



# STORMWATER MANAGEMENT PLAN (SWMP)

Town of Marshfield

September 2021 (revised)

**ENVIRONMENTAL**  
 **PARTNERS**

— An Apex Company —

## Stormwater Management Plan (SWMP) Revision History

MS4 Materials that supplement the 2019 SWMP Document

<u>Revision #</u>	<u>Date</u>	<u>Comments</u>
0	6/2019	SWMP Published for Town Comment
1	10/2020	IDDE Plan, O&M Plan, and Facility Inventory are included as Appendix K
2	9/2021	Year 3 Updates

"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 gathered and evaluated 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, 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."

Printed Name

Signature

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Date



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# SECTION 1 BACKGROUND

## SECTION 1.1 STORMWATER REGULATION

The Stormwater Phase II Final Rule was promulgated in 1999 and was the next step after the 1987 Phase I Rule in an effort by the Environmental Protection Agency (EPA) to preserve, protect, and improve the Nation's water resources from polluted stormwater runoff. The Phase II Rule expands the Phase I program by requiring additional programs and practices to control polluted stormwater runoff from small Municipal Separate Storm Sewer Systems (MS4s) in urbanized areas and construction sites, through the use of National Pollution Discharge Elimination System (NPDES) permits. Phase II is intended to further reduce adverse impacts to water quality and aquatic habitat by instituting the use of controls on the unregulated sources of stormwater discharges that have the greatest likelihood of causing continued environmental degradation. Under the Phase II rule all MS4s with stormwater discharges from U.S. Census-designated urbanized area are required to seek NPDES permit coverage for those stormwater discharges.

## SECTION 1.1 PERMIT PROGRAM BACKGROUND

On May 1, 2003, EPA Region 1 issued its Final General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (2003 small MS4 Permit) consistent with the Phase II Rule. The 2003 small MS4 Permit covered "traditional" (e.g., cities and towns) and "non-traditional" (e.g., Federal and state agencies) MS4 operators located in the states of Massachusetts and New Hampshire. This permit expired on May 1, 2008 but remained in effect until operators were authorized under the 2016 small MS4 General Permit, which became effective on July 1, 2018.

## SECTION 1.2 STORMWATER MANAGEMENT PLAN (SWMP)

The SWMP describes and details the permittee's plans and activities that will be implemented to meet the terms and conditions of the 2016 MS4 Permit. The document should be updated and/or modified during the MS4 Permit term as the permittee's activities are modified, changed, or updated to meet MS4 Permit conditions. Additionally, MS4 reports (Operation and Maintenance Plan, Illicit Discharge Detection and Elimination Plan, etc.) annual reports, and inspection reports should be attached to the SWMP as appendices. Thus, the SWMP should act as a living document that records the permittee's planned and completed progress toward meeting the MS4 Permit requirements.

The main elements, or minimum control measures (MCMs), of the stormwater management program are (1) a public education program in order to affect public behavior causing stormwater pollution, (2) an opportunity for the public to participate and provide comments on the stormwater program, (3) a program to effectively find and eliminate illicit discharges within the MS4, (4) a program to effectively control construction site stormwater discharges to the MS4, (5) a program to ensure that stormwater from development projects entering the MS4 is adequately controlled by the construction of stormwater controls, and (6) a good housekeeping program to ensure that stormwater pollution sources on municipal properties and from municipal operations are

minimized. The hyperlinks provided in Appendix A offer additional information and supporting documents related to the MS4 Permit and the aforementioned minimum control measures.

## SECTION 1.3 TOWN SPECIFIC MS4 BACKGROUND

The Town staff must give special consideration to and meet eligibility requirements for their discharges to be able to apply for coverage under the MS4 Permit. Eligibility will be determined based on three categories: Endangered Species Act, National Historic Preservation Act, and Water Quality Impaired Waters. The Town must establish that discharges from Marshfield's storm drain system do not adversely impact endangered species, critical habitats, and historic properties in order to be covered by the MS4 Permit. Furthermore, the Town must identify all receiving waters that have been classified as Water Quality Impaired Waters by the Massachusetts Department of Environmental Protection (MassDEP). The Town of Marshfield and its surrounding water bodies are shown on Figure 1: System Locus. The Notice of Intent (NOI) for coverage under the Small MS4 General Permit was submitted to EPA and MassDEP on September 28, 2018. A copy of the NOI is provided in Appendix B.

## SECTION 2 SWMP COMPONENTS

### SECTION 2.1 PARTIES INVOLVED IN IMPLEMENTATION

Stormwater programs in the Town of Marshfield are currently a responsibility of the Town Engineer, Rod Procaccino. The Town has not yet created or staffed a dedicated stormwater management position or stormwater committee. However the current departments involved in stormwater management are listed in Table 2-1, below.

**Table 2-1: List of Parties Responsible for SWMP Implementation**

Name	Title	Department
Rod Procaccino	Town Engineer	Department of Public Works (DPW) / Engineering
Tom Reynolds	DPW Superintendent	DPW Operations
Craig Hannafin	Chair	Conservation Committee
Michael Biviano Jr.	Chairman	Planning Board
Lynne Fidler	Chair	Zoning Board of Appeals

### SECTION 2.2 DOCUMENTATION REGARDING ENDANGERED SPECIES

In order to comply with part 1.9.1 of the NPDES Permit, the Town has attached documentation in Appendix D supporting Marshfield's eligibility determination of Criterion B with regard to federal Endangered and Threatened Species and Critical Habitat Protection. Criterion B states that, "under section 7 of the ESA [Endangered Species Act], the consultation resulted in either a no jeopardy opinion (formal consultation) or a written concurrence by USFWS [U.S. Fish and Wildlife Service] on a finding that the stormwater discharges and MA MS4 General Permit Appendix C page 3 of 7 discharge related activities are 'not likely to adversely affect' listed species or critical habitat (informal consultation)." In this case, USFWS provided a letter in place of a concurrence letter for informal consultation.

The attachments in Appendix D include the aforementioned letter, as well as the results of the Information, Planning, and Consultation System (IPaC System) environmental review process. Using the IPaC System environmental review process, four endangered species have been identified within Marshfield's boundaries: the Northern Long-Eared Bat, the Piping Plover, the Red Knot, and the Roseate Tern. None of these species have critical habitats designated within the Town, and the MS4 Permit will not adversely affect any of the listed species within the MS4 area.

### SECTION 2.3 DOCUMENTATION REGARDING HISTORIC PROPERTIES

The Town has attached documentation in Appendix E supporting Marshfield's eligibility determination regarding Historic Properties, in compliance with part 1.9.2 of the MS4 Permit. This document, Appendix D of the Massachusetts General MS4 Permit, includes information supporting



Marshfield's determination as Criterion A, stating that the discharges do not have the potential to cause adverse effects on historic properties.

Historic site considerations will be evaluated further as part of the design/permitting of new/retrofit structural best management practices (BMPs) proposed for implementation as part of MS4 Permit compliance. Regarding the National Historic Preservation Act, under 36 CFR 800, this permittee is an existing permittee authorized by the previous MS4 Permit, and is not undertaking any activity involving subsurface land disturbance less than one acre. This MS4 Permit will have "no potential to cause effects," in accordance with 36 CFR 800.3(a)(1).

## SECTION 2.4 DOCUMENTATION REGARDING DISCHARGES

Attached in Appendix F is the documentation for tracking any new or increased discharges granted by MassDEP in compliance with part 2.1.2 of the MS4 Permit. The Town will document any new and/or increased discharges on the form provided in Appendix F and include project specific information regarding best management practices implemented for those discharges.

## SECTION 2.5 SANITARY SEWER OVERFLOW (SSO) INVENTORY

In the event of an overflow or bypass, a notification must be reported within 24 hours by phone to MassDEP, EPA, and other relevant parties. The verbal notification should be followed up with a written report following MassDEP's Sanitary Sewer Overflow (SSO)/Bypass notification form within five calendar days of the time you become aware of the overflow, bypass, or backup.

An inventory of all known locations where SSOs have discharged to the MS4 will be maintained by the Town if any are found. This inventory shall include SSOs resulting from inadequate conveyance capacities, or where interconnectivity of the storm and sanitary sewer infrastructure allows for connection of flow between the systems. A SSO inventory form is provided in Appendix G and is updated annually. The inventory includes the following information:

1. Location (approximate street crossing/address and receiving water, if any);
2. A clear statement of whether the discharge entered a surface water directly or entered the MS4;
3. Date(s) and time(s) of each known SSO occurrence (i.e., beginning and end of any known discharge);
4. Estimated volume(s) of the occurrence;
5. Description of the occurrence indicating known or suspected cause(s);
6. Mitigation and corrective measures completed with dates implemented; and
7. Mitigation and corrective measures planned with implementation schedules.

## SECTION 2.6 IDDE PROGRAM AND BYLAWS

The Town's IDDE plan was developed during the first year of the new MS4 Permit. The IDDE program is detailed in Minimum Control Measures Section 3.3. The Town's current Stormwater Management and Erosion Control and Illicit Discharge Bylaw is provided in Appendix H.

## **SECTION 2.7      SEDIMENT AND EROSION CONTROL PROCEDURES**

Written procedures for the Town's site inspections and enforcement of sediment and erosion control procedures in accordance with part 2.3.5 of the MS4 Permit, Construction Site Stormwater Runoff Control, are detailed in Minimum Control Measures Sections 3.4 and 3.5. This information includes the party responsible for site inspections and implementation of procedures.

## **SECTION 2.8      PUBLIC DRINKING WATER SUPPLY SOURCES PROTECTION**

The Town has developed practices in effort to avoid or minimize impacts to surface public drinking water supply sources. These efforts are detailed in Minimum Control Measures Section 3.6, Good Housekeeping and Pollution Prevention. The Town plans to prioritize the enforcement of the existing stormwater pollution prevention plans.

## **SECTION 2.9      ACTIVITIES TO MONITOR DISCHARGES**

The Town will identify any discharges within public drinking water supply source areas and give priority to outfall inspections and screening required of the Minimum Control Measures in Section 3.3.

## **SECTION 2.10     ANNUAL PROGRAM EVALUATION**

To comply with part 4.1 of the MS4 Permit, the Town annually self-evaluates compliance with the terms and conditions of the MS4 Permit and submits each self-evaluation as part of the Fiscal Year annual report. The NPDES Phase II Small MS4 General Permit Annual Reports for Fiscal Year 2018 through the most recent Fiscal Year are attached in Appendix I.

## SECTION 3 MINIMUM CONTROL MEASURES

In an effort to reduce pollutants and comply with part 2.3 of the MS4 Permit, the Town focuses on the six minimum control measures detailed in this section. These sections describe the Town's practices to comply with each control measure, the responsible person(s) or party of each practice, and the BMP goal(s) of each control measure. The BMPs for each of the six minimum control measures are outlined in the forms provided in Appendix J.

### SECTION 3.1 PUBLIC EDUCATION AND OUTREACH

The permittee shall implement an education program that includes educational goals based on stormwater issues of significance within the MS4 area. The ultimate objective of a public education program, MS4 Permit part 2.3.2, is to increase knowledge and change behavior of the public so that the pollutants in stormwater are reduced.

The Town implemented a public education program as required by the 2003 permit and will continue that program and make the necessary adjustments to meet the additional requirements of the 2016 MS4 Permit.

The program must include the education of the following four audiences: (1) residents, (2) businesses, institutions (churches, hospitals), and commercial facilities, (3) developers (construction), and (4) industrial facilities.

#### Section 3.1.1 Background

The Town of Marshfield has implemented several actions in efforts to reach public education and outreach goals. The Town added language to the Water Quality Report to emphasize stormwater management, and that report is sent out on an annual basis. The Water Quality Report is mailed to all residents representing 98% of the Town.

The Town continues to partner with North and South River Watershed Association (NSRWA) and Greenscapes Coalition. Part of these partnerships involves the NSRWA Greenscapes Program, which includes brochures and reference guides that are on display at the Marshfield Town Hall, including pet waste information brochures. Presentations are made annually to Marshfield second graders at the Eames Way School, featuring the "Water All Around You" Program. A Facebook page has been set up to feature Greenscapes Program information, including the WaterSmart business program, rain barrel sale, and Gardening Green Expo.

#### Section 3.1.2 Best Management Practices

I. Distribution of a minimum of two (2) educational messages over the MS4 Permit term to the required audiences within the MS4 Permit term, as listed below.

A. Residents

1. Publish outreach materials; distribute new resident packets to residents within Wetland Protection Areas.

2. Develop/maintain stormwater website and/or utilize Town social media for outreach. Provide specific information directed towards residents.
- B. Businesses, Institutions, and Commercial Facilities
  1. Include stormwater information in permit materials.
  2. Develop/maintain stormwater website and/or utilize Town social media for outreach. Provide specific information directed towards businesses, institutions, and commercial facilities.
- C. Developers (Construction)
  1. Include stormwater information in permit materials. Review and update application forms to meet the new requirements.
  2. Develop/maintain stormwater website and/or utilize Town social media for outreach. Provide specific information directed towards developers.
- D. Industrial Facilities
  1. Distribute stormwater information to industrial groups based on zoning and property use.
  2. Develop/maintain stormwater website and/or utilize Town social media for outreach. Provide specific information directed towards industrial facilities.

## SECTION 3.2 PUBLIC INVOLVEMENT AND PARTICIPATION

The objective of the public involvement and participation control measure, MS4 Permit part 2.3.3, is for the Town to provide the public with opportunities to engage in activities that promote good stormwater practices. The public must also be given the chance every year to review the Stormwater Management Plan and its implementation.

### Section 3.2.1 Background

Responsible parties for public involvement and participation efforts include the Department of Public Works and Engineering Department. The Town has continued to host its annual “Keep Marshfield Clean” weekend. Typically during this event, 3.77 tons of trash are collected Town-wide, with approximately 200 people participating. The Town’s solid waste transfer station also supports other neighborhood clean-up efforts. NSRWA joined with the Conservation Department to host volunteer programs, including removing debris and trash from the river bank, select dead tree and brush from South River, and litter and vegetative management along Bridal Path and over conservation land adjacent to Maryland Street.

### Section 3.2.2 Best Management Practices

- I. Public Review
  - A. Stormwater Management Plan Review (SWMP)
    1. Make SWMP available at least annually for public review.
- II. Public Participation
  - A. Use Stormwater Website to publish SWMP and annual reports. Website should contain a space for electronically soliciting public comments.
    1. Make physical copy available at Marshfield Town Hall.

## SECTION 3.3 ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM

The Town has implemented an IDDE program, per MS4 Permit part 2.3.4, in order to find and eliminate non-stormwater discharge sources. Procedures have been developed to fix any prevalent issues in the Town's storm sewer system. The Town has 92 outfall structures that discharge to water bodies within the Town of Marshfield's MS4 area. The MS4 area is displayed in Figure 2: MS4 Urbanized Areas, and the Town's inventory of outfalls structures is shown in Figure 4: Stormwater System Map. Below, Table 3-1 lists the Town's impaired waters, the impairments per water body, and any associated final Total Maximum Daily Load (TMDL) report numbers. Impairments will be discussed further in Section 4.

**Table 3-1: Impaired Waters, Impairments, and TMDLs**

Impaired Waters	Category	Impairments	Associated TMDLs
Green Harbor River (MA94-10)	5	<ul style="list-style-type: none"> <li>Fish-Passage Barrier</li> <li>Flow Regime Modification</li> <li>Algae</li> <li>Turbidity</li> </ul>	
North River (MA94-05)	5	<ul style="list-style-type: none"> <li>Fecal Coliform</li> <li>Mercury in Fish Tissue</li> </ul>	Fecal Coliform TMDL: 61725
Green Harbor (MA94-11)	4	<ul style="list-style-type: none"> <li>Fecal Coliform</li> </ul>	61731
North River (MA94-06)	4a	<ul style="list-style-type: none"> <li>Fecal Coliform</li> </ul>	61730
South River (MA94-09)	4a	<ul style="list-style-type: none"> <li>Fecal Coliform</li> <li>Enterococcus</li> </ul>	61728
Black Mountain Pond (MA94009)	4c	<ul style="list-style-type: none"> <li>Non-Native Aquatic Plants</li> </ul>	N/A

Category 4a Waters – impaired water bodies with a completed Total Maximum Daily Load (TMDL).

Category 4c Waters – impaired water bodies where the impairment is not caused by a pollutant. No TMDL required.

Category 5 Waters – impaired water bodies that require a TMDL.

### Section 3.3.1 Background

Responsible parties for IDDE efforts include the Department of Public Works and Engineering Department. The Town of Marshfield first developed its geographic information systems (GIS) mapping capabilities in 2004. The Town continues its contract with Maps Online for web accessible mapping. The Town is in the process of developing a new data management system with a vendor for issuing work orders and tracking work.

The Town has hired a consultant to conduct outfall inspections and sampling. This work is detailed in the Town's IDDE Plan, attached as Appendix L.

Additionally, the Town has hired a consultant to evaluate the Riverside Circle stormwater sand filter. The stormwater connectivity was reviewed and eight structures were sampled in the field and found to be above the DEP standard of 14MPN/100ml for Coastal Marine Classes. Because this system discharges to the North River, the Town is considering replacing the media.

### Section 3.3.2 Best Management Practices

- I. Legal Authority
  - A. The IDDE program shall include adequate legal authority to prohibit illicit discharges; investigate suspected illicit discharges; eliminate illicit discharges, including discharges from properties not owned by or controlled by the MS4 that discharge into the MS4 system; and implement appropriate enforcement procedures and actions. Adequate legal authority consists of a currently effective ordinance, bylaw, or other regulatory mechanism. For permittees authorized by the 2003 MS4 Permit, the ordinance, bylaw, or other regulatory mechanism was a requirement of the 2003 MS4 Permit and was required to be effective by May 1, 2008. For new permittees the ordinance, bylaw, or other regulatory mechanism shall be in place within three years of the MS4 Permit effective date.
- II. SSO Inventory
  - A. Develop SSO Inventory Database within one year of effective MS4 Permit date that logs historical SSOs that have occurred in the last five years, as discussed in further detail in Section 2.5.
    1. Coordinate with Sewer Department for tracking of any future SSOs.
- III. Storm Sewer System Map
  - A. Update map within two years of effective date of the MS4 Permit and complete full system map 10 years after effective date of MS4 Permit.
    1. Make an electronic and physical copy of the map available to the public via the stormwater website and Marshfield Town Hall.
    2. Map/verify 10% of system per year during MS4 Permit years one to 10.
      - a) Phase I will be focused on during Years one and two, while Phase II will be focused on during Years three through 10.
    3. Integrate system map updates with planned sewer expansion projects.
- IV. Written IDDE Program Development
  - A. Develop and complete written IDDE program within one year of effective MS4 Permit date. The IDDE program and permit attachments will be available at Marshfield Town Hall.
- V. Implement IDDE Program
  - A. Implement catchment investigations according to program and MS4 Permit conditions within 18 months of the effective date of the MS4 Permit.
    1. Continue to enforce bylaw.
    2. Draft and implement stormwater management regulations.
    3. Coordinate water quality monitoring with dry weather screening.
      - a) New monitoring system should include surveying for illicit discharge detection.
- VI. Employee Training

- A. Coordinate annual stormwater training and incorporate with training required in Section 6.2.IV.B.
- VII. Dry Weather Screening
  - A. Conduct screening in accordance with outfall screening procedure and MS4 Permit conditions.
    - 1. Screen 25% of outfalls per year during MS4 Permit years two to five.
- VIII. Conduct Wet Weather Screening
  - A. Conduct screening in accordance with outfall screening procedure and MS4 Permit conditions, and as determined by dry weather screening results.
- IX. Ongoing Screening
  - A. Conduct ongoing screening as necessary, and upon completion of the IDDE program.

## SECTION 3.4 CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

The Town must implement a program focused on controlling stormwater runoff from construction sites. The program shall minimize or eliminate erosion on site and maintain the site so that the sediment is not transported in stormwater or allowed to discharge to a water of the U.S. through the permittee's MS4, as stated in part 2.3.5 of the MS4 Permit.

### Section 3.4.1 Background

The Town of Marshfield has adopted construction site stormwater runoff measures in the subdivision regulations. The Department of Public Works, Engineering Department, Conservation Commission, Planning Board, and Zoning Board of Appeals are all responsible for construction site stormwater runoff control BMPs.

### Section 3.4.2 Best Management Practices

- I. Site Inspection and Enforcement of Erosion and Sediment Control (ESC) Measures
  - A. Complete written procedures of site inspections and enforcement procedures within one year of effective date of the MS4 Permit.
    - 1. Recommend standards and practices for town inspection procedures. Seek input from relevant town groups (e.g. Building, Health, Conservation, etc.).
    - 2. Develop inspection form that includes ESC measures and integrate them with existing Town forms.
- II. Site Plan Review
  - A. Complete written procedures of site plan review and begin implementation within one year of the effective date of the MS4 Permit.
    - 1. Include site plan review workflow chart with permit applications.
    - 2. Review current Town procedure regarding when a Construction General Permit (CGP) is needed.
      - a) CGP required for disturbance of one acre or greater
- III. Erosion and Sediment Control Ordinance
  - A. Adoption of requirements for construction operators to implement a sediment and erosion control program within one year of the effective date of the MS4 Permit.

1. Set limit of onw acre before project requires inspection by Town official.
    - a) Coordinate limits and requirements with fill/extraction permits.
  2. Update all Town forms with erosion and sediment control checklist.
- IV. Waste Control
- A. Adoption of requirements to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes within one year of the effective date of the MS4 Permit.
    1. Incorporate into Town's general conditions for building permit and/or site plan review.
    2. Review and modify Town bylaw to meet new requirements.

## SECTION 3.5 POST CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT

The objective of an effective post construction stormwater management program, part 2.3.6 of the MS4 Permit, is to reduce the discharge of pollutants found in stormwater to the MS4 through the retention or treatment of stormwater after construction on new or redeveloped sites and to ensure proper maintenance of installed stormwater controls.

### Section 3.5.1 Background

The Town of Marshfield and a hired consultant conducted a review of their regulatory compliance of the NPDES 2003 MS4 Permit in 2012. Draft stormwater management regulations were developed and presented to the Board of Public Works on February 6, 2012 to address site plan review for new development and exemptions. The Board adopted the new regulations on August 20, 2012. The Department of Public Works, Engineering Department, Planning Board, and the Zoning Board of Appeals are all responsible for stormwater management in new and redevelopment.

### Section 3.5.2 Best Management Practices

- I. Post-Construction Ordinance
  - I. The permittee shall develop or modify, as appropriate, an ordinance or other regulatory mechanism within two years of the effective date of the MS4 Permit.
- II. As-Built Plans For On-Site Stormwater Control
  - I. Require submission of electronic data for as-built drawings (e.g. PDF, AutoCAD, GIS) within two years of completed construction.
    1. Operation and Maintenance (O&M) certification should include contact and contract information for contractors that perform O&M on the private BMPs.
- III. Inventory and Priority Ranking of MS4-Owned Properties That May Be Retrofitted with BMPs
  - I. Conduct detailed inventory of MS4-owned properties and rank for retrofit potential within four years of MS4 Permit effective date.
    1. Inventory Town parcels for existing stormwater BMPs and identify opportunities for green infrastructure and low impact development retrofits.



- a) Include schools, parks, recreation facilities, police/fire/EMS, libraries, public works, and town administrative offices.
- IV. Allow Green Infrastructure
  - I. Within four years of MS4 Permit effective date, develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist.
    - 1. Review bylaws and applications in order to incorporate green infrastructure and low impact development language as needed.
    - 2. Educate the public on green infrastructure through existing BMP retrofits/demonstration projects.
- V. Street Design and Parking Lot Guidelines
  - I. Within four years of MS4 Permit effective date, develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if changes to design standards for streets and parking lots can be modified to support low impact design options
    - 1. Publish street design and parking lot guidelines on stormwater website.
- VI. Ensure any stormwater controls or management practices for new development and redevelopment will prevent or minimize impacts to water quality.
  - I. Within three years of MS4 Permit effective date, adopt, amend, or modify regulation mechanisms to meet MS4 Permit requirements.
    - 1. Review rules and regulations and modify as needed. Include evaluation of subdivision/redevelopment requirements for long-term operations and management of private BMPs.
      - a) Work to establish cash (instead of bond) surety with developers to create binding obligation to keep stormwater runoff onsite.
    - 2. Continue to implement Post-Construction Site Runoff Control Bylaw.

## SECTION 3.6 GOOD HOUSEKEEPING AND POLLUTION PREVENTION FOR PERMITTEE-OWNED OPERATIONS

An operations and maintenance program must be implemented by the Town for Town-owned operations. The program shall focus on preventing or reducing pollutant runoff and protecting water quality from Town operations.

### Section 3.6.1 Background

The Town of Marshfield has developed and implemented an O&M Plan, which is attached as Appendix K. In addition, the Town is in the process of developing stormwater pollution prevention plans (SWPPPs). The Department of Public Works, Engineering Department, and Conservation Committee is responsible for pollution prevention BMPs.

The Marshfield Department of Public Works typically sweeps 80 miles of roadways within the Town, yielding 65 cubic yards of sediment. A sediment critical area was established with the tributary area

of Bass Creek, requiring additional sweeping. Ditches are cleaned by mosquito control in the Bass Creek area as well

After large storms, additional O&M practices are often needed to maintain the MS4 system and prevent pollutants from discharging into waterways. After a 2018 coastal storm, catch basins were cleaned on Foster Avenue. During that same storm, extensive flooding and erosion in the area of Brook Street due to a breach in the seawall batter boards required a significant cleanup effort. The Town removed over 1,000 cubic yards of sediment from the streets in Brant Rock and from other streets adjacent to the coast. Over \$350,000 in contract services to clean the area was spent due to the coastal storms between January and March 2018.

The Town completes annual inspections of its inventory of stormwater best management practices. Inspection reports from previous years' inspections are attached as Appendix M. In addition, the Town completed an inventory and stormwater audit of all Town-owned facilities in 2020; the audit report is attached as Appendix N.

## Section 3.6.2 Best Management Practices

- I. Create written O&M procedures for parks and open spaces, buildings and facilities, and vehicles and equipment within two years of MS4 Permit effective date.
  - A. Develop standards of practice for O&M of each public facility and combine in Town O&M Manual.
- II. Inventory all permittee-owned parks and open spaces, buildings and facilities (including storm drains), and vehicles and equipment within two years of the MS4 Permit effective date.
  - A. Develop a capital improvement plan that deals with flooding prevention measures and water quality improvements.
    1. Coordinate implementation with part 5.2.II of the MS4 Permit.
- III. Establish and implement program for repair and rehabilitation of MS4 infrastructure within two years of the MS4 Permit effective date.
  - A. Inspect assets and assess condition to develop program.
  - B. Review annual budget to set aside funding.
- IV. Stormwater Pollution Prevention Plans For Maintenance Garages, Transfer Stations and Other Waste-Handling Facilities.
  - A. Develop plans within two years of MS4 Permit effective date.
  - B. Schedule annual employee training.
    1. Look into workshop and speaking opportunities and seek formal training for all departments.
  - C. Develop an asset management system to process complaints, permits, inspections, and maintenance.
  - D. Continue to implement improved recycling standards and requirements.
    1. Advertise rigid plastic and antifreeze recycling to public. Enforce new standards for private haulers.
- V. Catch Basin Cleaning
  - A. Develop and maintain a cleaning schedule.
  - B. Develop electronic data collection system for tracking, inspection, and maintenance.

1. Update catch basin cleaning services request for proposals (RFP) requirements to require electronic data collection that is compatible with the Town's GIS and asset management system.
- VI. Street Sweeping Program
  - A. Continue to implement street sweeping program.
- VII. Road Salt Use Optimization Program
  - A. Continue working on salt reduction strategies.
    1. Calibrate spreaders to reduce salt use.

## SECTION 4 WATER QUALITY BASED REQUIREMENTS

In compliance with the Clean Water Act (CWA), each state must administer a program to monitor and assess the quality of its surface and groundwater. Section 305(b) process of the CWA entails assessing each use for rivers, lakes, and coastal waters, and causes and sources of impairment are identified wherever possible. Section 303(d) of the CWA along with the regulations at 40 CFR 130.7 requires states to identify those water bodies that are not expected to meet surface water quality standards (SWQS) after the implementation of technology based controls, and prioritize them for the development of Total Maximum Daily Loads. A TMDL establishes the maximum amount of a pollutant that may be introduced into a water body and still ensure attainment and maintenance of water quality standards. The 303(d) List of Impaired Waters (303(d) List) lists each water body in one of the following five categories and category subsets:

- Category 1) Unimpaired and not threatened for all designated uses;
- Category 2) Unimpaired for some uses and not assessed for others;
- Category 3) Insufficient information to make assessments for any uses;
- Category 4a) Impaired with a completed TMDL;
- Category 4b) Impaired with an impairment that is controlled by alternative pollution control requirements;
- Category 4c) Impaired or threatened for one or more uses, but not requiring the calculation of a TMDL; or
- Category 5) Impaired or threatened for one or more uses and requiring a TMDL.

Waters listed in Category 5 constitute the 303(d) List and are to be reviewed and approved by the EPA. Table 3-1: Impaired Waters, TMDLs and Impairments details the Town's Category 5 and 4 water bodies, which is also represented in Appendix B, the Notice of Intent. An overall map of the Town of Marshfield's stormwater system is attached as Figure 4: Stormwater System Map.

### Section 4.1.1 Background

Best management practices aim to improve and mitigate stormwater water quality impairments. This program will focus on watersheds and impaired waters with a TMDL (Category 4a) and impaired waters that require a TMDL (Category 5), as shown on Figure 3: Town Watersheds.

The entirety of the Town is located within the South Coastal Watershed. The South Coastal Watershed has an approved TMDL for bacteria and pathogens. In addition to the watershed-wide TMDL, the Town also has Category 4a impaired water bodies that have approved TMDLs. Category 4a impairments require the Town to follow specific requirements listed under Appendix F of the MS4 Permit. As shown in Table 3-1: Impaired Waters, TMDLs and Impairments, these water bodies include the South River, North River segment MA94-06, and Green Harbor. Table 2-1 has been updated to reflect impairments listed in the Massachusetts 2016 List of Integrated Waters, released in December 2019, which replaced the Massachusetts 2014 List of Integrated Waters that was used to inventory impairments for the Town's NOI.

The Town also has Category 5 water bodies that require a TMDL to be completed. These water bodies include the Green Harbor River and the North River segment MA94-05, as listed in Table 3-1. The Category 5 impairments require the Town to follow the specific requirements listed under Appendix H of the MS4 Permit to mitigate contaminants from discharges from the MS4 to the regulated water bodies. Note that the Green Harbor River's Category 5 turbidity impairment requires the Town to adhere to requirements under part 5 of the MS4 Permit Appendix H: discharges to water quality limited waterbodies and their tributaries where solids, oil and grease (hydrocarbons), or metals is the cause of the impairment.

The Town should prioritize sampling outfalls that discharge to their impaired water bodies and sample for any additional impairments required. The Marshfield Public Works Department is the primary party responsible for the BMPs to meet these impairment requirements.

## SECTION 4.2 ADDITIONAL IMPAIRMENT REQUIREMENTS

### Section 4.2.1 Public Education and Outreach

#### A. Bacteria or Pathogens

- Distribute an annual message that encourages the proper management of pet waste, including noting any existing ordinances where appropriate.
- Disseminate educational materials to dog owners at the time of issuance or renewal of dog license, or other appropriate time.
- Provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria or pathogens.

### Section 4.2.2 Stormwater Management in New Development and Redevelopment

#### A. Solids, Oil and Grease, or Metals

- Incorporate designs that allow for shutdown and containment where appropriate to isolate the system in the event of an emergency spill or unexpected event.
- Require any stormwater management system designed to infiltrate stormwater on commercial or industrial sites to provide the level of pollutant removal equal to or greater than the level of pollutant removal provided through the use of biofiltration of the same volume of runoff to be infiltrated, prior to infiltration.

### Section 4.2.3 Good Housekeeping and Pollution Prevention

#### A. Solids, Oil and Grease, or Metals

- Increase street sweeping frequency of all municipal owned streets and parking lots to a schedule determined by the permittee to target areas with potential for high pollutant loads.
- Prioritize inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full. Each annual report shall include the street sweeping schedule determined by the permittee to target high pollutant loads.

## Section 4.2.4 Illicit Discharge

### A. Bacteria or Pathogens

- Implement the illicit discharge program required by the MS4 Permit. Catchments draining to any water body impaired for bacteria or pathogens shall be designated either Problem Catchments or high priority in implementation of the IDDE program.

At any time during the MS4 Permit term, the permittee may be relieved of applicable requirements in Appendices F or H of the MS4 Permit if impaired water bodies become in compliance with surface water quality standards.

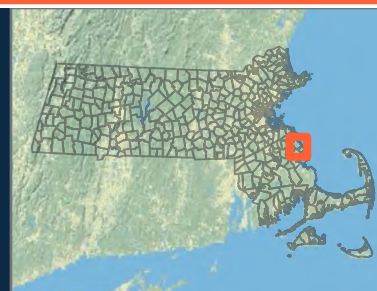
**FIGURE 1**  
System Locus





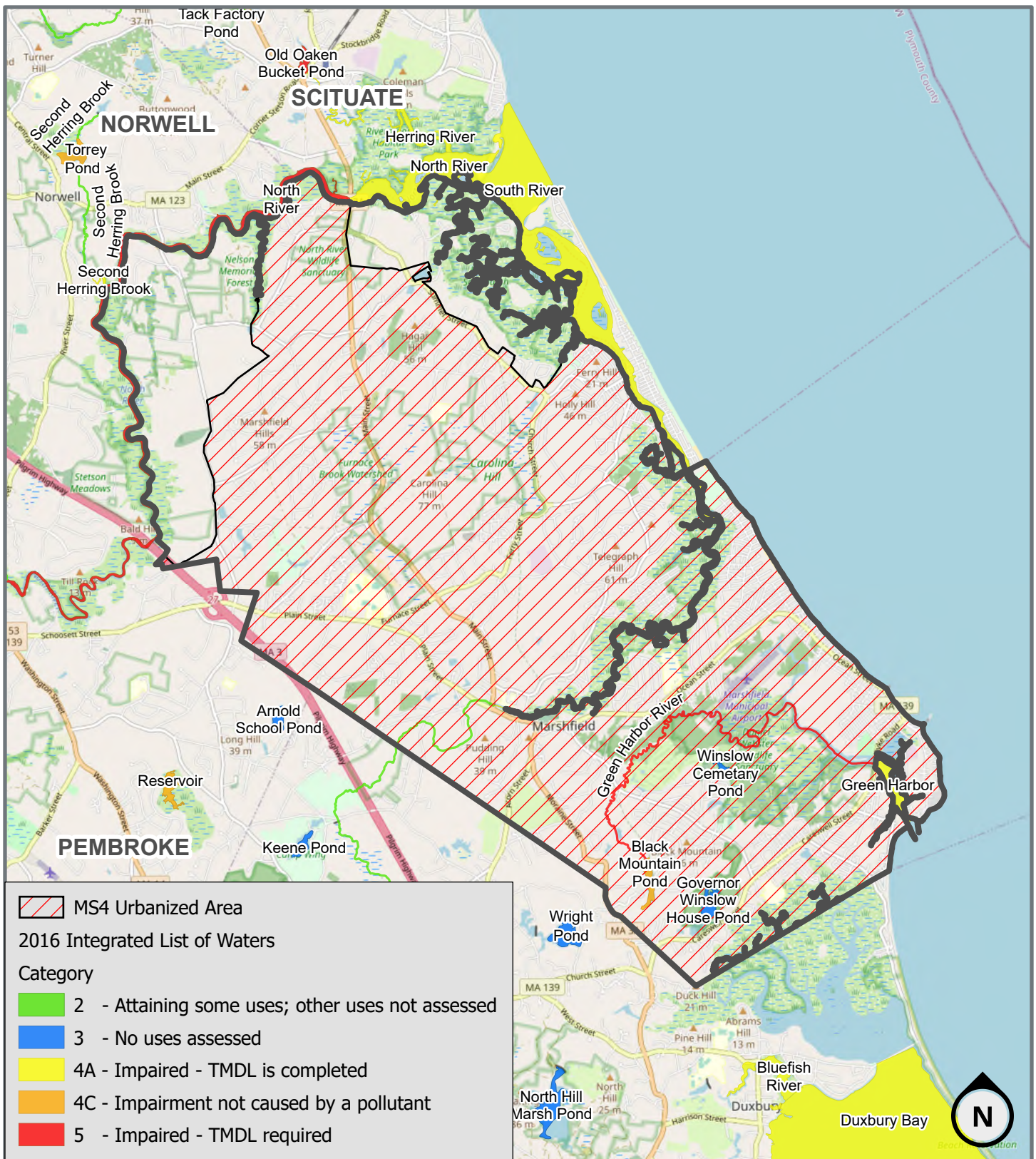
**Figure 1**  
**System Locus**

Marshfield, Massachusetts





**FIGURE 2**  
MS4 Urbanized Areas

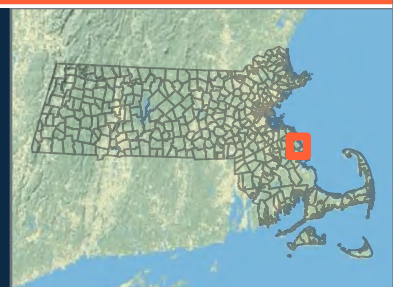


**Figure 2**  
**MS4 Urbanized Areas**

Marshfield, Massachusetts

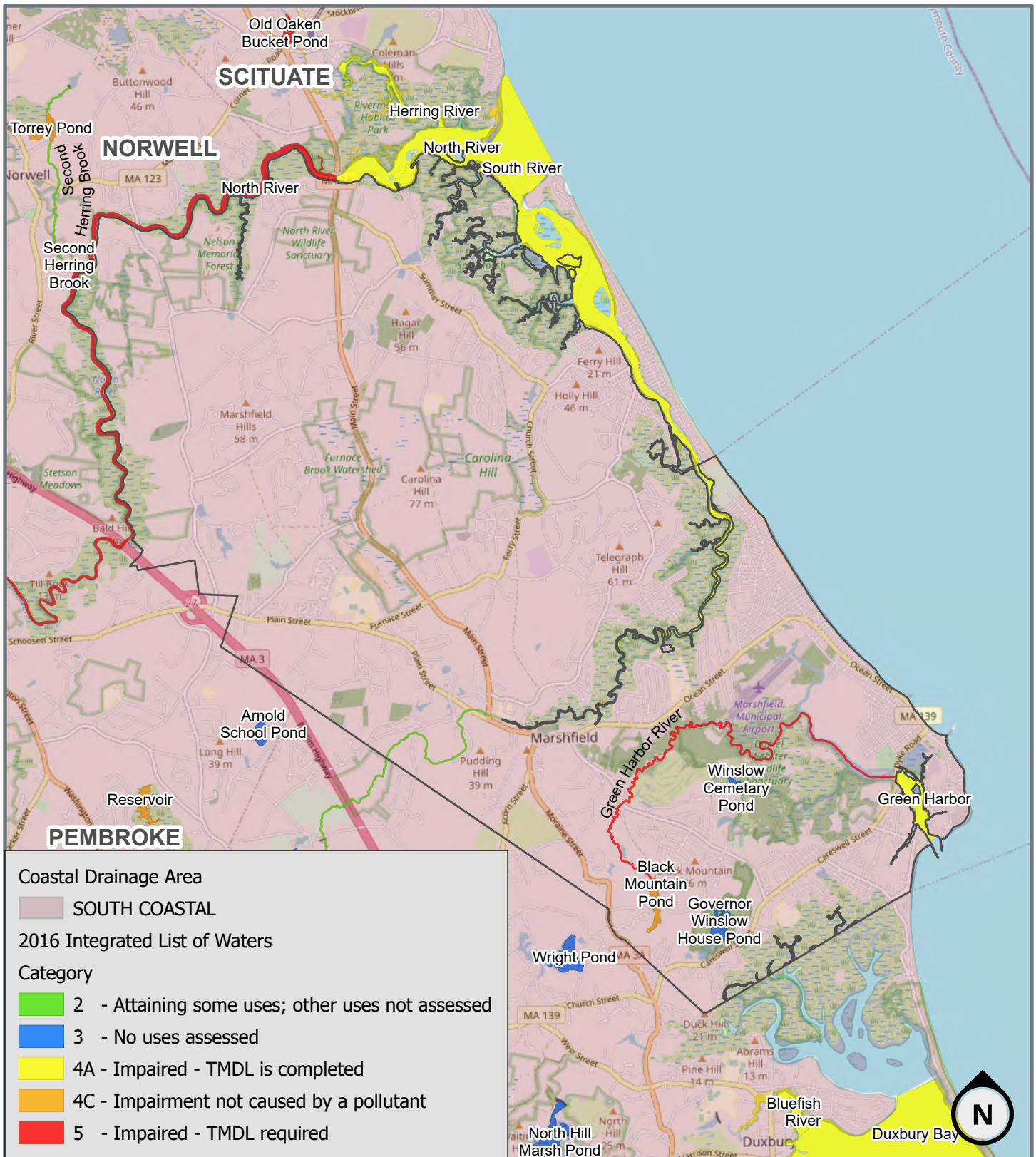
0 0.75 1.5  
Miles

**ENVIRONMENTAL**  
**PARTNERS**  
— An Apex Company —



**FIGURE 3**  
Town Watersheds



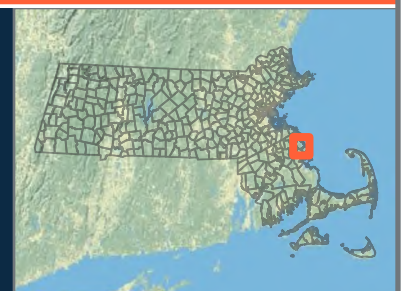


**Figure 3**  
**Town Watersheds**

Marshfield, Massachusetts

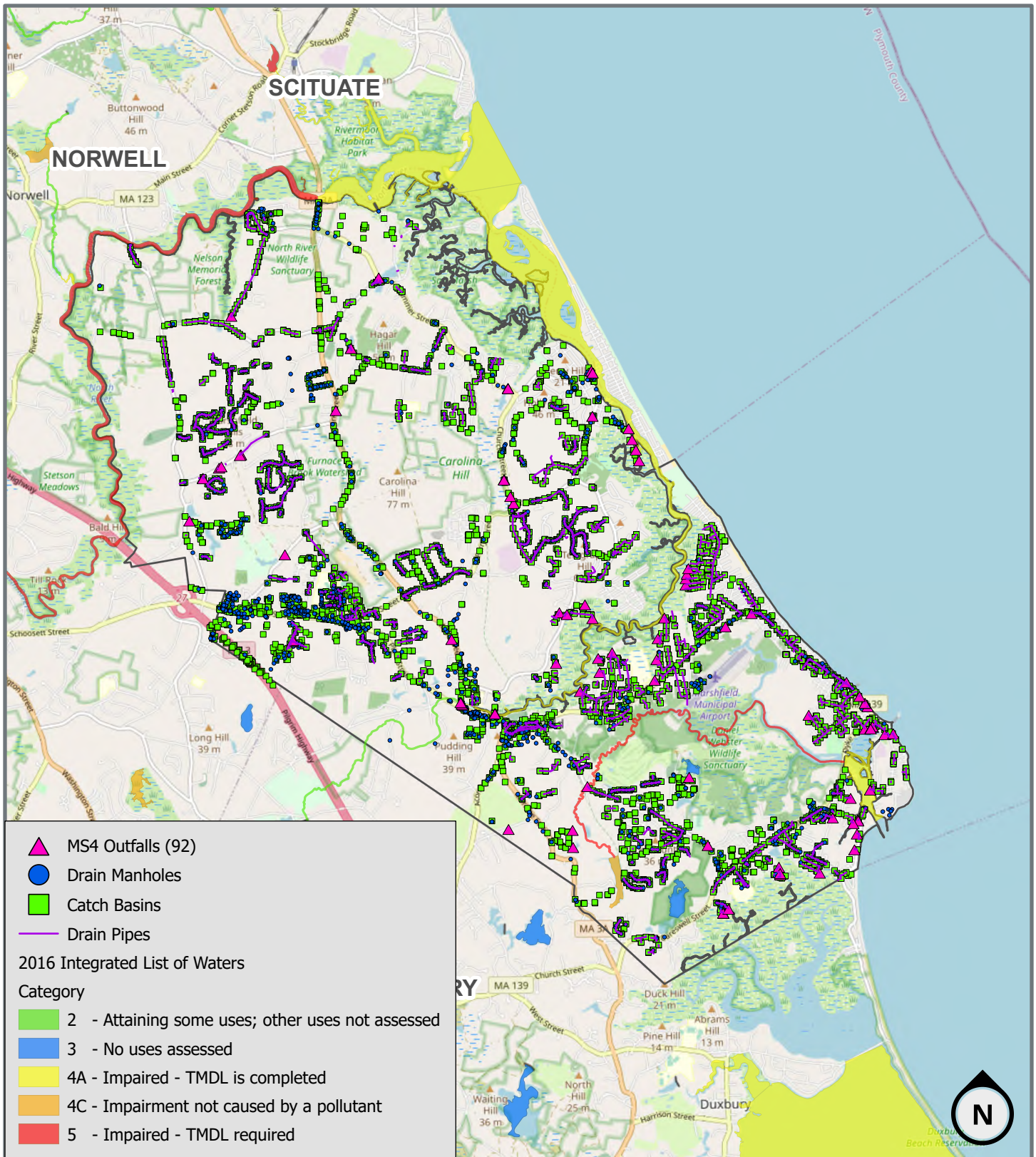
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**ENVIRONMENTAL**  
**PARTNERS**  
 — An Apex Company —



**FIGURE 4**  
Stormwater System

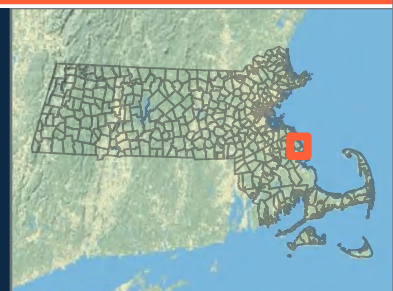




**Figure 4**  
**Stormwater System**

Marshfield, Massachusetts

0 0.75 1.5  
 Miles



## APPENDIX A

### MA MS4 Hyperlinks and References

## MA MS4 General Permit Hyperlinks

### General Hyperlinks

EPA MA MS4 Permit: <https://www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit>

DEP Permit Information:

<http://www.mass.gov/eea/agencies/massdep/water/wastewater/stormwater.html#8>

Town Hyperlink: <https://www.marshfield-ma.gov/engineering/pages/marshfields-stormwater-plan>

### MCM 1: Public Education and Outreach

EPA's Stormwater Education Toolbox, MassDEP's stormwater outreach materials, and other templates relevant to MCM 1 can be found here:

<https://www.epa.gov/npdes-permits/stormwater-tools-new-england#peo>

### MCM 3: Illicit Discharge Detection and Elimination (IDDE) Program

IDDE Program Template, SOPs, and other templates relevant to IDDE can be found here:

<https://www.epa.gov/npdes-permits/stormwater-tools-new-england#idde>

### MCM 4: Construction Site Stormwater Runoff Control

Examples and templates relevant to MCM 4, including model ordinances and site inspection templates, can be found here:

<https://www.epa.gov/npdes-permits/stormwater-tools-new-england#csrc>

### MCM 5: Post Construction Stormwater Management in New Development and Redevelopment

Examples and templates relevant to MCM 5, including model ordinances and bylaw review templates and guidance can be found here:

<https://www.epa.gov/npdes-permits/stormwater-tools-new-england#pcsm>

### MCM 6: Good Housekeeping and Pollution Prevention for Permittee Owned Operations

Examples and templates relevant to MCM 6, including SOP templates for catch basin cleaning, street sweeping, vehicle maintenance, parks and open space management, winter deicing, and Stormwater Pollution Prevention Plans can be found here:

<https://www.epa.gov/npdes-permits/stormwater-tools-new-england#gh>



## **APPENDIX B**

### Notice of Intent

## Part I: General Conditions

### General Information

Name of Municipality or Organization:  State: 

EPA NPDES Permit Number (if applicable): 

### Primary MS4 Program Manager Contact Information

Name:  Title: 

Street Address Line 1: 

Street Address Line 2: 

City:  State:  Zip Code: 

Email:  Phone Number: 

Fax Number: 

### Other Information

Stormwater Management Program (SWMP) Location (web address or physical location, if already completed): 

### Eligibility Determination

Endangered Species Act (ESA) Determination Complete? 

Eligibility Criteria (check all that apply): ☐ A ☒ B ☐ C

National Historic Preservation Act (NHPA) Determination Complete? 

Eligibility Criteria (check all that apply): ☒ A ☐ B ☐ C

☒ Check the box if your municipality or organization was covered under the 2003 MS4 General Permit

### MS4 Infrastructure (if covered under the 2003 permit)

Estimated Percent of Outfall Map Complete?  If 100% of 2003 requirements not met, enter an estimated date of completion (MM/DD/YY): 

Web address where MS4 map is published: 

*If outfall map is unavailable on the internet an electronic or paper copy of the outfall map must be included with NOI submission (see section V for submission options)*

### Regulatory Authorities (if covered under the 2003 permit)

Illicit Discharge Detection and Elimination (IDDE) Authority Adopted?  Effective Date or Estimated Date of Adoption (MM/DD/YY): 

Construction/Erosion and Sediment Control (ESC) Authority Adopted?  Effective Date or Estimated Date of Adoption (MM/DD/YY): 

Post- Construction Stormwater Management Adopted?  Effective Date or Estimated Date of Adoption (MM/DD/YY):

# Notice of Intent (NOI) for coverage under Small MS4 General Permit

Please list the waterbodies to which your MS4 discharges. For each waterbody, please report the number of outfalls discharging into it and, if applicable, the segment ID and any impairments.

Massachusetts list of impaired waters: <http://www.mass.gov/eea/docs/dep/water/resources/07v5/14list2.pdf>

[illegible]

[illegible]



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Click to lengthen table

## Notice of Intent (NOI) for coverage under Small MS4 General Permit

### Part III: Stormwater Management Program Summary

Identify the Best Management Practices (BMPs) that will be employed to address each of the six Minimum Control Measures (MCMs). For municipalities/organizations whose MS4 discharges into a receiving water with an approved Total Maximum Daily Load (TMDL) and an applicable waste load allocation (WLA), identify any additional BMPs employed to specifically support the achievement of the WLA in the TMDL section at the end of part III.

For each MCM, list each existing or proposed BMP by category and provide a brief description, responsible parties/departments, measurable goals, and the year the BMP will be employed (public education and outreach BMPs also requires a target audience). **Use the drop-down menus in each table or enter your own text to override the drop down menu.**

#### MCM 1: Public Education and Outreach

<b>BMP Media/Category</b> (enter your own text to override the drop down menu)	<b>BMP Description</b>	<b>Targeted Audience</b>	<b>Responsible Department/Parties</b> (enter your own text to override the drop down menu)	<b>Measurable Goal</b>	<b>Beginning Year of BMP Implementation</b>
Brochures/Pamphlets	Publish outreach materials; Distribute new resident packets to residents within Wetland Protection Areas; Distribute pet waste control information to residents when they (re)apply for a pet license; distribute information to septic maintenance contractors.	Residents	DPW Operations/Engineering, NSRWA	Distribution of a minimum of two (2) educational messages over the permit term (5 years)	2018
Brochures/Pamphlets	Include information in permit materials.	Businesses, Institutions and Commercial Facilities	DPW Operations/Engineering, NSRWA	Distribution of a minimum of two (2) educational messages over the permit term (5 years)	2018
Brochures/Pamphlets	Include information in permit materials; Review and Update application forms to meet the new requirements.	Developers (construction)	DPW Operations/Engineering, NSRWA	Distribution of a minimum of two (2) educational messages over the permit term (5 years)	2018

[illegible]




## Notice of Intent (NOI) for coverage under Small MS4 General Permit

## MCM 2: Public Involvement and Participation

[illegible]

## Notice of Intent (NOI) for coverage under Small MS4 General Permit

### Part III: Stormwater Management Program Summary *(continued)*

#### MCM 3: Illicit Discharge Detection and Elimination (IDDE)

<b>BMP Categorization</b> (enter your own text to override the drop down menu)	<b>BMP Description</b>	<b>Responsible Department/Parties</b> (enter your own text to override the drop down menu)	<b>Measurable Goal</b> (all text can be overwritten)	<b>Beginning Year of BMP Implementation</b>
SSO inventory	Develop SSO inventory in accordance of permit conditions	DPW Operations/Engineering	Complete within 1 year of effective date of permit	2018
Storm sewer system map	Create map and update during IDDE program completion	DPW Operations/Engineering	Update map within 2 years of effective date of permit and complete full system map 10 years after effective date of permit	2018
Written IDDE program	Create written IDDE program	DPW Operations/Engineering	Complete within 1 year of the effective date of permit and update as required	2018
Implement IDDE program	Implement catchment investigations according to program and permit conditions	DPW Operations/Engineering	Complete 10 years after effective date of permit	2018
Employee training	Train employees on IDDE implementation	DPW Operations/Engineering	Train annually	2018
Conduct dry weather screening	Conduct in accordance with outfall screening procedure and permit conditions	DPW Operations/Engineering	Complete 3 years after effective date of permit	2018
Conduct wet weather screening	Conduct in accordance with outfall screening procedure	DPW Operations/Engineering	Complete 10 years after effective date of permit	2018
Ongoing screening	Conduct dry weather and wet weather screening (as necessary)	DPW Operations/Engineering	Complete ongoing outfall screening upon completion of IDDE program	2018



## Notice of Intent (NOI) for coverage under Small MS4 General Permit

### Part III: Stormwater Management Program Summary (continued)

#### MCM 4: Construction Site Stormwater Runoff Control

<b>BMP Categorization</b> (enter your own text to override the drop down menu or entered text)	<b>BMP Description</b>	<b>Responsible Department/Parties</b> (enter your own text to override the drop down menu)	<b>Measurable Goal</b> (all text can be overwritten)	<b>Beginning Year of BMP Implementation</b>
Site inspection and enforcement of Erosion and Sediment Control (ESC) measures	Complete written procedures of site inspections and enforcement procedures	DPW Engineering, Conservation Committee, Planning Board, Zoning Board of Ap	Complete within 1 year of the effective date of permit	2018
Site plan review	Complete written procedures of site plan review and begin implementation	DPW Engineering, Conservation Committee, Planning Board, Zoning Board of Ap	Complete within 1 year of the effective date of permit	2018
Erosion and Sediment Control	Adoption of requirements for construction operators to implement a sediment and erosion control program	DPW Engineering, Conservation Committee, Planning Board, Zoning Board of Ap	Complete within 1 year of the effective date of permit	2018
Waste Control	Adoption of requirements to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes	DPW Engineering, Conservation Committee, Planning Board, Zoning Board of Ap	Complete within 1 year of the effective date of permit	2018



## Notice of Intent (NOI) for coverage under Small MS4 General Permit

### Part III: Stormwater Management Program Summary (continued)

#### MCM 5: Post-Construction Stormwater Management in New Development and Redevelopment

<b>BMP Categorization</b> (enter your own text to override the drop down menu or entered text)	<b>BMP Description</b>	<b>Responsible Department/Parties</b> (enter your own text to override the drop down menu)	<b>Measurable Goal</b> (all text can be overwritten)	<b>Beginning Year of BMP Implementation</b>
As-built plans for on-site stormwater control	The procedures to require submission of as-built drawings and ensure long term operation and maintenance will be a part of the SWMP	DPW Engineering, Planning Board, Zoning Board of Appeals	Require submission of as-built plans for completed projects	2018
Target properties to reduce impervious areas	Identify at least 5 permittee-owned properties that could be modified or retrofitted with BMPs to reduce impervious areas and update annually	DPW Engineering, Planning Board, Zoning Board of Appeals	Complete 4 years after effective date of permit and report annually on retrofitted properties	2022
Allow green infrastructure	Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist	DPW Engineering, Planning Board, Zoning Board of Appeals	Complete 4 years after effective date of permit and implement recommendations of report	2018
Street design and parking lot guidelines	Develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if changes to design standards for streets and parking lots can be modified to support low impact design options.	DPW Engineering, Planning Board, Zoning Board of Appeals	Complete 4 years after effective date of permit and implement recommendations of report	2022



[illegible]

## Notice of Intent (NOI) for coverage under Small MS4 General Permit

### Part III: Stormwater Management Program Summary (continued)

#### MCM 6: Municipal Good Housekeeping and Pollution Prevention

<b>BMP Categorization</b> (enter your own text to override the drop down menu or entered text)	<b>BMP Description</b>	<b>Responsible Department/Parties</b> (enter your own text to override the drop down menu)	<b>Measurable Goal</b> (all text can be overwritten)	<b>Beginning Year of BMP Implementation</b>
O&M procedures	Create written O&M procedures including all requirements contained in 2.3.7.a.ii for parks and open spaces, buildings and facilities, and vehicles and equipment	DPW Operations/Engineering	Complete and implement 2 years after effective date of permit	2018
Inventory all permittee-owned parks and open spaces, buildings and facilities, and vehicles and equipment	Create inventory	DPW Operations/Engineering	Complete 2 years after effective date of permit and implement annually	2019
Infrastructure O&M	Establish and implement program for repair and rehabilitation of MS4 infrastructure	DPW Operations/Engineering	Complete 2 years after effective date of permit	2019
Stormwater Pollution Prevention Plan (SWPPP)	Create SWPPPs for maintenance garages, transfer stations, and other waste-handling facilities	DPW Operations/Engineering, Conservation Committee	Complete and implement 2 years after effective date of permit	2019
Catch basin cleaning	Establish schedule for catch basin cleaning such that each catch basin is no more than 50% full and clean catch basins on that schedule	DPW Operations	Clean catch basins on established schedule and report number of catch basins cleaned and volume of material moved annually	2018
Street sweeping program	Sweep all streets and permittee-owned parking lots in accordance with permit conditions	DPW Operations	Sweep all streets and permittee-owned parking lots once per year in the spring	2018
Road salt use optimization program	Establish and implement a program to minimize the use of road salt	DPW Operations	Implement salt use optimization during deicing season	2018





# Notice of Intent (NOI) for coverage under Small MS4 General Permit

## Actions for Meeting Requirements Related to Water Quality Limited Waters

Use the drop-down menus to select the pollutant causing the water quality limitation and enter the waterbody ID(s) experiencing excursions above water quality standards for that pollutant. In addition, if you are subject to additional requirements due to a downstream nutrient impairment (see Part 2.2.2 of the permit) select the pollutant of concern and indicate applicable waterbody IDs or write "all waterbodies" if applicable. Choose the action description from the dropdown menu and indicate the responsible party. If no options are applicable, or more than one, **enter your own text to override drop-down menus.**

[illegible]

**Part IV: Notes and additional information**

Use the space below to indicate the part(s) of 2.2.1 and 2.2.2 that you have identified as not applicable to your MS4 because you do not discharge to the impaired water body or a tributary to an impaired water body due to nitrogen or phosphorus. Provide all supporting documentation below or attach additional documents if necessary. Also, provide any additional information about your MS4 program below.

**Attachments:**

Figure - MS4 Outfalls

USFWS Correspondence

The outfalls included in Part II: Summary of Receiving Waters were selected based on a 100 foot distance from any waters of the U.S.. Coordinates listed under unnamed water segments are based on the NAD 1983 State Plane Massachusetts FIPS 2001 (US Feet) Coordinate System, and are listed as latitude/longitude in decimal degrees.

Regarding the ESA section 7 consultation, I agree that the MS4 Permit will not adversely affect the Northern Long-eared Bat, Piping Plover, Red Knot, or Roseate Tern in the MS4 area. The concurrence letter issued by USFWS is attached.

Regarding the National Historic Preservation Act, under 36 CFR 800, this facility is an existing facility authorized by the previous Permit, and is not undertaking any activity involving subsurface land disturbance less than 1 acre. This MS4 Permit will have "no potential to cause effects," in accordance with 36 CFR 800.3(a)(1).

## Notice of Intent (NOI) for coverage under Small MS4 General Permit

Page 21 of 22

### Part V: 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:

Michael A. Maresco

Title:

Town Administrator

Signature:



Date:

9-28-18

[To be signed according to Appendix B, Subparagraph B.11, Standard Conditions]

Note: When prompted during signing, save the document under a new file name

## APPENDIX C

### Permit Schedule



## **MS4 Permit Draft Schedule Town of Marshfield, Massachusetts**

**July 2018** – MS4 Permit effective date to coincide with start of FY18

- **September 29, 2018** – Submit Updated NOI (within 90 days of effective date)

**July 2019** – Items due within 1 year of effective date

- Submit Updated Stormwater Management Plan
- Additional Mapping – update stormwater system GIS for connectivity (as needed)
- Written IDDE Plan, identify catchments contributing to high priority areas such as contributing to public water supplies, public bathing beaches, or Inventory Town Facilities
- Develop O&M for Town Facilities – Public Works facilities, Parks/Recreation, Town Hall, Schools
- Evaluate street sweeping and catch basin cleaning frequency
- Education/Outreach – Two educational messages to each of the 4 audiences over 5 years
- Additional Education/Outreach (x2 for *Impaired Water Requirements*)\*
  - Bacteria and Pathogens: Targeting Dog Waste/Septic Systems for South Coastal Watershed, South River, Green Harbor, and North River
- Additional BMPS for Waterbodies with Impairments by Solids \* - Green Harbor River and North River
  - New or Redevelopment of Commercial Industrial properties draining to the waterbodies shall incorporate stormwater BMPs that can be shutdown/isolated in event of a spill/release. EPA encourages requirements for stormwater infiltration and pollutant removal BMPs
  - Evaluate need for increased frequency of street sweeping of municipal streets and parking lots in areas with potential for higher pollutant loads
  - Evaluate need for increased frequency of catch basin inspections and cleaning if excessive sediment/debris loadings observed
- Public Participation
- Annual Training

**July 2020** – Items due within 2 years of effective date

- SWPPP for Appropriate Facilities
- SPCC Plan where appropriate
- Parks Maintenance Plan
- Ongoing Outfall Sampling (wet & dry) / Inspections / Update Mapping
- Continue to evaluate street sweeping and catch basin cleaning frequency.
- Education/Outreach – Two educational messages to each of the 4 audiences over 5 years
- Additional Education/Outreach (x2 for *Impaired Water Requirements*)\*
  - Bacteria and Pathogens: Targeting Dog Waste / Septic Systems for South Coastal Watershed, South River, Green Harbor, and North River
- Public Participation

- Annual Training

**July 2021** – Items due within 3 years of effective date

- Revisions to Stormwater Bylaw - Construction Site Stormwater Runoff Control
- Draft regulations to promote green infrastructure – Post-Construction Management
- Ongoing Outfall Sampling (wet & dry) / Inspections / Update Mapping
- Continue to evaluate street sweeping and catch basin cleaning frequency.
- Education/Outreach – Two educational messages to each of the 4 audiences over 5 years
- Additional Education/Outreach (x2 for *Impaired Water Requirements*)\*
  - Bacteria: Targeting Dog Waste / Septic Systems for – South Coastal Watershed, South River, Green Harbor, and North River
- Public Participation
- Annual Training

**July 2022** – Items due within 4 years of effective date

- Revisions to Stormwater Bylaw - Construction Site Stormwater Runoff Control
- Draft regulations to reduce impervious cover – Post-Construction Management
- Ongoing Outfall Sampling (wet & dry) / Inspections / Update Mapping
- Education/Outreach – Two educational messages to each of the 4 audiences over 5 years
- Continue to evaluate street sweeping and catch basin cleaning frequency.
- Additional Education/Outreach (x2 for *Impaired Water Requirements*)\*
  - Bacteria: Targeting Dog Waste / Septic Systems for – South Coastal Watershed, South River, Green Harbor, and North River
- Public Participation
- Annual Training

**July 2023** – Permit Length (5 years)

- Inventory/Priority Ranking of LID retrofits on Town-Owned Property – Post-Construction Management
- Ongoing Outfall Sampling (wet & dry) / Inspections / Update Mapping
- Education/Outreach – Two educational messages to each of the 4 audiences over 5 years
- Continue to evaluate street sweeping and catch basin cleaning frequency
- Additional Education/Outreach (x2 for *Impaired Water Requirements*)\*
  - Bacteria: Targeting Dog Waste / Septic Systems for – South Coastal Watershed, South River, Green Harbor, and North River
- Public Participation
- Annual Training

*\*Additional requirements for Water Quality Assessment are required due to documented bacteria or pathogens, and solids, oil and grease, or metals impairments. (see MA NPDES MS4 Appendix H, section III and section V.)*

## APPENDIX D

### Endangered Species and Critical Habitats Protection Documents



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE



New England Field Office  
70 Commercial St, Suite 300  
Concord, NH 03301-5087  
<http://www.fws.gov/newengland>

September 24, 2018

To whom it may concern:

The U.S. Fish and Wildlife Service (USFWS) reviewed the stormwater discharge activities associated with the 2016 National Pollutant Discharge and Elimination System (NPDES) Massachusetts (MA) Small Municipal Separate Storm Sewer System (MS4) general permit (MA MS4 General Permit) issued by the Environmental Protection Agency (EPA). We determined those activities may affect, but are not likely to adversely affect, certain species listed under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) when specific conditions are met. When these conditions are met, we do not need to review individual projects. These comments are provided in accordance with section 7 of the ESA and complement existing 2016 MA MS4 General Permit Appendix C Guidance. We understand the applicant is acting as a non-Federal representative of the EPA for the purpose of consultation under section 7. **This letter provides additional guidance for meeting Criterion B and should be submitted as part of your application package to the EPA.**

If the USFWS Information for Planning and Consultation website (<https://ecos.fws.gov/ipac/>) indicates your MA MS4 General Permit project action area may contain one or more of the following federally listed endangered species: roseate tern (*Sterna dougallii*), northern red-bellied cooter (*Pseudemys rubriventris*), dwarf wedgemussel (*Alasmidonta heterodon*), rusty patched bumble bee (*Bombus affinis*), northeastern bulrush (*Scirpus ancistrochaetus*), or American chaffseed (*Schwalbea americana*); threatened species: piping plover (*Charadrius melodus*), bog turtle (*Glyptemys muhlenbergii*), Puritan tiger beetle (*Cicindela puritana*), northeastern beach tiger beetle (*Cicindela dorsalis*), or red knot (*Calidris canutus rufa*); or their federally designated critical habitat; and the specific conditions listed below are met, you may submit this letter to complete the **MA MS4 General Permit Appendix C: Step 4** in place of a concurrence letter for informal consultation as documentation of ESA eligibility for **USFWS Criterion B**.

In addition, this letter also satisfies the requirement in the **MA MS4 General Permit Appendix C: Step 2 (3)** to contact the USFWS and obtain a concurrence letter, if you have not yet done so. If your project action area includes one or more of the above-listed species *and* one or more of the

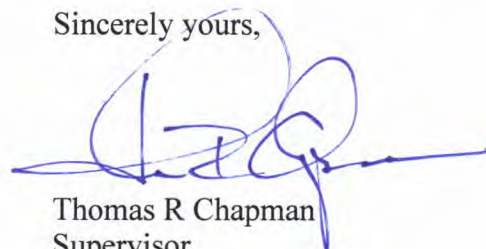
species listed under **Criterion C**,<sup>1</sup> you may still use this letter to certify under **Criterion B**. All existing guidance regarding requirements for certifying eligibility according to the USFWS Criterion A, B, or C for coverage by the 2016 MS4 Permit (see MA MS4 General Permit Appendix C – Endangered Species Guidance) remains unchanged.

We have determined that proposed stormwater discharge activities covered under the 2016 MS4 Permit *may affect, but are not likely to adversely affect*, the above-listed species and the species' critical habitat when the following are true:

1. all stormwater discharges are pre-existing or previously permitted by EPA;
2. any planned operations and maintenance work covered by this permit will only affect previously disturbed areas where stormwater controls are already installed. In these situations the chance of encountering any of the subject species is discountable;
3. the project implements EPA MS4 Best Management Practices (BMPs) and meets Clean Water Act and Massachusetts Water Quality Standards. Although permitted discharges may reach the environment used by these species, BMPs reduce pollutants to the extent that discharges are not known to have measurable impacts on these species or their habitat;
4. no new construction or structural BMPs are proposed under this permit at this time; and
5. you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the Notice of Intent (NOI), you will re-initiate consultation with the USFWS as necessary (see **MA MS4 General Permit Appendix C: Step 2 (5)**).

If the above criteria are met, further consultation with the USFWS under section 7 of the ESA is not required at this time; however, if the proposed action changes in any way such that it may affect a listed species in a manner not previously analyzed or if new information reveals the presence of additional listed species that may be affected by the project, the applicant or the EPA should contact us immediately and suspend activities that may affect those species until the appropriate level of consultation is completed with our office. Thank you for your cooperation, and please contact David Simmons of this office at (603) 227-6425 if you have questions or need further assistance.

Sincerely yours,

A handwritten signature in blue ink, appearing to read 'T. Chapman', with a long horizontal line extending to the right.

Thomas R Chapman  
Supervisor  
New England Field Office

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<sup>1</sup> Criterion C includes guidance for project action areas that may contain species for which EPA has already made a determination. These species include the northern long-eared bat (*Myotis septentrionalis*), sandplain gerardia (*Agalinis acuta*), small whorled pogonia (*Isotria medeoloides*), and/or American burying beetle (*Nicrophorus americanus*) (MA MS4 General Permit Appendix C: Step 3 – Determine if You Can Meet Eligibility USFWS Criterion C).





## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
New England Ecological Services Field Office  
70 Commercial Street, Suite 300  
Concord, NH 03301-5094  
Phone: (603) 223-2541 Fax: (603) 223-0104  
<http://www.fws.gov/newengland>

In Reply Refer To:

August 08, 2018

Consultation Code: 05E1NE00-2018-SLI-2649

Event Code: 05E1NE00-2018-E-06191

Project Name: Marshfield MS4

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

### To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan ([http://www.fws.gov/windenergy/eagle\\_guidance.html](http://www.fws.gov/windenergy/eagle_guidance.html)). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
-



## Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**New England Ecological Services Field Office**  
70 Commercial Street, Suite 300  
Concord, NH 03301-5094  
(603) 223-2541

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## Project Summary

Consultation Code: 05E1NE00-2018-SLI-2649

Event Code: 05E1NE00-2018-E-06191

Project Name: Marshfield MS4

Project Type: \*\* OTHER \*\*

Project Description: Stormwater MS4

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/42.111078860952134N70.72307252366679W>



Counties: Plymouth, MA

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## Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

### Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

### Birds

NAME	STATUS
Piping Plover <i>Charadrius melodus</i> Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/6039">https://ecos.fws.gov/ecp/species/6039</a>	Threatened
Red Knot <i>Calidris canutus rufa</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/1864">https://ecos.fws.gov/ecp/species/1864</a>	Threatened
Roseate Tern <i>Sterna dougallii dougallii</i> Population: northeast U.S. nesting pop. No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/2083">https://ecos.fws.gov/ecp/species/2083</a>	Endangered

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## **Critical habitats**

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

## APPENDIX E

### MA MS4 General Permit Appendix D - Historical Properties Documents

## **Appendix D**

### **National Historic Preservation Act Guidance**

#### **Background**

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of Federal “undertakings” on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. The term federal “undertaking” is defined in the NHPA regulations to include a project, activity, or program of a federal agency including those carried out by or on behalf of a federal agency, those carried out with federal financial assistance, and those requiring a federal permit, license or approval. See 36 CFR 800.16(y). Historic properties are defined in the NHPA regulations to include prehistoric or historic districts, sites, buildings, structures, or objects that are included in, or are eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and remains that are related to and located within such properties. See 36 CFR 800.16(1).

EPA’s issuance of a National Pollutant Discharge Elimination System (NPDES) General Permit is a federal undertaking within the meaning of the NHPA regulations and EPA has determined that the activities to be carried out under the general permit require review and consideration, in order to be in compliance with the federal historic preservation laws and regulations. Although individual submissions for authorization under the general permit do not constitute separate federal undertakings, the screening processes provides an appropriate site-specific means of addressing historic property issues in connection with EPA’s issuance of the permit. To address any issues relating to historic properties in connection with the issuance of this permit, EPA has included a screening process for applicants to identify whether properties listed or eligible for listing on the National Register of Historic Places are within the path of their discharges or discharge-related activities (including treatment systems or any BMPs relating to the discharge or treatment process) covered by this permit.

Applicants seeking authorization under this general permit must comply with applicable, State, Tribal, and local laws concerning the protection of historic properties and places and may be required to coordinate with the State Historic Preservation Officer (SHPO) and/or Tribal Historic Preservation Officer (THPO) and others regarding effects of their discharges on historic properties.

#### **Activities with No Potential to Have an Effect on Historic Properties**

A determination that a federal undertaking has no potential to have an effect on historic properties fulfills an agency’s obligations under NHPA. EPA has reason to believe that the vast majority of activities authorized under this general permit will have no potential effects on historic properties. This permit typically authorizes discharges from existing facilities and requires control of the pollutants discharged from the facility. EPA does not anticipate effects on historic properties from the pollutants in the authorized discharges. Thus, to the extent EPA’s issuance of this general permit authorizes discharges of such constituents, confined to existing channels, outfalls or natural drainage areas, the permitting action does not have the potential to cause effects on historical properties.

In addition, the overwhelming majority of sources covered under this permit will be facilities that are seeking renewal of previous permit authorization. These existing dischargers should have already addressed NHPA issues in the previous general permit as they were required to certify that they were either not affecting historic properties or they had obtained written agreement from

the applicable SHPO or THPO regarding methods of mitigating potential impacts. To the extent this permit authorizes renewal of prior coverage without relevant changes in operations the discharge has no potential to have an effect on historic properties.

### **Activities with Potential to Have an Effect on Historic Properties**

EPA believes this permit may have some potential to have an effect on historic properties the applicant undertakes the construction and/or installation of control measures that involve subsurface disturbance that involves less than 1 acre of land. (Ground disturbances of 1 acre or more require coverage under the Construction General Permit.) Where there is disturbance of land through the construction and/or installation of control measures, there is a possibility that artifacts, records, or remains associated with historic properties could be impacted. Therefore, if the applicant is establishing new or altering existing control measures to manage their discharge that will involve subsurface ground disturbance of less than 1 acre, they will need to ensure (1) that historic properties will not be impacted by their activities or (2) that they are in compliance with a written agreement with the SHPO, THPO, or other tribal representative that outlines all measures the applicant will carry out to mitigate or prevent any adverse effects on historic properties.

### ***Examples of Control Measures Which Involve Subsurface Disturbance***

The type of control measures that are presumptively expected to cause subsurface ground disturbance include:

- Dikes
- Berms
- Catch basins, drainage inlets
- Ponds, bioretention areas
- Ditches, trenches, channels, swales
- Culverts, pipes
- Land manipulation; contouring, sloping, and grading
- Perimeter Drains
- Installation of manufactured treatment devices

EPA cautions applicants that this list is non-inclusive. Other control measures that involve earth disturbing activities that are not on this list must also be examined for the potential to affect historic properties.

### **Certification**

Upon completion of this screening process the applicant shall certify eligibility for this permit using one of the following criteria on their Notice of Intent for permit coverage:

**Criterion A:** The discharges do not have the potential to cause effects on historic properties.



**Criterion B:** A historic survey was conducted. The survey concluded that no historic properties are present. Discharges do not have the potential to cause effects on historic properties.

**Criterion C:** The discharges and discharge related activities have the potential to have an effect on historic properties, and the applicant has obtained and is in compliance with a written agreement with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), or other tribal representative that outlines measures the applicant will carry out to mitigate or prevent any adverse effects on historic properties.

Authorization under the general permit is available only if the applicant certifies and documents permit eligibility using one of the eligibility criteria listed above. Small MS4s that cannot meet any of the eligibility criteria in above must apply for an individual permit.

### Screening Process

Applicants or their consultant need to answer the questions and follow the appropriate procedures below to assist EPA in compliance with 36 CFR 800.

**Question 1:** Is the facility an existing facility authorized by the previous permit or a new facility and the applicant is not undertaking any activity involving subsurface land disturbance less than an acre?

**YES** - The applicant should certify that fact in writing and file the statement with the EPA. This certification must be maintained as part of the records associated with the permit.

**The applicant should certify eligibility for this permit using Criterion A on their Notice of Intent for permit coverage.** The applicant does not need to contact the state Historic Commission. Based on that statement, EPA will document that the project has "no potential to cause effects" (36 CFR 800.3(a)(1)). There are no further obligations under the Section 106 regulations.

**NO**- Go to Question 2.

**Question 2:** Is the property listed in the National Register of Historic Places or have prior surveys or disturbances revealed the existence of a historic property or artifacts?

**NO** - The applicant should certify that fact in writing and file the statement with the EPA. This certification must be maintained as part of the records associated with the permit.

**The applicant should certify eligibility for this permit using Criterion B on their Notice of Intent for permit coverage.** The applicant does not need to contact the state Historic Commission. Based on that statement, EPA will document that the project has "no potential to cause effects" (36 CFR 800.3(a)(1)). There are no further obligations under the Section 106 regulations.

**YES** - The applicant or their consultant should prepare a complete information submittal to the SHPO. The submittal consists of:

- Completed Project Notification Form- forms available at <http://www.sec.state.ma.us/mhc/mhcform/formidx.htm>;

- USGS map section with the actual project boundaries clearly indicated; and
- Scaled project plans showing existing and proposed conditions.

(1) Please note that the SHPO does not accept email for review. Please mail a paper copy of your submittal (Certified Mail, Return Receipt Requested) or deliver a paper copy of your submittal (and obtain a receipt) to:

State Historic Preservation Officer  
Massachusetts Historical Commission  
220 Morrissey Blvd.  
Boston MA 02125.

(2) Provide a copy of your submittal and the proof of MHC delivery showing the date MHC received your submittal to:

NPDES Permit Branch Chief  
US EPA Region 1 (OEP06-1)  
5 Post Office Square, Suite 100  
Boston MA 02109-3912.

The SHPO will comment within thirty (30) days of receipt of complete submittals, and may ask for additional information. Consultation, as appropriate, will include EPA, the SHPO and other consulting parties (which includes the applicant). The steps in the federal regulations (36 CFR 800.2 to 800.6, etc.) will proceed as necessary to conclude the Section 106 review for the undertaking. **The applicant should certify eligibility for this permit using Criterion C on their Notice of Intent for permit coverage.**

## APPENDIX F

### New or Increased Discharges Tracking Log

New or Increased Discharges Marshfield, MA					
Location	Description	Proposed Use	Area	Contributing Area to MS4	BMP
**Harwood Rd	Housing Community	Residence	27 acres	27 acres	Stormceptor unit and detention pond

\*\* Example of what would be written for a new or increased discharge

## APPENDIX G

### SSO Inventory

Sanitary Sewer Overflow (SSO) Inventory									
Marshfield, MA									
Location	Discharge Location	Is Discharge Entering MS4? (Y/N)	Date/Time of SSO Occurrence	Estimated Volume of SSO Occurrence	Known/Suspected Cause	Mitigation Measures Completed	Mitigation Implementation Date	Mitigation Measures Planned	Mitigation Implementation Schedule
1 Example Rd	Enters into Example Pond	Yes	August 4, 2016 9:00 AM - August 5, 2016 3:00 PM	1,200 gallons	Illicit resident connection	Illicit connection removed	August 8, 2016		

\*The SSO occurrence listed above is an example

## APPENDIX H

### Current Stormwater Bylaws



## **Chapter 246**

### **STORMWATER MANAGEMENT**

#### **§ 246-1. Purpose and objectives.**

Increased stormwater runoff and contaminated stormwater runoff are the two major causes of impairment of lakes, ponds, streams, rivers, wetlands and groundwater; contamination of drinking water supplies; alteration or destruction of aquatic and wildlife habitat; and flooding. Regulation of illicit connections and discharges to the municipal storm drain system is necessary for the protection of the Town's water bodies and groundwater, and to safeguard the public health, safety, welfare and the environment. The objectives of this bylaw are:

- A. To help prevent pollutants from entering the Town's municipal storm drain system;
- B. To prohibit illicit connections and unauthorized discharges to the Town's municipal storm drain system, a requirement of NPDES Phase II General Permit (MS4);
- C. To require the removal of all such illicit connections;
- D. To comply with state 314 CMR 3.0 and 314 CMR 5.0 and other state and federal statutes and regulations relating to the quantity and quality of stormwater discharges;
- E. To establish the legal authority to ensure compliance with the provisions of this bylaw through inspection, monitoring, and enforcement; and
- F. To establish the legal authority to allow connections to the Town's municipal storm drain system through regulation adopted by the Board of Public Works.

#### **§ 246-2. Definitions.**

For the purposes of this bylaw, the following words or terms shall mean:

**AUTHORIZED ENFORCEMENT AGENCY** — The Board of Public Works (hereafter the Board), its employees or agents designated to enforce this bylaw.

**BEST MANAGEMENT PRACTICE (BMP)** — An activity, procedure, or structural improvement that helps to reduce the quantity or improve the quality of stormwater runoff.

**CLEAN WATER ACT** — The Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.) as hereafter amended.

**DISCHARGE OF POLLUTANTS** — The discharge from any source of any pollutant or combination of pollutants into the municipal storm drain system

or into the waters or wetlands of the United States or commonwealth or waters of the Town from any source.

GROUNDWATER — Water beneath the surface of the ground.

ILLICIT CONNECTION — A surface or subsurface drain or conveyance which allows an unauthorized illicit discharge into the municipal storm drain system, including without limitation sewage, process wastewater, wash water or any connections from indoor drains, sinks, or toilets, regardless of whether said connection was previously allowed, permitted, or approved before the effective date of this bylaw.

ILLICIT DISCHARGE — Direct or indirect discharge to the municipal storm drain system that is not composed entirely of stormwater, except as exempted in § 246-8. The term does not include a discharge in compliance with a National Pollutant Discharge Elimination System (NPDES) stormwater discharge permit or a surface water discharge permit, or discharge resulting from fire-fighting activities exempted pursuant to § 246-8Q of this bylaw.

IMPERVIOUS SURFACE — Any material or structure on or above the ground that prevents water infiltrating the underlying soil. "Impervious surface" includes without limitation roads, paved parking lots, sidewalks, and rooftops.

MUNICIPAL STORM DRAIN SYSTEM — The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the Town of Marshfield.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGE PERMIT — A permit issued by United States Environmental Protection Agency (EPA) or jointly with the state that authorizes the discharge of pollutants to waters of the United States.

NON-STORMWATER DISCHARGE — Discharge to the municipal storm drain system not composed entirely of stormwater.

PERSON — An individual, partnership, association, firm, company, trust, corporation, agency, authority, department or political subdivision of the commonwealth or the federal government, to the extent permitted by law, and any officer, employee, or agent of such person.

POLLUTANT — Any element or property of sewage, agricultural, industrial or commercial waste, runoff, leachate, heated effluent, or other matter, whether originating at a point or nonpoint source, that is or may be introduced into any sewage treatment works or waters of the commonwealth. Pollutants shall include without limitation:

- A. Paints, varnishes, and solvents;
- B. Oil and other automotive fluids;

- C. Non-hazardous liquid and solid wastes and yard wastes;
- D. Refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordnances, accumulations and floatables;
- E. Pesticides, herbicides, and fertilizers;
- F. Hazardous materials and wastes; sewage, fecal coliform and pathogens;
- G. Dissolved and particulate metals;
- H. Animal wastes;
- I. Rock, sand, salt, soils;
- J. Construction wastes and residues;
- K. Medical and bio-wastes; and
- L. Noxious or offensive matter of any kind.

PROCESS WASTEWATER — Water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any material, intermediate product, finished product, or waste product.

RECHARGE — The process by which groundwater is replenished by precipitation through the percolation of runoff and surface water through the soil.

STORMWATER — Stormwater runoff, snow melt runoff, and surface water runoff and drainage.

STORMWATER DISCHARGE — A discharge of stormwater runoff by a system of conveyances (including pipes, conduits, ditches and channels) used for collecting and conveying stormwater and as further defined by 314 CMR 5.04(2).

SURFACE WATER DISCHARGE PERMIT — A permit issued by the Department of Environmental Protection (DEP) pursuant to 314 CMR 3.00 that authorize the discharge of pollutants to waters of the Commonwealth of Massachusetts.

TOXIC OR HAZARDOUS MATERIAL OR WASTE — Any material which because of its quantity, concentration, or chemical, corrosive, flammable, reactive, toxic, infectious or radioactive characteristics, either separately or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare, or to the environment. Toxic or hazardous materials include any synthetic organic chemical, petroleum product, heavy metal, radioactive or infectious waste, acid and alkali, and any substance defined as toxic or hazardous under MGL c. 21C and c. 21E, and the regulations at 310 CMR 30.000 and 310 CMR 40.000.

WASTEWATER — Any sanitary waste, sludge, or overflow of contents from septic tank or cesspool, and water that during manufacturing, cleaning or

processing comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product or waste product.

**WATERCOURSE** — A natural or man-made channel through which water flows or a stream of water, including a river, brook or underground stream.

**WATERS OF THE COMMONWEALTH** — All waters within the jurisdiction of the commonwealth, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, coastal waters, and groundwater.

**WATERS OF THE TOWN** — All waters within the Town outside the jurisdiction of the commonwealth defined for the purpose of this bylaw.

### **§ 246-3. Applicability.**

This bylaw shall apply to all flows entering the municipally owned storm drainage system.

### **§ 246-4. Authority.**

This bylaw is adopted under the authority granted by the Home Rule Amendment of the Massachusetts Constitution and the Home Rule Procedures Act,<sup>1</sup> and pursuant to the regulations of the federal Clean Water Act found at 40 CFR 122.34.

### **§ 246-5. Administration.**

The Board of Public Works shall administer, implement and enforce this bylaw. Any powers granted to or duties imposed upon the Board may be delegated in writing by the Board to employees or agents of the Board. Copies of all orders of enforcement and correspondence shall be given to the Board of Public Works for maintenance of records.

### **§ 246-6. Rules and regulations.**

The Board of Public Works may promulgate rules and regulations to effectuate the purposes of this bylaw. Failure by the Board to promulgate such rules and regulations shall not have the effect of suspending or invalidating this bylaw.

### **§ 246-7. Prohibited activities.**

- A. Illicit discharges. No person shall dump, discharge, or cause or allow to be discharged any pollutant or non-stormwater discharge into the municipal storm drain system, into a watercourse, or into the waters of the commonwealth, or waters of the Town.
- B. Illicit connections. No person shall construct, use, allow, maintain or continue any illicit connection to the municipal storm drain system,

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1. Editor's Note: See MGL c. 43B.

regardless of whether the connection was permissible under applicable law, regulation or custom at the time of connection.

- C. Obstruction of municipal storm drain system. No person shall obstruct or interfere with the normal flow of stormwater into or out of the municipal storm drain system without prior written approval from the Board of Public Works.

#### **§ 246-8. Exemptions.**

The following non-stormwater discharges or flows are exempt from the prohibition of non-stormwaters provided that the source is not a significant contributor of a pollutant to the municipal storm drain system:

- A. Waterline flushing;
- B. Flow from potable water sources;
- C. Springs;
- D. Natural flow from riparian habitats and wetlands;
- E. Diverted stream flow;
- F. Rising groundwater;
- G. Uncontaminated groundwater infiltration as defined in 40 CFR 35.2005(b)(20), or uncontaminated pumped groundwater regulated and permitted in accordance with the Marshfield Department of Public Works Policy for Connection into the Town's Storm Drain System; **[Amended 4-24-2017 ATM by Art. 10]**
- H. Water from exterior foundation drains, footing drains (not including active groundwater dewatering systems), crawl space pumps, or air-conditioning condensation regulated and permitted in accordance with the Marshfield Department of Public Works Policy for Connection into the Town's Storm Drain System;
- I. Discharge from landscape irrigation or lawn watering;
- J. Water from individual residential car washing;
- K. Discharge from dechlorinated swimming pool water (less than one ppm chlorine) provided the water is allowed to stand for one week prior to draining and the pool is drained in such a way as not to cause a nuisance;
- L. Discharge from street sweeping;
- M. Dye testing, provided verbal notification is given to the Board of Public Works prior to the time of the test;
- N. Non-stormwater discharge permitted under an NPDES permit or a surface water discharge permit, waiver, or waste discharge order

administered under the authority of the United States Environmental Protection Agency or the Department of Environmental Protection, provided that the discharge is in full compliance with the requirements of the permit, waiver, or order and applicable laws and regulations;

- O. Discharge for which advanced written approval is received from the Board of Public Works as necessary to protect public health, safety, welfare or the environment;
- P. Exemptions as defined under 314 CMR 3.05; and
- Q. Discharge of flow resulting from fire-fighting activities.

**§ 246-9. Emergency suspension of storm drainage system access.**

The Board of Public Works may suspend municipal storm drain system access to any person or property without prior written notice when such suspension is necessary to stop an actual or threatened discharge of pollutants that presents imminent risk of harm to the public health, safety, welfare or the environment. In the event any person fails to comply with an emergency suspension order, the authorized enforcement agency may take all reasonable steps to prevent or minimize harm to the public health, safety, welfare or the environment.

**§ 246-10. Notification of spills.**

Notwithstanding other requirements of local, state or federal law, as soon as a person responsible for a facility or operation, or responsible for emergency response for a facility or operation, has information of or suspects a release of materials at that facility or operation resulting in or which may result in discharge of pollutants to the municipal drainage system or waters of the commonwealth, or waters of the Town, the person shall take all necessary steps to ensure containment and cleanup of the release. In the event of a release of oil or hazardous materials, the person shall immediately notify the Town's Fire and Police Departments, Conservation Agent and the Town's Health Agent and Department of Public Works. In the event of a release of non-hazardous material, the reporting person shall notify the Conservation Agent, the Town's Health Agent and Department of Public Works no later than the next business day. The reporting person shall provide to the Conservation Agent and Department of Public Works written confirmation of all telephone, facsimile or in-person notifications within three business days thereafter. If the discharge of prohibited materials is from a commercial or industrial facility, the facility owner or operator of the facility shall retain on site a written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

**§ 246-11. Enforcement; violations and penalties.**

- A. The Board of Public Works or an authorized agent of the Board of Public Works including the Conservation Agent and the Town's Health

Agent shall enforce this bylaw, regulations, orders, violation notices, and enforcement orders, and may pursue all civil and criminal remedies for such violations.

- B. Civil relief. If a person violates the provisions of this bylaw, regulations, permit, notice, or order issued thereunder, the Board of Public Works or Conservation Agent or the Town's Health Agent may seek injunctive relief in a court of competent jurisdiction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.
- C. Orders. The Board of Public Works or an authorized agent of the Board of Public Works, Conservation Agent, or the Town's Health Agent may issue a written order to enforce the provisions of this bylaw or the regulations thereunder, which may include:
  - (1) Elimination of illicit connections or discharges to the municipal storm drain system;
  - (2) Performance of monitoring, analyses, and reporting;
  - (3) That unlawful discharges, practices, or operations shall cease and desist; and
  - (4) Remediation of contamination in connection therewith.
- D. If the enforcing person determines that abatement or remediation of contamination is required, the order shall set forth a deadline by which such abatement or remediation must be completed. Said order shall further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the Town may, at its option, undertake such work, and expenses thereof shall be charged to the violator.
- E. Within 30 days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner will be notified of the costs incurred by the Town, including administrative costs. The violator or property owner may file a written protest objecting to the amount or basis of costs with the Board of Public Works within 30 days of receipt of the notification of the costs incurred. If the amount due is not received by the expiration of the time in which to file a protest or within 30 days following a decision of the Board of Public Works affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the costs shall become a special assessment against the property owner and shall constitute a lien on the owner's property for the amount of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in MGL c. 59, § 57, after the 31st day at which the costs first become due.
- F. Criminal penalty. Any person who violates any provision of this bylaw, regulation, order or permit issued thereunder shall be punished by a



fine of not more than \$300. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

- G. Noncriminal disposition. As an alternative to criminal prosecution or civil action, the Town's enforcing officer may elect to utilize the noncriminal disposition procedure set forth in MGL c. 40, § 21D, and adopted by the Town and set forth in Chapter 161, Article I, of the Town of Marshfield General Bylaws. The penalty for the first violation shall be \$100. The penalty for the second violation shall be \$200. The penalty for the third and subsequent violations shall be \$300. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.
- H. Entry to perform duties under this bylaw. To the extent permitted by state law, or if authorized by the owner or other party in control of the property, employees authorized by the Board of Public Works, Conservation Agent or Board of Health Agent may enter upon privately owned property for the purpose of performing their duties under this bylaw and regulations and may make or cause to be made such examinations, surveys or sampling as the Board of Public Works or Conservation Agent or Town Health Agent deems reasonably necessary.
- I. Appeals. The decisions or orders of the Board of Public Works or its agents, the Conservation Agent, or the Town's Health Agent shall be final. Further relief shall be to a court of competent jurisdiction.
- J. Remedies not exclusive. The remedies listed in this bylaw are not exclusive of any other remedies available under any applicable federal, state or local law.

#### **§ 246-12. Severability.**

The provisions of this bylaw are hereby declared to be severable. If any provision, paragraph, sentence, or clause of this bylaw or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of this bylaw.

#### **§ 246-13. Transitional provisions.**

- A. Existing connections. Property owners with existing connections shall notify the DPW and provide detail of the connection to the Town's municipal storm drainage system to obtain license or permit. Modifications may be required due to concern with water quality, water quantity or health and safety issues.
- B. Residential property owners shall have 365 days from the effective date of the bylaw to comply with its provisions unless good cause is shown for the failure to comply with the bylaw during that period. **[Amended 4-24-2017 ATM by Art. 10]**

- C. Commercial property owners shall have 180 days from the effective date of the bylaw to comply with its provisions unless good cause is shown for the failure to comply with the bylaw during that period.  
**[Amended 4-24-2017 ATM by Art. 10]**

**§ 246-14. Indemnification.**

Permit or license holders allowed to connect to the system shall hold the Town harmless and the Town of Marshfield shall not be held liable for illicit discharges to the stormwater system and receiving areas and receiving waters caused by others.

## APPENDIX I

### Annual Reports

**Year 1 Annual Report**  
**Massachusetts Small MS4 General Permit**  
**Reporting Period: May 1, 2018-June 30, 2019**

*\*\*Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form\*\**

*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.*

**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:

Fax Number:

**Stormwater Management Program (SWMP) Information**

SWMP Location (web address):

Date SWMP was Last Updated:

If the SWMP is not available on the web please provide the physical address and an explanation of why it is not posted on the web:

## Part II: Self Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4.

### 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.

### Year 1 Requirements

- ☒ Develop and begin public education and outreach program  
☒ Identify and develop inventory of all known locations where SSOs have discharged to the MS4 in the last 5 years
  - ☒ The SSO inventory is attached to the email submission
  - ☐ The SSO inventory can be found at the following website:☒ Develop written IDDE plan including a procedure for screening and sampling outfalls  
☒ IDDE ordinance complete  
☒ Identify each outfall and interconnection discharging from MS4, classify into the relevant category, and priority rank each catchment for investigation
  - ☒ The priority ranking of outfalls/interconnections is attached to the email submission
  - ☐ The priority ranking of outfalls/interconnections can be found at the following website:☒ Construction/ Erosion and Sediment Control (ESC) ordinance complete  
☒ Develop written procedures for site inspections and enforcement of sediment and erosion control measures  
☒ Develop written procedures for site plan review  
☒ Keep a log of catch basins cleaned or inspected  
☒ Complete inspection of all stormwater treatment structures

### Annual Requirements

- ☒ Annual opportunity for public participation in review and implementation of SWMP
- ☒ Comply with State Public Notice requirements
- ☒ 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
- ☒ All curbed roadways have been swept a minimum of one time per year

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

Annual Requirements

*Public Education and Outreach\**

- ☒ Annual message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- ☐ Permittee or its agents disseminate educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- ☐ Provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

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

**Solids, Oil and Grease (Hydrocarbons), or Metals**

Annual Requirements

*Good Housekeeping and Pollution Prevention for Permittee Owned Operations*

- ☒ Increase street sweeping frequency of all municipal owned streets and parking lots to a schedule to target areas with potential for high pollutant loads
- Prioritize inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Clean catch basins more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings

Use the box below to input additional details on any unchecked boxes above or any additional information you would like to share as part of your self assessment:

The Town will provide educational material to dog owners at the time of issuance or renewal of dog licenses starting in Year 2, prior to 2020 license issuance.

In Year 2, The North South River Watershed Association (NSRWA) on behalf of the Town will conduct the following outreach:

- Distribute septic maintenance information via press release, social media post, web page and brochure (Appendices F and H)

In Year 3, The NSRWA on behalf of the Town will conduct the following outreach:

- Additional Pet waste handout given at at the time of dog licensing (Appendices F and H)

### 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:

N/A

## 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 the reporting period:

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

#### **BMP: Gardening Green Expo**

Message Description and Distribution Method:

Gardening Green Expo - Regional event for WaterSmart South Shore Communities that provides information on how residents can reduce stormwater pollution from better landscaping practices. A press release went out to the town, The Globe, the Patriot Ledger, Wicked Local, and the Marshfield Mariner. Several Facebook posts were made on the North South River Watershed Association (NSRWA) page. Information about the event went out in our E-newsletter 4 times to 6,000+ subscribers each time. The videos of the speakers were added to the NSRWA website and shared online and on Facebook.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

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:

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#### **BMP: Rain Barrel Sale**

Message Description and Distribution Method:

Regional Rain Barrel Sale - Education about water conservation and the reduction of stormwater from impervious surfaces. A press release went out to the town, The Globe, the Patriot Ledger, Wicked Local, and the Marshfield Mariner. Facebook posts were made on the NSRWA page. Information about the sale went out in the NSRWA E-newsletter to 6,000+ subscribers.



Targeted Audience: Residents

Responsible Department/Parties: NSRWA

Measurable Goal(s):

Distribute at least two educational messages within the permit term (5 years).

There were 10 rain barrels sold in Marshfield.

Message Date(s): March 30, 2019

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:

This outreach was developed by the NSRWA on behalf of the Town of Marshfield to supplement the outreach described on the NOI.

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### **BMP: Greenscapes Guide**

Message Description and Distribution Method:

Greenscapes Guide - Digital download of landscaping techniques that reduce stormwater pollutants (fertilizers, pesticides, herbicides). We promoted the Greenscapes Guide at the Gardening Green Expo and handed out paper copies. It was promoted online and on the NSRWA Facebook page with a reach of 2,831 people and 187 engagements.

Targeted Audience: Residents

Responsible Department/Parties: NSRWA

Measurable Goal(s):

Distribute at least two educational messages within the permit term (5 years).

There have been 7 downloads from Marshfield at this time.

Message Date(s): May 22, 2019

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:

This outreach was developed by the NSRWA on behalf of the Town of Marshfield to supplement the outreach described on the NOI.

---

### **BMP: Spring Messaging**

Message Description and Distribution Method:

A grass clippings message and a fertilizer message were both posted on the NSRWA Facebook page in May.

The grass clippings message had a reach of 11,034 people and 472 engagements. The fertilizer message had a reach of 2,376 people and 239 engagements. Both messages were also posted to the Marshfield MA Forum Facebook page. The grass clippings Facebook post was boosted in June with a \$50 ad targeted to all WaterSmart towns with a reach of 9,678 and 266 engagements, and a \$50 ad targeted to Marshfield with a reach of 3,173 and 368 engagements.

Targeted Audience: Resident

Responsible Department/Parties: NSRWA

Measurable Goal(s):

Distribute at least two educational messages within the permit term (5 years).

Message Date(s): May 22, 2019; May 28, 2019

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: Fowl Water Campaign**

Message Description and Distribution Method:

Stormwater Social Media Video called "Stormwater pollution is trash, oil, cigarette butts, & dog waste" on the Think Blue Massachusetts "Fowl Water" campaign (<https://thinkbluemassachusetts.org/>). Advertisement on Facebook, Instagram, & YouTube.

Targeted Audience: Residents

Responsible Department/Parties: NSRWA

Measurable Goal(s):

Distribute at least two educational messages within the permit term (5 years).

5,022 Facebook/Instagram ad impressions; 4,048 YouTube ad impressions.

Message Date(s): June 23, 2019; July 12, 2019

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:

This outreach was developed by the NSRWA on behalf of the Town of Marshfield to supplement the outreach described on the NOI.

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**BMP: School Program**

## Message Description and Distribution Method:

School Program on Stormwater and conservation messaging covering a groundwater model, watershed model and cleaning dirty water taught to elementary school students and parent volunteers in school program. The program educated 2nd grade students and parent volunteers in Martinson, South, Governor Winslow, Eames Way, and Daniel Webster Elementary Schools. The program ran for 5 days and there were 294 students and 56 parent volunteers. A press release went out to the town, The Globe, the Patriot Ledger, Wicked Local, and the Marshfield Mariner. The program was also posted on the NSRWA Facebook page with a reach of 573 people and 21 engagements, and on the Marshfield MA Forum Facebook page.

Targeted Audience: Residents

Responsible Department/Parties: NSRWA

## Measurable Goal(s):

Annual school participation of program.

Message Date(s): March 8, 15, 20, 26 and 27, 2019

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: Pet Waste Education: Article**

## Message Description and Distribution Method:

Pet Waste Education - An article was written on The Problem of Dog Waste on the South Shore. This was sent to the Globe, the Patriot Ledger, the Duxbury Clipper and the Duxbury Mariner. The Patriot Ledger wrote a feature on it from our press release, and WATD did an on air interview. It was posted on the NSRWA Facebook page with a reach of 1,556 people and 197 engagements, and on the Marshfield MA Forum Facebook page.

Targeted Audience: Residents

Responsible Department/Parties: NSRWA

## Measurable Goal(s):

Distribute annual messaging in accordance with the Town's bacteria and pathogens impairment and TMDL.

Message Date(s): June 13, 2019

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:

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### **BMP: Pet Waste Education: Scoop It Cards**

Message Description and Distribution Method:

Pet Waste Education - Printed "Scoop It" cards, web article, press release, and social media posts for June. Pet waste "Scoop It" cards were distributed to the town clerk's office (100), South River Vet (100), and Marshfield Animal Hospital (100).

Targeted Audience: Residents

Responsible Department/Parties: NSRWA

Measurable Goal(s):

Distribute annual messaging in accordance with the Town's bacteria and pathogens impairment and TMDL.

Message Date(s): June 13, 2019

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:

Add an Educational Message

### **MCM2: Public Participation**

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

Annual review and public comment of the SWMP.

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

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

Hazardous Waste Cleanup Day (September 14, 15), Keep Marshfield Clean (April 27).

### **MCM3: Illicit Discharge Detection and Elimination (IDDE)**

#### **Sanitary Sewer Overflows (SSOs)**

*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:

*Below, report on the total number of SSOs identified in the MS4 system and removed to date. At a minimum, report SSOs identified since 2013.*

Total number of SSOs identified:

Total number of SSOs removed:

#### **MS4 System Mapping**

Describe the status of your MS4 map, including any progress made during the reporting period (phase I map due in year 2):

Previously, Marshfield has completed the following Phase 1 mapping requirements:

- Outfalls and receiving waters (updated 2016)
- Water bodies identified by name and indication of all use impairments as identified on the most recent EPA approved Massachusetts Integrated List of Waters report (taken from USGS/MassDEP Hydrography data updated April 2017)
- Initial catchment delineations. Any available system data and topographic information may be used to produce initial catchment delineations (attached as Attachment D and further developed in Section 5.1)

The Town continues to update its stormwater infrastructure GIS maps.

#### **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.*

- ☐ The outfall screening data is attached to the email submission
- ☐ The outfall screening data can be found at the following website:

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

Number of outfalls screened:

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

Percent of total outfalls screened:

### **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.*

- ☐ The catchment investigation data is attached to the email submission  
☐ The catchment investigation data can be found at the following website:

*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:*

N/A

### **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.*

- ☐ The illicit discharge removal report is attached to the email submission  
☐ The illicit discharge removal report can be found at the following 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:  [UNITS]

*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.*

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:

N/A

### **Employee Training**

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

Annual IDDE implementation training. Multiple MS4 Permit meetings held throughout reporting period.

### **MCM4: Construction Site Stormwater Runoff Control**

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

Number of site plan reviews completed:

Number of inspections completed:

Number of enforcement actions taken:

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

#### **Ordinance Development**

Describe the status of the post-construction ordinance required to be complete in year 2 of the permit term:

Nothing to date.

#### **As-built Drawings**

Describe the status of the measures the MS4 has utilized to require the submission of as-built drawings and ensure long term operation and maintenance of completed construction sites required to be complete in year 2 of the permit term:

Nothing to date.

### **Street Design and Parking Lots Report**

Describe the status of the street design and parking lots assessment due in year 4 of the permit term, including any planned or completed changes to local regulations and guidelines:

Nothing to date.

### **Green Infrastructure Report**

Describe the status of the green infrastructure report due in year 4 of the permit term, including the findings and progress towards making the practice allowable:

Nothing to date.

### **Retrofit Properties Inventory**

Describe the status of the inventory, due in year 4 of the permit term, of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

Nothing to date.

## **MCM6: Good Housekeeping**

### **Catch Basin Cleaning**

Describe the status of the catch basin cleaning optimization plan:

A catch basin cleaning optimization plan has been written as part of the MS4 Infrastructure O&M Program.

*If complete, attach the catch basin cleaning optimization plan or the schedule to gather information to develop the optimization plan:*

- ☐ The catch basin cleaning optimization plan or schedule is attached to the email submission
- ☐ The catch basin cleaning optimization plan or schedule can be found at the following website:



*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, if known.*

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:

N/A

### **Street Sweeping**

Describe the status of the written procedures for sweeping streets and municipal-owned lots:

A street sweeping procedure plan has been written as part of the MS4 Infrastructure O&M Program.

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

☐ Number of miles cleaned:

☒ Volume of material removed:

☐ Weight of material removed:

*If applicable:*

For rural uncurbed roadways with no catch basins, describe the progress of the inspection, documentation, and targeted sweeping plan:

Uncurbed roadways are swept at a minimum of 1 time per year. These procedures are documented in the MS4 Infrastructure O&M Program.

### **Winter Road Maintenance**

Describe the status of the written procedures for winter road maintenance including the storage of salt and sand:

A winter road maintenance plan has been written as part of the MS4 Infrastructure O&M Program.

**Inventory of Permittee-Owned Properties**

Describe the status of the inventory, due in year 2 of the permit term, of permittee-owned properties, including parks and open spaces, buildings and facilities, and vehicles and equipment, and include any updates:

In progress. All schools have been inventoried, the remaining municipal properties will be inventoried during Year 2.

**O&M Procedures for Parks and Open Spaces, Buildings and Facilities, and Vehicles and Equipment**

Describe the status of the operation and maintenance procedures, due in year 2 of the permit term, of permittee-owned properties (parks and open spaces, buildings and facilities, vehicles and equipment) and include maintenance activities associated with each:

Nothing to date.

**Stormwater Pollution Prevention Plan (SWPPP)**

Describe the status of any SWPPP, due in year 2 of the permit term, for permittee-owned or operated facilities including maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater:

No current SWPPPs in place. During Year 2, SWPPPs will be developed for required facilities.

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

Number of site inspections completed: 0

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

N/A

**O&M Procedures for Stormwater Treatment Structures**

Describe the status of the written procedure for stormwater treatment structure maintenance:

Written procedures for stormwater treatment structures are complete as part of the MS4 Standard Operating Procedures and MS4 Infrastructure O&M Program.

## 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 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:

N/A

### **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:

During this reporting period, a consulting company was contracted to inspect the Town's 15 stormwater BMPs, noting BMP type, condition and issues related to excess sedimentation, excess vegetation, soil erosion, clogging, trash/debris, oil/grease and invasive species. The consultants drafted a Municipal Stormwater Treatment Systems: O&M SOP. Additionally, they conducted facility audits to inspect town-owned facilities for potential contributions to illicit stormwater discharge.

### **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 2 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Complete system mapping Phase I
- Begin investigations of catchments associated with Problem Outfalls
- Develop or modify an ordinance or other regulatory mechanism for post-construction stormwater runoff from new development and redevelopment
- Establish and implement written procedures to require the submission of as-built drawings no later than two years after the completion of construction projects
- Develop, if not already developed, written operations and maintenance procedures
- Develop an inventory of all permittee owned facilities in the categories of parks and open space,

buildings and facilities, and vehicles and equipment; review annually and update as necessary

- Establish a written program detailing the activities and procedures the permittee will implement so that the MS4 infrastructure is maintained in a timely manner
- Develop and implement a written SWPPP for maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater
- Enclose or cover storage piles of salt or piles containing salt used for deicing or other purposes
- Develop, if not already developed, written procedures for sweeping streets and municipal-owned lots
- Develop, if not already developed, written procedures for winter road maintenance including storage of salt and sand
- Develop, if not already developed, a schedule for catch basin cleaning
- Develop, if not already developed, a written procedure for stormwater treatment structure maintenance
- Develop a written catchment investigation procedure (*18 months*)

#### 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 in the last 5 years
- 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 uncurbed streets at least annually

Provide any additional details on activities planned for permit year 2 below:

The Town of Marshfield has hired a consulting company to complete the following in Year 2:

- SWPPP Updates
- Evaluation of Town Facilities
- Revisions to Stormwater Bylaws to conform with new General Permit
- Dry and wet weather field investigations and water quality testing

The Town will continue to work with the North South River Watershed Association on education and outreach opportunities.

## Part V: Certification of Small MS4 Annual Report 2019

### **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:

Title:

Signature:

Date:

*[Signatory may be a duly authorized  
representative]*

# Year 2 Annual Report

## Massachusetts Small MS4 General Permit

### Reporting Period: July 1, 2019-June 30, 2020

**\*\*Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form\*\***

*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, 2019 and June 30, 2020 unless otherwise requested.*

### Part I: Contact Information

Name of Municipality or Organization: Town of Marshfield

EPA NPDES Permit Number: MAR041048

#### Primary MS4 Program Manager Contact Information

Name: Rod Procaccino

Title: Town Engineer

Street Address Line 1: 870 Moraine Street

Street Address Line 2:

City: Marshfield

State: MA

Zip Code: 02050

Email: rprocaccino@townofmarshfield.org

Phone Number: (781) 834-5561

#### Stormwater Management Program (SWMP) Information

SWMP Location (web address): [https://www.marshfield-ma.gov/sites/g/files/vyhli3416/f/uploads/for\\_comment\\_-\\_marshfield\\_swmp\\_report.pdf](https://www.marshfield-ma.gov/sites/g/files/vyhli3416/f/uploads/for_comment_-_marshfield_swmp_report.pdf)

Date SWMP was Last Updated: June 2019

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.

### Year 2 Requirements

- ☒ Completed Phase I of system mapping
- ☒ Developed a written catchment investigation procedure and added the procedure to the SWMP
- ☒ Developed written procedures to require the submission of as-built drawings and ensure the long term operation and maintenance of completed construction sites and added these procedures to the SWMP
- ☒ Enclosed or covered storage piles of salt or piles containing salt used for deicing or other purposes
- ☒ Developed written operations and maintenance procedures for parks and open space, buildings and facilities, and vehicles and equipment and added these procedures to the SWMP
- ☒ Developed an inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment and added this inventory to the SWMP
- ☒ Completed a written program for MS4 infrastructure maintenance to reduce the discharge of pollutants
  - Developed written SWPPPs, included in the SWMP, for all of the following permittee owned or
  - ☐ operated facilities: maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater

*Optional:* If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above year 2 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:

The SWMP will be updated to include the Year 2 Requirements in Year 3.

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 website:
- ☒ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters
- ☐ Provided training to employees involved in IDDE program within the reporting period
- ☒ All curbed roadways were swept at least once within the reporting period
- ☒ Updated outfall and interconnection inventory and priority ranking as needed

*Optional:* If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above annual 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:

**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

*\* 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:

In Year 3, on behalf of Marshfield the NSRWA will be completing the following outreach:  
 - Pet waste handout/mailer to go with dog licensing & distributed at local veterinarian offices and local pet



stores & WaterSmart website (Appendices F and H requirement). This was intended to be started in Year 2, but due to COVID-19, these flyers were not distributed to the town clerk's offices.

### **Solids, Oil and Grease (Hydrocarbons), or Metals**

#### Annual Requirements

##### *Good Housekeeping and Pollution Prevention for Permittee Owned Operations*

- ☒ Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule that targets areas with potential for high pollutant loads
- ☒ Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicated excessive sediment or debris loadings

*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:School curriculum, programs, press release, social media post**

Message Description and Distribution Method:

School Program: Stormwater and conservation messaging - Groundwater model, watershed model and cleaning dirty water taught to elementary school students and parent volunteers in school program

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Due to the Covid-19 pandemic, the school program had to go virtual. Environmental Educator Brian Taylor created videos on the school program content that teachers used with their students. The teachers also had the Watershed Jeopardy game to play with the students. All of the teachers were also given a packet of supplemental materials to go with the program.

A press release to went out to the town, The Globe, the Patriot Ledger, Wicked Local, and the Marshfield Mariner. There were 535 views on the school program web page. The program was also posted on the NSRWA Facebook page with a reach of 884 people and 83 engagements.

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:Press release, social media post, flyer, web page**

Message Description and Distribution Method:

Regional Rain Barrel Sale - Education about water consevation and the reduction of stormwater from impervious surfaces

Targeted Audience:

Responsible Department/Parties:

## Measurable Goal(s):

A press release to went out to the town, The Globe, the Patriot Ledger, Wicked Local, and the Marshfield Mariner. Facebook posts were made on the NSRWA page and on Marshfield MA Forum and Marshfield Connect. Information about the sale went out in the NSRWA E-newsletter to 7,800+ subscribers. There were 60 rain barrels sold with 2 sold to residents of Marshfield.

Message Date(s): March 5, 2020

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:

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**BMP:Special event, festival, fairs**

## Message Description and Distribution Method:

Gardening Green Expo - Regional event for WaterSmart South Shore Communities that provides information on how residents can reduce stormwater pollution from better landscaping practices.

Targeted Audience: Residents

Responsible Department/Parties: North and South Rivers Watershed Association as part of the WaterSmart reg

## Measurable Goal(s):

Due to the Covid-19 pandemic, the Gardening Green Expo had to go virtual. We put speaker videos online and we had 2,399 web page views. We took orders for rain barrels, had downloadable water saving plant lists, and also reposted last years speaker videos. We also had a drawing for a custom water saving garden design and 38 people registered for that drawing.

Message Date(s): March 12, 2020

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:Brochures and pamphlets, social media posts**

## Message Description and Distribution Method:

Greenscapes Guide - Digital download of landscaping techniques that reduce stormwater pollutants (fertilizers, pesticides, herbicides)

Targeted Audience: Residents

Responsible Department/Parties: North and South Rivers Watershed Association as part of the WaterSmart reg

Measurable Goal(s):

Due to the Covid-19 pandemic, the Greenscapes Guide could not be handed out at Gardening Green Expo. The downloadable Greenscapes Guide was promoted online and on the NSRWA Facebook page. It was also promoted on the Marshfield MA Forum and Marshfield Connect Facebook pages. There were 2 downloads from Marshfield. We also held a How to Build a Rain Garden Zoom webinar with 25 attendees.

Message Date(s): June 25, 2020

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:Social media posts**

Message Description and Distribution Method:

MS4 message - Fertilizer for May

Targeted Audience: Residents

Responsible Department/Parties: North and South Rivers Watershed Association as part of the WaterSmart reg

Measurable Goal(s):

A fertilizer message was posted on the NSRWA Facebook page in June with a reach of 23,001 people and 2,183 engagements. It was also posted on the Marshfield MA Forum and Marshfield Connect Facebook pages. The Facebook post was boosted in June with a \$50 ad targeted to Marshfield with a reach of 2,012 people and 225 engagements. There were also 19 page views on the Know Before You Mow! web page, 106 page views on the Best Mowing Practices web page, and 172 page views on the Stormwater web page. We also hosted a Zoom webinar on Stormwater in May with 17 attendees.

Message Date(s): May 13, 2020

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:Social media posts**

Message Description and Distribution Method:

MS4 messages - Grass Clippings in June

Targeted Audience: Residents

Responsible Department/Parties: North and South Rivers Watershed Association as part of the WaterSmart reg

Measurable Goal(s):

A grass clippings message was both posted on the NSRWA Facebook page in June with a reach of 119,638 people and 24,325 engagements. It was also posted to the Marshfield MA Forum and Marshfield Connect Facebook pages. The Facebook post was boosted in June with a \$50 ad targeted to Marshfield with a reach of 14,009 people and 660 engagements. There were also 19 page views on the Know Before You Mow! web page, 106 page views on the Best Mowing Practices web page, and 172 page views on the Stormwater web page.

Message Date(s): June 16, 2020

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: Brochures and Pamphlets, social media posts, press release**

Message Description and Distribution Method:

Pet Waste Education - Printed Scoop It cards, web article, press release, and social media posts for June

Targeted Audience: Residents

Responsible Department/Parties: North and South Rivers Watershed Association as part of the WaterSmart reg

Measurable Goal(s):

Due to the Covid-19 pandemic, the Pet waste Scoop It cards were not distributed to town clerk's offices, vets and businesses. An article was written on The Problem of Dog Waste on the South Shore. This was sent to The Globe, the Patriot Ledger, Wicked Local, and the Marshfield Mariner. It was posted on the NSRWA Facebook page with a reach of 67,503 people and 10,088 engagements, and on the Marshfield MA Forum and Marshfield Connect Facebook pages. The Facebook post was boosted with a \$50 ad targeted to Marshfield with a reach of 8,314 people and 219 engagements. There were also 453 page views on The Problem of Dog Waste on the South Shore web page, 22 page views on the Pet Waste Education page, 202 page views on the Addressing the Elephant in the Room - Dog Waste on the South Shore web page.

Message Date(s): June 2, 2020

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:Press release, social media post, web page, brochure**

Message Description and Distribution Method:

Septic maintenance - Maintenance of septic systems, corresponding with SepticSmart week in September

Targeted Audience: Residents

Responsible Department/Parties: North and South Rivers Watershed Association as part of the WaterSmart reg

Measurable Goal(s):

A press release to went out to the town, The Globe, the Patriot Ledger, Wicked Local, and the Marshfield Mariner. A Facebook post was boosted in September with a \$50 ad targeted to all WaterSmart towns with a reach of 27,648 people and 656 engagements, and a \$50 ad targeted to Marshfield with a reach of 3,179 people and 161 engagements.

Message Date(s): September 18, 2019

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:Social media posts**

Message Description and Distribution Method:

"MS4 messages - DON'T BLOW IT!Don't blow, sweep or dump grass clippings and yard waste into streets or storm drains. Social media posts for October "

Targeted Audience: Residents

Responsible Department/Parties: North and South Rivers Watershed Association as part of the WaterSmart reg

Measurable Goal(s):

A message about leaf litter was posted on the NSRWA Facebook page in October. The Facebook post was boosted in October with a \$50 ad targeted to all WaterSmart towns with a reach of 25,444 people and 1,492 engagements, and a \$50 ad targeted to Marshfield with a reach of 1,834 and 190 engagements. There were also 106 page views on the Best Mowing Practices web page, and 172 page views on the Stormwater web page.

Message Date(s): October 18, 2019

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:Brochure to be handed out with permits in towns**

Message Description and Distribution Method:

Proper Sediment and Erosion Control Management - Provided by Planning, Conservation, Building Department at permit request

Targeted Audience: Developers (construction)

Responsible Department/Parties: North and South Rivers Watershed Association as part of the WaterSmart reg

Measurable Goal(s):

A brochure entitled Construction Stormwater Pollution Prevention Guide was created and delivered to all of the town departments who issue permits, including Building, Conservation, Health, Planning, and Zoning. These brochures will be handed to the person when they receive their permit. There were 1,500 distributed to the town of Marshfield.

Message Date(s): October 2019 and Onward

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:Press release, social media post, web page**

Message Description and Distribution Method:

Video Contest - Video submissions will help educate the public about stormwater pollution and water conservation

Targeted Audience: Residents

Responsible Department/Parties: North and South Rivers Watershed Association as part of the WaterSmart reg

Measurable Goal(s):

We are holding a WaterSmart Video Contest. Submissions will be a 1-3 minute videos to help educate the public by creating a fun video that highlights either stormwater pollution and how to prevent it, or ways to conserve water. We partnered with Harbor Media for the contest and they provided the guidelines as well as a cash prize for the 1st place winner. All of the videos will be shared on the NSRWA and WaterSmart website pages and on social media.

Message Date(s): Summer of 2020



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:

This outreach was developed by the NSRWA to supplement outreach listed on the NOI.

---

**BMP: Press release, social media post, web page, brochure mailing**

Message Description and Distribution Method:

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

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:

---

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 Town of Marshfield has posted the SWMP online for public review and comment. Hard copies of the SWMP are also available at the Town Hall.

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 Town is a member of the North and South River Watershed Association.

Household Hazardous Waste Collection Day was 9/21/2019.

All scheduled public involvement, including beach clean-ups, etc, were canceled due to COVID-19.

### **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**

*Below, check all that apply.*

The following elements of the Phase I map have been completed:

- ☒ Outfalls and receiving waters
- ☒ Open channel conveyances
- ☒ Interconnections
- ☒ Municipally-owned stormwater treatment structures
- ☒ Waterbodies identified by name and indication of all use impairments
- ☒ Initial catchment delineations

*Optional:* Describe any additional progress you made on your map during this reporting period or provide additional status information regarding your map:

#### **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.*

- ☐ The outfall screening data is attached to the email submission
- ☐ The outfall screening data can be found at the following website:

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

Number of outfalls screened:

### **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.*

- ☐ The catchment investigation data is attached to the email submission  
☐ The catchment investigation data can be found at the following website:

*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:*

### **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.*

- ☐ The illicit discharge removal report is attached to the email submission  
☐ The illicit discharge removal report can be found at the following 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:

### **Employee Training**

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

### **MCM4: Construction Site Stormwater Runoff Control**

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

Number of site plan reviews completed: 30

Number of inspections completed: 31

Number of enforcement actions taken: 0

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

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

#### **Ordinance or Regulatory Mechanism**

*Below, select the option that describes your ordinance or regulatory mechanism progress.*

- ☒ Bylaw, ordinance, or regulations are updated and adopted consistent with permit requirements
- ☐ Bylaw, ordinance, or regulations are updated consistent with permit requirements but are not yet adopted

- ☐ Bylaw, ordinance, or regulations have not been updated or adopted

### **As-built Drawings**

Describe the measures the MS4 has utilized to require the submission of as-built drawings and ensure long term operation and maintenance of completed construction sites:

There are requirements for as-built plans and O&M plans as part of stormwater permits to be issued. Stormwater Permits are not required if the applicant is going through review process by Conservation, Planning Dept. or ZBA Site Plan or Special Permit. All of these departments require As-built plans. In most cases there are O&M plans required to maintain specified BMPs.

### **Street Design and Parking Lots Report**

Describe the status of the street design and parking lots assessment due in year 4 of the permit term, including any planned or completed changes to local regulations and guidelines:

No progress to date.

### **Green Infrastructure Report**

Describe the status of the green infrastructure report due in year 4 of the permit term, including the findings and progress towards making the practice allowable:

No progress to date.

### **Retrofit Properties Inventory**

Describe the status of the inventory, due in year 4 of the permit term, of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

No progress to date.

## **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:

### **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:

### **O&M Procedures and Inventory of Permittee-Owned Properties**

*Below, check all that apply.*

The following permittee-owned properties have been inventoried:

- ☒ Parks and open spaces
- ☒ Buildings and facilities
- ☒ Vehicles and equipment

The following O&M procedures for permittee-owned properties have been completed:

- ☒ Parks and open spaces
- ☒ Buildings and facilities
- ☒ Vehicles and equipment

### **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 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:

Wet outfall sampling was conducted to further investigate outfalls that discharge to sensitive areas.

### **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:

### **COVID-19 Impacts**

*Optional:* If any of the above year 2 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 3 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Inspect all outfalls/ interconnections (excluding Problem and Excluded outfalls) for the presence of dry weather flow
- Complete follow-up ranking as dry weather screening becomes available

#### 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 uncurbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- 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

Provide any additional details on activities planned for permit year 3 below:

In Year 3, the NSRWA will be completing the following outreach (in addition to NSRWA's annual initiatives):

- Pet waste handout/mailler to go with dog licensing; distribute to residents at local veterinarian offices and local pet stores & WaterSmart website. This outreach effort was delayed this year due to COVID-19.
- Messaging involving proper management of waste materials and dumpsters to minimize contaminants from entering stormwater; distributed to businesses, institutions, and commercial facilities via a press release, social media post, web page, and brochure.
- Messaging involving proper management of waste materials and dumpsters to minimize contaminants from entering stormwater; distributed to industrial facilities via a press release, social media post, web page, and brochure.
- Messaging involving parking lot maintenance, salt storage, sweeping, catch basin cleaning, and fleet maintenance; distribute to residents via a press release, social media post, web page, and brochure.



## Part V: Certification of Small MS4 Annual Report 2020

### **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:

Title:

Signature:

Date:

*[Signatory may be a duly authorized  
representative]*

# Year 3 Annual Report

## Massachusetts Small MS4 General Permit

### Reporting Period: July 1, 2020-June 30, 2021

**\*\*Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form\*\***

*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, 2020 and June 30, 2021 unless otherwise requested.*

### Part I: Contact Information

Name of Municipality or Organization: Town of Marshfield

EPA NPDES Permit Number: MAR041048

#### Primary MS4 Program Manager Contact Information

Name: Rod Procaccino

Title: Town Engineer

Street Address Line 1: 870 Moraine Street

Street Address Line 2:

City: Marshfield

State: MA

Zip Code: 02050

Email: rprocaccino@townofmarshfield.org

Phone Number: (781) 834-5561

#### Stormwater Management Program (SWMP) Information

SWMP Location (web address): [https://www.marshfield-ma.gov/sites/g/files/vyhlf3416/f/uploads/for\\_comment\\_-\\_marshfield\\_swmp\\_report.pdf](https://www.marshfield-ma.gov/sites/g/files/vyhlf3416/f/uploads/for_comment_-_marshfield_swmp_report.pdf)

Date SWMP was Last Updated: September 2021

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

N/A

## 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>

<b>Impairment(s)</b>			
<input checked="" type="checkbox"/> Bacteria/Pathogens	<input type="checkbox"/> Chloride	<input type="checkbox"/> Nitrogen	<input type="checkbox"/> Phosphorus
<input checked="" type="checkbox"/> Solids/ Oil/ Grease (Hydrocarbons)/ Metals			
<b>TMDL(s)</b>			
<i>In State:</i>	<input type="checkbox"/> Assabet River Phosphorus	<input checked="" type="checkbox"/> Bacteria and Pathogen	<input type="checkbox"/> Cape Cod Nitrogen
	<input type="checkbox"/> Charles River Watershed Phosphorus	<input type="checkbox"/> Lake and Pond Phosphorus	
<i>Out of State:</i>	<input type="checkbox"/> Bacteria/Pathogens	<input type="checkbox"/> Metals	<input type="checkbox"/> Nitrogen
	<input type="checkbox"/> Phosphorus		
<div style="border: 1px solid black; padding: 2px 10px; display: inline-block;">Clear Impairments and TMDLs</div>			

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.

### Year 3 Requirements

- ☒ Inspected and screened all outfalls/interconnections (excluding Problem and Excluded outfalls)
- ☒ Updated outfall/interconnection priority ranking based on the information collected during the dry weather inspections as necessary
- ☒ Post-construction bylaw, ordinance, or other regulatory mechanism was updated and adopted consistent with permit requirements

*Optional:* If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above year 3 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:

The Town has existing regulations that pertain to stormwater issues. In Year 3, a consulting company reviewed the Town's regulations, and in Year 4 the Town will work on revisions to ensure consistency with the MS4 Permit requirements.

### 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 website:

N/A

- ☒ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters
- ☐ Provided training to employees involved in IDDE program within the reporting period
- ☒ All curbed roadways were swept at least once within the reporting period
- ☒ Updated system map due in year 2 as necessary
- ☒ 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, provide any additional information, and/or if any of the above annual 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:

Annual IDDE training was delayed due to COVID-19 and completed in September 2021.

All required SWPPPs will be drafted and implemented in Year 4.

The stormwater O&M Plan and inventory of permittee-owned facilities were drafted in Year 2.

### **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

*\* 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:

N/A

### **Solids, Oil and Grease (Hydrocarbons), or Metals**

#### Annual Requirements

##### *Good Housekeeping and Pollution Prevention for Permittee Owned Operations*

- ☒ Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule that targets areas with potential for high pollutant loads

- ☒ Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicated excessive sediment or debris loadings

*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:

N/A

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

N/A

### **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:

The original NOI submitted for the Town of Marshfield stated that there were 129 MS4 outfalls. After conducting dry weather field screenings, the current outfall inventory includes 93 outfalls.

## 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: Water All Around You School Program**

Message Description and Distribution Method:

On behalf of the Town of Marshfield, the North and South Rivers Watershed Association had Environmental Educator Brian Taylor create a series of videos that teachers used with their students, had them play a Watershed Jeopardy game, and hand out a packet of supplemental materials to go with the program. A press release also went out to: the Town of Marshfield, The Globe, the Patriot Ledger, Wicked Local, and the Marshfield Mariner. This program was instated as part of the North and South Rivers Watershed Association WaterSmart Campaign.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

There were 371 views on the school program web page and 270 views on the NSRWA YouTube channel. The videos were also posted on the NSRWA Facebook page, which has an audience of over 5,000 people. Think Blue reports that 33,665 people in Marshfield have been reached in the WaterSmart Campaign.

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:

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#### **BMP: Rain Barrel Sale**

Message Description and Distribution Method:

On behalf of the Town of Marshfield, the North and South Rivers Watershed Association organized a Rain Barrel Sale as part of their WaterSmart Campaign. This event was promoted through a press release that went out to: the Town, The Globe, the Patriot Ledger, Wicked Local, and the Marshfield Mariner. The NSRWA created a Facebook post for their page, and also posted it to the town connect page to reach interested buyers.

Targeted Audience:

Responsible Department/Parties: Town of Marshfield, the North and South Rivers Watershed Association

Measurable Goal(s):

The NSRWA E-newsletter promoted the sale to 10,000+ subscribers, and 14 barrels were sold to residents of Marshfield.

Message Date(s): April 7, 2021

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:

N/A

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### **BMP: Gardening Green Expo and Greenscapes Guide**

Message Description and Distribution Method:

On behalf of the Town of Marshfield, the North and South Rivers Watershed Association organized a Gardening Green Expo, a week long event with live sessions each day as well as prerecorded speaker videos. A downloadable Greenscapes Guide was also promoted online, on the NSRWA Facebook page, and on the Marshfield Connect Facebook page.

Targeted Audience: Residents

Responsible Department/Parties: Town of Marshfield, the North and South Rivers Watershed Association

Measurable Goal(s):

There were 639 live attendees, as well as 1,007 YouTube viewers, Speaker videos online had 4,170 web page views, and a drawing for free products and prizes in which 115 people registered. In addition, 4 people from Marshfield downloaded the Greenscapes Guide. The Marshfield Connect Facebook page has 6,900 members.

Message Date(s): March 22, 2021

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:

N/A

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### **BMP: Spring Annual Message**

Message Description and Distribution Method:

On behalf of the Town of Marshfield, the North and South Rivers Watershed Association posted an annual message on their Facebook page targeted at Marshfield residents, encouraging the proper use and disposal of grass clippings as part of their WaterSmart campaign. The post was also shared on Marshfield MA Forum Facebook page.



Targeted Audience: Residents

Responsible Department/Parties: Town of Marshfield, the North and South Rivers Watershed Association

Measurable Goal(s):

The post had a reach of 121,097 people and 24,424 engagements. On Marshfield MA Forum Facebook page it received 2 engagements. The NSRWA also reports that there were 16 views on the Know Before You Mow! web page and 101 views on the Best Mowing Practices web page.

Message Date(s): June 3, 2021

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:

N/A

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### **BMP:Summer Annual Message**

Message Description and Distribution Method:

The Town provided a link to the Mass.gov Stormwater Pollution Education page, "Fertilizing the Lawn", which reminds residents that "you're not just fertilizing your lawn" and highlights the importance of clean water and addresses the problem of fertilizers in lakes, rivers, and streams. The North and South Rivers Watershed Association also boosted a Facebook post "You're not just fertilizing the lawn!" targeted to Marshfield residents.

Targeted Audience: Residents

Responsible Department/Parties: Town of Marshfield, State of Massachusetts, North and South Rivers Watershed Association

Measurable Goal(s):

The Facebook post titled "You're not just fertilizing the lawn!" was seen by 3,176 people and had 164 engagements when it was boosted in the Town of Marshfield. There were also 209 page views on the stormwater web pages.

Message Date(s): June 3, 2021

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:

N/A

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### **BMP:Fall Annual Message**

Message Description and Distribution Method:

The Town provided a link to the North and South Rivers Watershed Associations Facebook page, who distributed an annual message in the fall encouraging the proper disposal of leaf litter as part of their

WaterSmart South Shore campaign. The post was titled "Don't Blow it!".

Targeted Audience: Residents

Responsible Department/Parties: Town of Marshfield, the North and South Rivers Watershed Association

Measurable Goal(s):

The Facebook post titled "Don't Blow it!" reached 3,085 people and had 157 engagements.

Message Date(s): October 16, 2020

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:

N/A

---

### **BMP: Dog Waste Message**

Message Description and Distribution Method:

On behalf of the Town of Marshfield, the North and South Rivers Watershed Association posted an annual message in the summer encouraging the proper management of pet waste as part of their WaterSmart South Shore campaign. The post was titled "The Pet Waste Problem on the South Shore" and was published on the NSRWA Facebook page and on the Marshfield MA Forum Facebook page.

A press release highlighting the dog waste problem was sent to the The Globe, the Patriot Ledger, Wicked Local, and the Marshfield Mariner. The Town also provided a link on their Storm Water page directly to the NSRWAs website page on Pet Waste Education.

Targeted Audience: Residents

Responsible Department/Parties: Town of Marshfield, the North and South Rivers Watershed Association

Measurable Goal(s):

The Facebook post titled "The Pet Waste Problem on the South Shore" received 10 likes, 6 shares, and 2 comments.

Message Date(s): June 17, 2021

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:

N/A

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### **BMP: Septic Maintenance Message**

**Message Description and Distribution Method:**

On behalf of the Town of Marshfield, North and South Rivers Watershed Association organized and distributed a press release on septic maintenance that went out to: the Town, The Globe, the Patriot Ledger, Wicked Local, and the Marshfield Mariner, and was posted on the NSRWAs Facebook as part of their WaterSmart Campaign. A Facebook post highlighting the EPA's SepticSmart Week was created to spread awareness to residents as well. The Town also posted a link on the Stormwater page of their website to the NSRWAs Septic Systems page.

Targeted Audience: Residents

Responsible Department/Parties: Town of Marshfield, the North and South Rivers Watershed Association

**Measurable Goal(s):**

The Facebook post was boosted in September to Marshfield and reached 8,094 people, garnering 387 engagements.

Message Date(s): September 17, 2020

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:

N/A

---

**BMP: Construction Stormwater Pollution Prevention Guide****Message Description and Distribution Method:**

On behalf of the Town of Marshfield, North and South Rivers Watershed Association organized and distributed a brochure entitled "Construction Stormwater Pollution Prevention Guide" to all of the Town departments that issue permits, including Building and Zoning.

Targeted Audience: Developers (construction)

Responsible Department/Parties: Town of Marshfield, the North and South Rivers Watershed Association

**Measurable Goal(s):**

The Building and Zoning department handed these brochures to people when they receive their construction permit.

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:

N/A

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**BMP:Proper Management of Waste Materials and Dumpsters Postcard**

## Message Description and Distribution Method:

On behalf of the Town of Marshfield, the North and South Rivers Watershed Association organized and distributed a "Proper Management of Waste Materials and Dumpsters postcard" to all of the businesses, institutions, commercial facilities and industrial facilities in Marshfield.

Targeted Audience: Businesses, institutions and commercial facilities

Responsible Department/Parties: Town of Marshfield, the North and South Rivers Watershed Association

## Measurable Goal(s):

254 postcards were mailed in Marshfield.

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:

N/A

---

**BMP:Water for People WMA Grant: videos, online pledge, and lawn signs.**

## Message Description and Distribution Method:

The NSRWA also received a WMA Grant on behalf of the WaterSmart towns, which allowed them to produce a series of videos, an online pledge, and lawn signs. This campaign runs through summer 2021.

Targeted Audience: Residents

Responsible Department/Parties: Town of Marshfield, the North and South Rivers Watershed Association

## Measurable Goal(s):

To date, there have been 9,502 people reached and 121 engagements on Facebook in Marshfield. There have also been 863 YouTube views.

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:

N/A

---

**BMP:Rain Garden Flyer**

**Message Description and Distribution Method:**

The Town posted a link on their stormwater webpage to the Mass.gov "Going Green with Stormwater Raingardens" informational flyer.

Targeted Audience: Residents

Responsible Department/Parties: Town of Marshfield, State of Massachusetts

**Measurable Goal(s):**

Distribute two messages to each of the four audience groups within the permit term.

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:

N/A

---

**BMP: Pet Waste Information to Town Clerk's Office****Message Description and Distribution Method:**

The NSRWA distributed 100 pet waste "Scoop It" cards each to the Town Clerk's office, South River Vet, and Marshfield Animal Hospital.

Targeted Audience: Residents

Responsible Department/Parties: Town of Marshfield, the North and South Rivers Watershed Association

**Measurable Goal(s):**

Distribute messages at time of dog licensing or renewal in accordance with the Town's bacteria and pathogens impairment and TMDL.

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:

N/A

---

**BMP: Fowl Water Campaign****Message Description and Distribution Method:**

Stormwater social media video campaign called "Fowl Water" that educates residents on how "stormwater

pollution is trash, oil, cigarette butts, & dog waste." Campaign is run by Think Blue Massachusetts and published with advertisements on Facebook, Instagram, and YouTube.

Targeted Audience: Residents

Responsible Department/Parties: Think Blue Massachusetts

Measurable Goal(s):

Think Blue Massachusetts reports that 33,665 people in Marshfield have been reached by this campaign through Facebook and YouTube.

Message Date(s): May 17 to July 4, 2021

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:

This outreach was developed by Think Blue on behalf of the Town to supplement outreach already noted on the NOI.

---

### **BMP: Consumer Confidence Report (CCR) - "Strom Drains - Threat to Waterways"**

Message Description and Distribution Method:

The Town included stormwater related messaging in their latest Consumer Confidence Report (CCR). The message was titled "Storm Drains - Threat to Waterways" and described the process of how stormwater runoff collects and carries debris and pollutants, such as pesticides, animal waste, salts, oil, and litter into local waterways and urged residents to never dump oil or other materials into storm drains.

Targeted Audience: Residents

Responsible Department/Parties: Town of Marshfield Department of Public Works - Water Division

Measurable Goal(s):

The current Consumer Confidence Report (CCR) is always available for residents to view on the the Town website's Water Department page here: <https://www.marshfield-ma.gov/water-department>  
or  
here: [https://www.marshfield-ma.gov/sites/g/files/vyhlf3416/f/uploads/final\\_ccr\\_2020\\_0.pdf](https://www.marshfield-ma.gov/sites/g/files/vyhlf3416/f/uploads/final_ccr_2020_0.pdf)

Message Date(s): July 7, 2020

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:

This message supplements work already listed in the Town's NOI.

---

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 Town posted a copy of the SWMP on their stormwater webpage and provided a link for residents to leave comments.

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 Town hosted a Household Hazardous Waste, Mercury, Batteries and Medication Disposal Day in September 2020.

Marshfield is a member of the North and South Rivers Watershed Association, an organization that hosts cleanup days and educational events regularly.

## 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:

The Town continued to refine its stormwater mapping based on field observations.

### 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 outfall screening data is attached to the email submission
- ☐ The outfall screening data can be found at the following website:

N/A

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

Number of outfalls screened: 8

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

Percent of outfalls screened: 100

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

N/A

### **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 website:

N/A

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

Number of catchment investigations completed this reporting period: 0

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

Percent of total catchments investigated: 0

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

N/A

### **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 website:

N/A

*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: 

0

Number of illicit discharges removed: 

0

Estimated volume of sewage removed: 

0

 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: 

0

Total number of illicit discharges removed: 

0

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

N/A

### **Employee Training**

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

Annual IDDE training was delayed due to COVID-19 and completed in September 2021.

### **MCM4: Construction Site Stormwater Runoff Control**

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

Number of site plan reviews completed: 

73

Number of inspections completed: 

41

Number of enforcement actions taken: 

1

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

The Town received numerous construction site SWPPPs for private developments. Although few enforcement orders were issued, any items requiring attention by the owner or contractor are regularly communicated and addressed.

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

### **As-built Drawings**

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

Number of as-built drawings received:

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

N/A

### **Street Design and Parking Lots Report**

Describe the status of the street design and parking lots assessment due in year 4 of the permit term, including any planned or completed changes to local regulations and guidelines:

To be completed in Year 4.

### **Green Infrastructure Report**

Describe the status of the green infrastructure report due in year 4 of the permit term, including the findings and progress towards making the practice allowable:

To be completed in Year 4.

### **Retrofit Properties Inventory**

Describe the status of the inventory, due in year 4 of the permit term, of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

To be completed in Year 4.

## 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:

N/A

### **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:

The Town will develop SWPPPs for the necessary facilities in Year 4.

### **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 website(s):

N/A

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:

N/A

#### **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:

As part of a negotiation with private development the Town purchased 500 lf of drainage pipe and catch basins and the developer installed the drainage system in Norwell Street in an area on the top of hill that storm water runoff would negatively impact existing development down gradient.

An existing Town-owned building located at 965 Plain Street was expanded to house the DPW offices in Year 3. The drainage collection system at this facility was redesigned to manage the additional stormwater runoff generated from the building expansion and comply with Massachusetts Stormwater Management Standards.

The Town authorized easements for the construction of detention basins to manage the stormwater from the Rockwood Road upper baseball fields.

A Beneficial Use Determination (BUD) has been issued for the Town to dispose of catch basin cleanings located on Clay Pit Road. Additionally, containment bins were constructed at this facility to properly manage stockpiles.

The Town hired a consulting company to visit and observe the Town's BMPs. This observation report is

available upon request.

### **COVID-19 Impacts**

*Optional:* If any of the above year 3 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:

The Town was unable to clean the amount of catch basins typically cleaned annually. For the upcoming year, budget has been allocated to clean 1,000 catch basins by a subcontractor.

### **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 4 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Develop a report assessing current street design and parking lot guidelines and other local requirements within the municipality that affect the creation of impervious cover
- Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist
- Identify a minimum of 5 permittee-owned properties that could potentially be modified or retrofitted with BMPs to reduce impervious areas

### **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)

Provide any additional details on activities planned for permit year 4 below:

In Year 4, the NSRWA will be completing the following outreach (in addition to NSRWA's annual initiatives):

- Parking Lot Maintenance - The NSRWA will provide education relevant to parking lot maintenance, salt storage, sweeping, catch basin cleaning, and fleet maintenance to Marshfield businesses.
- Low Impact Development Information Targeted to Developers - The NSRWA will provide education relevant to reduction of impervious surfaces, use of alternatives to paving, decentralized approach to stormwater, rain gardens, swales, and bioretention area.
- WaterSmart Public Art Raffle or Contest - The NSRWA will come up with a stormwater message for residents to coincide with either an art raffle or a public contest to spread the message.

