

Year 5 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2022-June 30, 2023

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form. Also ensure any websites included on this form are to publicly accessible sites

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2022 and June 30, 2023 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization:

EPA NPDES Permit Number:

Primary MS4 Program Manager Contact Information

Name: Title:

Street Address Line 1:

Street Address Line 2:

City: State: Zip Code:

Email: Phone Number:

Stormwater Management Program (SWMP) Information

SWMP Location (publicly available web address):

Date SWMP was Last Updated:

If the SWMP is not available on the web please provide the physical address:

Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: <https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state>

Impairment(s)

Bacteria/Pathogens Chloride Nitrogen Phosphorus
 Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State:

Assabet River Phosphorus Bacteria and Pathogen Cape Cod Nitrogen
 Charles River Watershed Phosphorus Lake and Pond Phosphorus

Out of State:

Bacteria/Pathogens Metals Nitrogen Phosphorus

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. **By checking each box you are certifying that you have completed that permit requirement fully.** If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.

Annual Requirements

- Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements
- Kept records relating to the permit available for 5 years and made available to the public
- The SSO inventory has been updated, including the status of mitigation and corrective measures implemented
 - This is not applicable because we do not have sanitary sewer
 - This is not applicable because we did not find any new SSOs
 - The updated SSO inventory is attached to the email submission
 - The updated SSO inventory can be found at the following publicly available website:

<https://www.marionma.gov/public-works-department/pages/stormwater-management-information-town-and-public-npdes-ms4-permit>

- Updated system map due in year 2 as necessary
- Provided training to employees involved in IDDE program within the reporting period
- Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters
- All curbed roadways were swept at least once within the reporting period
- Enclosed all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt

- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- Updated inventory of all permittee owned facilities as necessary
- O&M programs for all permittee owned facilities have been completed and updated as necessary
- Implemented all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implemented program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Inspected all permittee owned treatment structures (excluding catch basins)

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The Town is making progress on the design of the new DPW facility to be located at the end of Benson Brook Road. This facility will be equipped with a salt storage shed which will eliminate the need to cover the existing storage pile with tarps.

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria
- This is not applicable because there are no septic systems present

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Nitrogen (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- Distributed an annual message in the spring (April/May) that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers
- Distributed an annual message in the summer (June/July) encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- Distributed an annual message in the fall (August/September/October) encouraging the proper disposal of leaf litter

* Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

- Increased street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two times per year (spring and fall)

Structural BMPs

- Completed the evaluation of all permittee owned properties identified as presenting retrofit opportunities or areas for structural BMP installation under permit part 2.3.6.d or identified in the Nitrogen Source Identification Report, including: (select the items of the evaluation that have been completed below)
 - Next planned infrastructure, resurfacing, or redevelopment activity planned for the property (if applicable) OR planned retrofit date
 - Estimated cost of redevelopment or retrofit BMPs
 - Engineering and regulatory feasibility of redevelopment or retrofit BMPs
- Completed a listing of planned structural BMPs and a plan and schedule for implementation
 - The BMP list and implementation schedule is attached to the email submission
 - The BMP list and implementation schedule can be found at the following publicly available website:

Any structural BMPs listed in Table 3 of Attachment 1 to Appendix F already existing or installed in the regulated area by the permittee or its agents was tracked and the nitrogen removal by the BMP was

- estimated consistent with Attachment 1 to Appendix F. The BMP type, total area treated by the BMP, the design storage volume of the BMP, and the estimated nitrogen removed in mass per year by the BMP were documented.
 - No BMPs were installed
 - The above referenced BMP information is attached to the email submission
 - The above referenced BMP information can be found at the following publicly available website:

<https://www.marionma.gov/public-works-department/pages/stormwater-management-information-town-and-public-mpdes-ms4-permit>

Total estimated nitrogen removed in lbs/year from the installed BMPs:

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Optional: Use the box below to provide any additional information you would like to share as part of your self-assessment:

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

- Yes
- No

If yes, describe below, including any relevant impairments or TMDLs:

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed **during this reporting period:**

Below, report on the educational messages completed **during this reporting period**. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.

BMP: Low Impact Development

Message Description and Distribution Method:

The pamphlet describes the different ways to reduce impervious surfaces and decentralize stormwater management systems to reduce potential stormwater impacts from property development. The document is available for viewing and downloading on the stormwater webpage.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

The stormwater webpage tracks the number of visitors to the site.

Message Date(s):

Message Completed for: Appendix F Requirements Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes No

If yes, describe why the change was made:

BMP: Stormwater Pollution Prevention for Small Construction Sites

Message Description and Distribution Method:

Ten steps are listed for pollution prevention during construction of small developments. The document is available for viewing and downloading on the stormwater webpage.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

The stormwater website tracks the number of visitors to the site.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes No

If yes, describe why the change was made:

BMP: Dumpster Management

Message Description and Distribution Method:

Guidance is provided on limiting leaks and spills from commercial dumpsters. The document is available for viewing and downloading on the stormwater webpage.

Targeted Audience: Businesses, institutions and commercial facilities

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

The stormwater website tracks the number of visitors to the site.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes No

If yes, describe why the change was made:

BMP: Stormwater Pollution Prevention for Industrial Sites

Message Description and Distribution Method:

Guidance is provided on preventing pollution from developed industrial sites. The document is available for viewing and downloading on the stormwater webpage.

Targeted Audience: Industrial facilities

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

The stormwater website tracks the number of visitors to the site.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes No

If yes, describe why the change was made:

BMP: Preventing Stormwater Pollution and You

Message Description and Distribution Method:

Provides basic information for homeowners on how to reduce the amount of pollutants in runoff from their properties for a number of potential sources. The document is available for viewing and downloading on the stormwater webpage.

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

The stormwater website tracks the number of visitors to the site.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes No

If yes, describe why the change was made:

BMP: Scoop the Poop: Why is it a problem?

Message Description and Distribution Method:

Informs pet owners of the hazards associated with leaving pet waste outside rather than bagging and disposing in a trash receptacle. The notice is given out to dog owners when they receive their annual license. It is also available to view and download on the stormwater webpage.

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations, Town Clerk

Measurable Goal(s):

The number of licenses purchased each year as well as the number of visitors on the stormwater webpage.

Message Date(s): Email notification sent to residents annually in June/July and ongoing on the webpage.

Message Completed for: Appendix F Requirements Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes No

If yes, describe why the change was made:

BMP: Grass Clippings and Fertilizers

Message Description and Distribution Method:

Encourages homeowners to reduce fertilization and promotes the proper disposal of grass clippings. The document is available for viewing and downloading on the stormwater webpage.

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

The stormwater webpage tracks the number of visitors to the site.

Message Date(s): Email notification sent to residents annually in April/May and ongoing on the webpage.

Message Completed for: Appendix F Requirements Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes No

If yes, describe why the change was made:

BMP: Managing Leaf Litter

Message Description and Distribution Method:

Encourages residents to rake and dispose of leaves to minimize the amount entering drainage systems. The document is available to view and download on the stormwater webpage.

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

The stormwater website tracks the number of visitors to the site.

Message Date(s): Email notification sent to residents annually in Aug/Sept/Oct and ongoing on the webpage

Message Completed for: Appendix F Requirements Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes No

If yes, describe why the change was made:

BMP: A Homeowners Guide to Septic Systems

Message Description and Distribution Method:

Educates homeowners on the importance of proper septic system maintenance. Document is available for viewing and downloading on the stormwater webpage.

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations and Board of Health

Measurable Goal(s):

The number of homes and frequency of septic tank pump out is tracked by the waste haulers and provided to the Board of Health.

Message Date(s): Ongoing on the webpage and as distributed with the issuance of permits by the Board of Health.

Message Completed for: Appendix F Requirements Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes No

If yes, describe why the change was made:

BMP: Stormwater Management for the Proactive Business Owner

Message Description and Distribution Method:

Lists basic maintenance tasks for business owners to properly dispose of potential pollutants.

Targeted Audience: Businesses, institutions and commercial facilities

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

The stormwater website tracks the number of visitors to the site.

Message Date(s): Ongoing on the stormwater webpage.

Message Completed for: Appendix F Requirements Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes No

If yes, describe why the change was made:

[Empty text box]

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period:**

The stormwater webpage is set up as a link within the DPW site on the Town's website. Residents are encouraged to contact the DPW Engineer with any questions or concerns.

Was this opportunity different than what was proposed in your NOI? Yes No

Describe any other public involvement or participation opportunities conducted **during this reporting period:**

The public is encouraged to report any problems with drainage or hazardous materials spills to the DPW and Board of Health. The Town's proposed Stormwater Bylaw has been developed during a number of public meetings held by various boards which provided an opportunity for public input. The DPW conducts a hazardous waste collection day each year.

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

This SSO section is NOT applicable because we DO NOT have sanitary sewer

Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period.**

Number of SSOs identified:

Number of SSOs removed:

MS4 System Mapping

Optional: Provide additional status information regarding your map:

System mapping is complete for the following categories: Outfalls and catchments, receiving waters, catch

basins, manholes, and pipes.

System mapping is mostly complete for the following categories: Interconnections, treatment systems (BMPs).

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses. Please also include the updated inventory and ranking of outfalls/interconnections based on monitoring results.

- No outfalls were inspected
- The above referenced outfall screening data is attached to the email submission
- The above referenced outfall screening data can be found at the following publicly available website:

<https://www.marionma.gov/public-works-department/pages/stormwater-management-information-town-and-public-npdes-ms4-permit>

*Below, report on the number of outfalls/interconnections screened **during this reporting period**.*

Number of outfalls screened:

*Below, report on the percent of outfalls/interconnections screened **to date**.*

Percent of outfalls screened:

Optional: Provide additional information regarding your outfall/interconnection screening:

Inspections of outfalls and interconnections was completed for dry weather flows. Five dry weather samples were collected. Wet weather sampling was performed at 43 out of 81 high and low priority outfalls.

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- No catchment investigations were conducted
- The catchment investigation data is attached to the email submission
- The catchment investigation data can be found at the following publicly available website:

<https://www.marionma.gov/public-works-department/pages/stormwater-management-information-town-and-public-npdes-ms4-permit>

*Below, report on the number of catchment investigations completed **during this reporting period**.*

Number of catchment investigations completed this reporting period:

*Below, report on the percent of catchments investigated **to date**.*

Percent of total catchments investigated:

Optional: Provide any additional information for clarity regarding the catchment investigations below:

The DPW has several projects within the MS4 which consist of improvements to the existing street drainage

system. A list and brief description of the problem areas and projects completed will be compiled for inclusion in the SWMP. An engineering consultant was hired during this reporting period to investigate several of the Town's drainage and sewer problem areas. Refer to the report prepared by Weston & Sampson dated July 18, 2023 which is attached to the email submitted with the Year 5 report.

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- No illicit discharges were found
- The illicit discharge removal report is attached to the email submission
- The illicit discharge removal report can be found at the following publicly available website:

*Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed **during this reporting period.***

Number of illicit discharges identified:

Number of illicit discharges removed:

Estimated volume of sewage removed: gallons/day

*Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed **since the effective date of the permit (July 1, 2018).***

Total number of illicit discharges identified:

Total number of illicit discharges removed:

Optional: Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

Refer to the Town of Marion IDDE Report prepared by the Buzzards Bay Stormwater Collaborative dated August 2022.

Employee Training

Describe the frequency and type of employee training conducted **during this reporting period:**

IDDE refresher training for DPW employees was conducted in the Spring of 2023 by personnel from the Buzzards Bay Stormwater Collaborative. The training was held at the Town Barn where the BBSC Illicit Discharge Investigation Trailer was present for the training.

*Below, report on the construction site plan reviews, inspections, and enforcement actions completed **during this reporting period.***

Number of site plan reviews completed: 1

Number of inspections completed: 5

Number of enforcement actions taken: 0

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

The above listed review and inspections were performed by the Building Inspector.

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance or Regulatory Mechanism

Date update was completed (due in year 3): Scheduled for 10-23-23 Town Meeting

Website of ordinance or regulatory mechanism:

As-built Drawings

*Below, report on the number of as-built drawings received **during this reporting period.***

Number of as-built drawings received: 0

Optional: Enter any additional information relevant to the submission of as-built drawings:

Street Design and Parking Lots Report

Below, describe any changes made or planned to be made to local regulations and guidelines based on the report completed in Year 4:

The EPA Small MS4 Checklist for evaluating street and parking lot standards was submitted to the Planning Department for their review and input. All of the existing local regulations were deemed to be adequate with the exception of the current design requirements for cul-de-sacs. The regulations are under review by the Planning Board and are anticipated to be updated in the near future.

Green Infrastructure Report

Below, describe progress towards making green infrastructure practices allowable based on the report completed in Year 4:

Green infrastructure is encouraged in the current regulations. A Green Infrastructure Report has not been completed to assess adequacy of the regulations.

Retrofit Properties Inventory

Below, list remaining permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas (must maintain a minimum of 5 sites in inventory until less than 5 sites remain):

Fire Station #1 - 50 Spring Street
Sippican School - 16 Spring Street
VFW Building - Mill Street
DPW Maintenance Garage - 631 Mill Street

Below, list all properties that have been modified or retrofitted with BMPs to mitigate impervious area that were inventoried as part of 2.3.6.d of the permit. Non-MS4 owned properties that have been modified or retrofitted with BMPs to mitigate impervious area may also be listed, but must be indicated as non-MS4.

MCM6: Good Housekeeping

Catch Basin Cleaning

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins **during this reporting period.***

Number of catch basins inspected:

Number of catch basins cleaned:

Total volume or mass of material removed from all catch basins:

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins:

If applicable:

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

The area contributing runoff to the catch basin is inspected to determine the source of sediment and evaluate if stabilization of the road shoulders is required. The section of road or parking lot may also be flagged as requiring more frequent sweeping.

Street Sweeping

*Report on street sweeping completed **during this reporting period** using one of the three metrics below.*

- Number of miles cleaned:
- Volume of material removed:
- Weight of material removed:

Stormwater Pollution Prevention Plan (SWPPP)

*Below, report on the number of site inspections for facilities that require a SWPPP completed **during this reporting period**.*

Number of site inspections completed:

Describe any corrective actions taken at a facility with a SWPPP:

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- Not applicable
- The results from additional reports or studies are attached to the email submission

- The results from additional reports or studies can be found at the following publicly available website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

Refer to the Town of Marion Report dated August 2022 prepared by the Buzzards Bay Stormwater Collaborative for a complete listing of the IDDE investigations and water quality sampling performed. Refer to the Additional Drain and Sewer Investigation report prepared by Weston & Sampson dated July 18, 2023 for a report on inspections to various areas of the Town drainage and sewer system which were reported to be experiencing problems or for which the Town did not have information on the size or system configuration.

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above. If any of the above year 5 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 6 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures

- Log catch basins cleaned or inspected
- Sweep all curbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary
- Review O&M programs for all permittee owned facilities; update if necessary
- Implement all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implement program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Enclose all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- Review as-built drawings for new and redevelopment to ensure compliance with post construction bylaws, regulations, or regulatory mechanism consistent with permit requirements
- Inspect all permittee owned treatment structures (excluding catch basins)
- Identify additional permittee-owned properties that could potentially be modified or retrofitted with BMPs to reduce impervious areas so that the permittee maintains a minimum of 5 sites in their inventory, until such a time when the permittee has less than 5 sites remaining

Provide any additional details on activities planned for permit year 6 below:

Part V: Certification of Small MS4 Annual Report 2023

40 CFR 144.32(d) Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name:	<input type="text" value="Rebecca Tilden"/>	Title:	<input type="text" value="DPW Director"/>
Signature:	<input type="text" value="Rebecca Tilden"/>	Date:	<input type="text" value="09/25/23"/>

[Signatory may be a duly authorized representative]



ENGINEERING,
INC.

ENGINEERS
SURVEYORS

September 21, 2023

Meghan Davis – Engineering Manager
Town of Marion
Department of Public Works
50 Benson Brook Road
Marion, MA 02738

**RE: EPA MS4
Street and Parking Lot Assessment Report
G.A.F. Job No. 22-9906**

Dear Meghan:

G.A.F. Engineering, Inc. provides this letter report on the Town of Marion's current street design and parking lot guidelines as required by the Massachusetts Small MS4 General Permit. This report is based on our review of the Town's current Zoning By-Laws, Subdivision Control Laws, and the following documents prepared by the USEPA.

- Green Parking Lot Resource Guide – February 2008
- Assessing Street and Parking Lot Design Standards to Reduce Excess Impervious Cover in New Hampshire and Massachusetts – April 2011

The above documents and the Town's regulations were reviewed in June 2023 prior to completion of a draft checklist which is part of the assessment document prepared by the EPA. This information was submitted to the Planning Department for review and input. It was determined that many of the Town's applicable regulations are consistent with the goal of reducing impervious surfaces without sacrificing suitable access and public safety. The completed checklist based on input from the Planning Department is attached for your reference. The sole action item consists of completion of revisions to the required street turnarounds on dead end streets.

Please contact me directly if you have questions.

Sincerely,
G.A.F. Engineering, Inc.

Robert J. Rogers
bob@gafenginc.com

Enclosures

266 MAIN ST.
WAREHAM, MA 02571

TEL 508.295.6600
FAX 508.295.6634

Table 2. Checklist for evaluating street and parking standards (adapted from CWP Codes and Ordinances Worksheet and MAPC LID Checklist*)

STREETS	
1. Street width	<p>1.1. Is the minimum pavement width for low traffic residential roads (<500 average daily trips) between 18-22 ft? 20 ft</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p>
	<p>1.2. Can parking lanes serve as traffic lanes in higher density areas?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No standard <input type="checkbox"/> Don't know <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p>
	<p>1.3. Are narrower pavement widths allowed on road sections where there are no houses, buildings, intersections, or on-street parking spaces?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No standard <input type="checkbox"/> Don't know <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p>
	<p>1.4. Are reductions in frontage distances allowable where appropriate (i.e., open space developments, around cul-de-sacs, and along outside sideline of curved streets) to minimize street length?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No standard <input type="checkbox"/> Don't know <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p>
	<p>1.5. Can permeable paving be used for residential roads, shoulders, and parking lanes?</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p>
2. Right-of-way (ROW)	<p>2.1. Are minimum ROW widths less than 45 ft for a residential street? ft</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p>
	<p>2.2. Can utilities be placed below the paved section of the ROW?</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p>
3. Dead-end streets and turnarounds	<p>3.1. Are landscaped/bioretention islands required in the center of cul-de-sacs?</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p>
	<p>3.2. Is the minimum required radius for cul-de-sacs less than 35 ft? ft</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p>
	<p>3.3. Are alternatives to cul-de-sacs such as "hammerheads" allowed for permanent turnarounds?</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know <i>Action:</i> <input type="checkbox"/> Leave as is <input checked="" type="checkbox"/> To be revised</p>
	<p>3.4. Are alternative road layouts such as one-way loops encouraged to eliminate dead end streets?</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know <i>Action:</i> <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</p>

4. Sidewalks	4.1. Are sidewalks always required on both sides of residential streets?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised
	4.2. Is permeable paving allowed for sidewalks?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No standard <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised
	4.3. Are alternative pedestrian pathway layouts allowed, rather than placement in road ROW?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No standard <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised
	5.1. Are reductions in setback distances allowable where appropriate to minimize driveway lengths?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised
	5.2. Is the minimum driveway width 9 feet or less (single lane) or 18 feet (two lane)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No standard <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised
5. Driveways	5.3. Are shared driveways allowable?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised
	5.4. Are alternative materials and designs (i.e., porous pavers, two-track design) allowed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised

PARKING

5. Parking ratios	6.1. Are parking ratios expressed as both minimum and maximums?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No, minimum only <input type="checkbox"/> No maximum only <input type="checkbox"/> No, Expressed as medians	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised									
	6.2. Are the minimum required # of parking spaces less than:	# of spaces <table border="1"> <tr> <td>3 spaces per 1000 sq ft for professional office building?</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No Standard</td> <td>Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</td> </tr> <tr> <td>4.5 spaces per sq ft for shopping centers?</td> <td><input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No Standard</td> <td>Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</td> </tr> <tr> <td>2 spaces per single family home?</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No Standard</td> <td>Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised</td> </tr> </table>	3 spaces per 1000 sq ft for professional office building?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No Standard	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised	4.5 spaces per sq ft for shopping centers?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No Standard	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised	2 spaces per single family home?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No Standard	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised	
	3 spaces per 1000 sq ft for professional office building?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No Standard	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised									
	4.5 spaces per sq ft for shopping centers?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No Standard	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised									
	2 spaces per single family home?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No Standard	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised									
6.3. Are parking requirements reduced for shared parking arrangements, structured parking, areas near mass transit, and special districts?	<input checked="" type="checkbox"/> Yes, all <input type="checkbox"/> Not all <input type="checkbox"/> Not for any <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised										
6.4. Are model shared parking agreements provided?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Shared parking not allowed <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised										
6.5. Are there special design standards for urban village centers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised										

7. Stall and aisle dimensions	7.1. Are minimum stall dimensions for standard parking space 9 x 18 feet or less?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised	<input type="text" value="ft"/>
	7.2. Are minimum driving aisle widths for standard two-way traffic 22 feet or less?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised	<input type="text" value="ft"/>
	7.3. Are smaller compact car stalls required for at least 30% of total parking spaces?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No standard <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised	<input type="text" value="%"/>
8. Landscape requirements	8.1. Does a portion of impervious parking area require shading with mature tree canopy cover?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No standard <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised	<input type="text" value="%"/>
	8.2. Is the minimum landscaping requirement at least 20% of the total parking area?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> No standard <input type="checkbox"/> Don't know	Action: <input checked="" type="checkbox"/> Leave as is <input type="checkbox"/> To be revised	<input type="text" value="%"/>

*See these checklists for a more extensive set of evaluation questions that include additional site design factors.

