.3657(	Couldn't locate OF. Sampled 1st upstream MH								
12	6f2712a5-	{6F2712A5	STONINGT	########	STONINGT	########			0	10	OF-340					148	OF-340					48ec2d55-9513-4799-	N	N	########	0.7	########	########	STONINGT	########	########	1.22	51	########	11.8	N	Y					CMG1		Fecal concentration is <10								N
13	6e92eda0-	{6E92EDA0	STONINGT	########	STONINGT	########			0	20	OF-106					41	OF-106					6ffc97ef-f642-4465-8(	N	N	########	0.7	########	########	STONINGT	########	########	1.22	51	########	11.9	N	Y					CMG1									N
14	5d798608-	{5D79860E	STONINGT	########	STONINGT	########			0	75	OF-105					171	OF-105					454a8559-39a5-42e3-	N	N	########	0.7	########	########	STONINGT	########	########	1.22	51	########	11.8	N	Y					CMG1									N
15	c4cece33-	{C4CECE33	STONINGT	########	STONINGT	########		cb	1	41	OF-36					63	OF-36					6d25b950-15fc-4911-(	N	N	########	0.7	########	########	STONINGT	########	########	1.22	51	########	11.9	N	Y					CMG1	xy41.3552(	OF under pier and not accessible. Sampled from 1st upstream CB								N
16	9af727bf-1	{9AF727BF	STONINGT	########	STONINGT	########		cb	1	20	OF-134					52	OF-134	0.043	0.94	OF-134	OF-134	d5ec3064-01a4-46f6-l	Y		########	0.7	########	########	STONINGT	########	########	1.22	51	########	9.6	N	Y					CMG1	xy41.3510(	CB not inundated, but not flowing. Sampled from upstream CB								N
17	e7e5a910-	{E7E5A910	STONINGT	########	STONINGT	########			0	20	OF-339					187	OF-339	0.066	1.01	OF-339	OF-339	f5e748eb-fd29-4118-l	Y		########	0.7	########	########	STONINGT	########	########	1.22	51	########	11.6	N	Y					CMG1									N
18	cca4145b-	{CCA4145E	STONINGT	########	STONINGT	########			0	135	OF-88					1520	OF-88	0.116	0.8	OF-88	OF-88	2b81b0d2-2518-4761-	Y		########	0.7	########	########	STONINGT	########	########	1.22	51	########	11.2	N	Y					CMG1									N
19	cca4145b-	{CCA4145E	STONINGT	########	STONINGT	########			0	10	OF-89					10	OF-89	0.033	1.23	OF-89	OF-89	6f0edf7c-a8c1-42c1-9	Y		########	0.7	########	########	STONINGT	########	########	1.22	51	########	11	N	Y					CMG1									N
20	72fa9298-(	{72FA9298	STONINGT	########	STONINGT	########			0	529	OF-90					2100	OF-90	0.06	1.12	OF-90	OF-90	c487ea03-b037-4c29-	Y		########	0.7	########	########	STONINGT	########	########	1.22	51	########	10.9	N	Y					CMG1									N
21	2211b229-	{2211B229	STONINGT	########	STONINGT	########			0	173	OF-110					199	OF-110	0.037	0.57	OF-110	OF-110	7aee95d4-8812-42ad-	Y		########	0.7	########	########	STONINGT	########	########	1.22	51	########	10.8	N	Y					CMG1									N
22	4298e5ec-	{4298E5EC	STONINGT	########	SBengtson_	########		cb	1	41	OF-10					1110	OF-10					5c174984-e6bf-4ffe-9(	N	N	########	0.7	########	########	STONINGT	########	########	1.22	75	########	11.9	N	Y					CMG1	xy41.36571	-71.962487								N
23	6f2712a5-	{6F2712A5	STONINGT	########	STONINGT	########			0	10	OF-340					148	OF-340					6c5ed94a-c77b-41c6-(	N	N	########	0.7	########	########	STONINGT	########	########	1.22	75	########	11.8	N	Y					CMG1									N
24	6e92eda0-	{6E92EDA0	STONINGT	########	STONINGT	########			0	20	OF-106					41	OF-106					df9ec740-837a-42e4-(	N	N	########	0.7	########	########	STONINGT	########	########	1.22	76	########	11.9	N	Y					CMG1									N
25	5d798608-	{5D79860E	STONINGT	########	STONINGT	########			0	75	OF-105					171	OF-105					5eecb752-de27-4a85-	N	N	########	0.7	########	########	STONINGT	########	########	1.22	76	########	11.8	N	Y					CMG1									N