## Part V: Certification of Small MS4 Annual Report 2021

### 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:

Roderic J. Procaccino Jr

Title:

Town Engineer

Signature:



Date:

9-24-2021

*[Signatory may be a duly authorized representative]*

## APPENDIX J

### Minimum Control Measures BMPs



**Town of Marshfield, Massachusetts**  
**MA MS4 General Permit - Control Measures**  
**CM #1 - Public Education and Outreach**

BMP ID	BMP Categorization	BMP Description	Targeted Audience	Responsible Department/Parties	Measurable Goal	Beginning Year of Implementation
R1	Brochures/Pamphlets	Publish outreach materials; Distribute new resident packets to residents within Wetland Protection	Residents (1)	DPW Operations/Engineering, NSRWA	Distribution of a minimum of two (2) educational messages over the permit term (5 years)	2018
R2	Brochures/Pamphlets	Include information in permit materials.	Businesses, Institutions, and Commercial Facilities (2)	DPW Operations/Engineering, NSRWA	Distribution of a minimum of two (2) educational messages over the permit term (5 years)	2018
R3	Brochures/Pamphlets	Include information in permit materials; Review and Update application forms to meet the new requirements.	Developers (construction) (3)	DPW Operations/Engineering, NSRWA	Distribution of a minimum of two (2) educational messages over the permit term (5 years)	2018
R4	Brochures/Pamphlets	Distribute information to industrial groups based on zoning and property use.	Industrial Facilities (4)	DPW Operations/Engineering, NSRWA	Distribution of a minimum of two (2) educational messages over the permit term (5 years)	2018
R5	Web Page	Develop/maintain stormwater website and/or utilize Town social media for outreach. Provide specific information directed towards residences.	Residents (1)	DPW Operations/Engineering, NSRWA	Town web site is operational with water quality links available through multiple committee and department pages	2018
R6	Web Page	Develop/maintain stormwater website and/or utilize Town social media for outreach. Provide specific information directed towards businesses, institutions, and commercial facilities	Businesses, Institutions, and Commercial Facilities (2)	DPW Operations/Engineering, NSRWA	Town stormwater web site is operational and includes section directed toward targeted audience	2018
R7	Web Page	Develop/maintain stormwater website and/or utilize Town social media for outreach. Provide specific information directed towards developers	Developers (construction) (3)	DPW Operations/Engineering, NSRWA	Town stormwater web site is operational and includes section directed toward targeted audience	2018
R8	Web Page	Develop/maintain stormwater website and/or utilize Town social media for outreach. Provide specific information directed towards industrial facilities	Industrial Facilities (4)	DPW Operations/Engineering, NSRWA	Town stormwater web site is operational and includes section directed toward targeted audience	2018

**Town of Marshfield, Massachusetts**  
**MA MS4 General Permit - Control Measures**  
**CM #2 - Public Involvement and Participation**

BMP ID	BMP Categorization	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of Implementation
R1	Public Review	SWMP Review	DPW Operations/Engineering	Allow annual review of stormwater management plan and posting of stormwater management plan on website	2018
R2	Public Participation	SWMP Review	DPW Operations/Engineering	Allow public to comment on stormwater management plan annually	2018

**Town of Marshfield, Massachusetts**  
**MA MS4 General Permit - Control Measures**

**CM #3 - Illicit Discharge Detection and Elimination (IDDE) Program**

BMP ID	BMP Categorization	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of Implementation
R1	SSO Inventory	Develop septic inventory in accordance with permit conditions	DPW Operations/Engineering	Complete within 1 year of effective date of permit	2018
R2	Storm Sewer System Map	Create map and update during IDDE program completion	DPW Operations/Engineering	Update map within 2 years of effective date of permit and complete full system map 10 years after effective date of permit	2018
R3	Written IDDE Program Development	Create written IDDE program	DPW Operations/Engineering	Complete within 1 year of the effective date of permit and update as required	2018
R4	Implement IDDE Program	Implement catchment investigations according to program and permit conditions	DPW Operations/Engineering	Complete 10 years after effective date of permit	2018
R5	Employee Training	Train employees on IDDE implementation	DPW Operations/Engineering	Train annually	2018
R6	Conduct Dry Weather Screening	Conduct in accordance with outfall screening procedure and permit conditions	DPW Operations/Engineering	Complete 3 years after effective date of permit	2018
R6	Conduct Wet Weather Screening	Conduct in accordance with outfall screening procedure	DPW Operations/Engineering	Complete 10 years after effective date of permit	2018
R7	Ongoing Screening	Conduct dry weather and wet weather screening as necessary	DPW Operations/Engineering	Complete ongoing outfall screening upon completion of IDDE program	2018

**Town of Marshfield, Massachusetts**  
**MA MS4 General Permit - Control Measures**

**CM #4 - Construction Site Stormwater Runoff Control**

BMP ID	BMP Categorization	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of Implementation
R1	Site inspection and enforcement of Erosion and Sediment Control (ESC) measures	Complete written procedures of site inspections and enforcement procedures	DPW Engineering, Conservation Committee, Planning Board, Zoning Board of Appeals	Complete within 1 year of the effective date of permit	2018
R2	Site plan review	Complete written procedures of site plan review and begin implementation	DPW Engineering, Conservation Committee, Planning Board, Zoning Board of Appeals	Complete within 1 year of the effective date of permit	2018
R3	Erosion and Sediment Control	Adoption of requirements for construction operators to implement a sediment and erosion control program	DPW Engineering, Conservation Committee, Planning Board, Zoning Board of Appeals	Complete within 1 year of the effective date of permit	2018
R4	Waste Control	Adoption of requirements to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes	DPW Engineering, Conservation Committee, Planning Board, Zoning Board of Appeals	Complete within 1 year of the effective date of permit	2018

**Town of Marshfield, Massachusetts**  
**MA MS4 General Permit - Control Measures**

**CM #5 - Stormwater Management in New Development and Redevelopment**

BMP ID	BMP Categorization	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of Implementation
R1	As-built plans for on-site stormwater control	The procedures to require submission of as-built drawings and ensure long term operation and maintenance will be a part of the SWMP	DPW Engineering, Planning Board, Zoning Board of Appeals	Require submission of as-built plans for completed projects	2018
R2	Inventory and priority ranking of MS4-owned properties that may be retrofitted with BMPs	Conduct detailed inventory of MS4 owned properties and rank for retrofit potential	DPW Engineering, Planning Board, Zoning Board of Appeals	Complete 4 years after effective date of permit and report annually on retrofitted properties	2022
R3	Allow green infrastructure	Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist	DPW Engineering, Planning Board, Zoning Board of Appeals	Complete 4 years after effective date of permit and implement recommendations of report	2018
R4	Street design and parking lot guidelines	Develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if changes to design standards for streets and parking lots can be modified to support low impact design options	DPW Engineering, Planning Board, Zoning Board of Appeals	Complete 4 years after effective date of permit and implement recommendations of report	2022
R5	Ensure any stormwater controls or management practices for new development and redevelopment meet the retention or treatment requirements of the permit and all applicable requirements of the Massachusetts Stormwater Handbook	Adoption, amendment or modification of a regulatory mechanism to meet permits requirements	DPW Engineering, Planning Board, Zoning Board of Appeals	Complete 2 years after effective date of permit	2020

**Town of Marshfield, Massachusetts**  
**MA MS4 General Permit - Control Measures**

**CM #6 - Good House Keeping and Pollution Prevention for Permittee Owned Operations**

BMP ID	BMP Categorization	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of Implementation
R1	O&M procedures	Create written O&M procedures for parks and open spaces, buildings and facilities, and vehicles and equipment	DPW Operations/Engineering	Complete and implement 2 years after effective date of permit	2018
R2	Inventory all permittee-owned parks and open spaces, buildings and facilities (including their storm drains), and vehicles and equipment	Create inventory	DPW Operations/Engineering	Complete 2 years after effective date of permit and implement annually	2019
R3	Infrastructure O&M	Establish and implement program for repair and rehabilitation of MS4 infrastructure	DPW Operations/Engineering	Complete 2 years after effective date of permit	2019
R4	Stormwater Pollution Prevention Plan (SWPPP)	Create Stormwater Pollution Prevention Plan (SWPPP) for maintenance garages, transfer stations and other waste- handling facilities	DPW Operations/Engineering, Conservation Committee	Complete and implement 2 years after effective date of permit	2019
R5	Catch Basin Cleaning	Establish schedule for catch basin cleaning such that each catch basin is no more than 50% full and clean catch basins on that schedule	DPW Operations	Clean catch basins on established schedule and report number of catch basins cleaned and volume of material moved annually	2018
R6	Street Sweeping Program	Sweep all strets and permittee-owned parking lots in accordance with permit conditions	DPW Operations	Sweep all streets and permittee-owned parking lots once per year in the spring	2018
R7	Road Salt use optimization program	Establish and implement a program to minimize the use of road salt	DPW Operations	Implement salt use optimization during deicing season	2018
R8	Inspections and maintenance of stormwater treatment structures	Establish and implement inspection and maintenance procedures and frequencies	DPW Operations/Engineering	Inspect and maintain treatment structures at least annually	2018

**Town of Marshfield, Massachusetts**  
**MA MS4 General Permit - In State Water Quality Impairments**  
**Bacteria and Pathogens**

BMP ID	BMP Categorization	BMP Description	Targeted Audience	Responsible Department/Parties	Measurable Goal	Beginning Year of Implementation
R1	Public Education and Outreach	Distribute annual message encouraging the proper management of pet waste	Residents	DPW Operations/Engineering, NSRWA	Annual distribution of educational messages over the permit term (5 years)	2018
		Provide information to owners of septic systems about proper maintenance in any catchment that discharges to a bacteria or pathogen impaired waterbody	Residents	DPW Operations/Engineering, NSRWA	Provide septic maintenance information to septic contractors to distribute to residents.	2018
R2	Illicit Discharge	Prioritize catchment areas		DPW Operations/Engineering	Complete within 1 year of the effective date of permit and update as required	2018

**Town of Marshfield, Massachusetts**  
**MA MS4 General Permit - In State Water Quality Impairments**  
**Solids, Oil and Grease, or Metals**

BMP ID	BMP Categorization	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of Implementation
R1	Stormwater Management in New Development and Redevelopment	Stormwater management systems designed on commercial and industrial land use areas draining to the water quality limited waterbody shall incorporate designs that allow for shutdown and containment where appropriate to isolate the system in the event of an emergency spill or other unexpected event.	DPW Engineering, Planning Board, Zoning Board of Appeals	Implement BMPs that allow for the prevention of metals being discharged into impaired bodies of water	2018
R2	Good House Keeping and Pollution Prevention for Permittee Owned Operations	Increase street sweeping frequency of all municipal owned streets and parking lots to a schedule determined by the permittee to target areas with potential for high pollutant loads.	DPW Operations/Engineering	Increase street sweeping frequency at target areas with potential for high pollutant loads	2018
R3		Prioritize inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full.	DPW Operations/Engineering	Review catch basin cleaning records annually to prioritize maintenance	2018
R4		Each annual report shall include the street sweeping schedule determined by the permittee to target high pollutant loads.	DPW Operations/Engineering	Include street sweeping schedule in annual report	2018



## APPENDIX K

### Operation and Maintenance Plan

# STORMWATER MS4 OPERATIONS & MAINTENANCE PLAN

Town of Marshfield

January 2020



ENVIRONMENTAL  
 PARTNERS

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**Figure 2:** Street Sweeping Prioritization

**Figure 3:** Storage Location of Street Sweepings and Catch Basin Cleanings

**Figure 4:** Storage Location of Salt and Sand Supplies  
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# LIST OF APPENDICES

**Appendix A:** Town of Marshfield Urbanized Area & Impaired Waterbodies Map

Town of Marshfield Impaired Waterbodies/TMDL Data

**Appendix B:** Catch Basin Inspection Form Template

**Appendix C:** BMP Inspection Form Template

**Appendix D:** Standard Operating Procedures (SOPs)

# LIST OF ATTACHMENTS

**Attachment 1:** Town of Marshfield Mapbook (Stand-Alone 11/17 Set of Maps)

# SECTION 1 INTRODUCTION

This Stormwater Operation & Maintenance (O&M) Plan has been developed as a requirement of the NPDES Phase II MS4 stormwater permit program. The NPDES Phase II General Permit (General Permit), which was issued in 2003, required Marshfield to develop, implement, and enforce a stormwater management plan (SWMP). A SWMP was first published by the Town on June 26, 2003, and an updated SWMP was published in June 2019 after the General Permit was re-issued (July 1, 2018). The objectives of the SWMP are to reduce the discharge of pollutants from the MS4 to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act (CWA). These objectives are accomplished through the implementation of six (6) minimum control measures (MCM) required by the Phase II regulations:

- Public Education and Outreach (MCM #1)
- Public Involvement/Participation (MCM #2)
- Illicit Discharge Detection and Elimination (IDDE) (MCM #3)
- Construction Site Stormwater Runoff Control (MCM #4)
- Post-Construction Stormwater Management in New Development and Redevelopment (MCM #5)
- Pollution Prevention/Good Housekeeping for Municipal Operations (MCM #6)

As part of MCM #6, Pollution Prevention/Good Housekeeping for Municipal Operations, Section 2.3.7 of the General Permit, this O&M Plan has been developed. In 2018, the EPA issued a General Permit for Stormwater Discharges from Small MS4's in Massachusetts (Permit). The Permit, which was to replace the 2003 General Permit, outlined the requirements for municipal MS4 O&M Plans.

The O&M Plan for the Town of Marshfield establishes procedures to address the proper use, storage and disposal of pesticides, herbicides and fertilizers. It also includes recommendations for proper lawn maintenance and disposal of grass clippings and other vegetative waste at Open Spaces and Parks maintained by the Town. The Plan for the Town of Marshfield includes a description of structural and non-structural BMP's under municipal control as well as recommended maintenance schedules and operations for all municipal stormwater structures. Long term operation and maintenance of stormwater BMP's, when accepted by the municipality, become the responsibility of the Town of Marshfield's Department of Public Works (DPW) and Highway Operations Division. The Town may enter into a services agreement with a qualified outside party to perform the required maintenance of the BMP's as well as providing the inspection records and maintenance logs of activity.

Inspection form templates are included to record observations and corrective actions taken for specific BMP's. The completed inspection forms should be kept on file for a minimum of 3 years and the information used to update the O&M Plan as necessary. For example, if a particular catch basin is scheduled for annual inspection / cleaning and each time is found to contain accumulated sediments to within one (1) foot of the outlet, the inspection frequency should be revised accordingly. Information obtained from prior maintenance activities, inspection reports, citizen complaints as well



as reports provided by Town departments such as the Conservation Commission among others, will be used to determine the appropriate priority level.

## SECTION 2 PERMIT REQUIREMENT ELEMENTS

The Permit details the requirements of an O&M Plan for stormwater infrastructure and includes the elements listed in Section 2.3.7.a.ii.1 and Sections 2.3.7.a.iii through 2.4.7.a.v of the Permit, as detailed below. EPA Maps and corresponding TMDL Data are attached to this report as Appendix A.

- **Fertilizer Use, Storage, and Disposal** – establish procedures to address the proper use, storage, and disposal of pesticides, herbicides, and fertilizers including minimizing the use of these products and using only in accordance manufacturer's instruction."
- **Lawn and Landscaping Maintenance** – evaluate lawn maintenance and landscaping activities to ensure practices are protective of water quality. Protective practices include reduced mowing frequencies, proper disposal of lawn clippings, and use of alternative landscaping materials (e.g. drought resistant planting)."
- **Public Trash Receptacles and Pet Waste Storage** – establish pet waste handling collection and disposal locations at all parks and open space where pets are permitted, including the placing of proper signage concerning the proper collection and disposal of pet waste... Establish procedures for management of trash containers at parks and open space (scheduled cleanings; sufficient number)."
- **Catch Basin Cleaning Program** – "the permittee shall optimize routine inspections, cleaning and maintenance of catch basins such that the following conditions are met:
  - ...prioritize inspection and maintenance for catch basins near construction activities...
  - ...establish a schedule with a goal that the frequency of routine cleaning will ensure that no catch basin at any time will be more than 50 percent full.
  - ...if a catch basin sump is more than 50 percent full during two consecutive routine inspections/cleaning events, ...document that finding, investigate the contributing drainage area for sources of excessive sediment loading, and...abate contributing sources.
  - ... [Consider] an excessive sediment or debris loading as a catch basin sump more than 50 percent full...
  - ...document in the SWMP and in the first annual report [the permittee's] plan for optimizing catch basin cleaning, inspection plans, or its schedule for gathering information to develop the optimization plan...
  - ...report in each annual report the total number of catch basins, number inspected, number cleaned, and the total volume or mass of material removed from all catch basins."
- **Street Sweeping Program** – "the permittee shall establish and implement procedures for sweeping and/or cleaning streets, and permittee-owned parking lots... The procedures shall also include more frequent sweeping of targeted areas determined by the permittee on the basis of pollutant load reduction potential, based on inspections, pollutant loads, catch basin cleaning or inspection results...The permittee shall report in each annual report the number of miles cleaned and the volume or mass of material removed."

- **BMP Maintenance & Inspection Procedures** – “the permittee shall establish and implement inspection and maintenance frequencies and procedures for all stormwater treatment structures such as water quality swales, retention/detention basins, infiltration structures, proprietary treatment devices or other similar structures. All permittee-owned stormwater treatment structures (excluding catch basins) shall be inspected annually at a minimum.”
- **Storage of Catch Basin Cleanings & Street Sweepings** – “the permittee shall ensure proper storage of catch basin cleanings and street sweepings prior to disposal or reuse such that they do not discharge to receiving waters.”
- **Winter Road Maintenance** – “the permittee shall establish and implement procedures for winter road maintenance including the use and storage of salt and sand; minimize the use of sodium chloride and other salts, and evaluate opportunities for use of alternative materials; and ensure that snow disposal activities do not result in disposal of snow into waters of the United States...”
- **Reporting** – “the permittee shall report in the annual report on the status of the inventory required by this part and any subsequent updates; the status of the O&M programs... and the maintenance activities associated with each...the permittee shall keep a written record of all required activities but not limited to maintenance activities, inspections and training...”

## SECTION 3 FERTILIZER USE, STORAGE, AND DISPOSAL

The Town maintains its public spaces and parks utilizing the DPW and sometimes subcontractors to periodically fertilize Town-owned land. The list of public spaces currently maintained by the DPW include: Town Hall, Police Station, South River School, Daniel Webster School, Marshfield High School, Governor Winslow School, Eames Way School, Recreation Center at Coast Guard Hill, Tower Avenue Park Complex, Recreation Center Complex, Grace Ryder Complex, and Daniel Webster Estate (see attached Figure 1).

### 3.1 CURRENT FERTILIZER USE

The Town of Marshfield currently uses fertilizers on all open spaces and at public parks. They do not use herbicides or pesticides. The DPW only uses North Country Organic Fertilizer, and typically purchases it and sprays it the day of purchase. The fertilizer is applied by the DPW. If they do need to purchase weed killer, it is also diluted properly and sprayed the day of purchase. Some small amounts are periodically stored at the Public Works Department. The public schools will occasionally use termite control pesticides around the perimeter of the properties. This, too, is diluted properly and sprayed the day of purchase.

The Town is currently reviewing its operation and usage of these chemicals, looking for ways to reduce the use, and to ensure that it is always applied in accordance with the manufacturer’s instructions.

## 3.2 FERTILIZER STORAGE

The Town does not need to store any of these materials, as the DPW generally uses and applies all the fertilizer purchased the same day. The public schools and Recreation Department follow the same procedure.

## 3.3 FERTILIZER DISPOSAL

The Town does not need to dispose of any of these materials, as their DPW uses and applies all the fertilizer purchased the same day. The public schools and Recreation Department follow the same procedure.

# SECTION 4 LAWN & LANDSCAPING MAINTENANCE

The Town maintains its public spaces and parks utilizing the DPW and sometimes subcontractors to periodically mow grass and landscape Town-owned land. The public schools take advantage of subcontractors for their maintenance needs. The list of public spaces currently maintained by the DPW include: Town Hall, Police Station, South River School, Daniel Webster School, Marshfield High School, Governor Winslow School, Eames Way School, Recreation Center at Coast Guard Hill, Tower Avenue Park Complex, Recreation Center Complex, Grace Ryder Complex, and Daniel Webster Estate (see attached Figure 1).

## 4.1 CURRENT LAWN & LANDSCAPING PRACTICES

The Town currently maintains a mowing and landscaping schedule through their DPW. The activities include: mowing, tree-trimming and landscaping. The Town uses subcontractors at some areas to perform these services, and mow weekly April through November. The Town is currently reviewing its operation schedule, looking for ways to reduce the mowing frequency.

## 4.2 DISPOSAL OF LAWN CLIPPINGS

The Town removes any lawn clippings from the mowed areas and stores them at the Marshfield Landfill.

## 4.3 ALTERNATIVE LANDSCAPING MATERIALS

The Town does not currently use alternative landscaping materials, but will look into the possibility of using them in future planting events.

# SECTION 5 PUBLIC TRASH RECEPTACLES & PET WASTE SIGNAGE

## 5.1 PUBLIC TRASH OPERATIONS

The DPW currently maintains the trash receptacles at the Town Hall, Police Station, South River School, Daniel Webster School, Marshfield High School, Governor Winslow School, Eames Way School, Recreation Center at Coast Guard Hill, Tower Avenue Park Complex, Recreation Center Complex, Grace Ryder Complex, and Daniel Webster Estate. The trash is collected and deposited into local dumpsters daily, which is collected by the Town's trash collection subcontractor.

The Town is currently reviewing its operation schedule, looking for ways to increase the efficiency of trash removal.

## 5.2 PLACEMENT OF PET WASTE SIGNAGE

The Town has Pet Waste informational signs installed along walkways in public parks and fields. The Town would like to introduce the signage to parks and playgrounds where residents frequently walk their dogs. The DPW will work with other Town Departments (Conservation, Highway Division, Planning) to discuss these objectives, with the goal of installing them in the next year or so.

# SECTION 6 CATCH BASIN CLEANING PROGRAM

Traditional municipal storm drain systems were designed to quickly collect and convey runoff to receiving waters. The purpose of catch basin, inlet and storm drain cleanouts is to prevent blockages, flooding and reduce pollution.

Fine particles and pollutants from run-on, atmospheric deposition, vehicle emissions, breakup of street surface materials, littering, and sanding can accumulate along the curbs of roads in between rainfall events. This results in the accumulation of pollutants such as sediment, nutrients, metals, hydrocarbons, bacteria, pesticides, trash and toxic chemicals. Storm drain maintenance is often the last opportunity to remove pollutants before they enter the storm drain system. Because they effectively trap these pollutants, catch basins need to be cleaned out periodically to prevent those materials from being transported by high stormwater flows into the Town's waterways and water resources.

The catch basin maintenance schedule should begin annually after the last Spring snowfall. Inspection is to include the condition of the inlet structure grate, brick or concrete risers, oil hoods and inlet and outlet pipes. As applicable, each stormwater inlet should include a public awareness message (e.g. "drains to pond" or "only rain in this drain") stenciled or otherwise marked near the drain. Catch basins with illegible or missing labels should be noted on the inspection report and be re-labeled before the next scheduled inspection. Damage or deterioration threatening the structural integrity of any component, conveyance or facility should be repaired as soon as possible but no longer than before the next scheduled inspection.

## 6.1 EXISTING CATCH BASIN CLEANING PROGRAM

The Marshfield DPW, with the assistance of a subcontractor, currently runs their catch basin cleaning program once per year, visiting all of their catch basins annually, typically in early Spring. The Town performs the catch basin cleanings using a vacuum truck. Historically, Marshfield has had issues with sediment build-up in their catch basin structures in the Brant Rock area. However, this area receives more frequent visits to help relieve the flooding issues. Marshfield has had no flooding issues in all other parts of Town and has not allowed sediment to build up in their catch basins beyond 50% full. This is primarily due to the Town's mandate that all Town catch basins are cleaned annually. Also, the Town cleans out manhole structures that have historic sediment buildup. Roads shared with neighboring Towns?

## 6.2 CATCH BASIN MAPPING AND INSPECTIONS

There are 3,929 catch basins throughout Marshfield that have been previously mapped in the MS4 area (2000 + 2010 Census) in Geographic Information System (GIS) format using historic aerial flyover data, handheld GPS units, and DPW employee knowledge. A Town-wide mapbook has been prepared showing unique catch basin identifiers (CB-1001) to aid in accurately recording and cataloging data from field inspections. The mapbook is included with this report as Attachment 1 (stand-alone 11x17 set of maps).

In the event that there are additional catch basin structures visited in the field that have not been mapped, the field crew will sketch in the approximate location, and label with a temporary ID for future entry into the system. This will allow for the field crew to generate a historic record in the logging system for the new structures characteristics. The locations of the new catch basin structures will be captured in the future using a hand-held GPS unit.

During the catch basin cleaning program, the field crew will utilize the mapbook and a field inspection form in order to create a historic log for each structure. Items to be noted will include: condition of the grate cover, volume of sediment accumulated in the structure, date inspected/cleaned, marking paint condition, etc. The inspection form template for the catch basins is attached as Appendix B.

## 6.3 CATCH BASIN STRUCTURE PRIORITY RANKING

This section of the O&M Plan is to be used in future years if the Town of Marshfield decides due to budget or other constraints, to reduce the scope of their annual catch basin cleaning program (i.e., not cleaning every catch basin every year).

In that event, using the data collected during the field inspection program, the Town's stormwater catch basins will be assigned a priority maintenance schedule according to the following criteria:

- Priority A – Catch basins that are designated as consistently generating the highest volumes of trash, sediment and/or debris
- Priority B – Catch basins that are designated as consistently generating moderate volumes of trash, sediment and/or debris

- Priority C – Catch basins that are designated as generating low volumes of trash, sediment and/or debris

The future inspection/cleaning schedule assignments would be as follows:

BMP	Activity	Frequency
Catch Basin	Inspection / Cleaning)	Priority A – one (1) time / year Priority B – one (1) time / 2-years Priority C – one (1) time / 3-years or as needed

The catch basin is to be cleaned of accumulated sediments and debris either by mechanical methods when its depth is equal to or greater than 1/3 the depth from the bottom of the basin to the invert of the lowest outlet pipe. If a hydrocarbon sheen is noted on the surface of the water in the basin it shall be removed using absorbent pads; these pads will be allowed to dry prior to disposal in a solid waste dumpster pursuant to DEP's "1-drip" policy.

The materials removed from the catch basin shall not re-enter the stormwater system. Non-hazardous sediments are to be disposed of at an approved solid waste landfill and used as daily cover in accordance with Massachusetts DEP policy and regulations. In cases where an inspection reveals sediments with abnormal, non-natural discoloration or detects strong petroleum and/or chemical odors, the crew performing the catch basin cleanings should notify the Marshfield Fire Department for proper handling of hazardous materials. Also, a Licensed Site Professional (LSP) registered in the State of Massachusetts pursuant to MGL c.21A, §§ 19 through 19J shall be responsible for managing the disposal of such material in accordance with 310 CMR 40.0000 the Massachusetts Contingency Plan. Refer to Section 7.0 for proper catch basin cleaning material storage protocol.

## SECTION 7 STREET SWEEPING PROGRAM

Street and parking lot sweeping is a practice that most municipalities initially conducted for aesthetic purposes. However, the water quality benefits are now widely recognized. Street sweeping also prevents particulate matter associated with road dust from accumulating on public streets and washing into storm drains.

A number of factors impact the effectiveness of a street sweeping program. The first factor is the type of equipment used. When equipment needs to be replaced, high-performance sweepers are purchased preferentially. Street sweeping has traditionally been more effective at removing large-sized particles, but new equipment has been developed to remove smaller, fine-grained particles. Mechanical sweepers (broom-type) are usually the least expensive and are better suited to pick up large-grained sediment. Vacuum and regenerative air sweepers are better at removing fine-grained articles, but they are more expensive. Removal efficiency can be improved through tandem sweeping

(i.e. two sweepers sweeping the same route, with one following the other to pick up missed material), or if the street sweeper makes multiple passes on a street.

The second factor influencing street sweeping effectiveness is the way in which the equipment is operated. That equipment must be operated according to the manufacturers' operating instructions by operators who have been properly trained to sweep in order to protect water quality.

The third determining factor is the degree to which parked cars or similar blockages can impede a sweeper's access to the curb.

## 7.1 EXISTING STREET SWEEPING PROGRAM

The Marshfield DPW currently runs their street sweeping program once per year, sweeping 131 miles of roads annually in early Spring. The department currently utilizes work orders to track the date, number of loads taken, start/end times, names of streets swept, etc.

## 7.2 STREET SWEEPING PRIORITY RANKING

The permittee shall establish and implement procedures for sweeping and/or cleaning streets, and permittee-owned parking lots. All streets with the exception of high speed limited access highways should be swept and/or cleaned a minimum of once per year in the Spring (following winter activities such as sanding). The procedures shall also include more frequent sweeping of targets areas (e.g., Brant Rock, areas discharging to TMDL waterbodies (See Appendix A and Figure 2)) determined by the permittee on the basis of following factors: (a) pollutant load reduction potential, (b) pollutant loads, (c) catch basin cleaning or inspection results, (d) land use, (e) proximity to impaired/TMDL waters or other relevant factors as determined by the Town. These targeted areas are shown in Figure 2, and also on Attachment 1. The permittee shall report in each annual report the number of miles cleaned and the volume or mass of material removed.

For uncurbed, limited access highways, the permittee shall either meet the minimum frequencies above, or develop and implement an inspection, documentation and targeted sweeping plan within one year of the effective date of the permit, and submit such plan with its year one annual report.

This schedule applies only to streets and municipal parking lots with curb/gutter construction. Other municipal roadways and parking lots will be prioritized according to the previous schedule and will include trash and litter control as well as hand sweeping and collection. Sweepings collected during sweeping activities are currently stockpiled at the DPW yard at 35 Parsonage Street and are targeted for use by the Town for the landfill capping activities. A Town-Wide GIS map will be drafted to display the designated priority zones to aid the Town in street sweeping optimization and planning for future activities. Refer to Section 7.0 for proper street sweeping material storage protocol.

# SECTION 8 BMP MAINTENANCE

An essential component of a successful municipal stormwater system is the ongoing operation and maintenance of the various components of the stormwater drainage and conveyance systems. Failure to provide effective maintenance can reduce the hydraulic capacity and the pollutant removal



efficiency of stormwater practices. Ideally, a program should address operation and maintenance concerns proactively instead of reacting to problems that occur such as flooding or water quality degradation associated with erosion, clogging or outright failure of one or more practices.

There are two key components to adequately maintaining a stormwater management infrastructure:

- Periodic and scheduled inspections, and
- Maintenance scheduling and performance.

## 8.1 SUBSURFACE SEPERATORS

Subsurface Separators provide a greater ability to trap and contain stormwater-borne pollutants than standard catch basins. They are fitted with baffles and chambers that create a hydrodynamic separation of floatable and non-floatable particles. The Town does not have any subsurface separators within its MS4 System at this time, but will adhere to the inspection process detailed within if a subsurface separator is to be installed in the future.

Subsurface Separators under operational control of the Town will be maintained annually.

Inspection of the subsurface separator will include the operational condition of any baffles and filters contained within the structure. The depth of sediment collected in the separator will also be measured. All floatable trash will be removed from the separator during each inspection. If a hydrocarbon sheen is noted on the surface of the water in the separator it shall be removed using absorbent pads; these pads will be allowed to dry prior to disposal in a solid waste dumpster pursuant to DEP's "1-drip" policy. If the accumulated sediment is within 18 inches of the outlet elevation, it will be removed by vacuum or mechanical means. Disposal of all collected sediments will conform to the procedures described herein for disposal of sediments collected from municipal catch basins.

## 8.2 WATER DETENTION/RETENTION BASINS

Open stormwater detention/retention basins under operational control by the Town will be maintained annually.

The stormwater basins shall be inspected/cleaned annually to ensure proper operation of the system and all components. The basin inspection includes observing the condition of the inlet and outlet structures, the accumulation of sediment within the basin, evidence of oil/gas sheen, the accumulation of trash within the basin and the condition of vegetation within the basin. Any erosion noted must be repaired as soon as possible but no later than the next scheduled inspection. Repairs may include the replacement of displaced rip-rap and the repair of eroded banks. Repairs to vegetated banks will be stabilized with erosion control mats until sufficient vegetation has been established as evidenced by 75% new seeding growth. Sediment collecting in the basin will be removed when its depth reaches 6-inches anywhere in the basin. Disposal of all collected sediments will conform to the procedures described herein for disposal of sediments collected from municipal catch basins.



During the growing season, the basin will be mowed. All tree saplings will be removed from embankments and basin bottoms. Materials removed from the basin shall not re-enter the stormwater system. Vegetation collected from the basin will be transported to the Town's composting facility.

The Town estimates that it has approximately 64 detention/retention basins within its MS4 System, specifically in newer developments. They are mapped on the attached Inspection Mapbook (Attachment 1).

## 8.3 WATER QUALITY SWALES

Water Quality Swales under operational control by the Town will be maintained annually.

The maintenance objective for this practice includes preserving the hydraulic and removal efficiency of the channel and maintaining a dense, healthy vegetative cover. The following activities are recommended: mowing and litter and debris removal, stabilization of eroded side slopes and bottom, nutrient and pesticide use management, and de-thatching swale bottom.

Every five years, scraping of the channel bottom and removal of sediment to restore original cross section and infiltration rate, and seeding to restore ground cover is recommended.

Dry swales should be inspected on an annual basis and after storms of greater than or equal to the 1-year precipitation event. Both the structural and vegetative components should be inspected and repaired. Trash and debris should be removed and properly disposed of.

Wet swales should be inspected annually and after storms of greater than or equal to the 1-year precipitation event. During inspection, the structural components of the system, including trash racks, valves, pipes, and spillway structures should be checked for proper function. Any clogged openings should be cleaned out and repairs should be made where necessary. Sediment should be removed from the bottom of the swale.

# SECTION 9 STORAGE OF CATCH BASIN CLEANINGS & STREET SWEEPINGS

This section of the report describes the storage of the Town's Catch Basin Cleanings and Street Sweeping materials which are permanently stored at a Town-owned DPW yard at 35 Parsonage Street (see Figure 3). The procedures for properly managing these materials are further described in the SOP's attached as Appendix D.

## 9.1 STREET SWEEPINGS

The Municipality's street sweeping operations are mainly conducted once per year in the Spring. The street sweepings are subsequently brought back to the Town-owned DPW yard at 35 Parsonage Street to the designated street sweeping stockpile area (Figure 3) and are currently being stored there for future use.

## 9.2 CATCH BASIN CLEANINGS

The Municipality's catch basin cleaning operations are conducted once per year in the Spring. The cleanings are subsequently brought back to the Town-owned DPW yard at 35 Parsonage Street to the catch basin cleanings stockpile area (Figure 3). The annual amount generated is approximately 30 cubic yards.

Figure 3 also shows the location of the Parsonage Street storage area and the proximity to localized wetlands and waterbodies surrounding the storage area; Green Harbor River and unnamed wetlands are adjacent to the storage area, but due to the distance present, there is no direct route to discharge these materials to receiving waters.

## SECTION 10 WINTER ROAD MAINTENANCE

Municipalities justifiably want their roads to be as safe as possible. Because of this, the tendency to think that "more sand/salt is better" can be difficult to overcome. But several recent studies have shown that by using new techniques, equipment, and chemicals, roads can actually be safer with less salt use.

Winter maintenance teams can benefit from a program known as the "4 R's."

1. Use the Right Material. Stop using sand, except for low-speed intersections, curves and hills. Use a chemical that is effective at current road surface temperatures. Consider using alternate chemicals on bridges and in source water protection areas.
2. Use the Right Amount. The number one factor in applying salt is the surface temperature. Warmer roads need less salt. Consider purchasing inexpensive infrared thermometers for spreading trucks.
3. Apply at the Right Place. Put salt down where it will do most good. Hills, curves/corners, shaded sections of road, bridges, etc., need special attention. A section of road with surface temp below 10°F will not benefit from rock salt. Use another chemical instead. Designate sensitive areas as low or no salt zones.
4. Apply at the Right Time. Apply as early as possible! Obtain and use the most up-to-date weather forecasts. Do not wait until snow is falling to get started. It takes much more salt to melt accumulated snow than it does to prevent accumulation. Factor in expected traffic, approaching day/night change in temperatures, etc. Brine can be applied very early, forming a bond with the road that can be effective for days in the right conditions.

### 10.1 SAND USE

The Marshfield DPW has recently decreased the amount of sand used in their deicing operations by 50%. Their mix is typically all salt, or 75% salt and 25% sand. It is applied using Town-owned trucks.

## 10.2 DEICING CHEMICAL USE

Marshfield DPW uses salt for deicing, but not any other deicing chemicals at this time, only a mix of Salt and Sand. Their mix is typically all salt, or 75% salt, 25% sand. It is applied using Town-owned trucks.

## 10.3 STORAGE OF SAND AND DEICING CHEMICALS

Improper storage techniques can cause some of the most severe environmental damage from winter maintenance materials because they can result in highly concentrated runoff. Salt is the big offender, but because sand is mixed with salt, sand piles should also be included in a proper storage program.

Deicing chemicals (i.e. salt, calcium chloride, etc.) shall be stored in storage sheds or tanks in a manner that minimizes the potential for runoff. All deicing chemicals shall be covered when not in use. Sand piles shall be bermed to minimize runoff. During handling, sand and salt which fall outside of the storage areas will be swept back to the storage areas within 48 hours of the activity, to minimize runoff.

A properly stored salt/sand pile is:

- Located away from source water protection areas, floodplains and wetlands
- Sited on an impermeable (paved) pad, with a drain that directs runoff to proper treatment
- Covered with a roof on at least 3 sides

During regular inspections, the sand and deicing chemical storage areas shall be inspected by the DPW to ensure that runoff is minimized. All findings during an inspection shall be sent to the Highway Operations Division Deputy Superintendent.

Figure 4 shows the location of the sand and salt storage areas and the proximity to localized wetlands and waterbodies surrounding the storage area. Green Harbor River and unnamed wetlands are adjacent to the storage area, but due to the distance present, there is no direct route to discharge these materials to receiving waters.

## 10.4 SNOW DISPOSAL ACTIVITIES

The roads are typically plowed, and the snow is left to the side of the roads to melt. Some snow disposal activities occur, and the main storage location is at the DPW yard at 35 Parsonage Street, about 660 feet from wetlands that lead to Green Harbor River. The Winter Snow Stockpile Area is shown in Attachment 1.

# SECTION 11 REPORTING AND RECORDKEEPING

The tracking and documentation of MS4 Maintenance and Operations is a required part of the permit program. All inspection forms will be recorded and stored at the DPW Office to ensure that the proper documentation is maintained and reported on the annual reports and that the relevant data is added to the Town's GIS system database.

All catch basin and BMP inspections will be recorded on field forms (see Appendices B and C). Documentation of investigative, corrective and enforcement actions will be maintained by the Highway Deputy Superintendent, who will ensure that these records are added to the GIS system database.

The Town plans to collect the data using the paper forms during the first year of inspections, and possibly transferring over to a digital format in the coming years.

## SECTION 12 TRAINING

This component of the O&M Plan establishes the procedures for identifying, planning, delivering and tracking training. The training is provided to DPW staff as necessary to maintain knowledge and skills that help ensure that they understand their roles and responsibilities and can adequately perform their duties as they relate to supporting the standard operating procedures outlined in this O&M Plan. Training is provided to DPW employees through three basic means: 1) Annual Environmental Awareness Training; 2) Right-to-Know Training; 3) Regulatory Specific Training (e.g., Stage II vapor recovery equipment inspections).

The Highway Deputy Superintendent is responsible for identifying the personnel that require training based upon job duties and how those duties relate to environmental compliance. It is not mandatory that all inspectors be trained engineers, but they should have some knowledge or experience with stormwater systems. In general, trained stormwater engineers should, however, direct them. Inspections by registered engineers should be performed where routine inspection has revealed a question of structural or hydraulic integrity affecting public safety.

### 12.1 TRAINING LEAD

For those staff responsible for implementing the O&M program, on the job training will be managed by the Highway Deputy Superintendent. He will manage and assign training as described below.

The Town shall, at a minimum, annually train all public works employees or other employees involved in the implementation of the O&M program about the program. The Town shall report on the frequency and type of employee training in the annual report.

### 12.2 TRAINING PLAN

Training will be assigned to those individuals specifically involved in the O&M procedures.

Note that the Town may elect to retain consultants for development of the O&M structure database, and associated mapping tasks. Preliminary training activities, a schedule and identification of those to receive training are listed in the following table:

Training Topic	Attendees	Estimated Number of Attendees	Training Type and Frequency	Description
O&M – Program field staff	Temporary and permanent alteration	2	In-field training	This training is for staff that will be responsible for

Training Topic	Attendees	Estimated Number of Attendees	Training Type and Frequency	Description
	of wetland resource areas.			field assessment of structures
O&M/IDDE – General Information		10	Lunch-and-Learn Session	This training will explain the O&M/IDDE program.

## SECTION 13 MEASUREMENT OF SUCCESS

The success of the O&M program will be measured by each of the elements outlined in the previous sections. Specifically, the following benchmarks will be used:

- Number of Catch Basins cleaned annually
- Amount of material removed from catch basins discharging to sensitive waters
- Number of street miles of street sweepings conducted annually
- Amount of material removed from streets adjacent to sensitive waters
- Number of BMPs maintained
- Number of Outfalls repaired
- Number of Employees trained

## SECTION 14 REFERENCES

Environmental Protection Agency, General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts, July 2018.

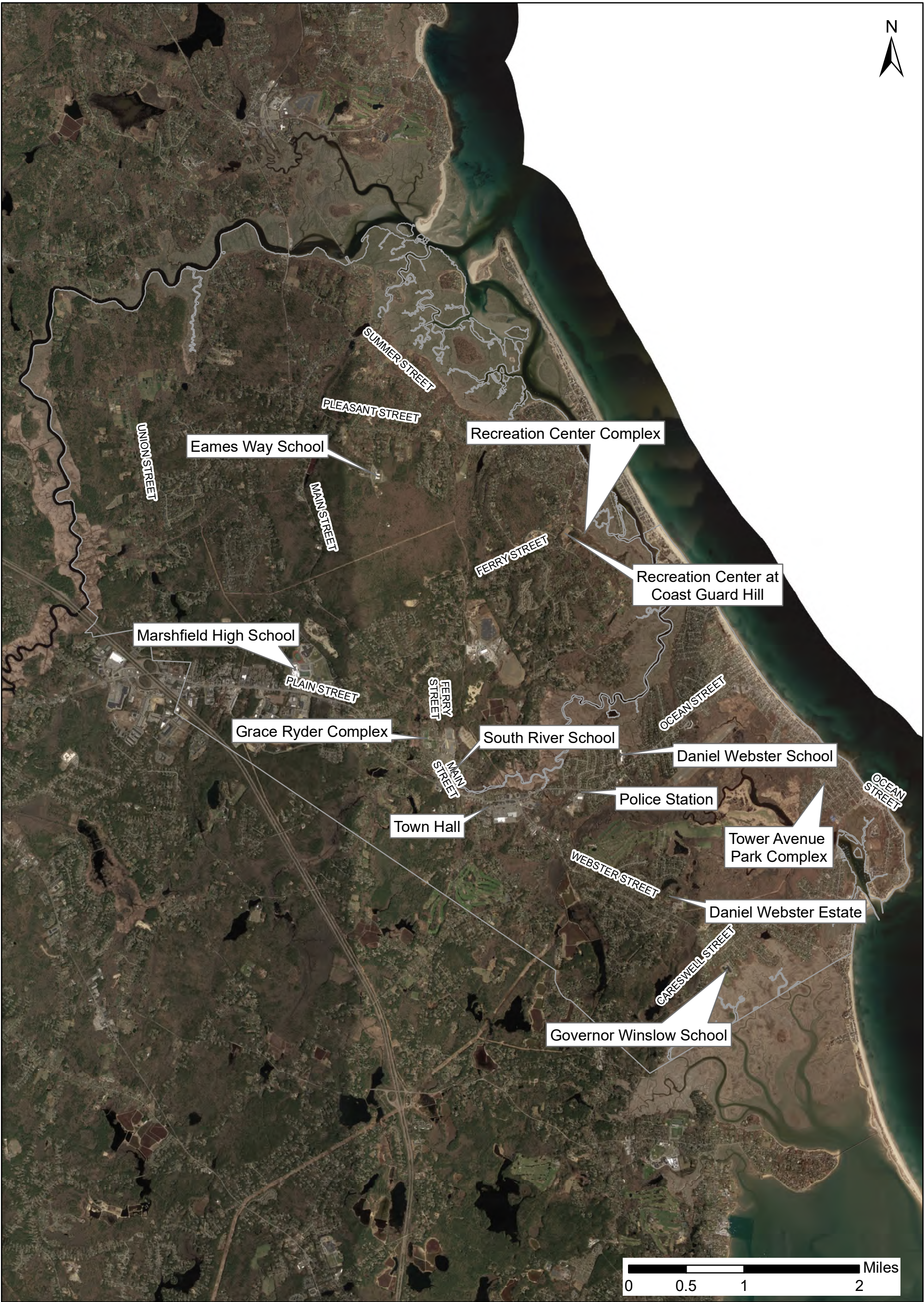
Massachusetts Department of Environmental Protection, Massachusetts Stormwater Handbook, February 2008.


Rhode Island Department of Environmental Management and Coastal Resources Management Council, Rhode Island Stormwater Design and Installation Standards Manual, December 2010.


## FIGURE 1

Parks and Open Space Maintenance










**Figure 1. Parks & Open Space Maintenance  
Marshfield, Massachusetts  
Spring 2019**

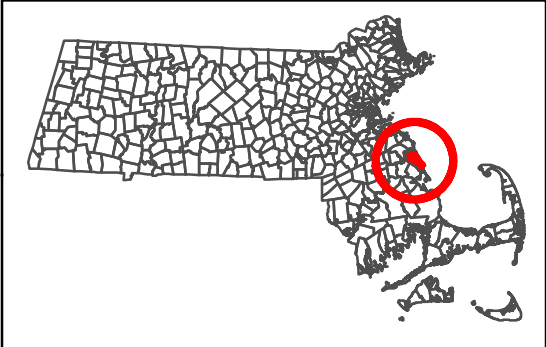
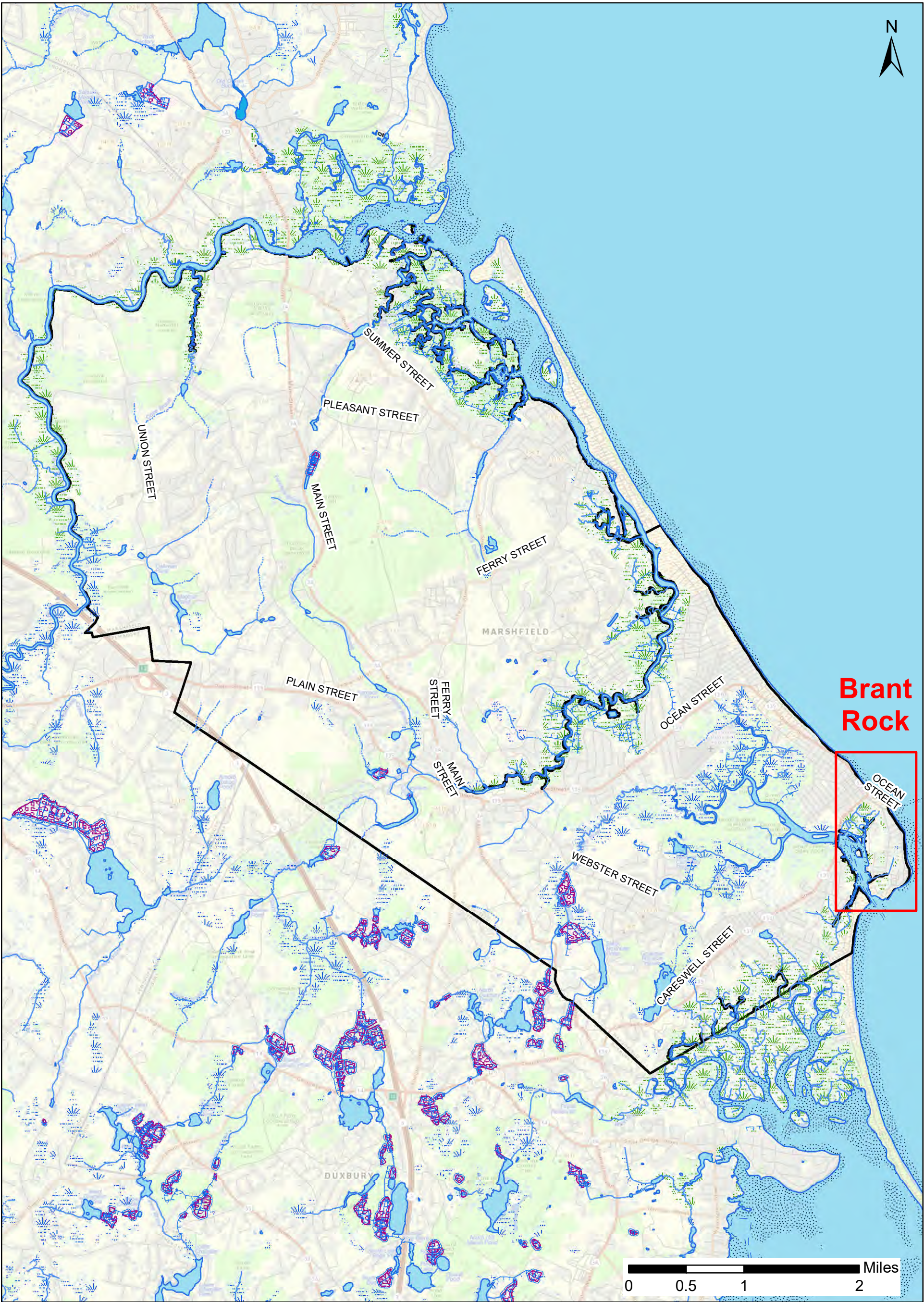




## FIGURE 2

Street Sweeping Prioritization





**Figure 2. Street Sweepings Prioritization Marshfield, Massachusetts Spring 2019**





## FIGURE 3

Storage Location of Street Sweepings and Catch Basin Cleanings





**Figure 3. Storage Location of  
Street Sweepings & Catch Basin Cleanings  
Marshfield, Massachusetts  
Spring 2019**



## FIGURE 4

Storage Locations of Salt and Sand Supplies



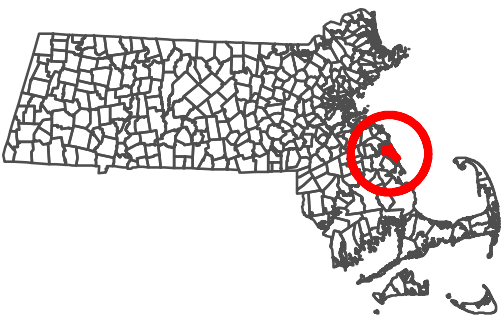


Figure 4. Storage Location of  
Salt and Sand Supplies  
Marshfield, Massachusetts  
Spring 2019

ENVIRONMENTAL  
PARTNERS

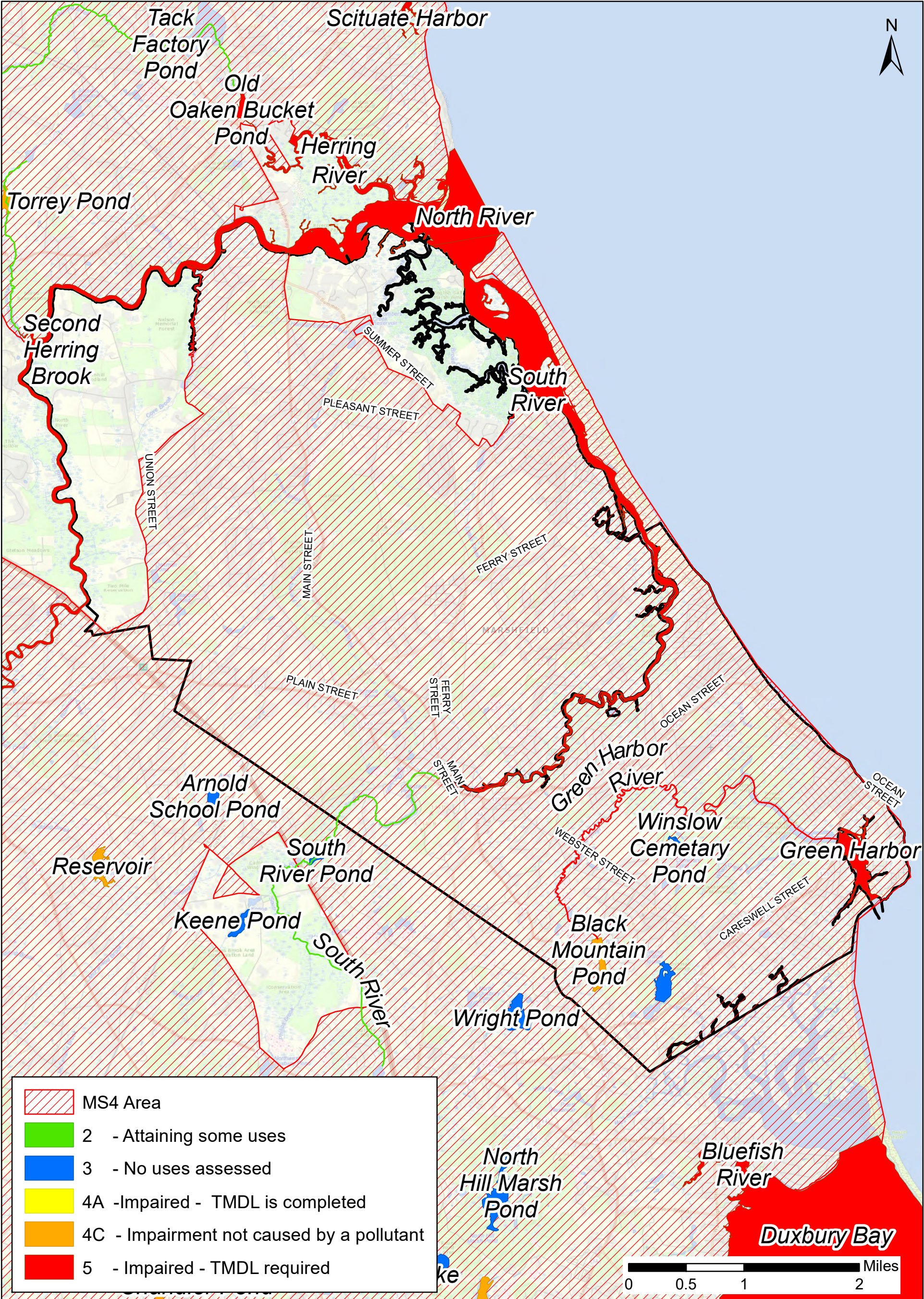


## APPENDIX A

Town of Marshfield Urbanized Area & Impaired Waterbodies Map Town  
of Marshfield, Massachusetts Year 2014 Integrated List of Waters

Town of Marshfield, Massachusetts						
Massachusetts Year 2014 Integrated List of Waters						
Impaired Waters						
Category	Name	Segment ID	Description	Size	Units	Impairment Cause
5 - "Water Requiring a TMDL"	South River	MA94-09	From dam at Main Street, Marshfield to confluence with North River/Massachusetts Bay, Marshfield/Scituate.	0.625	SQUARE MILES	Fecal Coliform
	Green Harbor River	MA94-10	Outlet Black Mountain Pond, Marshfield to the tidegate at Route 139, Marshfield.	5.648	MILES	(Fish-Passage Barrier*) (Other flow regime alterations*) Excess Algal Growth Turbidity
	Green Harbor	MA94-11	From the tidegates at Route 139, Marshfield to the mouth of the harbor at Massachusetts Bay/Cape Cod Bay, Marshfield	0.078	SQUARE MILES	Fecal Coliform
	North River	MA94-05	Confluence of Indian Head River and Herring Brook, Hanover/Pembroke to Route 3A (Main Street), Marshfield/Scituate.	0.302	SQUARE MILES	Fecal Coliform Mercury in Fish Tissue
						*TMDL not required (Non-pollutant)





**Appendix A. Urbanized Area and Impaired Waterbodies**  
**Marshfield, Massachusetts**  
**Spring 2019**



## APPENDIX B

### Catch Basin Inspection Form Template

Job No.: \_\_\_\_\_ Town: \_\_\_\_\_  
 Inspector: \_\_\_\_\_ Date: \_\_\_\_\_

**CATCH BASIN INSPECTION FORM**

<b>Catch Basin I.D.</b>		<b>Final Discharge from Structure?</b> Yes <input type="checkbox"/> No <input type="checkbox"/> <b>If Yes, Discharge to Outfall No:</b> _____	
<b>Catch Basin Label:</b>	Stencil <input type="checkbox"/> Ground Inset <input type="checkbox"/> Sign <input type="checkbox"/> None <input type="checkbox"/> Other _____		
<b>Basin Material:</b>	Concrete <input type="checkbox"/> Corrugated metal <input type="checkbox"/> Stone <input type="checkbox"/> Brick <input type="checkbox"/> Other: _____ <input type="checkbox"/>	<b>Catch Basin Condition:</b>	Good <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Crumbling <input type="checkbox"/>
<b>Pipe Material:</b>	Concrete <input type="checkbox"/> HDPE <input type="checkbox"/> PVC <input type="checkbox"/> Clay Tile <input type="checkbox"/> Other: _____ <input type="checkbox"/>	<b>Pipe Measurements:</b>	Inlet Dia. (in): d= _____  Outlet Dia. (in): D= _____
<b>Required Maintenance/ Problems (check all that apply):</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <input type="checkbox"/> Tree Work Required  <input type="checkbox"/> New Grate is Required  <input type="checkbox"/> Pipe is Blocked  <input type="checkbox"/> Frame Maintenance is Required  <input type="checkbox"/> Remove Accumulated Sediment  <input type="checkbox"/> Pipe Maintenance is Required  <input type="checkbox"/> Basin Undermined or Bypassed         </div> <div style="width: 48%;"> <input type="checkbox"/> Cannot Remove Cover  <input type="checkbox"/> Ditch Work  <input type="checkbox"/> Corrosion at Structure  <input type="checkbox"/> Erosion Around Structure  <input type="checkbox"/> Remove Trash &amp; Debris  <input type="checkbox"/> Need Cement Around Grate  <b>Other:</b> _____         </div> </div>			
<b>Catch Basin Grate Type :</b>	<b>Sediment Buildup Depth :</b>	<b>Description of Flow:</b>	<b>Street Name/ Structure Location:</b>
Bar: <input type="checkbox"/> Cascade: <input type="checkbox"/> Other: _____  Properly Aligned: Yes <input type="checkbox"/> No <input type="checkbox"/>	0-6 (in): _____ 6-12(in): _____ 12-18 (in): _____ 18-24 (in): _____ 24 + (in): _____	Heavy <input type="checkbox"/> Moderate <input type="checkbox"/> Slight <input type="checkbox"/> Trickling <input type="checkbox"/>	
<b>*If the outlet is submerged check yes and indicate approximate height of water above the outlet invert.</b> h above invert (in): _____		Yes <input type="checkbox"/>	No <input type="checkbox"/>
<input type="checkbox"/> <b>Flow</b> <input type="checkbox"/> <b>Standing Water</b> (check one or both)	<b>Observations:</b> Color: _____ Odor: _____		<b>Circle those present:</b> Foam  Sanitary Waste  Orange Staining  Excessive sediment  Other: _____
<b>Weather Conditions :</b> Dry > 24 hours <input type="checkbox"/> Wet <input type="checkbox"/>			
<b>Sample of Screenings Collected for Analysis?</b> Yes <input type="checkbox"/> No <input type="checkbox"/>			
<b>Comments:</b> <div style="height: 80px; border: 1px solid black;"></div>		Oil Sheen  Bacterial Sheen  Floatables  Pet Waste  Optical Enhancers	

## APPENDIX C

### Standard Operating Procedures (SOPs)

# STANDARD OPERATING PROCEDURE 1: CATCH BASIN INSPECTION AND CLEANING

## Introduction

Catch basins help minimize flooding and protect water quality by removing trash, sediment, decaying debris, solids from stormwater runoff, grease and oil, and pollutants attached to sediment such as phosphorus, nitrogen, bacteria, etc. Sediments are retained in the sump below the invert of the outlet pipe. Catch basin cleaning reduces foul odors, prevents clogs in the storm drain system, and reduces the loading of suspended solids, nutrients, and bacteria to receiving waters.

During regular cleaning and inspection procedures, data can be gathered related to the condition of the physical basin structure and its frame and grate and the quality of stormwater conveyed by the structure. Observations such as the following can indicate sources of pollution within the storm drain system:

- Oil sheen
- Discoloration
- Trash, debris and sediment

Both bacteria and petroleum can create a sheen on the water surface. The source of the sheen can be differentiated by disturbing it, such as with a pole. A sheen caused by oil will remain intact and move in a swirl pattern; a sheen caused by bacteria will separate and appear “blocky”. Bacterial sheen is not a pollutant but should be noted.

Observations such as the following can indicate a potential connection of a sanitary sewer to the storm drain system, which is an illicit discharge.

- Indications of sanitary sewage, including fecal matter or sewage odors
- Foaming, such as from detergent
- Optical enhancers, fluorescent dye added to laundry detergent

Each catch basin should be cleaned and inspected at least annually. Catch basins in high-use areas that collect significant amounts of sediment may require more frequent cleaning. The Massachusetts Department of Environmental Protection Stormwater Management Standards recommend that sediment be removed when it reaches up to 50% of the sump depth. Performing street sweeping on

an appropriate schedule will reduce the amount of sediment, debris, and organic matter entering the catch basins, which will in turn reduce the frequency with which structures need to be cleaned.

### Cleaning Procedure

Catch basin inspection cleaning procedures should address both the grate opening and the basin's sump. Document any and all observations about the condition of the catch basin structure and water quality on the Catch Basin Inspection Form (attached).

Catch basin inspection and cleaning procedures include the following:

1. Work upstream to downstream.
2. Clean sediment and trash off grate.
3. Visually inspect the outside of the grate.
4. Visually inspect the inside of the catch basin to determine cleaning needs.
5. Inspect catch basin for structural integrity.
6. Determine the most appropriate equipment and method for cleaning each catch basin.
  - a. Manually use a shovel to remove accumulated sediments, or
  - b. Use a bucket loader to remove accumulated sediments, or
  - c. Use a high pressure washer to clean any remaining material out of catch basin while capturing the slurry with a vacuum.
  - d. If necessary, after the catch basin is clean, use the rodder of the vacuum truck to clean downstream pipe and pull back sediment that might have entered downstream pipe.
7. If contamination is suspected, chemical analysis will be required to determine if the materials comply with the Massachusetts DEP Hazardous Waste Regulations, 310 CMR 30.000 ([https://www.mass.gov/files/documents/2016/08/xl/310cmr30\\_7883\\_54357.pdf](https://www.mass.gov/files/documents/2016/08/xl/310cmr30_7883_54357.pdf)). Chemical analysis required will depend on suspected contaminants. Note the identification number of the catch basin on the sample label, and note sample collection on the Catch Basin Inspection Form.
8. Properly dispose of collected sediments. See following section for guidance.
9. If fluids collected during catch basin cleaning are not being handled and disposed of by a third party, dispose of these fluids to a sanitary sewer system, with permission of the system operator.
10. If illicit discharges are observed or suspected, notify the appropriate Department.
11. At the end of each day, document location and number of catch basins cleaned, amount of waste collected, and disposal method for all screenings.
12. Report additional maintenance or repair needs to the appropriate Department.

### Disposal of Screenings

Catch basin cleanings from storm water-only drainage systems may be disposed at any landfill that is permitted by MassDEP to accept solid waste. MassDEP does not routinely require stormwater-only catch basin cleanings to be tested before disposal, unless there is evidence that they have been contaminated by a spill or some other means.

Screenings may need to be placed in a drying bed to allow water to evaporate before proper disposal. In this case, ensure that the screenings are managed to prevent pollution.

Catch basin cleanings collected by the Town of Duxbury need to be disposed of consistent with the Massachusetts Department of Environmental Protection policies regarding "Management of Catch Basin Cleanings." Materials removed from catch basins are typically defined as solid waste by the Massachusetts Department of Environmental Protection. Any catch basin that have been contaminated by a spill, or are suspected of contamination need to be disposed of in accordance with the 310 CMR 30,000 Hazardous Waste Regulations. Any materials that contain liquids are prohibited from being disposed of at landfills. Dry materials can be disposed of at landfills, and may be approved for use as grading and shaping materials at landfills.

#### [Attachments](#)

Catch Basin Inspection Form

# STANDARD OPERATING PROCEDURE 2: INSPECTING CONSTRUCTED BEST MANAGEMENT PRACTICES

## Introduction

Best Management Practices (BMPs) are policies, procedures and structures designed to reduce stormwater pollution, prevent contaminant discharges to natural water bodies, and reduce stormwater facility maintenance costs. Constructed BMPs are permanent site features designed to treat stormwater before infiltrating it to the subsurface or discharging it to a surface water body.

This Standard Operating Procedure provides a general summary of inspection procedures for eight common constructed BMPs, including:

1. Bioretention Areas and Rain Gardens
2. Constructed Stormwater Wetlands
3. Extended Dry Detention Basins
4. Proprietary Media Filters
5. Sand and Organic Filters
6. Wet Basins
7. Dry Wells
8. Infiltration Basins

This SOP is based on the Massachusetts Stormwater Handbook and is not intended to replace that document. This SOP is also not intended to replace the Stormwater BMP Operation and Maintenance (O&M) Plan required by the Massachusetts Wetlands Protection Act, Order of Conditions.

### Bioretention Areas and Rain Gardens

Bioretention areas and rain gardens are shallow depressions filled with sandy soil, topped with a thick layer of mulch and planted with dense native vegetation. There are two types of bioretention cells:

1. Filtering bioretention area: Areas that are designed solely as an organic filter; and
2. Exfiltration bioretention area: Areas that are configured to recharge groundwater in addition to acting as a filter



### *Inspection & Maintenance*

Regular inspection and maintenance are important to prevent against premature failure of bioretention areas or rain gardens. Regular inspection and maintenance of pretreatment devices and bioretention cells for sediment buildup, structural damage and standing water can extend the life of the soil media.

#### **MAINTENANCE SCHEDULE: BIORETENTION AREAS AND RAIN GARDENS**

Activity	Time of Year	Frequency
Inspect for soil erosion and repair	Year round	Monthly
Inspect for invasive species and remove if present	Year round	Monthly
Remove trash	Year round	Monthly
Mulch Void Areas	Spring	Annually
Remove dead vegetation	Fall and Spring	Bi-Annually
Replace dead vegetation	Spring	Annually
Prune	Spring or Fall	Annually
Replace all media and vegetation	Late Spring/Early Summer	As Needed

When failure is discovered, excavate the bioretention area, scarify the bottom and sides, replace the filter fabric and soil, replant vegetation and mulch the surface.

Never store snow within a bioretention area or rain garden. This would prevent required water quality treatment and the recharge of groundwater.

### *Constructed Stormwater Wetlands*

Constructed stormwater wetlands maximize the pollutant removal from stormwater through the use of wetland vegetation uptake, retention and settling. Constructed storm water wetlands must be used in conjunction with other BMPs, such as sediment forebays.

### *Inspection & Maintenance*

Regular inspection and maintenance are important to prevent against premature failure of bioretention areas or rain gardens. Regular inspection and maintenance of pretreatment devices and bioretention cells for sediment buildup, structural damage and standing water can extend the life of the soil media.

### MAINTENANCE SCHEDULE, CONSTRUCTED STORMWATER WETLANDS: YEARS 0-3

Activity	Time of Year	Frequency
Inspect for invasive species and remove if present	Year round	Monthly
Record and Map:	Year round	Annually
Types and distribution of dominant wetland plants	Year round	Bi-Annually
Presence and distribution of planted wetland species	Spring	Annually
Presence and distribution of invasive species	Fall and Spring	Bi-Annually
Indications other species are replacing planted wetland species	Spring	Annually
Percent of standing water that is not vegetated	Spring or Fall	Annually
Replace all media and vegetation	Late Spring/Early Summer	As Needed
Stability of original depth zones and micro-topographic features		
Accumulation of sediment in the forebay and micropool and survival rate of plants		

### MAINTENANCE SCHEDULE, CONSTRUCTED STORMWATER WETLANDS: YEARS 4 – LIFETIME

Activity	Time of Year	Frequency
Inspect for invasive species and remove if present	Year round	Monthly
Clean forebays	Year round	Annually
Clean sediment in basin/wetland system	Year round	Once every 10 years
Mulch Void Areas	Spring	Annually
Remove dead vegetation	Fall and Spring	Bi-Annually
Replace dead vegetation	Spring	Annually
Prune	Spring or Fall	Annually
Replace all media and vegetation	Late Spring/Early Summer	As Needed

When failure is discovered, excavate the bioretention area, scarify the bottom and sides, replace the filter fabric and soil, replant vegetation and mulch the surface.

Never store snow within a constructed stormwater wetland. This would prevent required water quality treatment and the recharge of groundwater.

#### Extended Dry Detention Basins

Extended dry detention basins are designed to control both stormwater quantity and quality. These BMPs are designed to hold stormwater for at least 24 hours, allowing solids to settle and to reduce local and downstream flooding. Pretreatment is required to reduce the potential for overflow clogging. The outflow may be designed as either fixed or adjustable. Additional nutrient removal may be achieved by a micropool or shallow marsh.

### *Inspection & Maintenance*

Annual inspection of extended dry detention basins is required to ensure that the basins are operating properly. Potential problems include: erosion within the basin and banks, tree growth on the embankment, damage to the emergency spillway and sediment accumulation around the outlet. Should any of these problems be encountered, necessary repairs should be made immediately.

#### **MAINTENANCE SCHEDULE: EXTENDED DRY DETENTION BASINS**

Activity	Time of Year	Frequency
Inspect basins	Spring and Fall	Bi-Annually, and during and after major storms
Examine outlet structure for clogging or high outflow release velocities	Spring and Fall	Bi-Annually
Mow upper stage, side slopes, embankment and emergency spillway	Spring through Fall	Bi-Annually
Remove trash and debris	Spring	Bi-Annually
Remove sediment from basin	Year round	At least once every 5 years

### *Proprietary Media Filters*

Media Filters are designed to reduce total suspended solids and other target pollutants, such as organics, heavy metals or nutrients, which are sorbed onto the filter media, which is contained in a concrete structure. The substrate used as filter media depends on the target pollutants, and may consist of leaf compost, pleated fabric, activated charcoal, perlite, amended sand in combination with perlite, and zeolite. Two types of Media Filters are manufactured: Dry Media Filters, which are designed to dewater within 72 hours; and Wet Media Filters, which maintain a permanent pool of water as part of the treatment system.

### *Inspection & Maintenance*

Maintenance in accordance with the manufacturer's requirements is necessary to ensure stormwater treatment. Inspection or maintenance of the concrete structure may require OSHA confined space training. Dry Media Filters are required to dewater in 72 hours, thus preventing mosquito and other insect breeding. Proper maintenance is essential to prevent clogging. Wet Media Filters require tight fitting seals to keep mosquitoes and other insects from entering and breeding in the permanent pools. Required maintenance includes routine inspection and treatment.

#### **MAINTENANCE SCHEDULE: EXTENDED DRY DETENTION BASINS**

Activity	Time of Year	Frequency
Inspect for standing water, trash, sediment and clogging	Per manufacturer's schedule	Bi-Annually (minimum)
Remove trash and debris	N/A	Each Inspection
Examine to determine if system drains in 72 hours	Spring, after large storm	Annually
Inspect filtering media for clogging	Per manufacturer's schedule	Per manufacturer's schedule

## Sand and Organic Filters

Sand and organic filters, also known as filtration basins, are intended for quality control rather than quantity control. These filters improve water quality by removing pollutants through a filtering media and settling pollutants on top of the sand bed and/or in a pretreatment basin. Pretreatment is required to prevent filter media from clogging. Runoff from the filters is typically discharged to another BMP for additional treatment.

### MAINTENANCE SCHEDULE: EXTENDED DRY DETENTION BASINS

Activity	Frequency
Inspect filters and remove debris	After every major storm for the first 3 months after construction completion. Every 6 months thereafter.

## Wet Basins

Wet basins are intended to treat stormwater quality through the removal of sediments and soluble pollutants. A permanent pool of water allows sediments to settle and removes the soluble pollutants, including some metals and nutrients. Additional dry storage is required to control peak discharges during large storm events, and if properly designed and maintained wet basins can add fire protection, wildlife habitat and aesthetic values to a property.

### Inspection & Maintenance

To ensure proper operation, wet basin outfalls should be inspected for evidence of clogging or excessive outfall releases. Potential problems to investigate include erosion within the basin and banks, damage to the emergency spillway, tree growth on the embankment, sediment accumulation around the outlet and the emergence of invasive species. Should any of these problems be encountered, perform repairs immediately. An on-site sediment disposal area will reduce sediment removal costs.

### MAINTENANCE SCHEDULE: WET BASINS

Activity	Time of Year	Frequency
Inspect wet basins	Spring and/or Fall	Annually (Minimum)
Mow upper stage, side slopes, embankment and emergency spillway	Spring through Fall	Bi-Annually (Minimum)
Remove sediment, trash and debris	Spring through Fall	Bi-Annually (Minimum)
Remove sediment from basin	Year round	As required, but at least once every 10 years

## Dry Wells

Dry wells are used to infiltrate uncontaminated runoff. These BMPs should never be used to infiltrate stormwater or runoff that has the potential to be contaminated with sediment and other pollutants. Dry wells provide groundwater recharge and can reduce the size and cost required of

downstream BMPs or storm drains. However, they are only applicable in drainage areas of less than one acre and may experience high failure rates due to clogging.

#### *Inspection & Maintenance*

Proper dry well function depends on regular inspection. Clogging has the potential to cause high failure rates. The water depth in the observation well should be measured at 24 and 48 hour intervals after a storm and the clearance rate calculated. The clearance rate is calculated by dividing the drop in water level (inches) by the time elapsed (hours).

#### **MAINTENANCE SCHEDULE: DRY WELLS**

Activity	Frequency
Inspect dry wells	After every major storm for the first 3 months after construction completion. Annually thereafter.

#### *Infiltration Basins*

Infiltration basins are designed to contain stormwater quantity and provide groundwater recharge. Pollution prevention and pretreatment are required to ensure that contaminated stormwater is not infiltrated. Infiltration basins reduce local flooding and preserve the natural water balance of the site, however high failure rates often occur due to improper siting, inadequate pretreatment, poor design and lack of maintenance.

#### *Inspection & Maintenance*

Regular maintenance is required to prevent clogging, which results in infiltration basin failure. Clogging may be due to upland sediment erosion, excessive soil compaction or low spots. Inspections should include signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth on the embankments, riprap condition, sediment accumulation and turf health.

#### **MAINTENANCE SCHEDULE: INFILTRATION BASINS**

Activity	Time of Year	Frequency
Preventative maintenance	Spring and Fall	Bi-Annually
Inspection	Spring and Fall	After every major storm for the first 3 months after construction completion. Bi-annually thereafter and discharges through the high outlet orifice.
Mow/rake buffer area, side slopes and basin bottom	Spring and Fall	Bi-Annually
Remove trash, debris and organic matter	Spring and Fall	Bi-Annually

#### *Attachments*

Inspection of Bioretention Areas/Rain Gardens

## STANDARD OPERATING PROCEDURE 3: OIL/WATER SEPARATOR (OWS) MAINTENANCE

Oil/water separators (OWS), also known as gas/oil separators, are structural devices intended to provide pretreatment of floor drain water from industrial and garage facilities. An OWS allows oils (and substances lighter than water) to be intercepted and be removed for disposal before entering the sanitary sewer system. Substances heavier than water settle into sludge at the bottom of the unit. The remaining water passes through the unit into the sanitary sewer system.

### General OWS Maintenance Requirements

OWS units are generally required where petroleum-based products, wastes containing petroleum, or oily and/or flammable materials are used, produced, or stored. OWS units should not be used to manage stormwater or flow from vehicle washing facilities. High flow rates through an OWS will reduce the structure's ability to separate materials. Detergents and solvents can emulsify oil and grease, allowing the particles to enter the sewer, so these should not be disposed of in drains entering the OWS.

1. Each OWS at a facility may receive different materials in different quantities, so the cleanout schedule may not be the same for every OWS at a facility.
2. Employees performing inspections of an OWS must be properly trained and be familiar with the maintenance of that specific structure, since function can vary based on design. Third-party firms may be utilized to perform quarterly inspections.
3. Do not drain petroleum, oil, or lubricants directly to an OWS. The structures are designed to manage these materials at low and medium concentrations in sanitary sewage, not as slug loads.
4. Do not drain antifreeze, degreasers, detergents, fuels, alcohols, solvents, coolant, or paint to the OWS.
5. Separator compartment covers should be tightly sealed to ensure floor drainage only enters the first compartment of the OWS.
6. Drains should be kept free of debris and sediment to the maximum extent practicable.
7. Spill cleanup materials should be maintained in the area served by the OWS. For more information on spill cleanup and response materials, refer to SOP 4, "Spill Response and Cleanup Procedures".

## OWS Inspection Procedures

Daily inspection of an OWS should include a visual examination of the area served by the OWS for evidence of spills or leaks.

Weekly inspections of an OWS should include the following:

Catch basin inspection and cleaning procedures include the following:

1. Visually examine the area served by the OWS for evidence of spills or leaks.
2. Inspect the point of discharge (i.e., sewer manhole) for evidence of petroleum bypassing the OWS.
3. Inspect drains for any signs of unauthorized substances entering the OWS.
4. Examine the OWS for signs of leaks or any malfunction.

Quarterly inspections of an OWS should include the following:

1. Complete tasks noted as appropriate for daily and weekly inspection.
2. Complete the Quarterly OWS Inspection Checklist, attached, during the inspection.
3. Take the following measurements to benchmark function of the OWS:
  - A. Distance from rim of access cover to bottom of structure
  - B. Distance from rim of access cover to top of sludge layer
  - C. Depth of sludge layer ( $C = A - B$ )
  - D. Distance from rim of access cover to the oil/water interface
  - E. Distance from rim of access cover to the top of the liquid surface
  - F. Depth of oil layer ( $F = D - E$ )

## OWS Cleaning Procedures

Cleaning of the OWS is required when there has been a spill to the OWS that exceeds ten gallons of oil, one gallon of detergent or solvent, or any material prohibited by the owner of the sanitary sewer. Cleaning is also required when the levels of accumulated sludge and/or oil meet the manufacturer's recommended levels for cleaning. This will vary based on the manufacturer of the OWS. If the manufacturer's recommendations are unknown, the following guidelines are appropriate for determining when to clean:

1. When sludge accumulates to 25% of the wetted height of the separator compartment; or
2. When oil accumulates to 5% of the wetted height of the separator compartment; or
3. When 75% of the retention capacity of the OWS is filled.

Cleaning should be performed a minimum of once per year. When cleaning is required, it shall be performed by licensed OWS maintenance companies. Materials removed from the OWS must be disposed of in accordance with Massachusetts Hazardous Waste Regulations, 310 CMR 30.00.



### Documentation of Cleaning and Service

The operator of the premises where the OWS is located shall maintain a log describing the date and type of all inspections, service and maintenance performed in connection with the Separator. Documentation shall include the identity of the inspector (or the identity of the person or entity that performed the service and/or maintenance). Records shall also document the amount of residue removed from the OWS each time it was cleaned, and how removed materials were disposed. This documentation shall be maintained for a minimum of six years.

### Attachments

Quarterly OWS Inspection Checklist

## STANDARD OPERATING PROCEDURE 4: MANAGEMENT OF SAND AND DEICING CHEMICALS AT DPW FACILITIES

### Purpose

To ensure that sand and deicing chemicals are managed consistent with environmental regulations.

### Responsibility

It is the responsibility of the Highway Division General Foreman to report leaks in sheds/tanks and other problems to the Director of Operations. It is the Highway Division's General Foreman's responsibility to ensure that spilled deicing chemicals are cleaned up and put back to the storage area within 48 hours.

The Director of Operations is responsible for ensuring regular inspections of the sand and deicing chemical storage areas during regular inspections.

### Policy

Deicing chemicals (i.e. salt, calcium chloride, etc.) shall be stored in storage sheds or tanks in a manner that minimizes the potential for runoff. All deicing chemicals shall be covered when not in use. Sand piles shall be bermed to minimize runoff. During handling, sand and salt which fall outside of the storage areas will be swept back to the storage areas within 48 hours of the activity, to minimize runoff.

During regular inspections, the sand and deicing chemical storage areas shall be inspected by the DPW Highway Division General Foreman or designee to ensure that runoff is minimized. All findings during an inspection shall be sent to the DPW Director of Operations.

# STANDARD OPERATING PROCEDURE 5:

## THE HANDLING AND STORAGE OF STREET SWEEPINGS AT LANDFILL

### Purpose

To provide guidance on the handling and storage of street sweepings.

Street sweepings are defined as sand and soil generated during the routine cleaning of roadways. Street sweepings may also contain leaves and other miscellaneous solid waste. Street sweepings do not include the material swept from the road surface that has resulted from hazardous materials spills or material cleaned from other roadway structures such as catch basins or other drainage structures.

This policy does cover sweepings collected by DPW contractors. DPW contractors are fully responsible for the reuse and/or disposal of sweepings according to Department of Environmental Protection (DEP) policy. Under no circumstances are private contractors allowed to store sweepings on DPW property.

### Responsibility

It is responsibility of the DPW Highway Division General Foreman and his designee (DPW Loader Operator) to ensure that sweepings are handled in compliance with this policy and other applicable state and federal regulations.

### Policy

This policy is based upon the DEP Policy #94.092 "Reuse and Disposal of Street Sweepings." The DEP policy is attached and must be followed as part of this policy.

Street Sweepings are to be stored in a labeled accumulation area at the DPW Yard that ensures the prevention of dust, erosion, and off-site migration. This is generally accomplished by marking the perimeter of the stockpile of Sweepings with signage and linked jersey barriers/berms, and locating the stockpile in an area where the grades do not allow for the off-site migration of stormwater from the stockpile.

The sweepings must not be stored within the 100-foot Buffer Zone of a Wetland, within a Wetland Resource Area or within the 200 foot Riverfront Area.

Sweepings collected from urbanized areas (non-residential areas) should be stockpiled separately from sweepings collected from other areas. These two types of street sweepings should be stored in separate accumulation areas so that non-urbanized sweepings can be more easily reused. Storage of street sweepings is temporary. Street sweepings should not be stored for longer than one year.

#### *Street Sweeping Reuse and Disposal*

As indicated in the DEP policy, there are options for reuse that require no analytical testing or DEP oversight. Options for reuse (construction fill, compost additive, reapplication, etc.) will be evaluated on a case by case basis by the DPW Director of Operations

Disposal of street sweepings as solid waste or as cover material is allowed at permitted solid waste landfills.

Street sweepings collected from urban areas must have analytical testing conducted before reuse. If testing is required for disposal or reuse, each stockpile of sweepings must be tested (1 sample/1000 cubic yards).

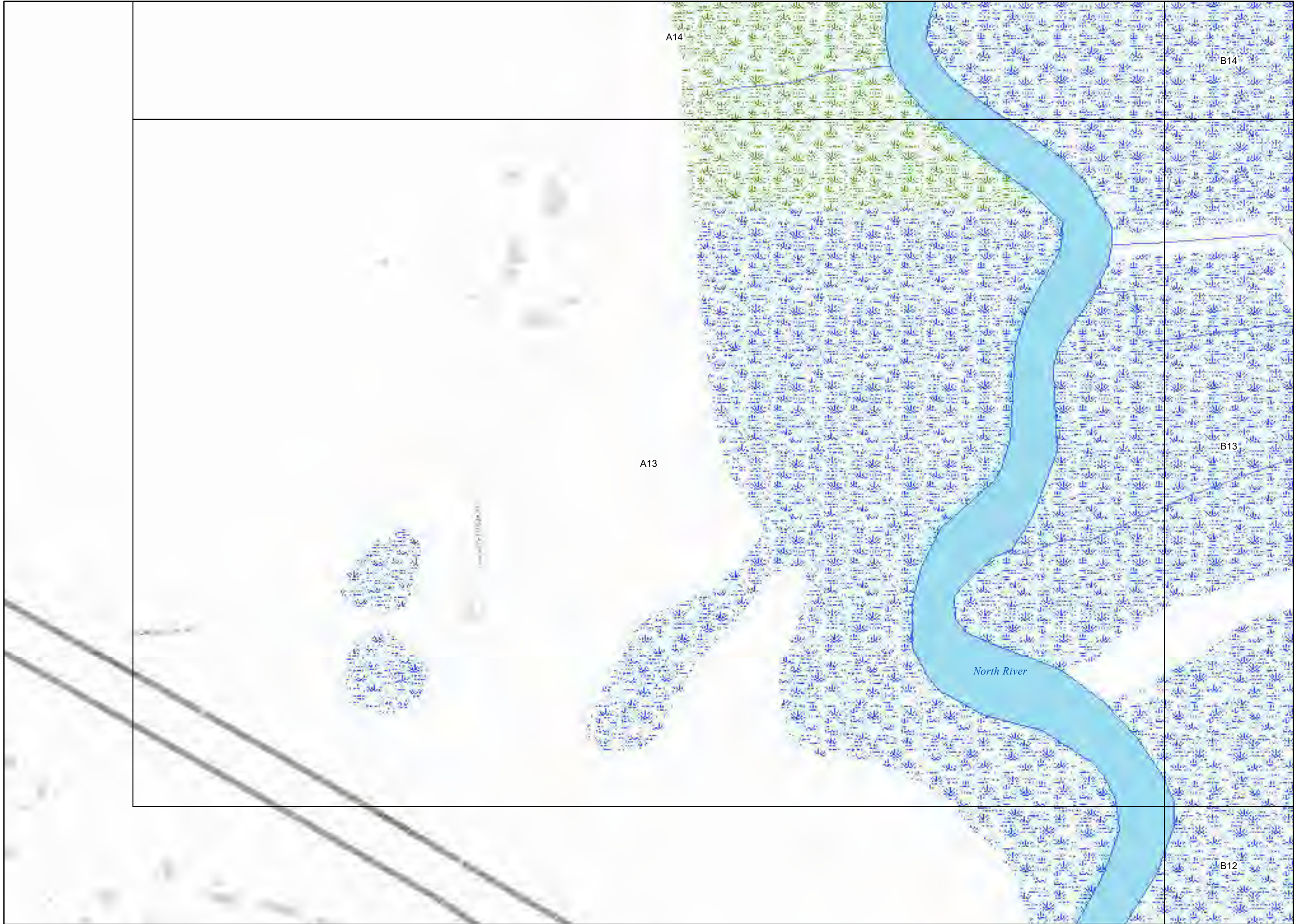
#### *Attachments*

DEP Policy #94.092 "Reuse and Disposal of Street Sweepings"

## **ATTACHMENT 1**

Town of Marshfield Mapbook (Stand-Alone Set of Maps)



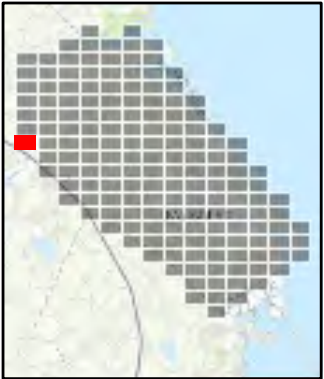


- ▲ Waterbody Outfalls (129)
- ▲ Upland Outfalls (177)
- Manholes (1656)
- Catch Basins (3929)
- Pipes (3154)
- Detention Ponds (64)

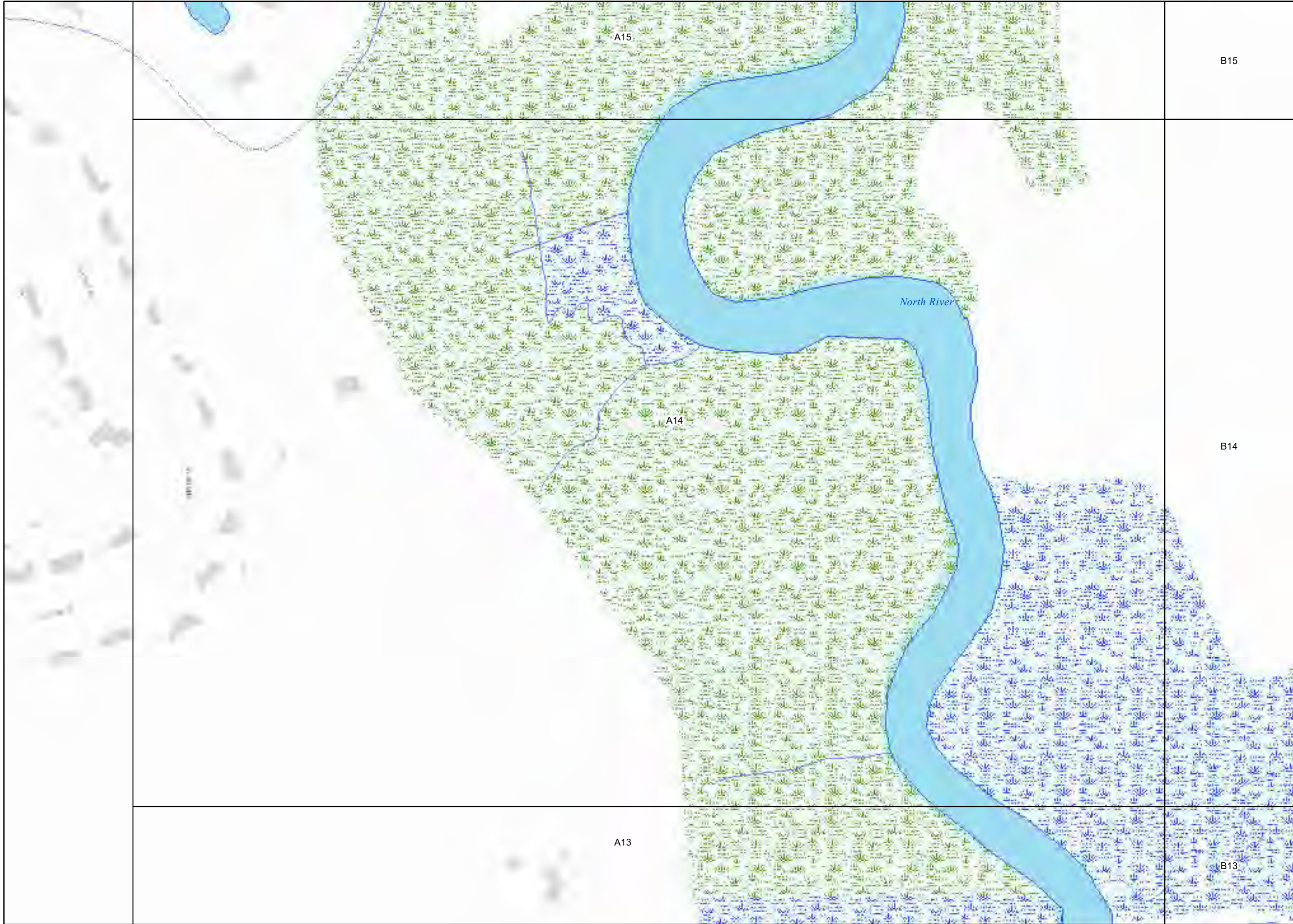
Stormwater Connectivity Mapbook  
Marshfield, Massachusetts  
Spring 2020



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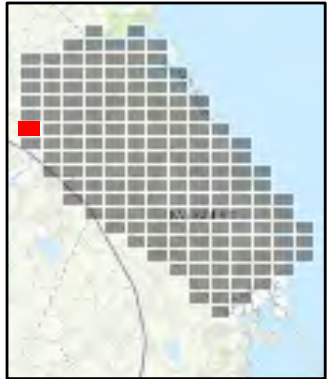
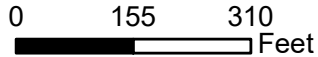






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Stormwater Connectivity Mapbook  
Marshfield, Massachusetts  
Spring 2020

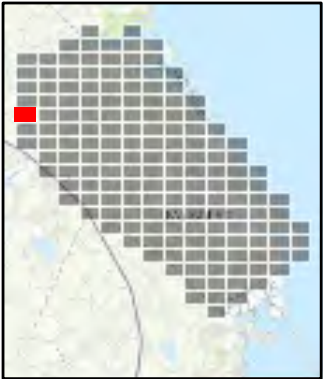
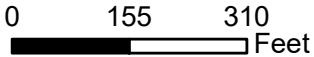




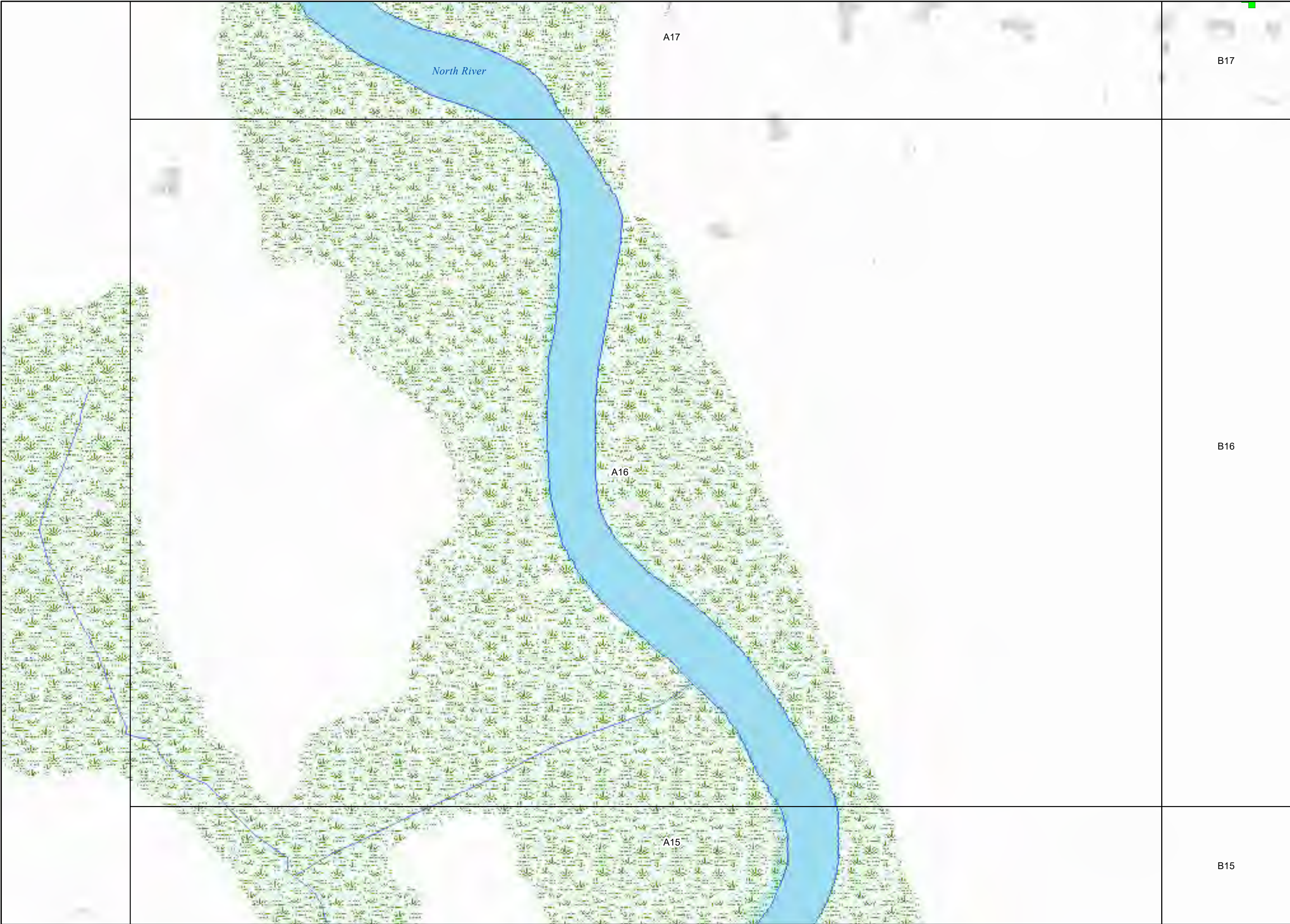


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Stormwater Connectivity Mapbook  
Marshfield, Massachusetts  
Spring 2020





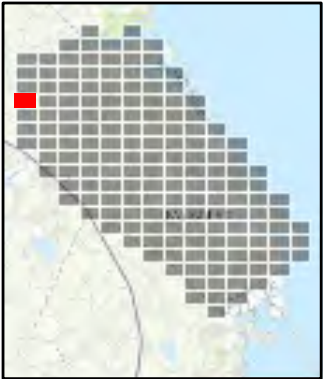


- ▲ Waterbody Outfalls (129)
- ▲ Upland Outfalls (177)
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- Catch Basins (3929)
- Pipes (3154)
- Detention Ponds (64)

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Marshfield, Massachusetts  
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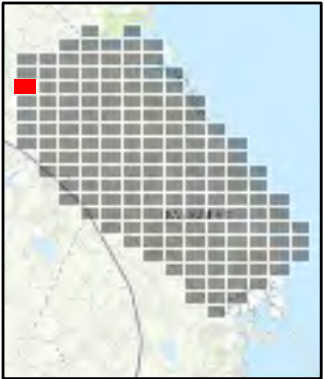


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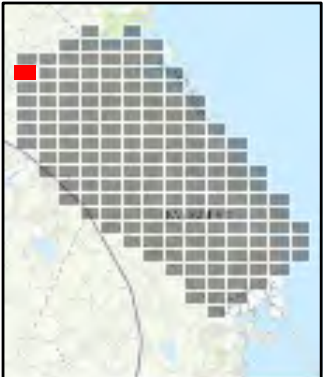


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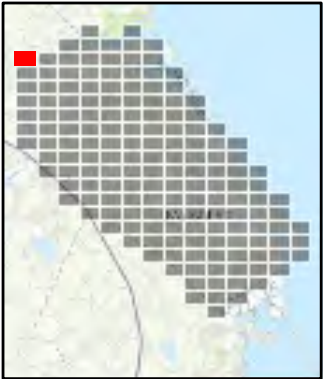


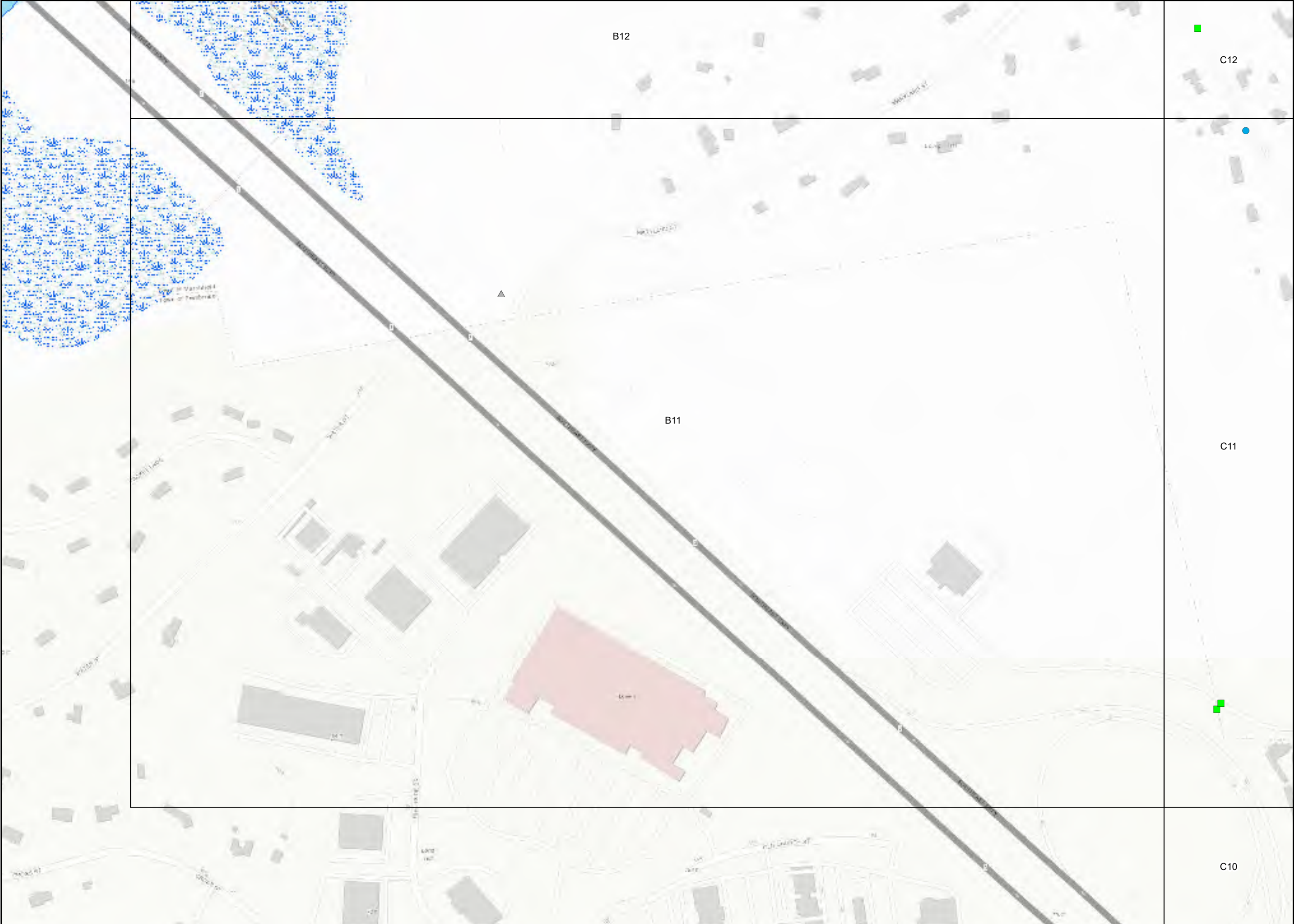
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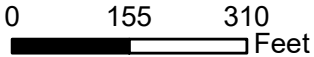
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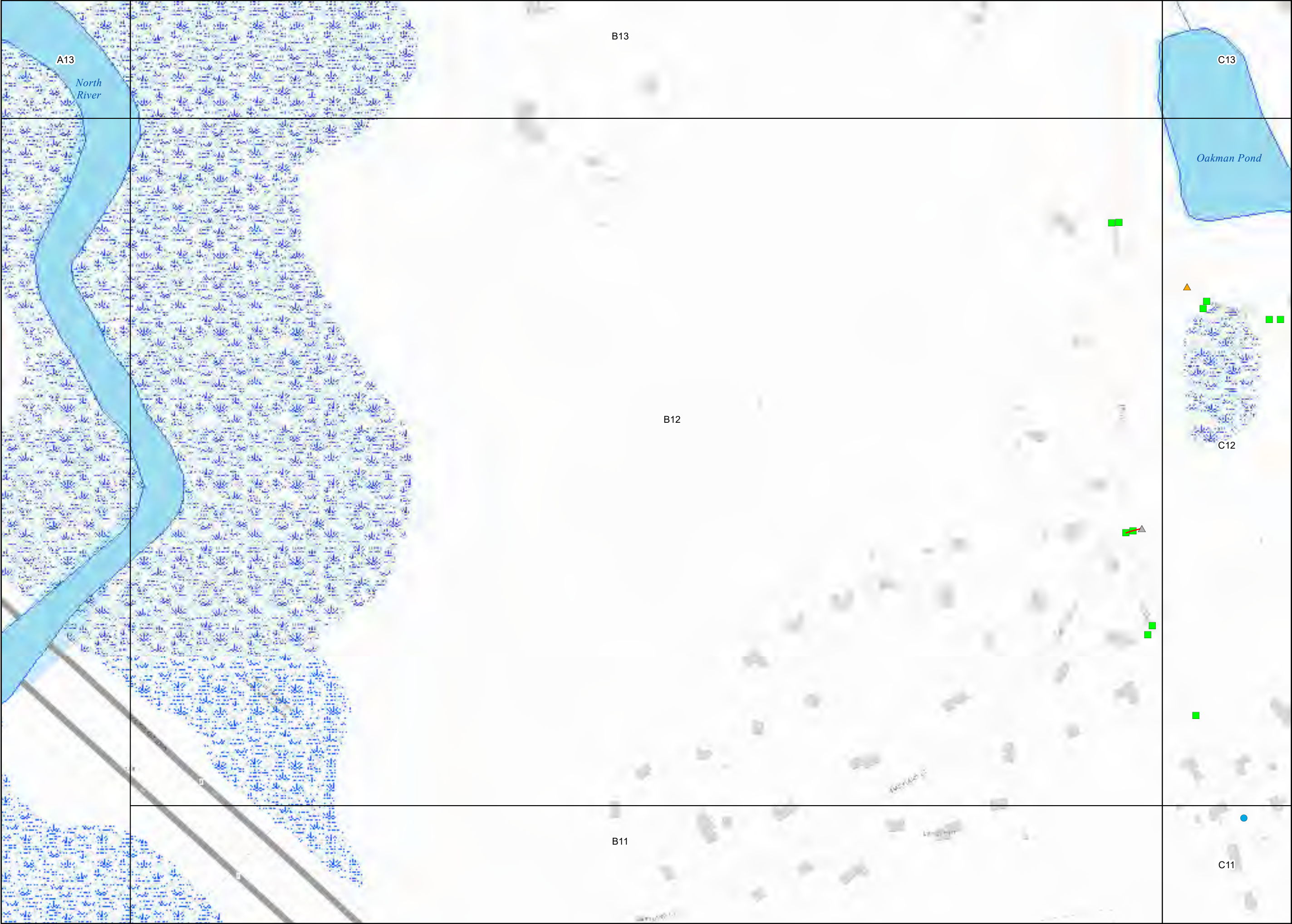


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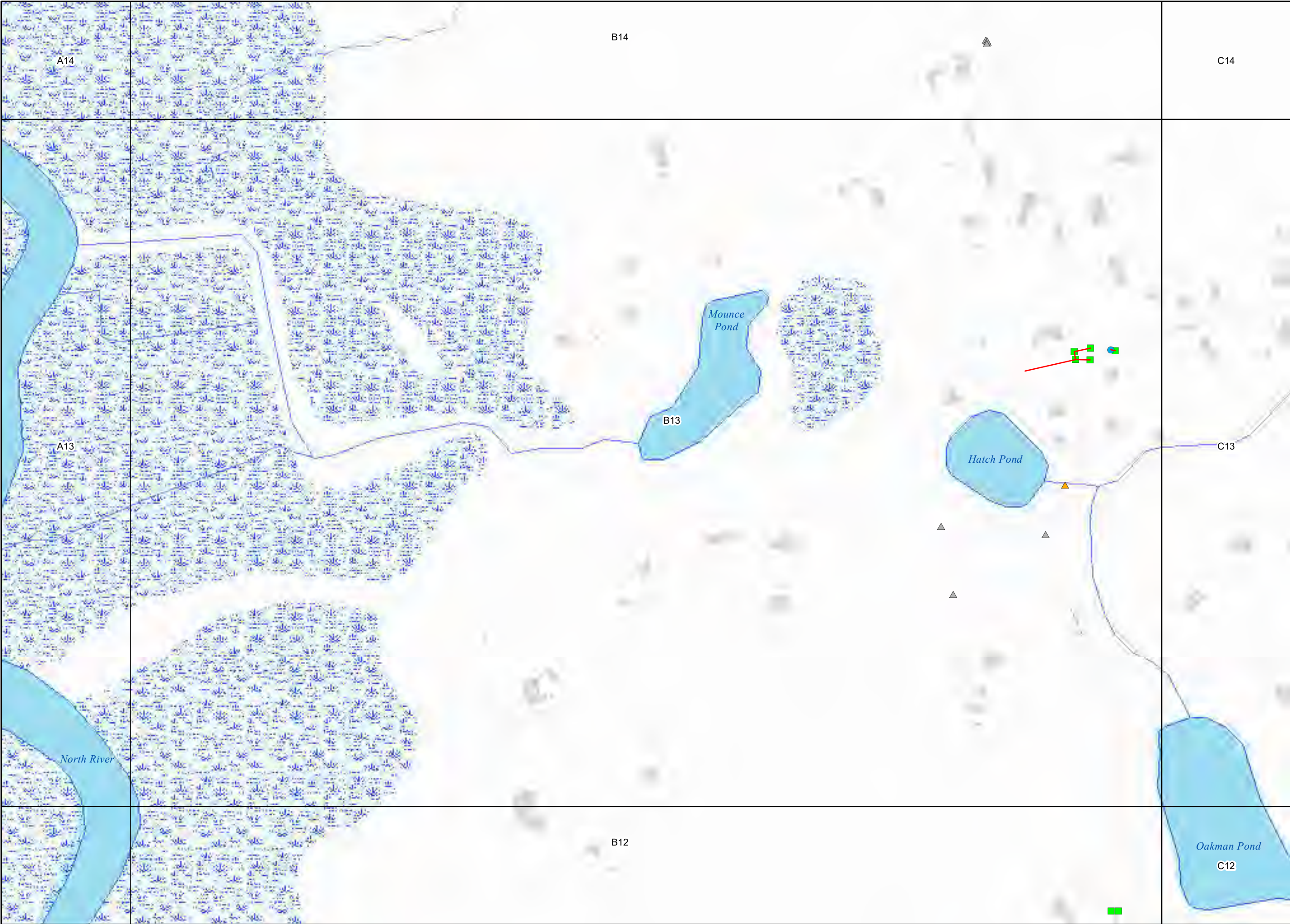


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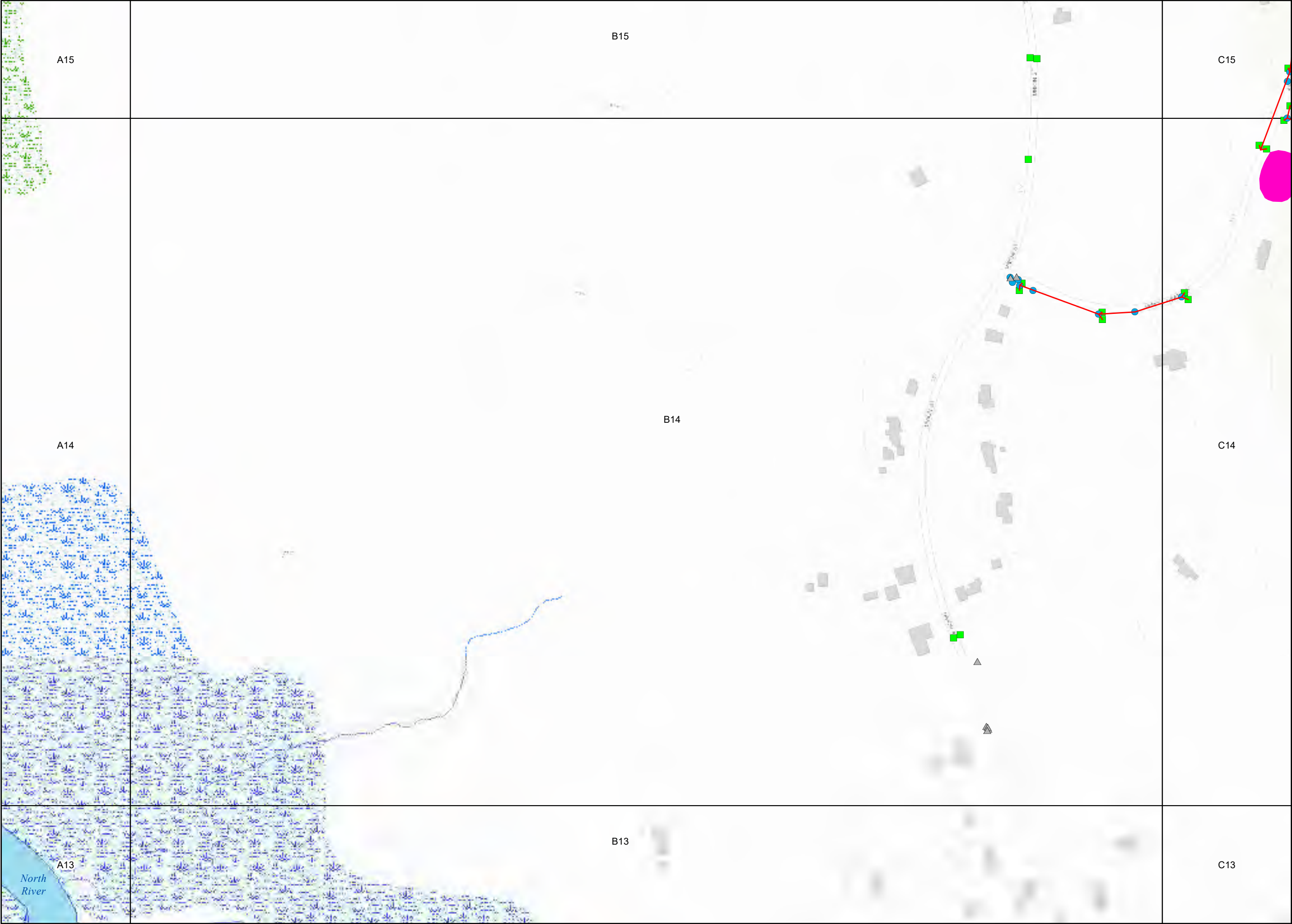


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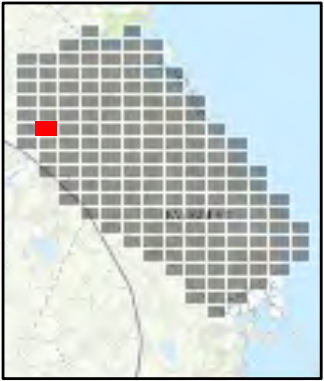


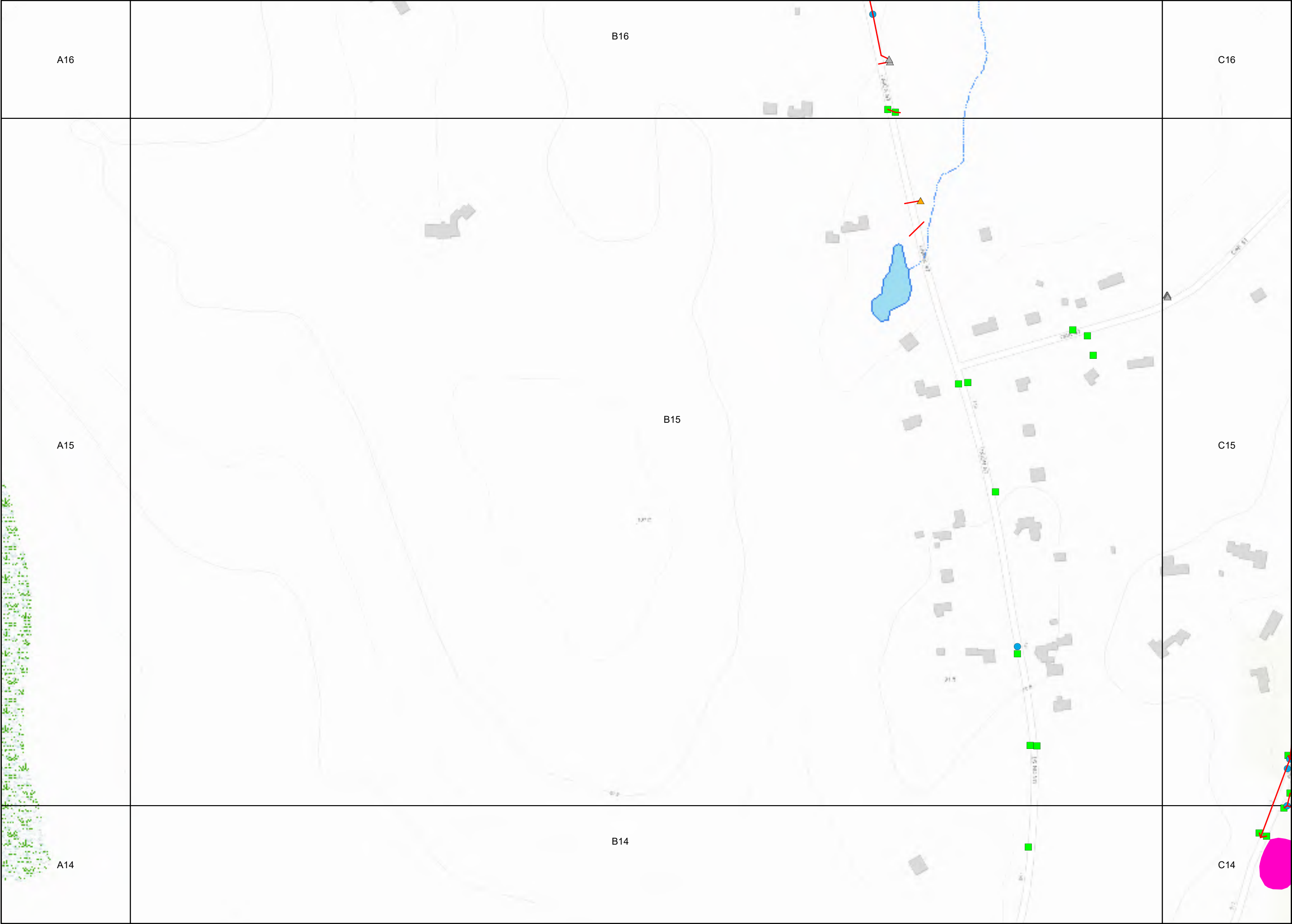




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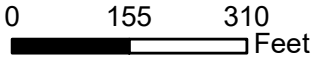
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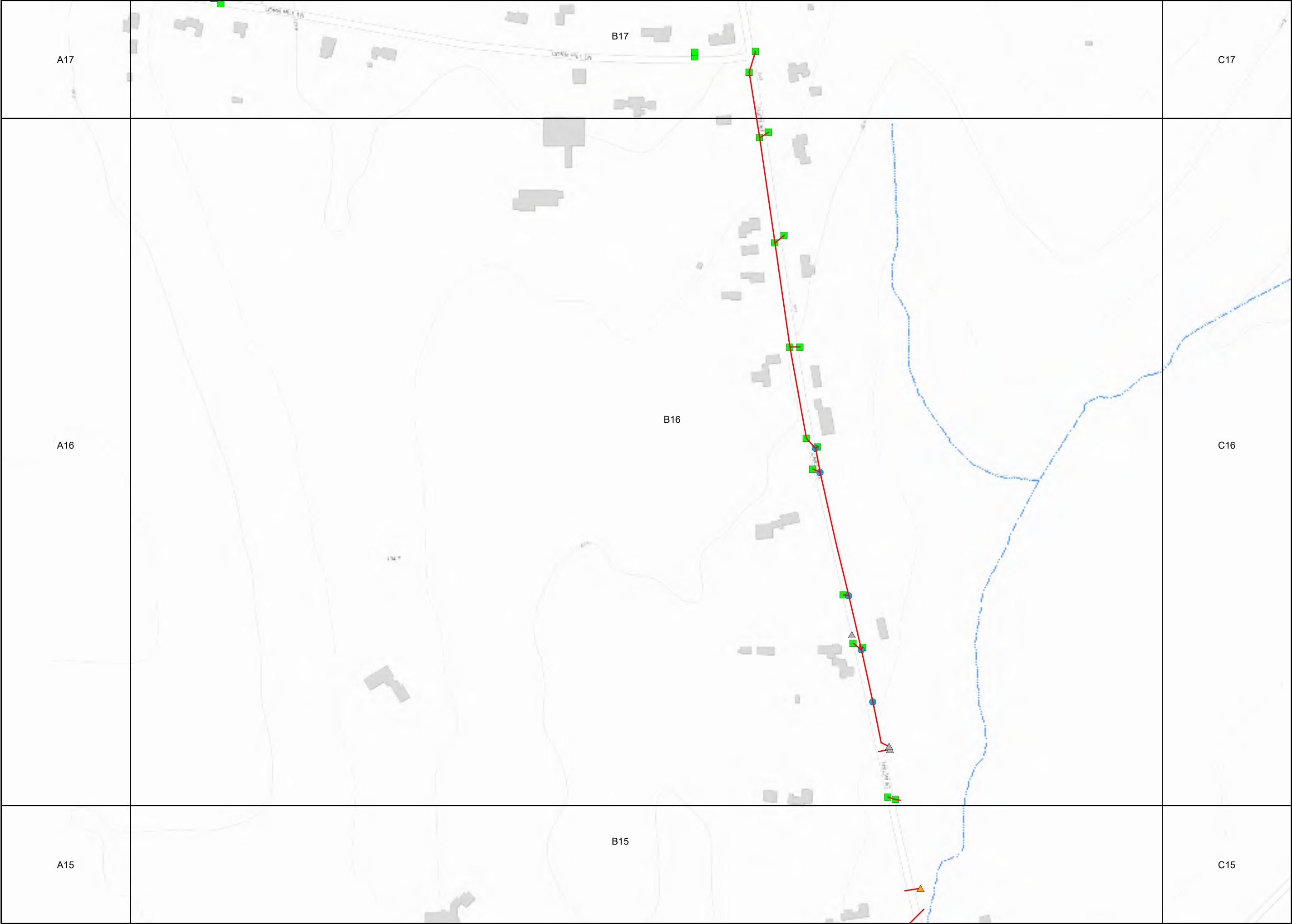




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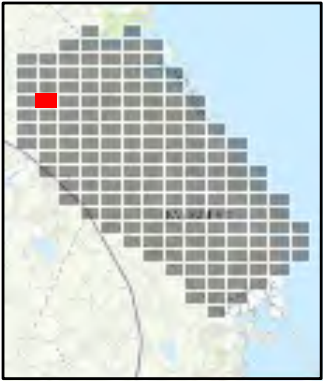


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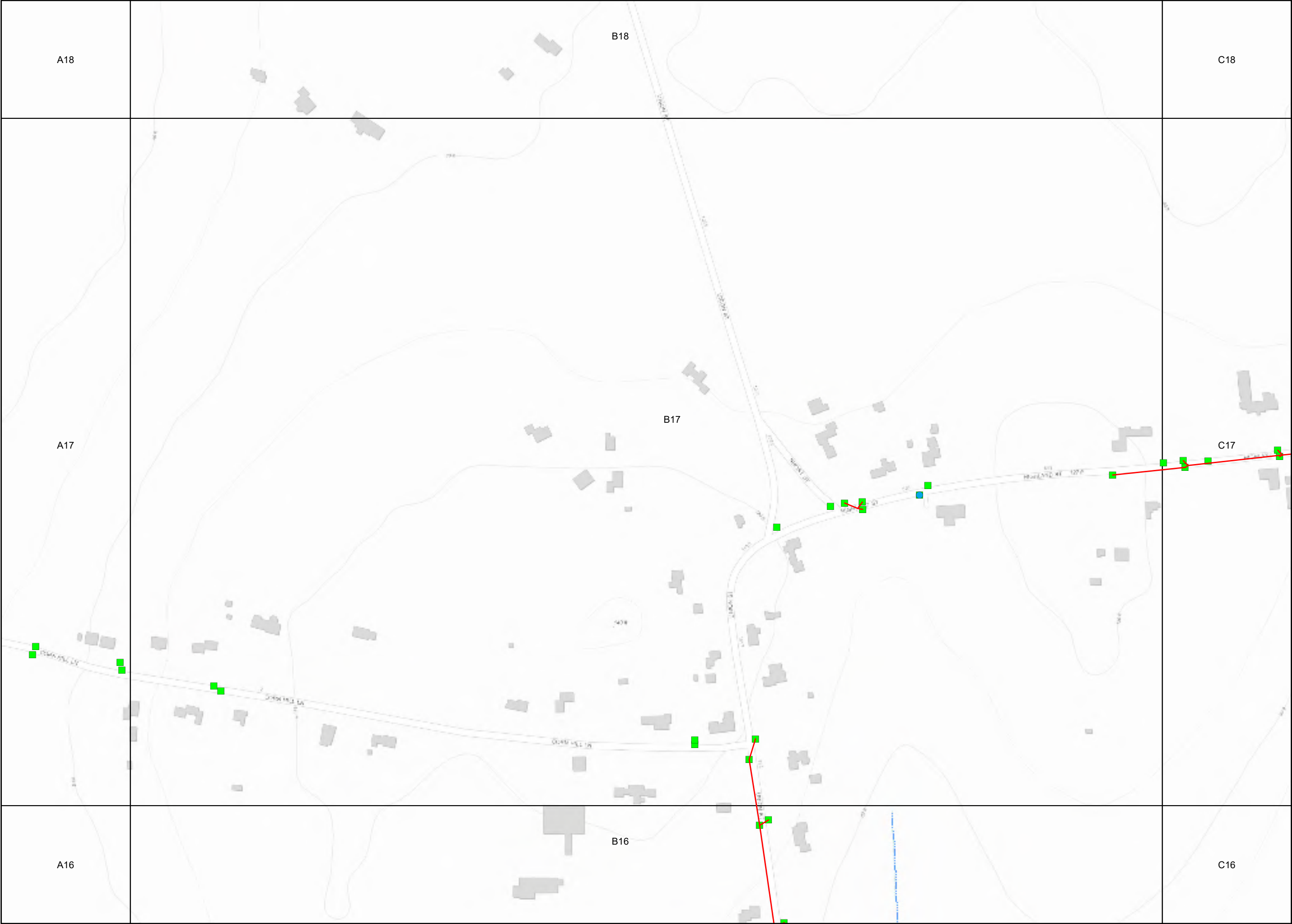
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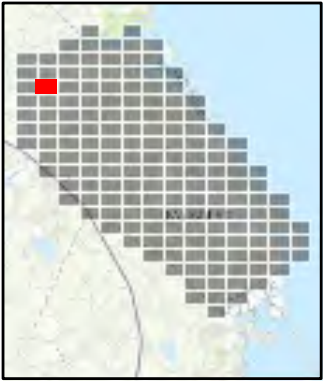
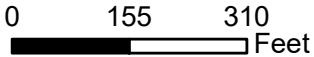




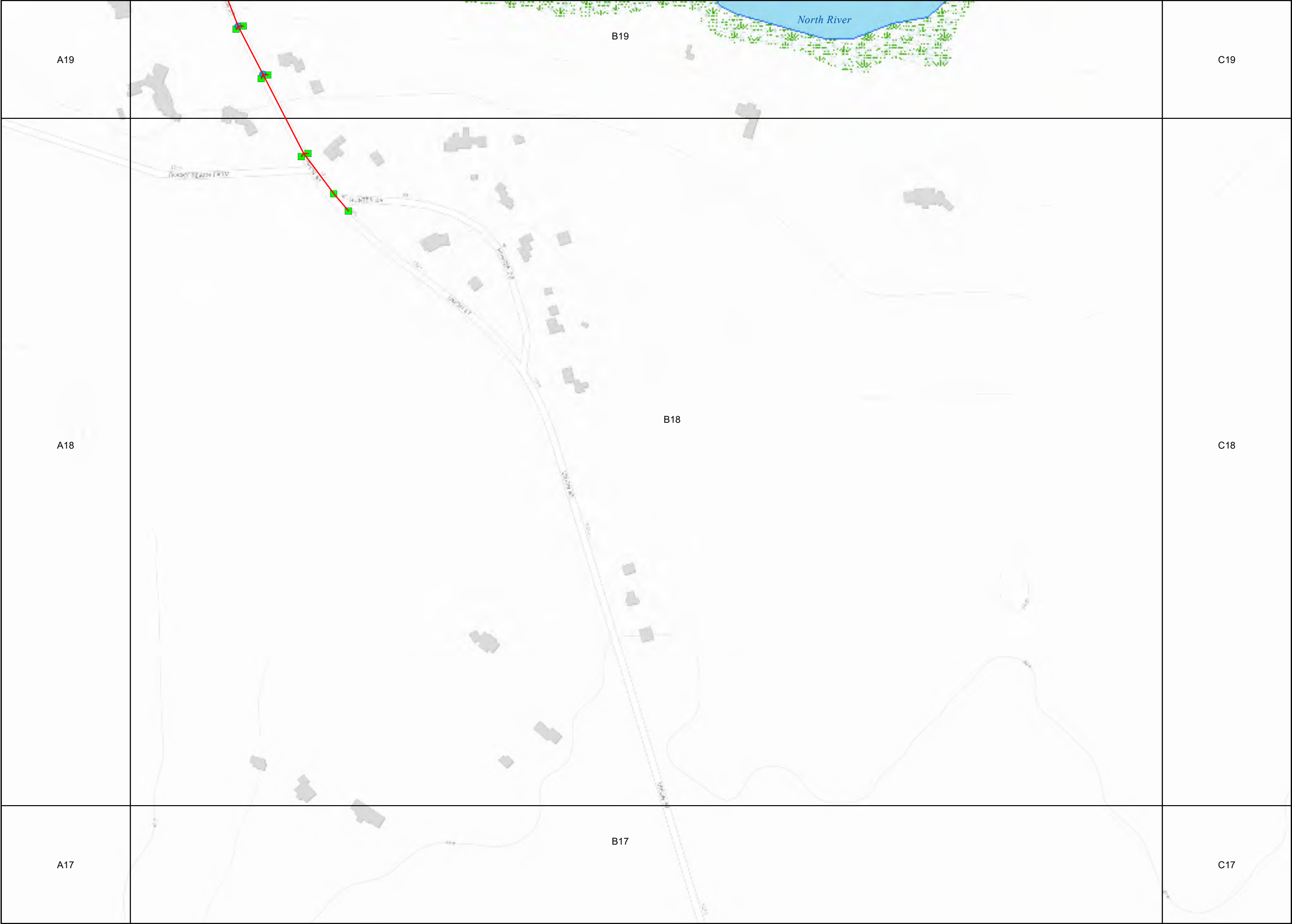


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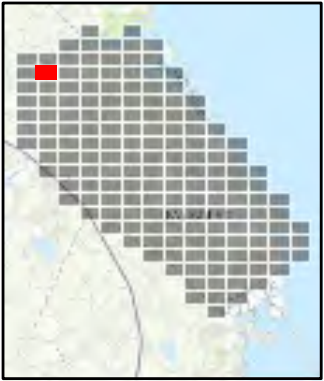




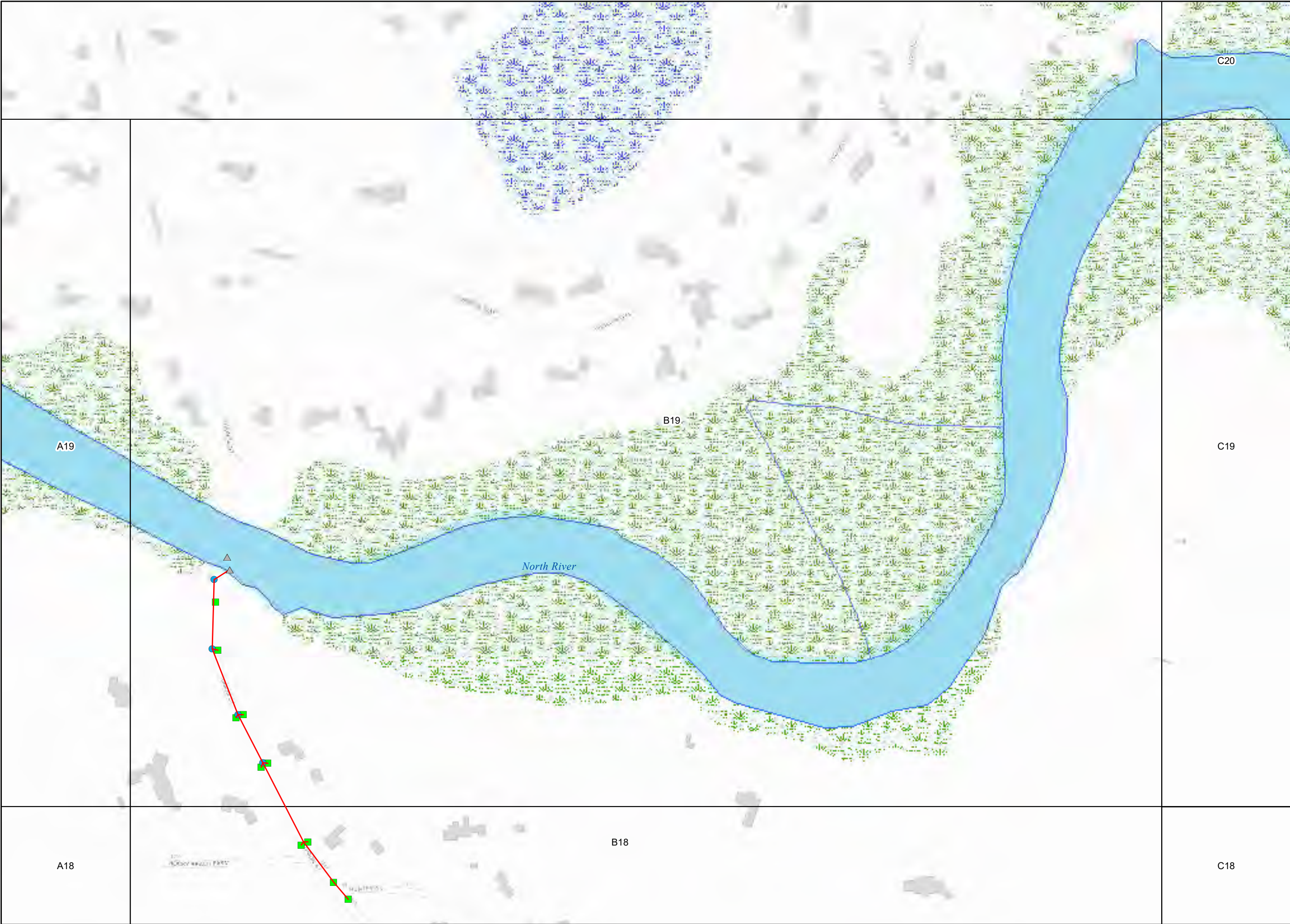


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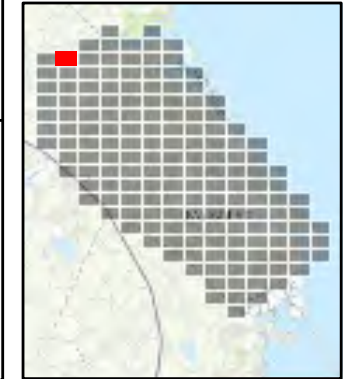
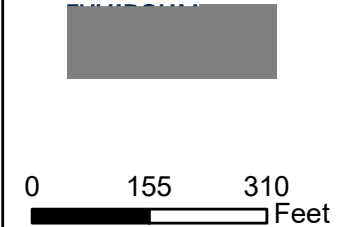




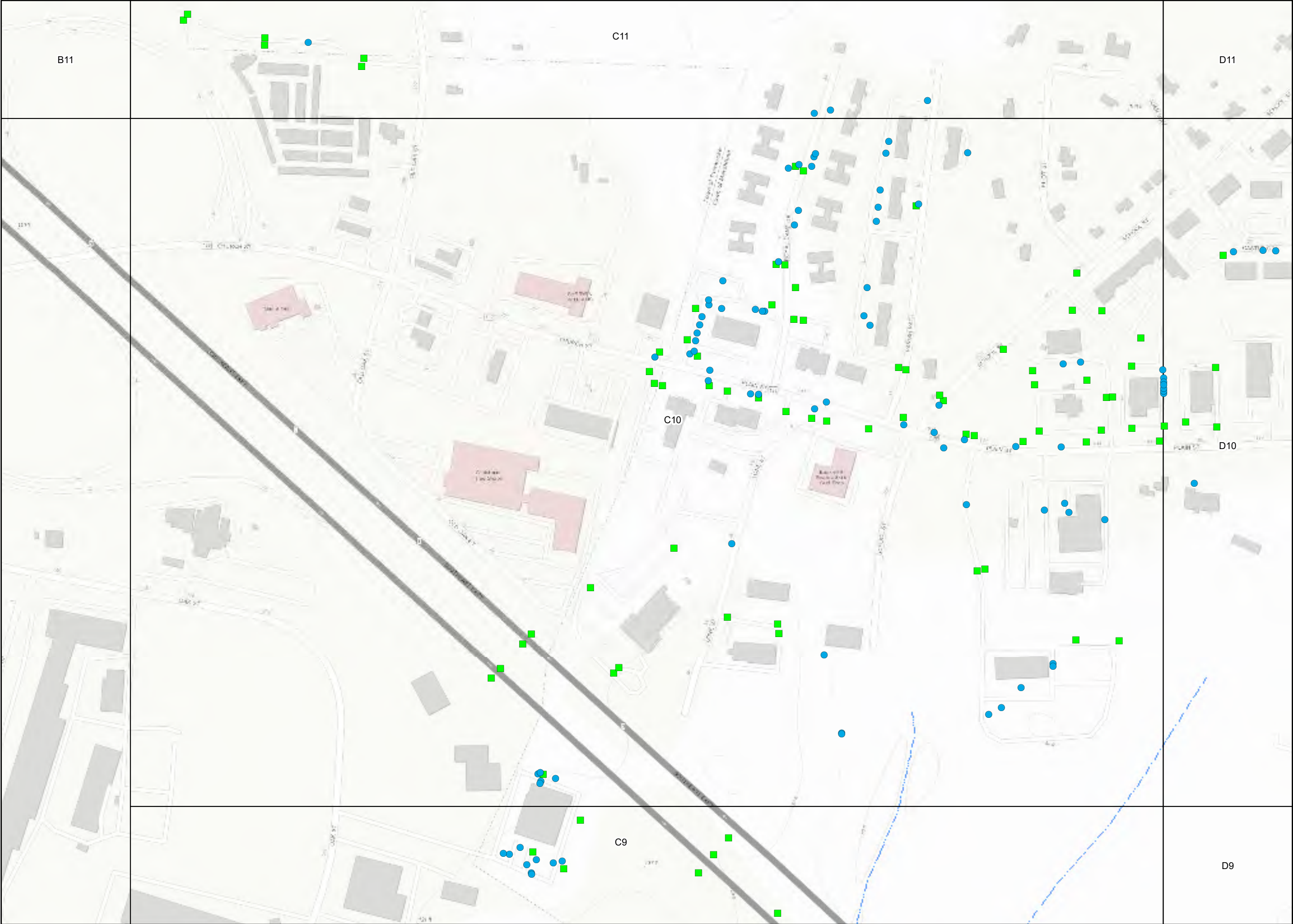


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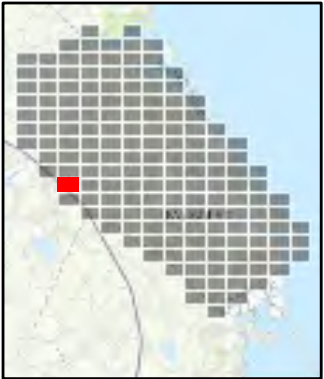


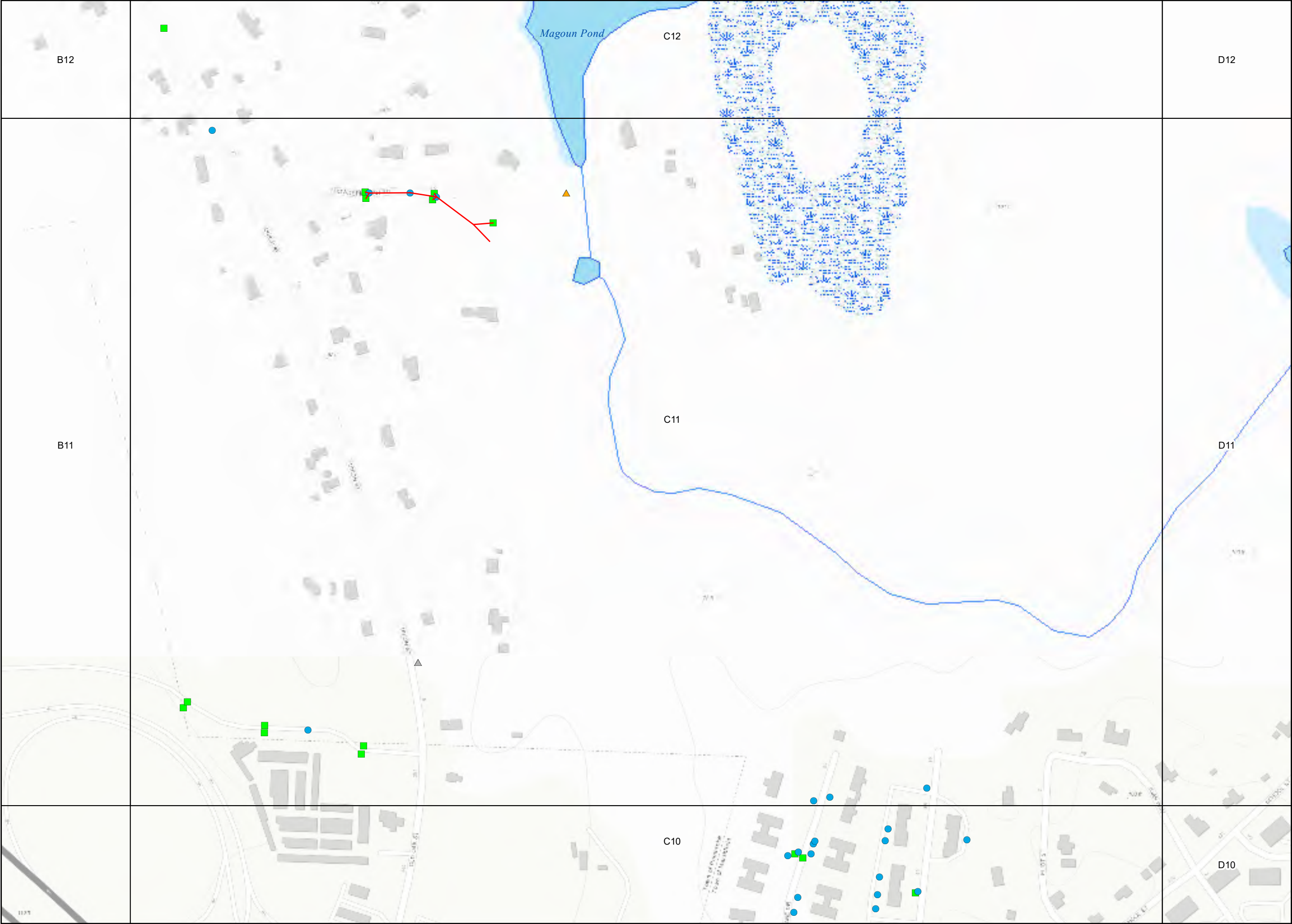
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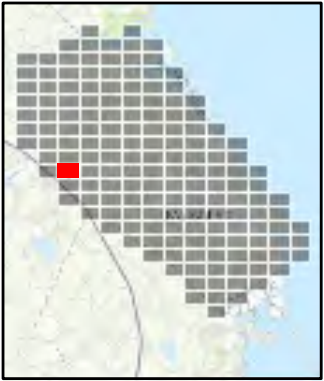


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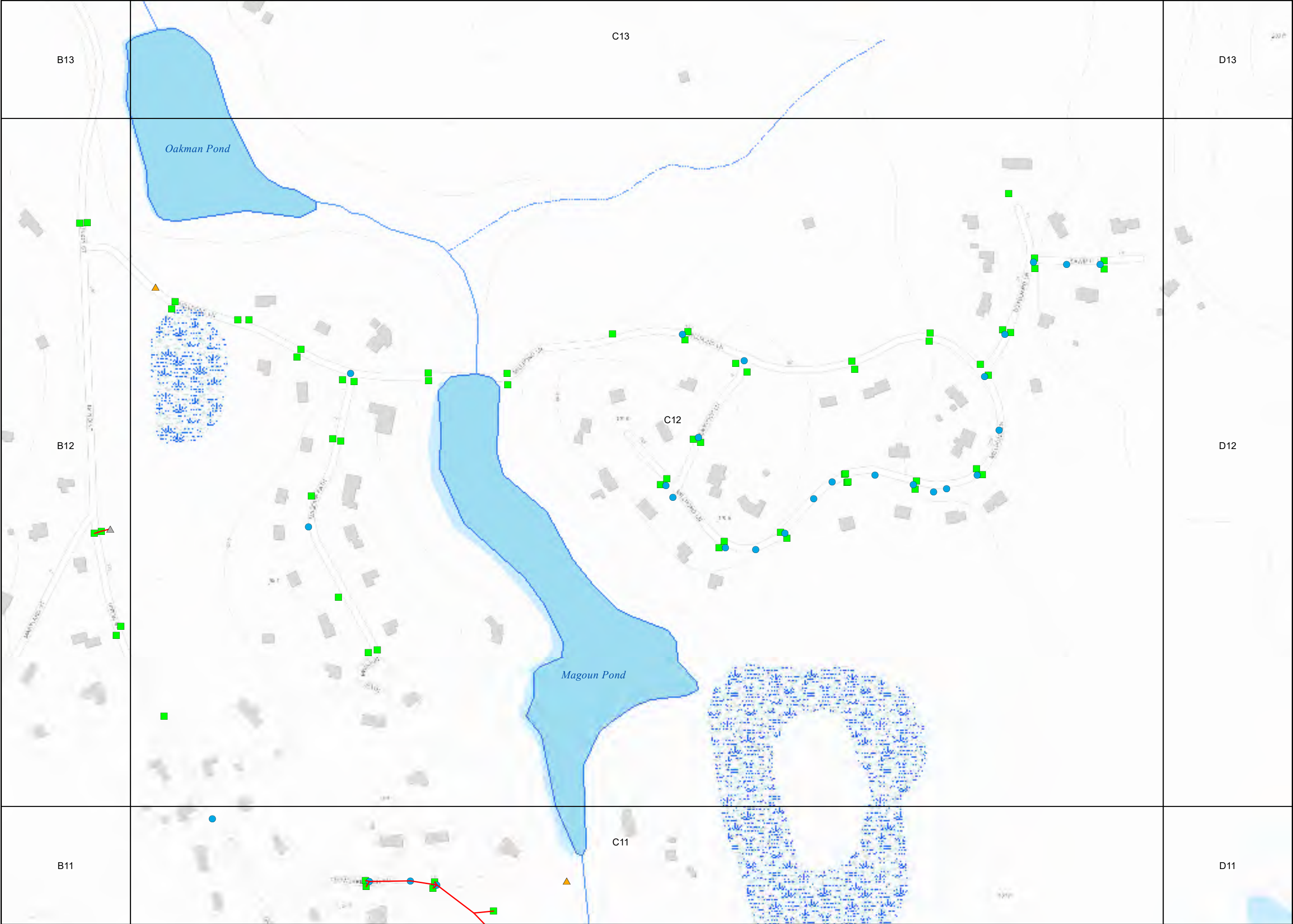
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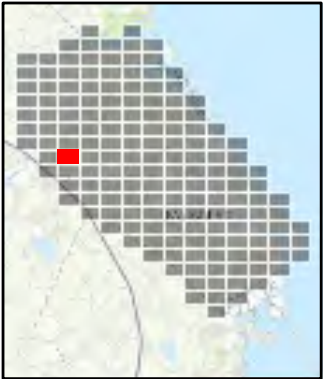




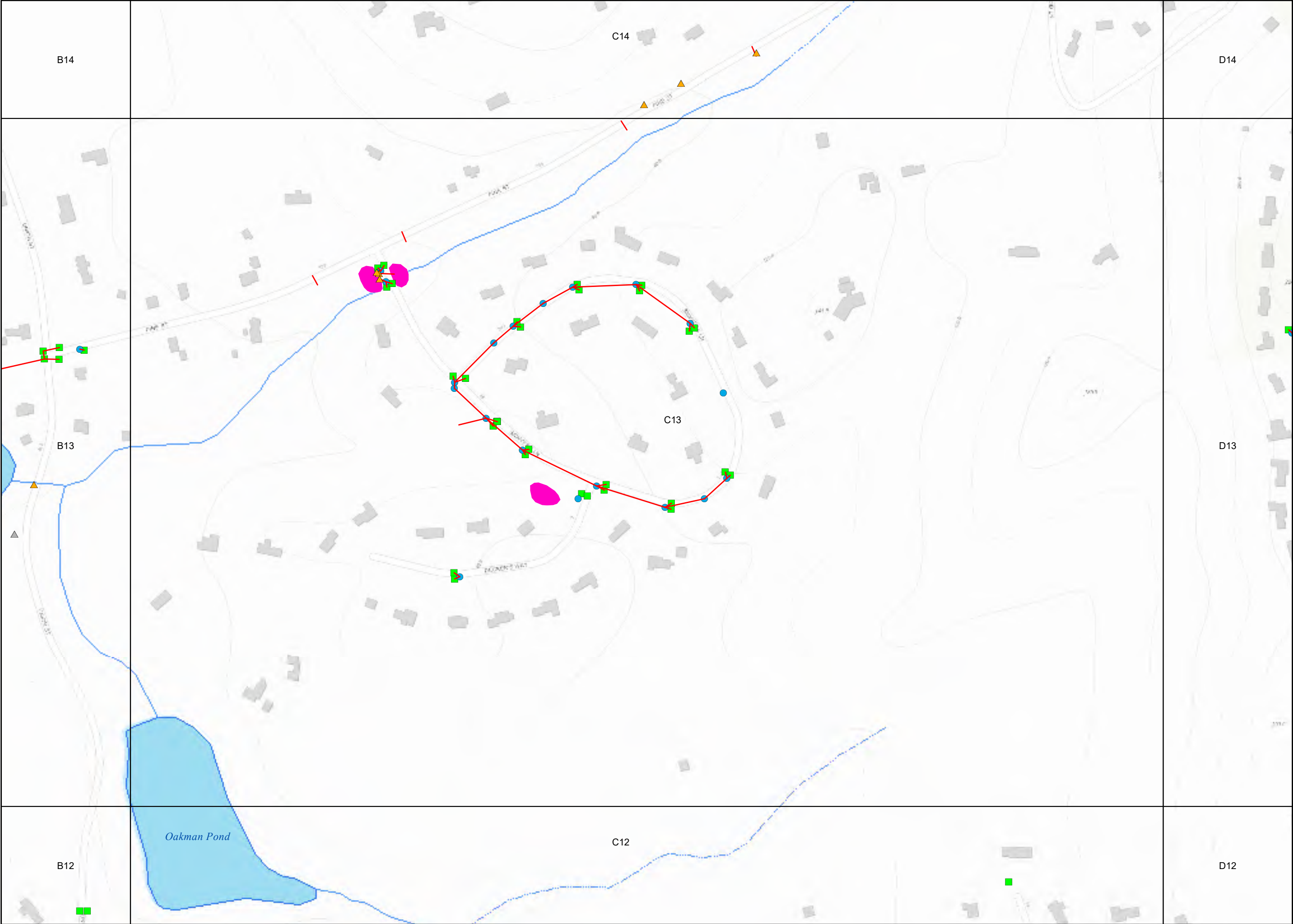


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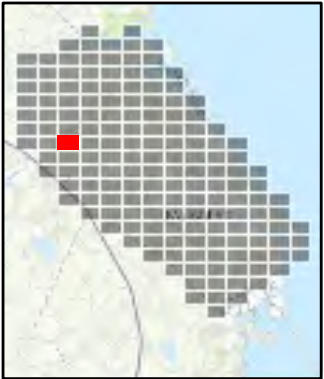
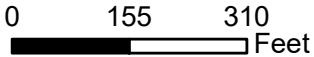