SUMMARY OF STANDARDS TO REVISE

The Planning Board has been reviewing alternative designs for turnarounds on residential streets with a goal of minimizing their footprint while still providing adequate access for emergency vehicles. Any approved alternative designs will be incorporated into the Town's subdivision rules and regulations.

**The Buzzards Bay Stormwater Collaborative
Illicit Discharge Investigation Trailer**



Town of Marion Report

August 2022

MassDEP MS4 Municipal Assistance Grant Program 2020-2021

MassDEP MS4 Municipal Assistance Grant Program 2021-2022

Marion Town Contract with Massachusetts Maritime Academy FY2022

Marion Town Contract with Massachusetts Maritime Academy FY2023

Collaborative Partners: Massachusetts Maritime Academy, Buzzards Bay National Estuary Program and the municipalities of Bourne, Wareham, Marion, Mattapoisett, Fairhaven, Acushnet, Dartmouth, and Westport.

Report Prepared by: Kevin Bartsch, Buzzards Bay National Estuary Program and Maura Flaherty, Massachusetts Maritime Academy

Marion IDDE Report

Illicit Discharge Detection and Elimination Field Work during April 12th through April 15th of 2021, July 5th through July 8th of 2021, June of 2022, and spring of 2023.

This report summarizes the findings from the Buzzards Bay Stormwater Collaborative discharge investigation under the 2021 MassDEP Stormwater Investigation Trailer grant. A total of 99 storm drain networks were examined for illicit connections. Each storm drain network is a collection of connected structures that discharge to one point and is referred to by the facility ID of the outfall pipe. Each network is a reflection of the stormwater catchment in which the structures collect stormwater and runoff. The purpose of an IDDE is to detect illicit connections that do not comply with the MS4 permit for stormwater discharges. There were no illicit connections detected in the observed storm drain networks. The stormdrain issues found are minor and itemized in this report with recommendations of possible actions to address.

Within the networks surveyed, each structure was opened by the DPW and inspected for evidence of illicit connections. Any indications of odors, unusual colors, excessive trash or debris, sheens, suds, or structural issues were recorded. Each pipe entering the structure was recorded for size, material type, and invert from the rim. Dry weather flow and standing water in the structures were also recorded. Directions to adjacent structures were verified and pipes with no apparent connection were checked with a camera or other method to best determine the situation. In areas with potential for a sewer cross connection the camera was used to inspect the pipe. Additionally, a few water samples were collected and analyzed for various parameters.

Some general observations for all the catchments visited: catchbasins are well maintained but a few had some composted debris accumulation; roadways and sidewalks had excessive pet waste in some areas; there were some sump pump and yard drain connections to catchbasins, and the public that stopped by to chat were generally interested in the environment. Another factor for the Town is the integration of the Tabor Academy drainage system with the Town systems. This makes the Town ultimately responsible for the stormwater drainage coming from the private school.

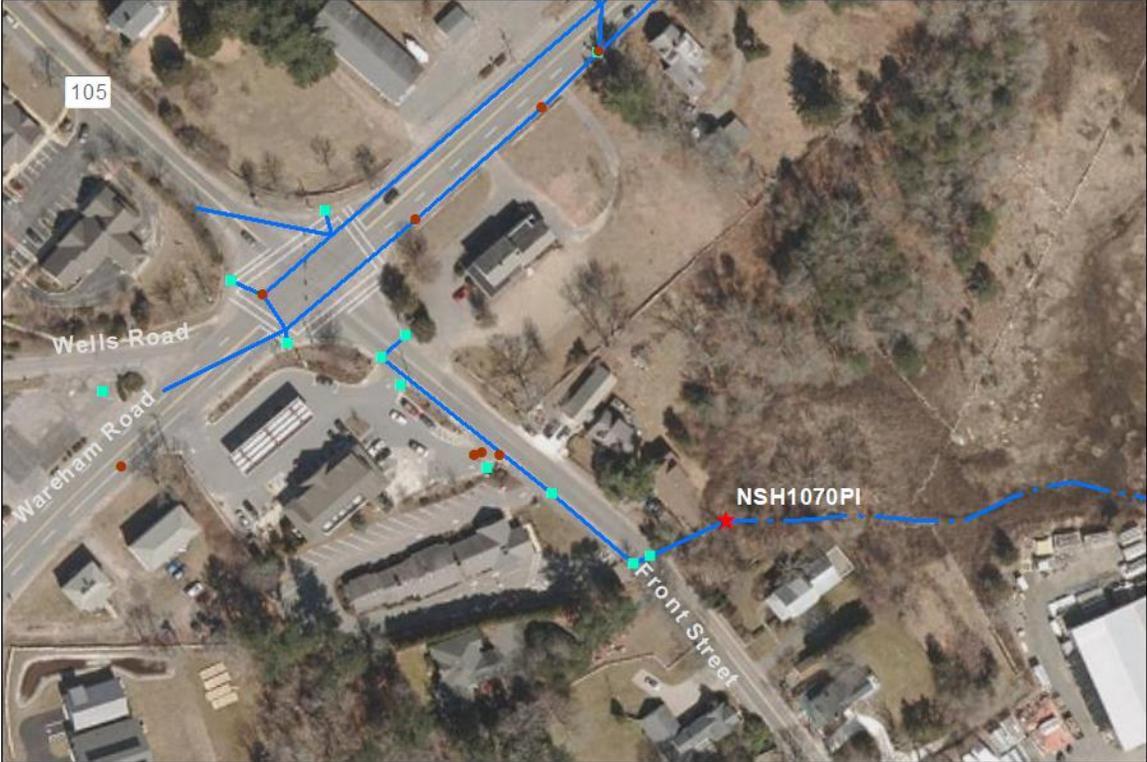
Of these observations, one of the most significant observations of the investigations, was the pet waste and the composted debris in structures. The most effective action to address the pet waste is an outreach effort to educate individuals about the negative impacts. This could be done with a newspaper editorial as a cost effective approach to appeal to individuals willing to correct their own behavior. The debris in the catchbasins is a challenging issue because the Town of Marion is already dedicating substantial resources to catchbasin cleaning. A review of procedures and equipment for possible improvements is recommended.

Another significant feature observed during multiple rounds of the investigation process were multiple sump pump connections found in several catchbasins. Sump pumps and yard drains are acceptable under the MS4 permit and local policy provided that only groundwater is pumped into the storm drain network. The sump pump connections were not running so no samples could be collected. An outreach effort on proper use of sump pumps is recommended. This could be done with a newspaper editorial as a cost effective approach to appeal to individuals willing to correct their own illicit connections. Other sump pump issues would need to be addressed on a case-by-case basis when discovered.

The data collected was used to update the Buzzards Bay National Estuary Program stormwater GIS. Despite the extensive mapping of the Marion drain network that the team started with before the investigation, there were opportunities for many corrections and additions while going through the investigation process. Updated maps depicting the inspected networks are included below. Red stars indicate outfall pipes, light blue squares show

catchbasins, brown circles show drain manholes, and blue lines show connecting pipes. Issues found within the network are annotated. Issues and recommendations are included in the text below each map.

Below are the observations made for 114 storm drain systems. Each drain system is referenced by the facility ID of the outfall pipe.



NSH1070PI – Front Street: No issues found, note that the Cumberland Farm’s drainage system does not connect to this network.



NSH1064PI- Front Street: No issues found. The NSH1064PI network used to traverse the ball field but has been rerouted around the field. At location A the catch basin is covered with a silt fence.



NSH1063PI- Front Street: No significant issues found. The manhole at point A was packed with dirt and had significant root growth. The Town cleaned it out and the connection between manholes was confirmed. It has previously flooded in this area. Further maintenance within the pipes may still be needed to avoid this.



NSH1066PI (1/2) – Front Street and Ryders Lane: No issues found. This system was installed in 2013 to re-route the stream North of Ryders Lane from traversing the ball field and directs it to a treatment system at Old Landing Wharf.



NSH1066PI (2/2) – Ryders Lane and Spring Street: No issues found.



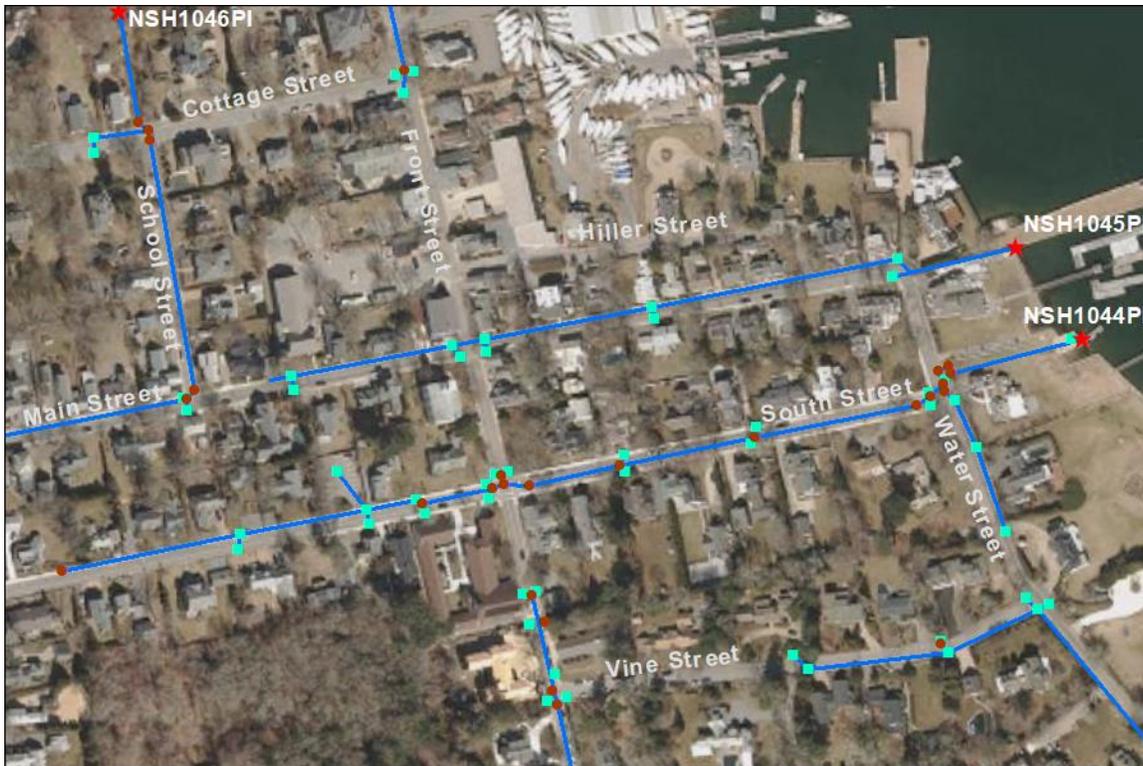
NSH1062PI and NSH1061PI – Front Street: No issues found. The catchbasins at the sailing center do not appear to connect to the Town’s network. At point A, a pipe exits the catchbasin in the direction of a wetland. The wetland fills with water during rain events. Extremely likely there is an outfall buried there that is fully functioning. However, it could not be confirmed.



NSH1060PI – Front Street: No issues found. The catch basins in the dining hall parking lot do not connect to this network. They appear to connect to the grease trap which drains to the sewer system causing inflow.



NSH1054PI, NSH1052PI, NSH1055PI, NSH1056PI, and NSH1058PI – Front Street: No issues found. NSH1052PI enters an artificial wetland with a manifold and then discharges to NSH1055PI. NSH1056PI was previously determined to be an abandoned outfall servicing no structures.



NSH1045PI – Main Street: No issues found. NSH1044PI – South Street: No issues found; this system was constructed in 2013 and includes a treatment system at the intersection of Water Street and South Street.

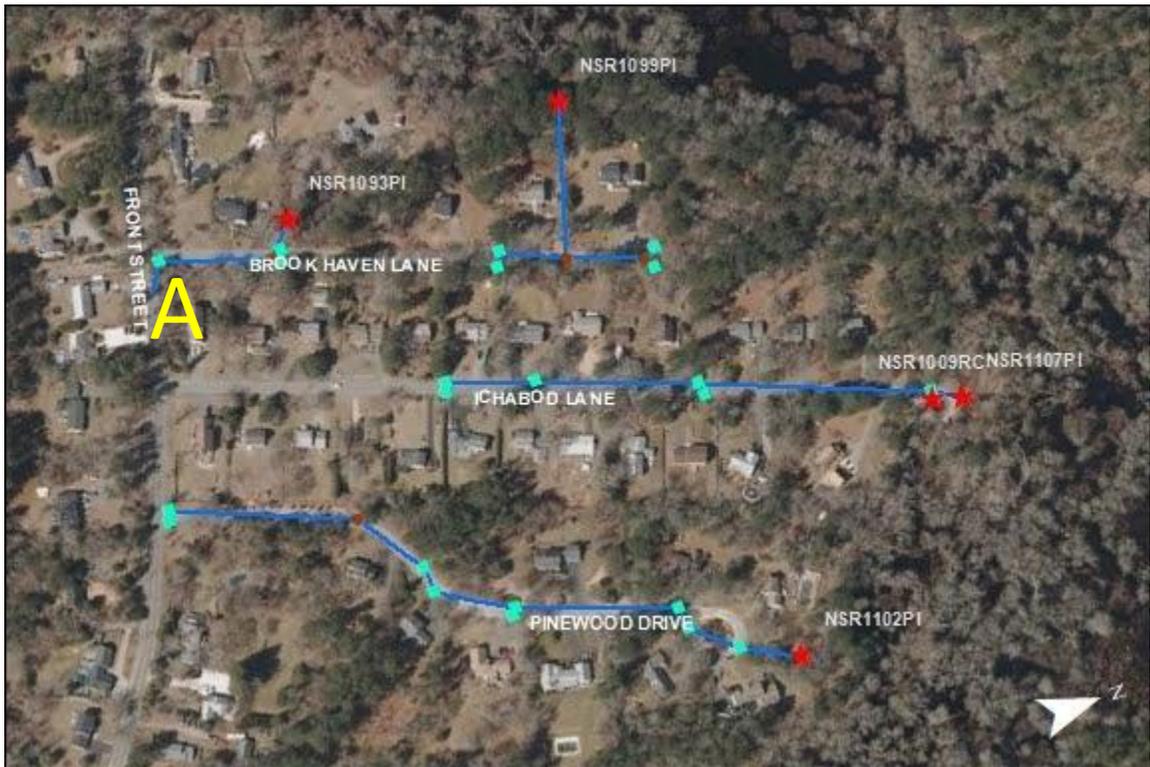


NSH1036PI – Vine Street and Water Street: No issues found. NSH1035PI – Water Street: No issues found; this culvert drains a stream from Front Street where a network drains into the channel. NSH1125PI – Water Street: No structures found connected to this outfall, it may be a seep drain for the wall. NSH1126PI – Water Street: Located below NSH1135PI and appears to drain the adjacent catchbasin on Water Street.

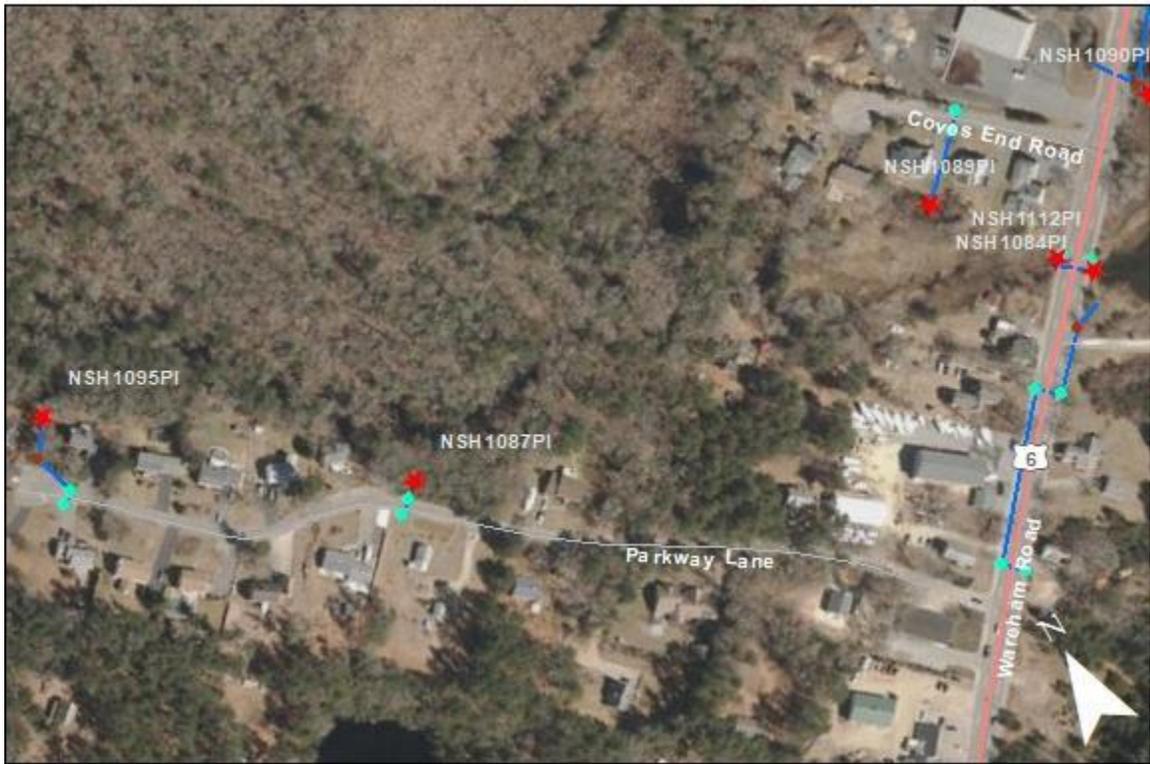


NSH1123PI – Holmes Street: No significant issues found; newly documented outfall; this is a very old network with various structures poorly added; excessive pet waste in area. Community outreach is recommended.

NSH1027PI – Allen Street: No significant issues found; this is also an old network with excessive pet waste in area. Community outreach is suggested.



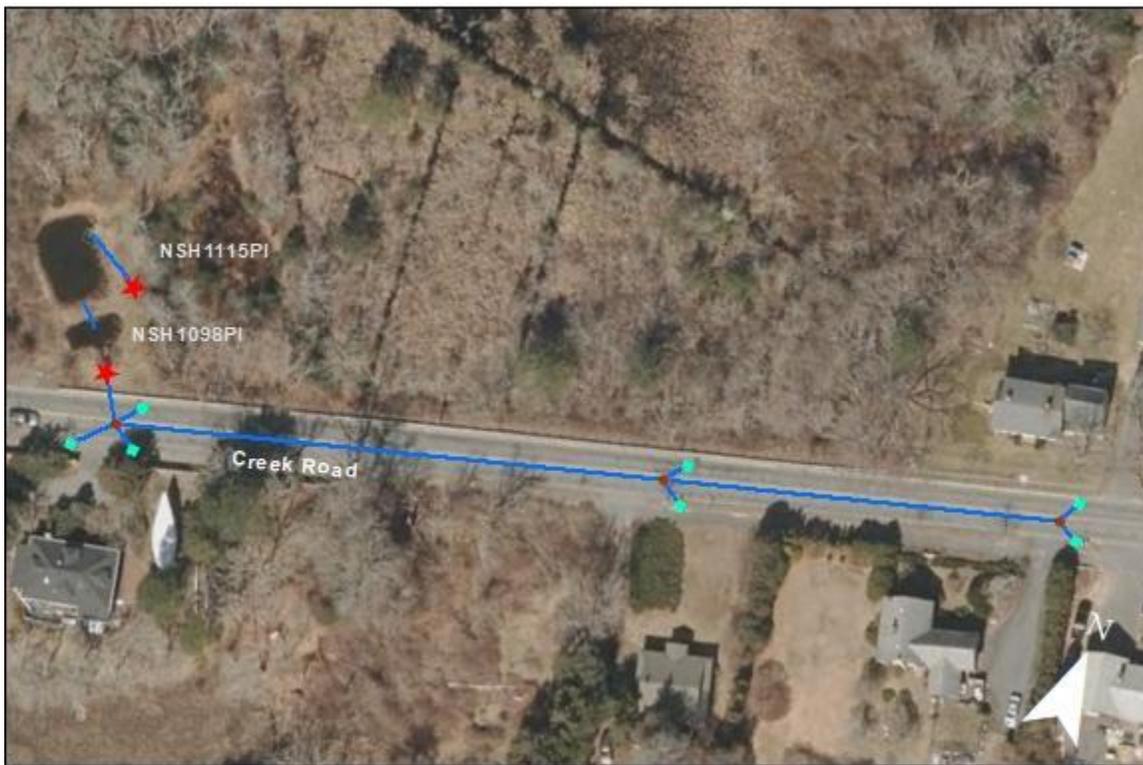
NSR1099PI and NSR1093PI- Brook Haven Lane: No issues found. NSR1107PI and NSR1009RC- Ichabod Lane: No issues found. NSR1102PI- Pinewood Drive: No issues found.