26	c4cece33-	{C4CECE33	STONINGT	########	STONINGT	########		cb	1	41	OF-36					63	OF-36					1d14ab0a-461f-4f84-(	N	N	########	0.7	########	########	STONINGT	########	########	1.22	77	########	11.9	N	Y					CMG1	xy41.355253	-71.967324								N
27	9af727bf-1	{9AF727BF	STONINGT	########	STONINGT	########		cb	1	20	OF-134					52	OF-134	0.043	0.93	OF-134	OF-134	ab588a77-6ca2-4b52-	Y		########	0.7	########	########	STONINGT	########	########	1.22	78	########	9.6	N	Y					CMG1	xy41.351115	-71.956667								N
28	e7e5a910-	{E7E5A910	STONINGT	########	STONINGT	########			0	20	OF-339					187	OF-339	0.066	0.59	OF-339	OF-339	aa5e61ac-a2a5-44a9-8	Y		########	0.7	########	########	STONINGT	########	########	1.22	79	########	11.6	N	Y					CMG1									N
29	cca4145b-	{CCA4145E	STONINGT	########	STONINGT	########			0	135	OF-88					1520	OF-88	0.116	0.78	OF-88	OF-88	ea58c788-56ee-4a24-`	Y		########	0.7	########	########	STONINGT	########	########	1.22	79	########	11.2	N	Y					CMG1									N
30	3e3c1eda-	{3E3C1EDA	STONINGT	########	STONINGT	########			0	10	OF-89					10	OF-89	0.033	1.23	OF-89	OF-89	e181bd00-56e3-4cc7-	Y		########	0.7	########	########	STONINGT	########	########	1.22	79	########	11	N	Y					CMG1									N
31	72fa9298-(	{72FA9298	STONINGT	########	STONINGT	########			0	529	OF-90					2100	OF-90	0.06	1.12	OF-90	OF-90	ac434e21-3920-4bff-9	Y		########	0.7	########	########	STONINGT	########	########	1.22	79	########	10.9	N	Y					CMG1									N
32	2211b229-	{2211B229	STONINGT	########	STONINGT	########			0	173	OF-110					199	OF-110	0.037	0.34	OF-110	OF-110	25c843a1-8a38-462b-	Y		########	0.7	########	########	STONINGT	########	########	1.22	80	########	10.8	N	Y					CMG1									N
33	946b7c24-	{946B7C24	STONINGT	########	STONINGT	########		cb	1	2100	OF-38					867	OF-38					191a7026-eba9-4f80-l	N	N	########	0.87	########	########	STONINGT	########	########	0.74	65	########	16.7	N	Y					CMG1	xy41.353797	-71.96831								N
34	0d118cb6-	{0D118CB6	STONINGT	########	STONINGT	########		cb	1	5790	OF-32					708	OF-332					5c7d7a23-0d9a-4b27-	N	N	########	0.87	########	########	STONINGT	########	########	0.74	65	########	16.7	N	Y					CMG1	xy41.34064	-71.940074								N
35	2bc88a40-	{2BC88A4C	STONINGT	########	STONINGT	########			0	148	OF-76					231	OF-76					709c74b2-1692-4ecb-	N	N	########	0.87	########	########	STONINGT	########	########	0.74	65	########	16.7	N	Y					CMG1									N
36	cb32d3ab-	{CB32D3A	STONINGT	########	STONINGT	########		cb	1	414	OF-77					292	OF-77					6546ea00-e2ce-4e41-(	N	N	########	0.87	########	########	STONINGT	########	########	0.74	65	########	16.7	N	Y					CMG1	xy41.348182	-71.937676								N
37	6ea2934f-f	{6EA2934F	STONINGT	########	STONINGT	########			0	97	OF-20					537	OF-20					ee7be810-9a45-440f-(	N	N	########	0.87	########	########	STONINGT	########	########	0.74	65	########	16.7	N	Y					CMG1									N
38	b4c41080-	{B4C41080	STONINGT	########	STONINGT	########			0	5170	OF-230					7700	OF-230					349c889d-0c06-4ecd-(	N	N	########	0.87	########	########	STONINGT	########	########	0.74	65	########	16.7	N	Y					CMG1		Pipe flap broken								N
39	dde6dce3-	{DDE6DCE	STONINGT	########	STONINGT	########			0	85	OF-231					1680	OF-231					6bb87a96-9602-4fb1-(	N	N	########	0.87	########	########	STONINGT	########	########	0.74	65	########	16.7	N	Y					CMG1									N