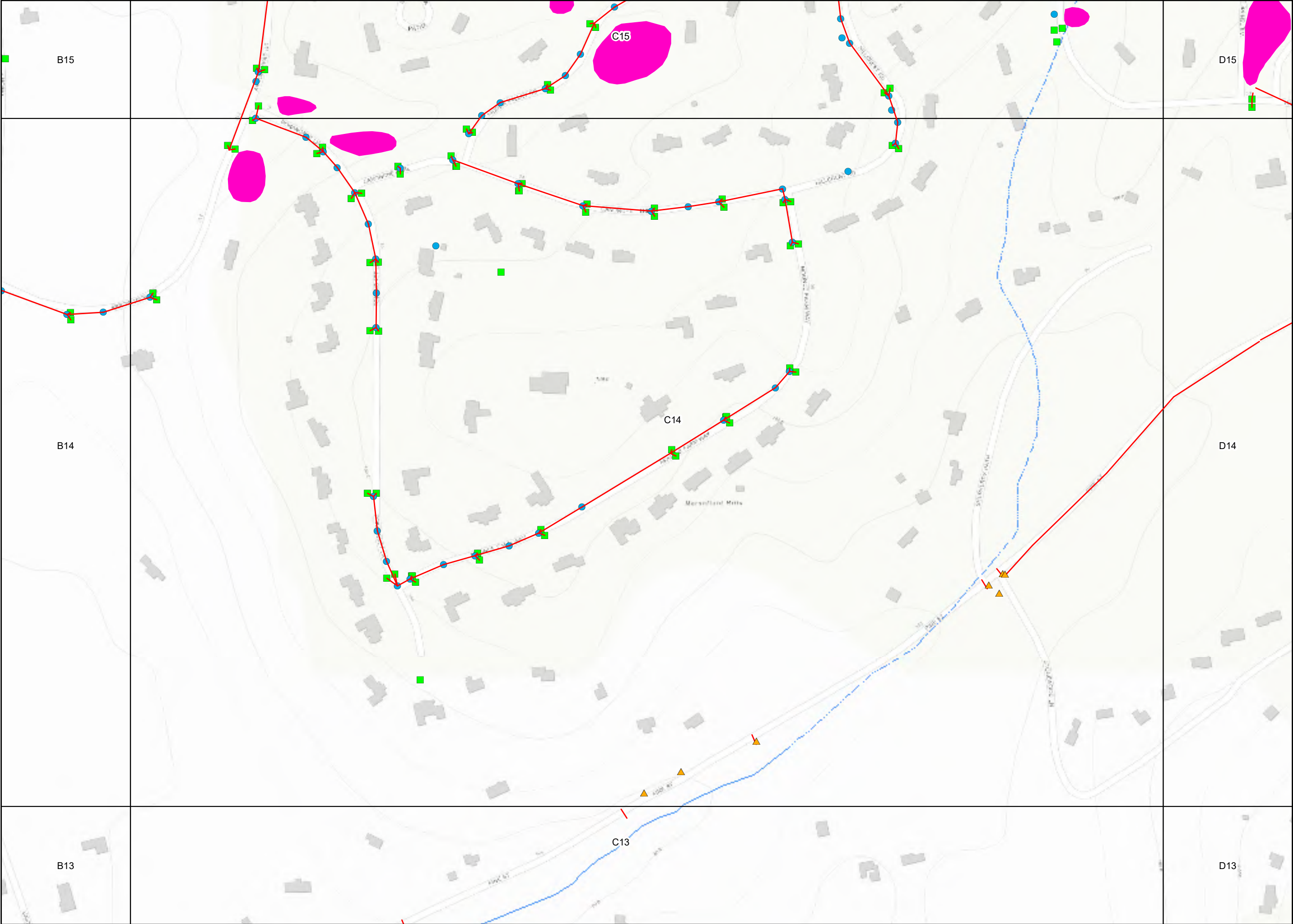




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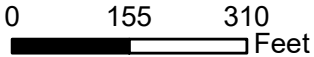
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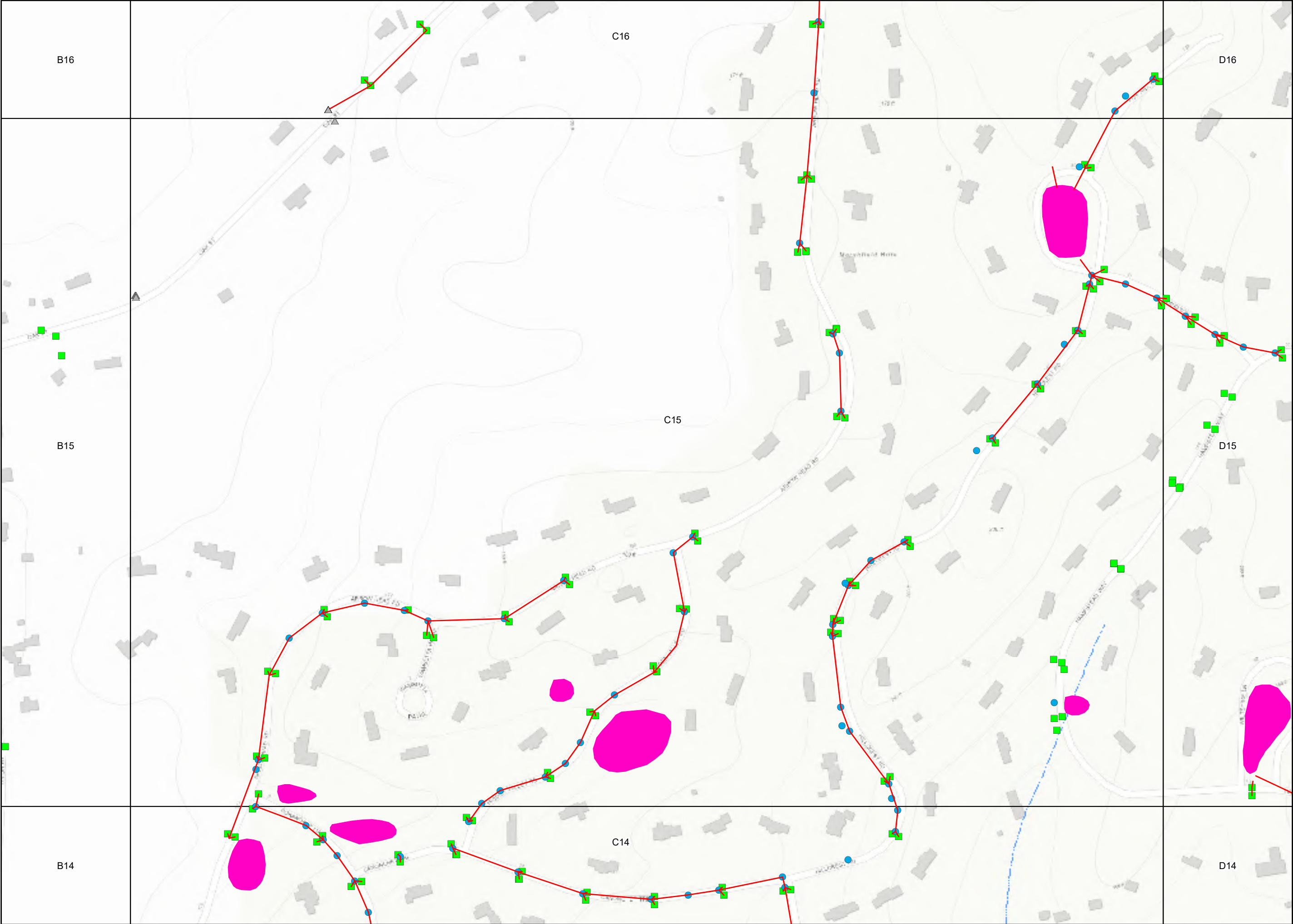


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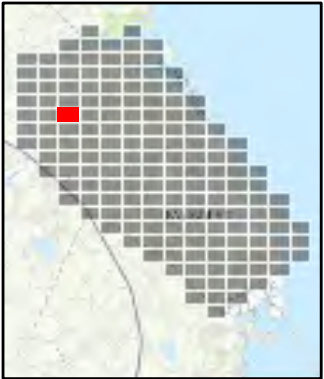


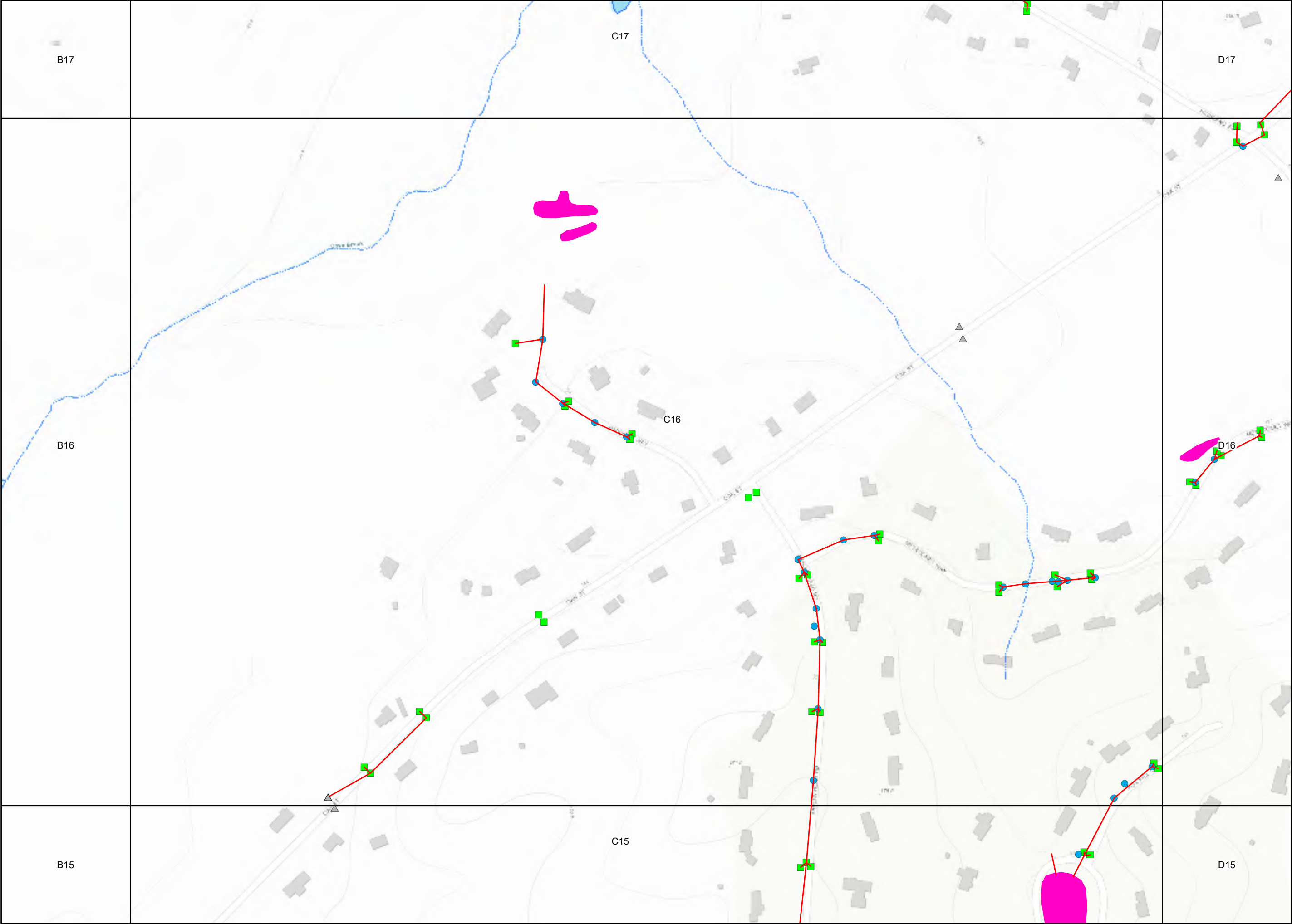




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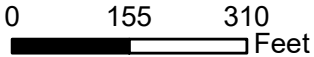
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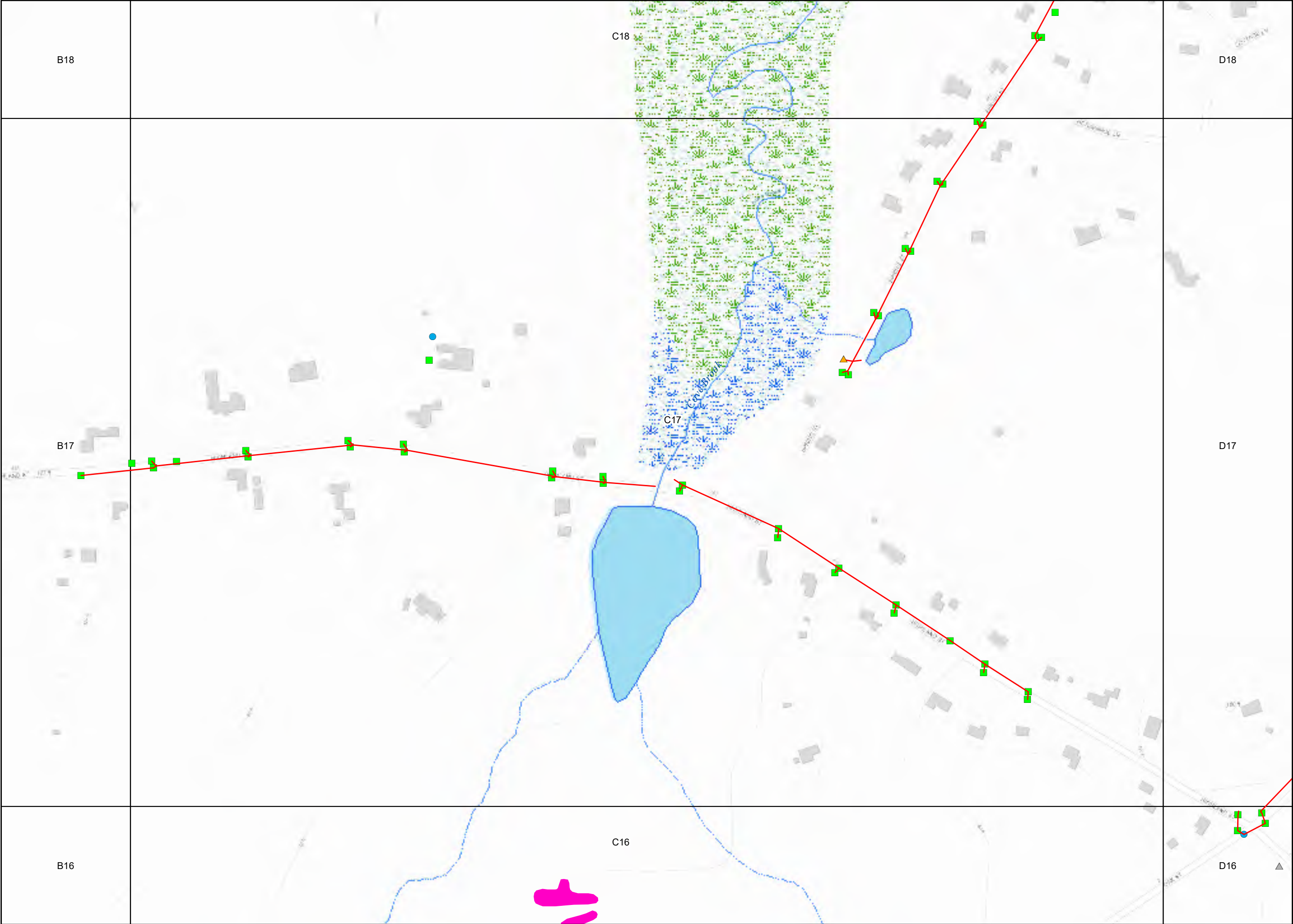


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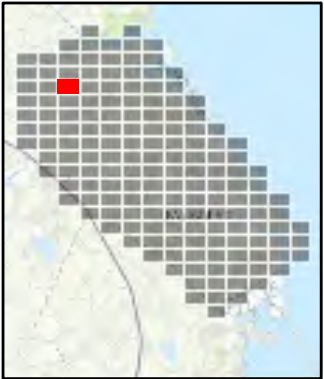
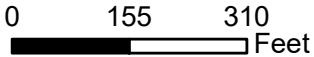




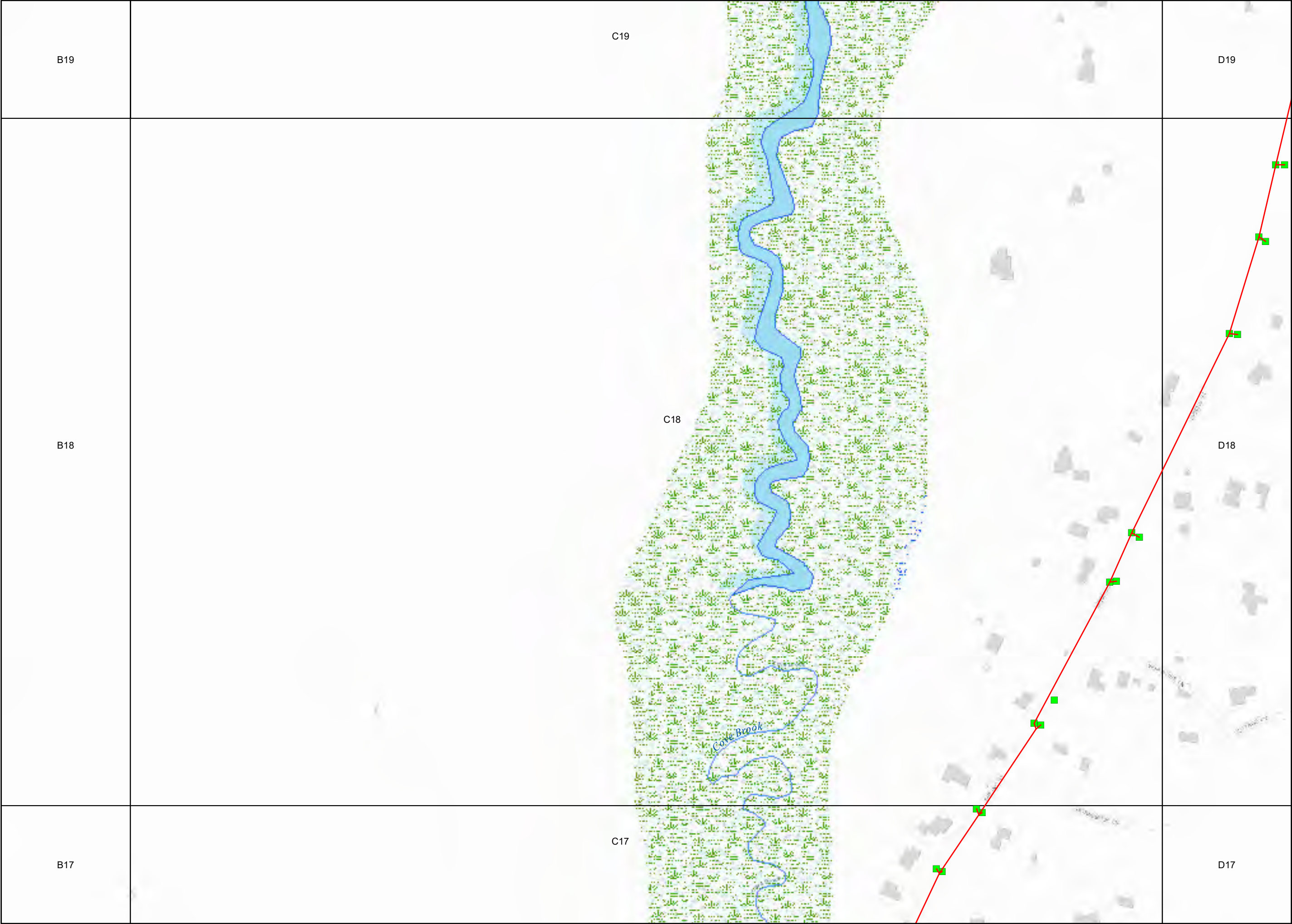


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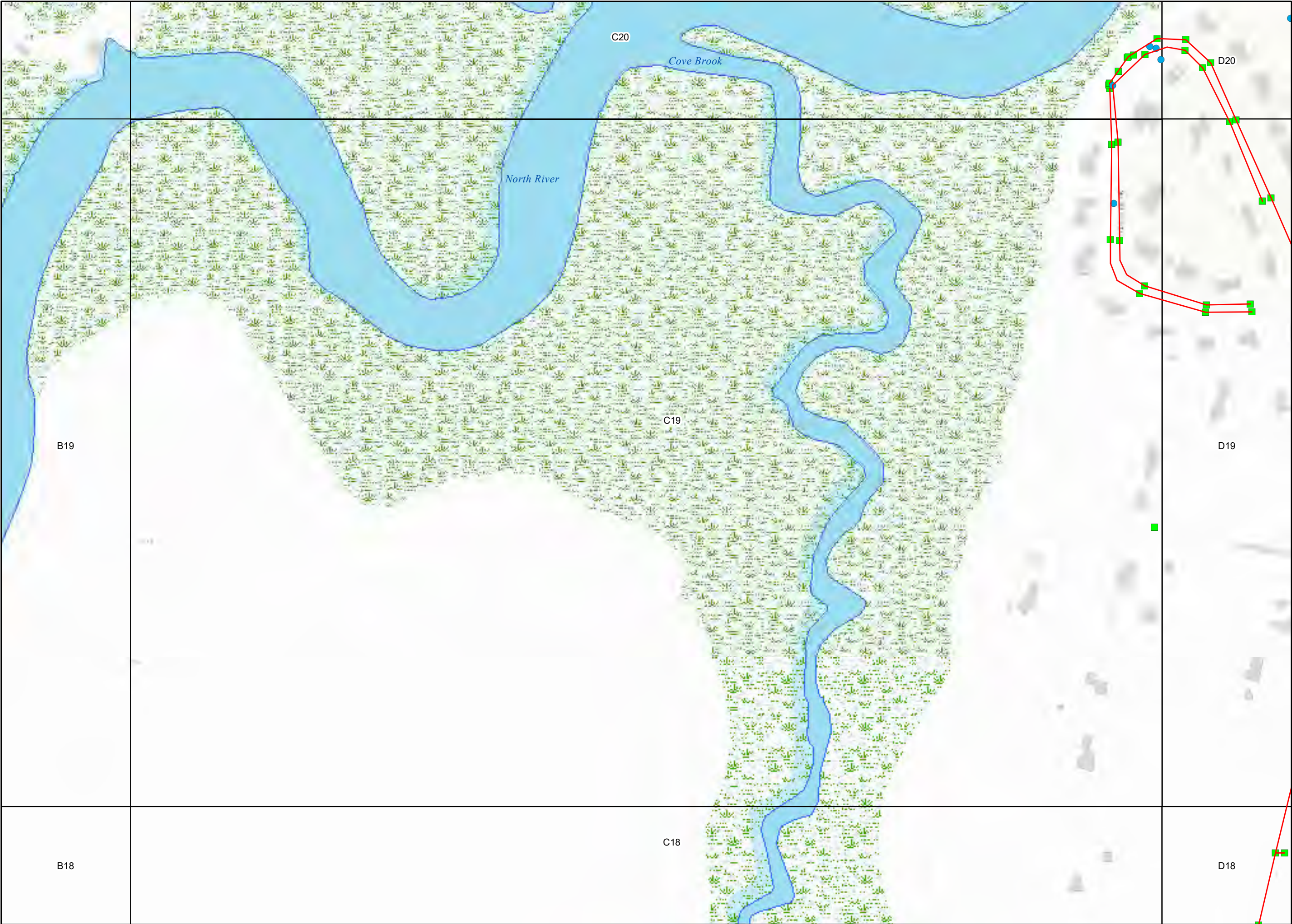
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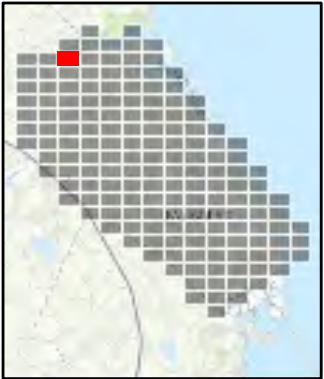
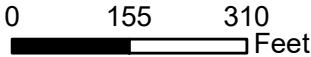






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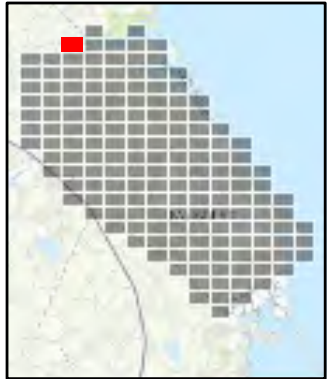
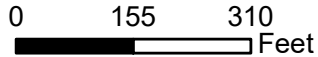




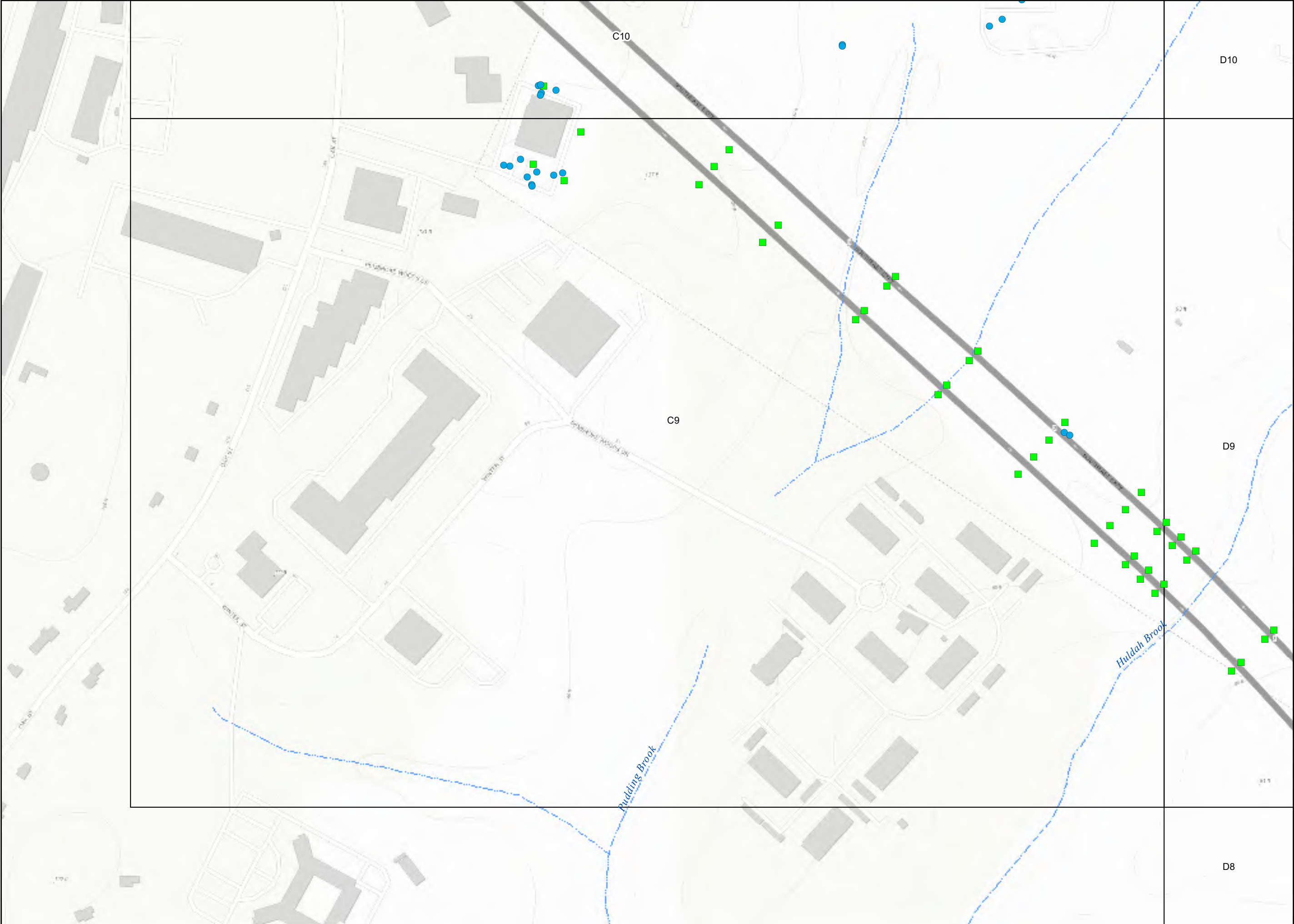


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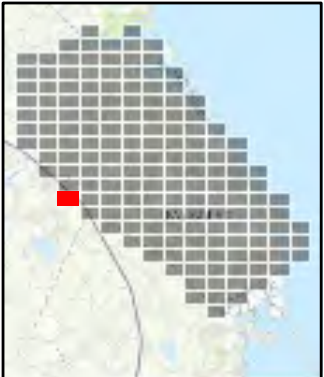


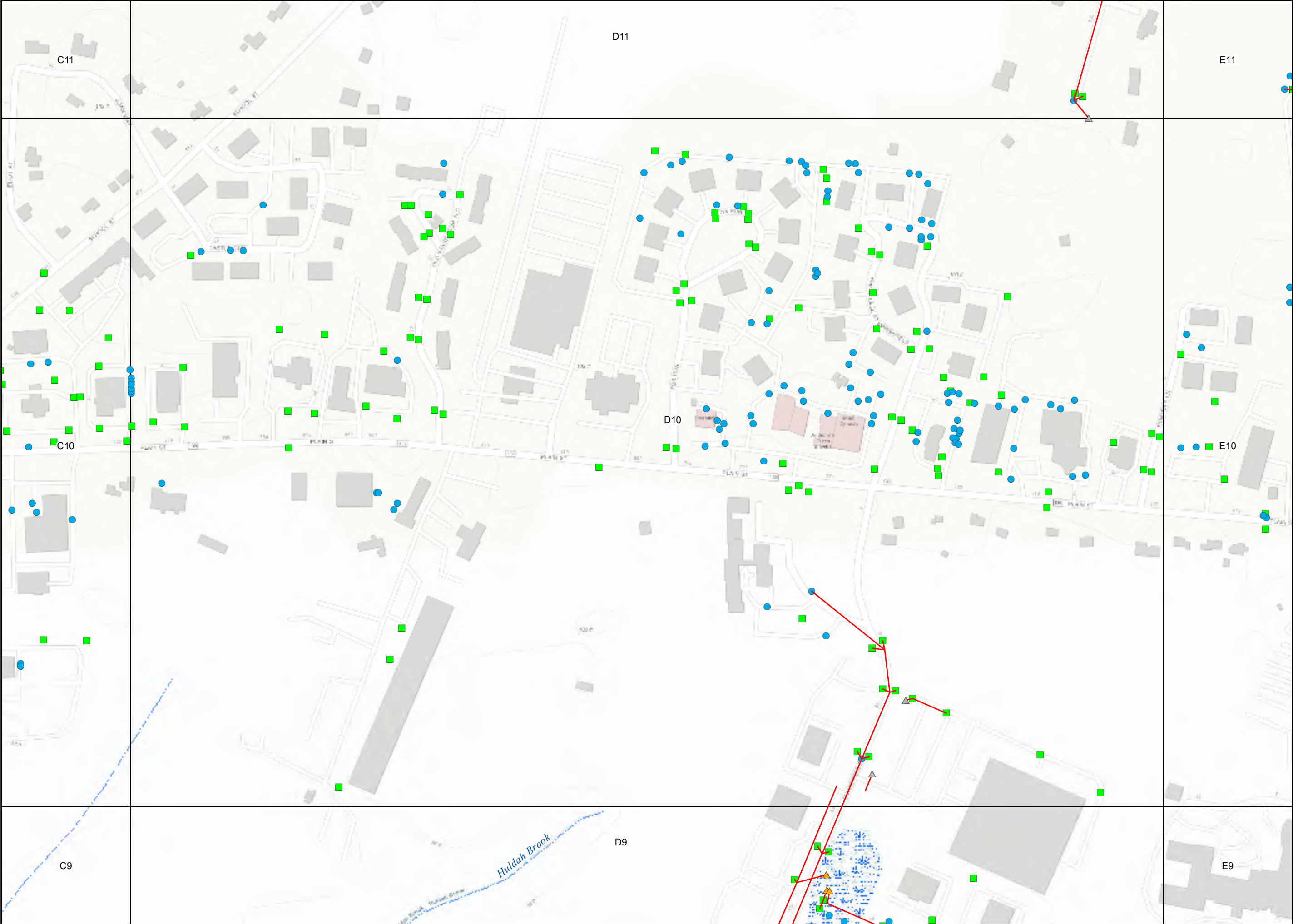




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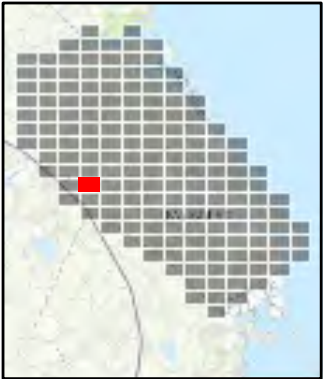
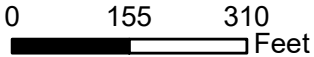
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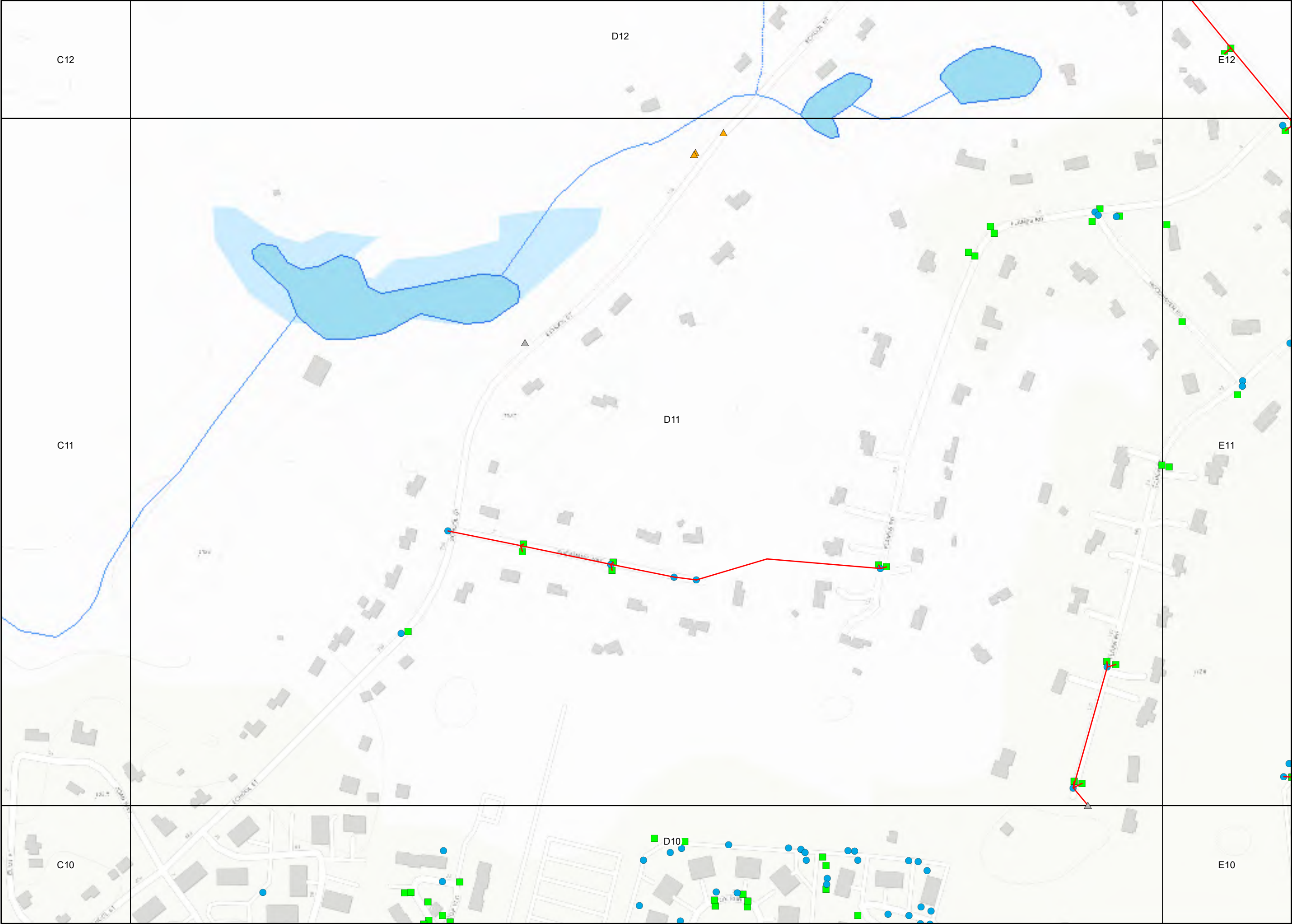


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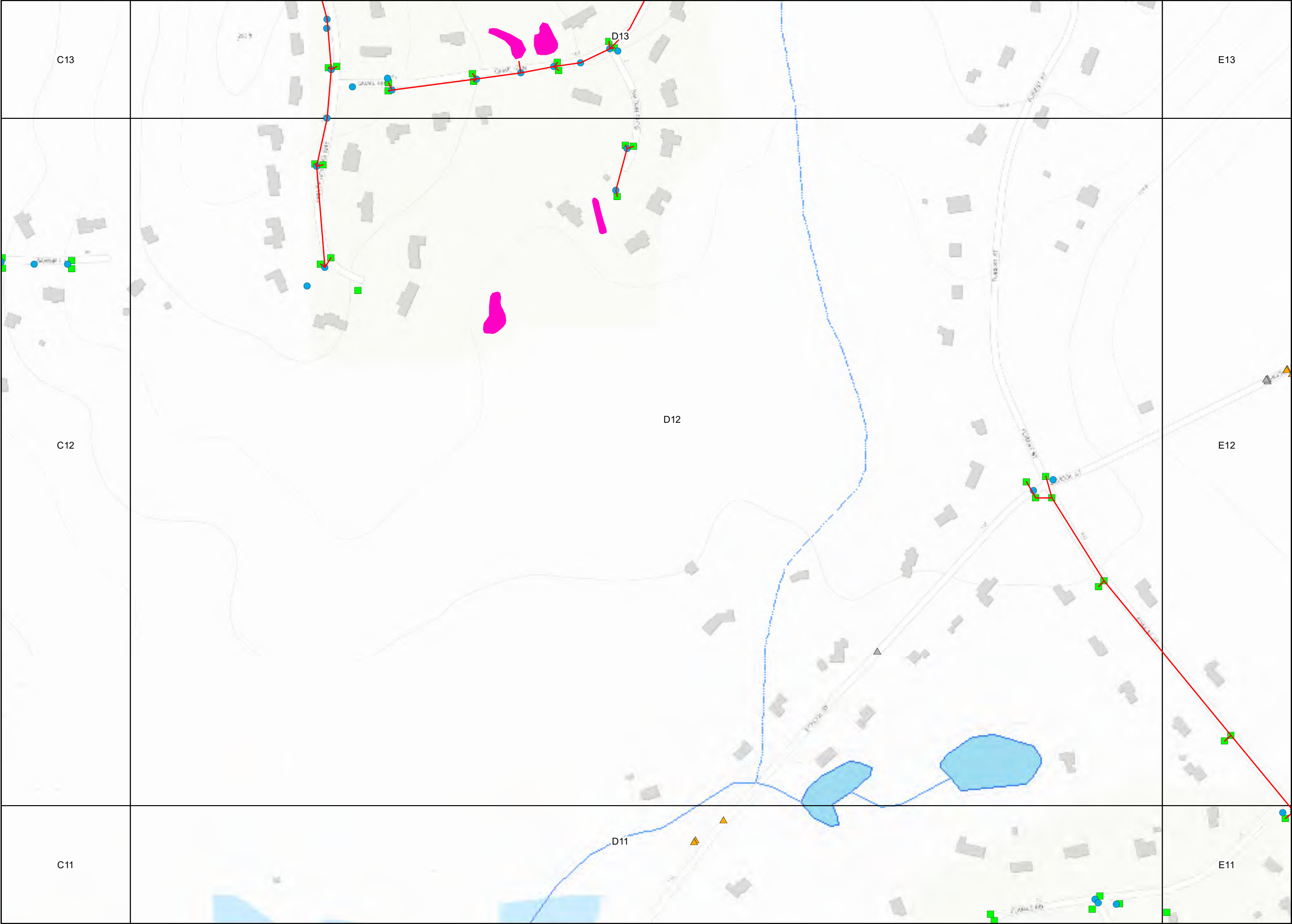




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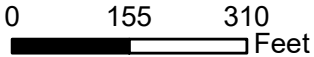
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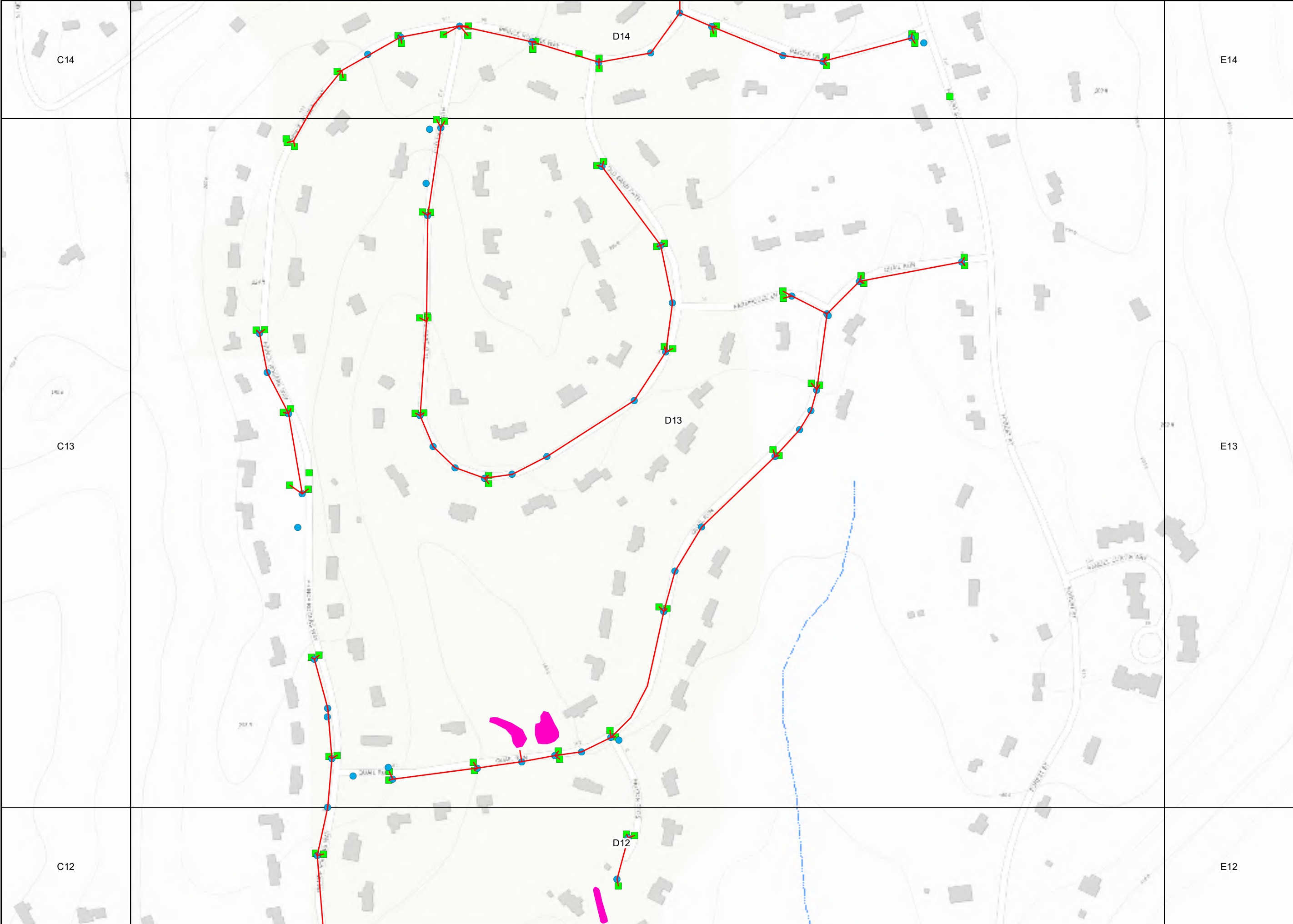


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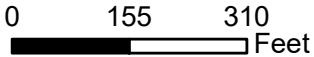


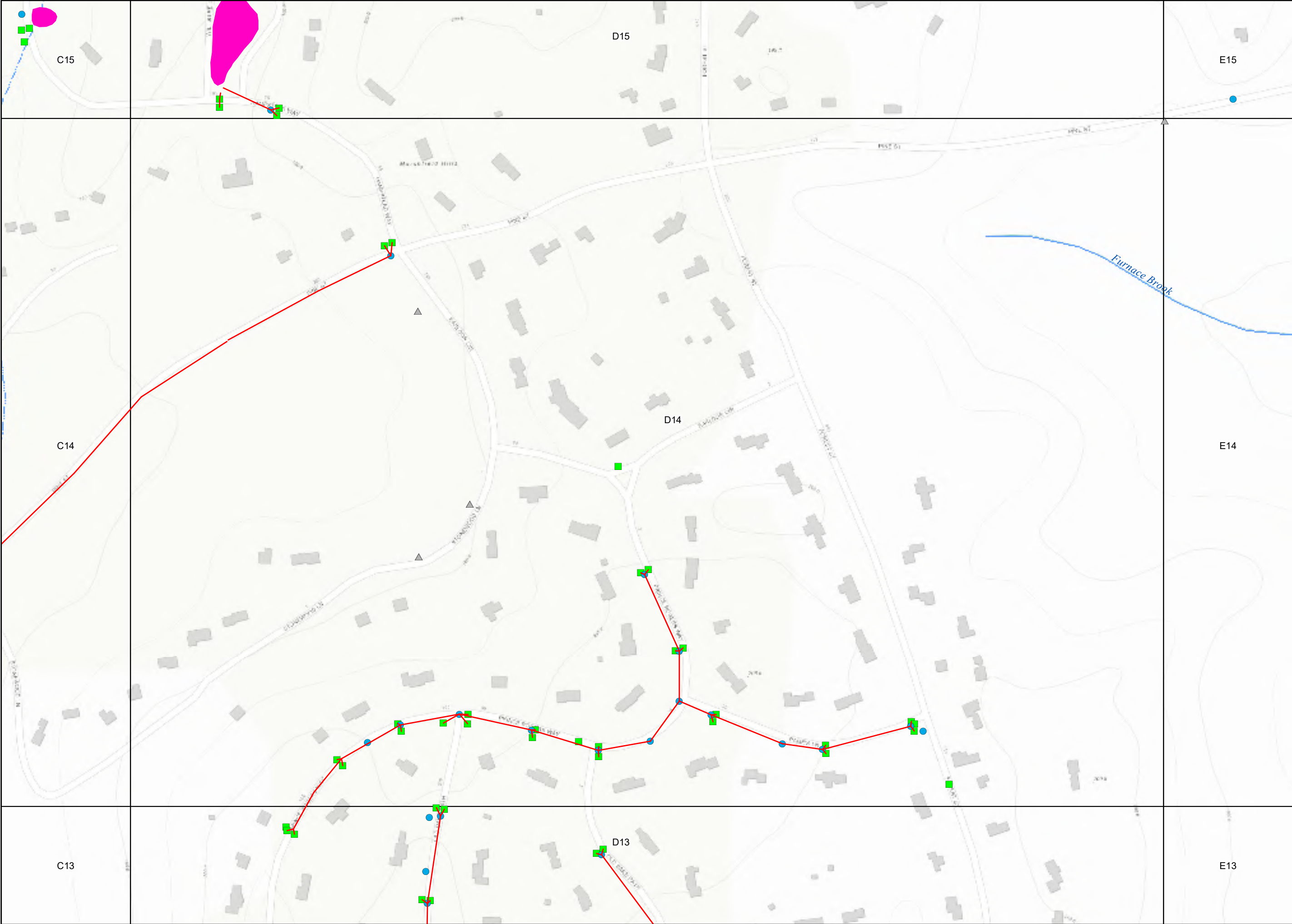




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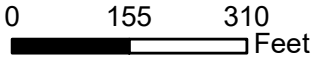
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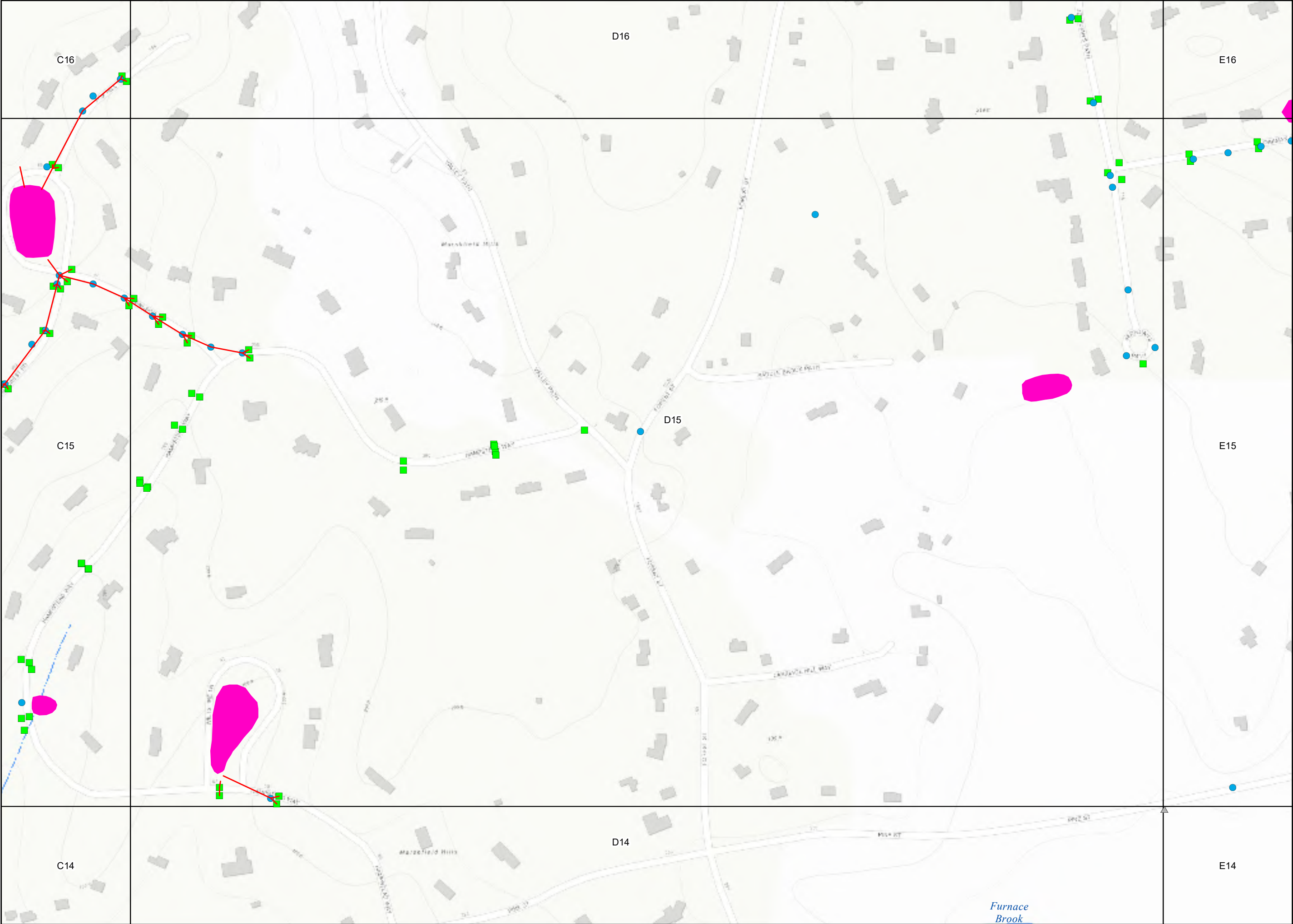


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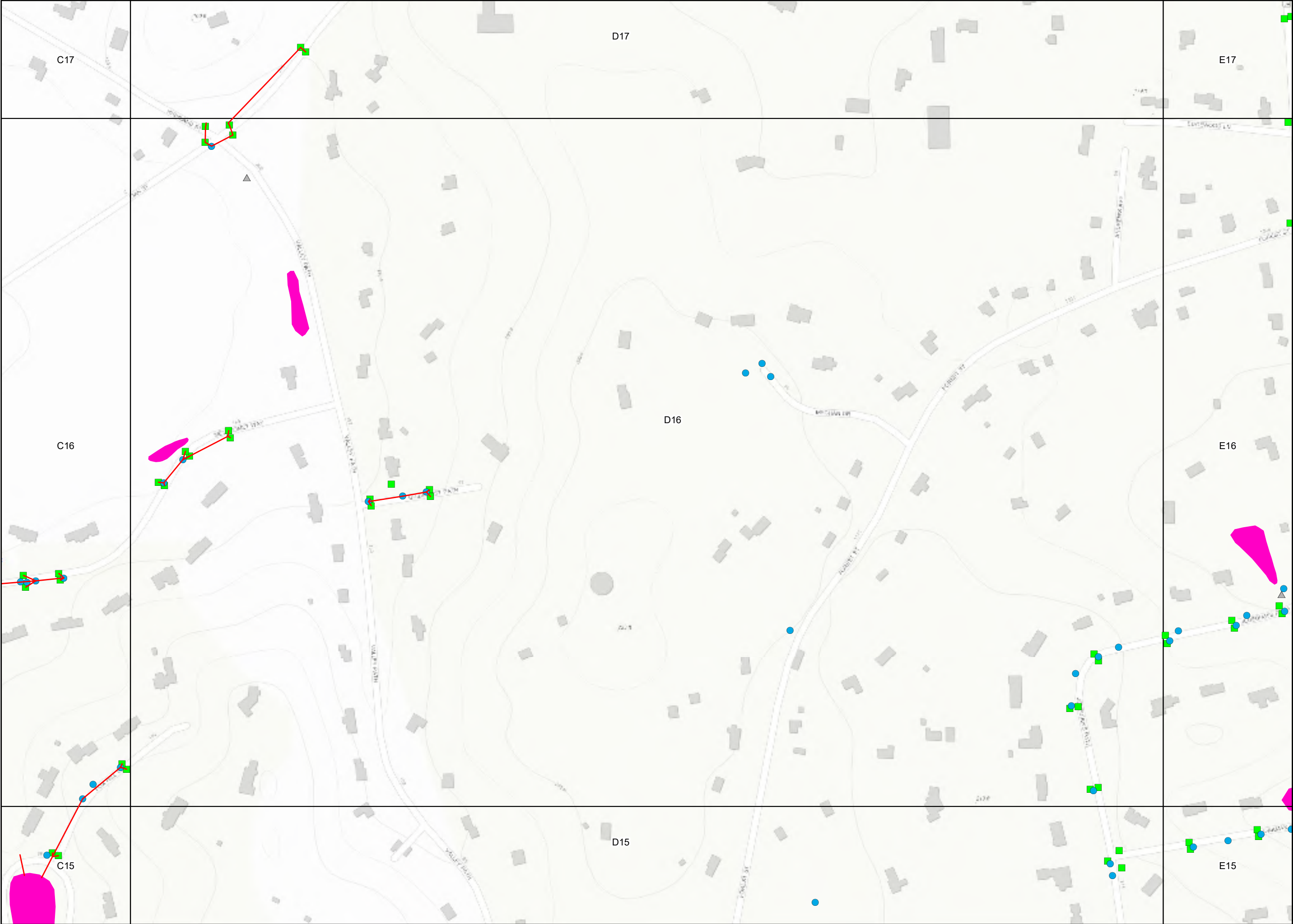


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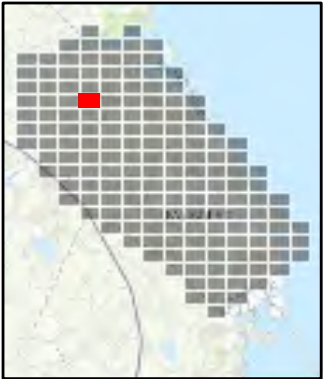
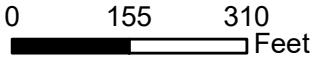


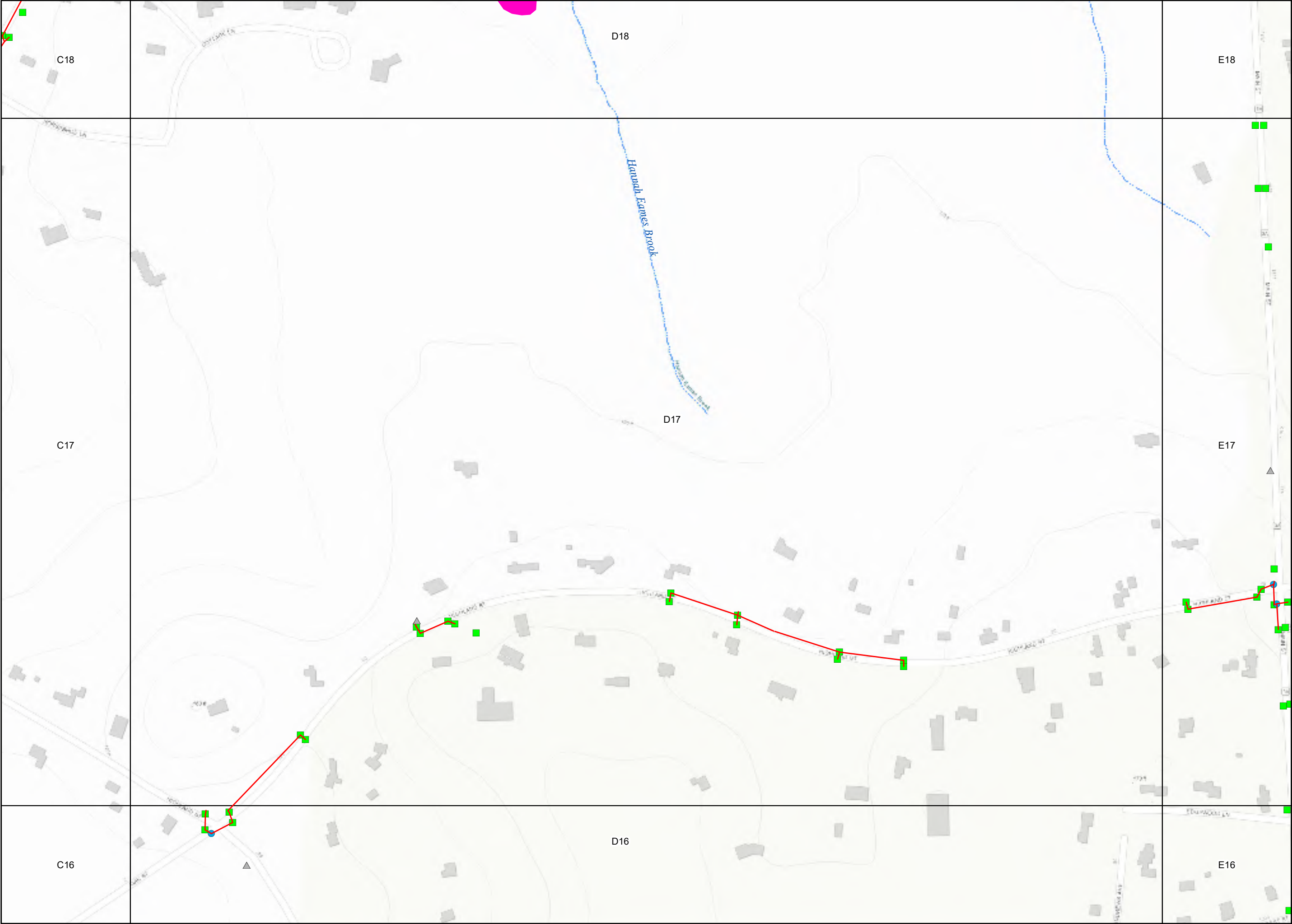




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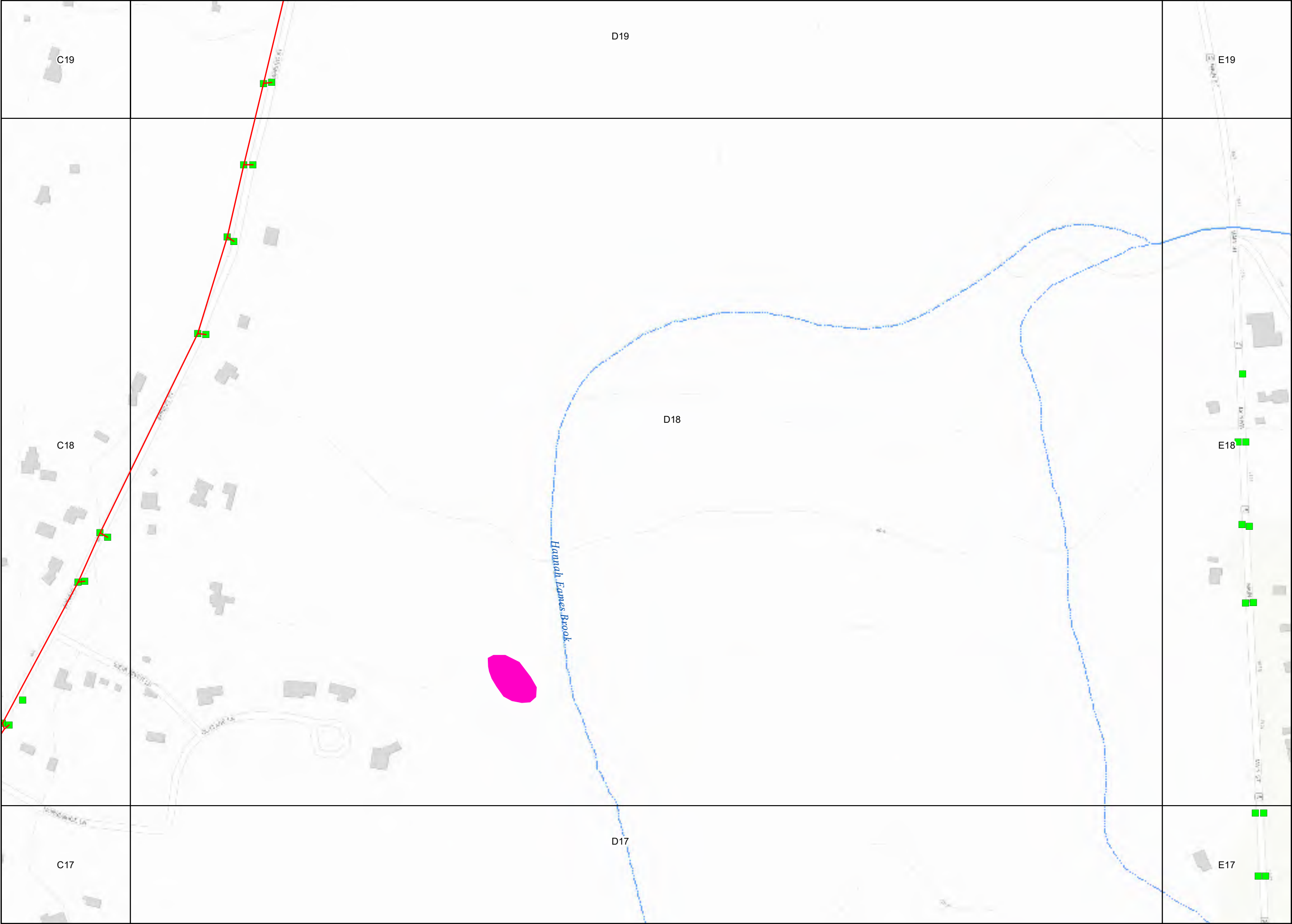


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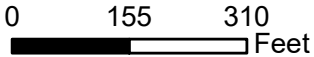


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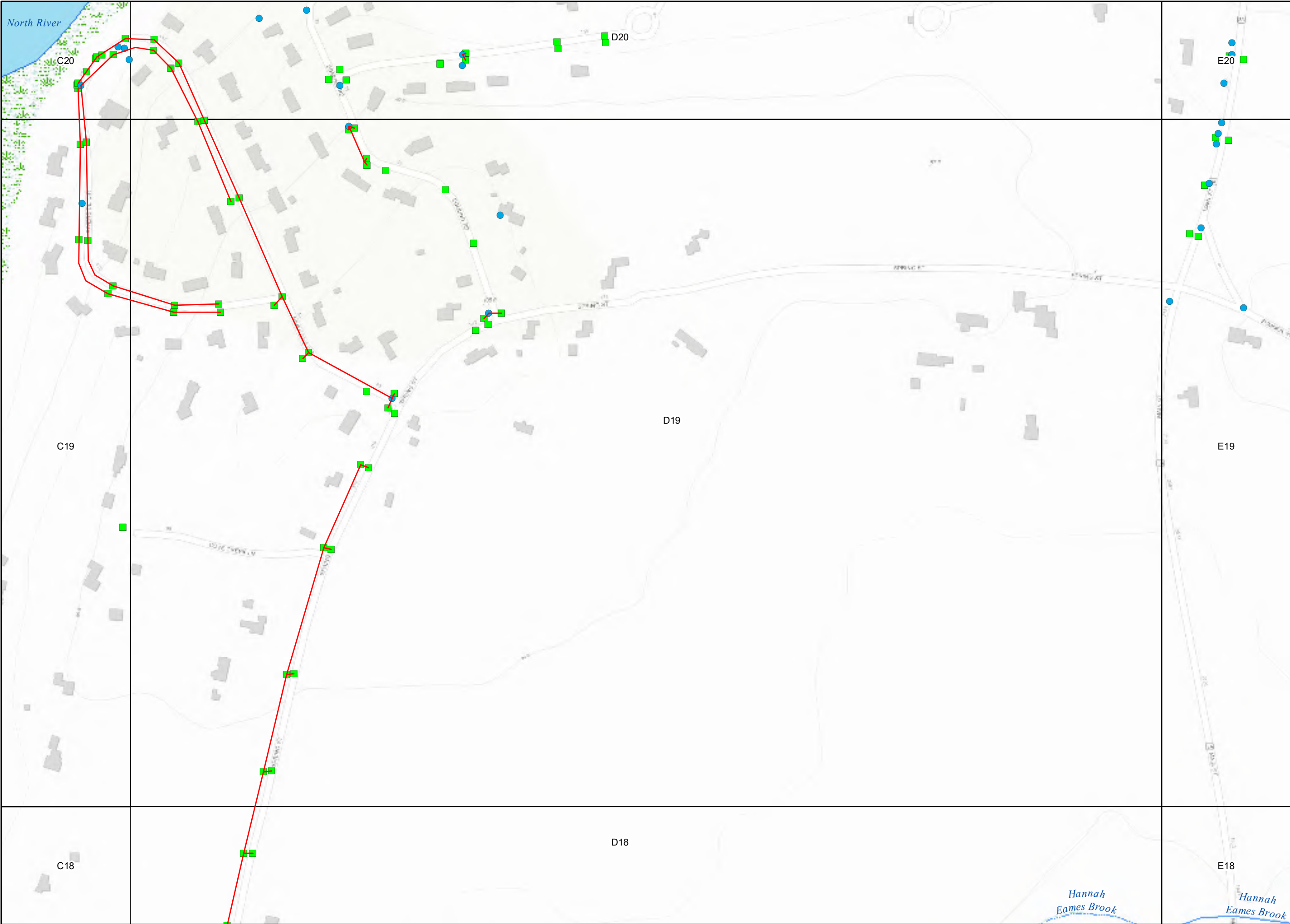


- ▲ Waterbody Outfalls (129)
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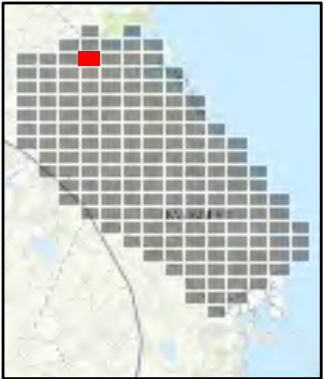
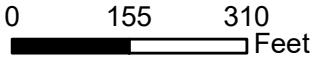




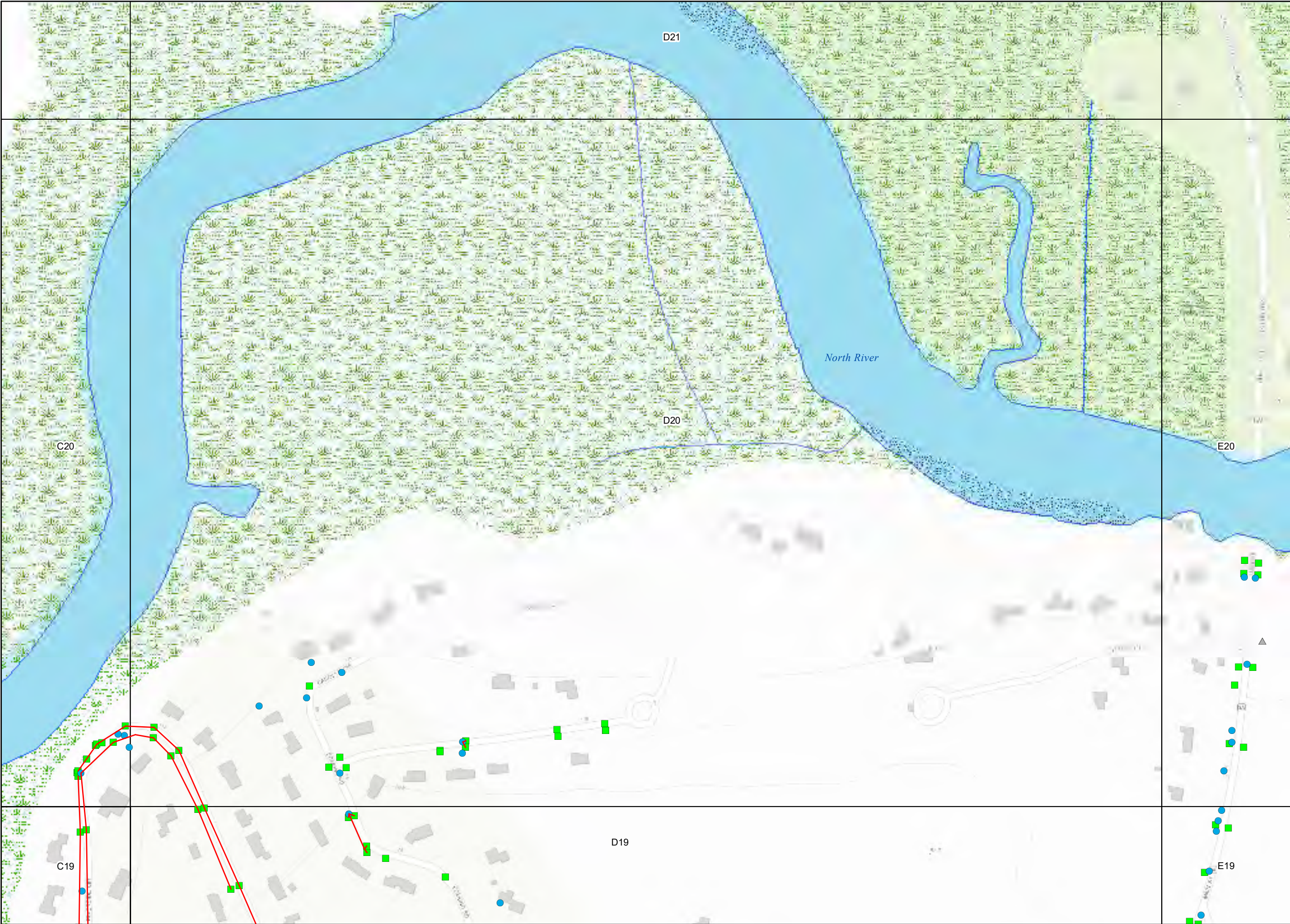


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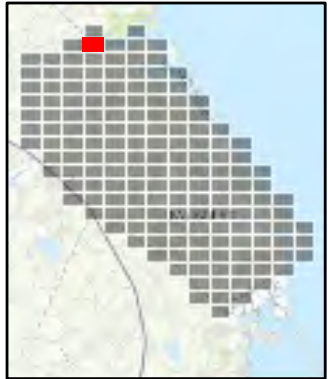


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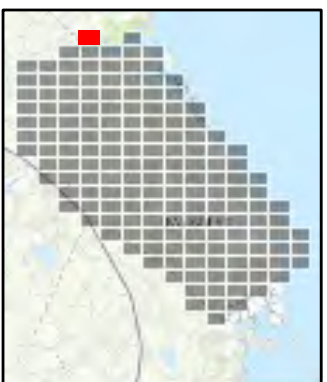
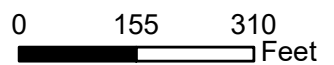
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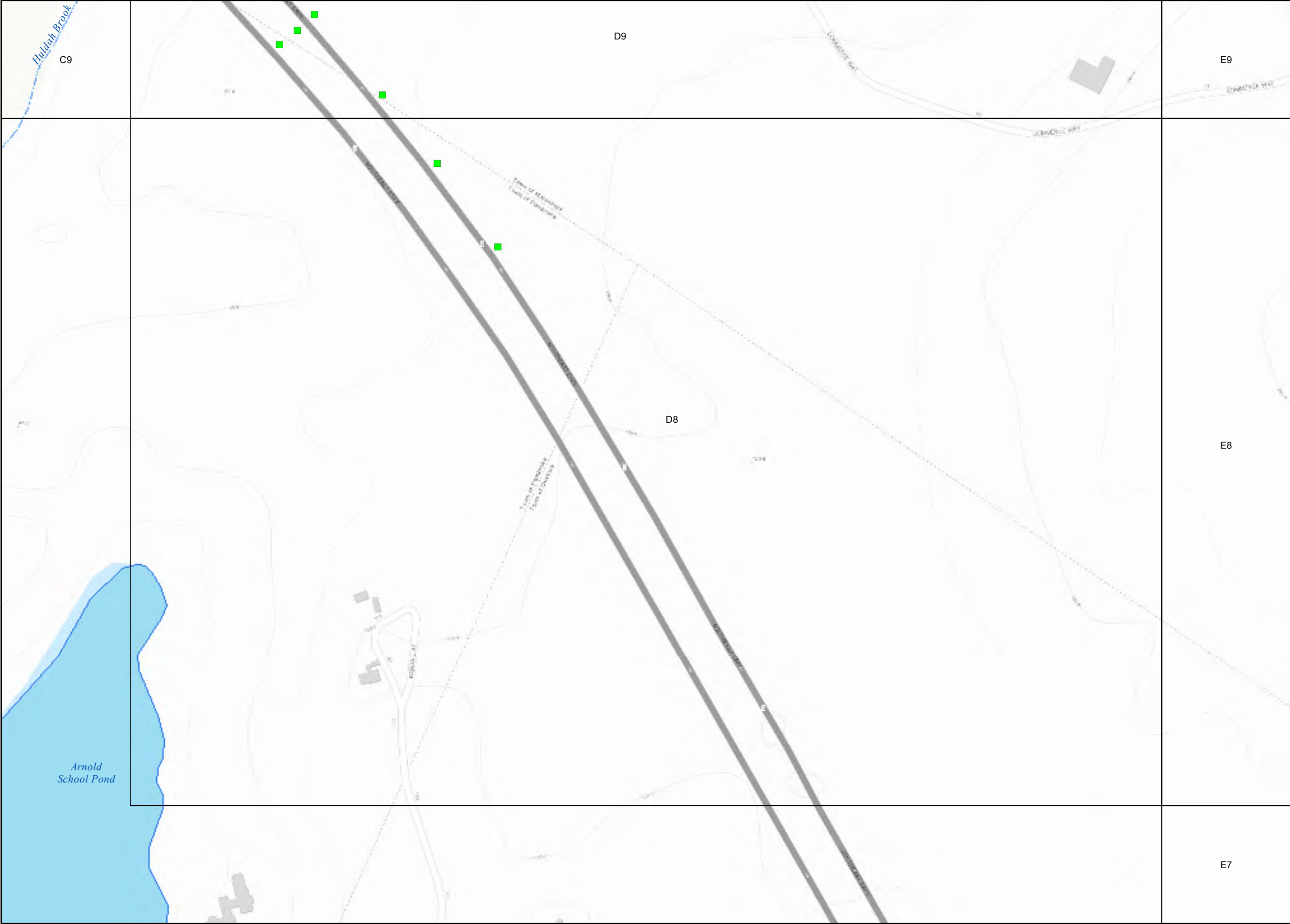




- # Stormwater Connectivity Mapbook Marshfield, Massachusetts Spring 2020

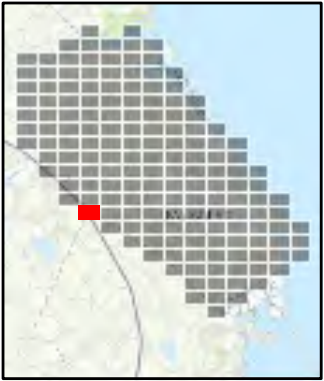


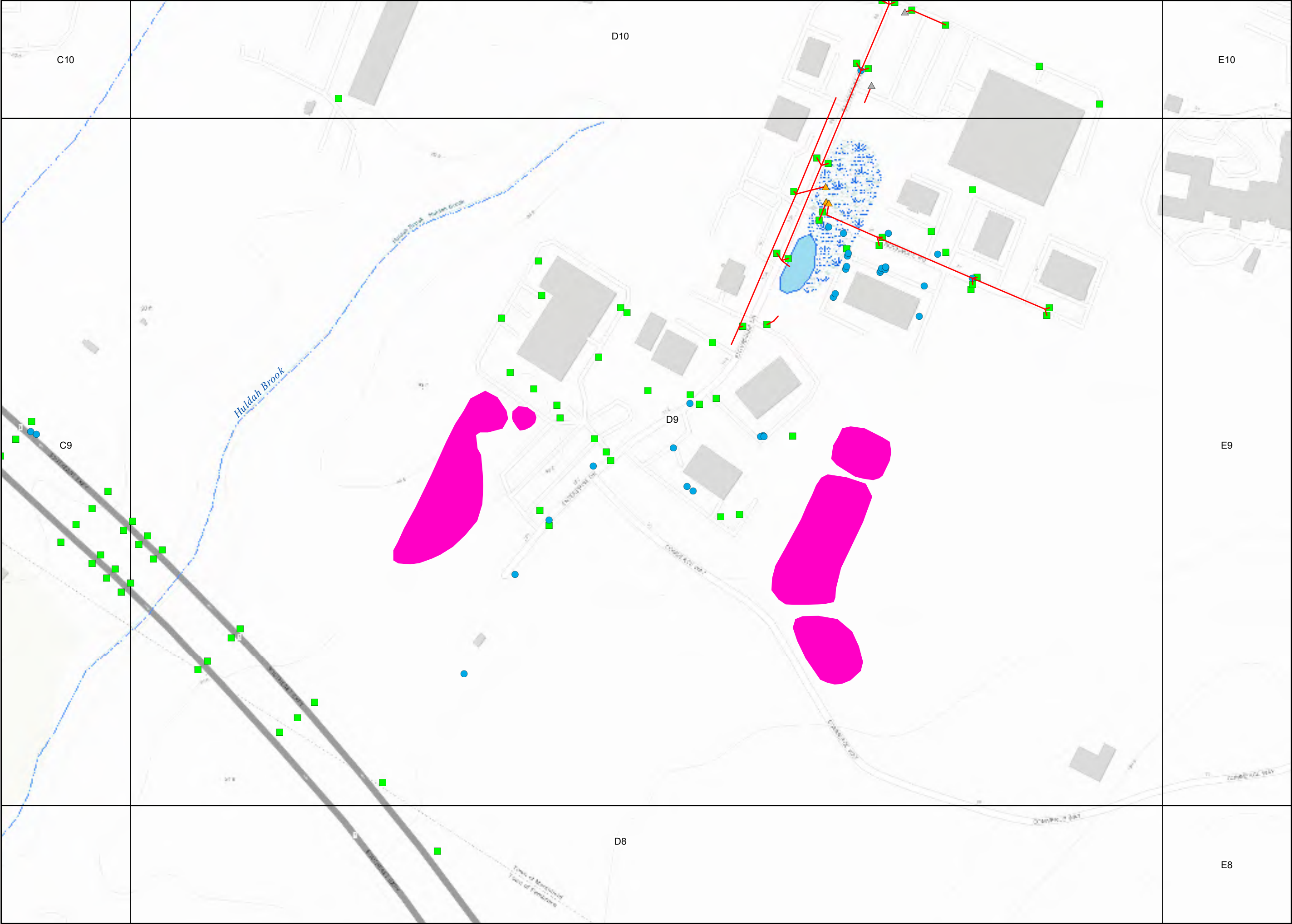




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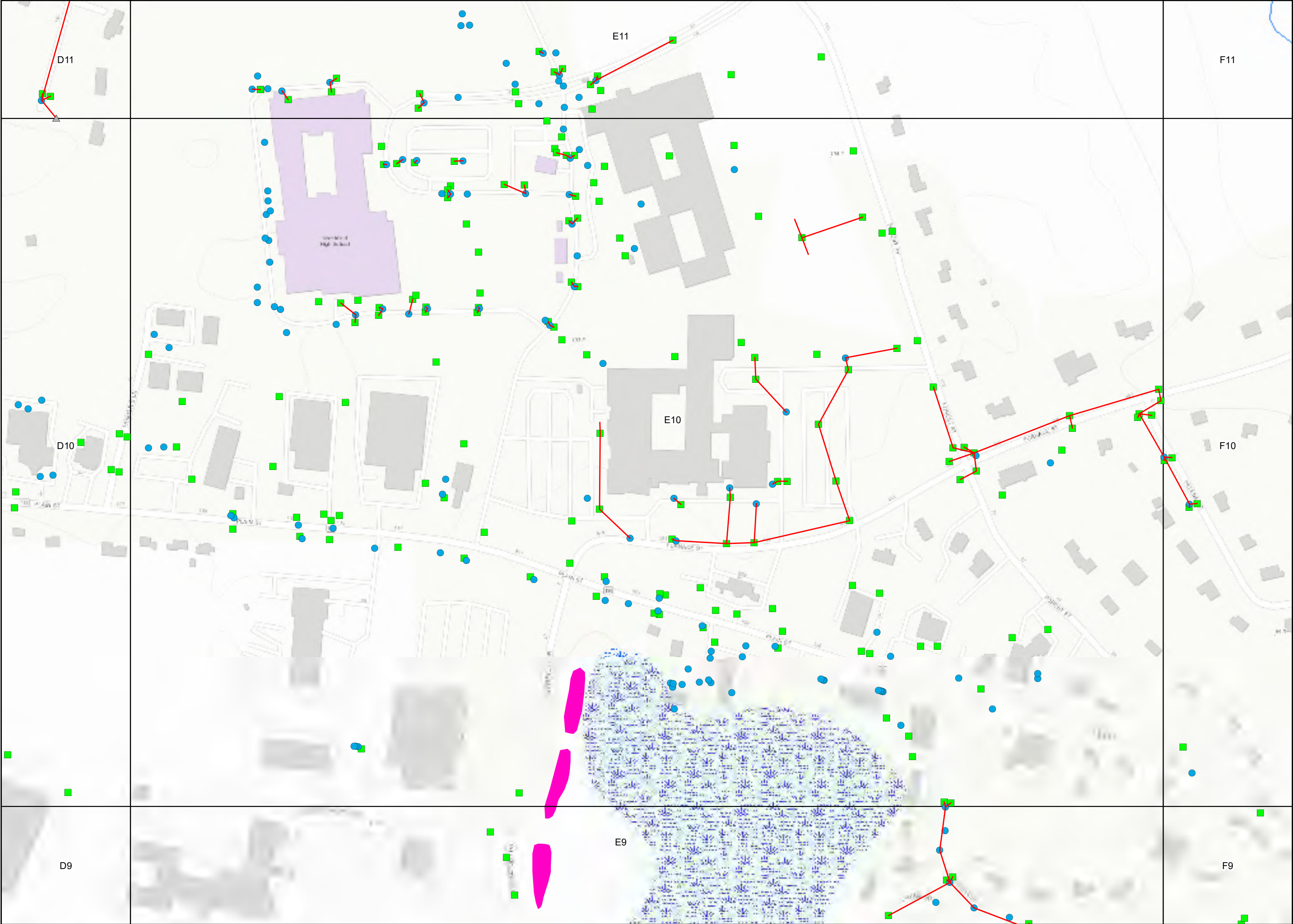
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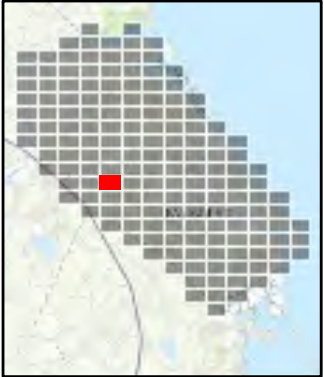
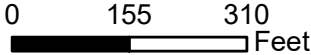




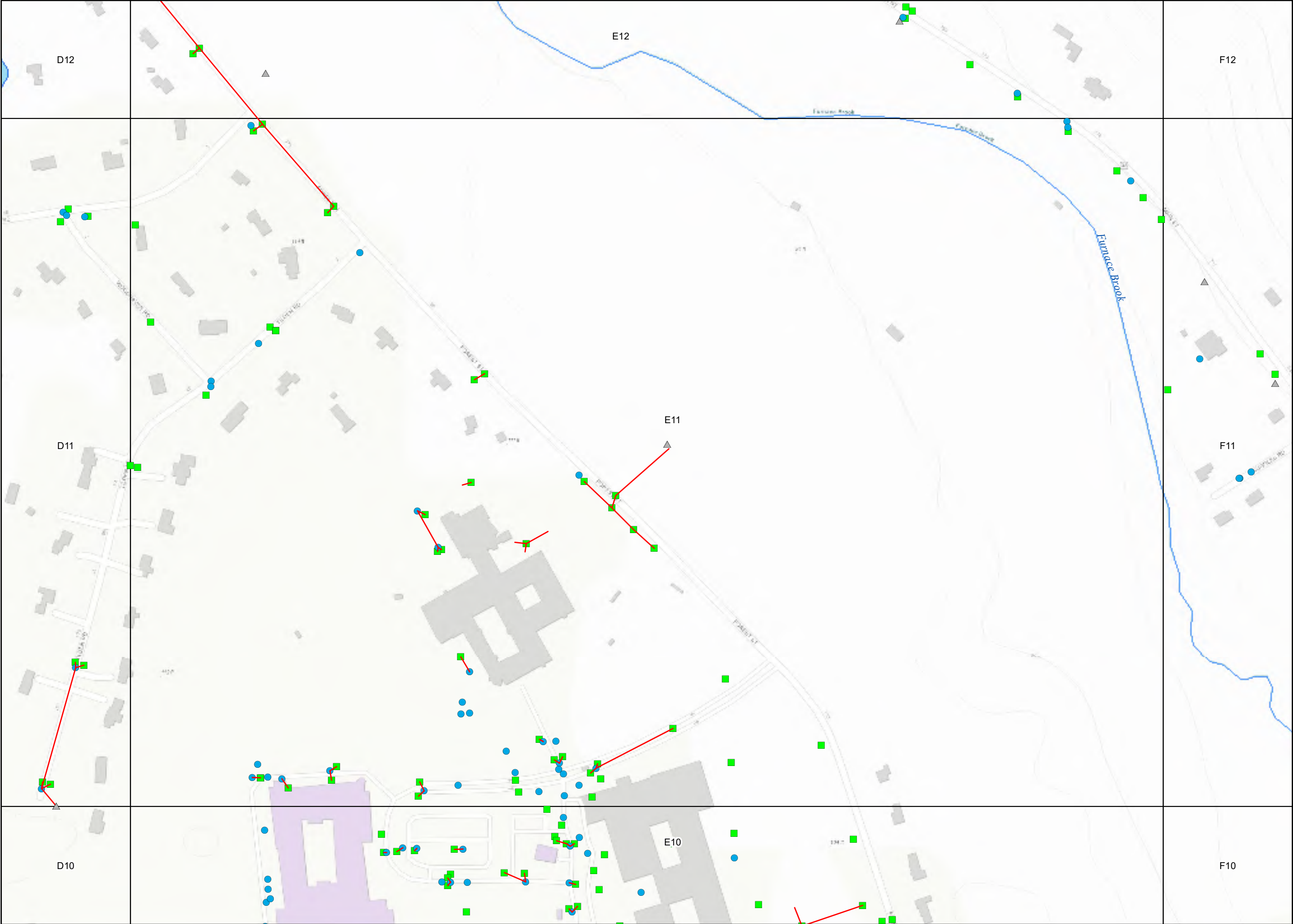


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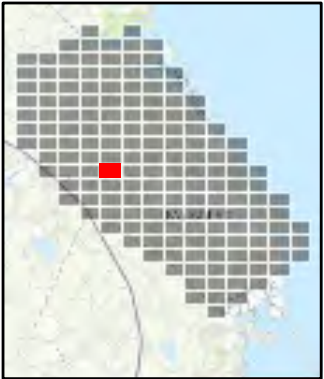


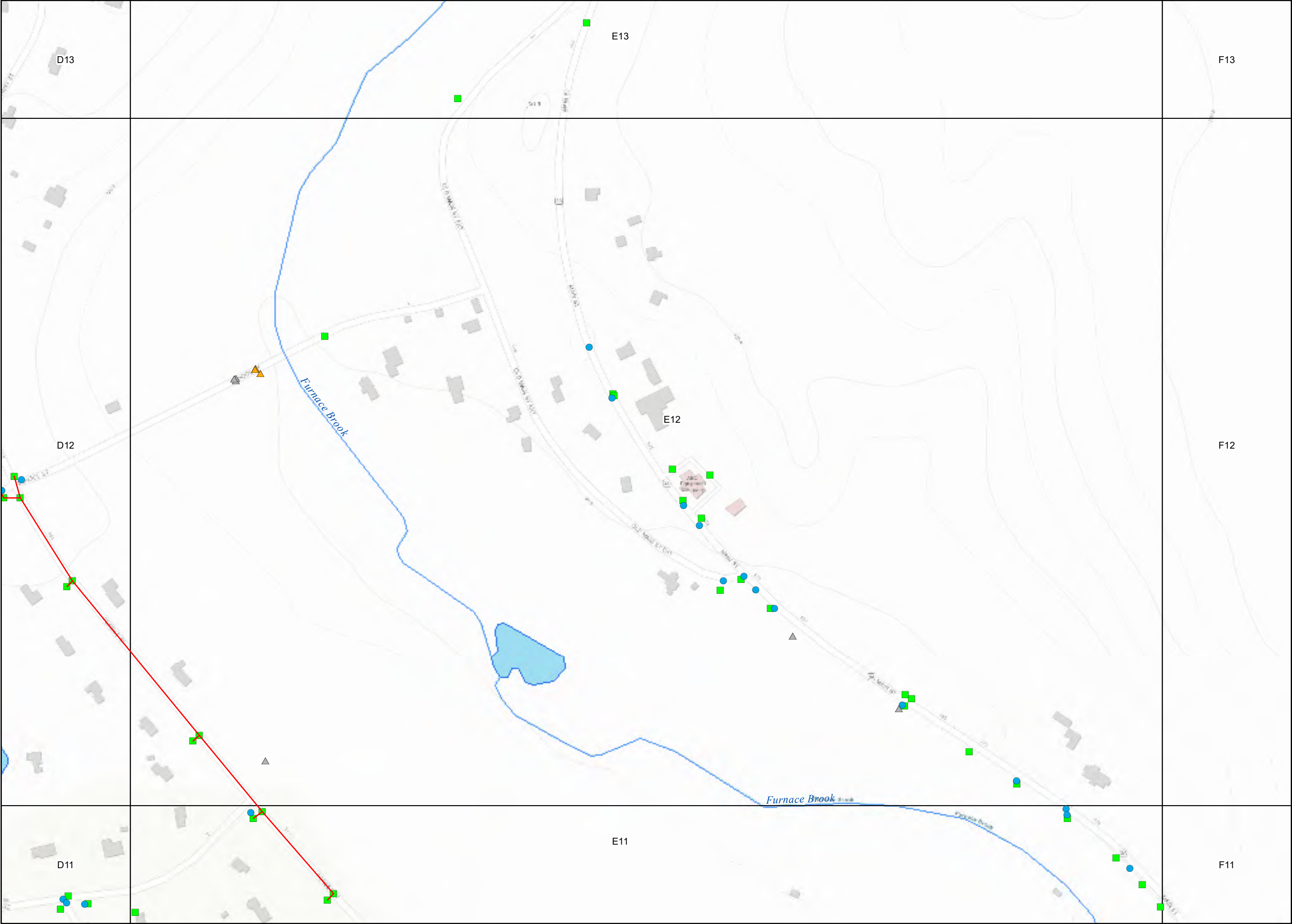




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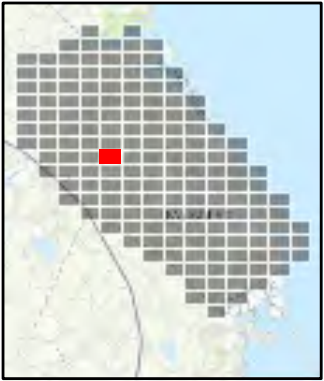
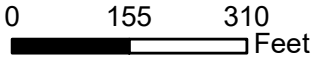
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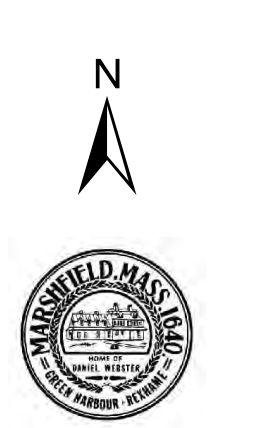
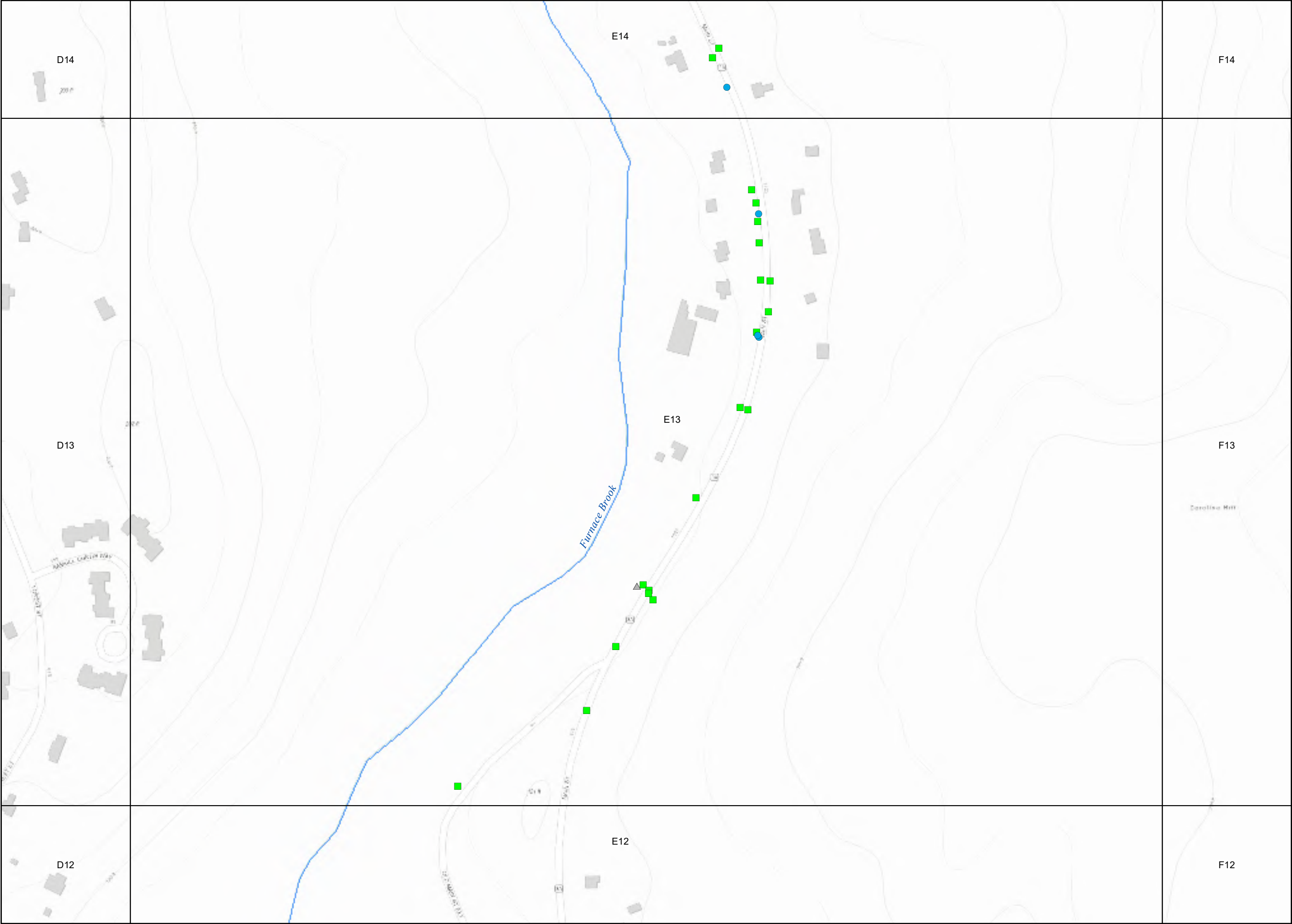




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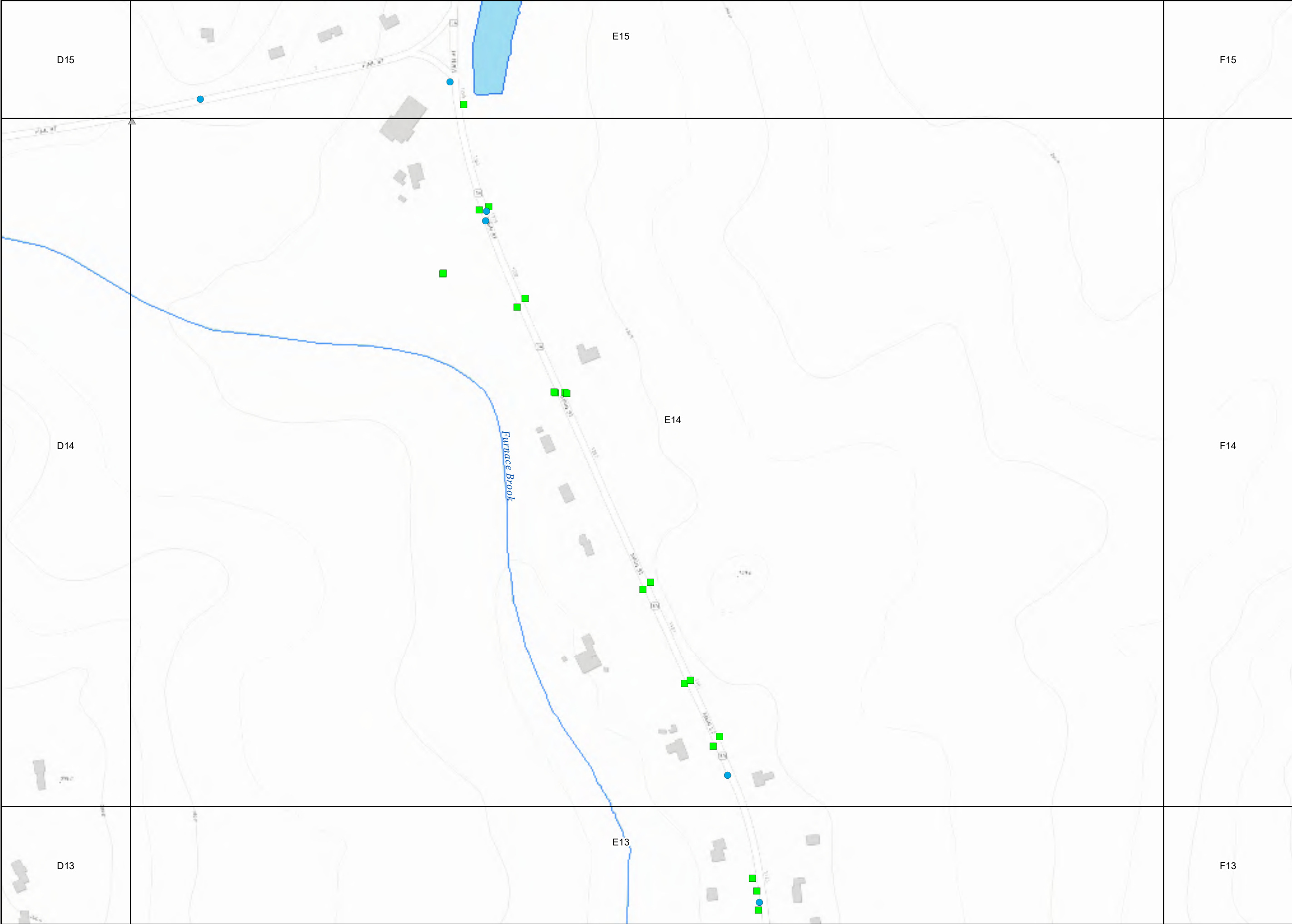
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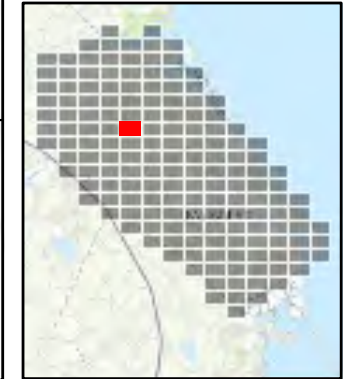
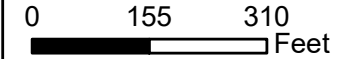




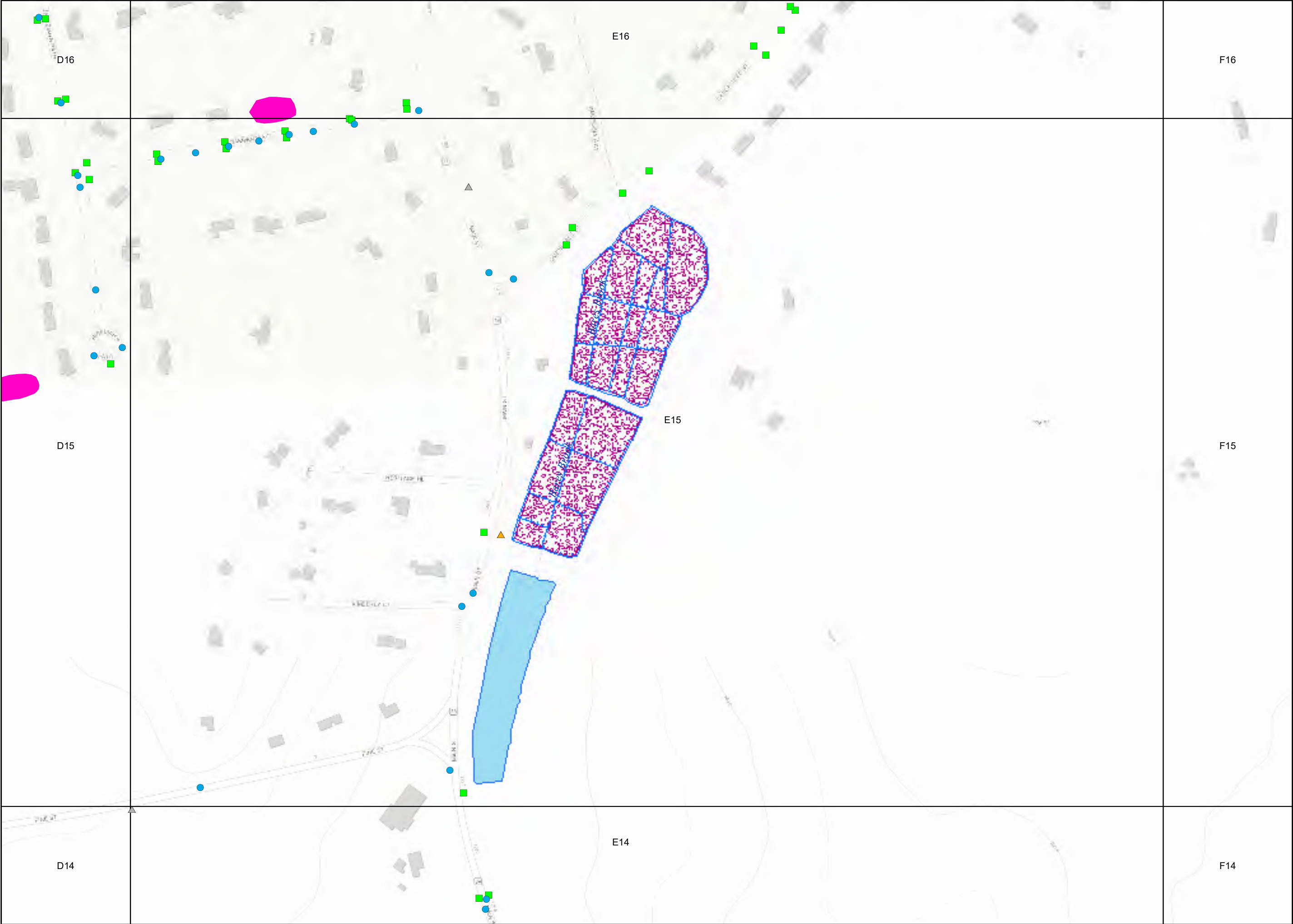


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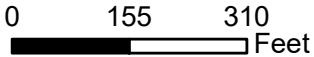


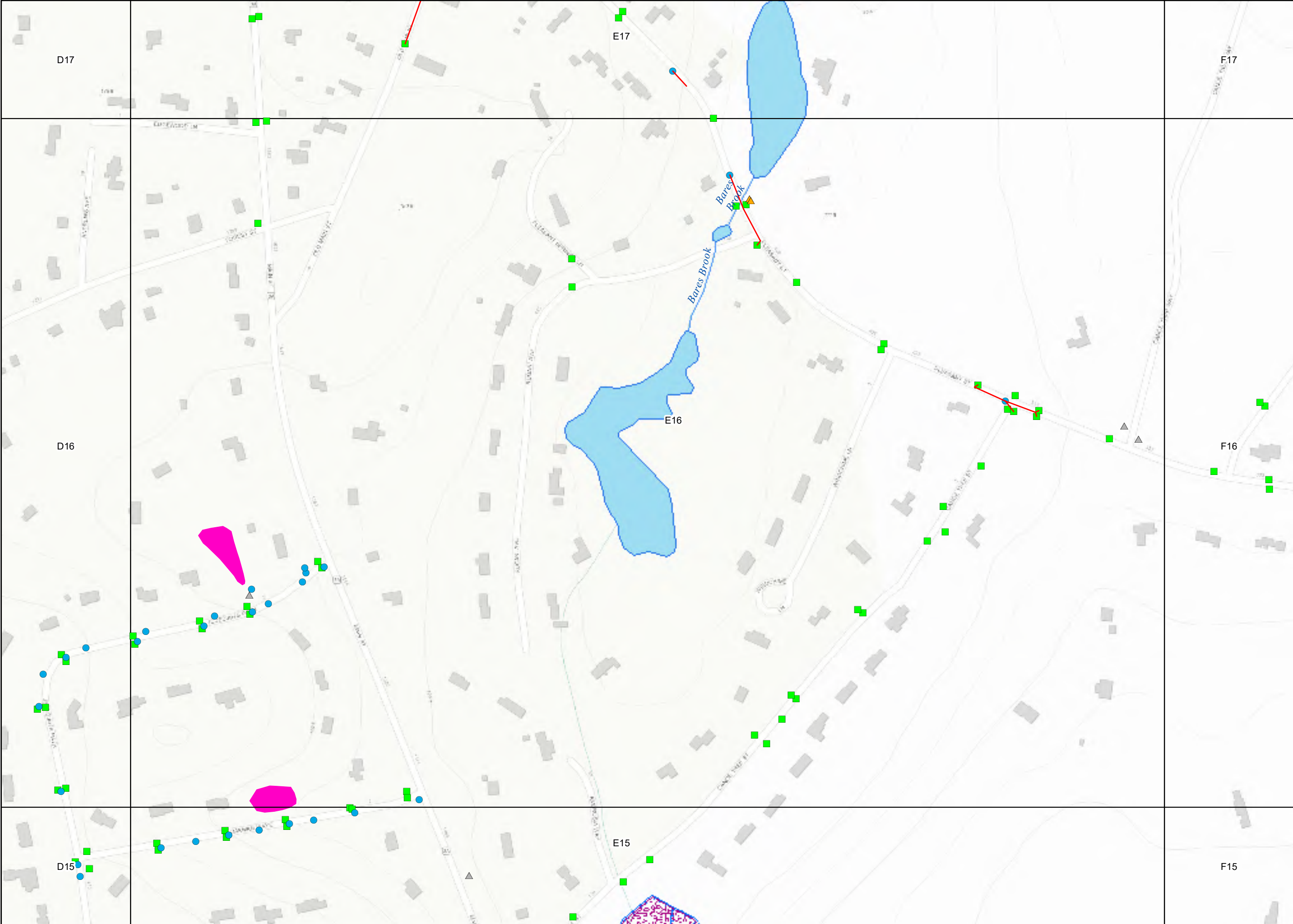




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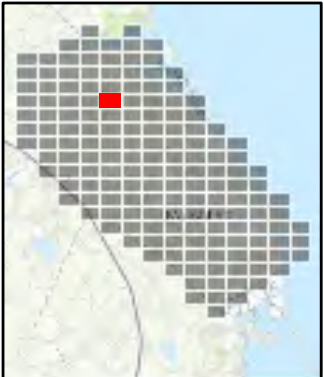
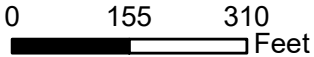
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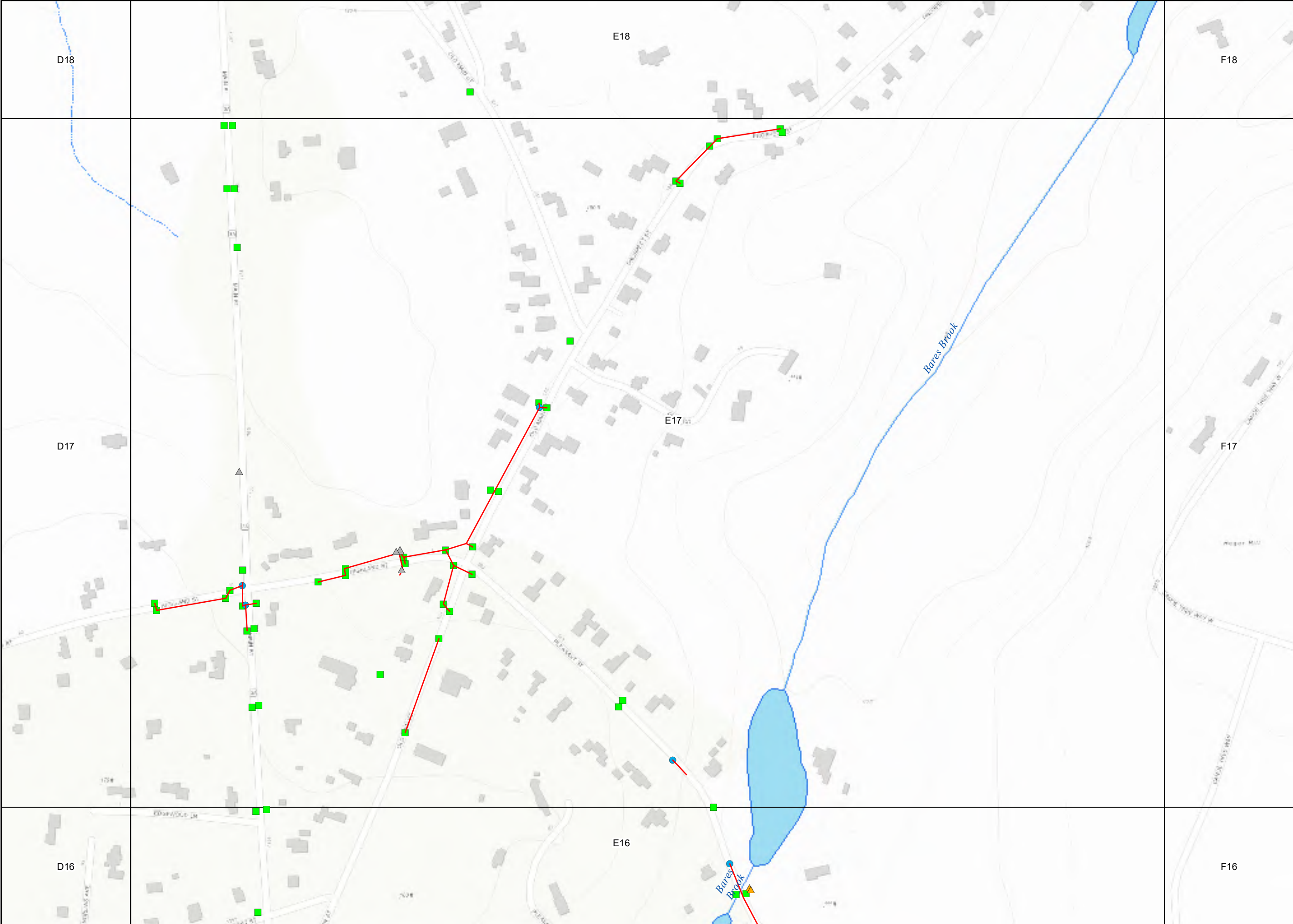


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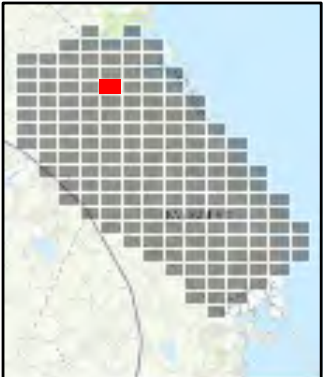


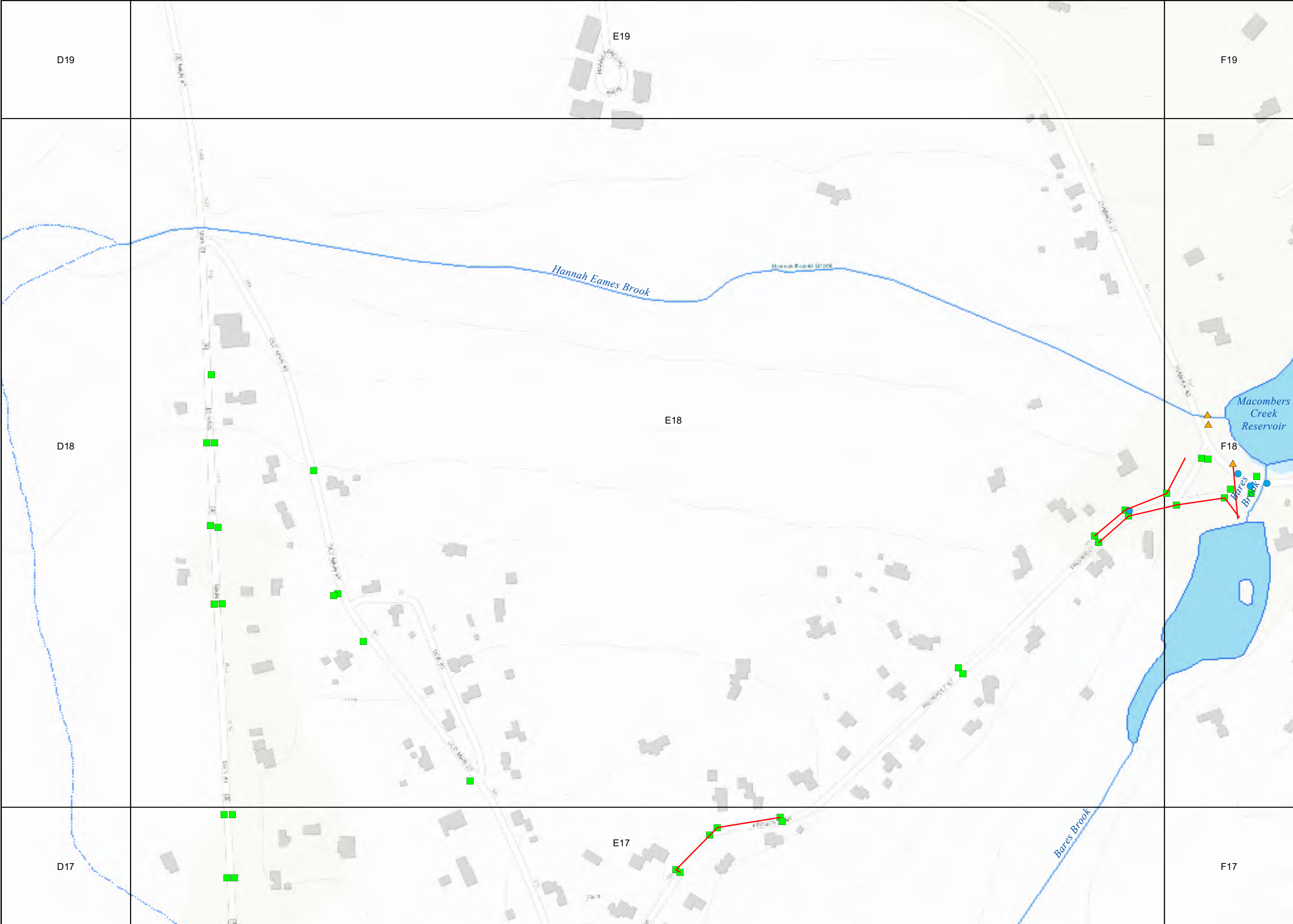




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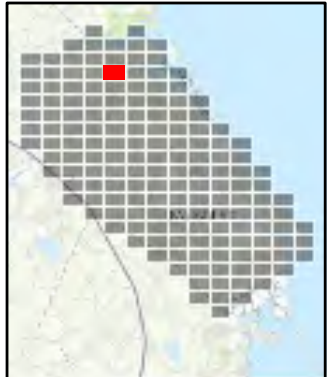


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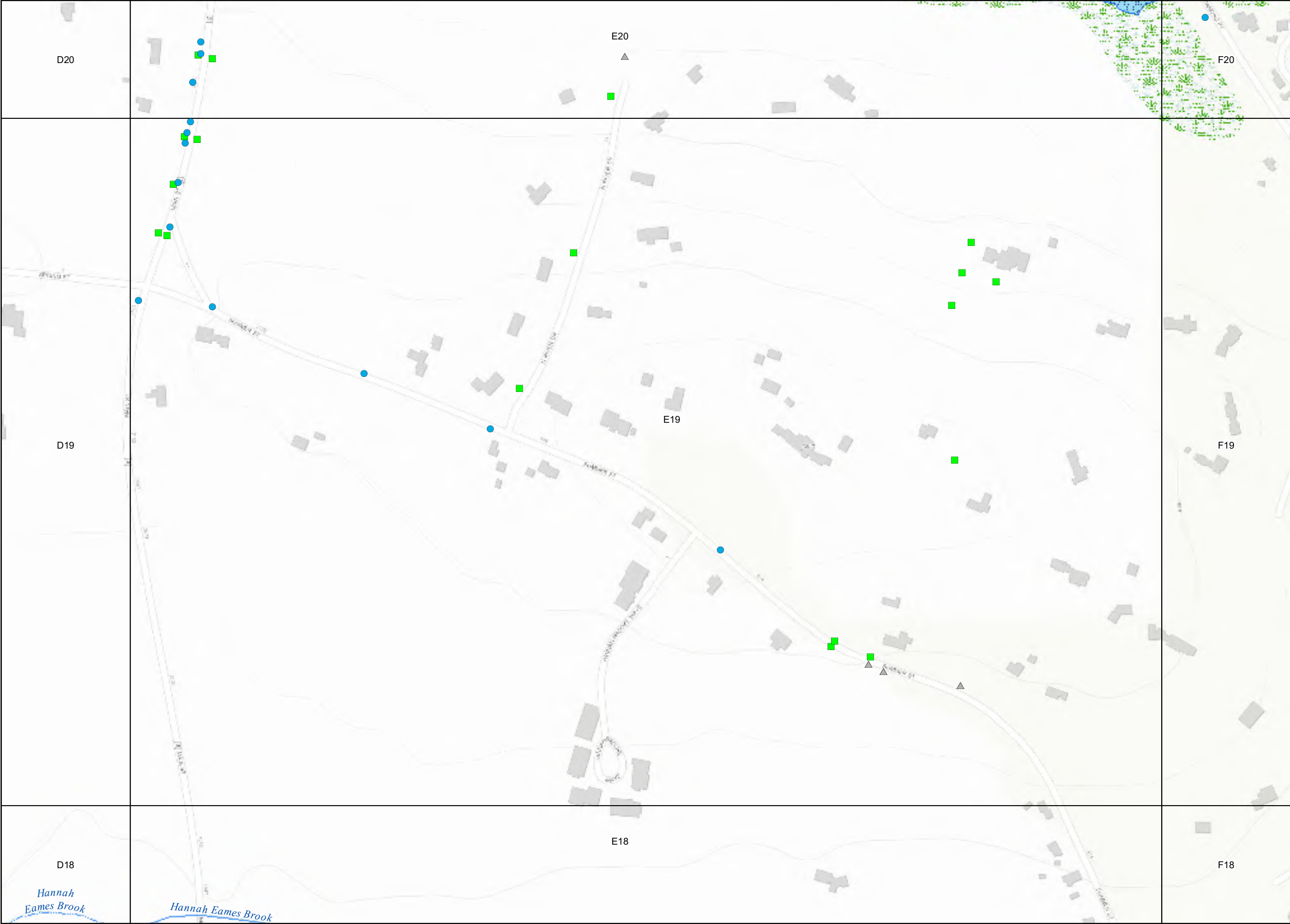
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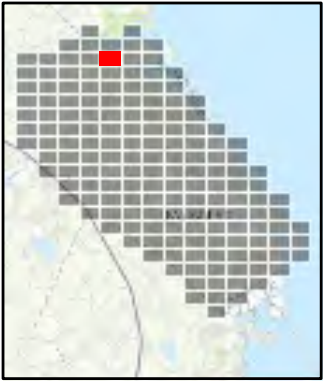


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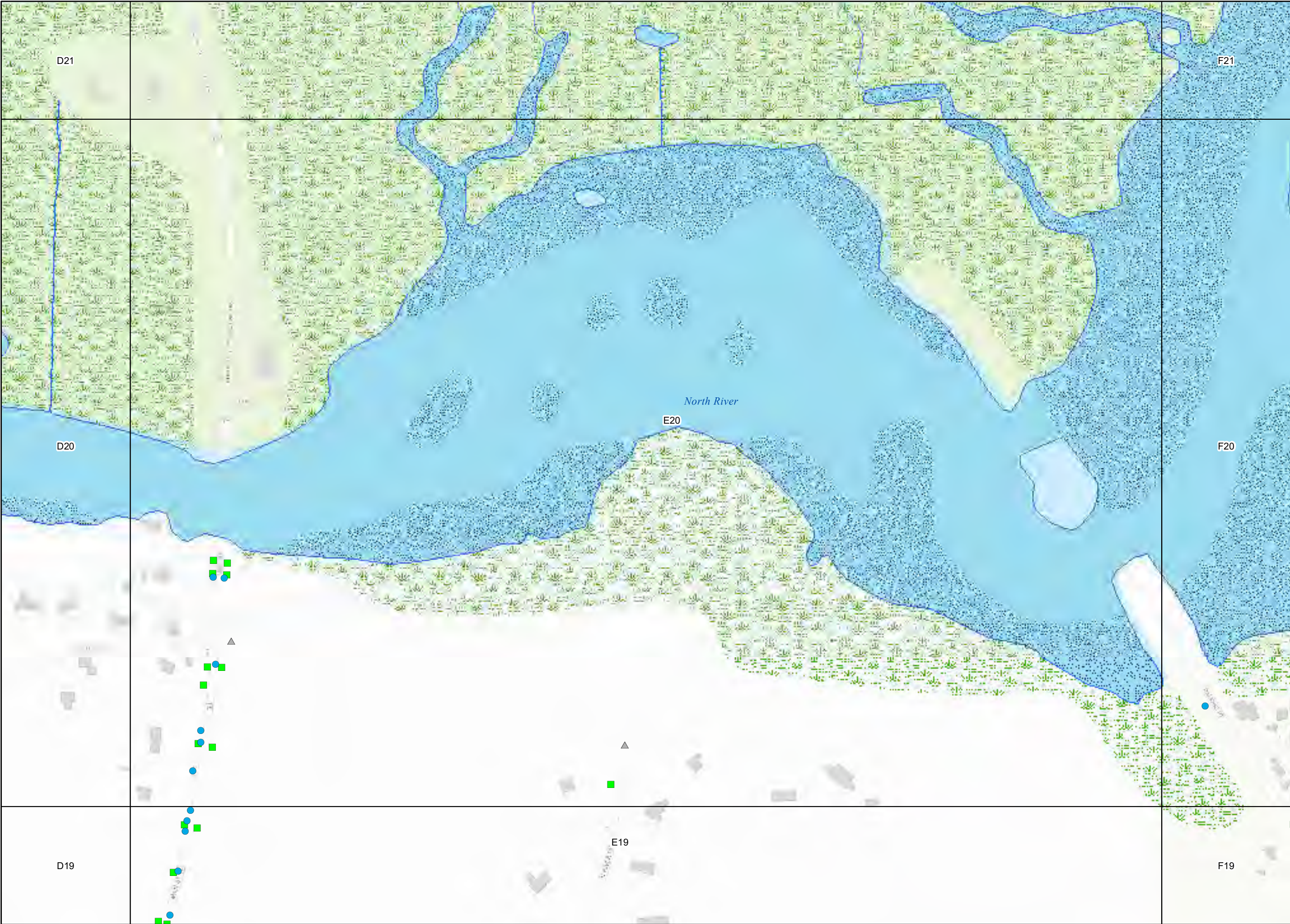
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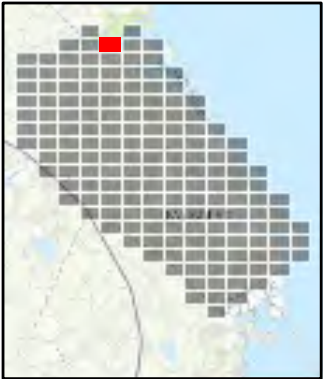


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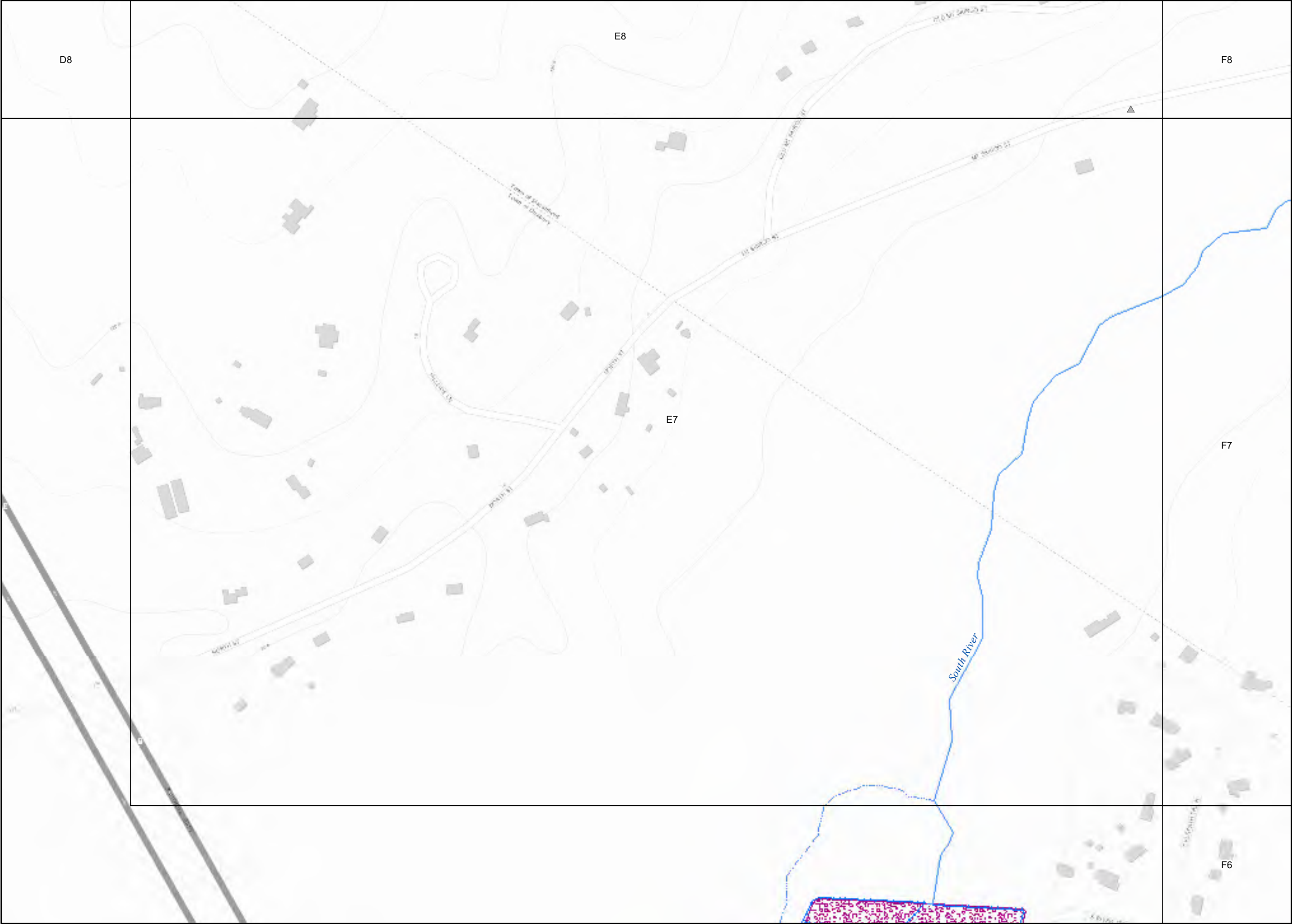
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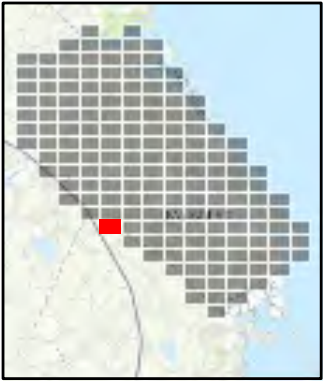
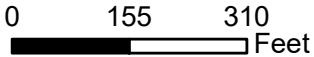






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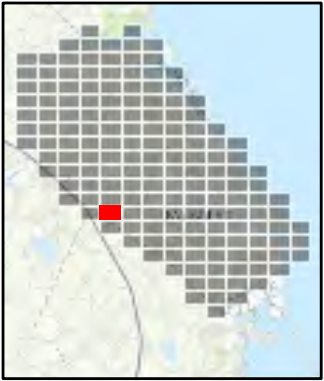
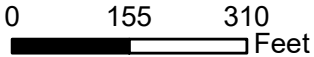
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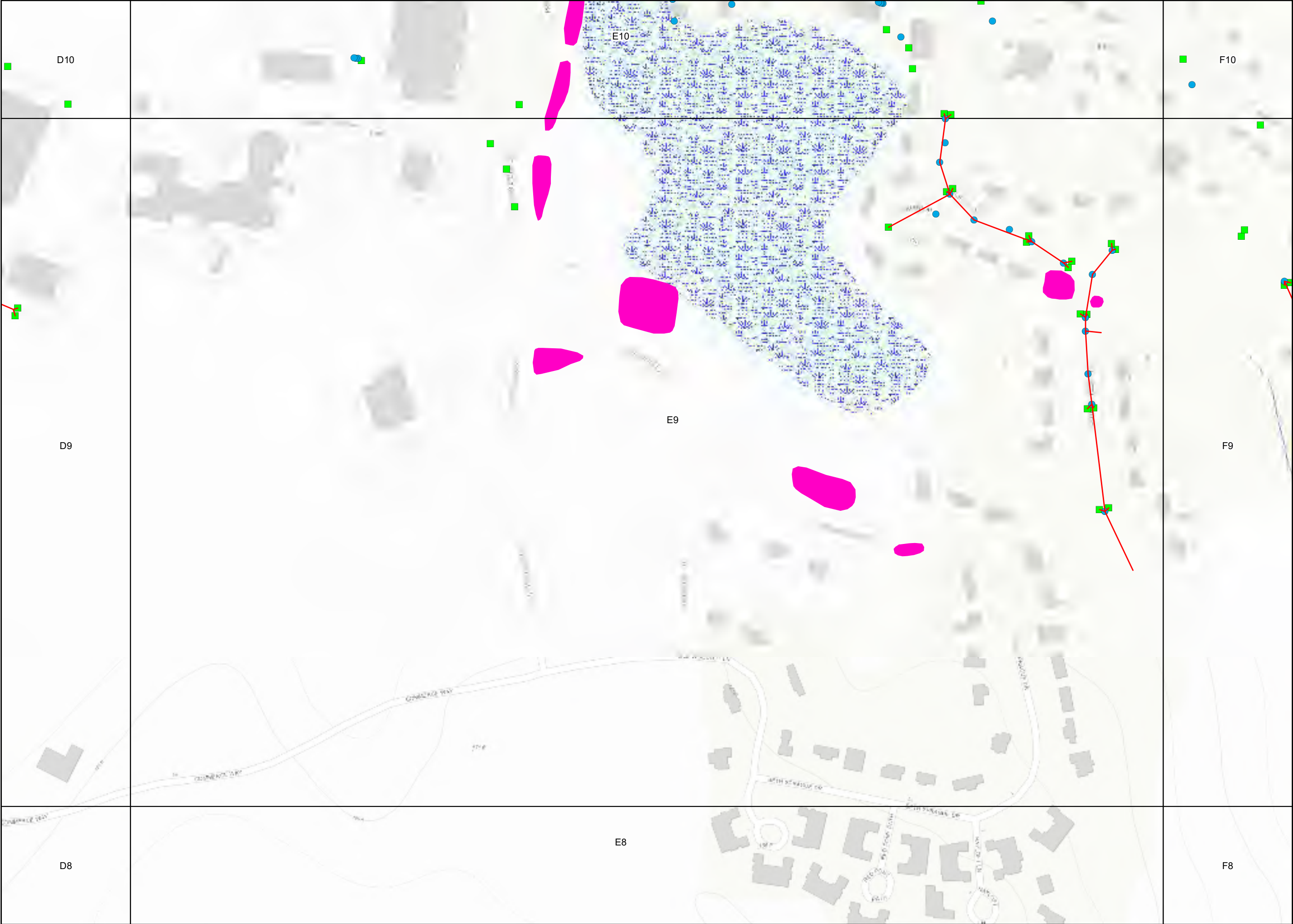


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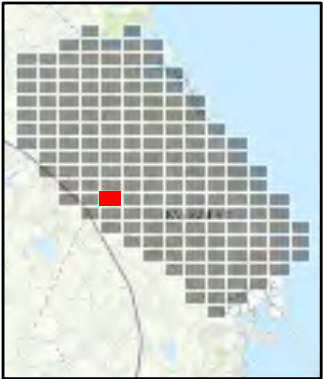


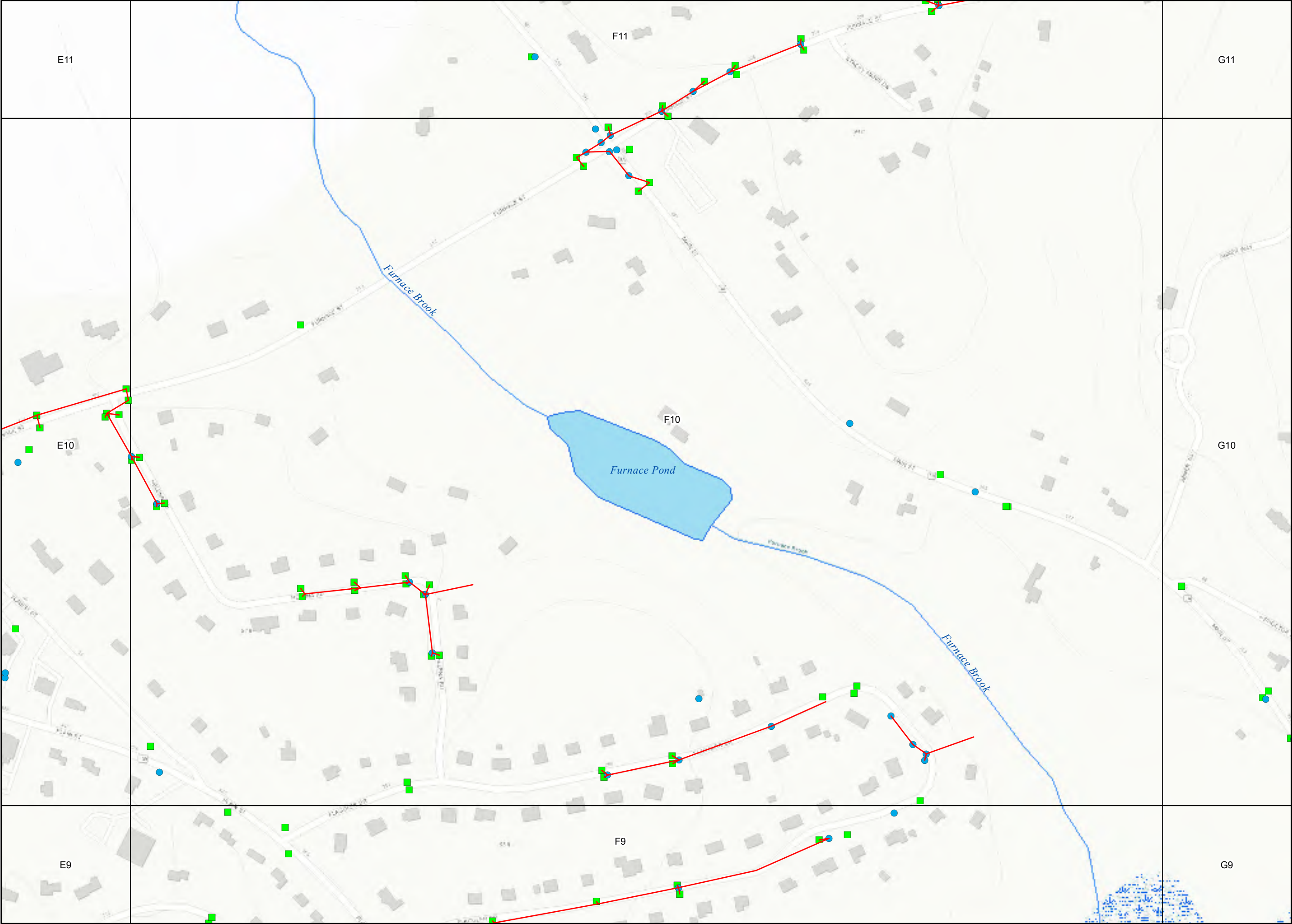




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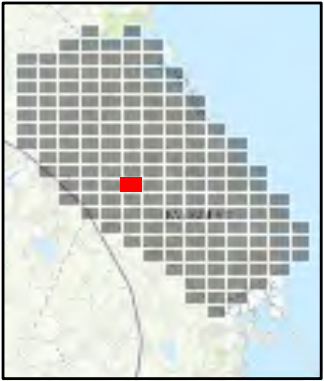
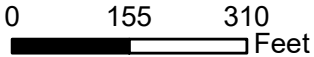
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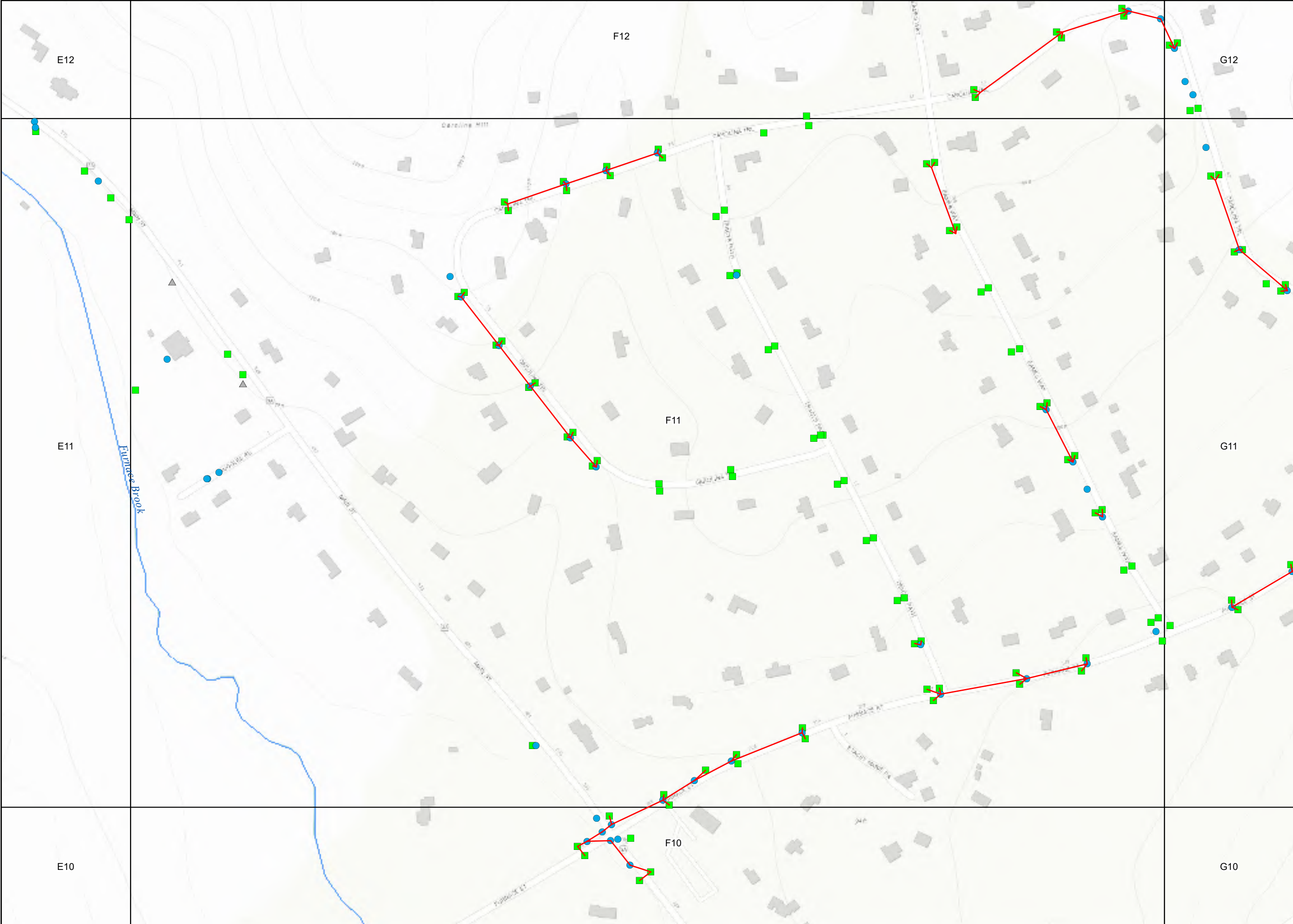


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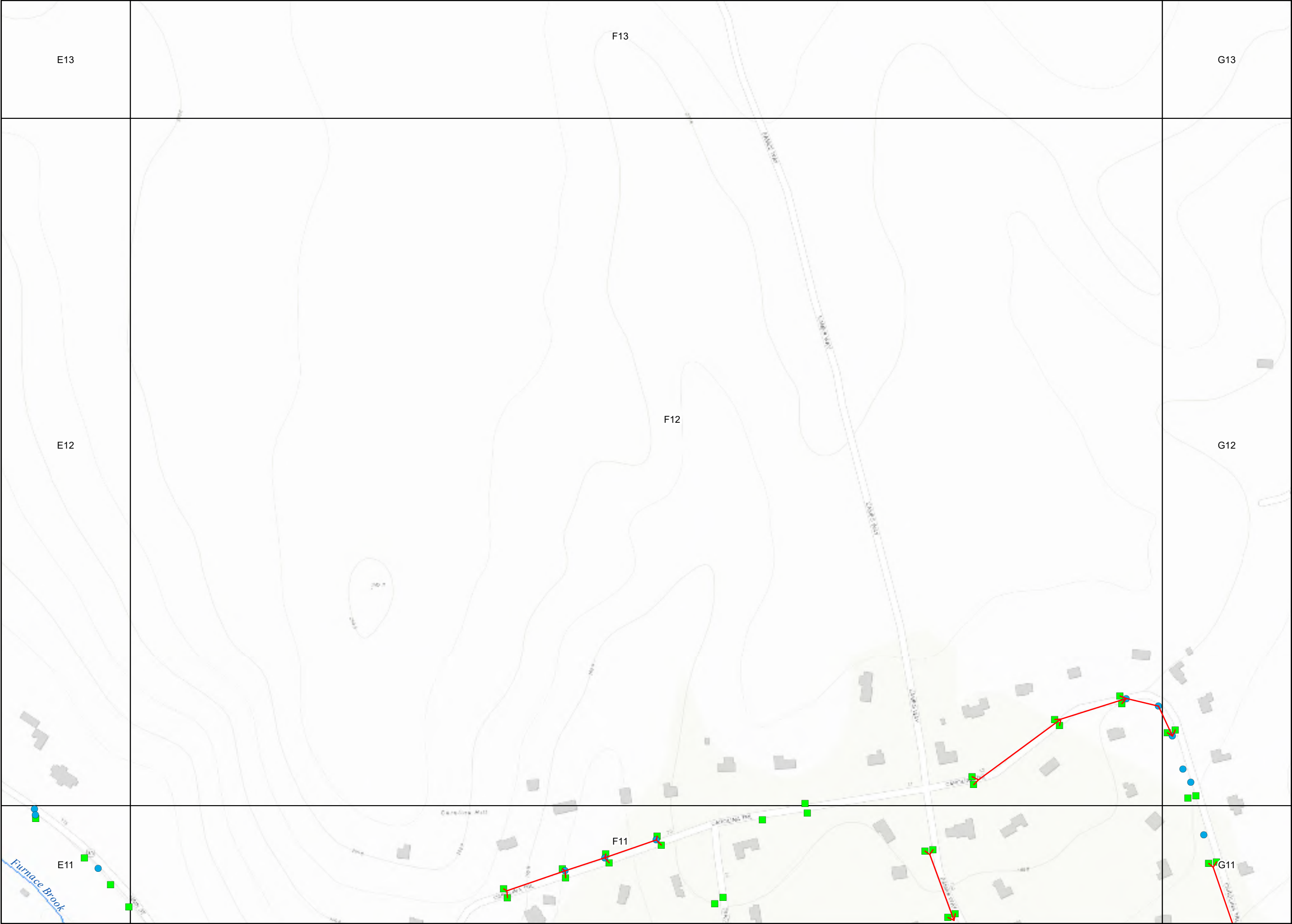




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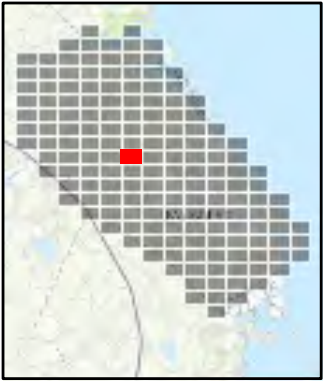
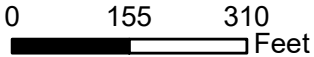
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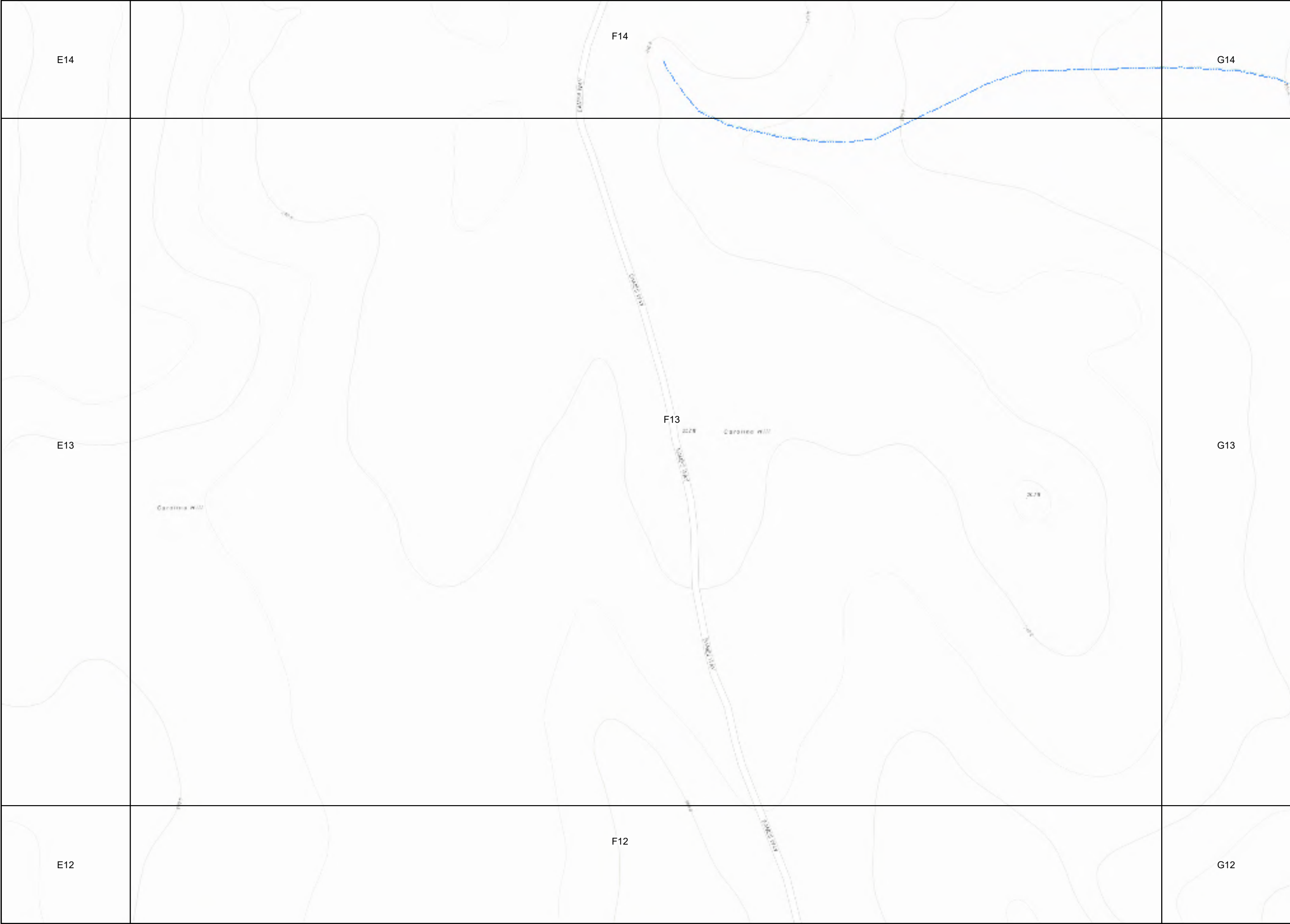


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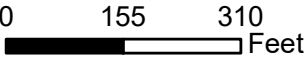