NSH1095PI and NSH1087PI- Parkway Lane: No Issues found. NSH1089PI- Covens End Road: No Issues found. Outfall is buried or submerged. Still in working order.



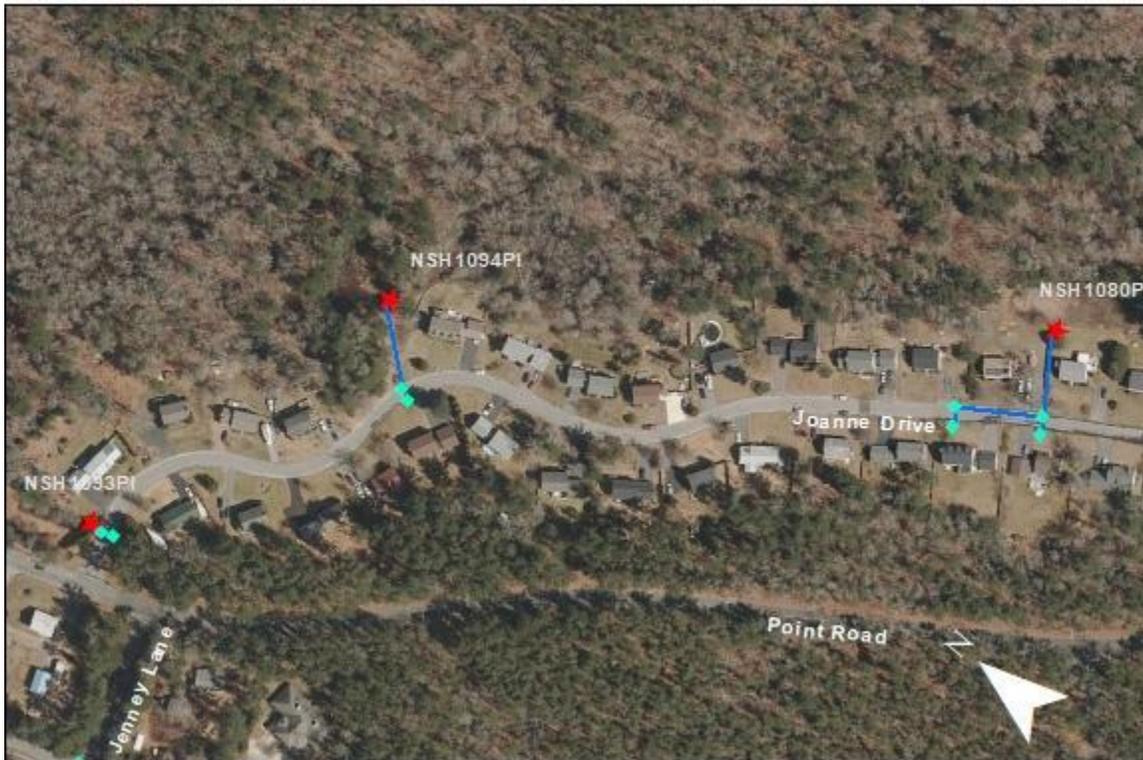
NSH1113PI, NSH1122PI, and NSH1096PI- Creek Road: No issues found.



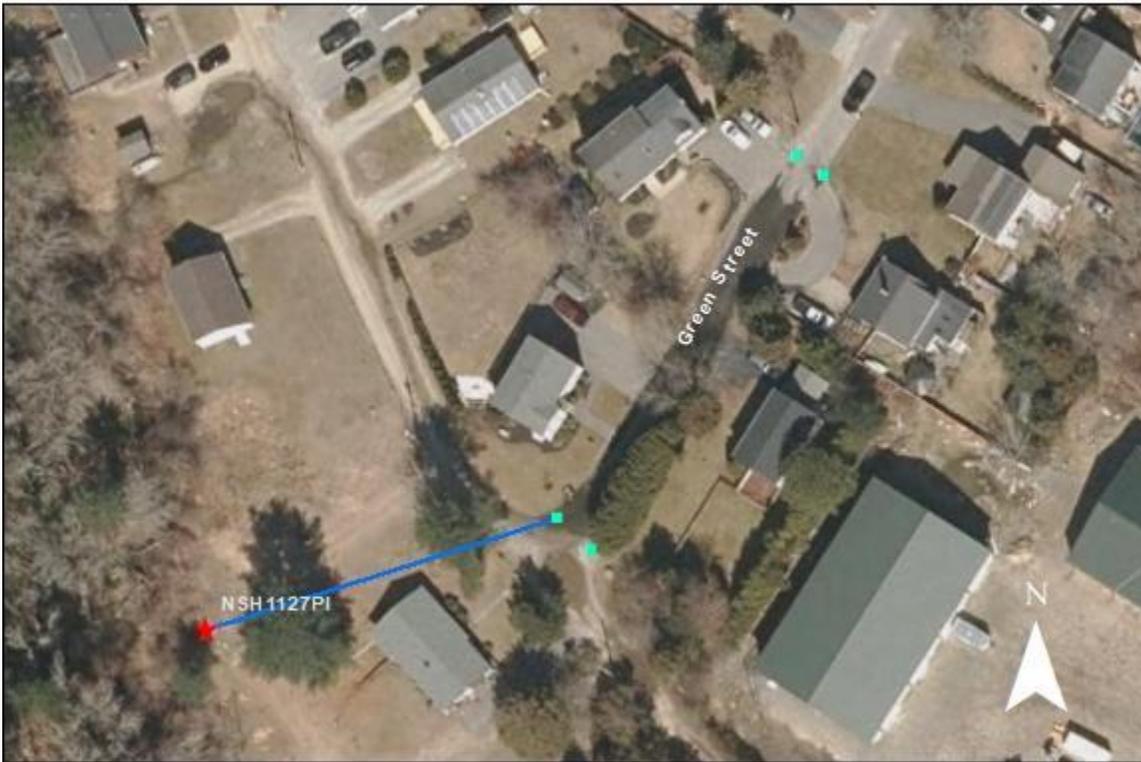
NSH1115PI and NSH1098PI- Creek Road: No issues found.



NSH1128PI-Point Road and Creek Road: No issues found. At point B a 12" pipe enters the catchbasin. Its origin is unknown.



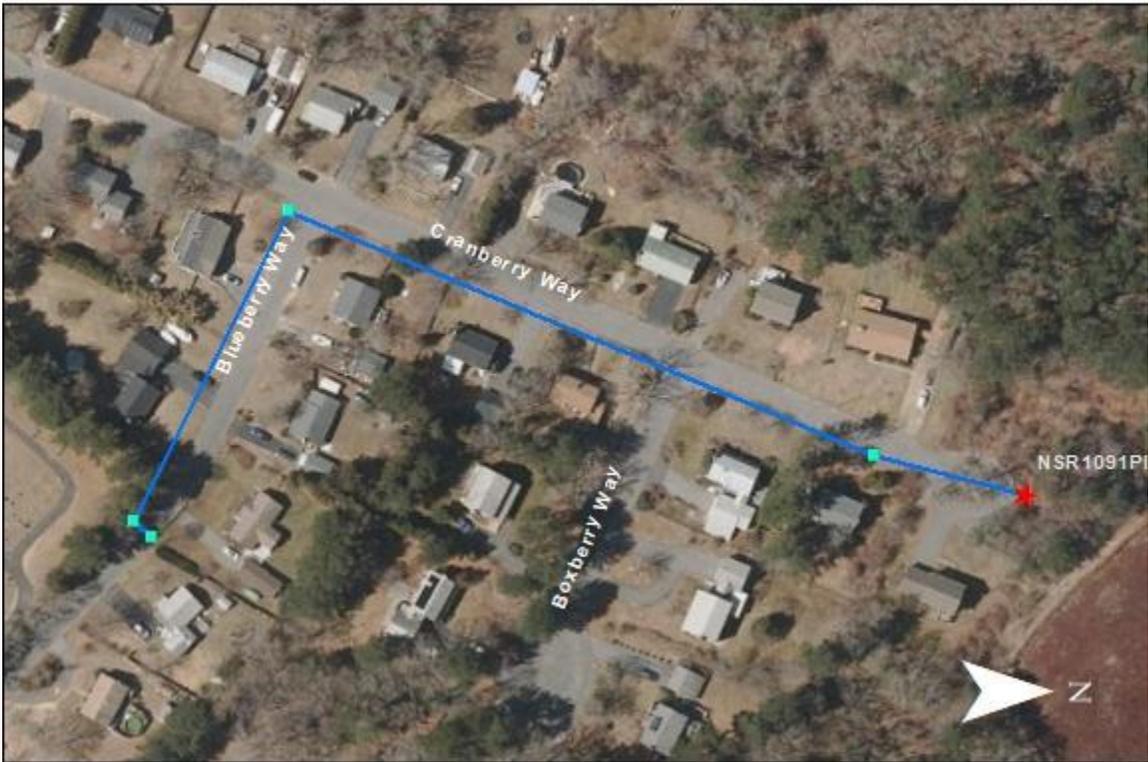
NSH1093PI, NSH1094PI, and NSH1080PI- Joanne Drive: No issues found.



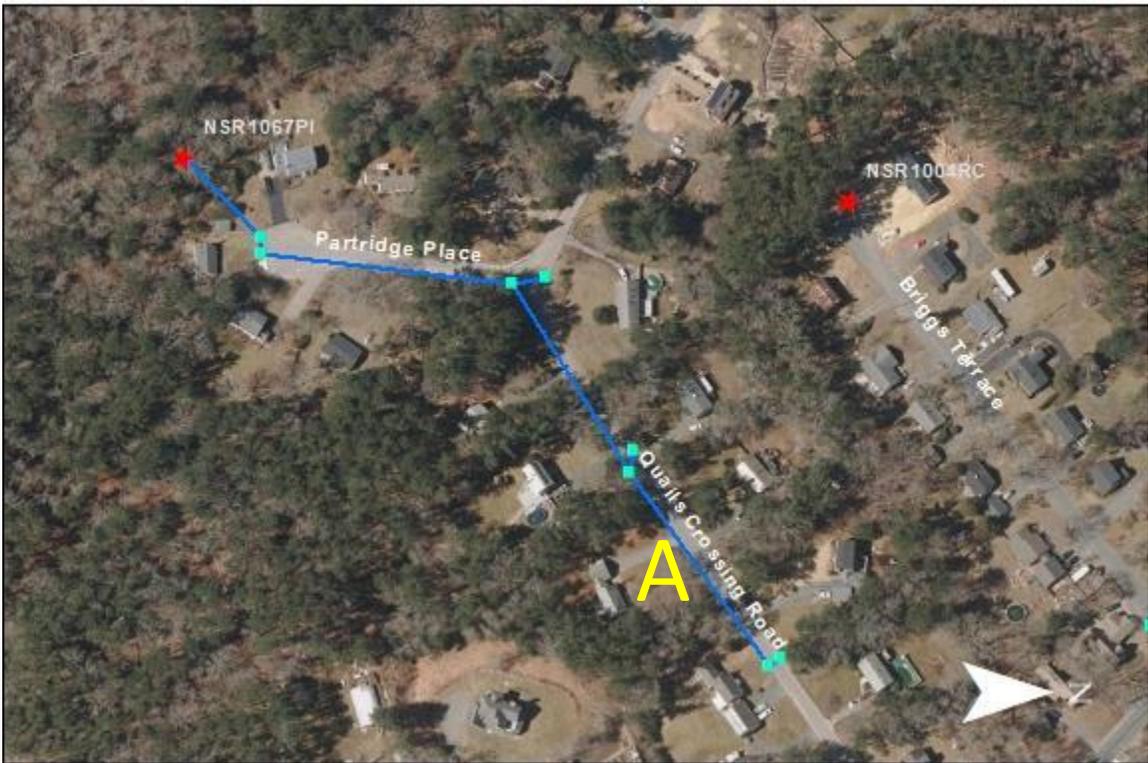
NSH1127PI- Green Street: No issues found. Catchbasins on Green Street are all infiltration basins except for the one shown connected to the outfall.



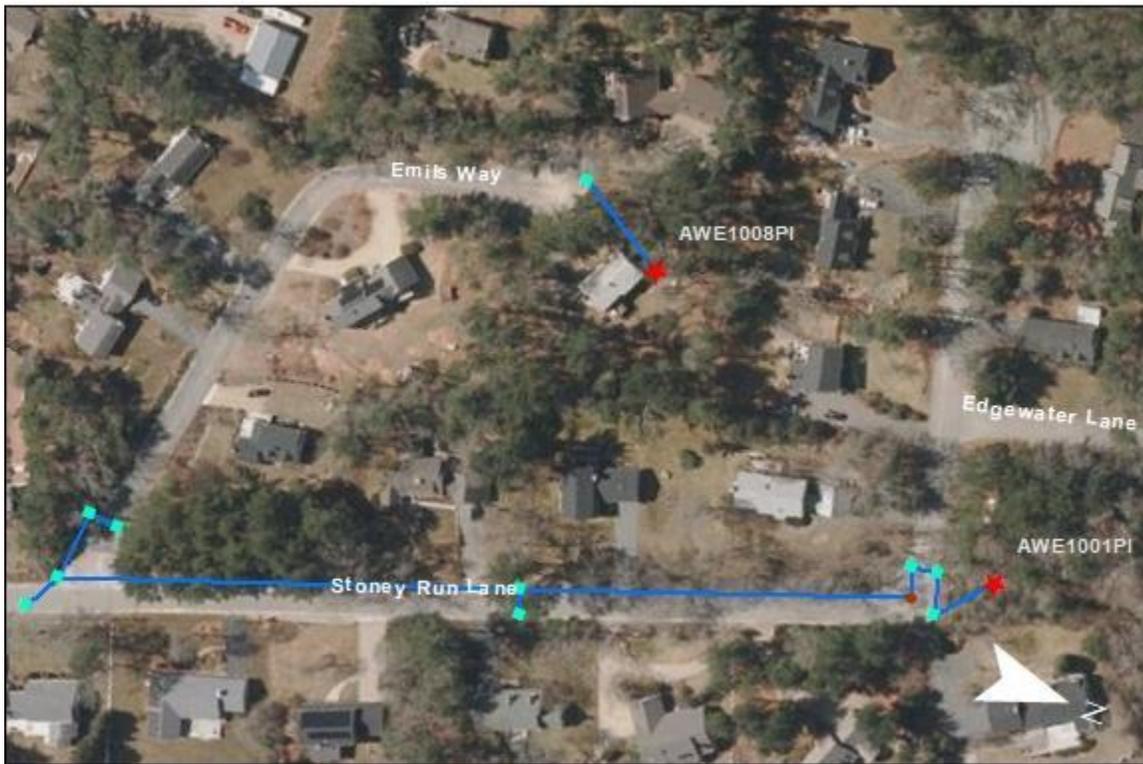
NSH1076PI and NSH1075PI- Sarah Sherman Lane: No issues found.
NSH1078PI- Oakdale Avenue: Pipe may be collapsed or buried. Unable to locate outfall. At point A, a clay pipe enters the catchbasin. Evidence pipe is broken in yard just South of basin.



NSR1091PI- Cranberry Way: No issues found.

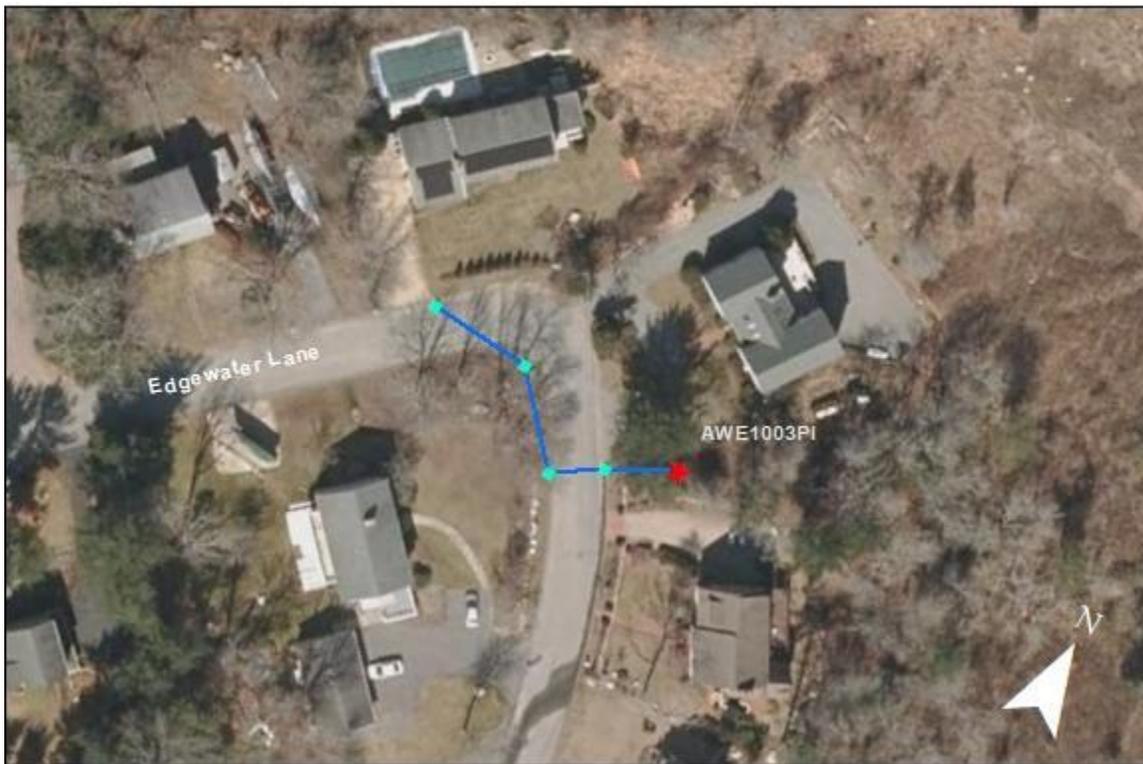


NSR1067PI- Partridge Place: No issues found. At point A groundwater is penetrating catchment at pipe seam.



AWE1008PI- Emils Way: No issues found.