40	18dd3190-	{18DD319(	STONINGT	########	STONINGT	########			0	228	OF-331					2580	OF-331					dd23b5f1-6d1f-4c9a-a	N	N	########	0.87	########	########	STONINGT	########	########	0.74	65	########	16.7	N	Y					CMG1									N
41	c89a4307-	{C89A4307	STONINGT	########	STONINGT	########		cb	1	820	OF-39					1400	OF-39					2d867610-91ae-4591-	N	N	########	0.87	########	########	STONINGT	########	########	0.74	65	########	16.7	N	Y					CMG1	xy41.333396	-71.929313								N
42	24ab391f-(	{24AB391F	STONINGT	########	STONINGT	########			0	17300	OF-235					24200	OF-235					98db0f6c-fba2-414d-b	N	N	########	0.87	########	########	STONINGT	########	########	0.74	65	########	16.7	N	Y					CMG1		Entero concentration was >24200								N
43	e1fbbc24-(	{E1FBBC24	STONINGT	########	STONINGT	########		cb	1	52	OF-236					173	OF-236					783e7d4f-ae1c-45ea-8	N	N	########	0.87	########	########	LeaderFVD	########	########	0.74	65	########	16.7	N	Y					CMG1	xy41.3343	2 OFs tho only 1 mapped								N
44	946b7c24-	{946B7C24	STONINGT	########	STONINGT	########		cb	1	2100	OF-38					867	OF-38					01ab33ba-15e9-410b-	N	N	########	0.87	########	########	STONINGT	########	########	0.74	65	########	16.7	N	Y					CMG1	xy41.353799	-71.968448								N
45	ff5579f2-8	{FF5579F2	STONINGT	########	STONINGT	########		cb	1	20	OF-16					150	OF-16					6fcc3c9c-e8b2-4349-a	N	N	########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1	xy41.3500	Sampled from first upstream CB								N
46	fc5eab9f-9	{FC5EA89F	STONINGT	########	STONINGT	########			0	959	OF-63					2140	OF-63					3a954477-18aa-408a-	N	N	########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1									N
47	046136d1-	{046136D1	STONINGT	########	STONINGT	########			0	15500	OF-154					1720	OF-154					d66b0cc9-e5f2-4ea5-t	N	N	########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1									N
48	28429b26-	{28429B26	STONINGT	########	STONINGT	########		cb	1	10	OF-10					118	OF-155					607c69bd-5bb0-4580-	N	N	########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1	xy41.3463	Sampled from first upstream CB. Fecal results were <10 MPN/100 mls								N
49	bdb2b724-	{BDB2B72(	STONINGT	########	STONINGT	########		cb	1	63	OF-156					216	OF-156					a1ea402c-3fa4-4bc6-a	N	N	########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1	xy41.3464	Sampled from first upstream CB								N
50	8030b367-	{8030B367	STONINGT	########	STONINGT	########			0	384	OF-161					5480	OF-161					db7170da-8687-4dc8-	N	N	########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1									N
51	7c527aa4-(	{7C527AA4	STONINGT	########	STONINGT	########		cb	1	2110	OF-159					405	OF-159					b9fe2a09-127c-4227-l	N	N	########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1	xy41.3470	Sampled from first upstream CB								N
52	8714841f-(	{8714841F	STONINGT	########	STONINGT	########			0	86	OF-96					14100	OF-96					2a259167-7d27-498a-	N	N	########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1									N
53	ae05dc2a-(	{AE05DC2A	STONINGT	########	STONINGT	########			0	86	OF-97					1350	OF-97					b9c586e3-dc2d-42f7-(	N	N	########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1									N
