APPENDIX K YEAR 2 UPDATES

DRAFT Illicit Discharge Detection and Elimination (IDDE) Plan

Hanover, MA

June 2019





A partnership for engineering solutions

Certification

Authorized Representative (Optional): All reports, including SWPPPs, inspection reports, annual reports, monitoring reports, reports on training and other information required by this permit must be signed by a person described in Appendix B, Subsection 11.A or by a duly authorized representative of that person in accordance with Appendix B, Subsection 11.B. If there is an authorized representative to sign MS4 reports, there must be a signed and dated written authorization.

The authorization letter is:

Attached to this document (document name listed below)

□ Publicly available at the website below

"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	ANN LEE	
Signature	Juhn	Date 9-25-2020

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- Appendix B Stormwater System Mapping
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- Appendix E Outfall Catchment System Vulnerability Factor (SVF) Inventory
- Appendix F New England Interstate Water Pollution Control Commission IDDE Manual
- Appendix G IDDE Employee Training Record

1 Introduction

1.1 MS4 PROGRAM

This Illicit Discharge Detection and Elimination (IDDE) Plan has been developed for The Town of Hanover 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 requires that each permittee, or regulated community, address six Minimum Control Measures. These measures include the following:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination Program
- Construction Site Stormwater Runoff Control
- Stormwater Management in New Development and Redevelopment (Post Construction Stormwater Management); and
- 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.

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 the unsuitability of original infrastructure to the modern regulatory environment. Examples of illicit discharges in this category include connected floor drains in old buildings, 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 funding and designing a project to reconnect sanitary sewer laterals. Others, such as improving self-policing of dog waste management, can be accomplished by outreach in conjunction with the minimal additional cost of dog waste bins and the municipal commitment to disposal of collected materials on a regular basis.

Regardless of the intention, when not addressed, illicit discharges can contribute high levels of pollutants, such as heavy metals, toxics, oil, grease, solvents, nutrients, and pathogens to surface waters.

1.3 ALLOWABLE NON-STORMWATER DISCHARGES

The following categories of non-storm water 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 them entirely).

1.4 RECEIVING WATERS AND IMPAIRMENTS

Table 1-1 lists the "impaired waters" within the boundaries of Hanover's regulated area based on the 2014 Massachusetts Integrated List of Waters produced by MassDEP every two years. 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.

Water Body Name	Segment ID	Category	Impairment(s)	Associated Approved TMDL
Drinkwater River	MA94-21	5	 Excess Algal Growth Fecal Coliform Mercury in Fish Tissue Oxygen, Dissolved Phosphorus (Total) Secchi disk transparency 	
Forge Pond	MA94037	5	 (Debris/Floatables/Trash*)(Non†Native Aquatic Plants*) Chlorophyll†a Dissolved oxygen saturation Excess Algal Growth Fecal Coliform Phosphorus (Total) Secchi disk transparency 	
Indian Head River	MA94-04	5	 Mercury in Fish Tissue Oxygen Dissolved Phosphorus (Total) 	
Indian Head River	MA94-22	5	Mercury in Fish Tissue	
Iron Mine Brook	MA94-24	5	Fecal Coliform	
Third Herring Brook	MA94-27	5	Fecal Coliform	
North River	MA94-05	5	Fecal ColiformMercury in Fish Tissue	

Table 1-1. Impaired Waters Hanover, Massachusetts

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 EPA as of the date of issuance of the 2016 MS4 Permit.

In order to comply with the 2016 MS4 Permit Appendix H Parts II and III, the Town of Hanover must implement the illicit discharge program. Catchments draining to Drinkwater River (MA94-21), Forge Pond (MA94037), Indian Head River (MA94-04 and MA94-22), Iron Mine Brook (MA94-24), Third Herring Brook (MA94-27), or North River (MA94-05) shall be designated either Problem Catchments or HIGH priority in implementation of the IDDE program.

1.5 IDDE PROGRAM GOALS, FRAMEWORK, AND TIMELINE

The goals of the IDDE program are to find and eliminate illicit discharges to the 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.

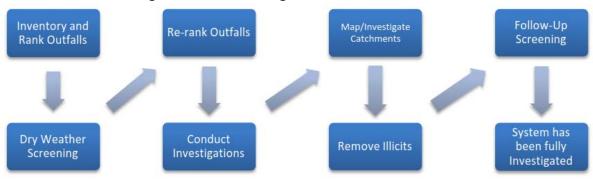


Figure 1-1. IDDE Investigation Procedure Framework

IDDE Program Requirement	Completion Date from Effective Date of Permit								
IDDE Program Requirement	1 Year	1.5 Years	2 Years	3 Years	7 Years	10 Years			
Written IDDE Program Plan	X								
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			

Table 1-2. IDDE Program Implementation Timeline

1.6 WORK COMPLETED TO DATE

The 2003 MS4 Permit required each MS4 community to develop a plan to detect illicit discharges using a combination of storm system mapping, 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 the removal would be documented.

The Town of Hanover 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 bylaw or regulatory mechanism
- Developed procedures for locating illicit discharges (i.e., 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, other IDDE-related activities that have been completed include:

- SSO inventory
- Outfall sampling
- Additional storm system mapping, including the locations of catch basins, manholes and pipe connectivity

2 Authority and Statement of IDDE Responsibilities

2.1 LEGAL AUTHORITY

The Town of Hanover has adopted an Illicit Discharge Detection and Elimination (IDDE) 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.

2.2 STATEMENT OF RESPONSIBILITIES

The Hanover Department of Public Works is the lead municipal agency or department responsible for implementing the IDDE program pursuant to the provisions of the Stormwater Management bylaw. A Stormwater Committee has been formed, consisting of the following departments:

- Department of Public Works Victor Diniak
- Executive Office Joseph Colangelo
- Department of Public Works Art Ceurvels
- Community Development Municipal Inspections Department Justin DeBruin
- Facilities Department Robert Murray
- Information Technology Department Bill Hartigan
- North and South Rivers Watershed Association Lori Wolfe

3 Stormwater System Mapping

The Town of Hanover originally developed mapping of its stormwater system to meet the mapping requirements of the 2003 MS4 Permit. A copy of the existing storm system map is provided in **Appendix B**. 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 Hanover will report on the progress towards completion of the storm system map in each annual report. Updates to the stormwater mapping will be included in **Appendix B**.

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 EPA 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 Hanover has completed the following updates to its stormwater mapping to meet the Phase I requirements:

- Outfalls and receiving waters (updated 2019)
- 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 (*mapped 2019*)

The Town of Hanover will update its stormwater mapping by July 1, 2020 to include the remaining Phase I information:

- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems
- Muncipality owned stormwater treatment structures

The following table contains information regarding the total number of drainage structures mapped within the MS4 Urbanized Area in Hanover. It has been compiled using data collected by the Town.

Structure Type	Number of Structures
MS4 Outfalls	166
Non-MS4 Outlet	300
Catch Basins	2830
Drain Manholes	1040

Table 3-1. Summary of Mapped MS4 Structures

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 Hanover 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

The Town of Hanover has already updated its stormwater mapping to include the remaining Phase II information.

3.3 ADDITIONAL RECOMMENDED MAPPING ELEMENTS

Although not a requirement of the 2016 MS4 Permit, the Town of Hanover 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.

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 Hanover has completed an inventory of SSOs that have discharged to the MS4 within the five (5) years prior to the effective date of the 2016 MS4 Permit, based on review of available documentation pertaining to SSOs. The inventory included 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. Between July 2014 and June 2019, there have been no known SSOs in Hanover (see Table 4-1).

Upon detection of an SSO, the Town of Hanover 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 Hanover will provide oral notice to EPA within 24 hours and written notice to EPA and MassDEP within five (5) days of becoming aware of the SSO occurrence.

The inventory in Table 4-1 will be updated by the Department of Public Works when new SSOs are detected. The SSO inventory will be included in the annual report, including the status of mitigation and corrective measures to address each identified SSO.

Table 4-1. SSO Inventory Hanover, Massachusetts Revision Date: June 2019

SSO Location ¹	Discharge Statement ²	Date ³	Time Start ³	Time End ³	Estimated Volume ⁴	Description⁵	Mitigation Completed ⁶	Mitigation Planned ⁷

¹Location (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

⁷ Mitigation and corrective measures planned with implementation schedules

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 have illicit discharges and SSOs and the related public health significance. The ranking helps determine the priority order for performing IDDE investigations and meeting permit milestones.

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 will be 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 will be completed as part of the Phase I mapping, and refined catchment delineations will be completed as part of the Phase I mapping to reflect information collected during catchment investigations.

5.2 OUTFALL AND INTERCONNECTION INVENTORY AND INITIAL RANKING

The Department of Public Works will complete an initial outfall and interconnection inventory and priority ranking to assess illicit discharge potential based on existing information. The initial inventory and ranking will be completed within one (1) year from the effective date of the permit. An updated inventory and ranking will be provided in each annual report thereafter. The inventory will be updated annually to include data collected in connection with dry weather screening and other relevant inspections.

The outfall and interconnection inventory will identify each outfall and interconnection discharging from the MS4, record its location and condition, and provide a framework for tracking inspections, screenings and other IDDE program activities.

Outfalls and interconnections will be 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 ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
 - Ammonia \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.

- 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.

- **3.** Low Priority Outfalls: Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information.
- 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; cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.

Outfalls will be ranked into the above priority categories (<u>except for excluded outfalls</u>, <u>which may be</u> <u>excluded from the IDDE program</u>) 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 is based upon responses provided by the Town of Hanover in May 2019.

- **Previous screening results** previous screening/sampling results indicate likely sewer input (see criteria above for Problem Outfalls).
- Past discharge complaints and reports.
- **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
 - o Ammonia levels above 0.5 mg/l
 - o Surfactants levels greater than or equal to 0.25 mg/l
- **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.
- 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 will probably have a high illicit discharge potential. Developments 20 years or younger will probably have a low illicit discharge potential.
- Sewer conversion Contributing catchment areas that were once serviced by septic systems, but have been converted to sewer connections may have a high illicit discharge potential.
 Historic combined sewer systems Contributing areas that were once serviced by a combined sewer system, but have been separated may have a high illicit discharge potential.
- **Surrounding density of aging septic systems** Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.
- **Culverted streams** Any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
- Water quality limited waterbodies that receive a discharge from the MS4 or waters with approved TMDLs applicable to the permittee, where illicit discharges have the potential to contain the pollutant identified as the cause of the water quality impairment.

Appendix C contains the initial outfall priority ranking matrix and catchment delineation mapping completed for the Town.

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 is 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.

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 will use precipitation data from the Hanover Mall Area Station (Station ID KMAHANOV2) If the Hanover Mall Area Station is not available or not reporting current weather data, then the Hanover Center Station (Station ID KMAHANOV19) will be used as a back-up.

6.2 DRY WEATHER SCREENING/SAMPLING PROCEDURE

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 2008 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.

6.2.2 Field Equipment

Table 6-1 lists field equipment commonly used for 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 w/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 (i.e., bacteria requires sterile containers).	
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	

Table 6-1. Field Equipment – Dry Weather Outfall Screening and Sampling

6.2.3 Sample Collection and Analysis

If flow is present during a dry weather outfall inspection, a sample will 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)
- 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 will proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results. Field staff will 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.

Analyte or Parameter	Instrumentation (Portable Meter)	Field Test Kit
Ammonia	CHEMetrics [™] V-2000 Colorimeter Hach [™] DR/890 Colorimeter	CHEMetrics™ K-1410 CHEMetrics™ K-1510 (series)
	Hach™ Pocket Colorimeter™ II	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

Table 6-2. Field Screening Parameters and Analysis Methods

Analyte or Parameter	Instrumentation (Portable Meter)	Field Test Kit
Temperature	YSI Pro30	NA
	YSI EC300A	
	Oakton 450	
Salinity	YSI Pro30	NA
	YSI EC300A	
	Oakton 450	
Dissolved Oxygen	YSI Pro30	NA
	YSI EC300A	
	Oakton 450	
Turbidity	Hach™ 2100Q Portable Turbidimeter	NA
	Oakton CON 150	

¹ Where the discharge is 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.

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
Ammonia	EPA : 350.2, SM : 4500- NH3C	0.05 mg/L	28 days	Cool \leq 6°C, H ₂ SO ₄ to pH <2, No preservative required if analyzed immediately
Surfactants	SM : 5540-C	0.01 mg/L	48 hours	Cool ≤6°C
Chlorine	SM : 4500-Cl G	0.02 mg/L	Analyze within 15 minutes	None Required
Temperature	SM : 2550B	NA	Immediate	None Required
Specific Conductance	EPA : 120.1, SM : 2510B	0.2 μs/cm	28 days	Cool ≤6°C
Salinity	SM : 2520	-	28 days	Cool ≤6°C
Biochemical Oxygen Demand (BOD)	EPA: 360.1	EPA: 3 mg/L	48 hours	Cool ≤6°C
Dissolved Oxygen	EPA: 365.1	EPA: 1 mg/L	Immediate	Cool ≤6°C
Turbidity	EPA: 160.2	EPA: 1 NTU	48 hours	Cool ≤6°C

Table 6-3. Required Analytical Methods, Detection Limits, Hold Times, and Preservatives

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
Indicator Bacteria: E.coli Enterococcus Fecal Coliform	E.coli EPA: 1603 SM: 9221B, 9221F, 9223 B Other: Colilert®, Colilert-18® Enterococcus EPA: 1600 SM: 9230 C Other: Enterolert® Fecal Coliform EPA: 1680	E.coli EPA: 1 cfu/100mL SM: 2 MPN/100mL Other: 1 MPN/100mL Enterococcus EPA: 1 cfu/100mL SM: 1 MPN/100mL SM: 1 MPN/100mL Fecal Coliform EPA: 1 ctu	8 hours	Cool ≤10°C, 0.0008% Na₂S₂O₃
Total Phosphorus	EPA: Manual-365.3, Automated Ascorbic acid digestion-365.1 Rev. 2, ICP/AES4-200.7 Rev. 4.4 SM: 4500-P E-F	EPA: 0.01 mg/L SM : 0.01 mg/L	28 days	Cool ≤6°C, H₂SO₄ to pH <2
Total Nitrogen (Ammonia + Nitrate/Nitrite, methods are for Nitrate-Nitrite and need to be combined with Ammonia listed above.)	EPA : Cadmium reduction (automated)- 353.2 Rev. 2.0, SM : 4500-NO ₃ E-F	EPA: 0.05 mg/L SM : 0.05 mg/L	28 days	Cool ≤6°C, H₂SO₄ to pH <2

40 CFR § 136: <u>http://www.ecfr.gov/cgi-bin/text</u>

idx?SID=b3b41fdea0b7b0b8cd6c4304d86271b7&mc=true&node=pt40.25.136&rgn=div5

SM = Standard Methods

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 U.S. EPA 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

Analyte or Parameter	Benchmark
Chlorine	>0.02 mg/L
	(detectable levels per the 2016 MS4 Permit)
Indicator Bacteria:	<i>E.coli</i> : the geometric mean of the five most recent samples taken during the same bathing season shall
E.coli	not exceed 126 colonies per 100 ml and no single
Enterococcus	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

6.2.4 Massachusetts Water Quality Standards: http://www.mass.gov/eea/docs/dep/service/regulations/314cmr04.pdf

6.4 FOLLOW-UP RANKING OF OUTFALLS AND INTERCONNECTIONS

The Town of Hanover will update and re-prioritize the initial outfall and interconnection rankings based on information gathered during dry weather screening. The rankings will be updated periodically as dry weather screening information becomes available, but will be completed within three (3) years of the effective date of the permit (July 1, 2021).

Outfalls/interconnections where relevant information was 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 will be 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.

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 will be recorded and reported in each annual report.

7.1 SYSTEM VULNERABILITY FACTORS

The Department of Public Works will review relevant mapping and historic plans and records to identify areas within the catchment with higher potential for illicit connections. The following information will be 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) will be identified for each catchment:

- 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 that 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 that 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 backups, 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 an Inflow/Infiltration program, 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 SVF inventory will be documented for each catchment as investigations occur and will be included in the annual report. An example of an outfall catchment SVF inventory is provided in **Appendix E**.

7.2 DRY WEATHER MANHOLE INSPECTIONS

The Town of Hanover 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.

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.

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 F**.

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, businesses and building lobbies for multi-family dwellings.

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 forecast. 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 sandbag, 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.

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 place 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.

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 (i.e., 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.

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.

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.

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 their 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.

7.5 ILLICIT DISCHARGE REMOVAL

When the specific source of an illicit discharge is identified, the Town of Hanover 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.

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.

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.

8 Training

Annual IDDE training will be made available to all employees involved in the IDDE program. This training will at a minimum include 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 will be maintained in **Appendix G**. The frequency and type of training will be included in the annual report.

9 Progress Reporting

The progress and success of the IDDE program will be evaluated on an annual basis. The evaluation will be documented in the annual report and will include 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 will be measured by the IDDE activities completed within the required permit timelines.

Appendix A

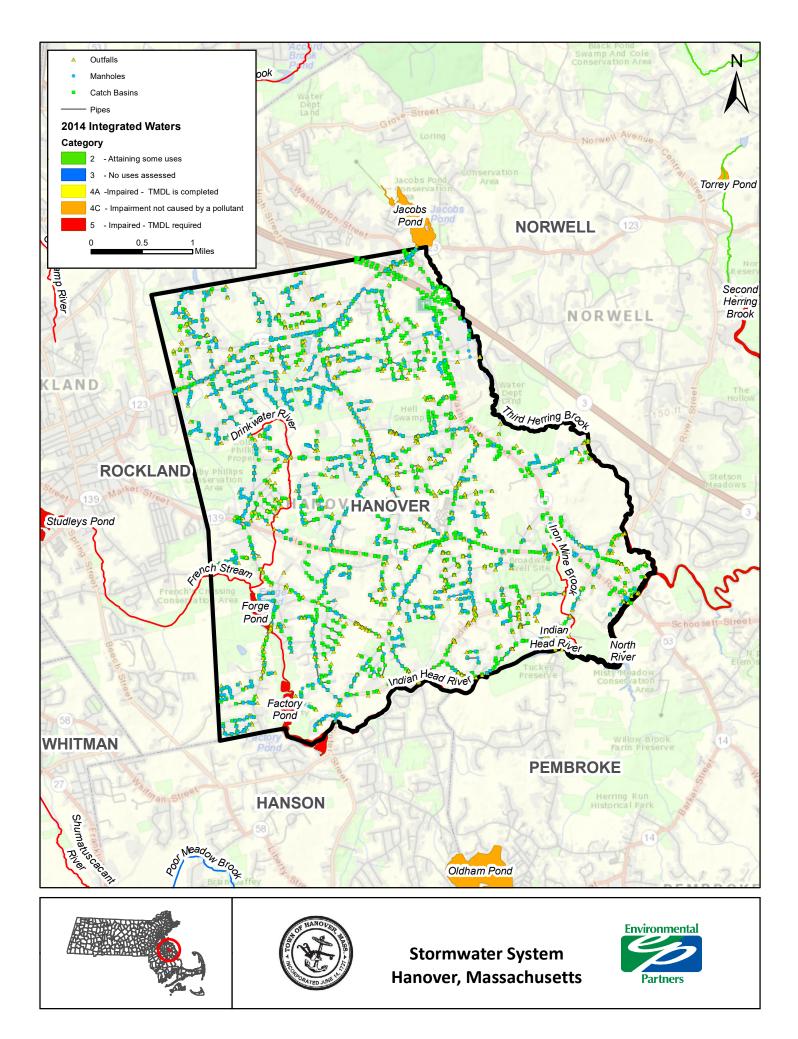
Legal Authority (IDDE Bylaw or Ordinance)



Appendix B

Stormwater System Mapping

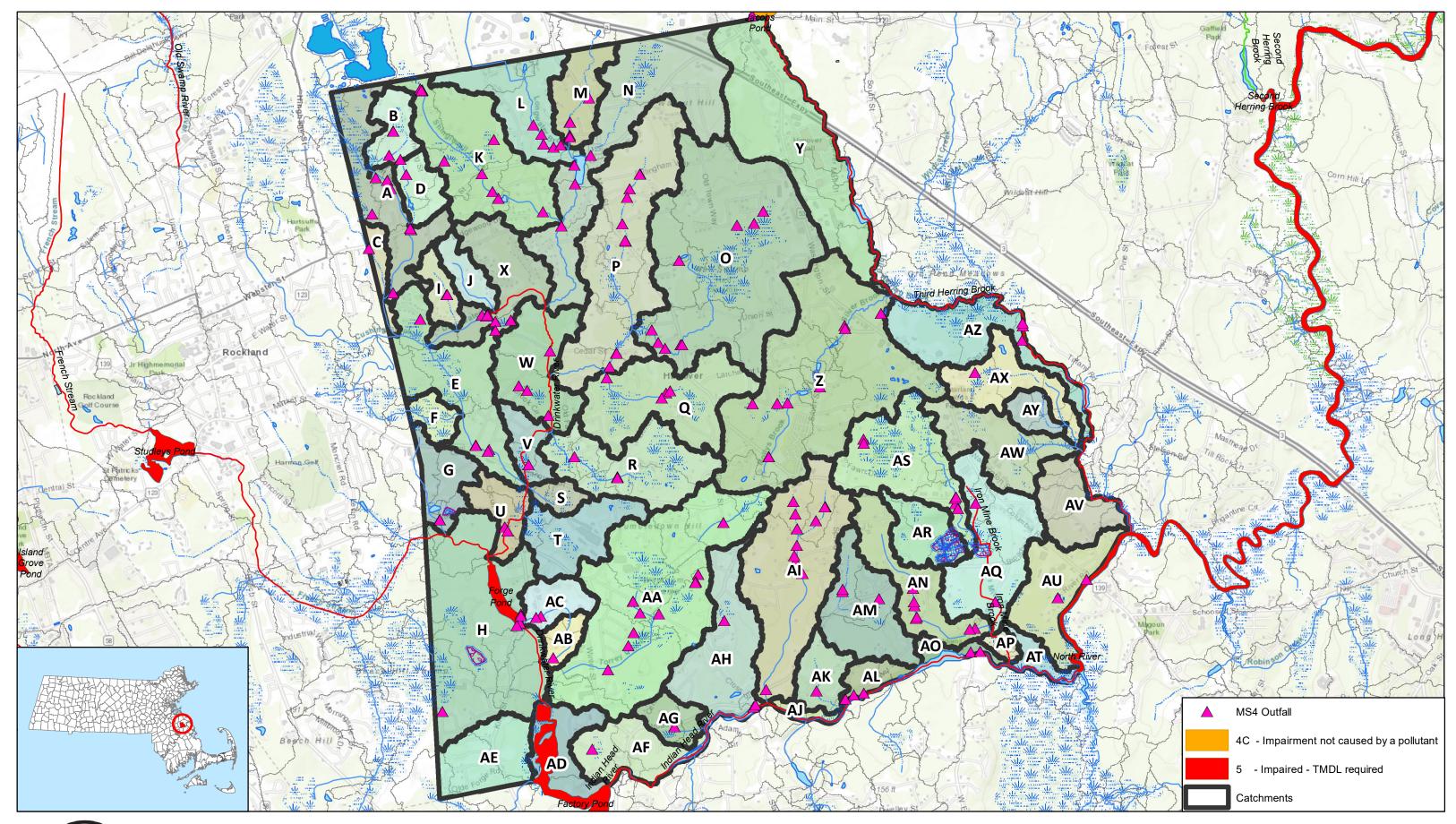




Appendix C

Catchment Delineation Mapping and Ranking Matrix





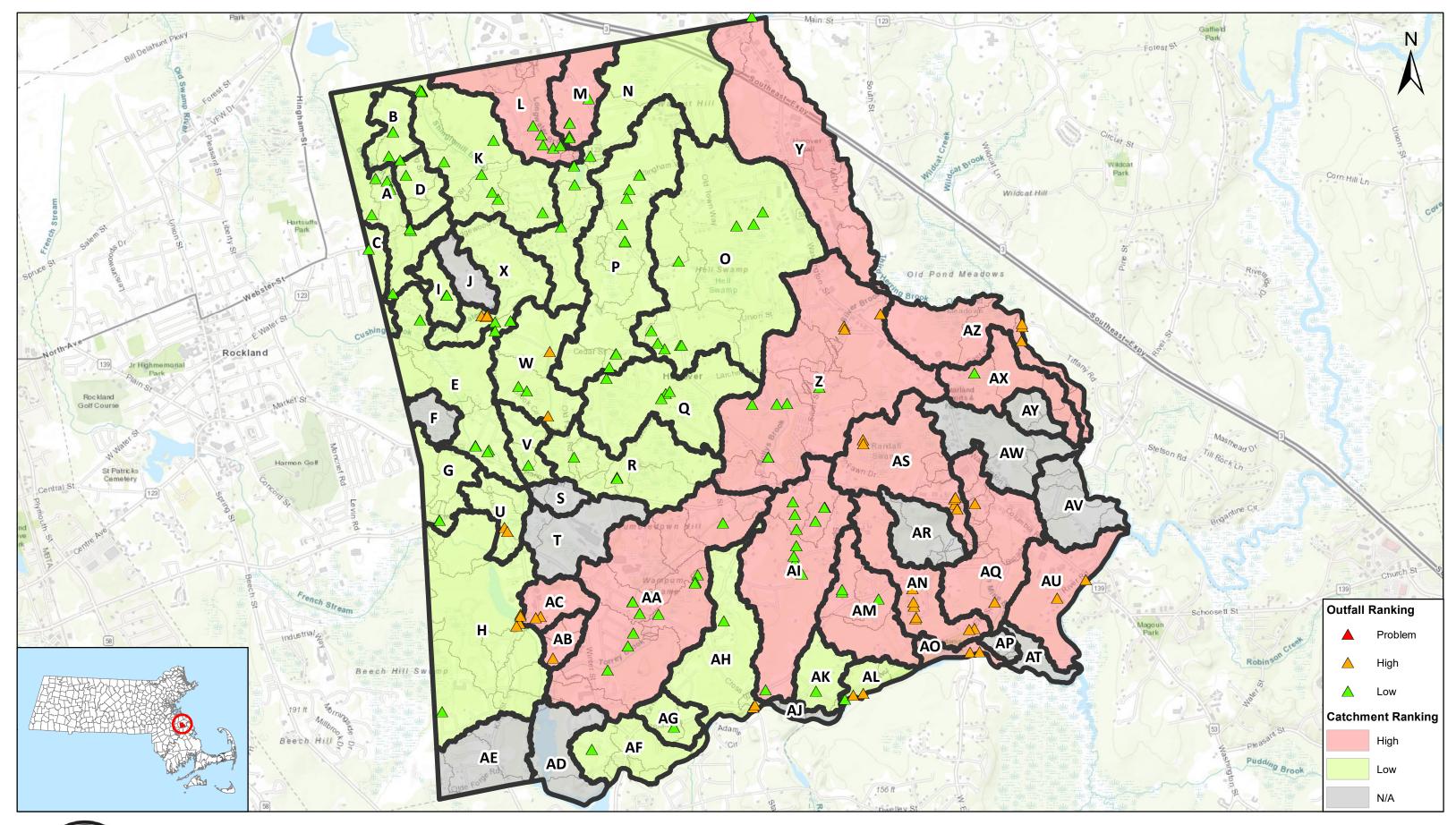


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Catchment Delineation Hanover, Massachusetts









Catchment and Outfall Rankings Hanover, 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 Sampled				
		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	Sampling Results	Outfall Score	Catchment Score	Outfall Ranking	Catchment Ranking
				High = 2	Older = 2	Yes = 2	Older = 2	Yes = 2	Yes = 2	Category 4a = 2	Yes = 2	Frequent = 2	Yes = 2	Yes				
		Scoring Criteria		Medium = 1	Medium = 1	No Data = 1	Medium = 1	No Data = 1	No Data = 1	Category 5 = 1	No Data = 1	Occasional = 1	No Data = 1	No				
				Low = 0	Newer = 0	No = 0	Newer = 0	No = 0	No = 0	Others = 0	No = 0	None = 0	No = 0	Dry				
							ent Scores			_		l Scores						
Y Z		Jacobs Pond (MA94077) Unnamed Water Body (42.131526, -70.833142)	165-O 420-O	2	2	0	1	1	2	0	0	0	0	Yes No	0	8	Low High	High High
Z		Silver Brook	420-0 CP-69-0	2	2	0	1	1	2	0	1	0	2	No	3	8	High	High
Z		Silver Brook	CP-70-0	2	2	0	1	1	2	0	1	0	2	No	3	8	High	High
z	100	Unnamed Wetland (42.123498, -70.846234)	332-0	2	2	0	1	1	2	0	1	0	0	No	1	8	Low	High
Z		Mollys Brook	CP-2-0	2	2	0	1	1	2	0	1	0	0	No	1	8	Low	High
Z		Mollys Brook	CP-3-0	2	2	0	1	1	2	0	1	0	0	No	1	8	Low	High
Z		Unnamed Wetland (42.124673, -70.841417)	CP-88-0	2	2	0	1	1	2	0	1	0	0	No	1	8	Low	High
Z		Mollys Brook Unnamed Wetland (42.123066, -70.849761)	CP-89-0 CP-97-0	2 2	2 2	0 0	1	1	2	0	1	0	0	No No	1	8	Low Low	High High
AU		Unnamed Water Body (42.105749, -70.812511)	242-0	1	2	0	1	1	2	0	1	0	2	No	3	7	High	High
AU		North River (MA94-05)	PP-100-0	1	2	0	1	1	2	1	1	0	0	No	2	7	High	High
AZ	47	Third Herring Brook (MA94-27)	CMP-4-0	1	2	0	1	1	2	1	1	0	0	No	2	7	High	High
AZ	47	Third Herring Brook (MA94-27)	CP-85-0	1	2	0	1	1	2	1	1	0	0	No	2	7	High	High
AZ		Third Herring Brook (MA94-27)	CP-86-0	1	2	0	1	1	2	1	1	0	0	No	2	7	High	High
AB		Drinkwater River (MA94-21)	275-0	2	2	0	1	1	0	1	1	0	0	No	2	6	High	High
AC AC		Drinkwater River (MA94-21) Drinkwater River (MA94-21)	278-0 428-0	2 2	2 2	0 0	1	1	0 0	1 1	1	0 0	0 0	No No	2 2	6 6	High High	High High
AL		Unnamed Stream (42.103884, -70.844986)	349-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
AI		Unnamed Stream (42.103884, -70.844986)	352-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
AI	125	Unnamed Stream (42.112893, -70.841343)	362-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
AI	125	Unnamed Stream (42.112893, -70.841343)	363-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
AI		Unnamed Stream (42.103884, -70.844986)	457-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
AI		Unnamed Stream (42.113378, -70.844069)	CP-101-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
AI		Unnamed Stream (42.113378, -70.844069) Unnamed Stream (42.112893, -70.841343)	CP-102-0 CP-103-0	0	2	0	1	1	2	0	1	0	0	No No	1	6	Low Low	High High
AI		Unnamed Stream (42.112893, -70.841343)	CP-103-0 CP-104-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
AI		Unnamed Stream (42.113378, -70.844069)	CP-140-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
AI	206	Unnamed Stream (42.103884, -70.844986)	CP-15-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
AI	206	Unnamed Stream (42.103884, -70.844986)	CP-16-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
AM		Unnamed Wetland (42.104269, -70.834501)	248-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
AM		Unnamed Stream (42.105889, -70.838843)	CP-17-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
AM		Unnamed Stream (42.105889, -70.838843) Unnamed Stream (42.103825, -70.829475)	CP-18-0	0	2	0	1	1	2	0	1	0	0	No No	1	6	Low High	High High
AN AN		Unnamed Stream (42.103825, -70.829475) Unnamed Stream (42.103825, -70.829475)	359-O 391-O	0	2	0	1	1	2	0	⊥ 1	0	∠ 2	No	3	6	High	High
AN		Unnamed Stream (42.103825, -70.829475)	CP-109-0	0	2	0 0	1	1	2	0	1	0	2	No	3	6	High	High
AN		Unnamed Stream (42.103825, -70.829475)	CP-110-0	0	2	0	1	1	2	0	1	0	2	No	3	6	High	High
AN	134	Unnamed Stream (42.103825, -70.829475)	CP-112-0	0	2	0	1	1	2	0	1	0	2	No	3	6	High	High
AN		Unnamed Stream (42.103825, -70.829475)	CP-113-0	0	2	0	1	1	2	0	1	0	2	No	3	6	High	High
AN		Unnamed Stream (42.103825, -70.829475)	CP-116-0	0	2	0	1	1	2	0	1	0	2	No	3	6	High	High
AN AO		Unnamed Stream (42.103825, -70.829475) Indian Head River (MA94-22)	CP-117-0 376-0	0	2	0	1	1 1	2	0	1	0	2	No No	3	6	High High	High High
AO		Indian Head River (MA94-22)	376-0 CP-115-0	0	2	0	1	1 1	2	1	1	0	0	No	2	6	High	High
AQ		Iron Mine Brook (MA94-24)	CP-118-0	0	2	0	1	1	2	1	1	0	2	No	4	6	High	High
AQ		Iron Mine Brook (MA94-24)	CP-121-0	0	2	0	1	1	2	1	1	0	2	No	4	6	High	High
AS	218	Unnamed Stream (42.11369, -70.824319)	444-0	0	2	0	1	1	2	0	1	0	2	No	3	6	High	High
AS		Unnamed Stream (42.11369, -70.824319)	445-0	0	2	0	1	1	2	0	1	0	2	No	3	6	High	High
AS		Unnamed Stream (42.11369, -70.824319)	446-0	0	2	0	1	1	2	0	1	0	2	No	3	6	High	High
AS	108	Unnamed Wetland (42.119783, -70.835905)	CP-100-0	0	2	0	1	1	2	0	1	0	2	No	3	6	High	High





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 Sampled				
		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	Sampling Results	Outfall Score	Catchment Score	Outfall Ranking	Catchment Ranking
				High = 2	Older = 2	Yes = 2	Older = 2	Yes = 2	Yes = 2	Category 4a = 2	Yes = 2	Frequent = 2	Yes = 2	Yes				
		Scoring Criteria		Medium = 1	Medium = 1	No Data = 1	Medium = 1	No Data = 1	No Data = 1	Category 5 = 1	No Data = 1	Occasional = 1	No Data = 1	No				
				Low = 0	Newer = 0	No = 0	Newer = 0	No = 0	No = 0	Others = 0	No = 0	None = 0	No = 0	Dry				
							ent Scores				Outfal	l Scores						
AS		Unnamed Stream (42.11369, -70.824319)	CP-120-0	0	2	0	1	1	2	0	1	0	2	No	3	6	High	High
AS AX		Unnamed Wetland (42.119783, -70.835905) Unnamed Wetland (42.125317, -70.821628)	CP-8-0 CM-10-0	0	2	0	1	1	2	0	1	0	2	No No	3	6	High Low	High High
1		Longwater Brook	159-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
L		Longwater Brook	CP-52-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
L	228	Longwater Brook	158-O	0	2	0	1	1	2	0	0	0	0	Yes	0	6	Low	High
L	228	Longwater Brook	160-O	0	2	0	1	1	2	0	0	0	0	Yes	0	6	Low	High
L		Longwater Brook	161-0	0	2	0	1	1	2	0	0	0	0	Yes	0	6	Low	High
M		Unnamed Stream (42.151709, -70.868775)	163-0	0	2	0	1	1	2	0	1	0	0	No	1	6	Low	High
M		Unnamed Stream (42.151709, -70.868775)	385-0	0	2	0 0	1	1	2	0	1	0	0	No	1	6	Low	High
M		Unnamed Stream (42.151709, -70.868775) Unnamed Stream (42.151709, -70.868775)	CP-54-0 CP-55-0	0	2	0	1	1	2	0	1	0	0	No No	1	6	Low Low	High
M		Unnamed Stream (42.151709, -70.868775)	CP-55-0 CPP-1-0	0	2	0	1	1	2	0	0	0	0	Yes	0	6	Low	High High
AA		Torrey Brook	277-0	1	2	0	1	1	0	0	1	0	0	No	1	5	Low	High
AA		Unnamed Wetland (42.102075, -70.863243)	307-0	1	2	0	1	1	0	0	1	0	0	No	1	5	Low	High
AA		Unnamed Wetland (42.102075, -70.863243)	308-O	1	2	0	1	1	0	0	1	0	0	No	1	5	Low	High
AA	172	Torrey Brook	309-O	1	2	0	1	1	0	0	1	0	0	No	1	5	Low	High
AA	249	Unnamed Wetland (42.10772, -70.856232)	336-O	1	2	0	1	1	0	0	1	0	0	No	1	5	Low	High
AA	172	Torrey Brook	380-O	1	2	0	1	1	0	0	1	0	0	No	1	5	Low	High
AA	172	Torrey Brook	381-0	1	2	0	1	1	0	0	1	0	0	No	1	5	Low	High
AA		Unnamed Wetland (42.10772, -70.856232)	386-O	1	2	0	1	1	0	0	1	0	0	No	1	5	Low	High
AA		Unnamed Wetland (42.10772, -70.856232)	387-0	1	2	0	1	1	0	0	1	0	0	No	1	5	Low	High
AA		Mollys Brook	CP-137-0	1	2	0	1	1	0	0	1	0	0	No	1	5	Low	High
AA		Unnamed Wetland (42.104003, -70.861688) Unnamed Wetland (42.147737, -70.898717)	CP-41-0 138-0	0	2	0	1	1	0	0	1	0	0	No No	1	<u> </u>	Low Low	High Low
Δ		Ben Mann Brook	139-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
A		Ben Mann Brook	140-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
A		Unnamed Wetland (42.147737, -70.898717)	143-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
А		Ben Mann Brook	215-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
А		Ben Mann Brook	384-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
А	79	Ben Mann Brook	145-0	0	2	0	1	1	0	0	0	0	0	Yes	0	4	Low	Low
А		Ben Mann Brook	146-0	0	2	0	1	1	0	0	0	0	0	Yes	0	4	Low	Low
AF		Unnamed Wetland (42.09244, -70.86848)	CP-133-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
AG		Unnamed Wetland (42.093731, -70.859141)	345-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
AH		Indian Head River (MA94-04)	CP-26-0 CP-28-0	0	2	0	1	1	0	1 1	1	0	0	No	2	4	High	Low
AH AH		Indian Head River (MA94-04) Unnamed Wetland (42.104475, -70.852696)	340-0	0 0	2 2	0 0	1	1	0	1	1	0	0	No No	2	4	High Low	Low Low
AK		Unnamed Stream (42.097622, -70.841723)	CP-46-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
AL		Indian Head River (MA94-04)	356-0	0	2	0	1	1	0	1	1	0	0	No	2	4	High	Low
AL		Indian Head River (MA94-04)	357-0	0	2	0	1	1	0	1	1	0	0	No	2	4	High	Low
AL		Unnamed Wetland (42.095598, -70.839584)	CP-43-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
В	46	Unnamed Stream (42.146397, -70.892254)	134-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
В		Unnamed Stream (42.14372, -70.890838)	135-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
В		Unnamed Wetland (42.149176, -70.891936)	405-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
В		Unnamed Wetland (42.149176, -70.891936)	406-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
D		Unnamed Stream (42.14372, -70.890838)	136-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
E		Unnamed Wetland (42.129425, -70.889579)	213-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
L E	194	Cushing Brook	253-O 254-O	0	2 2	0 0	1	1	0 0	0 0	1	0 0	0	No No	1	4	Low Low	Low Low