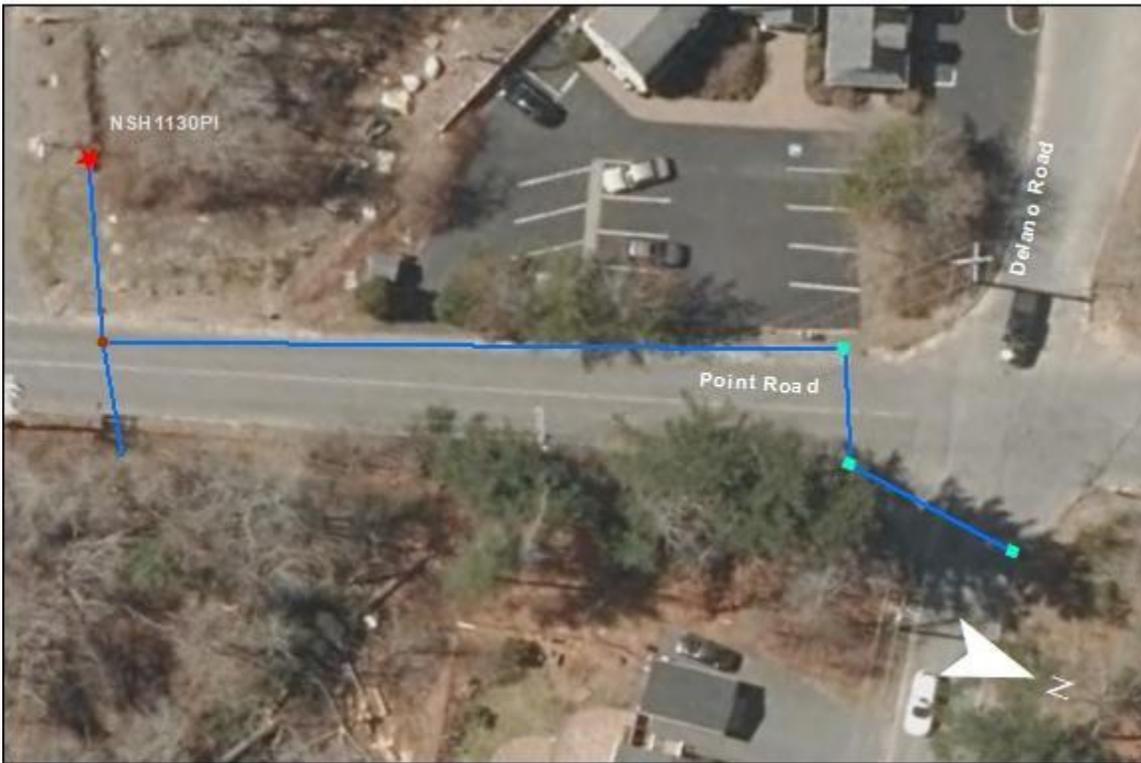
AWE1001PI- Stoney Run Lane: Structures near outfall are completely full of sand. Difficult to inspect due to debris. Further maintenance is suggested.



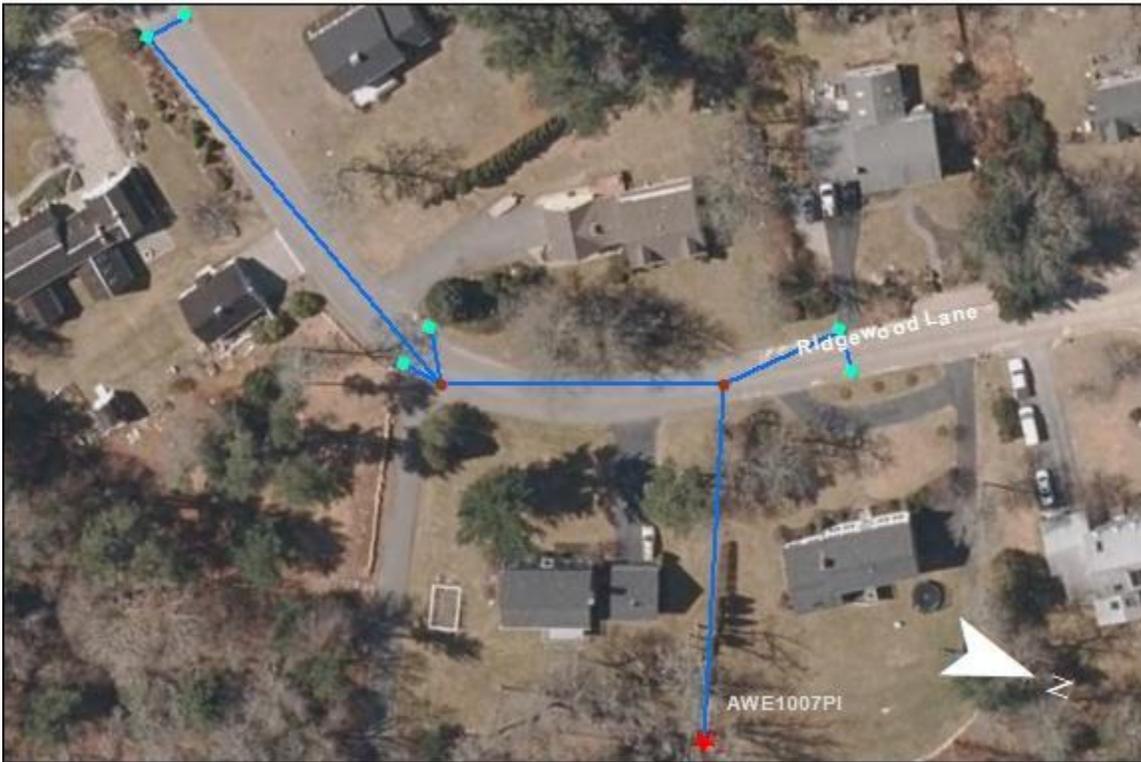
AWE1003PI- Edgewater Lane: No issues found.



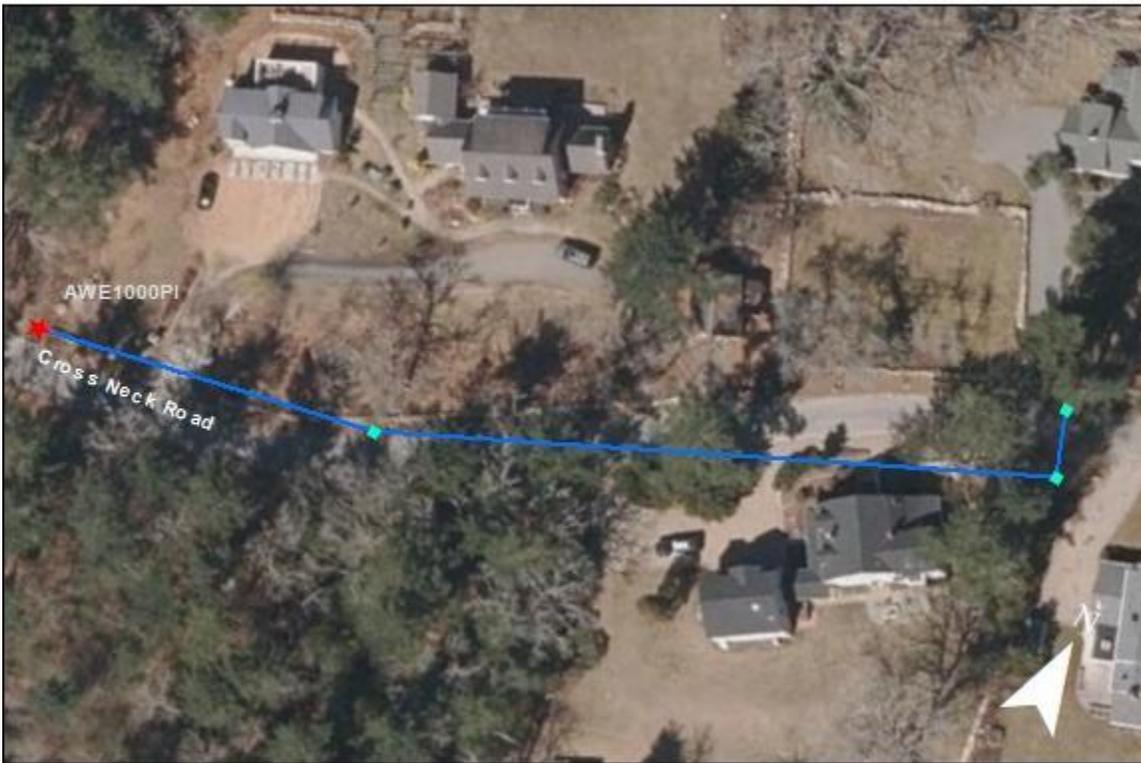
NSH1103PI- Point Road: No issues found. Pipe enters catchbasin at point A. Origin of pipe unknown.



NSH1130PI- Point Road: No issues found.



AWE1007PI- Ridgewood Lane: No issues found.



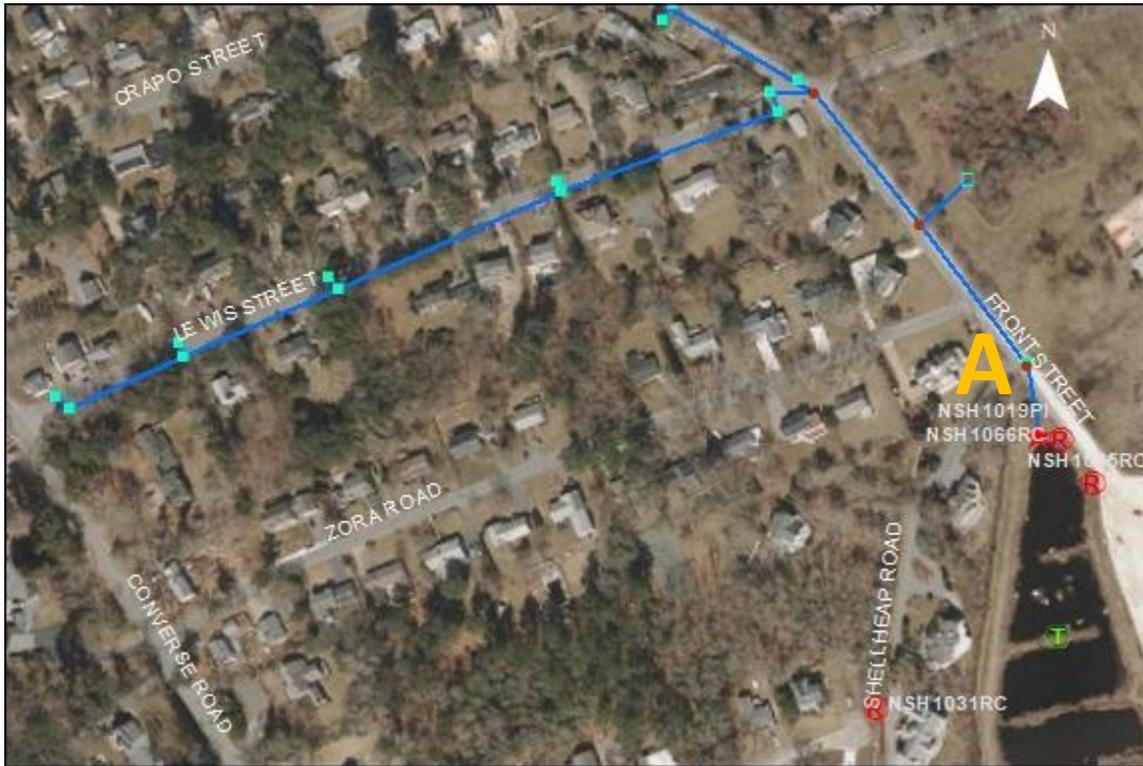
AWE1000PI- Cross Neck Road: No issues found.



AWE1002PI- Delano Road: No issues found.



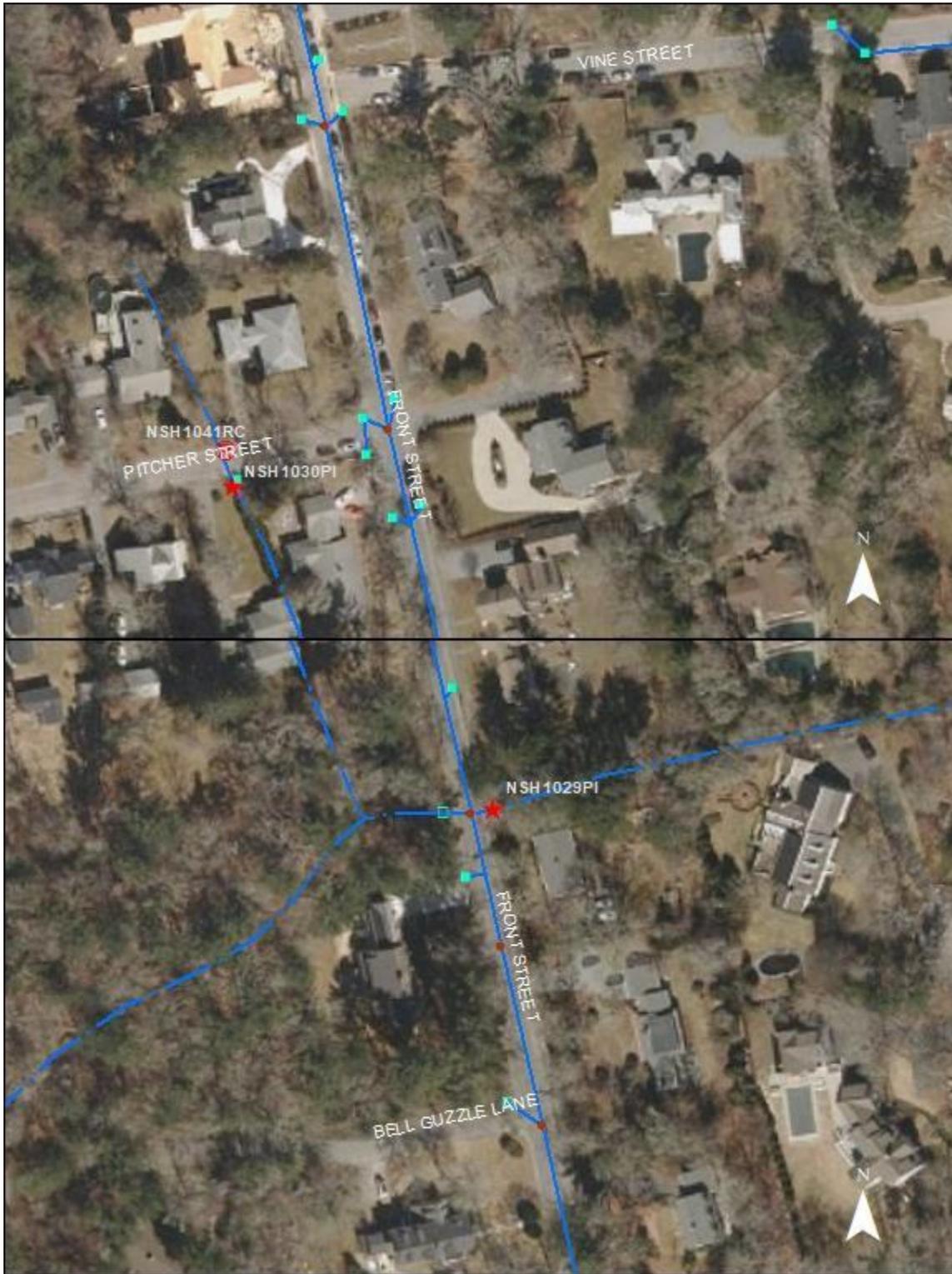
NSH1107PI, NSH1118PI, and NSH1117PI- Point Road: No issues found.



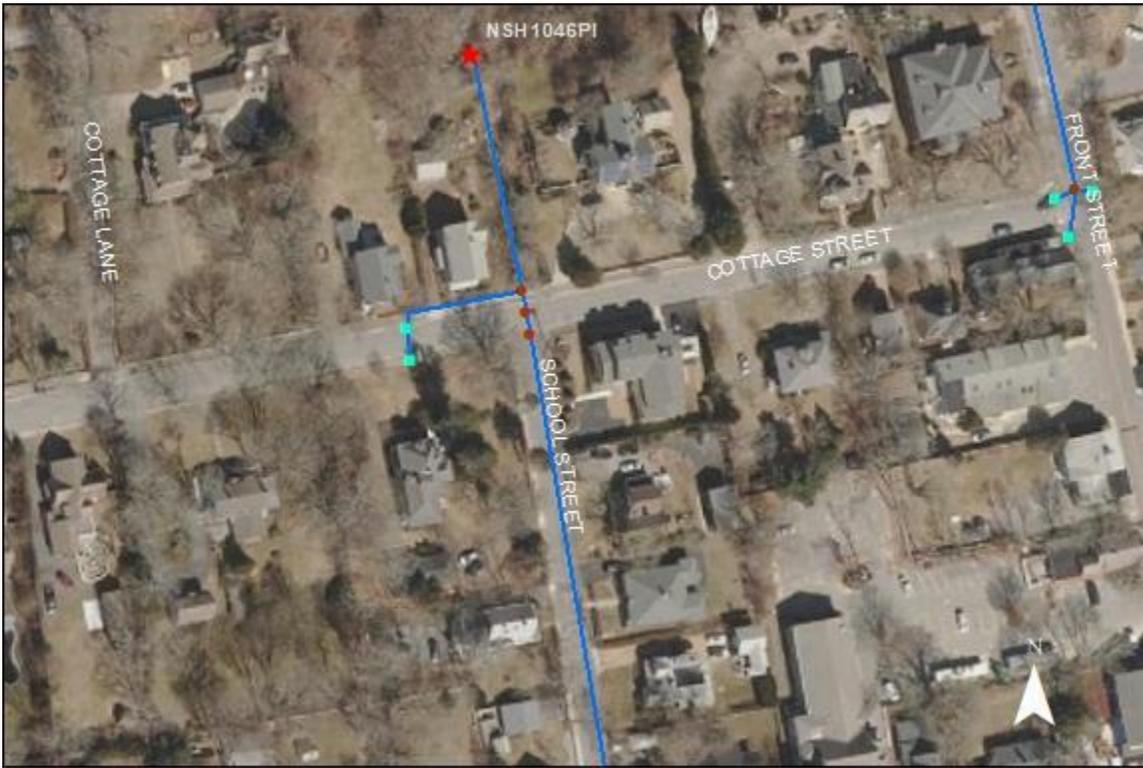
NSH1019PI (1/3)- Front Street and Lewis Street: No significant issues found. Two 12-inch concrete pipes enter the manhole at point A. Their origins are unknown. Several basins on Lewis Street had large amount of sand and leaf debris. Further maintenance is suggested.



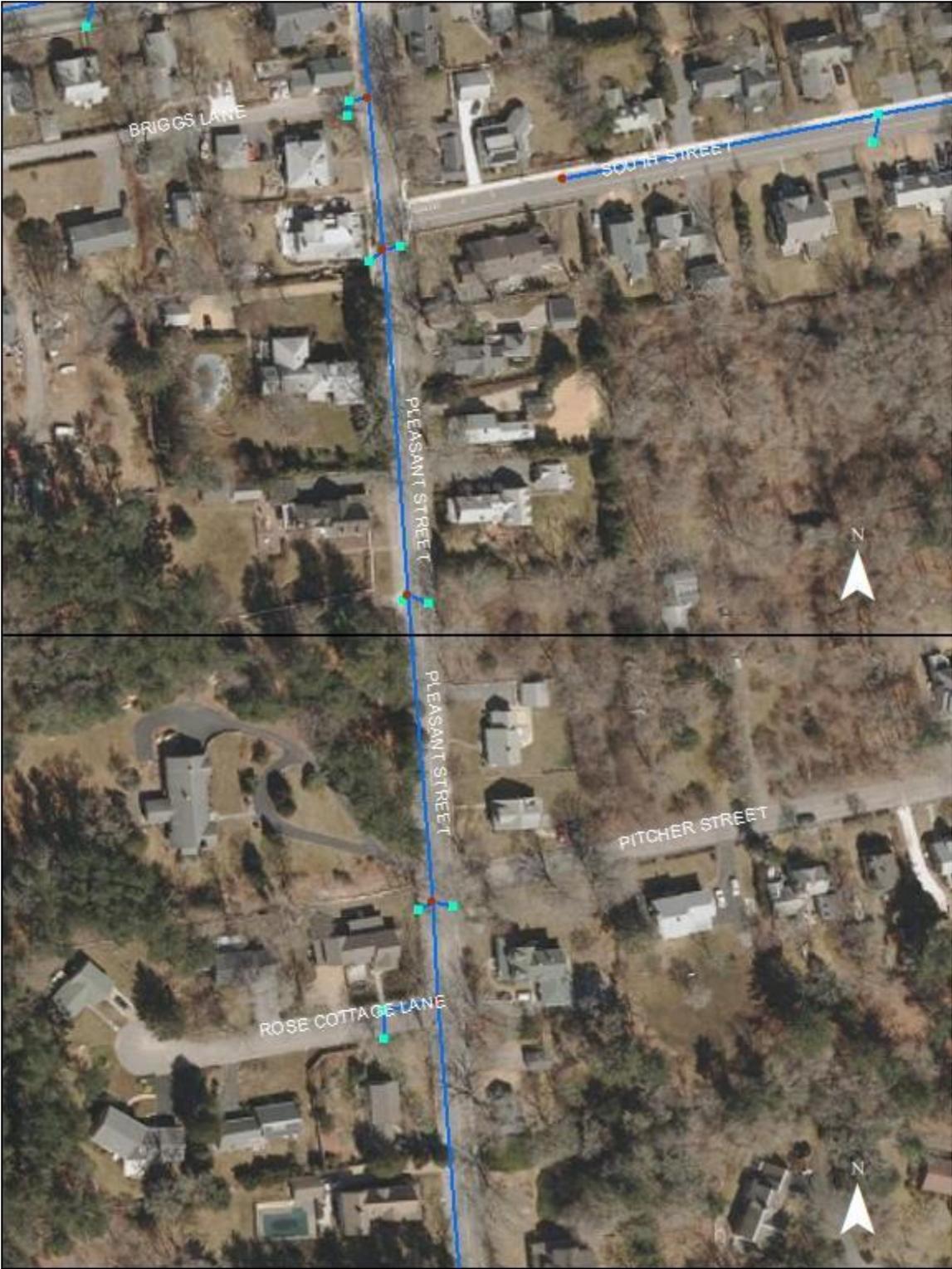
NSH1019PI (2/3)- Front Street: At point A and B the catchbasins have begun to sink. Both are in need of repair. Preventative maintenance is recommended.