54	2e1f62fc-5	{2E1F62FC	STONINGT	########	STONINGT	########			0	110	OF-162					1720	OF-162					4ce1617c-b7cb-4688-(	N	N	########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1									N
55	bc4eb7b2-	{BC4EB7B2	STONINGT	########	STONINGT	########			0	496	OF-319					4110	OF-319					b2fb8757-7e21-4d74-`	N	N	########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1									N
56	df0d1023-(	{DF0D102(	STONINGT	########	STONINGT	########			0	132	OF-B 369					1380	OF-B 369	0.153	0.62	OF-B 369	OF-B 369	a142252f-24c1-419f-b	Y		########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1							10.5	OF-B 369	Y	
57	95a2e773-	{95A2E773	STONINGT	########	STONINGT	########			0	122	OF- B 50					14100	OF- B 50	0.07	0.42	OF- B 50	OF- B 50	b9ba0dab-0e08-46d6-	Y		########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1							6.3	OF- B 50	Y	
58	9e00ebcc-	{9E00EBCC	STONINGT	########	STONINGT	########		cb	1	301	OF-B 52					1290	OF-B 52	0.139	0.74	OF-B 52	OF-B 52	0c3a8ab5-cb83-43cb-`	Y		########	0.44	########	########	STONINGT	########	########	0.8	58	########	13.2	N	Y					CMG1	xy41.3299	Sampled from first upstream CB							8.33	OF-B 52	Y	
59	43cc4670-(	{43CC4670	STONINGT	########	STONINGT	########			0			24200	OF-178					24200	OF-178			7ae4681f-91ef-4a81-b	N	N	########	0.17	########	########	STONINGT	########	########	0.24	74	########	22	Y	N					CMG1		Lab report indicated >24,200/100mls for both parameters								N
60	c9b0519e-	{C9B0519E	STONINGT	########	STONINGT	########			0			24200	OF-179					703	OF-179			207d4587-646d-4ab0-	N	N	########	0.17	########	########	STONINGT	########	########	0.24	74	########	22	Y	N					CMG1		Lab report indicated >24,200/100 mls for total coliform								N
61	e4c091ec-(	{E4C091EC	STONINGT	########	STONINGT	########			0			24200	OF-101					24200	OF-101			8d848471-293d-4343-	N	N	########	0.17	########	########	STONINGT	########	########	0.24	74	########	22	Y	N					CMG1		Lab report indicated >24,200/100mls for both parameters								N
62	40980011-	{40980011	STONINGT	########	STONINGT	########			0			24200	OF-100					24200	OF-100			bc97fb29-3c41-4545-(	N	N	########	0.17	########	########	STONINGT	########	########	0.24	74	########	22	Y	N					CMG1		Lab report indicated >24,200/100mls for both parameters. Outfall is an in-flow fi								N
63	dde3068f-(	{DDE3068F	STONINGT	########	STONINGT	########			0			24200	OF-177					5170	OF-177			cc592f20-53f9-4611-b	N	N	########	0.17	########	########	STONINGT	########	########	0.24	74	########	22	Y	N					CMG1		Lab report indicated >24,200/100mls for total coliform								N
64	60dd14e1-	{60DD14E1	STONINGT	########	STONINGT	########			0			24200	OF-191					12000	OF-191			e4f539b3-86f2-4bcf-9(	N	N	########	0.17	########	########	STONINGT	########	########	0.24	74	########	22	Y	N					CMG1		Lab report indicated >24,200/100mls for total coliform								N
65	01790d2c-	{01790D2C	STONINGT	########	STONINGT	########			0			24200	OF-176					20	OF-176			579ca8fa-7d46-4d35-(	N	N	########	0.17	########	########	STONINGT	########	########	0.24	74	########	22	Y	N					CMG1		Lab report indicated >24,200/100mls for total coliform								N
66	7817365f-(	{7817365F	STONINGT	########	STONINGT	########			0			24200	OF-304					86	OF-304			b7d8e93a-951c-4a56-	N	N	########	0.17	########	########	STONINGT	########	########	0.24	74	########	22	Y	N					CMG1		Lab report indicated >24,200/100mls for total coliform								N