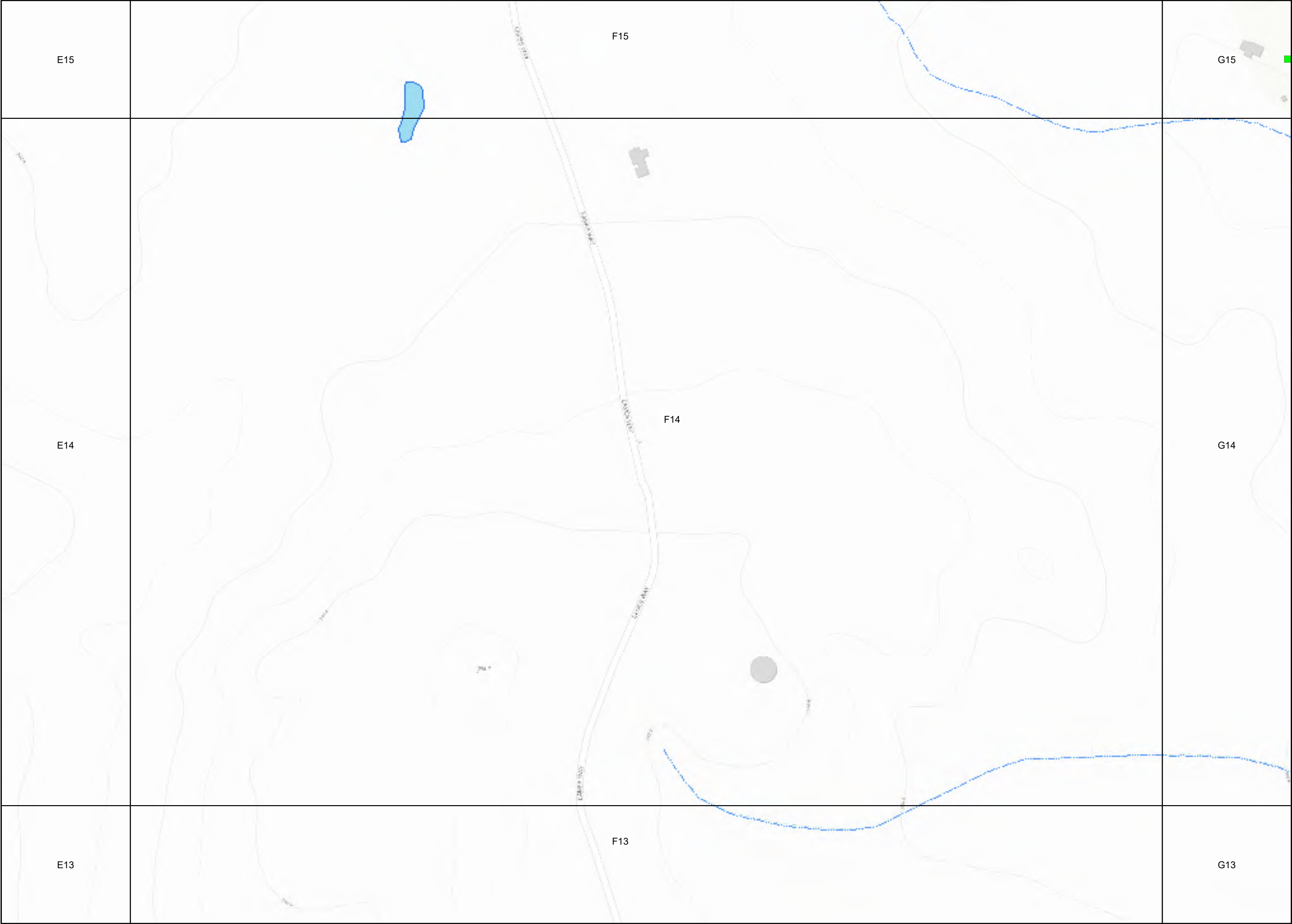




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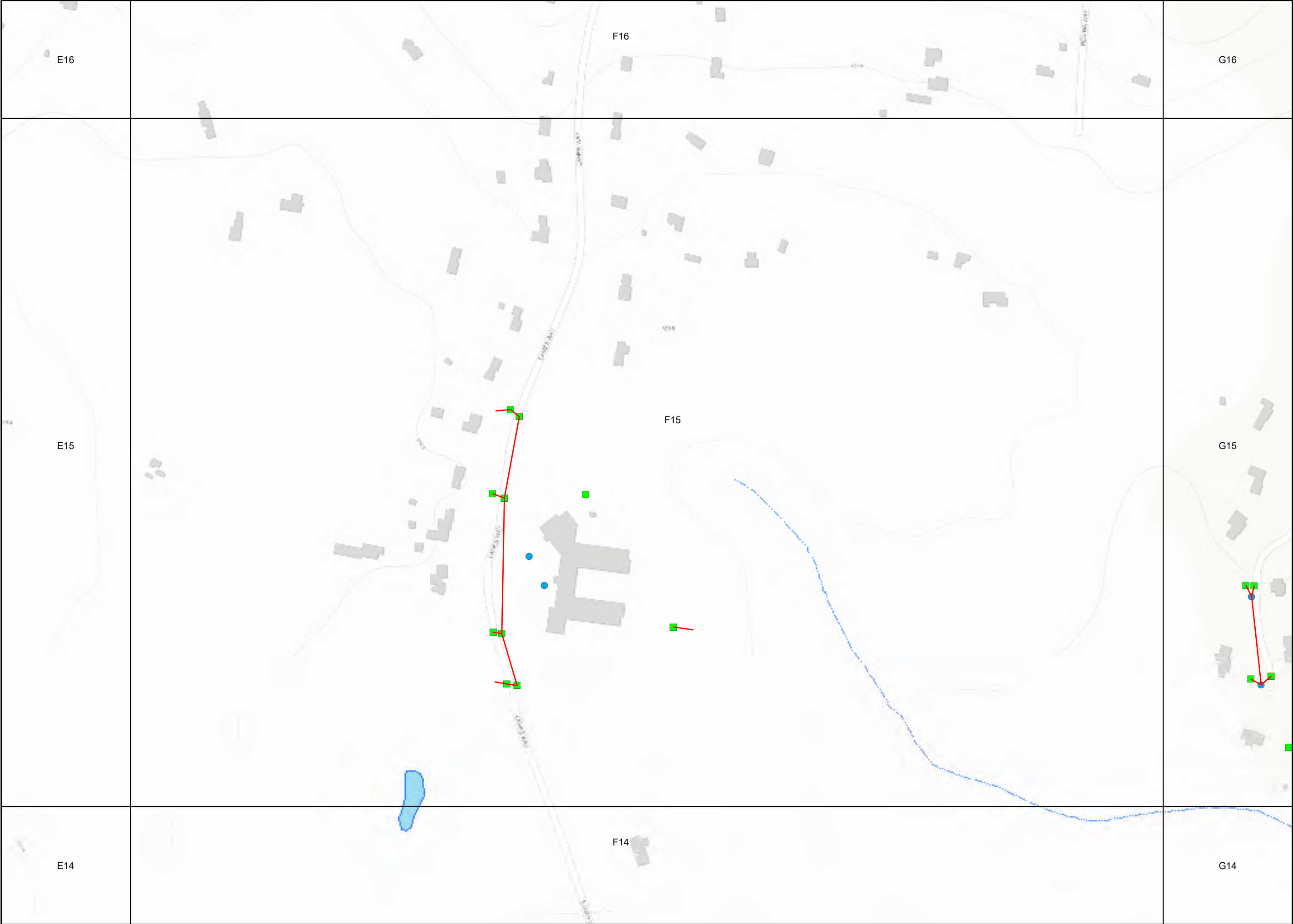
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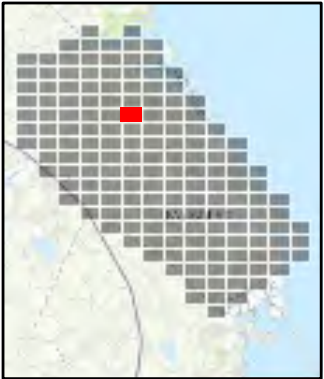


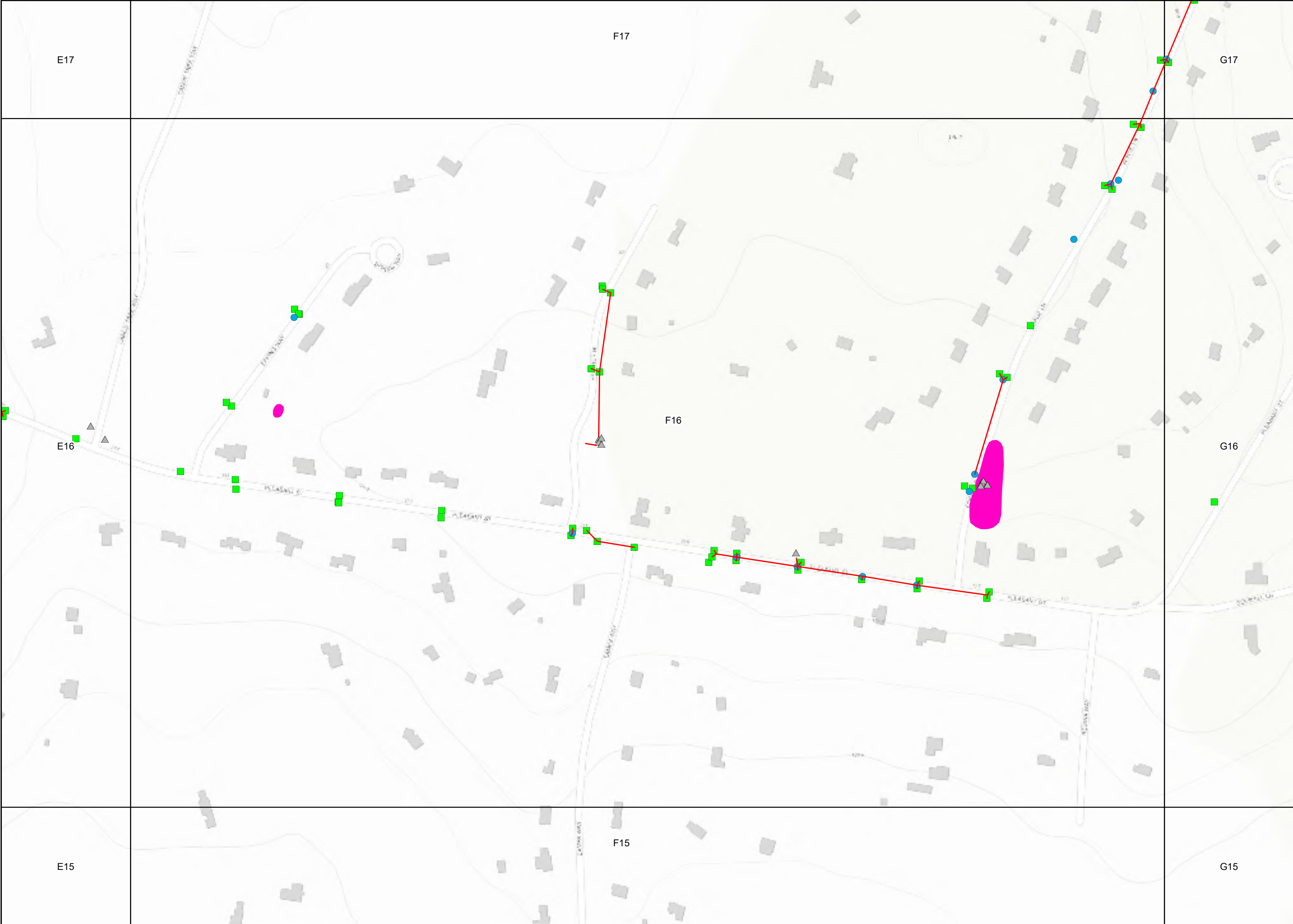
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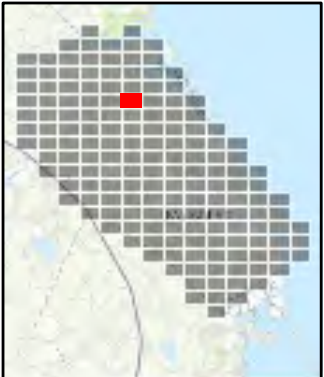
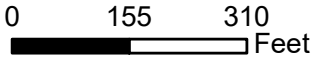
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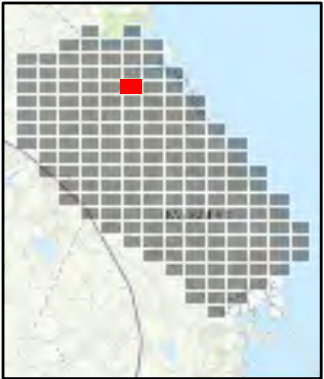




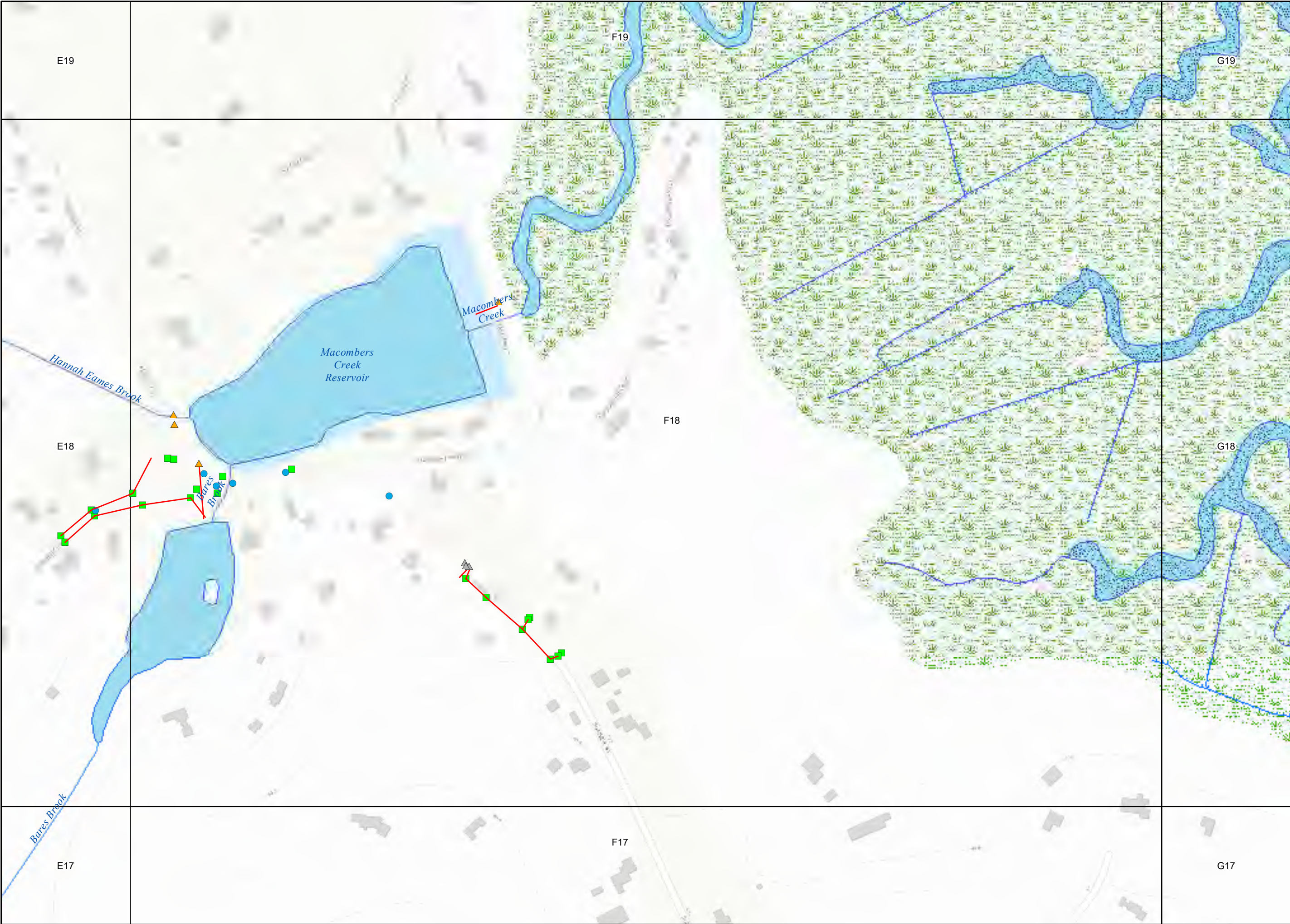


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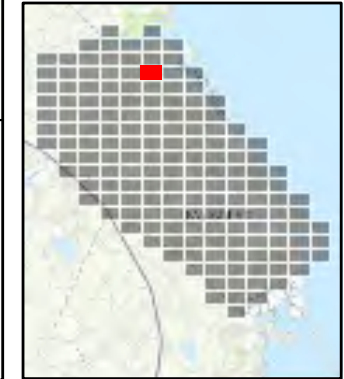


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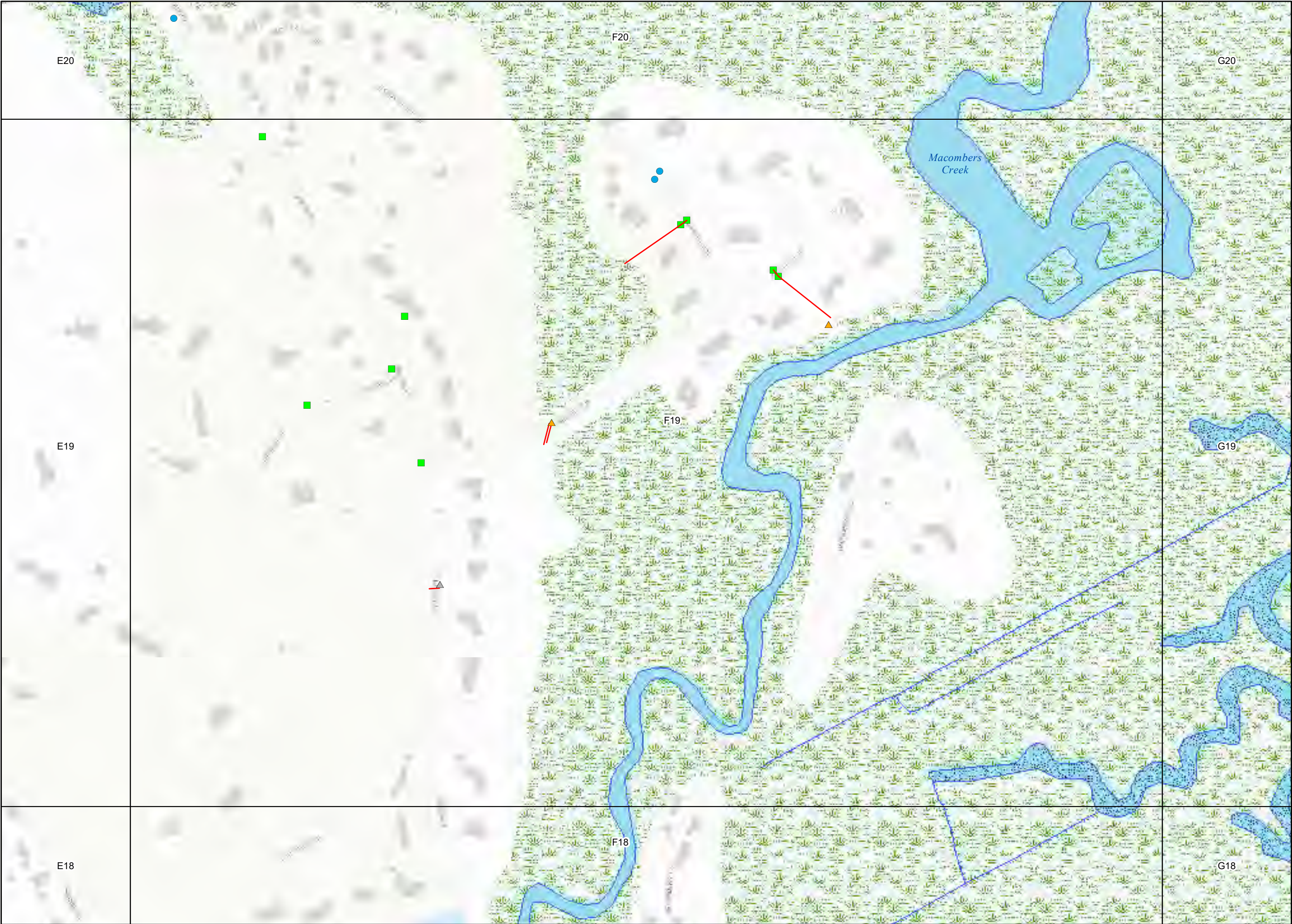
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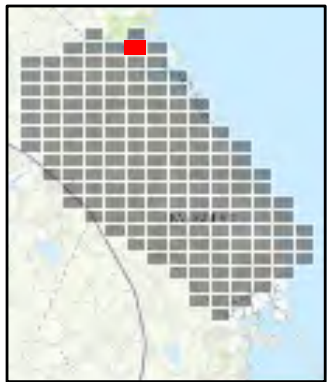
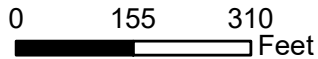
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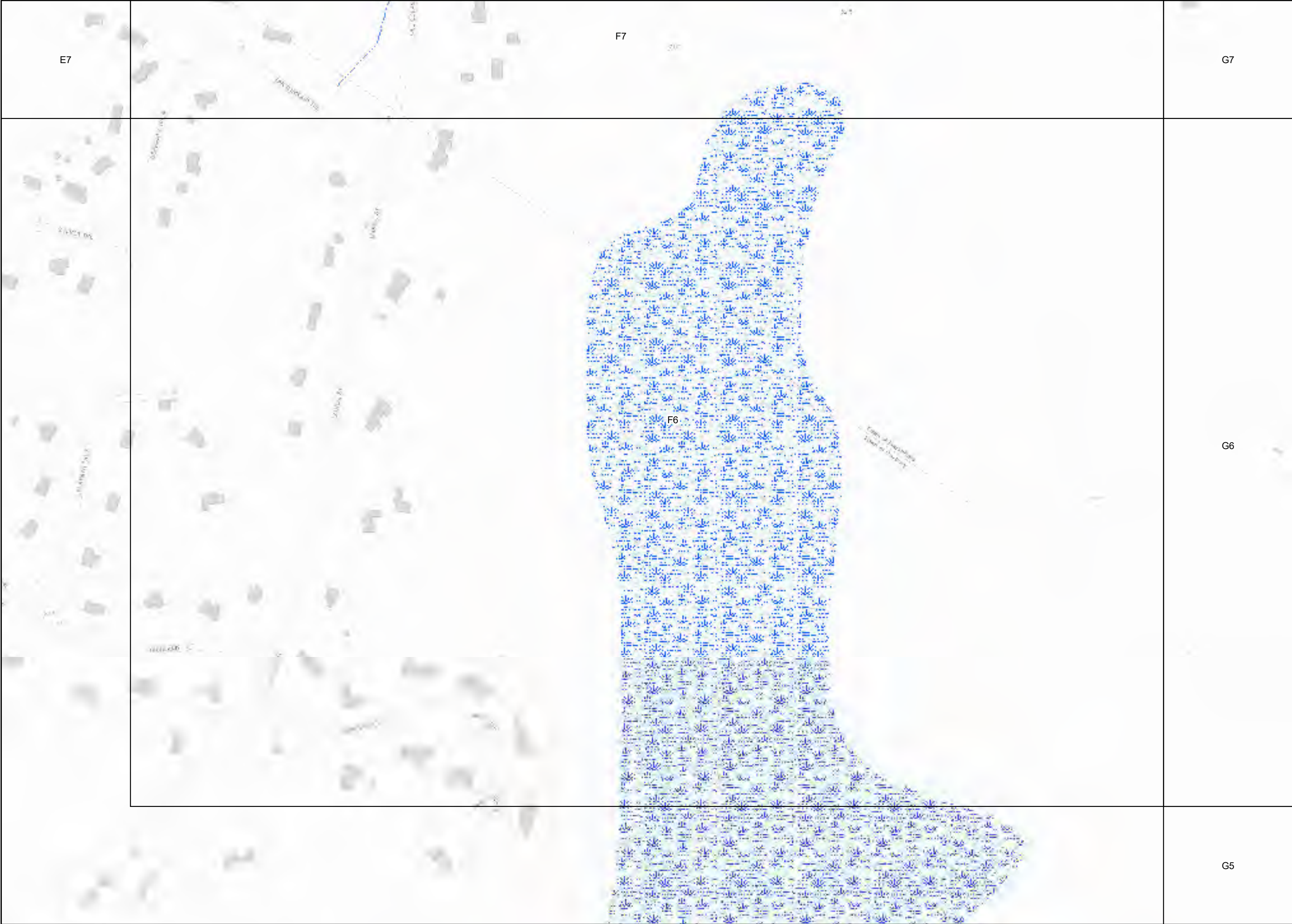
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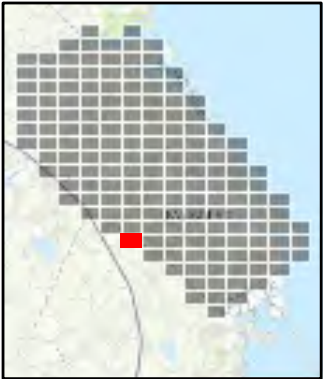
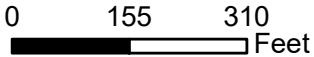


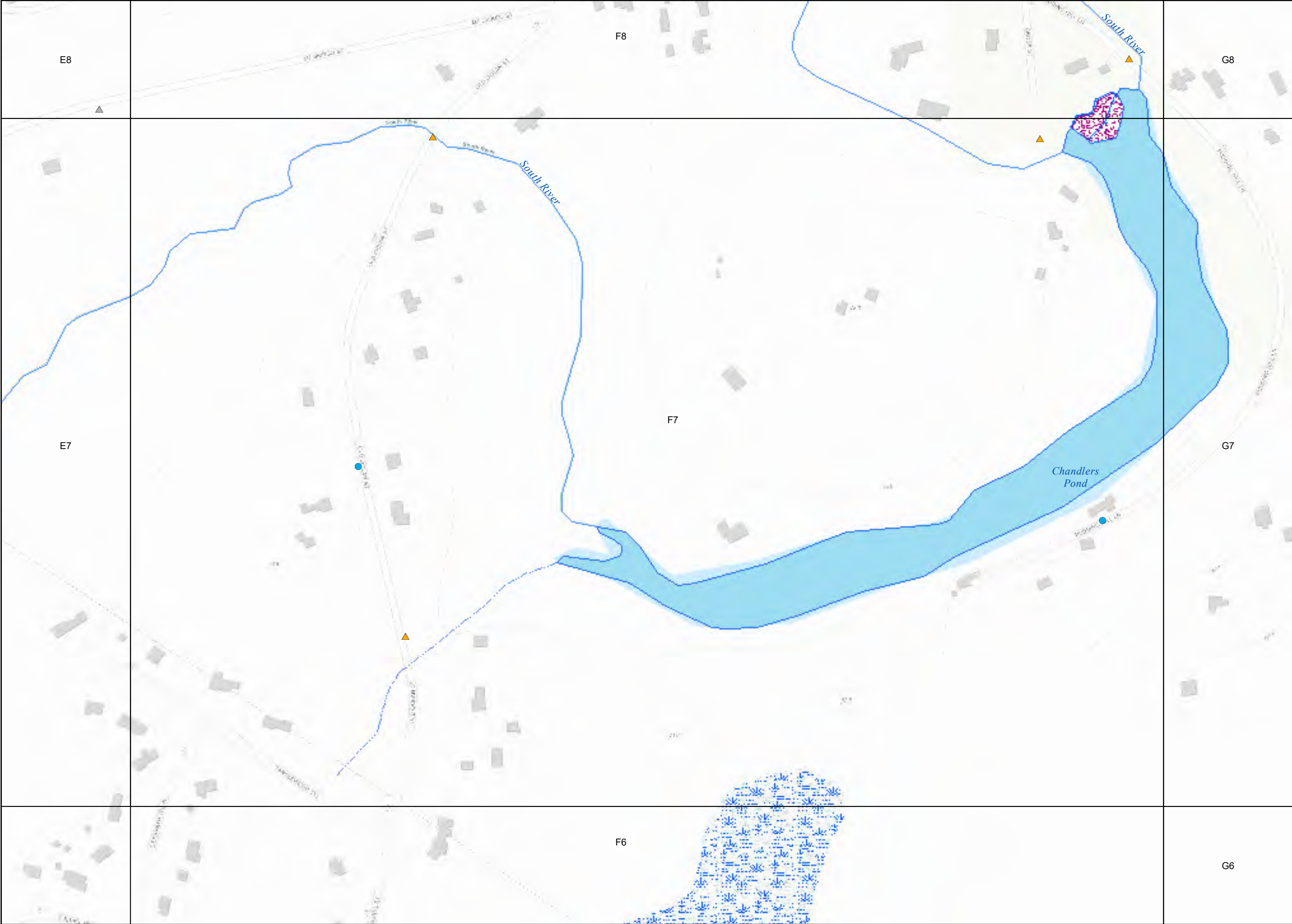




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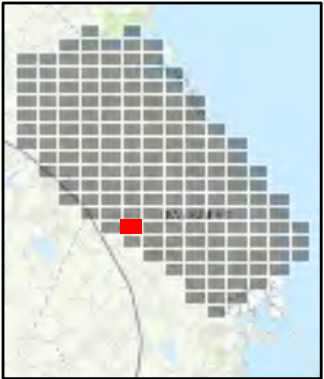
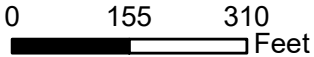
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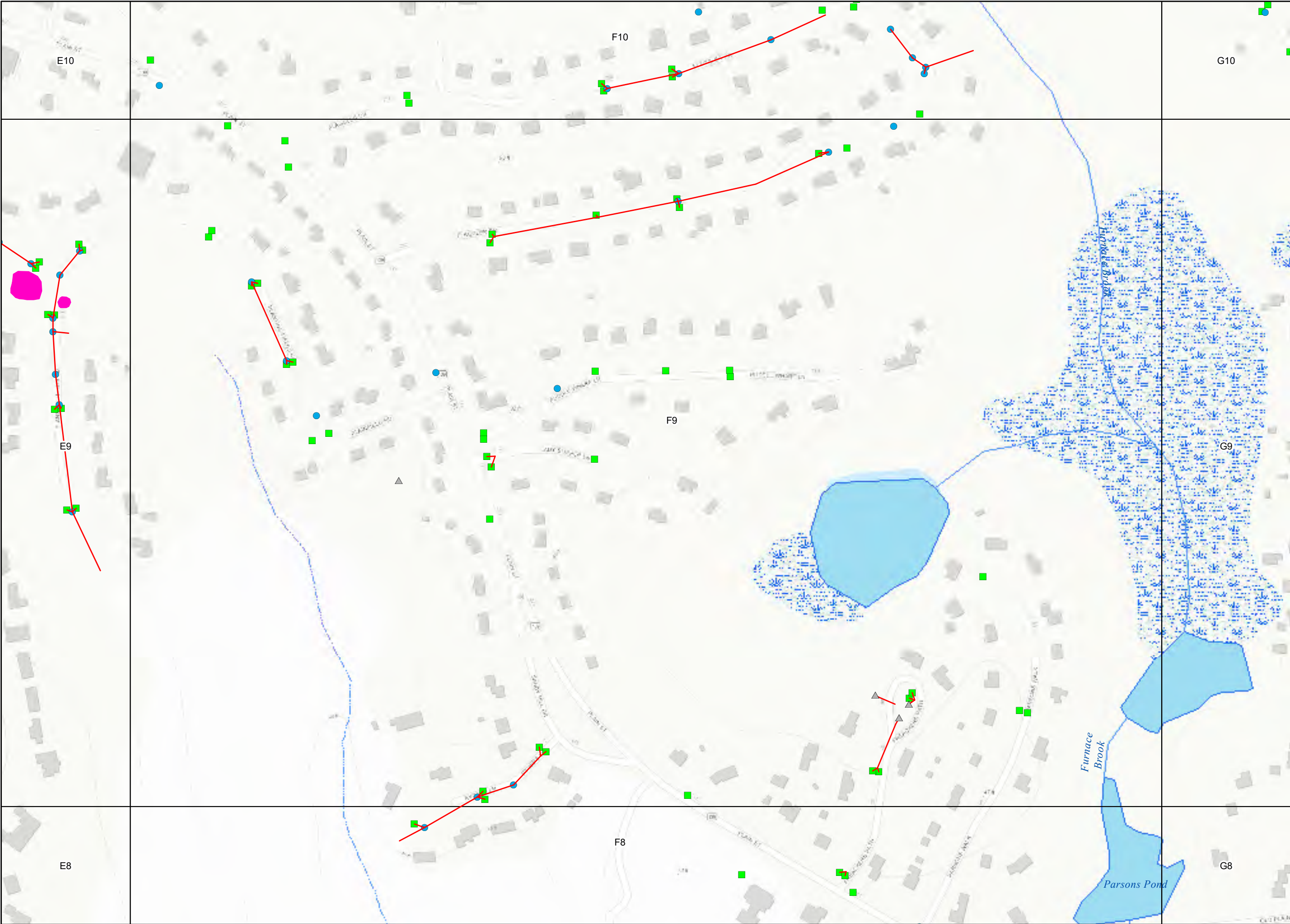
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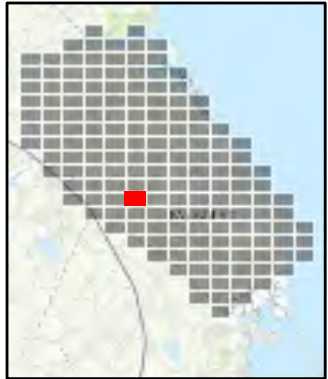


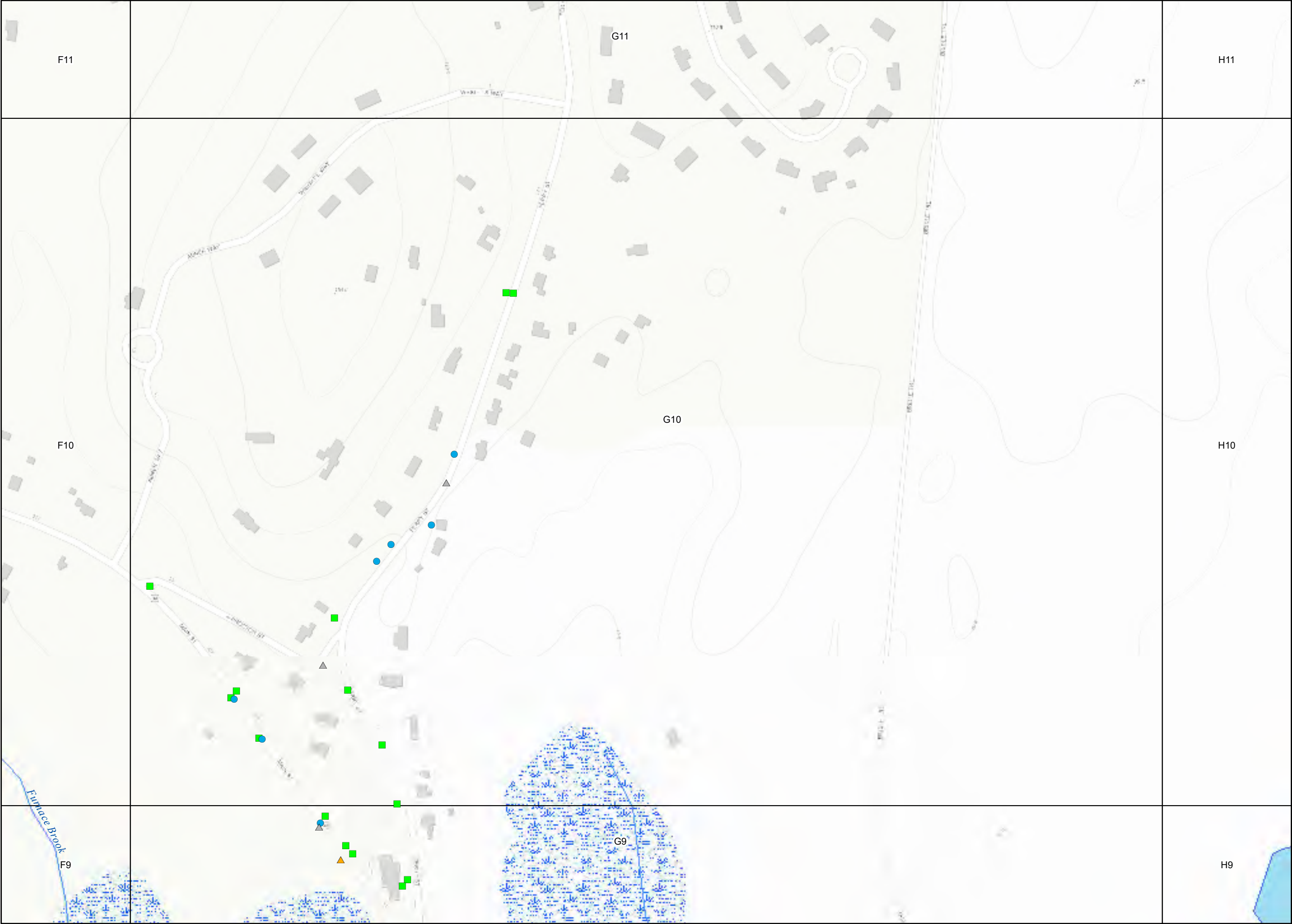
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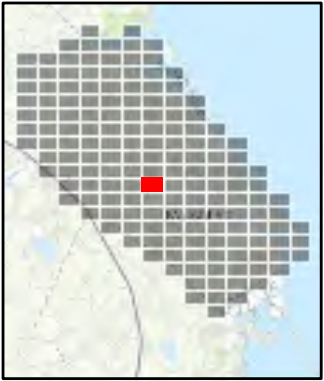
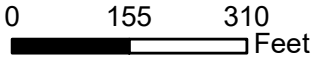
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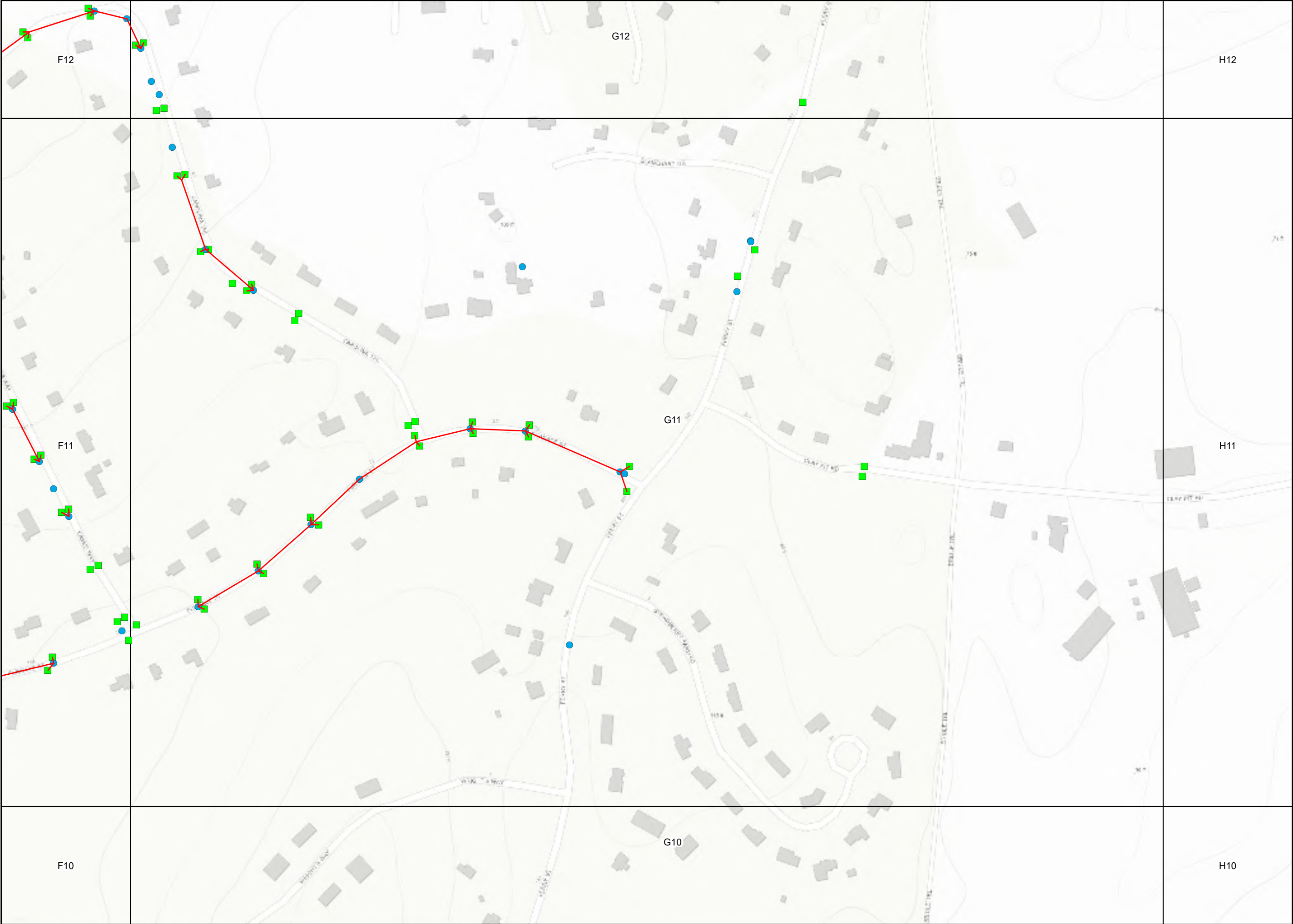


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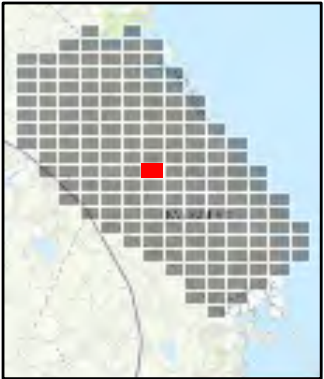


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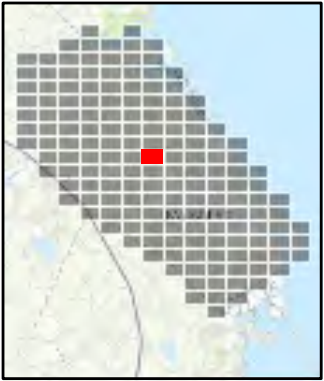
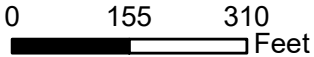
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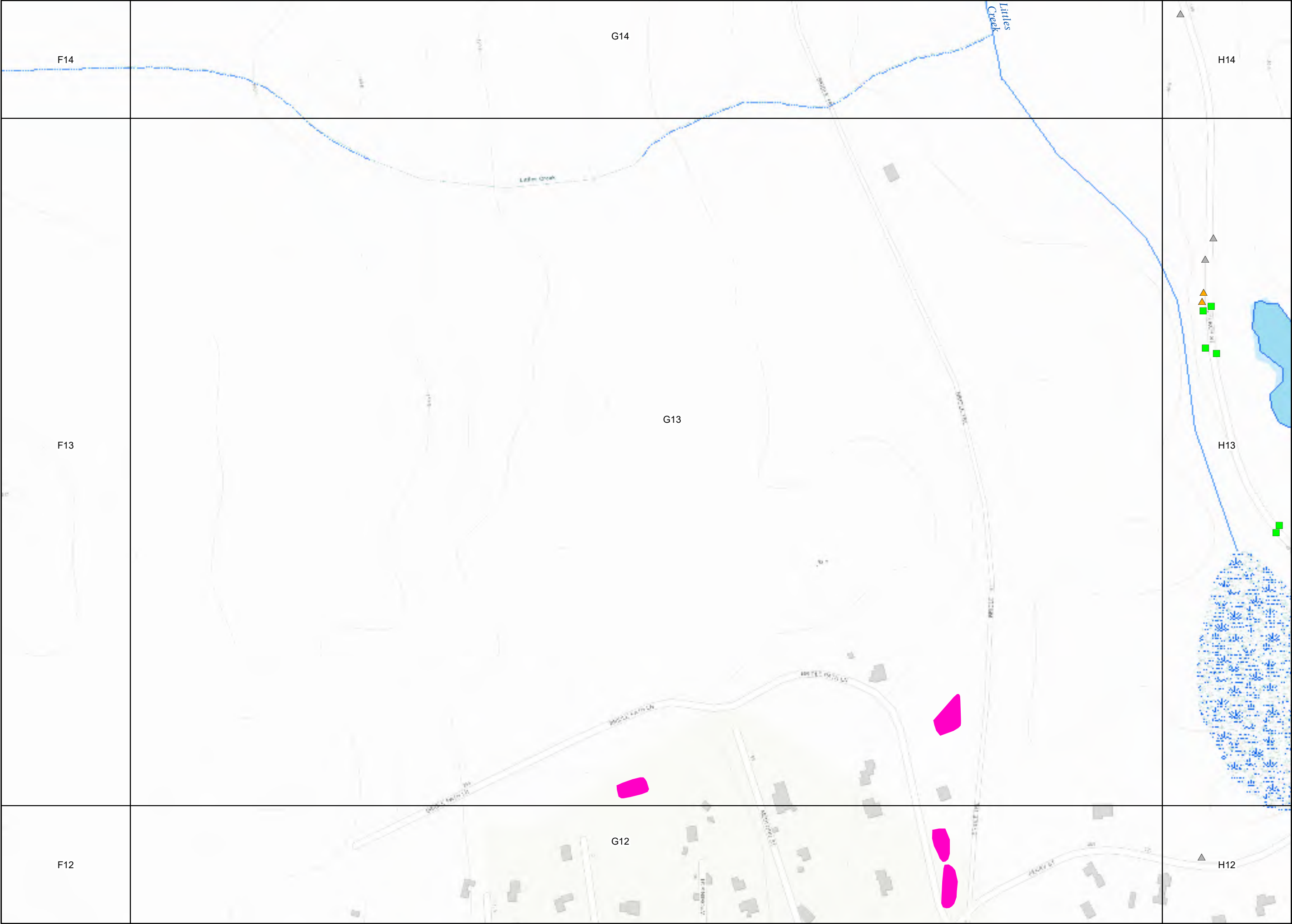


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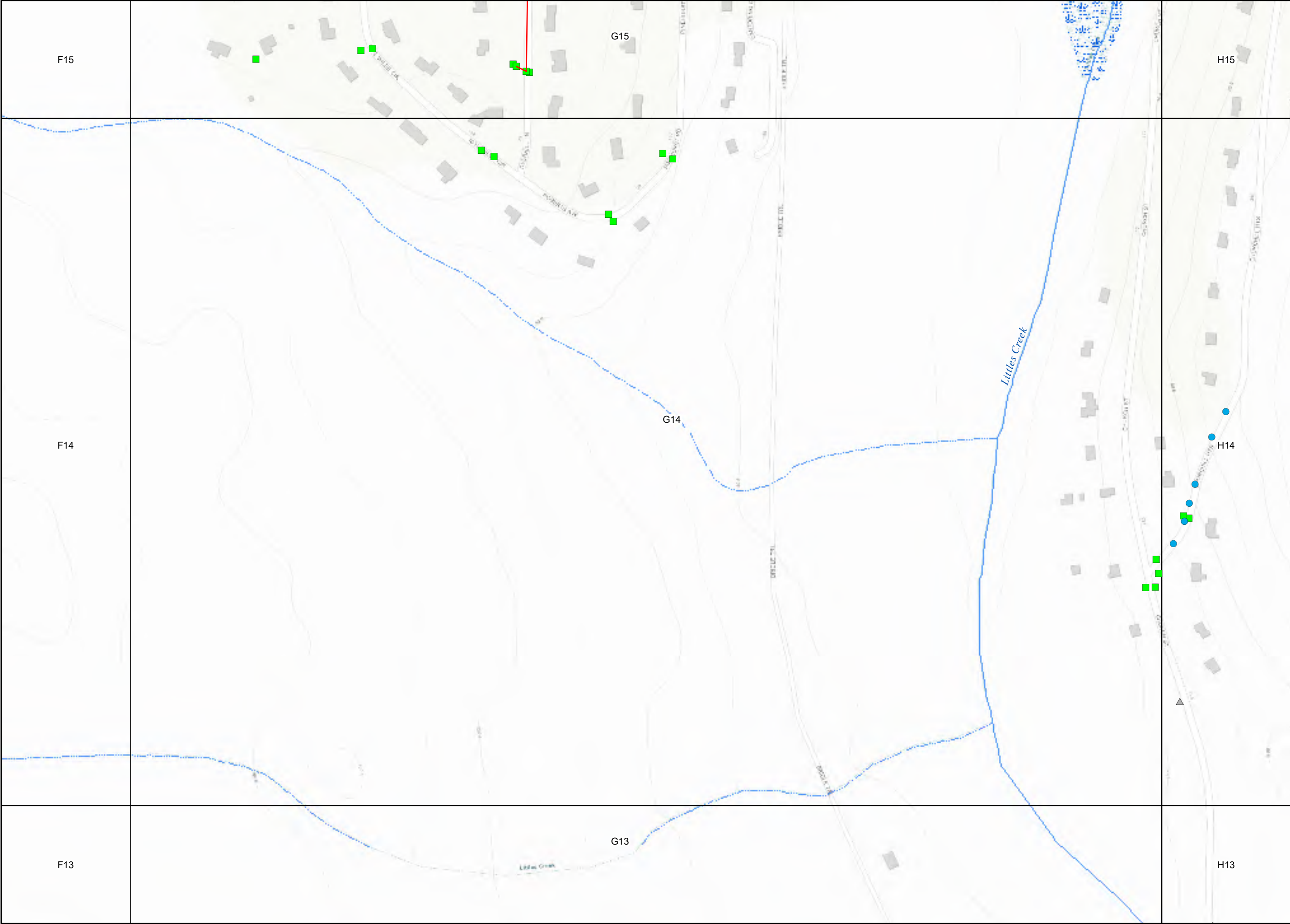


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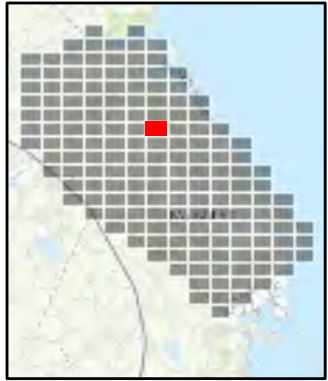


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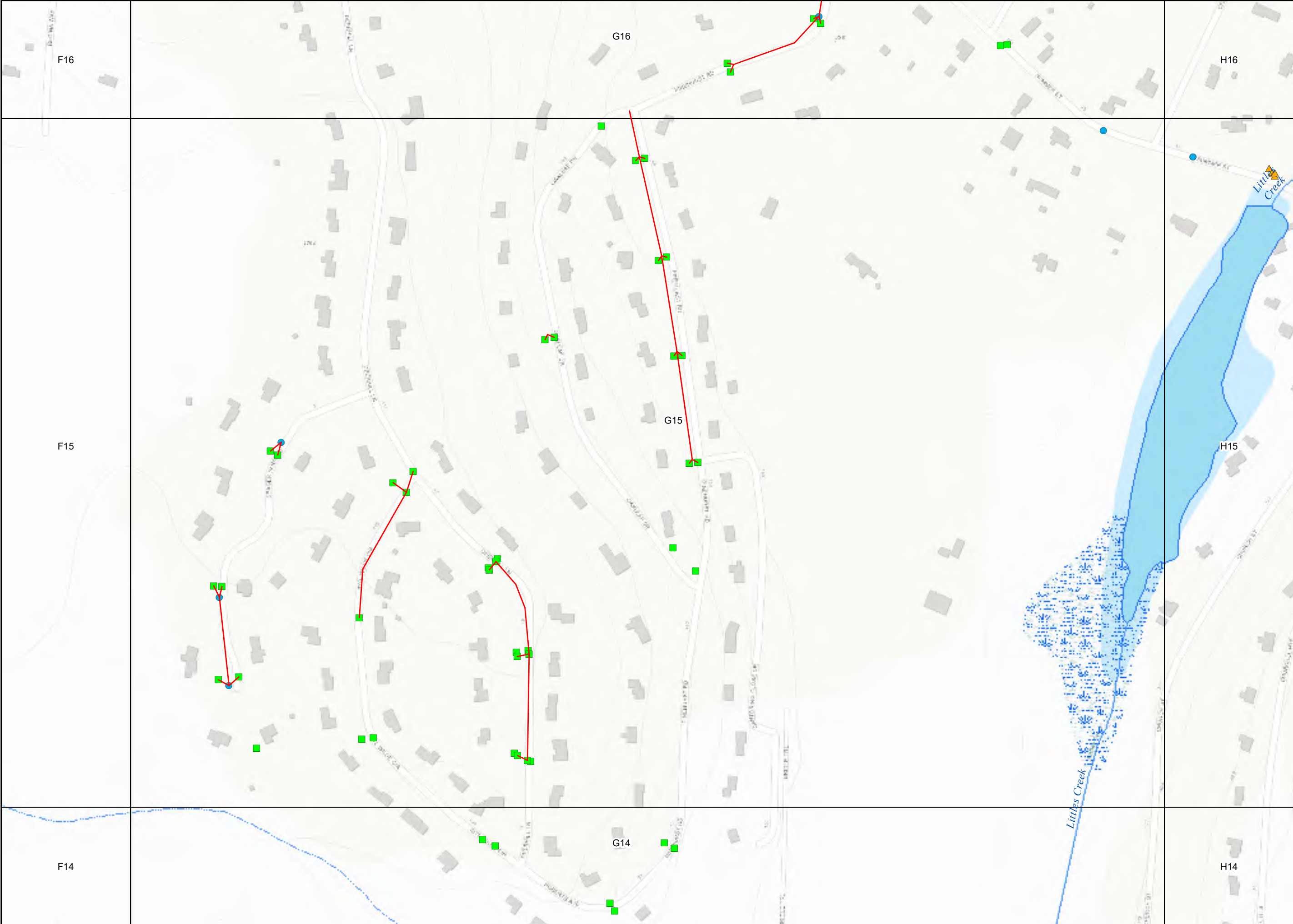
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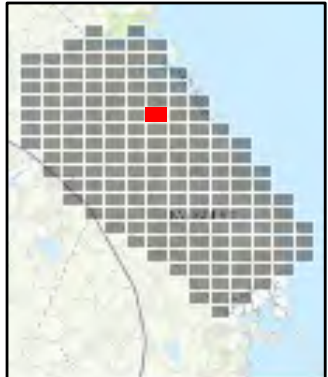


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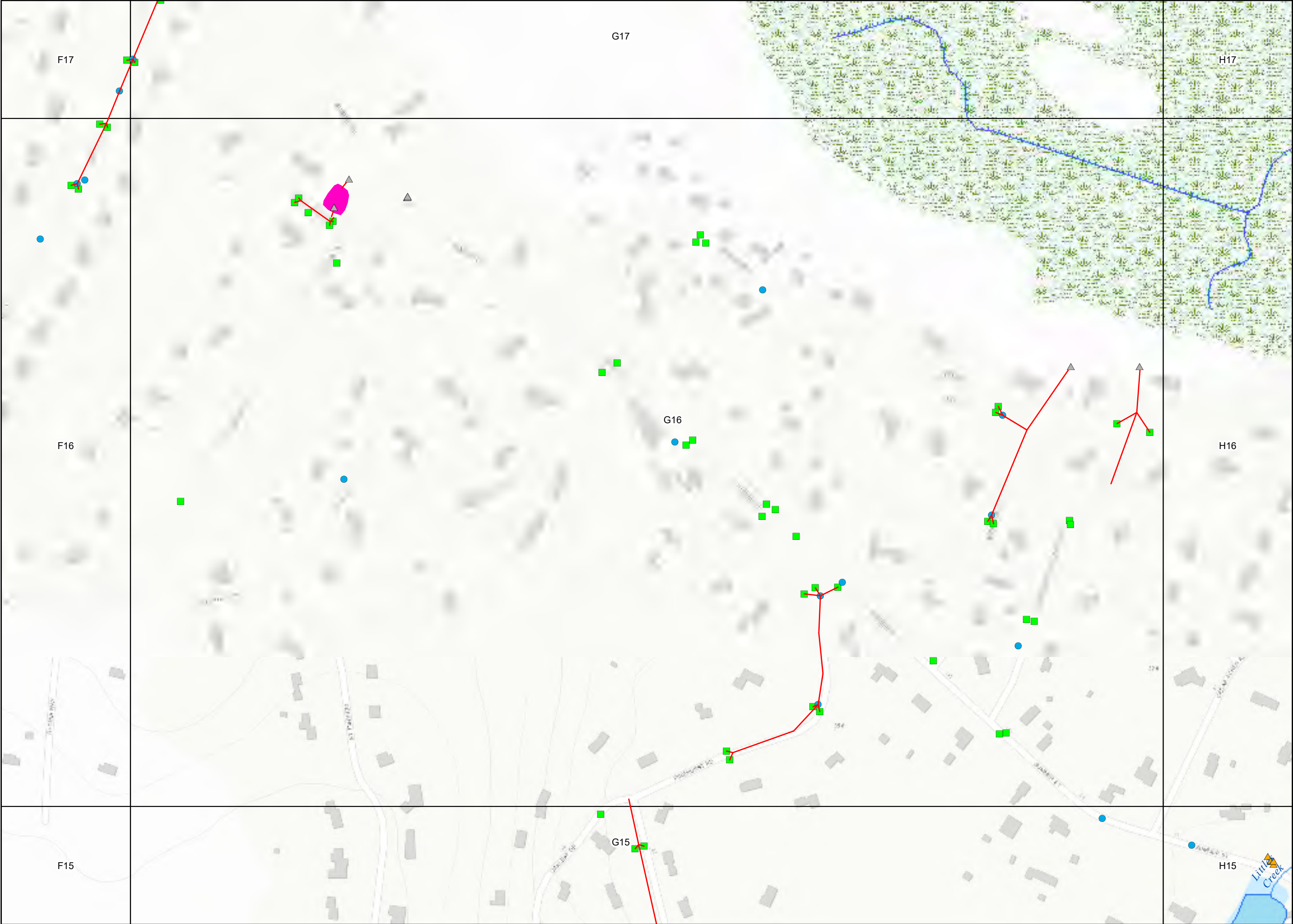
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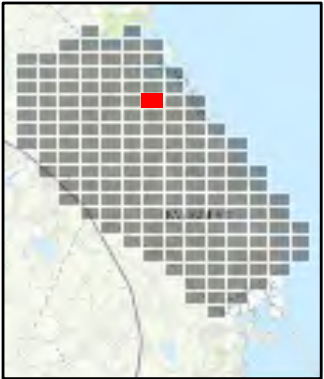




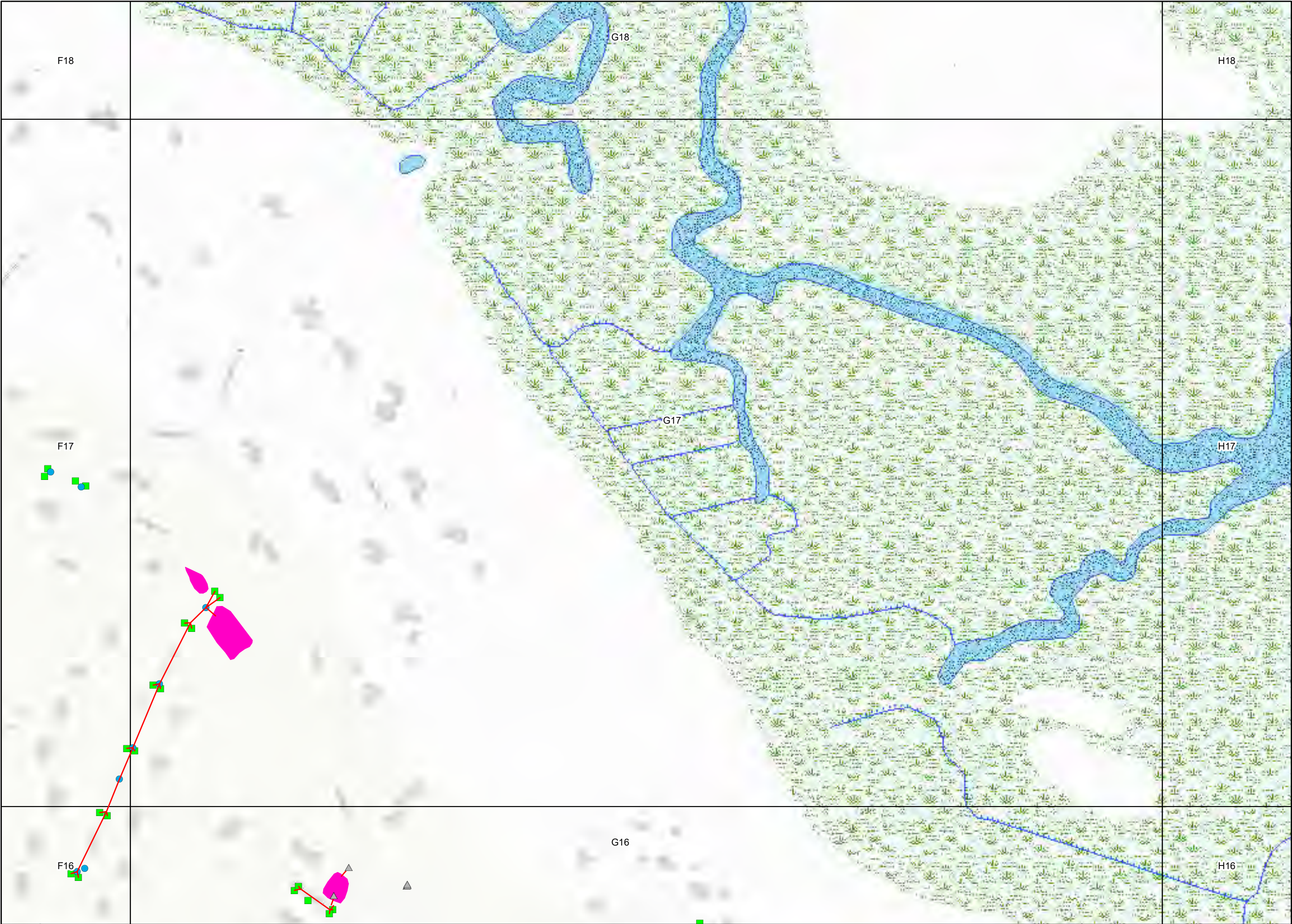


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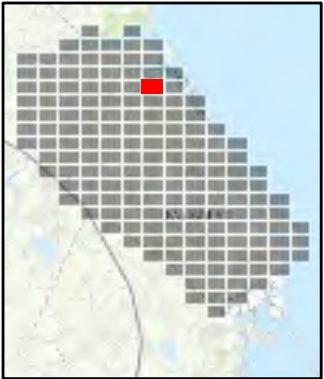


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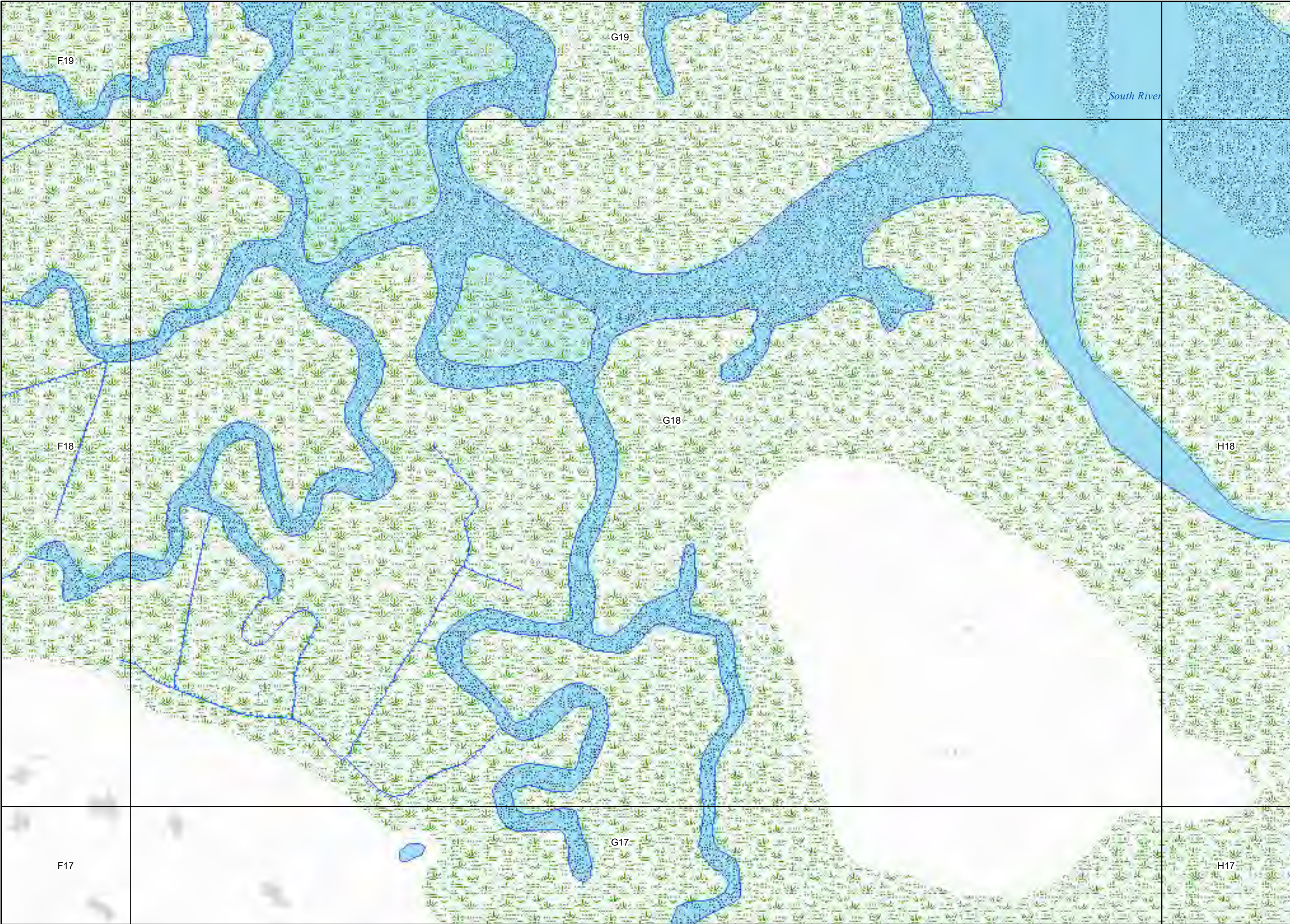
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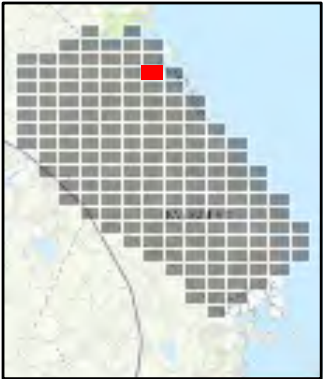






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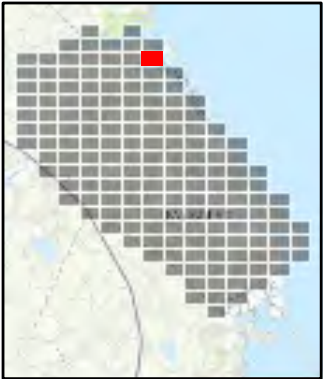


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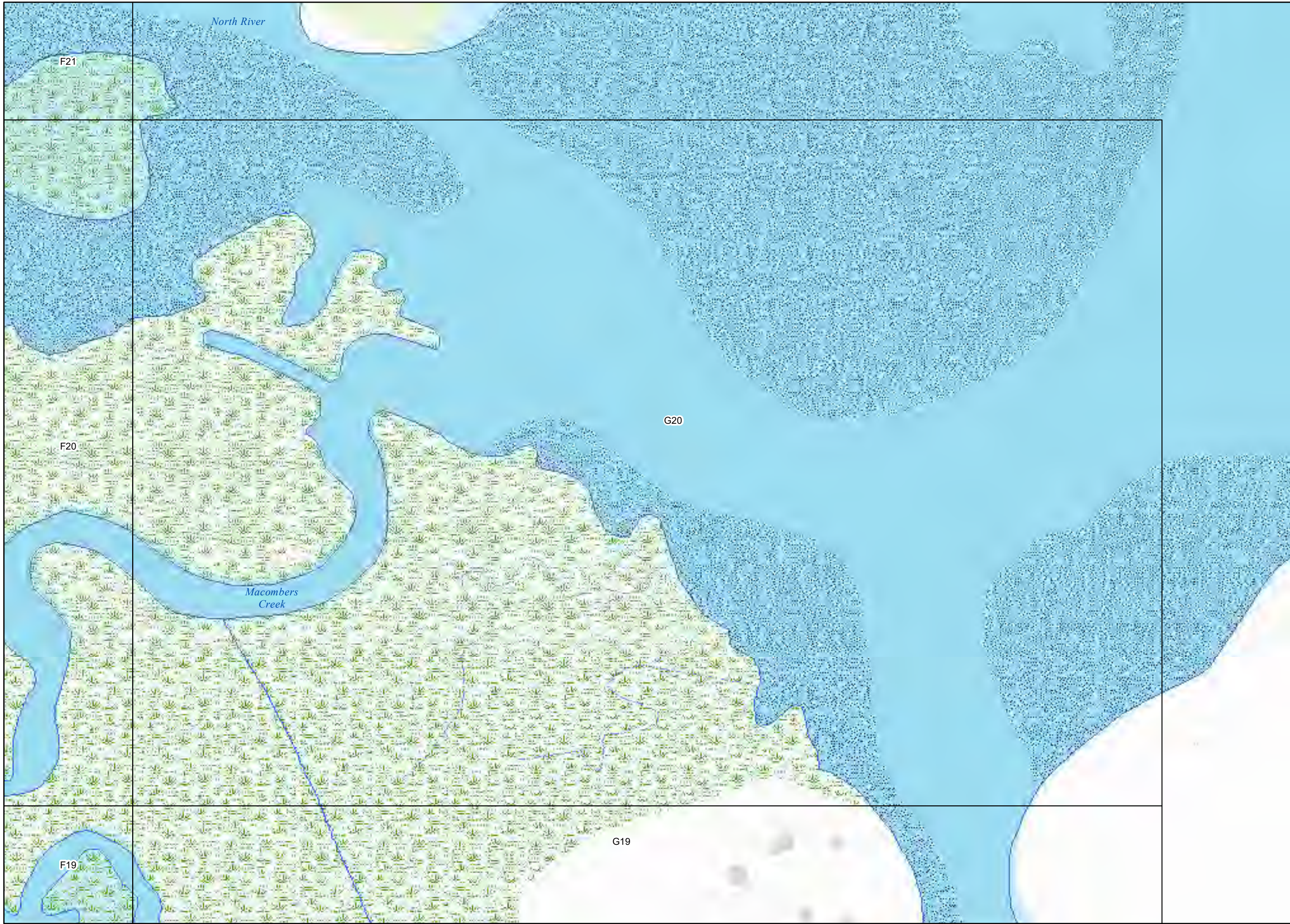
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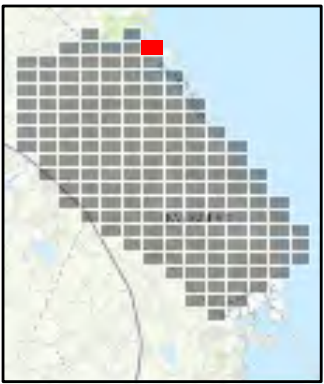
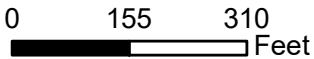






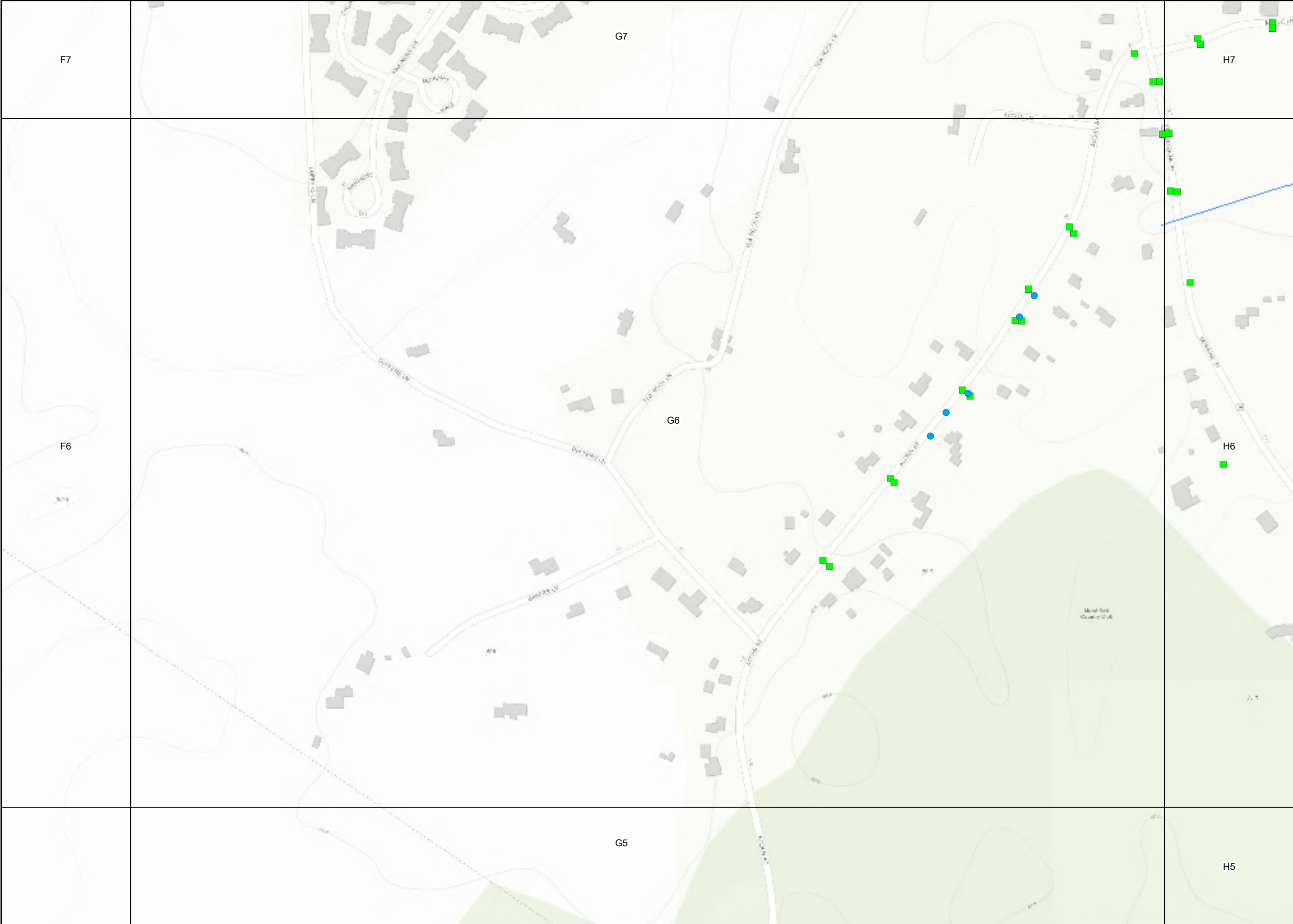
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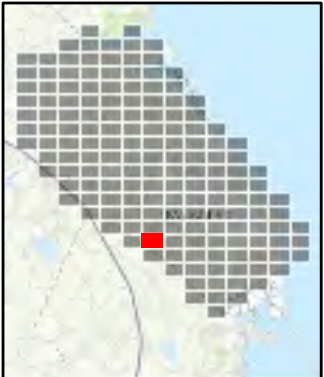
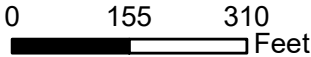




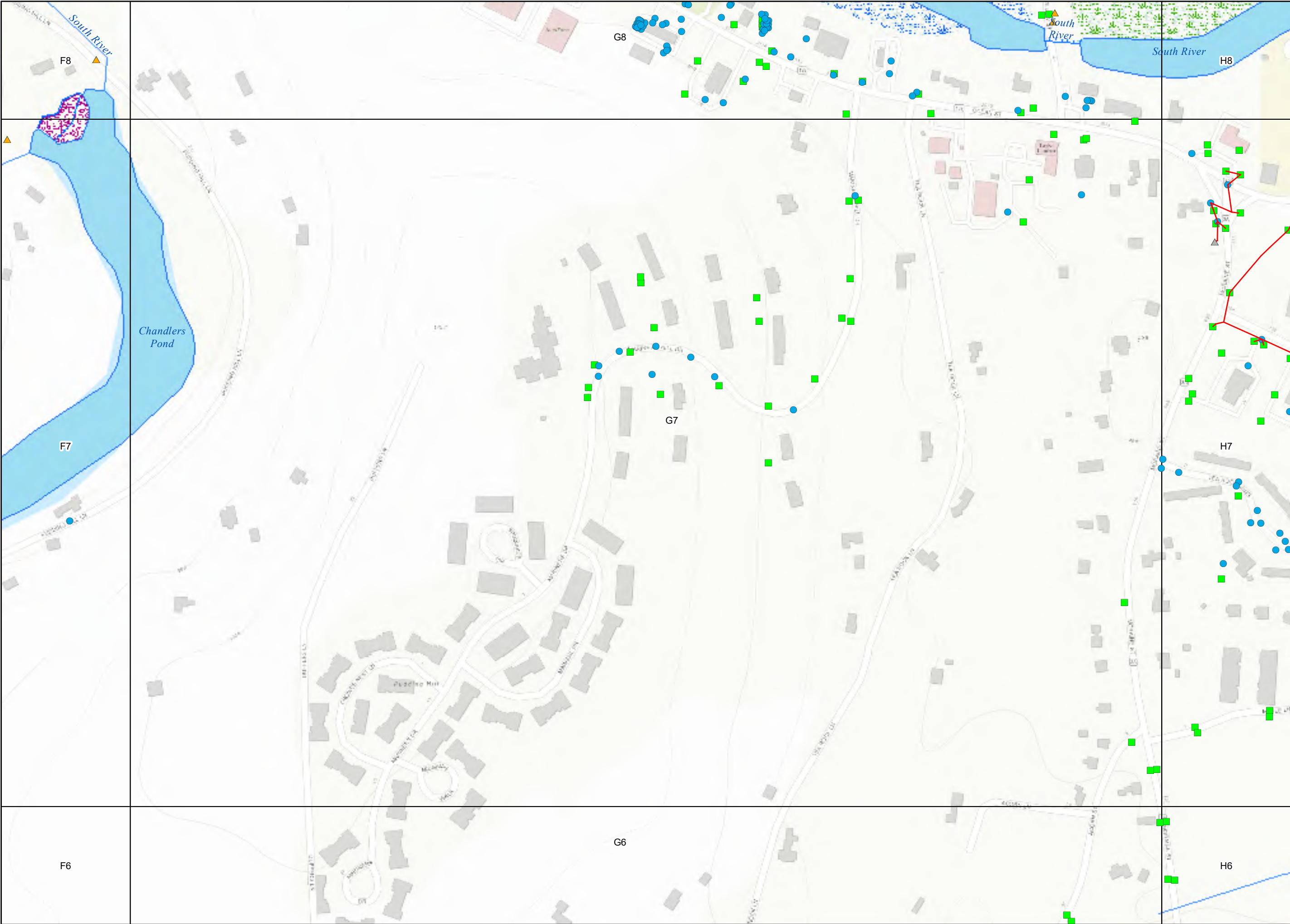


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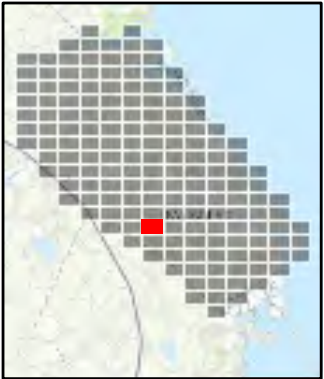




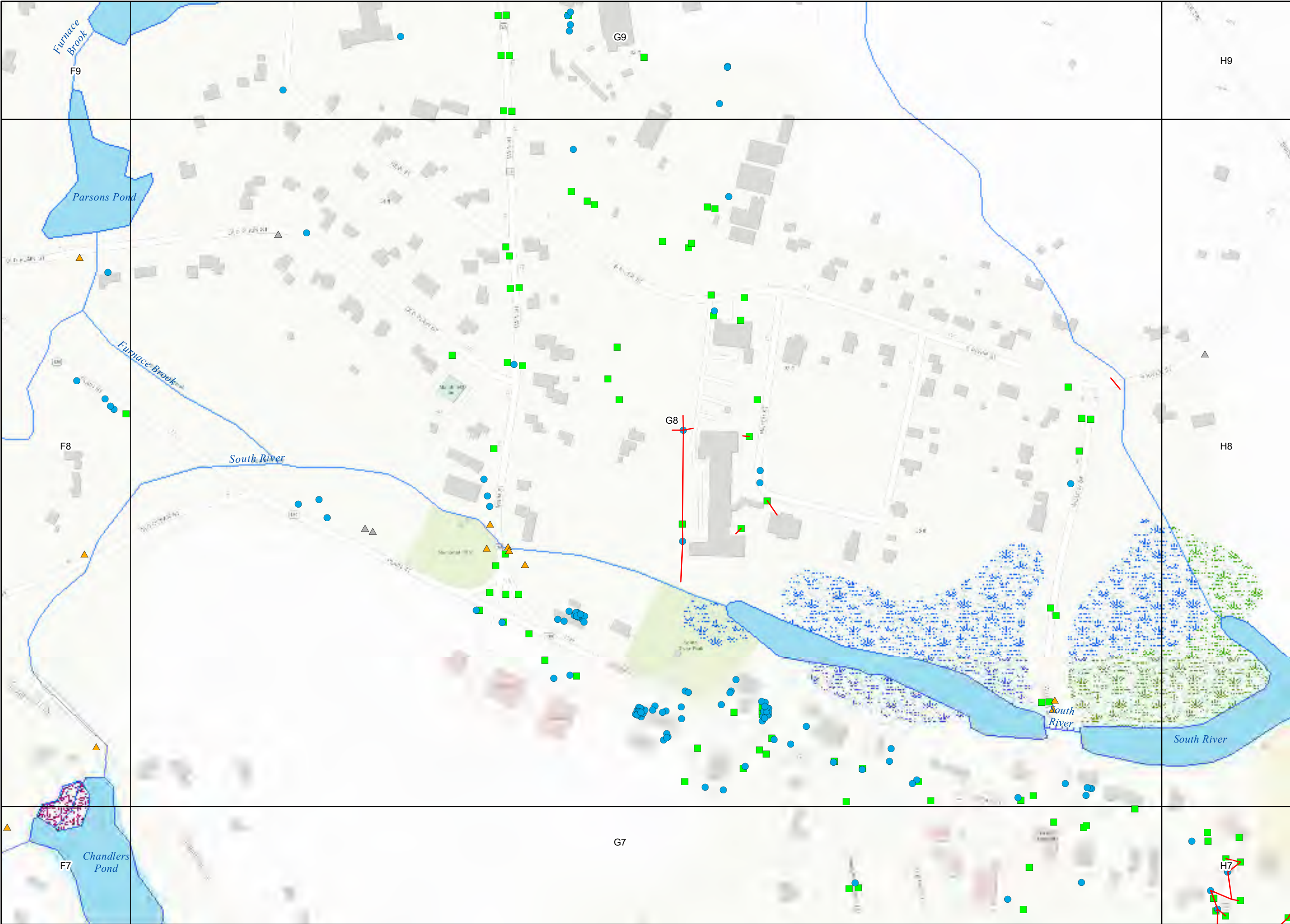


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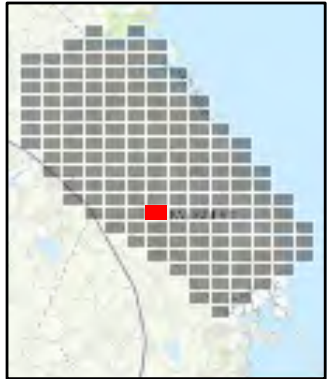
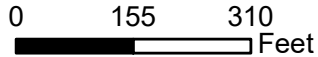




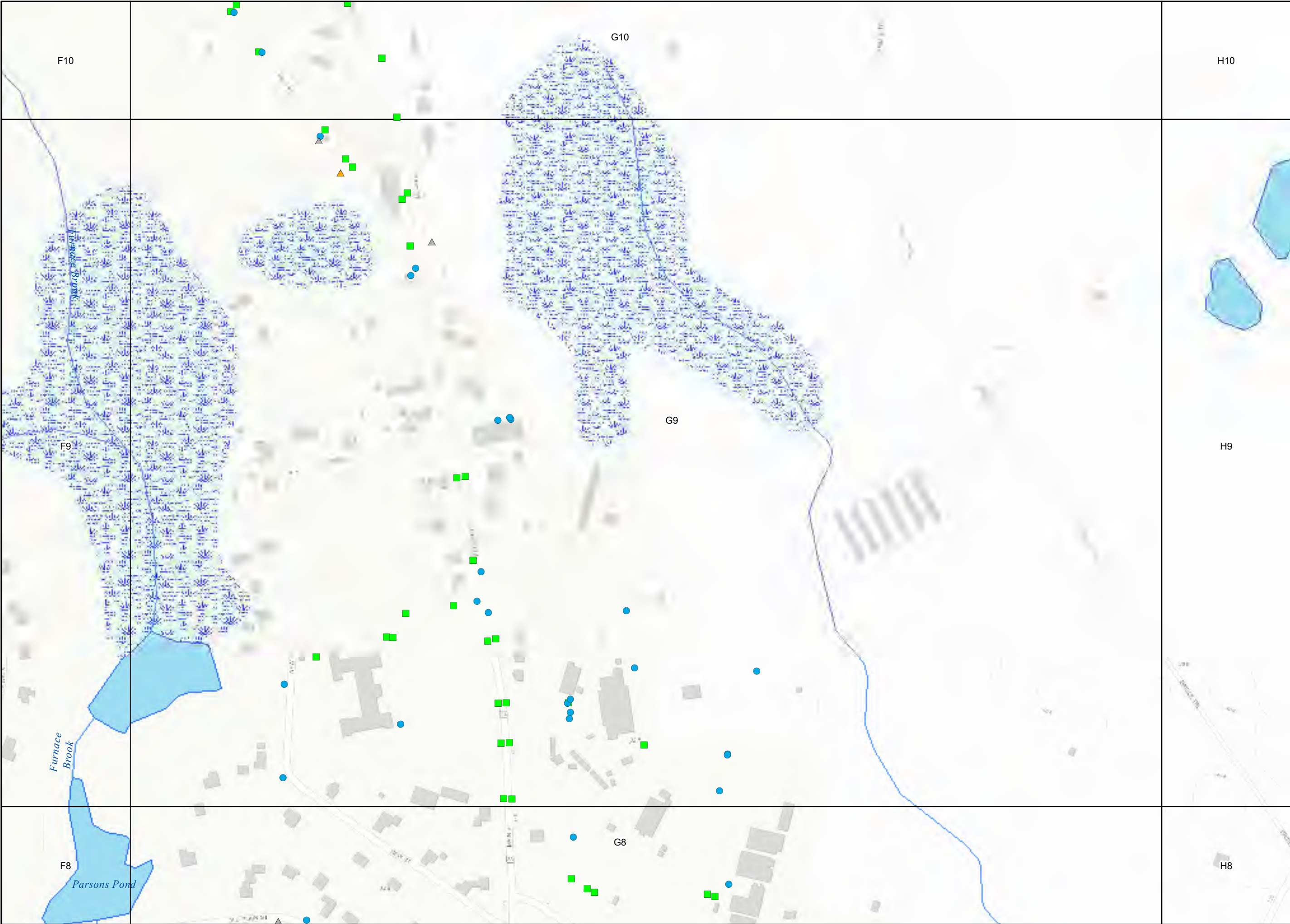


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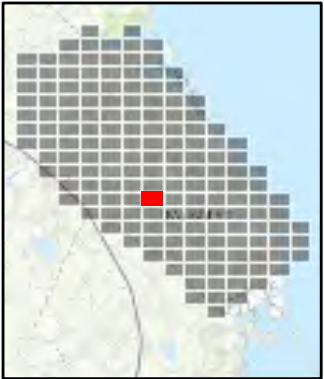


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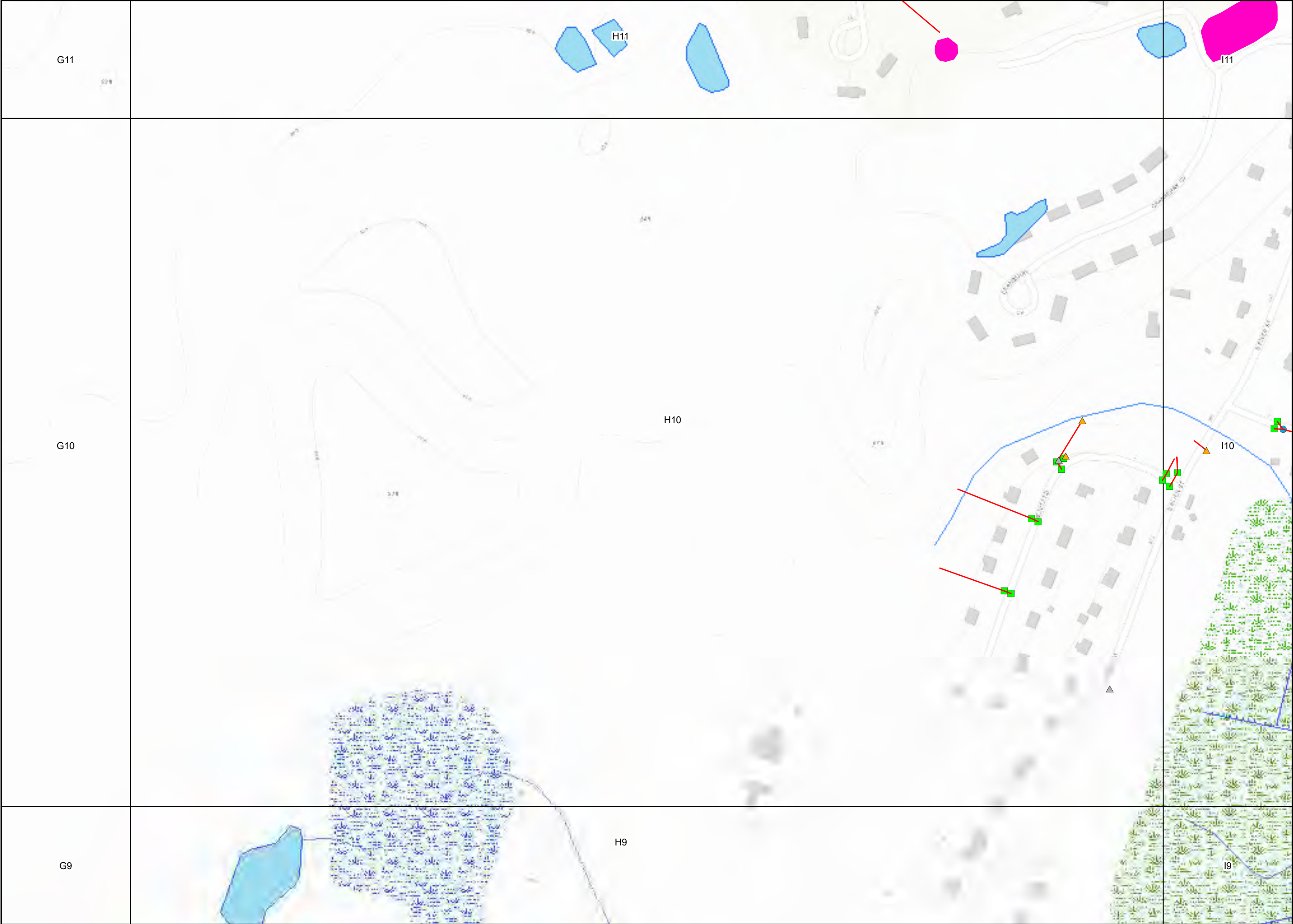
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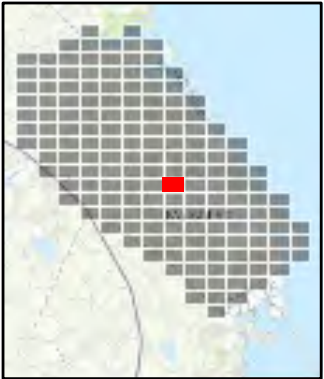


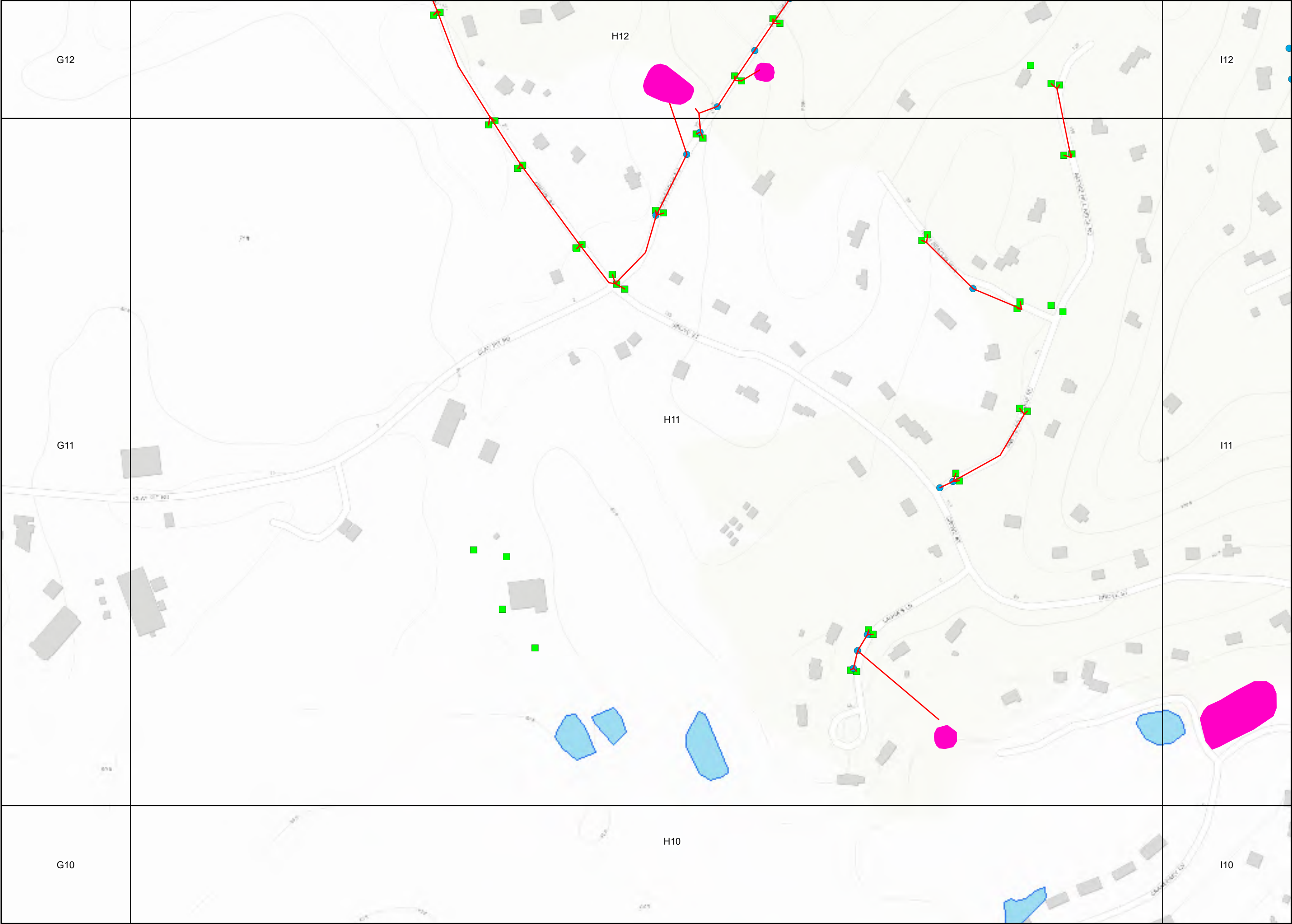




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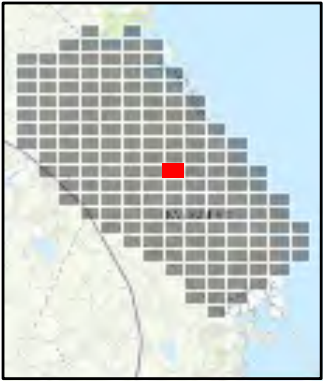
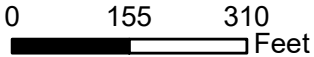
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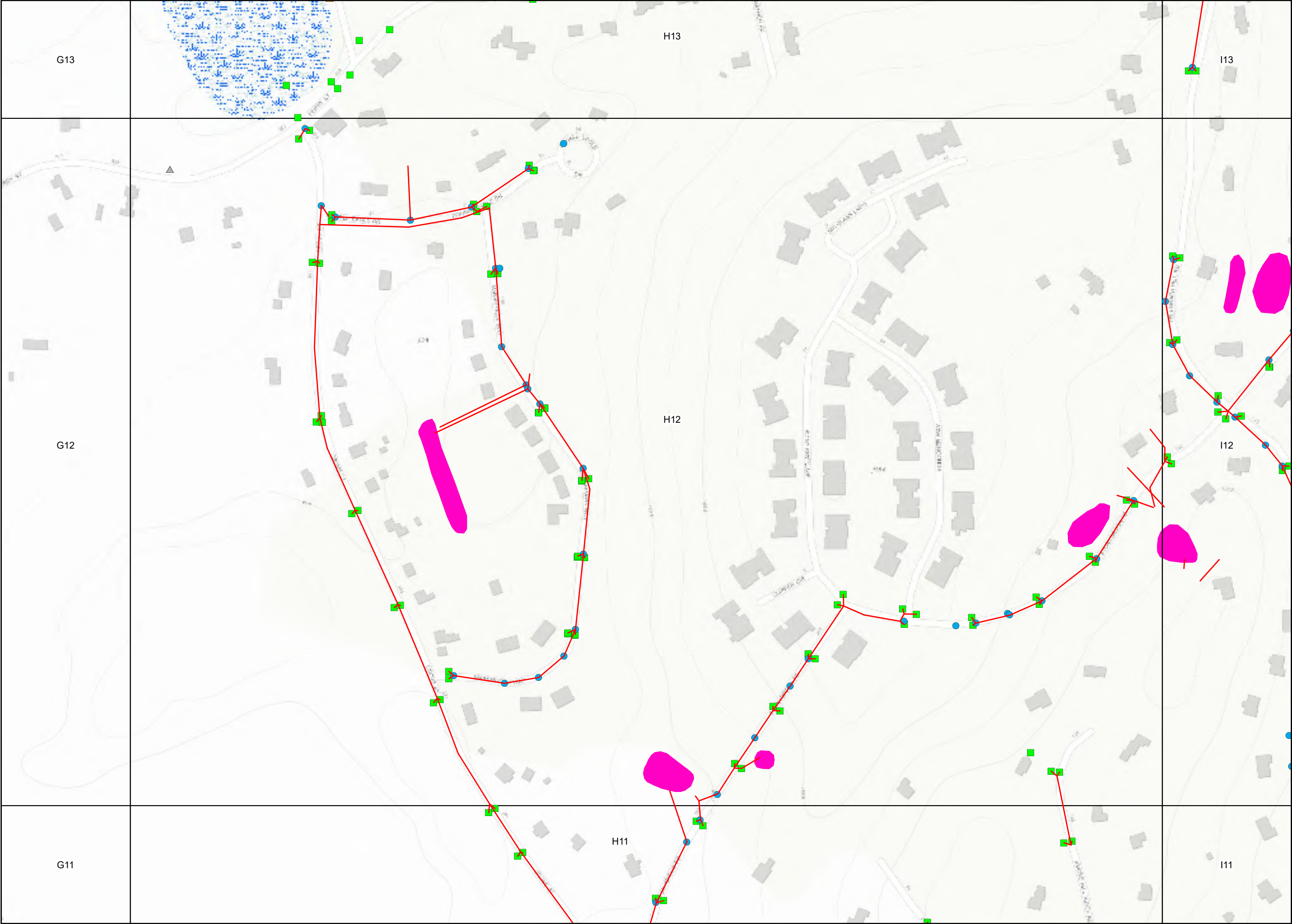


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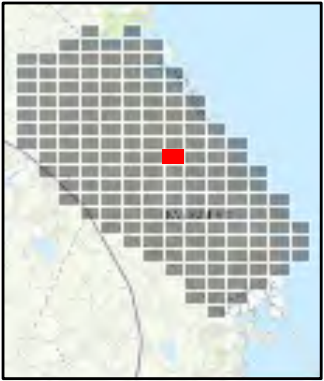


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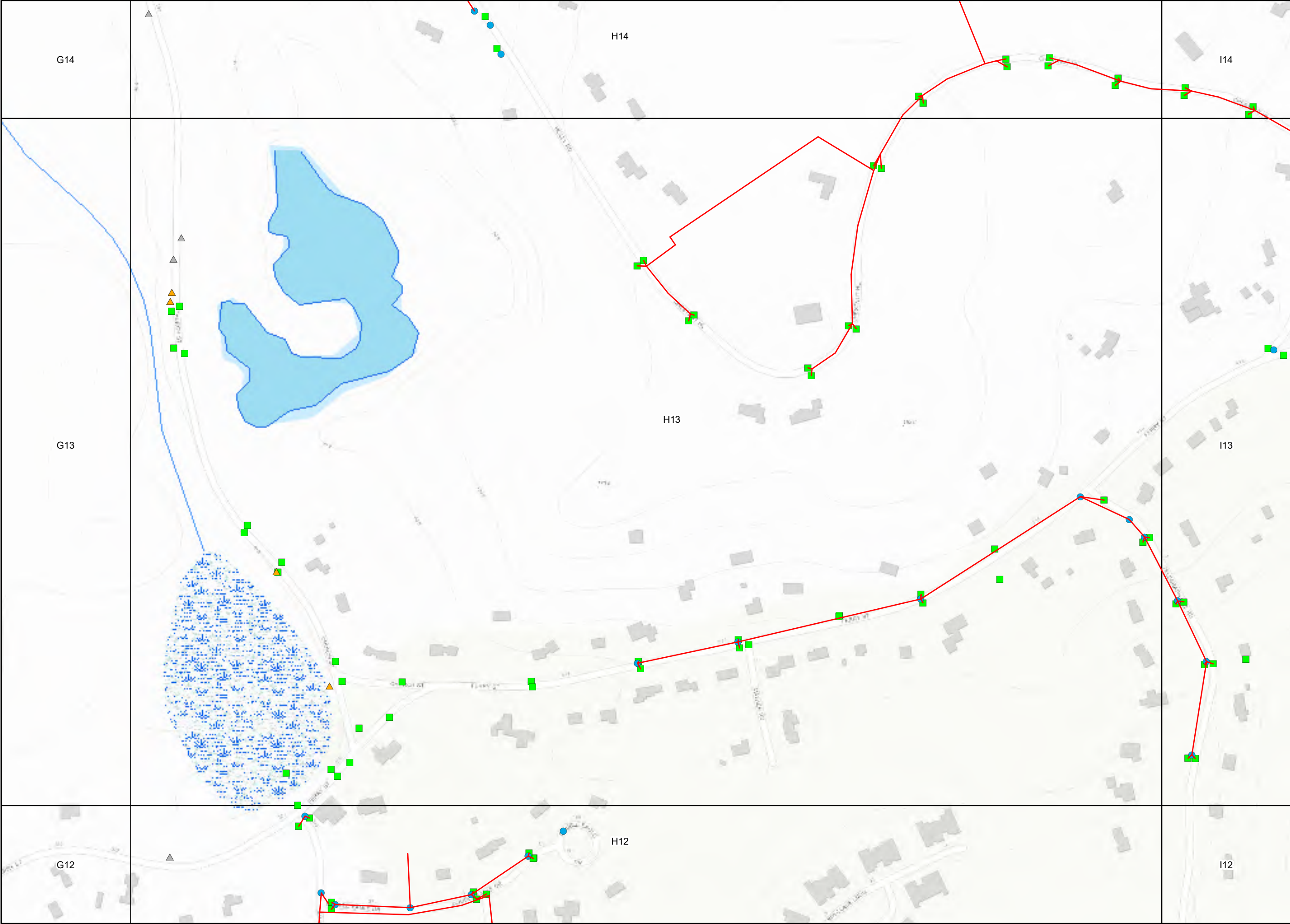
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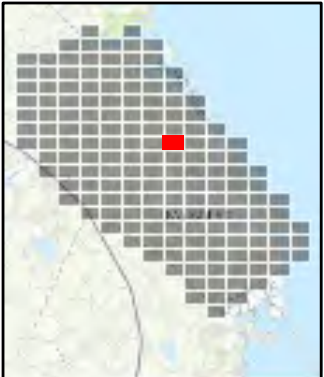


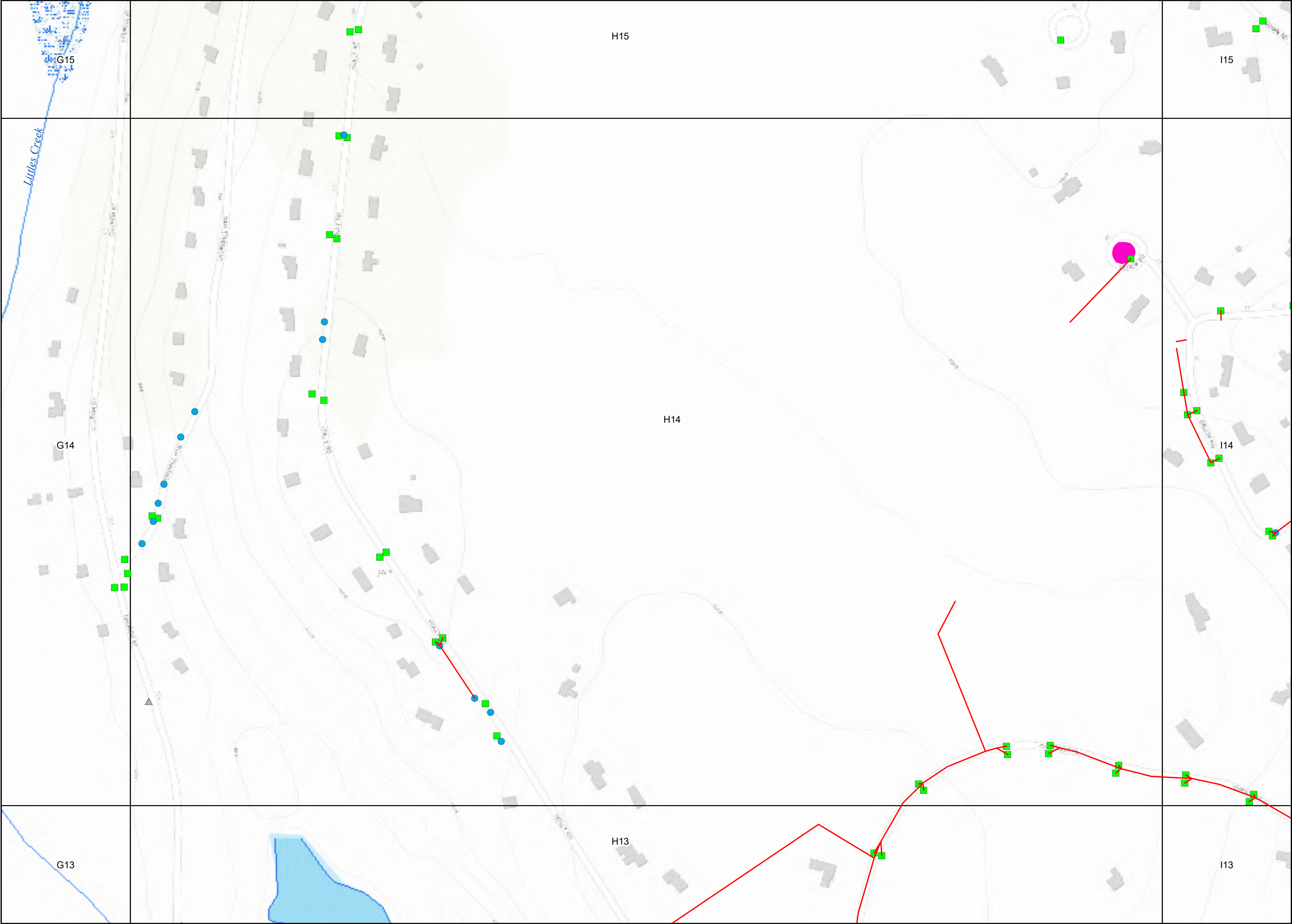
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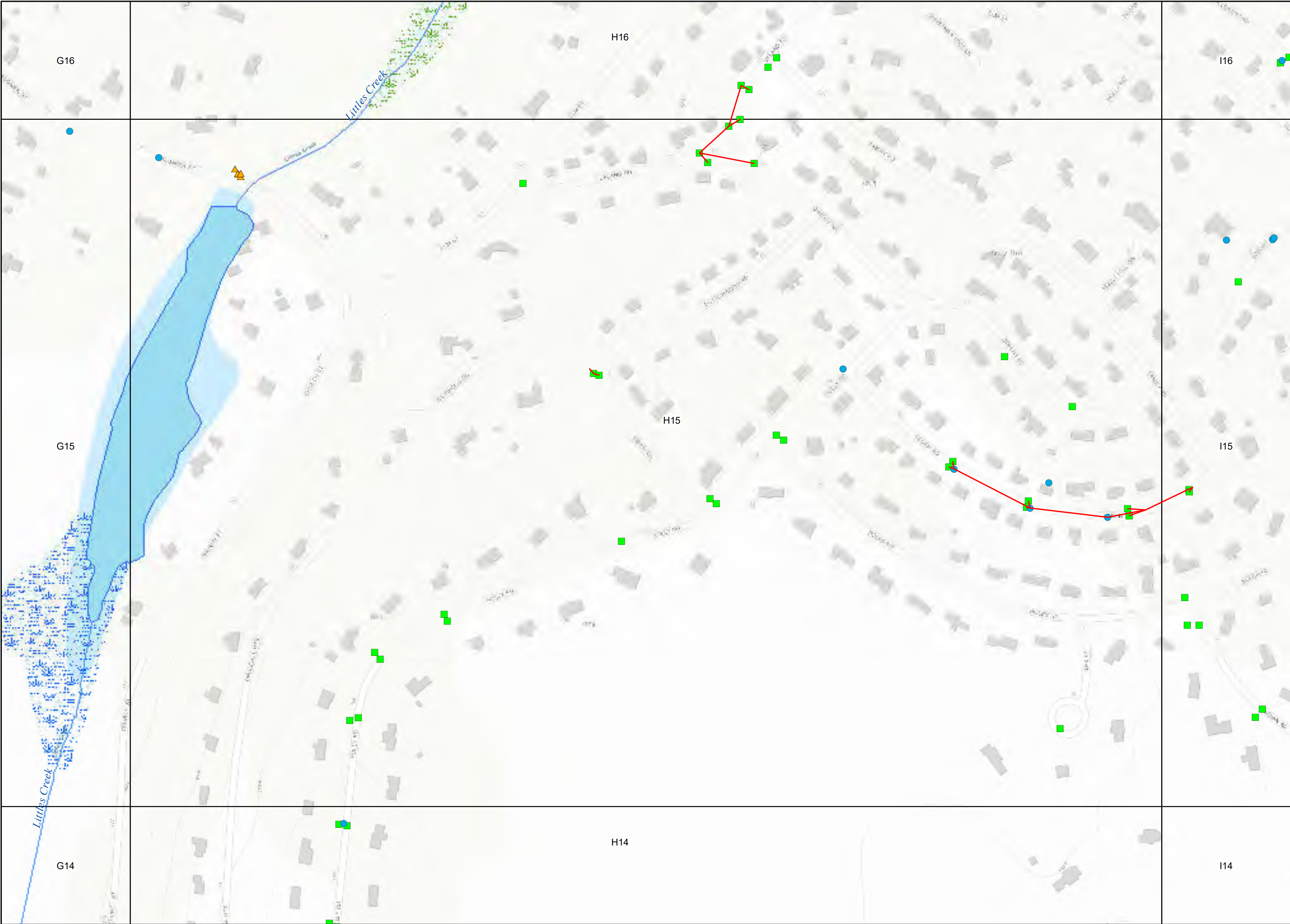
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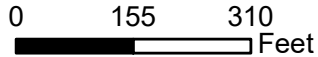
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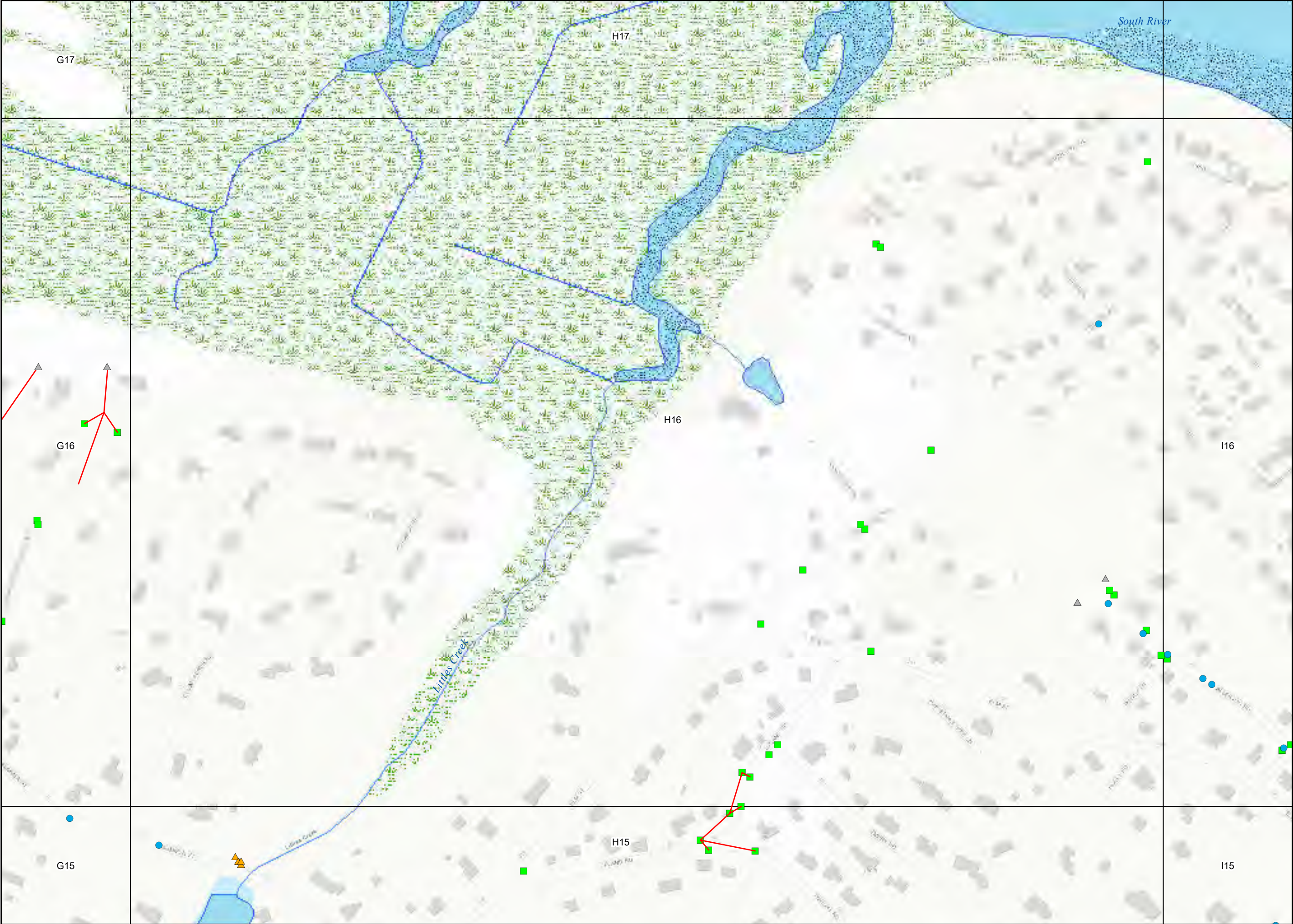


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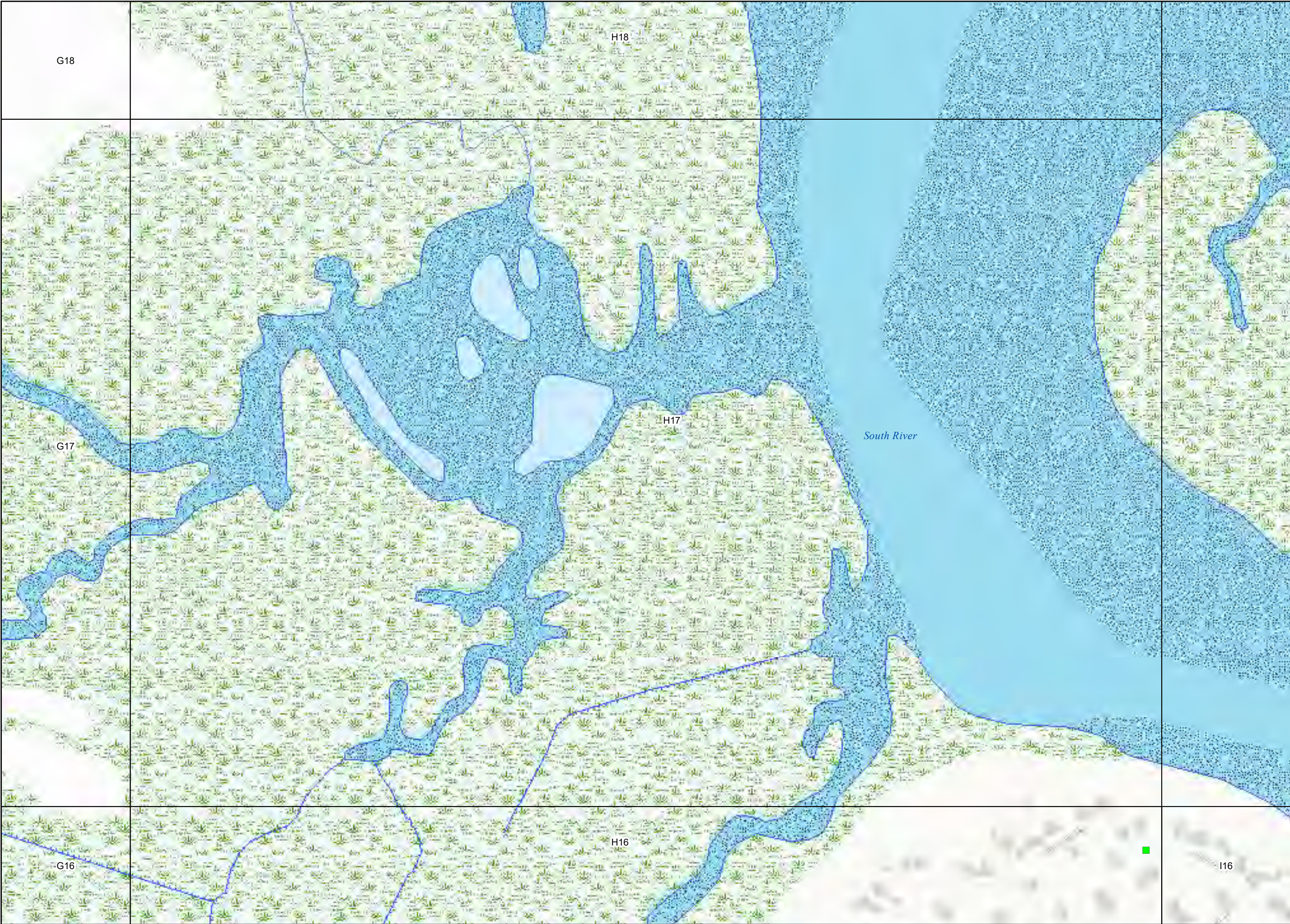


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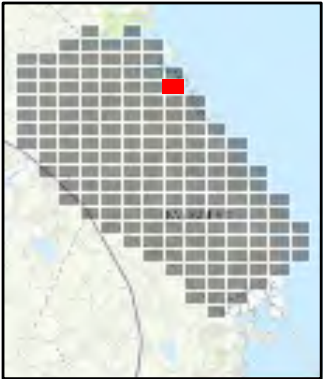


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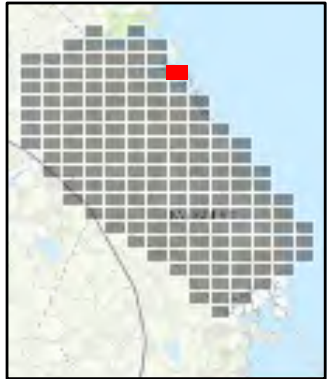


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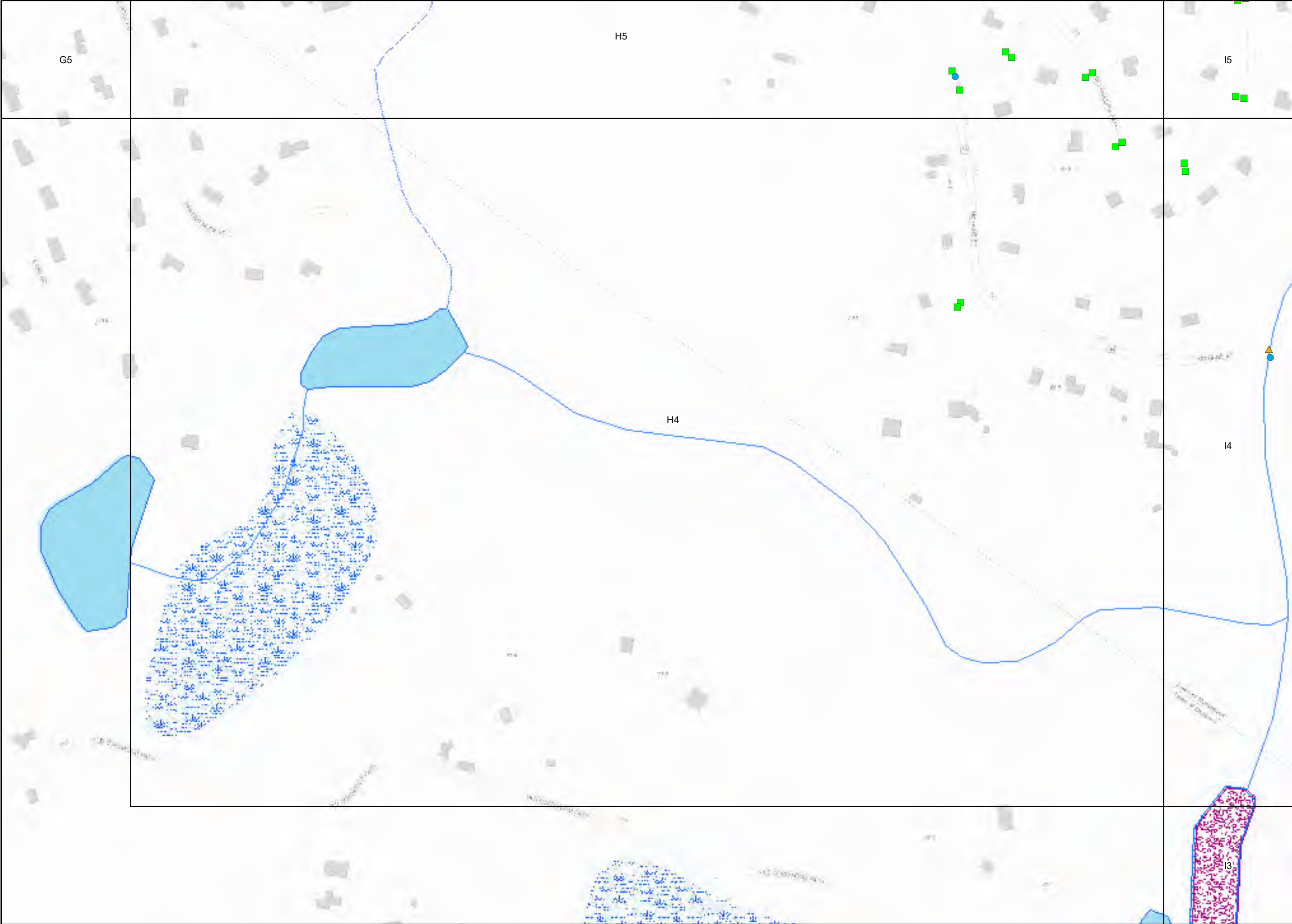
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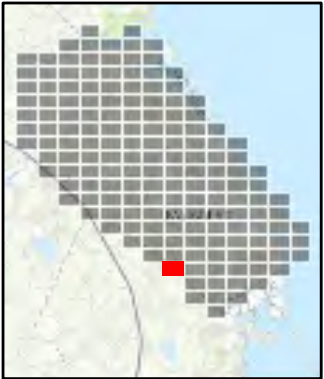




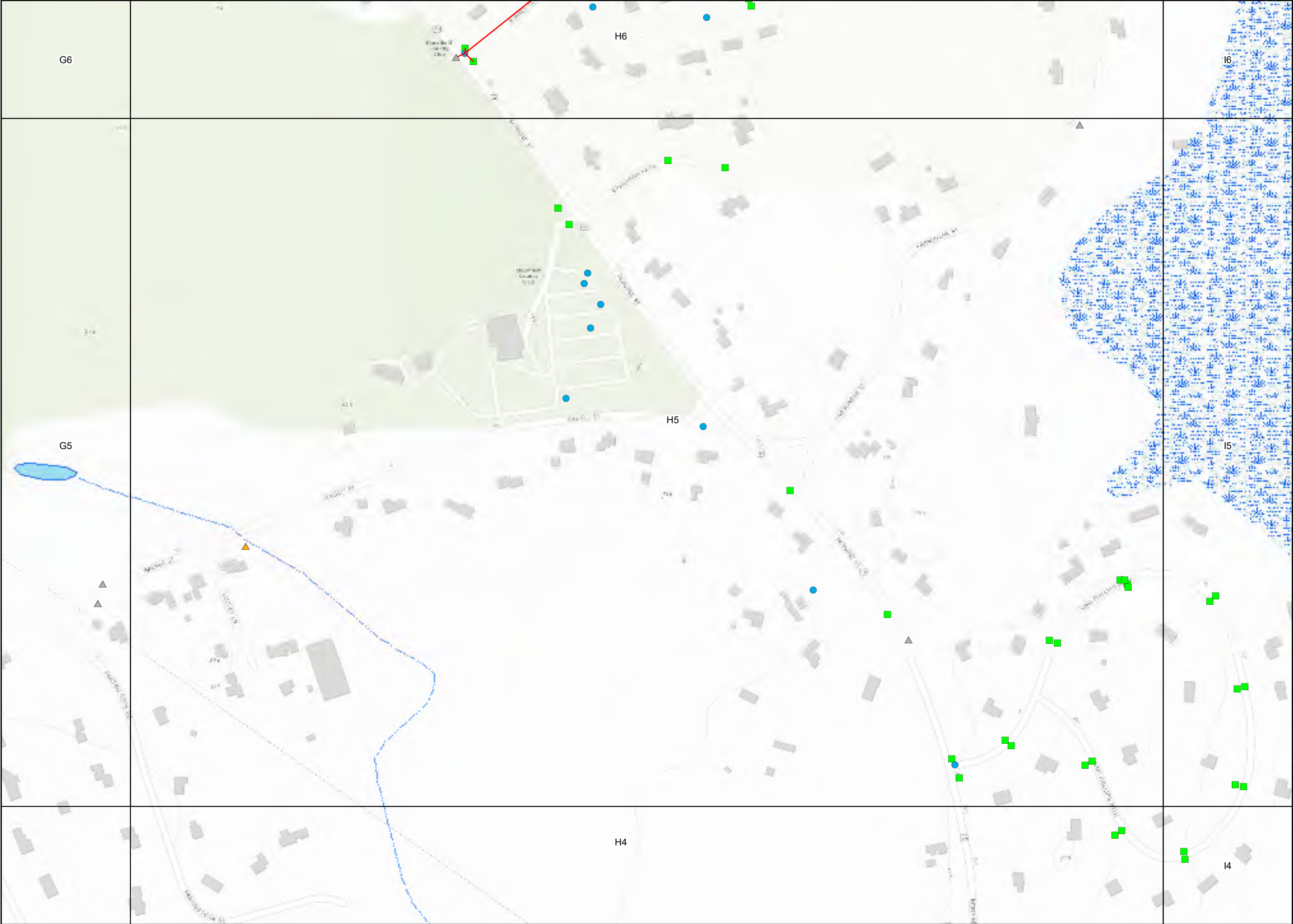


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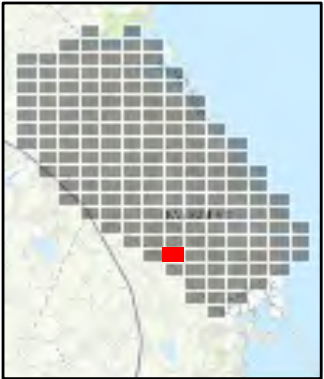


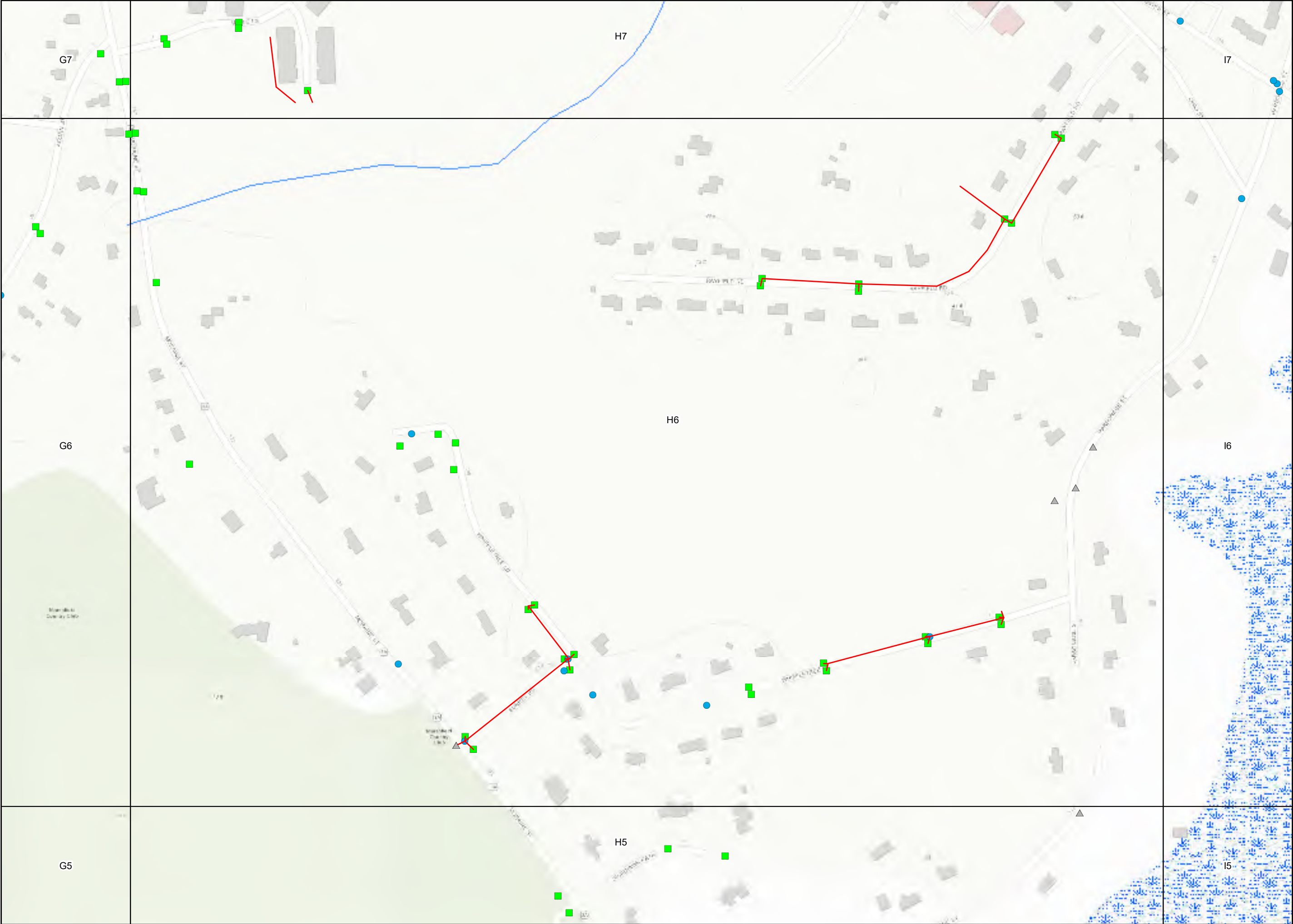
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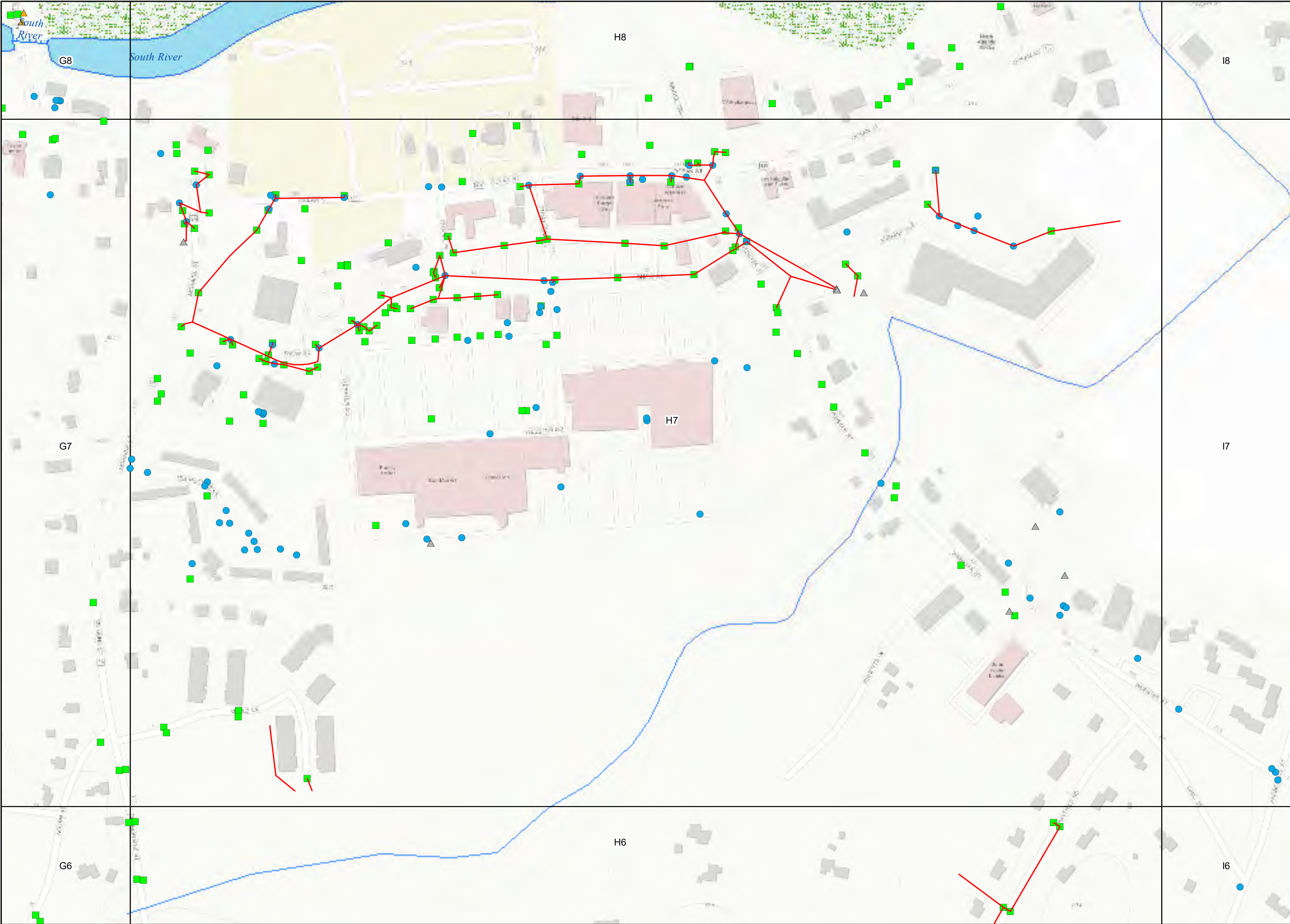
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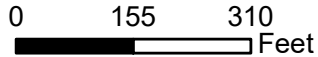




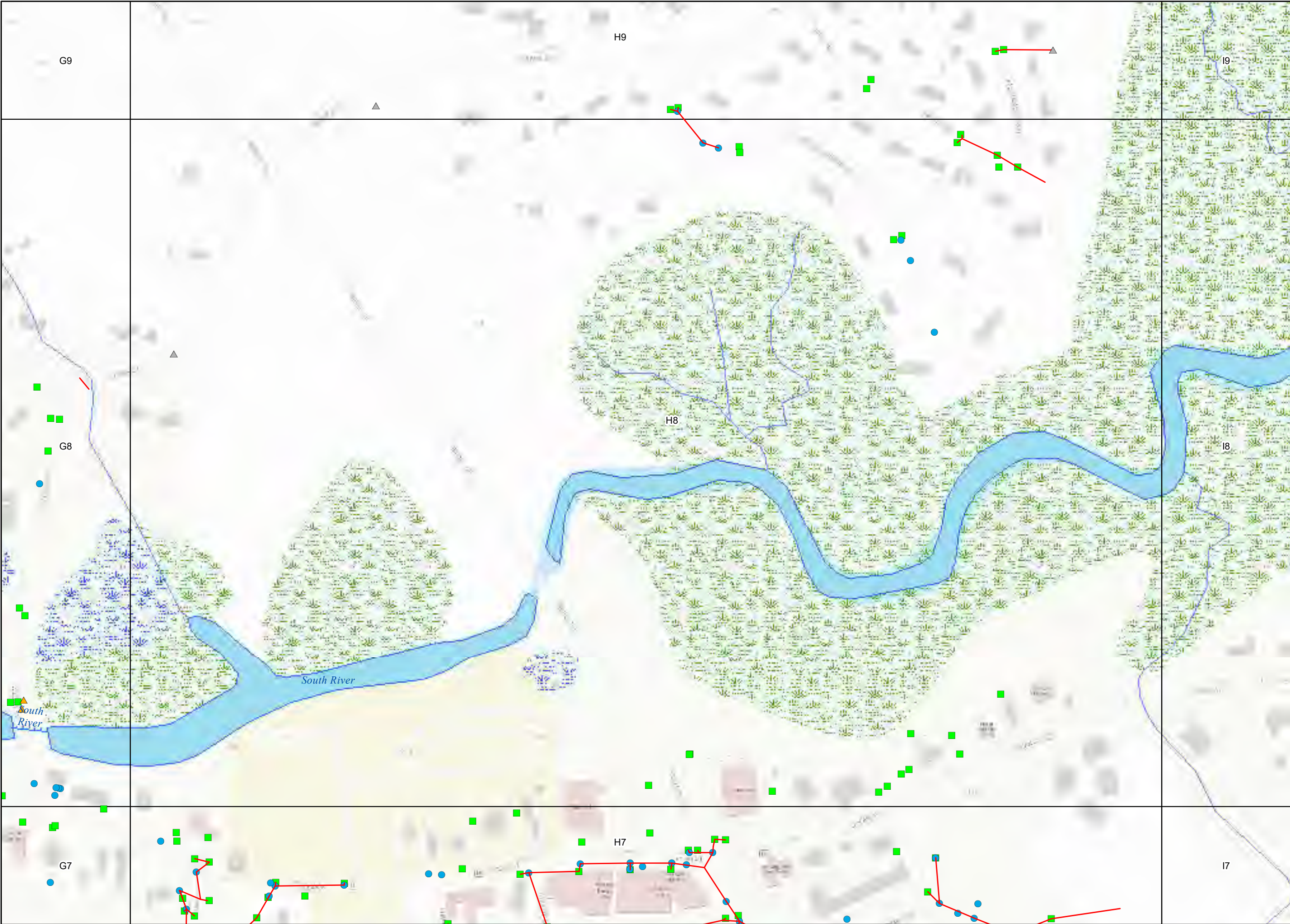


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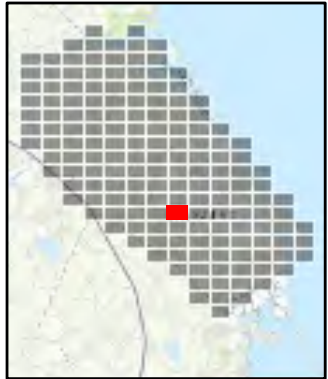
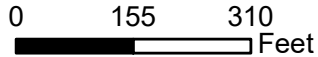




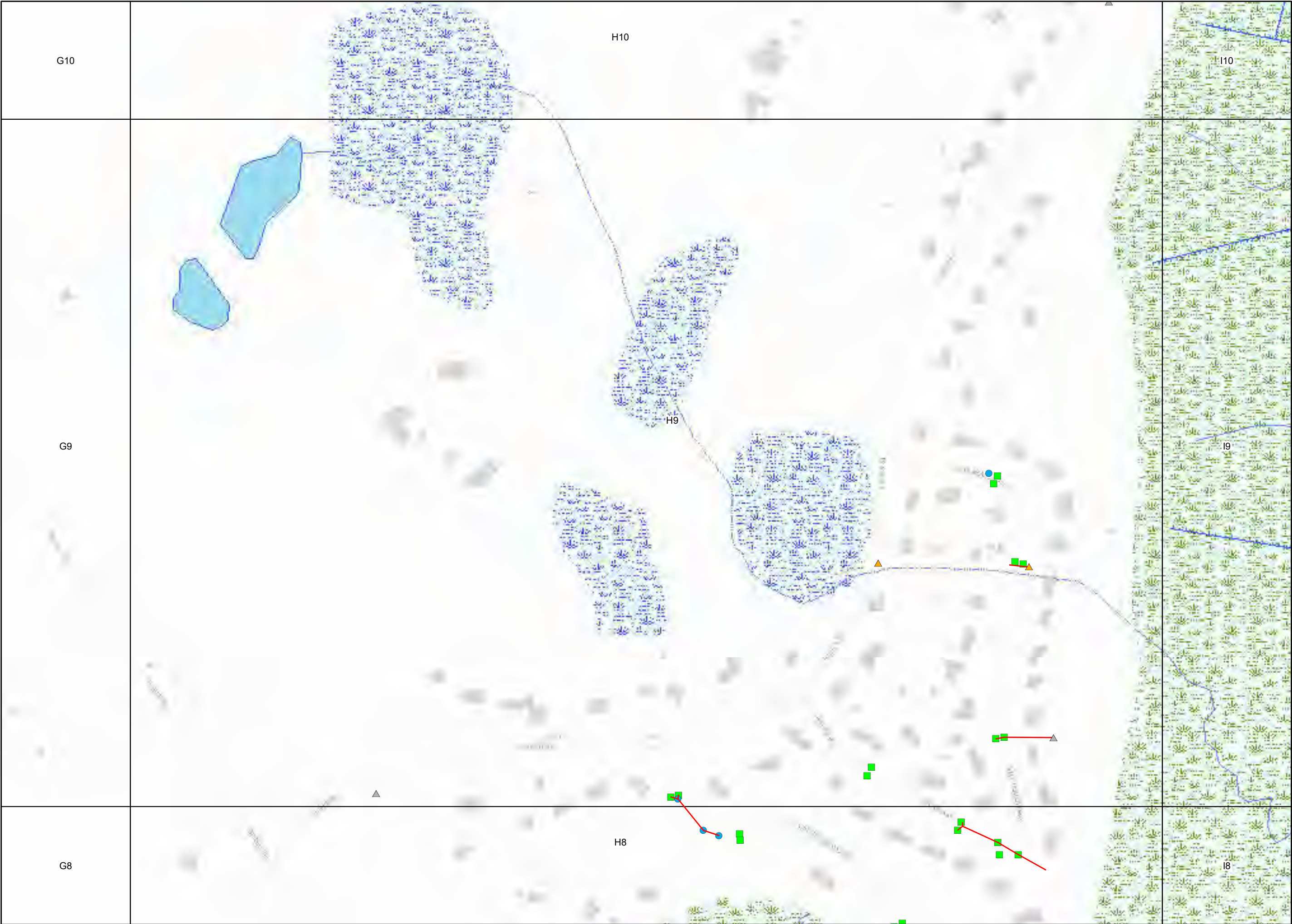


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- Detention Ponds (64)

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Marshfield, Massachusetts  
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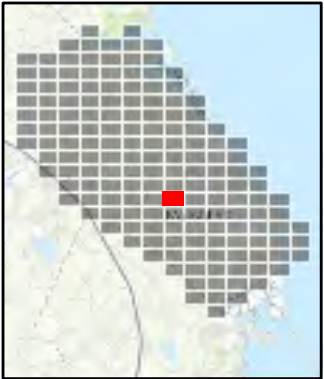




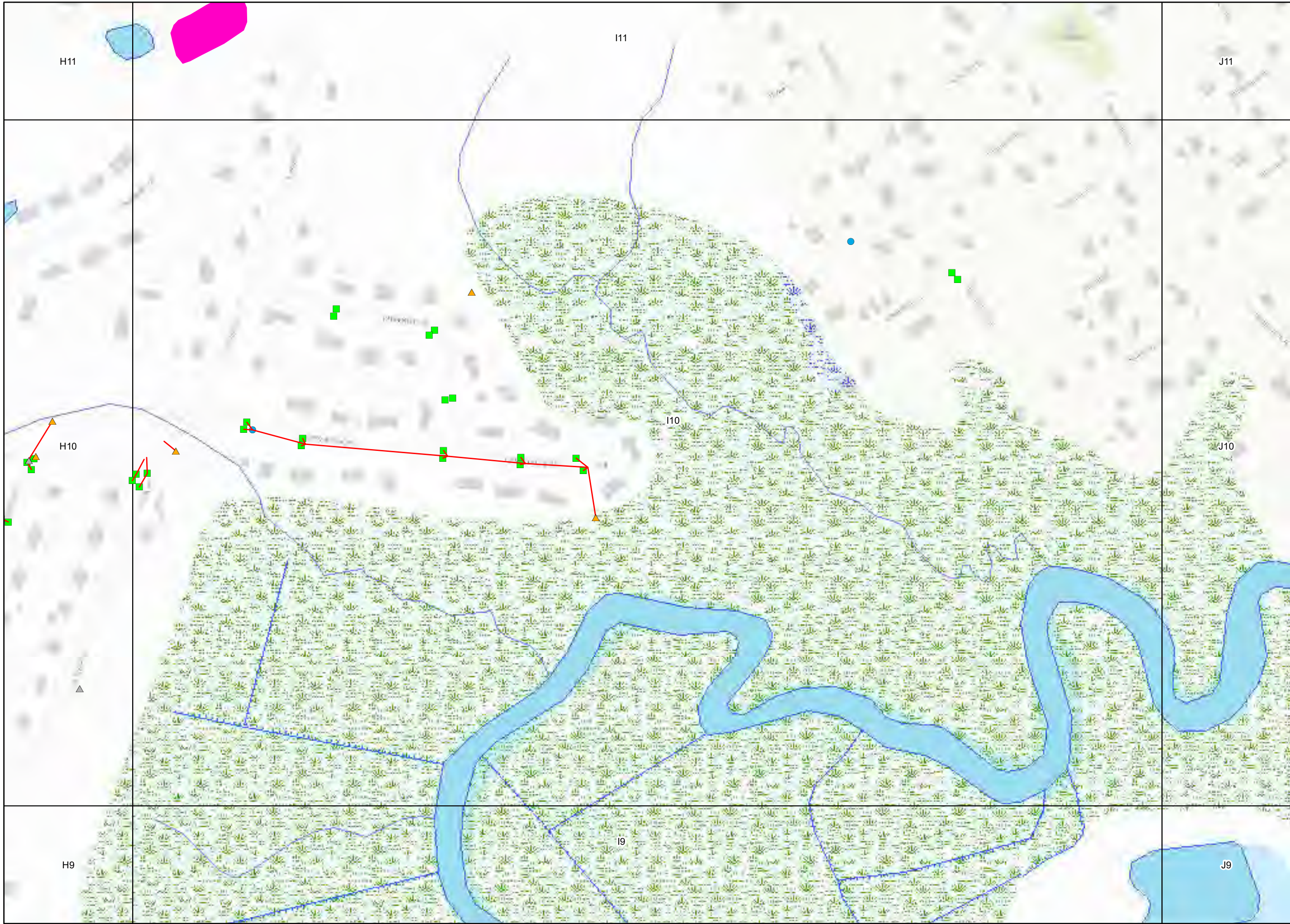


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Marshfield, Massachusetts  
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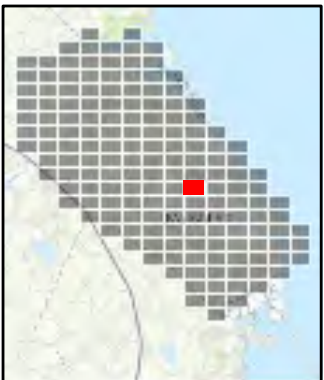
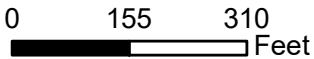