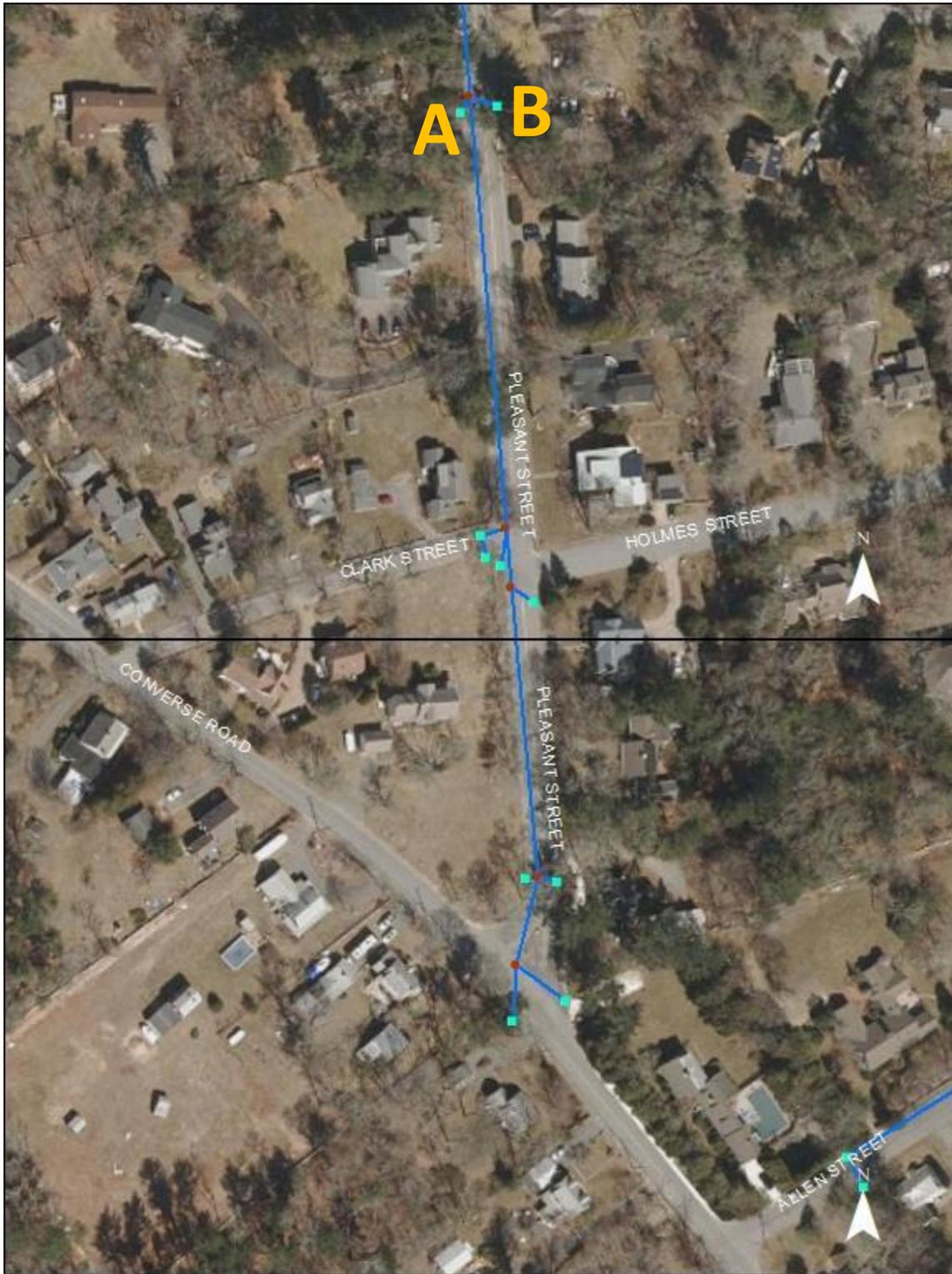


NSH1019PI (3/3)- Front Street: No issues found.

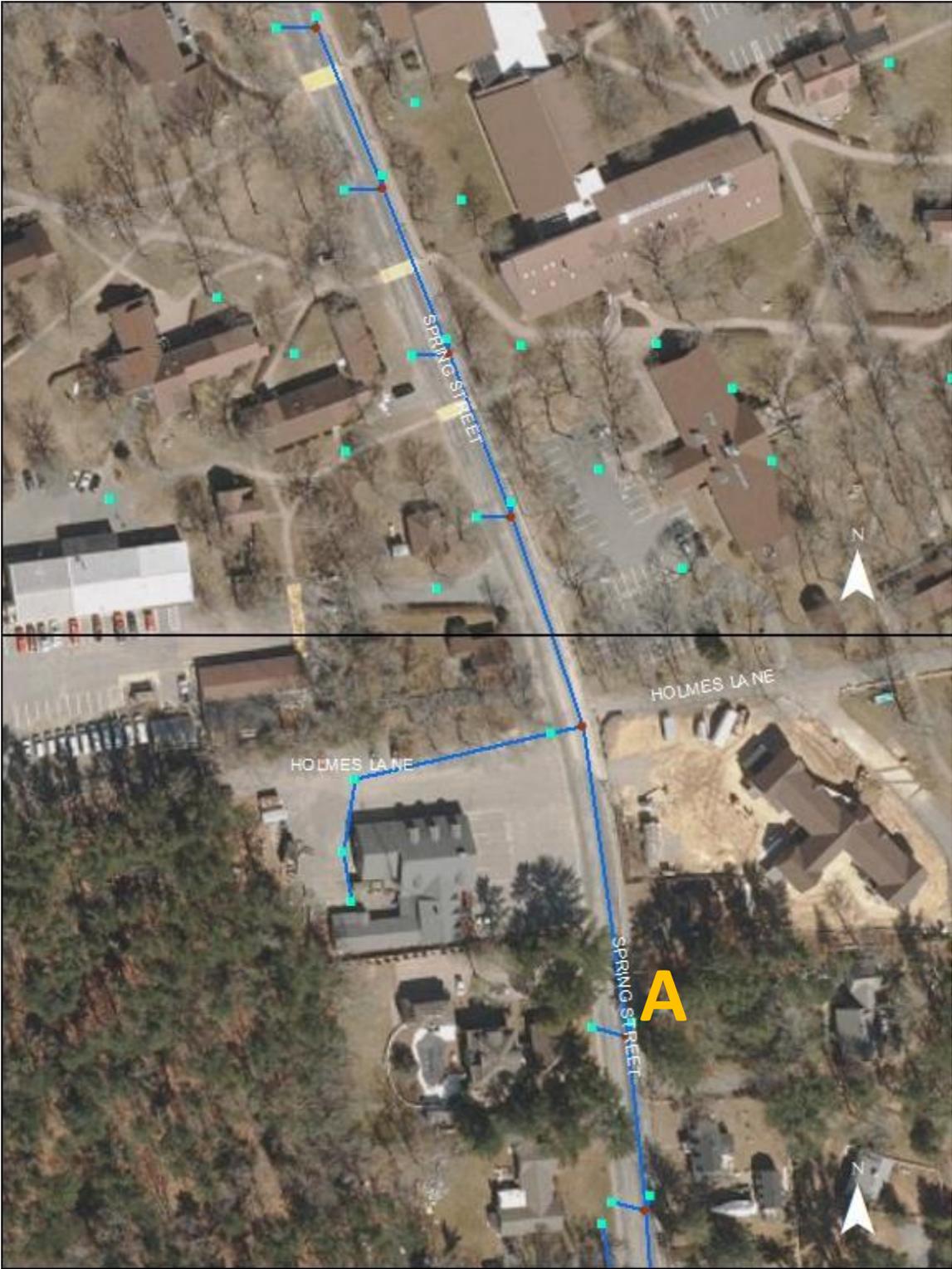


NSH1046PI (1/2) - School Street and Cottage Street: No issues found.



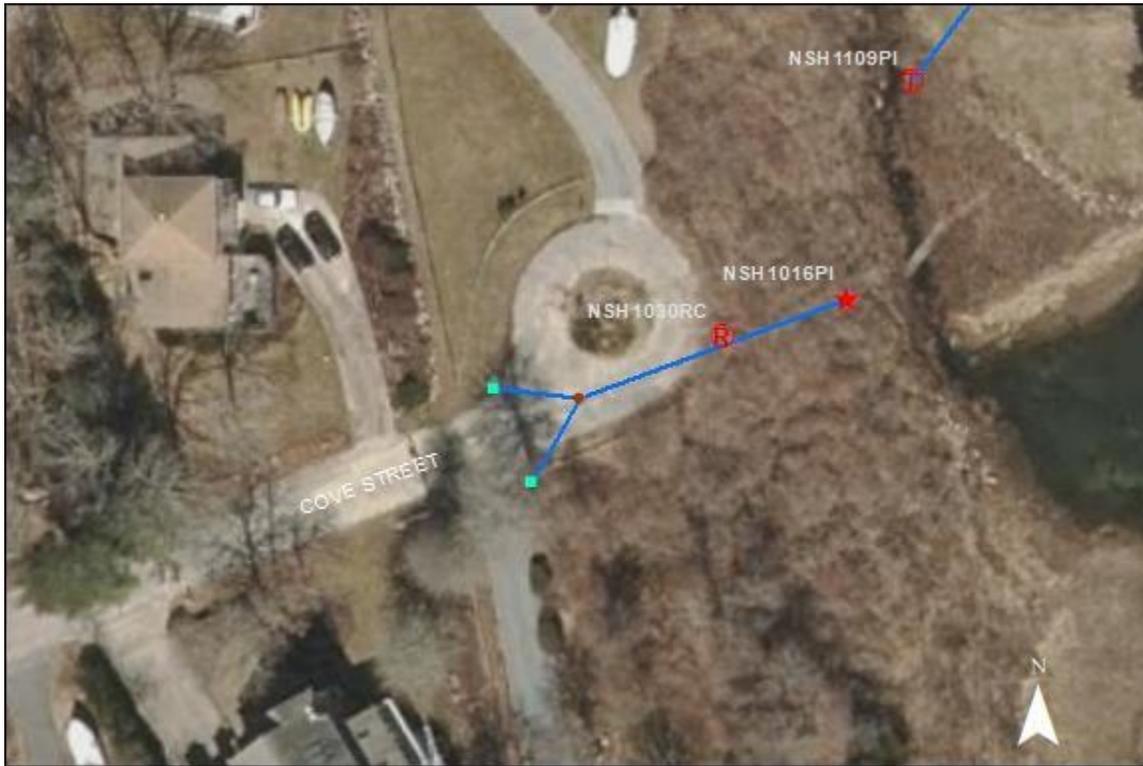


NSH1046PI (2/2) - Pleasant Street: At point A the bricks on the inside of the catchbasin are beginning to crumble. Catchbasin is in need of repair. At point B the catchbasin is full of dirt and not draining properly. The structure is in need of cleaning.

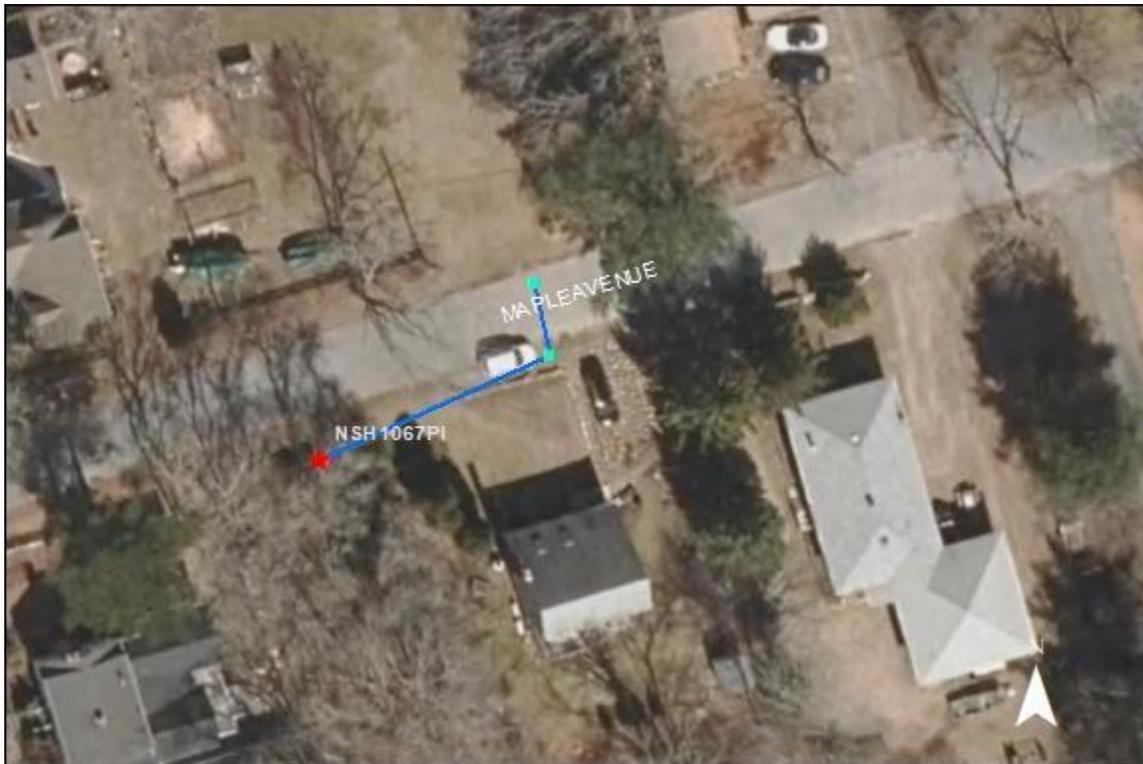




NSH1114PI and NSH1047PI- School Street: At point A there is a large construction sandbag inside the catchbasin. Its removal is recommended.



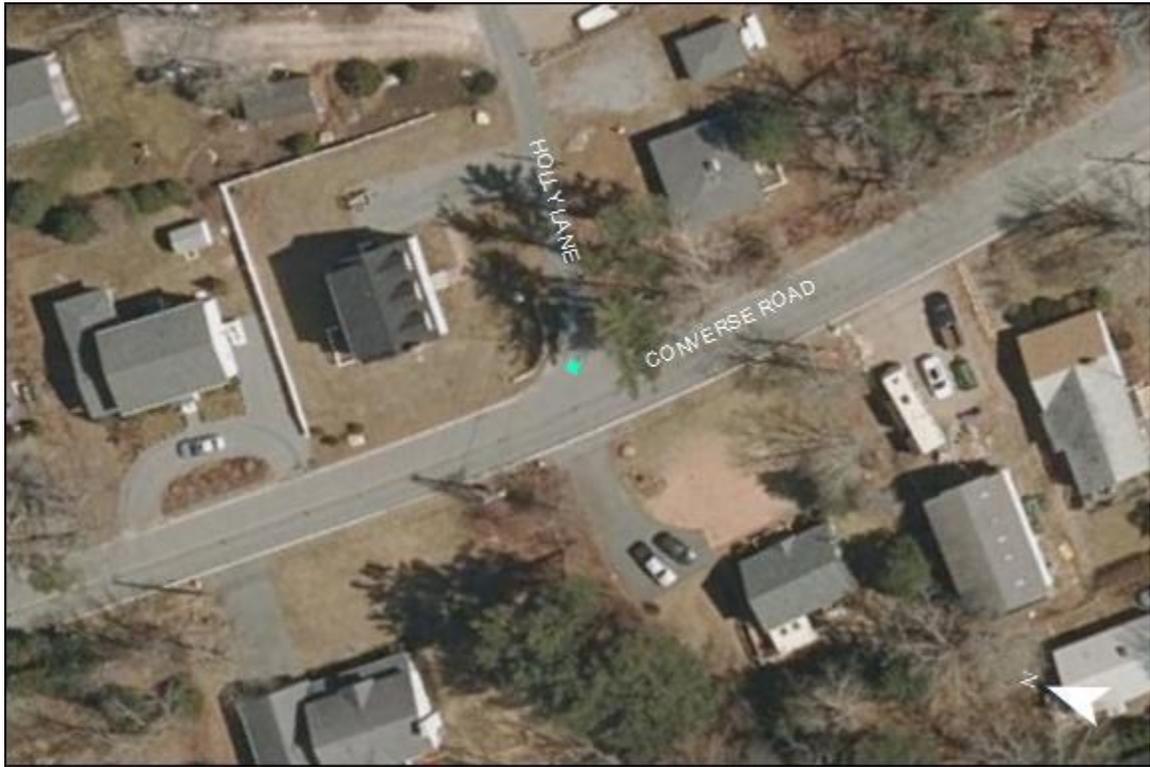
NSH1030RC and NSH1016PI- Cove Street: Catchbasins and the manhole on Cove Street are full of sand. Further maintenance is recommended.



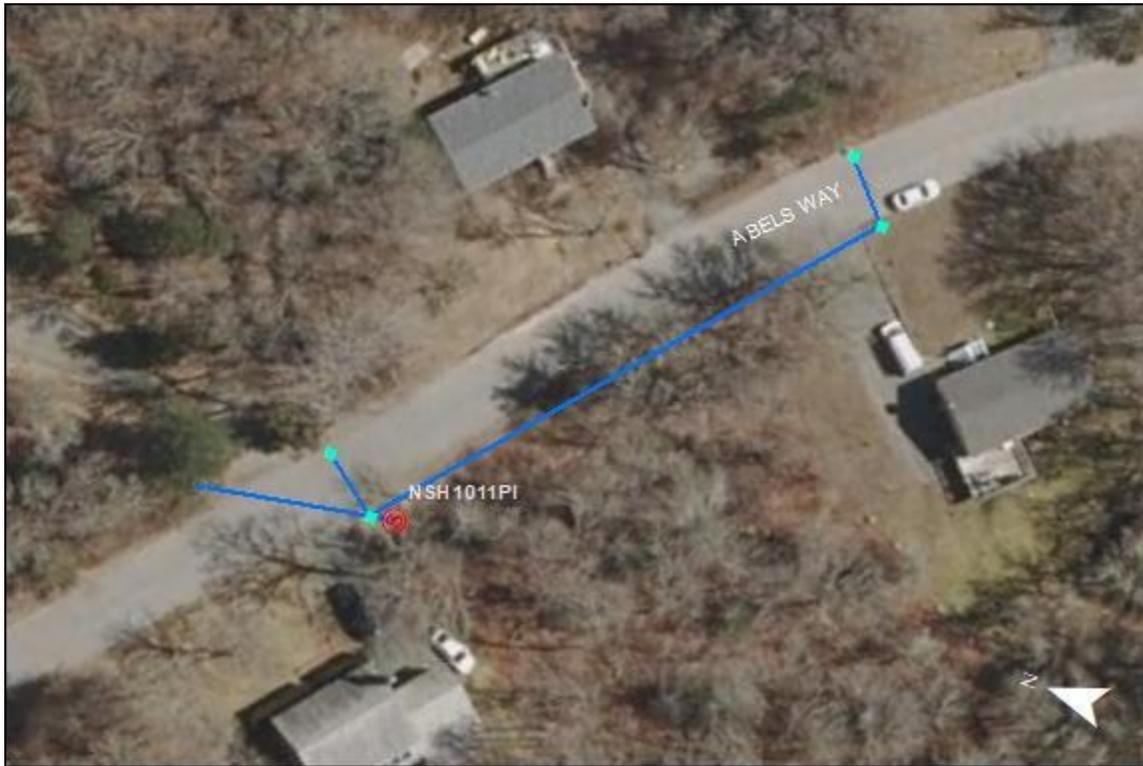
NSH1067PI- Maple Avenue: No issues found.