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 Sampled				
		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	Sampling Results	Outfall Score	Catchment Score	Outfall Ranking	Catchment Ranking
				High = 2	Older = 2	Yes = 2	Older = 2	Yes = 2	Yes = 2	Category 4a = 2	Yes = 2	Frequent = 2	Yes = 2	Yes				
		Scoring Criteria		Medium = 1	Medium = 1	No Data = 1	Medium = 1	No Data = 1	No Data = 1	Category 5 = 1	No Data = 1	Occasional = 1	No Data = 1	No				
				Low = 0	Newer = 0	No = 0	Newer = 0	No = 0	No = 0	Others = 0	No = 0	None = 0	No = 0	Dry				
							nt Scores				Outfall	Scores						
E		Cushing Brook	255-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
E H		Cushing Brook Forge Pond (MA94037)	379-0 264-0	0	2	0	1	1	0	0	1	0	0	No No	1 2	4	Low High	Low Low
н		Forge Pond (MA94037)	402-O	0	2	0	1	1	0	1	1	0	0	No	2	4	High	Low
н		Forge Pond (MA94037)	CP-125-0	0	2	0	1	1	0	1	1	0	0	No	2	4	High	Low
н		Forge Pond (MA94037)	CP-127-0	0	2	0	1	1	0	1	1	0	0	No	2	4	High	Low
н	168	Forge Pond (MA94037)	CP-128-0	0	2	0	1	1	0	1	1	0	0	No	2	4	High	Low
Н		Unnamed Wetland (42.099556, -70.891448)	269-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
		Unnamed Stream (42.133003, -70.886131)	211-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
I K		Unnamed Stream (42.133003, -70.886131) Shinglemill Brook	212-0 125-0	0	2	0	1	1	0	0	1	0	0	No No	1	4	Low	Low
ĸ		Shinglemill Brook	125-0 126-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low Low	Low Low
ĸ		Shinglemill Brook	128-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
к		Shinglemill Brook	150-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
к		Shinglemill Brook	411-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
к	3	Unnamed Wetland (42.145842, -70.884627)	458-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
к	233	Shinglemill Brook	462-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
к	3	Unnamed Wetland (42.147755, -70.880802)	CP-56-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
к		Shinglemill Brook	423-0	0	2	0	1	1	0	0	0	0	0	Yes	0	4	Low	Low
К		Unnamed Water Body (42.142006, -70.879373)	CM-9-0	0	2	0	1	1	0	0	0	0	0	Yes	0	4	Low	Low
N		Longwater Brook	226-0	0 0	2 2	0 0	1	1	0	0	1	0	0	No	1	4	Low	Low
N		Hackett Pond Unnamed Stream (42.147953, -70.866199)	227-0 228-0	0	2	0	1	1	0	0	1	0	0	No No	1	4	Low Low	Low Low
N		Longwater Brook	230-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
0		Unnamed Wetland (42.136626, -70.85181)	173-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
0		Unnamed Wetland (42.136626, -70.85181)	174-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
0		Unnamed Wetland (42.136626, -70.85181)	177-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
0	59	Unnamed Water Body (42.136728, -70.857468)	232-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
0	80	Unnamed Stream (42.129239, -70.857678)	235-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
0		Unnamed Stream (42.129239, -70.857678)	324-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
0		Unnamed Stream (42.129239, -70.857678)	383-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
0		Unnamed Stream (42.129239, -70.857678)	CP-35-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
0 P		Unnamed Stream (42.129239, -70.857678) Unnamed Stream (42.140654, -70.864989)	CP-37-0 182-0	0	2	0	1	1	0	0	1	0	0	No No	1	4	Low	Low
P D		Unnamed Stream (42.140654, -70.864989) Unnamed Stream (42.140654, -70.864989)	182-0 183-0	n	2	0	1 1	1	0	0	1	0	0	No	1	4	Low Low	Low Low
P		Unnamed Stream (42.140654, -70.864989)	185-0 186-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
P		Unnamed Stream (42.140654, 70.864989)	187-0	0	2	0	1	1	0	0	- 1	0	0	No	1	4	Low	Low
Р		Unnamed Stream (42.140654, -70.864989)	188-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
Р	44	Unnamed Stream (42.140654, -70.864989)	190-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
Р	44	Unnamed Stream (42.140654, -70.864989)	191-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
Р		Unnamed Stream (42.127284, -70.866454)	299-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
Р		Unnamed Stream (42.127284, -70.866454)	326-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
P		Unnamed Stream (42.127284, -70.866454)	327-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
Q		Unnamed Stream (42.125891, -70.866943)	297-0 218 0	0 0	2 2	0 0	1 1	1	0	0	1	0	0	No	1	4	Low	Low
Q Q		Unnamed Stream (42.123943, -70.862701) Unnamed Stream (42.123943, -70.862701)	318-0 319-0	0	2	0	1	1	0	0	1	0	0	No No	1	4	Low Low	Low Low
Q		Unnamed Stream (42.123943, -70.862701)	319-0 382-0	0	2	0	1	1	0	0	± 1	0	0	No	1	4	Low	Low
R		Unnamed Stream (42.118539, -70.802701)	302-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
R		Unnamed Stream (42.116878, -70.865622)	396-O	0	2	0	1	1	0	0	- 1	0	0	No	1	4	Low	Low





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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 Sampled				
		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	Sampling Results	Outfall Score	Catchment Score	Outfall Ranking	Catchment Ranking
				High = 2	Older = 2	Yes = 2	Older = 2	Yes = 2	Yes = 2	Category 4a = 2	Yes = 2	Frequent = 2	Yes = 2	Yes				
		Scoring Criteria		Medium = 1	Medium = 1	No Data = 1	Medium = 1	No Data = 1	No Data = 1	Category 5 = 1	No Data = 1	Occasional = 1	No Data = 1	No				
				Low = 0	Newer = 0	No = 0	Newer = 0	No = 0	No = 0	Others = 0	No = 0	None = 0	No = 0	Dry				
						Catchme	nt Scores				Outfal	Scores						
R	126	Unnamed Stream (42.116878, -70.865622)	397-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
R	126	Unnamed Stream (42.116878, -70.865622)	398-O	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
U	201	Drinkwater River (MA94-21)	262-0	0	2	0	1	1	0	1	1	0	0	No	2	4	High	Low
U	227	Drinkwater River (MA94-21)	CP-130-0	0	2	0	1	1	0	1	1	0	0	No	2	4	High	Low
V	123	Unnamed Wetland (42.118835, -70.877007)	282-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
w	217	Drinkwater River (MA94-21)	285-0	0	2	0	1	1	0	1	1	0	0	No	2	4	High	Low
W	83	Drinkwater River (MA94-21)	CP-39-0	0	2	0	1	1	0	1	1	0	0	No	2	4	High	Low
w		Unnamed Wetland (42.124405, -70.875454)	287-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
W		Unnamed Wetland (42.124405, -70.875454)	288-0	0	2	0	1	1	0	0	1	0	0	No	1	4	Low	Low
С		Unnamed Stream (42.138892, -70.896479)	144-0	0	1	0	1	1	0	0	1	0	0	No	1	3	Low	Low
G		Unnamed Stream (42.113214, -70.887589)	260-0	0	1	0	1	1	0	0	1	0	0	No	1	3	Low	Low
G		Unnamed Stream (42.113214, -70.887589)	261-0	0	1	0	1	1	0	0	1	0	0	No	1	3	Low	Low
х		Drinkwater River (MA94-21)	206-0	0	1	0	1	1	0	1	1	0	0	No	2	3	High	Low
х		Drinkwater River (MA94-21)	409-0	0	1	0	1	1	0	1	1	0	0	No	2	3	High	Low
х		Drinkwater River (MA94-21)	410-0	0	1	0	1	1	0	1	1	0	0	No	2	3	High	Low
Х		Drinkwater River (MA94-21)	464-0	0	1	0	1	1	0	1	1	0	0	No	2	3	High	Low
Х		Unnamed Wetland (42.130847, -70.879705)	205-0	0	1	0	1	1	0	0	1	0	0	No	1	3	Low	Low
Х		Unnamed Wetland (42.130847, -70.879705)	291-0	0	1	0	1	1	0	0	1	0	0	No	1	3	Low	Low
Х	232	Unnamed Wetland (42.130847, -70.879705)	434-0	0	1	0	1	1	0	0	1	0	0	No	1	3	Low	Low



Appendix D

Field Forms and Hyperlinks to Laboratories and Field Services Companies



Date:	

Weather Observations: _____

Staff	Onsite:	

Photos: _____

Hanover Storm Drain Mapping Form

Structure #:
Мар #:
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:
Material:
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)

Structure Number: _____

Is Crown (top inside of pipe) Above or Below Surface Water?:

Dry Weather Flow Conditions: ______ (weather, ground condition, flowing?)

Description of Visua	I Characteristics or Odo	rs:
-----------------------------	--------------------------	-----

(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:

Appendix D – Links to Relevant Laboratories and Field Services Companies

Local Massachusetts State Certified Laboratories:

- ESS Laboratory; Cranston, RI <u>http://www.esslaboratory.com/</u>
- Alpha Analytical Labs; Westborough, MA <u>https://alphalab.com/</u>
- G&L Laboratories; Quincy, MA <u>http://www.gllab.com/</u>
- MassDEP Searchable Laboratory Certification Listing <u>https://eeaonline.eea.state.ma.us/DEP/Labcert/Labcert.aspx</u>

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 <u>https://pipejetter.com/cctv-inspection.html</u>
- Inland Waters Inc.; Johnston, RI <u>http://www.inlandwatersinc.com/</u>

Appendix E

Outfall Catchment System Vulnerability Factor (SVF) Inventory



Appendix E – Outfall Catchment System Vulnerability Factor (SVF) Inventory Hanover, Massachusetts **Revision Date: June 2019**

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:

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

Appendix F

New England Interstate Water Pollution Control Commission IDDE Manual



ILLICIT DISCHARGE DETECTION AND ELIMINATION MANUAL

A Handbook for Municipalities

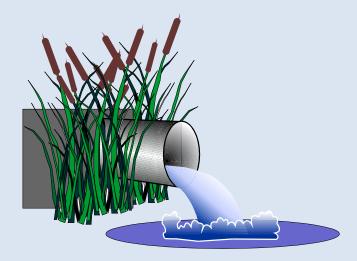


NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION January 2003

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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.

January 2003

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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.

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APPENDIX A: MODEL ILLICIT DISCHARGE AND CONNECTION STORM WATER ORDINANCE

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ACRONYMS

BMP	Best Management Practice		
BWSC	Boston Water and Sewer Commission		
GIS	Geographic Information System		
GPS	Global Positioning System		
IDDE	Illicit Discharge Detection and Elimination		
MS4	Municipal Separate Storm Sewer System		
NPDES	National Pollutant Discharge Elimination System		
NOV	Notice of Violation		
SIC	Standard Industrial Classification		
EPA	U.S. Environmental Protection Agency		
CTDEP	Connecticut Department of Environmental Protection		
MEDEP	Maine Department of Environmental Protection		
MADEP	Massachusetts Department of Environmental Protection		
NHDES	New Hampshire Department of Environmental Services		

- **NYSDEC** New York State Department of Environmental Conservation
- **RIDEM** Rhode Island Department of Environmental Management
- **VTDEC** 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 activities¹ 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.

¹ 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, 2003². 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.

² There are some exceptions to this deadline; contact the permitting authority in your state for up-to-date official information.

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.

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

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. lllicit 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 firefighting activities.

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

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.

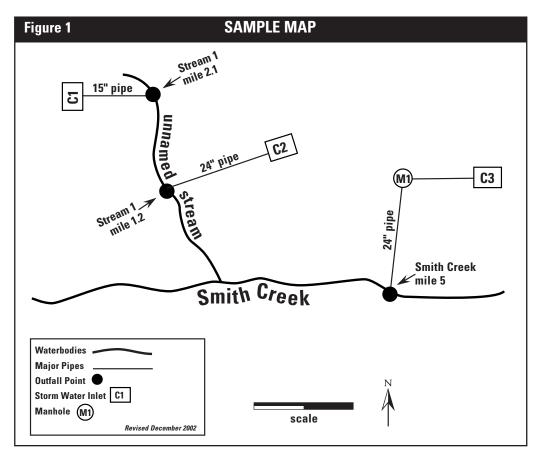
If you plan to map via computer, decide if you want to make the mapping system compatible with other departments within your municipality and/or with other data sources (e.g., state agencies that provide GIS layers). Since storm sewer systems are often constructed in roadways, the use of the GIS road 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.

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.

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.



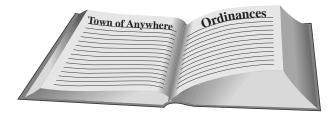


REFERENCES: CHAPTER 2

- 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
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- 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*

PROHIBITING ILLICIT DISCHARGES

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."



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.

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

A municipal ordinance created to comply with Phase II regulations must include a prohibition of illicit discharges and an enforcement mechanism. 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.

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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.

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USEPA. 2002. Model Ordinances to Protect Local Resources: Illicit Discharges. http://www.epa.gov/owow/nps/ordinance/discharges.htm

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.

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			
Water Quality Test	Use of Water Quality Test	Comments	
Conductivity	Used as an indicator of dissolved solids	 Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter Typically measured in the field with a probe 	
Ammonia	High levels can be an indicator of the presence of sanitary wastewater	 Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter Used very often and equipment is readily available; Boston, MA uses a field test kit (see case example) 	
Surfactants	Indicate the presence of detergent (e.g., laundry, car washing)	 Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter Boston, MA uses a field test kit (see case example) 	
pН	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)	 Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter Typically measured in the field or lab with a probe 	
Temperature	Sanitary wastewater and industrial cool- ing water can substantially influence outfall discharge temperatures. This measurement is most useful during cold weather.	 Pitt et al. 1993 suggested parameter Measured in the field with a thermometer or probe 	
Hardness	Used to distinguish between natural and treated waters	- Pitt et al. 1993 suggested parameter	
Total Chlorine	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 com- pounds)	- Pitt et al. 1993 suggested parameter	
Fluoride	Used to indicate potable water sources in areas where water supplies are fluori- dated	- Pitt et al. 1993 suggested parameter	
Potassium	High levels may indicate the presence of sanitary wastewater	- Pitt et al. 1993 suggested parameter	
Optical Brighteners (Fluorescence)	Used to indicate presence of laundry detergents (which often contain fabric whiteners, which cause substantial fluo- rescence)	-Pitt et al. 1993 suggested parameter -Used by City of Winooski, VT (see case example)	
Bacteria (fecal coliform, <i>E. coli,</i> and/or <i>enterococci)</i>	Used to indicate the presence of sani- tary wastewater	- Used by NHDES (see case example in chapter 5)	

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Interview with Paul Barden and Charlie Jewell, BWSC, August 15, 2002.

Interview with Andrea Donlon, NHDES, July 29, 2002.

Interview with Tim Grover, City of Winooski, VT, August 9, 2002.

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5

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.

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





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.

CASE STUDY: NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES

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:

- 5
 - ► 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

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.

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.

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.

Developing a coordinated system for collecting and tracking reports of illegal dumping can help pinpoint this difficult-to-find source of illicit discharges.

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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 voluntary 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

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 fix-tures, 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

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: 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.



6

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 lawenforcement 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

h

- 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)

REFERENCES: CHAPTER 6

- 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
- Center for Watershed Protection. Pollution Prevention Fact Sheet: Illegal Dumping Control. http://www.stormwatercenter.net/Pollution_Prevention_Factsheets/IllegalDumpingControl.htm
- Interview with Paul Barden and Charlie Jewell, BWSC, August 15, 2002.

Interview with Andrea Donlon, NHDES, July 29, 2002.

- 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
- 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
- USEPA. 1997. Guidance Manual for Implementing Municipal Storm Water Management Programs Volume 1: Planning and Administration (Draft). Office of Wastewater Management and Office of Research and Development. http://www.epa.gov/npdes/pubs/owm0233.pdf
- 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. 2002. Storm Water Phase II Menu of BMPs Illicit Discharge Detection and Elimination: Illegal Dumping. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/illi_3.cfm
- USEPA. 2002. Model Ordinances to Protect Local Resources: Illicit Discharges. http://www.epa.gov/owow/nps/ordinance/discharges.htm

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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

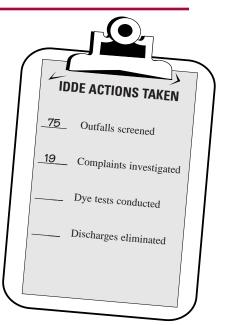
LPA recommends that the IDDE plan include procedures for program evaluation and assessment. Program evaluation is the time to step back, look at what has been done, determine what worked and what didn't, and make adjustments to planned future actions as appropriate. In this final component of your IDDE 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

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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).

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

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.

f 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
- 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
- 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

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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.)

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

EPA allows **MS4** operators a great deal of flexibility in determining what BMPs are most appropriate for their storm water programs.

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
- 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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RESOURCES

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.cdphe.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

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IDDE MANUAL Resources

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

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*

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* 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

• 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*.

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 *tetratech1@earthlink.net* or *kathryn.phillips@tetratech-ffx.com*.

CONTACTS

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*

Regional Storm Water Assistance Team Ann Herrick 617-918-1560; *herrick.ann@epa.gov* Shelly Puleo 617-918-1545; *puleo.shelly@epa.gov* Olga Vergara 617-918-1519, *vergara.olga@epa.gov*

Massachusetts Assistance Dave Gray 617-918-1577; gray.davidj@epa.gov

EPA Region 2

Regional Storm Water Coordinator Karen O'Brien 212-637-3717; *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*

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

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 Linda Domizio 508-849-4005; linda.domizio@state.ma.us

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IDDE MANUAL Resources

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*

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 Greg Goblick 401-222-4700 x7265; 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

APPENDIX A

Model Illicit Discharge and Connection Stormwater Ordinance¹

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:

<u>Authorized Enforcement Agency:</u> employees or designees of the director of the municipal agency designated to enforce this ordinance.

<u>Best Management Practices (BMPs)</u>: 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.

<u>Clean Water Act</u>. The federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), and any subsequent amendments thereto.

<u>Construction Activity</u>. 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.

<u>Hazardous Materials</u>. 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.

<u>Illegal Discharge</u>. Any direct or indirect non-storm water discharge to the storm drain system, except as exempted in Section X of this ordinance.

<u>Illicit Connections</u>. An illicit connection is defined as either of the following:

¹ USEPA. 2002. Model Ordinances to Protect Local Resources: Illicit Discharges. http://www.epa.gov/owow/nps/ordinance/discharges.htm

IDDE MANUAL Appendix A: Model Illicit Discharge and Connection Stormwater Ordinance

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.

<u>Industrial Activity</u>. Activities subject to NPDES Industrial Permits as defined in 40 CFR, Section 122.26 (b)(14). <u>National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit</u>. 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.

<u>Non-Storm Water Discharge</u>. Any discharge to the storm drain system that is not composed entirely of storm water. <u>Person</u>. 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.

<u>Pollutant</u>. 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.

<u>Premises</u>. Any building, lot, parcel of land, or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.

<u>Storm Drainage System.</u> 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.

<u>Storm Water</u>. Any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.

<u>Stormwater Pollution Prevention Plan.</u> 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 wet-land 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

IDDE MANUAL Appendix A: Model Illicit Discharge and Connection Stormwater Ordinance

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 [authorized enforcement agency] prior to the allowing of disthe

charges 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)[authorized enforcement agency] shall be permitted The 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)[authorized enforcement agency] has the right to The 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.
- Unreasonable delays in allowing the ______ [authorized enforce-(6) ment 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.

IDDE MANUAL Appendix A: Model Illicit Discharge and Connection Stormwater 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 fac-simile 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 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.

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 G

IDDE Employee Training Record



Illicit Discharge Detection and Elimination (IDDE)

Employee Training Record

Hanover, Massachusetts

Date of Training: _____

Duration of Training: _____

Name	Title	Signature



STORMWATER MS4 OPERATIONS & MAINTENANCE PLAN

Town of Hanover

June 2020 Revised September 2020





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Appendix B: Catch Basin Inspection Form Template
Appendix C: Stormwater BMP Inspection Form Template
Appendix D: Inventory of Stormwater Best Management Practices
Appendix E: Standard Operating Procedures (SOPs)
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Appendix G: Street and Parking Lot Sweeping Log

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Attachment 1: Town of Hanover Mapbook

SECTION 1 INTRODUCTION

This Stormwater Operation & Maintenance (O&M) Plan has been prepared for the Town of Hanover to address stormwater infrastructure O&M requirements (Part 2.3.7.a.iii) of the Environmental Protection Agency's (EPA'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."

This O&M Plan addresses Minimum Control Measure 6, Good Housekeeping and Pollution Prevention for Permittee Owned Operations, by describing the activities and procedures the Town of Hanover will implement so that the MS4 infrastructure is maintained in a timely manner to reduce the discharge of pollutants from the MS4. The O&M Plan outlines inspection and maintenance procedures for catch basins, municipally-owned streets, facilities, and parking lots, and stormwater Best Management Practices.

The O&M Plan for the Town of Hanover also establishes procedures to address the proper use, storage and disposal of pesticides, herbicides and fertilizers. It includes recommendations for proper lawn maintenance and disposal of grass clippings and other vegetative waste at Open Spaces and Parks maintained by the Town of Hanover. The Plan 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.

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 is consistently 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 the Town of Hanover departments such as the Conservation Commission among others, will be used to determine the appropriate priority level.

The O&M Plan reflects the current processes for Town operations, and its use is applied throughout the Department, as listed below:

Department	Supervisor
Public Works	Victor J. Diniak
	Kurt Kelley
Parks and Recreation	Lauren Rodday
Facilities	Robert Murray, PE
Conservation	Sandra MacFarlane

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. Town-owned facilities typically include parks and open space, buildings and facilities, and vehicles and equipment. The requirements of the Permit as itemized below detail individual elements associated with each facility that can either affect stormwater quality or specifically treat stormwater generated by these facilities. 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** 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 to a catch basin as a sump more than 50 percent full.
 - Document in the SWMP and in the first annual report the 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 Establish and implement procedures for sweeping and/or cleaning streets, and permittee-owned parking lots. The procedures shall 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, land use, water quality limited or TMDL waters or other relevant factors as

determined by the permittee. Report in each annual report the number of miles cleaned and the volume or mass of material removed.

- **BMP Maintenance & Inspection Procedures** –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 Town-owned stormwater treatment structures (excluding catch basins) shall be inspected annually at a minimum.
- Storage of Catch Basin Cleanings & Street Sweepings 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 Establish and implement procedures for winter road maintenance including the use and storage of salt and sand; minimizing the use of sodium chloride and other salts and evaluating 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.
- Vehicles and Equipment Establish procedures for the storage of Town owned vehicles and establish procedures to ensure that vehicle wash waters are not discharged to the municipal storm sewer system or to surface waters.
- **Reporting** 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 and keep a written record of all required activities but not limited to maintenance activities, inspections and training.

The following sections present the Town of Hanover O&M procedures associated with each of these requirements.

SECTION 3 FERTILIZER USE, STORAGE, AND DISPOSAL

The Town of Hanover maintains its public spaces and parks utilizing subcontractors to periodically fertilize town-owned land. The list of public facilities currently maintained by the DPW or other departments include:

Fire Department Headquarters	Pond Street Water Treatment	Ellis Field
	Facility	
Town Hall	Broadway Well Building #1	Ceurvels Field
John Curtis Free Library	Broadway Well Building #2	Salmond School
Council on Aging	Philip C. Beal Well Building #1	Sylvester School
Fire Station #1	Philip C. Beal Well Building #2	Veterans Memorial Park
Fire Station #2	Hanover Street Well Building #1	B.E. Hall Field/Playground
		Facility
Forge Pond Park	Hanover Street Well Building #2	Luddams Ford Site
DPW Garage	Pond Street Well Building #1	Hanover Center Cemetery
DPW Maintenance Garage	Pond Street Well Building #2	Union Cemetery
DPW Storage Yard	Pond Street Well Building #3	Darling Cemetery
Facility Garage	Hanover Street Well Backup	Hanover Senior Center
	Generator	
Transfer Station	Center School	Briggs Field
Police Station	Hanover Middle School	Gallant Field
Broadway Water Treatment	Hanover High School	
Facility		
Philip C. Beal Water Treatment	Cedar School	
Facility		

The location of these facilities are shown on attached Figure 1.

3.1 CURRENT FERTILIZER USE

The Town's subcontractor currently uses fertilizers on all open spaces and at public parks. They do not use pesticides. The subcontractor only uses Lesco Granular Fertilizer and typically purchases it and sprays it the day of purchase. The fertilizer is applied by the subcontractors. The Town also uses Tri-Power Selective Herbicide and Barricade 4FL Herbicides, applied by subcontractors.

The Town is consistently 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.

All fertilizer applications should conform to the requirements outlined in 330 CMR 31.00 Plant Nutrient Application Requirements for Agricultural Land and Non-Agricultural Turf and Lawns. The purpose of this regulation is to ensure that municipalities limit non-point source pollutants from entering the surface and groundwater resources of the Commonwealth as well as minimizing the impacts of nutrients on water resources to protect human health and safety. This Regulation also references the University of Massachusetts Amherst Extension Service guidelines for fertilizer applications. With regard to fertilizer applications, 330 CMR 31.00 includes the following requirements:

- Apply fertilizers and nutrients consistent with University of Massachusetts Extension Service guidelines for turf
- Do not apply fertilizers or nutrients to surface waters, saturated soils, flooded soils, or frozen soils
- Do not apply fertilizers within 100 feet of surface waters used for public water supplies
- Do not apply fertilizers within a Zone I of a public Water Supply Well
- Apply fertilizers using a broadcast method outside of 20 feet of Surface Waters not used for public water supplies
- Apply fertilizers using a drop spreader or rotary spreader with a deflector or targeted spray within ten feet of Surface Waters not used for public water supplies
- Do not apply fertilizers to impervious areas
- Do not apply fertilizers for de-icing purposes
- Do not apply fertilizers to drought dormant, cold dormant, inactive, or brown turf
- Do not apply fertilizers containing Phosphorus unless
 - A soil test was taken within the last three years that indicates additional phosphorus is needed for growth
 - Phosphorous containing fertilizer is used to establish a new lawn
- Records shall be kept for all applications of Plant Nutrients or Phosphorus Containing Fertilizer to Non-agricultural Turf and Lawns consistent with 330 CMR 31.07

3.2 FERTILIZER STORAGE

All fertilizers are applied by a subcontractor; therefore, the Town does not store fertilizers. Should the Town decide to purchase and apply fertilizer themselves, the following guidelines would apply.

Fertilizer storage and handling should be performed consistent with UMass Extension Service regarding Fertilizer storage and handling. Guidance can be found here:

https://ag.umass.edu/greenhouse-floriculture/greenhouse-best-management-practices-bmp-manual/fertilizer-storage-handling

Specifically, fertilizers should be stored as follows:

- Store fertilizers separate from other chemicals in dry conditions
- Provide extra care to concentrate stock solutions. Secondary containment should be used for stock solutions.
- Provide pallets to keep large drums or bags off the floor. Shelves for smaller containers should have a lip to keep the containers from sliding off easily. Steel shelves are easier to clean than wood if a spill occurs.
- For storage in large bulk tanks, provide a containment area large enough to confine 125 percent of the contents of the largest bulk container.

- Keep the storage area locked and clearly labeled as a fertilizer storage area. Preventing unauthorized use of fertilizers reduces the chance of accidental spills or theft. Labels on the windows and doors of the building give firefighters information about fertilizers and other products present during an emergency response to a fire or a spill.
- Provide adequate road access for deliveries and use, and in making the storage area secure. Also make it accessible, to allow getting fertilizers and other chemicals out in a hurry.
- Never store fertilizers inside a well house or a facility containing an abandoned well.
- Reseal open containers and return to storage.
- Replace and/or repair damaged containers.
- Insure there are no floor drains within fertilizer containment areas.
- Insure fire detection and alarm systems are present. Oxidizers and flammable materials should be stored separately. Fire extinguishers should be immediately available. Fire Department should be notified annually of fertilizer inventories.
- Inventories should be actively maintained.
- Lighting should be provided.
- Inspections should occur monthly for 1) signs of container corrosion or other damage (leaking or damaged containers should be repackaged as appropriate) 3) faulty ventilation, electrical, and fire suppression systems (problems should be reported and corrected).
- Storage areas should be locked.
- Signs should be posted.
- Active mechanical temperature control should be provided with no direct sources of heat.
- Mechanical ventilation should be working and used.
- Fertilizer stock tanks should be labeled with fertilizer formulation and concentration; records should be kept of fertilizer formulation, concentration, date, and location of application; records should be kept of media nutrient analyses.
- Concentrated stock should be stored near the injector in high density polyethylene or polypropylene containers with extra heavy duty walls; secondary containment should be provided.
- Sufficient planning should be made to eliminate the need for disposal; empty fertilizer containers should be discarded based on latest advice from environmental protection authorities.
- Fertilizer systems should be cleaned. Solids and rinse solution should be composted.
- Secondary containment should be used for fertilizer stock tanks routinely; spill clean-up materials should be used for liquids (e.g., absorbent materials) and solids (e.g., shovel, dust pan, broom and empty and/or buckets) should be available within the general area.
- Any fertigation equipment should be checked monthly for accuracy; containment tanks, back flow preventers and any equipment that holds fertilizer in the dry or liquid form should be inspected; stock tanks should be inspected weekly for deterioration and cracks; the manufacturer recommendations should be followed when calibrating or working on fertilizer injector equipment; stock solution tanks and the areas surrounding fertilizer injectors and concentrated solutions should be kept clean and free of debris.

3.3 FERTILIZER DISPOSAL

All fertilizers are applied by a subcontractor; therefore, the Town does not need to dispose of fertilizers. Should the Town decide to purchase and apply fertilizer themselves, the following guidelines would apply.

Consistent with the UMass Extension Service's guidance on fertilizer management, sufficient planning would be made to eliminate the need for disposal. Empty fertilizer containers would be discarded based on latest advice from environmental authorities.

SECTION 4 LAWN & LANDSCAPING MAINTENANCE

The Town DPW maintains its public spaces and parks. The list of public spaces currently maintained by the Town include:

Fire Department Headquarters	Pond Street Water Treatment Facility	Ellis Field
Town Hall	Broadway Well Building #1	Ceurvels Field
John Curtis Free Library	Broadway Well Building #2	Salmond School
Council on Aging	Philip C. Beal Well Building #1	Sylvester School
Fire Station #1	Philip C. Beal Well Building #2	Veterans Memorial Park
Fire Station #2	Hanover Street Well Building #1	B.E. Hall Field/Playground
		Facility
Forge Pond Park	Hanover Street Well Building #2	Luddams Ford Site
DPW Garage	Pond Street Well Building #1	Hanover Center Cemetery
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Facility Garage	Hanover Street Well Backup	Hanover Senior Center
	Generator	
Transfer Station	Center School	Briggs Field
Police Station	Hanover Middle School	Gallant Field
Broadway Water Treatment	Hanover High School	
Facility		
Philip C. Beal Water Treatment	Cedar School	
Facility		

The location of these facilities are shown on attached Figure 1.

4.1 CURRENT LAWN & LANDSCAPING PRACTICES

The Town currently maintains a mowing and landscaping schedule through the DPW. In addition to the application of fertilizers described in Section 3.0, lawn and landscaping maintaining activities include: mowing, tree-trimming and landscaping. The Town performs these services, and mows biweekly April through November. The Town is currently reviewing its operation schedule, looking for ways to reduce the mowing frequency. Lawn mowing should be performed consistent with UMass Extension Service recommendations as follows:

https://ag.umass.edu/home-lawn-garden/fact-sheets/lawn-mowing

4.2 DISPOSAL OF LAWN CLIPPINGS

The Town mulches any lawn clippings generated by the mowed areas and they remain onsite..

The UMass Extension Service recommends that lawn clippings should generally remain left on the lawn unless there is an excessive amount of lawn clippings due to infrequent mowing. Lawn clippings

are a valuable source of nutrients and can reduce the need for fertilization. In the event that lawns are mowed when grass is wet, they may clump together and need to be removed. Lawn clippings should be managed consistent with the UMass Extension Service recommendations as follows:

https://ag.umass.edu/home-lawn-garden/fact-sheets/lawn-mowing

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. Any alternative landscape materials or practices should be coordinated with applicable guidance documents and regulations including, but not limited to:

- Massachusetts Regulations
- UMass Extension Service Guidance
- Applicable Federal Laws and Regulations
- Environmental Protection Agency Policies and Guidance documents.

SECTION 5 TRASH RECEPTACLES & PET WASTE

5.1 PUBLIC TRASH OPERATIONS

The Town currently maintains the trash receptacles in public spaces. The trash is collected and disposed of by subcontractors.

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

5.2 PET WASTE

The Town has Pet Waste informational signs installed along walkways in Forge Pond Park. The Town will work with other Town Departments (Conservation, Highway Division, and Planning) to discuss potential other locations where Pet Waste information should be installed.

Efforts will be made to increase the number of signs installed to alert pet owners regarding the removal and disposal of pet wastes. All pet wastes should be collected by pet owners and disposed of in trash receptacles. Any signs posted would include wording that discourages pet owners from disposing of pet waste in catch basins.

SECTION 6 CATCH BASIN CLEANING PROGRAM

Traditional municipal storm drain systems were designed to quickly collect, treat, detain, infiltrate and convey stormwater runoff to receiving waters. The purpose of catch basin, inlet and storm drain cleanings is to remove accumulated sediment which prevents blockages, flooding and reduce the release of downstream pollutants.

Fine particles and pollutants generated by stormwater run-off, atmospheric deposition, vehicle emissions, breakup of street surface materials, littering, and sanding accumulate along the curbs of roads in between rainfall events. This results in the accumulation of trash and sediment. Pollutants attach to trash and sediment including nutrients, metals, hydrocarbons, bacteria, pesticides, and toxic chemicals. Storm drain maintenance is often the first opportunity to provide pre-treatment and remove pollutants before they are conveyed through 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 downstream stormwater best management practices and Hanover's waterways and water resources.

The catch basin maintenance schedule should begin annually after the last spring snowfall. Inspection should 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. The Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards recommend cleaning catch basins four times per year, including at the end of the snow removal and foliage removal seasons.

6.1 EXISTING CATCH BASIN CLEANING PROGRAM

The Town's subcontractors currently run their catch basin cleaning program once per year, visiting all of their catch basins annually, typically in early spring. The subcontractors perform the catch basin cleanings using a clamshell truck. Hanover has had no flooding issues 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 catch basins are cleaned regularly. Also, the Town no longer uses sand as part of the winter roadway maintenance.

6.2 CATCH BASIN MAPPING AND INSPECTIONS

There are 2,831 catch basins throughout Hanover that have been previously mapped in the MS4 area, as defined by the 2000 and 2010 Census. All catch basins are located in Geographic Information System (GIS) format using historic aerial flyover data, handheld GPS units, and employee knowledge. A Town-wide mapbook has been prepared showing unique catch basin identifiers (e.g. 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 Town personnel identify additional catch basin structures 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 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.

The Town subcontracts the annual catch basin cleaning. 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 to focus on areas that typically found to generate high levels of sediment or if the Town decides, to reduce the scope of their annual catch basin cleaning program (i.e., not cleaning every catch basin every year).

In the event that catch basin cleaning's are prioritized, 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. These catch basins are typically located near construction
 activities. Any catch basins that are more than 50 percent full during two consecutive
 inspections and cleanings should receive top priority. Catch basins that are located in a high
 priority watershed or watershed discharging to an impaired water or water that has an
 established Total Maximum Daily Load should also be inspected more often.
- Priority B Catch basins that are designated as consistently generating moderate volumes of trash, sediment and/or debris. These catch basins will consistently show sediment loads in the catch basin sumps but the depths of sediment may not reach 50 percent of the sump depth.
- Priority C Catch basins that are designated as generating low volumes of trash, sediment and/or debris. These catch basins may not include any sediment on a consistent basis.

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

ВМР	Activity	Frequency	
Catch Basin	Inspection / Cleaning)	Priority A – Inspect four times/year. Clean when sediment reaches 50% of sump depth. Priority B – Inspect minimum of one time per year. Clean when sediment reaches 50% of sump depth. Priority C – Inspect minimum of one time/year	

The MassDEP Stormwater Management Standards recommend that catch basins be inspected four times per year or whenever the depths of sediment within the catch basin sump equals ½ the depth from the bottom of the sump to the catch basin invert. Newer catch basins that were installed consistent with MassDEP Stormwater Management Standards have typically included a four foot deep sump. Catch basins that were installed prior to the promulgation of these Standards, or did not meet the standards, may have been installed with a smaller sump depth, or possibly no sump at all. The Town has noted that, since the catch basins have been cleaned annually, the depths of sediment have consistently been less than ½ the depth of the bottom sump to the catch basin invert.

Catch basin are to be cleaned when accumulated sediments and debris either by mechanical methods when its depth is equal to or greater than 1/2 the depth from the bottom of the basin to the invert of the 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 MassDEP's "1-drip" policy.

The materials removed from the catch basin shall not re-enter the stormwater system. Nonhazardous sediments are to be disposed of at an approved solid waste landfill or used as landfill daily cover in accordance with MassDEP 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 Hanover 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.

The MS4 permit requires that logs be kept documenting the number of catch basins cleaned and inspected each year. The number of catch basins inspected, cleaned, and the total mass of material removed from each catch basin shall be reported each year.

SECTION 7 STREET SWEEPING PROGRAM

Street and parking lot sweeping is a practice that municipalities may have traditionally conducted for aesthetic purposes. However, the water quality benefits are widely recognized and street and parking lot sweeping is identified in the MassDEP Stormwater Management Standards as a pretreatment strategy for removing solids, as well as the pollutants that become attached to sediment.

A number of factors impact the effectiveness of a street sweeping program. The first factor is the type of equipment used. When standard mechanical sweeping equipment needs to be replaced, highperformance 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. Vacuum sweepers are also best suited for cleaning pervious pavements.

The second factor influencing street sweeping effectiveness is the way in which the equipment is operated. The 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.

The frequency of street sweeping is also a significant factor in removing sediments and other pollutants from municipal streets. The MS4 permit requires streets to be swept once per year in the spring following winter activities.

7.1 EXISTING STREET SWEEPING PROGRAM

The Town currently runs their street sweeping program once per year, sweeping 90 miles of roads annually in early spring. The department currently utilizes GIS tracking to track the date, number of loads taken, start/end times, names of streets swept, etc.

7.2 STREET SWEEPING PRIORITY RANKING

In accordance with the MS4 permit, the Town will sweep and/or clean streets, and Town-owned parking lots a minimum of once per year. All streets with the exception of high speed limited access highways will be swept and/or cleaned a minimum of once per year, preferably in the spring (following winter activities). More frequent sweeping shall occur in targeted areas including streets and parking lots that consistently experience higher pollutant loads based on catch basin inspections and cleanings, proximity to constructions sites, and areas that discharge to water bodies with impairments or have a Total Maximum Daily Load. The procedures shall also include more frequent sweeping of targets areas (See Appendix A and Figure 2) determined by the Town on the basis of following factors: (a) pollutant load reduction potential, (b) pollutant loads, (c) catch basin cleaning or inspection results, (d) land use, or (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 – Town of Hanover Mapbook. The Town 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 Town shall either meet the minimum frequencies above, or develop and implement an inspection, documentation and targeted sweeping plan.

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 Garage located at 219 Ames Way and will either be disposed or reused in accordance with the MassDEP policy entitled "Reuse and Disposal of Street Sweepings, Department of Environmental Protection Policy # BAW-18-001," dated 5/14/18. Figure 2 is a Street Sweeping Prioritization Map showing the designated priority zones to aid the Town in prioritizing street sweeping and planning for future activities. As shown on Figure 2, Winter Street is the only prioritized street in the Hanover MS4 area. Refer to Section 9.1 for street sweeping material storage protocol.

SECTION 8 BMP MAINTENANCE

An essential component of an effective 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 of stormwater management systems can reduce the hydraulic capacity, the pollutant removal efficiency, and infiltration capacity of stormwater practices. Stormwater management system Operation and Maintenance Programs 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 of the system components. Proactively inspecting facilities and addressing concerns provides some consistency in workflow and helps to avoid emergency situations.

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

- Regularly scheduled inspections, and
- Regular maintenance.

Following is a description of some of the most common Stormwater Best Management Practices (BMPs) in municipalities and the recommended or required inspection and maintenance schedule.

8.1 STORMWATER BASINS

Stormwater basins are designed differently depending on site conditions and each project's approach to stormwater management. The more common stormwater basins designed and constructed, include:

- Extended Detention basins
- Infiltration Basins
- Wet Basins
- Bioretention Basins/Rain Gardens
- Sediment Forebays

Each specific type of basin has distinct operations and maintenance requirements as outlined in the Operations and Maintenance plan that was developed as part of each project's design and approval process. Below are operation and maintenance requirements that are specific to each type of stormwater basin as described in the Massachusetts Stormwater Management Standards.