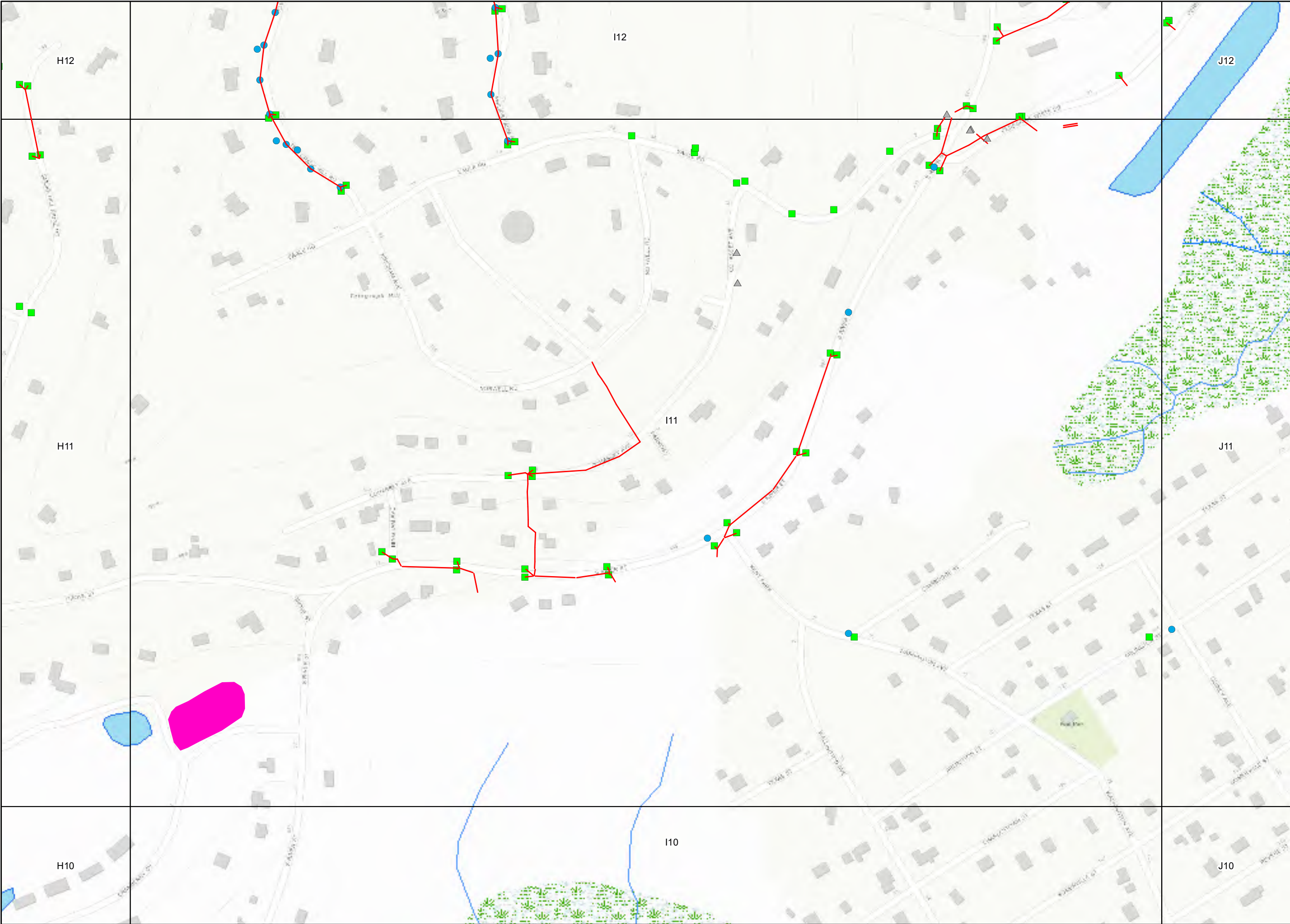


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Marshfield, Massachusetts  
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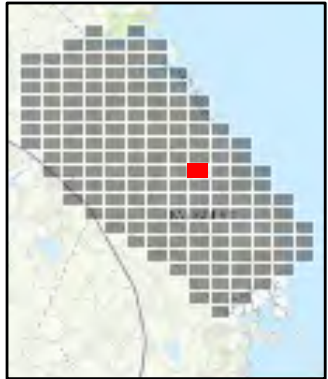
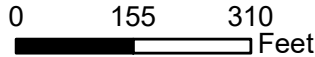




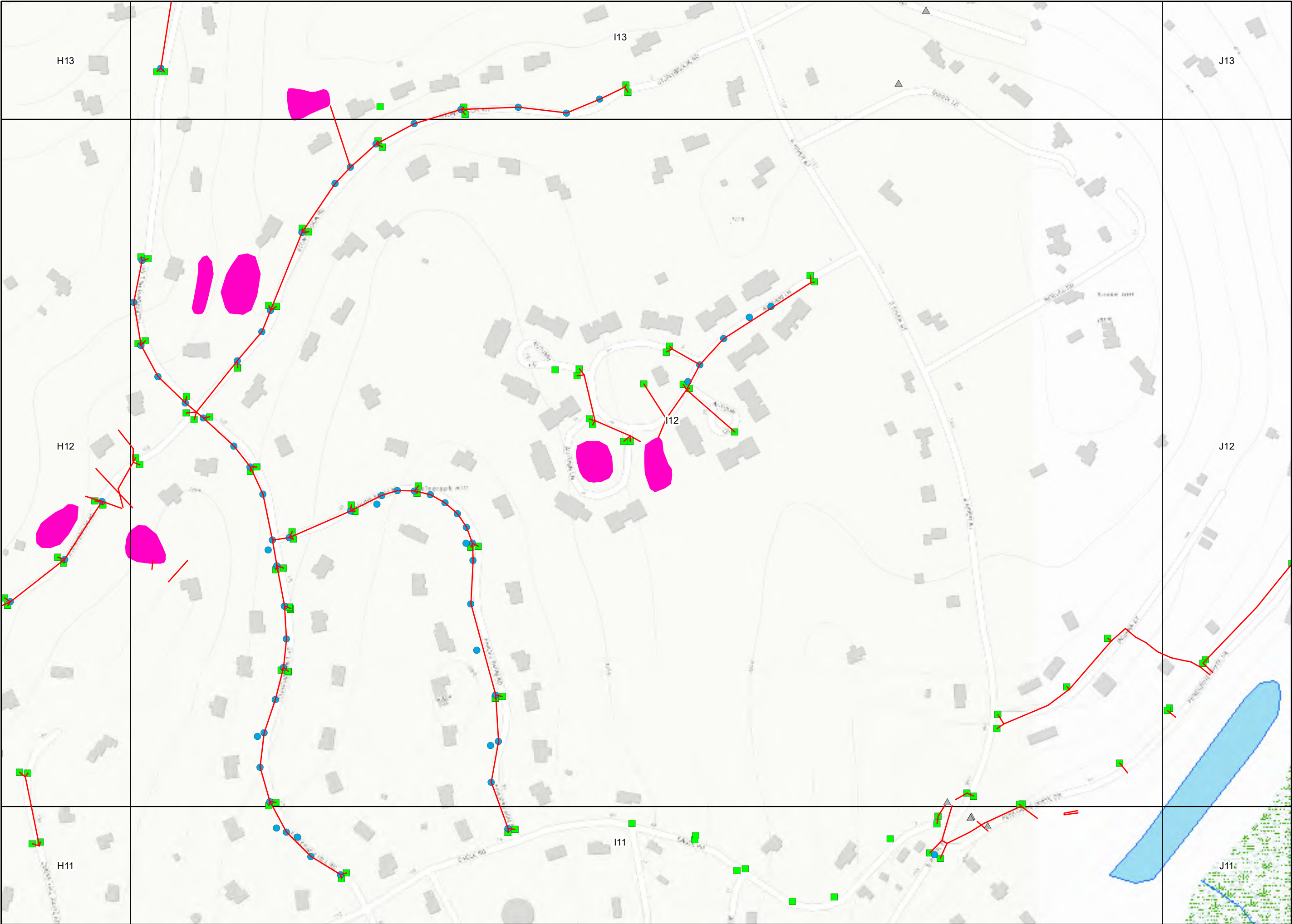


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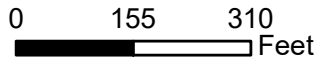




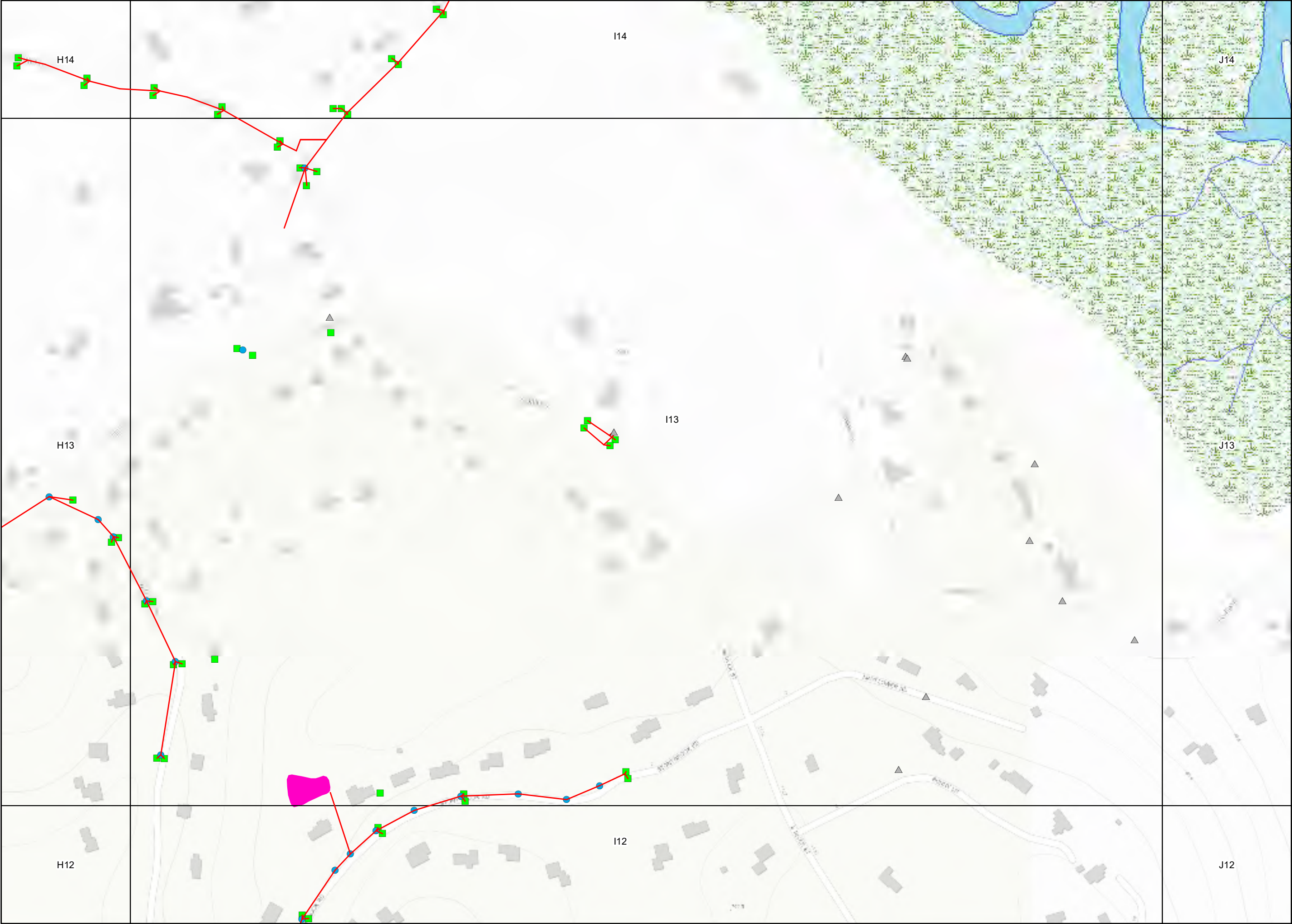


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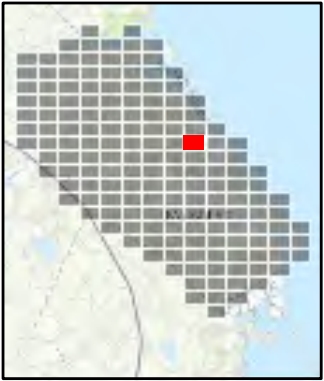


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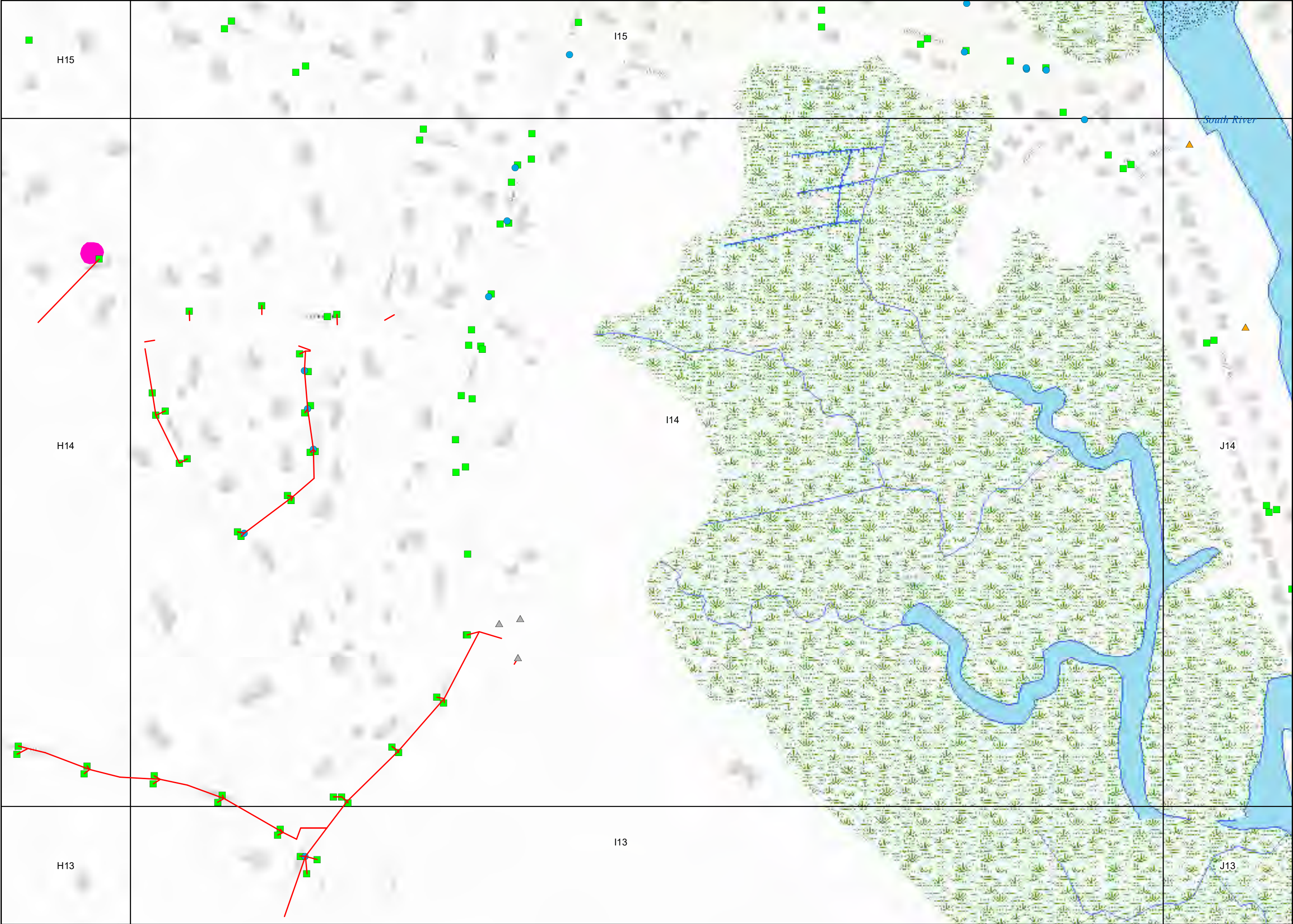
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Marshfield, Massachusetts  
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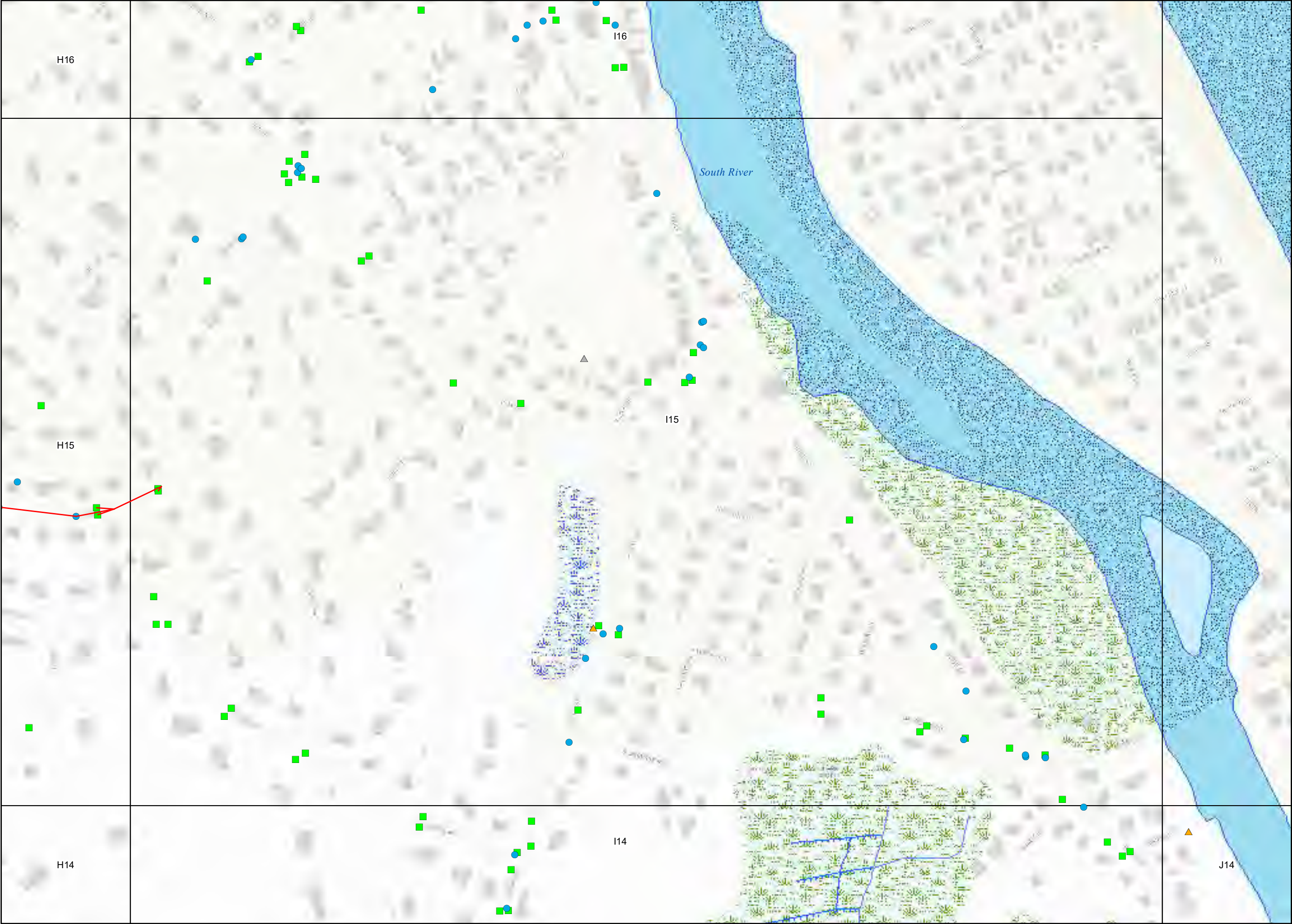


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Marshfield, Massachusetts  
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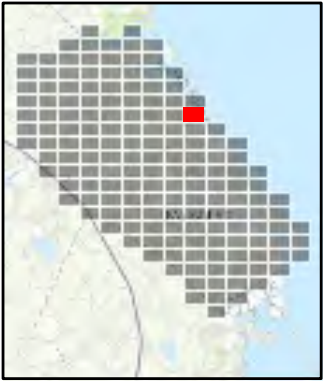




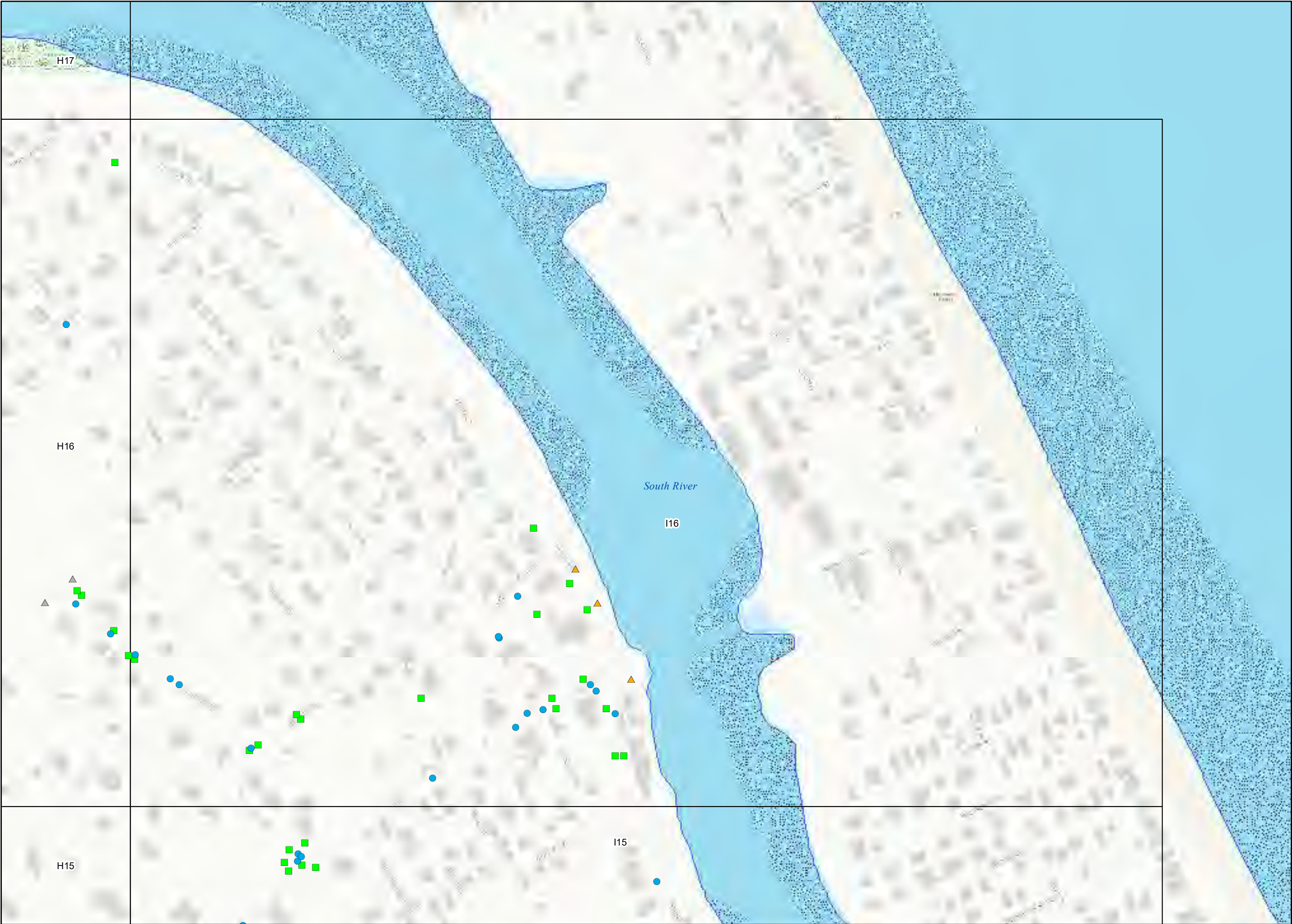


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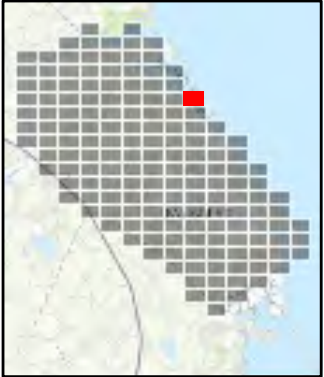
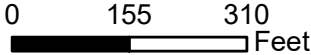




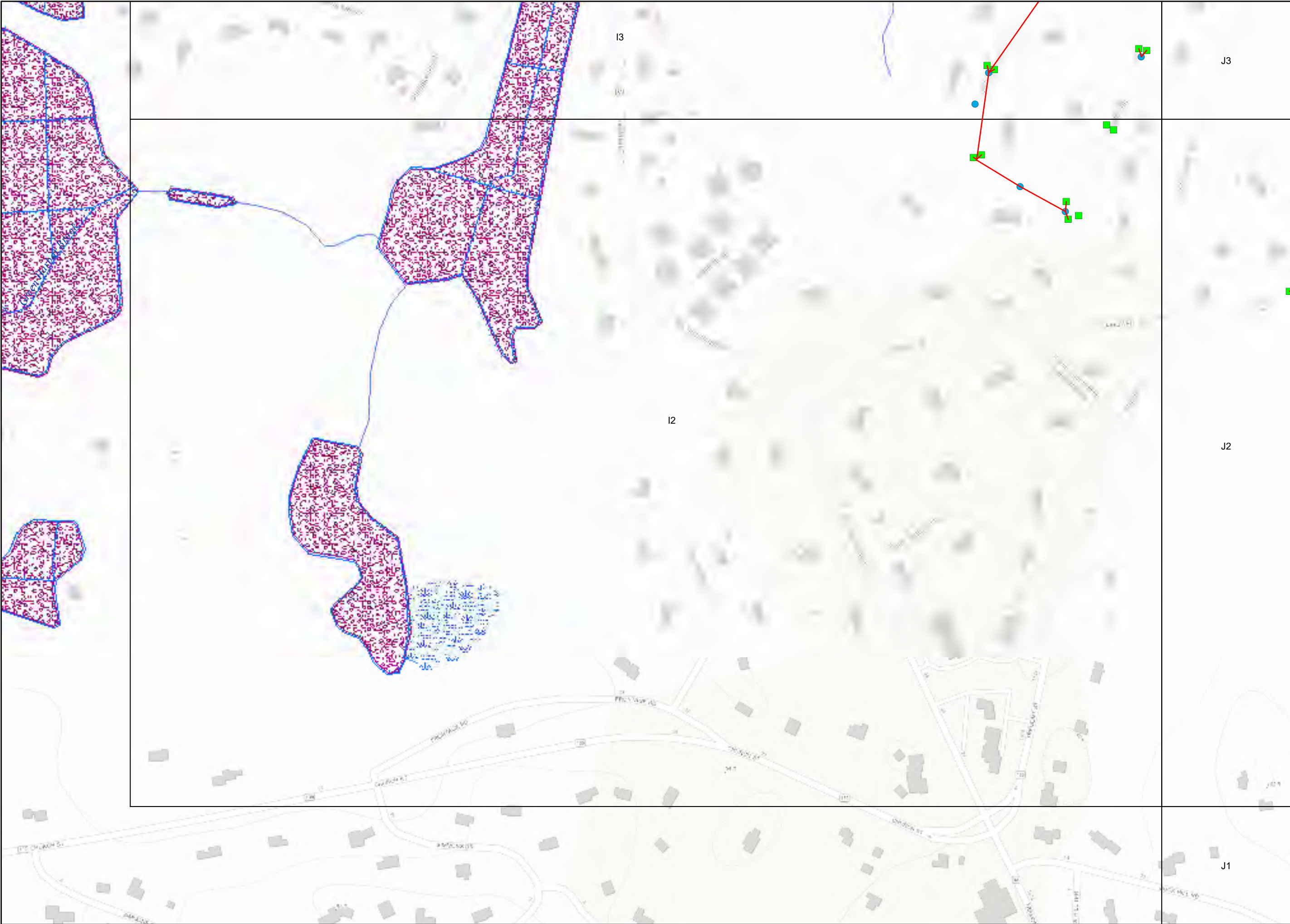


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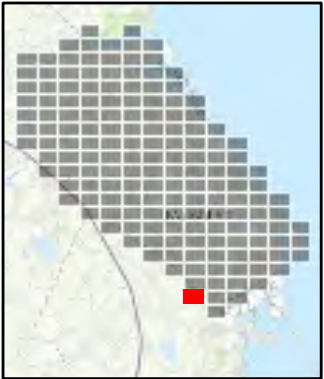


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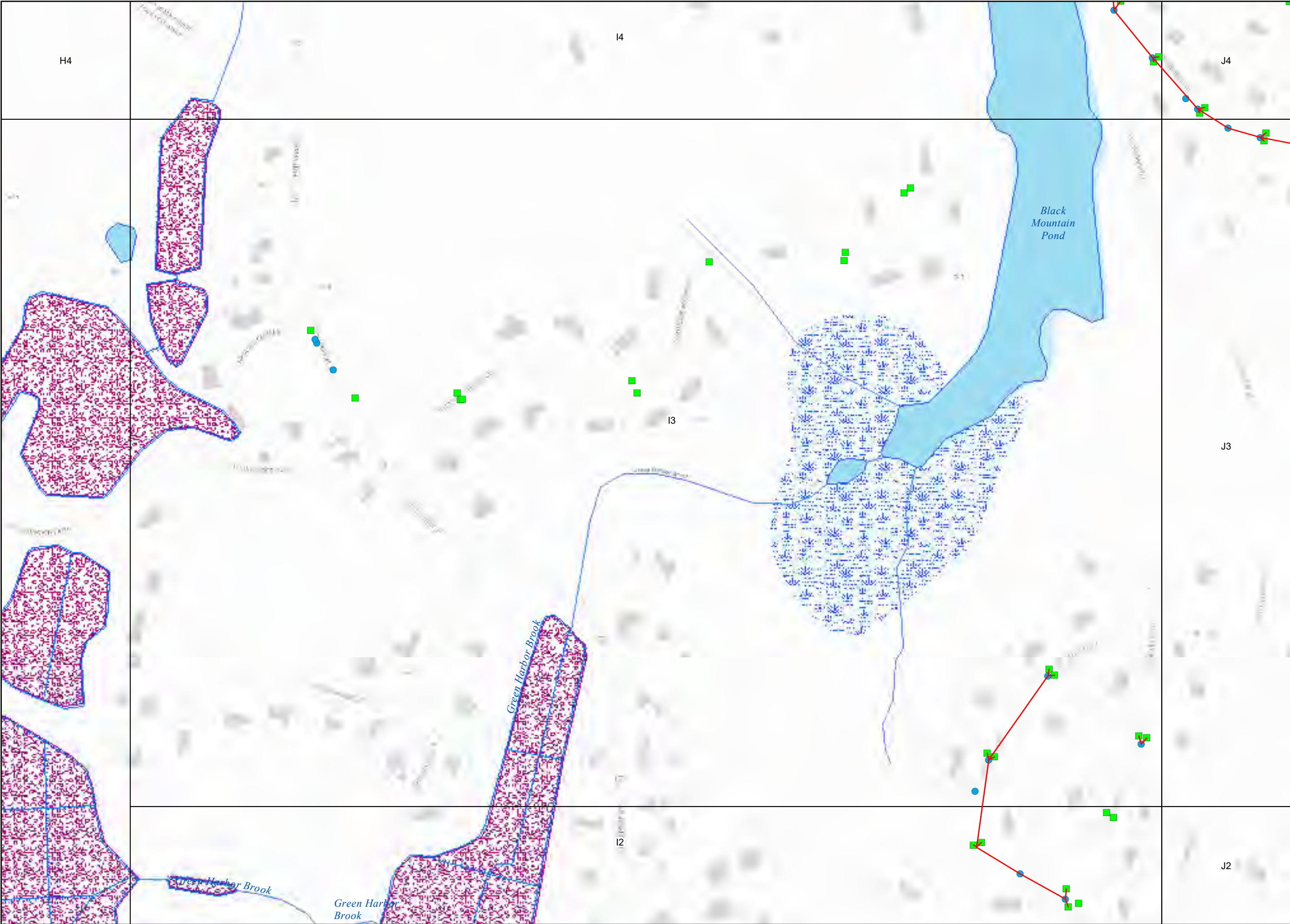
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Spring 2020



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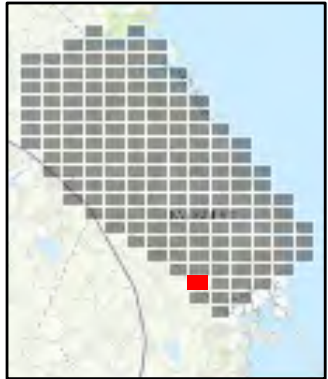
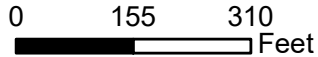




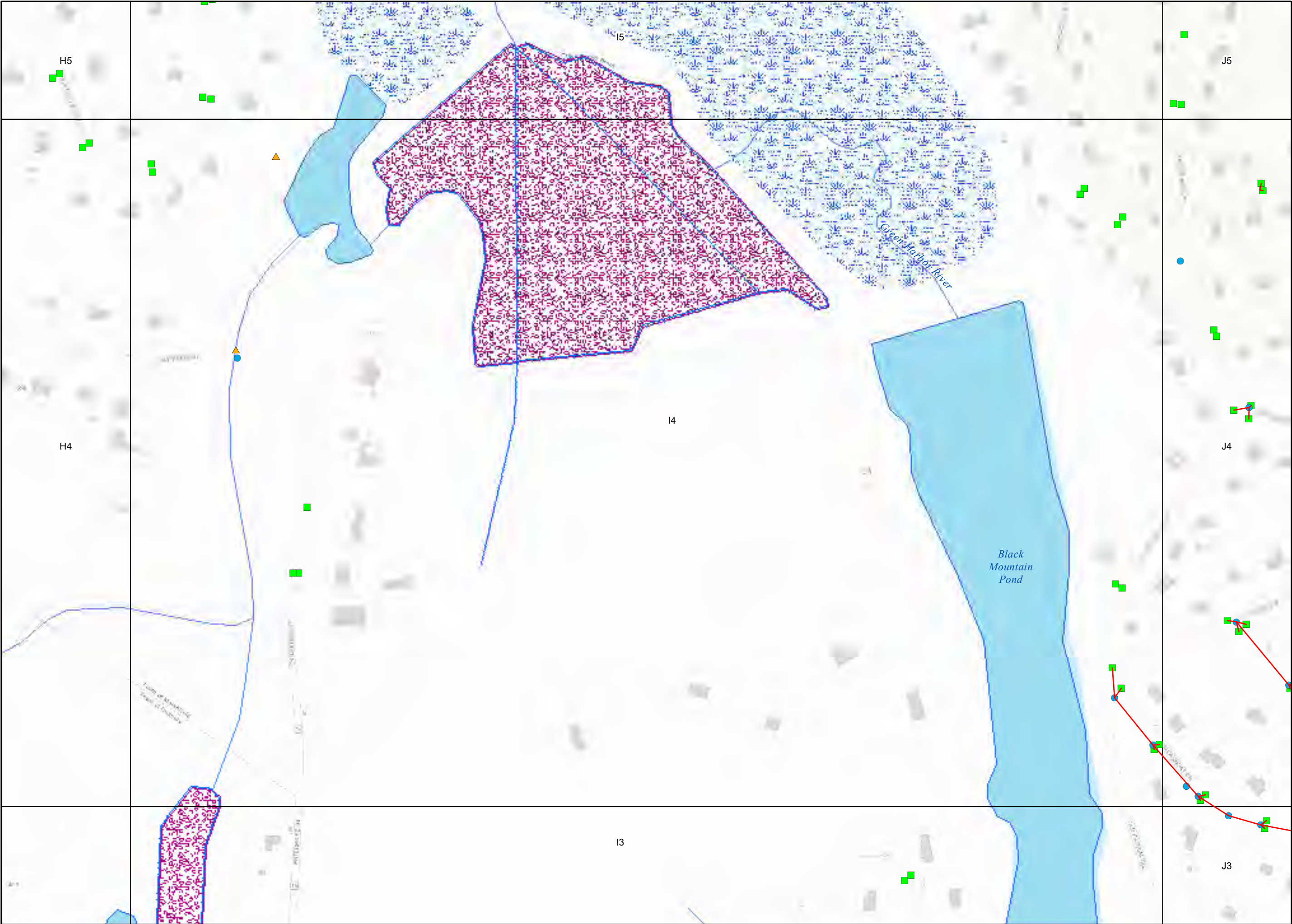


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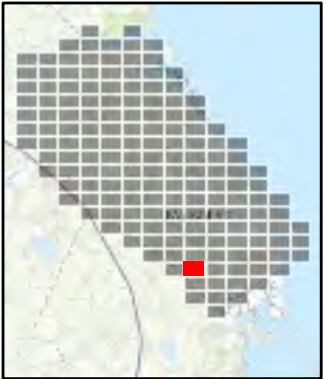




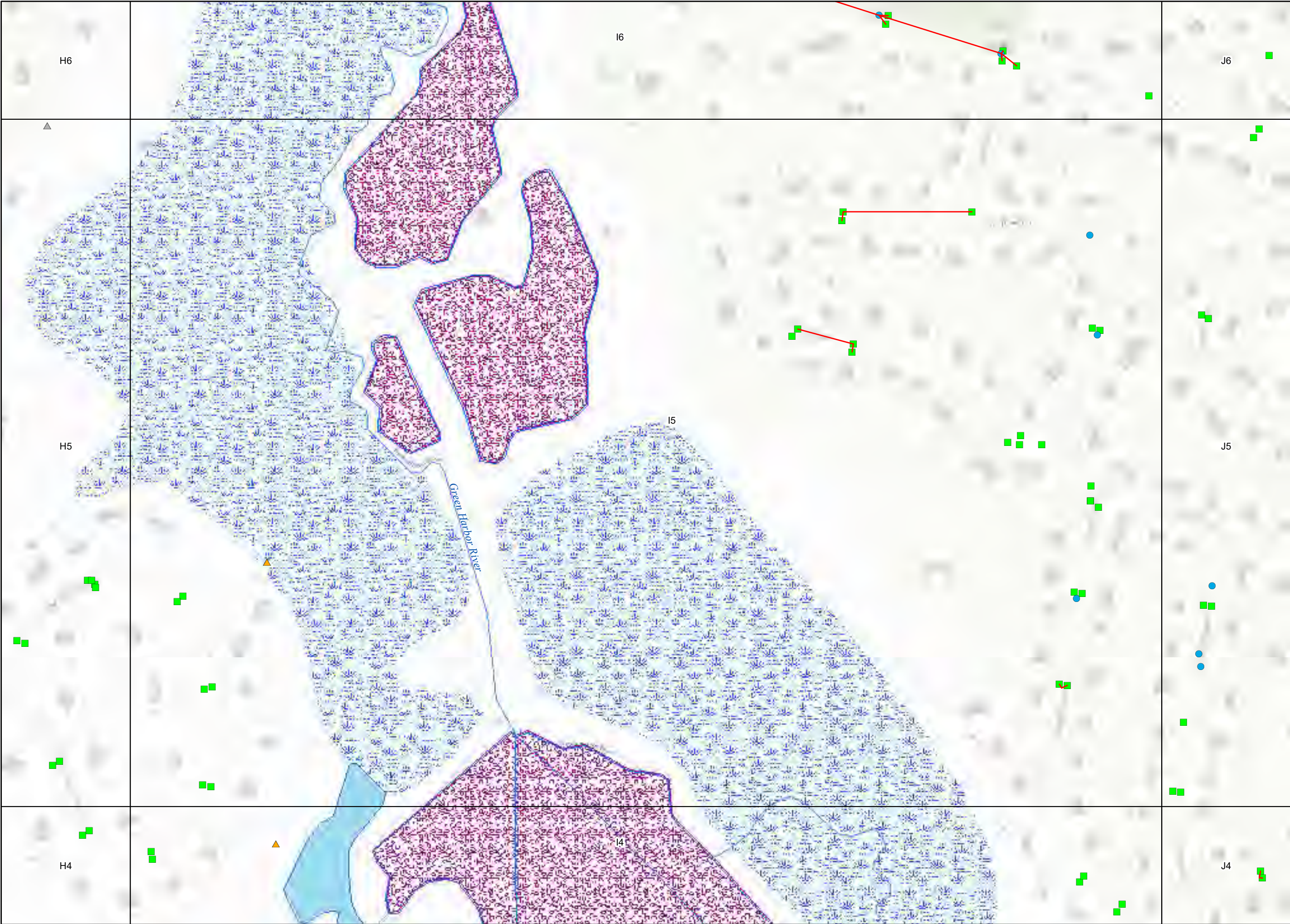


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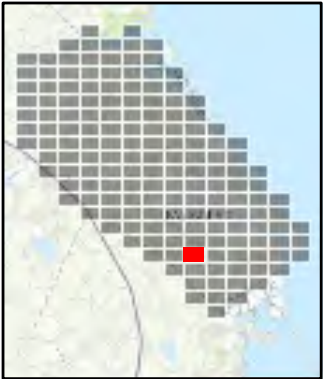




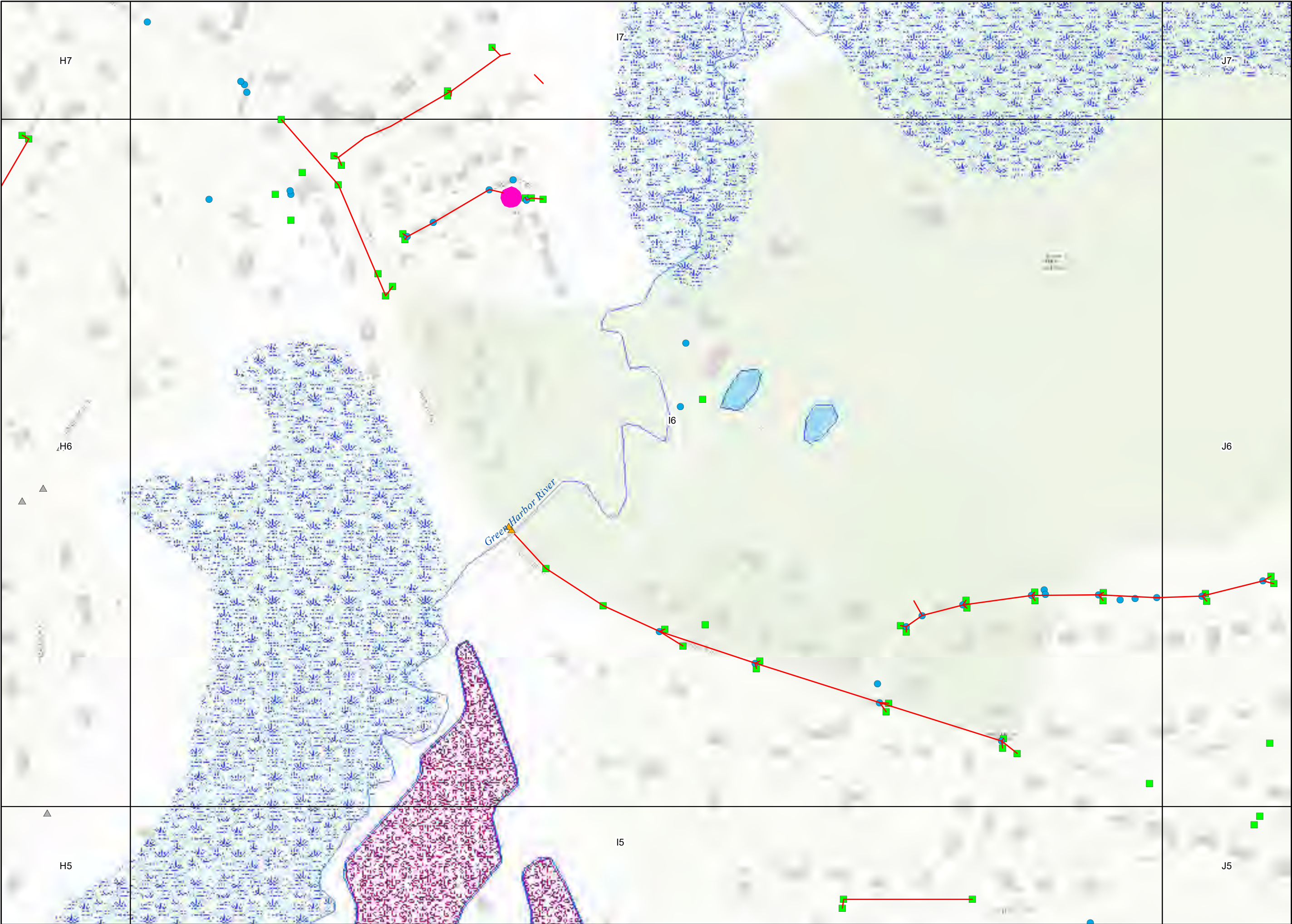


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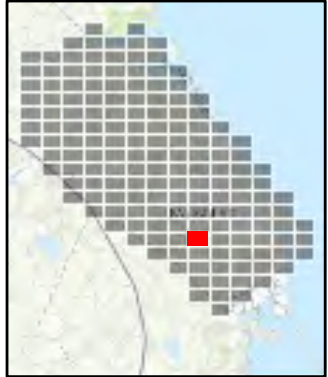
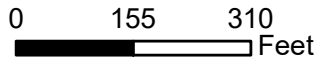




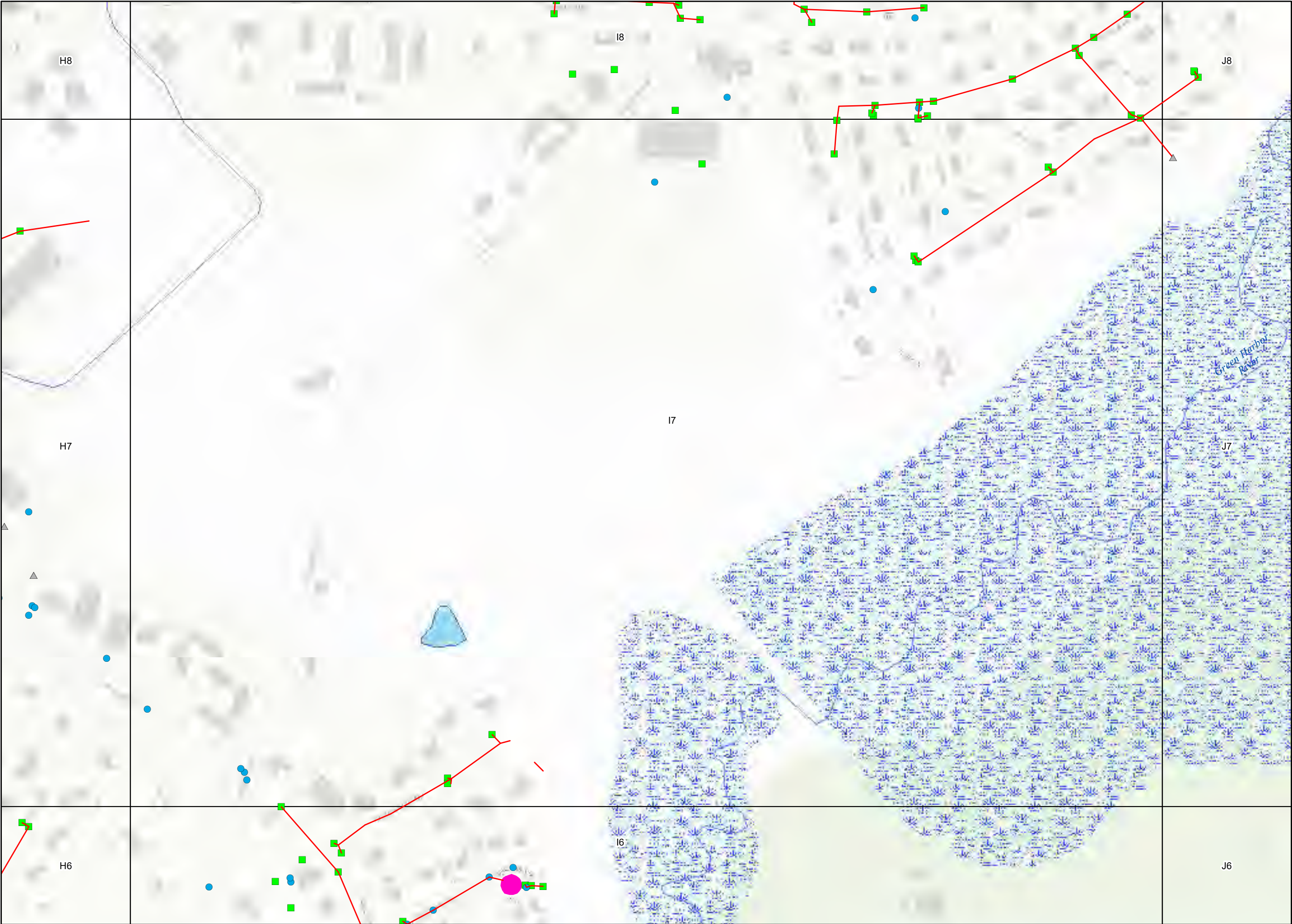


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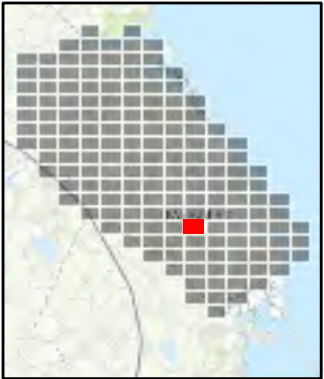
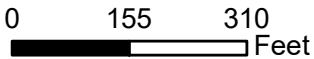




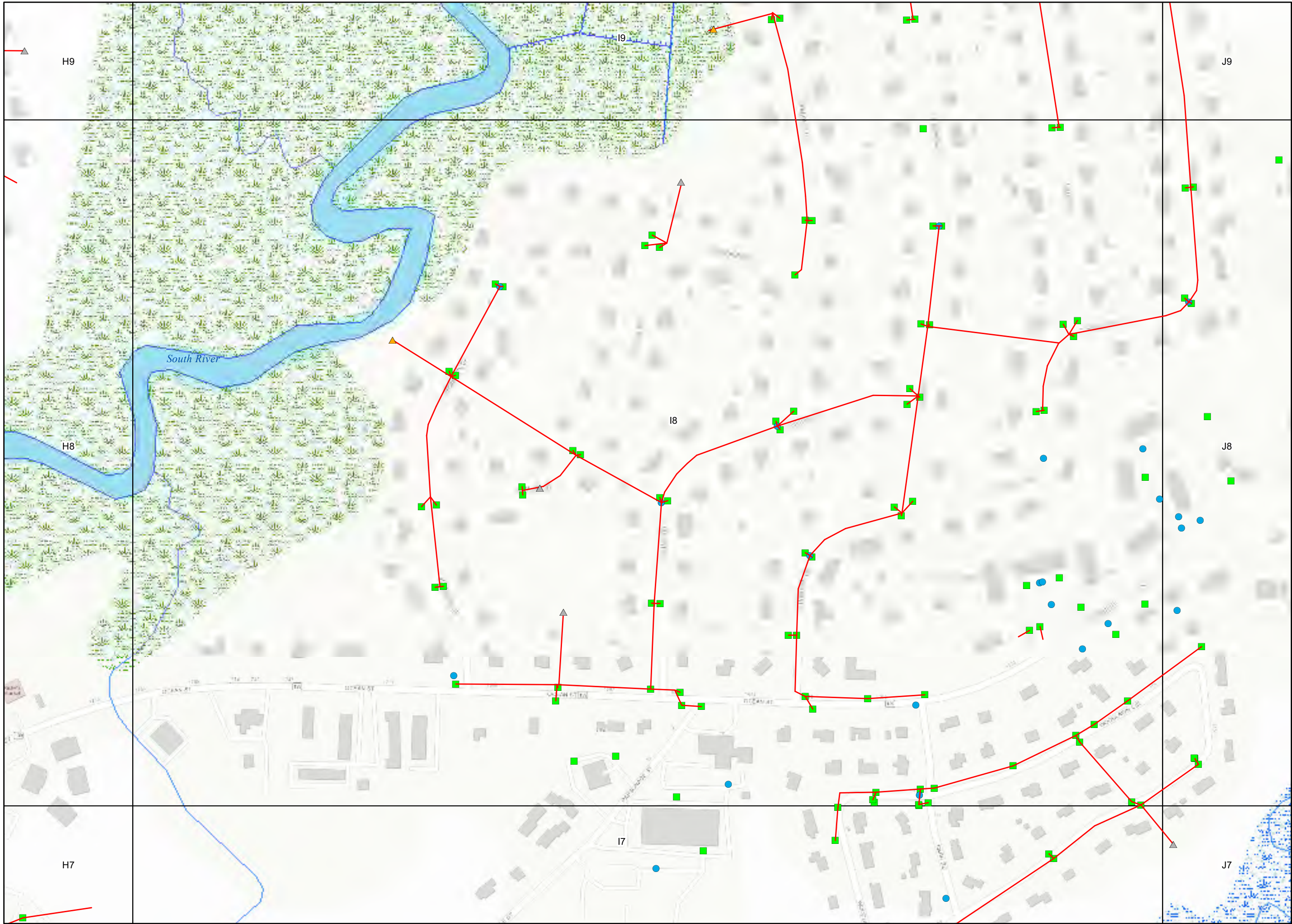


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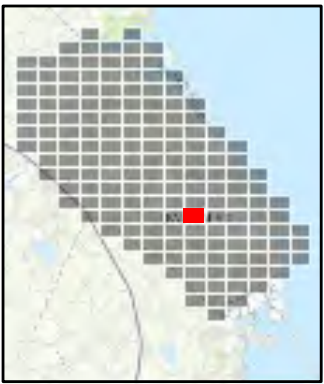


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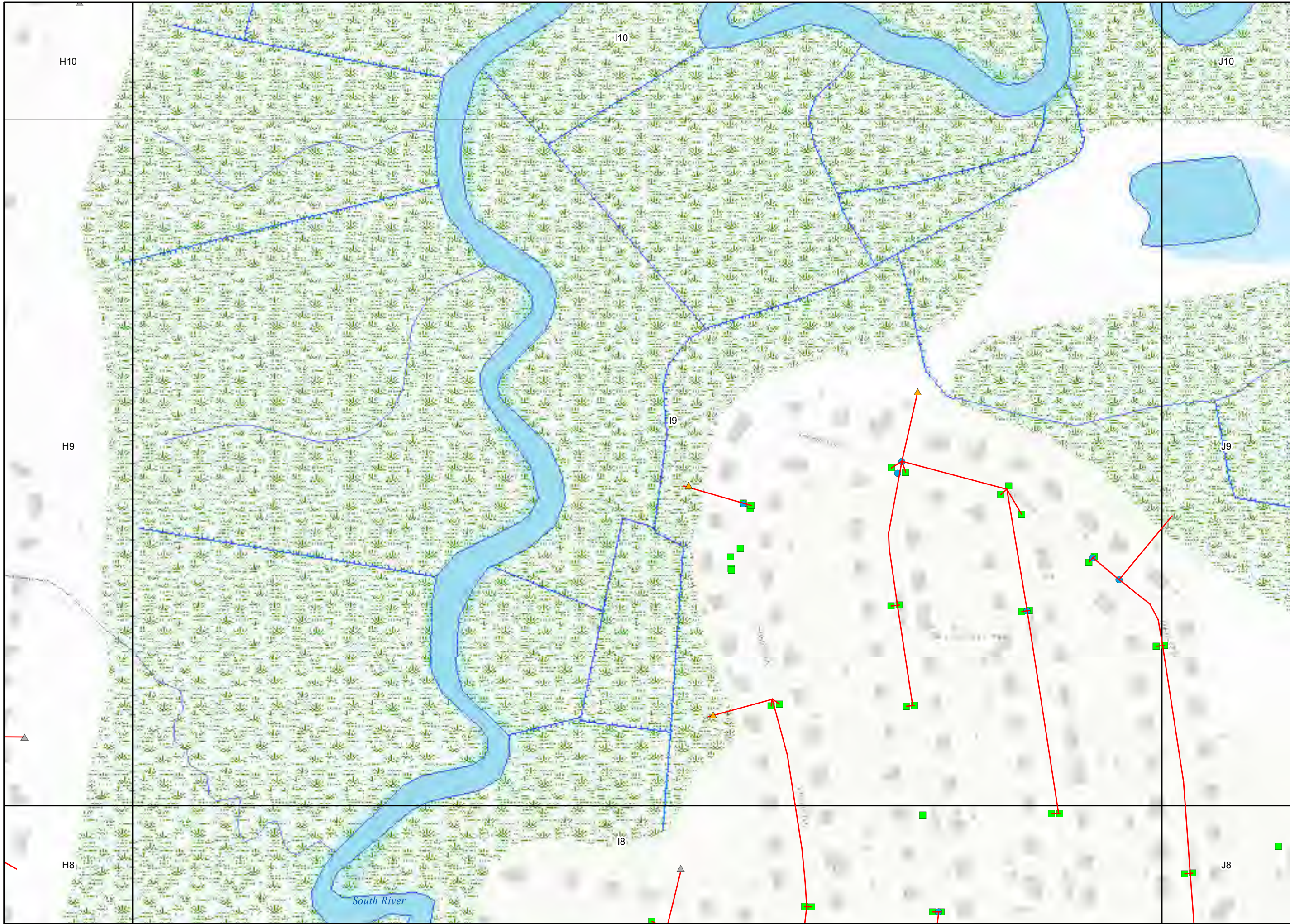
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Marshfield, Massachusetts  
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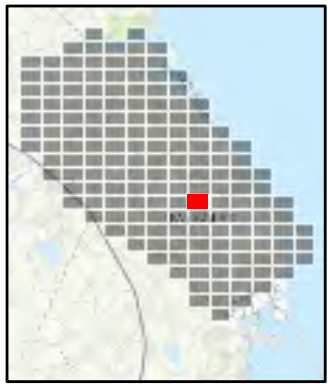
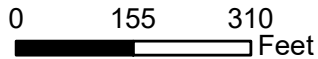






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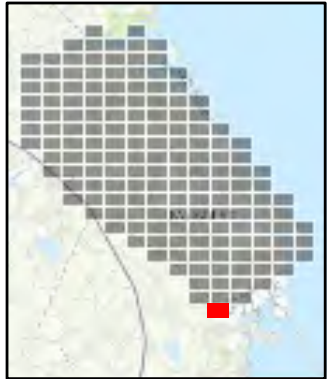
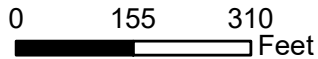




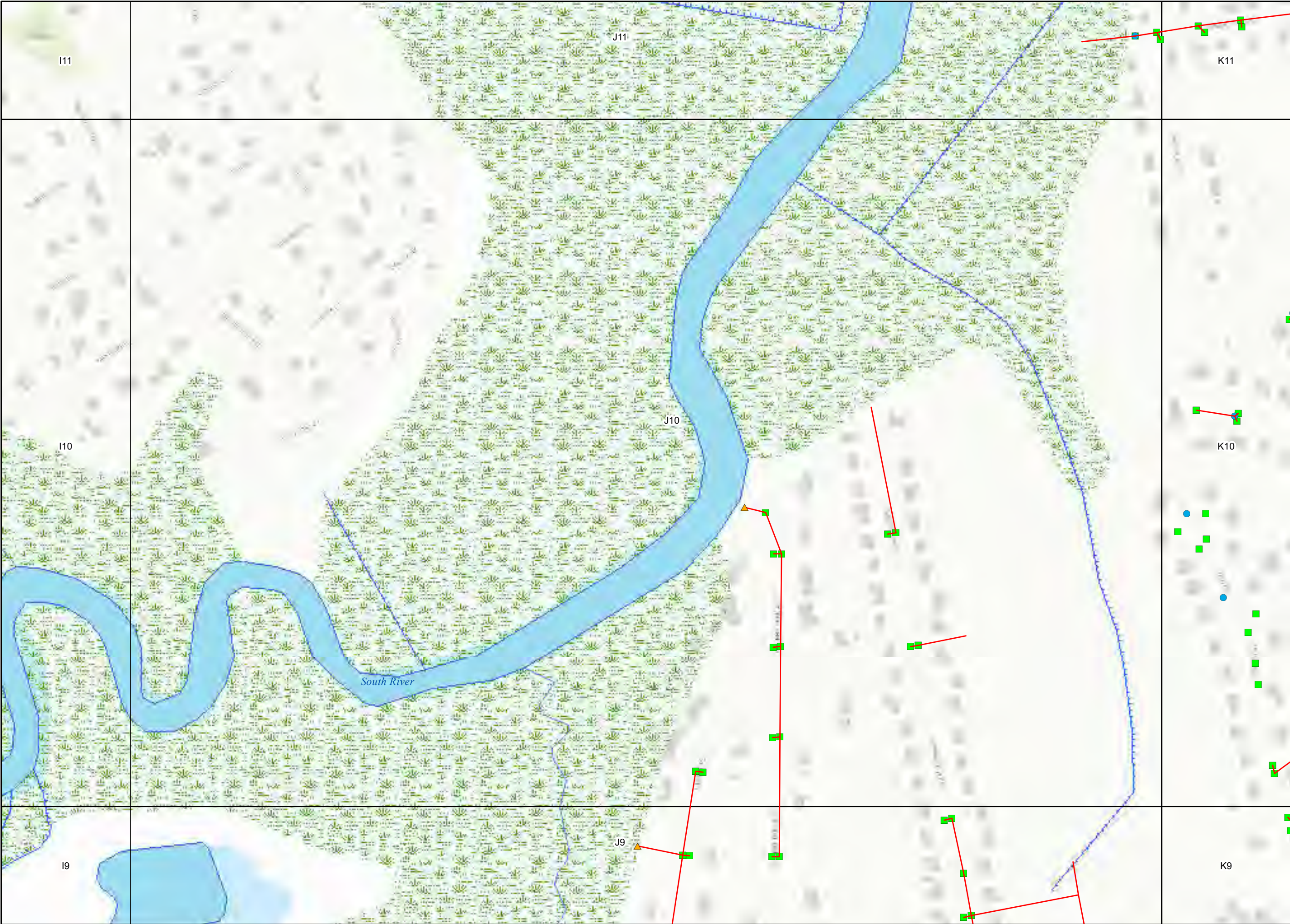


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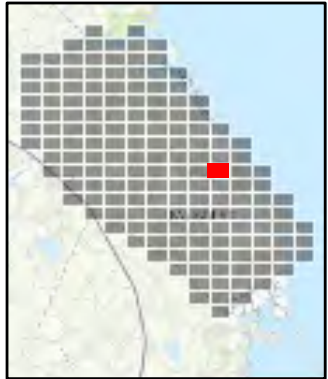
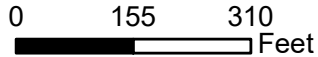




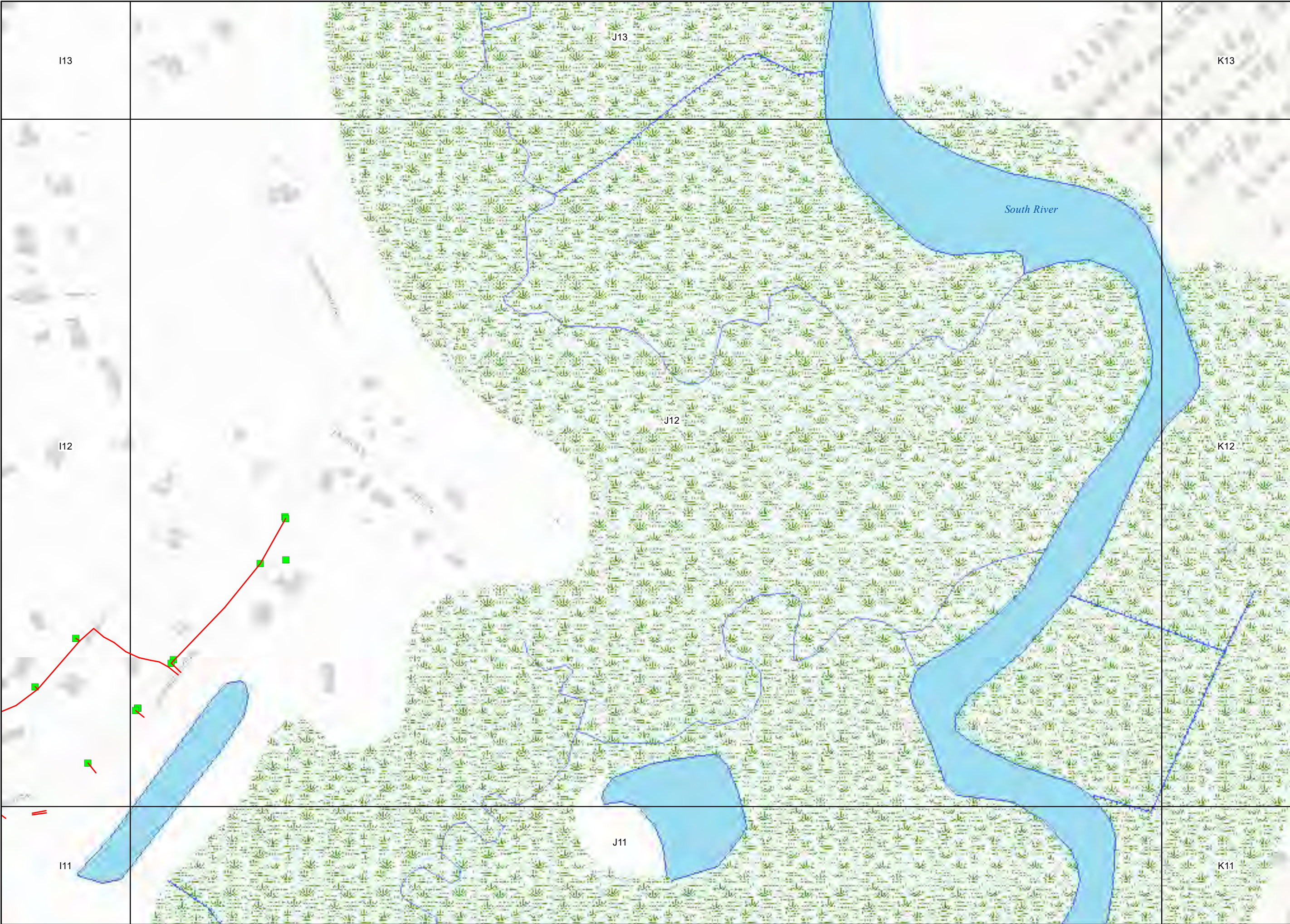


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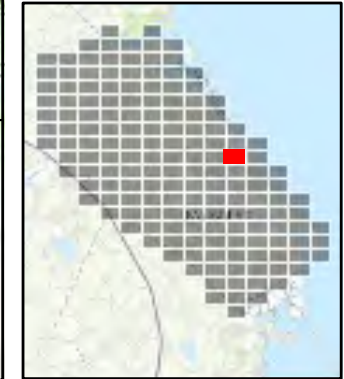
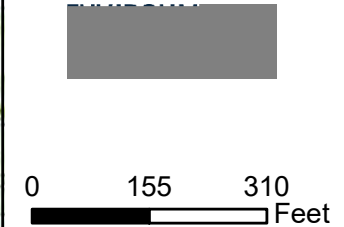






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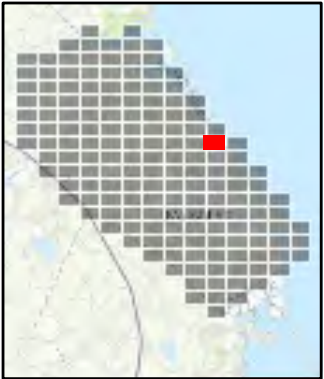


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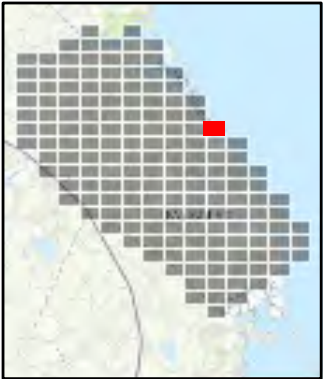




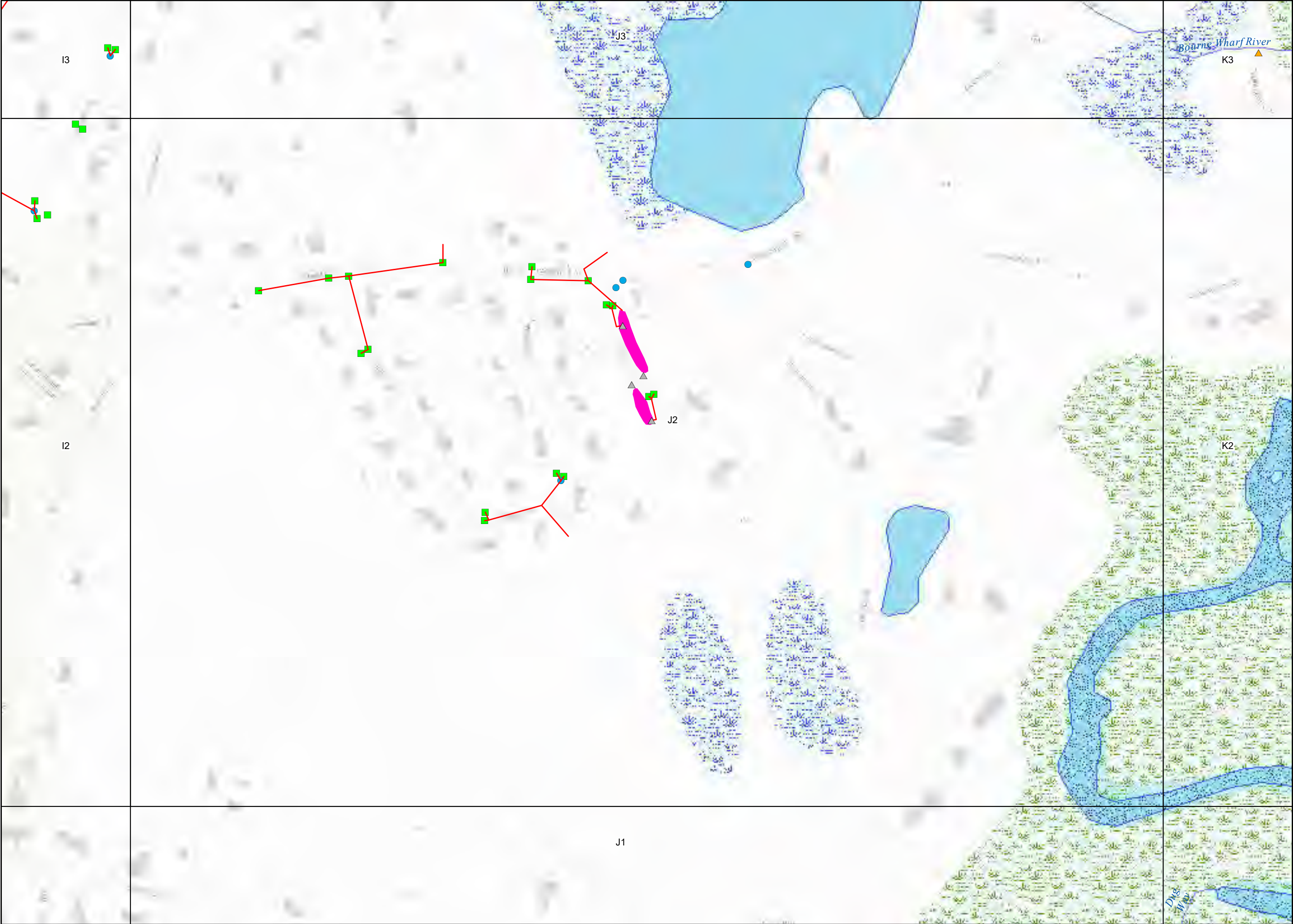


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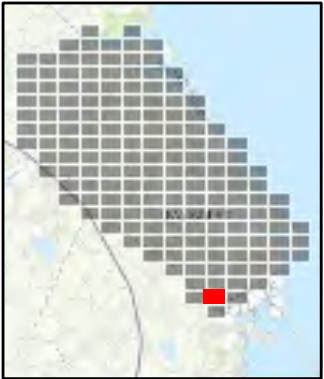




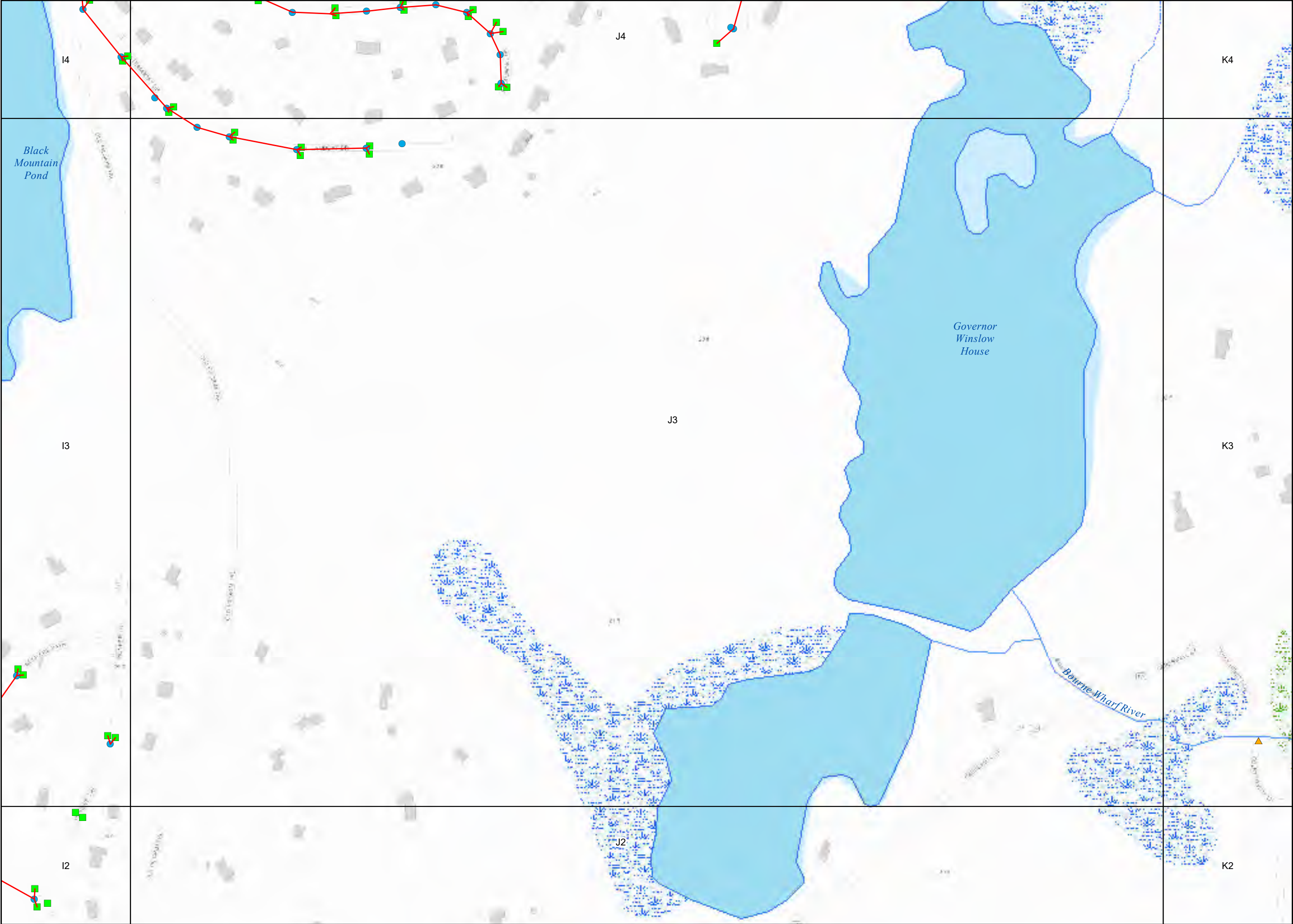


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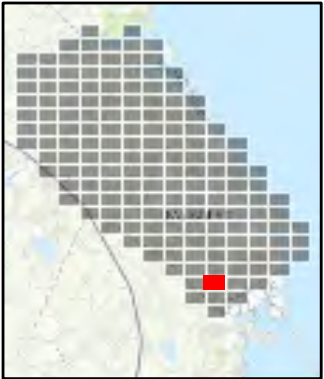






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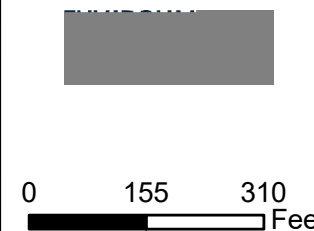
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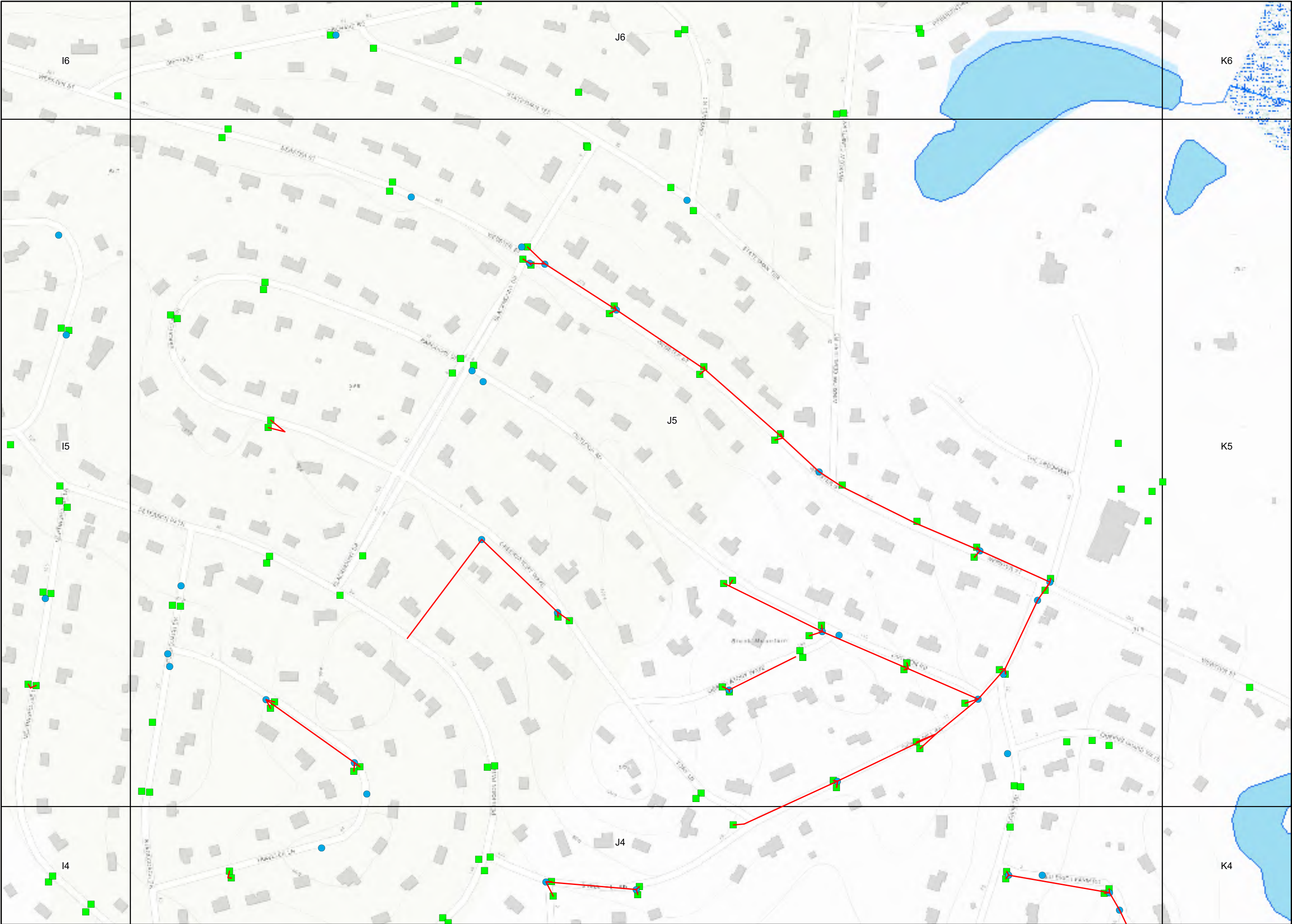


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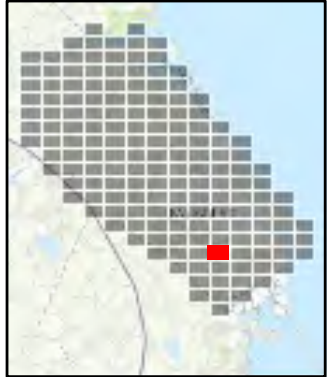


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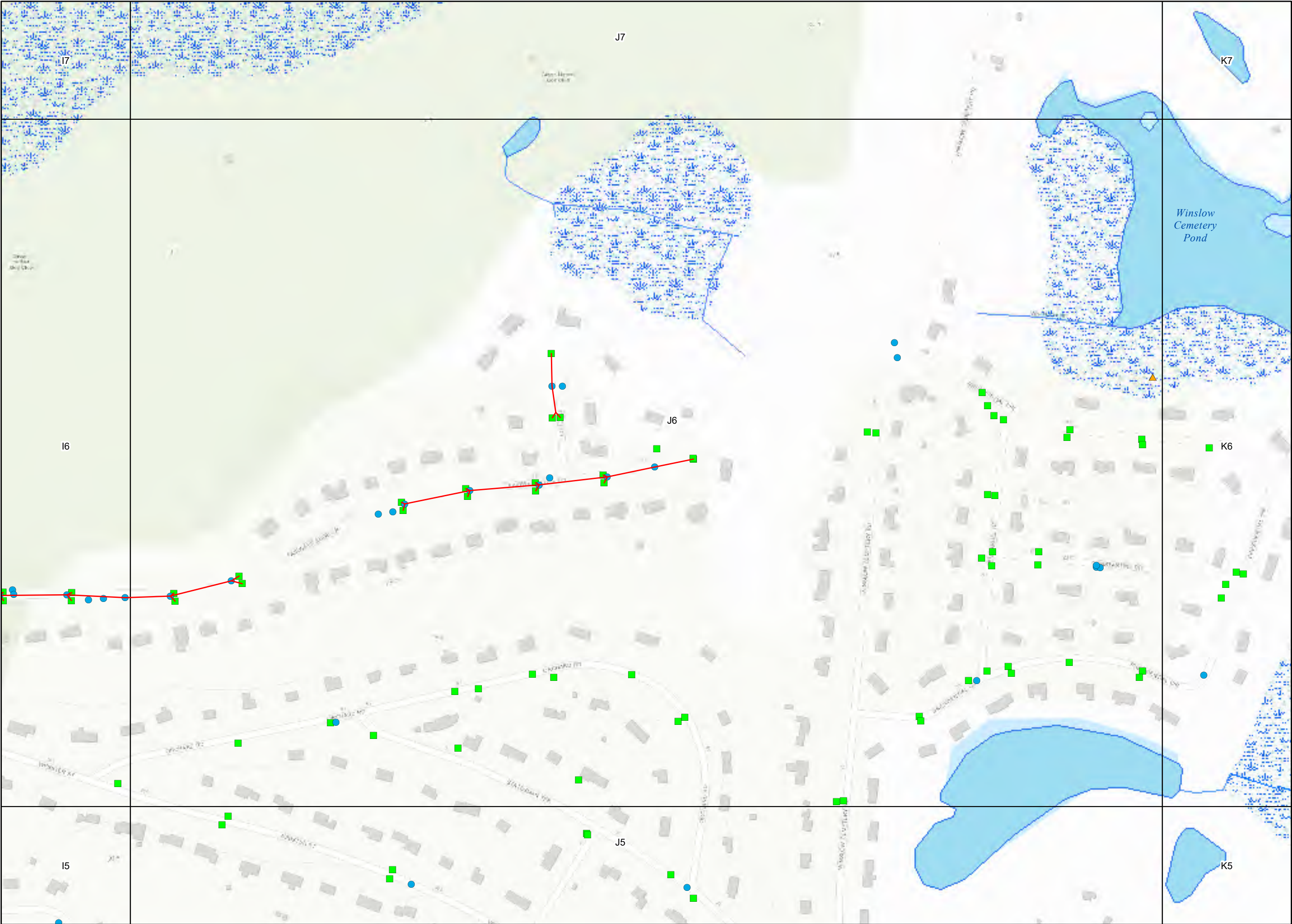
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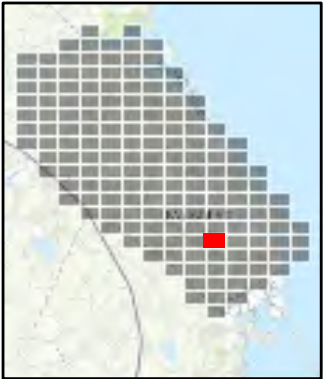




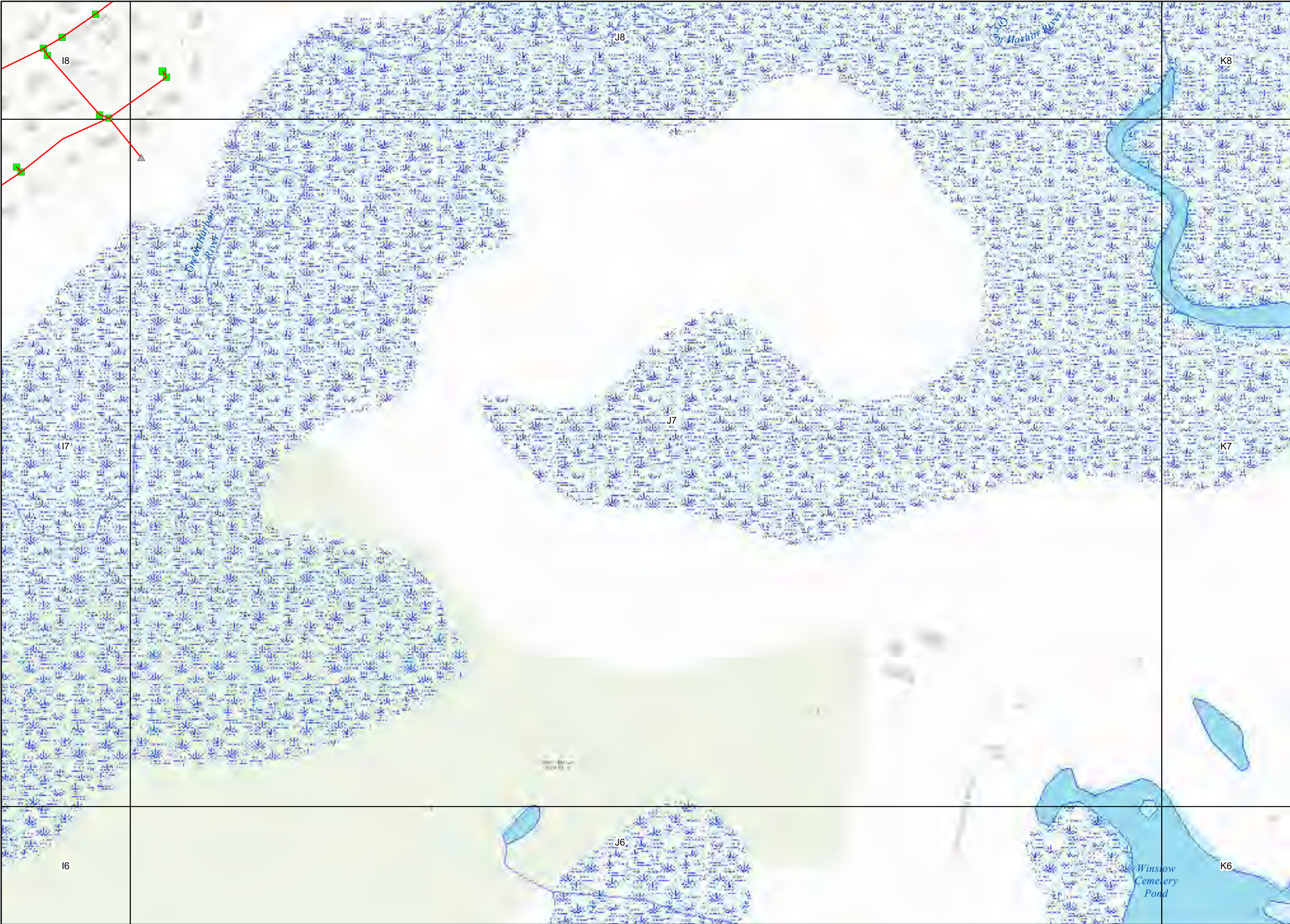


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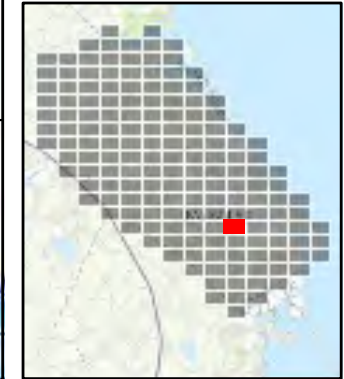
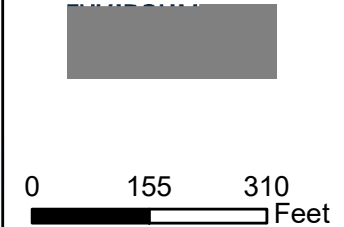




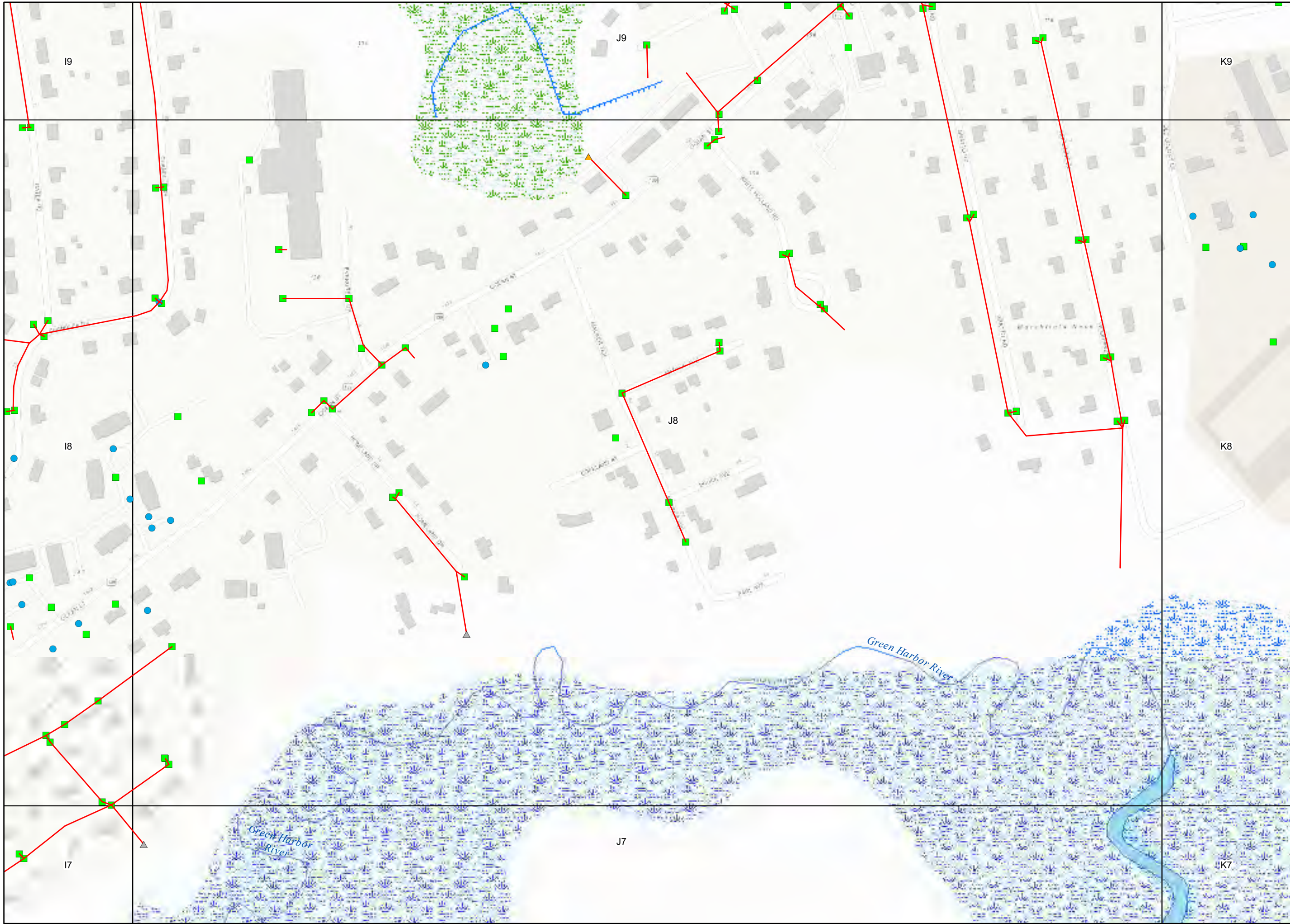


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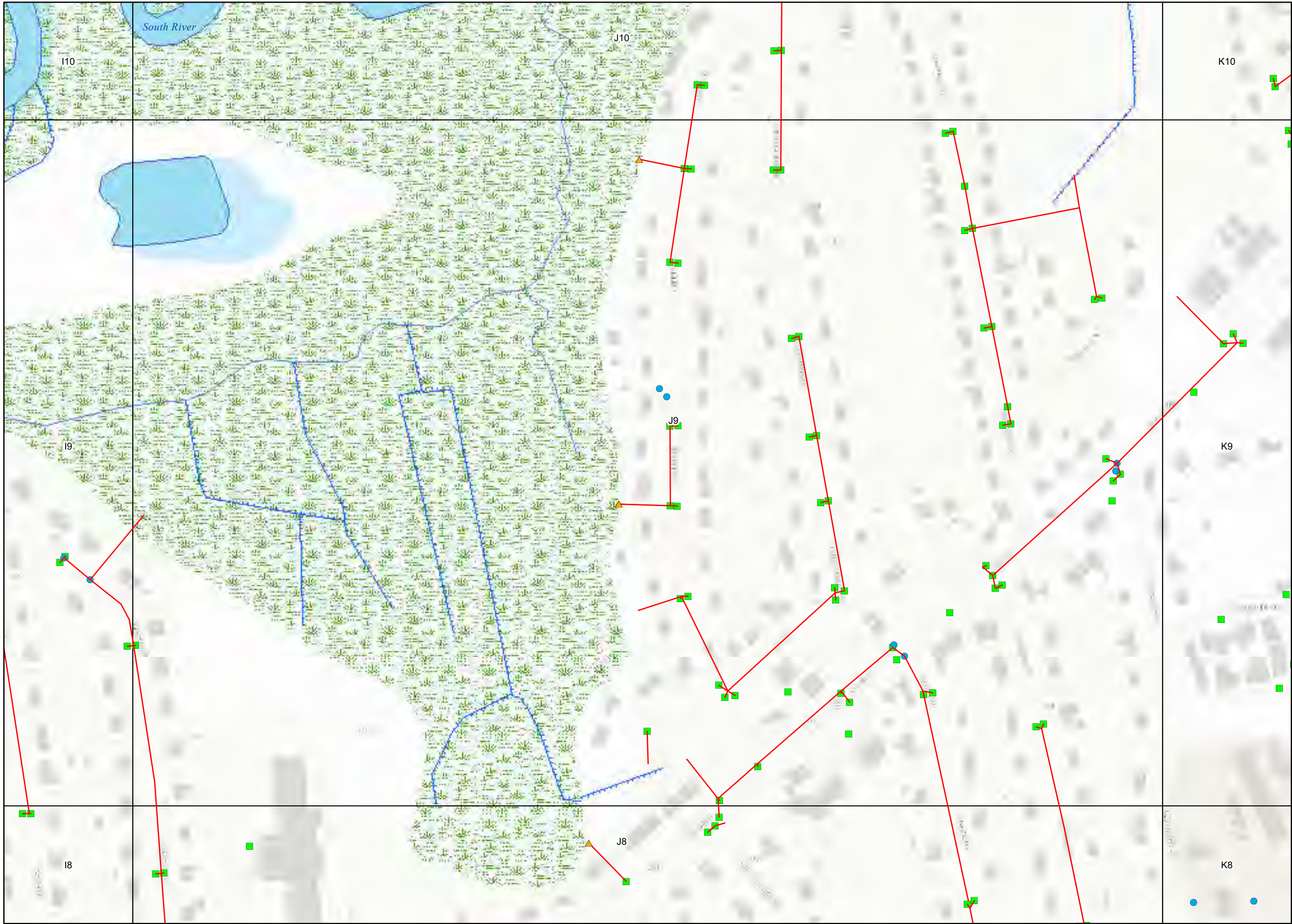


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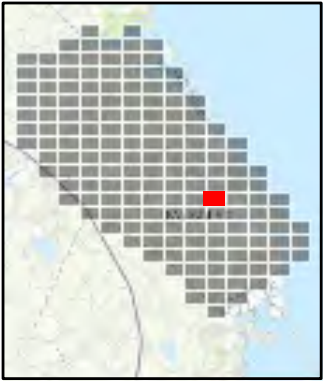
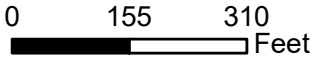




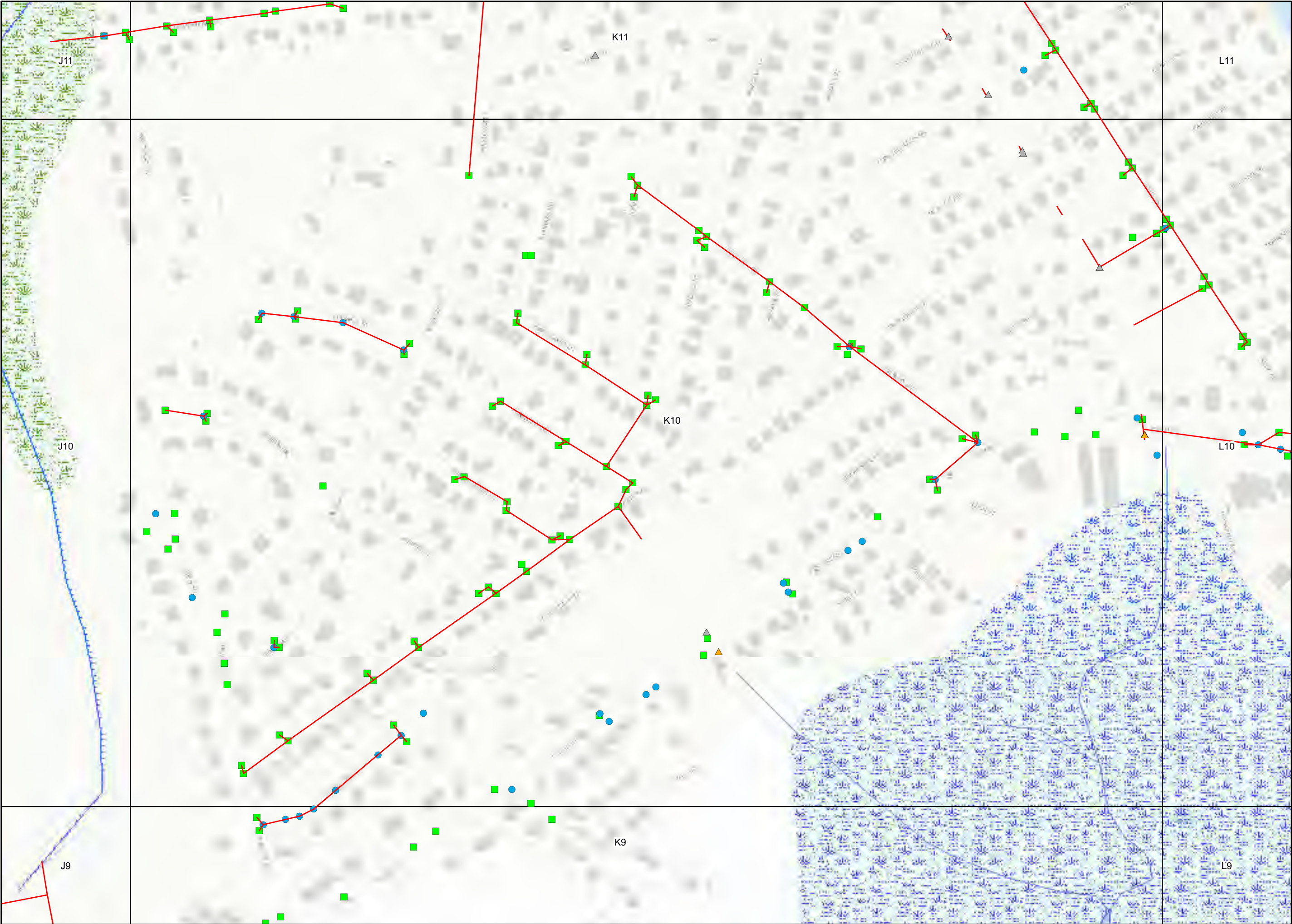


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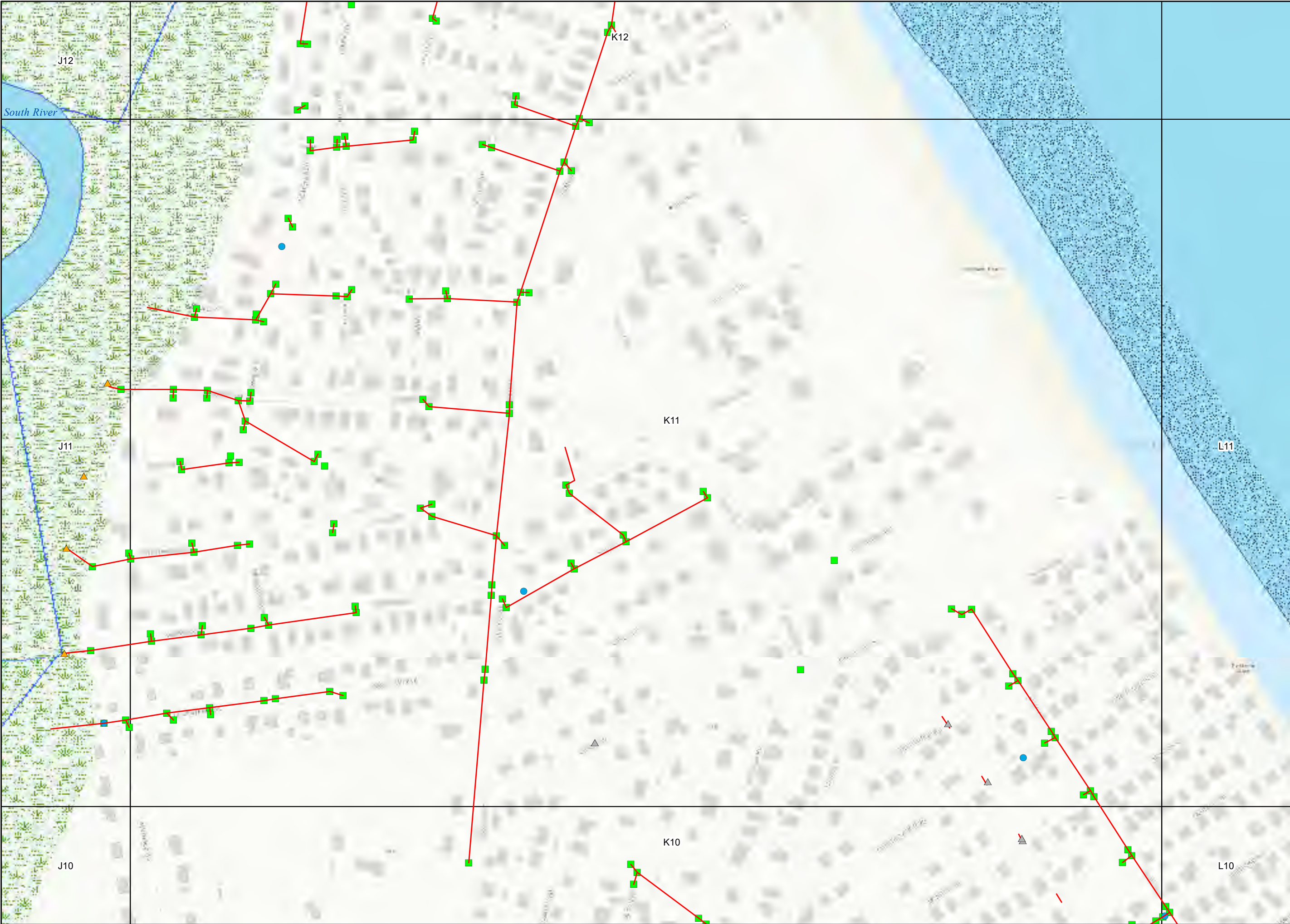


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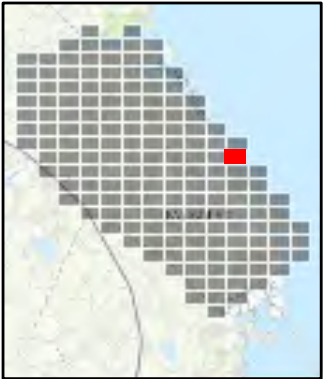




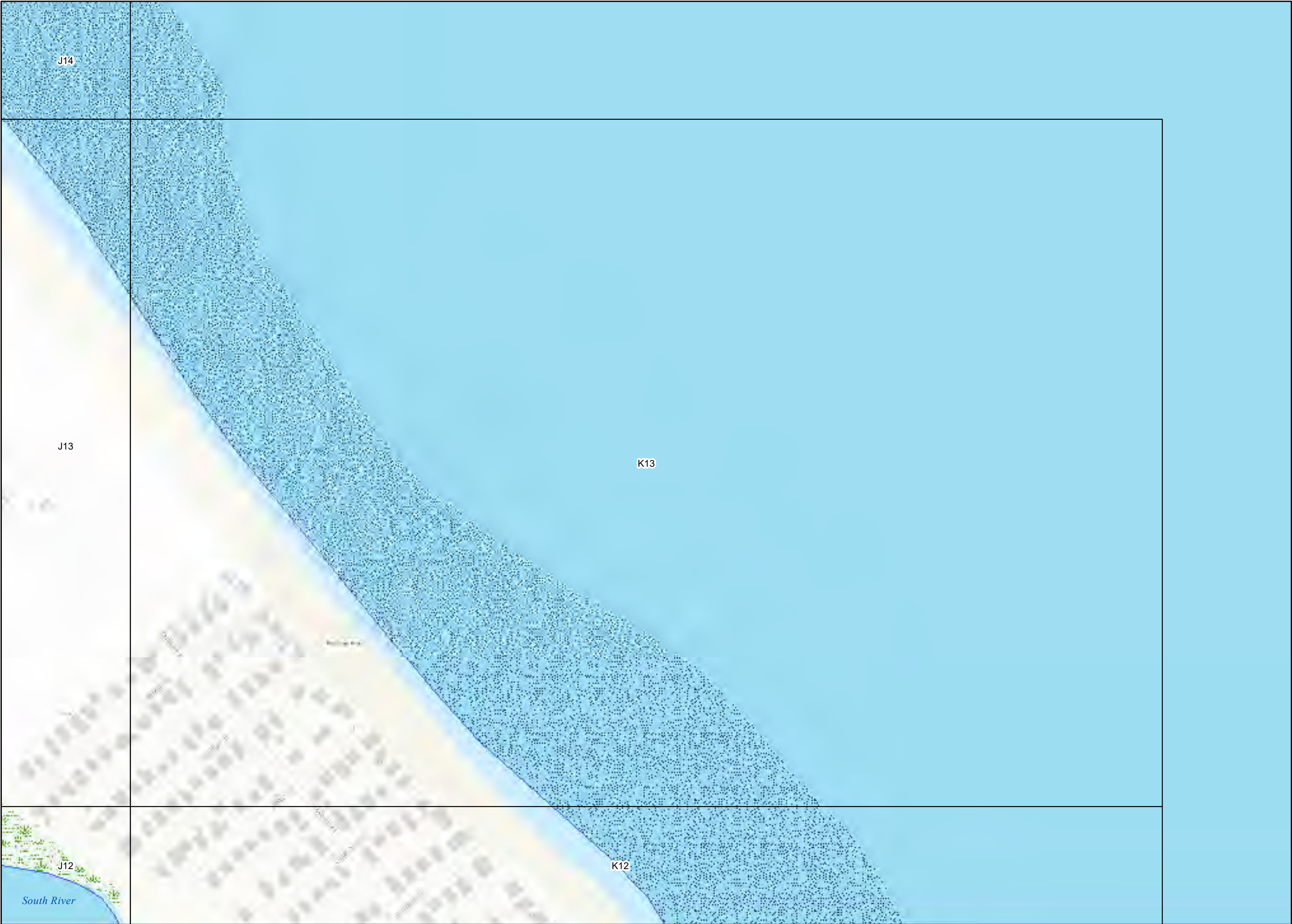


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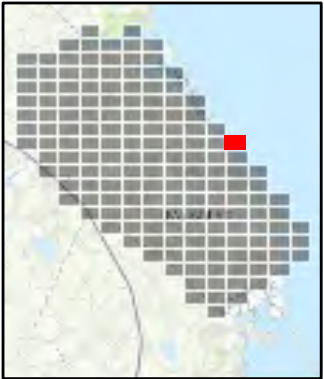


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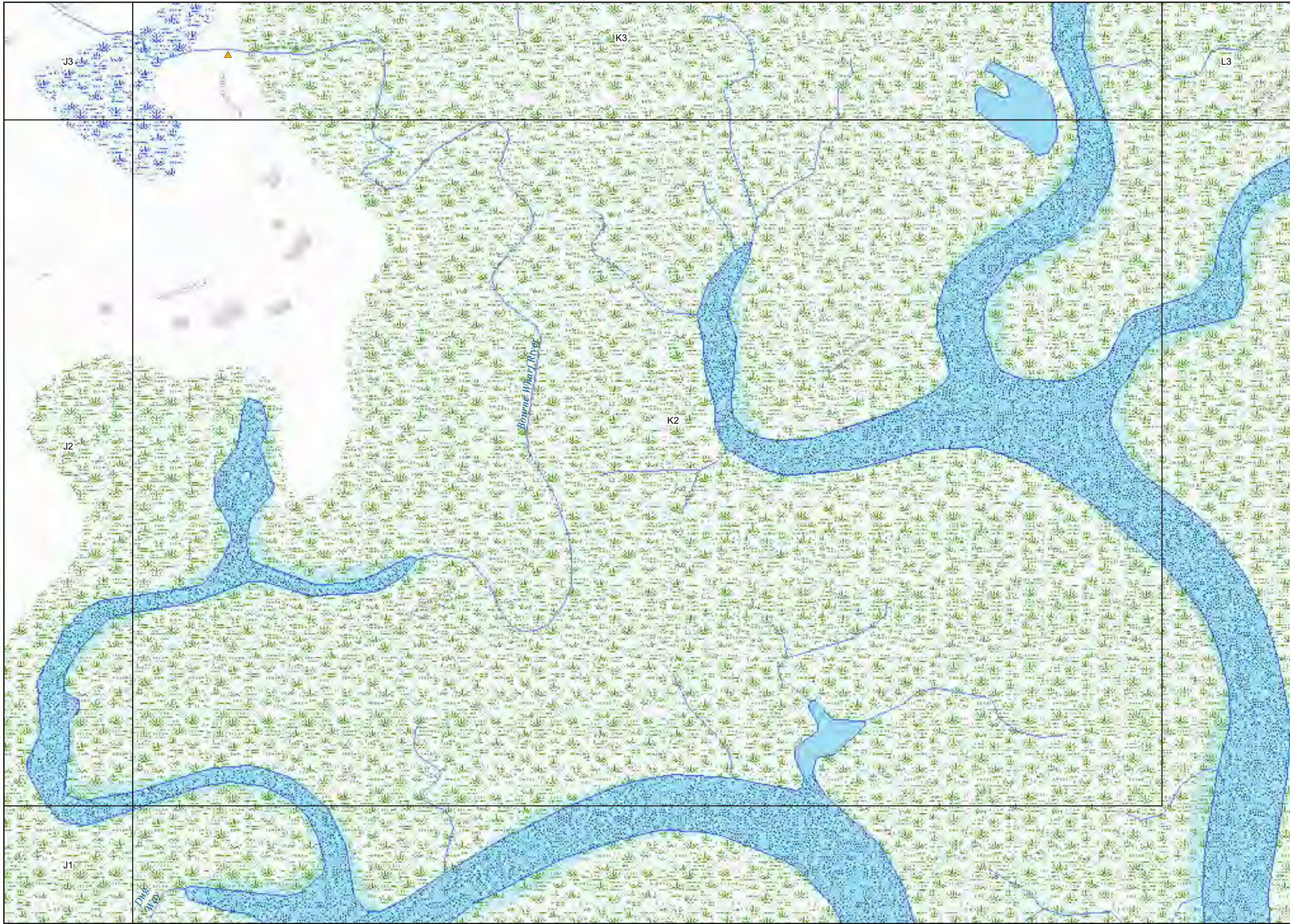
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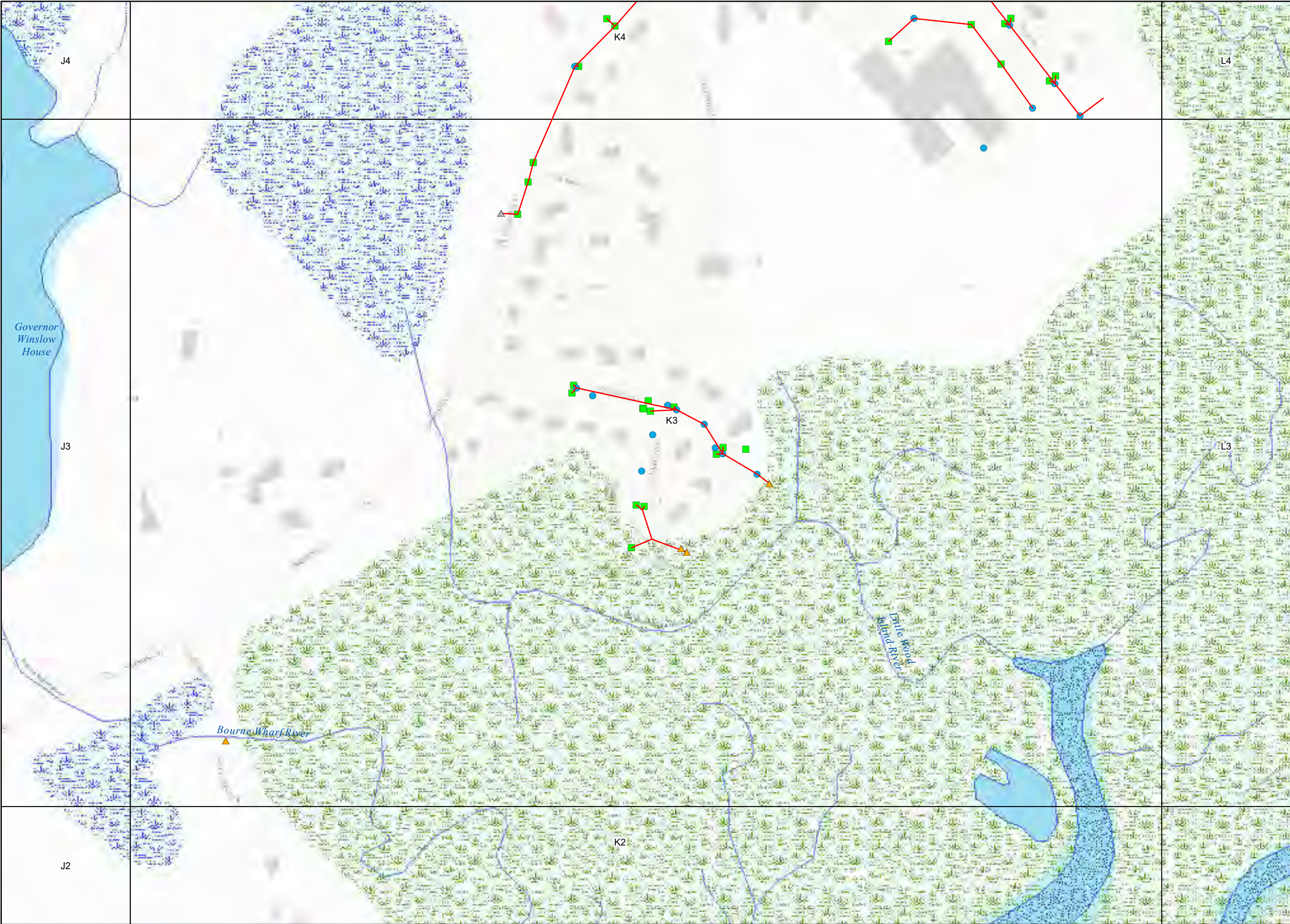
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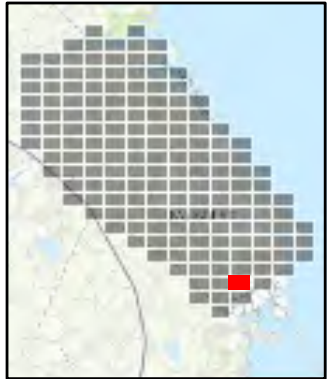
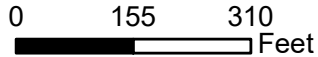
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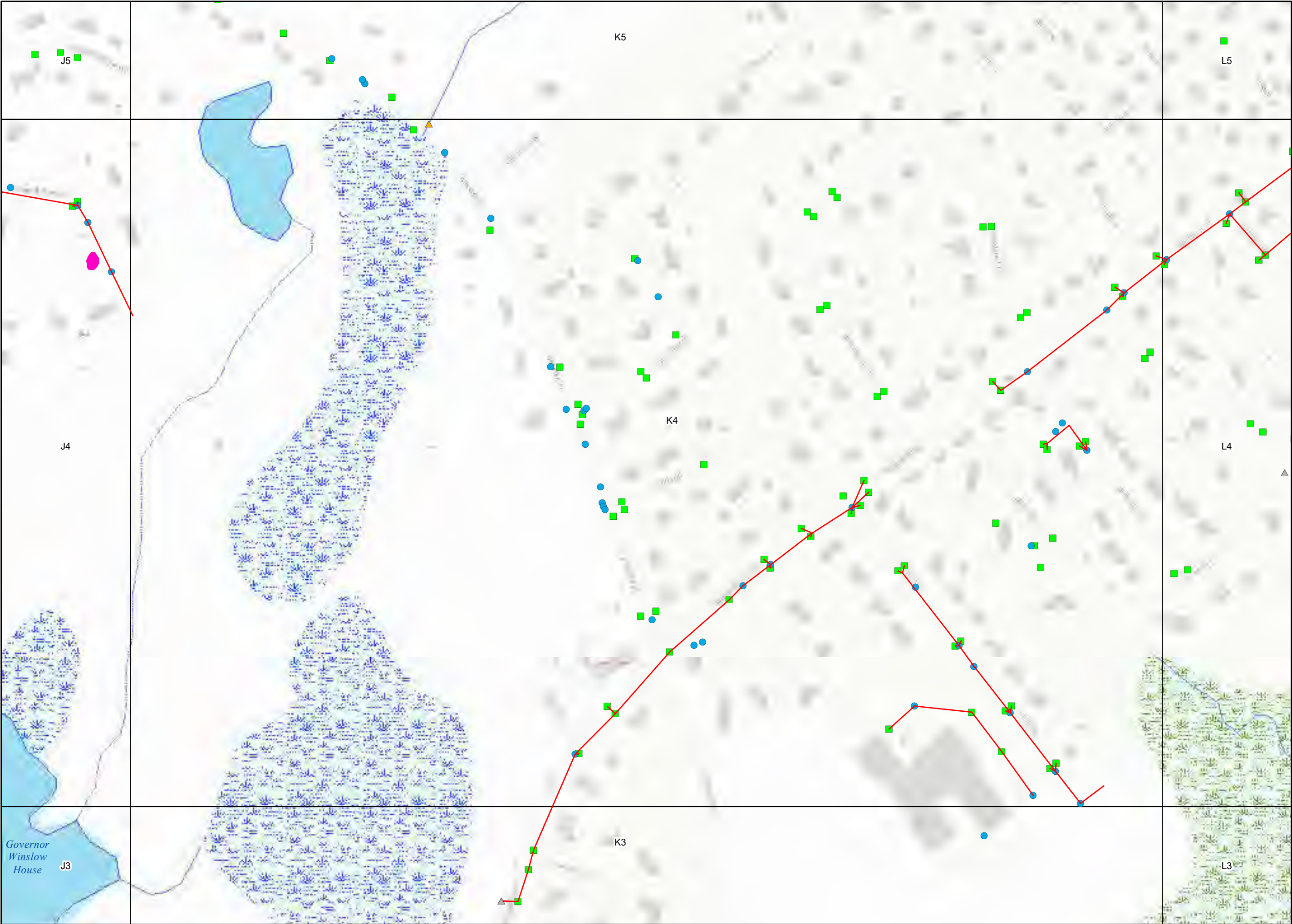


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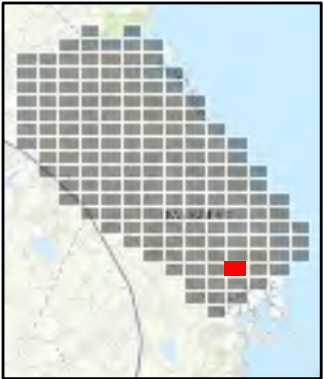


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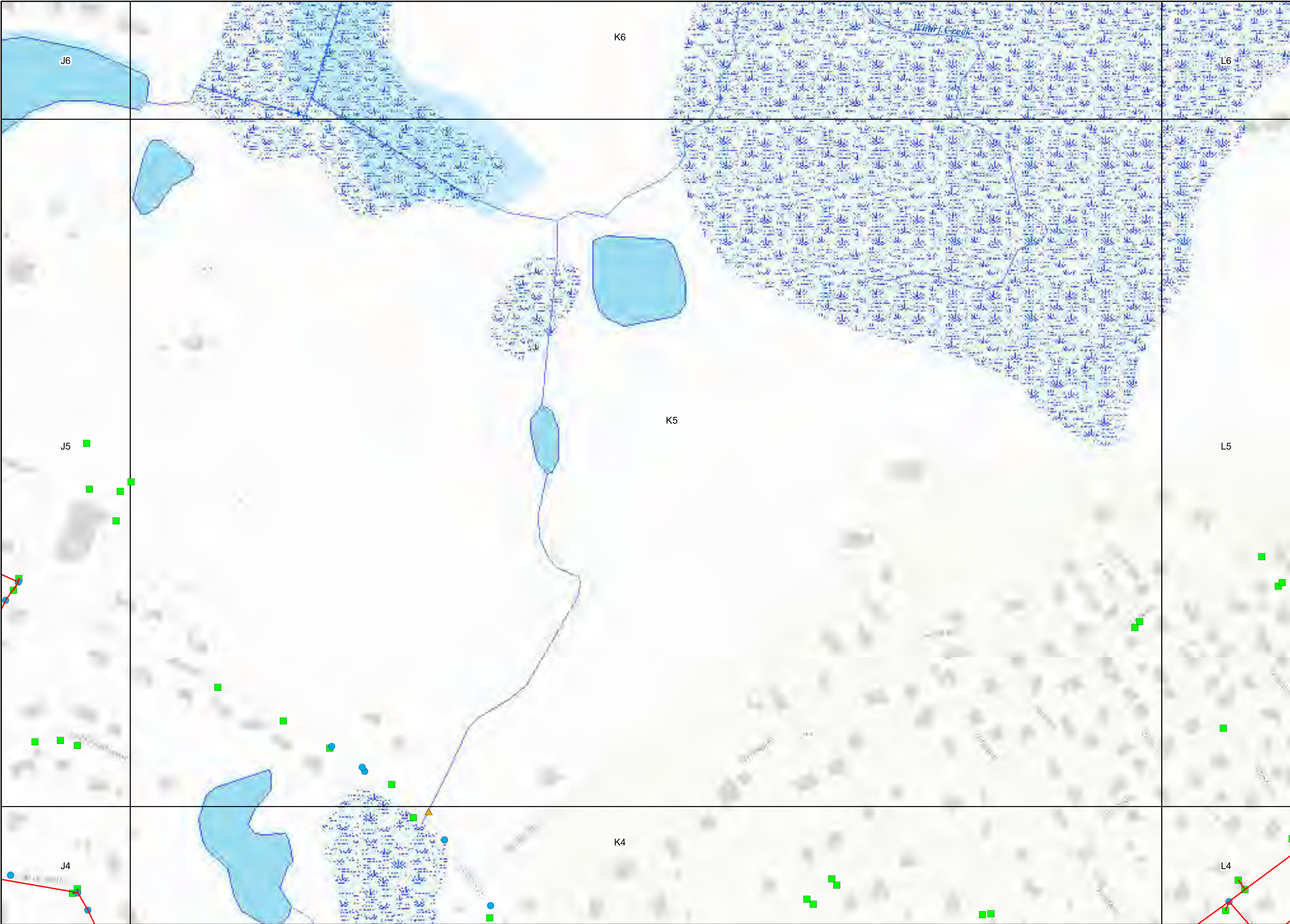
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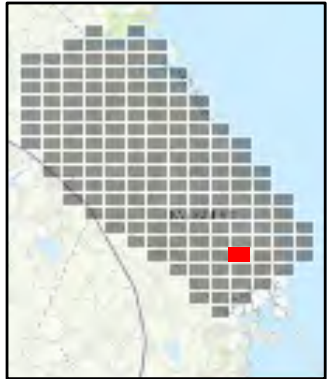
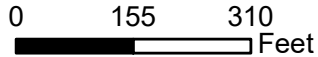




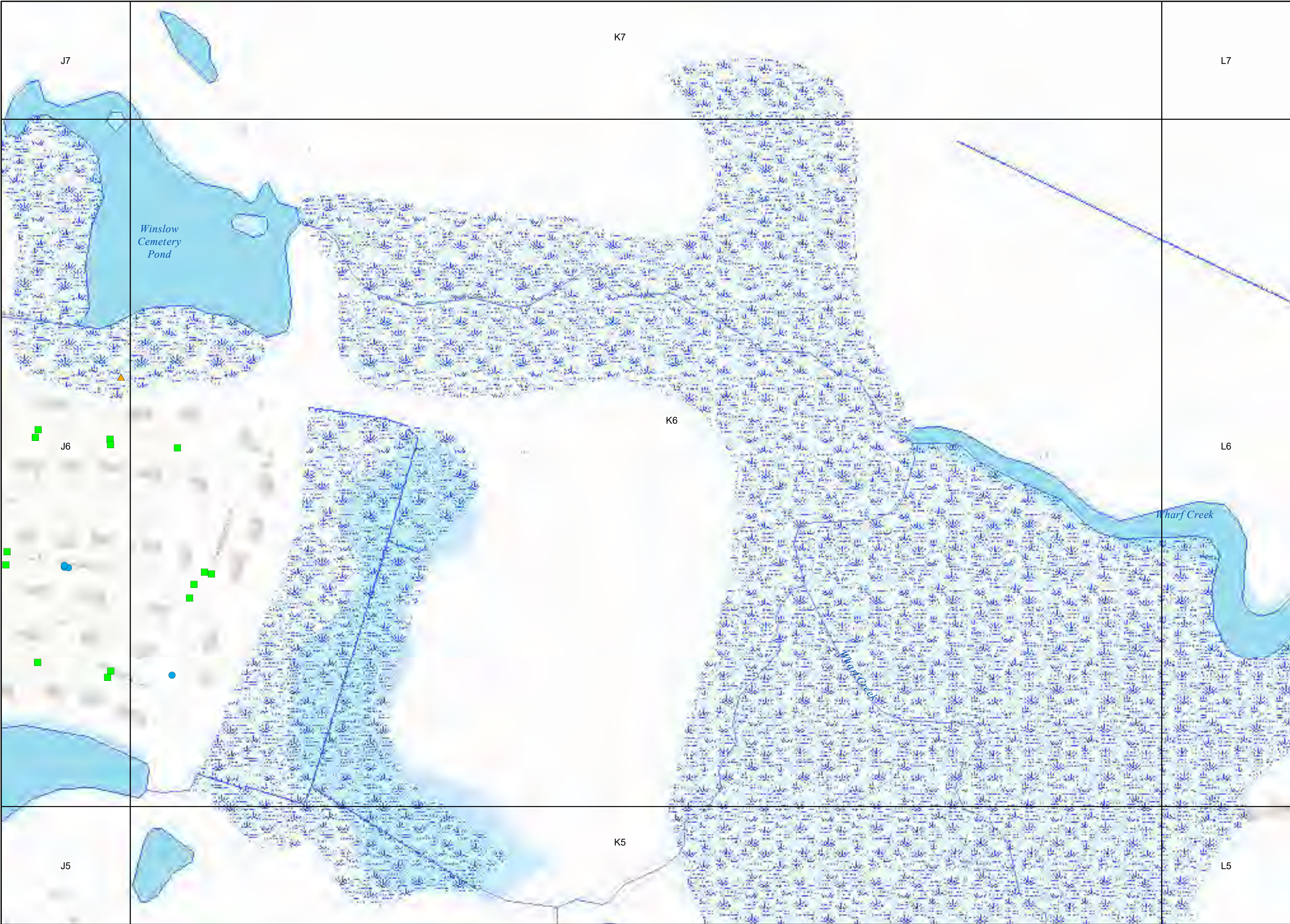


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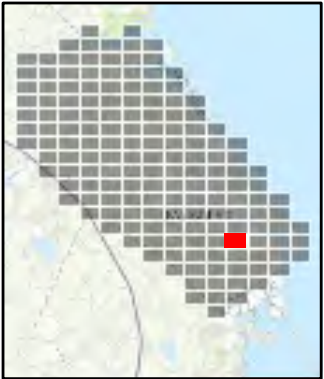


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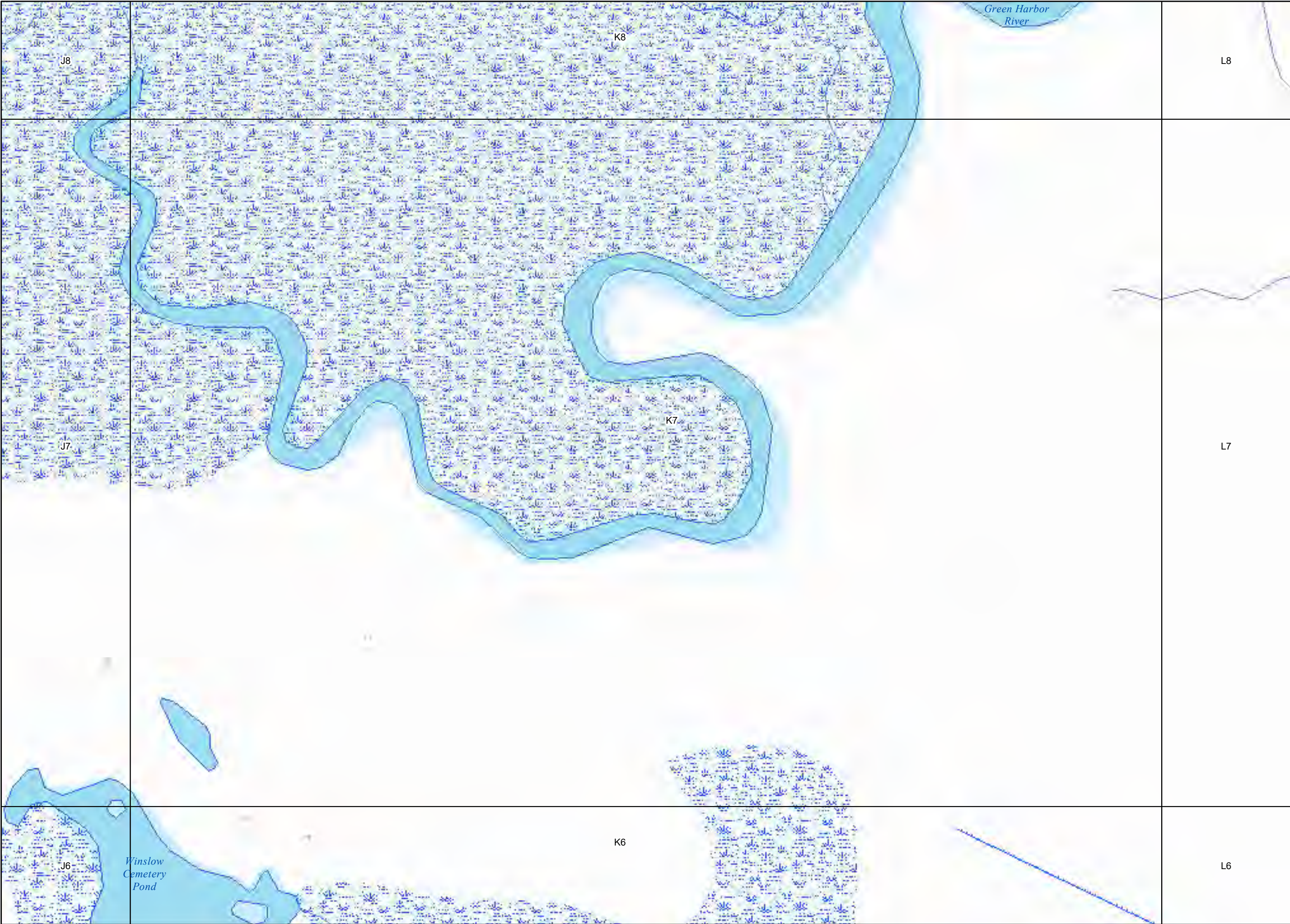
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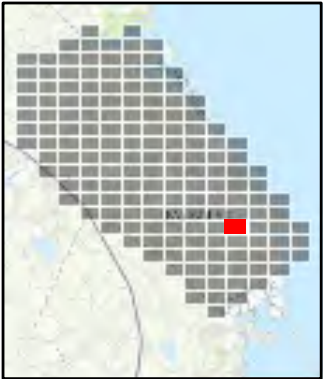


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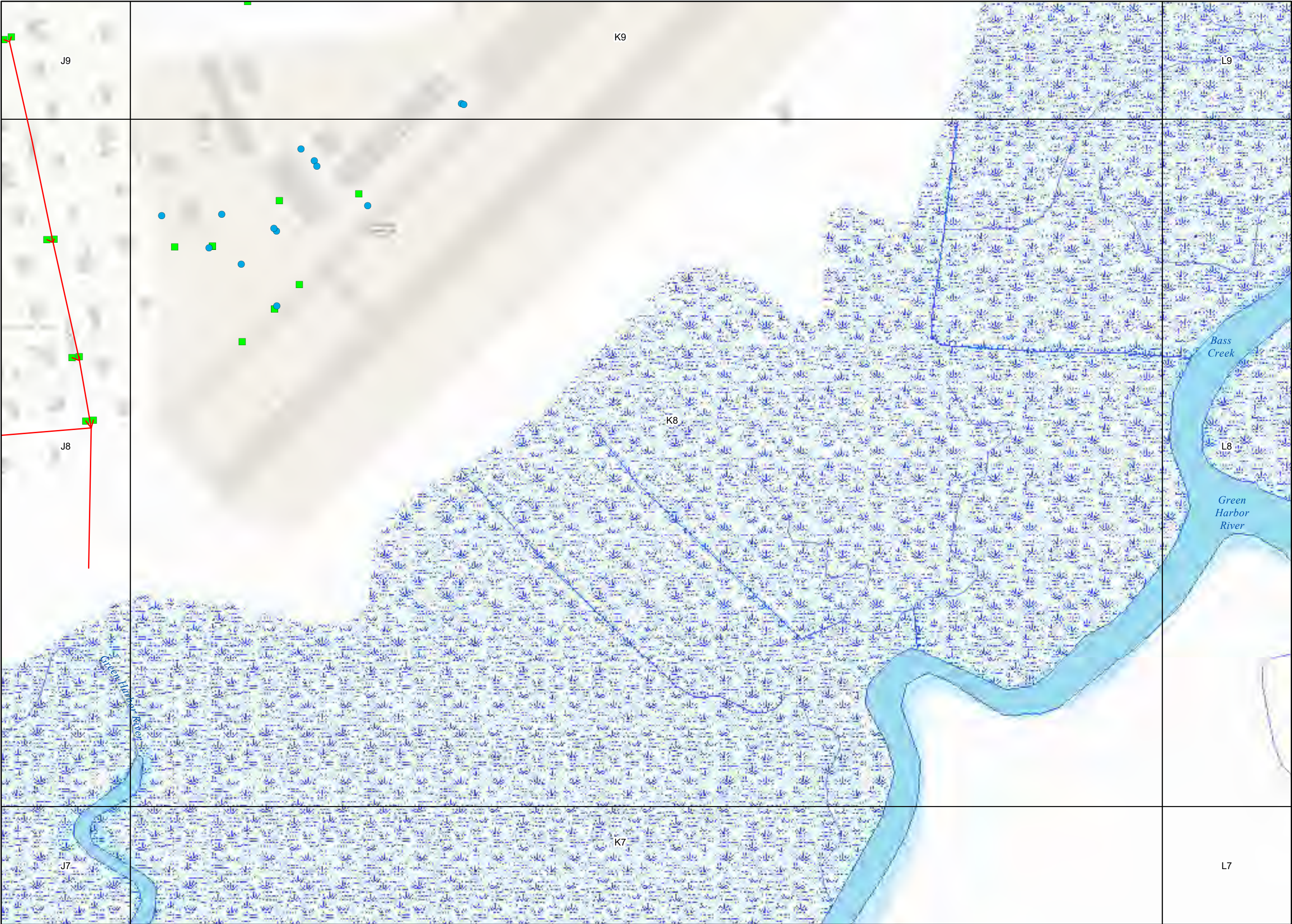
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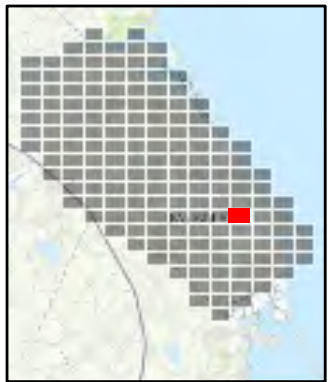


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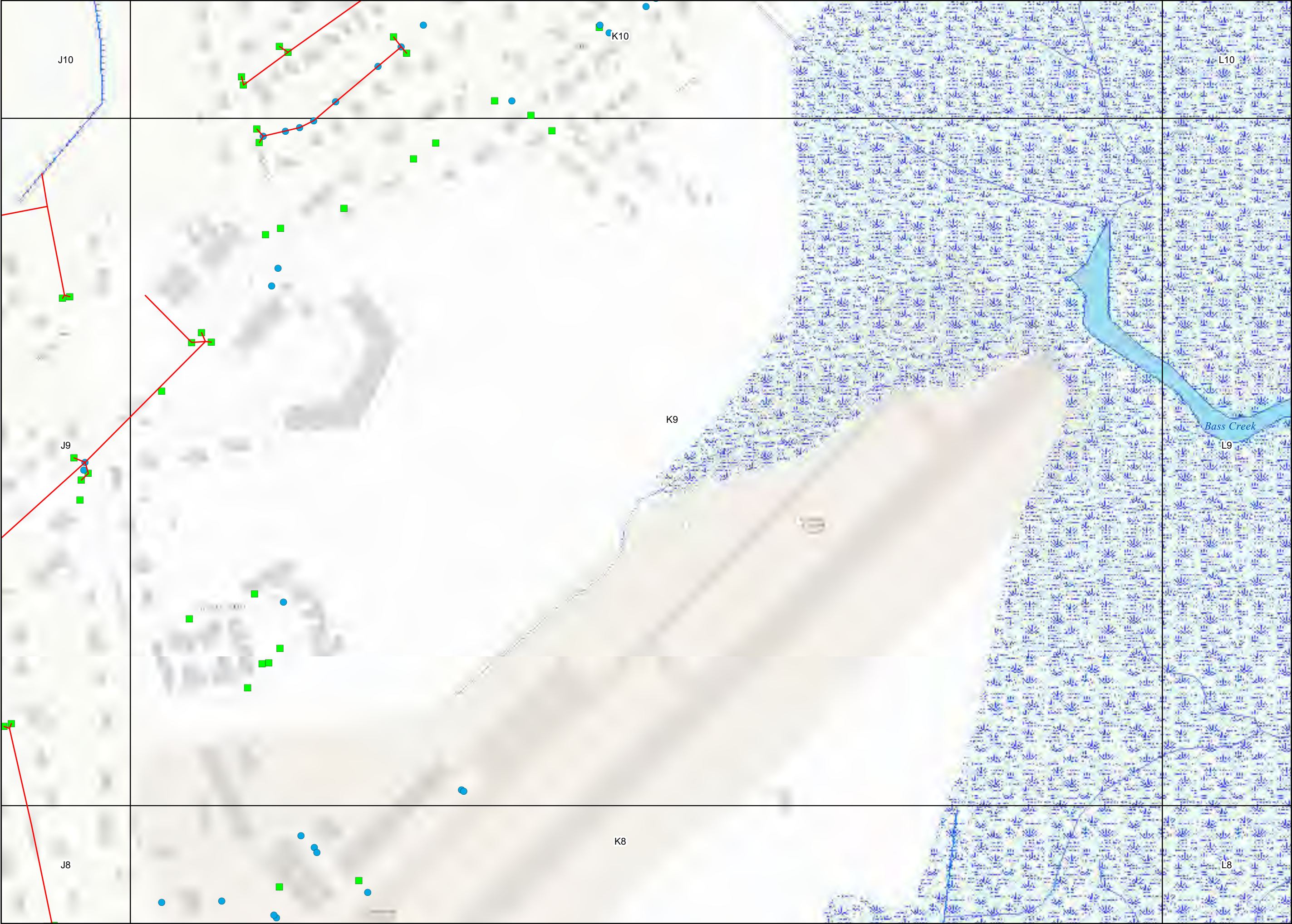
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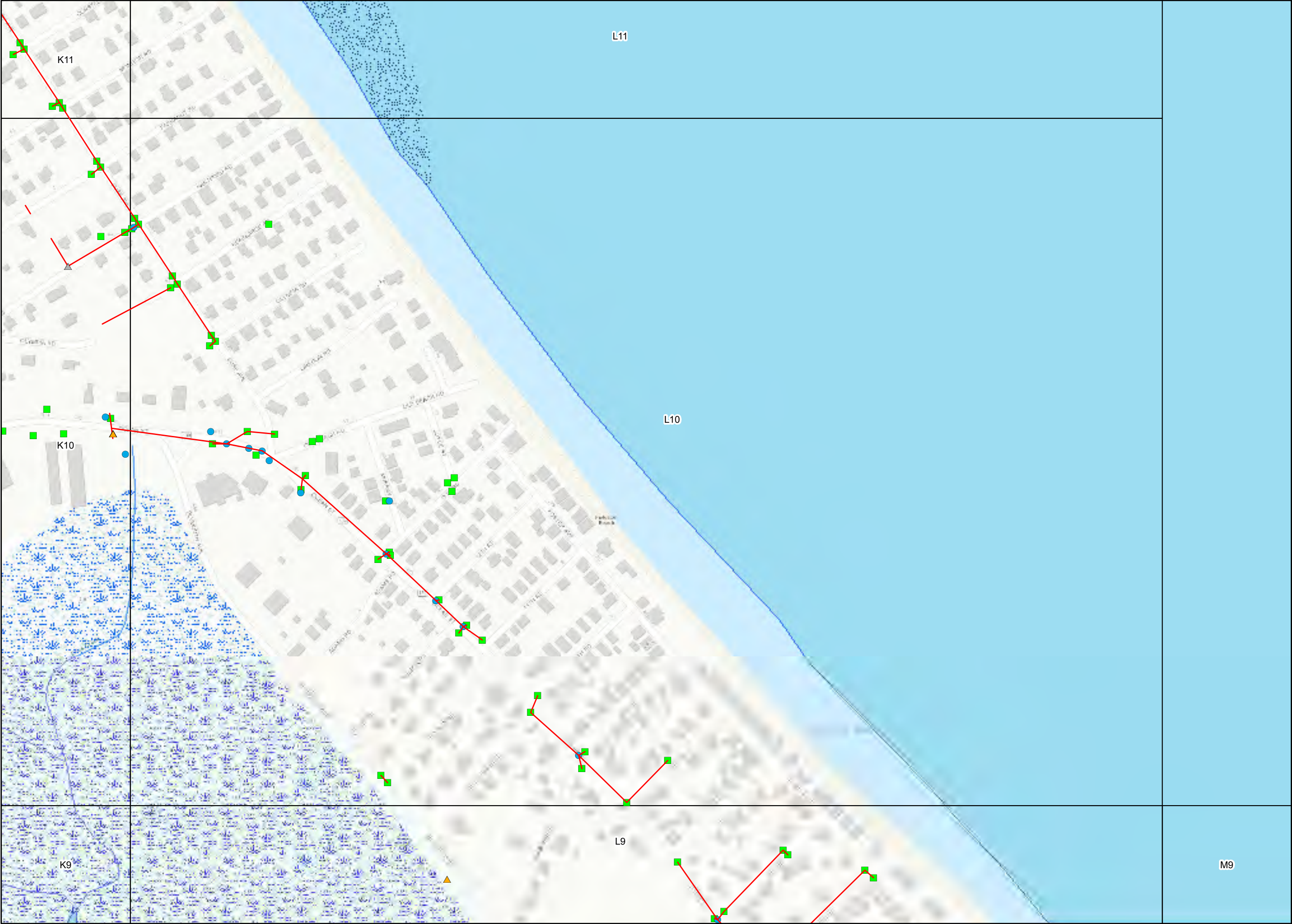
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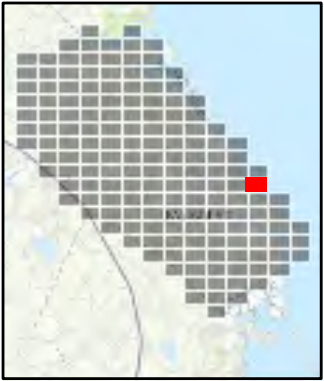
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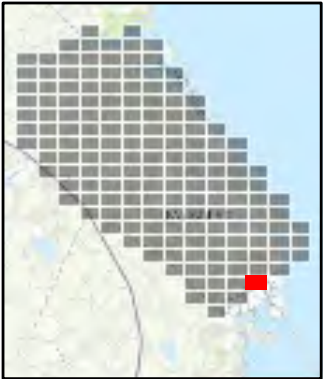
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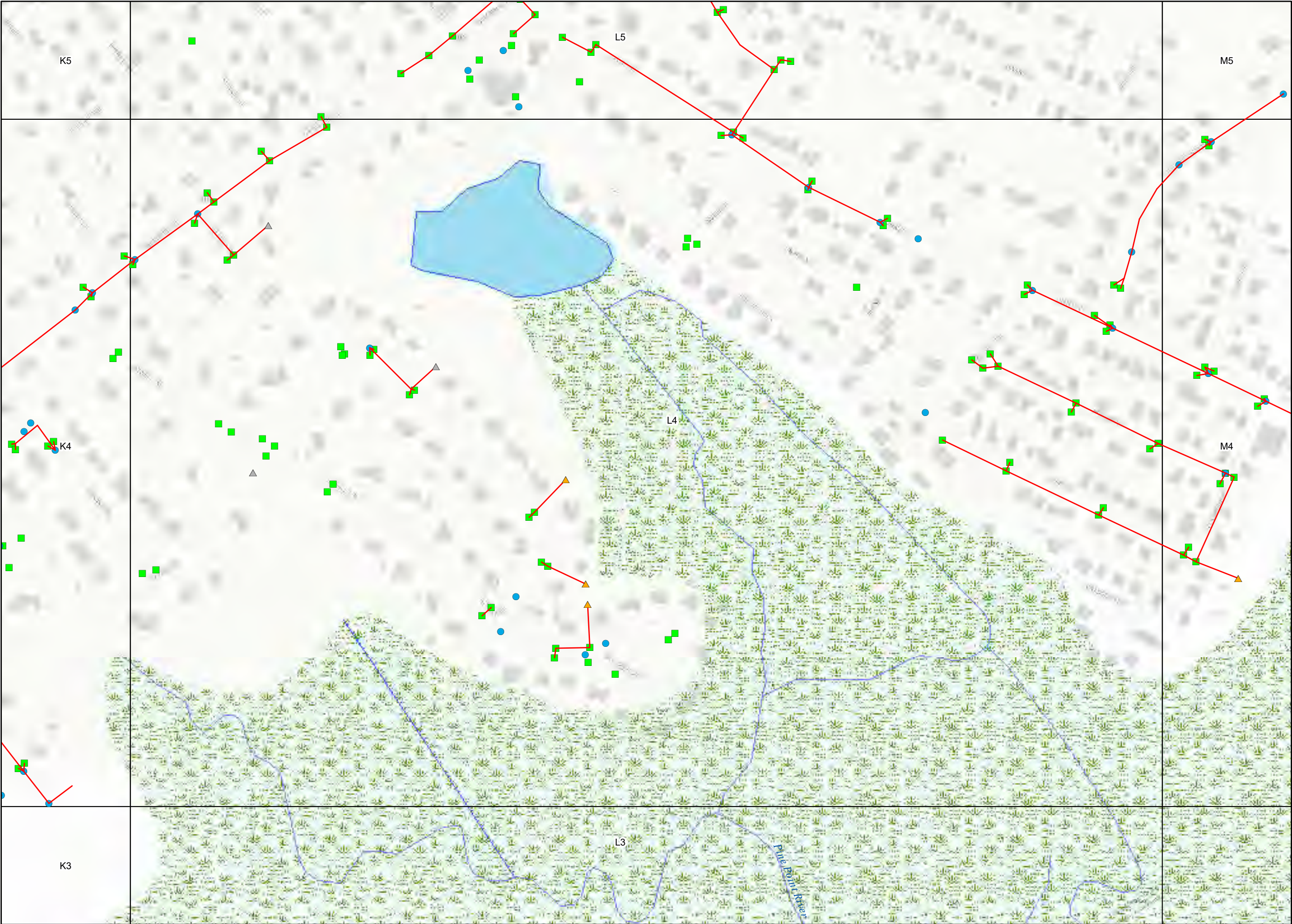