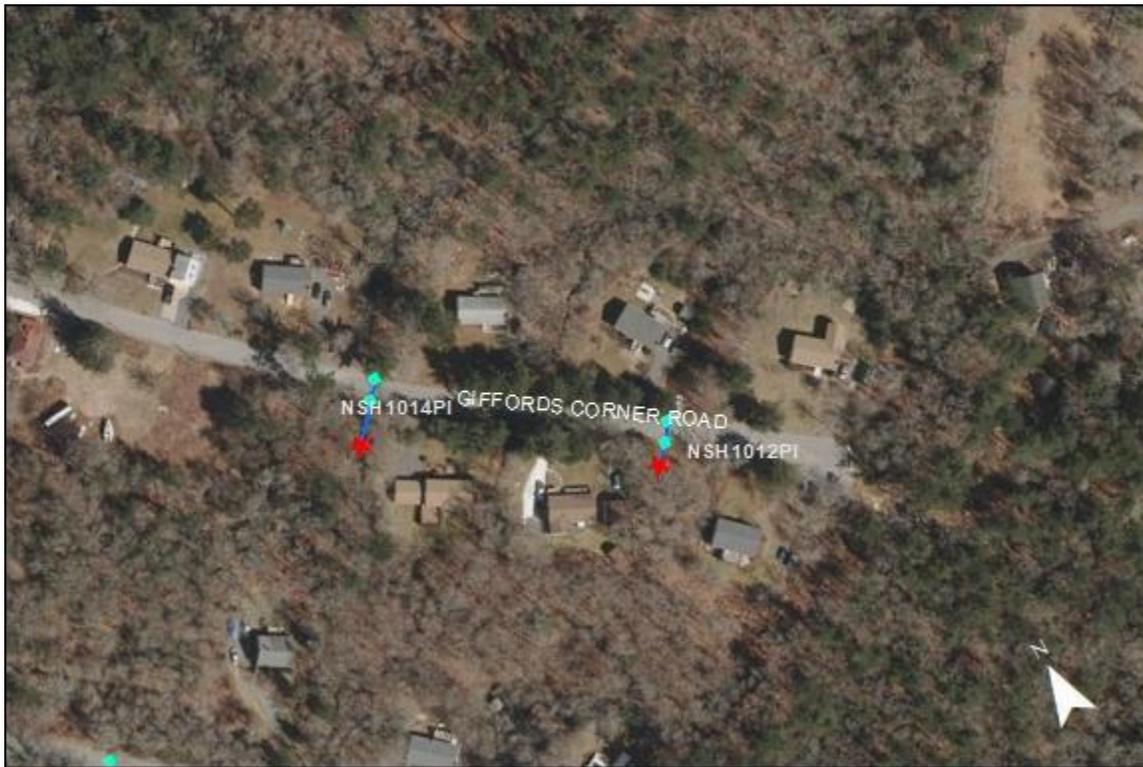
NSH1065PI- Spring Street: No issues found.



Holly Lane: No issues found. Catchbasin is a standalone infiltration basin.



NSH1011PI- Abels Way: No issues found.



NSH1014PI and NSH1012PI- Giffords Corner Road: No issues found.



NSR1096PI, NSR1123PI, NSR1092PI, and NSR1124PI- County Road at Point Road: No significant issues. Pipe at point A is clogged. Further maintenance is recommended.



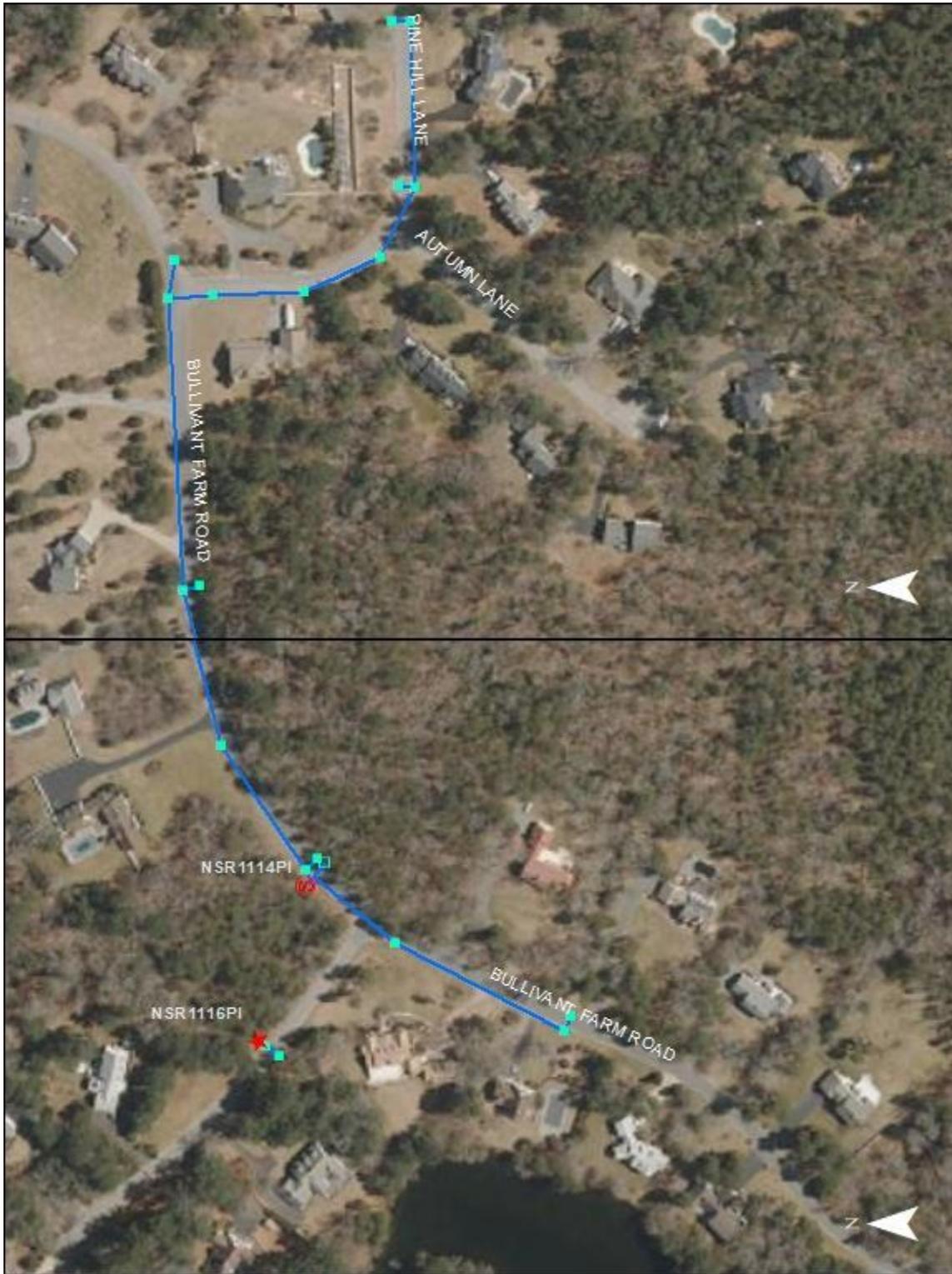
NSR1120PI- Tucker Lane: No issues found.



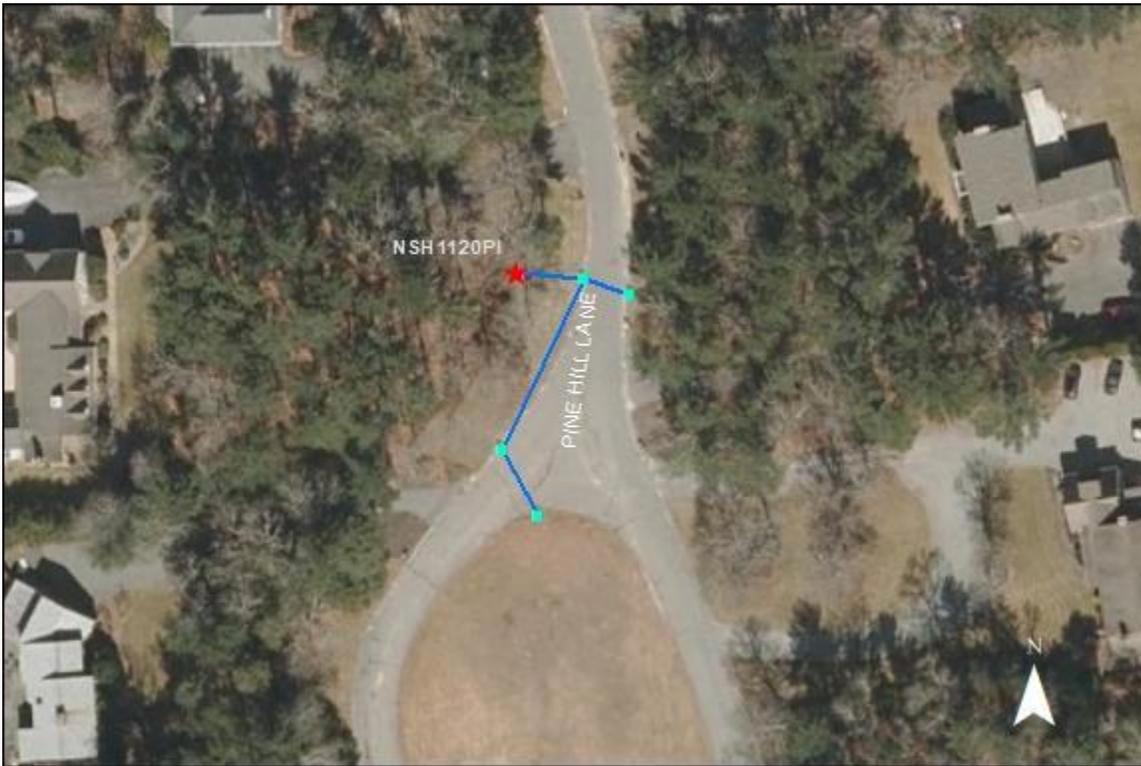
NSR1121PI, NSR1139PI, and NSR1138PI- Tucker Lane: Catchbasins at A, B, and C have all begun to sink. Preventative maintenance is recommended.



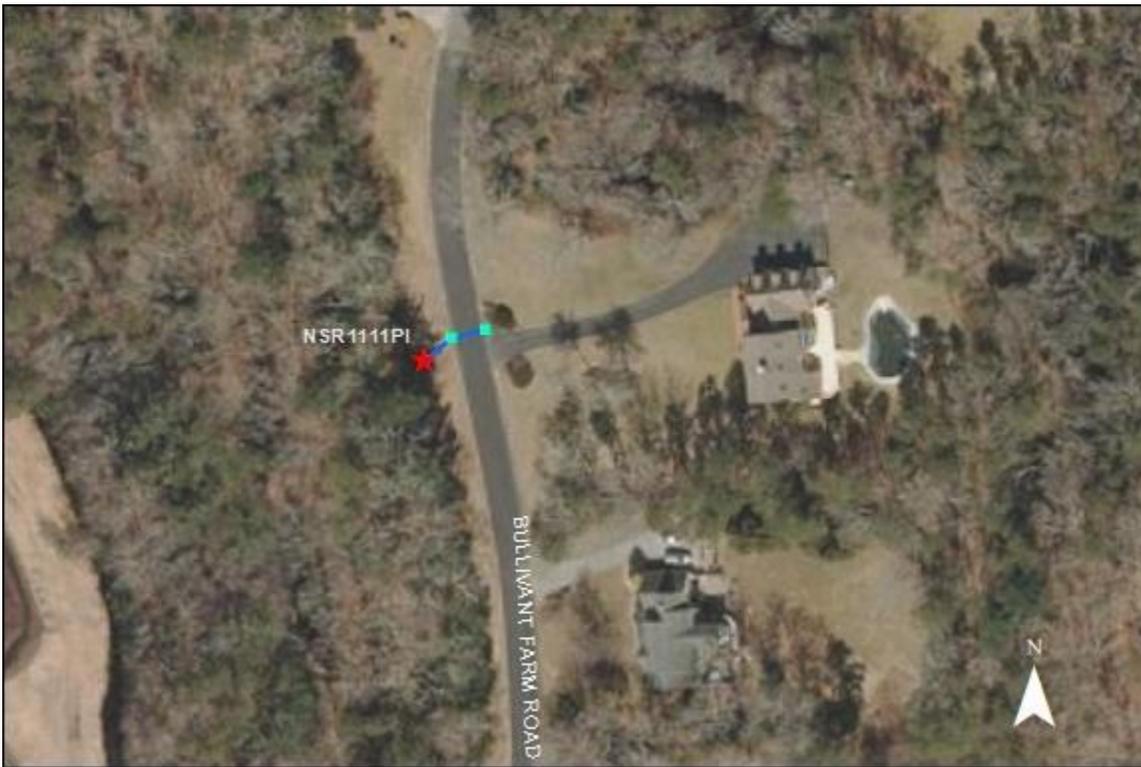
NSR1119PI and NSR1128PI- Bullivant Farm Road: No issues found.



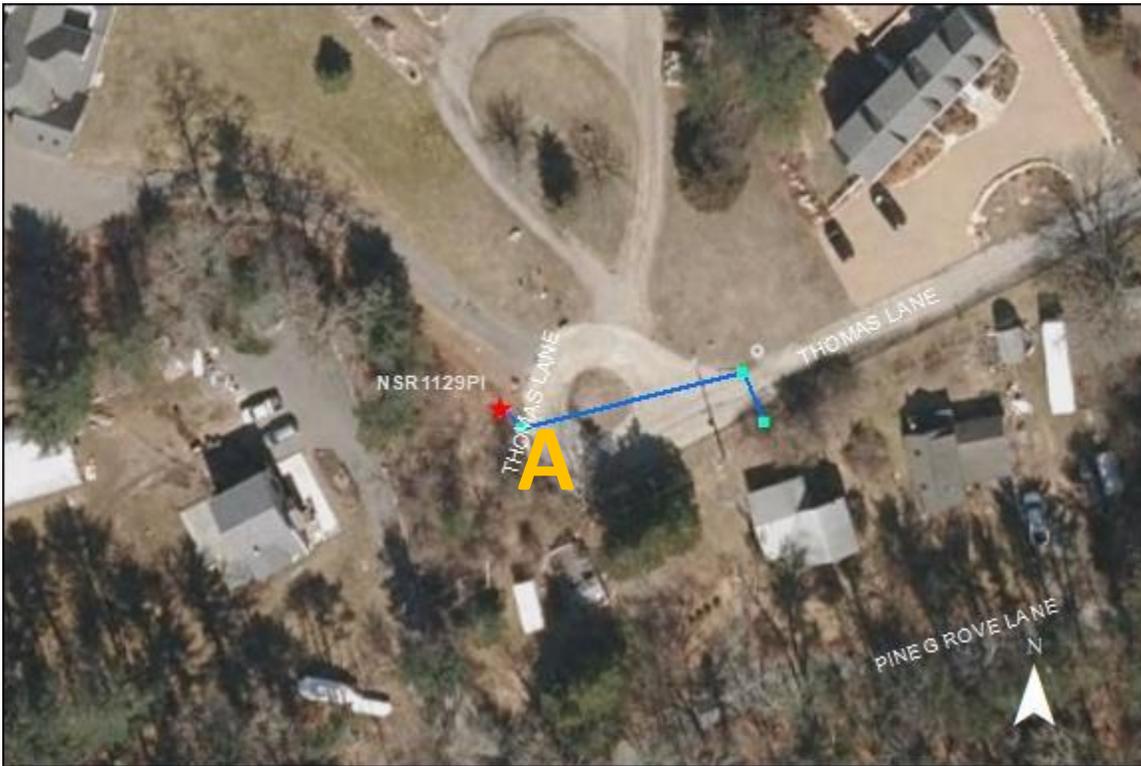
NSR1114PI and NSR1116PI: Bullivant Farm Road and River View Lane: No issues found.



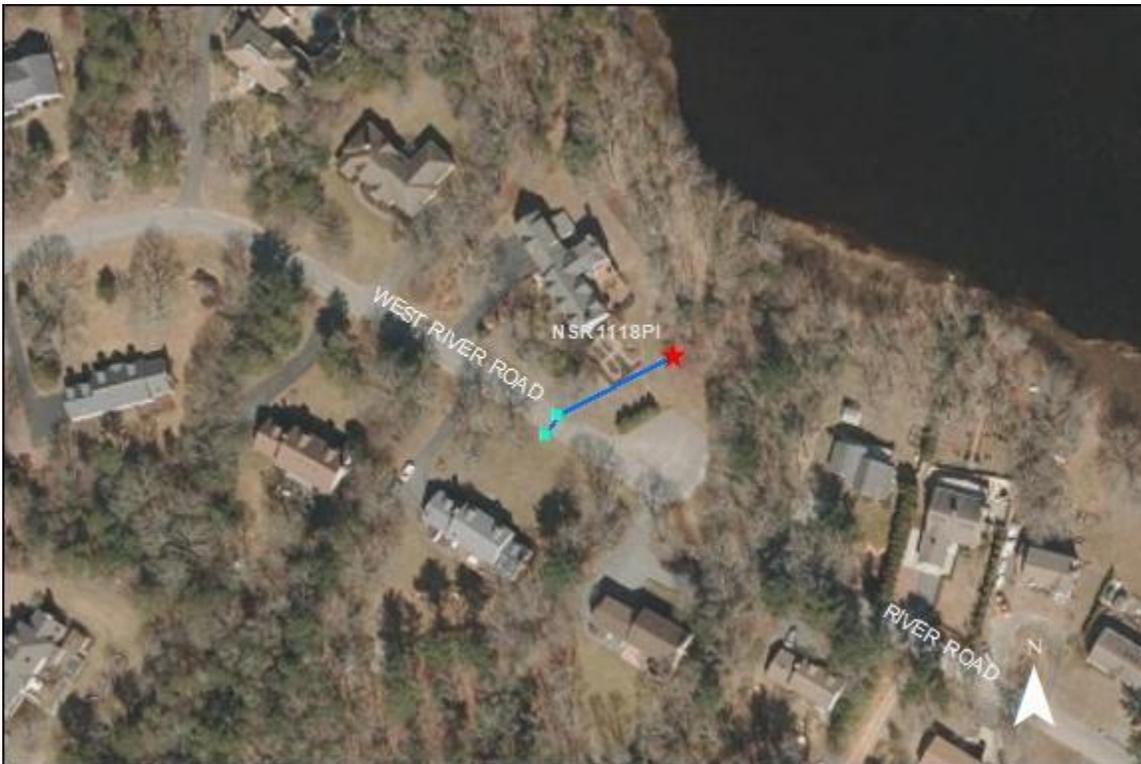
NSH1120PI- Pine Hill Lane: No issues found.



NSR1111PI- Bullivant Farm Road: No issues found.



NSR1129PI- Thomas Lane: The catchbasin at point A had a lot of lumber dumped into it. Catchbasin should be cleared of debris.



NSR1118PI- West River Road: No issues found.



NSR1137PI and NSR1130PI- Village Drive: No issues found.



NSR1133PI, NSR1132PI, and NSR1134PI- Field Stone Lane: No issues found.



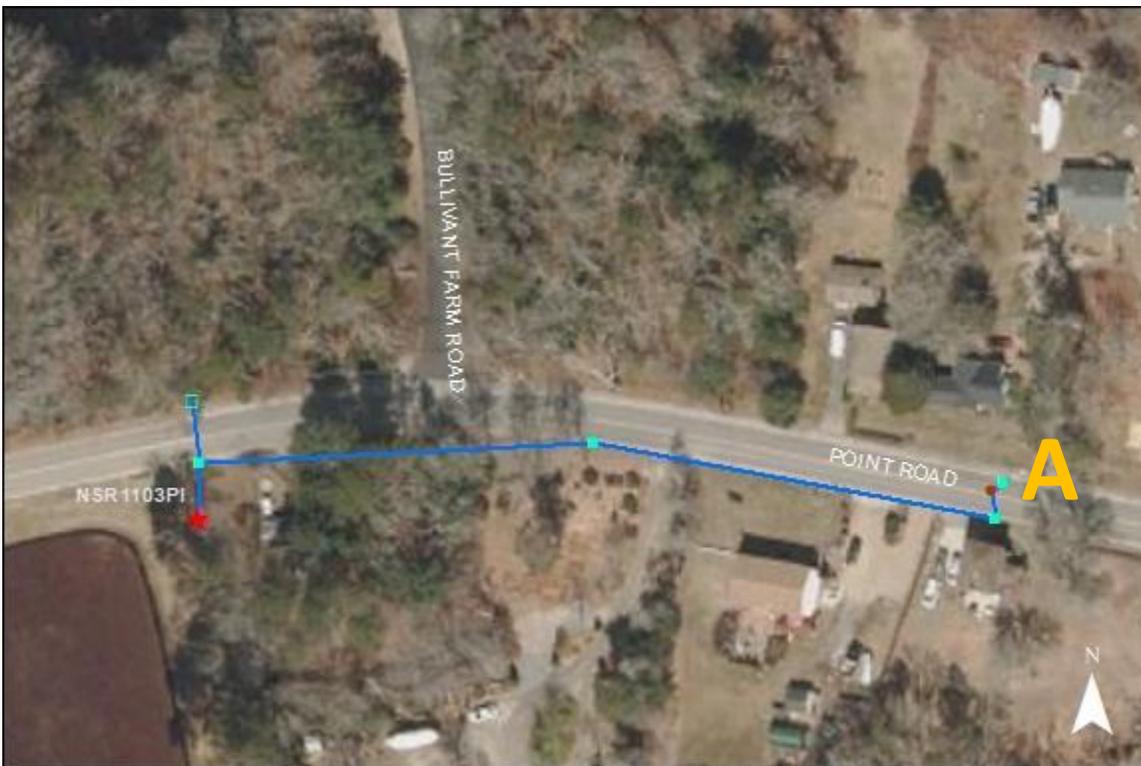
NSR1134PI and NSR1135PI- Village Drive: No issues found.