Extended Dry Detention Basins

- Inspect complete structure biannually
- Inspect outlet control structure for clogging, etc., twice per year
- Check for erosion, twice per year
- Check for sedimentation, annually
- Mow basin bottom, side slopes, spillway, twice per year
- Remove trash, twice per year

Infiltration Basins

- Inspection and perform preventive maintenance, minimum twice per year
- Inspect pretreatment BMP, as required by each BMP and after major storm events for first six months
- Inspect after major storms for first six months, check drawdown times
- Address ponding immediately
- Inspect twice per year for
 - o Differential settlement
 - o Cracking
 - o Erosion
 - Leakage in embankments
 - o Tree growth on embankments
 - Condition of rip-rap
 - o Sediment accumulation (when bottom is dry)
 - Health of turf
- Mow side slopes and basin bottom, twice per year
- Remove trash and debris, twice per year
- When removing sediment, wait until bottom is dry, till remaining soil, revegetate
- Inspect and clean pretreatment devices minimum twice per year or more

Wet Basins

- Inspect annually
- Inspect outlet control structure for clogging, etc., twice per year
- Check for erosion, tree growth, etc., twice per year
- Mow dry/upper stages, twice per year
- Remove trash, sediment, twice per year

Bioretention Basins/Rain Gardens

- Inspect for soil erosion, monthly
- Inspect and remove trash monthly
- Inspect for invasive species/weeds, monthly
- Replace mulch, annually in the spring
- Remove dead vegetation, annually in either the fall or spring
- Replace dead vegetation, annually in either the fall or spring
- Prune, annually in either the fall or spring
- Replace soil media and all vegetation, as needed

Sediment Forebays

- Inspect monthly
- Clean minimum of four times per year
- Mow twice per year or when grass exceeds 6 inches in height
- Replace rip-rap pads, when necessary

8.2 WATER QUALITY SWALES

Water Quality Swales under operational control by the Town should be maintained consistent with the Massachusetts Stormwater Management Standards or the Operations and Maintenance manual as approved as part of the projects design and approval.

The maintenance objective for water quality swales includes preserving the hydraulic and removal efficiency of the channel and maintaining a dense, healthy vegetative cover to encourage sediment removal and – where appropriate – stormwater infiltration. The following operations and maintenance activities are recommended for Water Quality Swales consistent with the Massachusetts Stormwater Management Standards:

- Inspect twice per year
- Mow annually, or if vegetation exceeds 6 inches
- Remove Sediment/Trash, Minimum once per year
- Reseed eroded areas, as needed

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 if needed. 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.

8.3 DRY WELLS

Dry wells are structures that collect stormwater generated by either roof tops or paved surfaces and infiltrate stormwater into the ground. Drywells vary in size and depth, but are typically either four, six or eight feet in diameter and have varying depths depending on ground water elevations. Dry wells typically have open bottoms and include perforations in concrete that allows water to leach out of the bottom and sides of the structures. The structures are typically surrounded by one to two feet of 3/4 to 1-1/2 inch stone around the sides and bottom of the dry well. When these facilities collect and infiltrate stormwater from surface runoff, pretreatment of stormwater is critical to insure that sediments are removed prior to discharge to the structure.

Maintenance of dry wells should include the following consistent with the Massachusetts Stormwater Management Standards:

• Inspect annually to insure that there has been no sediment build-up that could impact the functionality of the dry well.

- Remove sediment in the dry well when it reaches 50% capacity.
- Replace the structure and or stone when the system fails to infiltrate effectively.

8.4 PROPRIETY SUBSURFACE SEPERATORS

Proprietary Subsurface Separators have 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 know of 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.

Proprietary Subsurface Separators under operational control of the Town will be maintained consistent with manufacturers operations and maintenance guidelines. Typically, these units need to be inspected a minimum of once per year. For units that are installed in high sediment areas, these units may need to be inspected more frequently.

Inspection of proprietary subsurface separators will include inspecting 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 MassDEP'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.

8.5 OTHER STORMWATER BEST MANAGEMENT PRACTICES

The Stormwater BMPs described above are typically designed and constructed for projects where it is intended that the local municipality will assume Operations and Maintenance activities. There are numerous other stormwater BMPs that are described within the Massachusetts Stormwater Standards. Operations and Maintenance activities related to these additional BMPs should be conducted as outlined in the Standards, as well as in the Operations and Maintenance Plans developed and approved by local regulatory boards for each approved BMP. Additional stormwater BMPs that could be Operated and Maintained by municipalities include:

- Gravel Wetlands
- Constructed Wetlands
- Vegetated Filter Strips
- Sand and Organic Filters
- Infiltration Trenches
- Leaching Fields
- Porous Pavements
- Rain Barrels and Cisterns

SECTION 9 STREET SWEEPING & CATCH BASIN CLEANINGS

This section describes the disposal requirements of the Town's Street Sweeping and Catch Basin Cleanings materials. The Town has traditionally stockpiled catch basin cleanings and street sweepings at a Town–owned yard located at the DPW Garage, 219 Ames Way (see Figure 3). The procedures required for properly managing these materials are further described below and in the SOP's attached as Appendix D.

9.1 STREET SWEEPINGS

The Town's street sweeping operations are mainly conducted once per year in the spring, although prioritized areas are swept two times per year, once in the spring and once in the fall. The street sweepings are subsequently brought back to the Town-owned yard at 219 Ames Way to the designated street sweeping stockpile area (Figure 3) and are currently being stored there for up to one year. The annual amount generated is approximately 20 cubic yards.

Street sweepings need to be disposed of consistent with the MassDEP policy entitled "Reuse and Disposal of Street Sweepings, MassDEP Policy # BAW-18-001," dated 5/14/18. They must also be managed under MassDEP Policy #COMM-97-001 "Reuse and Disposal of Contaminated Soil at Massachusetts Landfills."

Street sweepings can be stored prior to use under the following conditions:

- Storage must at a site where the sweepings are generated,
- Storage must be at a location, such as a Department of Public Works yard, that is under control of the government entity doing the sweeping.
- Must be protected from wind and rain to prevent dust, erosion and off-site migration.
- Cannot be stored within 100 feet of a wetland or within a wetlands resource area or riverfront area,
- Cannot be stored within 500 feet of a ground or drinking water supply,
- Cannot result in a public nuisance
- Must be temporary and will be used within one year of collection.

Street sweepings are considered "solid waste" and are therefore subject to the Massachusetts solid waste regulations. Street sweepings have been preapproved for the following uses, without Prior Approval from MassDEP:

- Daily cover at permitted lined solid waste landfills provided they meet the daily cover materials specified at 310 19.130(15).
- Use as Fill in Public or Private Ways and Parking Lots with some restrictions and conditions.
- Use as an Additive to Restricted Use Compost with some restrictions and conditions.
- Reuse as Anti-Skid Material with some restrictions and conditions.

- Reuse at Landfills Regulated under MassDEP Policy #COMM-97-001 with some restrictions and conditions.
- Use at Reclamation Soil Facilities Regulated Under MassDEP Policy #COMM-15-01.
- Street sweepings may also be used as a bulking agent for wastewater sludge or septage disposal, with prior approval from MassDEP.

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 the catch basin cleanings stockpile area, as shown on Figure 3. The annual amount generated is approximately 500 cubic yards.

Figure 3 also shows the location of the storage area and the proximity to localized wetlands and waterbodies surrounding the storage area; Torrey Brook and Drinkwater River are adjacent to the storage area. The Town is in the process of redesigning and moving their salt shed, at which time the catch basin cleanings will be stored on pavement, in the current location of the salt shed.

Catch basin cleanings collected by the Town's subcontractors need to be disposed of consistent with the MassDEP policies regarding "Management of Catch Basin Cleanings." Materials removed from catch basins are typically defined as solid waste by the MassDEP. Any catch basin cleanings 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.

SECTION 10 WINTER ROAD MAINTENANCE

Winter Road Maintenance includes the management of equipment and facilities needed to maintain roads for safe travel as well as the application of anti-icing and de-icing materials. Municipalities are required to insure roads are as safe as possible. Because of this, the tendency to think "more sand/salt is better" can be difficult to overcome. Several studies have shown that by using new techniques, equipment, and chemicals, roads can actually be safer with less salt use. MassDOT typically treats road using both anti-icing and de-icing strategies. Anti-icing involve applying a liquid solution to roads before a storm that prevents snow and ice from binding to the pavement. De-icing is performed during and after storms to remove ice and snow through plowing and applying additional materials to the surface of the roads. MassDOT typically uses 5 different materials to treat roads for snow and ice as follows:

- Rock salt
- Liquid Magnesium Chloride
- Liquid Brine
- Sand
- Pre-mix (rock salt and calcium chloride)

Winter maintenance teams can benefit from the following practices:

- 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.
- 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 Town does not use sand for winter road maintenance. Municipalities should avoid using sand to the greatest extent practicable as it can clog storm drains and other stormwater management systems elements. In the event the stormwater management system is not maintained properly and unable to capture sand, sand could possibly be discharges to water and wetland resources.

10.2 DEICING CHEMICAL USE

The Town uses a salt and magnesium chloride wetting agent. As described above, de-icing and antiicing strategies should be used, when appropriate.

10.3 STORAGE OF DEICING CHEMICALS

The deicing material is stored in a covered shed at the DPW Garage.

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 can cause serious environmental issues. Sand is typically 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 on a flat site
- 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 and walls on at least 3 sides

During regular inspections, the salt and deicing chemical storage areas shall be inspected by the Deputy Superintendent of Public Works to ensure that runoff is minimized. All findings during an inspection shall be sent to the Director of Public Works.

Figure 4 shows the location of the salt and de-icing storage areas and the proximity to localized wetlands and streams surrounding the storage area.

MassDEP Guideline DWSG97-1 pertaining to storage of road salt and other chemical deicing agents became effective December 19, 1997. Uncovered storage of salt is forbidden by Massachusetts General Law Chapter 85, section 7A in areas that would threaten water supplies. 310 CMR 22.21(2)(b) restricts deicing chemical storage within wellhead protection areas, such as Zone I and Zone II, for public water supply wells, unless storage is within a structure designed to prevent the leaching or runoff of salt. 310 CMR 22.20C prohibits uncovered or uncontained storage of road or parking lot de-icing and sanding materials within Zone A at reservoirs.

10.4 SNOW DISPOSAL ACTIVITIES

The Town does not use a centralized snow storage or dumping area.

The MassDEP Bureau of Water Resources Snow Disposal Guidance, effective December 23, 2019 provides guidance on snow disposal activities. These guidelines provide the following criteria for selection of snow disposal sites including:

- Locating them adjacent to or on pervious surfaces in upland areas
- Locating sites away from water resources and drinking water wells
- Avoid storage of disposal of snow and ice containing deicing chemicals in Zone A And Zone II of a drinking water supply
- Avoid storage and disposal of snow or ice within an Interim Wellhead Protection Area (IWPA) of public water supply wells and within 75 feet of private wells
- Avoid dumping snow into any waterbody, including rivers, the ocean, reservoirs, ponds, or Wetlands.
- Avoid dumping snow on MassDEP designated high and medium yield aquifers
- Avoid dumping snow in sanitary landfills and gravel pits.
- Avoid disposing of snow on top of storm drain catch basins or in stormwater drainage systems including detention basins, swales, or ditches.

With regard to Site Preparation and Maintenance, MassDEP provides the following standards for snow disposal sites:

- Install a silt fence or barrier on the down gradient side of snow disposal sites
- Maintain a minimum 50 foot vegetated buffer between the disposal site and adjacent waterbodies
- Clear debris from the site prior to using the sit for snow removal
- Clear debris from the site and properly dispose of it at the end of snow season, and no later than May 15

With regard to snow disposal site approvals, MassDEP provides the following guidance:

- No review needed for previously used and mapped upland and pervious snow disposal locations.
- In cases where there is no snow disposal capacity, local Conservation Commissions may provide Emergency Certification under the Wetlands Protection Act to authorize snow disposal in buffer zones to wetlands, open water areas, and resource areas. Emergency authorizations should utilize the following guidelines:
 - Dispose of snow in open water with adequate flow and mixing to prevent ice dams from forming.
 - Do not dispose of snow in salt marshes, vegetated wetlands, certified vernal pools, shellfish beds, mudflats, drinking water reservoirs and their tributaries, Zone IIs or IWPAs of public water supply wells, Outstanding Resource Waters, or Areas of Critical Environmental Concern.
 - Do not dispose of snow where trucks may cause shoreline damage or erosion.
 - Consult with the municipal Conservation Commission to ensure that snow disposal in open water complies with local ordinances and bylaws.

SECTION 11 VEHICLES AND EQUIPMENT

Regular maintenance of both municipal and contracted vehicles and heavy equipment prolongs the life of municipal assets and helps reduce the potential for leaking of fluids associated with normal wear and tear. Leakage of fluids from vehicles can drain towards stormwater management facilities and ultimately towards water bodies and wetland resources. Therefore, it is important from both an operational and stormwater management perspective that municipalities maintain their vehicles and equipment properly. With regards to the maintenance of vehicles and equipment, municipalities should conduct the following activities to insure their vehicles and other equipment are maintained in good working order.

11.1 VEHICLE AND EQUIPMENT MAINTENANCE

The Town DPW currently conducts vehicle maintenance at their Ames Way Highway Garage facility. All vehicle and equipment maintenance should be performed consistent with the Guidelines below.

- Create an inventory of all vehicles and equipment that are used on a regular basis.
- Maintain and update the inventory of vehicles and equipment.
- Monitor vehicles and equipment for leaks.
- In instances where machinery have leaks, repair machinery as soon as possible.
- Dispose of and/or recycle all fluids consistent with state and federal regulations. Do not dump fluids outside or into stormwater management facilities
- Perform regular maintenance consistent with equipment manufacturer's recommendations.
- Perform all repairs and maintenance, including regular maintenance (i.e. oil changes. etc,) and painting, indoors.
- Insure that all drains within indoor facilities are not connected to stormwater management systems.
- Dispose of all waste materials and fluids consistent with local, state, and federal regulations.
- Insure that all fueling areas are covered,
- Insure that fueling areas should drain to an oil/gas separator or preferably fuel containment area.
- Store any waste materials under protection from outdoor elements and include secondary containment.
- Store all fluids in designated storage containers and areas. Insure these containers are located within buildings.
- Store and recycle batteries indoors,
- Insure that storage areas do not have floor drains. In the event that they do have floor drains, insure that they do not discharge to the municipal drain system or to wetland resource areas.
- Insure that all hazardous wastes are labelled and stored according to local, state, and federal regulations.
- Insure that any hazardous wastes are disposed of in accordance with local, state, and federal regulations.

• Perform all cleaning of parts indoors. Insure that all solvents are collected and recycled.

11.2 VEHICLE AND EQUIPMENT WASHING

Vehicle and equipment washing is performed at the Highway Garage on Ames Way. Smaller vehicles are washed inside the maintenance garage, while larger trucks are washed outside the garage on pervious ground surface. All vehicle and equipment washing should be performed consistent with the Guidelines below.

- All vehicles should be washed in a designated area.
- If possible, wash vehicles and equipment indoors. Indoor facilities should not have floor drains that are connected to the municipal stormwater management system or discharge to wetlands or water resources. Floor drains should be connected to either the sanitary sewage system, a recycled water system, or a tight tank.
- All wash water from vehicle washing should be collected by a recycling unit or tight tank.
- Do not discharge vehicle wash water to wetland resource areas or municipal drain systems.
- Use biodegradable or phosphate free detergents.
- Do not discharge any wash water to groundwater resource areas or wellhead protection areas.
- Maintain drip kits in wash areas.
- Provide separate wash and maintenance areas if possible.
- Remove any heavy debris, dirt, mud, etc. from vehicles separate from designated wash areas. Remove heavy debris, dirt, mud, etc. and dispose of properly.
- Wash engines or other motorized parts with a high incidence of fluids indoors. Contain any drips and spills to maximum extent practicable.
- Avoid using solvents and heavy detergents to the maximum extent practicable.

11.3 EMPLOYEE TRAINING

Regular employee training should be provided for all staff performing regular maintenance and/or equipment cleaning. Providing regular training a minimum of one time per year is recommended.

SECTION 12 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 facility at 50 Pond Street, 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 management database.

SECTION 13 TRAINING

This component of the O&M Plan establishes the procedures for identifying, planning, delivering and tracking training. The training is provided to operations and maintenance 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 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 Deputy Superintendent of Public Works is responsible for identifying the personnel that require training based upon job duties and how those duties relate to environmental compliance. All inspectors of stormwater management facilities should have some knowledge or experience with stormwater systems. If possible, trained stormwater engineers should direct them. Inspections by registered engineers should be performed where routine inspection has revealed a question of structural or hydraulic integrity affecting public safety.

13.1 TRAINING LEAD

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

The Town of Hanover 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 of Hanover shall report on the frequency and type of employee training in the annual report.

13.2 TRAINING PLAN

Training will be assigned to those individuals specifically involved in the O&M procedures. The Town of Hanover 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 of wetland resource areas.	2	In-field training	This training is for staff that will be responsible for field assessment of structures
O&M/IDDE – General Information		10	Lunch-and-Learn Session	This training will explain the O&M/IDDE program.

SECTION 14 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 inspected and cleaned annually
- Volume of material removed from catch basins
- Number of street miles of street sweepings conducted annually
- Number of municipally owned parking lots swept annually
- Amount of material removed from streets adjacent to sensitive waters
- Number of stormwater Best Management Practices inspected and maintained
- Number of Outfalls repaired
- Training: Number of Employees trained

SECTION 15 REFERENCES

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

Massachusetts Department of Environmental Protection, <u>Massachusetts Stormwater Handbook</u>, February 2008.

330 CMR 31.00 Plant Nutrient Application Requirements for Agricultural Land and Non-Agricultural Turf and Lawns.

UMass Extension Service Resources/Websites

https://ag.umass.edu/greenhouse-floriculture/greenhouse-best-management-practices-bmp-manual/fertilizer-storage-handling

https://ag.umass.edu/home-lawn-garden/fact-sheets/lawn-mowing

Massachusetts Department of Environmental Protection policy entitled "Reuse and Disposal of Street Sweepings, Department of Environmental Protection Policy # BAW-18-001," dated 5/14/18.

Massachusetts Department of Environmental Protection Guidelines on Road Salt Storage DWSG97-1, effective December 19, 1997;

The Massachusetts Department of Environmental Protection Bureau of Water Resources Snow Disposal Guidance, effective December 23, 2019.

SECTION 16 O&M PLAN 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 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.

D

Authorized Official

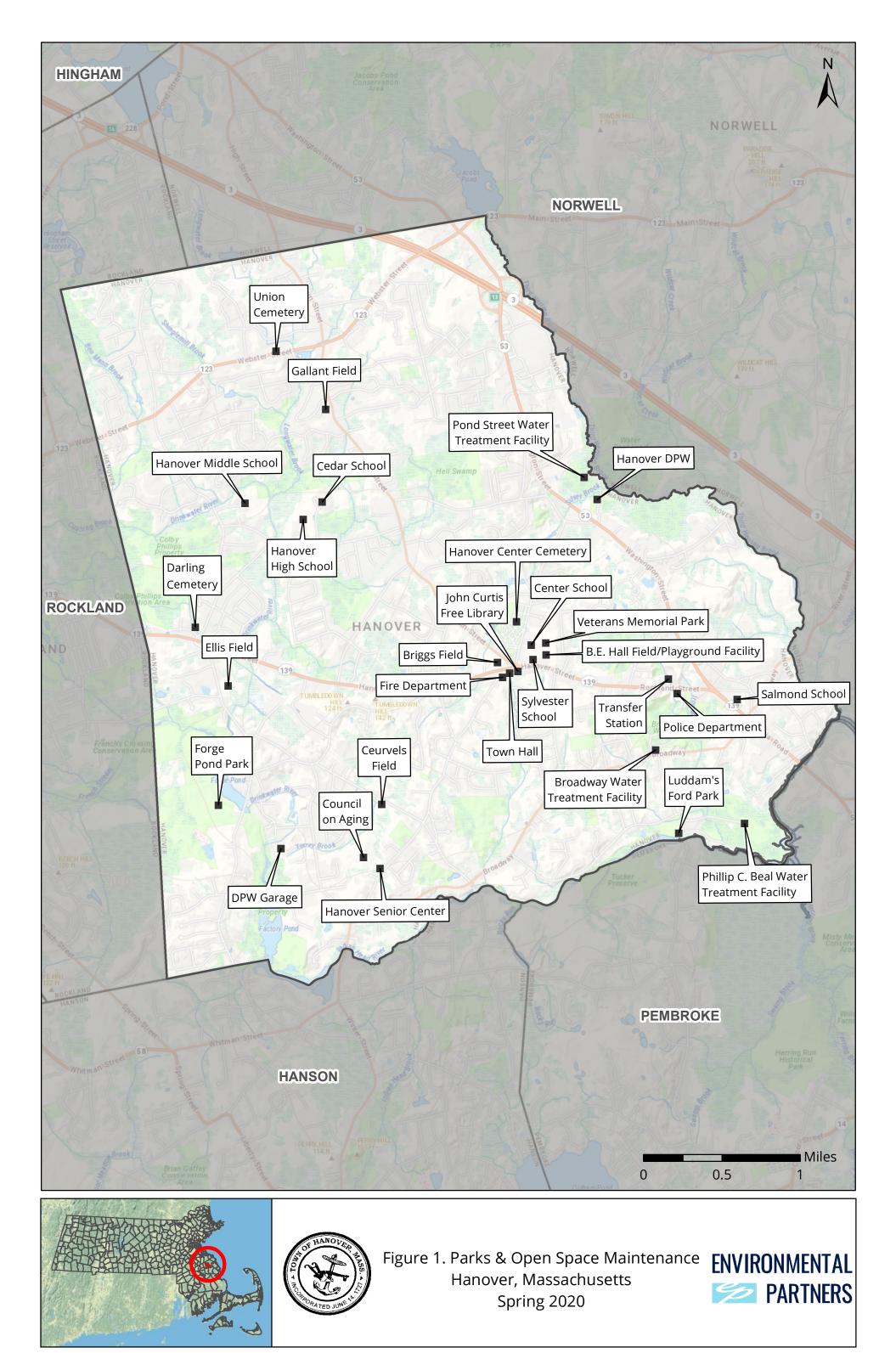
cting Town MAN Ager Title

1-23-2020

Date

FIGURE 1

Parks and Open Space Maintenance



I:\Hanover.102\Stormwater\102-1906 FY2020 Stormwater\4. O&M Plan\Figures\MXDs\1 - Parks & Open Space Maintenance.mxd

FIGURE 2

Street Sweeping Prioritization

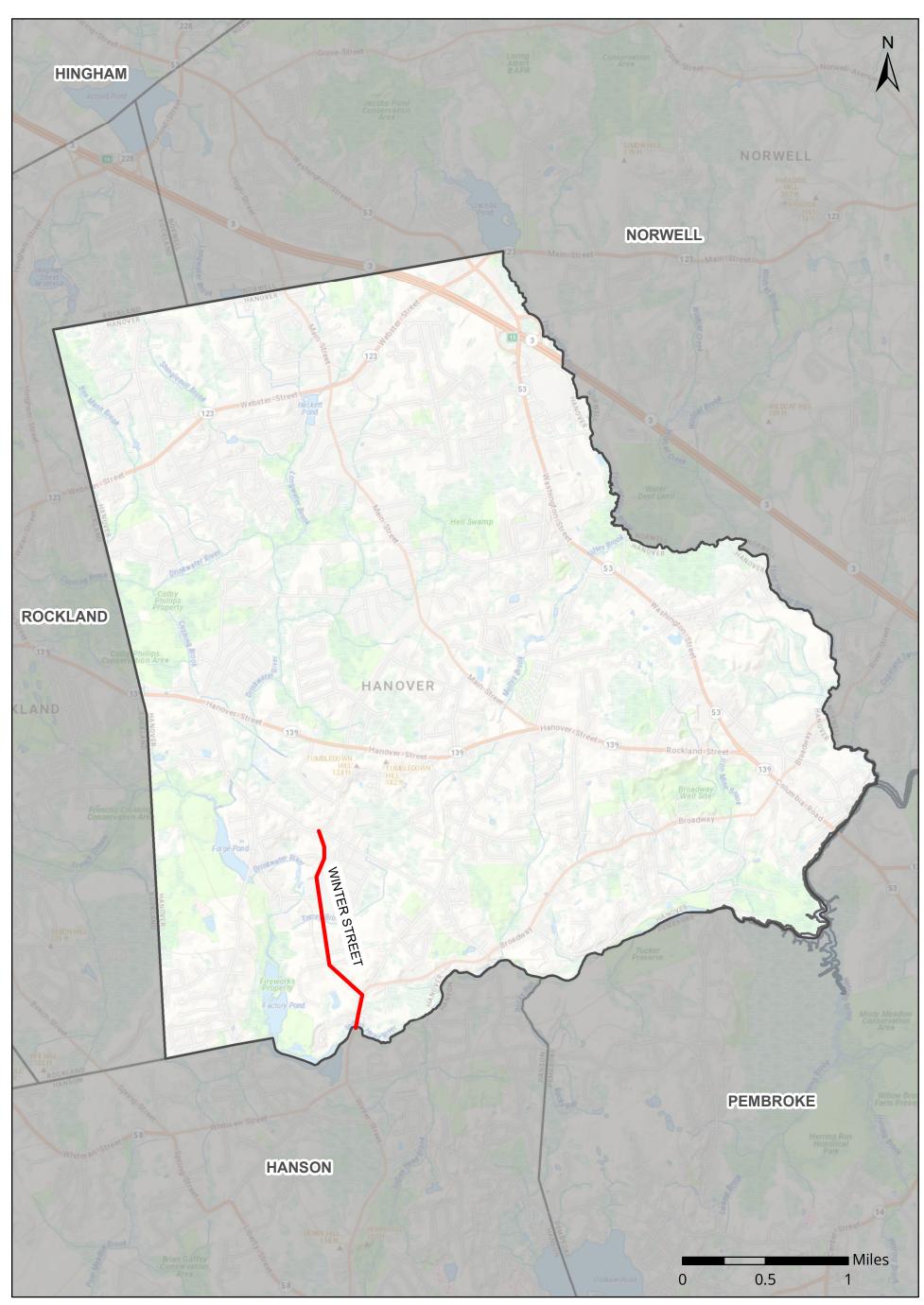






Figure 2. Street Sweepings Prioritization Hanover, Massachusetts Spring 2020



I:\Hanover.102\Stormwater\102-1906 FY2020 Stormwater\4. O&M Plan\Figures\MXDs\2 - Street Sweeping Prioritization.mxd

FIGURE 3

Storage Location of Street Sweepings and Catch Basin Cleanings

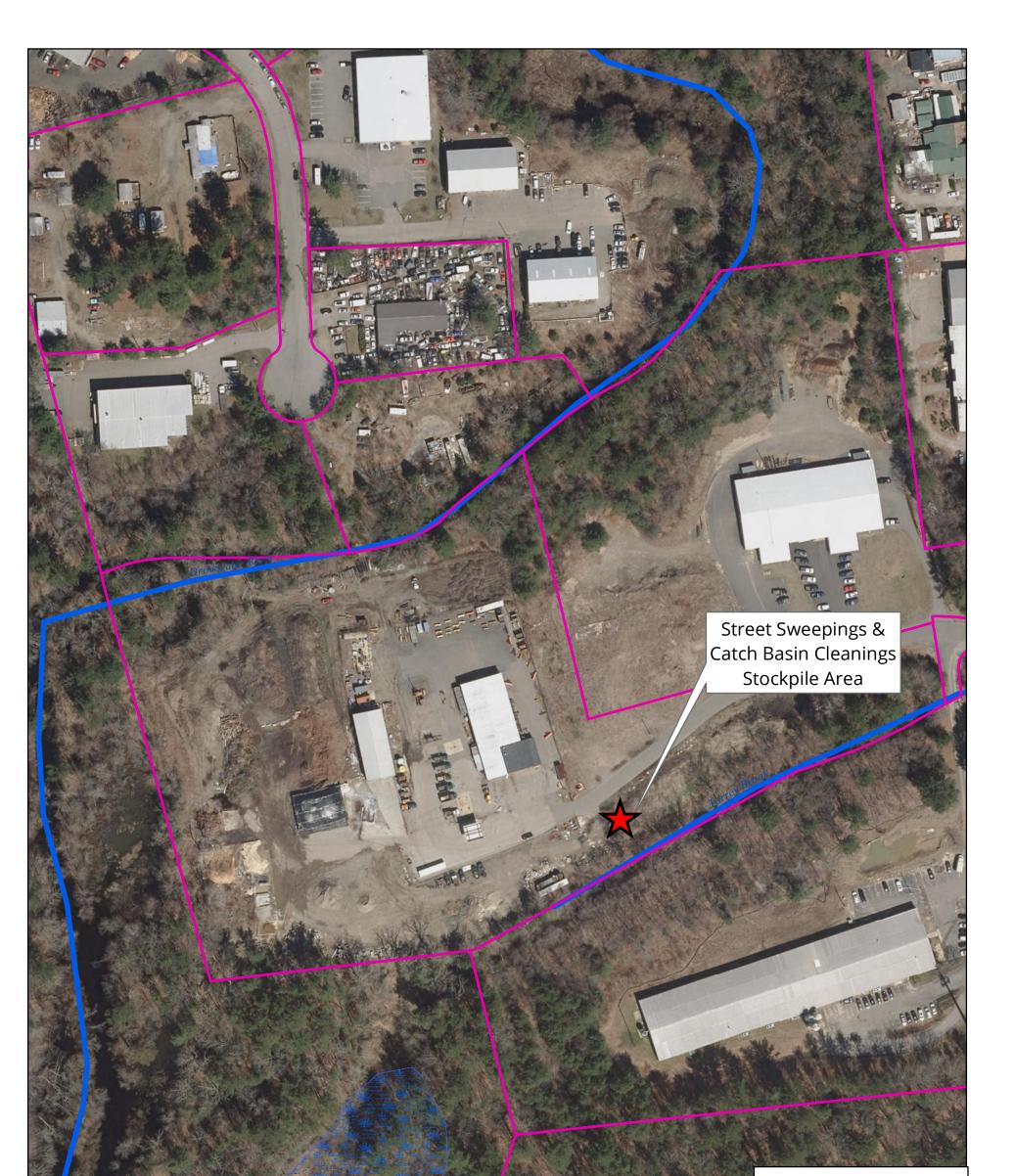








Figure 3. Storage Locations of Street Sweepings & Catch Basin Cleanings ENVIRONMENTAL Hanover, Massachusetts Spring 2020



I:\Hanover.102\Stormwater\102-1906 FY2020 Stormwater\4. O&M Plan\Figures\MXDs\3 - SS & CB Cleanings Storage.mxd

FIGURE 4

Storage Locations of Salt and Sand Supplies

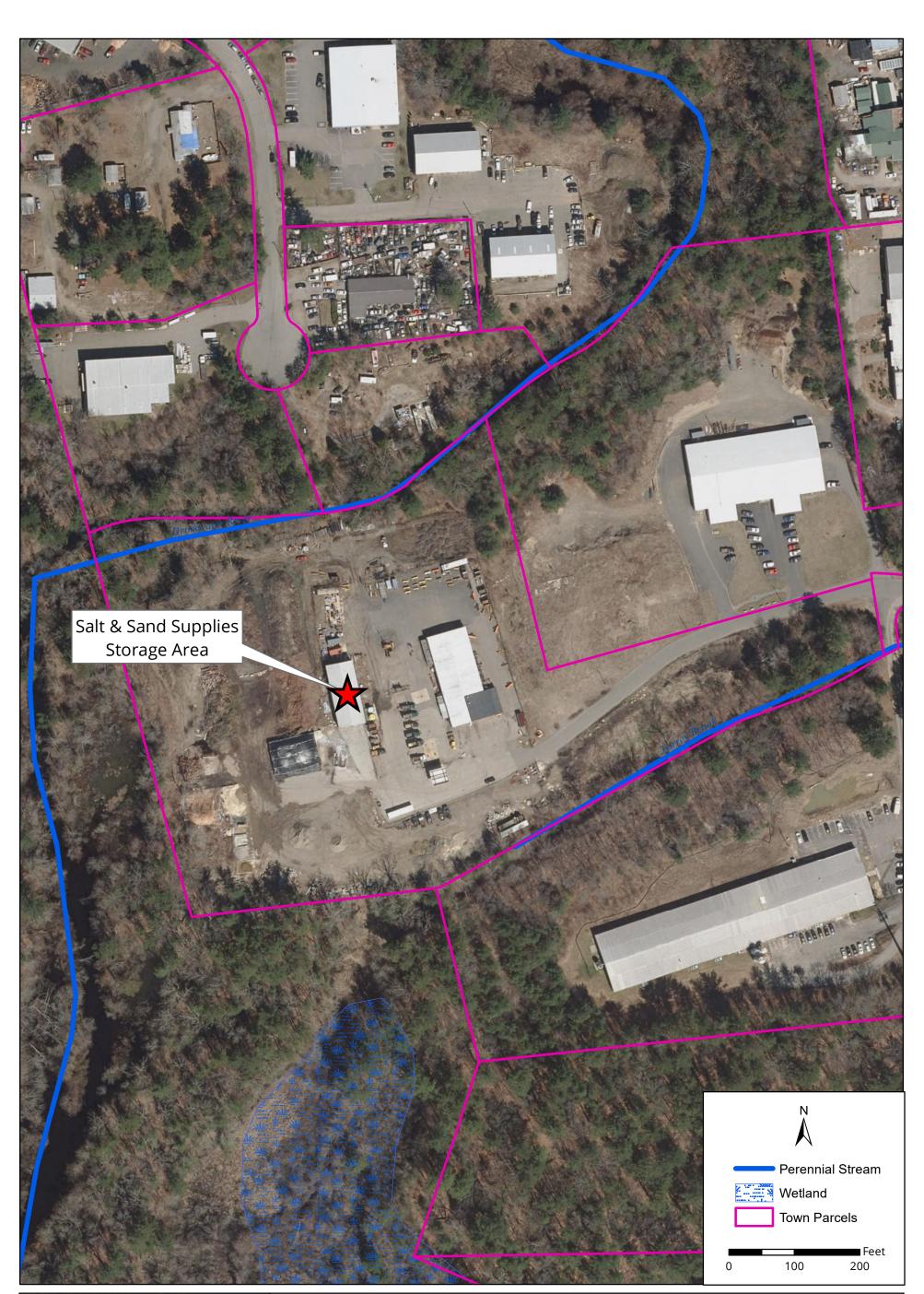






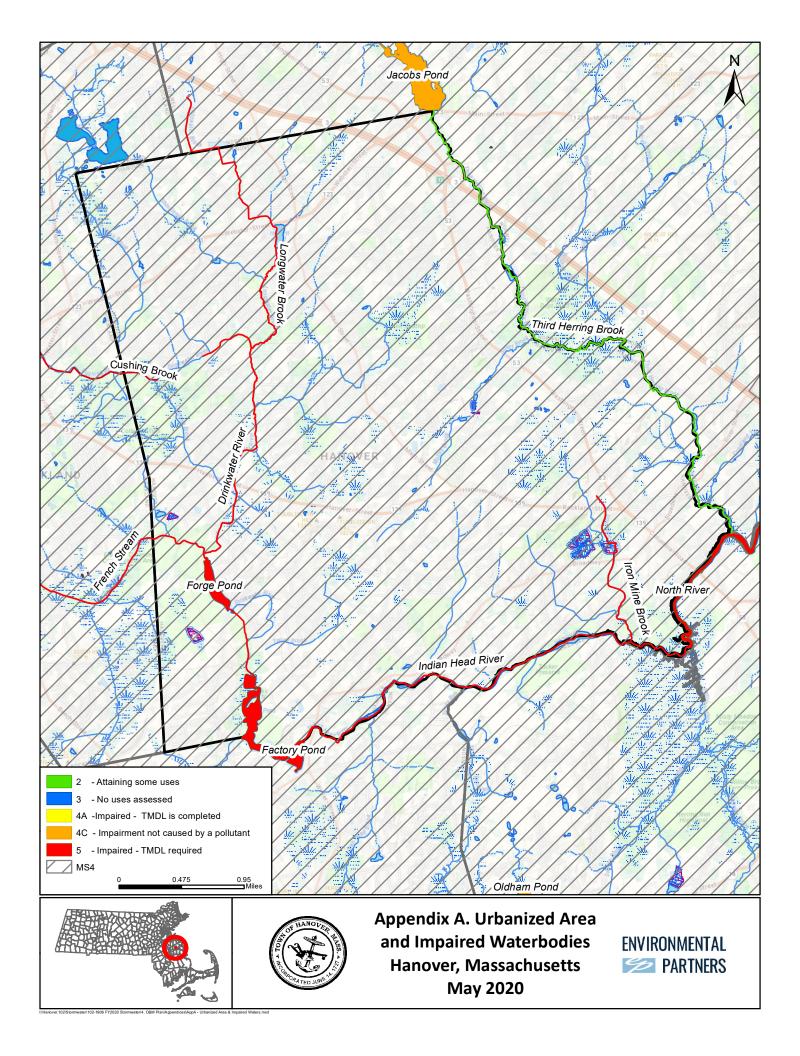
Figure 4. Storage Locations of Salt and Sand Supplies Hanover, Massachusetts Spring 2020



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APPENDIX A

Town of Hanover Urbanized Area & Impaired Waterbodies Map Town of Hanover, Massachusetts Year 2016 Integrated List of Waters



Town of Hanover, Massachusetts						
Massachusetts Year 2016 Integrated List of Waters						
Category	Name	Segment ID	Impaired Waters Description	Size	Units	Impairment Cause
Category	Cushing Brook	MA94-40	From the headwaters east of Pleasant Street, Rockland to mouth at confluence with Drinkwater River, Hanover.	3.50	MILES	E. Coli
	Drinkwater River	MA94-21	From Whiting Street, Hanover through Forge Pond to the inlet of Factory Pond, Hanover.	3.50	MILES	Debris* Non-Native Aquatic Plants* Trash* Excess Algal Growth Fecal Coliform E. Coli Mercury in Fish Tissue Dissolved Oxygen Dissolved Oxygen Supersaturation Phosphorus (Total) Secchi disk transparency
	Factory Pond	MA94175	Hanson/Hanover	51.00	ACRES	Mercury in Fish Tissue
5 - "Water Requiring a TMDL"	French Stream	MA94-03	From the headwaters on the southeast side of the South Weymouth Naval Air Station, Rockland through Studleys Pond to the confluence with Drinkwater River, Hanover.	5.80	MILES	Dissolved Oxygen E. Coli Fecal Coliform Fish Bioassessments Phosphorus (Total) Whole Effluent Toxicity (WET)
	Indian Head River	MA94-04	Outlet of Factory Pond, Hanover/Hanson to Curtis Crossing Dam (also called Ludhams Ford Dam) west of Elm Street, Hanover/Pembroke.	2.80	MILES	Mercury in Fish Tissue Dissolved Oxygen Phosphorus (Total) E. Coli
	Indian Head River	MA94-22	From Curtis Crossing Dam (also called Ludhams Ford Dam) west of Elm Street, Hanover/Pembroke to confluence with Herring Brook, (forming headwaters of North River) Hanover/Pembroke.	0.90	MILES	Mercury in Fish Tissue
	Longwater Brook	MA94-39	Headwaters, south of Route 3, Norwell to mouth at confluence with Drinkwater River, Hanover.	2.80	MILES	E. Coli
	North River	MA94-05	Confluence of Indian Head River and Herring Brook, Hanover/Pembroke to Route 3A (Main Street), Marshfield/Scituate.	0.30	SQUARE MILES	Fecal Coliform Mercury in Fish Tissue *TMDL not required (Non-pollutant)

APPENDIX B

Catch Basin Inspection Form Template



Job No.:	Town:	Hanover
- ,	T	

Inspector:

Date:

CATCH BASIN INSPECTION FORM

Catch Basin I.D.						arge from Struc charge to Outfall			-	
Catch Basin Label:	Stencil		Ground Ins	set [S	ign 🗌 Nor	ne 🗌 Otl	her		
Basin Material:	Concrete Corrugate Stone Brick Other:	d metal		Cat	ch Basi	n Condition:	Good Fair		Poor Crumbli	ing
Pipe Material:	ConcreteHDPEPVCClay TileOther:		Pipe Measurements:			Inlet Dia. (in): d= Outlet Dia. (in): D=				
Required Maintenance/	Problems	(check)	all that annly	7)•						
Required Maintenance/ Tree Work Required New Grate is Required Pipe is Blocked Frame Maintenance is Remove Accumulated Pipe Maintenance is F Basin Undermined or Catch Basin Grate Type Bar:	d Required Sedimen Required Bypassed :	L t	ent Buildup D :): in): in):		Di Di Co Erd Re Ne Other:	nnot Remove Co tch Work prosion at Structu osion Around Str move Trash & D eed Cement Aroun Description of Heavy Moderate Slight Trickling	ure ucture ebris nd Grate Flow: S	treet	Name/ ure Loca	ıtion:
*If the outlet is submerg above the outlet invert.				roxin	nate hei	ght of water	Yes 🗌		No	
Flow		rvations					Circle those	pres	ent:	
Standing Water	Color	:					Foam	-	Oil She	en
(check one or both)	Odor	:					Contra M			-1.01
Weather Conditions :	ther Conditions : $Dry > 24$ hours Wet			Sanitary Was	ste	Bacteria	al Sheen			
· · · · · · · · · · · · · · · · · · ·	Sample of Screenings Collected for Analysis? Yes No			Orange Stain	ing	Floatab	les			
Comments:							Excessive sediment Other:		Pet Was Optical Enhanc	ste

_

APPENDIX C

Stormwater BMP Inspection Form Template



INSPECTION OF BIORETENTION AREAS / RAIN GARDENS

General Information

BMP Description	Bioretention Area / Rain Garden			
BMP Location				
Inspector's Name				
Date of Inspection		Date of Last Inspection		
Start Time		End Time		
Type of Inspection: Regular Pre-	Storm Event 🗌 Durin	ng Storm Event 🗌 🛛 F	Post-Storm Event	
Describe the weather conditions at time of inspection				

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for soil erosion and repair	Monthly	Yes No	
Inspect for invasive species and remove if present	Monthly	Yes No	
Remove trash	Monthly	Yes No	
Mulch void areas	Annually	Yes No	
Remove dead vegetation	Bi-Annually	Yes No	
Replace dead vegetation	Annually	Yes No	
Prune	Annually	Yes No	
Replace all media and vegetation	As Needed	Yes No	





INSPECTION OF CONSTRUCTED STORMWATER WETLANDS Years 0-3 of Operation

General Information

BMP Description	Constructed Stormwater Wetland			
BMP Location				
Inspector's Name				
Date of Inspection		Date of Last Inspection		
Start Time		End Time		
Type of Inspection: Regular Pre-	Storm Event 🗌 Duri	ng Storm Event 🗌 🛛 F	Post-Storm Event	
Describe the weather conditions at time of inspection				

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for invasive species and remove if present	Monthly	Yes No	
Replace all media and vegetation	As Needed	Yes No	

In addition, the following information should be recorded and mapped at least once per year:

- Types and distribution of dominant wetland plants
- Presence and distribution of planted wetland species
- Presence and distribution of invasive species
- Indications other species are replacing planted wetland species
- Percent of standing water that is not vegetated
- Replace all media and vegetation
- Stability of original depth zones and micro-topographic features
- Accumulation of sediment in the forebay and micropool and survival rate of plants





INSPECTION OF CONSTRUCTED STORMWATER WETLANDS Year 4 - Lifetime of Operation

General Information

BMP Description	Constructed Stormwater Wetland			
BMP Location				
Inspector's Name				
Date of Inspection		Date of Last Inspection		
Start Time		End Time		
Type of Inspection: Regular Pre-	Storm Event 🗌 Duri	ng Storm Event 🗌 🛛 F	Post-Storm Event	
Describe the weather conditions at time of inspection				

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for invasive species and remove if present	Monthly	Yes 🗌 No 🗌	
Clean forebays	Annually	Yes No	
Clean sediment in basin/wetland system	Once every 10 years	Yes 🗌 No 🗌	
Mulch void areas	Annually	Yes 🗌 No 🗌	
Remove dead vegetation	Bi-Annually	Yes No	
Replace dead vegetation	Annually	Yes No	
Prune	Annually	Yes 🗌 No 🗌	
Replace all media and vegetation	As Needed	Yes No	





INSPECTION OF EXTENDED DRY DETENTION BASINS

Inspections should be conducted bi-annually, and during and after major storm events.