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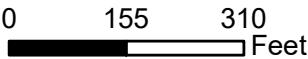




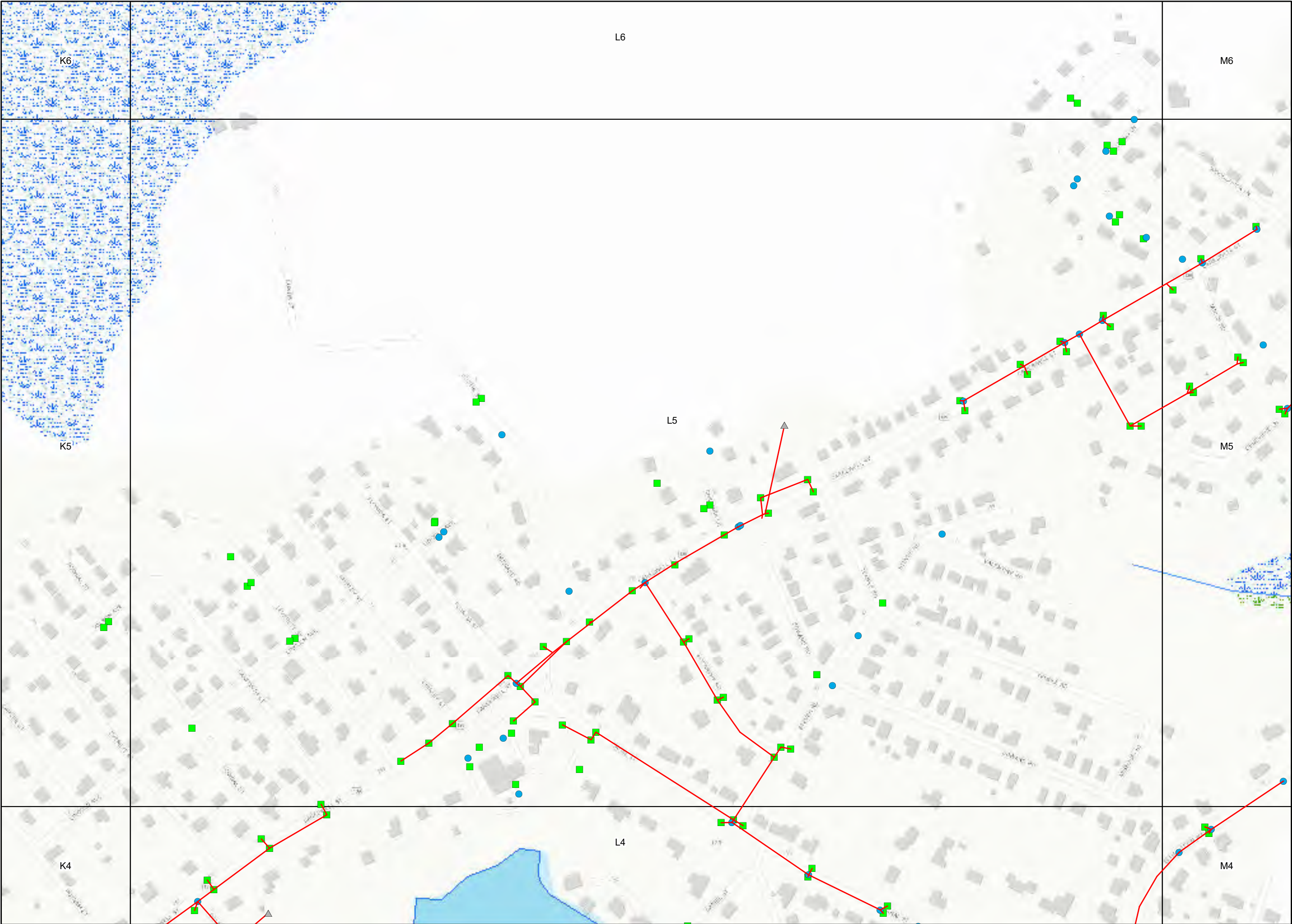


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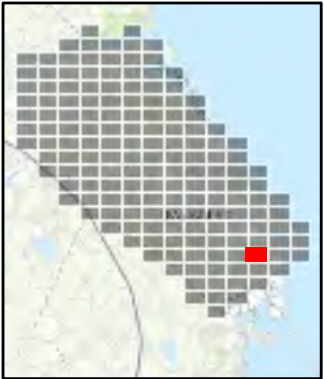
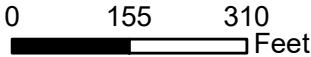




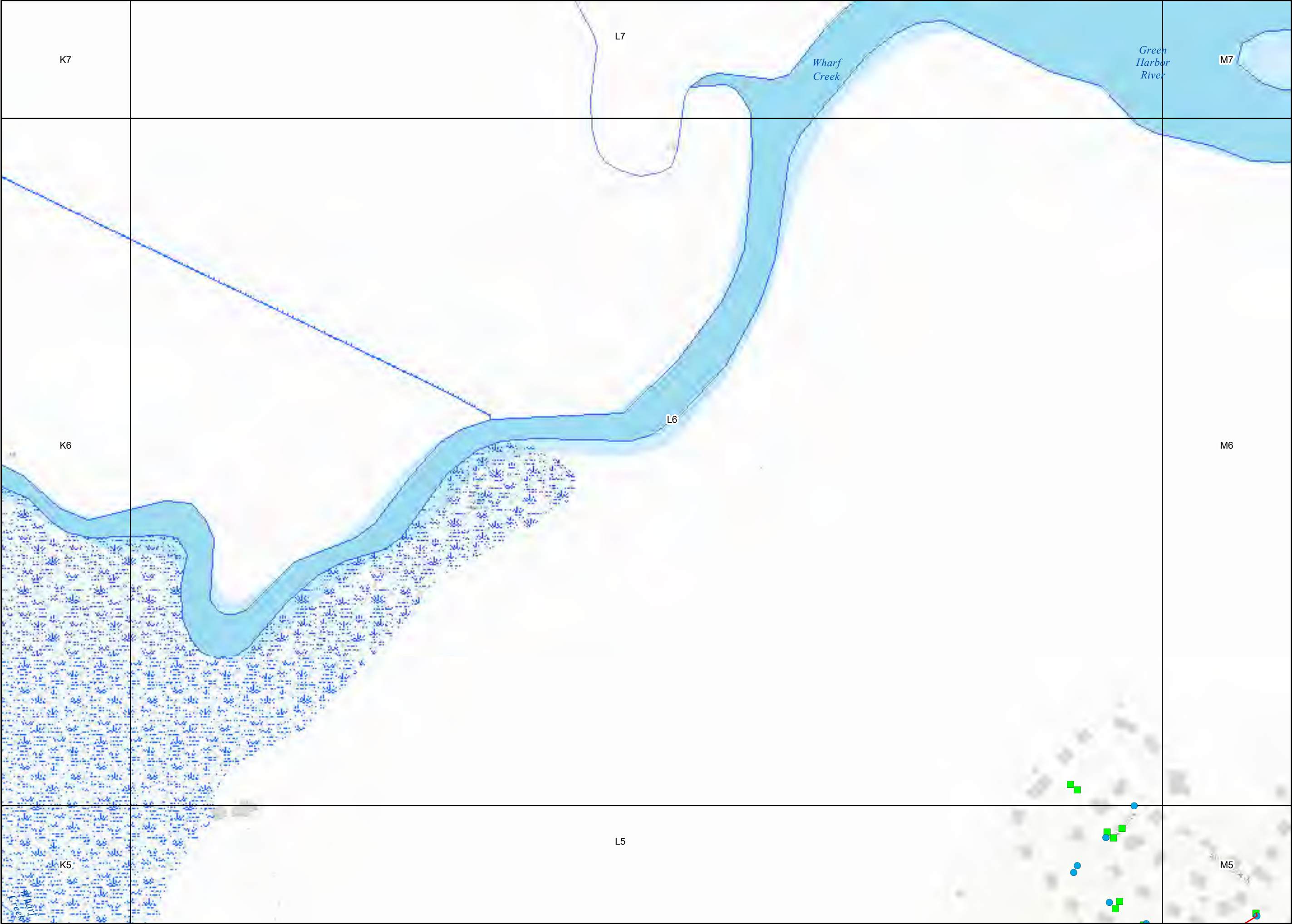


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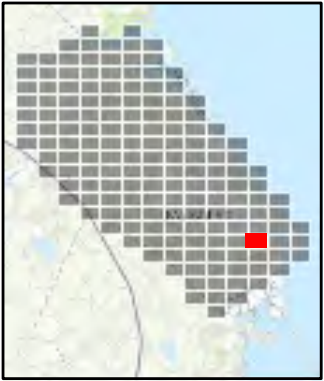


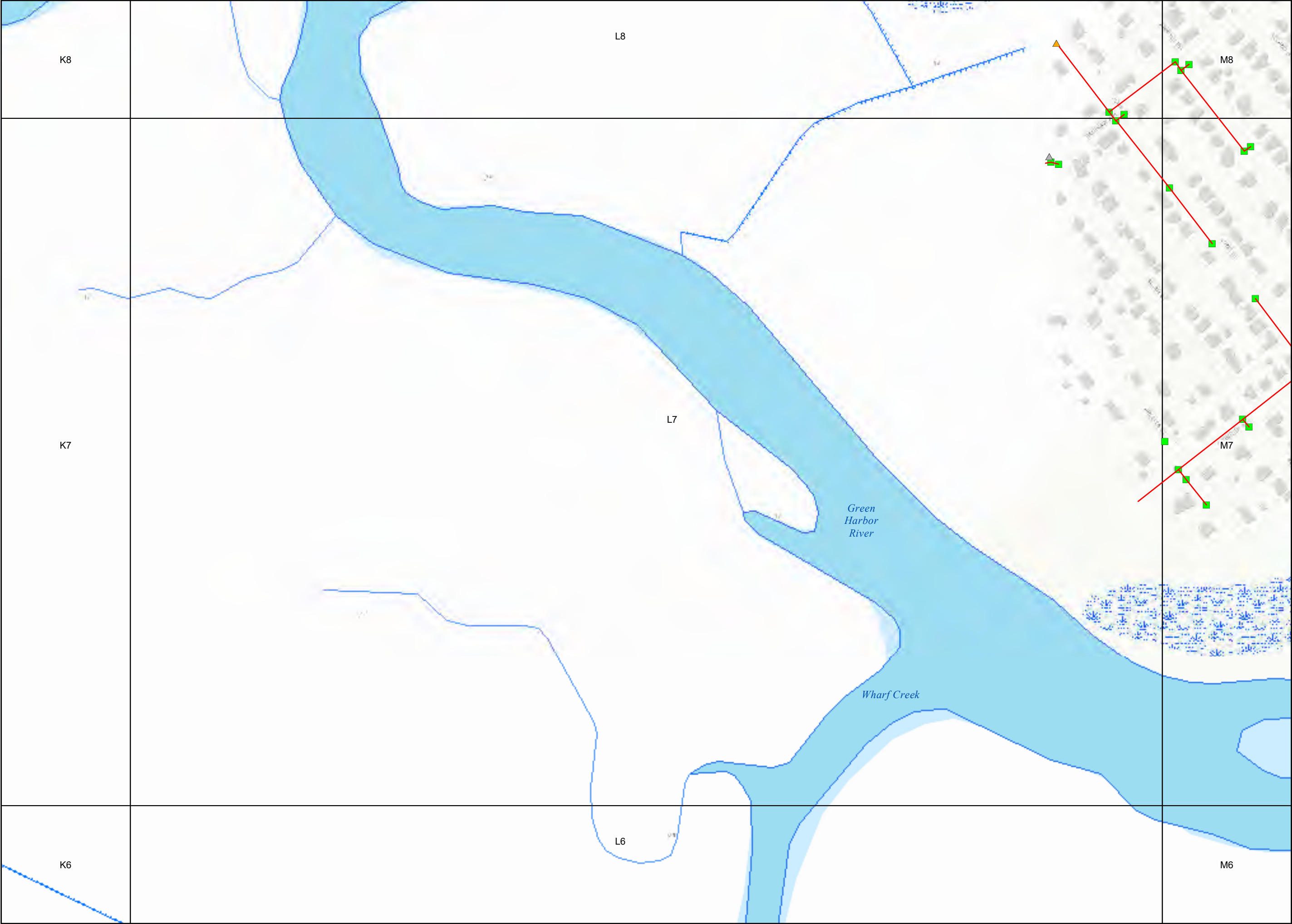
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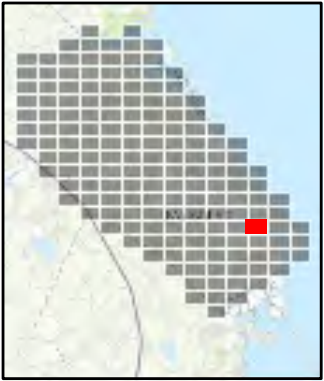


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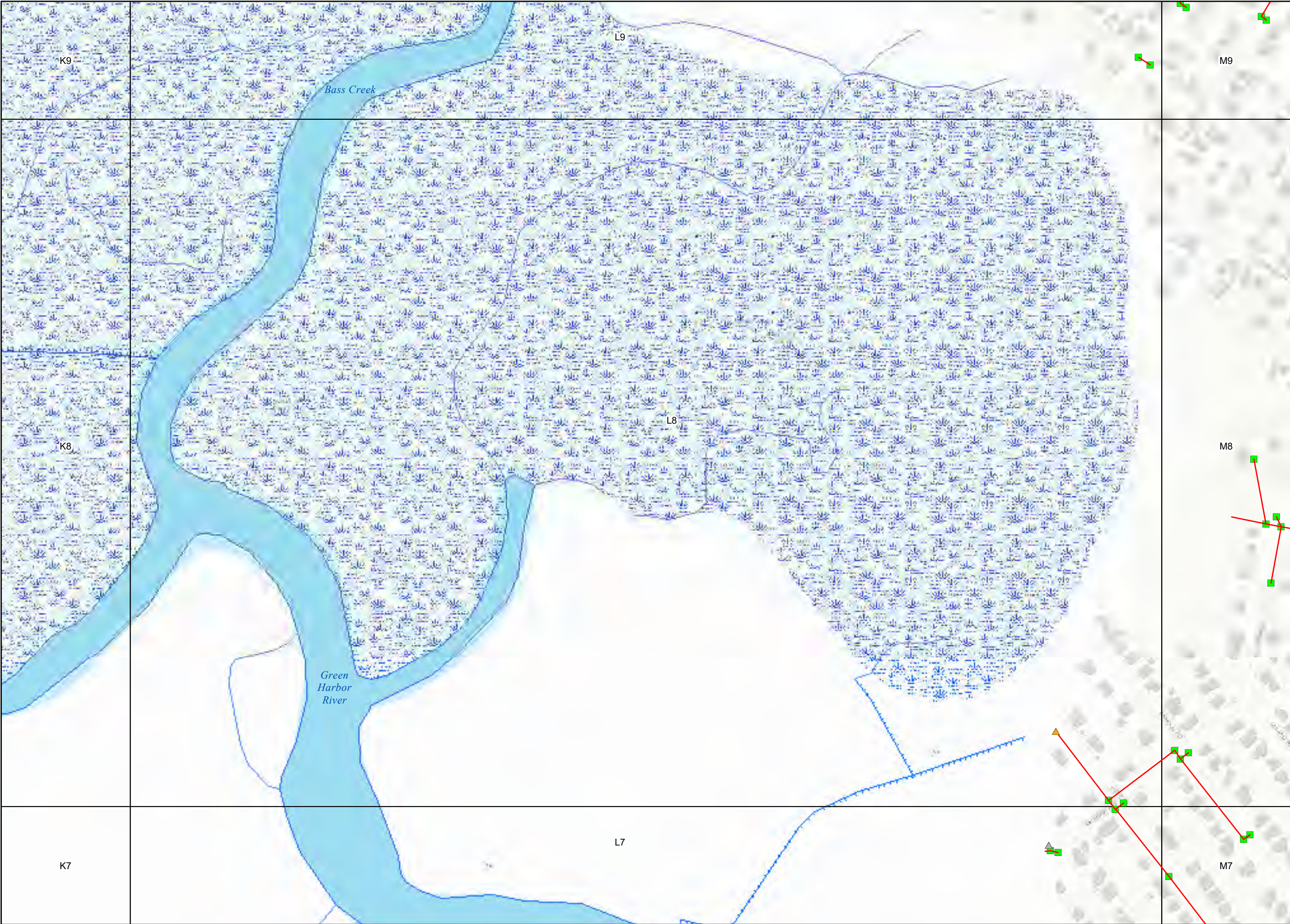
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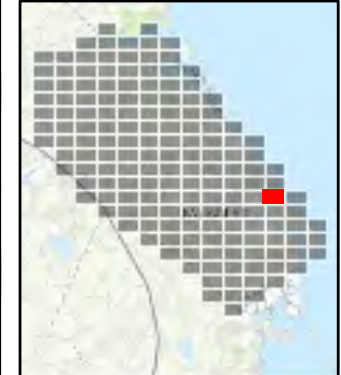
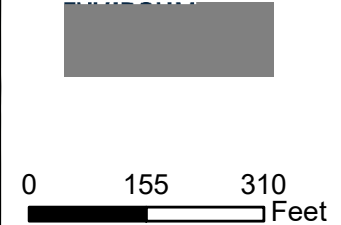




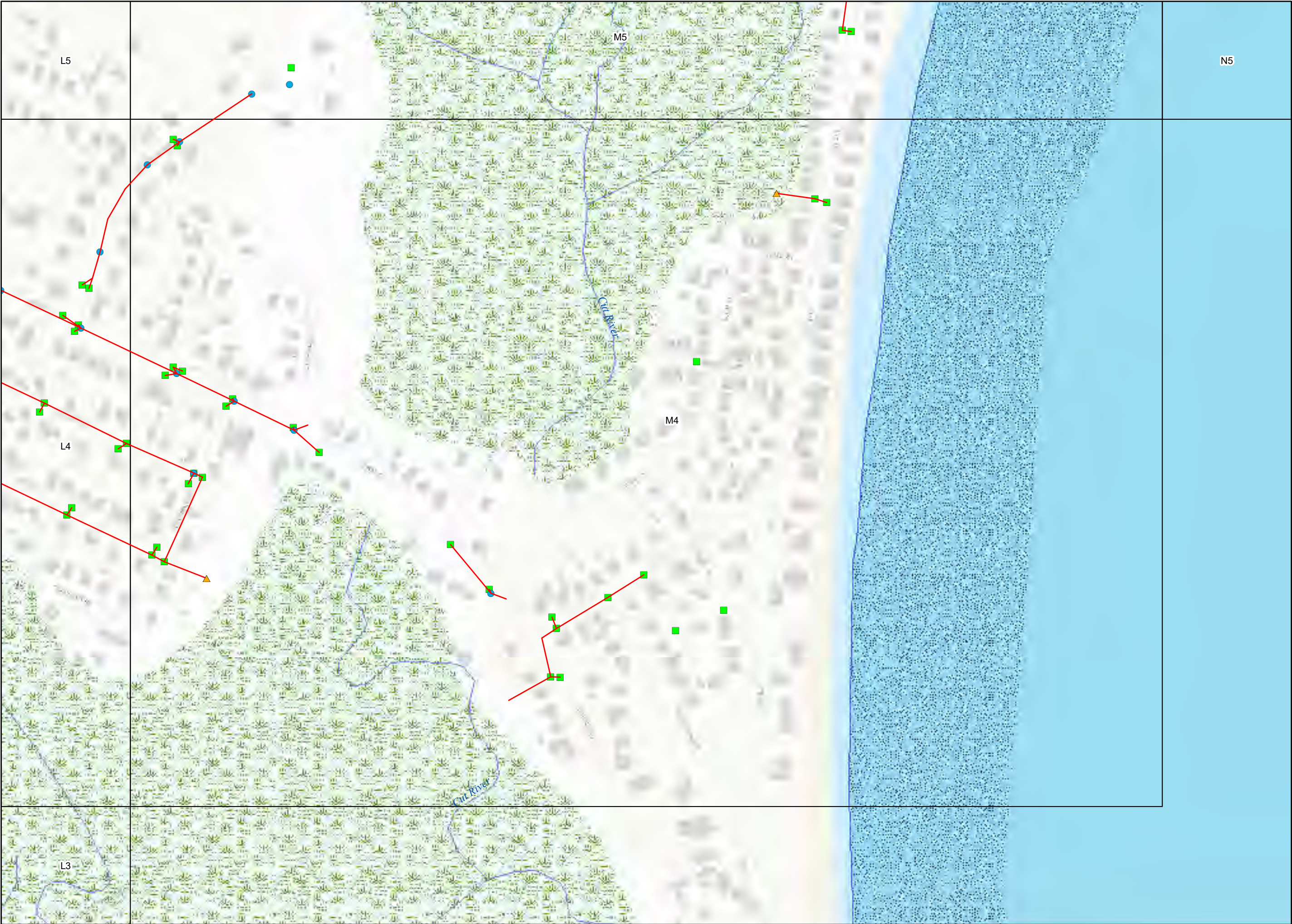


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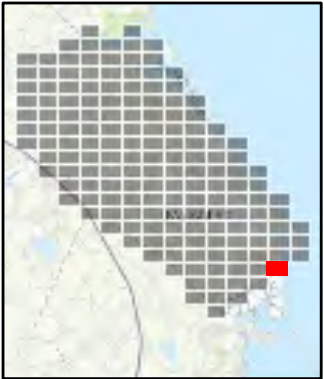


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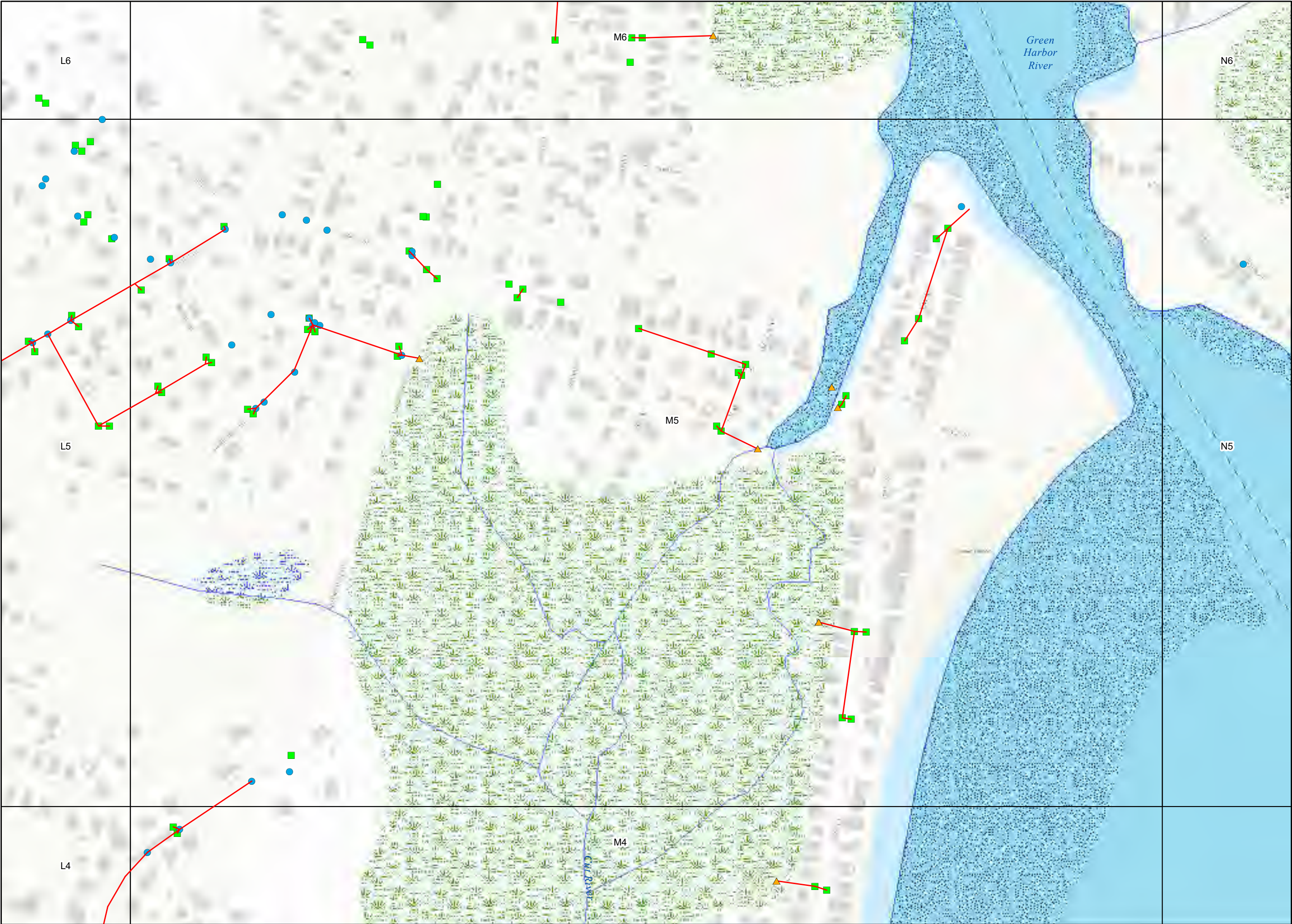
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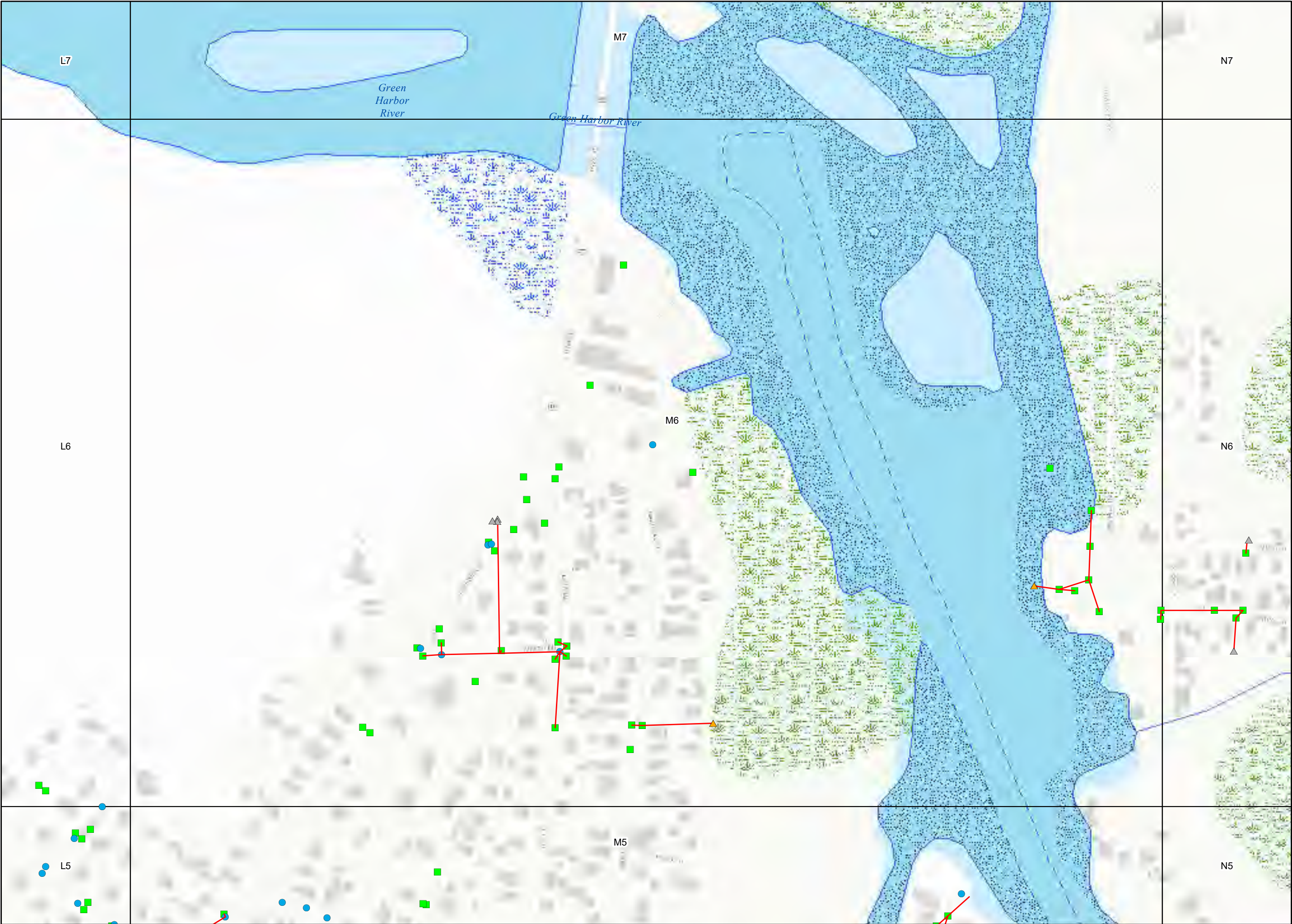


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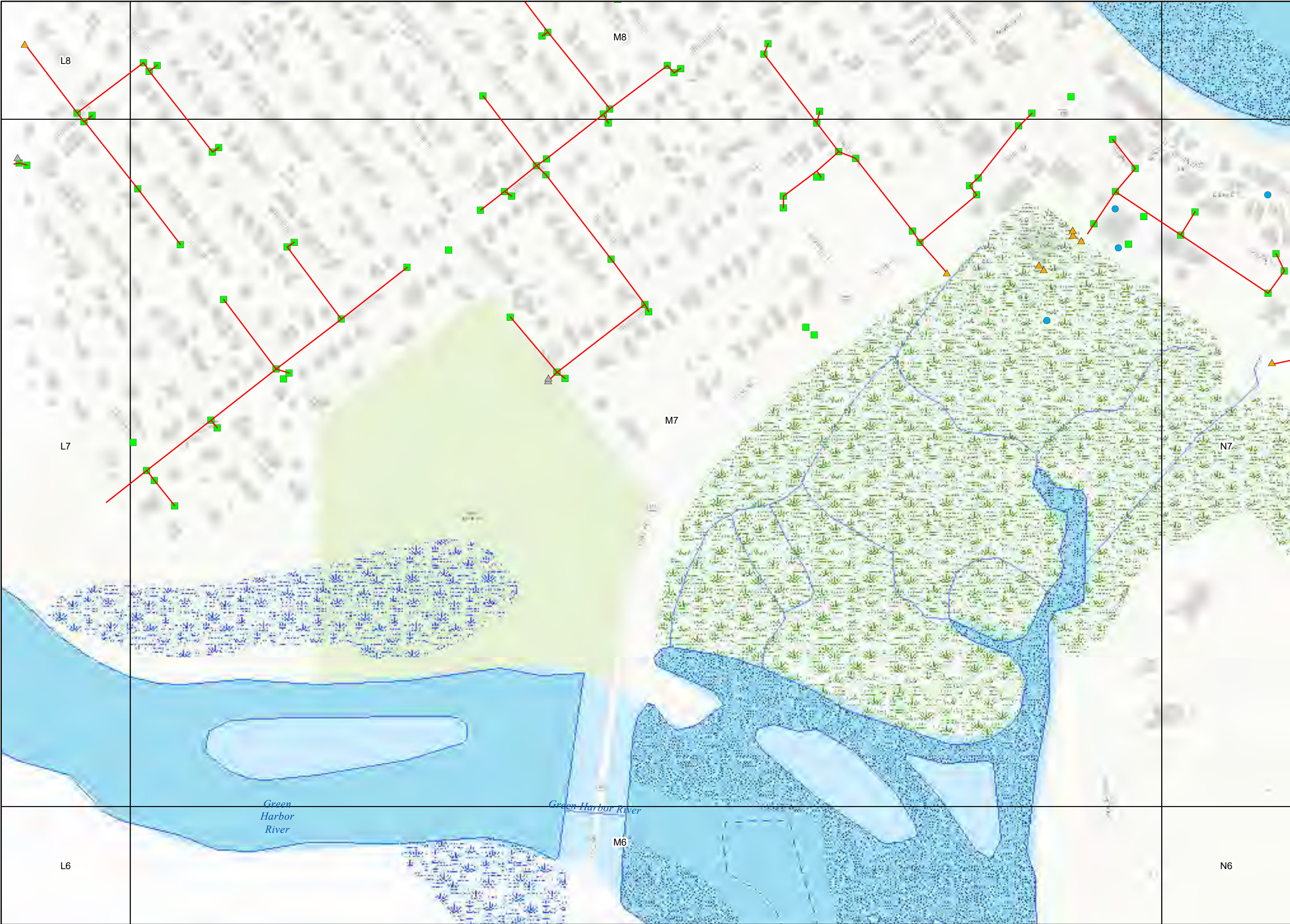
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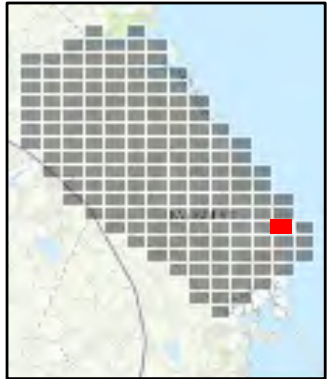


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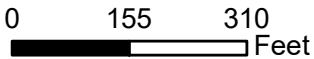




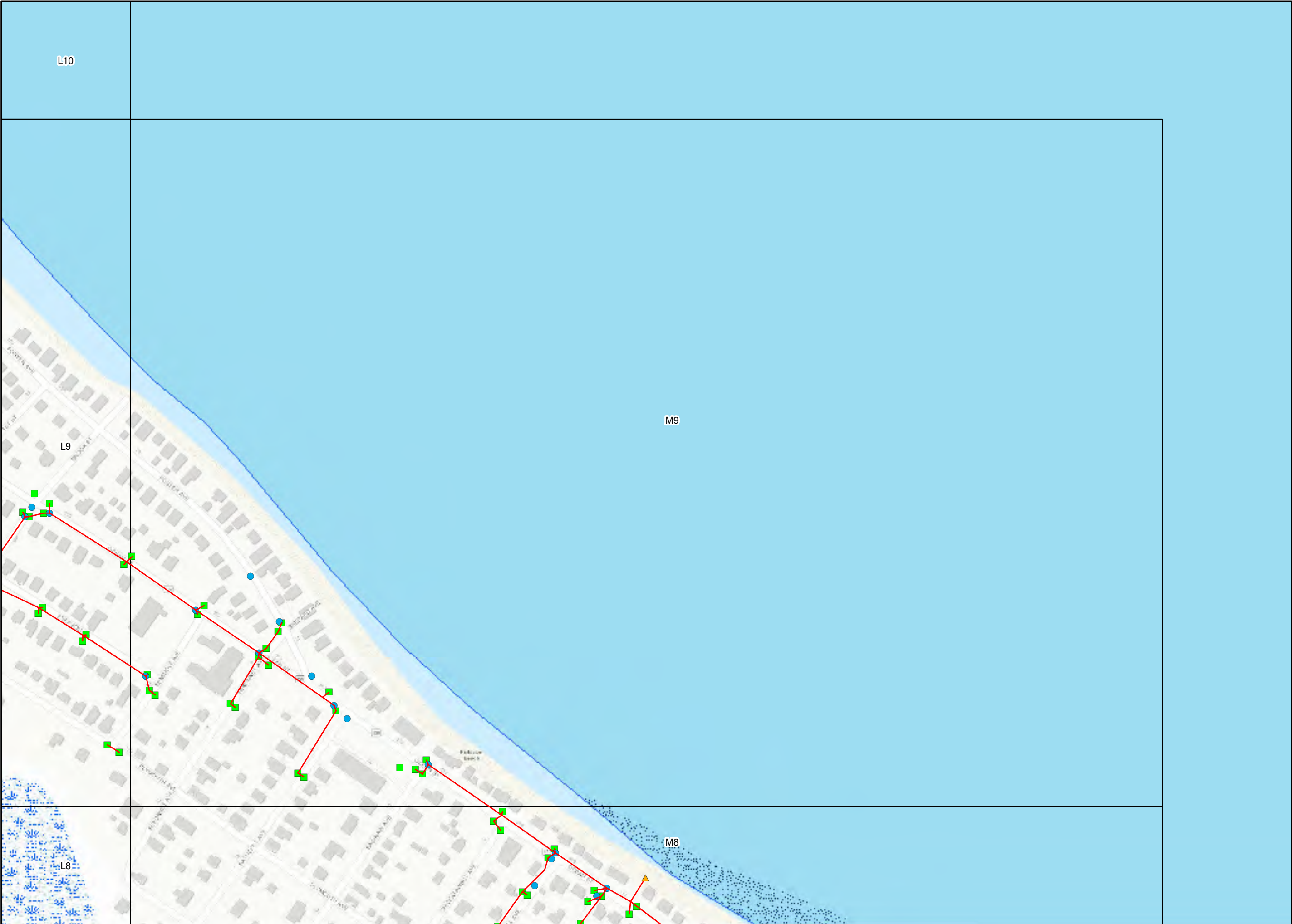


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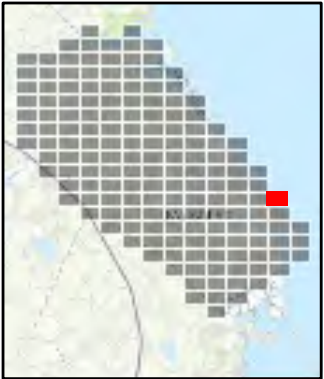




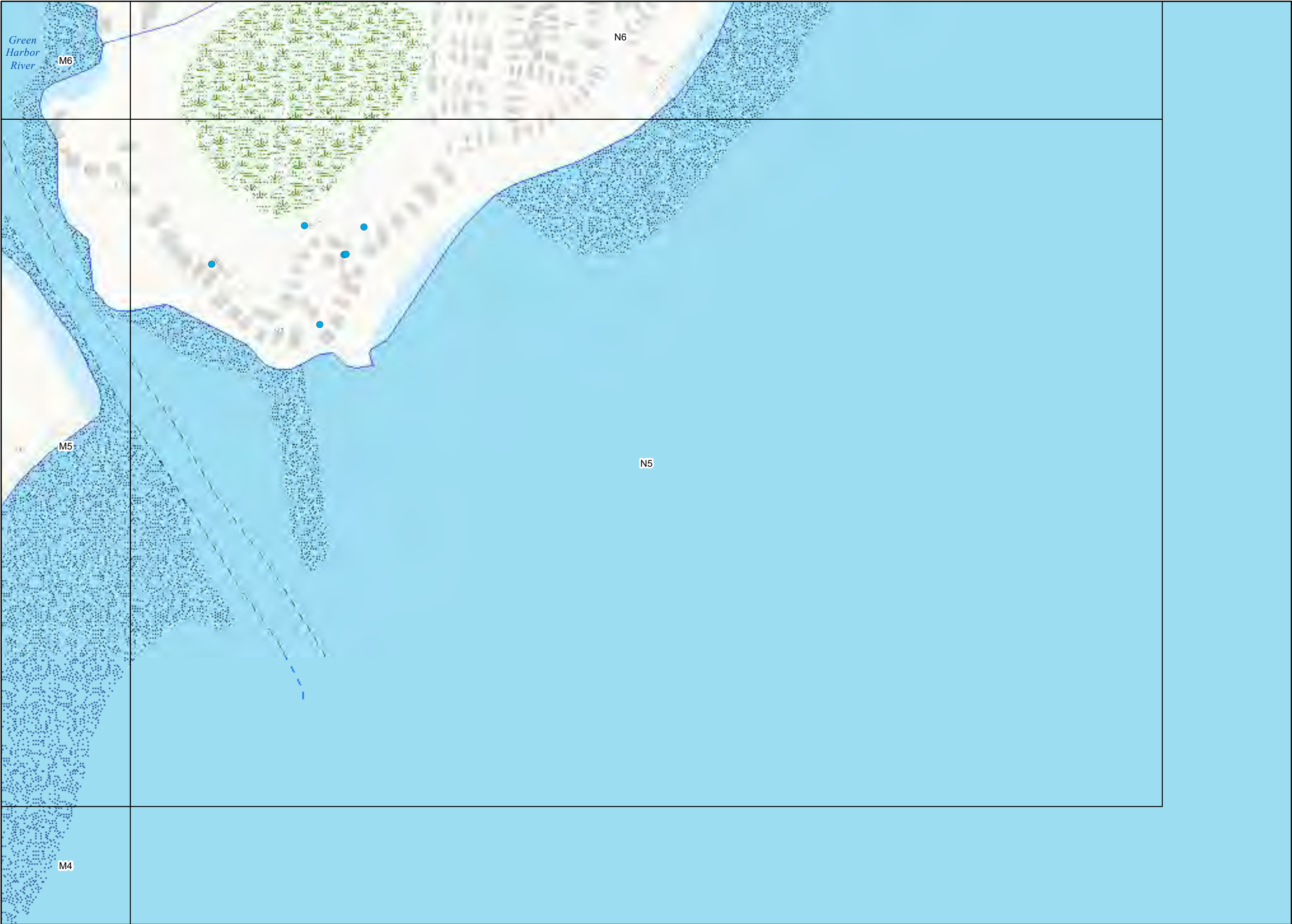


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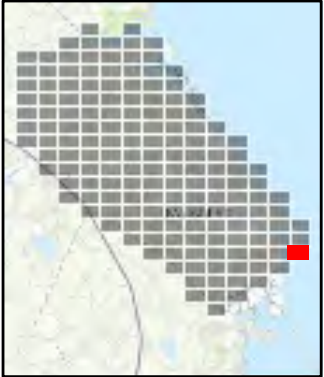
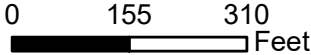






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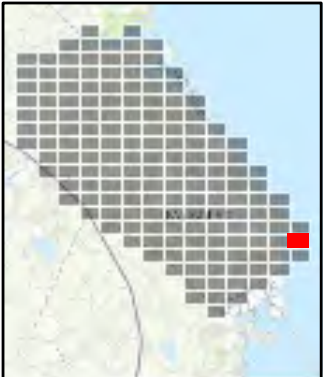


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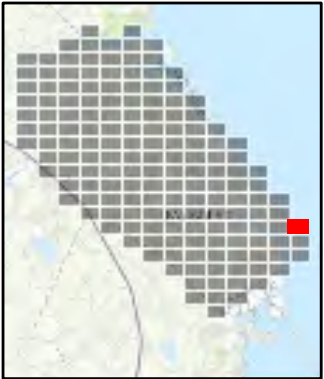


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## APPENDIX L

### IDDE Plan



# ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PLAN

Town of Marshfield

September 2021 (revised)



— An Apex Company —



## Illicit Discharge Detection and Elimination (IDDE) Plan Revision History

MS4 Materials that supplement the 2019 IDDE Plan

<u>Revision #</u>	<u>Date</u>	<u>Comments</u>
0	5/2019	IDDE Plan Published
1	9/2021	Year 3 Updates

"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 gathered and evaluated 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, 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."

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Appendix C – Catchment Delineation Mapping and Ranking Matrix

Appendix D – Field Forms and Hyperlinks to Laboratories and Field Services Companies

Appendix E – Outfall Sampling Results

Appendix F – System Vulnerability Factor (SVF) Inventory

Appendix G – New England Interstate Water Pollution Control Commission IDDE Manual

Appendix H – IDDE Employee Training Record



# SECTION 1 INTRODUCTION

## SECTION 1.1 MS4 PROGRAM

This Illicit Discharge Detection and Elimination (IDDE) Plan has been developed for The Town of Marshfield to address the requirements of the United States Environmental Protection Agency's (USEPA's) 2016 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, hereafter referred to as the "2016 Massachusetts MS4 Permit" or "MS4 Permit."

The 2016 Massachusetts MS4 Permit and 2020 Permit Modifications require that each permittee, or regulated community, address six Minimum Control Measures. These measures include the following:

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination Program
4. Construction Site Stormwater Runoff Control
5. Stormwater Management in New Development and Redevelopment (Post Construction Stormwater Management)
6. Good Housekeeping and Pollution Prevention for Permittee Owned Operations

Under Minimum Control Measure 3, the permittee is required to implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges. The IDDE program must also be recorded in a written (hardcopy or electronic) document. This IDDE Plan has been prepared to address this requirement. Originally, the Town published this Plan in 2019, and since then, the Town has updated the Plan as needed.

## SECTION 1.2 ILLICIT DISCHARGES

An "illicit discharge" is any discharge to a drainage system that is not composed entirely of stormwater, with the exception of discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the MS4) and discharges resulting from fire-fighting activities.

Illicit discharges may take a variety of forms. Illicit discharges may enter the drainage system through direct or indirect connections. Direct connections may be relatively obvious, such as cross-connections of sewer services to the storm drain system. Indirect illicit discharges may be more difficult to detect or address, such as failing septic systems that discharge untreated sewage to a ditch within the MS4, or a sump pump that discharges contaminated water on an intermittent basis.

Some illicit discharges are intentional, such as dumping used oil (or other pollutant) into catch basins, a resident or contractor illegally tapping a new sewer lateral into a storm drain pipe to avoid

the costs of a sewer connection fee and service, and illegal dumping of yard wastes into surface waters.

Some illicit discharges are related to outdated building and construction practices. Examples of illicit discharges in this category include floor drains in old buildings that are connected to the storm drain system, as well as sanitary sewer overflows that enter the drainage system. Sump pumps legally connected to the storm drain system may be used inappropriately, such as for the disposal of floor washwater or old household products, in many cases due to a lack of understanding on the part of the homeowner.

Elimination of some discharges may require substantial costs and efforts, such as reconfiguring a sanitary sewer connection from a municipal storm to a sanitary sewer drain. Other beneficial strategies, such as reducing dog waste, can be accomplished through public outreach in conjunction with installing dog waste bins.

Regardless of the situation, illicit discharges can contribute high levels of pollutants, such as heavy metals, toxics, oil, grease, solvents, nutrients, and pathogens to surface waters.

## SECTION 1.3 ALLOWABLE NON-STORMWATER DISCHARGES

The following categories of non-stormwater discharges are allowed under the MS4 Permit unless the permittee, USEPA, or Massachusetts Department of Environmental Protection (MassDEP) identifies any category or individual discharge of non-stormwater discharge as a significant contributor of pollutants to the MS4:

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground water
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20))
- Uncontaminated pumped groundwater
- Discharge from potable water sources
- Foundation drains
- Air conditioning condensation
- Irrigation water, springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual resident car washing
- De-chlorinated swimming pool discharges
- Street wash waters
- Residential building wash waters without detergents

If these discharges are identified as significant contributors to the MS4, they must be considered an “illicit discharge” and addressed in the IDDE Plan (i.e., control these sources so they are no longer significant contributors of pollutants and/or eliminate the sources entirely).



## SECTION 1.4 RECEIVING WATERS AND IMPAIRMENTS

**Table 1-1** lists the “impaired waters” within the boundaries of Marshfield’s MS4 regulated area. Impaired waters are water bodies that do not meet water quality standards for one or more designated use(s), such as recreation or aquatic habitat. The inventory is based on the Massachusetts 2016 Integrated List of Waters published by MassDEP in December 2019 and updated every two years. The first draft of this IDDE Plan, published in 2019, and the Town’s Notice of Intent (NOI), published in 2018, used the previous Massachusetts 2014 Integrated List of Waters. There are a few changes for Marshfield between the 2014 and 2016 Integrated Lists of Waters. In this period, MassDEP published Total Maximum Daily Load (TMDL) reports for segments of Green Harbor River, North River, and South River within Marshfield, and these water bodies are now Category 4a Waters, instead of Category 5 Waters. In addition, the 2016 List inventoried a new segment of the North River (Segment ID MA94-05), and this water body contains impairments for fecal coliform and mercury in fish tissue.

**Table 1-1 Impaired Waters  
Marshfield, Massachusetts**

Water Body Name	Segment ID	Category	Impairment(s)	Associated Approved TMDL
Green Harbor River	MA94-10	5	<ul style="list-style-type: none"> <li>Fish-Passage Barrier</li> <li>Flow Regime Modification</li> <li>Algae</li> <li>Turbidity</li> </ul>	
North River	MA94-05	5	<ul style="list-style-type: none"> <li>Fecal Coliform</li> <li>Mercury in Fish Tissue</li> </ul>	Fecal Coliform TMDL: 61725
Green Harbor	MA94-11	4a	<ul style="list-style-type: none"> <li>Fecal Coliform</li> </ul>	61731
North River	MA94-06	4a	<ul style="list-style-type: none"> <li>Fecal Coliform</li> </ul>	61730
South River	MA94-09	4a	<ul style="list-style-type: none"> <li>Fecal Coliform</li> <li>Enterococcus</li> </ul>	61728
Black Mountain Pond	MA94009	4c	<ul style="list-style-type: none"> <li>Non-Native Aquatic Plants</li> </ul>	N/A

Category 4a Waters – impaired water bodies with a completed Total Maximum Daily Load (TMDL).

Category 4c Waters – impaired water bodies where the impairment is not caused by a pollutant. No TMDL required.

Category 5 Waters – impaired water bodies that require a TMDL.

“Approved TMDLs” are those that have been approved by USEPA as of the date of issuance of the Massachusetts 2016 List of Integrated Waters (December 2019).

These impairments require additional sampling in accordance with Appendix G of the MS4 Permit. The Town must sample for total phosphorus, total nitrogen, total suspended solids, and turbidity at outfalls discharging to the Green Harbor River; fecal coliform at outfalls discharging to the North River or Green Harbor; and fecal coliform and enterococcus at outfalls discharging to the South River. Due to the South Coastal Watershed’s TMDL for pathogens, the Town must sample all outfalls for E. coli and fecal coliform.

In order to comply with the 2016 MS4 Permit Appendix H, the Town of Marshfield must implement the illicit discharge program. Catchments draining to South River, Green Harbor River, Green Harbor, or North River shall be designated either Problem Catchments or High Priority Catchments for purposes of implementing the IDDE program.

## SECTION 1.5 IDDE PROGRAM GOALS, FRAMEWORK, AND TIMELINE

The goals of the IDDE program are to find and eliminate illicit discharges to the Town's municipal separate storm sewer system and to prevent illicit discharges from happening in the future. The program consists of the following major components as outlined in the MS4 Permit:

- Legal authority and regulatory mechanism to prohibit illicit discharges and enforce this prohibition
- Storm system mapping
- Inventory and ranking of outfalls
- Dry weather outfall screening
- Catchment investigations
- Identification/confirmation of illicit sources
- Illicit discharge removal
- Follow-up screening
- Employee training

The IDDE investigation procedure framework is shown in **Figure 1-1**. The required timeline for implementing the IDDE program is shown in **Table 1-2**.



**Figure 1-1 IDDE Investigation Procedure Framework**



**Table 1-2 IDDE Program Implementation Timeline**

IDDE Program Requirement	Completion Date from Effective Date of Permit					
	1 Year (June 2019)	1.5 Years (Dec. 2019)	2 Years (June 2020)	3 Years (June 2021)	7 Years (June 2025)	10 Years (June 2028)
Written IDDE Program Plan	X					
Sanitary Sewer Overflow (SSO) Inventory	X					
Written Catchment Investigation Procedure		X				
Phase I Mapping			X			
Phase II Mapping						X
IDDE Regulatory Mechanism or By-law (if not already in place)				X		
Dry Weather Outfall Screening				X		
Follow-up Ranking of Outfalls and Interconnections				X		
Catchment Investigations – Problem Outfalls					X	
Catchment Investigations – all Problem, High and Low Priority Outfalls						X

## SECTION 1.6 WORK COMPLETED UNDER THE 2003 MS4 PERMIT

The 2003 MS4 Permit required each MS4 community to develop a plan to detect illicit discharges using a combination of mapping of the storm system, adopting a regulatory mechanism to prohibit illicit discharges and enforce this prohibition, and identifying tools and methods to investigate suspected illicit discharges. Each MS4 community was also required to define how confirmed discharges would be eliminated and how their removal would be documented.

The Town of Marshfield has completed the following IDDE program activities consistent with the 2003 MS4 Permit requirements:

- Developed a map of outfalls and receiving waters
- Adopted an IDDE by-law or regulatory mechanism
- Developed procedures for locating illicit discharges (e.g., visual screening of outfalls for dry weather discharges, dye, or smoke testing)
- Developed procedures for locating the source of the discharge
- Developed procedures for removal of the source of an illicit discharge
- Developed procedures for documenting actions and evaluating impacts on the storm sewer system subsequent to removal

In addition to the 2003 MS4 Permit requirements, the Town completed other IDDE-related activities prior to the 2016 MS4 Permit:

- Outfall sampling
- Additional storm system mapping, including the locations of catch basins, manholes and pipe connectivity



# SECTION 2 AUTHORITY AND STATEMENT OF IDDE RESPONSIBILITIES

## SECTION 2.1 LEGAL AUTHORITY

The Town of Marshfield has adopted Chapter 246: Stormwater Management (April 23, 2007). A copy of the Stormwater Management By-law is provided in **Appendix A**. The Stormwater Management By-law provides the Town of Marshfield with adequate legal authority to:

- Prohibit illicit discharges
- Investigate suspected illicit discharges
- Eliminate illicit discharges, including discharges from properties not owned by or controlled by the MS4 that discharge into the MS4 system
- Implement appropriate enforcement procedures and actions

The Town of Marshfield is in the process of reviewing its current Stormwater Management By-Law and related land use regulations and policies for consistency with the 2016 MS4 Permit and 2020 Permit Modifications.

## SECTION 2.2 STATEMENT OF RESPONSIBILITIES

The Marshfield Department of Public Works is the lead municipal agency responsible for implementing the IDDE program pursuant to the provisions of the Illicit Discharges to Storm Drainage System. Other agencies or departments with responsibility for aspects of the program include:

- Conservation Commission
- Planning Board
- Zoning Board of Appeals

## SECTION 3 STORMWATER SYSTEM MAPPING

The Town of Marshfield originally developed mapping of its stormwater system to meet the mapping requirements of the 2003 MS4 Permit. The 2016 MS4 Permit requires a more detailed storm system map than was required by the 2003 MS4 Permit. The revised mapping is intended to facilitate the identification of key infrastructure, factors influencing proper system operation, and the potential for illicit discharges.

The 2016 MS4 Permit requires the storm system map to be updated in two phases as outlined below. The Department of Public Works is responsible for updating the stormwater system mapping pursuant to the 2016 MS4 Permit. The Town of Marshfield reports on the progress towards completion of the storm system map in each annual report. Updates to the stormwater mapping are included in **Appendix B**.

### SECTION 3.1 PHASE I MAPPING

Phase I mapping must be completed within two (2) years of the effective date of the permit (July 1, 2020) and include the following information:

- Outfalls and receiving waters (previously required by the MS4-2003 permit)
- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems
- Municipally owned stormwater treatment structures
- Water bodies identified by name and indication of all use impairments as identified on the most recent USEPA approved Massachusetts Integrated List of Waters report
- Initial catchment delineations. Topographic contours and drainage system information may be used to produce initial catchment delineations.

The Town of Marshfield has completed the following updates to its stormwater mapping to meet the Phase I requirements:

- Outfalls and receiving waters
- Municipally owned stormwater treatment structures (also known as stormwater best management practices (BMPs))
- Water bodies identified by name and indication of all use impairments as identified on the most recent USEPA approved Massachusetts Integrated List of Waters report (*taken from USGS/MassDEP Hydrography data updated April 2017*)
- Initial catchment delineations. Any available system data and topographic information may be used to produce initial catchment delineations (*attached as Attachment D and further developed in Section 5.1*)

The Town of Marshfield is in the process of updating its stormwater mapping to include the remaining Phase I information:



- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems

The following table contains information regarding the total number of drainage structures mapped within the MS4 Urbanized Area in Marshfield. It has been compiled using data collected by the Town. A complete stormwater system mapbook is included in the Marshfield Operations and Maintenance (O&M) Plan as Attachment 1.

**Table 3-1 Summary of Mapped MS4 Structures**

Structure Type	Number of Structures
Outfalls	92
Upland Outlets	214
Catch Basins	3865
Drain Manholes	1673
Stormwater BMPs	15
Drain Pipes	3143

## SECTION 3.2 PHASE II MAPPING

Phase II mapping must be completed within ten (10) years of the effective date of the permit (July 1, 2028) and include the following information:

- Outfall spatial location (latitude and longitude with a minimum accuracy of +/-30 feet)
- Pipes
- Manholes
- Catch basins
- Refined catchment delineations. Catchment delineations must be updated to reflect information collected during catchment investigations
- Municipal sanitary sewer system (if available/applicable)
- Municipal combined sewer system (if applicable)

The Town of Marshfield has completed the following updates to its stormwater mapping to meet the Phase II requirements:

- Outfall spatial location (latitude and longitude with a minimum accuracy of +/-30 feet)
- Pipes
- Manholes
- Catch basins
- Municipal combined sewer system (none in Marshfield)
- Municipal sanitary sewer system (mapping is ongoing)

The Town of Marshfield will update its stormwater mapping by July 1, 2028 to include the remaining Phase II information.

## SECTION 3.3      ADDITIONAL RECOMMENDED MAPPING ELEMENTS

Although not a requirement of the 2016 MS4 Permit, the Town of Marshfield will consider the following recommended elements in its storm system mapping:

- Storm sewer material, size (pipe diameter), age
- Sanitary sewer system material, size (pipe diameter), age (if/when applicable)
- Privately owned stormwater treatment structures
- Area where the permittee's MS4 has received or could receive flow from septic system discharges
- Seasonal high water table elevations impacting sanitary alignments
- Topography
- Orthophotography
- Alignments, dates, and representation of work completed of past illicit discharge investigations
- Locations of suspected confirmed and corrected illicit discharges with dates and flow estimates



## SECTION 4 SANITARY SEWER OVERFLOWS (SSOs)

The 2016 MS4 Permit requires municipalities to prohibit illicit discharges, including sanitary sewer overflows (SSOs), to the separate storm sewer system. SSOs are discharges of untreated sanitary wastewater from a municipal sanitary sewer that can contaminate surface waters, cause serious water quality problems and property damage, and threaten public health. SSOs can be caused by blockages, line breaks, sewer defects that allow stormwater and groundwater to overload the system, power failures, improper sewer design, and vandalism.

The Town of Marshfield has completed an inventory of SSOs that have discharged to the MS4 since five (5) years prior to the effective date of the 2016 MS4 Permit, based on a review of available documentation pertaining to SSOs. The inventory includes all SSOs that occurred during wet or dry weather resulting from inadequate conveyance capacities or where interconnectivity of the storm and sanitary sewer infrastructure allows for transfer of flow between systems. **Table 4-1** is provided below as reference for future use, if necessary.

Upon detection of an SSO, the Town of Marshfield will eliminate it as expeditiously as possible and take interim measures to minimize the discharge of pollutants to and from its MS4 until the SSO is eliminated. Upon becoming aware of an SSO to the MS4, the Town of Marshfield will provide oral notice to USEPA within 24 hours and written notice to USEPA and MassDEP within five (5) days of becoming aware of the SSO occurrence.

The inventory in **Table 4-1** is updated by the Department of Public Works when new SSOs are detected. The SSO inventory is included in the annual report, including the status of mitigation and corrective measures to address each identified SSO.

**Table 4-1 SSO Inventory**  
**Marshfield, Massachusetts**  
**Revision Date: September 2021**

SSO Location <sup>1</sup>	Discharge Statement <sup>2</sup>	Date <sup>3</sup>	Time Start <sup>3</sup>	Time End <sup>3</sup>	Estimated Volume <sup>4</sup>	Description <sup>5</sup>	Mitigation Completed <sup>6</sup>	Mitigation Planned <sup>7</sup>
None								

<sup>1</sup> Location (approximate street crossing/address and receiving water, if any)

<sup>2</sup> A clear statement of whether the discharge entered a surface water directly or entered the MS4

<sup>3</sup> Date(s) and time(s) of each known SSO occurrence (i.e., beginning and end of any known discharge)

<sup>4</sup> Estimated volume(s) of the occurrence

<sup>5</sup> Description of the occurrence indicating known or suspected cause(s)

<sup>6</sup> Mitigation and corrective measures completed with dates implemented

<sup>7</sup> Mitigation and corrective measures planned with implementation schedules



# SECTION 5 ASSESSMENT AND PRIORITY RANKING OF OUTFALLS

The 2016 MS4 Permit requires an assessment and priority ranking of outfalls in terms of their potential to contain illicit discharges and SSOs. The ranking helps determine the priority order for performing IDDE investigations and meeting permit milestones.

## SECTION 5.1 OUTFALL CATCHMENT DELINEATIONS

A catchment is the area that drains to an individual outfall or interconnection. The catchments for each of the MS4 outfalls have been delineated to define contributing areas for investigation of potential sources of illicit discharges. Catchments are typically delineated based on topographic contours and mapped drainage infrastructure, where available. As described in Section 3, initial catchment delineations were completed as part of the Phase I mapping, and refined catchment delineations will be completed as part of the Phase II mapping to reflect information collected during catchment investigations.

## SECTION 5.2 OUTFALL AND INTERCONNECTION INVENTORY AND INITIAL RANKING

The Department of Public Works completed an initial outfall and interconnection inventory and priority ranking to assess illicit discharge potential based on existing information. The initial inventory and ranking was completed within one (1) year from the effective date of the permit. The inventory is updated annually to include data collected in connection with dry weather screening and other relevant inspections. An updated inventory and ranking is provided in each annual report.

The outfall and interconnection inventory identifies each outfall and interconnection discharging from the MS4, records the structure location and condition, and provides a framework for tracking inspections, screenings, and other IDDE program activities.

Outfalls and interconnections are classified into one of the following categories:

1. **Problem Outfalls:** Outfalls/interconnections with known or suspected contributions of illicit discharges based on existing information shall be designated as Problem Outfalls. This shall include any outfalls/interconnections where previous screening indicates likely sewer input. Likely sewer input indicators are any of the following:
  - Olfactory or visual evidence of sewage,
  - Ammonia  $\geq 0.5$  mg/L, surfactants  $\geq 0.25$  mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
  - Ammonia  $\geq 0.5$  mg/L, surfactants  $\geq 0.25$  mg/L, and detectable levels of chlorine.

Dry weather screening and sampling, as described in **Section 6** of this IDDE Plan and Part 2.3.4.7.b of the MS4 Permit, is not required for Problem Outfalls.

*Marshfield has no Problem Outfalls*

**2. High Priority Outfalls:** Outfalls/interconnections that have not been classified as Problem Outfalls and that are:

- Discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds
- Determined by the permittee as high priority based on the characteristics listed below or other available information

*Marshfield has 21 High Priority Outfalls*

**3. Low Priority Outfalls:** Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information.

*Marshfield has 71 Low Priority Outfalls*

**4. Excluded Outfalls:** Outfalls/interconnections with no potential for illicit discharges may be excluded from the IDDE program. This category is limited to roadway drainage in undeveloped areas with no dwellings and no sanitary sewers; drainage for athletic fields, parks, or undeveloped green space and associated parking without services; and cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.

*Marshfield has no Excluded Outfalls*

Outfalls are ranked into the above priority categories (except for excluded outfalls, which are excluded from the IDDE program) based on the following characteristics of the defined initial catchment areas, where information is available. Additional relevant characteristics, including location-specific characteristics, may be considered but must be documented in this IDDE Plan. The initial ranking was based upon responses provided by the Town of Marshfield in May 2019 and have since been updated based on sampling data. The initial characteristics considered include:

- **Previous screening results** – Previous screening/sampling results indicate likely sewer input (see criteria above for Problem Outfalls).
  - Four MS4 outfalls screened in 2016.
- **Past discharge complaints and reports**
  - No complaints provided.
- **Poor receiving water quality** – The following guidelines are recommended to identify waters as having a high illicit discharge potential:
  - Exceeding water quality standards for bacteria,
  - Ammonia levels above 0.5 mg/L, or
  - Surfactants levels greater than or equal to 0.25 mg/L.



- No information provided.
- **Density of generating sites** – Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.
  - Gas stations, car washes, garden centers, car dealerships, and industrial areas were found within catchments: B, J, K, M, N, O, Q, R, S, T, U, V, X, Y, AB, AF, AO, AP.
- **Age of development and infrastructure** – Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old may have a high illicit discharge potential. Developments 20 years or younger may have a low illicit discharge potential.
  - Built date from Assessor parcel mapping showed an even distribution that leaned more towards an age of 40+ years old.
- **Sewer conversion** – Contributing catchment areas that were once serviced by septic systems, but have since been converted to sewer connections may have a high illicit discharge potential.
  - No information provided.
- **Historic combined sewer systems** – Contributing areas that were once serviced by a combined sewer system, but have since been separated may have a high illicit discharge potential.
  - No information provided.
- **Surrounding density of aging septic systems** – Septic systems 30 years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.
  - Septic install database from Board of Health showed newer septic installs event distributed throughout the Town.
- **Culverted streams** – Any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
  - No information provided.
- **Water quality limited water bodies** – Impaired waters and/or waters with approved TMDL(s) that receive discharge from the MS4 have a high illicit discharge potential if the discharges could contain the pollutant identified as the cause of the water quality impairment.
  - Impaired water bodies are listed in **Table 1-1**.

The Town has updated the initial outfall priority ranking matrix based on screening and sampling completed since the initial ranking was developed. The screening and sampling and updates to the ranking table are discussed further in **Section 6.4** and **Section 6.5**. The updated outfall priority ranking matrix and catchment delineation mapping is included in **Appendix C**.

# SECTION 6 DRY WEATHER OUTFALL SCREENING AND SAMPLING

Dry weather flow is a common indicator of potential illicit connections. The MS4 Permit requires all outfalls/interconnections (excluding Problem and Excluded Outfalls) to be inspected for the presence of dry weather flow. The Department of Public Works, or hired representatives, are responsible for conducting dry weather outfall screening, starting with High Priority outfalls, followed by Low Priority outfalls, based on the initial priority rankings described in the previous section.

## SECTION 6.1 WEATHER CONDITIONS

Dry weather outfall screening and sampling may occur when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring. For purposes of determining dry weather conditions, program staff can use precipitation data from the Marshfield Municipal Airport Weather Station (Station ID KGHG). If the Marshfield Municipal Airport Weather Station is not available or not reporting current weather data, then the Ocean Bluff Weather Station (Station ID KMAMARSH132) can be used as a back-up.

## SECTION 6.2 DRY WEATHER SCREENING/SAMPLING PROCEDURE

### Section 6.2.1 General Procedure

The dry weather outfall inspection and sampling procedure consists of the following general steps:

1. Identify outfall(s) to be screened/sampled based on initial outfall inventory and priority ranking.
2. Acquire the necessary staff, mapping, and field equipment (see **Table 6-1** for list of potential field equipment).
3. Conduct the outfall inspection during dry weather:
  - a. Mark and photograph the outfall.
  - b. Record the inspection information and outfall characteristics (using paper forms or digital form using a tablet or similar device) (see form in **Appendix D**).
  - c. Look for and record visual/olfactory evidence of pollutants in flowing outfalls including odor, color, turbidity, and floatable matter (suds, bubbles, excrement, toilet paper, or sanitary products). Also, observe outfalls for deposits and stains, vegetation, and damage to outfall structures.
4. If flow is observed, sample and test the flow following the procedures described in the following sections.
5. If no flow is observed, but evidence of illicit flow exists (illicit discharges are often intermittent or transitory), revisit the outfall during dry weather within one week of the initial observation, if practicable, to perform a second dry weather screening and sample any



observed flow. Other techniques can be used to detect intermittent or transitory flows including conducting inspections during evenings or weekends and using optical brighteners.

6. Input results from screening and sampling into spreadsheet/database. Include pertinent information in the outfall/interconnection inventory and priority ranking.
7. Include all screening data in the annual report.

Previous outfall screening/sampling conducted under the 2003 MS4 Permit may be used to satisfy the dry weather outfall/screening requirements of the 2016 MS4 Permit only if the previous screening and sampling was substantially equivalent to that required by the 2016 MS4 Permit, including the list of analytes outlined in Section 2.3.4.7.b.iii.4 of the 2016 permit.

## Section 6.2.2 Field Equipment

**Table 6-1** lists field equipment commonly used for dry weather outfall screening and sampling.

**Table 6-1 Field Equipment – Dry Weather Outfall Screening and Sampling**

Equipment	Use/Notes
Clipboard	For organization of field sheets and writing surface
Field Sheets	Field sheets for both dry weather inspection and dry weather sampling should be available with extras
Chain of Custody Forms	To ensure proper handling of all samples
Pens/Pencils/Permanent Markers	For proper labeling
Nitrile Gloves	To protect the sampler as well as the sample from contamination
Flashlight/headlamp with Batteries	For looking in outfalls or manholes, helpful in early mornings as well
Cooler with Ice	For transporting samples to the laboratory
Digital Camera	For documenting field conditions at time of inspection
Personal Protective Equipment (PPE)	Reflective vest, safety glasses, and boots at a minimum
GPS Receiver	For taking spatial location data
Water Quality Sonde	If needed, for sampling conductivity, temperature, pH
Water Quality Meter	Hand held meter, if available, for testing for various water quality parameters such as ammonia, surfactants, and chlorine
Test Kits	Have extra kits on hand to sample more outfalls than are anticipated to be screened in a single day
Label Tape	For labeling sample containers
Sample Containers	Make sure all sample containers are clean. Keep extra sample containers on hand at all times. Make sure there are proper sample containers for what is being sampled for (e.g., bacteria requires sterile containers)

Equipment	Use/Notes
Pry Bar or Pick	For opening catch basins and manholes when necessary
Sandbags	For damming low flows in order to take samples
Small Mallet or Hammer	Helping to free stuck manhole and catch basin covers
Utility Knife	Multiple uses
Measuring Tape	Measuring distances and depth of flow
Safety Cones	Safety
Hand Sanitizer	Disinfectant/decontaminant
Zip Ties/Duct Tape	For making field repairs
Rubber Boots/Waders	For accessing shallow streams/areas
Sampling Pole/Dipper/Sampling Cage	For accessing hard to reach outfalls and manholes

### Section 6.2.3 Sample Collection and Analysis

If flow is present during a dry weather outfall inspection, a sample must be collected and analyzed for the required permit parameters listed in **Table 6-2**. The general procedure for collection of outfall samples is as follows:

1. Fill out all sample information on sample bottles and field sheets (see **Appendix D** for Field Sheets).
2. Put on protective gloves (nitrile/latex/other) before sampling.
3. Collect sample with dipper or directly in sample containers. If possible, collect water from the flow directly in the sample bottle. Be careful not to disturb sediments.
4. If using a dipper or other device, triple rinse the device with distilled water and then in water to be sampled (not for bacteria sampling).
5. Use test strips, test kits, and field meters (rinse similar to dipper) for most parameters (see **Table 6-2**).
6. Place laboratory samples on ice for analysis of bacteria and pollutants of concern.
7. Fill out chain-of-custody form for laboratory samples.
8. Deliver samples to Massachusetts state certified laboratory.
9. Dispose of used test strips and test kit ampules properly.
10. Decontaminate all testing personnel and equipment.

In the event that an outfall is submerged, either partially or completely, or inaccessible, field staff can proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results. Field staff must continue to the next upstream structure until there is no longer an influence from the receiving water on the visual inspection or sampling.

Field test kits or field instrumentation are permitted for all parameters except indicator bacteria and any pollutants of concern. Field kits need to have appropriate detection limits and ranges. **Table 6-2**



lists various field test kits and field instruments that can be used for outfall sampling associated with the 2016 MS4 Permit parameters, other than indicator bacteria and any pollutants of concern.

**Table 6-2 Field Screening Parameters and Analysis Methods**

Analyte or Parameter	Instrumentation (Portable Meter)	Field Test Kit
Ammonia	CHEMetrics™ V-2000 Colorimeter Hach™ DR/890 Colorimeter Hach™ Pocket Colorimeter™ II	CHEMetrics™ K-1410 CHEMetrics™ K-1510 (series) Hach™ NI-SA Hach™ Ammonia Test Strips
Surfactants (Detergents)	CHEMetrics™ I-2017	CHEMetrics™ K-9400 and K-9404 Hach™ DE-2
Chlorine	CHEMetrics™ V-2000, K-2513 Hach™ Pocket Colorimeter™ II	NA
Conductivity	CHEMetrics™ I-1200 YSI Pro30 YSI EC300A Oakton 450	NA
Temperature	YSI Pro30 YSI EC300A Oakton 450	NA
Salinity	YSI Pro30 YSI EC300A Oakton 450	NA
Dissolved Oxygen	YSI Pro30 YSI EC300A Oakton 450	NA
Turbidity	Hach™ 2100Q Portable Turbidimeter Oakton CON 150	NA

<sup>1</sup> Where the stormwater discharges directly into a water quality limited water or a water subject to an approved TMDL, the sample must be analyzed for the pollutant(s) of concern identified as the cause of the water quality impairment.

Testing for indicator bacteria and any pollutants of concern must be conducted using analytical methods and procedures found in 40 CFR § 136. Samples for laboratory analysis must also be stored and preserved in accordance with procedures found in 40 CFR § 136. **Table 6-3** lists analytical methods, detection limits, hold times, and preservatives for laboratory analysis of dry weather sampling parameters.

**Table 6-3 Required Analytical Methods, Detection Limits, Hold Times, and Preservatives**

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
Ammonia	<b>EPA:</b> 350.2 <b>SM:</b> 4500-NH3C	0.05 mg/L	28 days	Cool ≤6°C, H <sub>2</sub> SO <sub>4</sub> to pH <2,

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
				No preservative required if analyzed immediately
Surfactants	<b>SM:</b> 5540-C	0.01 mg/L	48 hours	Cool $\leq 6^{\circ}\text{C}$
Chlorine	<b>SM:</b> 4500-Cl G	0.02 mg/L	Analyze within 15 minutes	None Required
Temperature	<b>SM:</b> 2550B	NA	Immediate	None Required
Specific Conductance	<b>EPA:</b> 120.1 <b>SM:</b> 2510B	0.2 $\mu\text{S}/\text{cm}$	28 days	Cool $\leq 6^{\circ}\text{C}$
Salinity	<b>SM:</b> 2520	-	28 days	Cool $\leq 6^{\circ}\text{C}$
Biochemical Oxygen Demand (BOD)	<b>EPA:</b> 360.1	<b>EPA:</b> 3 mg/L	48 hours	Cool $\leq 6^{\circ}\text{C}$
Dissolved Oxygen	<b>EPA:</b> 365.1	<b>EPA:</b> 1 mg/L	Immediate	Cool $\leq 6^{\circ}\text{C}$
Turbidity	<b>EPA:</b> 160.2	<b>EPA:</b> 1 NTU	48 hours	Cool $\leq 6^{\circ}\text{C}$
Indicator Bacteria: <i>E.coli</i> <i>Enterococcus</i> <i>Fecal Coliform</i>	<i>E.coli</i> <b>EPA:</b> 1603 <b>SM:</b> 9221B, 9221F, 9223 B <b>Other:</b> Colilert®, Colilert-18® <i>Enterococcus</i> <b>EPA:</b> 1600 <b>SM:</b> 9230 C <b>Other:</b> Enterolert® <i>Fecal Coliform</i> <b>EPA:</b> 1680	<i>E.coli</i> <b>EPA:</b> 1 cfu/100mL <b>SM:</b> 2 MPN/100mL <b>Other:</b> 1 MPN/100mL <i>Enterococcus</i> <b>EPA:</b> 1 cfu/100mL <b>SM:</b> 1 MPN/100mL <b>Other:</b> 1 MPN/100mL <i>Fecal Coliform</i> <b>EPA:</b> 1 ctu	8 hours	Cool $\leq 10^{\circ}\text{C}$ , 0.0008% $\text{Na}_2\text{S}_2\text{O}_3$
Total Phosphorus	<b>EPA:</b> Manual-365.3, Automated Ascorbic acid digestion-365.1 Rev. 2, ICP/AES4-200.7 Rev. 4.4  <b>SM:</b> 4500-P E-F	<b>EPA:</b> 0.01 mg/L <b>SM:</b> 0.01 mg/L	28 days	Cool $\leq 6^{\circ}\text{C}$ , $\text{H}_2\text{SO}_4$ to pH <2
Total Nitrogen (Ammonia + Nitrate/Nitrite, methods are for Nitrate-Nitrite and need to be combined)	<b>EPA:</b> Cadmium reduction (automated)-353.2 Rev. 2.0, <b>SM:</b> 4500-NO <sub>3</sub> E-F	<b>EPA:</b> 0.05 mg/L <b>SM:</b> 0.05 mg/L	28 days	Cool $\leq 6^{\circ}\text{C}$ , $\text{H}_2\text{SO}_4$ to pH <2



Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
with Ammonia listed above.)				

40 CFR § 136: <http://www.ecfr.gov/cgi-bin/text>

[idx?SID=b3b41fdea0b7b0b8cd6c4304d86271b7&mc=true&node=pt40.25.136&rgn=div5](http://www.ecfr.gov/cgi-bin/text?id=SID=b3b41fdea0b7b0b8cd6c4304d86271b7&mc=true&node=pt40.25.136&rgn=div5)

SM = Standard Methods

## SECTION 6.3 INTERPRETING OUTFALL SAMPLING RESULTS

Outfall analytical data from dry weather sampling can be used to help identify the major type or source of discharge. **Table 6-4** shows values identified by the USEPA and the Center for Watershed Protection as typical screening values for select parameters. These represent the typical concentration (or value) of each parameter expected to be found in stormwater. Screening values that exceed these benchmarks may be indicative of pollution and/or illicit discharges.

**Table 6-4 Benchmark Field Measurements for Select Parameters**

Analyte or Parameter	Benchmark
Ammonia	>0.5 mg/L
Conductivity	>2,000 µS/cm
Surfactants	>0.25 mg/L
Chlorine	>0.02 mg/L (detectable levels per the 2016 MS4 Permit)
Indicator Bacteria: <i>E.coli</i> <i>Enterococcus</i>	<i>E.coli</i> : the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 126 colonies per 100 ml and no single sample taken during the bathing season shall exceed 235 colonies per 100 ml  <i>Enterococcus</i> : the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 33 colonies per 100 mL and no single sample taken during the bathing season shall exceed 61 colonies per 100 mL

## SECTION 6.4 DRY WEATHER WORK COMPLETED TO DATE

The Town's outfall inventory contained 129 outfalls when the NOI was submitted in 2018. Town field staff, or hired representatives, screened many outfalls as part of the 2003 MS4 Permit, and since the start of the new 2016 MS4 Permit, the Town has completed dry weather screenings of the remaining

outfalls. Screenings were completed over the course of five days in July 2020, March 2021, and April 2021. During screenings, field staff observed that 86 outfalls were dry and 6 were flowing during dry weather. Based on field observations, the Town removed 37 previously identified outfall structures from the Town's outfall inventory because the structures were determined to be culvert outlets/inlets, the drainage network changed since the original mapping was completed, or the structure was determined to be located outside the MS4 area. After completing dry weather screenings, the Town's outfall inventory is 92 outfalls. Screening and sampling results are attached in **Appendix E**.

## SECTION 6.5 FOLLOW-UP RANKING OF OUTFALLS AND INTERCONNECTIONS

The Town of Marshfield is responsible for updating the ranking of outfalls and interconnections. Outfalls/interconnections where relevant information is found indicating sewer input to the MS4 or sampling results indicating sewer input are highly likely to contain illicit discharges from sanitary sources. Such outfalls/interconnections are ranked at the top of the High Priority Outfalls category for investigation. Other outfalls and interconnections may be re-ranked based on any new information from the dry weather screening.

The Town updated and re-prioritized the initial outfall and interconnection rankings based on information gathered during dry weather screening over the first three (3) years of the permit term (June 30, 2021). The outfall ranking table did not significantly change. Only two (2) outfalls were elevated from a low priority to a high priority outfall. These structures had elevated levels of ammonia during dry weather sampling in March 2021, which triggered the high priority ranking. The updated ranking table is attached as **Appendix C**.



## SECTION 7 CATCHMENT INVESTIGATIONS

Once stormwater outfalls with evidence of illicit discharges have been identified, various methods can be used to trace the source of the potential discharge within the outfall catchment area. Catchment investigation techniques include, but are not limited to, review of maps, historic plans, and records; manhole observation; dry and wet weather sampling; video inspection; smoke testing; and dye testing. This section outlines a systematic procedure to investigate outfall catchments to trace the source of potential illicit discharges. All data collected as part of the catchment investigations is recorded and reported in each annual report.

### SECTION 7.1 SYSTEM VULNERABILITY FACTORS

The Department of Public Works has reviewed relevant mapping and historic plans and records to identify areas within the catchment with higher potential for illicit connections. The following information has been reviewed:

- Plans related to the construction of the drainage network
- Plans related to the construction of the sewer network
- Prior work on storm drains or sewer lines
- Board of Health or other municipal data on septic systems
- Complaint records related to SSOs
- Septic system breakouts

Based on the review of this information, the presence of any of the following **System Vulnerability Factors (SVFs)** have been identified for each catchment and will continue to be evaluated:

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages
- Any storm drain infrastructure greater than 40 years old
- Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)
- History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)
- Common or twin-invert manholes serving storm and sanitary sewer alignments
- Common trench construction serving both storm and sanitary sewer alignments
- Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system
- Sanitary sewer alignments known or suspected to have been constructed with an underdrain system
- Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints

- Areas formerly served by combined sewer systems
- 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
- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs
- Any sanitary sewer infrastructure greater than 40 years old

A blank SVF inventory is documented in **Appendix F** and will be filled out for each catchment as SVFs are identified. The SVF inventory will be included in each annual report.

## SECTION 7.2 DRY WEATHER MANHOLE INSPECTIONS

The Town of Marshfield will implement a dry weather storm drain network investigation that involves systematically and progressively observing, sampling, and evaluating key junction manholes in the MS4 to determine the approximate location of suspected illicit discharges or SSOs.

The Department of Public Works will be responsible for implementing the dry weather manhole inspection program and making updates as necessary. Infrastructure information will be incorporated into the storm system map, and catchment delineations will be refined based on the field investigation, where necessary. The SVF inventory will also be updated based on information obtained during the field investigations, where necessary.

Several important terms related to the dry weather manhole inspection program are defined by the MS4 Permit as follows:

- **Junction Manhole** is a manhole or structure with two or more inlets accepting flow from two or more MS4 alignments. Manholes with inlets solely from private storm drains, individual catch basins, or both are not considered junction manholes for these purposes.
- **Key Junction Manholes** are those junction manholes that can represent one or more junction manholes without compromising adequate implementation of the illicit discharge program. Adequate implementation of the illicit discharge program would not be compromised if the exclusion of a particular junction manhole as a key junction manhole would not affect the permittee's ability to determine the possible presence of an upstream illicit discharge. A permittee may exclude a junction manhole located upstream from another located in the immediate vicinity or that is serving a drainage alignment with no potential for illicit connections.

For all catchments identified for investigation, during dry weather, field crews will systematically inspect **key junction manholes** for evidence of illicit discharges. This program involves progressive inspection and sampling at manholes in the storm drain network to isolate and eliminate illicit discharges.



The manhole inspection methodology will be conducted in one of two ways (or a combination of both):

- By working progressively up from the outfall and inspecting key junction manholes along the way, or
- By working progressively down from the upper parts of the catchment toward the outfall.

For most catchments, manhole inspections will proceed from the outfall moving up into the system.

However, the decision to move up or down the system depends on the nature of the drainage system and the surrounding land use and the availability of information on the catchment and drainage system. Moving up the system can begin immediately when an illicit discharge is detected at an outfall, and only a map of the storm drain system is required. Moving down the system requires more advance preparation and reliable drainage system information on the upstream segments of the storm drain system, but may be more efficient if the sources of illicit discharges are believed to be located in the upstream portions of the catchment area. Once a manhole inspection methodology has been selected, investigations will continue systematically through the catchment.

Inspection of key junction manholes will proceed as follows:

1. Manholes will be opened and inspected for visual and olfactory evidence of illicit connections. A sample field inspection form is provided in **Appendix D**.
2. If flow is observed, a sample will be collected and analyzed at a minimum for ammonia, chlorine, and surfactants. Field kits can be used for these analyses. Sampling and analysis will be in accordance with procedures outlined in **Section 6**. Additional indicator sampling may assist in determining potential sources (e.g., bacteria for sanitary flows, conductivity to detect tidal backwater, etc.).
3. Where sampling results or visual or olfactory evidence indicate potential illicit discharges or SSOs, the area draining to the junction manhole will be flagged for further upstream manhole investigation and/or isolation and confirmation of sources.
4. Subsequent key junction manhole inspections will proceed until the location of suspected illicit discharges or SSOs can be isolated to a pipe segment between two manholes.
5. If no evidence of an illicit discharge is found, catchment investigations will be considered complete upon completion of key junction manhole sampling.

## SECTION 7.3 WET WEATHER OUTFALL SAMPLING

Where a minimum of one (1) System Vulnerability Factor (SVF) is identified based on previous information or the catchment investigation, a wet weather investigation must also be conducted at the associated outfall. The Public Works Department will be responsible for implementing the wet weather outfall sampling program and making updates as necessary.

Outfalls will be inspected and sampled under wet weather conditions, to the extent necessary, to determine whether wet weather-induced high flows in sanitary sewers or high groundwater in areas served by septic systems result in discharges of sanitary flow to the MS4.

Wet weather outfall sampling will proceed as follows:

1. At least one wet weather sample will be collected at the outfall for the same parameters required during dry weather screening.
2. Wet weather sampling will occur during or after a storm event of sufficient depth or intensity to produce a stormwater discharge at the outfall. There is no specific rainfall amount that will trigger sampling, although minimum storm event intensities that are likely to trigger sanitary sewer interconnections are preferred. To the extent feasible, sampling should occur during the spring (March through June) when groundwater levels are relatively high.
3. If wet weather outfall sampling indicates a potential illicit discharge, then additional wet weather source sampling will be performed, as warranted, or source isolation and confirmation procedures will be followed as described in **Section 7.4**.
4. If wet weather outfall sampling does not identify evidence of illicit discharges, and no evidence of an illicit discharge is found during dry weather manhole inspections, catchment investigations will be considered complete.

## SECTION 7.4 SOURCE ISOLATION AND CONFIRMATION

Once the source of an illicit discharge is approximated between two manholes, more detailed investigation techniques will be used to isolate and confirm the source of the illicit discharge. The following methods may be used in isolating and confirming the source of illicit discharges:

- Sandbagging
- Smoke Testing
- Dye Testing
- CCTV/Video Inspections
- Optical Brightener Monitoring
- IDDE Canines

These methods are described in the sections below. Instructions for these and other IDDE methods are provided in **Appendix G**.

Public notification is an important aspect of a detailed source investigation program. Prior to smoke testing, dye testing, or TV inspections, the Department of Public Works will notify property owners in the affected area. Smoke testing notification will include hanging notifications for single family homes and posting notifications in businesses and building lobbies of multi-family dwellings.

### Section 7.4.1 Sandbagging

This technique can be particularly useful when attempting to isolate intermittent illicit discharges or those with very little perceptible flow. The technique involves placing sandbags or similar barriers (e.g., caulking, weirs/plates, or other temporary barriers) within outlets to manholes to form a temporary dam that collects any intermittent flows that may occur. Sandbags are typically left in place for 48 hours and should only be installed when dry weather is forecasted. If flow has collected behind the sandbags/barriers after 48 hours, it can be assessed using visual observations or by sampling. If



no flow collects behind the sandbags/barriers, the upstream pipe network can be ruled out as a source of the intermittent discharge. Finding appropriate durations of dry weather and the need for multiple trips to each manhole makes this method both time-consuming and somewhat limiting.

### Section 7.4.2 Smoke Testing

Smoke testing involves injecting non-toxic smoke into drain lines and noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the system itself. Typically, a smoke bomb or smoke generator is used to inject the smoke into the system at a catch basin or manhole, and air is then forced through the system. Test personnel are placed in areas where there are suspected illegal connections or cracks/leaks, noting any escape of smoke (indicating an illicit connection or damaged storm drain infrastructure). It is important when using this technique to make proper notifications to area residents and business owners as well as local police and fire departments.

If the initial test of the storm drain system is unsuccessful, then a more thorough smoke test of the sanitary sewer lines can also be performed. Unlike storm drain smoke tests, buildings that do not emit smoke during sanitary sewer smoke tests may have problem connections and may also have sewer gas venting inside, which is hazardous.

It should be noted that smoke may cause minor irritation of respiratory passages. Residents with respiratory conditions may need to be monitored or evacuated from the area of testing altogether to ensure safety during testing.

### Section 7.4.3 Dye Testing

Dye testing involves flushing non-toxic dye into plumbing fixtures such as toilets, showers, and sinks and observing nearby storm drains and sewer manholes as well as stormwater outfalls for the presence of the dye. Similar to smoke testing, it is important to inform local residents and business owners. Police, fire, and local public health staff should also be notified prior to testing in preparation of responding to citizen phone calls concerning the dye and their presence in local surface waters.

A team of two or more people is needed to perform dye testing (ideally, all with two-way radios). One person is inside the building, while the others are stationed at the appropriate storm sewer and sanitary sewer manholes (which should be opened) and/or outfalls. The person inside the building adds dye into a plumbing fixture (e.g., toilet or sink) and runs a sufficient amount of water to move the dye through the plumbing system. The person inside the building then radios to the outside crew that the dye has been dropped, and the outside crew watches for the dye in the storm sewer and sanitary sewer, recording the presence or absence of the dye.

The test can be relatively quick (about 30 minutes per test), effective (results are usually definitive), and inexpensive. Dye testing is best used when the likely source of an illicit discharge has been narrowed down to a few specific houses or businesses.

## Section 7.4.4 CCTV/Video Inspection

Another method of source isolation involves the use of mobile video cameras that are guided remotely through stormwater drain lines to observe possible illicit discharges. IDDE program staff can review the videos and note any visible illicit discharges. While this tool is both effective and usually definitive, it can be costly and time-consuming when compared to other source isolation techniques.

## Section 7.4.5 Optical Brightener Monitoring

Optical brighteners are fluorescent dyes that are used in detergents and paper products to enhance their appearance. The presence of optical brighteners in surface waters or dry weather discharges suggests there is a possible illicit discharge or insufficient removal through adsorption in nearby septic systems or wastewater treatment. Optical brightener monitoring can be done in two ways. The most common, and least expensive, methodology involves placing a cotton pad in a wire cage and securing it in a pipe, manhole, catch basin, or inlet to capture intermittent dry weather flows. The pad is retrieved at a later date and placed under UV light to determine the presence/absence of brighteners during the monitoring period. A second methodology uses handheld fluorometers to detect optical brighteners in water sample collected from outfalls or ambient surface waters. Use of a fluorometer, while more quantitative, is typically more costly and is not as effective at isolating intermittent discharges as other source isolation techniques.

## Section 7.4.6 IDDE Canines

Dogs specifically trained to smell human-related sewage are becoming a cost-effective way to isolate and identify sources of illicit discharges. While not widespread at the moment, the use of IDDE canines is growing as is the canines' accuracy. The use of IDDE canines is not recommended as a standalone practice for source identification; rather it is recommended as a tool to supplement other conventional methods, such as dye testing, in order to fully verify sources of illicit discharges.

# SECTION 7.5 ILLICIT DISCHARGE REMOVAL

When the specific source of an illicit discharge is identified, the Town of Marshfield will exercise its authority as necessary to require its removal. The annual report will include the status of IDDE investigation and removal activities including the following information for each confirmed source:

- The location of the discharge and its source(s)
- A description of the discharge
- The method of discovery
- Date of discovery
- Date of elimination, mitigation, or enforcement action OR planned corrective measures and a schedule for completing the illicit discharge removal
- Estimate of the volume of flow removed



### Section 7.5.1 Confirmatory Outfall Screening

Within one (1) year of removal of all identified illicit discharges within a catchment area, confirmatory outfall or interconnection screening will be conducted. The confirmatory screening will be conducted in dry weather unless System Vulnerability Factors have been identified, in which case both dry weather and wet weather confirmatory screening will be conducted. If confirmatory screening indicates evidence of additional illicit discharges, the catchment will be scheduled for additional investigation.

## SECTION 7.6 ONGOING SCREENING

Upon completion of all catchment investigations and illicit discharge removal and confirmation (if necessary), each outfall or interconnection will be re-prioritized for screening and scheduled for ongoing screening once every five (5) years. Ongoing screening will consist of dry weather screening and sampling consistent with the procedures described in **Section 6** of this plan. Ongoing wet weather screening and sampling will also be conducted at outfalls where wet weather screening was required due to System Vulnerability Factors and will be conducted in accordance with the procedures described in **Section 7.3**. All sampling results will be reported in the annual report.

## SECTION 8 TRAINING

Annual IDDE training is made available to all employees involved in the IDDE program. This training includes information on how to identify illicit discharges and SSOs and may also include additional training specific to the functions of particular personnel and their function within the framework of the IDDE program. Training records are and will continue to be maintained. A training attendance log is included in **Appendix H**. The frequency and type of training is included in the annual report.



## SECTION 9 PROGRESS REPORTING

The progress and success of the IDDE program is evaluated on an annual basis. The evaluation is documented in the annual report and includes the following indicators of program progress:

- Number of SSOs and illicit discharges identified and removed
- Number and percent of total outfall catchments served by the MS4 evaluated using the catchment investigation procedure
- Number of dry weather outfall inspections/screenings
- Number of wet weather outfall inspections/sampling events
- Number of enforcement notices issued
- All dry weather and wet weather screening and sampling results
- Estimate of the volume of sewage removed, as applicable
- Number of employees trained annually

The success of the IDDE program is measured by the IDDE activities completed within the required permit timelines.

## APPENDIX A

Legal Authority (IDDE By-law or Ordinance)



## **Chapter 246**

### **STORMWATER MANAGEMENT**

#### **§ 246-1. Purpose and objectives.**

Increased stormwater runoff and contaminated stormwater runoff are the two major causes of impairment of lakes, ponds, streams, rivers, wetlands and groundwater; contamination of drinking water supplies; alteration or destruction of aquatic and wildlife habitat; and flooding. Regulation of illicit connections and discharges to the municipal storm drain system is necessary for the protection of the Town's water bodies and groundwater, and to safeguard the public health, safety, welfare and the environment. The objectives of this bylaw are:

- A. To help prevent pollutants from entering the Town's municipal storm drain system;
- B. To prohibit illicit connections and unauthorized discharges to the Town's municipal storm drain system, a requirement of NPDES Phase II General Permit (MS4);
- C. To require the removal of all such illicit connections;
- D. To comply with state 314 CMR 3.0 and 314 CMR 5.0 and other state and federal statutes and regulations relating to the quantity and quality of stormwater discharges;
- E. To establish the legal authority to ensure compliance with the provisions of this bylaw through inspection, monitoring, and enforcement; and
- F. To establish the legal authority to allow connections to the Town's municipal storm drain system through regulation adopted by the Board of Public Works.

#### **§ 246-2. Definitions.**

For the purposes of this bylaw, the following words or terms shall mean:

**AUTHORIZED ENFORCEMENT AGENCY** — The Board of Public Works (hereafter the Board), its employees or agents designated to enforce this bylaw.

**BEST MANAGEMENT PRACTICE (BMP)** — An activity, procedure, or structural improvement that helps to reduce the quantity or improve the quality of stormwater runoff.

**CLEAN WATER ACT** — The Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.) as hereafter amended.

**DISCHARGE OF POLLUTANTS** — The discharge from any source of any pollutant or combination of pollutants into the municipal storm drain system

or into the waters or wetlands of the United States or commonwealth or waters of the Town from any source.

GROUNDWATER — Water beneath the surface of the ground.

ILLCIT CONNECTION — A surface or subsurface drain or conveyance which allows an unauthorized illicit discharge into the municipal storm drain system, including without limitation sewage, process wastewater, wash water or any connections from indoor drains, sinks, or toilets, regardless of whether said connection was previously allowed, permitted, or approved before the effective date of this bylaw.

ILLCIT DISCHARGE — Direct or indirect discharge to the municipal storm drain system that is not composed entirely of stormwater, except as exempted in § 246-8. The term does not include a discharge in compliance with a National Pollutant Discharge Elimination System (NPDES) stormwater discharge permit or a surface water discharge permit, or discharge resulting from fire-fighting activities exempted pursuant to § 246-8Q of this bylaw.

IMPERVIOUS SURFACE — Any material or structure on or above the ground that prevents water infiltrating the underlying soil. "Impervious surface" includes without limitation roads, paved parking lots, sidewalks, and rooftops.

MUNICIPAL STORM DRAIN SYSTEM — The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the Town of Marshfield.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGE PERMIT — A permit issued by United States Environmental Protection Agency (EPA) or jointly with the state that authorizes the discharge of pollutants to waters of the United States.

NON-STORMWATER DISCHARGE — Discharge to the municipal storm drain system not composed entirely of stormwater.

PERSON — An individual, partnership, association, firm, company, trust, corporation, agency, authority, department or political subdivision of the commonwealth or the federal government, to the extent permitted by law, and any officer, employee, or agent of such person.

POLLUTANT — Any element or property of sewage, agricultural, industrial or commercial waste, runoff, leachate, heated effluent, or other matter, whether originating at a point or nonpoint source, that is or may be introduced into any sewage treatment works or waters of the commonwealth. Pollutants shall include without limitation:

- A. Paints, varnishes, and solvents;
- B. Oil and other automotive fluids;



- C. Non-hazardous liquid and solid wastes and yard wastes;
- D. Refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordnances, accumulations and floatables;
- E. Pesticides, herbicides, and fertilizers;
- F. Hazardous materials and wastes; sewage, fecal coliform and pathogens;
- G. Dissolved and particulate metals;
- H. Animal wastes;
- I. Rock, sand, salt, soils;
- J. Construction wastes and residues;
- K. Medical and bio-wastes; and
- L. Noxious or offensive matter of any kind.

PROCESS WASTEWATER — Water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any material, intermediate product, finished product, or waste product.

RECHARGE — The process by which groundwater is replenished by precipitation through the percolation of runoff and surface water through the soil.

STORMWATER — Stormwater runoff, snow melt runoff, and surface water runoff and drainage.

STORMWATER DISCHARGE — A discharge of stormwater runoff by a system of conveyances (including pipes, conduits, ditches and channels) used for collecting and conveying stormwater and as further defined by 314 CMR 5.04(2).

SURFACE WATER DISCHARGE PERMIT — A permit issued by the Department of Environmental Protection (DEP) pursuant to 314 CMR 3.00 that authorize the discharge of pollutants to waters of the Commonwealth of Massachusetts.

TOXIC OR HAZARDOUS MATERIAL OR WASTE — Any material which because of its quantity, concentration, or chemical, corrosive, flammable, reactive, toxic, infectious or radioactive characteristics, either separately or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare, or to the environment. Toxic or hazardous materials include any synthetic organic chemical, petroleum product, heavy metal, radioactive or infectious waste, acid and alkali, and any substance defined as toxic or hazardous under MGL c. 21C and c. 21E, and the regulations at 310 CMR 30.000 and 310 CMR 40.000.

WASTEWATER — Any sanitary waste, sludge, or overflow of contents from septic tank or cesspool, and water that during manufacturing, cleaning or

processing comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product or waste product.

**WATERCOURSE** — A natural or man-made channel through which water flows or a stream of water, including a river, brook or underground stream.

**WATERS OF THE COMMONWEALTH** — All waters within the jurisdiction of the commonwealth, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, coastal waters, and groundwater.

**WATERS OF THE TOWN** — All waters within the Town outside the jurisdiction of the commonwealth defined for the purpose of this bylaw.

### **§ 246-3. Applicability.**

This bylaw shall apply to all flows entering the municipally owned storm drainage system.

### **§ 246-4. Authority.**

This bylaw is adopted under the authority granted by the Home Rule Amendment of the Massachusetts Constitution and the Home Rule Procedures Act,<sup>1</sup> and pursuant to the regulations of the federal Clean Water Act found at 40 CFR 122.34.

### **§ 246-5. Administration.**

The Board of Public Works shall administer, implement and enforce this bylaw. Any powers granted to or duties imposed upon the Board may be delegated in writing by the Board to employees or agents of the Board. Copies of all orders of enforcement and correspondence shall be given to the Board of Public Works for maintenance of records.

### **§ 246-6. Rules and regulations.**

The Board of Public Works may promulgate rules and regulations to effectuate the purposes of this bylaw. Failure by the Board to promulgate such rules and regulations shall not have the effect of suspending or invalidating this bylaw.

### **§ 246-7. Prohibited activities.**

- A. Illicit discharges. No person shall dump, discharge, or cause or allow to be discharged any pollutant or non-stormwater discharge into the municipal storm drain system, into a watercourse, or into the waters of the commonwealth, or waters of the Town.
- B. Illicit connections. No person shall construct, use, allow, maintain or continue any illicit connection to the municipal storm drain system,

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1. Editor's Note: See MGL c. 43B.



regardless of whether the connection was permissible under applicable law, regulation or custom at the time of connection.

- C. Obstruction of municipal storm drain system. No person shall obstruct or interfere with the normal flow of stormwater into or out of the municipal storm drain system without prior written approval from the Board of Public Works.

#### **§ 246-8. Exemptions.**

The following non-stormwater discharges or flows are exempt from the prohibition of non-stormwaters provided that the source is not a significant contributor of a pollutant to the municipal storm drain system:

- A. Waterline flushing;
- B. Flow from potable water sources;
- C. Springs;
- D. Natural flow from riparian habitats and wetlands;
- E. Diverted stream flow;
- F. Rising groundwater;
- G. Uncontaminated groundwater infiltration as defined in 40 CFR 35.2005(b)(20), or uncontaminated pumped groundwater regulated and permitted in accordance with the Marshfield Department of Public Works Policy for Connection into the Town's Storm Drain System; **[Amended 4-24-2017 ATM by Art. 10]**
- H. Water from exterior foundation drains, footing drains (not including active groundwater dewatering systems), crawl space pumps, or air-conditioning condensation regulated and permitted in accordance with the Marshfield Department of Public Works Policy for Connection into the Town's Storm Drain System;
- I. Discharge from landscape irrigation or lawn watering;
- J. Water from individual residential car washing;
- K. Discharge from dechlorinated swimming pool water (less than one ppm chlorine) provided the water is allowed to stand for one week prior to draining and the pool is drained in such a way as not to cause a nuisance;
- L. Discharge from street sweeping;
- M. Dye testing, provided verbal notification is given to the Board of Public Works prior to the time of the test;
- N. Non-stormwater discharge permitted under an NPDES permit or a surface water discharge permit, waiver, or waste discharge order

administered under the authority of the United States Environmental Protection Agency or the Department of Environmental Protection, provided that the discharge is in full compliance with the requirements of the permit, waiver, or order and applicable laws and regulations;

- O. Discharge for which advanced written approval is received from the Board of Public Works as necessary to protect public health, safety, welfare or the environment;
- P. Exemptions as defined under 314 CMR 3.05; and
- Q. Discharge of flow resulting from fire-fighting activities.

**§ 246-9. Emergency suspension of storm drainage system access.**

The Board of Public Works may suspend municipal storm drain system access to any person or property without prior written notice when such suspension is necessary to stop an actual or threatened discharge of pollutants that presents imminent risk of harm to the public health, safety, welfare or the environment. In the event any person fails to comply with an emergency suspension order, the authorized enforcement agency may take all reasonable steps to prevent or minimize harm to the public health, safety, welfare or the environment.

**§ 246-10. Notification of spills.**

Notwithstanding other requirements of local, state or federal law, as soon as a person responsible for a facility or operation, or responsible for emergency response for a facility or operation, has information of or suspects a release of materials at that facility or operation resulting in or which may result in discharge of pollutants to the municipal drainage system or waters of the commonwealth, or waters of the Town, the person shall take all necessary steps to ensure containment and cleanup of the release. In the event of a release of oil or hazardous materials, the person shall immediately notify the Town's Fire and Police Departments, Conservation Agent and the Town's Health Agent and Department of Public Works. In the event of a release of non-hazardous material, the reporting person shall notify the Conservation Agent, the Town's Health Agent and Department of Public Works no later than the next business day. The reporting person shall provide to the Conservation Agent and Department of Public Works written confirmation of all telephone, facsimile or in-person notifications within three business days thereafter. If the discharge of prohibited materials is from a commercial or industrial facility, the facility owner or operator of the facility shall retain on site a written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

**§ 246-11. Enforcement; violations and penalties.**

- A. The Board of Public Works or an authorized agent of the Board of Public Works including the Conservation Agent and the Town's Health



Agent shall enforce this bylaw, regulations, orders, violation notices, and enforcement orders, and may pursue all civil and criminal remedies for such violations.

- B. Civil relief. If a person violates the provisions of this bylaw, regulations, permit, notice, or order issued thereunder, the Board of Public Works or Conservation Agent or the Town's Health Agent may seek injunctive relief in a court of competent jurisdiction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.
- C. Orders. The Board of Public Works or an authorized agent of the Board of Public Works, Conservation Agent, or the Town's Health Agent may issue a written order to enforce the provisions of this bylaw or the regulations thereunder, which may include:
  - (1) Elimination of illicit connections or discharges to the municipal storm drain system;
  - (2) Performance of monitoring, analyses, and reporting;
  - (3) That unlawful discharges, practices, or operations shall cease and desist; and
  - (4) Remediation of contamination in connection therewith.
- D. If the enforcing person determines that abatement or remediation of contamination is required, the order shall set forth a deadline by which such abatement or remediation must be completed. Said order shall further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the Town may, at its option, undertake such work, and expenses thereof shall be charged to the violator.
- E. Within 30 days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner will be notified of the costs incurred by the Town, including administrative costs. The violator or property owner may file a written protest objecting to the amount or basis of costs with the Board of Public Works within 30 days of receipt of the notification of the costs incurred. If the amount due is not received by the expiration of the time in which to file a protest or within 30 days following a decision of the Board of Public Works affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the costs shall become a special assessment against the property owner and shall constitute a lien on the owner's property for the amount of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in MGL c. 59, § 57, after the 31st day at which the costs first become due.
- F. Criminal penalty. Any person who violates any provision of this bylaw, regulation, order or permit issued thereunder shall be punished by a

fine of not more than \$300. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

- G. Noncriminal disposition. As an alternative to criminal prosecution or civil action, the Town's enforcing officer may elect to utilize the noncriminal disposition procedure set forth in MGL c. 40, § 21D, and adopted by the Town and set forth in Chapter 161, Article I, of the Town of Marshfield General Bylaws. The penalty for the first violation shall be \$100. The penalty for the second violation shall be \$200. The penalty for the third and subsequent violations shall be \$300. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.
- H. Entry to perform duties under this bylaw. To the extent permitted by state law, or if authorized by the owner or other party in control of the property, employees authorized by the Board of Public Works, Conservation Agent or Board of Health Agent may enter upon privately owned property for the purpose of performing their duties under this bylaw and regulations and may make or cause to be made such examinations, surveys or sampling as the Board of Public Works or Conservation Agent or Town Health Agent deems reasonably necessary.
- I. Appeals. The decisions or orders of the Board of Public Works or its agents, the Conservation Agent, or the Town's Health Agent shall be final. Further relief shall be to a court of competent jurisdiction.
- J. Remedies not exclusive. The remedies listed in this bylaw are not exclusive of any other remedies available under any applicable federal, state or local law.

#### **§ 246-12. Severability.**

The provisions of this bylaw are hereby declared to be severable. If any provision, paragraph, sentence, or clause of this bylaw or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of this bylaw.

#### **§ 246-13. Transitional provisions.**

- A. Existing connections. Property owners with existing connections shall notify the DPW and provide detail of the connection to the Town's municipal storm drainage system to obtain license or permit. Modifications may be required due to concern with water quality, water quantity or health and safety issues.
- B. Residential property owners shall have 365 days from the effective date of the bylaw to comply with its provisions unless good cause is shown for the failure to comply with the bylaw during that period. **[Amended 4-24-2017 ATM by Art. 10]**



- C. Commercial property owners shall have 180 days from the effective date of the bylaw to comply with its provisions unless good cause is shown for the failure to comply with the bylaw during that period.  
**[Amended 4-24-2017 ATM by Art. 10]**

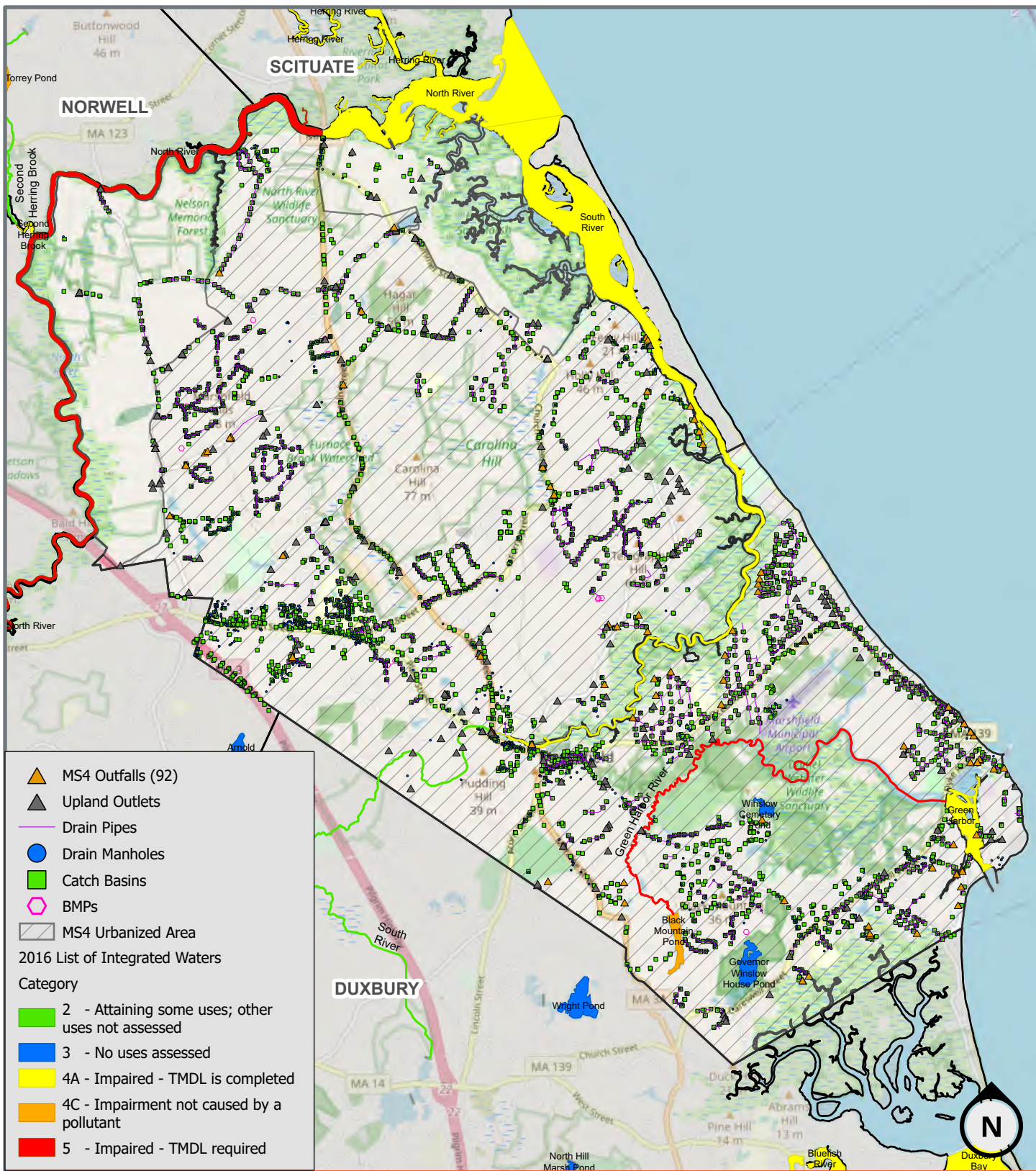
**§ 246-14. Indemnification.**

Permit or license holders allowed to connect to the system shall hold the Town harmless and the Town of Marshfield shall not be held liable for illicit discharges to the stormwater system and receiving areas and receiving waters caused by others.

## APPENDIX B

### Stormwater System Mapping

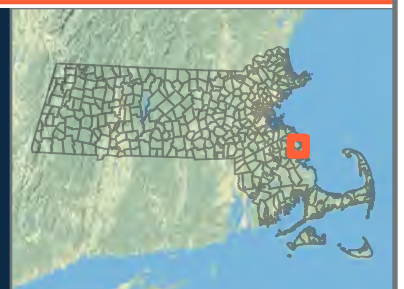
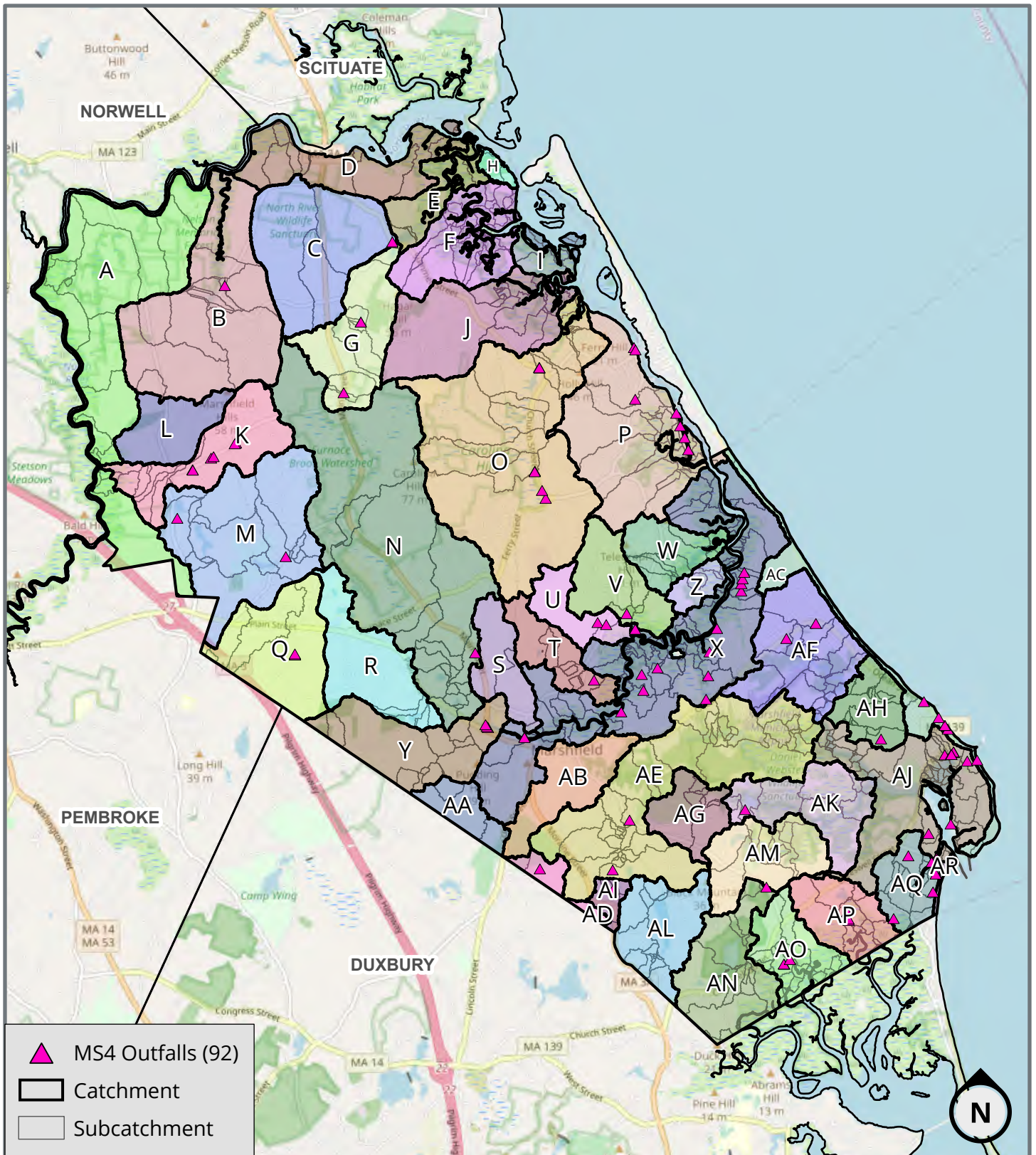




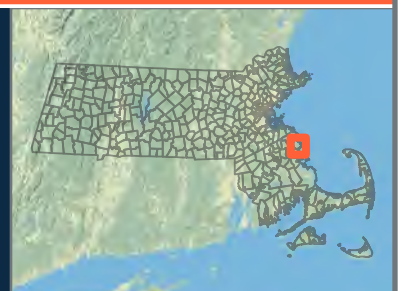
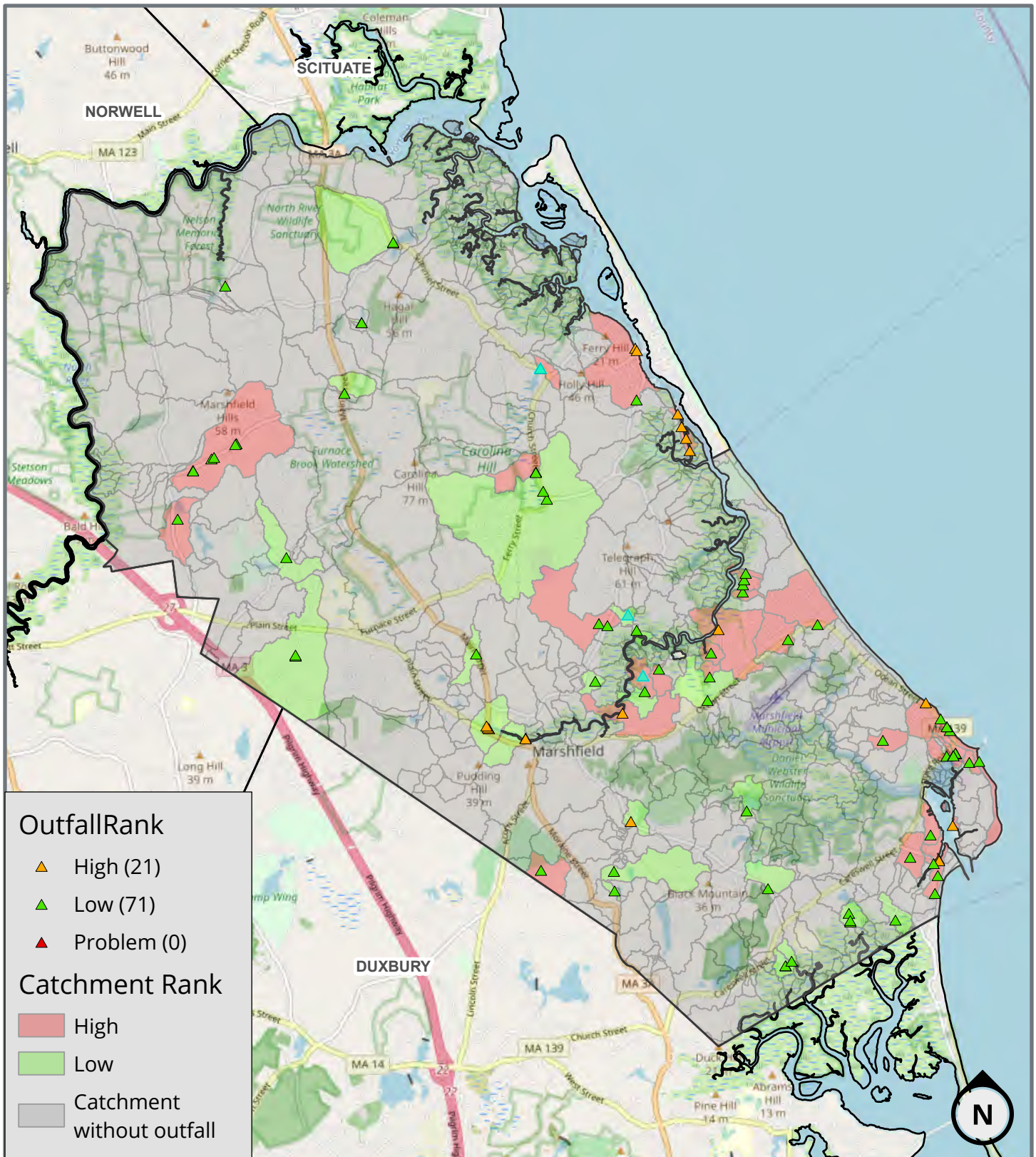
## APPENDIX C

### Catchment Delineation Mapping and Ranking Matrix











Catchment and Outfall Ranking Table  
Marshfield, Massachusetts

Catchment ID	Subcatchment ID	Receiving Water	Outfall ID	Density of Generating Sites	Age of Development/ Infrastructure	Historic Combined Sewers or Septic?	Aging Septic?	Culverted Streams?	Discharging to Area of Concern to Public Health? (Catchment)	Receiving Water Quality	Previous Screening Results Indicate Likely Sewer Input?	Frequency of Past Discharge Complaints	Discharging to Area of Concern to Public Health? (Outfall)	Outfall Screening/Sampling Results		Outfall Score	Catchment Score	Outfall Ranking	Catchment Ranking
Information Source				Land Use/GIS Maps, Aerial Photography, Google Earth	Land Use Information, Town Input	Town Input, GIS Maps	Parcel Age	GIS and Storm System Maps	GIS Maps, Town Input	Impaired Waters List	Outfall inspections and sample results	Town Input	GIS Maps, Town Input	2003 MS4 Permit Sampling Results	2016 MS4 Permit Sampling Results				
Scoring Criteria				High = 2 Medium = 1 Low = 0	Older = 2 Medium = 1 Newer = 0	Yes = 2 No Data = 1 No = 0	Older = 2 Medium = 1 Newer = 0	Yes = 2 No Data = 1 No = 0	Yes = 2 No Data = 1 No = 0	Category 4a = 2 Category 5 = 1 Others = 0	Yes = 2 No Data = 1 No = 0	Frequent = 2 Occasional = 1 None = 0	Yes = 2 No Data = 1 No = 0						
AJ	432	Green Harbor MA94-11	1000-O	0	2	0	2	1	2	2	0	0	2	2014 - No Flow	2014 - No Flow	4	7	High	High
AJ	288	Green Harbor MA94-11	10-O	0	2	0	2	1	2	2	0	0	2	2014 - No Flow	2014 - No Flow	4	7	High	High
AJ	432	Green Harbor MA94-11	3-O	0	2	0	2	1	2	2	0	0	2	2004 - No Flow	2004 - No Flow	4	7	High	High
P	153	South River MA94-09	47-O	0	2	0	2	1	2	2	0	0	2	2004 - No Flow	2004 - No Flow	4	7	High	High
P	153	South River MA94-09	48-O	0	2	0	2	1	2	2	0	0	2	2004 - No Flow	2004 - No Flow	4	7	High	High
P	153	South River MA94-09	49-O	0	2	0	2	1	2	2	0	0	2	2004 - No Flow	2004 - No Flow	4	7	High	High
P	130	South River MA94-09	50-O	0	2	0	2	1	2	2	0	0	2	2004 - No Flow	2004 - No Flow	4	7	High	High
P	132	South River MA94-09	55-O	1	2	0	2	1	2	2	0	0	2	2004 - No Flow	2004 - No Flow	4	8	High	High
P	132	South River MA94-09	56-O	1	2	0	2	1	2	2	0	0	2	2004 - No Flow	2004 - No Flow	4	8	High	High
X	344	South River MA94-09	205-O	2	2	0	2	1	0	2	0	0	2	2016 - Flow (Sampled)	2021- No Flow	4	7	High	High
X	276	South River MA94-09	96 O	1	2	0	2	1	2	2	0	0	2	No Data	2020- No Flow	4	8	High	High
AC	104	Atlantic Ocean	31-O	0	2	0	2	1	2	0	0	0	2	2004 - Flow	2020- No Flow	2	7	Low	High
AC	104	Atlantic Ocean	1005-O	0	2	0	2	1	2	0	0	0	2	2004 - No Flow	2004 - No Flow	2	7	Low	High
AC	104	Atlantic Ocean	19-O	0	2	0	2	1	2	0	0	0	2	2014 - No Flow	2014 - No Flow	2	7	Low	High
AC	104	Atlantic Ocean	23-O	0	2	0	2	1	2	0	0	0	2	2004 - No Flow	2004 - No Flow	2	7	Low	High
AC	104	Atlantic Ocean	25-O	0	2	0	2	1	2	0	0	0	2	2004 - No Flow	2004 - No Flow	2	7	Low	High
AC	104	Atlantic Ocean	29-O	0	2	0	2	1	2	0	0	0	2	2004 - No Flow	2004 - No Flow	2	7	Low	High
O	127	Little Creek	3001-O	1	2	0	2	1	2	0	0	0	0	No Data	2021- Flowing	0	8	Low	High
O	127	Little Creek	3002-O	1	2	0	2	1	2	0	0	0	0	No Data	2020- No Flow	0	8	Low	High
O	168	Little Creek	3005-O	1	2	0	2	1	2	0	0	0	0	2004 - No Flow	2004 - No Flow	0	8	Low	High
O	168	Little Creek	3006-O	1	2	0	2	1	2	0	0	0	0	2004 - No Flow	2004 - No Flow	0	8	Low	High
O	127	Little Creek	59-O	1	2	0	2	1	2	0	0	0	0	2004 - No Flow	2004 - No Flow	0	8	Low	High
AQ	428	Unnamed Stream (42.078357, -70.649412)	4-O	0	2	0	2	1	2	0	0	0	0	2004 - No Flow	2004 - No Flow	0	7	Low	High
B	366	Unnamed Stream (42.145927, -70.757999)	310	1	2	0	2	1	2	0	0	0	0	No Data	2020- No Flow	0	8	Low	High
AD	539	Unnamed Tributary (42.077267, -70.708458)	200-O	2	2	0	2	1	0	0	0	0	0	No Data	2020- No Flow	0	7	Low	High
AJ	311	Unnamed Tributary (42.089828, -70.643763)	20-O	0	2	0	2	1	2	0	0	0	0	2014 - No Flow	2014 - No Flow	0	7	Low	High
AJ	282	Unnamed Tributary (42.09079, -70.646926)	22-O	0	2	0	2	1	2	0	0	0	0	2014 - No Flow	2014 - No Flow	0	7	Low	High
AH	313	Unnamed Tributary (42.092461, -70.657838)	28-O	0	2	0	2	1	2	0	0	0	0	No Data	2020- No Flow	0	7	Low	High
X	31	Unnamed Tributary (42.100851, -70.689664)	127-O	2	2	0	2	1	2	0	0	0	0	2004 - Flow	2021- Flowing	0	9	Low	High
AF	20	Unnamed Tributary (42.103977, -70.67094)	43a-O	1	2	0	2	1	2	0	0	0	0	2004 - Flow	2020- No Flow	0	8	Low	High
AF	422	Unnamed Tributary (42.105814, -70.666621)	36-O	0	2	0	2	1	2	0	0	0	0	2004 - Flow	2020- No Flow	0	7	Low	High
U	246	Unnamed Tributary (42.106502, -70.700457)	132-O	1	2	0	2	1	2	0	0	0	0	2014 - No Flow	2014 - No Flow	0	8	Low	High
U	246	Unnamed Tributary (42.106502, -70.700457)	134-O	1	2	0	2	1	2	0	0	0	0	2004 - No Flow	2020- No Flow	0	8	Low	High
K	222	Unnamed Tributary (42.124541, -70.762833)	1016-O	1	2	0	2	1	2	0	0	0	0	2004 - No Flow	2020- No Flow	0	8	Low	High
K	222	Unnamed Tributary (42.124541, -70.762833)	1017-O	1	2	0	2	1	2	0	0	0	0	2004 - No Flow	2020- No Flow	0	8	Low	High
K	222	Unnamed Tributary (42.124541, -70.762833)	1067-O	1	2	0	2	1	2	0	0	0	0	2004 - No Flow	2004 - No Flow	0	8	Low	High
K	222	Unnamed Tributary (42.124541, -70.762833)	1068-O	1	2	0	2	1	2	0	0	0	0	2004 - No Flow	2004 - No Flow	0	8	Low	High
K	222	Unnamed Tributary (42.128914, -70.756172)	1065-O	1	2	0	2	1	2	0	0	0	0	2004 - Flow	2020- Flowing	0	8	Low	High
K	222	Unnamed Tributary (42.128914, -70.756172)	281-O	1	2	0	2	1	2	0	0	0	0	2004 - No Flow	2020- No Flow	0	8	Low	High
K	222	Unnamed Tributary (42.128914, -70.756172)	282-O	1	2	0	2	1	2	0	0	0	0	2004 - No Flow	2004 - No Flow	0	8	Low	High
AQ	472	Unnamed Wetland (42.076032, -70.651302)	1-O	0	2	0	2	1	2	0	0	0	0	2004 - No Flow	2004 - No Flow	0	7	Low	High
AQ	472	Unnamed Wetland (42.076032, -70.651302)	2-O	0	2	0	2	1	2	0	0	0	0	2004 - No Flow	2004 - No Flow	0	7	Low	High
AQ	626	Unnamed Wetland (42.076032, -70.651302)	5-O	0	2	0	2	1	2	0	0	0	0	2004 - Flow	2020- No Flow	0	7	Low	High
AJ	349	Unnamed Wetland (42.082574, -70.648826)	8-O	0	2	0	2	1	2	0	0	0	0	2014 - No Flow	2014 - No Flow	0	7	Low	High
AJ	245	Unnamed Wetland (42.089033, -70.646654)	1003A-O	0	2	0	2	1	2	0	0	0	0	2014 - No Flow	2014 - No Flow	0	7	Low	High
AJ	245	Unnamed Wetland (42.089033, -70.646654)	1003B-O	0	2	0	2	1	2	0	0	0	0	2014 - No Flow	2014 - No Flow	0	7	Low	High
AJ	54	Unnamed Wetland (42.089033, -70.646654)	1003C-O	0	2	0	2	1	2	0	0	0	0	2014 - No Flow	2014 - No Flow	0	7	Low	High
AJ	245	Unnamed Wetland (42.089033, -70.646654)	1003D-O	0	2	0	2	1	2	0	0	0	0	2014 - No Flow	2014 - No Flow	0	7	Low	High
AJ	245	Unnamed Wetland (42.089033, -70.646654)	21-O	0	2	0	2	1	2	0	0	0	0	No Data	2020- No Flow	0	7	Low	High
X	71	Unnamed Wetland (42.101439, -70.689518)	126-O	2	2	0	2	1	2	0	0	0	0	2016 - Flow (Sampled)	2021- Flowing	0	9	Low	High
X	6	Unnamed Wetland (42.101439, -70.689518)	97 O	2	2	0	2	1	2	0	0	0	0	2004 - No Flow	2004 - No Flow	0	9	Low	High
X	264	Unnamed Wetland (42.101439, -70.689518)	98 O	2	2	0	2	1	2	0	0	0	0	2004 - No Flow	2004 - No Flow	0	9	Low	High
X	217	Unnamed Wetland (42.112024, -70.678515)	478 O	0	2	0	2	1	2	0	0	0	0	2004 - Flow	2020- No Flow	0	7	Low	High
X	182	Unnamed Wetland (42.112024, -70.678515)	479 O	0	2	0	2	1	2	0	0	0	0	2004 - Flow	2020- No Flow	0	7	Low	High

Catchment and Outfall Ranking Table  
Marshfield, Massachusetts

Catchment ID	Subcatchment ID	Receiving Water	Outfall ID	Density of Generating Sites	Age of Development/ Infrastructure	Historic Combined Sewers or Septic?	Aging Septic?	Culverted Streams?	Discharging to Area of Concern to Public Health? (Catchment)	Receiving Water Quality	Previous Screening Results Indicate Likely Sewer Input?	Frequency of Past Discharge Complaints	Discharging to Area of Concern to Public Health? (Outfall)	Outfall Screening/Sampling Results		Outfall Score	Catchment Score	Outfall Ranking	Catchment Ranking
Information Source				Land Use/GIS Maps, Aerial Photography, Google Earth	Land Use Information, Town Input	Town Input, GIS Maps	Parcel Age	GIS and Storm System Maps	GIS Maps, Town Input	Impaired Waters List	Outfall inspections and sample results	Town Input	GIS Maps, Town Input	2003 MS4 Permit Sampling Results	2016 MS4 Permit Sampling Results				
Scoring Criteria				High = 2  Medium = 1  Low = 0	Older = 2  Medium = 1  Newer = 0	Yes = 2  No Data = 1  No = 0	Older = 2  Medium = 1  Newer = 0	Yes = 2  No Data = 1  No = 0	Yes = 2  No Data = 1  No = 0	Category 4a = 2  Category 5 = 1  Others = 0	Yes = 2  No Data = 1  No = 0	Frequent = 2  Occasional = 1  None = 0	Yes = 2  No Data = 1  No = 0						
X	182	Unnamed Wetland (42.112024, -70.678515)	480 O	0	2	0	2	1	2	0	0	0	0	2014 - No Flow	2014 - No Flow	0	7	Low	High
X	413	Unnamed Wetland (42.112024, -70.678515)	481 O	0	2	0	2	1	2	0	0	0	0	2004 - No Flow	2004 - No Flow	0	7	Low	High
M	280	Unnamed Wetland (42.118198, -70.765403)	286-O	0	2	0	2	1	2	0	0	0	0	No Data	2020- No Flow	0	7	Low	High
P	132	Unnamed Wetland (42.13249, -70.694761)	412-O	1	2	0	2	1	2	0	0	0	0	2004 - Flow	2020- No Flow	0	8	Low	High
AE	517	Green Harbor River MA94-10	116a-O	0	2	0	2	1	0	1	0	0	2	2004 - Flow	2020- No Flow	3	5	High	Low
Y	473	South River MA94-08	210-O	1	2	0	2	1	0	1	0	0	2	2004 - No Flow	2020- No Flow	3	6	High	Low
Y	473	South River MA94-08	211-O	1	2	0	2	1	0	1	0	0	2	2004 - No Flow	2020- No Flow	3	6	High	Low
X	628	South River MA94-09	208-O	1	2	0	2	1	0	2	0	0	2	2004 - Flow	2021- No Flow	4	6	High	Low
X	628	South River MA94-09	209-O	1	2	0	2	1	0	2	0	0	2	2014 - No Flow	2014 - No Flow	4	6	High	Low
Y	473	South River MA94-09	1040-O	1	2	0	2	1	0	2	0	0	2	2004 - No Flow	2004 - No Flow	4	6	High	Low
G	372	Bares Brook	1043-O	0	2	0	2	1	0	0	0	0	0	No Data	2020- No Flow	0	5	Low	Low
G	372	Bares Brook	1044-O	0	2	0	2	1	0	0	0	0	0	No Data	2020- No Flow	0	5	Low	Low
G	169	Bares Brook	434-O	0	2	0	2	1	0	0	0	0	0	2004 - No Flow	2004 - No Flow	0	5	Low	Low
C	468	Hannah Eames Brook	1020-O	0	2	0	2	1	0	0	0	0	0	2014 - No Flow	2014 - No Flow	0	5	Low	Low
C	457	Hannah Eames Brook	1021-O	0	2	0	2	1	0	0	0	0	0	2004 - No Flow	2004 - No Flow	0	5	Low	Low
AM	523	Unnamed Tributary (42.076892, -70.673687)	114-O	0	2	0	2	1	0	0	0	0	0	2004 - Flow	2020- No Flow	0	5	Low	Low
T	64	Unnamed Tributary (42.099747, -70.701617)	137-O	1	2	0	2	1	0	0	0	0	0	2014 - No Flow	2014 - No Flow	0	6	Low	Low
M	15	Unnamed Tributary (42.114374, -70.749805)	1073-O	1	2	0	2	1	0	0	0	0	0	No Data	2020- No Flow	0	6	Low	Low
AI	544	Unnamed Waterbody (42.075443, -70.698009)	189 Out	0	2	0	2	1	0	0	0	0	0	2004 - No Flow	2004 - No Flow	0	5	Low	Low
AO	557	Unnamed Wetland (42.062792, -70.662617)	1011-O	0	2	0	2	1	0	0	0	0	0	2014 - No Flow	2014 - No Flow	0	5	Low	Low
AO	557	Unnamed Wetland (42.062792, -70.662617)	1012-O	0	2	0	2	1	0	0	0	0	0	2014 - No Flow	2014 - No Flow	0	5	Low	Low
AO	554	Unnamed Wetland (42.062792, -70.662617)	110-O	1	2	0	2	1	0	0	0	0	0	2014 - No Flow	2014 - No Flow	0	6	Low	Low
AP	483	Unnamed Wetland (42.062792, -70.662617)	106-O	1	2	0	2	1	0	0	0	0	0	2004 - No Flow	2004 - No Flow	0	6	Low	Low
AP	483	Unnamed Wetland (42.062792, -70.662617)	182-O	1	2	0	2	1	0	0	0	0	0	2014 - No Flow	2014 - No Flow	0	6	Low	Low
AP	483	Unnamed Wetland (42.062792, -70.662617)	315-O	1	2	0	2	1	0	0	0	0	0	2014 - No Flow	2014 - No Flow	0	6	Low	Low
AQ	507	Unnamed Wetland (42.062792, -70.662617)	105-O	1	2	0	2	1	0	0	0	0	0	2004 - Flow	2020- No Flow	0	6	Low	Low
AE	708	Unnamed Wetland (42.080972, -70.698711)	188 O	0	2	0	2	1	0	0	0	0	0	2004 - No Flow	2004 - No Flow	0	5	Low	Low
AK	695	Unnamed Wetland (42.084659, -70.678125)	469-O	0	2	0	2	1	0	0	0	0	0	2004 - Flow	2020- No Flow	0	5	Low	Low
X	32	Unnamed Wetland (42.101439, -70.689518)	451-O	0	2	0	2	1	0	0	0	0	0	2004 - No Flow	2004 - No Flow	0	5	Low	Low
X	326	Unnamed Wetland (42.101439, -70.689518)	125-O	1	2	0	2	1	0	0	0	0	0	2004 - Flow	2021- Flowing	0	6	Low	Low
V	247	Unnamed Wetland (42.101691, -70.697233)	131-O	1	2	0	2	1	0	0	0	0	0	2014 - Flow (Sampled)	2021- Flowing	0	6	Low	Low
X	724	Unnamed Wetland (42.101691, -70.697233)	130-O	1	2	0	2	1	0	0	0	0	0	2004 - No Flow	2004 - No Flow	0	6	Low	Low
N	105	Unnamed Wetland (42.102452, -70.72005)	145-b-O	1	2	0	2	1	0	0	0	0	0	2004 - No Flow	2004 - No Flow	0	6	Low	Low
Q	629	Unnamed Wetland (42.102904, -70.747536)	1075-O	1	2	0	2	1	0	0	0	0	0	No Data	2020- No Flow	0	6	Low	Low
Q	629	Unnamed Wetland (42.102904, -70.747536)	1076-O	1	2	0	2	1	0	0	0	0	0	No Data	2020- No Flow	0	6	Low	Low
Q	629	Unnamed Wetland (42.102904, -70.747536)	1077-O	1	2	0	2	1	0	0	0	0	0	No Data	2020- No Flow	0	6	Low	Low
O	236	Unnamed Wetland (42.12081, -70.709486)	83-O	1	2	0	2	1	0	0	0	0	0	2004 - Flow	2020- No Flow	0	6	Low	Low
O	236	Unnamed Wetland (42.12081, -70.709486)	84-O	1	2	0	2	1	0	0	0	0	0	2004 - No Flow	2004 - No Flow	0	6	Low	Low



## APPENDIX D

Field Forms and Hyperlinks to Laboratories  
and Field Services Companies

Date: \_\_\_\_\_

Weather Observations: \_\_\_\_\_

Staff Onsite: \_\_\_\_\_

Photos: \_\_\_\_\_

## Marshfield Storm Drain Mapping Form

Structure #: \_\_\_\_\_

Map #: \_\_\_\_\_

Street Name: \_\_\_\_\_

Nearest Structure: \_\_\_\_\_  
(address, bldg, utility pole, etc)

Type of Structure: \_\_\_\_\_  
(outfall, culvert, inlet, etc)

Headwall?: \_\_\_\_\_  
(Y/N; concrete, stone, rip rap, none)

Material: \_\_\_\_\_  
(concrete, concrete FES, corrugated metal, plastic, pvc, clay, cast iron, etc)

Size & Shape of Structure: \_\_\_\_\_  
\_\_\_\_\_  
(diameter, width/height)

Invert (top of headwall to bottom inside of pipe): \_\_\_\_\_  
\_\_\_\_\_

Pipe Condition/headwall condition: \_\_\_\_\_  
\_\_\_\_\_

Connectivity: \_\_\_\_\_  
(from MH, CB, culvert, other)



Date: \_\_\_\_\_

Structure Number: \_\_\_\_\_

**Is Crown (top inside of pipe) Above or Below Surface Water?:** \_\_\_\_\_

**Dry Weather Flow Conditions:** \_\_\_\_\_  
(weather, ground condition, flowing?)

**Description of Visual Characteristics or Odors:** \_\_\_\_\_  
\_\_\_\_\_  
(aesthetics, deposits/stains, erosion, vegetation)

**Field Screening Data:**

**pH:** \_\_\_\_\_  
**Temperature:** \_\_\_\_\_  
**Sp. Conduct.:** \_\_\_\_\_  
**Turbidity:** \_\_\_\_\_

**Flag as Future Sample Location? (Y/N):** \_\_\_\_\_

**Sample collected for lab analysis? \*\* (Y/N):** \_\_\_\_\_

**Lab Sample ID:** \_\_\_\_\_

**Analyses:** \_\_\_\_\_

**Sampling Date/Time:** \_\_\_\_\_

**\*\* (ensure SOP for stormwater grab sampling has been followed, see Appendix F of IDDE Plan)**

**Additional comments/Sketch:**

## Hyperlinks to Relevant Laboratories and Field Services Companies

### Local Massachusetts State Certified Laboratories:

- ESS Laboratory; Cranston, RI <http://www.esslaboratory.com/>
- Alpha Analytical Labs; Westborough, MA <https://alphalab.com/>
- G&L Laboratories; Quincy, MA <http://www.gllab.com/>
- MassDEP Searchable Laboratory Certification Listing  
<https://eeaonline.eea.state.ma.us/DEP/Labcert/Labcert.aspx>

### Local Field Equipment Suppliers

- U.S. Environmental; Waltham, MA <https://usenvironmental.com/>
- Pine Environmental; Woburn, MA <http://www.pine-environmental.com/locations/?list>
- Hach Company Analytical Instruments <https://www.hach.com/>

### CCTV/Video Inspection Companies

- National Water Main Cleaning Co.; Canton, MA <https://nwmcc.com/>
- BMC Corp.; Billerica, MA <https://pipejetter.com/cctv-inspection.html>
- Inland Waters Inc.; Johnston, RI <http://www.inlandwatersinc.com/>



## APPENDIX E

### Outfall Sampling Reports

**Appendix E - Outfall Sampling Report**  
**Marshfield, MA**

Structure ID	Discharging Waterbody	Sample Date	Field Test Results					Analytical Results							
			Temp. (°C)	Specific Conductance (µS/cm) Threshold: 2000	Salinity (ppt)	pH Threshold: 6.5-8.0	DO (mg/L)	Ammonia as Nitrogen (mg/L) Threshold: 0.5	Chloride (mg/L)	Chlorine, TRC (mg/L)	Fecal Coliform, MF (col/100ml)	Enterococcus (col/100ml)	E. coli (MPN/100 mL) Threshold: 236	Phosphorus, Total (mg/L)	Surfactants, MBAS (mg/L) Threshold: 0.25
1065-O	Unnamed Tributary	7/16/2020	15.5	295	0.14	7.46	7.19	0.136	-	ND	-	-	2.02	-	0.06
125-O	South River	3/30/2021	11.9	73.3	0.03	7.42	2.52	-	14	-	ND	1	-	0.127	ND
		9/30/2021	-	-	-	-	-	ND	-	ND	-	-	-	-	-
126-O	South River	3/30/2021	10.3	416.8	0.2	7.52	1.83	-	110		2	4.09	-	0.042	ND
		6/23/2016	-	-	-	-	-	0.5	-	0.3	-	-	750	-	0.75
		9/30/2021	17.5	182.5	0.09	5.39	1.46	0.129	-	ND	15	8.52	8.52	0.249	0.11
127-O	South River	3/30/2021	12.5	260	0.12	8.47	2.02	-	71	-	16	ND	-	0.043	ND
		9/30/2021	-	-	-	-	-	0.175	-	ND	-	-	-	-	-
131-O	South River	3/30/2021	7.7	274.3	0.13	6.90	9.77	3.1	52	-	2	<1	ND	ND	ND
		9/30/2021	-	-	-	-	-	-	-	ND	-	-	-	-	-
		6/23/2014	-	-	-	-	-	-	-	-	-	-	80	-	-
205-O	South River	6/23/2016	-	-	-	-	-	3.0	-	0.25	-	-	83	-	0.5
3001-O	Littles Creek	3/30/2021	9.9	366.7	0.2	7.71	8.02	1.78	70	-	ND	-	<1	0.063	ND
		9/30/2021	-	-	-	-	-	-	-	ND	-	-	-	-	-
54-O	South River	6/23/2016	-	-	-	-	-	0	-	0.25	-	-	30	-	0.5

Notes

- : Not Tested

ND: Non-detect

**Bold Values exceed contaminant criteria**



## TECHNICAL MEMORANDUM

**Date:** April 12, 2021

**To** Tom Reynolds - DPW Superintendent, Town of Marshfield

**From** Scott Turner, P.E. – Director of Planning, Environmental Partners

**CC** Helen Gordon, P.E. – Senior Program Manager, Environmental Partners

**Subject** Illicit Discharge Detection & Elimination (IDDE) Investigations  
MS4 General permit Assistance for the DPW Engineering Division

This memorandum summarizes the FY21 Dry Weather Investigations, outlined in Task 2A of the Agreement for Professional Engineering Services – Municipal Separate Storm Sewer Systems (MS4) General Permit Assistance for the Department of Public Works (DPW) Engineering Division of the Town of Marshfield.

Under this task, Environmental Partners Group, Inc. (EP) conducted outfall screening and sampling over the course of two (2) days in March and April 2021. A total of eight (8) outfalls were screened, of which five (5) were found to be flowing during dry weather. This work completed the MS4 General Permit requirement to screen during dry weather all MS4 outfalls by the third year of the permit term (June 30, 2021).