NSH1009PI- Upland Way and Olde Logging Road: At point A, B, and C, the catchbasins are beginning to sink and the frames are beginning to chip. Preventative maintenance is recommended.



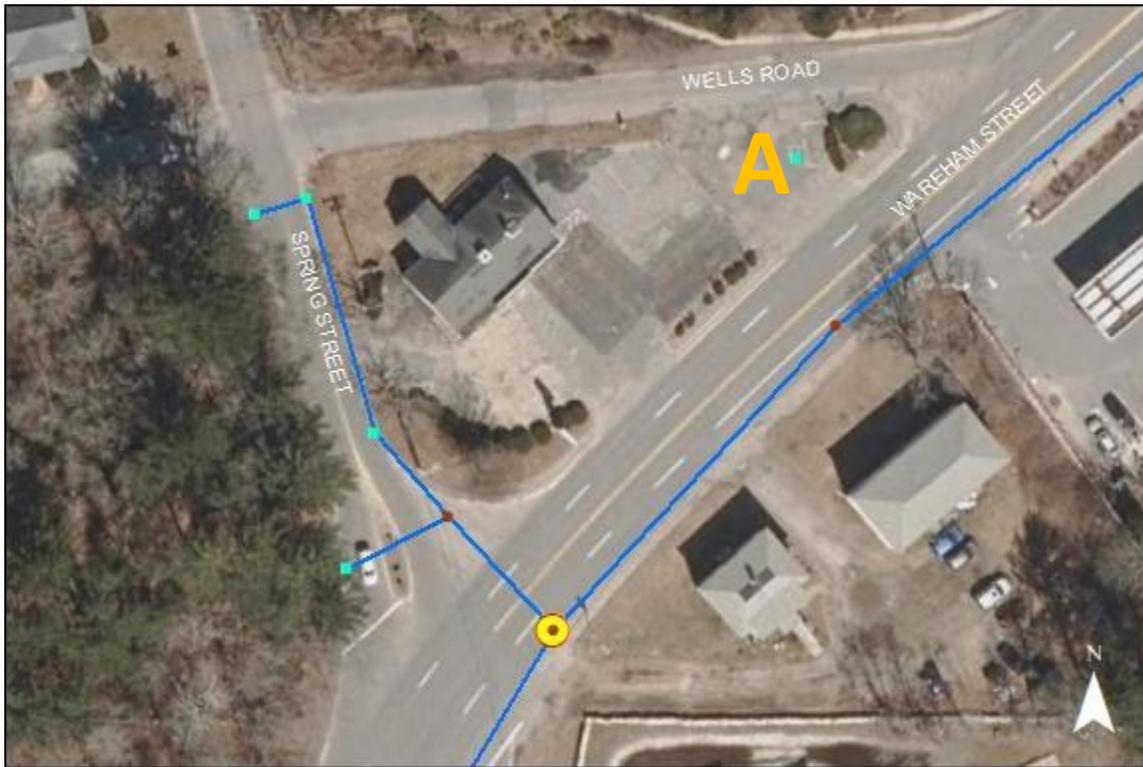
Sippican Elementary School- No issues observed. At point A there is a 12" cement pipe running through the structure. It is damaged. Unsure of what that piper carries. Further attention is strongly recommended.



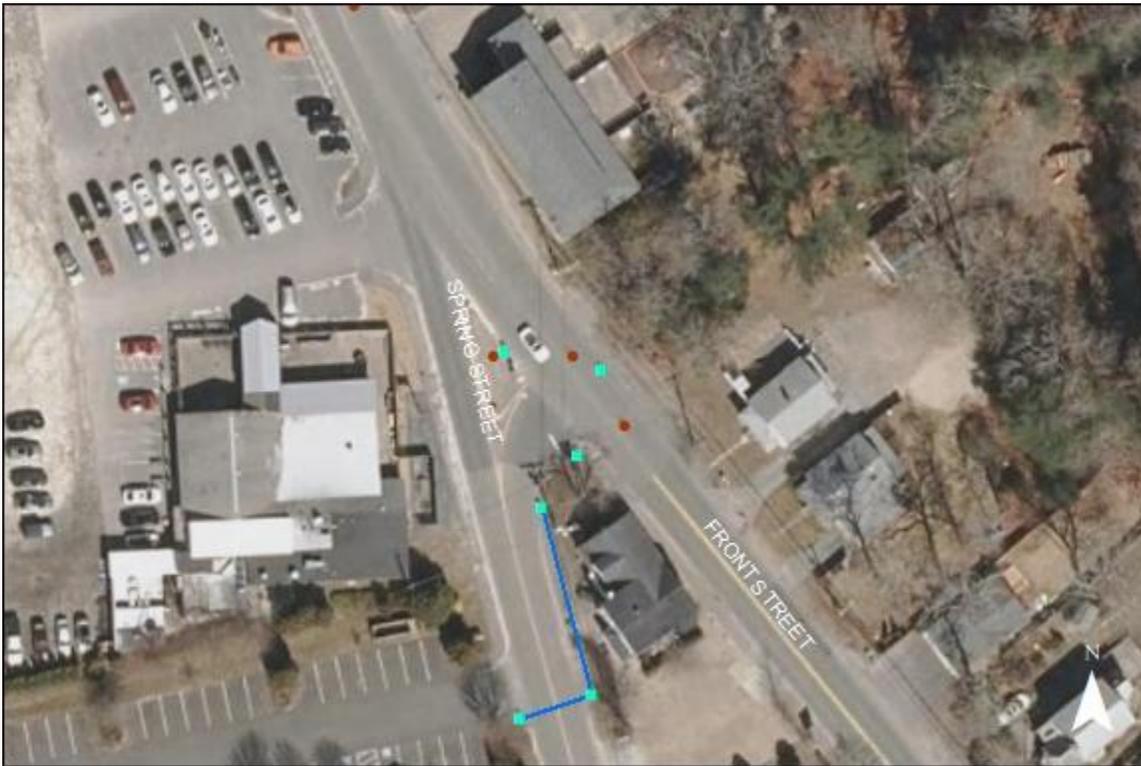
NSR1103PI- Point Road: At Point A, both the manhole and catchbasin are full of dirt. Further maintenance is recommended.



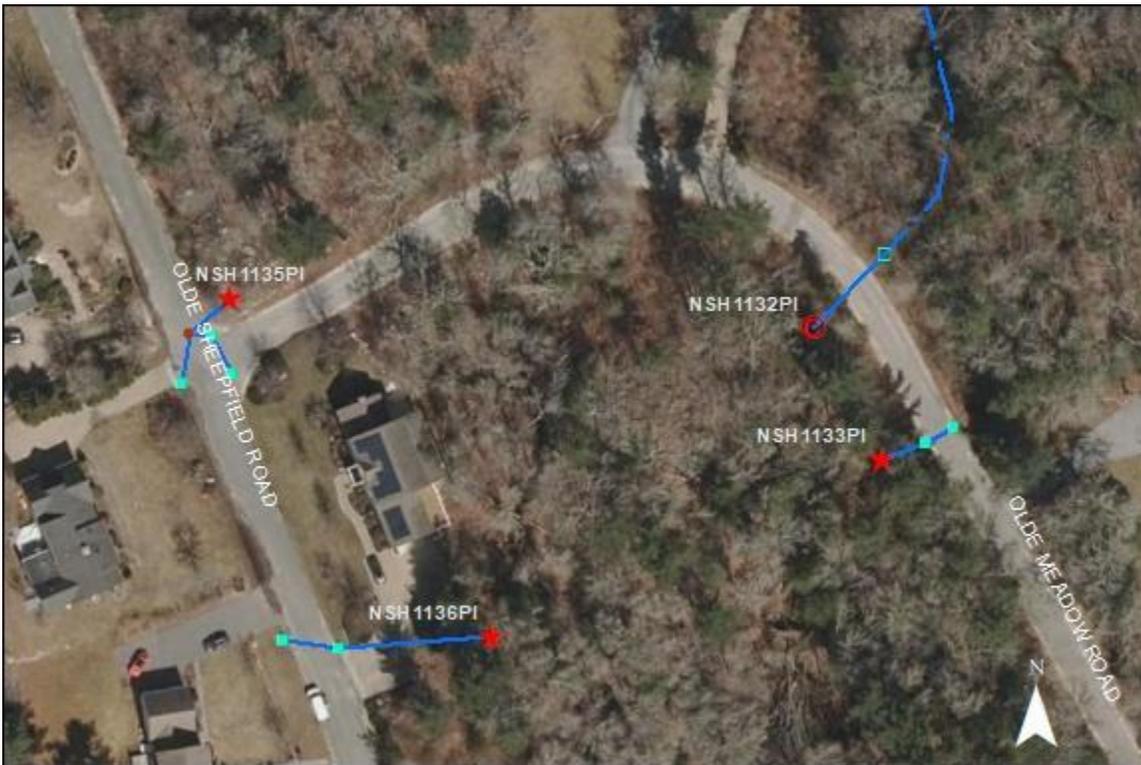
NSR1098PI, NSR1127PI, NSR1126PI, and NSR1097PI- Point Road: No issues found.



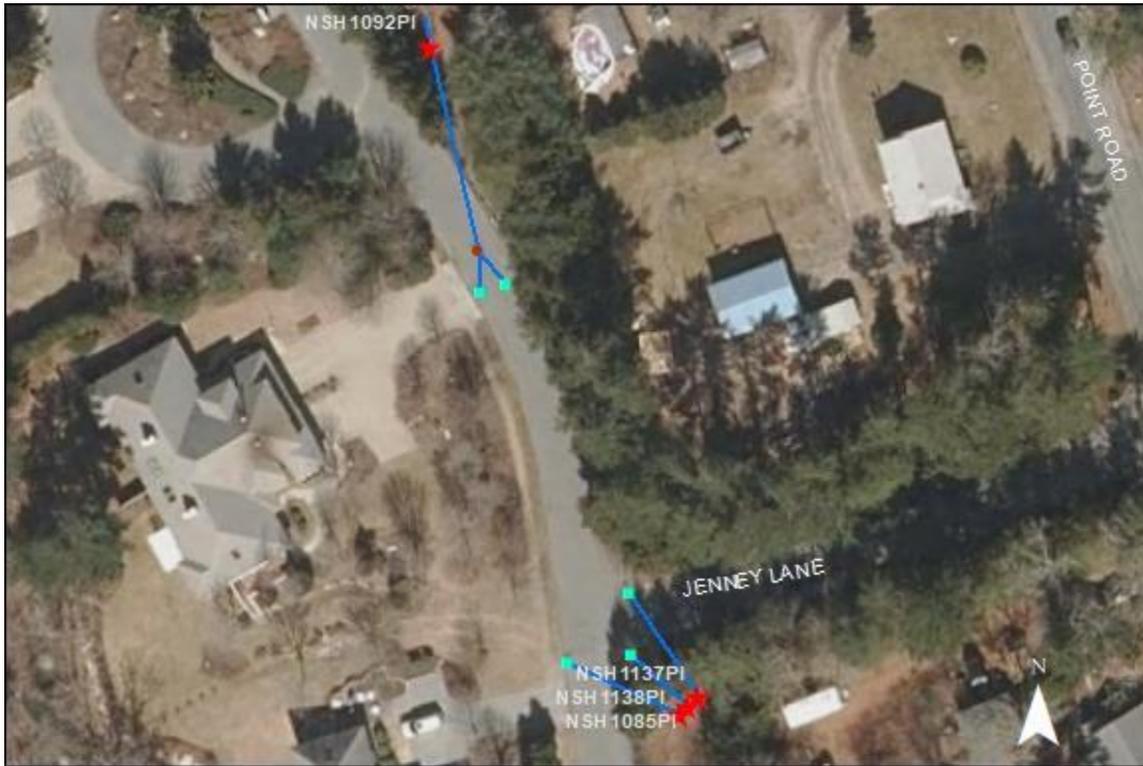
Spring Street: No issues found. Spring Street drains into a state road as shown at the yellow circle above. The catchbasin shown at point A is sinking. Further maintenance is suggested.



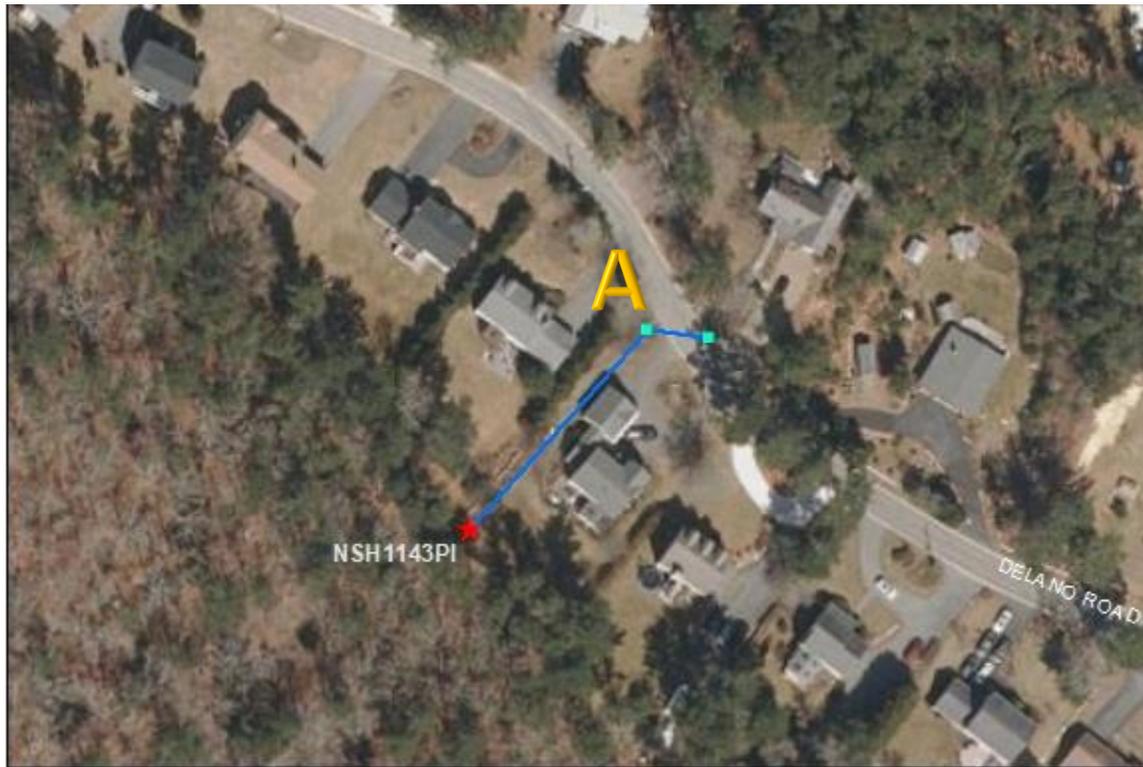
Spring Street: No issues found. Front Street North of Route 6 needs a police detail to be completed.



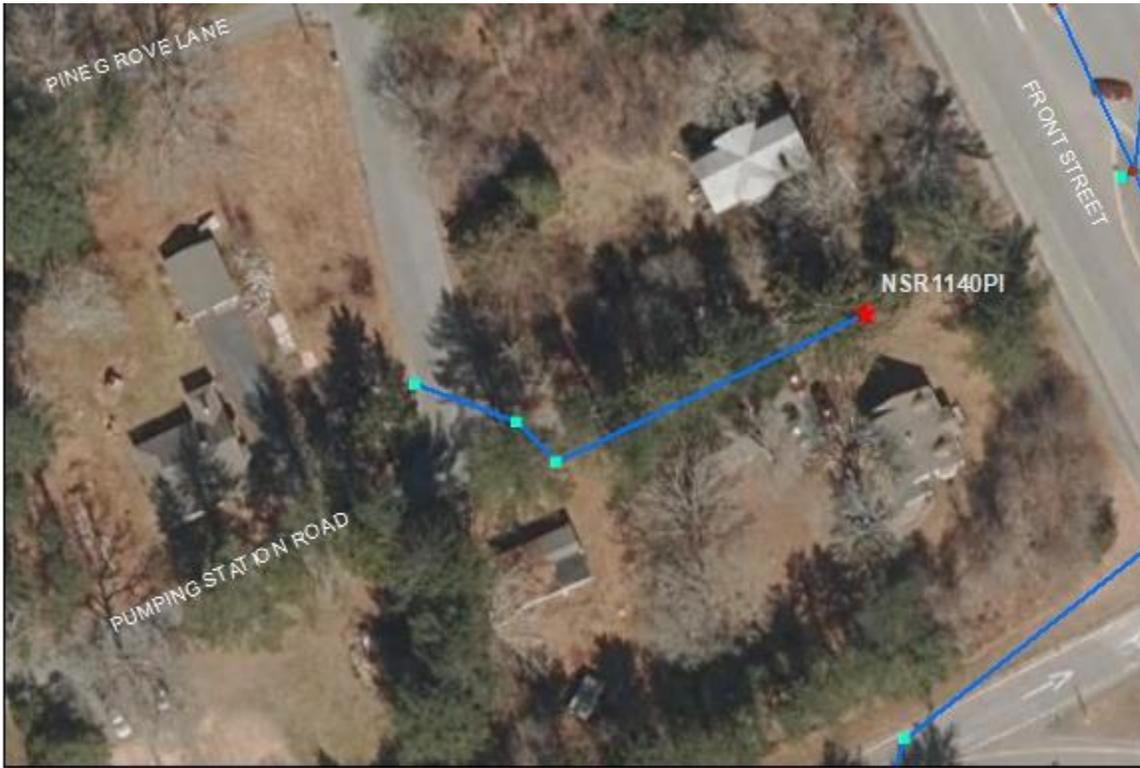
NSH1133PI, NSH1132PI, NSH1136PI, and NSH1135PI- Olde Meadow Road and Olde Sheepfield Road: No issues found.



NSH1092PI, NSH1137PI, NSH1138PI, and NSH1085PI- Jenny Lane: No issues found.



NSH1143PI- Delano Road: No significant issues found. At point A the road floods during rain events. There is a small 4" HDPE pipe located above ground to help relieve this issue. However, it does not extend far enough to drain the water retention in front of house #529. Further remediation is recommended.



NSR1140PI- Pumping Station Road: No issues found.

July 18, 2023

Meghan Davis, PE
Engineering Manager
50 Benson Brook Road
Marion, Massachusetts 02738

Re: Additional Drain and Sewer Investigation – Memorandum

Project Overview

The Town of Marion tasked Weston & Sampson with inspecting areas of the sanitary sewer system and stormwater drain system in various areas of town. The goal of this project was to locate problem areas and any structural defects within the sewer and drain systems that have caused ongoing operation and maintenance issues, or the configuration is unclear. The investigations took place on January 27th, February 7th, June 21st and June 22nd, 2023. Weston & Sampson is pleased to present the following memorandum, detailing our findings.

907 and 909 Point Road Drainage

Under the direction and supervision of Weston & Sampson, Truax Corporation investigated the drainage network area near 907 and 909 Point Road. Due to previous access issues the town was unclear of the condition of the drains in this area. In total, four (4) segments were investigated, and the information is as follows:

CB-2 to CB-3 (Upstream Camera Direction) – 12-inch Concrete – 12-foot joints – 35 LF (Partial)

- 0+05 – Roots - Minor
- 0+35 – Obstruction – Heavy Debris
- 0+35 – Survey Abandoned – Could not pass heavy debris

DMH-1 to Inlet (Upstream Camera Direction) – 12-inch Concrete – 3-foot joints – 115 LF

- 0+05 – Material Change – Concrete to VC
- 0+05 – Offset Joints - Throughout
- 0+71 – Broken Joint
- 0+71 – Material Change – VC to Corrugated Metal
- 0+93 – Material Change – Corrugated Metal to VC
- 1+01 – Crack - Longitudinal
- 1+09 – Roots – Minor
- 1+15 – Inlet (Plug Shown in Video)

DMH-1 to NSH1103PI (Downstream Camera Direction) – 24-inch Corrugated Metal - 48 LF

- 0+19 – Surface Corrosion - Throughout
- 0+28 – Open Joint
- 0+48 – NSH1103PI (Plug Shown in Video)

DMH-1 to CB-1 (Upstream Camera Direction) – 12-inch Concrete – 15 LF

- 0+15 – CB-1

Ultimately, the residents have not experienced drainage issues since the town installed a grate at the inlet and no further action appears to be necessary.