General Information

BMP Description	Extended Dry Detention Basin			
BMP Location				
Inspector's Name				
Date of Inspection		Date of Last Inspection		
Start Time		End Time		
Type of Inspection: Regular Pre-	Storm Event 🗌 Durin	ng Storm Event 🗌 🛛 F	Post-Storm Event	
Describe the weather conditions at time of inspection				

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Examine outlet structure for clogging or high outflow release velocities	Bi-Annually	Yes 🗌 No 🗌	
Mow upper stage, side slopes, embankment and emergency spillway	Bi-Annually	Yes 🗌 No 🗌	
Remove trash and debris	Bi-Annually	Yes No	
Remove sediment from basin	At least once every 5 years	Yes No	





INSPECTION OF PROPRIETARY MEDIA FILTERS

General Information

BMP Description	Media Filter		
BMP Location			
Media Type			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection:			
Regular Pre-	Storm Event Duri	ng Storm Event	Post-Storm Event
Describe the weather conditions at time of inspection			

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for standing water, trash, sediment and clogging	Bi-Annually (minimum)	Yes 🗌 No 🗌	
Remove trash and debris	Each Inspection	Yes No	
Examine to determine if system drains in 72 hours	Annually	Yes No	
Inspect filtering media for clogging	Per manufacturer's schedule	Yes No	





INSPECTION OF SAND AND ORGANIC FILTERS

Inspections should be conducted after every major storm event for the first 3 months following completion, then every 6 months thereafter.

General Information

BMP Description	Sand/Organic Filter		
BMP Location			
Media Type			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular Pre-	Storm Event 🗌 Durin	ng Storm Event 🗌 🛛 I	Post-Storm Event
Describe the weather conditions at time of inspection			

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Remove sediment, trash, and debris	Every 6 months	Yes 🗌 No 🗌	
Rake sand	Every 6 months	Yes No	





INSPECTION OF DRY WELLS

Regular inspections should be conducted after every major storm event for the first 3 months following completion, then annually thereafter.

General Information

BMP Description	Dry Well		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular Pre-	Storm Event Duri	ng Storm Event 🗌 🛛 F	Post-Storm Event
Describe the weather conditions at time of inspection			
Describe condition of dry well at time of inspection			

After a major storm event, the water depth in the observation well should be measured at 24 and 48 hour intervals and the clearance rate calculated.





INSPECTION OF WET BASINS

Inspections should be conducted after every major storm event for the first 3 months following completion, then biannually thereafter.

General Information

BMP Description	Wet Basin		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular Pre-Storm Event During Storm Event Post-Storm Event			
Describe the weather conditions at time of inspection			
Describe condition of wet basin at time of inspection			

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Preventative maintenance	Bi-Annually	Yes No	
Mow/rake buffer area, side slopes and basin bottom	Bi-Annually	Yes No	
Remove trash, debris and organic matter	Bi-Annually	Yes No	
Inspect and clean pretreatment devices	Every other month and after every major storm event	Yes 🗌 No 🗌	



Constructed BMP Inspection Report



INSPECTION OF OTHER BMP

General Information

BMP Description			
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular Pre-	Storm Event 🗌 🛛 Du	uring Storm Event	Post-Storm Event
Describe the weather conditions at time of inspection			

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
		Yes 🗌 No 🗌	
		Yes 🗌 No 🗌	
		Yes 🗌 No 🗌	
		Yes 🗌 No 🗌	
		Yes 🗌 No 🗌	
		Yes 🗌 No 🗌	
		Yes No	





OIL/WATER SEPARATOR (OWS) QUARTERLY INSPECTION CHECKLIST

Facility:	
OWS Location:	
Inspected By:	
Date:	

Visual Inspection	Are there any signs of spills or leaks in the general area?	Yes 🗌	No 🗌
	Is there any evidence of petroleum bypassing the OWS?	Yes 🗌	No 🗌
	Are there any unauthorized substances entering the OWS?	Yes 🗌	No 🗌
	Does the OWS exhibit any signs of leaks or malfunctions?	Yes 🗌	No 🗌

If you answered "Yes" to any of the above questions, further inspection, repair, and/or cleaning may be necessary.

Measurements	А	Distance from rim of access cover to bottom of structure	
	В	Distance from rim of access cover to top of sludge layer	
	C = A - B	Depth of sludge layer	
	D	Distance from rim of access cover to the oil/water interface	
	Е	Distance from rim of access cover to the top of the liquid surface	
	$\mathbf{F} = \mathbf{D} - \mathbf{E}$	Depth of oil layer	

If the values for "C" and/or "F" are greater than those in the manufacturer's recommendations, the OWS must be cleaned by a licensed OWS maintenance company.



APPENDIX D

Inventory of Stormwater Best Management Practices

BMP ID	Location	BMP Category	ВМР Туре
BMP-1	On the south side along the entrance to 253 King St, off of King St; before the ball fields	Conveyance	Grassed Channel (Biofilter Swale)
BMP-2	On the south side of the entrance road to 253 King St, from King St; start of grassed drainage channel	Structural Pretreatment	Vegetative Filter Strip
BMP-3	Along the east side of the first parking lot on the right (north) leading into 253 King St from King St; before the park starts	Conveyance	Grassed Channel (Biofilter Swale)
BMP-4	In the NE corner of the first parking lot on the right (north) coming into 253 King St (Forge Pond Park) from King St	Structural Pretreatment	Vegetative Filter Strip
BMP-5	On the north (farthest) side of the first parking lot on the right (north) coming into 253 King St (Forge Pond Park) from King St	Treatment	Constructed Stormwater Wetland
BMP-6	On the northeast side of the third baseball field on the Forge Pond Park access road, to the South side of the road	Structural Pretreatment	Sediment Forebay
BMP-7	On the south side of the Forge Pond Park access road (253 King St), after the third baseball field and before a parking lot	Treatment	Constructed Stormwater Wetland
BMP-8	Along the south side of the Forge Pond Park access road (253 King St), after the third baseball field and before a parking lot	Conveyance	Grassed Channel (Biofilter Swale)
BMP-9	Along the north/east side of the Forge Pond Park access road (253 King St) as it curves north toward the furthest baseball fields	Conveyance	Grassed Channel (Biofilter Swale)
BMP-10	On the northern-most land adjacent to the Forge Pond Park access road (253 King St), passed all the baseball fields	Treatment	Constructed Stormwater Wetland
BMP-11	On the Forge Pond Park access road (253 King St), passed all the baseball fields, on the right (east) side of the road, between the road and the furthest parking lot away from King St (not the one along the cul-de-sac)	Conveyance	Grassed Channel (Biofilter Swale)

BMP-12	Along the south corner of the entrance to the 663-733 Center St access road	Conveyance	Grassed Channel (Biofilter Swale)
BMP-13	Along the south side of the 663-733 Center St access road	Conveyance	Drainage Channel
BMP-14	Southwest side of the 663 Center St access road	Treatment	Constructed Stormwater Wetland
BMP-15	Along the north side of the 663-733 Center St access road	Conveyance	Grassed Channel (Biofilter Swale)
BMP-16	Along the south side of the 663-733 access road, near the curve in the road	Structural Pretreatment	Vegetative Filter Strip
BMP-17	Along the south side of the 663-733 Center St access road, near the bend in the road	Treatment	Wet Basin
BMP-18	Along the north side of the 663-733 access road, near the curve in the road	Treatment	Constructed Stormwater Wetland
BMP-19	Near the southeast corner of the parking lot at 663-733 Center Street, along the east side of the access road	Treatment	Bioretention Area / Rain Garden
BMP-20	Along the southern edge of the parking lot at 663-733 Center Street	Structural Pretreatment	Vegetative Filter Strip
BMP-21	Hanover Council on Aging parking lot	Structural Pretreatment	Oil/Grit Separator
BMP-22	Past the southwest corner of the parking lot at 663-733 Center St	Treatment	Bioretention Area / Rain Garden
BMP-23	South of the parking lot at 663-733 Center St	Treatment	Wet Basin
BMP-24	On the southwest corner of the parking lot at 663-733 Center St	Structural Pretreatment	Sediment Forebay
BMP-25	Trees on the vegetated island in the parking lot at 663-733 Center St	Treatment	Sand & Organic Filter
BMP-26	Near the northeast corner of the parking lot at 663-733 Center St	Treatment	Sand & Organic Filter

APPENDIX E

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 (<u>https://www.mass.gov/files/documents/2016/08/xl/310cmr30_7883_54357.pdf</u>). 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 Hanover 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
	Late Spring/Early	
Replace all media and vegetation	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.

Activity	Time of Year	Frequency
Inspect for invasive species and remove if present	Year round	Monthly
Record and Map:	Year round	Annually
		Bi-
Types and distribution of dominant wetland plants	Year round	Annually
Presence and distribution of planted wetland species	Spring	Annually
		Bi-
Presence and distribution of invasive species	Fall and Spring	Annually
Indications other species are replacing planted wetland		
species	Spring	Annually
Percent of standing water that is not vegetated	Spring or Fall	Annually
	Late Spring/Early	
Replace all media and vegetation	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 0-3

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.

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

MAINTENANCE SCHEDULE: EXTENDED DRY DETENTION BASINS

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.

Activity	Time of Year	Frequency
Inspect for standing water, trash, sediment and clogging Remove trash and debris	Per manufacturer's schedule N/A	Bi-Annually (minimum) 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

MAINTENANCE SCHEDULE: EXTENDED DRY DETENTION BASINS

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.

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

MAINTENANCE SCHEDULE: EXTENDED DRY DETENTION BASINS

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).

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

MAINTENANCE SCHEDULE: DRY WELLS

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

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.

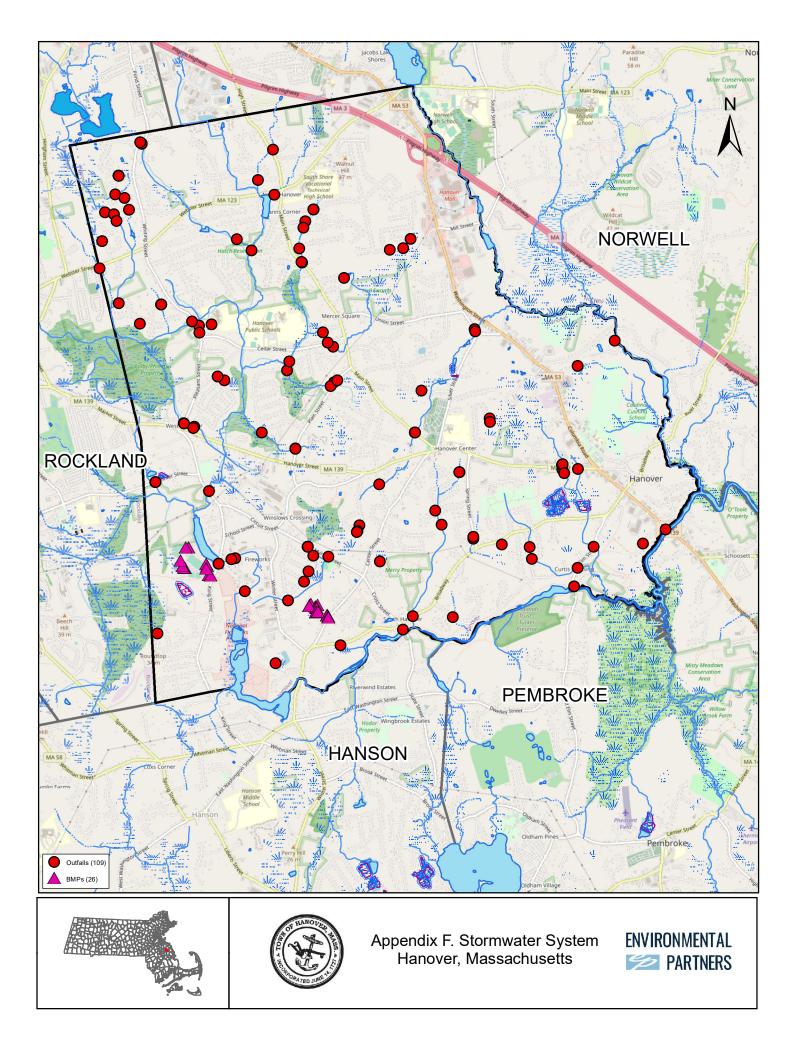
Street sweepings collected from urban areas must have analytical testing conducted before reuse. If testing is required for disposal or reuse, each stockpile of sweepings must be tested (1 sample/1000 cubic yards).

Attachments

DEP Policy #94.092 "Reuse and Disposal of Street Sweepings"

APPENDIX F

Stormwater Infrastructure Map



APPENDIX G

Street and Parking Lot Sweeping Map

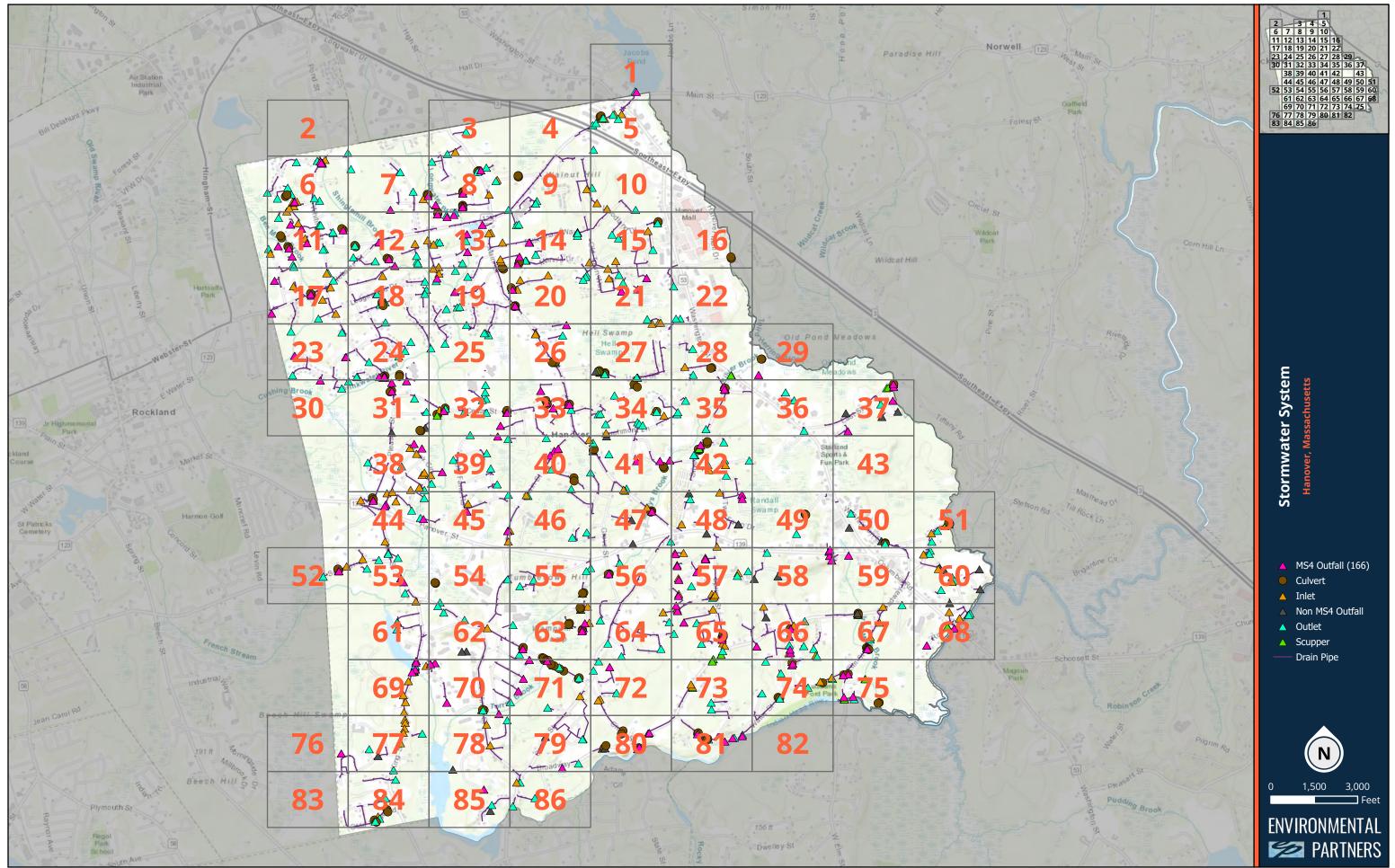
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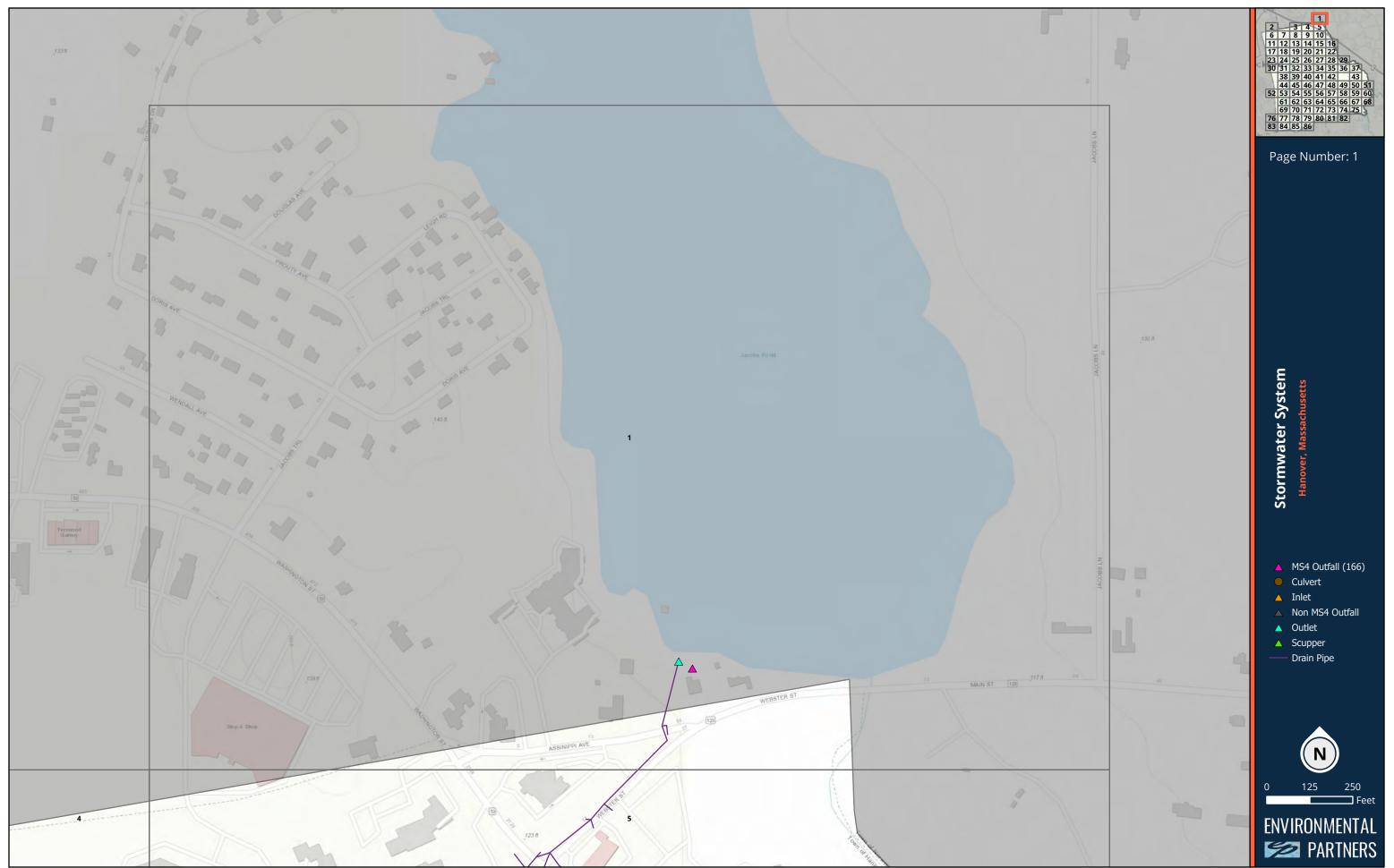
	Street Sweeping Log				
Date	Precipitati	on in the last three days?	Yes 🗆 🛛	No 🗆	
Weather Today:		Tempera	ature:		
Supervisor/Crew Lead	er:				
Street Swept (Name)				Comments	
		None Construction Activity Erosion	Material Storage Equipment Storage Other		
		None Construction Activity Erosion	Material Storage Equipment Storage Other		
		None Construction Activity Erosion	Material Storage Equipment Storage Other		
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		None Construction Activity Erosion	Material Storage Equipment Storage Other		
		None Construction Activity Erosion	Material Storage Equipment Storage Other		
Total Sediment Accum	nulated from	Route (estimated based o	on truck loads)	cubic yards	
	Total Sedim	nent Accumulated from Re	oute (if weighed) _	tons	

ATTATCHMENT 1

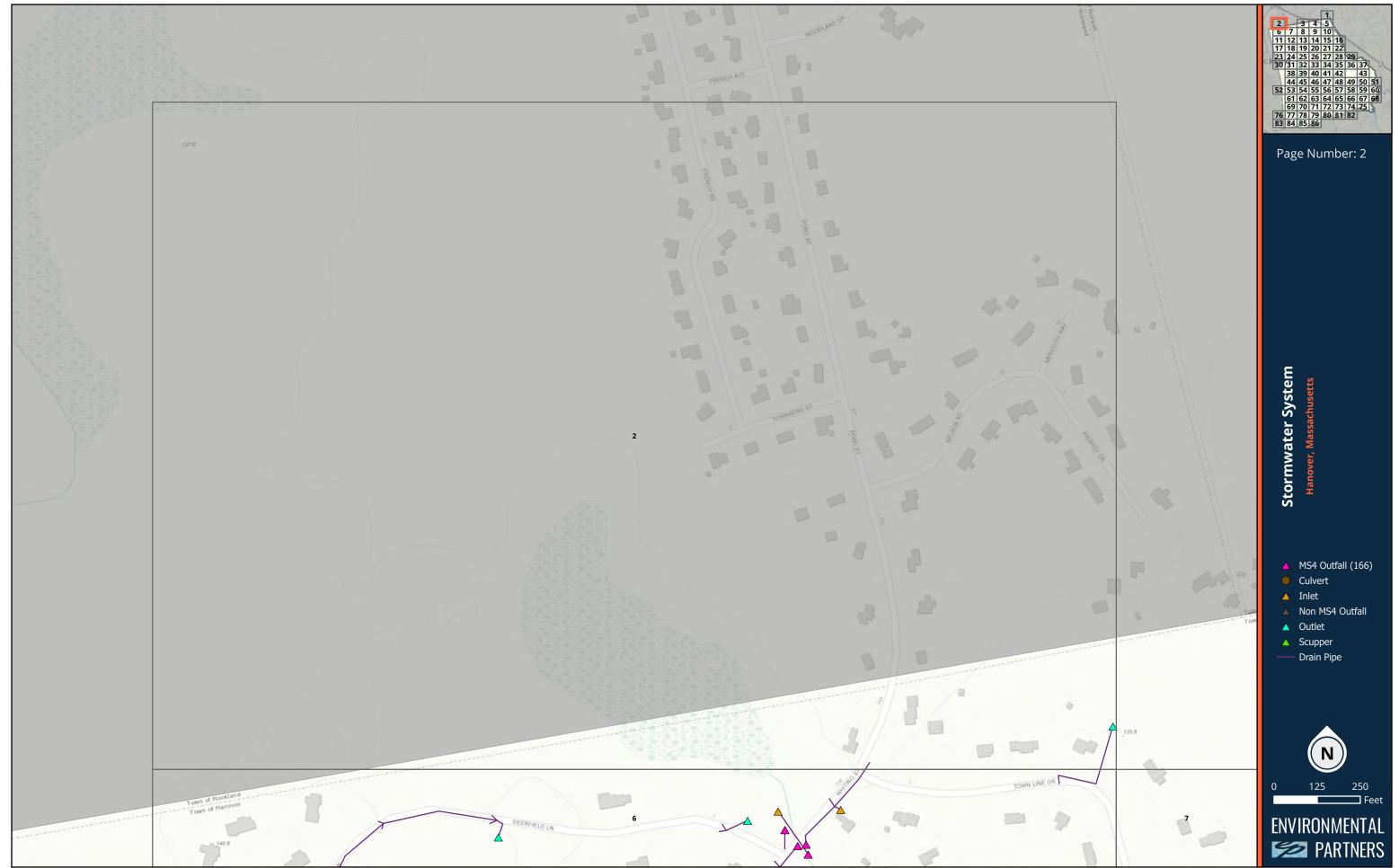
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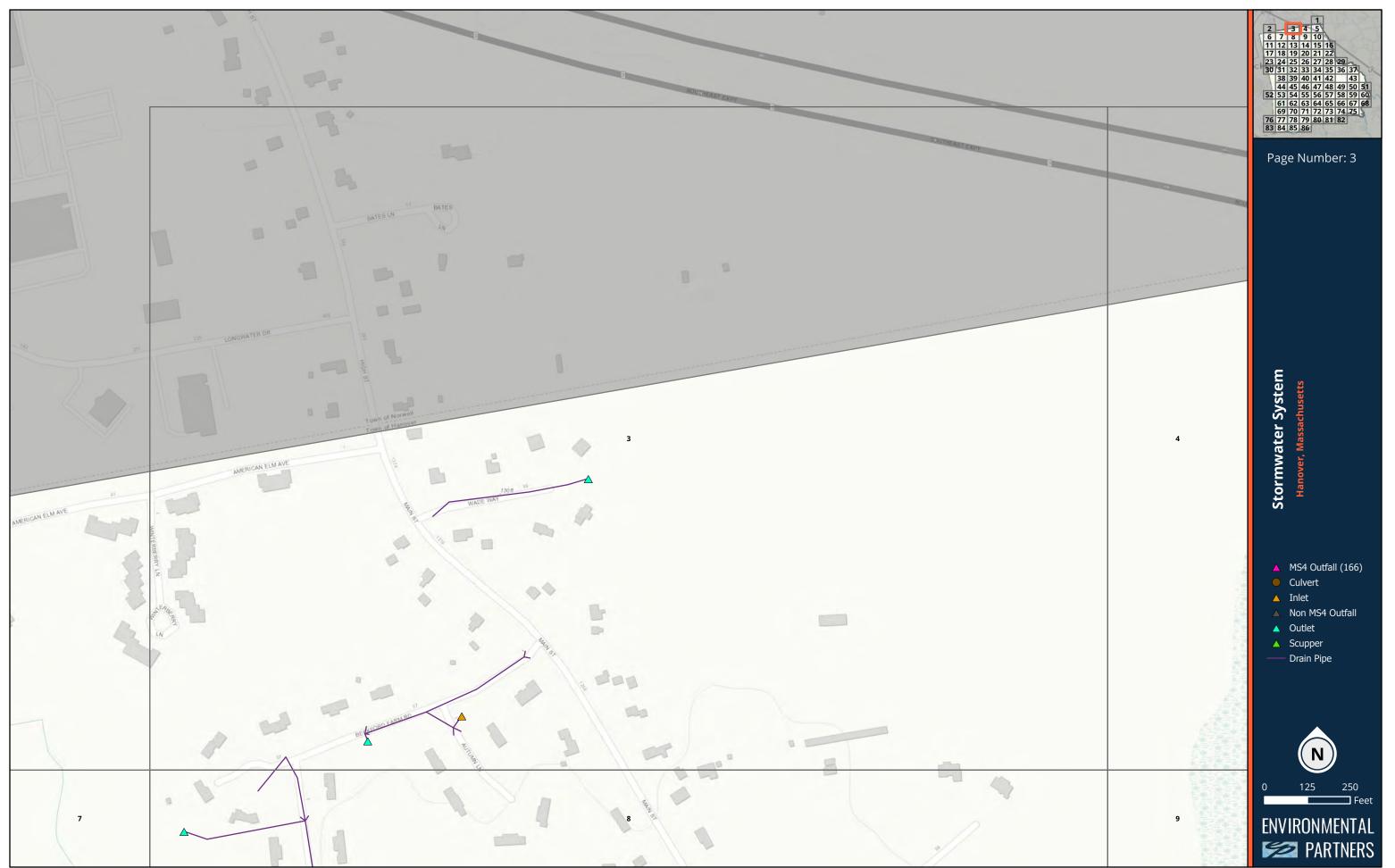
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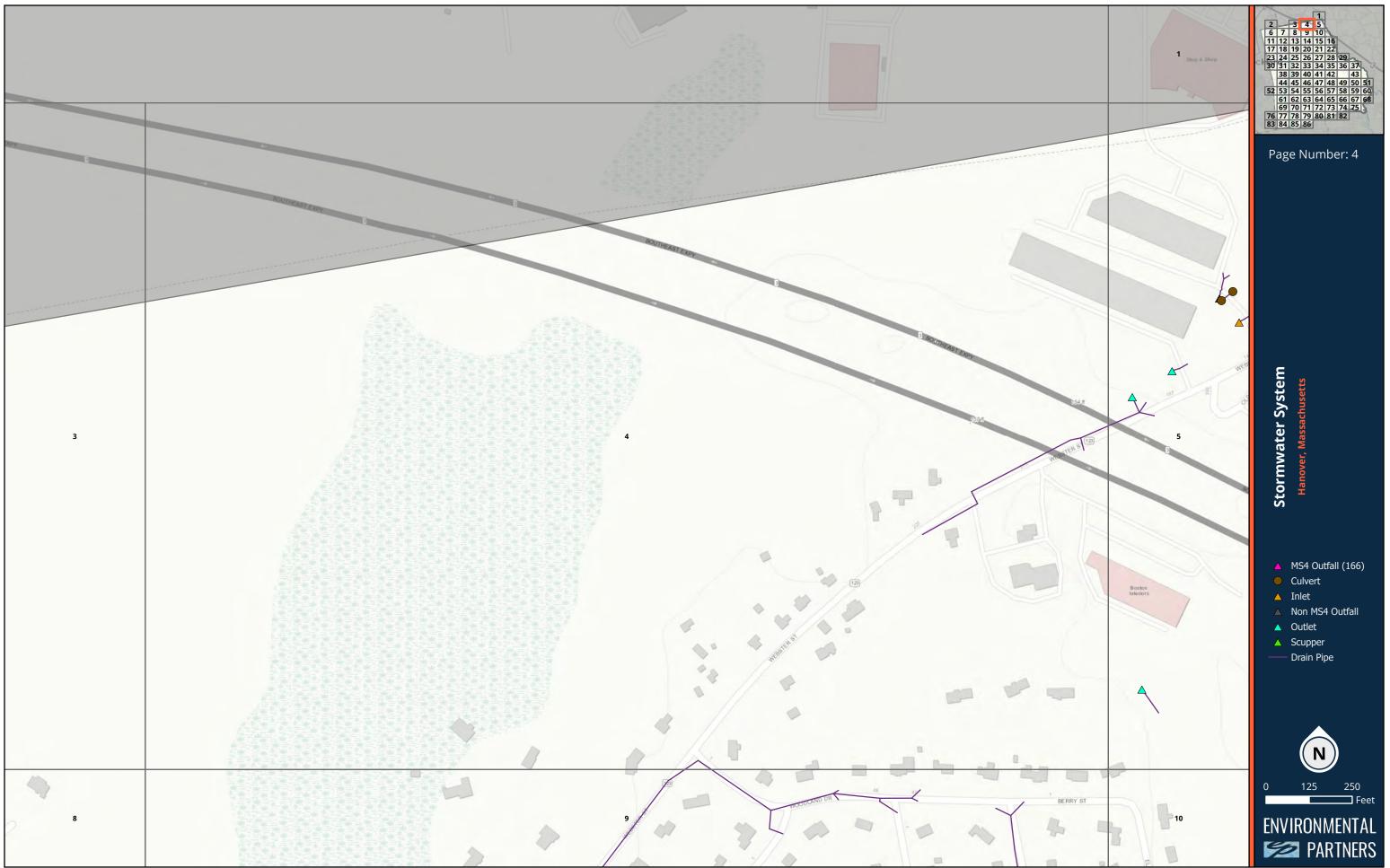
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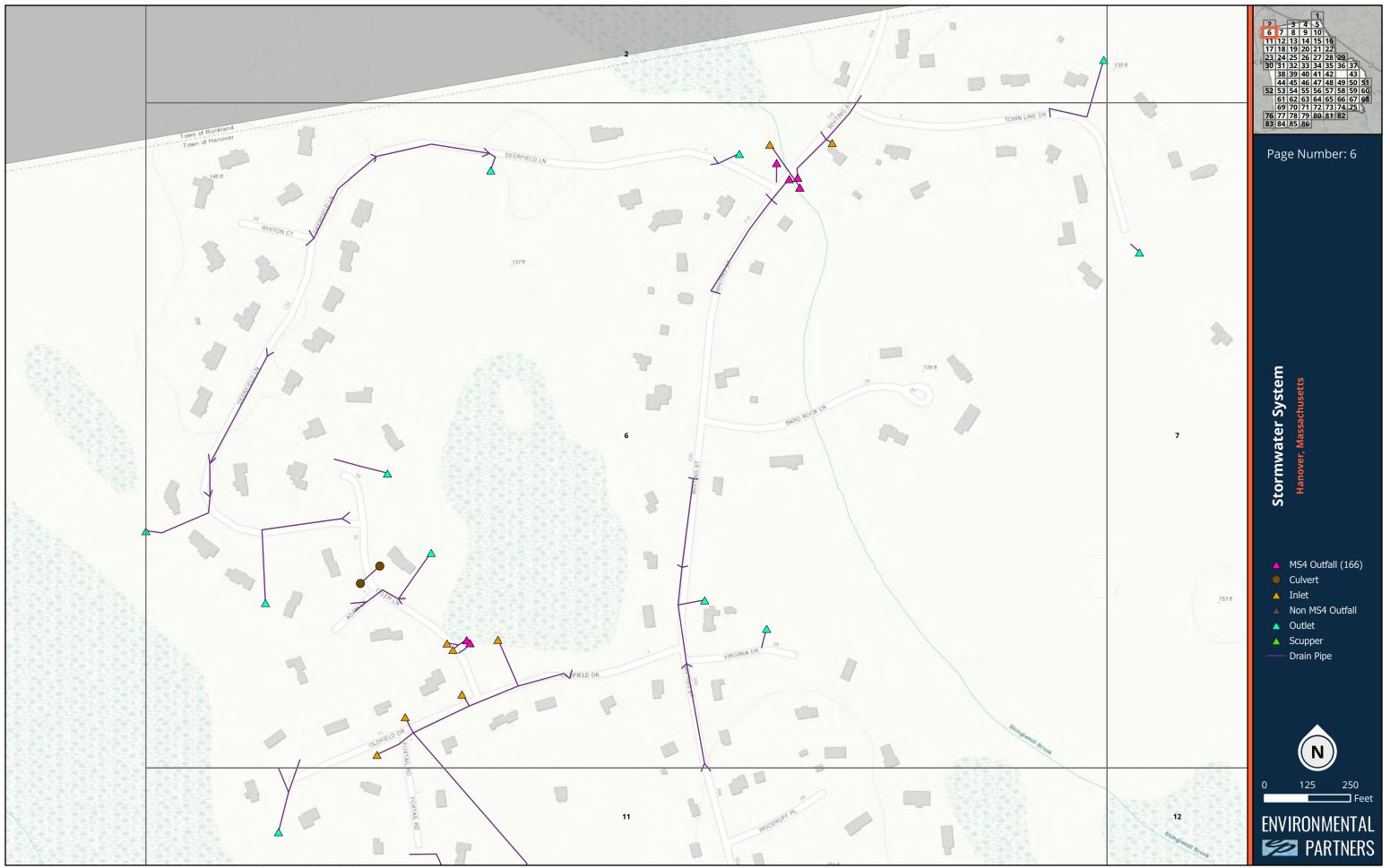