### Outfall Sampling

On March 30<sup>th</sup> and April 9<sup>th</sup>, 2021, EP staff attempted to visit twelve outfall locations during dry weather. These twelve locations represent the remaining outfalls in the Town's MS4 outfall inventory left to be inspected during dry weather and outfalls EP previously found were flowing during dry weather and sampled. The locations of all twelve screened outfalls are shown on Figure 1: Dry Weather Outfall Sampling Locations.

During outfall screening, EP could not locate four (4) outfalls (54-O, 3000-O, 67-O and 134- I a), and the Town confirmed that those outfalls do not exist. The new MS4 Outfall count for Marshfield is 93 outfalls. Following this round of screening, all outfalls required to be screened by the MS4 permit have been screened.

## Results and Recommendations

A total of five (5) outfalls were sampled for field measurements and laboratory analysis: 125-O, 126-O, 127-O, 131-O, and 3001-O. All samples were analyzed for ammonia, chlorine, fecal coliform, E.coli, phosphorous, and surfactants at a state-certified laboratory, Alpha Analytical Inc. in Westborough, MA. Outfalls 125-O, 126-O, 127-O, and 131-O required additional analysis for enterococcus due to water quality impairments.

Field parameters sampled for include: temperature, specific conductance, salinity, pH, and dissolved oxygen. A summary of the field and analytical results is presented in Table 1: Stormwater Field Screening and Analytical Results.

Three (3) outfalls sampled resulted in parameters outside the regulated thresholds. At Outfalls 131-O and 3001-O, ammonia as nitrogen was detected slightly above the limit of 0.5 mg/L (1.78 mg/L at 3001-O and 3.1mg/L at 131-O). At Outfall 127-O, pH was detected at 8.47, slightly above the threshold limit of 8.0.

During this sampling round, EP sampled four (4) outfalls that were previously found to be flowing during prior dry weather sampling conducted in 2014, 2016, and 2020. Of those four outfalls, EP observed two (2) outfalls to be flowing again:

- Outfall 126-O: On June 6<sup>th</sup>, 2016, lab results from Outfall 126-O showed elevated ammonia (0.5 mg/L) and elevated surfactants (0.75 mg/L). This year, the same outfall had non-detectable levels of ammonia and surfactants; however, as previously stated, this outfall did have a pH field measurement of 8.47, which is outside the allowable range of 6.5 to 8.
- Outfall 131-O: In 2014, Outfall 131-O was determined to have E. Coli levels below the regulated limit; EP does not have any other sampling results for this outfall from this date. This year, E. Coli was not detected at Outfall 131-O, but ammonia was detected above the 0.5 mg/L threshold, at 3.1 mg/L.

Moving forward, EP recommends the following:

- Perform additional investigation of the three (3) outfalls sampled that had elevated parameter levels (126-O, 131-O, and 3001-O) to determine the likely source of the elevated pollutant levels.
- Begin IDDE catchment investigations, starting with the high priority outfalls and high priority catchments.
- Perform wet weather outfall sampling at outfalls within catchments that have at least one (1) System Vulnerability Factor (SVF) identified.



## [Attachments](#)

Table 1: Stormwater Field Screening and Analytical Results

Figure 1: Dry Weather Sampling Locations

Laboratory Analytical Report

Marshfield MS4 Certification Page

## TABLE 1: STORMWATER FIELD SCREENING AND ANALYTICAL RESULTS



**Table 1: Stormwater Field Screening and Analytical Results**

Marshfield, MA

April 2021

Outfall Identification		125-O	126-O	127-O	131-O	3001-O
Discharge Waterbody		South River	South River	South River	South River	Littles Creek
Date Sampled		4/9/2021	4/9/2021	4/9/2021	3/30/2021	3/30/2021
Sample Time		10:00 AM	09:45 AM	09:30 AM	11:05 AM	10:30 AM
Field Test Results	Threshold					
Temperature (°C)	-	11.9	10.3	12.5	7.7	9.9
Specific Conductance (µS/cm)	2000 µS/cm	73.3	416.8	260	274.3	366.7
Salinity (ppt)	-	0.03	0.2	0.12	0.13	0.2
pH	6.5-8.0	7.42	7.52	<b>8.47</b>	6.90	7.71
Dissolved Oxygen (mg/L)	-	2.52	1.83	2.02	9.77	8.02
Analytical Results						
Ammonia as Nitrogen (mg/L)	0.5 mg/L	-	-	-	<b>3.1</b>	<b>1.78</b>
Chlorine (TRC) (mg/L)	-	14	110	71	52	70
Coliform, Fecal (MF) (col/100mL)		ND	2	16	2	ND
Enterococcus (MPN/100ml)		1	4.09	ND	ND	<1
E. coli (MPN/100 mL)	236 MPN/100 mL	-	-	-	<1	0.063
Phosphorus, Total (mg/L)	-	0.127	0.042	0.043	ND	ND
Surfactants, MBAS (mg/L)	0.25 mg/L	ND	ND	ND	ND	ND

Notes:

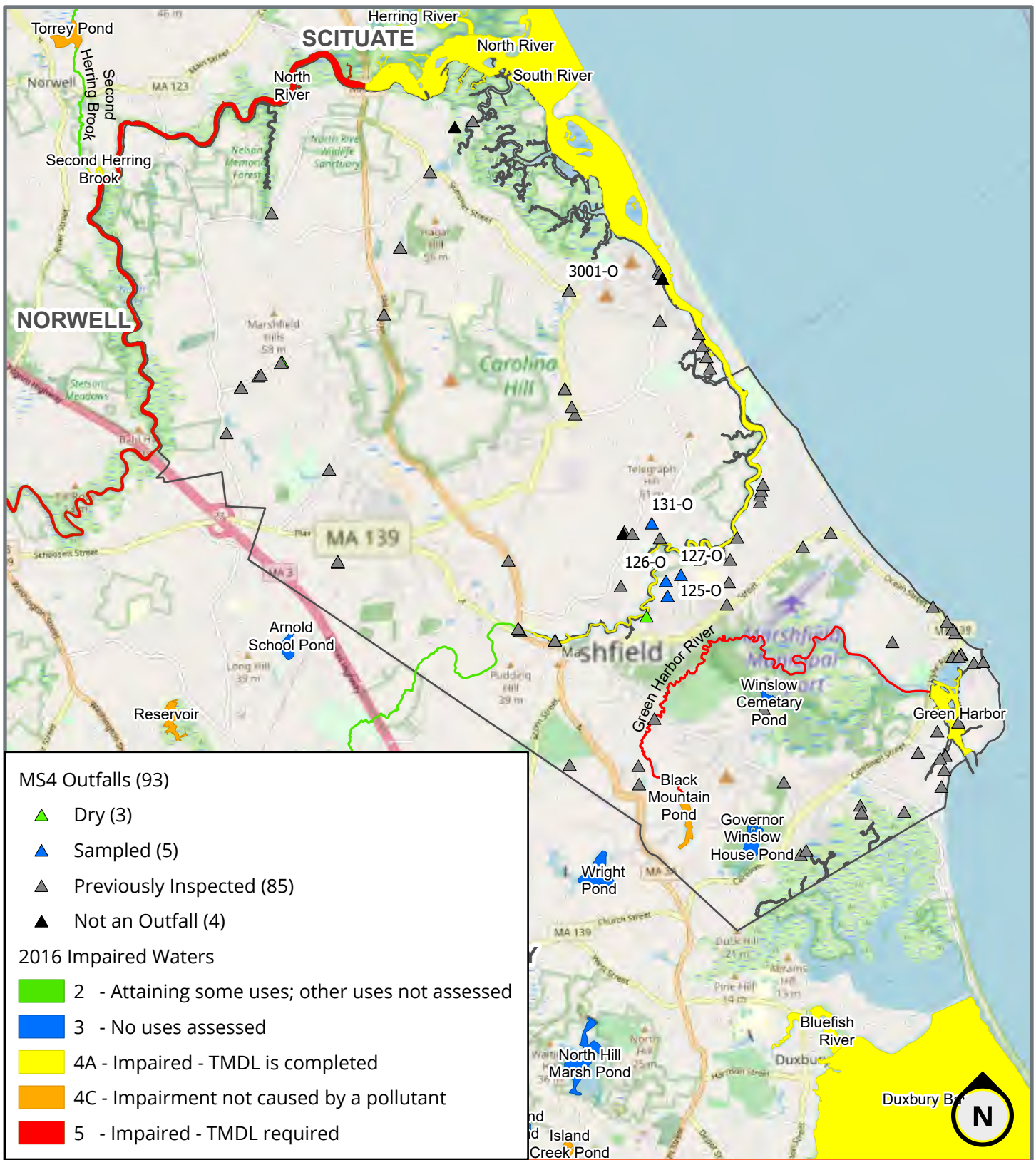
- : Not Tested

ND: Non-detect

**Bold Values exceed contaminant criteria.**

## FIGURE 1: DRY WEATHER OUTFALL SAMPLING LOCATIONS





**Figure 1:**  
**Dry Weather Sampling Locations**  
Marshfield, Massachusetts

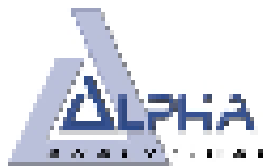
ENVIRONMENTAL  
PARTNERS

0 0.5 1 2  
Miles



## LABORATORY RESULTS





## ANALYTICAL REPORT

Lab Number:	L2115810
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Scott Turner
Phone:	(207) 939-3883
Project Name:	MARSHFIELD STORMWATER
Project Number:	Not Specified
Report Date:	04/07/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

---

Eight Walkup Drive, Westborough, MA 01581-1019  
508-898-9220 (Fax) 508-898-9193 800-624-9220 - [www.alphalab.com](http://www.alphalab.com)



**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2115810  
**Report Date:** 04/07/21

<b>Alpha Sample ID</b>	<b>Client ID</b>	<b>Matrix</b>	<b>Sample Location</b>	<b>Collection Date/Time</b>	<b>Receive Date</b>
L2115810-01	3001-0	WATER	MARSHFIELD, MA	03/30/21 10:30	03/30/21
L2115810-02	131-0	WATER	MARSHFIELD, MA	03/30/21 11:05	03/30/21



**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2115810  
**Report Date:** 04/07/21

### Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

**HOLD POLICY** - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

---

**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2115810  
**Report Date:** 04/07/21

**Case Narrative (continued)**

Coliform, Fecal (MF)

L2115810-01: The sample has an elevated detection limit due to the dilution required by the method.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Caitlin Walukevich

Title: Technical Director/Representative

Date: 04/07/21



# **INORGANICS & MISCELLANEOUS**

**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2115810  
**Report Date:** 04/07/21

### SAMPLE RESULTS

**Lab ID:** L2115810-01  
**Client ID:** 3001-0  
**Sample Location:** MARSHFIELD, MA

**Date Collected:** 03/30/21 10:30  
**Date Received:** 03/30/21  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	ND		col/100ml	2.0	NA	2	-	03/30/21 18:21	121,9222D	CC
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	03/30/21 17:47	121,9223B	CC
General Chemistry - Westborough Lab										
Chloride	70.		mg/l	1.0	--	1	-	04/01/21 22:34	121,4500CL-E	TH
Nitrogen, Ammonia	1.78		mg/l	0.075	--	1	04/03/21 02:33	04/05/21 12:57	121,4500NH3-BH	JO
Phosphorus, Total	0.063		mg/l	0.010	--	1	04/01/21 10:30	04/01/21 14:10	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/31/21 04:00	03/31/21 07:50	121,5540C	AW





**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2115810  
**Report Date:** 04/07/21

**SAMPLE RESULTS**

**Lab ID:** L2115810-02  
**Client ID:** 131-0  
**Sample Location:** MARSHFIELD, MA

**Date Collected:** 03/30/21 11:05  
**Date Received:** 03/30/21  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
<b>Microbiological Analysis - Westborough Lab</b>										
Coliform, Fecal (MF)	2.0		col/100ml	2.0	NA	2	-	03/30/21 18:21	121,9222D	CC
E. Coli (MPN)	ND		MPN/100ml	1	NA	1	-	03/30/21 17:47	121,9223B	CC
ENTEROCOCCUS	<1		MPN/100ml	1	NA	1	-	03/30/21 17:50	102,ENTEROLER T	CC
<b>General Chemistry - Westborough Lab</b>										
Chloride	52.		mg/l	1.0	--	1	-	04/01/21 21:49	121,4500CL-E	TH
Nitrogen, Ammonia	3.10		mg/l	0.075	--	1	04/03/21 02:33	04/05/21 12:16	121,4500NH3-BH	JO
Phosphorus, Total	ND		mg/l	0.010	--	1	04/01/21 10:30	04/01/21 14:11	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/31/21 04:00	03/31/21 07:50	121,5540C	AW



**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2115810  
**Report Date:** 04/07/21

**Method Blank Analysis**  
**Batch Quality Control**

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-02 Batch: WG1480561-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	03/30/21 17:47	121,9223B	CC
Microbiological Analysis - Westborough Lab for sample(s): 02 Batch: WG1480562-1										
ENTEROCOCCUS	<1		MPN/100ml	1	NA	1	-	03/30/21 17:50	102,ENTEROLER T	CC
Microbiological Analysis - Westborough Lab for sample(s): 01-02 Batch: WG1480580-1										
Coliform, Fecal (MF)	ND		col/100ml	1.0	NA	1	-	03/30/21 18:21	121,9222D	CC
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1480682-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/31/21 04:00	03/31/21 07:44	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1481287-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	04/01/21 10:30	04/01/21 13:54	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1481562-1										
Chloride	ND		mg/l	1.0	--	1	-	04/01/21 21:12	121,4500CL-E	TH
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1482039-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	04/03/21 02:33	04/05/21 12:09	121,4500NH3-BH	JO





**Lab Control Sample Analysis****Batch Quality Control****Project Name:** MARSHFIELD STORMWATER**Project Number:** Not Specified**Lab Number:** L2115810**Report Date:** 04/07/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1480682-2								
Surfactants, MBAS	90		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1481287-2								
Phosphorus, Total	99		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1481562-2								
Chloride	97		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1482039-2								
Nitrogen, Ammonia	93		-		80-120	-		20

# **Matrix Spike Analysis** Batch Quality Control

**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2115810  
**Report Date:** 04/07/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1480682-4 QC Sample: L2115768-02 Client ID: MS Sample												
Surfactants, MBAS	ND	0.4	0.420	105		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1481287-3 QC Sample: L2114291-05 Client ID: MS Sample												
Phosphorus, Total	7.08	0.5	7.48	79		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1481562-4 QC Sample: L2115810-01 Client ID: 3001-0												
Chloride	70	20	86	80		-	-		58-140	-		7
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1482039-4 QC Sample: L2115897-04 Client ID: MS Sample												
Nitrogen, Ammonia	0.182	4	3.77	90		-	-		80-120	-		20



**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Duplicate Analysis**  
*Batch Quality Control*

**Lab Number:** L2115810  
**Report Date:** 04/07/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1480682-3 QC Sample: L2115768-02 Client ID: DUP Sample						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1481287-4 QC Sample: L2114291-05 Client ID: DUP Sample						
Phosphorus, Total	7.08	6.98	mg/l	1		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1481562-3 QC Sample: L2115810-01 Client ID: 3001-0						
Chloride	70	71	mg/l	1		7
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1482039-3 QC Sample: L2115897-04 Client ID: DUP Sample						
Nitrogen, Ammonia	0.182	0.178	mg/l	2		20

**Project Name:** MARSHFIELD STORMWATER**Lab Number:** L2115810**Project Number:** Not Specified**Report Date:** 04/07/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

**Cooler Information**

<b>Cooler</b>	<b>Custody Seal</b>
A	Absent

**Container Information**

<b>Container ID</b>	<b>Container Type</b>	<b>Cooler</b>	<b>Initial pH</b>	<b>Final pH</b>	<b>Temp deg C</b>	<b>Pres</b>	<b>Seal</b>	<b>Frozen Date/Time</b>	<b>Analysis(*)</b>
L2115810-01A	Bacteria Cup Na2S2O3 preserved	A	NA		5.7	Y	Absent		E-COLI-QT(.33)
L2115810-01B	Bacteria Cup Na2S2O3 preserved	A	NA		5.7	Y	Absent		E-COLI-QT(.33)
L2115810-01C	Bacteria Cup Na2S2O3 preserved	A	NA		5.7	Y	Absent		F-COLI-MF(.33)
L2115810-01D	Bacteria Cup Na2S2O3 preserved	A	NA		5.7	Y	Absent		F-COLI-MF(.33)
L2115810-01E	Plastic 500ml H2SO4 preserved	A	<2	<2	5.7	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2115810-01F	Plastic 950ml unpreserved	A	7	7	5.7	Y	Absent		CL-4500(28)
L2115810-01G	Plastic 950ml unpreserved	A	7	7	5.7	Y	Absent		MBAS-5540(2)
L2115810-02A	Bacteria Cup Na2S2O3 preserved	A	NA		5.7	Y	Absent		E-COLI-QT(.33)
L2115810-02B	Bacteria Cup Na2S2O3 preserved	A	NA		5.7	Y	Absent		E-COLI-QT(.33)
L2115810-02C	Bacteria Cup Na2S2O3 preserved	A	NA		5.7	Y	Absent		F-COLI-MF(.33)
L2115810-02D	Bacteria Cup Na2S2O3 preserved	A	NA		5.7	Y	Absent		F-COLI-MF(.33)
L2115810-02E	Bacteria Cup Na2S2O3 preserved	A	NA		5.7	Y	Absent		ENTRO-QT(.33)
L2115810-02F	Bacteria Cup Na2S2O3 preserved	A	NA		5.7	Y	Absent		ENTRO-QT(.33)
L2115810-02G	Plastic 500ml H2SO4 preserved	A	<2	<2	5.7	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2115810-02H	Plastic 950ml unpreserved	A	7	7	5.7	Y	Absent		MBAS-5540(2)
L2115810-02I	Plastic 950ml unpreserved	A	7	7	5.7	Y	Absent		CL-4500(28)



**Project Name:** MARSHFIELD STORMWATER**Lab Number:** L2115810**Project Number:** Not Specified**Report Date:** 04/07/21

## GLOSSARY

### Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

*Report Format: Data Usability Report*

**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2115810  
**Report Date:** 04/07/21

### Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

**Difference:** With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

**Final pH:** As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

**Initial pH:** As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

**PAH Total:** With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

**Total:** With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

### Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

**Report Format:** Data Usability Report





**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2115810  
**Report Date:** 04/07/21

**Data Qualifiers**

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2115810  
**Report Date:** 04/07/21

## REFERENCES

- 102 Standard Test Method for Enterococci in Water Using Enterolert (IDEXX Defined Substrate Technology), American Society of Testing & Materials, ASTM D6503-99.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

## LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.





## Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

### Westborough Facility

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene

**EPA 625/625.1:** alpha-Terpineol

**EPA 8260C/8260D:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

**EPA 8270D/8270E:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO<sub>2</sub>, NO<sub>3</sub>.

### Mansfield Facility

**SM 2540D:** TSS

**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

**Biological Tissue Matrix:** EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

### Westborough Facility:

#### Drinking Water

**EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

**EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**

**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

#### Non-Potable Water

**SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

**SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

**EPA 624.1:** Volatile Halocarbons & Aromatics,

**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

### Mansfield Facility:

#### Drinking Water

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

**EPA 522, EPA 537.1.**

#### Non-Potable Water

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

**EPA 245.1 Hg.**

**SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.







## ANALYTICAL REPORT

Lab Number:	L2117976
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Scott Turner
Phone:	(207) 939-3883
Project Name:	MARSHFIELD
Project Number:	R133.2007.02
Report Date:	04/19/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

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Eight Walkup Drive, Westborough, MA 01581-1019  
508-898-9220 (Fax) 508-898-9193 800-624-9220 - [www.alphalab.com](http://www.alphalab.com)



**Project Name:** MARSHFIELD  
**Project Number:** R133.2007.02

**Lab Number:** L2117976  
**Report Date:** 04/19/21

<b>Alpha Sample ID</b>	<b>Client ID</b>	<b>Matrix</b>	<b>Sample Location</b>	<b>Collection Date/Time</b>	<b>Receive Date</b>
L2117976-01	127-0	WATER	MARSHFIELD	04/09/21 09:30	04/09/21
L2117976-02	126-0	WATER	MARSHFIELD	04/09/21 09:45	04/09/21
L2117976-03	125-0	WATER	MARSHFIELD	04/09/21 10:00	04/09/21



**Project Name:** MARSHFIELD  
**Project Number:** R133.2007.02

**Lab Number:** L2117976  
**Report Date:** 04/19/21

### Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

**HOLD POLICY** - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

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**Project Name:** MARSHFIELD  
**Project Number:** R133.2007.02

**Lab Number:** L2117976  
**Report Date:** 04/19/21

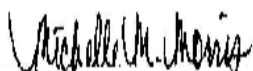
**Case Narrative (continued)**

Coliform, Fecal (MF)

L2117976-03: The sample has an elevated detection limit due to the dilution required by the method.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Michelle M. Morris

Title: Technical Director/Representative

Date: 04/19/21



# **INORGANICS & MISCELLANEOUS**

**Project Name:** MARSHFIELD  
**Project Number:** R133.2007.02

**Lab Number:** L2117976  
**Report Date:** 04/19/21

### SAMPLE RESULTS

**Lab ID:** L2117976-01  
**Client ID:** 127-0  
**Sample Location:** MARSHFIELD

**Date Collected:** 04/09/21 09:30  
**Date Received:** 04/09/21  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
<b>Microbiological Analysis - Westborough Lab</b>										
Coliform, Fecal (MF)	16		col/100ml	2.0	NA	2	-	04/09/21 16:20	121,9222D	JW
ENTEROCOCCUS	ND		MPN/100ml	1	NA	1	-	04/09/21 15:05	102,ENTEROLER T	JW
<b>General Chemistry - Westborough Lab</b>										
Chloride	71.		mg/l	1.0	--	1	-	04/13/21 23:53	121,4500CL-E	TL
Phosphorus, Total	0.043		mg/l	0.010	--	1	04/13/21 09:15	04/13/21 14:42	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	04/10/21 06:30	04/10/21 08:10	121,5540C	AW





**Project Name:** MARSHFIELD  
**Project Number:** R133.2007.02

**Lab Number:** L2117976  
**Report Date:** 04/19/21

### SAMPLE RESULTS

**Lab ID:** L2117976-02  
**Client ID:** 126-0  
**Sample Location:** MARSHFIELD

**Date Collected:** 04/09/21 09:45  
**Date Received:** 04/09/21  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
<b>Microbiological Analysis - Westborough Lab</b>										
Coliform, Fecal (MF)	2.0		col/100ml	2.0	NA	2	-	04/09/21 16:20	121,9222D	JW
ENTEROCOCCUS	4.09		MPN/100ml	1	NA	1	-	04/09/21 15:05	102,ENTEROLER T	JW
<b>General Chemistry - Westborough Lab</b>										
Chloride	110		mg/l	10	--	10	-	04/13/21 23:55	121,4500CL-E	TL
Phosphorus, Total	0.042		mg/l	0.010	--	1	04/13/21 09:15	04/13/21 14:44	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	04/10/21 06:30	04/10/21 08:10	121,5540C	AW



**Project Name:** MARSHFIELD  
**Project Number:** R133.2007.02

**Lab Number:** L2117976  
**Report Date:** 04/19/21

### SAMPLE RESULTS

**Lab ID:** L2117976-03  
**Client ID:** 125-0  
**Sample Location:** MARSHFIELD

**Date Collected:** 04/09/21 10:00  
**Date Received:** 04/09/21  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
<b>Microbiological Analysis - Westborough Lab</b>										
Coliform, Fecal (MF)	ND		col/100ml	2.0	NA	2	-	04/09/21 16:20	121,9222D	JW
ENTEROCOCCUS	1		MPN/100ml	1	NA	1	-	04/09/21 15:05	102,ENTEROLER T	JW
<b>General Chemistry - Westborough Lab</b>										
Chloride	14.		mg/l	1.0	--	1	-	04/13/21 23:56	121,4500CL-E	TL
Phosphorus, Total	0.127		mg/l	0.010	--	1	04/13/21 09:15	04/13/21 14:45	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	04/10/21 06:30	04/10/21 08:11	121,5540C	AW





**Project Name:** MARSHFIELD  
**Project Number:** R133.2007.02

**Lab Number:** L2117976  
**Report Date:** 04/19/21

**Method Blank Analysis**  
**Batch Quality Control**

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-03 Batch: WG1484497-1										
ENTEROCOCCUS	<1		MPN/100ml	1	NA	1	-	04/09/21 15:05	102,ENTEROLER T	JW
Microbiological Analysis - Westborough Lab for sample(s): 01-03 Batch: WG1484499-1										
Coliform, Fecal (MF)	ND		col/100ml	1.0	NA	1	-	04/09/21 16:20	121,9222D	JW
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1484666-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	04/10/21 06:30	04/10/21 08:08	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1485509-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	04/13/21 09:15	04/13/21 14:30	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1485813-1										
Chloride	ND		mg/l	1.0	--	1	-	04/13/21 20:49	121,4500CL-E	TL



## Lab Control Sample Analysis

### Batch Quality Control

**Project Name:** MARSHFIELD

**Project Number:** R133.2007.02

**Lab Number:** L2117976

**Report Date:** 04/19/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1484666-2								
Surfactants, MBAS	98		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1485509-2								
Phosphorus, Total	103		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1485813-2								
Chloride	103		-		90-110	-		



# **Matrix Spike Analysis** Batch Quality Control

**Project Name:** MARSHFIELD

**Project Number:** R133.2007.02

**Lab Number:** L2117976

**Report Date:** 04/19/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1484666-4 QC Sample: L2117976-03 Client ID: 125-0												
Surfactants, MBAS	ND	0.4	0.450	112		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1485509-3 QC Sample: L2116995-04 Client ID: MS Sample												
Phosphorus, Total	0.063	0.5	0.565	100		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1485813-4 QC Sample: L2117976-01 Client ID: 127-0												
Chloride	71	20	84	65		-	-		58-140	-		7

**Project Name:** MARSHFIELD  
**Project Number:** R133.2007.02

## Lab Duplicate Analysis

*Batch Quality Control*

**Lab Number:** L2117976  
**Report Date:** 04/19/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1484666-3 QC Sample: L2117976-03 Client ID: 125-0						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1485509-4 QC Sample: L2116995-04 Client ID: DUP Sample						
Phosphorus, Total	0.063	0.061	mg/l	3		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1485813-3 QC Sample: L2117976-01 Client ID: 127-0						
Chloride	71	70	mg/l	1		7



**Project Name:** MARSHFIELD  
**Project Number:** R133.2007.02

Serial\_No:04192115:22  
**Lab Number:** L2117976  
**Report Date:** 04/19/21

### Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

#### Cooler Information

**Cooler**                      **Custody Seal**  
A                                  Absent

#### Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2117976-01A	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-01B	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-01C	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-01D	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-01E	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-01F	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-01G	Plastic 500ml H2SO4 preserved	A	<2	<2	5.3	Y	Absent		TPHOS-4500(28)
L2117976-01H	Plastic 950ml unpreserved	A	7	7	5.3	Y	Absent		CL-4500(28)
L2117976-01I	Plastic 950ml unpreserved	A	7	7	5.3	Y	Absent		MBAS-5540(2)
L2117976-02A	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-02B	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-02C	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-02D	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-02E	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-02F	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-02G	Plastic 500ml H2SO4 preserved	A	<2	<2	5.3	Y	Absent		TPHOS-4500(28)
L2117976-02H	Plastic 950ml unpreserved	A	7	7	5.3	Y	Absent		CL-4500(28)
L2117976-02I	Plastic 950ml unpreserved	A	7	7	5.3	Y	Absent		MBAS-5540(2)
L2117976-03A	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-03B	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-03C	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-03D	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-03E	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)

**Project Name:** MARSHFIELD  
**Project Number:** R133.2007.02

Serial\_No:04192115:22  
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**Container Information**

<b>Container ID</b>	<b>Container Type</b>	<b>Cooler</b>	<b>Initial pH</b>	<b>Final pH</b>	<b>Temp deg C</b>	<b>Pres</b>	<b>Seal</b>	<b>Frozen Date/Time</b>	<b>Analysis(*)</b>
L2117976-03F	Bacteria Cup Na2S2O3 preserved	A	NA		5.3	Y	Absent		ENTRO-QT(.33),F-COLI-MF(.33)
L2117976-03G	Plastic 500ml H2SO4 preserved	A	<2	<2	5.3	Y	Absent		TPHOS-4500(28)
L2117976-03H	Plastic 950ml unpreserved	A	7	7	5.3	Y	Absent		CL-4500(28)
L2117976-03I	Plastic 950ml unpreserved	A	7	7	5.3	Y	Absent		MBAS-5540(2)



**Project Name:** MARSHFIELD  
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**Lab Number:** L2117976  
**Report Date:** 04/19/21

## GLOSSARY

### Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



**Project Name:** MARSHFIELD  
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### Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

**Difference:** With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

**Final pH:** As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

**Initial pH:** As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

**PAH Total:** With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

**Total:** With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

### Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

**Report Format:** Data Usability Report





**Project Name:** MARSHFIELD  
**Project Number:** R133.2007.02

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**Data Qualifiers**

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

**Project Name:** MARSHFIELD  
**Project Number:** R133.2007.02

**Lab Number:** L2117976  
**Report Date:** 04/19/21

## REFERENCES

- 102 Standard Test Method for Enterococci in Water Using Enterolert (IDEXX Defined Substrate Technology), American Society of Testing & Materials, ASTM D6503-99.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

## LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.





**Alpha Analytical, Inc.**Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

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**Certification Information**

The following analytes are not included in our Primary NELAP Scope of Accreditation:

**Westborough Facility****EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene**EPA 625/625.1:** alpha-Terpineol**EPA 8260C/8260D:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.**EPA 8270D/8270E:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO<sub>2</sub>, NO<sub>3</sub>.**Mansfield Facility****SM 2540D:** TSS**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

**Biological Tissue Matrix:** EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

**Westborough Facility:****Drinking Water****EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,****EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B****EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.****Non-Potable Water****SM4500H-B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,****SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.**EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.****EPA 522, EPA 537.1.****Non-Potable Water****EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1 Hg.****SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



6 Wakeup Drive  
Westboro, MA 01581  
Tel: 508-339-9200

120 Spring Blvd  
Methuen, MA 02844  
Tel: 978-353-4000

# CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 4/9/21

ALPHA Job #: 22117572

## Client Information

Client: Environmental Partners  
Address: 1906 Crown Colony Dr  
#402 Quincy MA  
Phone: 207 939 3583  
Email: aet@envpartners.com

## Project Information

Project Name: Marshfield  
Project Location: Marshfield  
Project #: R133-2007-02  
Project Manager: Scott Turner  
ALPHA Quote #:

## Turn-Around Time

☒ Standard ☐ RUSH  
Date Due:

## Report Information - Data Deliverables

☐ ADE ☒ EMAIL

☒ Same as Client Info ☐ PO #

## Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCF Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods  
☐ Yes ☐ No Matrix Spike Required on this SDGT (Required for MCP Inorganics)  
☐ Yes ☐ No GW Standards (Info Required for Metals & EPH with Targets)  
☒ Yes ☐ No NPDES RGP MS4  
☐ Other State/Fed Program: Criteria

## Additional Project Information:

MS4 Stormwater

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials	ANALYSIS	SAMPLE INFO	Sample Comments
		Date	Time					
17476-01	127-0	4/9	9:30	Water	AT	YOC: <input type="checkbox"/> 0300 <input type="checkbox"/> 0324 <input type="checkbox"/> 0342 SVOC: <input type="checkbox"/> ABL <input type="checkbox"/> PAH METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> MCP 15 EPH: <input type="checkbox"/> RCRA 8 <input type="checkbox"/> RCRA 9 <input type="checkbox"/> RCRA 10 VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only <input type="checkbox"/> PCB <input type="checkbox"/> PEST TRI: <input type="checkbox"/> Client Only <input type="checkbox"/> Proprietary Enterococcus Chloride/Sulfate Total Phos Fecal Coliform	<input type="checkbox"/> Filtration <input type="checkbox"/> Field <input checked="" type="checkbox"/> Lab to do Preservation: <input type="checkbox"/> Lab to do	
17476-02	126-0	↓	9:45	↓	↓		X X X X	
17476-03	125-0	↓	10:00	↓	↓		X X X X	

## Container Type

Plastic  
A= Ambient  
V= Vial  
U= Urine  
B= Bacteria  
C= CUBS  
D= Dose  
E= Enzyme  
F= BOD Bottle

## Preservative

H= HCl  
B= HCl  
C= HNO3  
D= H2SO4  
E= NaOH  
F= NaOH  
G= NaHCO3  
H= Na2S2O8  
I= Ascorbic Acid  
J= NH4Cl  
K= Zn Acetate  
L= Other

## Container Type

## Preservative

2214  
H 014

## Relinquished By:

AMM  
MEM

## Date/Time

4/9/21 11:15  
4/9/21 12:57

## Received By:

MEM  
MEM  
MEM

## Date/Time

4/9/21 11:15  
4/9/21 12:57

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO. 01-01 (Rev. 12/10/2012)





## TECHNICAL MEMORANDUM

**Date:** September 25, 2020

**To** Rod Procaccino –Town Engineer, Town of Marshfield

**From** Scott Turner, P.E. – Director of Planning, Environmental Partners

**CC** Helen Gordon, P.E. – Senior Program Manager, Environmental Partners

File

**Subject** Illicit Discharge Detection & Elimination (IDDE) Investigations  
MS4 General permit Assistance for the DPW Engineering Division

This memorandum summarizes the FY20 Dry Weather Investigations, outlined in Task 1 of the Agreement for Professional Engineering Services –MS4 General Permit Assistance for the DPW Engineering Division of the Town of Marshfield.

Under this task, Environmental Partners Group, Inc. (EP) conducted outfall screening and sampling over the course of three (3) days in July 2020. A total of seventy-two (72) outfalls were screened, of which one was found to be flowing during dry weather. Due to the ongoing COVID-19 pandemic, EP's field work protocol was to avoid interacting with residents while conducting outfall investigations. Any outfalls that would require crossing through private property were avoided during this investigation, and will be prioritized in future visits when safe to do so.

### Outfall Sampling

On July 9<sup>th</sup>, 10<sup>th</sup> and 16<sup>th</sup>, 2020, EP staff attempted to visit seventy-two (72) outfalls locations during dry weather, approximately 55% of the 129 total identified MS4 outfalls in the Town of Marshfield. The locations of all seventy-two (72) screened outfalls are shown on Figure 1: Dry Weather Outfall Sampling Locations.

### Results and Recommendations

A sample was collected from outfall 1065-O, which discharges to an unnamed tributary, on July 16<sup>th</sup>, 2020. The sample was submitted to Alpha Analytical of Westborough, MA for E. Coli, Surfactants,

Ammonia and Chlorine analysis. Analytical results from this sample were below the EPA Benchmarks for all analytes, which indicates that the source of the flow is unlikely to be an illicit discharge. Laboratory analytical results are summarized in Table 1: Dry Weather Outfall Sampling Results, and a copy of the laboratory report is included as Attachment A: Laboratory Analytical Report.

#### [Attachments](#)

Table 1: Dry Weather Outfall Sampling Results

Figure 1: Dry Weather Outfall Sampling Locations

Laboratory Analytical Report

Marshfield MS4 Certification Page



**Table 1: Stormwater Field Screening and Analytical Results**

Marshfield, MA

July 16, 2020

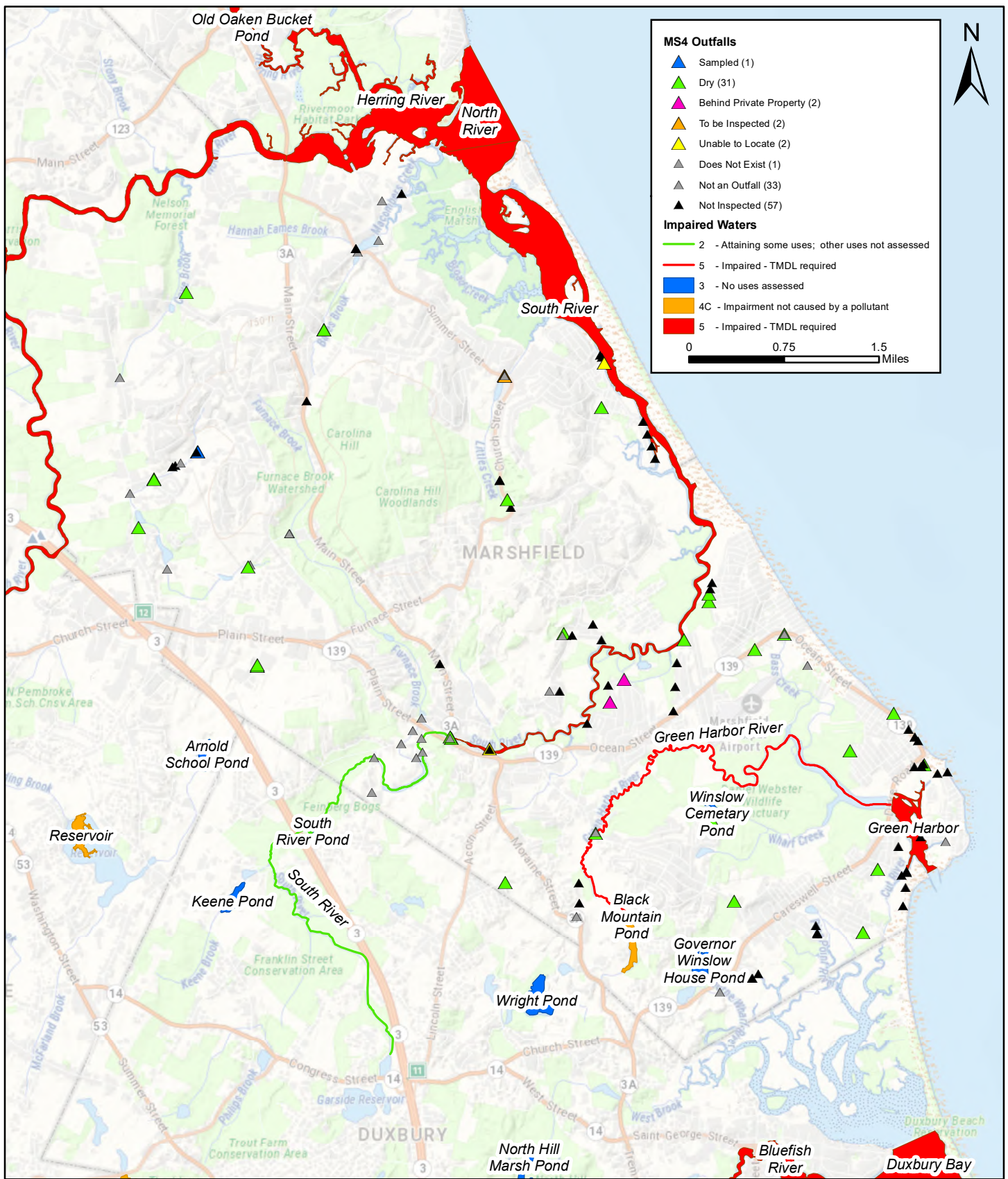
Outfall Identification		1065-O
Discharge Waterbody		Unnamed Tributary
Date Sampled		7/16/2020
Flow		Yes
Sample Time		4:30 PM
Field Test Results	Threshold	
Temperature (°C)	-	15.5
Specific Conductance (µS/cm)	2000 (µS/cm)	295
Salinity (ppt)	-	0.14
pH	6.5-8.0	7.46
DO (mg/L)	-	7.19
Analytical Results		
Ammonia as Nitrogen (mg/L)	0.5 mg/L	0.136
Biochemical Oxygen Demand (BOD) (mg/L)	-	-
Chlorine (TRC) (mg/L)	-	ND
E. coli (MPN/100 mL)	236 MPN/100 mL	2.02
Phosphorus, Total (mg/L)	-	-
Surfactants, MBAS (mg/L)	0.25 mg/L	0.06
Nitrogen, Total (mg/L)	-	-
Nitrate as N	-	-
Nitrite as N	-	-
Turbidity	-	-

Notes:

- : Not Tested

ND: Non-detect

**Bold Values exceed contaminant criteria.**



**Figure 1**  
**Dry Weather Outfall Sampling Locations**  
**Marshfield, Massachusetts**

ENVIRONMENTAL PARTNERS





## ANALYTICAL REPORT

Lab Number:	L2030328
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Stephen Gabriel
Phone:	(617) 657-0263
Project Name:	MARSHFIELD STORMWATER
Project Number:	Not Specified
Report Date:	08/07/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

---

Eight Walkup Drive, Westborough, MA 01581-1019  
508-898-9220 (Fax) 508-898-9193 800-624-9220 - [www.alphalab.com](http://www.alphalab.com)



**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2030328  
**Report Date:** 08/07/20

<b>Alpha Sample ID</b>	<b>Client ID</b>	<b>Matrix</b>	<b>Sample Location</b>	<b>Collection Date/Time</b>	<b>Receive Date</b>
L2030328-01	1065-0	WATER	MARSHFIELD, MA	07/16/20 16:30	07/16/20



**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2030328  
**Report Date:** 08/07/20

### Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

**HOLD POLICY** - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Cristin Walker

Title: Technical Director/Representative

Date: 08/07/20

# **INORGANICS & MISCELLANEOUS**



**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2030328  
**Report Date:** 08/07/20

### SAMPLE RESULTS

**Lab ID:** L2030328-01  
**Client ID:** 1065-0  
**Sample Location:** MARSHFIELD, MA

**Date Collected:** 07/16/20 16:30  
**Date Received:** 07/16/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	2.02		MPN/100ml	1	NA	1	-	07/16/20 21:42	121,9223B	CM
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/17/20 00:11	121,4500CL-D	AS
Nitrogen, Ammonia	0.136		mg/l	0.075	--	1	07/20/20 03:47	07/27/20 22:00	121,4500NH3-BH	AT
Surfactants, MBAS	0.060		mg/l	0.050	--	1	07/17/20 04:16	07/17/20 06:04	121,5540C	CB



**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2030328  
**Report Date:** 08/07/20

**Method Blank Analysis**  
**Batch Quality Control**

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01 Batch: WG1393095-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	07/16/20 21:42	121,9223B	CM
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1393098-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/17/20 00:11	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1393136-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	07/17/20 04:16	07/17/20 05:55	121,5540C	CB
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1393870-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/20/20 03:47	07/27/20 21:41	121,4500NH3-BH	AT





**Lab Control Sample Analysis****Batch Quality Control****Project Name:** MARSHFIELD STORMWATER**Project Number:** Not Specified**Lab Number:** L2030328**Report Date:** 08/07/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1393098-2								
Chlorine, Total Residual	104		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1393136-2								
Surfactants, MBAS	96		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1393870-2								
Nitrogen, Ammonia	84		-		80-120	-		20

# Matrix Spike Analysis

## Batch Quality Control

**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2030328  
**Report Date:** 08/07/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1393098-4 QC Sample: L2030190-04 Client ID: MS Sample												
Chlorine, Total Residual	ND	0.25	0.25	100		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1393136-4 QC Sample: L2030109-01 Client ID: MS Sample												
Surfactants, MBAS	0.060	0.4	0.490	108		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1393870-4 QC Sample: L2029896-01 Client ID: MS Sample												
Nitrogen, Ammonia	0.178	4	3.31	78	Q	-	-		80-120	-		20



# Lab Duplicate Analysis

*Batch Quality Control*

**Project Name:** MARSHFIELD STORMWATER

**Project Number:** Not Specified

**Lab Number:** L2030328

**Report Date:** 08/07/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1393098-3 QC Sample: L2030190-05 Client ID: DUP Sample						
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1393136-3 QC Sample: L2030109-01 Client ID: DUP Sample						
Surfactants, MBAS	0.060	0.060	mg/l	0		32
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1393870-3 QC Sample: L2029896-01 Client ID: DUP Sample						
Nitrogen, Ammonia	0.178	0.150	mg/l	17		20

**Project Name:** MARSHFIELD STORMWATER**Lab Number:** L2030328**Project Number:** Not Specified**Report Date:** 08/07/20**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

**Cooler Information****Cooler**                      **Custody Seal**

A                                  Absent

**Container Information**

<b>Container ID</b>	<b>Container Type</b>	<b>Cooler</b>	<b>Initial pH</b>	<b>Final pH</b>	<b>Temp deg C</b>	<b>Pres</b>	<b>Seal</b>	<b>Frozen Date/Time</b>	<b>Analysis(*)</b>
L2030328-01A	Bacteria Cup Na2S2O3 preserved	A	NA		3.8	Y	Absent		E-COLI-QT(.33)
L2030328-01B	Bacteria Cup Na2S2O3 preserved	A	NA		3.8	Y	Absent		E-COLI-QT(.33)
L2030328-01C	Plastic 500ml H2SO4 preserved	A	<2	<2	3.8	Y	Absent		NH3-4500(28)
L2030328-01D	Amber 500ml unpreserved	A	7	7	3.8	Y	Absent		TRC-4500(1)
L2030328-01E	Plastic 60ml unpreserved	A	7	7	3.8	Y	Absent		MBAS-5540(2)
L2030328-01F	Plastic 950ml unpreserved	A	7	7	3.8	Y	Absent		MBAS-5540(2)



**Project Name:** MARSHFIELD STORMWATER**Lab Number:** L2030328**Project Number:** Not Specified**Report Date:** 08/07/20

## GLOSSARY

### Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
	Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

### Footnotes

*Report Format: Data Usability Report*

**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2030328  
**Report Date:** 08/07/20

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

**Difference:** With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

**Final pH:** As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

**Initial pH:** As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

**PAH Total:** With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

**Total:** With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

### Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration. (DoD and NYSDEC Part 375 PFAS only.)
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration

Report Format: Data Usability Report





**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2030328  
**Report Date:** 08/07/20

**Data Qualifiers**

Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

**Project Name:** MARSHFIELD STORMWATER  
**Project Number:** Not Specified

**Lab Number:** L2030328  
**Report Date:** 08/07/20

## REFERENCES

- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

## LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.





**Alpha Analytical, Inc.**Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 17

Published Date: 4/28/2020 9:42:21 AM

Page 1 of 1

**Certification Information**

The following analytes are not included in our Primary NELAP Scope of Accreditation:

**Westborough Facility****EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.**EPA 8270D:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO<sub>2</sub>, NO<sub>3</sub>.**Mansfield Facility****SM 2540D:** TSS**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

**EPA TO-12** Non-methane organics**EPA 3C** Fixed gases**Biological Tissue Matrix:** EPA 3050B

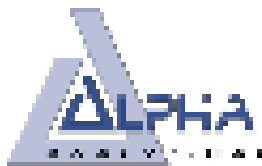
The following analytes are included in our Massachusetts DEP Scope of Accreditation

**Westborough Facility:****Drinking Water****EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,****EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B****EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.**Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.****Non-Potable Water****SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.**EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.**EPA 522.****Non-Potable Water****EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1** Hg.**SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.







## ANALYTICAL REPORT

Lab Number:	L2153109
Client:	Environmental Partners 1900 Crown Colony Drive Suite 402 4th Floor Quincy, MA 02169
ATTN:	Annie Tucker
Phone:	(617) 657-0973
Project Name:	MARSHFIELD OUTFALLS
Project Number:	Not Specified
Report Date:	10/19/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

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Eight Walkup Drive, Westborough, MA 01581-1019  
508-898-9220 (Fax) 508-898-9193 800-624-9220 - [www.alphalab.com](http://www.alphalab.com)



**Project Name:** MARSHFIELD OUTFALLS  
**Project Number:** Not Specified

**Lab Number:** L2153109  
**Report Date:** 10/19/21

<b>Alpha Sample ID</b>	<b>Client ID</b>	<b>Matrix</b>	<b>Sample Location</b>	<b>Collection Date/Time</b>	<b>Receive Date</b>
L2153109-01	3001-0	WATER	MARSHFIELD, MA	09/30/21 09:10	09/30/21
L2153109-02	131-0	WATER	MARSHFIELD, MA	09/30/21 09:35	09/30/21
L2153109-03	127-0	WATER	MARSHFIELD, MA	09/30/21 10:02	09/30/21
L2153109-04	126-0	WATER	MARSHFIELD, MA	09/30/21 10:20	09/30/21
L2153109-05	125-0	WATER	MARSHFIELD, MA	09/30/21 11:05	09/30/21



**Project Name:** MARSHFIELD OUTFALLS  
**Project Number:** Not Specified

**Lab Number:** L2153109  
**Report Date:** 10/19/21

### Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

**HOLD POLICY** - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

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**Project Name:** MARSHFIELD OUTFALLS  
**Project Number:** Not Specified

**Lab Number:** L2153109  
**Report Date:** 10/19/21

**Case Narrative (continued)**

Chlorine, Total Residual

The WG1553089-4 MS recovery, performed on L2153109-02, is outside the acceptance criteria for chlorine, total residual (76%); however, the associated LCS recovery is within criteria. No further action was taken.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Kelly Stenstrom

Title: Technical Director/Representative

Date: 10/19/21



# **INORGANICS & MISCELLANEOUS**

**Project Name:** MARSHFIELD OUTFALLS**Project Number:** Not Specified**Lab Number:** L2153109**Report Date:** 10/19/21**SAMPLE RESULTS****Lab ID:** L2153109-01**Client ID:** 3001-0**Sample Location:** MARSHFIELD, MA**Date Collected:** 09/30/21 09:10**Date Received:** 09/30/21**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	10/01/21 00:20	121,4500CL-D	AS



**Project Name:** MARSHFIELD OUTFALLS**Project Number:** Not Specified**Lab Number:** L2153109**Report Date:** 10/19/21**SAMPLE RESULTS****Lab ID:** L2153109-02**Client ID:** 131-0**Sample Location:** MARSHFIELD, MA**Date Collected:** 09/30/21 09:35**Date Received:** 09/30/21**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	10/01/21 00:20	121,4500CL-D	AS





**Project Name:** MARSHFIELD OUTFALLS**Lab Number:** L2153109**Project Number:** Not Specified**Report Date:** 10/19/21**SAMPLE RESULTS****Lab ID:** L2153109-03**Date Collected:** 09/30/21 10:02**Client ID:** 127-0**Date Received:** 09/30/21**Sample Location:** MARSHFIELD, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	10/01/21 00:20	121,4500CL-D	AS
Nitrogen, Ammonia	0.175		mg/l	0.075	--	1	10/14/21 12:01	10/18/21 17:07	121,4500NH3-BH	AT



**Project Name:** MARSHFIELD OUTFALLS  
**Project Number:** Not Specified

**Lab Number:** L2153109  
**Report Date:** 10/19/21

### SAMPLE RESULTS

**Lab ID:** L2153109-04  
**Client ID:** 126-0  
**Sample Location:** MARSHFIELD, MA

**Date Collected:** 09/30/21 10:20  
**Date Received:** 09/30/21  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
<b>Microbiological Analysis - Westborough Lab</b>										
Coliform, Fecal (MF)	15		col/100ml	2.0	NA	2	-	09/30/21 17:37	121,9222D	JW
E. Coli (MPN)	8.52		MPN/100ml	1	NA	1	-	09/30/21 17:20	121,9223B	JW
ENTEROCOCCUS	8.52		MPN/100ml	1	NA	1	-	09/30/21 17:07	102,ENTEROLER T	JW
<b>General Chemistry - Westborough Lab</b>										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	10/01/21 00:20	121,4500CL-D	AS
Nitrogen, Ammonia	0.129		mg/l	0.075	--	1	10/14/21 12:01	10/18/21 17:08	121,4500NH3-BH	AT
Phosphorus, Total	0.249		mg/l	0.010	--	1	10/08/21 09:00	10/08/21 13:31	121,4500P-E	SD
Surfactants, MBAS	0.110		mg/l	0.050	--	1	10/01/21 01:43	10/01/21 03:25	121,5540C	KA



**Project Name:** MARSHFIELD OUTFALLS**Lab Number:** L2153109**Project Number:** Not Specified**Report Date:** 10/19/21**SAMPLE RESULTS****Lab ID:** L2153109-05**Date Collected:** 09/30/21 11:05**Client ID:** 125-0**Date Received:** 09/30/21**Sample Location:** MARSHFIELD, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	10/01/21 00:20	121,4500CL-D	AS
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	10/14/21 12:01	10/18/21 17:09	121,4500NH3-BH	AT





**Project Name:** MARSHFIELD OUTFALLS**Lab Number:** L2153109**Project Number:** Not Specified**Report Date:** 10/19/21

### Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 04 Batch: WG1553047-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	09/30/21 17:20	121,9223B	JW
Microbiological Analysis - Westborough Lab for sample(s): 04 Batch: WG1553048-1										
ENTEROCOCCUS	<1		MPN/100ml	1	NA	1	-	09/30/21 17:07	102,ENTEROLER T	JW
Microbiological Analysis - Westborough Lab for sample(s): 04 Batch: WG1553049-1										
Coliform, Fecal (MF)	ND		col/100ml	1.0	NA	1	-	09/30/21 17:37	121,9222D	JW
General Chemistry - Westborough Lab for sample(s): 01-05 Batch: WG1553089-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	10/01/21 00:20	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 04 Batch: WG1553123-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	10/01/21 01:43	10/01/21 03:20	121,5540C	KA
General Chemistry - Westborough Lab for sample(s): 04 Batch: WG1556015-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	10/08/21 09:00	10/08/21 13:17	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 03-05 Batch: WG1558290-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	10/14/21 12:01	10/18/21 17:04	121,4500NH3-BH	AT



**Lab Control Sample Analysis****Batch Quality Control****Project Name:** MARSHFIELD OUTFALLS**Project Number:** Not Specified**Lab Number:** L2153109**Report Date:** 10/19/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-05 Batch: WG1553089-2								
Chlorine, Total Residual	100		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 04 Batch: WG1553123-2								
Surfactants, MBAS	106		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 04 Batch: WG1556015-2								
Phosphorus, Total	100		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 03-05 Batch: WG1558290-2								
Nitrogen, Ammonia	102		-		80-120	-		20

# **Matrix Spike Analysis** Batch Quality Control

**Project Name:** MARSHFIELD OUTFALLS

**Project Number:** Not Specified

**Lab Number:** L2153109

**Report Date:** 10/19/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG1553089-4 QC Sample: L2153109-02 Client ID: 131-0												
Chlorine, Total Residual	ND	0.25	0.19	76	Q	-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 04 QC Batch ID: WG1553123-4 QC Sample: L2153024-01 Client ID: MS Sample												
Surfactants, MBAS	ND	0.4	0.260	65		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 04 QC Batch ID: WG1556015-3 QC Sample: L2152969-12 Client ID: MS Sample												
Phosphorus, Total	0.023	0.5	0.516	99		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 03-05 QC Batch ID: WG1558290-4 QC Sample: L2153109-05 Client ID: 125-0												
Nitrogen, Ammonia	ND	4	3.82	96		-	-		80-120	-		20



# Lab Duplicate Analysis

*Batch Quality Control*

**Project Name:** MARSHFIELD OUTFALLS

**Project Number:** Not Specified

**Lab Number:** L2153109

**Report Date:** 10/19/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG1553089-3 QC Sample: L2153109-01 Client ID: 3001-0						
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 04 QC Batch ID: WG1553123-3 QC Sample: L2153024-01 Client ID: DUP Sample						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 04 QC Batch ID: WG1556015-4 QC Sample: L2152969-12 Client ID: DUP Sample						
Phosphorus, Total	0.023	0.020	mg/l	14		20
General Chemistry - Westborough Lab Associated sample(s): 03-05 QC Batch ID: WG1558290-3 QC Sample: L2153109-05 Client ID: 125-0						
Nitrogen, Ammonia	ND	0.110	mg/l	NC		20

**Project Name:** MARSHFIELD OUTFALLS**Lab Number:** L2153109**Project Number:** Not Specified**Report Date:** 10/19/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

**Cooler Information**

<b>Cooler</b>	<b>Custody Seal</b>
A	Absent

**Container Information**

<b>Container ID</b>	<b>Container Type</b>	<b>Cooler</b>	<b>Initial pH</b>	<b>Final pH</b>	<b>Temp deg C</b>	<b>Pres</b>	<b>Seal</b>	<b>Frozen Date/Time</b>	<b>Analysis(*)</b>
L2153109-01A	Plastic 950ml unpreserved	A	7	7	3.1	Y	Absent		TRC-4500(1)
L2153109-02A	Plastic 950ml unpreserved	A	7	7	3.1	Y	Absent		TRC-4500(1)
L2153109-03A	Plastic 500ml H2SO4 preserved	A	<2	<2	3.1	Y	Absent		NH3-4500(28)
L2153109-03B	Plastic 950ml unpreserved	A	7	7	3.1	Y	Absent		TRC-4500(1)
L2153109-04A	Plastic 120ml unpreserved	A	7	7	3.1	Y	Absent		TRC-4500(1)
L2153109-04B	Bacteria Cup Na2S2O3 preserved	A	NA		3.1	Y	Absent		E-COLI-QT(.33)
L2153109-04C	Bacteria Cup Na2S2O3 preserved	A	NA		3.1	Y	Absent		ENTRO-QT(.33)
L2153109-04D	Bacteria Cup Na2S2O3 preserved	A	NA		3.1	Y	Absent		ENTRO-QT(.33)
L2153109-04E	Bacteria Cup Na2S2O3 preserved	A	NA		3.1	Y	Absent		F-COLI-MF(.33)
L2153109-04F	Plastic 500ml H2SO4 preserved	A	<2	<2	3.1	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2153109-04G	Plastic 950ml unpreserved	A	7	7	3.1	Y	Absent		MBAS-5540(2)
L2153109-05A	Plastic 500ml H2SO4 preserved	A	<2	<2	3.1	Y	Absent		NH3-4500(28)
L2153109-05B	Plastic 950ml unpreserved	A	7	7	3.1	Y	Absent		TRC-4500(1)

**Project Name:** MARSHFIELD OUTFALLS**Lab Number:** L2153109**Project Number:** Not Specified**Report Date:** 10/19/21

## GLOSSARY

### Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

*Report Format: Data Usability Report*



**Project Name:** MARSHFIELD OUTFALLS**Lab Number:** L2153109**Project Number:** Not Specified**Report Date:** 10/19/21**Footnotes**

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

**Terms**

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

**Difference:** With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

**Final pH:** As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

**Initial pH:** As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

**PAH Total:** With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

**Total:** With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

**Data Qualifiers**

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

**Report Format:** Data Usability Report



**Project Name:** MARSHFIELD OUTFALLS**Lab Number:** L2153109**Project Number:** Not Specified**Report Date:** 10/19/21**Data Qualifiers**

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

**Project Name:** MARSHFIELD OUTFALLS  
**Project Number:** Not Specified

**Lab Number:** L2153109  
**Report Date:** 10/19/21

## REFERENCES

- 102 Standard Test Method for Enterococci in Water Using Enterolert (IDEXX Defined Substrate Technology), American Society of Testing & Materials, ASTM D6503-99.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

## LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.





## Certification Information

---

The following analytes are not included in our Primary NELAP Scope of Accreditation:

**Westborough Facility**

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene

**EPA 625/625.1:** alpha-Terpineol

**EPA 8260C/8260D:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

**EPA 8270D/8270E:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO<sub>2</sub>, NO<sub>3</sub>.

**Mansfield Facility**

**SM 2540D:** TSS

**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

**Biological Tissue Matrix:** EPA 3050B

---

The following analytes are included in our Massachusetts DEP Scope of Accreditation

**Westborough Facility:**

**Drinking Water**

**EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

**EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**

**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

**Non-Potable Water**

**SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

**SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**

**EPA 624.1:** Volatile Halocarbons & Aromatics,

**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

**Mansfield Facility:**

**Drinking Water**

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

**EPA 522, EPA 537.1.**

**Non-Potable Water**

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

**EPA 245.1 Hg.**

**SM2340B**

---

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



5 Walling Drive  
Westboro, MA 01581  
Tel: 508-896-0200

320 Forbes Blvd  
Mansfield, MA 02048  
Tel: 508-329-4300

# CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 9/30/21

ALPHA Job #: L2153109

## Project Information

Project Name: Marshfield Outfalls

Project Location: Marshfield, MA

Project #:

Project Manager:

ALPHA Quote #:

## Turn-Around Time

☒ Standard ☐ RUSH (extra charges & processing)

Date Due:

## Report Information - Data Deliverables

☒ ADE ☒ EMAIL

## Billing Information

☒ Same as Client info ☐ PO #:

## Regulatory Requirements & Project Information Requirements

- ☐ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods  
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)  
☐ Yes ☐ No GWI Standards (Info Required for Metals & EPH with Targets)  
☒ Yes ☐ No NPDES RGP  
☐ Other State/Fed Program ☐ Other:

## Client Information

Client: Environmental Partners

Address: 1900 Crown Colony Dr. #402

Quincy, MA

Phone: 207 939 5883

Email: net@envpartners.com

set@envpartners.com

Additional Project Information:

MA M154

stormwater  
↓

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials	ANALYSIS												Sample Comments	1 2 3						
		Date	Time			VOC	SVOC	METAL	METAL	EPH: L	UPH: L	D PCB	TPH: L	T	SW	SW	total			P	CH				
5369-01	3002-0	9/30	9:10	SW	AT																			1	
-02	131-0	9/30	9:35	SW	AT																				1
-03	127-0	9/30	10:02	SW	AT																				2
-04	126-0	9/30	10:20	↓	↓																				2
-05	125-0	9/30	11:05	↓	↓																				2

## Container Type

1= Plastic  
2= Amber glass  
3= Vial  
4= Can  
5= Backsiphon  
6= Cube  
7= Drum  
8= Endcap  
9= BOD Bottle

## Preservative

A= None  
B= HCl  
C= HNO<sub>3</sub>  
D= H<sub>2</sub>SO<sub>4</sub>  
E= NaOH  
F= NaCl  
G= NaHSO<sub>4</sub>  
H= Na<sub>2</sub>SO<sub>4</sub>  
I= Acetic Acid  
J= NH<sub>4</sub>Cl  
K= Zn Acetate  
L= Other

## Container Type

## Preservative

Relinquished By:

*Amber Tucker*

Date/Time:

9/30/21 12:25  
9/30/21 1:01

Received By:

*Alpha*  
*C. J. Deane*

Date/Time:

9/30/21 1:05  
9/30/21 1:01

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO. 01-01 (rev. 12-Mar-2012)

## APPENDIX F

### System Vulnerability Factor (SVF) Inventory



**Appendix F – Outfall Catchment System Vulnerability Factor (SVF) Inventory**  
**Marshfield, Massachusetts**  
**Revision Date: September 2021**

Outfall ID	Receiving Water	1 History of SSOs	2 Common or Twin Invert Manholes	3 Common Trench Construction	4 Storm/Sanitary Crossings (Sanitary Above)	5 Sanitary Lines with Underdrains	6 Inadequate Sanitary Level of Service	7 Areas Formerly Served by Combined Sewers	8 Sanitary Infrastructure Defects	9 SSO Potential In Event of System Failures	10 Sanitary and Storm Drain Infrastructure >40 years Old	11 Septic with Poor Soils or Water Table Separation	12 History of BOH Actions Addressing Septic Failure
Sample 1	XYZ River	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

**Presence/Absence Evaluation Criteria:**

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages
- Common or twin-invert manholes serving storm and sanitary sewer alignments
- Common trench construction serving both storm and sanitary sewer alignments
- Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system
- Sanitary sewer alignments known or suspected to have been constructed with an underdrain system
- Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints
- Areas formerly served by combined sewer systems
- 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
- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs
- Any sanitary sewer and storm drain infrastructure greater than 40 years old
- Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)
- History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)

## **APPENDIX G**

New England Interstate Water Pollution Control Commission  
IDDE Manual

# **ILLICIT DISCHARGE DETECTION AND ELIMINATION MANUAL**

## **A Handbook for Municipalities**



**NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION**

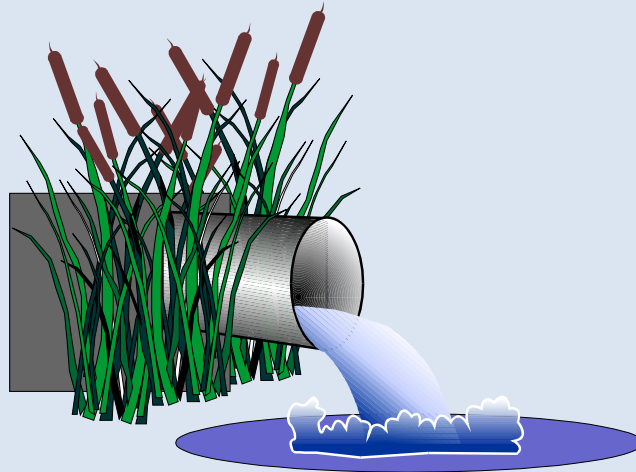
**January 2003**



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# **ILLICIT DISCHARGE DETECTION AND ELIMINATION MANUAL**

## **A Handbook for Municipalities**



**Prepared by the  
NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION  
Boott Mills South  
100 Foot of John Street  
Lowell, Massachusetts 01852**

**Ronald F. Poltak, *Executive Director***

### **COMPACT MEMBER STATES**

**Connecticut  
Maine  
Massachusetts  
New Hampshire  
New York  
Rhode Island  
Vermont**

Copies of this document may be downloaded from [www.neiwpcc.org](http://www.neiwpcc.org).

**January 2003**

# ACKNOWLEDGEMENTS

This manual was developed by the New England Interstate Water Pollution Control Commission (NEIWPCC). NEIWPCC is a nonprofit interstate agency, established by an Act of Congress in 1947, that serves its member states (Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont) by providing coordination, public education, training, and leadership in the management and protection of water quality.

This project was initiated by NEIWPCC's Storm Water Workgroup, which is composed of state and federal environmental agency staff. The group perceived a need for resources to help municipalities in NEIWPCC-member states that are regulated under the U.S. Environmental Protection Agency's (EPA's) Phase II storm water program comply with regulatory requirements. This manual is intended to help municipalities develop illicit discharge detection and elimination programs—one of the six minimum control measures under Phase II.

This manual was made possible by a grant from the U.S. Environmental Protection Agency. The contents do not necessarily reflect the views and policies of EPA or NEIWPCC's member states, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

This manual was compiled and written by Rebekah Lacey, with assistance from Kim Starbuck and other NEIWPCC staff. Editing, graphic design, and layout were performed by Ellen Frye and Ricki Pappo of ENOSIS. Thelma Murphy served as the EPA Project Officer. NEIWPCC would like to thank Andrea Donlon, NHDES, for her many contributions to this document, which included providing information, comments, and photographs—most of the photographs in the manual were either provided by Andrea or taken by NEIWPCC staff while accompanying Andrea on field work.

NEIWPCC would also like to thank the following people who contributed their time in providing information for and/or reviewing the manual:

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Ginny Scarlet, MADEP  
Chris Stone, CTDEP



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# ACRONYMS

<b>BMP</b>	Best Management Practice
<b>BWSC</b>	Boston Water and Sewer Commission
<b>GIS</b>	Geographic Information System
<b>GPS</b>	Global Positioning System
<b>IDDE</b>	Illicit Discharge Detection and Elimination
<b>MS4</b>	Municipal Separate Storm Sewer System
<b>NPDES</b>	National Pollutant Discharge Elimination System
<b>NOV</b>	Notice of Violation
<b>SIC</b>	Standard Industrial Classification

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<b>EPA</b>	U.S. Environmental Protection Agency
<b>CTDEP</b>	Connecticut Department of Environmental Protection
<b>MEDEP</b>	Maine Department of Environmental Protection
<b>MADEP</b>	Massachusetts Department of Environmental Protection
<b>NHDES</b>	New Hampshire Department of Environmental Services
<b>NYSDEC</b>	New York State Department of Environmental Conservation
<b>RIDEM</b>	Rhode Island Department of Environmental Management
<b>VTDEC</b>	Vermont Department of Environmental Conservation



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# INTRODUCTION

**A**lthough the quality of the nation's waters has improved greatly since the passage of the Clean Water Act in 1972, many water bodies are still impaired by pollution. According to the U.S. Environmental Protection Agency's (EPA's) 2000 National Water Quality Inventory, 39 percent of assessed river and stream miles, 46 percent of assessed lake acres, and 51 percent of assessed estuarine square miles do not meet water quality standards. The top causes of impairment include siltation, nutrients, bacteria, metals (primarily mercury), and oxygen-depleting substances. Polluted storm water runoff, including runoff from urban/suburban areas and construction sites, is a leading source of this impairment. To address this problem, EPA has put into place a program that regulates certain storm water discharges.

In 1990, EPA promulgated Phase I of its storm water program under the National Pollutant Discharge Elimination System (NPDES) permit provisions of the Clean Water Act. Phase I addressed storm water runoff from "medium" and "large" municipal separate storm sewer systems (MS4s) generally serving populations of 100,000 or greater, construction activity that would disturb five or more acres of land, and 10 categories of industrial activity. To further reduce the adverse effects of storm water runoff, EPA instituted its Storm Water Phase II Final Rule on December 8, 1999.

## WHO ADMINISTERS THE PHASE II STORM WATER PROGRAM?

The Phase II storm water program is part of EPA's NPDES program, which in many states is delegated to state authorities to administer. Connecticut, Maine, New York, Rhode Island, and Vermont are authorized to serve as NPDES permitting authorities. EPA Region 1 serves as the permitting authority for Massachusetts and New Hampshire. EPA is also the permitting authority for all federally recognized Indian Country lands and for federal facilities in Massachusetts, New Hampshire, and Vermont.

## WHAT IS REGULATED UNDER PHASE II?

Phase II regulates discharges from small MS4s located in "urbanized areas" (as delineated by the Census Bureau in the most recent census) and from additional small MS4s designated by the permitting authority. Phase II also regulates construction activities that would disturb between one and five acres of land. In addition, the Phase II Final Rule ends the temporary exemption from Phase I requirements for some municipally operated industrial activities<sup>1</sup> and revises the "no exposure" provision for Phase I-regulated industrial activities.

MS4s are typically operated by municipalities, but the Phase II definition of "municipal separate storm sewer systems" includes storm sewer systems owned or operated by other public bodies (e.g., states, counties, Indian tribes, departments of transportation, universities). EPA also notes that an MS4 is not always just a system of underground pipes; it can include roads with drainage systems, gutters, and ditches.

***Polluted storm water runoff, including runoff from urban/suburban areas and construction sites, is a leading source of water quality impairment. To address this problem, EPA has put into place a program that regulates certain storm water discharges.***

<sup>1</sup> This temporary exemption was provided by the Intermodal Surface Transportation Act (ISTEA) of 1991.

The rules for determining which small MS4s are regulated under Phase II are somewhat complex; MS4 operators should consult the NPDES permitting authority for their state to determine whether their MS4s are regulated. Note also that requirements may be different if a municipality is located only partially within an urbanized area.

## WHERE DOES IDDE FIT IN?

EPA's Phase II rule specifies that permitting authorities must issue general permits for "automatically designated" small MS4s by December 9, 2002. The rule requires that operators of these automatically designated small MS4s apply for NPDES permit coverage within 90 days of permit issuance, and no later than March 10, 2003<sup>2</sup>. To obtain this coverage, an MS4 operator must develop, implement, and enforce a storm water management program that is designed to reduce the discharge of pollutants to the maximum extent practicable, protect water quality, and satisfy the applicable water quality requirements of the Clean Water Act. EPA's Storm Water Phase II Final Rule states that this storm water management program must include the following six minimum control measures:

- Public education and outreach on storm water impacts
- Public involvement and participation
- **Illicit discharge detection and elimination (IDDE)**
- Construction site storm water runoff control
- Post-construction storm water management in new development and redevelopment
- Pollution prevention and good housekeeping for municipal operations

As part of their applications for permit coverage, MS4 operators must identify the best management practices they will use to comply with each of the six minimum control measures and the measurable goals they have set for each measure.

## ABOUT THIS MANUAL

This manual is intended to help municipalities in the New England states and New York develop illicit discharge detection and elimination (IDDE) programs required by EPA's Phase II storm water program. EPA's Phase II storm water regulations provide guidelines that are used by permitting authorities in writing their permits. This manual provides general information based on EPA's Phase II storm water regulations; it is important to consult the permitting authority in your state (see Chapter 10) to find out about state-specific requirements.

Chapter 1 explains the IDDE requirement of EPA's Phase II regulations. Chapters 2 through 8 describe the required elements of an IDDE program and provide information to help municipalities execute each of these elements. Chapter 9 provides information on best management practices and measurable goals for IDDEs. Chapter 10 lists additional resources and contacts that may be helpful in developing an IDDE program.

***EPA's Phase II storm water regulations provide guidelines that are used by permitting authorities in writing their permits. This manual provides general information based on EPA's Phase II storm water regulations; it is important to consult the permitting authority in your state to find out about state-specific requirements.***

<sup>2</sup> There are some exceptions to this deadline; contact the permitting authority in your state for up-to-date official information.



# 1

## GETTING STARTED WITH YOUR IDDE PROGRAM

***As you set out to develop your illicit discharge detection and elimination (IDDE) program, you will need to start by making sure that you know the answers to two key questions: (1) What is an illicit discharge? and (2) What are the required elements of an IDDE program? In this chapter we'll review the answers to these questions; we'll provide supporting information and details in subsequent chapters.***



### WHAT IS AN ILLICIT DISCHARGE?

The term “illicit discharge” is defined in EPA’s Phase II storm water regulations as “any discharge to a municipal separate storm sewer that is not composed entirely of storm water, except discharges pursuant to an NPDES permit and discharges resulting from fire-fighting activities.”

Illicit discharges can be categorized as either direct or indirect.

- Examples of direct illicit discharges:
  - sanitary wastewater piping that is directly connected from a home to the storm sewer
  - materials (e.g., used motor oil) that have been dumped illegally into a storm drain catch basin
  - a shop floor drain that is connected to the storm sewer
  - a cross-connection between the municipal sewer and storm sewer systems
- Examples of indirect illicit discharges:
  - an old and damaged sanitary sewer line that is leaking fluids into a cracked storm sewer line
  - a failing septic system that is leaking into a cracked storm sewer line or causing surface discharge into the storm sewer

### ***Illicit discharge***

***Any discharge to a municipal separate storm sewer that is not composed entirely of storm water, except discharges pursuant to an NPDES permit and discharges resulting from fire-fighting activities.***

### WHAT ARE THE ELEMENTS OF AN IDDE PROGRAM?

EPA’s Phase II regulations state that an IDDE program must incorporate the following four elements.

- Develop (if not already completed) a storm sewer system map showing the location of all outfalls, and the names and location of all waters of the United States that receive discharges from those outfalls.

## **NON-STORM WATER DISCHARGES THAT YOUR IDDE PROGRAM MAY NOT NEED TO ADDRESS**

According to EPA's Phase II storm water regulations, an illicit discharge detection and elimination program need only address the following categories of non-storm water discharges if the operator of a small MS4 identifies them as significant contributors of pollutants to the MS4:

- water line flushing
- landscape irrigation
- diverted stream flows
- rising ground waters
- uncontaminated ground water infiltration
- uncontaminated pumped ground water
- discharges from potable water sources
- foundation drains
- air conditioning condensation
- irrigation water
- springs
- water from crawl space pumps
- footing drains
- lawn watering
- individual residential car washing
- flows from riparian habitats and wetlands
- dechlorinated swimming pool discharges
- street wash water

- To the extent allowable under state, tribal, or local law, effectively prohibit through ordinance, or other regulatory mechanism, illicit discharges into the separate storm sewer system and implement appropriate enforcement procedures and actions as needed.
- Develop and implement a plan to detect and address illicit discharges, including illegal dumping, to the system.
- Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

For each of these mandatory elements, EPA suggests a variety of approaches that can help in creating a successful IDDE program. The mandatory elements and the suggested approaches will be discussed further in the next seven chapters.

### **REFERENCES: CHAPTER 1**

- USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. <http://www.epa.gov/npdes/regulations/phase2.pdf>
- USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.5: *Illicit Discharge Detection and Elimination Minimum Control Measure*. EPA 833-F-00-007. January 2000. <http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>

# 2

## DEVELOPING A STORM SEWER MAP

***The creation of a storm sewer map is the first mandatory element of an IDDE program. Phase II requires that the operator of a regulated MS4 develop a map of the MS4 that shows, at a minimum, the location of all outfalls and the names and locations of all waters of the United States that receive discharges from those outfalls. While many municipalities in the Northeast already have detailed maps of their storm sewer systems, others, typically those in older or more rural areas, have the information scattered in different locations. These municipalities will have the most work to do to comply with this requirement. If you need to develop a map, begin by collecting any existing information on outfall locations (e.g., review city records, drainage maps, storm drain maps, state or federal storm water permit files, state transportation maintenance maps), and then conduct field surveys to verify the locations.***



### CONDUCTING A FIELD SURVEY

A field survey of outfall locations will often be necessary to create a map or verify and update an existing map. The References section at the end of the chapter provides a Web link for a sample guide for conducting a storm drain mapping survey (MA DFWELE, 2002). Field outfall surveys generally include the following basic steps:

- ▶ Survey receiving waters on foot or by boat to look for all outfalls (i.e., wade small receiving waters or use a boat for larger receiving waters).
- ▶ Note the locations of outfalls on a map. The map scale should be such that outfalls can be located accurately.
- ▶ Assign a code or label to each outfall. Adopt a logical, easy-to-understand system (e.g., distance along the stream).
- ▶ Fill out a survey sheet for each outfall, noting characteristics such as dry weather discharge and deposits or stains.

### MAPPING OPTIONS

For municipalities that do not already have a storm sewer map, it is important to determine the type of map (e.g., topographic, hand or computer drafted) that best fits your needs. Because there is no specific mapping standard in the Phase II rule, the goal of a mapping program should be functionality—find a way to map outfalls such that you

***The goal of a mapping program should be functionality—find a way to map outfalls such that you (and the permitting authority) can locate any specific outfall to check on discharges.***



### CAN A DITCH BE AN OUTFALL?

*The paragraph below is an excerpt from EPA's Storm Water Phase II Final Rule (USEPA, 1999).*

The term "outfall" is defined in 40 CFR 122.26(b)(9) as "a point source at the point where a municipal separate storm sewer discharges to waters of the United States." The term "municipal separate storm sewer" is defined at 40 CFR 122.26(b)(8) as "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains)." Following the logic of these definitions, a "ditch" may be part of the municipal separate storm sewer, and at the point where the ditch discharges to waters of the United States, it is an outfall. As with any determination about jurisdictional provisions of the CWA, however, final decisions require case-specific evaluations of fact.

(and the permitting authority) can locate any specific outfall to check on discharges. The most basic way to meet the mapping requirement is to use an existing map (e.g., a topographic map) that shows receiving waters. You can then mark outfall locations on the map by hand (using existing information augmented by a field survey). Make sure the names of receiving waters are shown on the map; for receiving waters that don't have names, it is helpful to indicate the nearest named water body downstream. The graphic at the beginning of this chapter shows an example of a marked-up United States Geological Survey map (markings do not represent actual outfalls). The next step up is a more sophisticated paper map (e.g., blueprint-style).

Figure 1 presents an example of a simple paper map showing outfalls and other key features of the storm sewer system.



In many municipalities, a paper map may be completely adequate for carrying out an IDDE program. However, if your MS4 has the resources, or if your municipality has a complex storm sewer system, you may want to make use of available computer technology in making your map.

Global Positioning System (GPS) technology can be used to obtain the coordinates (longitude and latitude) for each outfall. A GPS unit, which uses data from the U.S. Department of Defense's constellation of GPS satellites to constantly update position, can be carried with you on your field survey. A particular position can be recorded and later downloaded into a Geographic Information System (GIS) database. Using GIS, the coordinates can be linked with other site-specific information, such as a picture and history of the outfall. GPS units can be purchased or rented.

There are various computerized mapping programs. A GIS program (e.g., ArcGIS) combines a georeferenced database with mapping capability, so that different geographical attributes (e.g., streets, outfalls, land use, monitoring data) can be mapped as

“layers” and displayed either separately or together. AutoCAD®, a design/drafting platform, is another program commonly used for storm sewer mapping.

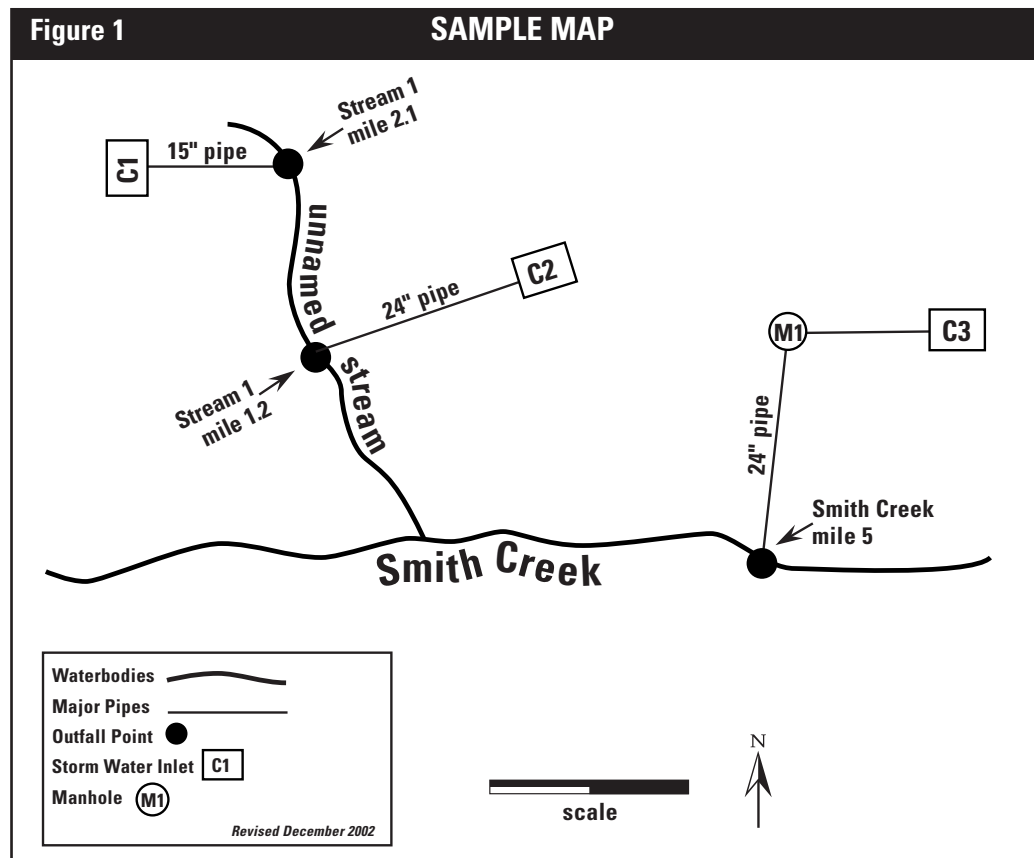
If you plan to map via computer, decide if you want to make the mapping system compatible with other departments within your municipality and/or with other data sources (e.g., state agencies that provide GIS layers). Since storm sewer systems are often constructed in roadways, the use of the GIS road line data layer can be helpful in developing a map. If this layer is available, it is usually very accurate and frequently updated by state or regional agencies. Local or regional planning commissions may be able to provide assistance with GIS technology and map development. Once a particular software system has been chosen, it is helpful to require developers to submit compatible electronic updates for subsequent development to ensure that the map and data remain current after the initial mapping effort is finished.

### PRIORITIZING AREAS TO BE MAPPED

You may find that practical considerations will dictate the need to conduct mapping in phases. In this case, it is best to prioritize your mapping agenda. For example, older developed areas are more likely to have illicit discharges than newer areas for various reasons (e.g., many municipalities have imposed inspection requirements on new construction that help to prevent illegal connections). Therefore, if your community has limited resources, you would benefit from mapping the older areas first to ensure that priority areas are mapped.

Other considerations in setting mapping priorities include land uses, reports of illicit discharges, and other information specific to each MS4. Although EPA’s Phase II regulations require that only outfalls be mapped, once an illicit discharge is detected at an outfall, it may be necessary to map the portion of the storm sewer system leading to the outfall so that you are able to locate the source of the discharge. If possible, mapping the entire storm sewer system may prove very helpful to your IDDE program.

*You may find that practical considerations will dictate the need to conduct mapping in phases. In this case, it is best to prioritize your mapping agenda.*





## REFERENCES: CHAPTER 2

- Colorado Department of Public Health and Environment, Water Quality Control Division. 2001. *Colorado's Phase II Municipal Guidance: A guide to application requirements and program development for coverage under Colorado's Phase II municipal stormwater discharge permit*.  
<http://www.cdphe.state.co.us/wq/PermitsUnit/wqcdpmt.html>
- Massachusetts Division of Fisheries, Wildlife, and Environmental Law Enforcement. 2002. *Storm Drain Mapping Project Field Manual* (Draft). <http://www.state.ma.us/dfwele/River/pdf/rivstormdrainmanual.pdf>
- Oakland County, Michigan. 2002. *Illicit Discharge Elimination Program*.  
[http://www.co.oakland.mi.us/drain/program\\_service/illicit\\_disch.html](http://www.co.oakland.mi.us/drain/program_service/illicit_disch.html)
- Pitt, R., M. Lalor, R. Field, D.D. Adrian, and D. Barbe. 1993. *Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems: A User's Guide*. USEPA Office of Research and Development. EPA/600/R-92/238. <http://www.epa.gov/clariton>
- Rohrer, C.A., and Beckley, R.J. Undated. *Using GIS Tools to Implement an Illicit Discharge Elimination Program in Livonia, Michigan*. Rouge River Demonstration Project. <http://www.rougeriver.com/proddata>
- USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. <http://www.epa.gov/npdes/regulations/phase2.pdf>



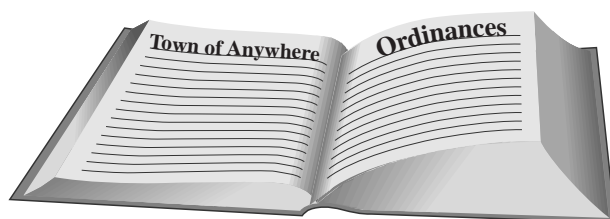
# 3

## PROHIBITING ILLICIT DISCHARGES

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***The second mandatory element of a Phase II IDDE program requires that MS4 operators “to the extent allowable under State, Tribal, or local law, effectively prohibit through ordinance, or other regulatory mechanism, illicit discharges into the separate storm sewer system and implement appropriate enforcement procedures and actions as needed.”***

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### ILLICIT DISCHARGE ORDINANCES

As EPA’s guidance specifies, a municipal ordinance created to comply with Phase II regulations must include a *prohibition* of illicit discharges and an *enforcement* mechanism. Note that it is also essential for the municipality to establish legal authority to inspect properties suspected of releasing contaminated discharges into the storm sewer system. Your municipality may already have a sewer use ordinance or similar bylaw that meets Phase II requirements, or that can be amended to meet the requirements. Consult with your town counsel and other municipal authorities to review your town’s existing bylaws and regulations and determine what changes or additions are needed and what the procedure is for making those changes. If you need to make changes, you may want to review the model bylaws and other guidance discussed below.

EPA’s nonpoint source pollution program Web site offers several examples of local ordinances for illicit discharges (USEPA, 2002). Appendix A of this manual presents EPA’s general model ordinance, which synthesizes a number of existing municipal ordinances. In using any of these ordinances as a model, a community should take into account the legal authority granted to it under state law, the Phase II permit requirements in that state, the enforcement methods it deems appropriate, and any other locality-specific considerations.

A workgroup chaired by Massachusetts Department of Environmental Protection (MADEP) staff has been working on developing model bylaws that municipalities in the state can use to help them comply with Phase II regulations. The products of this group’s work (model bylaws and associated guidance) are expected to be available on the MADEP Web site (see Chapter 10) by the time this manual is published. This group found that many of the available model ordinances did not fit well with the structure of Massachusetts government and, therefore, developed models that would work for towns in the state. The group also found that entry onto private property can be a tricky legal issue and should be treated carefully in any new or amended bylaws.

***A municipal ordinance created to comply with Phase II regulations must include a prohibition of illicit discharges and an enforcement mechanism.***

The Boston Water and Sewer Commission’s (BWSC’s) *Regulations Governing the Use of Sanitary and Combined Sewers and Storm Drains* are available on the Web (<http://www.bwsc.org>; click on “Engineering” then “Regulations”) and may serve as a useful local model. The regulations specify certain conditions under which BWSC

representatives must be granted access to property; denial of access may lead to termination of water service.

Note that illicit discharges to *storm* sewers should be addressed hand-in-hand with the issue of illegal connections of extraneous water to *sanitary* sewers (typically referred to as infiltration/inflow or I/I programs); bylaws or regulations should make clear which discharges belong in which system.

### REFERENCES: CHAPTER 3

BWSC. 2002. *Regulations Governing the Use of Sanitary and Combined Sewers and Storm Drains*.  
<http://www.bwsc.org>

Personal communication from Ginny Scarlet, MADEP, November 29, 2002.

USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851.

USEPA. 2002. *Model Ordinances to Protect Local Resources: Illicit Discharges*.  
<http://www.epa.gov/owow/nps/ordinance/discharges.htm>

# 4

## DEVELOPING AND IMPLEMENTING AN IDDE PLAN: LOCATING PRIORITY AREAS

*Developing and implementing a plan to detect and address illicit discharges is the third mandatory element of a Phase II IDDE program. EPA recommends that the plan include the following four components: locating priority areas; tracing the source of an illicit discharge; removing the source of an illicit discharge; and program evaluation and assessment. The first component, locating priority areas, is the subject of this chapter. Each of the other three components will be discussed in chapters five, six, and seven respectively.*

### THE IDDE PLAN

#### ➤ Locating priority areas

- Tracing the source of an illicit discharge
- Removing the source of an illicit discharge
- Program evaluation and assessment

*The process of identifying “priority areas” can be broken down into three steps:*

- *Use available information to identify potential hot spots*
- *Conduct dry-weather field screening to look for non-storm water discharges*
- *Conduct water quality tests to see if these non-storm water discharges seem to be illicit discharges*

*The following sections focus on each of these approaches.*

### IDENTIFYING POSSIBLE HOT SPOTS

“Hot spots” are areas that are considered to be likely sources of illicit discharges, based on available information. The following list provides examples of potential hot spots.

**Commercial/ industrial areas** These areas have been found in some communities’ IDDE programs to (a) have significant numbers of illicit connections and/or (b) have discharges with a high potential to affect water quality (Tuomari, 1999 and Pitt et al., 1993). Specific business sectors can be prioritized (e.g., businesses subject to waste water pretreatment rules, businesses falling under certain Standard Industrial Classification [SIC] codes, or business sectors with a record of enforcement actions).

**Older areas of town** Older development may predate more stringent construction codes regarding illegal connections and may have deteriorating sewer and/or storm sewer infrastructure that can lead to infiltration problems.



### Hot spots

*Areas that are considered to be likely sources of illicit discharges, based on available information.*



**Areas where there have been repeated complaints** Areas where illegal dumping or apparently contaminated discharges have been reported are obvious priority targets. Geographic Information System (GIS) mapping can be useful for visualizing complaint locations. These maps can be overlain with other pertinent resource information (e.g., locations of facilities that have had compliance violations, water quality data for receiving waters).

**Locations identified from ambient water quality sampling data** The locations of high levels of particular contaminants (e.g., bacteria) can help to target priority outfalls. Good resources for this information are the periodic water quality assessment reports (“305(b) reports”) and lists of impaired waters (“303(d) lists”) that the Clean Water Act requires each state to prepare and submit to EPA. These reports are prepared by each state’s environmental agency and are available to the public, often on the state’s Web site. Also, local watershed groups monitor many water bodies, particularly those in more developed areas. In addition to providing sampling data, these groups can often serve as valuable resources for information about a particular water body and potential problem areas. Other possible sources of water quality data include local Boards of Health (in Massachusetts, they must test at beaches) and water districts or departments.



## CONDUCTING DRY-WEATHER OUTFALL/MANHOLE SURVEYS

Once your general geographic priority areas have been determined, dry-weather surveys of outfalls and/or manholes can be undertaken to look for non-storm water flows.

EPA recommends that you make visual observations of outfalls during dry weather. Some operators have found that dry-weather manhole inspections can also be useful. The presence of flow in a storm sewer outfall or manhole during dry weather indicates a likely illicit discharge. (Other explanations for the presence of such flow include infiltrating ground water or the diversion of a surface stream into the storm sewer system.) Because illicit discharges are often intermittent, you should ideally check for discharges multiple times in a given location (particularly in a priority location). Please note that only those with confined-space training should enter a manhole or outfall. The observation and sampling strategies described below can typically be conducted without entering manholes or outfalls.

### **IMPORTANT NOTE:**

*Only those with confined-space training should enter a manhole or outfall.*

In implementing your dry-weather survey, consider adopting the following strategies.

- Combine this survey with the outfall mapping field survey (see Chapter 2) and/or water quality sampling of the discharges (discussed in the next section of this chapter).
- Enlist a watershed association or other volunteer organization to help with the outfall survey.
- Notify the public that the survey will be taking place (e.g., send notices to property owners in the area). Note that while it is desirable to keep the public informed

about the presence of survey-takers to prevent undue alarm, notification may also tip off an illegal discharger to curtail discharges; use your judgment as to the most appropriate course of action. For example, you might just specify a very general time frame during which the survey will take place.

- Keep safety considerations at the forefront of survey procedures at all times. Likely hazards should be anticipated and discussed with the individuals carrying out the survey, and individuals should be instructed to use their judgment and err on the side of caution as they conduct the survey. The survey should be conducted in groups of two or more. If manholes are opened for inspection as part of the survey, staff should wear high-visibility safety vests and block off their work area with traffic cones; police presence can be helpful for safety and to allay public concerns that can be created by individuals opening manholes.
- Determine your criterion for “dry weather.” The working definition of dry weather used for sampling programs can vary depending on location-specific factors. Pitt et al. (1993) suggest that storm-runoff drainage ends in most urban areas no more than 12 hours after a storm event, but many programs (e.g., Boston, NH DES, San Diego) use a longer time period, such as no rain or no more than 1/10 inch of rain in the last 48 or 72 hours.
- Observe dry-weather flows for odor, color, turbidity, and floatable matter. Observe outfalls for deposits and stains, vegetation, and damage to outfall structures. This information can help identify contaminants present in the discharge and/or the likely nature of the discharge (e.g., sanitary, industrial). Some of the resources listed in Chapter 10 provide examples of data and observation sheets to be filled out for each outfall.
- Look up some of the resources listed in the references for this chapter for more detailed instructions for conducting dry-weather field surveys (e.g., MA DFWELE, 2002).

### **CASE STUDY: BOSTON WATER AND SEWER COMMISSION**

#### **USING SANDBAGS TO DETECT ILLICIT DISCHARGES**

The Boston Water and Sewer Commission has had success using sandbags to help detect illicit discharges. Sandbags are placed in storm drain outlets that empty into manholes and/or water bodies. The sandbags are small enough that they do not block the storm drain outlet. They must be placed in the outlet after 48 hours of dry weather (1/10 inch of rain or less). After the bag is placed in the outlet, another 48 hours of dry weather is needed (total of 96 hours of dry weather). The outlet is then observed, and any water buildup behind the sandbag is sampled. This method is very effective in narrowing down the manhole junctures that contain illicit discharges. Sandbags cost approximately \$60 each and can be reused. The main difficulty in using this method is the need for 96-hour periods of dry weather.

*Information from an interview with Paul Barden, Deputy Director of Engineering Services, and Charlie Jewell, Project Director, Boston Water and Sewer Commission, August 15, 2002.*

## CONDUCTING WATER QUALITY TESTS

When dry-weather flow is observed, visual or odor observations (e.g., observation of pieces of toilet paper, strongly colored or very muddy discharge, or the odor of sewage or chemicals) may provide enough information to determine that the discharge is illicit and to identify the likely source. If not, water quality sampling can be used to determine whether the flow is likely to have resulted from an illicit discharge.

Certain water quality parameters can serve as indicators of the likely presence or absence of a specific type of discharge. Some of these parameters can be measured in the field with probes or test kits; others must be analyzed for in the laboratory. A wide variety of water quality parameters can be measured in an IDDE program, and many references exist that describe these parameters. Some of the more commonly used and useful parameters are summarized in Table 1, which focuses on parameters suggested in Pitt et al. (1993) and the subset of those recommended in EPA's Phase II regulations.



### CASE STUDY: WINOOSKI, VERMONT

#### USE OF OPTICAL BRIGHTENERS

The city of Winooski, Vermont has found that testing for optical brighteners is an efficient, cheap way to determine the presence of a non-storm water discharge in a particular outfall. Optical brighteners are used in laundry detergents and thus serve as a marker for household or commercial laundry discharges. These tests are extremely sensitive to the presence of detergents.

To perform an optical-brightener test, an untreated cotton pad (\$9/100 pads) surrounded by a mesh bag or a suet cage is placed in a storm drain outlet, manhole, or catch basin that has been found to have dry-weather discharge and left for a certain period of time (i.e., 5-7 days). The cotton pad is then brought back to the lab and placed under a UV lamp (approximately \$200) in a dark room. A blue color indicates the presence of detergents, signifying either illegal dumping, a direct illicit connection, a leaking sewer, or leakage from a failed septic system. If the test is positive for detergents, further tests need to be performed to determine the source.

*Information from an interview with Tim Grover, Water Pollution Control Facility Superintendent, City of Winooski, August 9, 2002.*



**TABLE 1 WATER QUALITY TEST PARAMETERS AND USES**

<b>Water Quality Test</b>	<b>Use of Water Quality Test</b>	<b>Comments</b>
<b>Conductivity</b>	Used as an indicator of dissolved solids	<ul style="list-style-type: none"> <li>- Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter</li> <li>- Typically measured in the field with a probe</li> </ul>
<b>Ammonia</b>	High levels can be an indicator of the presence of sanitary wastewater	<ul style="list-style-type: none"> <li>- Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter</li> <li>- Used very often and equipment is readily available; Boston, MA uses a field test kit (see case example)</li> </ul>
<b>Surfactants</b>	Indicate the presence of detergent (e.g., laundry, car washing)	<ul style="list-style-type: none"> <li>- Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter</li> <li>- Boston, MA uses a field test kit (see case example)</li> </ul>
<b>pH</b>	Extreme pH values (low or high) may indicate commercial or industrial flows; not useful in determining the presence of sanitary wastewater (which, like uncontaminated baseflows, tends to have a neutral pH, i.e., close to 7)	<ul style="list-style-type: none"> <li>- Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter</li> <li>- Typically measured in the field or lab with a probe</li> </ul>
<b>Temperature</b>	Sanitary wastewater and industrial cooling water can substantially influence outfall discharge temperatures. This measurement is most useful during cold weather.	<ul style="list-style-type: none"> <li>- Pitt et al. 1993 suggested parameter</li> <li>- Measured in the field with a thermometer or probe</li> </ul>
<b>Hardness</b>	Used to distinguish between natural and treated waters	<ul style="list-style-type: none"> <li>- Pitt et al. 1993 suggested parameter</li> </ul>
<b>Total Chlorine</b>	Used to indicate inflow from potable water sources; not a good indicator of sanitary wastewater because chlorine will not exist in a "free" state in water for long (it will combine with organic compounds)	<ul style="list-style-type: none"> <li>- Pitt et al. 1993 suggested parameter</li> </ul>
<b>Fluoride</b>	Used to indicate potable water sources in areas where water supplies are fluoridated	<ul style="list-style-type: none"> <li>- Pitt et al. 1993 suggested parameter</li> </ul>
<b>Potassium</b>	High levels may indicate the presence of sanitary wastewater	<ul style="list-style-type: none"> <li>- Pitt et al. 1993 suggested parameter</li> </ul>
<b>Optical Brighteners (Fluorescence)</b>	Used to indicate presence of laundry detergents (which often contain fabric whiteners, which cause substantial fluorescence)	<ul style="list-style-type: none"> <li>- Pitt et al. 1993 suggested parameter</li> <li>- Used by City of Winooski, VT (see case example)</li> </ul>
<b>Bacteria (fecal coliform, <i>E. coli</i>, and/or <i>enterococci</i>)</b>	Used to indicate the presence of sanitary wastewater	<ul style="list-style-type: none"> <li>- Used by NHDES (see case example in chapter 5)</li> </ul>

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## DEVELOPING AND IMPLEMENTING AN IDDE PLAN: TRACING THE SOURCE OF AN ILLICIT DISCHARGE

*Developing and implementing a plan to detect and address illicit discharges is the third mandatory element of a Phase II IDDE program. EPA recommends that the plan include the following four components: (1) locating priority areas; (2) tracing the source of an illicit discharge; (3) removing the source of an illicit discharge; and (4) program evaluation and assessment. The second component, tracing the source of an illicit discharge, is the subject of this chapter.*

### THE IDDE PLAN

- Locating priority areas
- Tracing the source of an illicit discharge
- Removing the source of an illicit discharge
- Program evaluation and assessment

*Once storm drain outlets with evidence of illicit discharges have been located, various methods can be used to pinpoint the exact source of the discharge. These techniques, many of which are already used by municipal sewer departments, include manhole observation, video inspection, smoke testing, dye testing, aerial infrared and thermal photography, and tracking illegal dumping.*

### MANHOLE OBSERVATIONS

A key tracing technique is to follow dry-weather flows upstream along the conveyance system to bracket the location of the source. This can be accomplished by taking the following steps:

- Consult the drainage system map.
- Check the next “upstream” manhole with a junction to see if there is evidence of discharge. You may wish to sample each manhole that has a discharge.
- Repeat these steps until a junction is found with no evidence of discharge; the discharge source is likely to be located between the junction with no evidence of discharge and the next downstream junction.
- Be aware of the surrounding areas and look for water in gutters and streets.

Note that the Boston Water and Sewer Commission has had success working in the opposite direction (i.e., upstream to downstream) (Jewell 2001). Manhole observations can be time-consuming, but they are generally a necessary step before conducting other tests.



**A** key tracing technique is to follow dry-weather flows upstream along the conveyance system to bracket the location of the source.



## VIDEO INSPECTION

Mobile video cameras can be guided remotely through storm sewer lines to observe possible illegal connections into storm sewer systems and record observations on a videocassette or DVD. Public works staff can observe the videos and note any visible illegal connections. This technique is time-consuming and expensive but thorough and usually definitive, and it does not require the intrusion on members of the public that some of the other methods do.



## SMOKE TESTING

This technique involves injecting non-toxic smoke into storm sewer lines and then noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the storm sewer lines. The injection is accomplished by placing a smoke bomb in the storm sewer manhole below ground and forcing air in after it. Smoke-generating machines can also be used. Test personnel should be stationed at points of suspected illegal connections or cracks/leaks, noting any escape of smoke (indicating an illicit connection or damaged storm sewer infrastructure). Prior to performing this test, it is necessary to inform building owners and occupants in the area in advance. It is also advisable to inform the police and fire departments.

For a more thorough smoke-test program, the sanitary sewer lines can also be smoked. For houses that do not emit smoke during either the sanitary sewer or the storm sewer system tests, sewer gas may be venting inside, which is hazardous. Interviews with various IDDE program staff suggest that the smoke-test method is more effective in infiltration/inflow investigations of the sanitary sewer system than in detecting illegal connections to the storm sewer system.

Smoke may cause minor irritation of respiratory passages; residents with respiratory conditions should receive special attention to determine if it is safe for them to be present for the testing. Smoke testing is typically used to survey an area all at once, in contrast to dye testing, which tests one building at a time.

**Smoke testing** involves injecting non-toxic smoke into storm sewer lines and then noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the storm sewer lines.

## DYE TESTING

This technique involves flushing non-toxic dye into toilets and sinks and observing storm sewer and sanitary sewer manholes and storm sewer outfalls for the presence of the dye. Prior to performing this test, it is necessary to inform building owners and occupants in advance and gain permission for entry. Local public health and state water quality staff should also be notified so that they will be prepared to respond to citizens calling about any dye observed in surface waters.

To perform the test, you need a crew of two or more people (ideally, all with two-way radios). One person is inside the building; the others are stationed at the appropriate storm sewer and sanitary sewer manholes (which



**CASE STUDY: NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES****LOCATING AND TRACING ILLICIT DISCHARGES IN NEW HAMPSHIRE COASTAL COMMUNITIES**

*In 1996, the New Hampshire Department of Environmental Services (NHDES) began a program of investigating and eliminating illicit connections to storm drainage systems in coastal communities to reduce bacterial contamination in coastal waters. The following excerpt from the NHDES report on the first phase of the project describes the process used to detect and trace illicit discharges.*

Beginning in the summer of 1996, the coastal shorelines were surveyed by foot or canoe at low tide for potential pollution sources. All pipes, seeps, streams, and swales with flow were sampled for bacteria. In addition, temperature was measured, and observations related to the condition of the pipe (stained or structurally damaged), odor, evidence of untreated wastewater (e.g., toilet paper), turbidity, color, debris, estimated flow, and any other observations were noted. Dry pipes were rechecked on several occasions for intermittent flow. Evidence indicating the presence of wastewater and/or elevated bacteria levels prompted further investigation of these locations.

Upstream catch basins and manholes associated with the outfall pipes that were identified by the screening process were surveyed for evidence of wastewater and sampled for bacteria. Smoke testing (using non-toxic smoke blown into catch basins) was then used to identify buildings connected to the storm drainage system by canvassing the neighborhood for vents emitting smoke. Final confirmation of an illicit connection from the buildings that emitted smoke was accomplished by dye testing indoor plumbing and observing the storm drainage and sewer systems for the presence or absence of the dye.

Feeder streams were surveyed for outfall pipes with dry-weather flow. Other potential bacteriological sources (e.g., pigeon roosting sites on bridges) were bracketed with water quality sampling stations. Where contaminated seeps and swales were suspected, the drainage area was surveyed for potential sources, such as broken sewer mains.

*Landry, N. 1999. Elimination of Illicit Connections in Coastal New Hampshire Spurs Cooperation and Controversy: A Final Report to the New Hampshire Estuaries Project. New Hampshire Department of Environmental Services.*

should be opened) and/or outfalls. The inside person drops dye into a plumbing fixture (i.e., toilet or sink) and runs a sufficient amount of water to move the dye through the plumbing system. The inside person then radios to the outside crew that the dye has been dropped, and the outside crew watches for the dye in the storm sewer and sanitary sewer, recording the presence or absence of the dye.

The test is relatively quick (about 30 minutes per test), effective (results are usually definitive), and cheap. Dye testing is best used when the likely source of an illicit discharge has been narrowed down to a few specific houses or businesses.

**AERIAL INFRARED AND THERMAL PHOTOGRAPHY**

Aerial infrared and/or thermal photography can be used to locate illicit discharges from outfalls and failing septic systems using temperature and vegetation as markers. This technique requires knowledge of aerial photo interpretation. Using aerial infrared or thermal photographs, do the following:

- For outfalls
  - Note if discharge has a higher temperature than that of the stream
  - Note if algae growth is concentrated near an outfall
- For potentially failing septic systems
  - Note evidence of increased moisture in surrounding soil
  - Observe vegetation located close to the potentially failing septic system, and note any increase in vegetation compared to the surrounding area
  - Observe any increase in temperature readings at the septic system location

**A**erial infrared and/or thermal photography can be used to locate illicit discharges from outfalls and failing septic systems using temperature and vegetation as markers.

This is still a developing technology and not commonly used for IDDE programs. You may still need further tests to determine specific houses/businesses with illegal connections. This technique has been used primarily for the detection of failing septic systems, which are only considered “illicit discharges” under the Phase II Storm Water program if they discharge into the storm sewer system.

## TRACKING ILLEGAL DUMPING

Developing a coordinated system for collecting and tracking reports of illegal dumping can help pinpoint this difficult-to-find source of illicit discharges. Suggestions for tracking illegal dumping include the following:

- Create a hotline that can be used to report any illegal-dumping behavior (i.e., who illegally dumped and where illegal dumping occurred).
- Observe the materials that have been illegally dumped and trace the potential sources of the materials.
- Note where dumping occurs most often, record patterns of time of day and day of the week, and note common responsible parties.

**D**eveloping a coordinated system for collecting and tracking reports of illegal dumping can help pinpoint this difficult-to-find source of illicit discharges.

Challenges in addressing illegal dumping include the difficulty of catching dumpers in the act and the significant staff time needed to receive, respond to, and track complaints.



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# 6

## DEVELOPING AND IMPLEMENTING AN IDDE PLAN: REMOVING THE SOURCE OF AN ILLICIT DISCHARGE

*Developing and implementing a plan to detect and address illicit discharges is the third mandatory element of a Phase II IDDE program. EPA recommends that the plan include the following four components: (1) locating priority areas; (2) tracing the source of an illicit discharge; (3) removing the source of an illicit discharge; and (4) program evaluation and assessment. The third component, removing the source of an illicit discharge, is the subject of this chapter.*

### THE IDDE PLAN

- Locating priority areas
- Tracing the source of an illicit discharge
- Removing the source of an illicit discharge
- Program evaluation and assessment

*Because there are various sources of illicit discharges to the storm sewer system, there are different kinds of actions municipalities may have to take to remove those sources and prevent future illicit discharges. This section groups those actions into three categories: compliance assistance and enforcement for illegal connections to homes and businesses; proper construction and maintenance of MS4s; and responding to and preventing illegal dumping.*



### COMPLIANCE ASSISTANCE AND ENFORCEMENT FOR ILLEGAL CONNECTIONS TO HOMES AND BUSINESSES

There is a range of ways in which municipalities may wish to handle the removal of illegal connections between homes or businesses and the storm sewer system. Enforcement measures should be spelled out in the required IDDE ordinance (see Chapter 3), but the MS4 operator will normally be allowed to use judgment about what mix of compliance assistance and enforcement actions is appropriate in a given situation. Typically, a municipality responds to the discovery of an illegal connection in a graduated manner, beginning with efforts to obtain voluntary compliance and escalating to increasingly severe enforcement actions if compliance is not obtained.

#### Voluntary Compliance

Often, home or business owners are not aware of the existence of illegal connections between their buildings and the storm sewer systems. In these cases, providing the responsible party with information about the connection, its environmental consequences, the applicable regulations, and how to remedy it may be enough to secure vol-



untary compliance. The cost of removing the connection and reconnecting it to the sanitary sewer system can be an obstacle. Recognizing this, some localities (e.g., Boston and coastal New Hampshire) have chosen to provide assistance with these costs, using municipal public works funds or state or federal grants.

### Enforcement

EPA's model illicit discharge ordinance (Appendix A) provides an example of the enforcement steps that might be specified in a typical local ordinance. These steps are summarized below.

- The authorized enforcement agency sends the property owner a Notice of Violation (NOV), which may require the violator to take steps such as monitoring, elimination of an illicit connection or discharge, or payment of a fine.
- The person receiving the NOV may appeal it.
- If the person receiving the NOV does not appeal or loses the appeal and fails to correct the violation, the enforcement agency may “take any and all measures necessary to abate the violation and/or restore the property.” The agency then may require reimbursement from the violator for the cost of the abatement, including administrative costs.
- The authorized enforcement agency also has the ability to seek an injunction against the violator “restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.”

If the municipality has not yet obtained enforcement authority (e.g., because a local ordinance has not yet been passed), it may be possible for the municipality to seek enforcement action from state or federal authorities. Involvement of state or federal

*Typically, a municipality responds to the discovery of an illegal connection in a graduated manner, beginning with efforts to obtain voluntary compliance and escalating to increasingly severe enforcement actions if compliance is not obtained.*

## CASE STUDY: WAYNE COUNTY, MICHIGAN

### ENFORCEMENT PROCEDURE

Wayne County, Michigan, began its illicit discharge detection and elimination program by targeting certain industrial and commercial facilities for site inspections—starting at the other end of the pipe from the outfall survey approach. County personnel visited the facilities, dye tested a representative number of plumbing fixtures, and observed general “housekeeping” practices.

If no violations were found, a thank you letter was sent to the facility acknowledging staff participation and closing the file. If a facility was found to have an illicit connection, a violation letter was sent, giving the facility 30 to 90 days to correct it. If a facility failed to comply with the request, the municipal plumbing inspector or building department became involved. If the municipality was not able to gain compliance, the facility was referred to the Michigan Department of Environmental Quality. When an illicit connection was eliminated, the county provided confirmation. Once a correction was confirmed, a confirmation/thank you letter was sent to facility management, thanking them for their participation and closing the file.

*Information from Tuomari, D. 1999. Dos and Don'ts on Implementing a Successful Illicit Connection Program. Technical Report of the Rouge River Demonstration Project. <http://www.rougeriver.com/proddata>*

**CASE STUDY: ST. LOUIS, MISSOURI****ENFORCEMENT PROCEDURE**

The Metropolitan St. Louis Sewer District has a comprehensive ordinance regulating users who discharge into the sanitary sewer and storm sewer systems. Upon discovery of a violation of this ordinance, the Sewer District notifies the user of the nature of the violation and directs that actions be taken to remedy the non-compliance. Within 30 days of receipt of the notice, the user must submit a plan for correction of the violation to the Sewer District. If a violation is found within the house or business that appears to present an immediate danger to human health or welfare, a verbal notification is given immediately by telephone or visit, directing the user to take immediate action to discontinue or reduce the discharge to safe levels. A written notice is sent within five days of the verbal notification.

The Sewer District has the power to issue the following Administrative Orders: Cease and Desist Order (directing the user to stop the violating action), Compliance Order (directing the user take action to correct violation), Show Cause Order (directing the user to show cause why a proposed enforcement action should not be taken), and Consent Order (establishing an agreement with a user to correct a violation).

If the violator does not take action within the time allotted, the Sewer District has the right to eliminate the illicit discharge at the expense of the violator. Legal actions can be taken against, and penalties imposed on, any violator that does not comply.

*Information from Metropolitan St. Louis Sewer District Ordinance No. 8472, on EPA's nonpoint source pollution Web site at <http://www.epa.gov/owow/nps/ordinance/discharges.htm>*

authorities may also be necessary if the source of an illicit discharge is located outside of the municipality's boundaries. Examples of enforcement procedures implemented in Wayne County, Michigan, and St. Louis, Missouri, are included in this section.

**PROPER CONSTRUCTION AND MAINTENANCE OF MS4s**

Some illicit discharge problems may be the responsibility of the MS4 operator. These problems include cross-connections between the sanitary sewer and storm sewer systems and infiltration into damaged or deteriorating storm sewer pipes.

Cross-connections between a municipality's sanitary sewer and storm sewer systems may exist by mistake, because of deterioration over time, or as part of the design in an antiquated system. Complete and accurate maps of the sewer and storm sewer systems can help identify these cross-connections and prevent them during any new construction that takes place.

Contamination can infiltrate into a cracked or leaking MS4 from leaking sanitary sewer pipes, failing septic systems, or contaminated groundwater. To help prevent this, both MS4s and sanitary sewer systems should be inspected periodically and maintained properly to keep them in good repair.



## PREVENTING AND RESPONDING TO ILLEGAL DUMPING

It is often difficult to identify and locate the individuals responsible for illegal dumping; therefore, a program to address illegal dumping should focus on prevention, backed up by enforcement to the extent possible.

EPA Region 5 has prepared an *Illegal Dumping Prevention Guidebook* that suggests the following key strategies that can be used to prevent illegal dumping.

- **Site maintenance and controls** Measures should be taken to clean up areas where illegal dumping has taken place, and controls such as signs or access restrictions should be used, as appropriate, to prevent further dumping.
- **Community outreach and involvement** Outreach is the linchpin of an illegal-dumping prevention program and can include the following components:
  - Educating businesses, municipal employees, and the general public about the environmental and legal consequences of illegally disposing of waste into the storm sewer system
  - Providing and publicizing ways for citizens to properly dispose of waste
  - Providing opportunities for citizens to get involved in preventing and reporting illegal dumping
- **Targeted enforcement** This strategy should include a prohibition against illegal dumping via ordinance or another similar measure, backed up by trained law-enforcement personnel and possibly field operations.
- **Program measurement** Tracking and evaluation methods should be used to measure the impact of illegal-dumping prevention efforts and determine whether goals are being met.

Although the EPA Region 5 guidebook is targeted more to land dumping of solid waste, these strategies can also be applied to illegal dumping into the storm drain system. Some specific methods that municipalities can use to implement these strategies include the following:

- **Site maintenance and controls**
  - Storm-drain stenciling program
  - Spill-response plans for hazardous-waste spills
- **Community outreach and involvement**
  - An illegal-dumping reporting hotline
  - Outreach to business sectors that handle hazardous materials and/or have a history of illegal-dumping problems; outreach should include information on Best Management Practices for spill prevention and proper waste disposal





- Printed outreach materials for the public
- Publicizing of waste-disposal options, such as used oil recycling and household hazardous waste collections

➤ **Targeted enforcement**

- An illegal-dumping ordinance (or section of IDDE ordinance)
- Surveillance of known illegal-dumping locations
- Business facility inspections
- Training of municipal employees, police officers, and other local entities to be on lookout

➤ **Program measurement**

- Tracking of incident locations
- Compilation of statistics (e.g., annual cleanup costs, facility compliance, arrests, convictions, fines, complaints)

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## DEVELOPING AND IMPLEMENTING AN IDDE PLAN: EVALUATION OF THE IDDE PROGRAM

*Developing and implementing a plan to detect and address illicit discharges is the third mandatory element of a Phase II IDDE program. EPA recommends that the plan include the following four components: (1) locating priority areas; (2) tracing the source of an illicit discharge; (3) removing the source of an illicit discharge; and (4) program evaluation and assessment. The fourth component, program evaluation and assessment, is the subject of this chapter.*

### THE IDDE PLAN

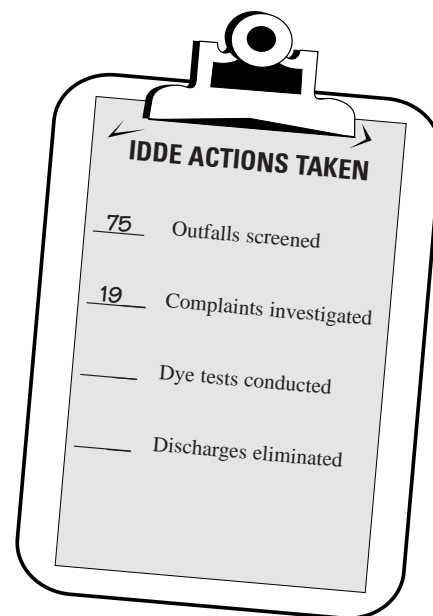
- Locating priority areas
- Tracing the source of an illicit discharge
- Removing the source of an illicit discharge
- Program evaluation and assessment

**EPA recommends that the IDDE plan include procedures for program evaluation and assessment. Program evaluation is the time to step back, look at what has been done, determine what worked and what didn't, and make adjustments to planned future actions as appropriate. In this final component of your IDDE plan, you outline how you will go about evaluating your program.**

### EVALUATION STRATEGY

Evaluation procedures should include documentation of actions taken to locate and eliminate illicit discharges. Such documentation might include numbers of outfalls screened, complaints taken and investigated, feet of storm sewers videotaped, numbers of discharges eliminated, or number of dye or smoke tests conducted. Note that this component of the IDDE plan fits in with the overall Phase II requirements for identifying measurable goals for each Best Management Practice (BMP) and reporting on progress toward achieving those goals. (Chapter 9 discusses BMPs and measurable goals in more detail.) Annual reports are necessary during the first permit term (typically five years), and in years two and four in subsequent terms. (For more information on reporting requirements, see EPA's Fact Sheet 2.9.)

Determining the impact of these actions is more of a challenge, but it is an important part of the overall process because EPA allows for adjustments to the storm water management program over the life of the permit. Assessment of what worked and what didn't provides the information needed to make these adjustments to your IDDE program. EPA's Phase II regulations do not specify exactly how to evaluate your IDDE program, so check whether your permitting authority has made any particular specifications, and brainstorm from there.



**Evaluation procedures should include documentation of actions taken to locate and eliminate illicit discharges.**



Here are few suggestions for assessing the effectiveness of various IDDE strategies:

- Evaluate the number of possible illicit discharges that were detected using different detection methods. This can help you determine which detection methods are most effective.
- Evaluate the number of discharges and/or quantity of discharges eliminated using different possible enforcement and compliance measures.
- If you have access to monitoring data for receiving waters, evaluate changes in the water quality of receiving waters.
- Program evaluation might also include procedures for considering efficiency and feasibility. Questions you might want to ask include:
  - How much staff time and expense did it take to achieve a given result?
  - Were practical difficulties encountered with this approach? What were they, and how much of a problem did they present?

The strategies listed above are only suggestions. Because you are allowed a great deal of flexibility in determining what procedures you will use for program evaluation and assessment, you can decide what procedures will be most helpful in providing the information that you will need to move forward with your IDDE program.

## REFERENCES: CHAPTER 7

- USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. <http://www.epa.gov/npdes/regulations/phase2.pdf>
- USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.9: *Permitting and Reporting: The Process and Requirements*. EPA 833-F-011. January 2000. <http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>
- USEPA New England. 2002. *NPDES General Permit for Storm Water Discharges from Regulated Small Municipal Separate Storm Sewer Systems (MS4s)* (Draft). September 27, 2002. <http://www.epa.gov/region01/npdes/ms4.html>

# 8

## OUTREACH TO EMPLOYEES, BUSINESSES, AND THE GENERAL PUBLIC

***The fourth mandatory element of an IDDE program calls for the MS4 operator to “inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.” As noted in the Introduction, the requirement for public education and outreach on storm water impacts is also one of the six minimum control measures in the storm water management program. Therefore, fulfilling the outreach requirement for IDDE helps the MS4 to comply with this mandatory element; IDDE outreach can be integrated into the broader storm water outreach program.***



***Some suggestions for conducting IDDE outreach to the different community sectors are presented below. Many examples of storm water outreach materials, including some that are intended to be modified and used by anyone, are available on the Web; some useful Web sites are listed in Chapter 10. Operators of regulated small MS4s may want to work together with other operators in their area in developing outreach materials and campaigns to share ideas and save money.***

### PUBLIC EMPLOYEES

While it is clear that public works employees should receive specific technical training on the requirements of the IDDE program and the techniques that will be used to carry it out, other municipal departments should also be targeted for training.

A training program for municipal employees on pollution prevention techniques is required under the “Pollution Prevention/Good Housekeeping for Municipal Operations” minimum control measure. Preventing non-storm water discharges into the storm sewer system from municipal operations can be one part of this training.

Many public employees can play an important role as partners in the detection and/or prevention of illicit discharges. For example, highway department staff who maintain catch basins can look for signs of illicit discharges. Municipal building inspectors can help ensure that illegal connections to the storm sewer system do not take place in construction and renovation projects. Police officers, public works employees, and other municipal staff whose jobs keep them outside and mobile can help spot illegal dumpers. Fire and police department personnel who respond to hazardous material spills can help keep these spills out of the storm sewer system and adjacent water bodies.

***Many public employees can play an important role as partners in the detection and/or prevention of illicit discharges.***

## BUSINESSES

Most businesses are willing to comply with environmental requirements and take proactive steps to prevent pollution if they understand the issues and the possible solutions. Here are some steps you can take to reach out to businesses.

- Create a general brochure and presentation to inform businesses about the IDDE program. This information can be presented and/or made available at Chamber of Commerce meetings and other business forums.
- Conduct compliance assistance outreach (e.g., visits, group training, and/or printed materials) for specific business types (e.g., auto repair shops, mobile carpet cleaning, restaurants).
- Provide contractors and developers with information on preventing illegal connections (in coordination with training on construction and post-construction storm water requirements).

***Most businesses are willing to comply with environmental requirements and take proactive steps to prevent pollution if they understand the issues and the possible solutions.***

## GENERAL PUBLIC

There are many ways in which the general public can be made aware of environmental issues and the things they can do to help mitigate or prevent problems. Here are some things you can do to inform and involve the public.

- Work with citizen groups to conduct storm-drain stenciling (e.g., “Don’t Dump – Drains to River”) and outfall surveys.
  - In conducting these activities, you should:
    - Educate the groups about their activity (either informally or via a video or other presentation)
    - Make sure volunteers understand constraints associated with storm-drain stenciling activities (e.g., heavy traffic use areas, historic districts)
    - Have volunteers sign liability forms, if necessary
  - You may also wish to:
    - Publicize the activities through the media
    - Give volunteers brochures to hand out to the public with who they interact
    - Repeat stenciling periodically (due to paint wear off), unless placards are used—stenciling on curbs lasts longer than on street surfaces
    - See Chapter 10 for information on storm-drain stenciling resources
- Create a program to promote, publicize, and facilitate public reporting of illicit connections or discharges (e.g., a hotline). Some considerations in running a hotline include:
  - Callers should be able to at least leave a message at any time of day
  - It may be helpful to have the hotline staffed during business hours
  - A system should be created for monitoring the hotline so that staff can follow up quickly on reports of discharges

***If made aware of environmental issues, the general public can help mitigate or prevent problems.***



- The municipality may wish to offer a small reward for callers that provide information leading to the detection of an illicit discharge source
- Distribute (by mail and by making available at various locations and events) printed outreach materials. A general flyer about illicit discharges might include information on the following:
  - Background information on water pollution
  - A definition of what constitutes an illicit discharge
  - Measures to prevent illicit discharges
  - Information about the municipality's illicit discharge ordinance
- Create Public Service Announcements for radio and/or television.
- Work with the local access cable station and local newspapers to develop features on illicit discharge prevention.
- Create and publicize a household hazardous waste disposal/recycling program.
- Provide classroom speakers and/or printed information for schools.

## REFERENCES: CHAPTER 8

Chesterfield County (VA). Undated. *Household Guide to Chesterfield County's Illicit Discharge Ordinance*. <http://www.chesterfield.gov/CommunityDevelopment/Engineering/HouseholdFactSheet.pdf>

North Central Texas Council of Governments. 2002. *Storm Water Management in North Central Texas: Illicit Discharge Detection and Elimination*. [http://www.dfwstormwater.com/Storm\\_Water\\_BMPs/illicit.html](http://www.dfwstormwater.com/Storm_Water_BMPs/illicit.html)

USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. <http://www.epa.gov/npdes/regulations/phase2.pdf>

USEPA. 2000. *Storm Water Phase II Compliance Assistance Guide*. EPA 833-R-00-002. Office of Water. <http://www.epa.gov/npdes/pubs/comguide.pdf>

USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.3: *Public Education and Outreach Minimum Control Measure*. EPA 833-F-00-005. January 2000. <http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>

USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.8: *Pollution Prevention/Good Housekeeping Minimum Control Measure*. EPA 833-F-00-010. January 2000. <http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>

USEPA. 2002. Storm Water Phase II Menu of BMPs – *Public Education and Outreach on Storm Water Impacts*. [http://cfpub.epa.gov/npdes/stormwater/menuofbmps/pub\\_ed.cfm](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/pub_ed.cfm)

USEPA. 2002. Storm Water Phase II Menu of BMPs – *Public Education and Outreach on Storm Water Impacts: Proper Disposal of Household Hazardous Wastes*. [http://cfpub.epa.gov/npdes/stormwater/menuofbmps/edu\\_5.cfm](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/edu_5.cfm)

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# 9

## BMPS AND MEASURABLE GOALS FOR IDDE

***As mentioned in the Introduction, operators of regulated small MS4s generally must submit applications for Phase II storm water general permits by March 10, 2003. As part of their application, they must identify best management practices (BMPs) that they will use to comply with each of the six minimum control measures, and the measurable goals that they will use to demonstrate BMP implementation. Within the first permit term, the operators have to fully implement their storm water management programs.***



### GETTING STARTED

EPA allows MS4 operators a great deal of flexibility in determining what BMPs are most appropriate for their storm water programs. The agency has developed the following materials to assist operators in identifying appropriate BMPs:

- *A National Menu of Best Management Practices for Storm Water Phase II*, which includes a toolkit of example BMPs for each of the Phase II minimum control measures (available on the Web)
- *Measurable Goals Guidance for Small MS4s*
- *A Storm Water Phase II Compliance Guide*, which offers examples of BMPs and measurable goals for each of the six minimum measures

Others, including states, regional agencies, trade associations, and non-profit organizations have also developed BMP information.

A sample list of IDDE BMPs and measurable goals is presented below. This list draws from BMP and measurable goal recommendations that have been offered by EPA and others. The list has not been officially endorsed by EPA or state agencies; it is intended to serve as a starting point to help municipalities think about the BMPs and measurable goals that are appropriate to their IDDE programs. BMPs are listed in bold, followed by the measurable goals for each BMP. (The BMPs are organized according to the four elements required in an IDDE program.)

***EPA allows MS4 operators a great deal of flexibility in determining what BMPs are most appropriate for their storm water programs.***

### ■ STORM SEWER MAP

- **Create a storm sewer map**
  - Map a certain percentage of outfalls (adding up to 100% by the end of the permit term) or of the area of the town



**■ ORDINANCE****➤ Pass an illicit discharge ordinance**

- Draft an IDDE ordinance (or storm water ordinance with IDDE component) or an amendment to existing bylaws
- Pass an ordinance or amendment

**■ IDDE PLAN****➤ Prepare an IDDE plan**

- Complete a final plan and obtain the signature of the person overseeing the plan

**➤ Conduct dry weather field screening of outfalls**

- Screen a certain percentage of outfalls (adding up to 100% by the end of the permit term)

**➤ Trace the source of potential illicit discharges**

- Trace the source of a certain percentage of continuous flows (adding up to 100% by the end of the permit term)
- Trace the source of a certain percentage of intermittent flows and illegal dumping reports (100% may never be an achievable goal in this case)

**➤ Eliminate illicit discharges**

- Eliminate a certain number of discharges and/or a certain volume of flow, or a certain percentage of discharges whose source is identified (adding up to 100% by the end of the permit term)

**■ OUTREACH****➤ Implement and publicize a household hazardous waste collection program**

- Hold a periodic (e.g., annual) hazardous waste collection day
- Mail flyers about the hazardous waste collection program to all town residences

**➤ Create and distribute an informational flyer for homeowners about IDDE**

- Mail the flyer to town residences
- Print the flyer as a doorknob hanger and have water-meter readers distribute it

**➤ Create and distribute an informational flyer for businesses about IDDE**

- Mail the flyer to targeted businesses

**➤ Work with community groups to stencil storm drains**

- Stencil a certain percentage of drains

➤ **Create and publicize an illicit discharge reporting hotline**

- Put the hotline in place
- Include an announcement of the hotline in sewer bills
- Follow up on all hotline reports within 48 hours

**REFERENCES: CHAPTER 9**

- North Central Texas Council of Governments. 2002. *Storm Water Management in North Central Texas: Illicit Discharge Detection and Elimination*. [http://www.dfwstormwater.com/Storm\\_Water\\_BMPs/illicit.html](http://www.dfwstormwater.com/Storm_Water_BMPs/illicit.html)
- USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. <http://www.epa.gov/npdes/regulations/phase2.pdf>
- USEPA. 2000. *Storm Water Phase II Compliance Assistance Guide*. EPA 833-R-00-002. Office of Water. <http://www.epa.gov/npdes/pubs/comguide.pdf>
- USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.9: *Permitting and Reporting: The Process and Requirements*. EPA 833-F-011. January 2000. <http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>
- USEPA. 2002. *National Menu of Best Management Practices for Storm Water Phase II*. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm>
- USEPA. 2002. *Measurable Goals Guidance for Phase II Small MS4s*. <http://cfpub.epa.gov/npdes/stormwater/measurablegoals/index.cfm>

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## WEB SITES AND PUBLICATIONS

### Key Information Available on EPA's Storm Water Web Site

#### Entry Point and General Information

<http://www.epa.gov/npdes>

➔ click on “Storm Water”

➔ click on “Municipal Separate Storm Sewer Systems” or “Phase II”

#### Storm Water Phase II Final Rule

<http://www.epa.gov/npdes/regulations/phase2.pdf>

IDDE section of the Phase II Final Rule: see section II(H)(3)(b)(iii), pp. 68756-68758.

#### EPA's Fact Sheet Series

<http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>

##### Overview

1.0 *Storm Water Phase II Final Rule: An Overview*

##### Small MS4 Program

2.0 *Small MS4 Storm Water Program Overview*

2.1 *Who's Covered? Designation and Waivers of Small Regulated MS4s*

2.2 *Urbanized Areas: Definition and Description*

##### Minimum Control Measures

2.3 *Public Education and Outreach*

2.4 *Public Participation/Involvement*

2.5 *Illicit Discharge Detection and Elimination*

2.6 *Construction Site Runoff Control*

2.7 *Post-Construction Runoff Control*

2.8 *Pollution Prevention/Good Housekeeping*

2.9 *Permitting and Reporting: The Process and Requirements*

2.10 *Federal and State-Operated MS4s: Program Implementation*

##### Construction Program

3.0 *Construction Program Overview*

3.1 *Construction Rainfall Erosivity Waiver*

##### Industrial “No Exposure”

4.0 *Conditional No Exposure Exclusion for Industrial Activity*

#### Documents

*Storm Water Phase II Compliance Assistance Guide*

<http://www.epa.gov/npdes/pubs/comguide.pdf>

*National Menu of BMPs for Storm Water Phase II*

<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm>

*Measurable Goals Guidance for Phase II Small MS4s*

<http://cfpub.epa.gov/npdes/stormwater/measurablegoals/index.cfm>

### **Storm Water Web Sites**

#### **The Rouge River National Wet Weather Demonstration Project**

<http://www.rougeriver.com>

(See specific information on IDDE at <http://www.rougeriver.com/techtop/illicit/overview.html> .)

#### **Center for Watershed Protection's Storm Water Manager's Resource Center**

<http://www.stormwatercenter.net>

#### **The University of Tennessee's Municipal Technical Advisory Service NPDES Phase II Storm Water Management BMP Toolkit**

<http://www.mtas.utk.edu/bmptoolkit.htm>

The Illicit Discharge section provides a number of useful web links and downloadable PDFs.

### **Organization Web Sites**

#### **Water Environment Federation**

<http://www.wef.org>

#### **American Public Works Association**

<http://www.apwa.net>

#### **Local Government Environmental Assistance Network**

<http://www.lgean.org>

#### **Center for Watershed Protection**

<http://www.cwp.org>

#### **The Boston Water and Sewer Commission**

(the Web site includes the BWSC's regulations, outreach information, and other useful items)

<http://www.bwsc.org>

### **Storm Water Manuals**

California Coastal Commission. 2002. *Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities*. <http://www.coastal.ca.gov/la/murp.html>

Colorado Department of Public Health and Environment, Water Quality Control Division. October 2001. *Colorado's Phase II Municipal Guidance: A guide to application requirements and program development for coverage under Colorado's Phase II municipal stormwater discharge permit*.

<http://www.cdph.state.co.us/wq/PermitsUnit/wqcdpmt.html>

### **IDDE Manuals**

San Diego Stormwater Copermittees Jurisdictional Urban Runoff Management Program. 2001. *Illicit Connection/Illicit Discharge (IC/ID) Detection and Elimination Model Program Guidance*.

[http://www.projectcleanwater.org/html/model\\_programs.html](http://www.projectcleanwater.org/html/model_programs.html)

Pitt, R., M. Lalor, R. Field, D.D. Adrian, and D. Barbe. 1993. *Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems: A User's Guide*. USEPA Office of Research and Development. EPA/600/R-92/238. (Available on the Web via EPA's National Environmental Publications Information System, <http://www.epa.gov/clariton>.)

North Central Texas Council of Governments. 2002. *Storm Water Management in North Central Texas: Illicit Discharge Detection and Elimination*. [http://www.dfwstormwater.com/Storm\\_Water\\_BMPs/illicit.html](http://www.dfwstormwater.com/Storm_Water_BMPs/illicit.html)

## **Information on Specific Topics**

### **Ordinances**

USEPA's *Model Ordinances to Protect Local Resources: Illicit Discharges*.

<http://www.epa.gov/owow/nps/ordinance/discharges.htm>

(The same information can be found at <http://www.stormwatercenter.net>.)

Boston Water and Sewer Commission's *Regulations Governing the Use of Sanitary and Combined Sewers and Storm Drains*. <http://www.bwsc.org>

The Massachusetts Citizen Planner Training Collaborative offers "Tips on Drafting Bylaws" for Massachusetts municipalities: [http://www.umass.edu/masscptc/Tips\\_on\\_Drafting.html](http://www.umass.edu/masscptc/Tips_on_Drafting.html)

### **Optical Brighteners**

Sargent, D. and W. Castonguay. 1998. *An Optical Brightener Handbook*. Available at:

[http://www.mvpc.org/services\\_sec/mass\\_bays/optical\\_handbook.htm](http://www.mvpc.org/services_sec/mass_bays/optical_handbook.htm) and

<http://www.naturecompass.org/8tb/sampling/>

### **Dye Testing**

Dye supplier used by a reviewer of this manual: NORLAB, Inc., Amherst, OH. 1-800-247-9422;

<http://www.norlabdyes.com>

### **Smoke Testing**

Smoke testing equipment supplier used by a reviewer of this manual: Hurco Technologies, Inc., 1-800-888-1436;

<http://www.hurcotech.com>

### **Outfall/Manhole Surveys**

Massachusetts Division of Fisheries, Wildlife, and Environmental Law Enforcement. Storm Drain Mapping Project Field Manual (Draft). January 2002. <http://www.state.ma.us/dfwele/River/pdf/rivstormdrainmanual.pdf>

Jewell, C. 2001. A Systematic Methodology for Identification and Remediation of Illegal Connections. Presented at the Water Environment Federation Specialty Conference 2001 *A Collection Systems Odyssey: Combining Wet Weather and O&M Solutions*. (Available for purchase via the WEF Web site, <http://www.wef.org>.)

### **Outreach**

- **Household Hazardous Waste Collection**

Household hazardous waste collection days in New Hampshire can be viewed online at

<http://www.des.state.nh.us/hhw/hhwevent.htm>.

Environmental Depot, Burlington VT. [http://www.cswd.net/facilities/hazardous\\_waste.shtml](http://www.cswd.net/facilities/hazardous_waste.shtml)



- **Storm-Drain Stenciling**

Earthwater Stencils, an organization that does storm drain stenciling: <http://www.earthwater-stencils.com/>

The Ocean Conservancy's Storm Drain Sentries program has a goal of having volunteers stencil one million storm drains with educational pollution prevention messages. The Ocean Conservancy supplies volunteers with a fact sheet about nonpoint source pollution, tips on conducting a stenciling project, and stencils for volunteer organizations to use. In return, stenciling project leaders are asked to submit data about the number of storm drains they stenciled, the types of pollutants found near the storm drains, and potential pollutant sources. This information is added to a growing database maintained by the Ocean Conservancy. Contact the Ocean Conservancy's Office of Pollution Prevention and Monitoring at 757-496-0920 or [stormdrain@oceanconservancyva.org](mailto:stormdrain@oceanconservancyva.org).

<http://www.oceanconservancy.org/dynamic/getInvolved/events/sentries/sentries.htm>

Resources for storm drain stenciling programs in New Hampshire:

- Coordinated by Julia Peterson of UNH-Cooperative Extension in the coastal watershed  
<http://ceinfo.unh.edu/Common/Documents/gsc5401.htm>. Also described at  
<http://www.seagrant.unh.edu/extension.htm>
- Coordinated by the NH Coastal Program (part of the Office of State Planning)  
<http://www.state.nh.us/coastal/CoastalEducation/marinedebris.htm>
- Description of Manchester's storm drain stenciling on EPA's Web site describing the SEPP  
<http://www.epa.gov/region1/eco/csoman/sepp.html> (See #1 and #6)

- **Outreach Materials**

EPA is preparing educational materials on different water topics each month as part of the year-long celebration of the 30th anniversary of the Clean Water Act. April 2003 will be Storm Water Month. The public education kit is expected to include:

- General Storm Water Awareness brochure
- Homeowner Guide (car washing, vehicle fluids changing, lawn & garden care, pet waste, septic system management)
- Small Construction Guide poster
- Press release
- Public service announcement for the radio
- Stickers
- Door hanger with illicit discharge message
- PowerPoint presentation

These items will be available for download or order on EPA's Year of Clean Water Web site, <http://www.epa.gov/water/yearofcleanwater/month.html>. Before the materials are available on the Web site, you can contact EPA's contractor, TetraTech, to be on the mailing list for the materials. Email Kathryn Phillips at [ttratech1@earthlink.net](mailto:ttratech1@earthlink.net) or [kathryn.phillips@ttratech-ffx.com](mailto:kathryn.phillips@ttratech-ffx.com).

## CONTACTS

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USEPA-New England is the NPDES permitting authority for Massachusetts and New Hampshire. The other five NEIWPCC member states serve as NPDES permitting authorities for the storm water program. Contact information below was taken from the EPA-New England Web site

<http://www.epa.gov/region01/npdes/stormwater/administration.html>, the EPA NPDES Web site <http://www.epa.gov/npdes>, and the New York State Department of Environmental Conservation Web site <http://www.dec.state.ny.us>.

### U.S. EPA

#### **EPA Region 1, New England**

Regional Storm Water Coordinator

Thelma Murphy 617-918-1615; [murphy.thelma@epa.gov](mailto:murphy.thelma@epa.gov)

Regional Storm Water Assistance Team

Ann Herrick 617-918-1560; [herrick.ann@epa.gov](mailto:herrick.ann@epa.gov)

Shelly Puleo 617-918-1545; [puleo.shelly@epa.gov](mailto:puleo.shelly@epa.gov)

Olga Vergara 617-918-1519, [vergara.olga@epa.gov](mailto:vergara.olga@epa.gov)

Massachusetts Assistance

Dave Gray 617-918-1577; [gray.davidj@epa.gov](mailto:gray.davidj@epa.gov)

#### **EPA Region 2**

Regional Storm Water Coordinator

Karen O'Brien 212-637-3717; [obrien.karen@epa.gov](mailto:obrien.karen@epa.gov)

### STATES

#### **Connecticut**

Connecticut Department of Environmental Protection

Bureau of Water Management

Permitting, Enforcement, and Remediation Division

<http://www.dep.state.ct.us>

Contact: Chris Stone 860-424-3850; [chris.stone@po.state.ct.us](mailto:chris.stone@po.state.ct.us)

#### **Maine**

Maine Department of Environmental Protection

Bureau of Land and Water Quality

<http://www.state.me.us/dep/blwq/stormwtr/index.htm>

Contact: David Ladd 207-287-5404; [david.ladd@state.me.us](mailto:david.ladd@state.me.us)

#### **Massachusetts**

Massachusetts Department of Environmental Protection

Division of Watershed Management

<http://www.state.ma.us/dep/brp/stormwtr/stormhom.htm>

Contacts: Ginny Scarlet 508-767-2797; [ginny.scarlet@state.ma.us](mailto:ginny.scarlet@state.ma.us)

Linda Domizio 508-849-4005; [linda.domizio@state.ma.us](mailto:linda.domizio@state.ma.us)

**New Hampshire**

New Hampshire Department of Environmental Services

Storm Water Fact Sheet: <http://www.des.state.nh.us/factsheets/wwt/web-8.htm>

Storm Water Web Site: <http://www.des.state.nh.us/StormWater>

Contacts: Jeff Andrews 603-271-2984

Public Information and Permitting Office 603-271-2975

**New York**

New York State Department of Environmental Conservation

Division of Water

<http://www.dec.state.ny.us/website/dow/mainpage.htm>

Contact: Mike Rafferty 518-402-8094; [mrraffer@gw.dec.state.ny.us](mailto:mrraffer@gw.dec.state.ny.us)

**Rhode Island**

Rhode Island Department of Environmental Management

Water Resources – Permitting

<http://www.state.ri.us/dem/programs/benviron/water/permits/ripdes/stwater/index.htm>

Contacts: Margarita Chatterton 401-222-4700 x7605; [mchatter@dem.state.ri.us](mailto:mchatter@dem.state.ri.us)

Greg Goblick 401-222-4700 x7265; [ggoblick@dem.state.ri.us](mailto:ggoblick@dem.state.ri.us)

**Vermont**

Vermont Department of Environmental Conservation

Water Quality Division

<http://www.anr.state.vt.us/dec/waterq/stormwater.htm>

Contact: Peter LaFlamme 802-241-3765; [petel@dec.anr.state.vt.us](mailto:petel@dec.anr.state.vt.us)



# APPENDIX A

## Model Illicit Discharge and Connection Stormwater Ordinance<sup>1</sup>

ORDINANCE NO. \_\_\_\_\_

### SECTION 1. PURPOSE/INTENT.

The purpose of this ordinance is to provide for the health, safety, and general welfare of the citizens of (\_\_\_\_\_) through the regulation of non-storm water discharges to the storm drainage system to the maximum extent practicable as required by federal and state law. This ordinance establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system (MS4) in order to comply with requirements of the National Pollutant Discharge Elimination System (NPDES) permit process. The objectives of this ordinance are:

- 1) To regulate the contribution of pollutants to the municipal separate storm sewer system (MS4) by stormwater discharges by any user
- (2) To prohibit Illicit Connections and Discharges to the municipal separate storm sewer system
- (3) To establish legal authority to carry out all inspection, surveillance and monitoring procedures necessary to ensure compliance with this ordinance

### SECTION 2. DEFINITIONS.

For the purposes of this ordinance, the following shall mean:

Authorized Enforcement Agency: employees or designees of the director of the municipal agency designated to enforce this ordinance.

Best Management Practices (BMPs): schedules of activities, prohibitions of practices, general good house keeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

Clean Water Act. The federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), and any subsequent amendments thereto.

Construction Activity. Activities subject to NPDES Construction Permits. Currently these include construction projects resulting in land disturbance of 5 acres or more. Beginning in March 2003, NPDES Storm Water Phase II permits will be required for construction projects resulting in land disturbance of 1 acre or more. Such activities include but are not limited to clearing and grubbing, grading, excavating, and demolition.

Hazardous Materials. Any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Illegal Discharge. Any direct or indirect non-storm water discharge to the storm drain system, except as exempted in Section X of this ordinance.

Illicit Connections. An illicit connection is defined as either of the following:

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<sup>1</sup> USEPA. 2002. *Model Ordinances to Protect Local Resources: Illicit Discharges*. <http://www.epa.gov/owow/nps/ordinance/discharges.htm>

Any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the storm drain system including but not limited to any conveyances which allow any non-storm water discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency or,

Any drain or conveyance connected from a commercial or industrial land use to the storm drain system which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency.

Industrial Activity. Activities subject to NPDES Industrial Permits as defined in 40 CFR, Section 122.26 (b)(14). National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit. means a permit issued by EPA (or by a State under authority delegated pursuant to 33 USC § 1342(b)) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.

Non-Storm Water Discharge. Any discharge to the storm drain system that is not composed entirely of storm water. Person. means any individual, association, organization, partnership, firm, corporation or other entity recognized by law and acting as either the owner or as the owner's agent.

Pollutant. Anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordinances, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

Premises. Any building, lot, parcel of land, or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.

Storm Drainage System. Publicly-owned facilities by which storm water is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.

Storm Water. Any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.

Stormwater Pollution Prevention Plan. A document which describes the Best Management Practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to Stormwater, Stormwater Conveyance Systems, and/or Receiving Waters to the Maximum Extent Practicable.

Wastewater means any water or other liquid, other than uncontaminated storm water, discharged from a facility.

### **SECTION 3.      APPLICABILITY.**

This ordinance shall apply to all water entering the storm drain system generated on any developed and undeveloped lands unless explicitly exempted by an authorized enforcement agency.

### **SECTION 4.      RESPONSIBILITY FOR ADMINISTRATION.**

The \_\_\_\_\_ [authorized enforcement agency] shall administer, implement, and enforce the provisions of this ordinance. Any powers granted or duties imposed upon the authorized enforcement agency may be delegated in writing by the Director of the authorized enforcement agency to persons or entities acting in the beneficial interest of or in the employ of the agency.

### **SECTION 5.      SEVERABILITY.**

The provisions of this ordinance are hereby declared to be severable. If any provision, clause, sentence, or paragraph of this Ordinance or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of this Ordinance.

## **SECTION 6. ULTIMATE RESPONSIBILITY.**

The standards set forth herein and promulgated pursuant to this ordinance are minimum standards; therefore this ordinance does not intend nor imply that compliance by any person will ensure that there will be no contamination, pollution, nor unauthorized discharge of pollutants.

## **SECTION 7. DISCHARGE PROHIBITIONS.**

### Prohibition of Illegal Discharges.

No person shall discharge or cause to be discharged into the municipal storm drain system or watercourses any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than storm water.