Delano Road Culvert

Under the direction and supervision of Weston & Sampson, Truax Corporation investigated the Delano Road culvert as requested by the Town of Marion. This inspection was performed on June 22, 2023 and the culvert information is below:

Inlet to Discharge (Downstream Camera Direction) – RC Box Culvert – 30 LF

- 0+00 – Partial Collapse – 9 o'clock - Begins
- 0+00 – Deterioration – 4 o'clock to 8 o'clock
- 0+11 – Partial Collapse - 9 o'clock - Ends

- 0+13 – Deterioration - 4 o'clock to 8 o'clock – Ends
- 0+28 – Water Main Visible
- 0+30 – Survey Abandoned - Discharge

Recommend replacement of box culvert and relocate existing water main to flow below final elevation of box culvert.

290 Delano Road Drainage

Truax Corporation attempted to clean and televise the 4-inch PVC outgoing line that was identified in the leaching basin near 290 Delano Road. It was discovered that the 4-inch PVC travels along Delano and then has an alignment change and travels approximately 75 linear feet down the neighboring driveway until it discharges to a stone pit. There is no access at the downstream discharge.

Truax Corporation could not conduct the drain cleaning and inspection due to a lack of access at the points of entry. An attempt was made to clean the 4-inch pipe from the leaching basin, however, the contractor immediately hit an obstruction and no inspection could be attempted. It is believed that there may be a break in the pipe as debris was pulled back from the cleaning operation.

Recommend replacement of the 4-inch outgoing pipe with potentially a larger pipe and discharge to an infiltration basin, if possible. There is no town-owned drainage network within a practical distance to this location to connect to at this time.

Ichabod Lane Drainage

Under the direction and supervision of Weston & Sampson, Truax Corporation attempted to clean and televise the drainage on Ichabod Lane. This small drainage network includes six (6) catch basins and two outfalls. An attempt was made to inspect this network on two occasions. Once in January 2023 and once in June 2023. On both occasions, the outfall was completely submerged, and inspection could not be complete. Through significant dewatering partial inspection of one segment was complete. It was also identified that a majority of the sewer in this area is unreinforced concrete and therefore can not be properly cleaned.

At the time of the attempted inspection significant roots and debris were removed from CB-3 on the plan. This appeared to allow for slightly improved flow of the stormwater, however, since both outfalls are submerged it was difficult to confirm if the street's drainage network will see significant improvements in functionality.

Segment CB-3 to CB-2 was partially investigated on January 27, 2023. Segment information is as follows:
CB-3 to CB-2 (Upstream Camera Direction) – 12-inch Concrete – 12-foot joints – 88 LF (Partial)

- 0+02 – Material Change – Concrete to Corrugated PVC
- 0+11 – Material Change – Corrugated PVC to Corrugated Metal
- 0+88 – Material Change – Corrugated Metal to Concrete
- 0+88 – Survey Abandoned – Could not pass Material Change

Recommend a study to confirm if rehabilitation of entire drainage network on Ichabod Lane is needed. In speaking with residents and town personnel it appears that multiple open cut point repairs were completed in this area over the years. This has caused the drainage pipe to have multiple material changes which hinder flow and create areas where roots can intrude into the system. Total replacement, if possible, would decrease the likelihood of root intrusion in the future and will also create an area that will be easier to clean and maintain in the future since currently the pipe can not be heavily cleaned easily due to the unreinforced concrete pipe. Therefore, recommend full replacement of the drainage network with potential upsizing of the pipe and reconfiguration elevations of the piping and outfalls.

Front Street Drainage

Under the direction and supervision of Weston & Sampson, Truax Corporation performed drain inspections on Front Street near house number 260. The town was interested in investigating this area due to recent operation and maintenance issues. During the investigation, it was identified that OF-NSH1124PI either does not exist or is not connected to the drainage network on the street as shown on the town's mapping. In total five (5) segments were inspected in this area and the information is as follows:

DMH to CB-1 (Upstream Camera Direction) – 12-inch RC – 8 LF (Partial)

- 0+08 – Offset Joint - Severe
- 0+08 – Survey Abandoned – Could not pass Offset

DMH-1 to CB-2 (Upstream Camera Direction) – 12-inch DI – 2 LF (Partial)

- 0+02 – Roots – Heavy
- 0+02 – Survey Abandoned – Could not pass Roots

CB-3 to DMH (Downstream Camera Direction) – 12-inch DI – 18 LF

- 0+18 – DMH

DMH to NSH1063PI (Downstream Camera Direction) – 12-inch RC – 15 LF

- 0+15 – NSH1063PI

DMH-1 to DMH (Downstream Camera Direction) – 12-inch Concrete – 15 LF

- 0+02 – Surface Corrosion – Throughout
- 0+02 – Roots – Light – Throughout
- 0+31 – Hole – Large – Rocks and Soil Visible
- 0+91 – Hole – Minor Puncture
- 0+97 – Offset Joint – Minor
- 1+15 – Offset Joint – Medium
- 1+18 – Sag – Medium
- 1+37 – Broken – Joint
- 1+90 – Offset Joint – Minor
- 1+92 – DMH

After reviewing the inspections for the area of Front Street. Multiple issues were identified that may require attention. They are as follows:

- o Recommend heavy cleaning to remove roots and debris between DMH-1 and CB-2.
- o Recommend clearing area around NSH1063PI as it appears debris buildup could impede flow from the catch basins on Front St.
- o In addition, recommend open cut point repair approximately 8 LF upstream of DMH toward CB-1 to repair severe offset joint. It appears this offset may have been constructed with this alignment change/offset due to other utility conflicts. Therefore, that would need to be investigated prior to construction.
- o Another open cut repair is recommended 0+31 downstream of DMH-1 toward DMH to repair a large hole in the drain pipe with rocks and soil visible.

Creek Road Drainage

Under the direction and supervision of Weston & Sampson, Truax Corporation cleaned and investigated a drainage network on Creek Road near 63 Creak Road. This area was identified for investigation as the wooded area near the discharge becomes flooded during heavy rain events. In total six (6) drainage segments were inspected in this area and the inspection information is below:

DMH-1 to NSH1098PI (Downstream Camera Direction) – 12-inch DI – 25 LF

- 0+23 – Material Change – DI to RC
- 0+23 – Roots - Medium
- 0+25 – NSH1098PI

DMH-1 to CB-1 (Upstream Camera Direction) – 12-inch DI – 22 LF

- 0+22 – CB-1

DMH-1 to CB-2 (Upstream Camera Direction) – 8-inch DI – 16 LF

- 0+16 – CB-2

DMH-1 to CB-3 (Right Pipe) (Downstream Camera Direction) – 8-inch DI – 15 LF

- 0+15 – DMH-1

DMH-1 to CB-3 (Left Pipe) (Downstream Camera Direction) – 8-inch DI – 15 LF

- 0+15 – DMH-1

Discharge to Inlet (Upstream Camera Direction) – 12-inch RC – 33 LF

- 0+09 – Roots – Medium
- 0+15 – Hole – Large – Rocks and Soil Visible
- 0+17 – Collapse

- 0+17 – Survey Abandoned – Could not pass Collapse
- 0+33 – Heavy Debris
- 0+33 – Reversal Begins

Recommend clearing area around NSH1098PI as it appears debris buildup could impede flow from the catch basins on Creek Rd. In addition, recommend replacement of drain from Discharge to Inlet due to collapse identified during the investigation.

F-5-0100 Spring Street Sewer Investigation

The town requested Weston & Sampson to investigate the incoming line at 12 o'clock in the manhole investigation photograph of F-5-0100 on Spring Street. At the time, the town had no record of this incoming line and wanted to confirm if there were any active services connected to this potential stub.

This segment was investigated on June 21, 2023. It was discovered that this segment is 8-inch AC and there was an upstream manhole. Segment information is as follows:

F-5-0100 to F-5-100A (Upstream Camera Direction) – 8-inch AC – 13-foot joints – 208 LF

- 0+56 – Tap Break-in – 9 o'clock – Active
- 0+68 – Broken Pipe – Hole
- 1+41 – Tap Break-in – 9 o'clock - Active – Intruding 1-inch
- 2+08 – SMH F-5-0100A
- 2+08 – Tap Factory – 9 o'clock – Active – in SMH F-5-0100A

Recommend this sewer segment be added to the town's Geographic Information System (GIS) layer and a sewer tie card be created and filed with the town for future reference for all three sewer connections that were identified.

Summary and Conclusion

In total, Weston & Sampson investigated seven (7) areas as requested by the town. Below is our recommendation for each area based on these investigations:

- 907 and 909 Point Road: No further action required.
- Delano Road Culvert: Replace culvert.
- 290 Delano Road: Replace 4-inch PVC discharge pipe, if owned by the town.
- Ichabod Lane: Perform a study to determine if upgrades would remedy the existing drainage issues.
- 260 Front Street: Two open cut point repairs and additional cleaning is needed at the outfall and within the collection system.
- Creek Road: One open cut point repair and additional cleaning is needed at the outfall.
- F-5-0100 Spring Street Sewer: New SMH found, recommend adding to town's GIS and creating sewer tie cards for three sewer services that were identified.

cc: Nathaniel Munafo, Marion WPCF

P:\MA\Marion\2230029 - FY23 Sewer Investigation\Memo\Marion - Additional Investigation Memo.docx

ATTACHMENTS

LOCUS MAPS



CB-3

CB-2

CB-1

DMH-1

Inlet

NSH1103PI

Televise small drainage network near 907 and 909 Point Road

NO PIPE CONNECTING CB-2 TO CB-1



Televise Delano
Road Culvert

Inlet

Discharge

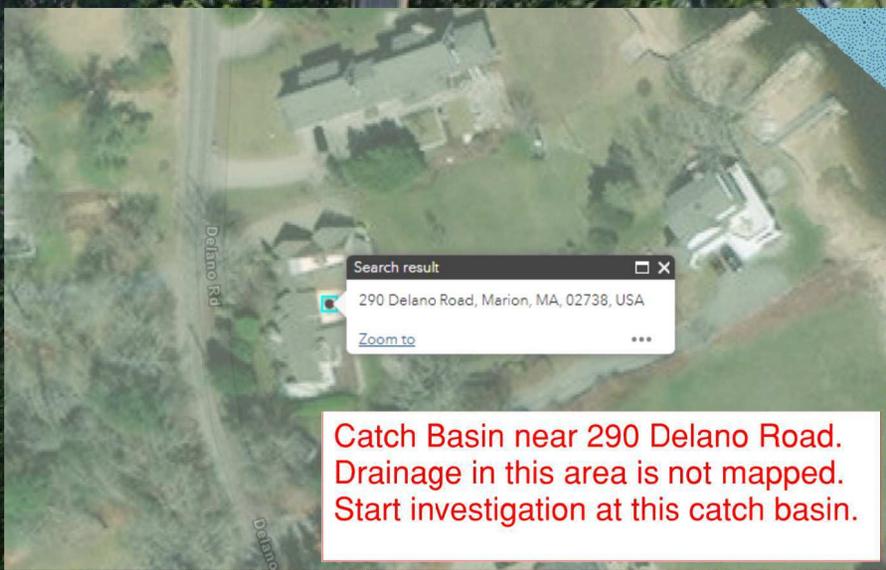
Delano Rd

S Great Hill Dr

S Great Hill Dr

Delano Rd

Delano Rd



Catch Basin near 290 Delano Road.
Drainage in this area is not mapped.
Start investigation at this catch basin.

Leaching
Basin

Televised approx. 90 LF upstream of this CB. Could not clean do to condition of pipe.

Televise drainage network on Ichabod Lane

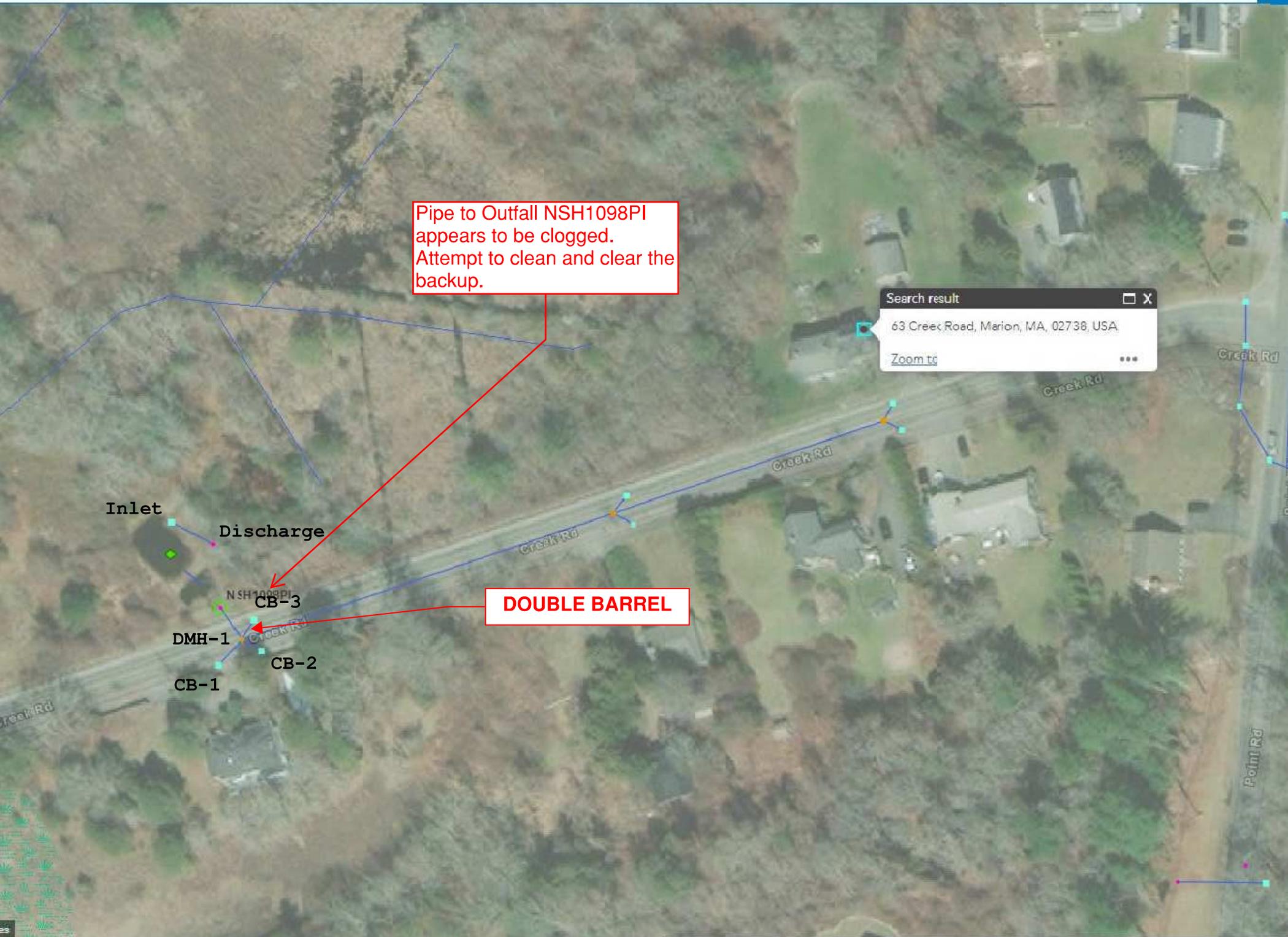




Televise these segments in front of 260 Front Street.

DMH-1 TIES INTO DMH:
DMH-1 HAS NO
OUTGOING PIPE TO
NSH1124PI



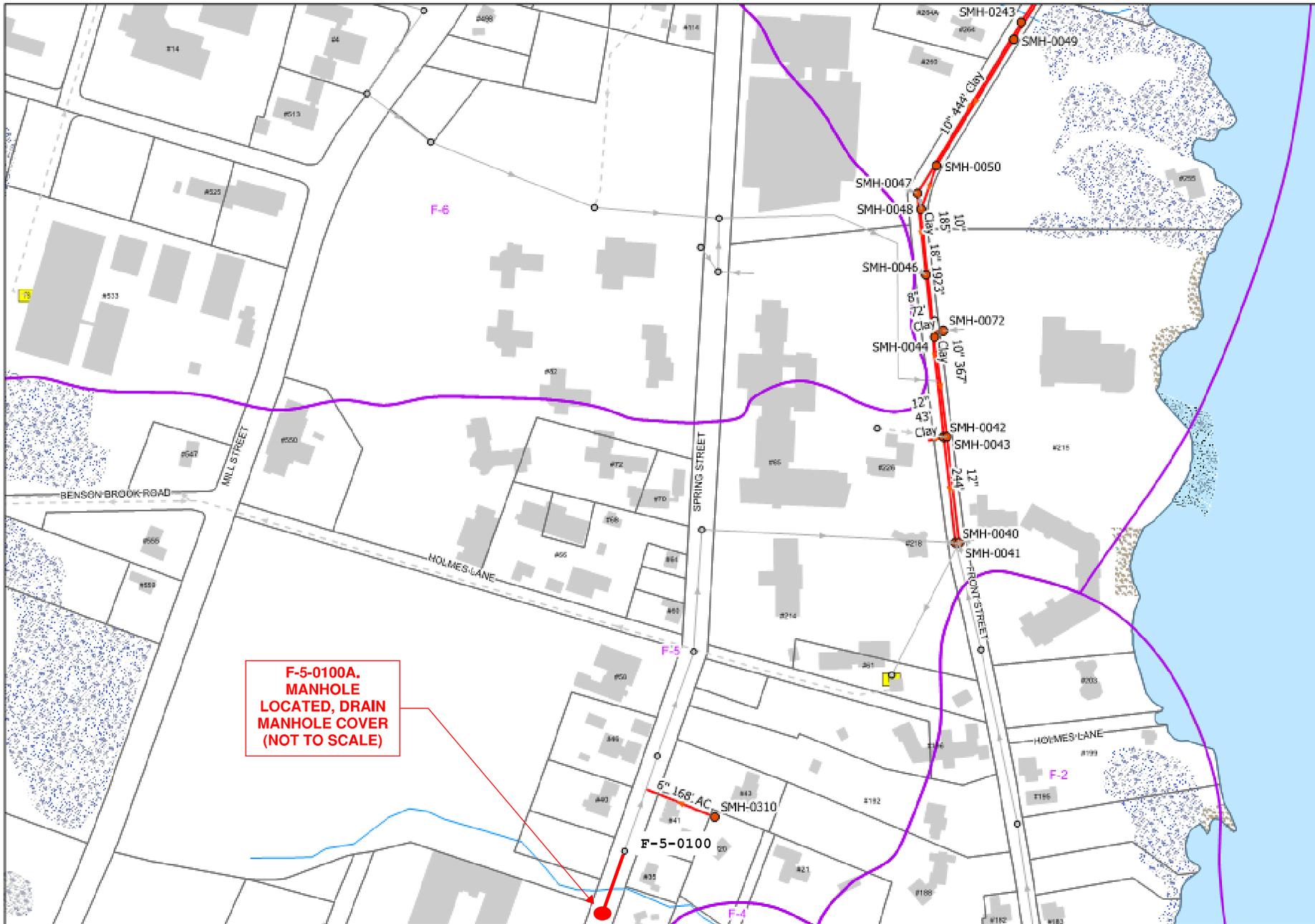


Pipe to Outfall NSH1098PI appears to be clogged. Attempt to clean and clear the backup.

DOUBLE BARREL

Search result
63 Creec Road, Marion, MA, 02738, USA
Zoom to

Inlet
Discharge
NSH1098PI
CB-3
DMH-1
CB-1
CB-2



**F-5-0100A.
MANHOLE
LOCATED, DRAIN
MANHOLE COVER
(NOT TO SCALE)**

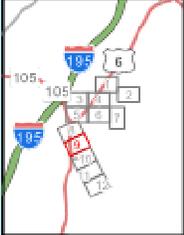
FIGURE 1
MARION, MASSACHUSETTS
FY23 III INVESTIGATION

Disclaimer:
The information shown is for planning purposes only and
does not constitute a contract. For construction and
utilization is required.

- Legend**
- Force Main
 - Non-Project Gravity Main
 - Low Pressure
 - Parcel
 - Building
 - Pump Station
 - Manhole
 - Project Edge
 - SheetPile
 - Structure
 - Hydrologic Connection
 - Manhole
 - Crumbly Bag
 - Open Water
 - Reservoir (with FHEED)
 - Tidal Flats
 - Beach/Dune
 - Non-Project Manhole



Weston & Sampson



9

MAP SHEET 9 of 12