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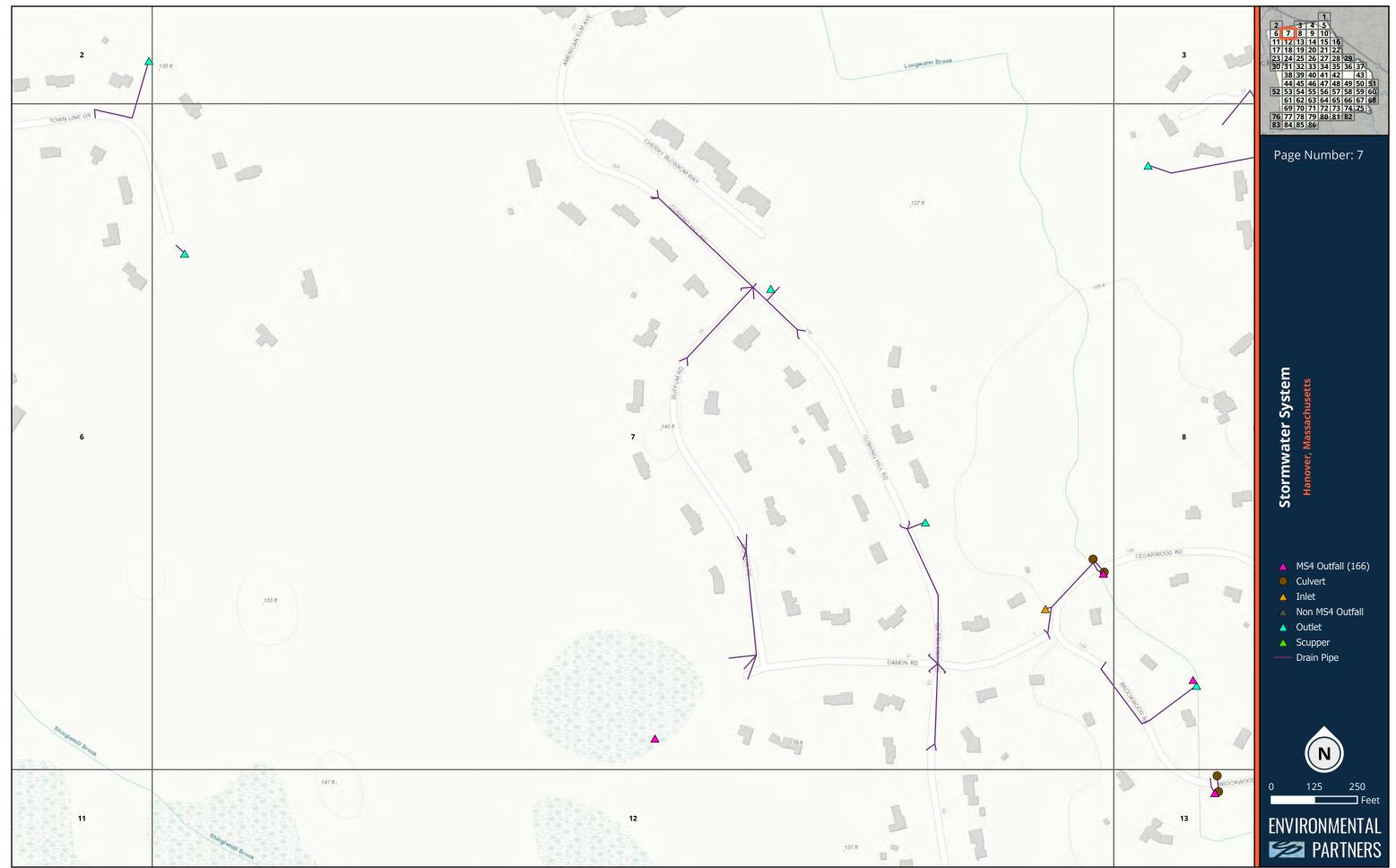




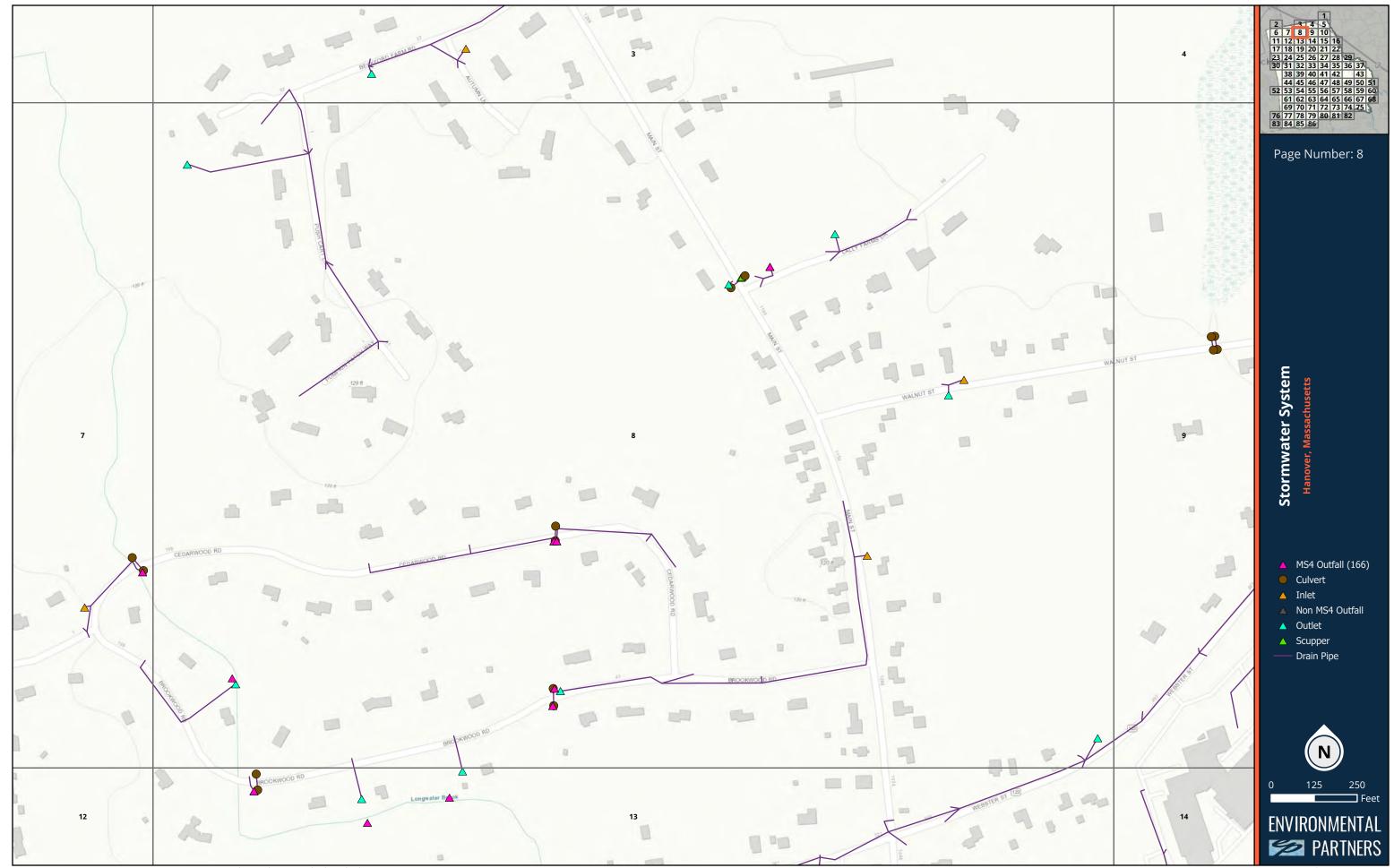
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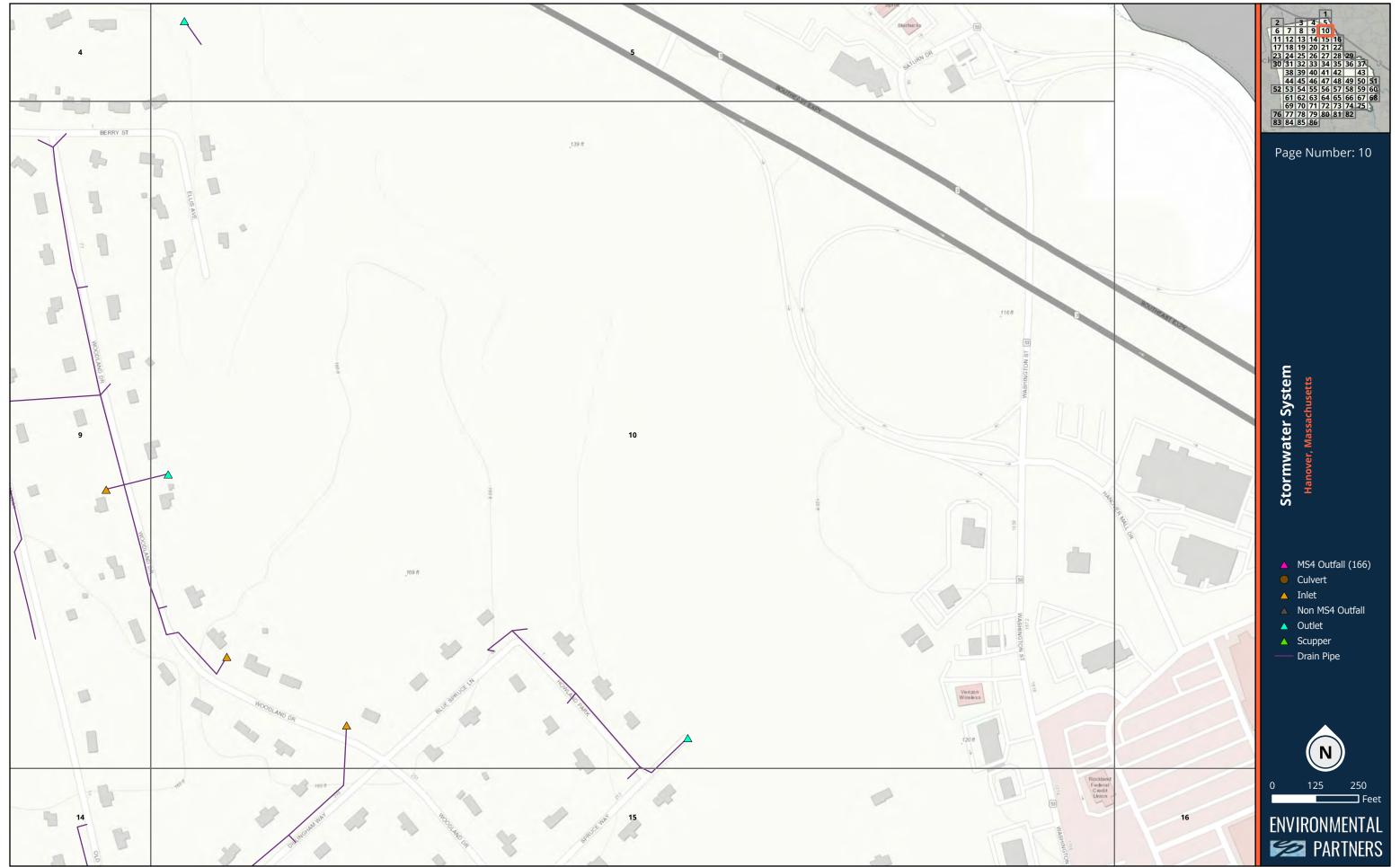
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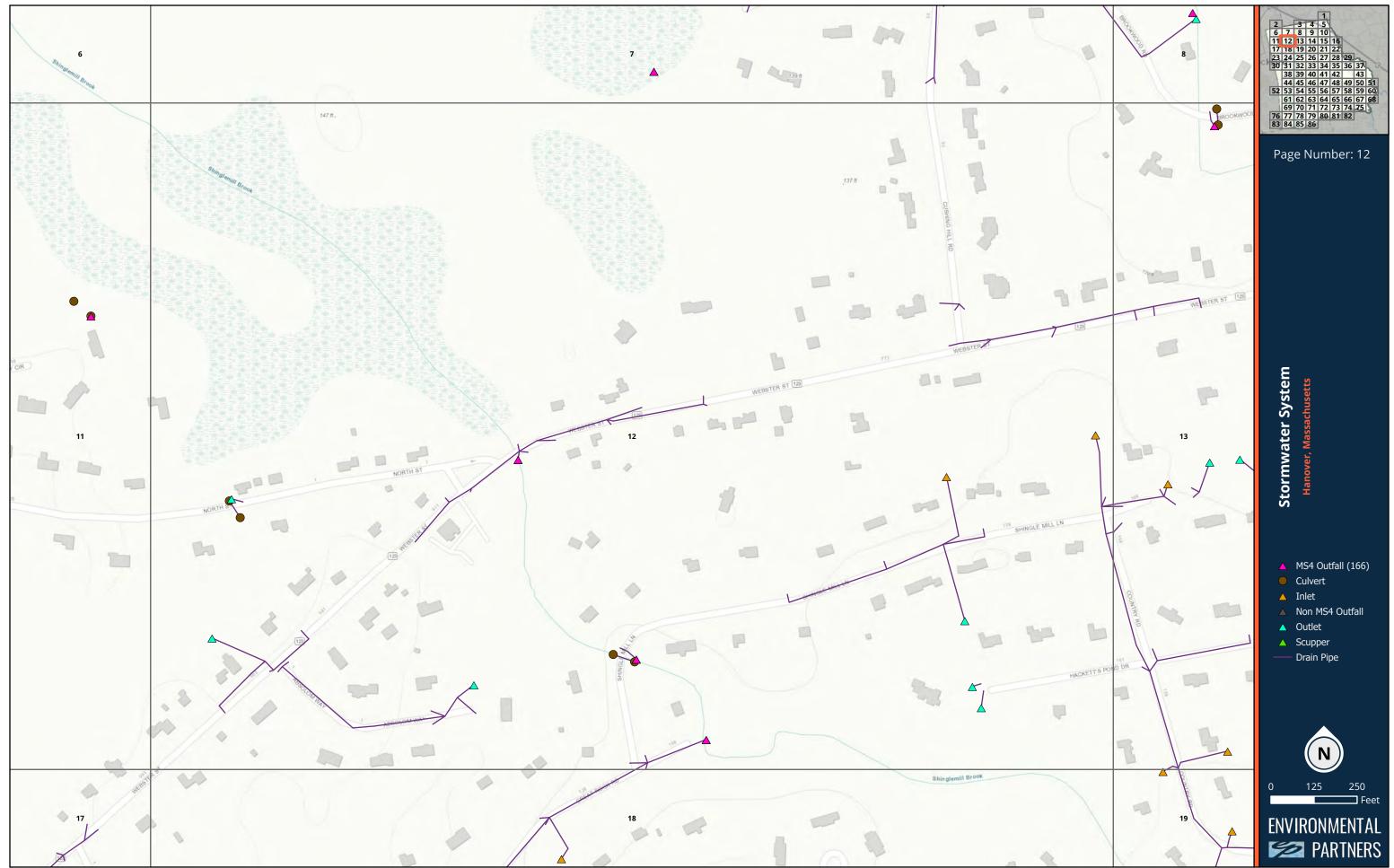
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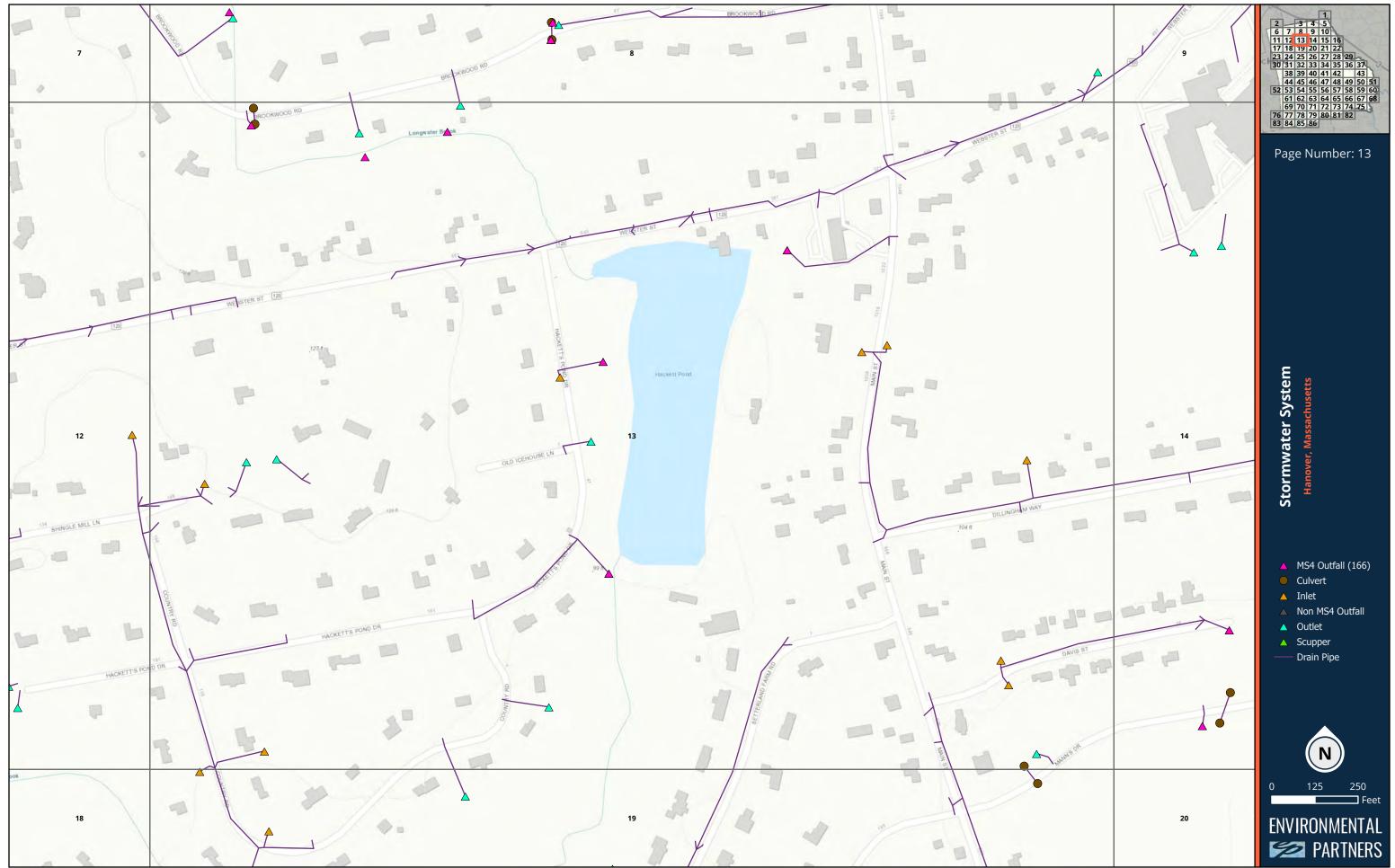


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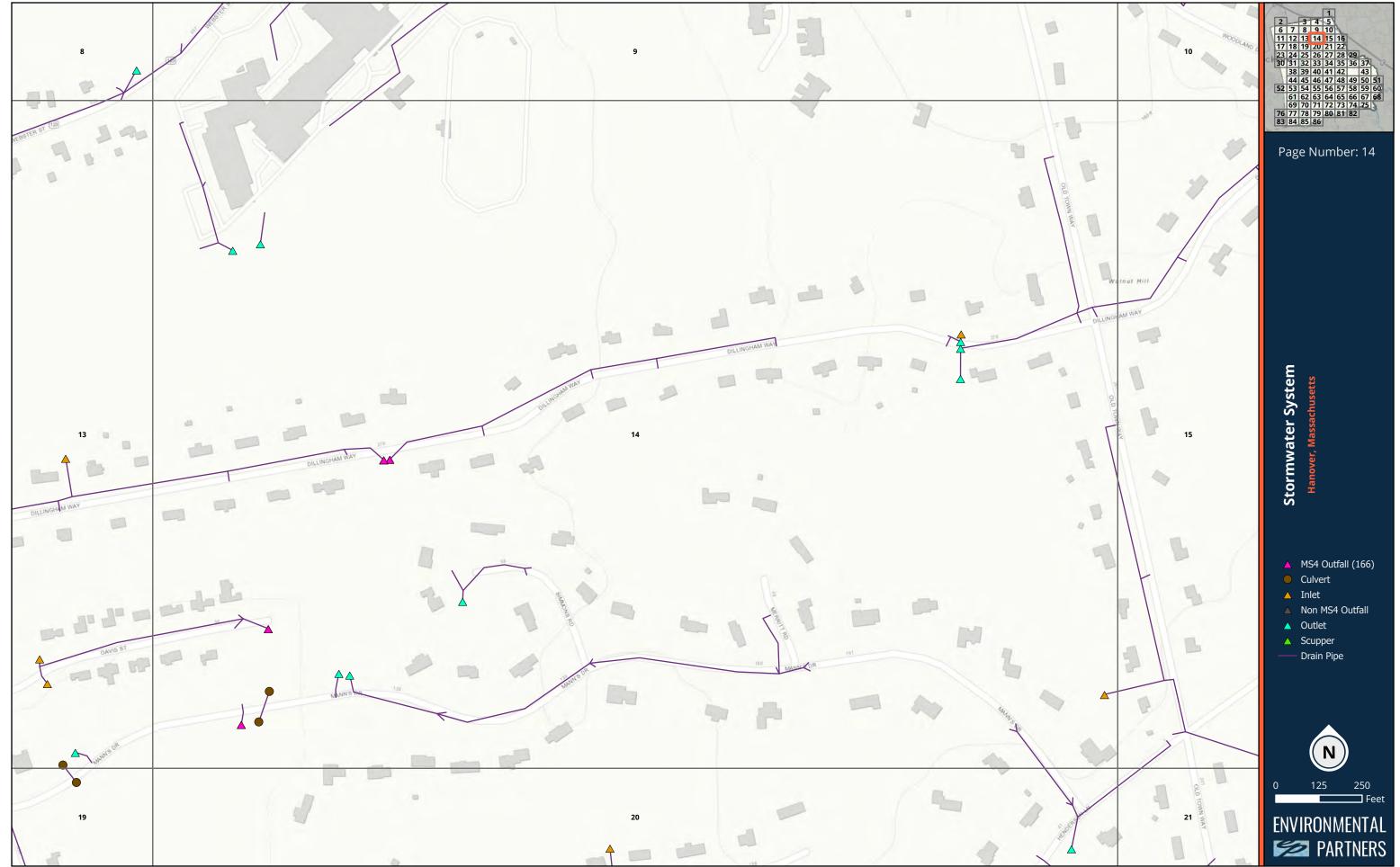


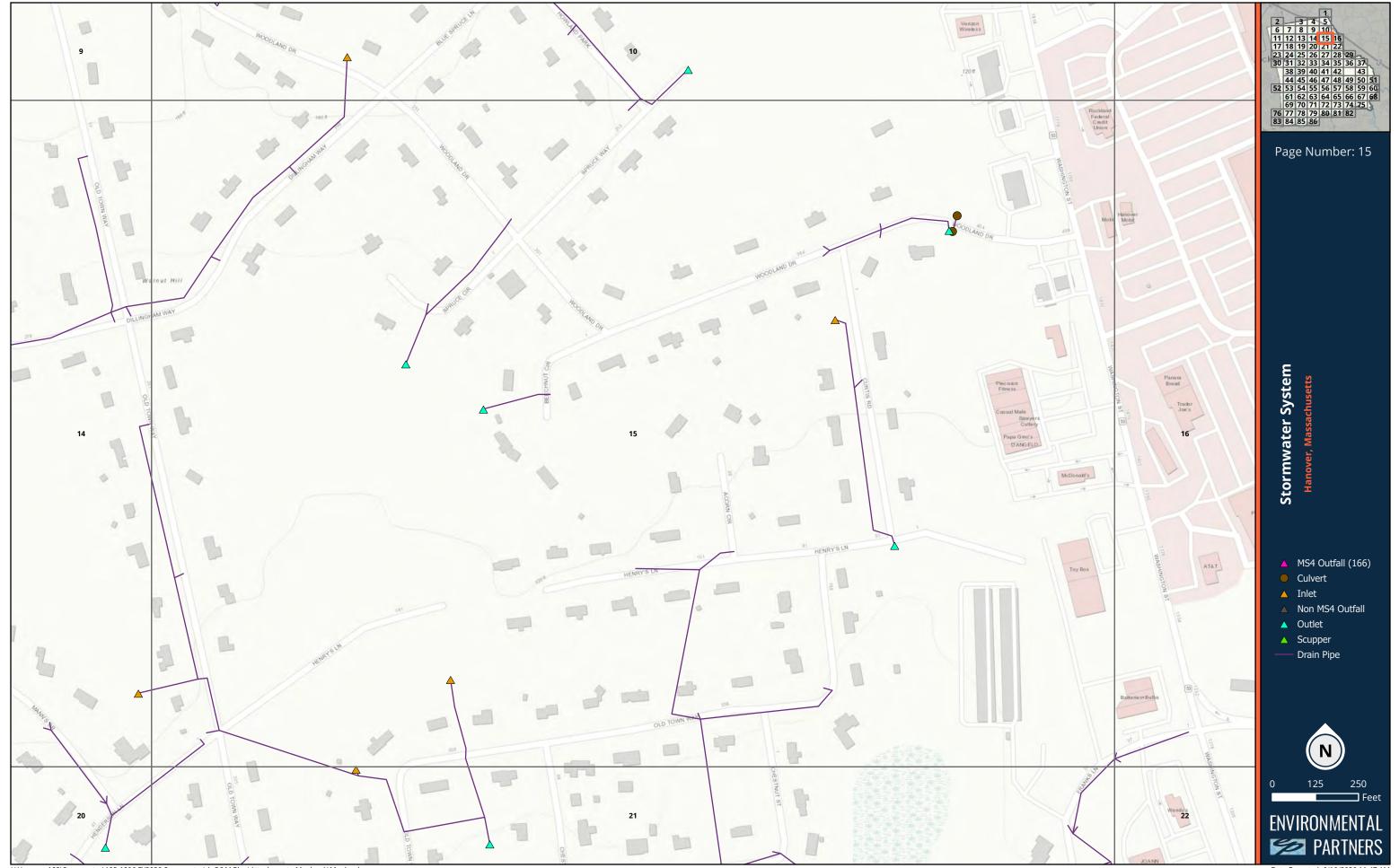




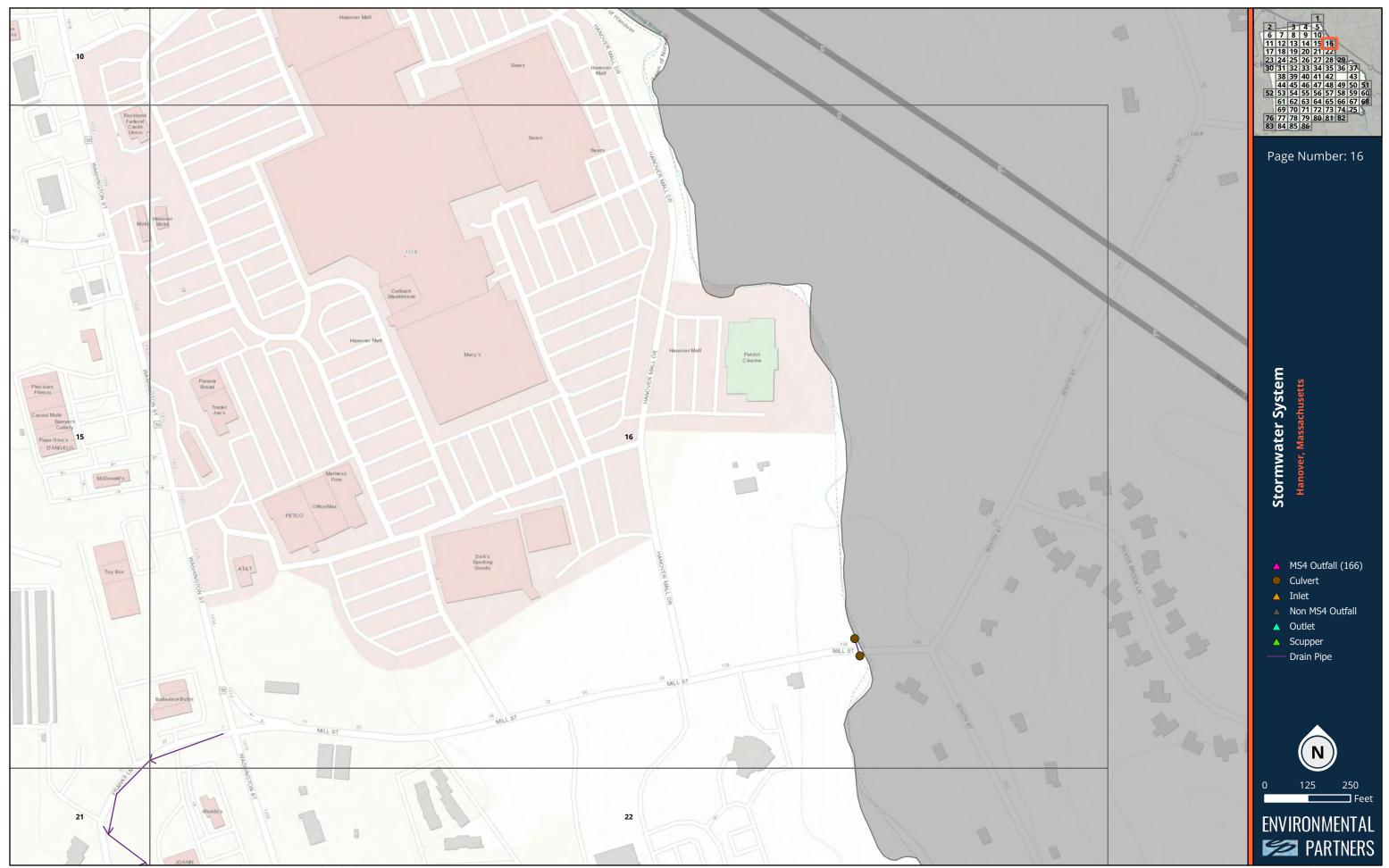


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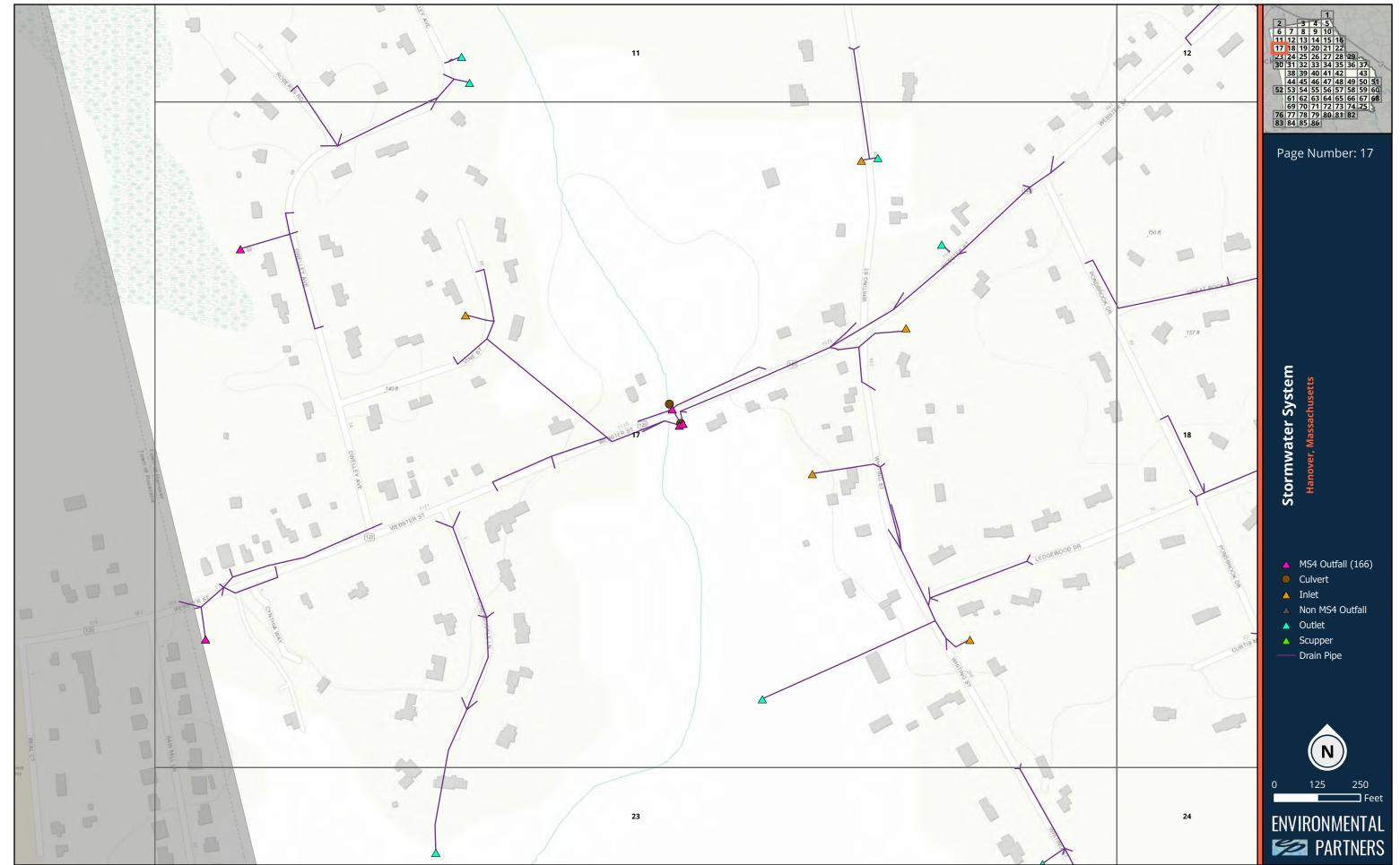


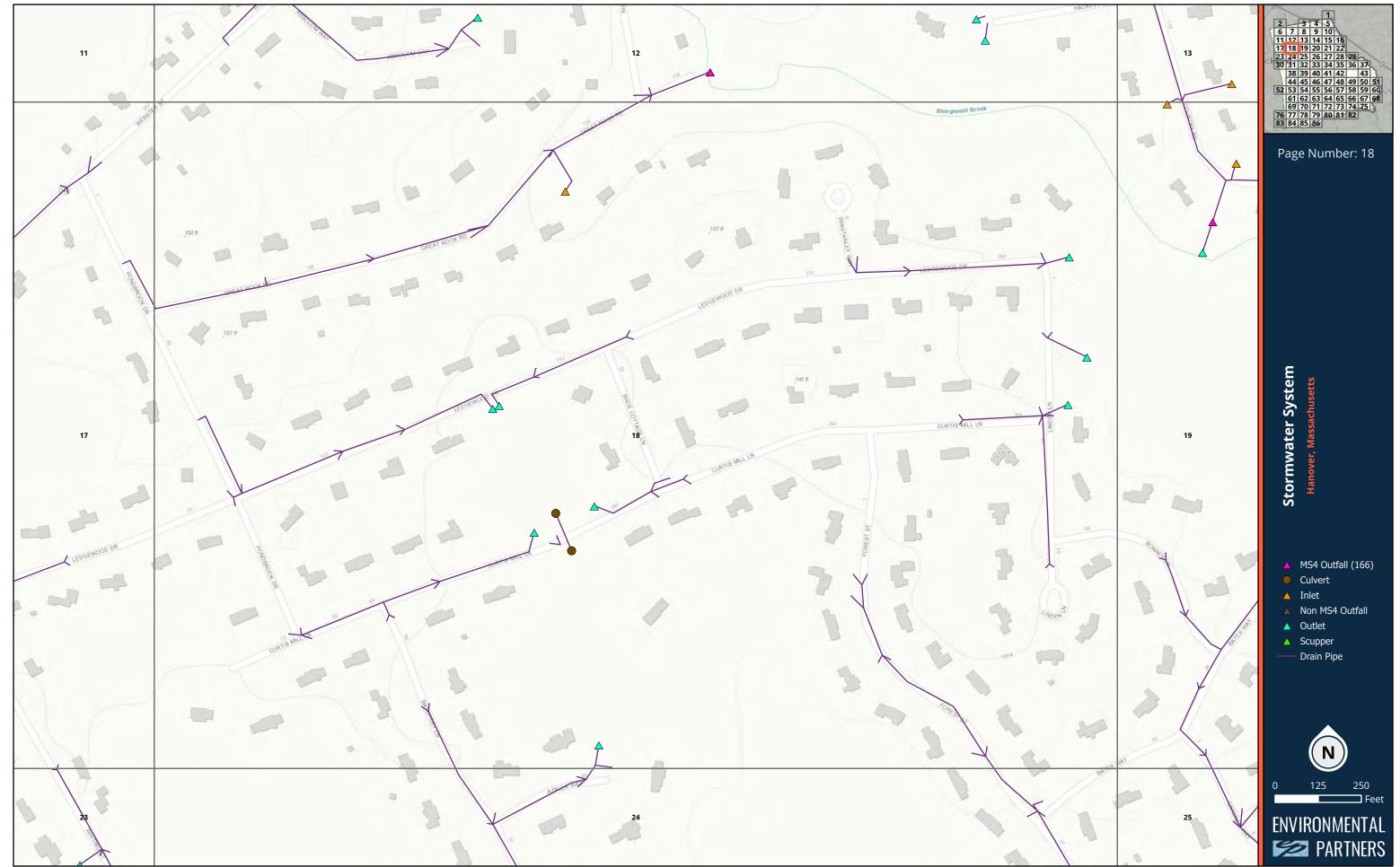


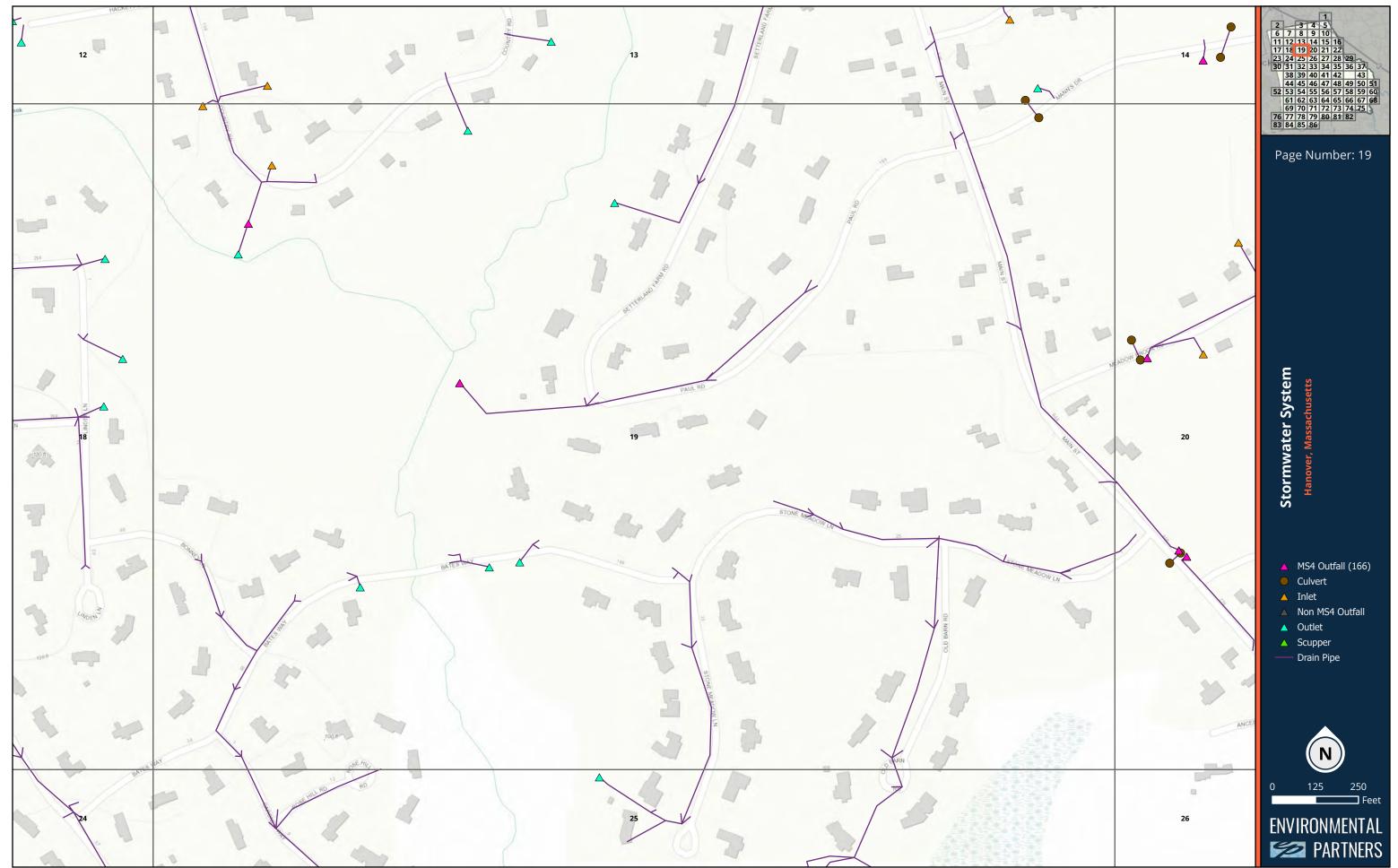
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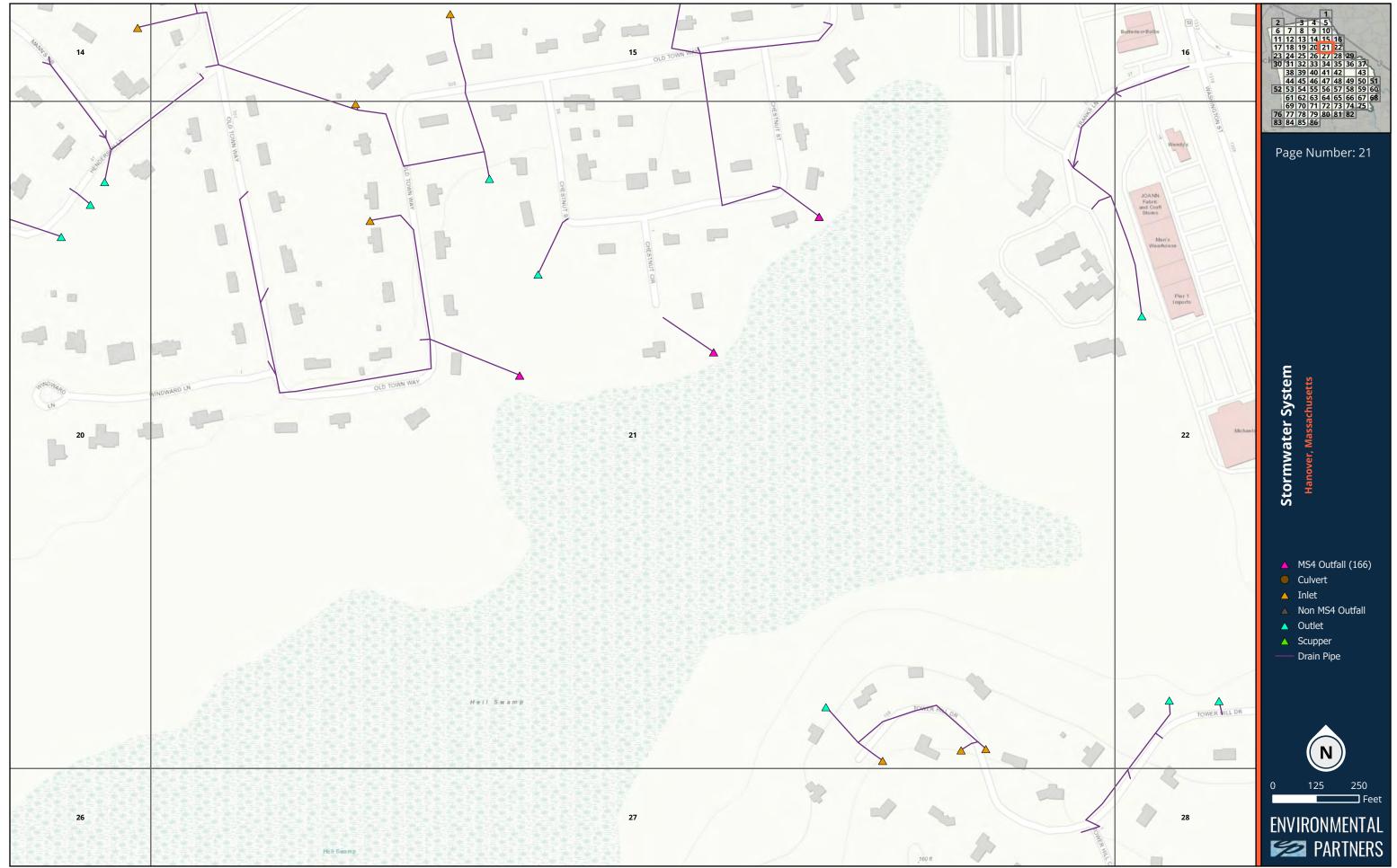