The commencement, conduct or continuance of any illegal discharge to the storm drain system is prohibited except as described as follows:

- (1) The following discharges are exempt from discharge prohibitions established by this ordinance: water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, non-commercial washing of vehicles, natural riparian habitat or wetland flows, swimming pools (if dechlorinated - typically less than one PPM chlorine), fire fighting activities, and any other water source not containing Pollutants.
- (2) Discharges specified in writing by the authorized enforcement agency as being necessary to protect public health and safety.
- (3) Dye testing is an allowable discharge, but requires a verbal notification to the authorized enforcement agency prior to the time of the test.
- (4) The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

### Prohibition of Illicit Connections.

- (1) The construction, use, maintenance or continued existence of illicit connections to the storm drain system is prohibited.
- (2) This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.
- (3) A person is considered to be in violation of this ordinance if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.

## **SECTION 8. SUSPENSION OF MS4 ACCESS.**

### Suspension due to Illicit Discharges in Emergency Situations

The \_\_\_\_\_ [authorized enforcement agency] may, without prior notice, suspend MS4 discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or to the MS4 or Waters of the United States. If the violator fails to comply with a suspension order issued in an emergency, the authorized enforcement agency may take such steps as deemed necessary to prevent or minimize damage to the MS4 or Waters of the United States, or to minimize danger to persons.

### Suspension due to the Detection of Illicit Discharge

Any person discharging to the MS4 in violation of this ordinance may have their MS4 access terminated if such



termination would abate or reduce an illicit discharge. The authorized enforcement agency will notify a violator of the proposed termination of its MS4 access. The violator may petition the authorized enforcement agency for a reconsideration and hearing.

A person commits an offense if the person reinstates MS4 access to premises terminated pursuant to this Section, without the prior approval of the authorized enforcement agency.

#### **SECTION 9. INDUSTRIAL OR CONSTRUCTION ACTIVITY DISCHARGES.**

Any person subject to an industrial or construction activity NPDES storm water discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the \_\_\_\_\_ [authorized enforcement agency] prior to the allowing of discharges to the MS4.

#### **SECTION 10. MONITORING OF DISCHARGES.**

**1. Applicability.**

This section applies to all facilities that have storm water discharges associated with industrial activity, including construction activity.

**2. Access to Facilities.**

- (1) The \_\_\_\_\_ [authorized enforcement agency] shall be permitted to enter and inspect facilities subject to regulation under this ordinance as often as may be necessary to determine compliance with this ordinance. If a discharger has security measures in force which require proper identification and clearance before entry into its premises, the discharger shall make the necessary arrangements to allow access to representatives of the authorized enforcement agency.
- (3) Facility operators shall allow the \_\_\_\_\_ [authorized enforcement agency] ready access to all parts of the premises for the purposes of inspection, sampling, examination and copying of records that must be kept under the conditions of an NPDES permit to discharge storm water, and the performance of any additional duties as defined by state and federal law.
- (3) The \_\_\_\_\_ [authorized enforcement agency] shall have the right to set up on any permitted facility such devices as are necessary in the opinion of the authorized enforcement agency to conduct monitoring and/or sampling of the facility's storm water discharge.
- (4) The \_\_\_\_\_ [authorized enforcement agency] has the right to require the discharger to install monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure stormwater flow and quality shall be calibrated to ensure their accuracy.
- (5) Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the operator at the written or oral request of the [authorized enforcement agency] and shall not be replaced. The costs of clearing such access shall be borne by the operator.
- (6) Unreasonable delays in allowing the \_\_\_\_\_ [authorized enforcement agency] access to a permitted facility is a violation of a storm water discharge permit and of this ordinance. A person who is the operator of a facility with a NPDES permit to discharge storm water associated with industrial activity commits an offense if the person denies the authorized enforcement agency reasonable access to the permitted facility for the purpose of conducting any activity authorized or required by this ordinance.

- (7) If the \_\_\_\_\_ [authorized enforcement agency] has been refused access to any part of the premises from which stormwater is discharged, and he/she is able to demonstrate probable cause to believe that there may be a violation of this ordinance, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this ordinance or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the authorized enforcement agency may seek issuance of a search warrant from any court of competent jurisdiction.

**SECTION 11. REQUIREMENT TO PREVENT, CONTROL, AND REDUCE STORM WATER POLLUTANTS BY THE USE OF BEST MANAGEMENT PRACTICES.**

[Authorized enforcement agency] will adopt requirements identifying Best Management Practices for any activity, operation, or facility which may cause or contribute to pollution or contamination of storm water, the storm drain system, or waters of the U.S. The owner or operator of a commercial or industrial establishment shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the municipal storm drain system or watercourses through the use of these structural and non-structural BMPs. Further, any person responsible for a property or premise, which is, or may be, the source of an illicit discharge, may be required to implement, at said person's expense, additional structural and non-structural BMPs to prevent the further discharge of pollutants to the municipal separate storm sewer system. Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of storm water associated with industrial activity, to the extent practicable, shall be deemed compliance with the provisions of this section. These BMPs shall be part of a stormwater pollution prevention plan (SWPP) as necessary for compliance with requirements of the NPDES permit.

**SECTION 12. WATERCOURSE PROTECTION.**

Every person owning property through which a watercourse passes, or such person's lessee, shall keep and maintain that part of the watercourse within the property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse. In addition, the owner or lessee shall maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

**SECTION 13. NOTIFICATION OF SPILLS.**

Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials which are resulting or may result in illegal discharges or pollutants discharging into storm water, the storm drain system, or water of the U.S. said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of non-hazardous materials, said person shall notify the authorized enforcement agency in person or by phone or facsimile no later than the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to the \_\_\_\_\_ [authorized enforcement agency] within three business days of the phone notice. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

**SECTION 14. ENFORCEMENT.**

**1. Notice of Violation.**

Whenever the \_\_\_\_\_ [authorized enforcement agency] finds that a

person has violated a prohibition or failed to meet a requirement of this Ordinance, the authorized enforcement agency may order compliance by written notice of violation to the responsible person. Such notice may require without limitation:

- (a) The performance of monitoring, analyses, and reporting;
- (b) The elimination of illicit connections or discharges;
- (c) That violating discharges, practices, or operations shall cease and desist;
- (d) The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property; and
- (e) Payment of a fine to cover administrative and remediation costs; and
- (f) The implementation of source control or treatment BMPs.

If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by a designated governmental agency or a contractor and the expense thereof shall be charged to the violator.

#### **SECTION 15. APPEAL OF NOTICE OF VIOLATION.**

Any person receiving a Notice of Violation may appeal the determination of the authorized enforcement agency. The notice of appeal must be received within \_\_ days from the date of the Notice of Violation. Hearing on the appeal before the appropriate authority or his/her designee shall take place within 15 days from the date of receipt of the notice of appeal. The decision of the municipal authority or their designee shall be final.

#### **SECTION 16. ENFORCEMENT MEASURES AFTER APPEAL.**

If the violation has not been corrected pursuant to the requirements set forth in the Notice of Violation, or , in the event of an appeal, within \_\_ days of the decision of the municipal authority upholding the decision of the authorized enforcement agency, then representatives of the authorized enforcement agency shall enter upon the subject private property and are authorized to take any and all measures necessary to abate the violation and/or restore the property. It shall be unlawful for any person, owner, agent or person in possession of any premises to refuse to allow the government agency or designated contractor to enter upon the premises for the purposes set forth above.

#### **SECTION 17. COST OF ABATEMENT OF THE VIOLATION.**

Within \_\_ days after abatement of the violation, the owner of the property will be notified of the cost of abatement, including administrative costs. The property owner may file a written protest objecting to the amount of the assessment within \_\_ days. If the amount due is not paid within a timely manner as determined by the decision of the municipal authority or by the expiration of the time in which to file an appeal, the charges shall become a special assessment against the property and shall constitute a lien on the property for the amount of the assessment. Any person violating any of the provisions of this article shall become liable to the city by reason of such violation. The liability shall be paid in not more than 12 equal payments. Interest at the rate of \_\_ percent per annum shall be assessed on the balance beginning on the \_\_st day following discovery of the violation.

#### **SECTION 18. INJUNCTIVE RELIEF.**

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this Ordinance. If a person has violated or continues to violate the provisions of this ordinance, the authorized enforcement agency may petition for a preliminary or permanent injunction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

#### **SECTION 19. COMPENSATORY ACTION.**

In lieu of enforcement proceedings, penalties, and remedies authorized by this Ordinance, the authorized enforcement agency may impose upon a violator alternative compensatory actions, such as storm drain stenciling, attendance at compliance workshops, creek cleanup, etc.



**SECTION 20. VIOLATIONS DEEMED A PUBLIC NUISANCE.**

In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this Ordinance is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken.

**SECTION 21. CRIMINAL PROSECUTION.**

Any person that has violated or continues to violate this ordinance shall be liable to criminal prosecution to the fullest extent of the law, and shall be subject to a criminal penalty of \_\_\_\_\_ dollars per violation per day and/or imprisonment for a period of time not to exceed \_\_\_\_ days.

The authorized enforcement agency may recover all attorney's fees court costs and other expenses associated with enforcement of this ordinance, including sampling and monitoring expenses.

**SECTION 22. REMEDIES NOT EXCLUSIVE.**

The remedies listed in this ordinance are not exclusive of any other remedies available under any applicable federal, state or local law and it is within the discretion of the authorized enforcement agency to seek cumulative remedies.

**SECTION 23. ADOPTION OF ORDINANCE.**

This ordinance shall be in full force and effect \_\_ days after its final passage and adoption. All prior ordinances and parts of ordinances in conflict with this ordinance are hereby repealed.

PASSED AND ADOPTED this \_\_\_\_ day of \_\_\_\_\_, 19\_\_, by the following vote:

## APPENDIX H

### IDDE Employee Training Record

**Illicit Discharge Detection and Elimination (IDDE)**  
**Employee Training Record**  
**Marshfield, Massachusetts**

**Date of Training:** \_\_\_\_\_

**Duration of Training:** \_\_\_\_\_

Name	Title	Signature





1900 Crown Colony Drive, Suite 402  
Quincy, MA 02169  
P: 617.657.0200    F: 617.657.0201

[envpartners.com](http://envpartners.com)

## APPENDIX M

### Annual BMP Inspection Reports

## MEMORANDUM

**Date:** July 30, 2019

**To** Paul F. Tomkavage, P.E. – Project Manager

**From** Natalie Pommersheim – EP

**CC** Rod Procaccino, Town Engineer  
Helen Gordon, P.E. – EP  
Vern Lincoln – EP

**Subject** Stormwater Treatment Structure Inspections

On April 13, 2016, the Environmental Protection Agency (EPA) released the General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts, which became effective July 1, 2018. The Permit imposes a host of new requirements for the Town of Marshfield and all communities under its jurisdiction.

In order to address the Permit requirements (Section 2.3.7.a.iii.6) for the stormwater treatment structure inspections, Environmental Partners Group, Inc. (EP) completed observations on 15 of the Town's stormwater treatment structures (BMPs) to provide inventory and condition data, as shown on Figure 1, and summarized in Table 1. For the Town's reference, the BMP inspection data forms are enclosed and pictures of each BMP included.

According to the findings of these BMP site visits, conducted on June 6, 2019, the following maintenance issues are present at the Town's BMPs:

- Soil Erosion
  - BMP-9
- Excess Vegetation
  - BMP-1, BMP-3, BMP-4, BMP-5, BMP-6, BMP-7, BMP-8, BMP-9, BMP-10, BMP-11, BMP-12, BMP-13, BMP-14, BMP-15
- Trash/Debris
  - BMP-13
- Clogging/Standing Water
  - BMP-12, BMP-13



- Other Issues
  - BMP-9: Outlet detached due to erosion
  - BMP-13: Residents are dumping debris

## Enclosures

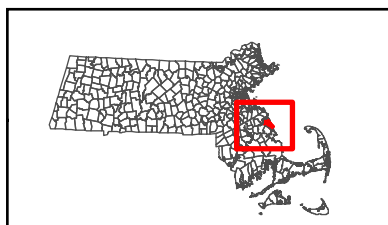
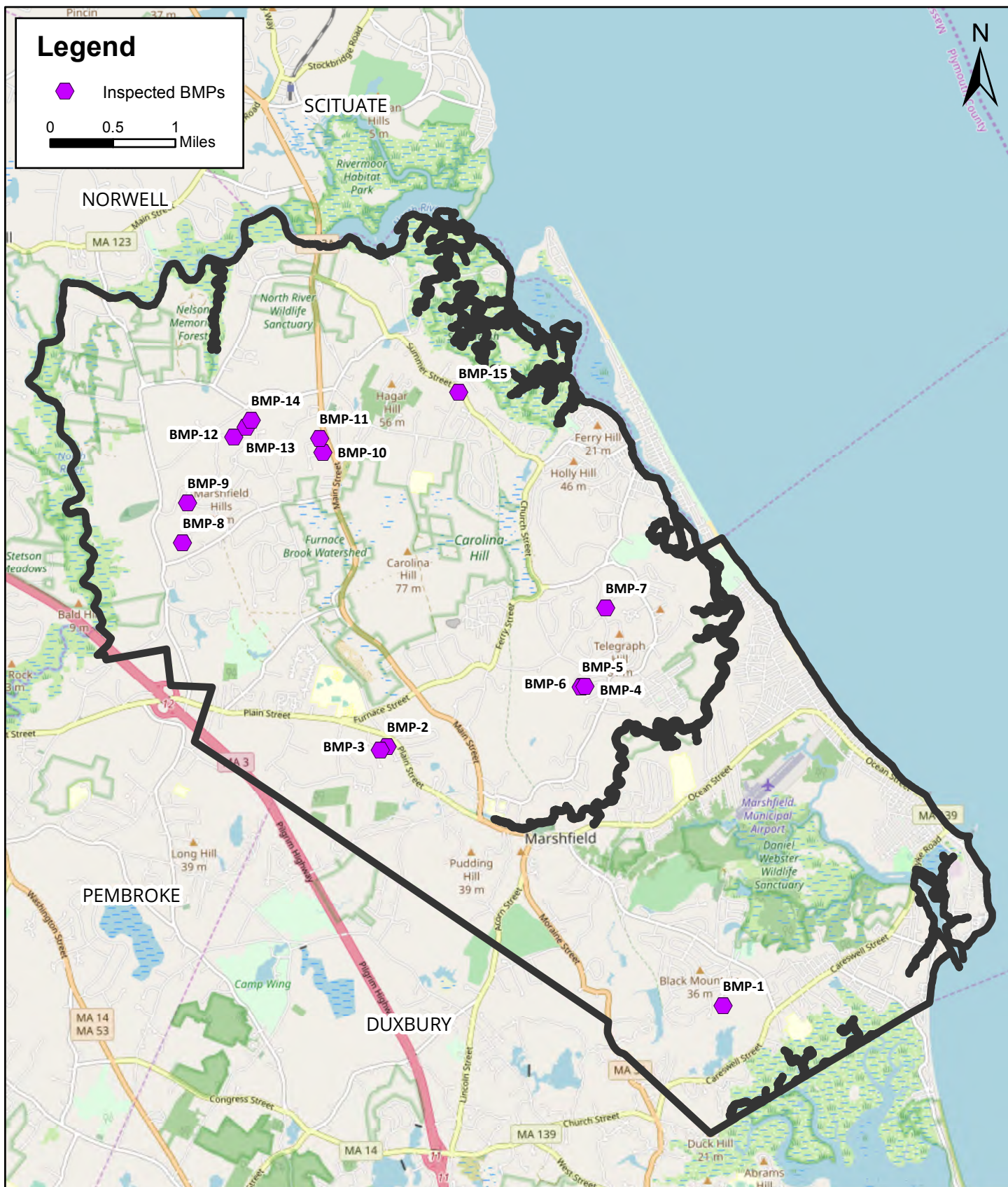
*Figure 1: Inspected BMP Locations*

*Table 1: Stormwater BMP Inspection Table*

*BMP Inspection Data Forms*

Figure 1

**Inspected BMP Locations**



**Figure 1: BMP Inspection Locations  
Marshfield, Massachusetts**

**ENVIRONMENTAL  
PARTNERS**



## Table 1

### Stormwater BMP Inspection Table

Table 1: Stormwater BMP Inspection Table



BMP ID	Date	Weather	Location	BMP Category	BMP Type	Type of Inspection	Invasive Species	Soil Erosion	Excess Vegetation	Dead Vegetation	Excess Salt	Trash/ Debris	Oil/Grease	Excess Sediment	Outlet Condition	Inlet/Outlet Condition	Outlet Erosion	Cracking	Clogging	Other
BMP-1	2019-06-06	Overcast	South of the cul-de-sac on Pilgrim Trail	Infiltration BMP	Infiltration Basin	Regular	Not Applicable	Satisfactory	Unsatisfactory	Not Applicable	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Not Applicable	Satisfactory	Satisfactory
BMP-2	2019-06-06	Overcast	South side of the curve of Planting Field Rd	Treatment BMP	Constructed Stormwater Wetland	Regular	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Not Applicable	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory
BMP-3	2019-06-06	Overcast	South side of the curve of Planting Field Rd	Conveyance BMP	Drainage Channel	Regular	Satisfactory	Satisfactory	Unsatisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory
BMP-4	2019-06-06	Overcast	End of Cranberry Cove	Conveyance BMP	Drainage Channel	Regular	Satisfactory	Satisfactory	Unsatisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory
BMP-5	2019-06-06	Overcast	Between the end of Cranberry Cove and Laura's Lane	Conveyance BMP	Drainage Channel	Regular	Satisfactory	Satisfactory	Unsatisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory
BMP-6	2019-06-06	Overcast	South of Laura's Lane	Treatment BMP	Wet Basin	Regular	Satisfactory	Satisfactory	Unsatisfactory	Unsatisfactory	Not Applicable	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory
BMP-7	2019-06-06	Overcast	East of the 80 Stonybrook Rd residence	Treatment BMP	Constructed Stormwater Wetland	Regular	Satisfactory	Satisfactory	Unsatisfactory	Satisfactory	Not Applicable	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory
BMP-8	2019-06-06	Overcast	East of the 122 Pokanoket Ln residence	Treatment BMP	Constructed Stormwater Wetland	Regular	Satisfactory	Satisfactory	Unsatisfactory	Satisfactory	Not Applicable	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory
BMP-9	2019-06-06	Overcast	On the north side of Canochet Trail	Treatment BMP	Constructed Stormwater Wetland	Regular	Unsatisfactory	Unsatisfactory	Unsatisfactory	Satisfactory	Not Applicable	Satisfactory	Satisfactory	Satisfactory	Unsatisfactory	Not Applicable	Unsatisfactory	Not Applicable	Satisfactory	Unsatisfactory
BMP-10	2019-06-06	Overcast	North side of Oakman Way	Other BMP	Constructed Stormwater Wetland	Regular	Satisfactory	Satisfactory	Unsatisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
BMP-11	2019-06-06	Overcast	In between 26 Jedediah's Path and 1577 Main Street	Treatment BMP	Constructed Stormwater Wetland	Regular	Satisfactory	Satisfactory	Unsatisfactory	Satisfactory	Not Applicable	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory
BMP-12	2019-06-06	Overcast	Near the East side of the road circle on Metacomet Way	Conveyance BMP	Drainage Channel	Regular	Satisfactory	Satisfactory	Unsatisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Unsatisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory
BMP-13	2019-06-06	Overcast	North side of Metacomet Way	Conveyance BMP	Drainage Channel	Regular	Satisfactory	Satisfactory	Unsatisfactory	Satisfactory	Not Applicable	Unsatisfactory	Not Applicable	Satisfactory	Unsatisfactory	Not Applicable	Satisfactory	Not Applicable	Unsatisfactory	Unsatisfactory
BMP-14	2019-06-06	Overcast	East side of Valley Path, North of the 199 Valley Path residence	Treatment BMP	Constructed Stormwater Wetland	Regular	Unsatisfactory	Satisfactory	Unsatisfactory	Satisfactory	Not Applicable	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory
BMP-15	2019-06-06	Overcast	Between 140 Forge Lane and Summer Street	Treatment BMP	Constructed Stormwater Wetland	Regular	Satisfactory	Satisfactory	Unsatisfactory	Satisfactory	Not Applicable	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Not Applicable	Satisfactory	Not Applicable	Satisfactory	Satisfactory

# BMP Inspection Data Form

**BMP-1**



## Town of Marshfield, BMP-1, Infiltration BMP

Created	2019-06-06 12:48:35 UTC by EPField 06
Updated	2019-07-30 14:08:35 UTC by EPField 06
Location	42.0721720113, -70.6805917808
Client	Town of Marshfield
Date	2019-06-06
Time	08:48
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-1
Location	South of the cul-de-sac on Pilgrim Trail
BMP Category	Infiltration BMP
BMP Type - Infiltration	Infiltration Basin
Address	97 Pilgrim Trail Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Soil Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Mow/Rake/Prune

### Trash/Debris

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Inlet/Outlet Condition

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Clogging/Standing Water

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Other Issues

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

Photos







# BMP Inspection Data Form

**BMP-2**

## Town of Marshfield, BMP-2, Treatment BMP

Created	2019-06-06 14:15:48 UTC by EPField 06
Updated	2019-07-30 14:14:45 UTC by EPField 06
Location	42.1025458491, -70.7323848177
Client	Town of Marshfield
Date	2019-06-06
Time	10:15
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-2
Location	South side of the curve of Planting Field Rd
BMP Category	Treatment BMP
BMP Type - Treatment	Constructed Stormwater Wetland
Address	48 Planting Fields Rd Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Soil Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Vegetation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Dead Vegetation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Trash/Debris

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Oil/Grease

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Condition

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Area Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Clogging/Standing Water

--	--

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

## Other Issues

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

Notes	Natural forest wetlands
-------	-------------------------

Photos







# BMP Inspection Data Form

**BMP-3**

## Town of Marshfield, BMP-3, Conveyance BMP

Created	2019-06-06 14:26:50 UTC by EPField 06
Updated	2019-07-30 14:15:23 UTC by EPField 06
Location	42.1021244489, -70.7335297857
Client	Town of Marshfield
Date	2019-06-06
Time	10:26
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-3
Location	South side of the curve of Planting Field Rd
BMP Category	Conveyance BMP
BMP Type - Conveyance	Drainage Channel
Address	115 Planting Field Rd Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Soil Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Mow/Rake/Prune, chop

### Dead Vegetation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Trash/Debris

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
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### Outlet Condition

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Area Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Clogging/Standing Water

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----



## Other Issues

Is Status of BMP Satisfactory?

Yes

Photos



# BMP Inspection Data Form

**BMP-4**

## Town of Marshfield, BMP-4, Conveyance BMP

Created	2019-06-06 13:54:54 UTC by EPField 06
Updated	2019-07-30 14:17:26 UTC by EPField 06
Location	42.1092713206, -70.7016085648
Client	Town of Marshfield
Date	2019-06-06
Time	09:54
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-4
Location	End of Cranberry Cove
BMP Category	Conveyance BMP
BMP Type - Conveyance	Drainage Channel
Address	71 Grove St Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Soil Erosion

Is Status of BMP Satisfactory?	Yes
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### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Mow/Rake/Prune, chop

### Dead Vegetation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Trash/Debris

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Condition

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Area Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Clogging/Standing Water

Is Status of BMP Satisfactory?	Yes
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## Other Issues

Is Status of BMP Satisfactory?

Yes

Photos





# BMP Inspection Data Form

**BMP-5**



## Town of Marshfield, BMP-5, Conveyance BMP

Created	2019-06-06 13:48:47 UTC by EPField 06
Updated	2019-07-30 14:19:02 UTC by EPField 06
Location	42.1092803311, -70.7020699047
Client	Town of Marshfield
Date	2019-06-06
Time	09:48
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-5
Location	Between the end of Cranberry Cove and Laura's Lane
BMP Category	Conveyance BMP
BMP Type - Conveyance	Drainage Channel
Address	45 Laura's Ln Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Soil Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Mow/Rake/Prune

### Dead Vegetation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Trash/Debris

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Condition

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Area Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Clogging/Standing Water

Is Status of BMP Satisfactory?	Yes
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## Other Issues

Is Status of BMP Satisfactory?

Yes

Photos



Flared-end outlet





# BMP Inspection Data Form

**BMP-6**

## Town of Marshfield, BMP-6, Treatment BMP

Created	2019-06-06 13:50:43 UTC by EPField 06
Updated	2019-07-30 14:22:19 UTC by EPField 06
Location	42.1091701091, -70.7021642011
Client	Town of Marshfield
Date	2019-06-06
Time	09:50
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-6
Location	South of Laura's Lane
BMP Category	Treatment BMP
BMP Type - Treatment	Wet Basin
Address	45 Laura's Ln Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	Yes
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### Soil Erosion

Is Status of BMP Satisfactory?	Yes
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### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Mow/Rake/Prune, chop

### Dead Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Trees are down
Corrective Action Needed	Remove

### Trash/Debris

Is Status of BMP Satisfactory?	Yes
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### Oil/Grease

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Condition

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

## Outlet Area Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

## Clogging/Standing Water

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

## Other Issues

Is Status of BMP Satisfactory?	Yes
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Notes	Detention pond here, according to the Stormwater Detention Ponds map
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Photos	
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# BMP Inspection Data Form

**BMP-7**

## Town of Marshfield, BMP-7, Treatment BMP

Created	2019-06-06 13:27:33 UTC by EPField 06
Updated	2019-07-30 14:24:11 UTC by EPField 06
Location	42.1182903741, -70.6982741599
Client	Town of Marshfield
Date	2019-06-06
Time	09:27
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-7
Location	East of the 80 Stonybrook Rd residence
BMP Category	Treatment BMP
BMP Type - Treatment	Constructed Stormwater Wetland
BMP Type - Infiltration	Infiltration Basin
Address	80 Stonybrook Rd Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	Yes
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### Soil Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Totally overgrown
Corrective Action Needed	Mow/Rake/Prune, chop

### Dead Vegetation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Trash/Debris

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Oil/Grease

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Condition

Is Status of BMP Satisfactory?	Yes
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### Outlet Area Erosion



Is Status of BMP Satisfactory?	Yes
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### Clogging/Standing Water

Is Status of BMP Satisfactory?	Yes
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### Other Issues

Is Status of BMP Satisfactory?	Yes
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Photos





# BMP Inspection Data Form

**BMP-8**



## Town of Marshfield, BMP-8, Treatment BMP

Created	2019-06-06 16:27:20 UTC by EPField 06
Updated	2019-07-30 14:27:31 UTC by EPField 06
Location	42.1262661741, -70.7638985944
Client	Town of Marshfield
Date	2019-06-06
Time	12:27
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-8
Location	East of the 122 Pokanoket Ln residence
BMP Category	Treatment BMP
BMP Type - Treatment	Constructed Stormwater Wetland
Address	122 Pokanoket Ln Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	Yes
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### Soil Erosion

Is Status of BMP Satisfactory?	Yes
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### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Mow/Rake/Prune

### Dead Vegetation

Is Status of BMP Satisfactory?	Yes
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### Trash/Debris

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Oil/Grease

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
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### Outlet Condition

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Area Erosion

Is Status of BMP Satisfactory?	Yes
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## Clogging/Standing Water

Is Status of BMP Satisfactory?	Yes
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## Other Issues

Is Status of BMP Satisfactory?	Yes
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Photos

















# BMP Inspection Data Form

**BMP-9**

## Town of Marshfield, BMP-9, Treatment BMP

Created	2019-06-06 16:48:27 UTC by EPField 06
Updated	2019-07-30 14:29:05 UTC by EPField 06
Location	42.1309131431, -70.7630757429
Client	Town of Marshfield
Date	2019-06-06
Time	12:48
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-9
Location	On the north side of Canochet Trail
BMP Category	Treatment BMP
BMP Type - Treatment	Constructed Stormwater Wetland
Address	15 Canonchet Trail Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Remove Species

### Soil Erosion

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Washed out the outlet pipe
Corrective Action Needed	Regrade and repair outlet pipe

### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Mow/Rake/Prune, chop

### Dead Vegetation

Is Status of BMP Satisfactory?	Yes
BMP Issue Location/Amount	Overgrown

### Trash/Debris

Is Status of BMP Satisfactory?	Yes
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### Oil/Grease

Is Status of BMP Satisfactory?	Yes
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### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

## Outlet Condition

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Outlet detached
Corrective Action Needed	Reconnect outlet

## Outlet Area Erosion

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Erosion caused pipe to separate
Corrective Action Needed	Reconnect outlet

## Clogging/Standing Water

Is Status of BMP Satisfactory?	Yes
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## Other Issues

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Needs corrective actions
Corrective Action Needed	All of the above

Photos



Detached outlet











Catch basin



# BMP Inspection Data Form

**BMP-10**

## Town of Marshfield, BMP-10, Other BMP

Created	2019-06-06 14:58:44 UTC by EPField 06
Updated	2019-07-30 14:33:40 UTC by EPField 06
Location	42.1365859313, -70.7419815101
Client	Town of Marshfield
Date	2019-06-06
Time	10:58
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-10
Location	North side of Oakman Way
BMP Category	Other BMP
BMP Type - Treatment	Constructed Stormwater Wetland
BMP Type - Other	Dry Detention Basin
Address	32 Oakman Way Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	Yes
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### Soil Erosion

Is Status of BMP Satisfactory?	Yes
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### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Mow/Rake/Prune, chop

### Dead Vegetation

Is Status of BMP Satisfactory?	Yes
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### Excess Salt

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Trash/Debris

Is Status of BMP Satisfactory?	Yes
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### Oil/Grease

Is Status of BMP Satisfactory?	Yes
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### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
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### Outlet Condition

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Is Status of BMP Satisfactory?	Yes
<b>Inlet/Outlet Condition</b>	
Is Status of BMP Satisfactory?	Yes
<b>Outlet Area Erosion</b>	
Is Status of BMP Satisfactory?	Yes
<b>Cracking</b>	
Is Status of BMP Satisfactory?	Yes
<b>Clogging/Standing Water</b>	
Is Status of BMP Satisfactory?	Yes
<b>Other Issues</b>	
Is Status of BMP Satisfactory?	Yes
Notes	Detention pond located here, according to the Stormwater Detention Ponds map
Photos	







# BMP Inspection Data Form

**BMP-11**

## Town of Marshfield, BMP-11, Treatment BMP

Created	2019-06-06 15:05:14 UTC by EPField 06
Updated	2019-07-30 14:38:47 UTC by EPField 06
Location	42.1382277366, -70.74243824
Client	Town of Marshfield
Date	2019-06-06
Time	11:05
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-11
Location	In between 26 Jedediah's Path and 1577 Main Street
BMP Category	Treatment BMP
BMP Type - Treatment	Constructed Stormwater Wetland
Address	26 Jedediah's Path Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	Yes
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### Soil Erosion

Is Status of BMP Satisfactory?	Yes
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### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Mow/Rake/Prune, chop

### Dead Vegetation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Trash/Debris

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Oil/Grease

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Condition

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Area Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----



## Clogging/Standing Water

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

## Other Issues

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

Notes	Detention pond located here, according to the Stormwater Detention Ponds map
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Photos	
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# BMP Inspection Data Form

**BMP-12**

## Town of Marshfield, BMP-12, Conveyance BMP

Created	2019-06-06 15:27:03 UTC by EPField 06
Updated	2019-07-22 19:59:24 UTC by EPField 04
Location	42.1384439478089, -70.7558550686303
Client	Town of Marshfield
Date	2019-06-06
Time	11:27
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-12
Location	Near the East side of the road circle on Metacomet Way
BMP Category	Conveyance BMP
BMP Type - Conveyance	Drainage Channel
Address	61 Metacomet Way Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	Yes
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### Soil Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Mow/Rake/Prune

### Dead Vegetation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Trash/Debris

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Condition

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Clogged
Corrective Action Needed	Clean

### Outlet Area Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

## Clogging/Standing Water

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

## Other Issues

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

Photos







# BMP Inspection Data Form

**BMP-13**

## Town of Marshfield, BMP-13, Conveyance BMP

Created	2019-06-06 15:34:02 UTC by EPField 06
Updated	2019-07-22 20:01:01 UTC by EPField 04
Location	42.1395794861411, -70.7538762689296
Client	Town of Marshfield
Date	2019-06-06
Time	11:34
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-13
Location	North side of Metacomet Way
BMP Category	Conveyance BMP
BMP Type - Conveyance	Drainage Channel
Address	91-199 Metacomet Way Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Soil Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Mow/Rake/Prune

### Dead Vegetation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Trash/Debris

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Residents are dumping debris into channel.
Corrective Action Needed	Remove Trash/Debris

### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Outlet Condition

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Clogged
Corrective Action Needed	Clean

### Outlet Area Erosion



Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

## Clogging/Standing Water

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Should be no standing water
Corrective Action Needed	Clean

## Other Issues

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	All clogged
Corrective Action Needed	Clean

Photos





Standing Water



Standing Water



Standing Water

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# BMP Inspection Data Form

**BMP-14**

## Town of Marshfield, BMP-14, Treatment BMP

Created	2019-06-06 15:49:30 UTC by EPField 06
Updated	2019-07-22 20:02:25 UTC by EPField 04
Location	42.1403938718533, -70.7530848496321
Client	Town of Marshfield
Date	2019-06-06
Time	11:49
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-14
Location	East side of Valley Path, North of the 199 Valley Path residence
BMP Category	Treatment BMP
BMP Type - Treatment	Constructed Stormwater Wetland
Address	199 Valley Path Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Taking over
Corrective Action Needed	Remove Species

### Soil Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Mow/Rake/Prune

### Dead Vegetation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Trash/Debris

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Oil/Grease

Is Status of BMP Satisfactory?	Yes
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### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
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### Outlet Condition

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

## Outlet Area Erosion

Is Status of BMP Satisfactory?	Yes
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## Clogging/Standing Water

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

## Other Issues

Is Status of BMP Satisfactory?	Yes
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Photos









Residents are dumping here







# BMP Inspection Data Form

**BMP-15**

## Town of Marshfield, BMP-15, Treatment BMP

Created	2019-06-06 17:43:56 UTC by EPField 06
Updated	2019-07-22 20:03:38 UTC by EPField 04
Location	42.1433794219, -70.7207597886
Client	Town of Marshfield
Date	2019-06-06
Time	13:43
Weather	Overcast
Inspector	Doug Ballum

### General Information

BMP ID	BMP-15
Location	Between 140 Forge Lane and Summer Street
BMP Category	Treatment BMP
BMP Type - Treatment	Constructed Stormwater Wetland
Address	140 Forge Ln Marshfield, MA 02050
Type of Inspection	Regular
Inspection Information	

### Invasive Species

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Soil Erosion

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Vegetation

Is Status of BMP Satisfactory?	No
BMP Issue Location/Amount	Overgrown
Corrective Action Needed	Mow/Rake/Prune

### Dead Vegetation

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Trash/Debris

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Oil/Grease

Is Status of BMP Satisfactory?	Yes
--------------------------------	-----

### Excess Sedimentation

Is Status of BMP Satisfactory?	Yes
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### Outlet Condition

Is Status of BMP Satisfactory?	Yes
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### Outlet Area Erosion

Is Status of BMP Satisfactory?	Yes
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## Clogging/Standing Water

Is Status of BMP Satisfactory?	Yes
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## Other Issues

Is Status of BMP Satisfactory?	Yes
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Photos







## APPENDIX N

### Town-owned Facilities Stormwater Audit



September 6, 2020

Paul Tomkavage, P.E.  
Town of Marshfield Department of Public Works  
870 Moraine Street, 2<sup>nd</sup> Floor  
Marshfield, MA 02050

**RE: NPDES Phase II Stormwater Assistance  
Pollution Prevention & Good Housekeeping for Municipal Operations  
Municipal Facility Audit Report**

Dear Mr. Tomkavage,

Environmental Partners (EP) is forwarding this report on our audit of municipal facilities for compliance with the Town of Marshfield's National Pollution Discharge Elimination System (NPDES) Stormwater General Permit (the Stormwater General Permit). Implementing Best Management Practices (BMPs) aimed at ensuring proper pollution prevention and good housekeeping for municipal operations is one requirement (Part II.B.6) of the 2016 General Permit.

On August 27, 28, and 29, EP performed facility audits at 19 public facilities owned and operated by the Town of Marshfield within the MS4 Regulated Area, shown on Figure 1.

These included:

1. Town Hall
2. Police Station
3. Fire Station, Central
4. Fire Station #2
5. Fire Station #3
6. DPW Highway Garage
7. Transfer Station
8. Recreation Department
9. Ventress Memorial Library
10. Harbor Master
11. Senior Center
12. Animal Shelter
13. Daniel Webster School
14. Eames Way School
15. Furnace Brook Middle School
16. Governor Edward Winslow School
17. Marshfield High School
18. Martinson Elementary School
19. South River Elementary School



The audit process included touring the buildings and grounds of each property, observing accessible areas, reviewing available documents, and interviewing available facility contacts. Observations related to pollution prevention and good housekeeping, stormwater management, areas of erosion, water ponding, impervious surfaces, storage containers, and stockpile areas were documented in writing and by photograph.

The municipal facilities audited in the Town of Marshfield are generally in compliance with respect to the Pollution Prevention and Good Housekeeping minimum control measure of the Stormwater General Permit. There were little to no observances of fuel storage tanks, which have had a history of leading to problems with storm drain contamination if floor drains/sump pumps are connected to the drainage system. EP has provided recommended facility improvements to better control stormwater runoff/releases from the facilities described in this report.

A summary of our findings from the audits is provided in Appendix A (Table 1). The table lists the facilities where audits were performed and, where applicable, identifies instances of non-conformance with the goals of the Stormwater General Permit. Recommendations for corrective action are also provided for instances of non-conformance. Photographs for many of the identified instances of non-conformance or potential upgrades are shown in Appendix B.

Corrective actions taken in response to the report should be documented in writing by the facility managers of the individual facilities, with a copy forwarded to you at the Department of Public Works to be kept on file with other Stormwater General Permit compliance documentation.

We very much appreciate the opportunity to work with the Town of Marshfield on this project, and welcomed the proactive and thorough approach by all the facility contacts we worked with throughout this program. Please call or e-mail us if you have any questions or require additional information.

**Figures:** 1. Municipal Facility Audit Map

**Appendices:** A. Municipal Facility Audit Summary  
 B. PDF Reports with Photo Documentation  
 C. Facility Figures  
 D. A Summary of Requirements for Small Quantity Generators of Hazardous Waste

## *Appendix A:*

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### *Municipal Facility Audit Summary*



Town of Marshfield, Massachusetts  
National Pollution Discharge Elimination System Stormwater Permit  
Pollution Prevention & Good Housekeeping for Municipal Operations  
Municipal Facility Audit Summary



Facility	Address	Purpose of Facility	Date of Site Visit	Floor Drain Information*	Observed Instances of Non-Conformance	Recommendation	Non-MS4 Observations & Recommendations
Town Hall	870 Moraine St	Municipal Administration	2020-08-26	None	None	None	Generator present, fuel unknown
Police Station	1639 Ocean St	Public Safety	2020-08-27	None	None	None	Generator present, fuel unknown
Fire Station, Central	60 S River St	Public Safety	2020-08-27	Floor drains in vehicle bays connect to manholes next to building.	Dumpster left open	None	Natural gas generator on site
Fire Station #2	229 Old Main St	Public Safety	2020-08-27	Floor drains in vehicle bays connect to manholes next to building.	None	None	Natural gas generator on site
Fire Station #3	21 Massasoit Ave	Public Safety	2020-08-27	Floor drain at each garage door discharges to unknown location.	None	None	Natural gas generator on site
DPW Highway Garage	35 Parsonage St	DPW Operations	2020-08-27	Floor drains in garage discharge into tight tank which is cleaned out as needed.	None	None	Diesel generator present, 1,000 gal waste oil tank, "found fluids" tank, 2x 10,000 gal diesel fuel tanks, roof drains of fueling pad discharge to leaching CB, street sweepings stored at Claypit Road site
Transfer Station	25 Clay Pit Rd	DPW Operations	2020-08-26	Floor drains present in trash hopper building, believed to go to sewer	None	None	None
Recreation Department	900 Ferry St	Recreation	2020-08-26	None	None	None	MH marked electric at outlet behind building, probably roof drains?
Ventress Memorial Library	1837 Ocean St	Library	2020-08-26	None	None	None	None
Harbor Master	93 Central St	DPW Operations	2020-08-26	None	None	None	Propane generator on site
Senior Center	230 Webster St	Recreation	2020-08-26	Floor drain located in kitchen discharges to unknown location.	None	None	None
Animal Shelter	156 Clay Pit Rd	Public Safety	2020-08-26	None	None	None	None
Daniel Webster School	1456 Ocean St	School	2019-08-29	Floor drain located in boiler room, connected to sewer system.	None	None	None
Eames Way School	164 Eames Way	School	2019-08-28	Floor drains in boiler room, bathrooms, kitchen, and chemical storage closet. All drain to septic	None	None	None
Furnace Brook Middle School	500 Furnace St	School	2019-08-28	Floor drains in boiler room, unknown discharge location.	None	None	None
Governor Edward Winslow School	28 Regis Rd	School	2019-08-27	Floor drains in boiler room and bathrooms, drain to septic.	None	None	None
Marshfield High School	167 Forest St	School	2019-08-29	Floor drains in bathroom and kitchen discharge to sewer. Floor drains in boiler room discharge to acid/waste tank.	None	None	None
Martinson Elementary School	285 Forest St	School	2019-08-28	Kitchen floor drains discharge to tight tank. Floor drains in bathrooms and boiler room discharge to sewer.	None	None	None
South River Elementary School	60 S River St	School	2019-08-28	Bathroom and kitchen floor drains discharge to septic.	None	None	None

\* Floor drain discharge location based on information provided by the Town. EP did not verify discharge locations by field methods.



## *Appendix B:*

---

### *PDF Reports and Photo Documentation*

## Recreation Department, Recreation Department

Created	2020-08-26 14:00:14 EDT by EPField 01
Updated	2020-08-26 14:07:10 EDT by EPField 01
Location	42.1254766828569, -70.6929804012179

### General

Client	Town of Marshfield
Date	2020-08-26
Time	14:00
Address	900 Ferry St Marshfield, MA 02050
Facility Type	Recreation Department
Facility Name	Recreation Department

### Inspections

#### Main Inspection

Observed Instance of Non-Conformance	No
Notes	MH at outlet

Photos









## Transfer station, Transfer Station

Created	2020-08-26 12:00:15 EDT by EPField 01
Updated	2020-08-26 12:24:37 EDT by EPField 01
Location	42.1117266516257, -70.7069309055805

### General

Client	Town of Marshfield
Date	2020-08-26
Time	12:00
Address	25 Clay Pit Rd Marshfield, MA 02050
Facility Type	Transfer station
Facility Name	Transfer Station

### Inspections

#### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos













































## School, Governor Edward Winslow School

Created	2019-08-27 08:48:28 EDT by Vern Lincoln
Updated	2019-08-27 09:39:16 EDT by Vern Lincoln
Location	42.0704584089161, -70.669593885541

### General

Client	Town of Marshfield
Date	2019-08-27
Time	08:48
Address	28 Regis Rd Green Harbor, MA 02050
Facility Type	School
Facility Name	Governor Edward Winslow School

### Inspections

#### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos

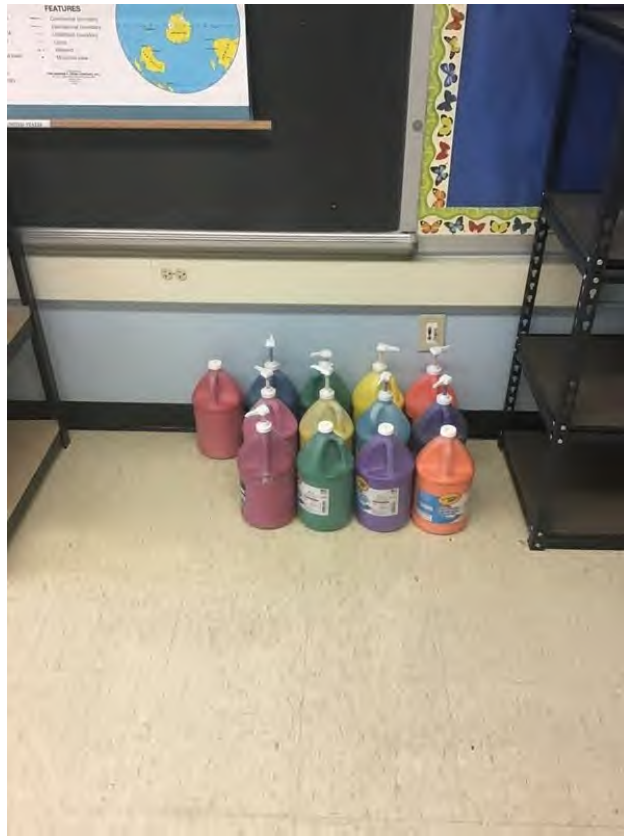












2 septic tanks



Leaching field















Unmapped outfall











## School, Martinson Elementary School

Created	2019-08-28 08:52:59 EDT by Vern Lincoln
Updated	2019-08-28 09:59:09 EDT by Vern Lincoln
Location	42.1108195604653, -70.7400320470333

### General

Client	Town of Marshfield
Date	2019-08-28
Time	08:52
Address	285 Forest St Marshfield, MA 02050
Facility Type	School
Facility Name	Martinson Elementary School

### Inspections

#### Main Inspection

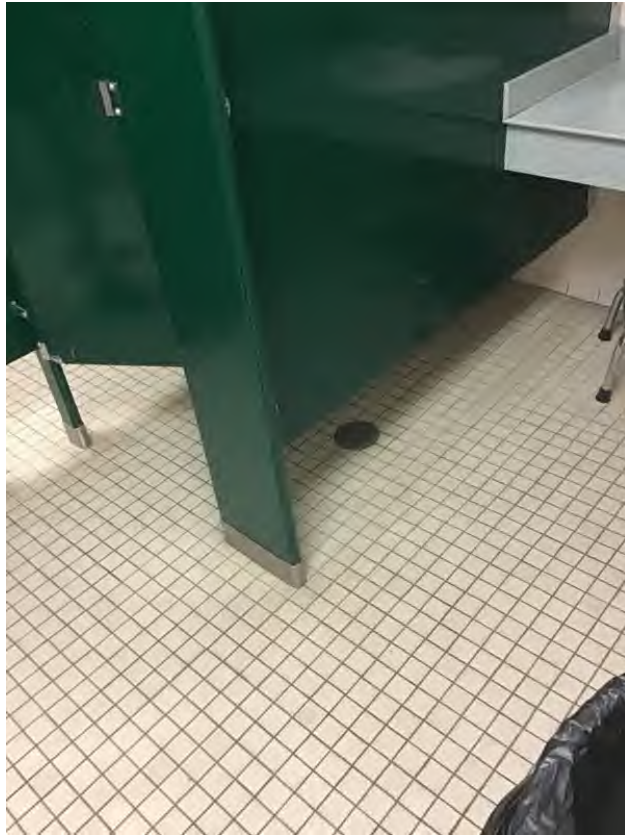
Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos





Tank to which kitchen drains go







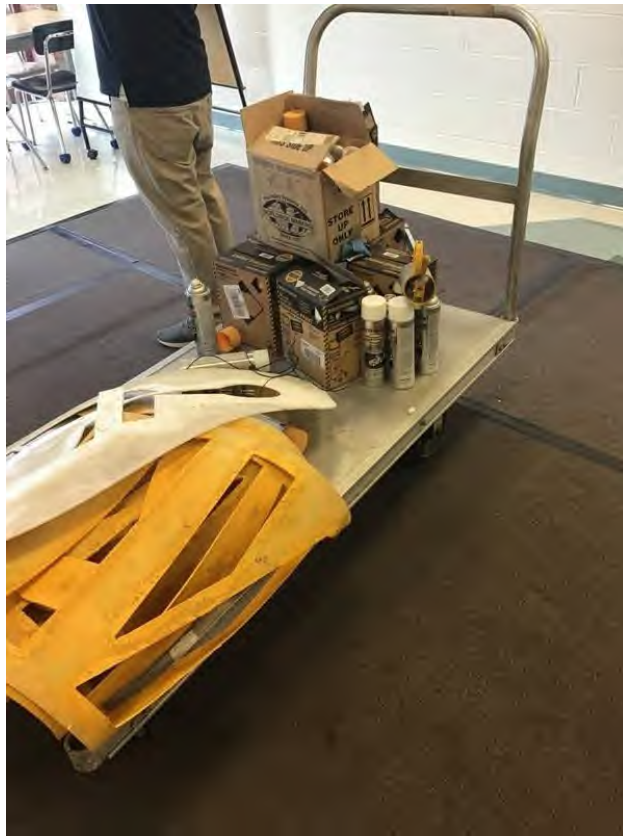












Not used or accessible





WWTP



Storage for computers



No gutters. Needs new roof







Cardboard and trash dumpsters





Paint stripper





Place to dump floor stripper etc.



Trash dumpster of 2



DPW shed





MH





Outfall









Oil/grease separator





## Fire Station, Station 3

Created	2020-08-27 11:13:33 EDT by EPField 01
Updated	2020-08-27 11:42:06 EDT by EPField 01
Location	42.0960331643158, -70.6508703902364

## General

Client	Town of Marshfield
Date	2020-08-27
Time	11:13
Address	21 Massasoit Ave Ocean Bluff, MA 02050
Facility Type	Fire Station
Facility Name	Station 3

## Inspections

### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos























## Fire Station, Station 2

Created	2020-08-27 10:48:17 EDT by EPField 01
Updated	2020-08-27 11:26:42 EDT by EPField 01
Location	42.1474062936597, -70.7400749623775

### General

Client	Town of Marshfield
Date	2020-08-27
Time	10:48
Address	229 Old Main St Marshfield, MA 02050
Facility Type	Fire Station
Facility Name	Station 2

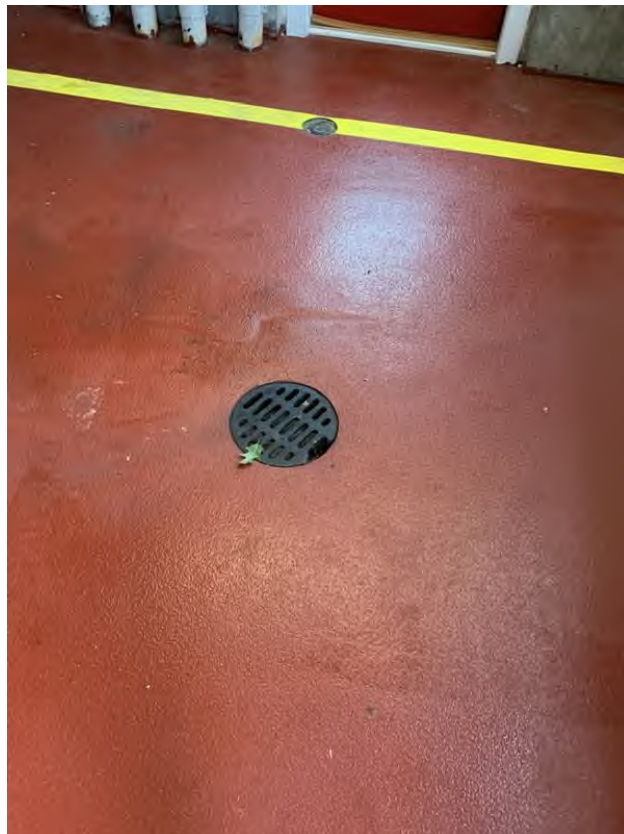
### Inspections

#### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos











## Library, Ventress Memorial Library

Created	2020-08-26 13:24:55 EDT by EPField 01
Updated	2020-08-26 13:32:03 EDT by EPField 01
Location	42.091120517815, -70.7023845613003

### General

Client	Town of Marshfield
Date	2020-08-26
Time	13:24
Address	1837 Ocean St Marshfield, MA 02050
Facility Type	Library
Facility Name	Ventress Memorial Library

### Inspections

#### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos









## School, Furnace Brook Middle School

Created	2019-08-28 10:42:03 EDT by Vern Lincoln
Updated	2019-08-29 11:56:46 EDT by Vern Lincoln
Location	42.1066376202723, -70.7381920516491

### General

Client	Town of Marshfield
Date	2019-08-28
Time	12:00
Address	Marshfield, MA 02050
Facility Type	School
Facility Name	Furnace Brook Middle School

### Inspections

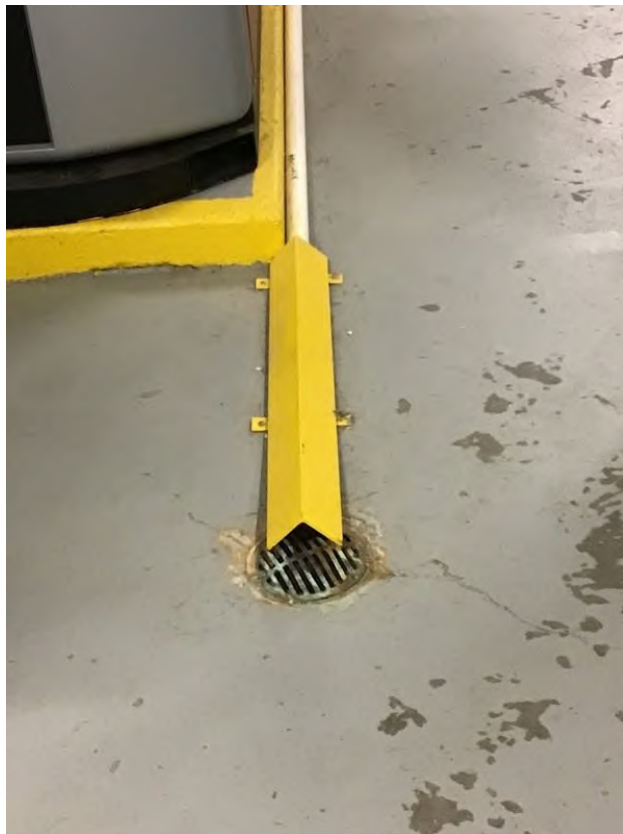
#### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos





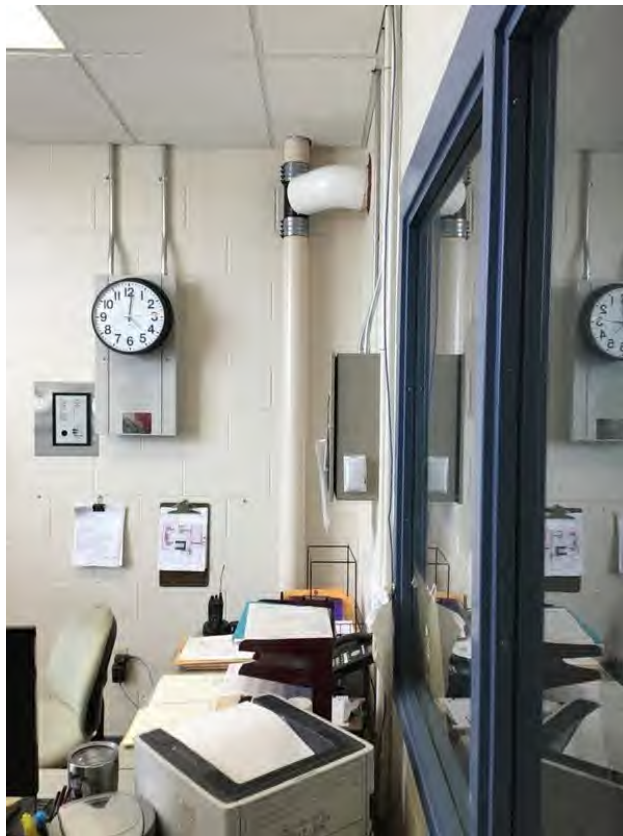
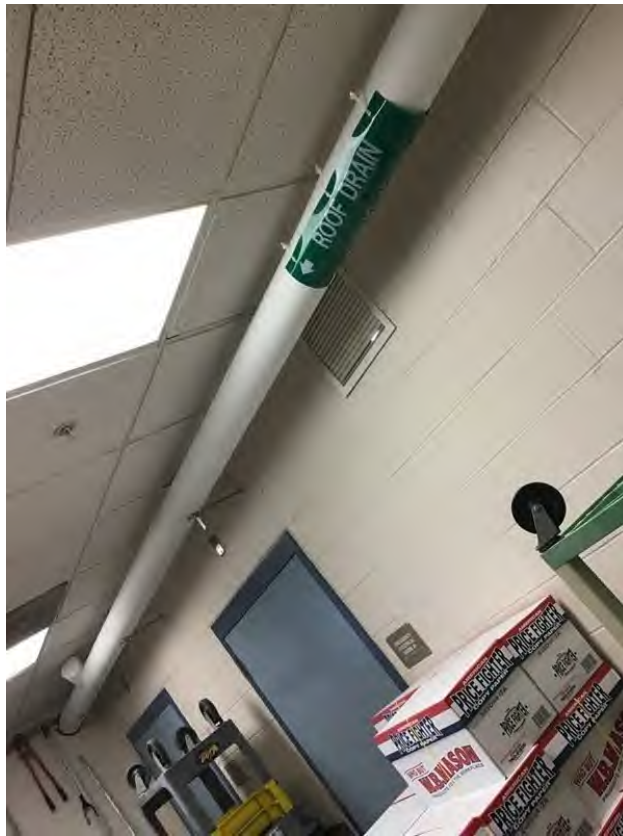












Food drain goes down here











Bathroom floor drain





































































## Council on Aging, Marshfield Senior Center

Created	2020-08-26 11:02:44 EDT by EPField 01
Updated	2020-08-26 11:46:25 EDT by EPField 01
Location	42.0780020914366, -70.6785504519939

### General

Client	Town of Marshfield
Date	2020-08-26
Time	11:02
Address	230 Webster St Marshfield, MA 02050
Facility Type	Council on Aging
Facility Name	Marshfield Senior Center

### Inspections

#### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos





























## Harbor Master, Harbor Master


Created	2020-08-26 14:45:20 EDT by EPField 01
Updated	2020-08-26 14:58:43 EDT by EPField 01
Location	42.0825604182141, -70.6459817290306

### General

Client	Town of Marshfield
Date	2020-08-26
Time	14:45
Address	93 Central St Ocean Bluff, MA 02050
Facility Type	Harbor Master
Facility Name	Harbor Master

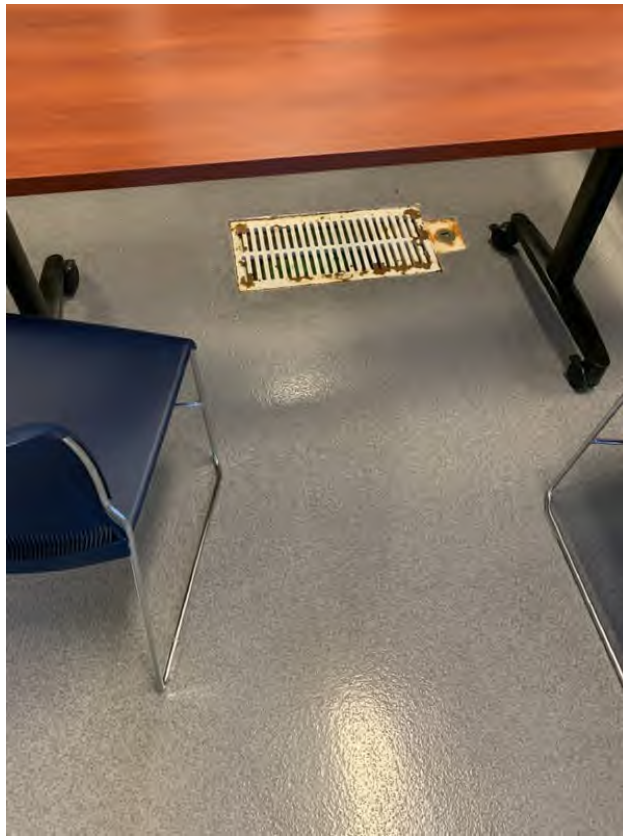
### Inspections

#### Main Inspection

Observed Instance of Non-Conformance	No
Notes	Generator is natural gas. Floor drain contains oil water separator which connects into a sewer.
Photos	







## School, South River Elementary School

Created	2019-08-28 13:03:38 EDT by Vern Lincoln
Updated	2019-08-28 14:00:26 EDT by Vern Lincoln
Location	42.0951656543353, -70.7157137989998

### General

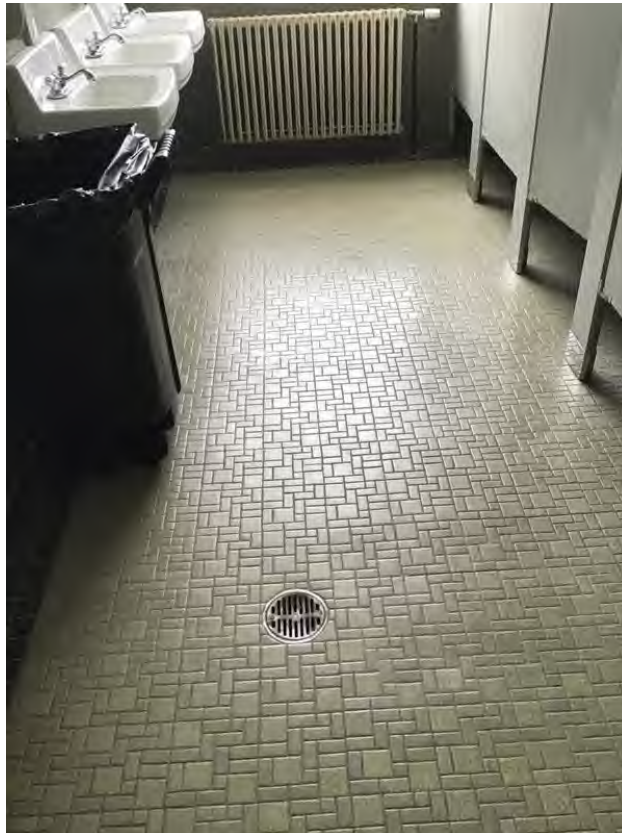
Client	Town of Marshfield
Date	2019-08-28
Time	13:03
Address	60 S River St Marshfield, MA 02050
Facility Type	School
Facility Name	South River Elementary School

### Inspections

#### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos



Floor drain to leach field



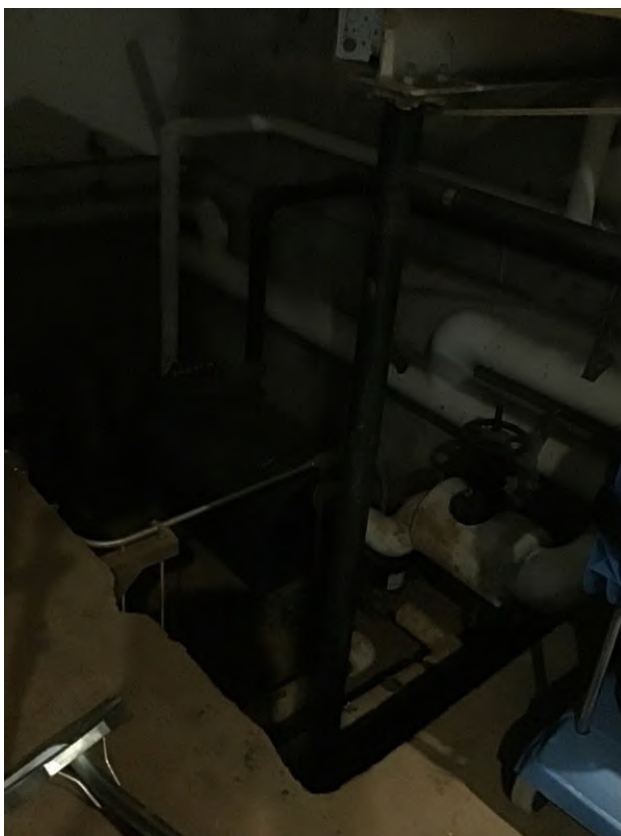












Boiler room floor drain



Kitchen floor drain





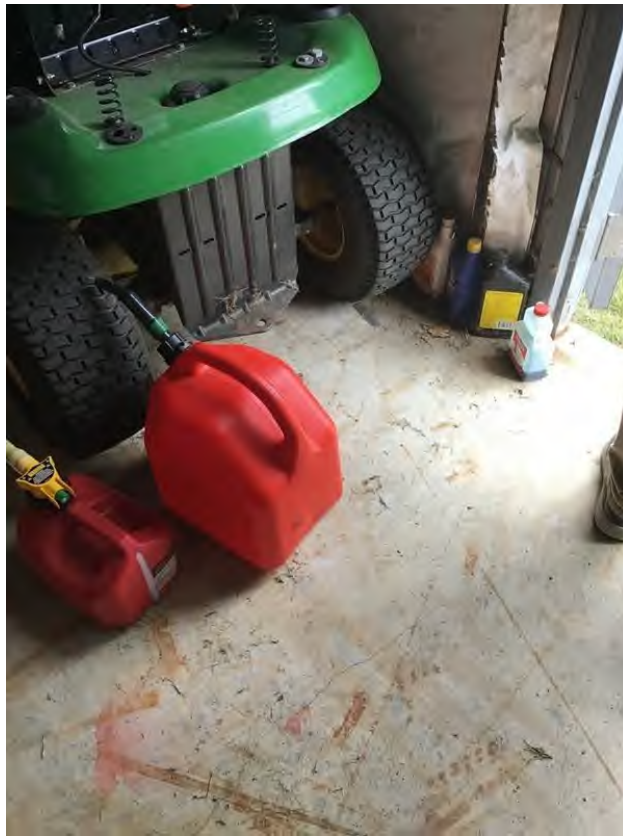




1 recycling, 1 trash









White liquid











Leaching field









Outfall across river from school; note for future





Suspected outfall location, unable to confirm

---

## Town Hall, Town Hall

Created	2020-08-26 14:23:28 EDT by EPField 01
Updated	2020-08-26 14:29:45 EDT by EPField 01
Location	42.0909727294815, -70.7094176486135

### General

Client	Town of Marshfield
Date	2020-08-26
Time	14:23
Address	870 Moraine St Marshfield, MA 02050
Facility Type	Town Hall
Facility Name	Town Hall

### Inspections

#### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos









## School, Daniel Webster School

Created	2019-08-29 13:07:38 EDT by Vern Lincoln
Updated	2019-08-29 13:47:46 EDT by Vern Lincoln
Location	42.0973497068356, -70.6871539726853

### General

Client	Town of Marshfield
Date	2019-08-29
Time	13:07
Address	1456 Ocean St Marshfield, MA 02050
Facility Type	School
Facility Name	Daniel Webster School

### Inspections

#### Main Inspection

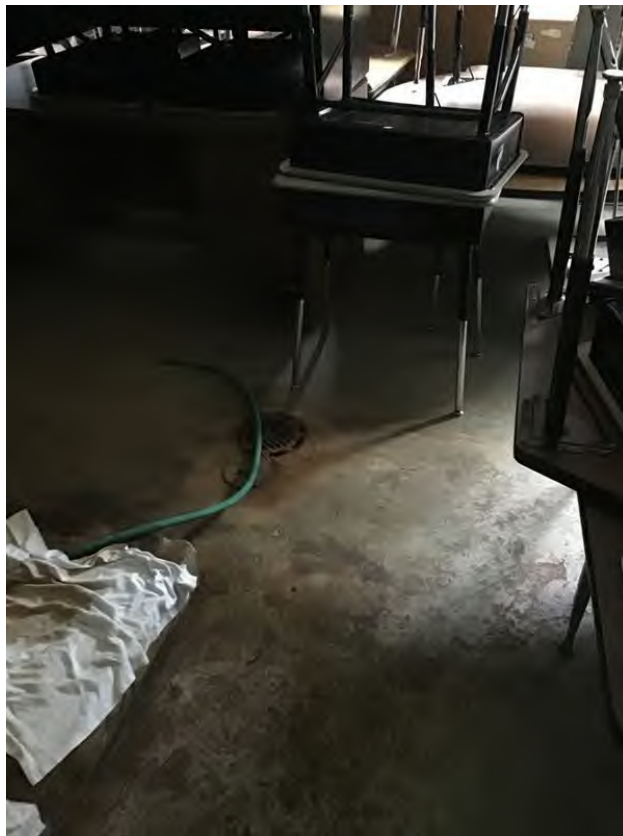
Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos

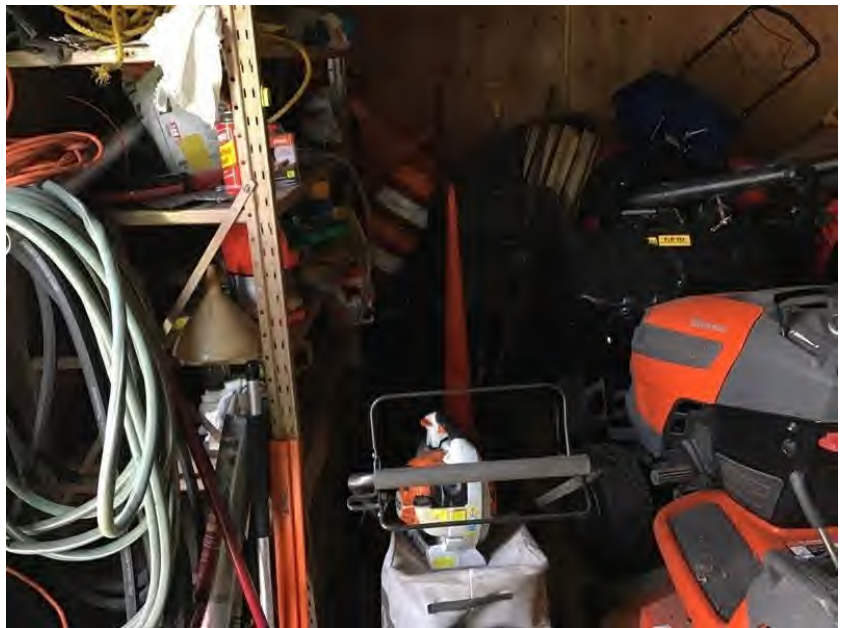
































## School, Eames Way School

Created	2019-08-28 11:02:59 EDT by Vern Lincoln
Updated	2019-08-28 11:45:48 EDT by Vern Lincoln
Location	42.1327360945181, -70.727720707655

### General

Client	Town of Marshfield
Date	2019-08-28
Time	11:02
Address	164 Eames Way Marshfield, MA 02050
Facility Type	School
Facility Name	Eames Way School

### Inspections

#### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos





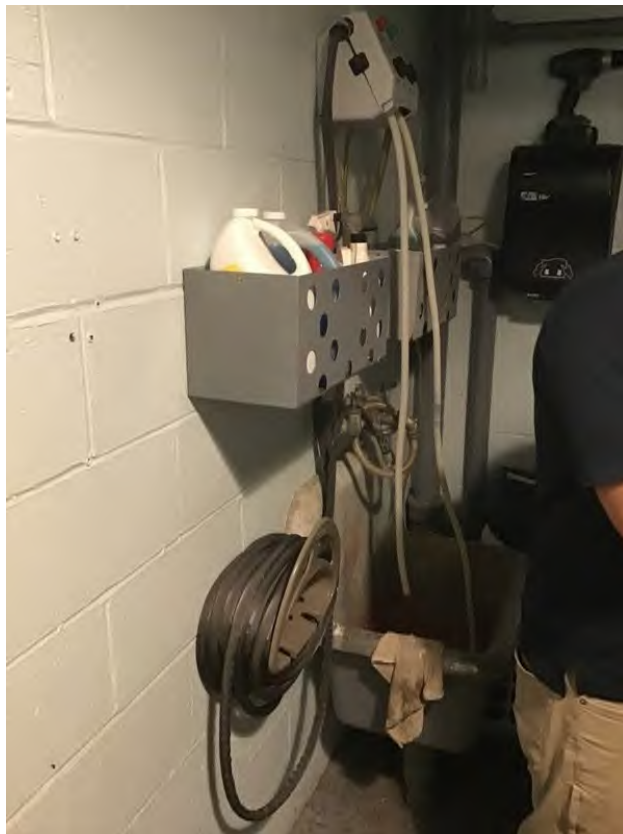






Tie in to roof drain





















Grass clippings deposited here





Leaching field





BMP not town owned

---

## School, Marshfield High School

Created	2019-08-29 08:55:38 EDT by Vern Lincoln
Updated	2019-08-29 13:07:33 EDT by Vern Lincoln
Location	42.1084131068423, -70.7418814301491

### General

Client	Town of Marshfield
Date	2019-08-29
Time	08:55
Address	167 Forest St Marshfield, MA 02050
Facility Type	School
Facility Name	Marshfield High School

### Inspections

#### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos





















































































































































































































## Fire Station, central

Created	2020-08-27 10:33:24 EDT by EPField 01
Updated	2020-08-27 10:48:11 EDT by EPField 01
Location	42.0962809510503, -70.7156242802739

## General

Client	Town of Marshfield
Date	2020-08-27
Time	10:33
Address	60 S River St Marshfield, MA 02050
Facility Type	Fire Station
Facility Name	central

## Inspections

### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos















## Police Station, Police Station

Created	2020-08-27 11:42:13 EDT by EPField 01
Updated	2020-08-27 12:21:13 EDT by EPField 01
Location	42.092754377, -70.6936720758677

## General

Client	Town of Marshfield
Date	2020-08-27
Time	11:42
Address	1639 Ocean St Marshfield, MA 02050
Facility Type	Police Station
Facility Name	Police Station

## Inspections

### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos









## Animal Sheltet, Animal Shelter

Created	2020-08-26 15:17:26 EDT by EPField 01
Updated	2020-08-26 15:18:51 EDT by EPField 01
Location	42.1117512749778, -70.7124840840697

### General

Client	Town of Marshfield
Date	2020-08-26
Time	15:17
Address	156 Clay Pit Rd Marshfield, MA 02050
Facility Type	Animal Sheltet
Facility Name	Animal Shelter

### Inspections

#### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

Photos





## DPW, Highway Garage

Created	2020-08-27 12:21:16 EDT by EPField 01
Updated	2020-08-27 13:20:50 EDT by EPField 01
Location	42.092022914866, -70.6942336633801

### General

Client	Town of Marshfield
Date	2020-08-27
Time	12:21
Address	35 Parsonage St Marshfield, MA 02050
Facility Type	DPW
Facility Name	Highway Garage

### Inspections

#### Main Inspection

Observed Instance of Non-Conformance	No
--------------------------------------	----

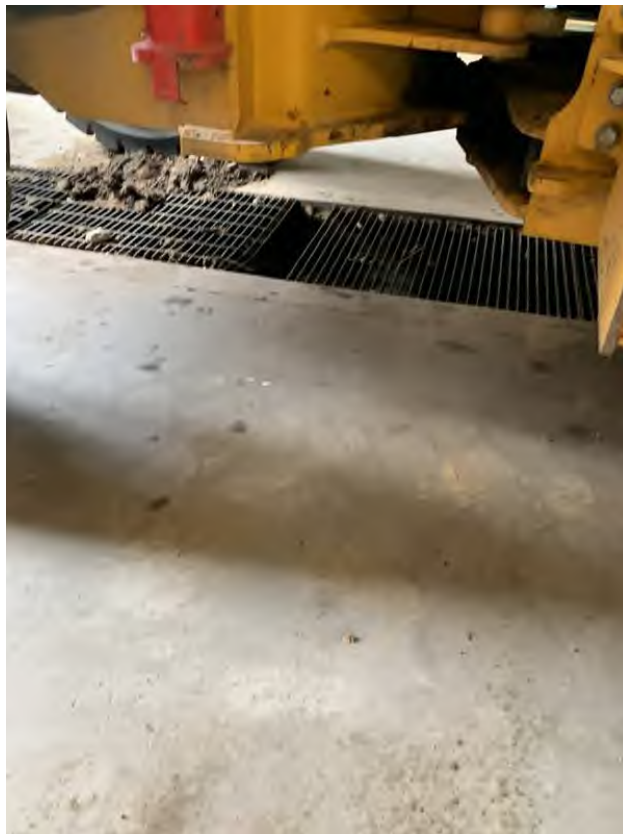
Photos

























Unknown found liquids tank





















## *Appendix C:*

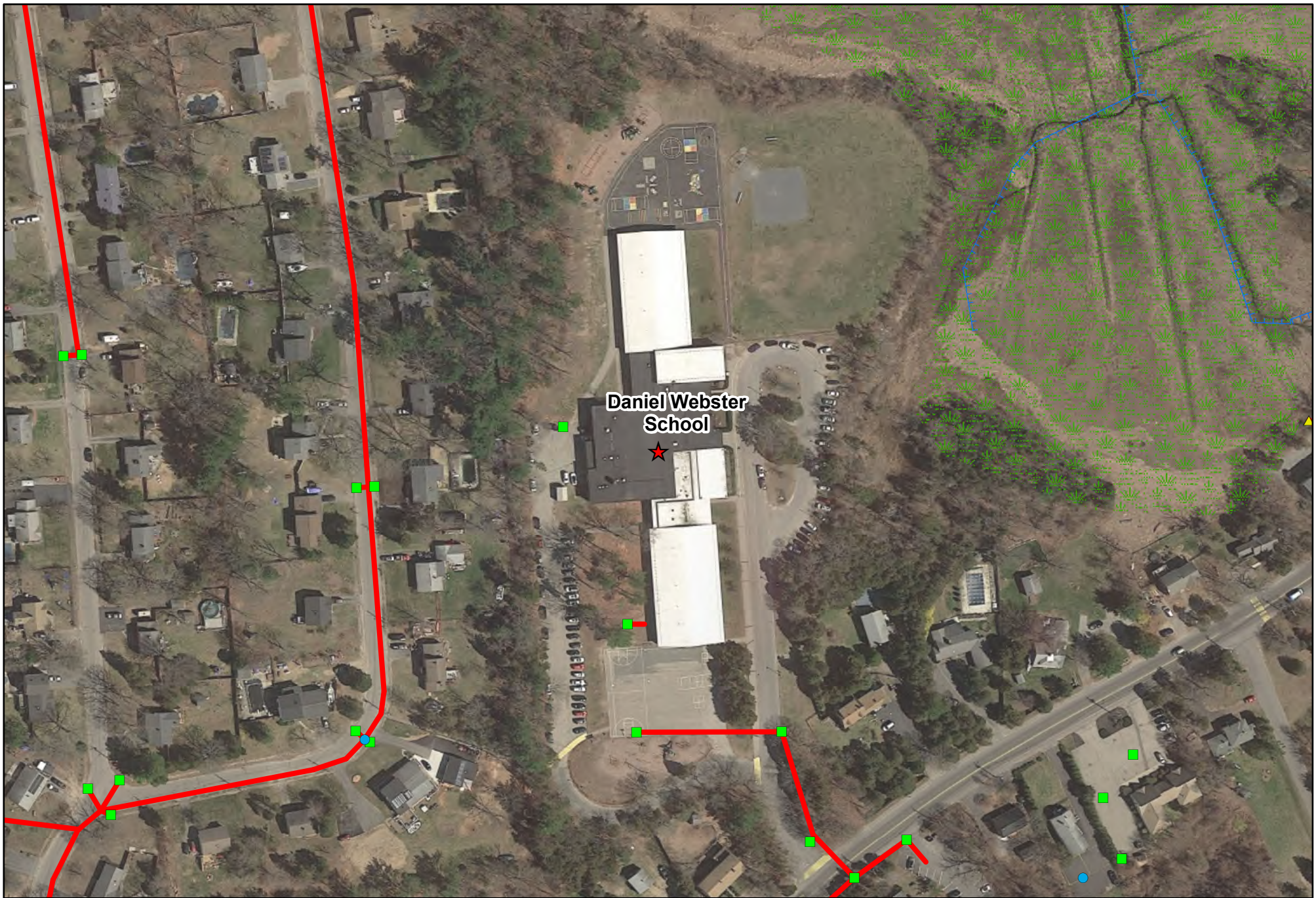
---

### *Facility Figures*









ENVIRONMENTAL  
ep PARTNERS

1 inch = 170 feet  
0 40 80 160 Feet



- Manholes
- Catch Basins
- ▲ Outfalls
- Pipes

Stormwater MS4 Program  
Facility Inspections - 2019  
Daniel Webster School  
Town of Marshfield, MA



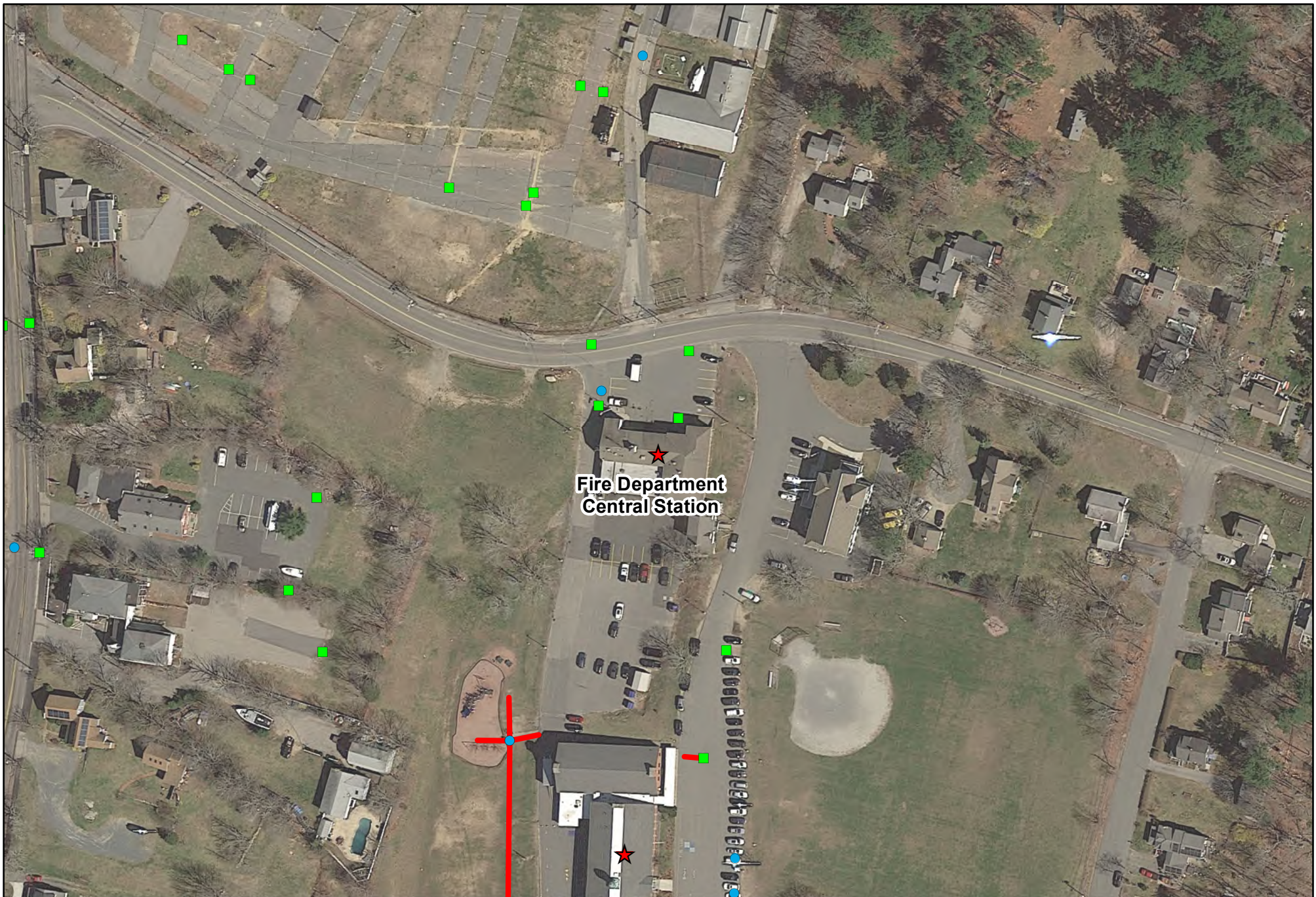












Fire Department  
Central Station

ENVIRONMENTAL  
PARTNERS

1 inch = 130 feet  
0 30 60 120 Feet

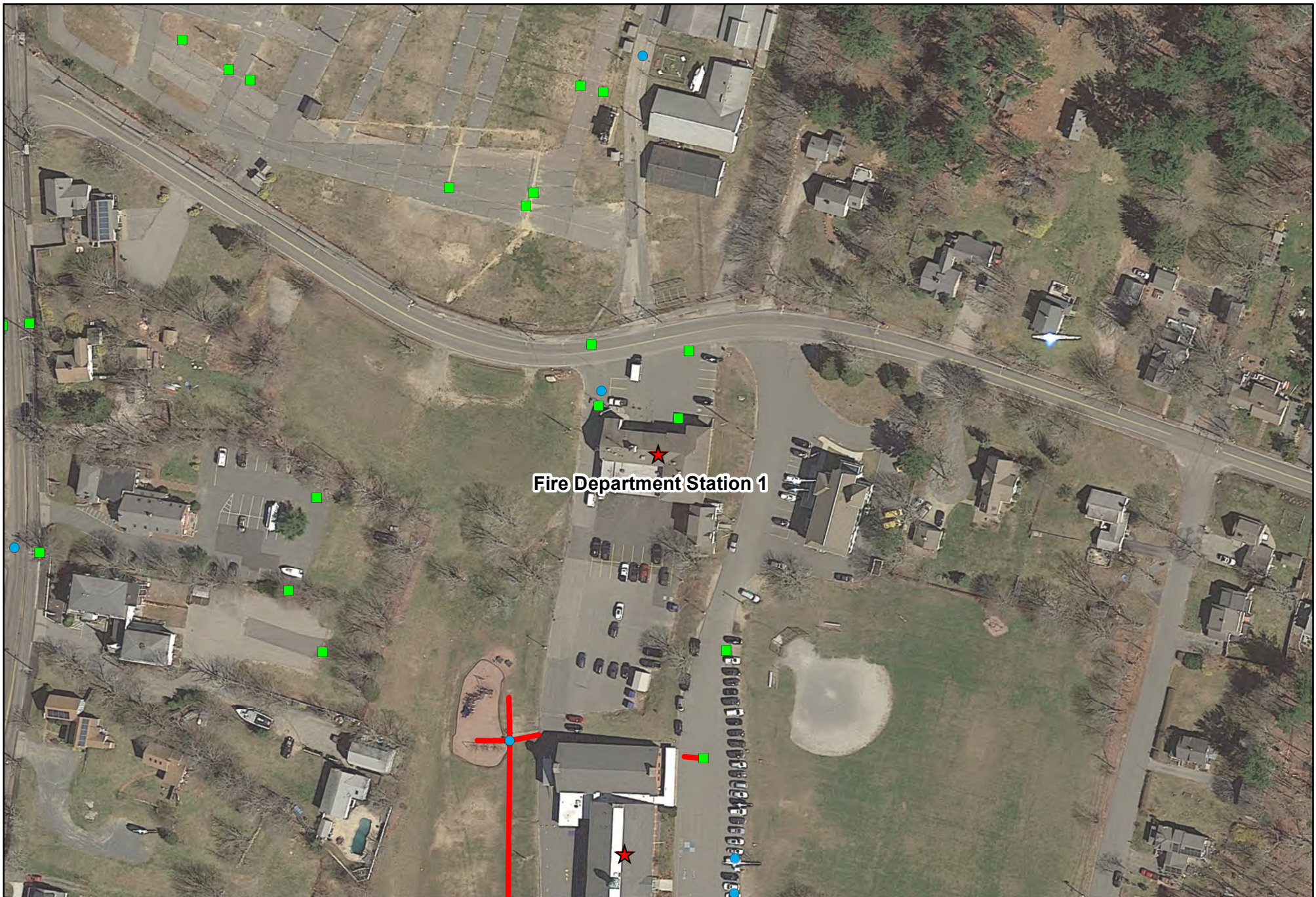


- Manholes
- Catch Basins
- Outfalls
- Pipes

Stormwater MS4 Program  
Facility Inspections - 2019  
Fire Department Central Station  
Town of Marshfield, MA







Fire Department Station 1

ENVIRONMENTAL  
ep PARTNERS

1 inch = 130 feet  
0 30 60 120 Feet

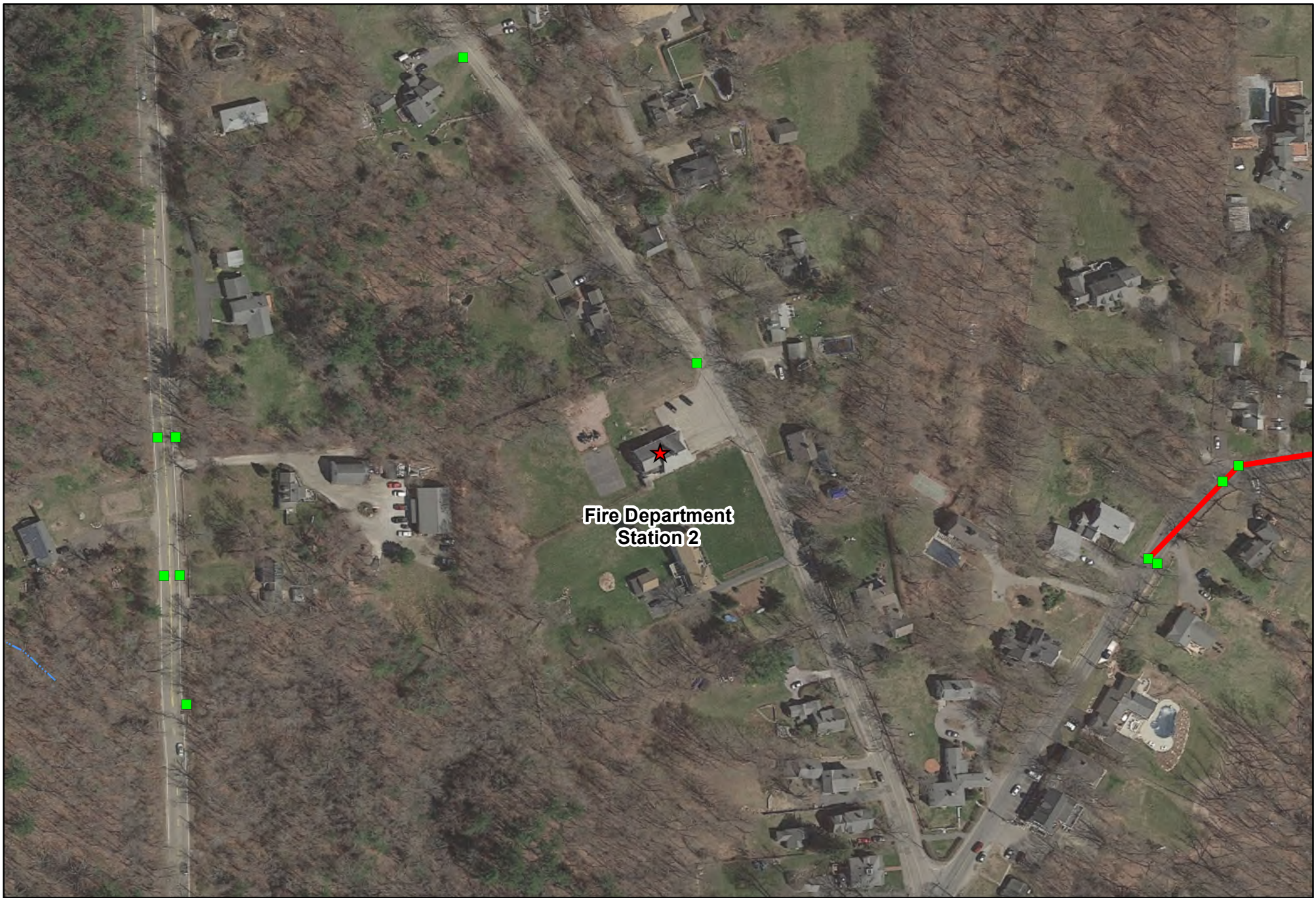


- Manholes
- Catch Basins
- ▲ Outfalls
- Pipes

Stormwater MS4 Program  
Facility Inspections - 2019  
Fire Department Station 1  
Town of Marshfield, MA











ENVIRONMENTAL  
PARTNERS

1 inch = 210 feet  
0 50 100 200 Feet

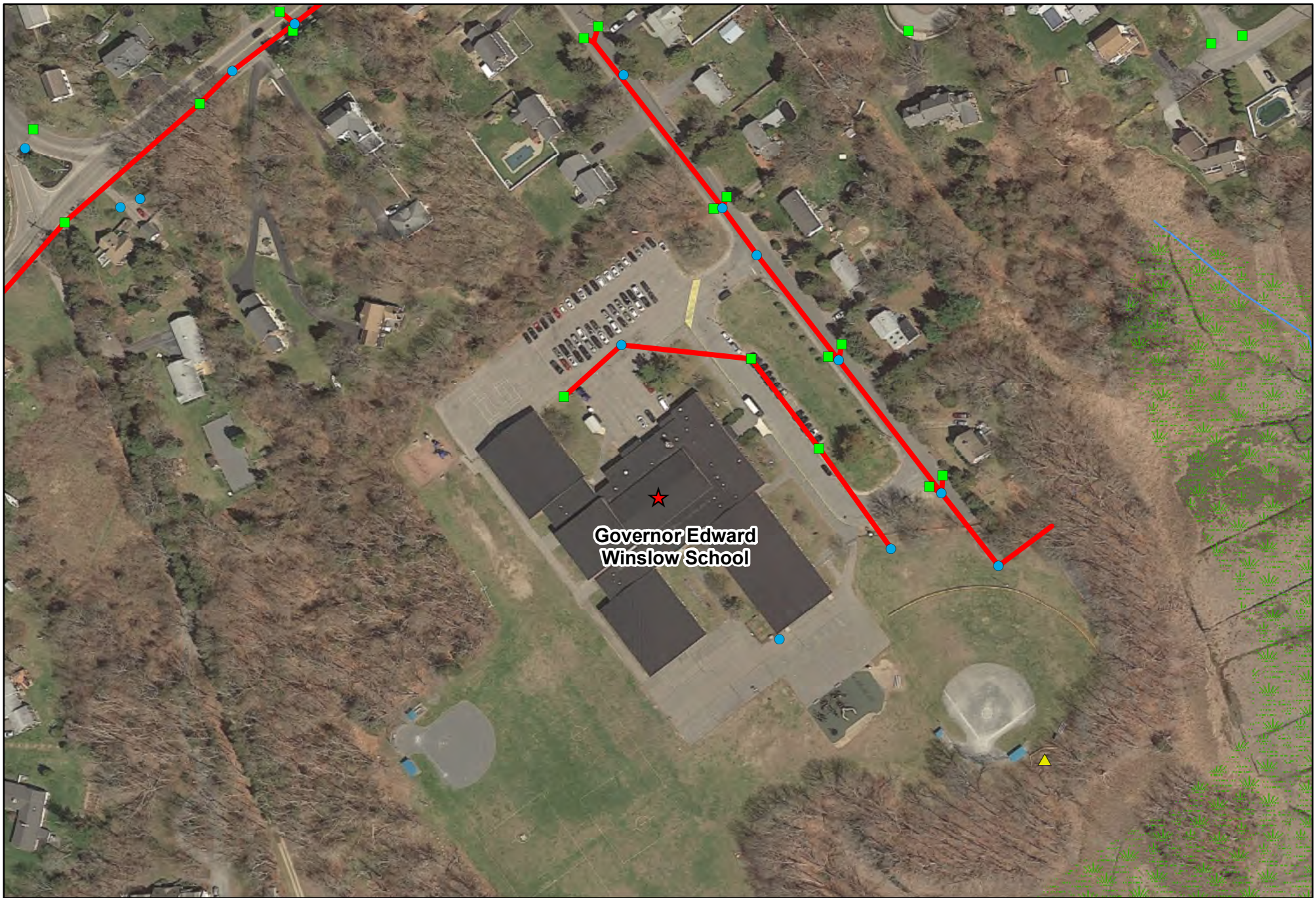


- Manholes
- Catch Basins
- Outfalls
- Pipes

Stormwater MS4 Program  
Facility Inspections - 2019  
Furnace Brook Middle School  
Town of Marshfield, MA







ENVIRONMENTAL  
ep PARTNERS

1 inch = 160 feet  
0 37.5 75 150 Feet



- Manholes
- Catch Basins
- ▲ Outfalls
- Pipes

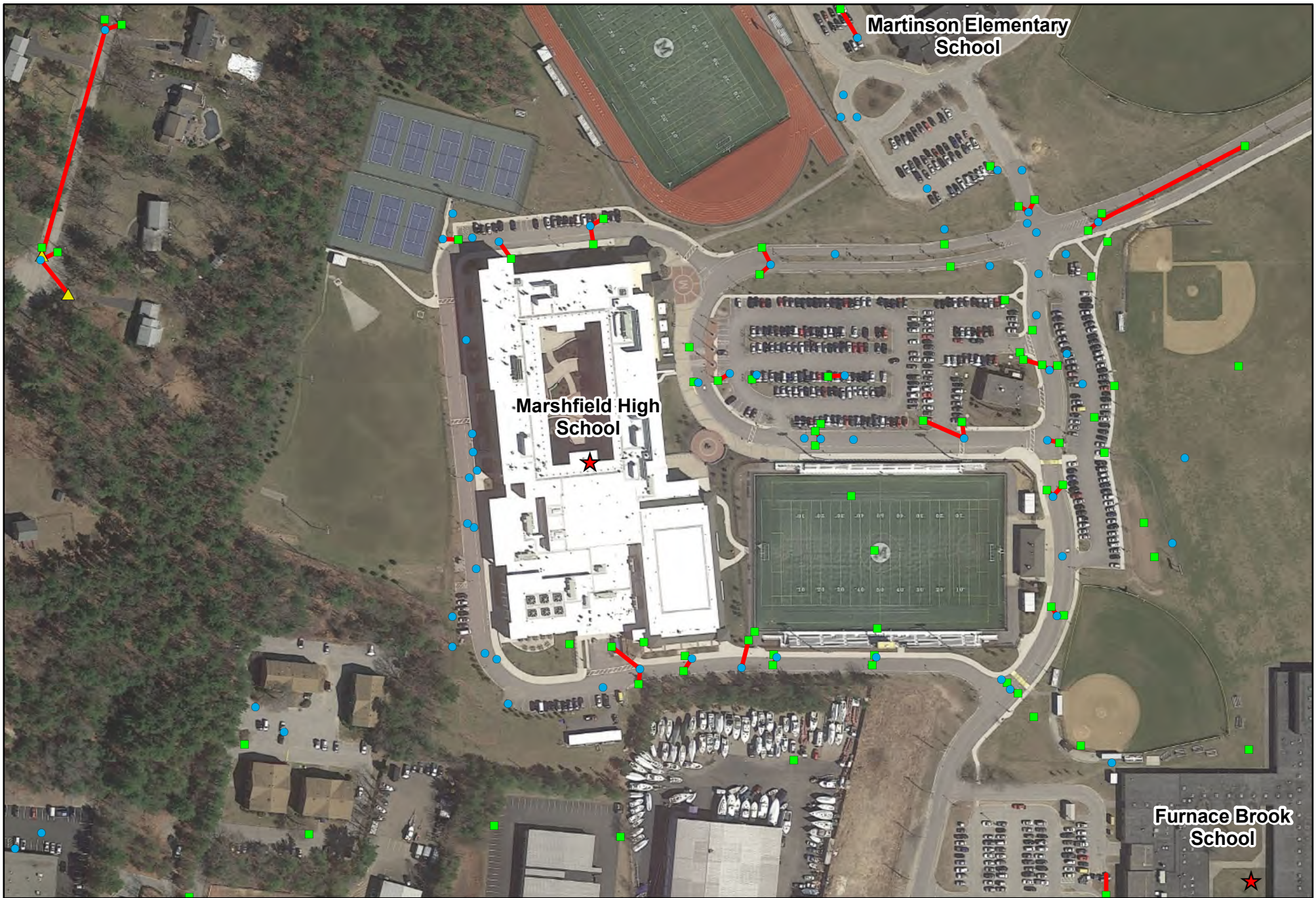
Stormwater MS4 Program  
Facility Inspections - 2019  
Governor Edward Winslow School  
Town of Marshfield, MA











ENVIRONMENTAL  
ep PARTNERS

1 inch = 190 feet  
0 45 90 180 Feet

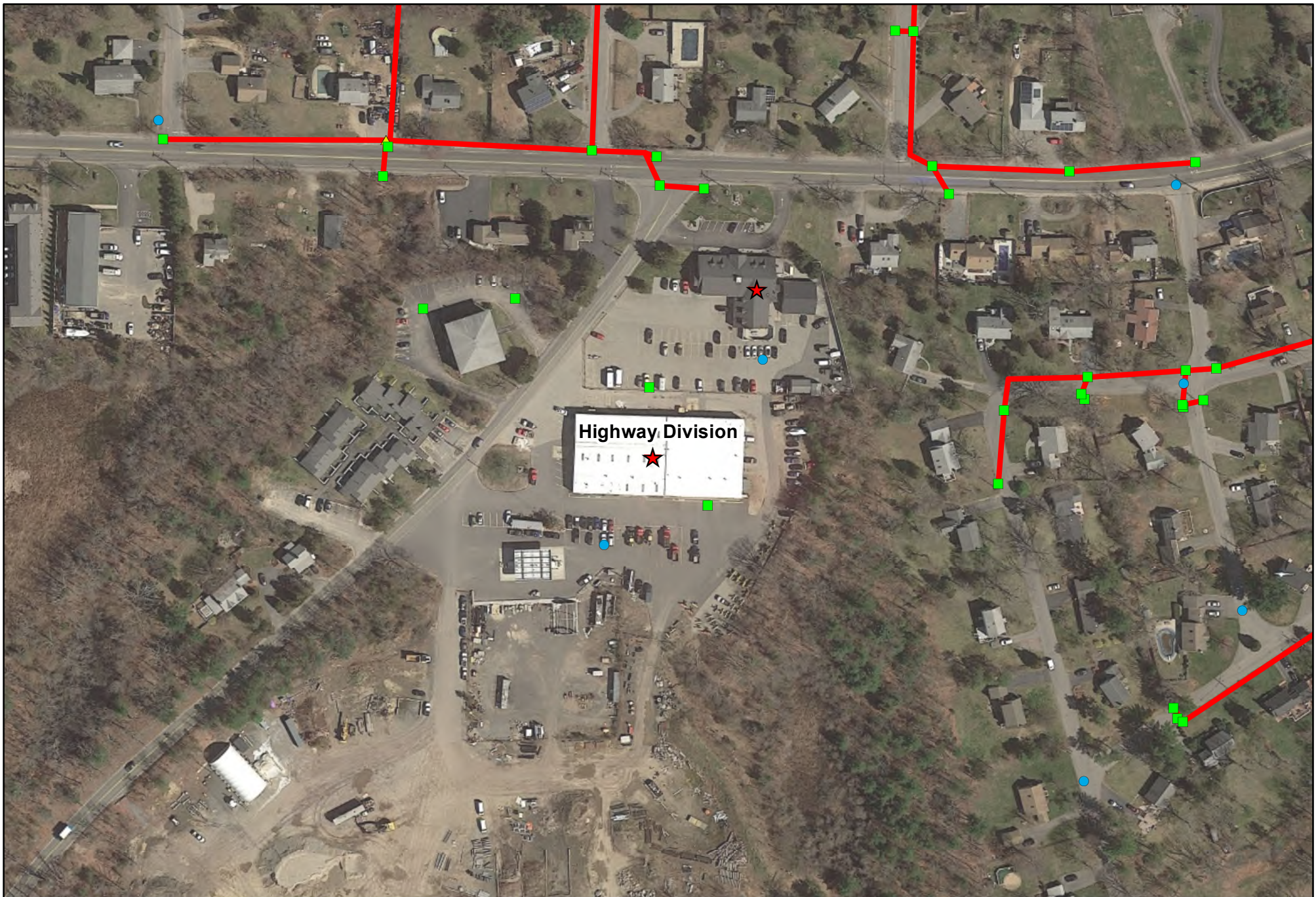


- Manholes
- Catch Basins
- Outfalls
- Pipes

Stormwater MS4 Program  
Facility Inspections - 2019  
Marshfield High School  
Town of Marshfield, MA







ENVIRONMENTAL  
PARTNERS

1 inch = 170 feet  
0 40 80 160 Feet

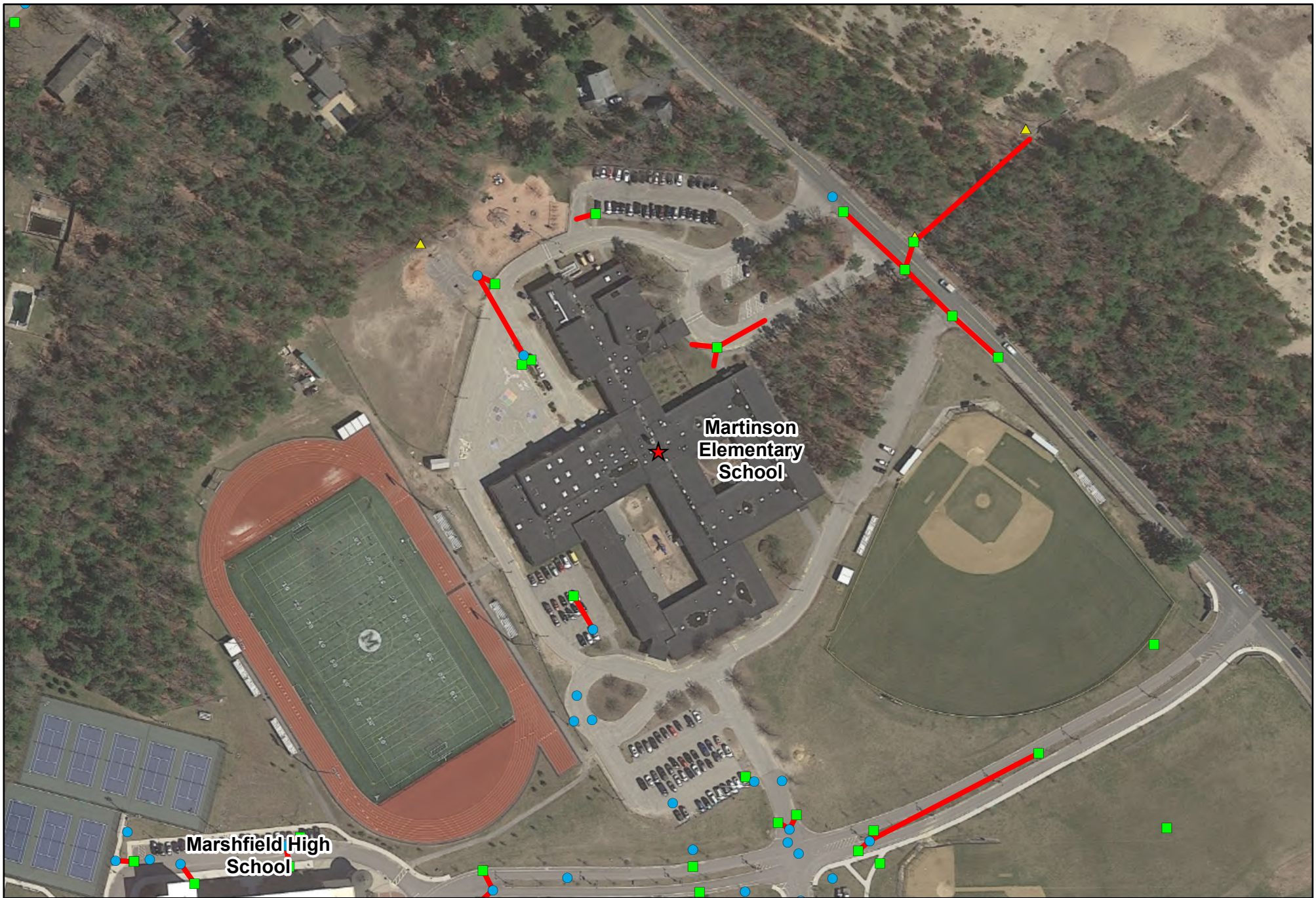


- Manholes
- Catch Basins
- Outfalls
- Pipes

Stormwater MS4 Program  
Facility Inspections - 2019  
Marshfield Highway Division  
Town of Marshfield, MA







ENVIRONMENTAL  
PARTNERS

1 inch = 170 feet  
0 40 80 160 Feet

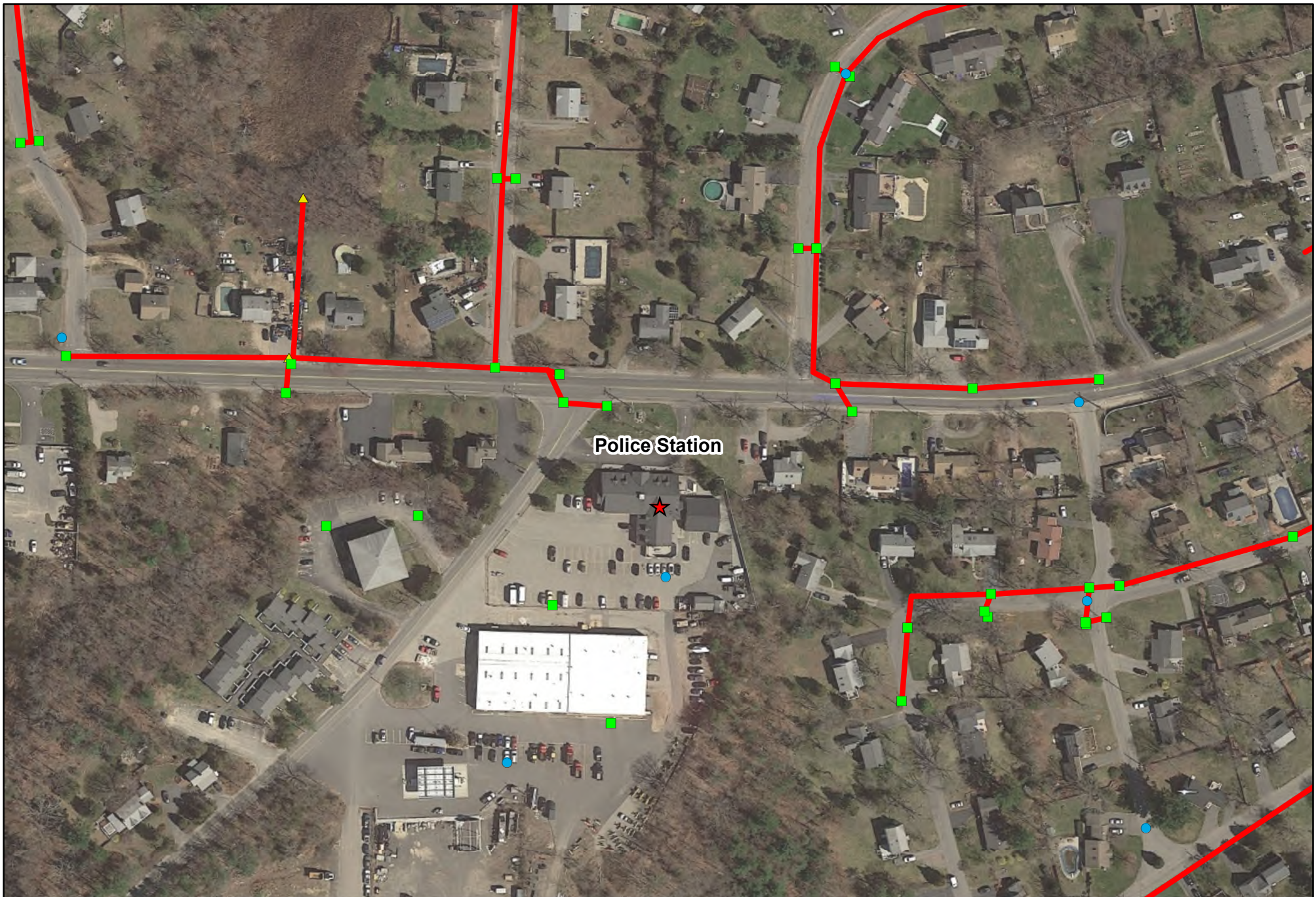


- Manholes
- Catch Basins
- Outfalls
- Pipes

Stormwater MS4 Program  
Facility Inspections - 2019  
Martinson Elementary School  
Town of Marshfield, MA







ENVIRONMENTAL  
PARTNERS

1 inch = 170 feet  
0 40 80 160 Feet



- Manholes
- Catch Basins
- Outfalls
- Pipes

Stormwater MS4 Program  
Facility Inspections - 2019  
Police Department  
Town of Marshfield, MA







Recreation Department

ENVIRONMENTAL  
PARTNERS

1 inch = 170 feet  
0 40 80 160 Feet

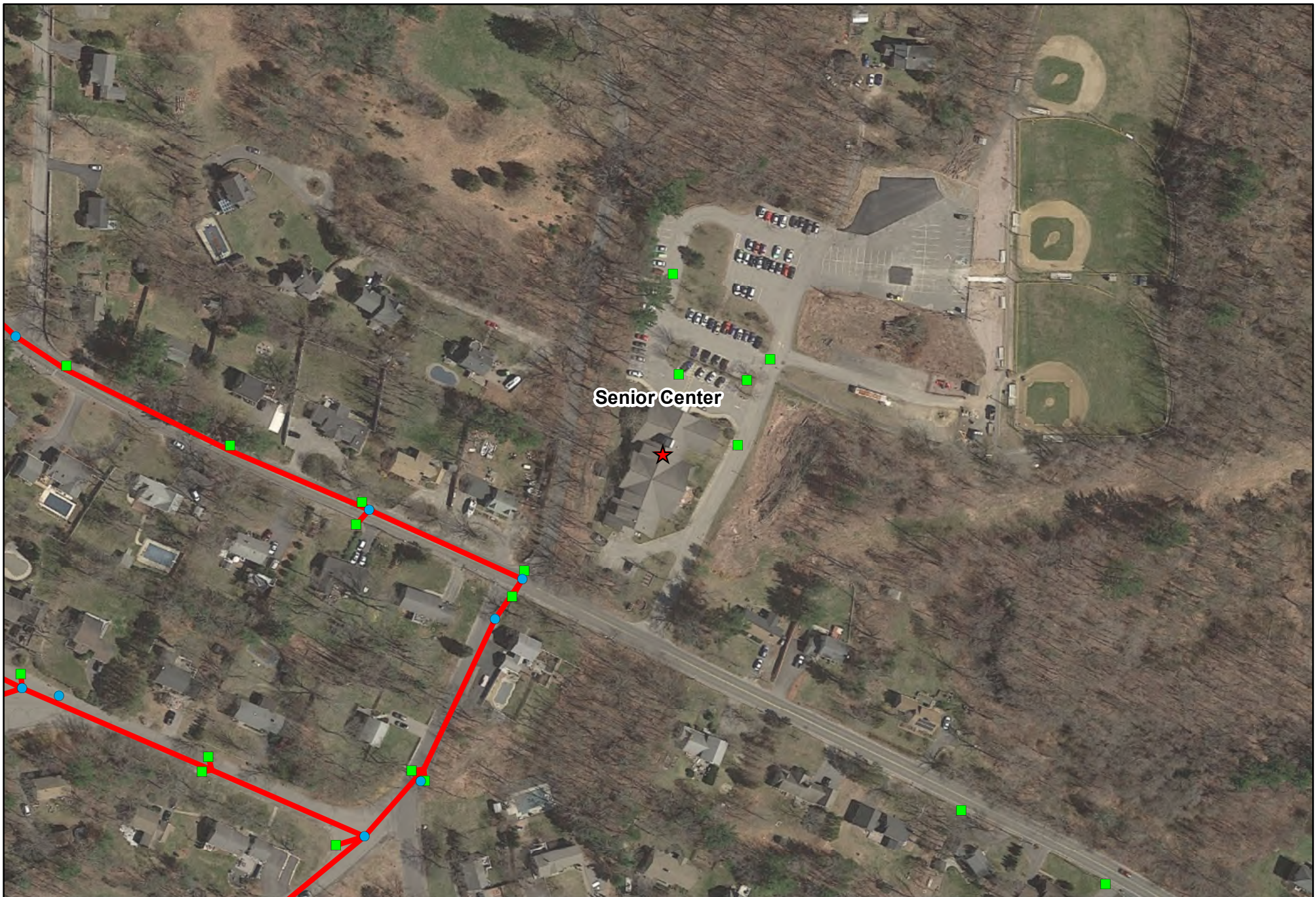


- Manholes
- Catch Basins
- Outfalls
- Pipes

Stormwater MS4 Program  
Facility Inspections - 2019  
Recreation Department  
Town of Marshfield, MA



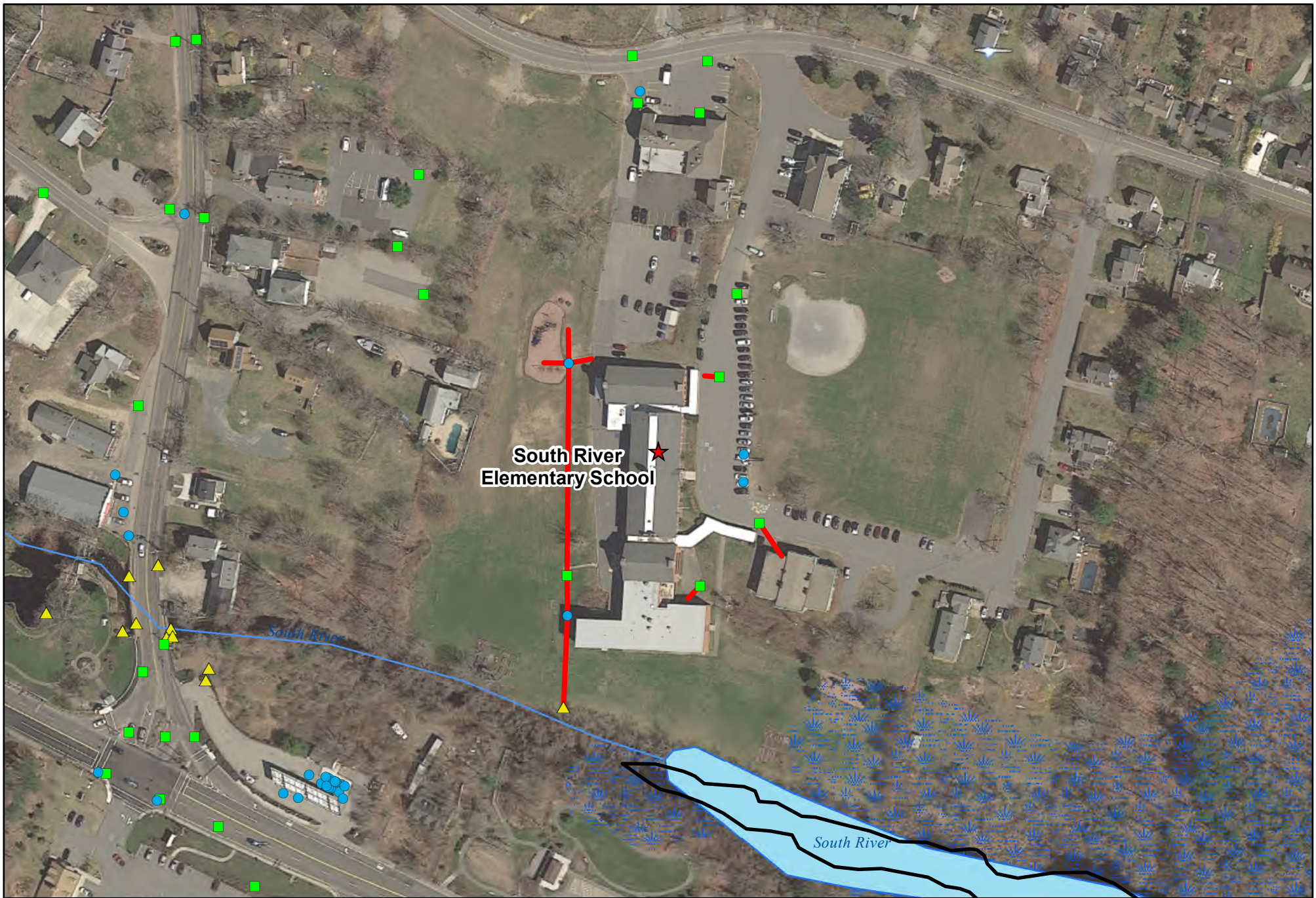




- Manholes
- Catch Basins
- Outfalls
- Pipes







ENVIRONMENTAL  
ep PARTNERS

1 inch = 160 feet  
0 37.5 75 150 Feet



- Manholes
- Catch Basins
- Outfalls
- Pipes

Stormwater MS4 Program  
Facility Inspections - 2019  
South River Elementary School  
Town of Marshfield, MA







ENVIRONMENTAL  
ep PARTNERS

1 inch = 130 feet  
0 30 60 120 Feet



- Manholes
- Catch Basins
- ▲ Outfalls
- Pipes

Stormwater MS4 Program  
Facility Inspections - 2019  
Marshfield Transfer Station  
Town of Marshfield, MA





## *Appendix D:*

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### *A Summary of Requirements for Small Quantity Generators of Hazardous Waste*

**A SUMMARY OF REQUIREMENTS  
FOR  
SMALL QUANTITY GENERATORS  
OF HAZARDOUS WASTE**

**Updated July 2014**

Prepared by:  
Massachusetts Department of Environmental Protection  
Bureau of Waste Prevention  
Business Compliance Division  
1 Winter Street  
Boston, MA 02108  
[www.mass.gov/dep/](http://www.mass.gov/dep/)

## INTRODUCTION

Many essential services, including auto repair and dry-cleaners and institutions, such as schools and hospitals, produce hazardous waste. If you use cleaning solvents, oil, inks, paints, acids, or alkalines, for example, you may be a generator of hazardous waste.

As a generator, it is your responsibility to know your legal obligations under the Massachusetts Hazardous Waste Regulations. Inappropriate handling and disposal of hazardous waste has damaged water supplies and threatened human health. Increasingly, businesses find that meeting the legal requirements is good practice that protects the environment, the equity in their property and their neighbors and employees.

Under the "Superfund" law, you are liable for your hazardous waste and any damage it causes even after it leaves your site and is taken away by a transporter to a treatment, storage or disposal facility. You can be required to contribute to the costs of cleaning up any contamination, resulting from your wastes wherever they end up. It is important, therefore, that you determine how to prevent pollution before it begins.

The cost of waste disposal and liability coverage is escalating. Landfilling of many hazardous wastes is now banned. There are few commercial hazardous waste disposal facilities and their capacity is limited.

Reducing the amount of your hazardous waste may be the most economical and environmentally sound approach to meeting your requirements. Substituting non-hazardous for hazardous products, modifying your process, segregating non-hazardous from hazardous waste streams, recycling your waste and better housekeeping should be key considerations for you.

The Massachusetts Department of Environmental Protection (DEP) regulates all non-households (businesses and institutions) which generate any amount of hazardous waste. Radioactive wastes, unless mixed with hazardous waste, and infectious wastes are regulated by the Massachusetts Department of Public Health as well as by federal agencies.

This brochure is a summary of a portion of the Massachusetts Hazardous Waste Regulations and is organized as follows:

- Classification
- Paperwork
- Housekeeping
- Very Small Quantity Generators



It is designed to help you understand the regulations and will assist you in meeting your legal obligation and avoiding potential penalties. However, it is not a substitute for reading and complying with the full Hazardous Waste Regulations 310 CMR 30.000.

Because Massachusetts requirements are more stringent than the federal requirements, you will be in compliance with federal hazardous waste regulations when you meet the state standards.

The complete regulations are available at cost at the State House Bookstores. You can have them sent to you by calling Boston's bookstore (617) 727-2834, or (413) 784-1376 in Springfield. Ask for the most recent compilation of 310 CMR 30.000.

For a specific fact sheet for your industry, which will provide more detailed information, call the Hazardous Waste Regulatory Program's Compliance Assistance Line at (617) 292-5898.

## CLASSIFICATION

**Determine whether your waste is hazardous** (310 CMR 30.100)

Common hazardous wastes are:

- waste oil
- solvents and thinners
- acids and bases/alkalines
- toxic or flammable paint wastes
- nitrates, perchlorates and peroxides
- abandoned or used pesticides
- some wastewater treatment sludges

There are two ways a waste may be identified as hazardous: it may be **listed** in the regulations (310 CMR 30.131-136) or it may be defined by its hazardous **characteristic** (310 CMR 30.120).

Hazardous waste may be a listed discarded chemical, an off-specification product, or a liquid or solid residue from an operation process, which has one or more of the characteristics below:

- \* **Ignitable** (easily catches fire, flash point 140 F);
- \* **Corrosive** (easily corrodes materials or human tissue, very acidic or alkaline, pH of  $\leq 2$  or  $\geq 12.5$ );
- \* **Reactive** (explosive, produces toxic gases when mixed with water or acid);
- \* **Toxic** (can leach toxic chemicals as determined by a special laboratory test).

Your waste is considered **acutely hazardous** if it is on the list of acutely hazardous wastes (310 CMR 30.136). These wastes are extremely toxic or reactive and are regulated more strictly than other hazardous wastes.

To find out if your waste is hazardous check with:

- \* the supplier of the product (request a material safety data sheet);
- \* laboratories;
- \* trade associations;
- \* consulting engineers;

and verify by reviewing the Massachusetts Hazardous Waste Regulations.

## Determine your generator status and regulatory requirements

Two activities determine your generator category: the *rate* at which you generate and *how much* you store (accumulate). The amount and length of time you can accumulate your wastes will vary according to the type of waste.

A **Large Quantity Generator (LQG)** generates more than 1,000 kilograms (2200 lbs.) of hazardous waste in a month, or more than 1 kilogram of acutely hazardous waste (acutely hazardous waste is listed in the Massachusetts regulations, 310 CMR 30.136). The waste must be shipped within 90 days. There is no limit to the amount which can be accumulated.

A **Small Quantity Generator (SQG)** generates less than 1,000 kilograms in a month, and/or less than 1 kilogram of acutely hazardous waste. The waste must be shipped within 180 days and accumulation is limited to 6000 kilograms in tanks and containers.

A **Very Small Quantity Generator (VSQG)** generates less than 100 kilograms in a month, generates no acutely hazardous waste, and accumulates no more than 1,000 kilograms at any time.

To understand how you are regulated, estimate your maximum monthly volume of waste oil and your maximum monthly volume of all other hazardous waste. The Guide to Determining Status and Regulatory Requirements on page 5 will assist you.

Example:

Your firm generates 55 gallons of spent solvent and 500 gallons of waste oil in a month. According to the Guide (see conversions), you are a Small Quantity Generator (SQG) of hazardous waste because you generate more than 100 kilograms but less than 1000 kilograms, and a Large Quantity Generator (LQG) of waste oil because you generate more than 1000 kilograms. Your regulatory status will be found on the fifth line [SQG/LQG].

Reading across, you may accumulate your solvent for as long as 180 days, or until you have reached a volume of 6000 kilograms (1500 gallons) (see page 10), whichever happens first. You must ship your waste oil every 90 days, regardless of the volume. You must obtain an EPA Identification Number and use a manifest for both wastes. You must manage your waste according to the accumulation area standards on page 8 and you must fulfill the emergency preparation and response requirements on page 11. You are not required to file an annual report or a contingency plan or provide full personnel training, which is necessary for large generators of hazardous waste.



This matrix does not reflect ACUTELY Hazardous waste

Regulatory Status		Hazardous Waste Management Accumulation Limits		Waste Oil Management Accumulation Limits		Transport Requirements		Management Requirements		
Hazardous Waste	Waste Oil	Time (Days)	Volume in Tanks and Containers (kg)	Time (Days)	Volume in Tanks and Containers (kg)	Must Use Manifest	May Self Transport Haz Waste and/or Waste Oil	Accumulation Area Standards	Emergency Preparation	Personnel Training & Contingency Plans & Biennial Rpt
NOTIFICATION TO EPA	LQG	LQG	90	NO LIMIT	90	NO LIMIT	YES		YES	YES
	LQG	SQG	90	NO LIMIT	180	6000	YES		YES	YES
	LQG	VSQG	90	NO LIMIT	NO LIMIT	1000	YES*	YES <sub>(WO)</sub>	YES	YES
	LQG	NONE	90	NO LIMIT	N/A	N/A	YES		YES	YES
	SQG	LQG	180	6000	90	NO LIMIT	YES		YES	YES
	SQG	SQG	180	6000	180	6000	YES		YES	YES
	SQG	VSQG	180	6000	NO LIMIT	1000	YES*	YES <sub>(WO)</sub>	YES	YES
	SQG	NONE	180	6000	N/A	N/A	YES		YES	YES
	VSQG	LQG	NO LIMIT	1000	90	NO LIMIT	YES*	YES <sub>(HW)</sub>	YES	YES
	NONE	LQG	N/A	N/A	90	NO LIMIT	YES		YES	YES
TO DEP	VSQG	SQG	NO LIMIT	1000	180	6000	YES*	YES <sub>(HW)</sub>	YES	YES
	VSQG	VSQG	NO LIMIT	1000	NO LIMIT	1000	YES*	YES	YES	
	VSQG	NONE	NO LIMIT	1000	N/A	N/A	YES*	YES	YES	
	NONE	SQG	N/A	N/A	180	6000	YES		YES	YES
	NONE	VSQG	N/A	N/A	NO LIMIT	1000	YES*	YES	YES	

\* - A manifest must be used for the VSQG category unless self transported.

Definitions:	<u>Regulatory Status</u>	<u>Kilograms/ Month (Generation)</u>	Conversions::	<u>Kilograms</u>	<u>Pounds</u>	<u>Gallons (varies by substance)</u>
	LQG	1000 OR MORE		100	220	25-27
	SQG	100-999		1000	2200	250-270
	VSQG	LESS THAN 100		6000	13200	1500-1620

## PAPERWORK

### **The Manifest (310 CMR 30.310)**

As a generator you always retain responsibility for your hazardous waste. If your waste is dumped or disposed of improperly, you can be held responsible. It is therefore important that you know where your waste is going and that it is handled properly and safely.

Federal law (the Resource Conservation and Recovery Act of 1976, known as RCRA) requires a national 'cradle to grave' tracking system for hazardous waste. In Massachusetts, every shipment of hazardous waste by a large or small generator must be transported by a licensed hauler and sent to a licensed treatment, storage or disposal facility (TSDF) or a permitted recycling facility and must be accompanied by a shipping document, called the Uniform Hazardous Waste Manifest.

You are responsible for completing the generator portion of the manifest. Directions for the distribution of the copies are on the back of the manifest. A copy will be returned to you when the facility has accepted your shipment.

If you do not receive a copy of the manifest from the receiving facility within 35 days of the date when your waste was shipped, you should contact your transporter or the operator of the facility to determine the status of your waste. If you have still not received the manifest within 45 days, you must file an Exception Report, explaining the efforts you've taken, with the DEP's Business Compliance Division and with the state where the designated facility is located.

If you are shipping hazardous waste directly to an out-of-state designated facility, you must submit a photocopy of Copy 3 to the Department within 30 days of receiving your copy from the designated facility.

Note the generator's certification statement on your manifest, which you must sign:

*"If I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford."*

All generators must keep copies of all manifests, any records of tests and analyses done of their hazardous waste, and records of waste determinations (including any determinations that their wastes are not hazardous) for at least three years, and for the duration of any enforcement action.

### **The EPA Identification Number (EPA ID) (310 CMR 30.303)**

As a Small Quantity Generator of Hazardous Waste, to have your waste accepted by a licensed hauler or treatment/storage facility, you will need to obtain a federal Identification Number. The Environmental Protection Agency (EPA) will assign a 12-digit number, such as **MAR999999999**, which is unique for your location. Enter this number in Block **1** on each manifest.

In order to get an EPA ID, call DEP (617-338-2255 or 1-800-462-0444, outside the 617 area code) or go to <http://www.mass.gov/dep/bwp/dhm/files/hwepaid.pdf> for an application. Mail the completed application to the office listed in the instructions. Your number will be mailed to you within a few months. While you are waiting for your ID, you can use a temporary ID beginning with the letters MP, followed by your 10-digit telephone number.

The ID number is site-specific. You are required to notify the Bureau of Waste Prevention in your DEP Regional office of any change in your address, name of company, contact person or generator status. (See listing of towns by DEP Region on the back page.)

### **Shipping Your Hazardous Waste (310 CMR 30.304, 30.305)**

All hazardous waste must be transported in containers that are labeled with the words HAZARDOUS WASTE, the name of the waste, type of hazard (e.g., toxic, flammable), generator's name, address and EPA ID number. Refer to the container standards described on page 8.

A list of licensed transporters is now available on DEP's Website at [www.mass.gov/dep/](http://www.mass.gov/dep/) under the Bureau of Waste Prevention: you may also call DEP at (617) 292-55576. Transporters may assist you in preparing your waste for shipment.

### **Annual Compliance Assurance Fee (310 CMR 4.03)**

All Small Quantity Generators of hazardous waste<sup>\*</sup> are billed an annual compliance fee of \$645 to cover costs of the services provided by the Department. These services include, but are not limited to, notification processing, compliance inspection, compliance assistance hot line, and information services.

As a Small Quantity Generator of hazardous waste you must notify the Department if you intend to cancel or modify your registration in any way. Any changes to your generator status must be received by the Department before July 1 to change your annual compliance fee for the upcoming fiscal year.

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<sup>\*</sup> Small Quantity Generators of waste oil only are not subject to the fee.



## HOUSEKEEPING

### Accumulation Area Standards (310 CMR 30.351[8])

Your accumulation or storage area must meet the following conditions for both containers and tanks. (**VSQG** indicates VSQG's are also required to meet the standard.)

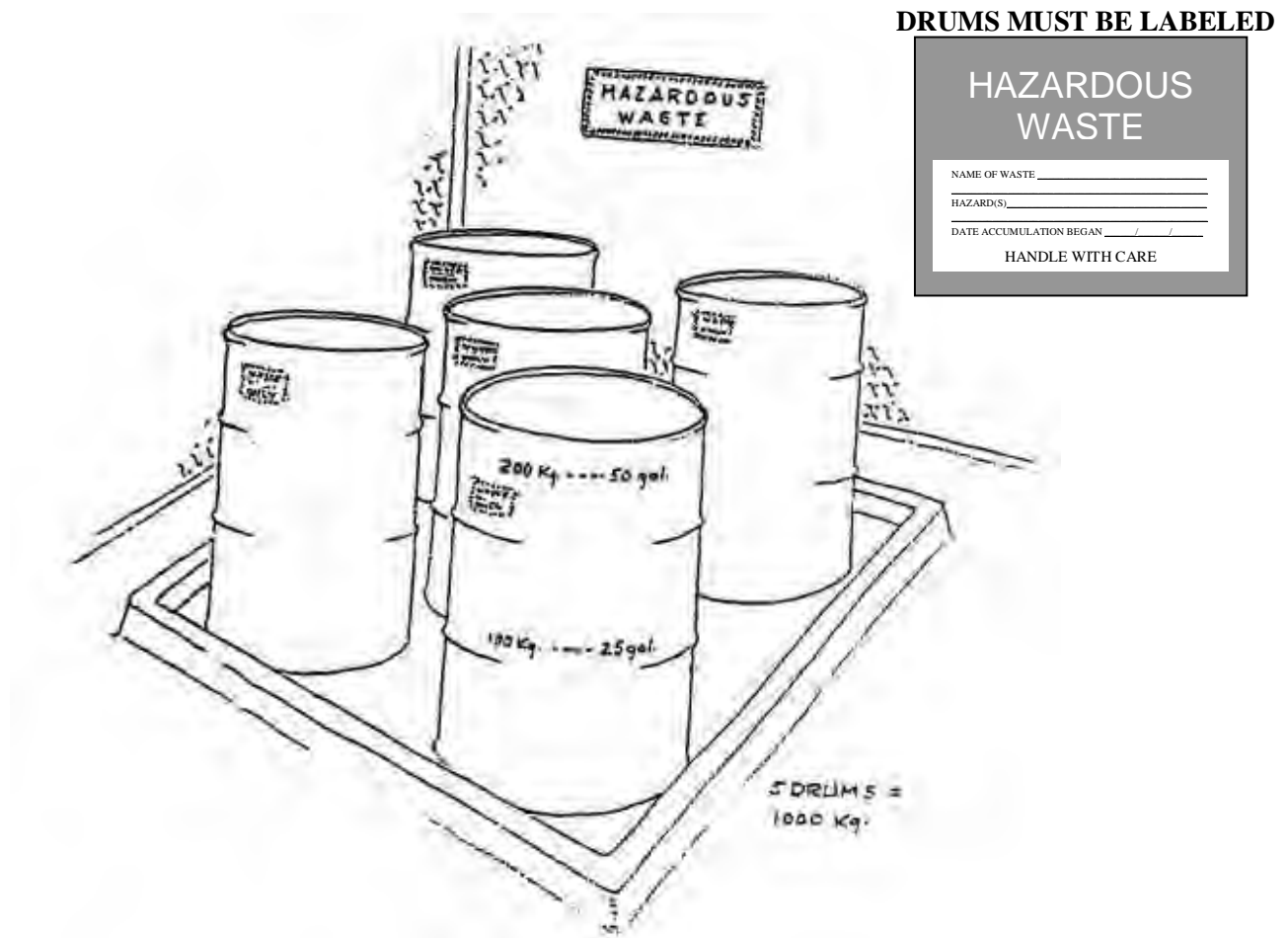
- VSQG**      • Above-ground tanks and containers must be on a surface which does not have any cracks or gaps and is impervious to the hazardous wastes being stored and on pallets if containers are stacked;
- VSQG**      • Area must be secured against unauthorized entry;
- VSQG**      • Area must be clearly marked (e.g., by a visible line or tape, or by a fence) and be separate from any points of generation;
- VSQG**      • Area must be posted with a sign: "HAZARDOUS WASTE" in capital letters at least one inch high;
- VSQG**      • An **outdoor** area must have secondary containment, such as a berm or dike, which will hold any spill or leaks at:
  - 10% of the total volume of the containers, or
  - 110% of the volume of the largest container, whichever is larger.Any spillage must be promptly removed.

(In general, if the hazardous waste being stored has no free liquids, no pad or berm is required, provided that the accumulation area is sloped, or the containers are elevated.)

### Standards for Containers and Tanks [310 CMR 30.341(2), 30.680, 30.690]

- VSQG**      • Each container and tank must be clearly and visibly labeled throughout the period of accumulation with the following:
  - the words "HAZARDOUS WASTE:
  - the name of the waste (e.g., waste oil, acetone)
  - the type of hazard(s) (e.g., ignitable, toxic)
- SQG ONLY**      - date on which accumulation began.
- VSQG**      • Each container must be in good condition

- VSQG**
- Wastes of different types must be segregated. This includes not mixing waste oil or used fuel oil with other wastes. Be careful not to put incompatible wastes in the same container or put wastes in unwashed containers that previously held incompatible wastes.
- VSQG**
- Separate containers of incompatible wastes by a berm, dike, or similar structure.
- VSQG**
- Each container holding hazardous wastes must be tightly closed throughout the period of accumulation, except when the waste is being added or removed.
  - Containers holding ignitable or reactive wastes must be at least 15 meters (50 ft.) from the property line. If this is not possible or practical, you must store such containers in compliance with all applicable local ordinances and by-laws.
  - Inspect your accumulation area at least once a week for any leaking or deterioration of your containers. You must have enough aisle space between your containers to allow for inspections.



### **Accumulation Time Limits (310 CMR 30.351[5])**

As a small quantity generator (SQG), you may accumulate up to 6000 kgs (1500-1620 gallons) in containers and *tanks* for as long as 180 days. You have two upper limits - time and volume. Whichever is reached first determines the date on which you must ship your waste.

### **Satellite Accumulation (310 CMR 30.351[4])**

Additional flexibility is offered by allowing you to accumulate up to 55 gallons of hazardous waste (per wastestream), or one quart of acutely hazardous waste, at each point where you generate your waste, if you meet the following conditions:

- The waste must be generated from a process at the location of the satellite accumulation;
- Each satellite accumulation area can have only one container for each waste stream in use at a time;
- Each satellite accumulation area must be managed by the person who is directly responsible for the process producing the waste;
- The waste must be moved to the main designated accumulation area within three days after the container is full.

### **Accumulation of Waste Oil in Underground Tanks (including those resting directly on the ground) [310 CMR 30.253(1)(g)]**

All underground tanks must have tight caps, leak detection devices and cathodic protection with an overflow and spill prevention device by December 22, 1998.

- Tanks must have continuous leak detection capability through an in-tank monitoring device or be double-walled.
- Keep a log of all test results, beginning and ending measurements, variation and average figures, for at least 3 years.
- Report a difference of a month's average greater than 5 gallons (for tanks containing 550 gallons or less) to your DEP regional office.



## **EMERGENCY PREPARATION AND RESPONSE (310 CMR 30.351(9))**

### **Equipment**

To minimize the risk of fire, explosion, or release of hazardous wastes that may contaminate the environment, you are required to have on site, and immediately accessible to your hazardous waste handling area, the following (unless the hazards posed by your wastes do not require one of them):

- \* an alarm or communication system which can provide emergency instruction to employees;
- \* a telephone, two-way radio or other device which can summon police, fire or emergency response teams;
- \* portable fire extinguishers and/or fire control equipment (e.g. foam, inert gas), and spill control/decontamination equipment;
- \* adequate supply and pressure of water, automatic sprinklers or water sprays, or foam-producing equipment.

All your equipment must be periodically tested and properly maintained so it will work during an emergency.

### **Prepare Your Employees**

You must thoroughly familiarize each of your employees with all the waste handling and emergency procedures that may be needed for each of their jobs. An employee must have immediate access to alarm or communication devices, either directly or through another employee, whenever hazardous waste is being handled. If your operation is at any time being handled by a single employee, that person must have immediate access to a telephone or two-way radio.

For easy movement of employees and emergency equipment, you must maintain adequate aisle space in the area of hazardous waste handling. Mark all exits clearly.

### **Notify Local Authorities**

You must make every reasonable attempt to carry out the following arrangements, in regards to the waste you produce:

- \* Familiarize your police department, fire department, local boards of health, and any emergency response teams with the hazardous nature of your waste; the layout of your site, including entrances and evacuation routes, and the location where your employees usually work;
- \* Familiarize local hospitals with the hazards of your waste and the types of injuries that could result from any accidents;
- \* Obtain agreements with emergency response teams and contractors, and local boards of health;
- \* If more than one police and/or fire department might respond to an emergency, make an agreement with the department which will have primary emergency authority and specify others as support.

If such arrangements cannot be made, a copy of a signed and dated letter which demonstrates an effort to make these arrangements from you, the generator, to the state or local entity will be considered sufficient.

### **Emergency Coordinator**

You must designate at least one employee to be on call (or on the premises) at all times. This person is the emergency coordinator and is responsible for coordinating all emergency response measures.

### **Emergency Response**

You must have posted next to each telephone near your waste generation area the following:

- \* name(s) and telephone number(s) of your emergency coordinator(s);
- \* location(s) of the fire control equipment and any fire alarms;
- \* telephone number of the fire department, or if there is a direct alarm system, instructions on how to use it;
- \* evacuation routes, where applicable.

**If any of the following emergencies occur:**

Fire - attempt to extinguish the fire and/or call the fire department;

Spill or leak - contain the flow as quickly as possible and as soon as is practical, clean up the waste and any soil or other materials which may have become contaminated with waste;

A release (spill or leak) or threat of release, fire or explosion of hazardous waste that may threaten human health or the environment

- Call the appropriate DEP Regional Office (see page 17) and ask for Emergency Response, or the Central Boston office at (617) 556-1133 or (888) 304-1133.

and

- Call the National Response Center's 24-hour toll-free number (1-800-424-8802).



## **VERY SMALL QUANTITY GENERATOR (VSQG) (310 CMR 30.353)**

### **Registration**

If you generate less than 100 kgs a month of hazardous waste, and no acutely hazardous waste, you are eligible to register as a Very Small Quantity Generator (see page 5 for the generation and accumulation limits). To qualify as a Very Small Quantity Generator you must register with DEP (see page 16).

**Housekeeping Requirements** (see pages 8 and 9 for VSQG identified lines)

### **Treatment/Disposal Options**

As a registered VSQG you have the following options for handling your waste:

You may recycle or treat your waste, provided the process you describe in your registration is acceptable to DEP;

You may transport your waste to another generator who is in compliance with the regulations and who will count your waste as part of their generation;

You may transport your waste in your own vehicle to a licensed treatment, storage or disposal facility, or permitted recycling facility, by pre-arrangement;

You may use a licensed transporter and a manifest form. Use of the manifest requires an ID number. (VSQG's and SQG's of waste oil use a number beginning with the letters MV followed by their 10-digit telephone number.)

### **Self-Transport Option**

As a registered VSQG you may transport your own hazardous waste under the following conditions:

You transport only the waste that you generated on your premises;

You do not transport more than 200 kgs at one time;

## **VSQG (cont.)**

Your waste is in containers that are:

- no larger than 55 gallons in volume
- compatible with the waste
- tightly sealed
- labeled as "HAZARDOUS WASTE"
- labeled with the name of the waste and the type of hazard
- tightly secured to the vehicle

You do not transport incompatible wastes in the same shipment;

In the event of a spill or leak of hazardous waste that may threaten human health or the environment you notify DEP or the State Police and the National Response Center, as described on page 13;

You must have a copy of your registration with DEP in the vehicle;

You must be in compliance with federal Department of Transportation (617-494-2770) and Massachusetts Department of Public Safety (978-567-3300) requirements.

### **Record-keeping**

If you are not using a licensed transporter but are transporting your own wastes, you do not need a manifest form. You must, however, keep a record of the type and quantity, as well as the date, of the transport and treatment or disposal of your waste. You will need proof of the receipt of the waste by the facility or generator.

You must keep receipts or manifests of waste shipped and records of waste analysis for at least 3 years, or for the duration of any enforcement action by DEP.

### **Accumulation Limits**

You may accumulate up to 1000 kgs (approximately 270 gallons or five 55 gallon drums) of hazardous waste in containers that meet the standards on pages 8-9 with no time limit.

**There is no annual compliance assurance fee for Very Small Quantity Generators.**

## STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODES

### Automotive Industry

5013 Auto parts/supplies  
 7512 Autobody shops  
 7549 Automotive repair services  
 5511 Car dealers, new & used  
 7542 Car washes  
 7699 Engine repair  
 5541 Gasoline service stations  
 7538 General auto & truck repair  
 4231 Motor freight terminals  
 371 Motor vehicles & equipment  
 5093 Scrap & waste dealers  
 4214 Trucking & storage

### Construction, Building Trades

2951 Asphalt paving manufacture  
 1521 Building contractor (single family)  
 7349 Building maintenance  
 1751 Carpenter, cabinetmaker  
 1731 Electrical contractor  
 8711 Engineering, architecture  
 1749 Excavating contractor  
 1752 Floor laying  
 154 General contractor (non-residential)  
 162 Heavy construction contractor  
 1721 Painting, paper hanging  
 1611 Paving contractor  
 1711 Plumbing, heating  
 1761 Roofing  
 1442 Sand & gravel

### Educational Institutions

8221 Colleges & universities  
 8211 Elementary & secondary schools  
 8412 Museums  
 8922 Non-commercial educational scientific & research organizations  
 8249 Vocational schools

### Food Industry (Retail)

5461 Bakery products  
 5451 Dairy products

### Machine shops/metal fabrication

3362 Brass, bronze & copper castings  
 3432 Brass goods/plumbing fixtures  
 3471 Electroplating, anodizing  
 3431 Enameled iron & metal ware  
 3499 Fabricated metal products  
 344 Fabricated structural metal  
 346 Forgings & stamping  
 3429 Hardware  
 3569 Heavy equipment  
 391 Jewelry silverware, plated ware  
 3544 Job shops, tool & die  
 355 Machinery  
 3412 Metal barrels, drums  
 3398 Metal heat treating  
 3451 Screw machine products  
 3444 Sheet metal work  
     333 Smelting – non-ferrous metals  
     334 7692 Welding

### Manufacturing

362 Electric appliances (industrial)  
 2851 Paints, varnish  
 2621 Paper mills  
 2821 Plastics, liquid resins  
 367 Printed circuit boards, semiconductor  
 243 Wood products, mill work

### Medical Services

8021 Dentists  
 8060 Hospitals  
 8071 Medical & X-ray laboratories  
 8011 Physicians  
 8731 Research laboratories  
 074 Veterinarians

### Municipal Services

9224 Fire  
 9221 Police  
 9229 Public works  
 4953 Refuse, landfills

### Other Services

7623 Air conditioning repair  
 764 Antiques repair  
 8999 Art restoration  
 7231 Beauty salons  
 4493 Boat yard  
 7699 Cesspool cleaning  
 7342 Disinfecting  
 7216 Dry cleaning  
 7641 Furniture stripping  
 078 Landscaping, horticultural  
 7389 Miscellaneous business services  
 5983 Motor oil retailer  
 7512 Paint shops  
 1611 Paving contractor  
 722 Photographers  
 4311 Postal, U.S.  
 5093 Scrap & waste dealers  
 4171 Transportation (bus)  
 448 Transportation (water)

### Printing Industry

7334 Blueprinting, photocopying  
 2731 Book publishing  
 2754 Commercial gravure  
 2752 Lithographic printing  
 2711 Newspaper publishers  
 2721 Periodical publishers  
 2793 Photoengraving  
 7384 Photofinishing laboratories  
 226 Screenprinting





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