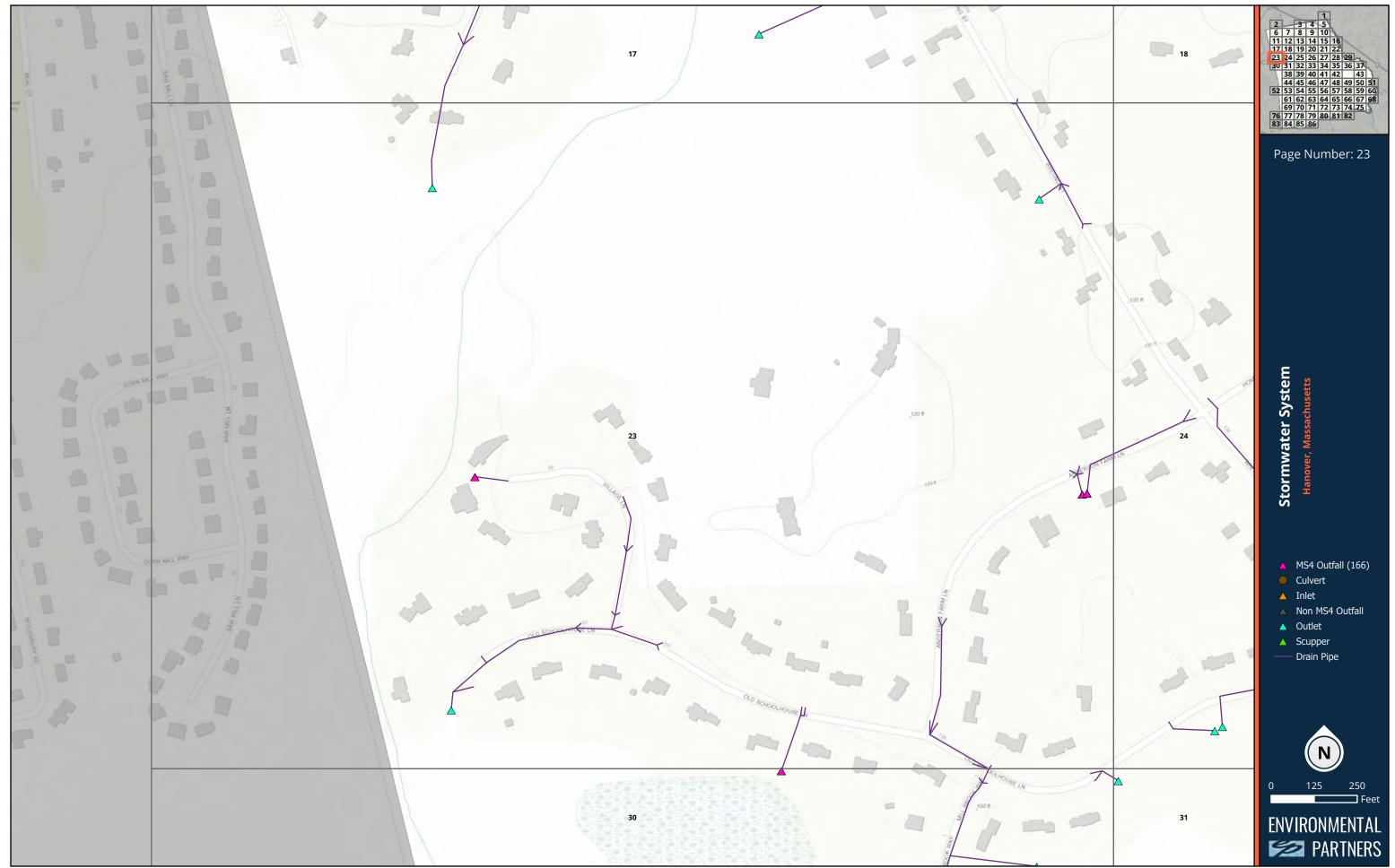
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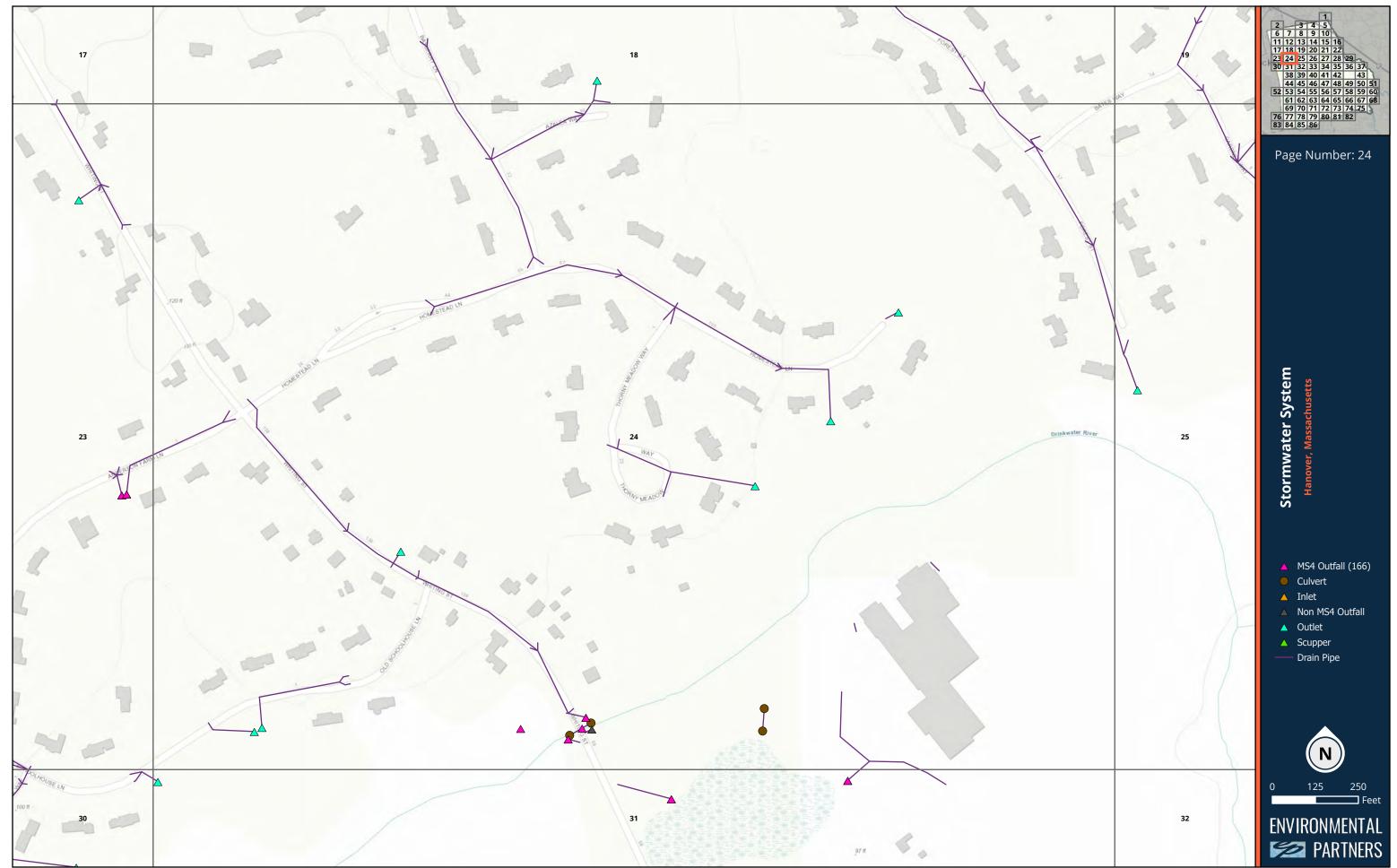


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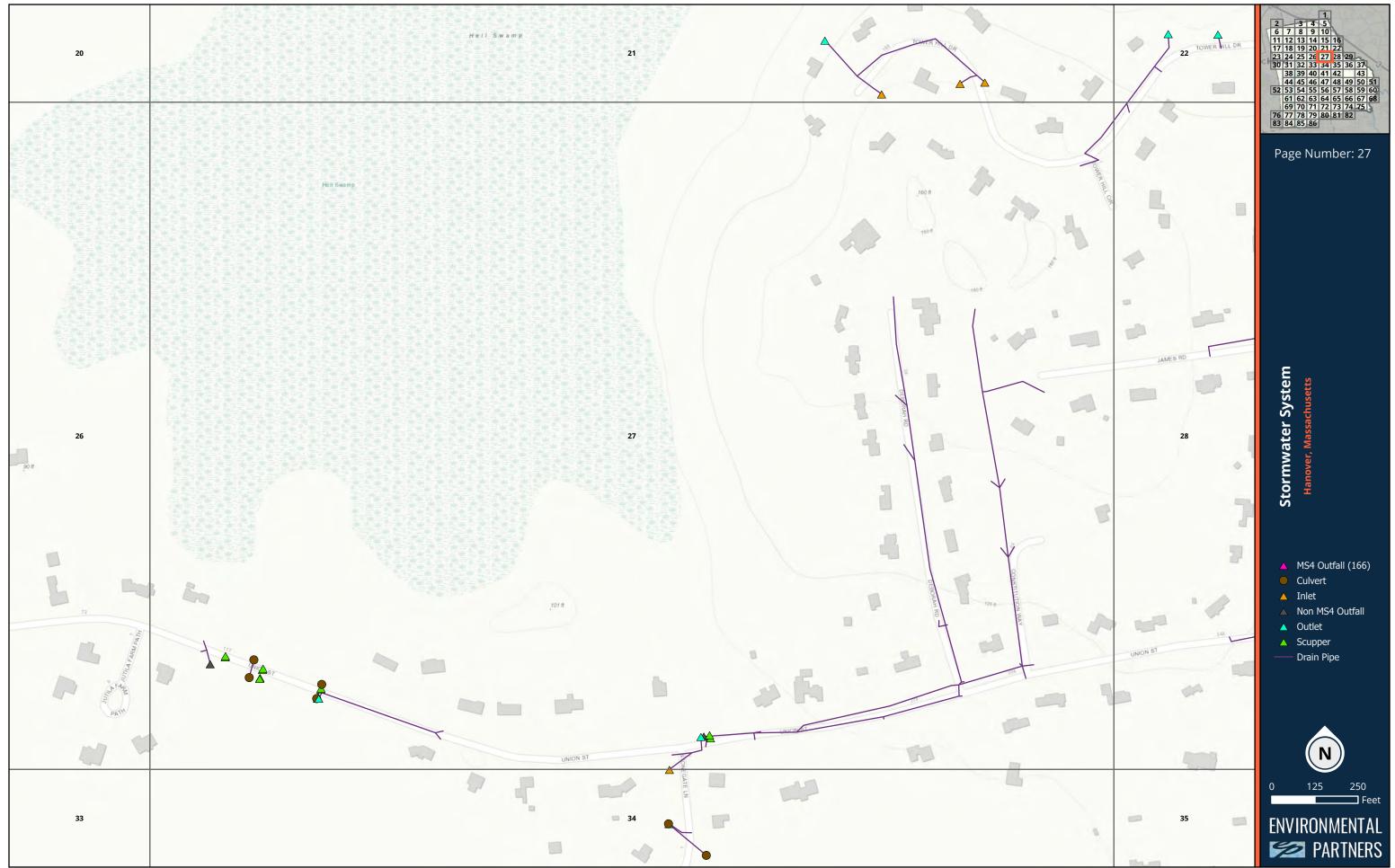


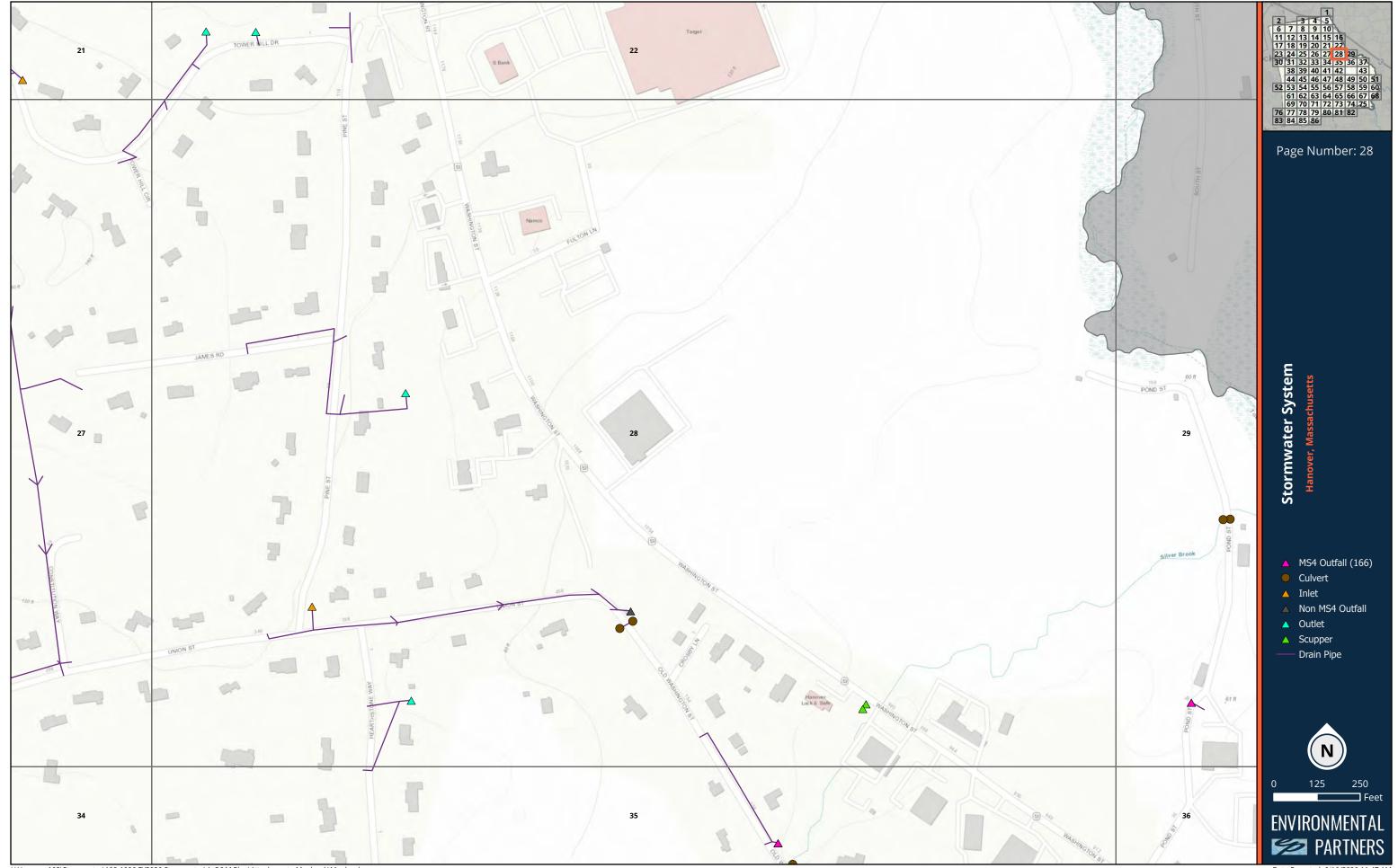
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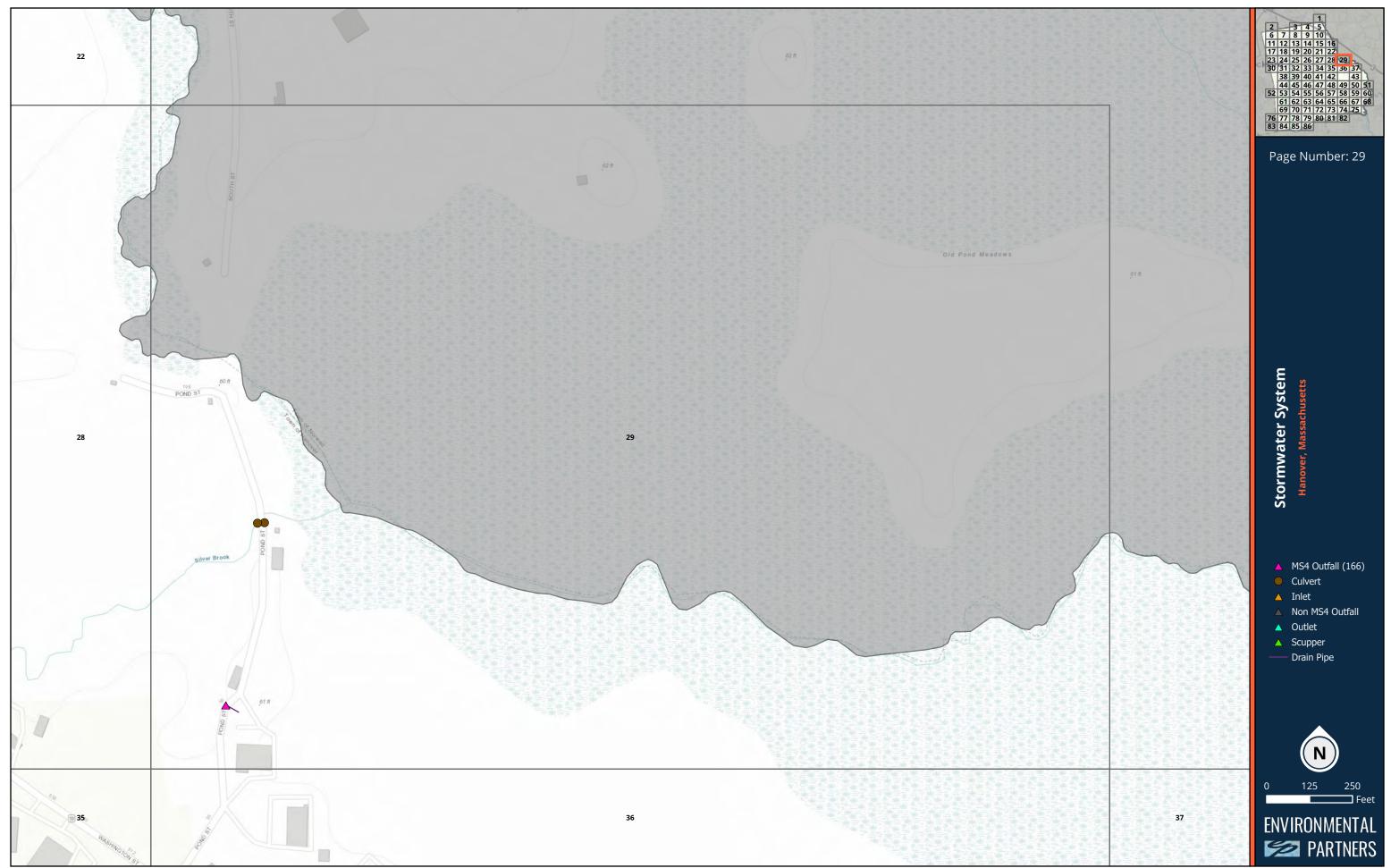


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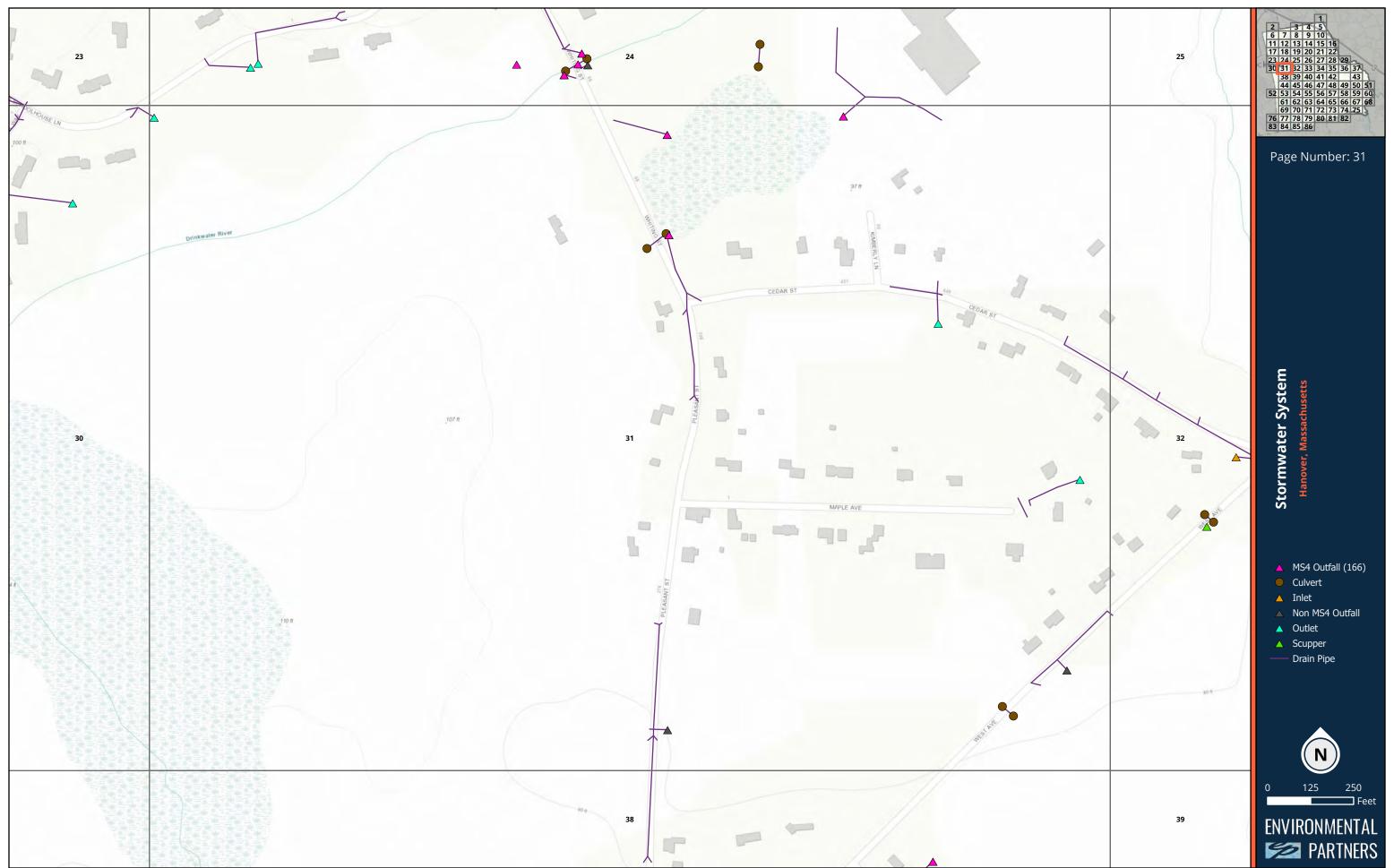


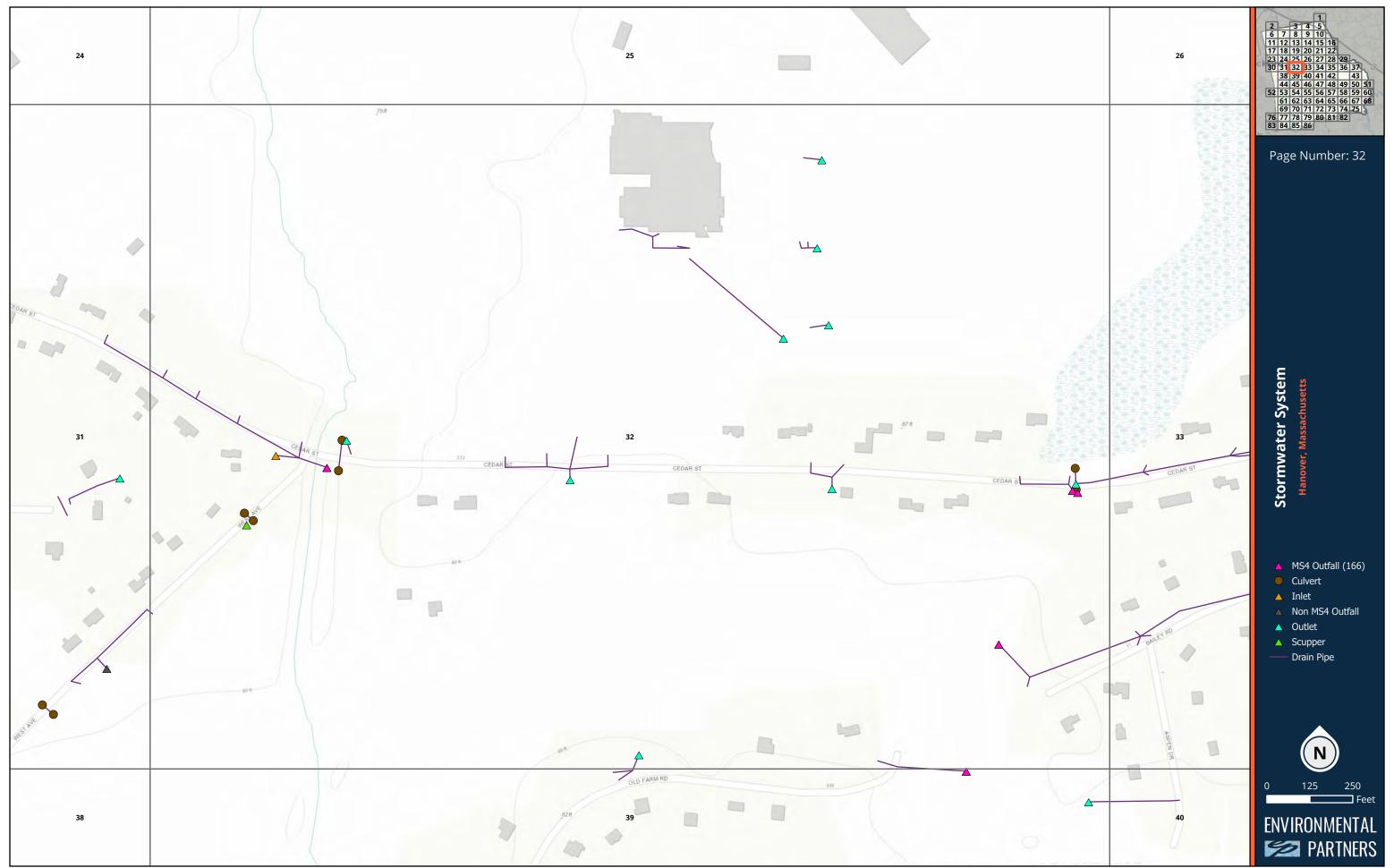
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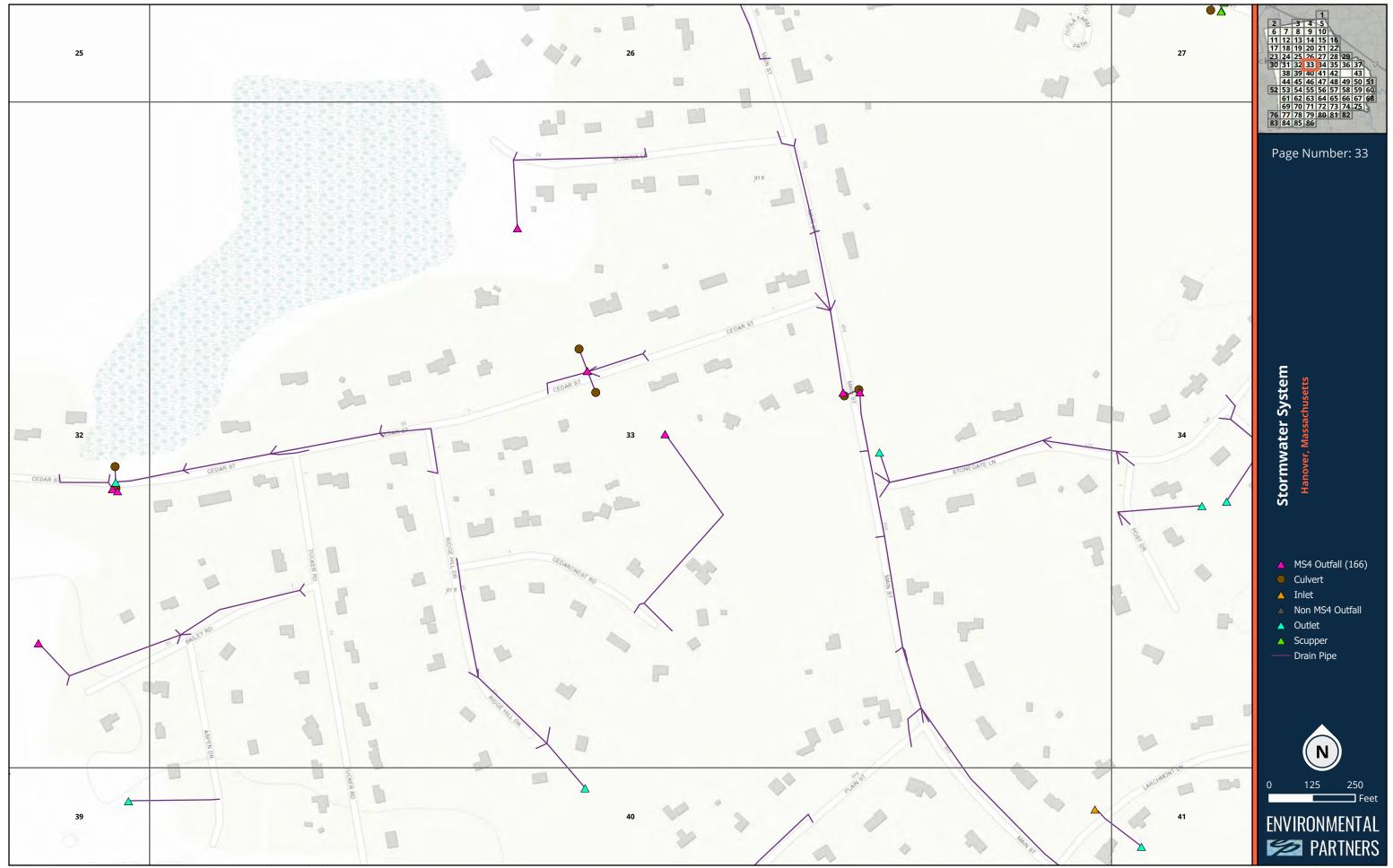
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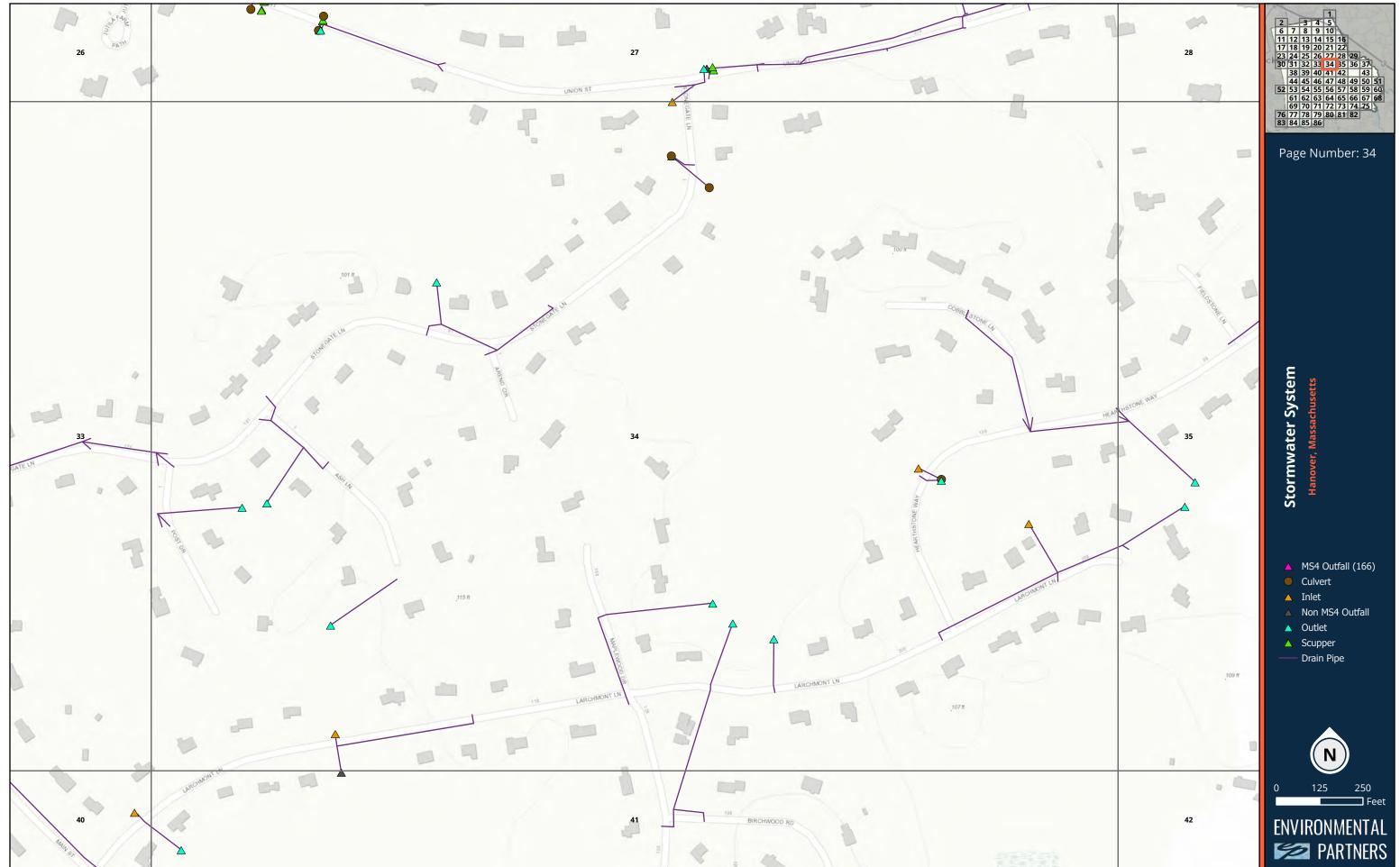


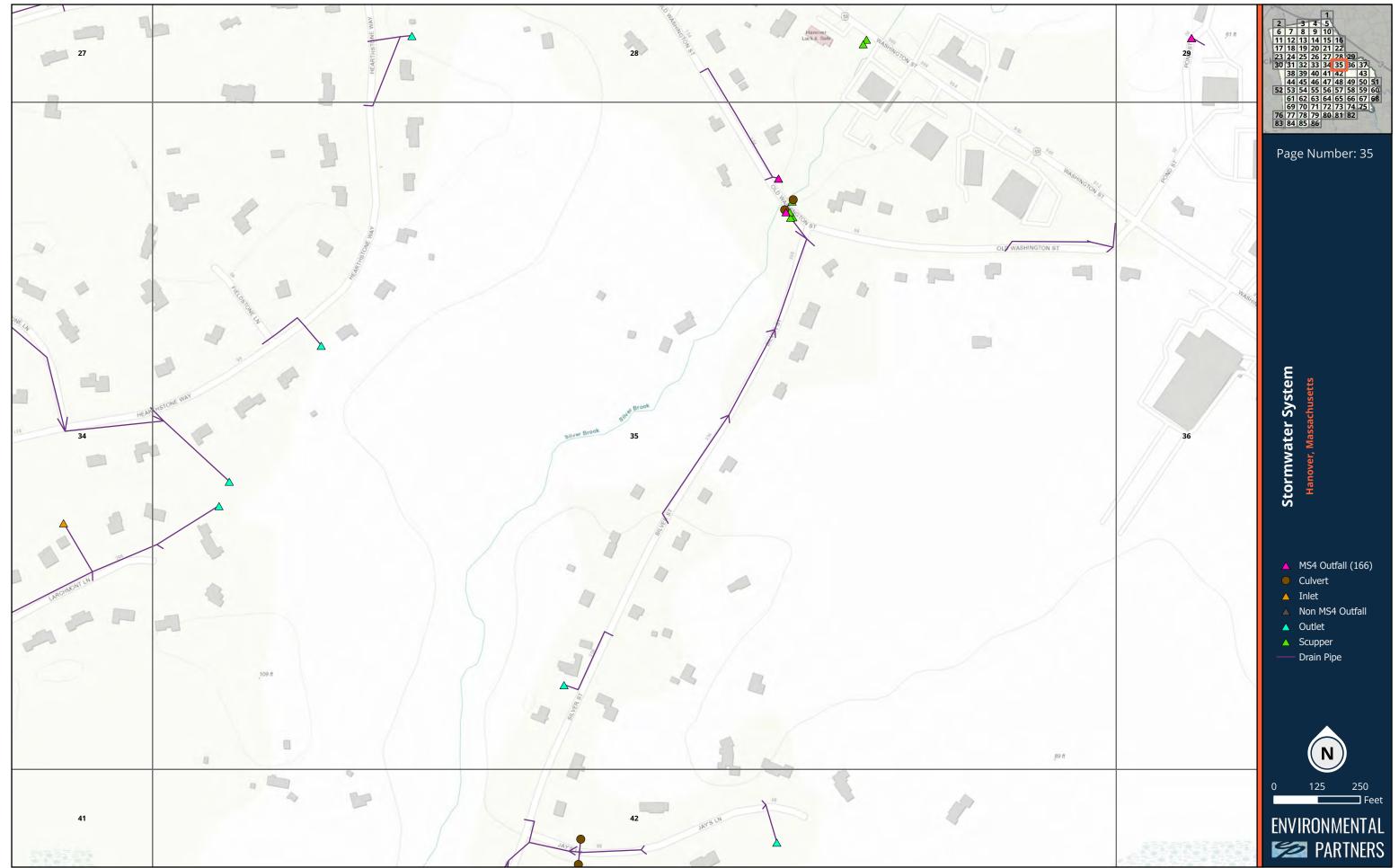


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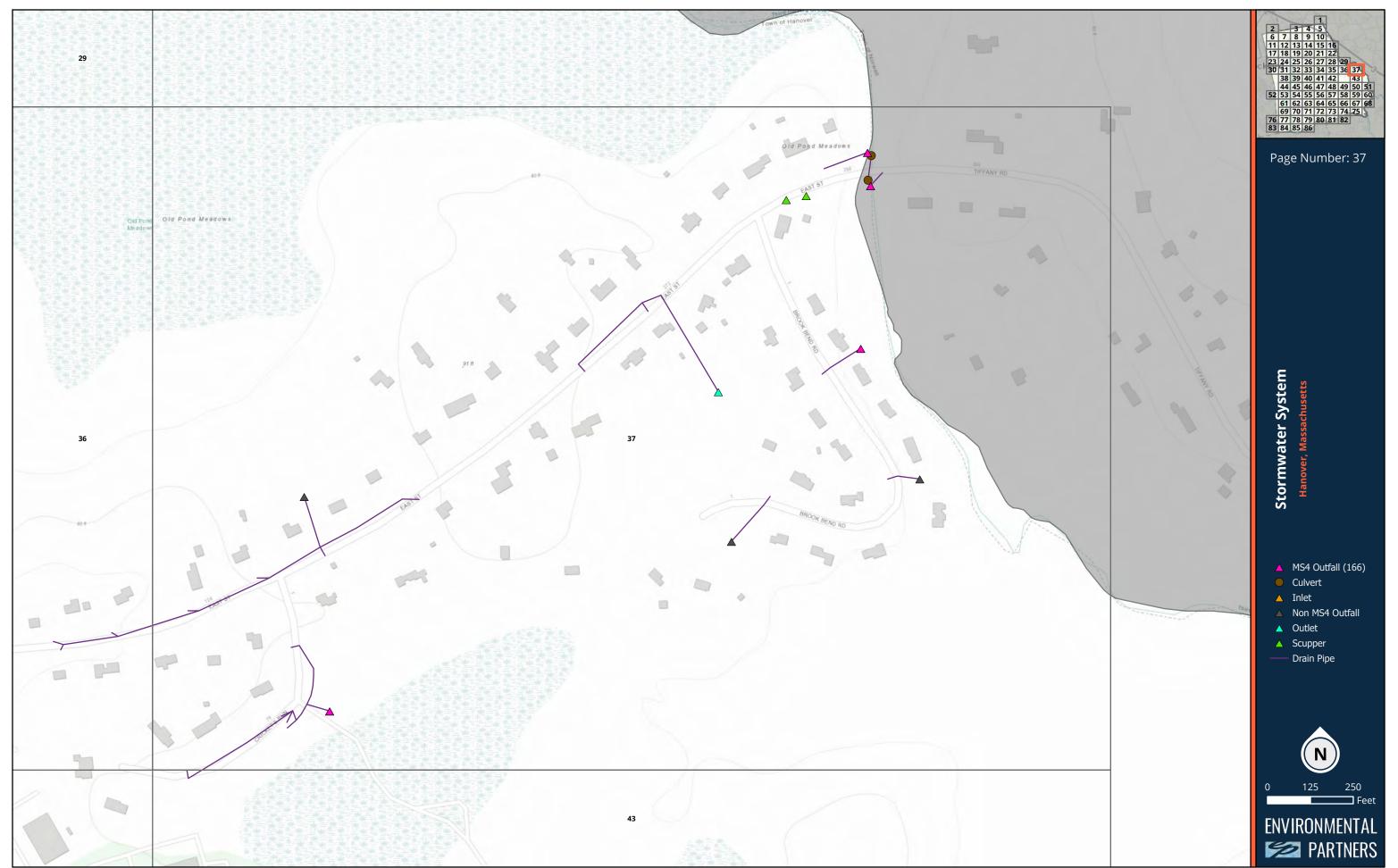
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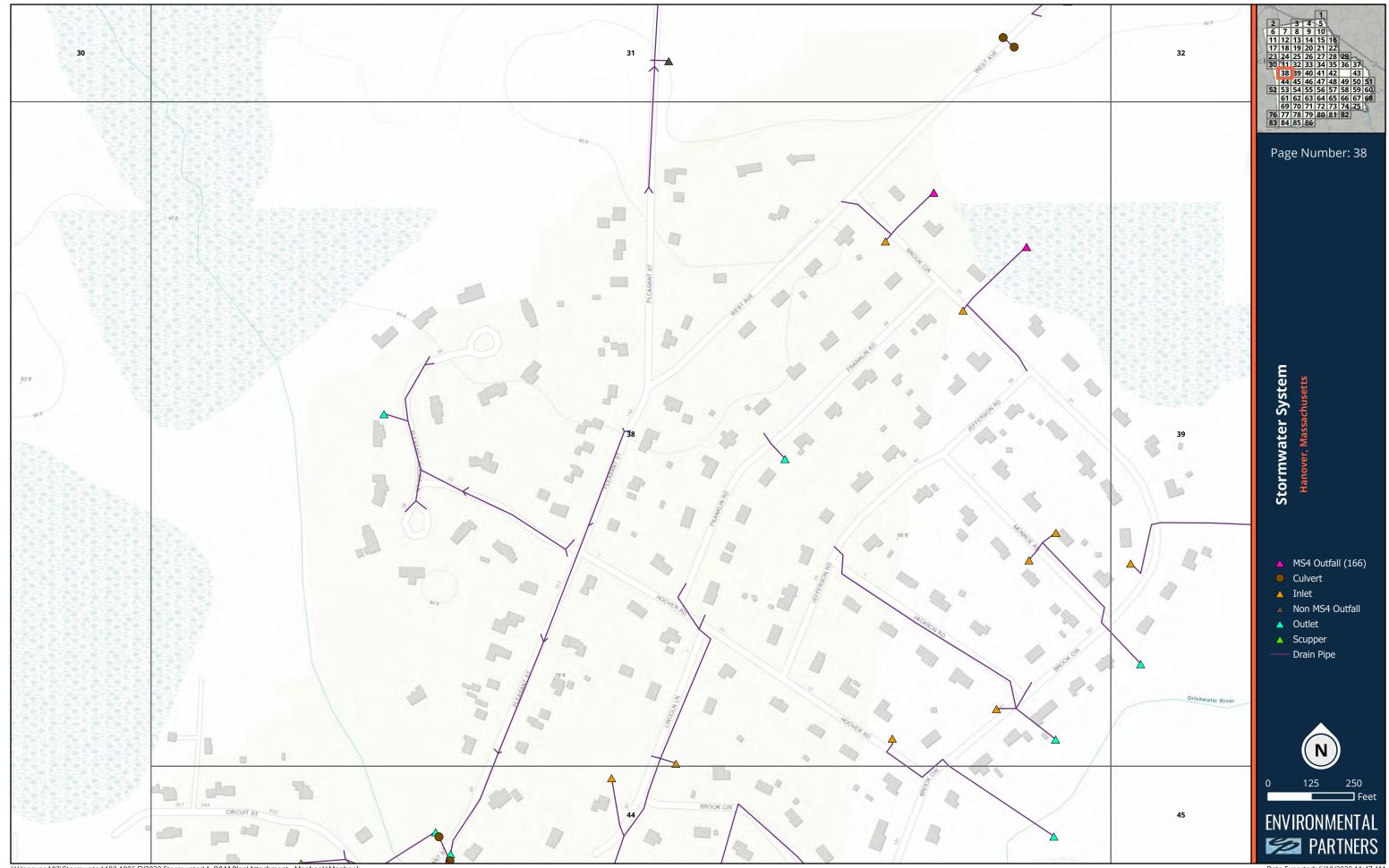




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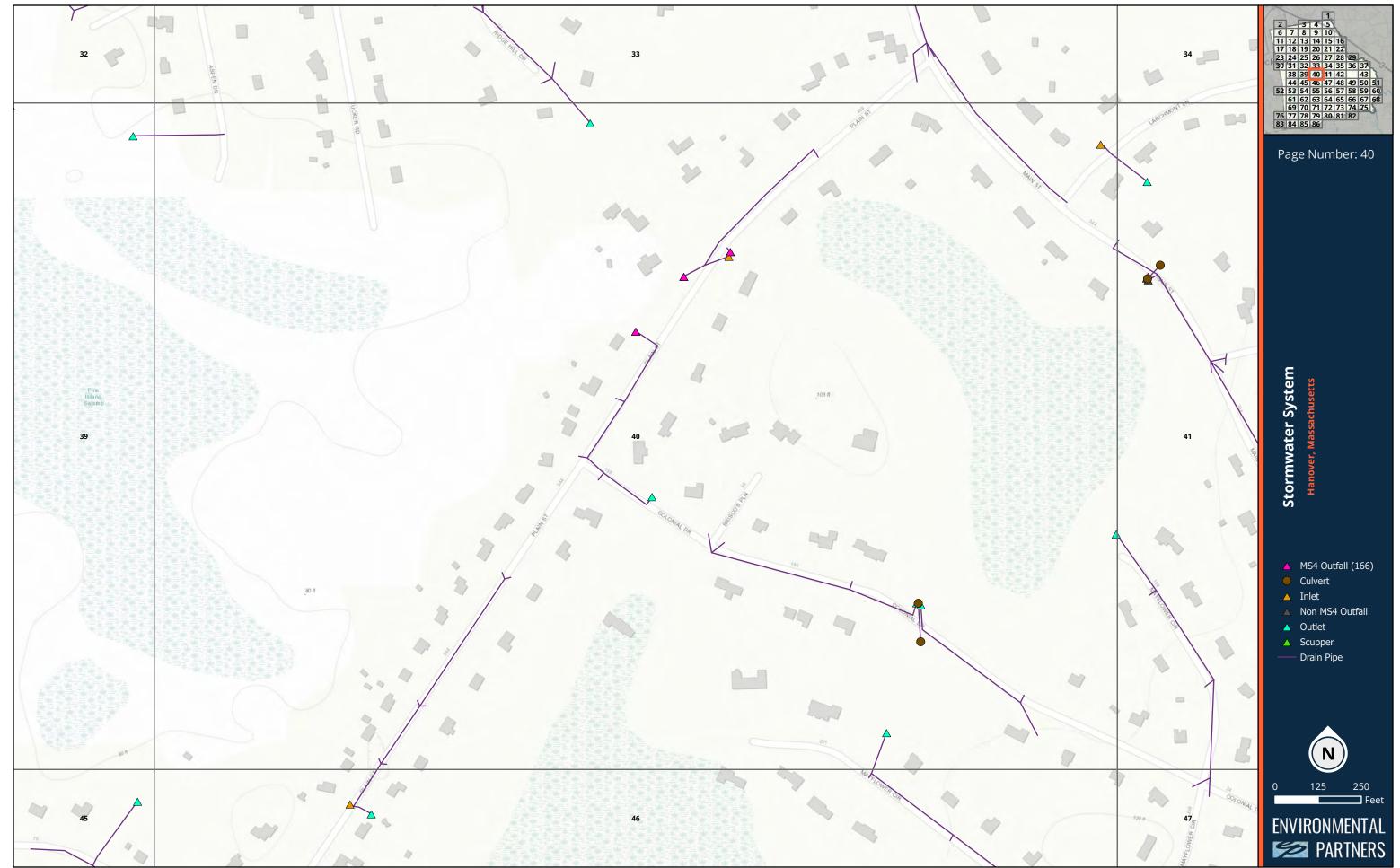
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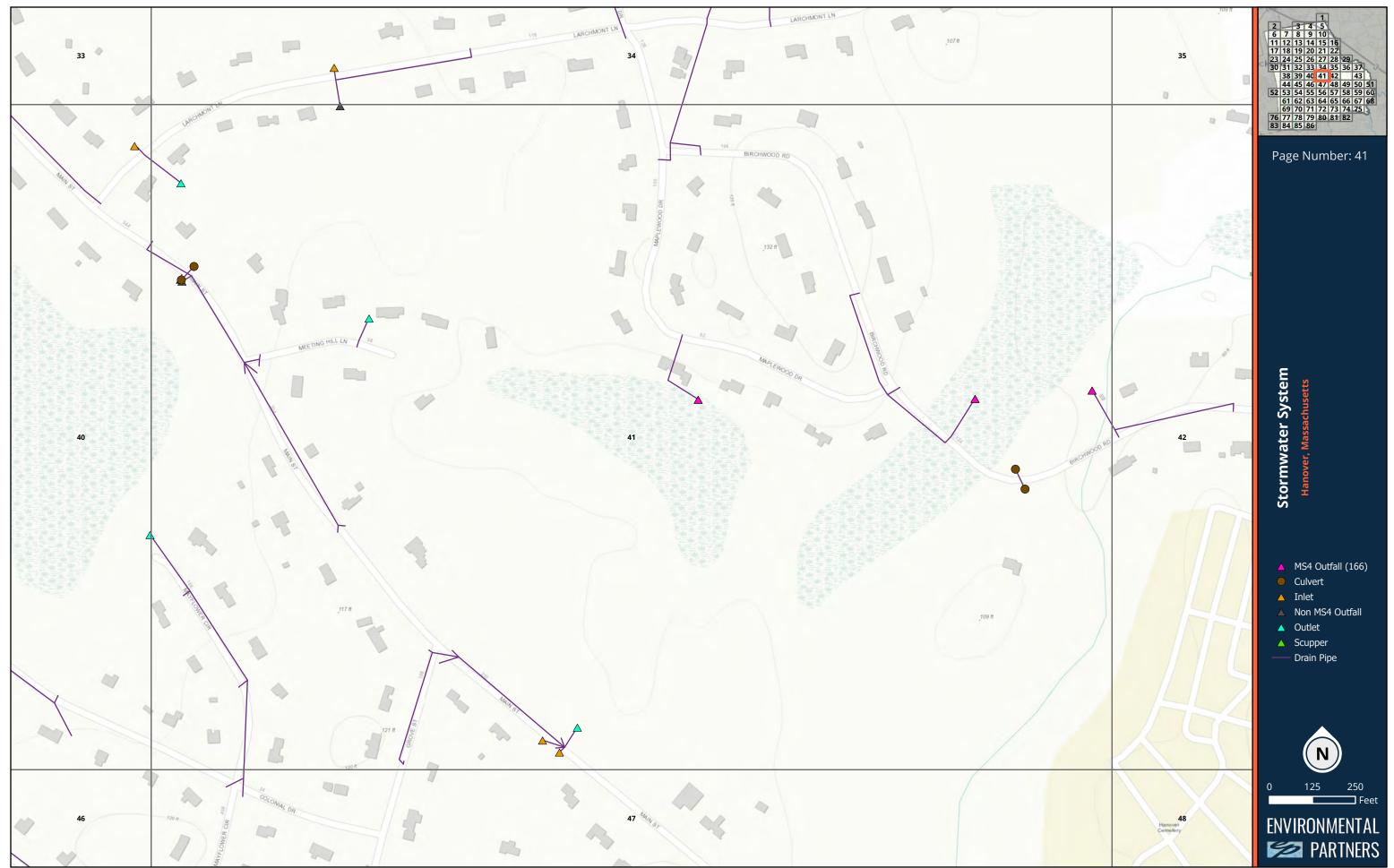


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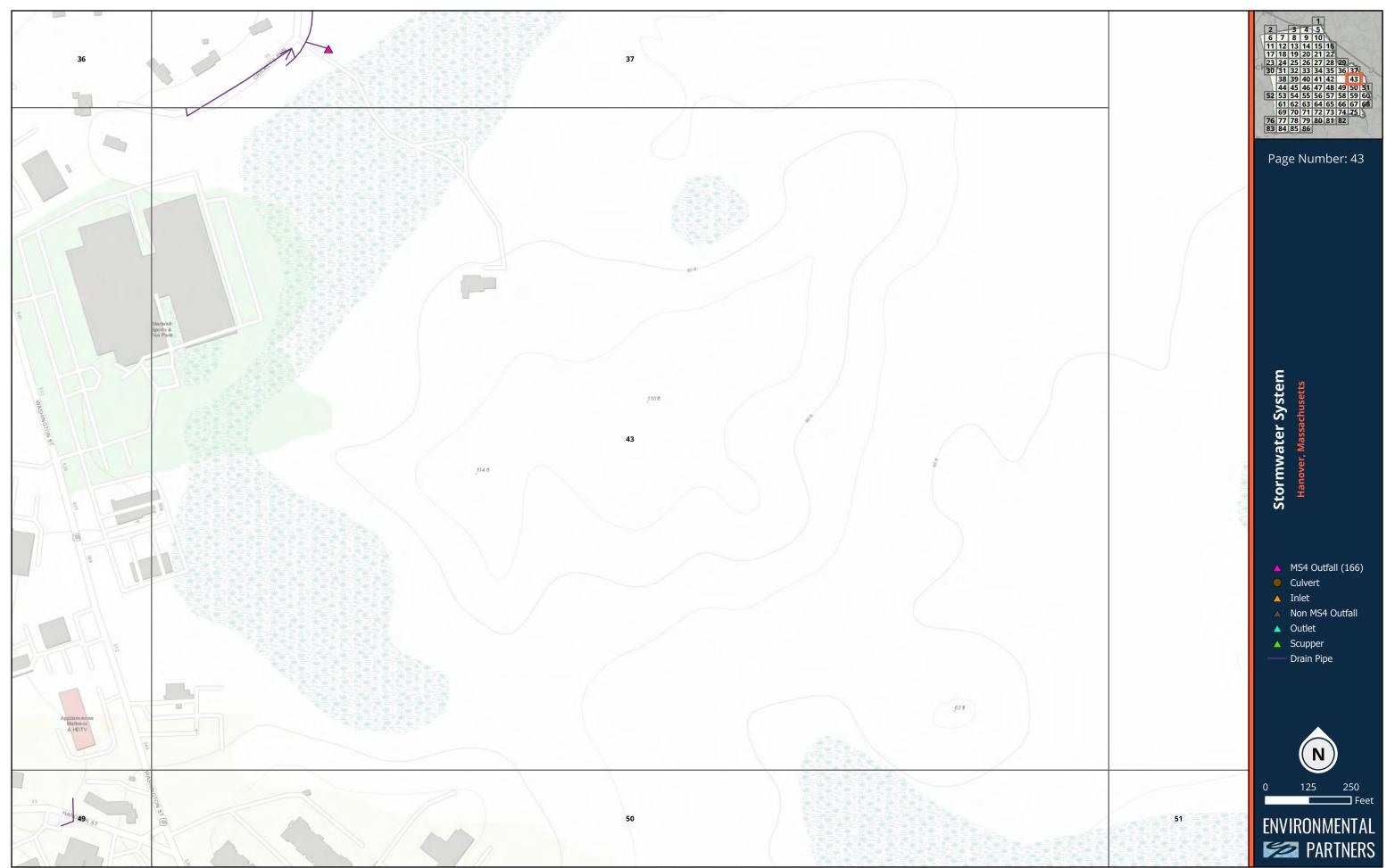
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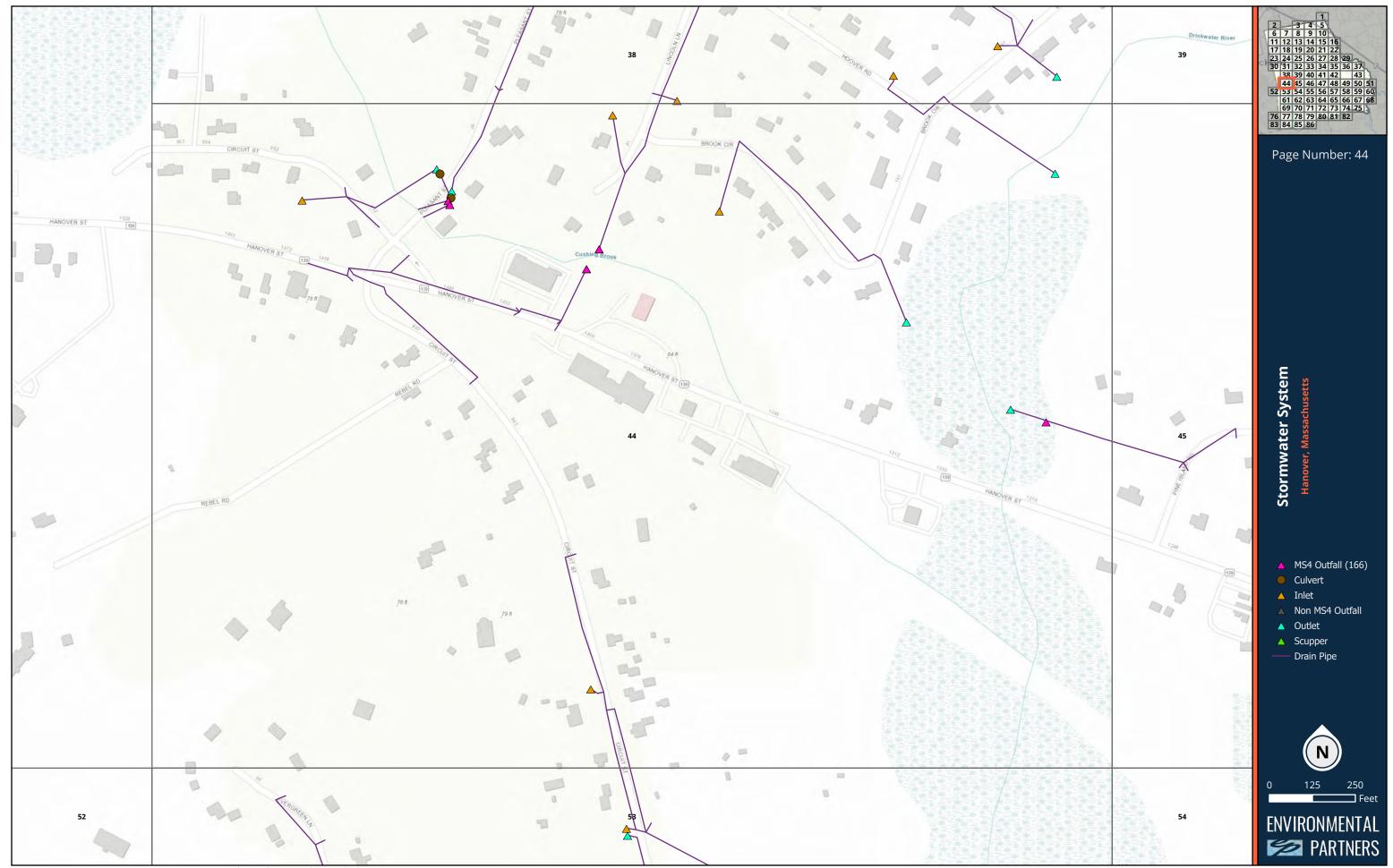




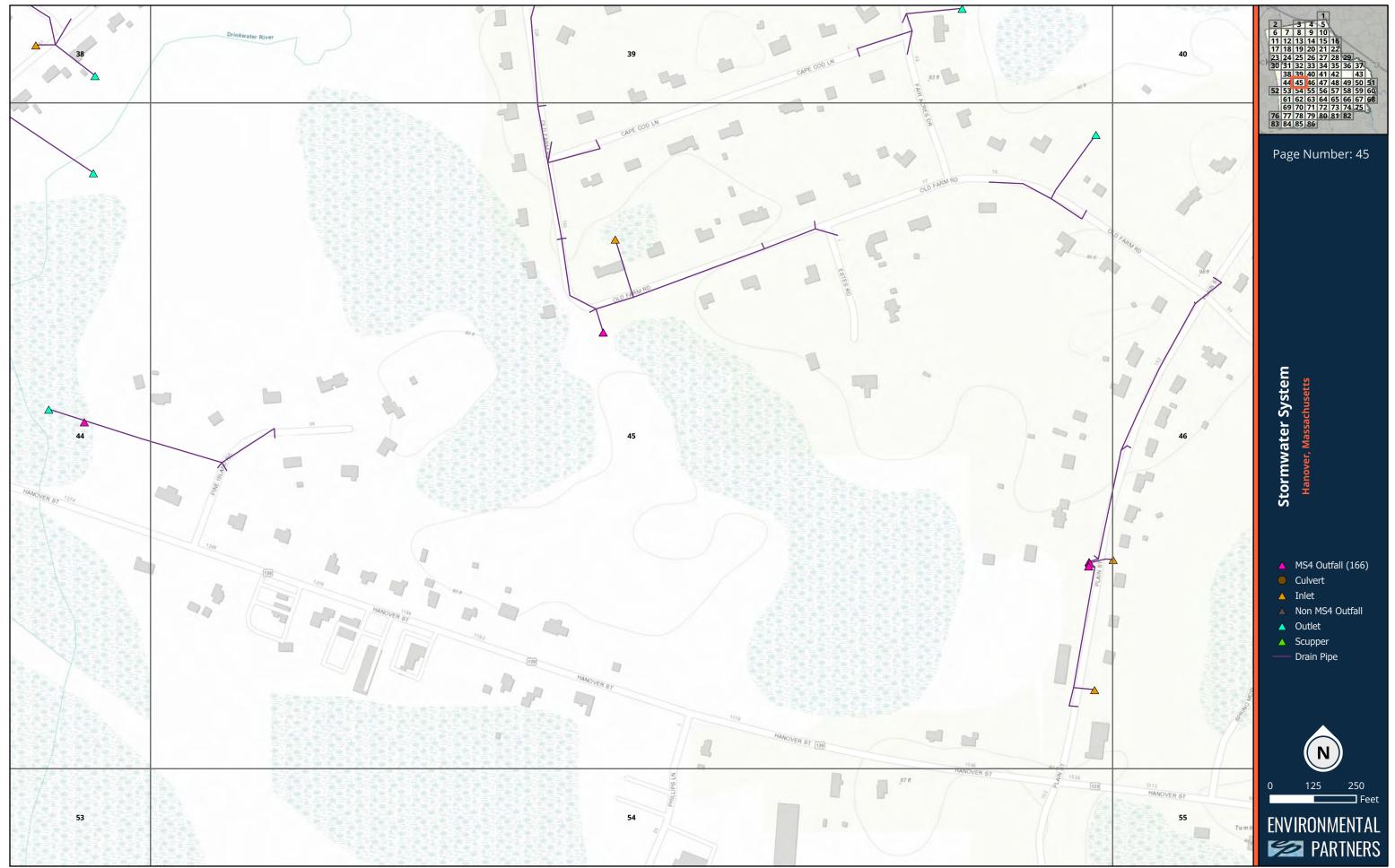


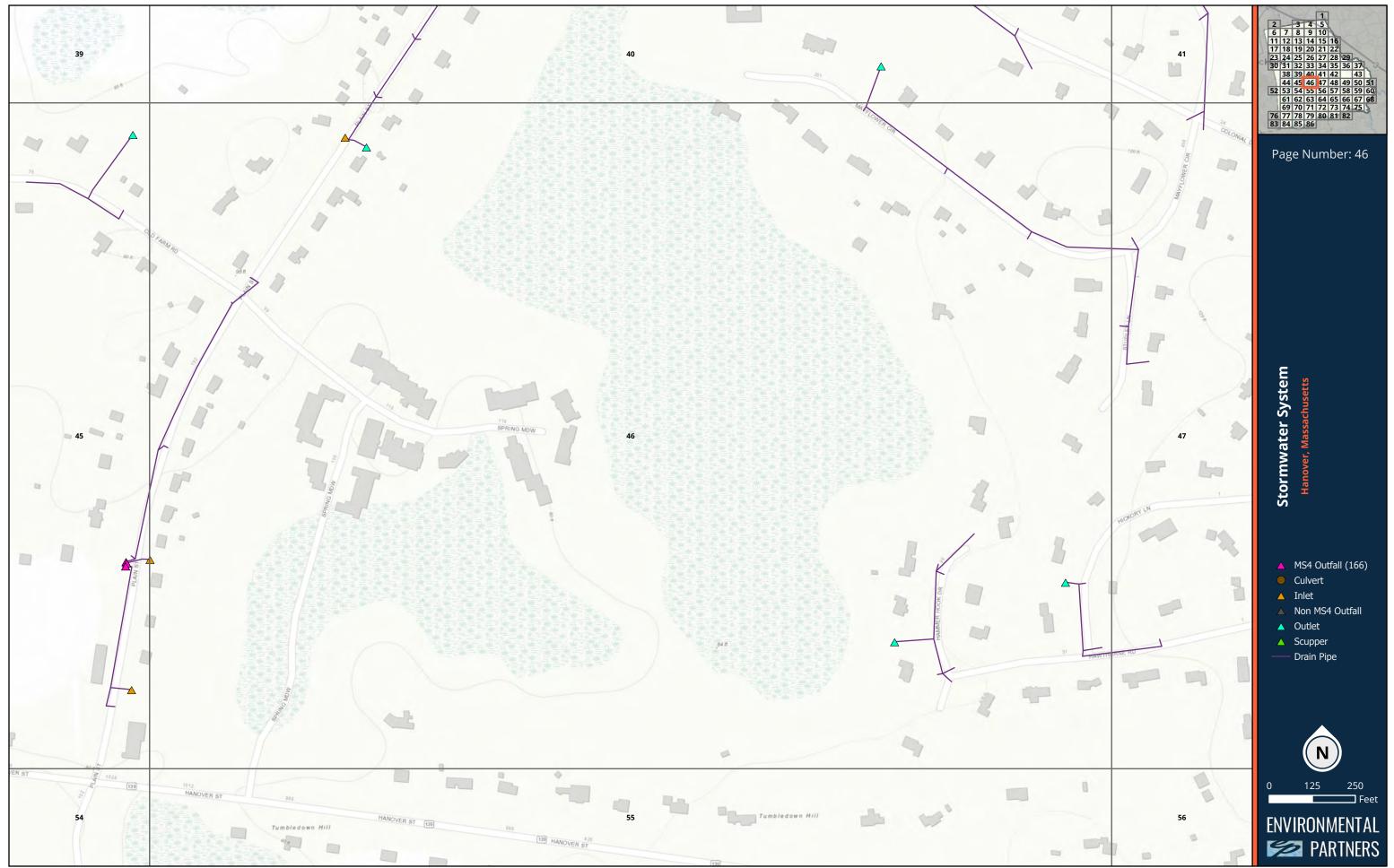
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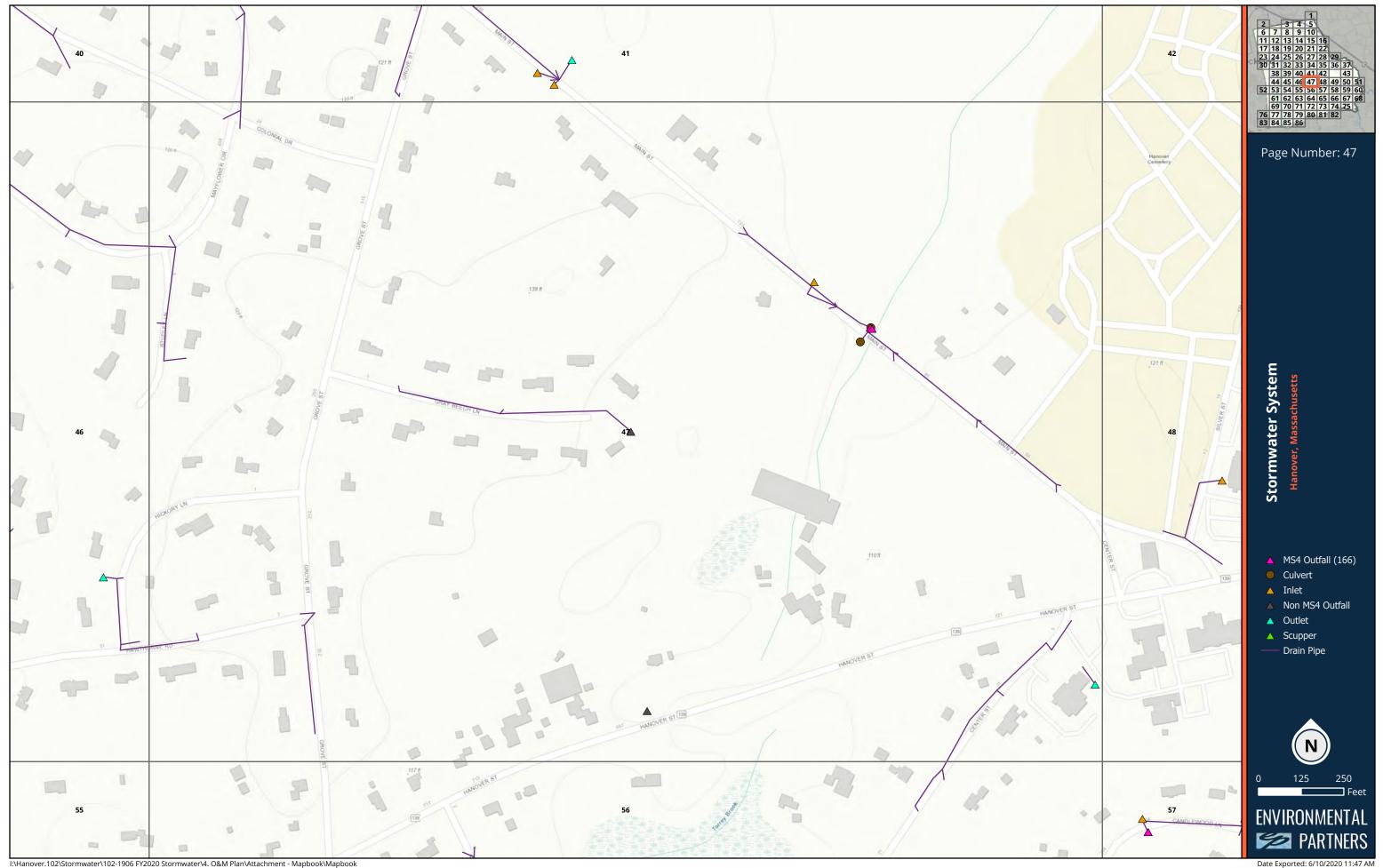


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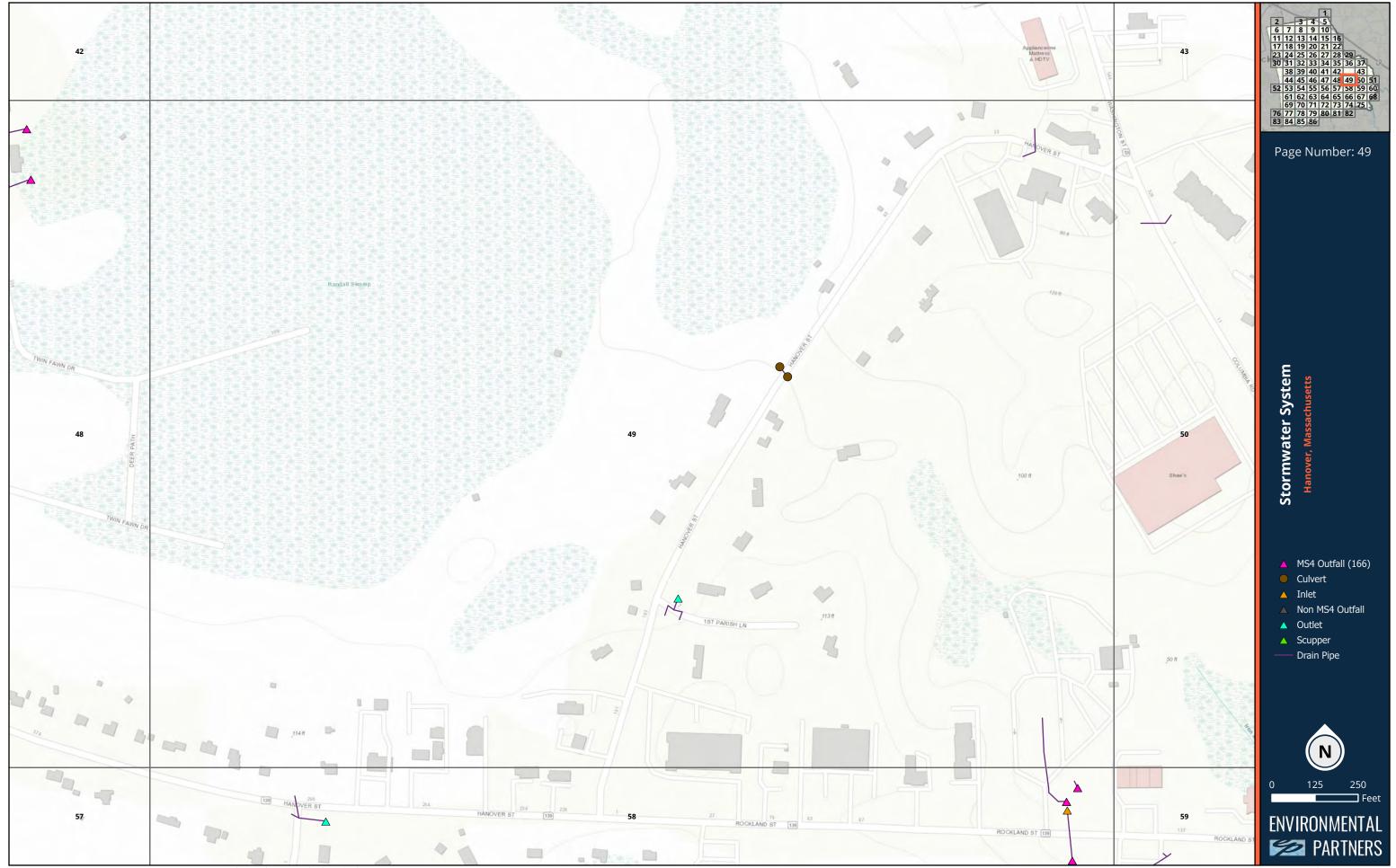
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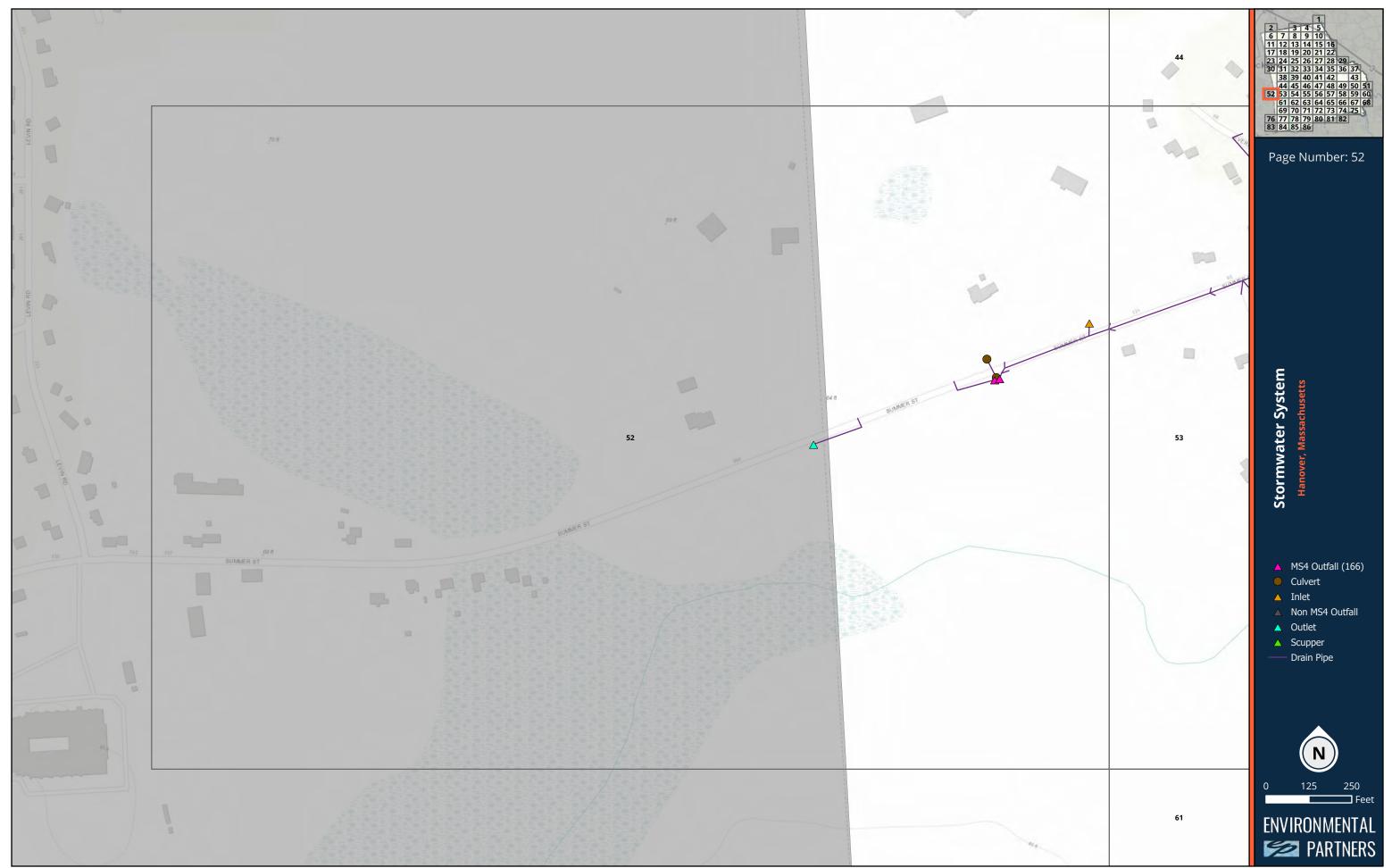
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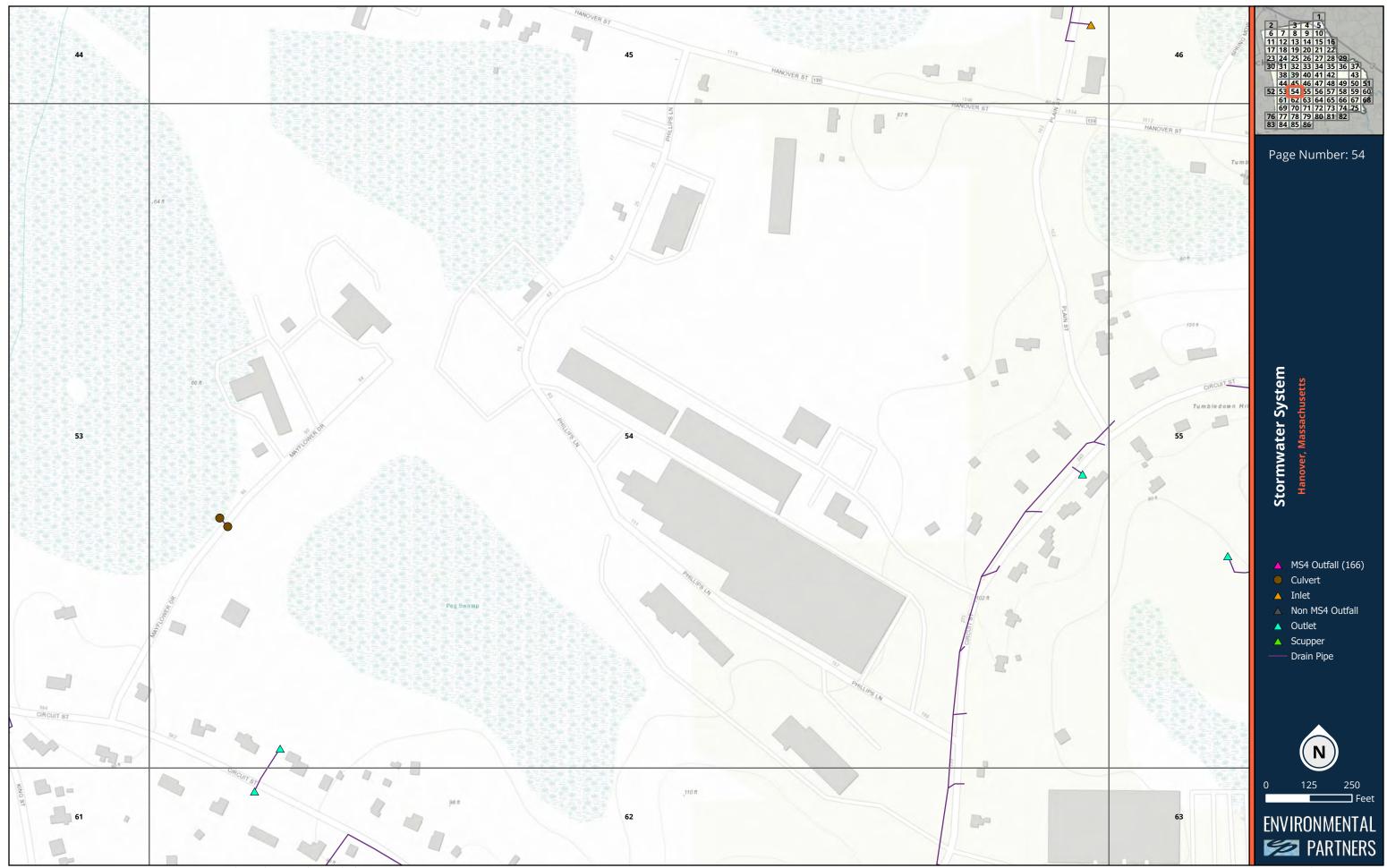
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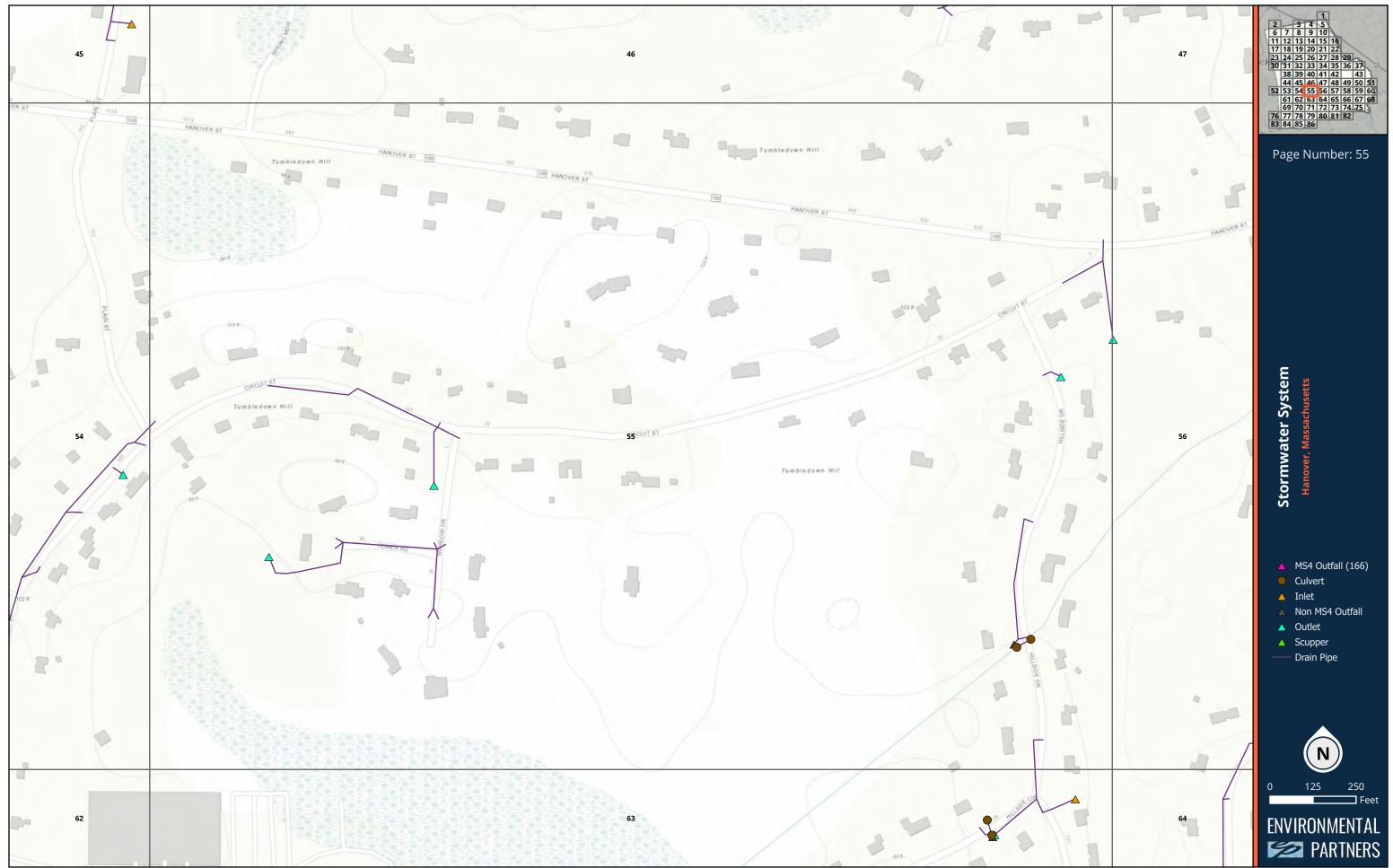
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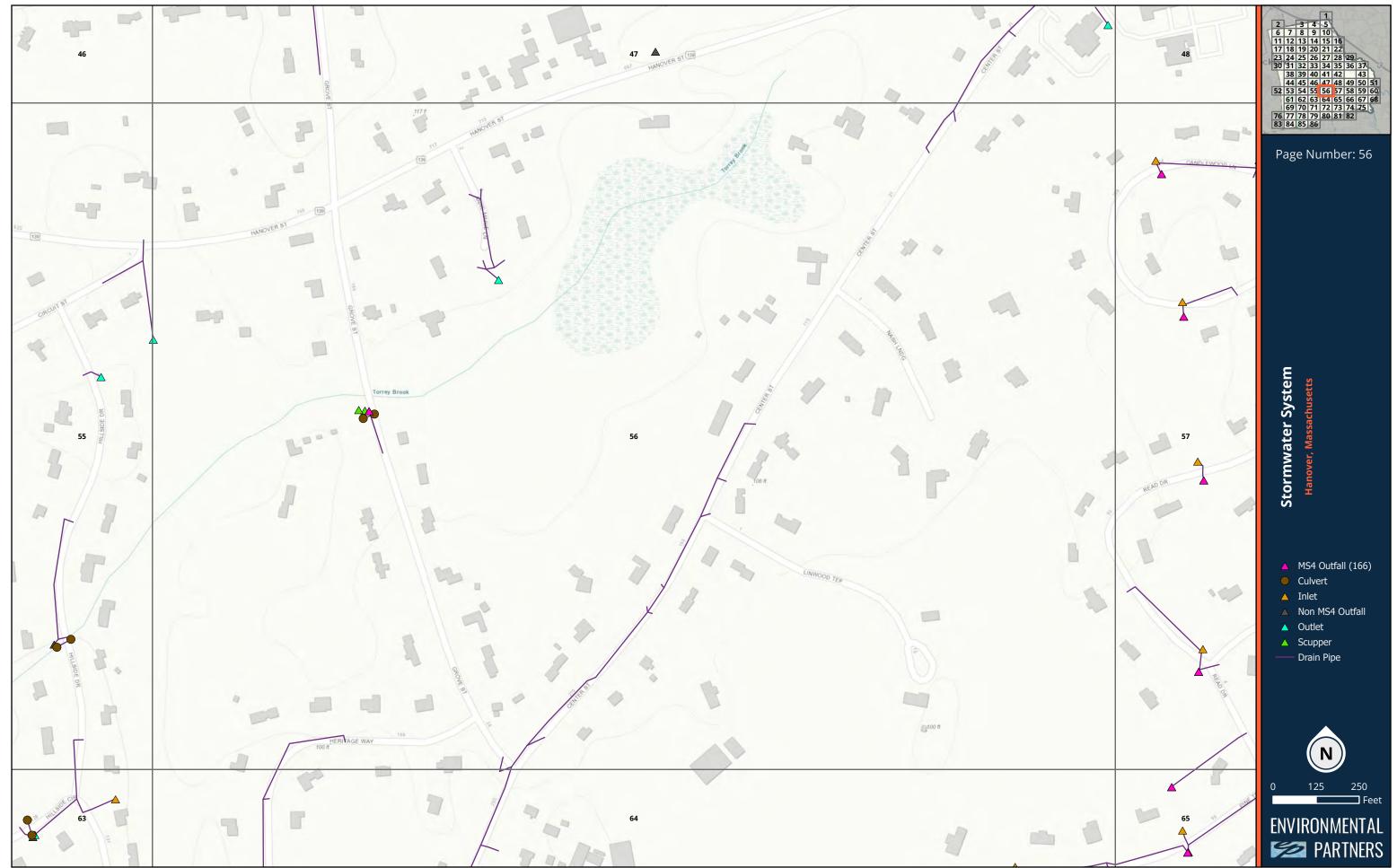
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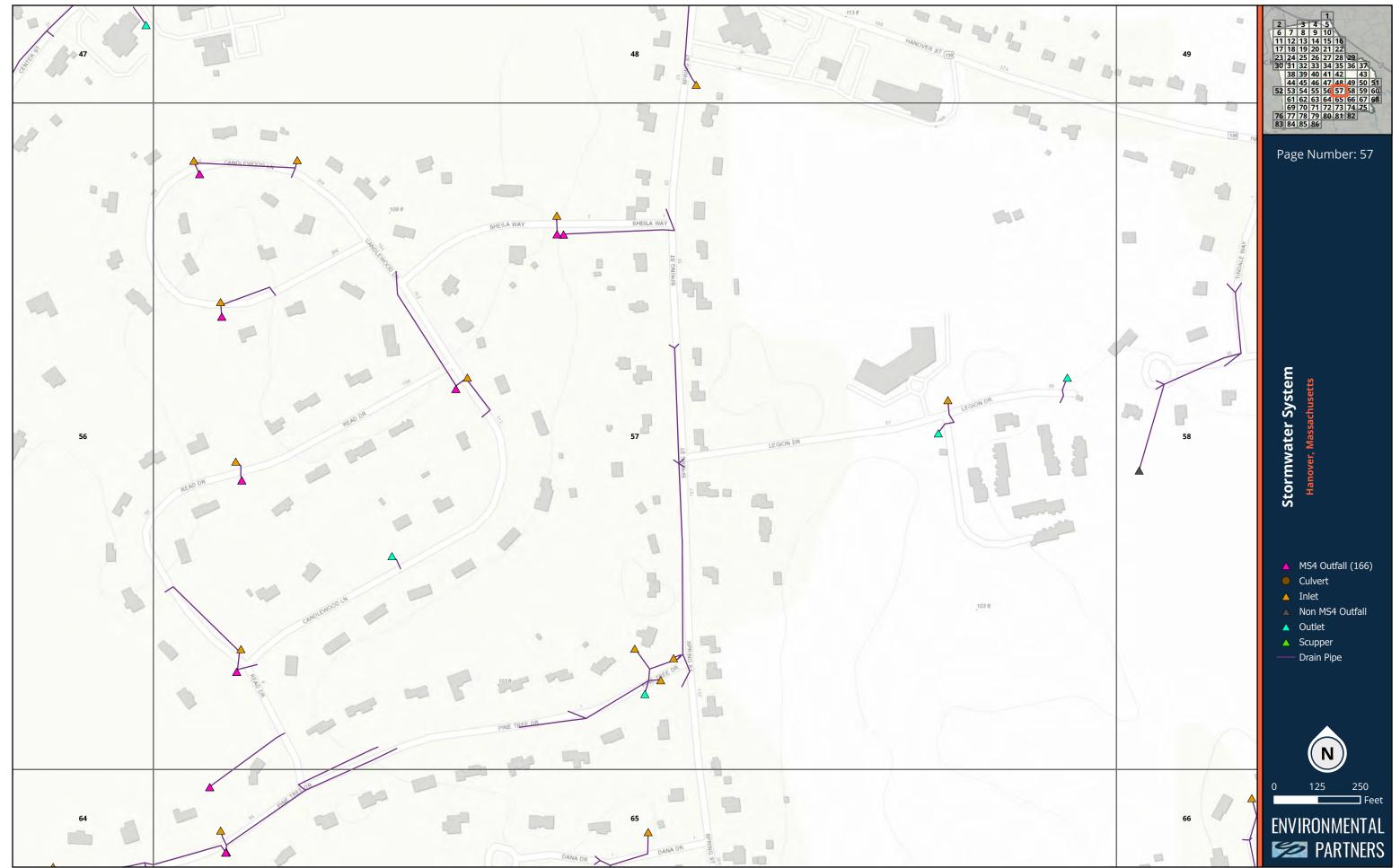


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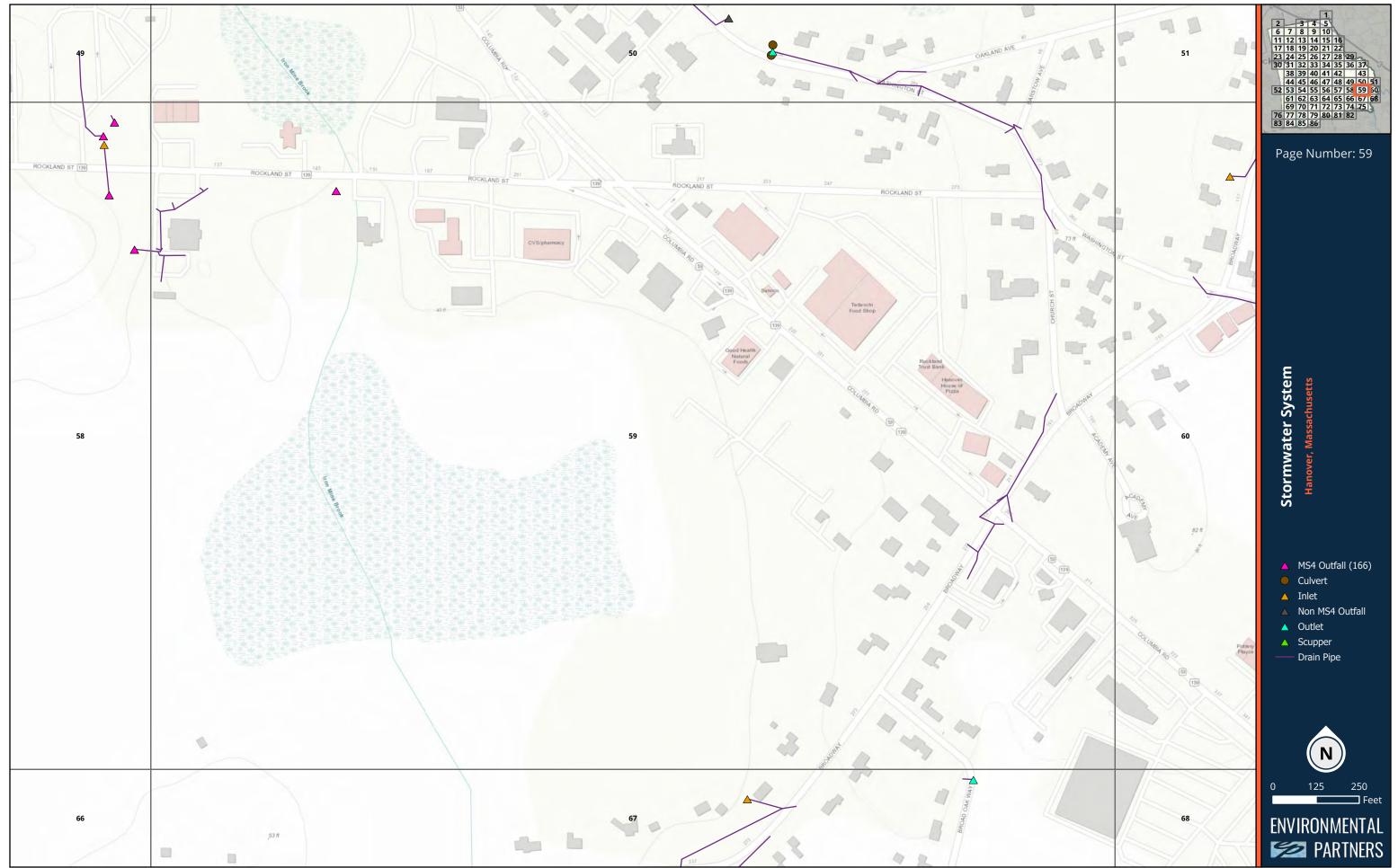


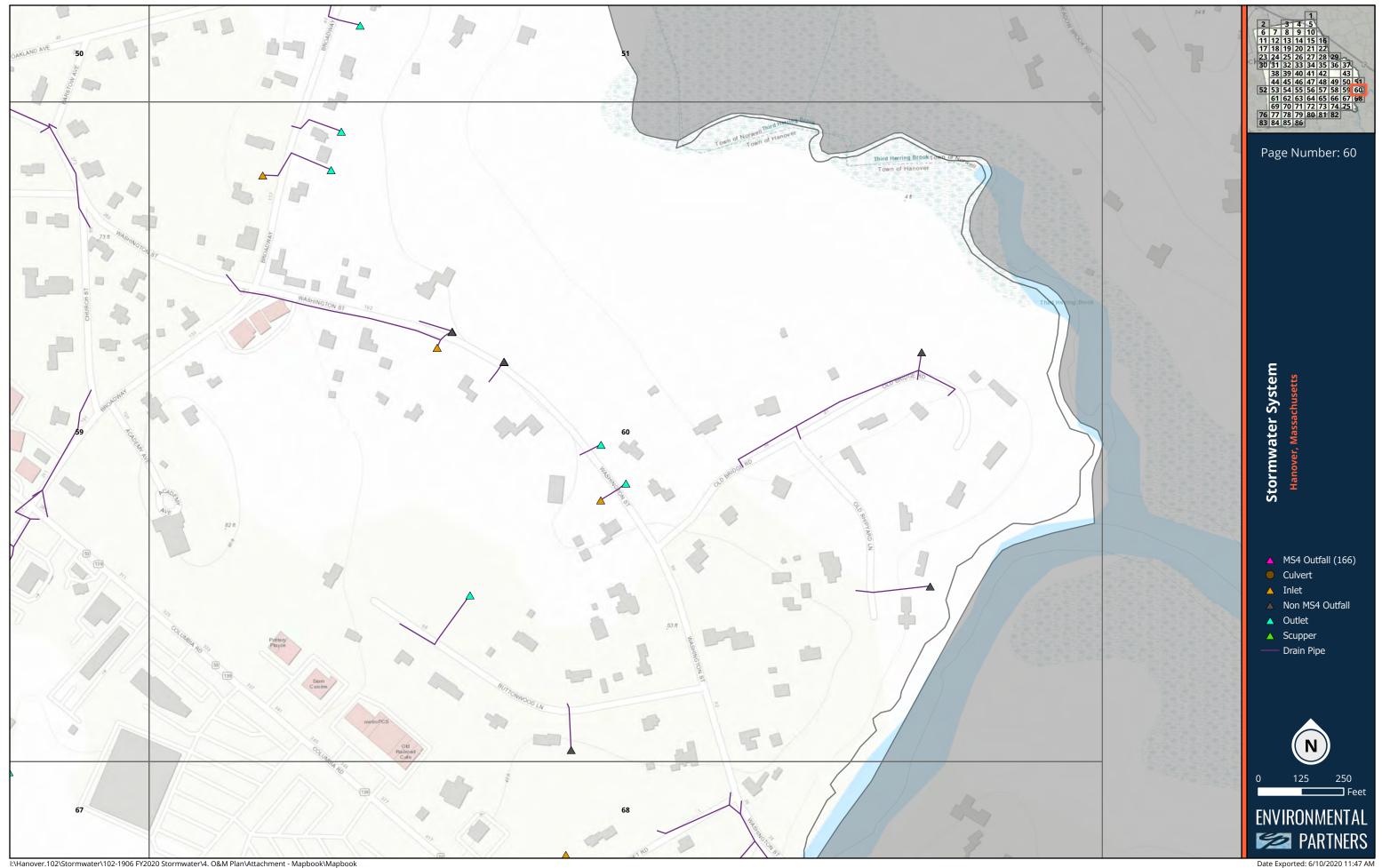
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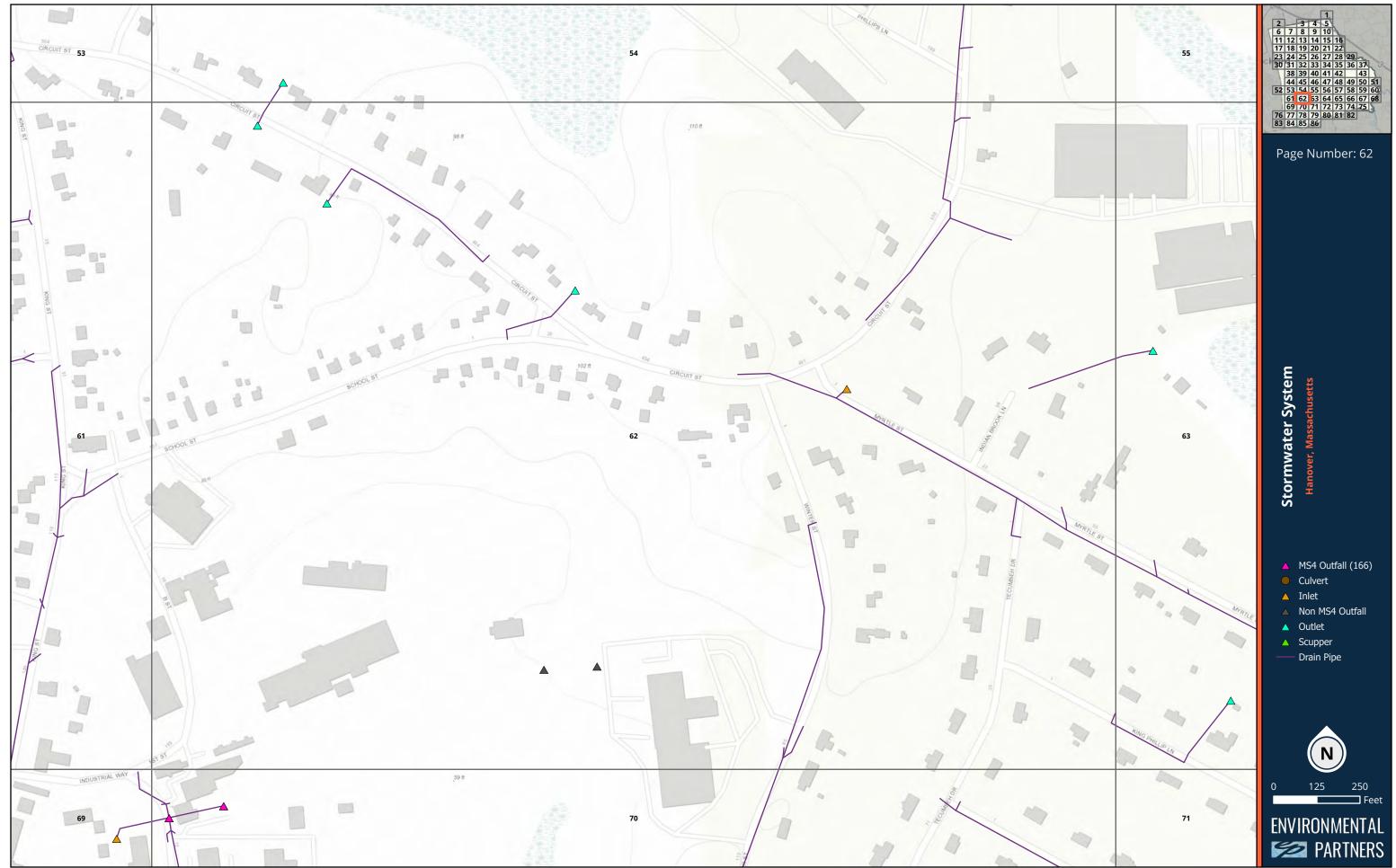
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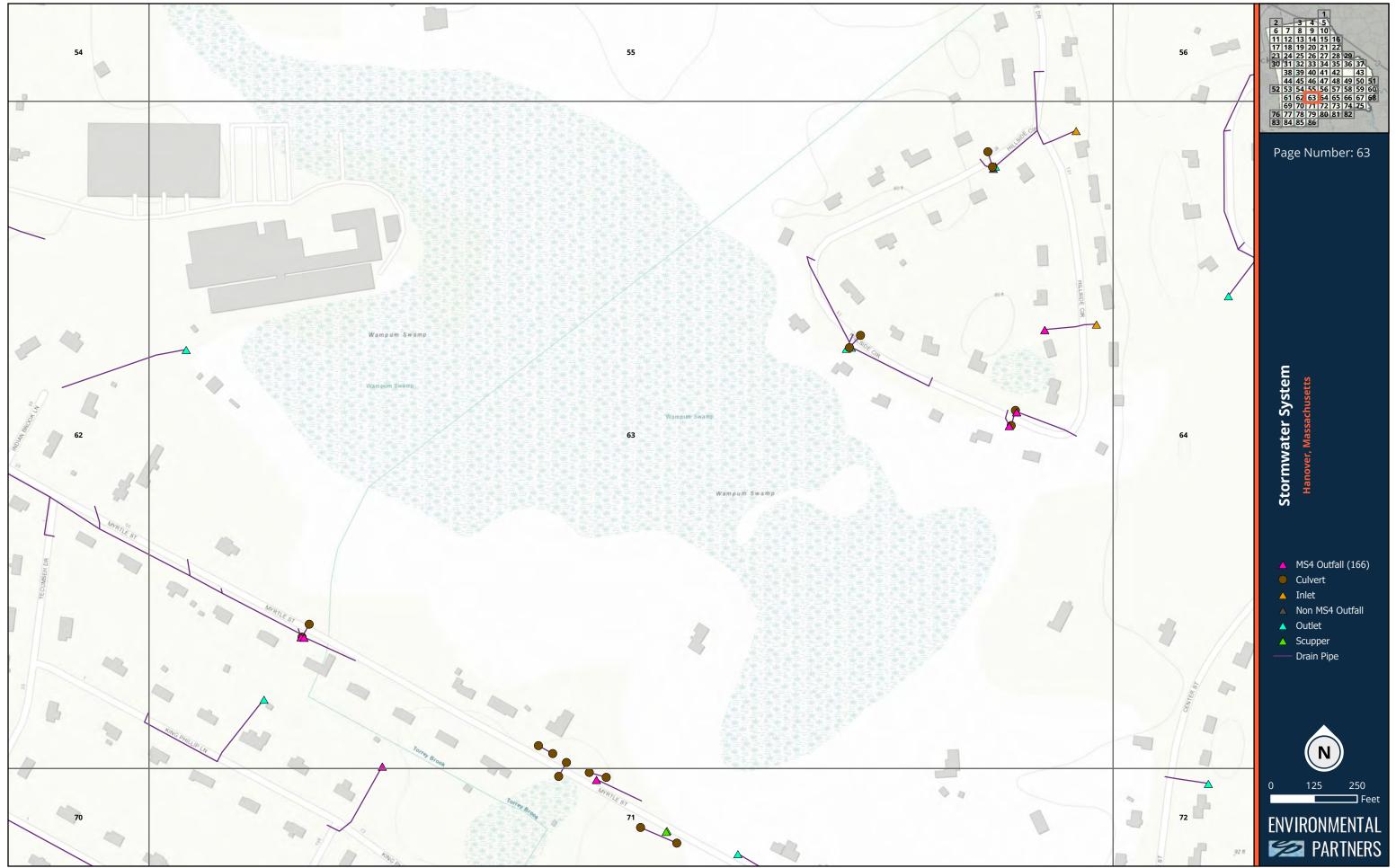


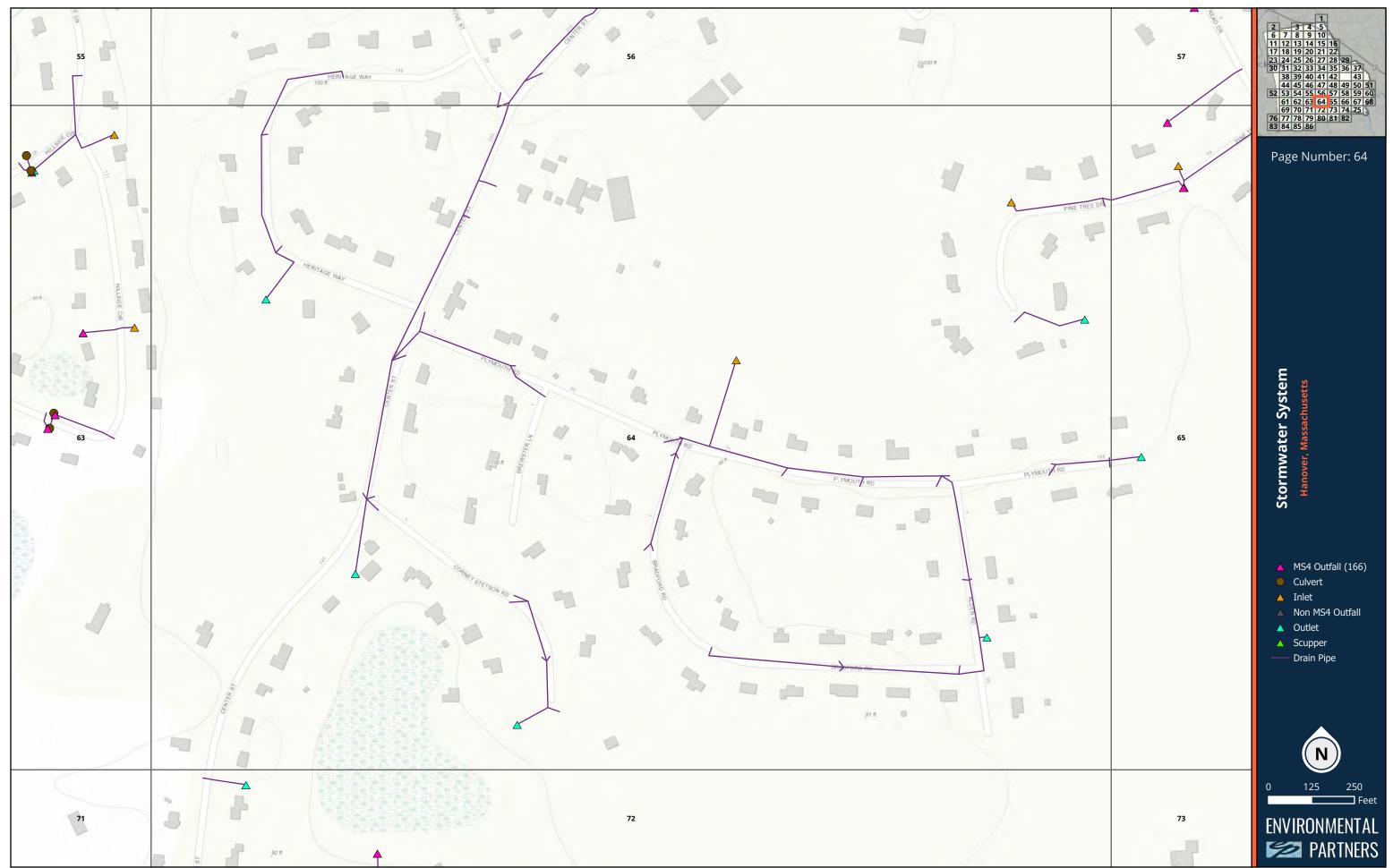


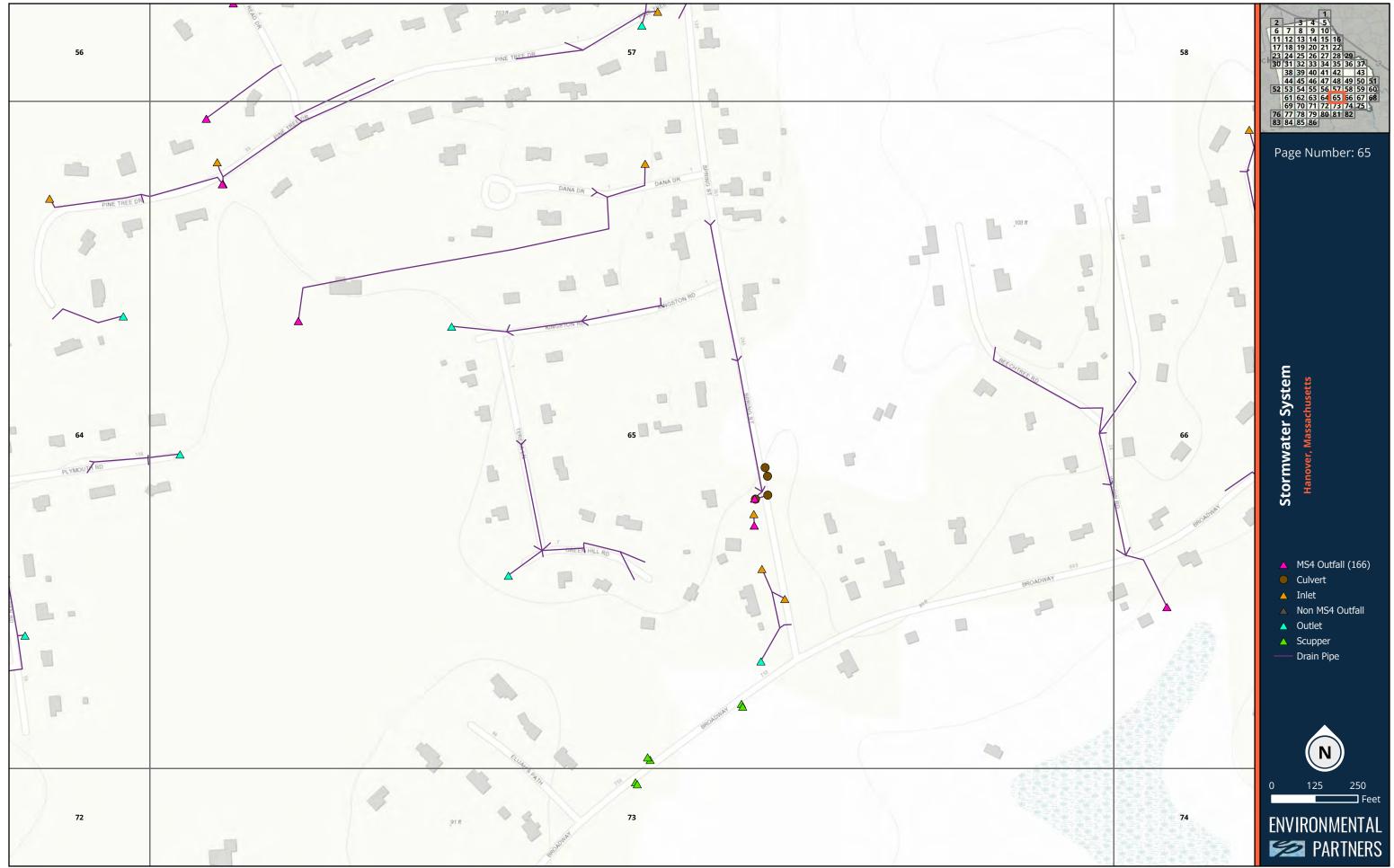
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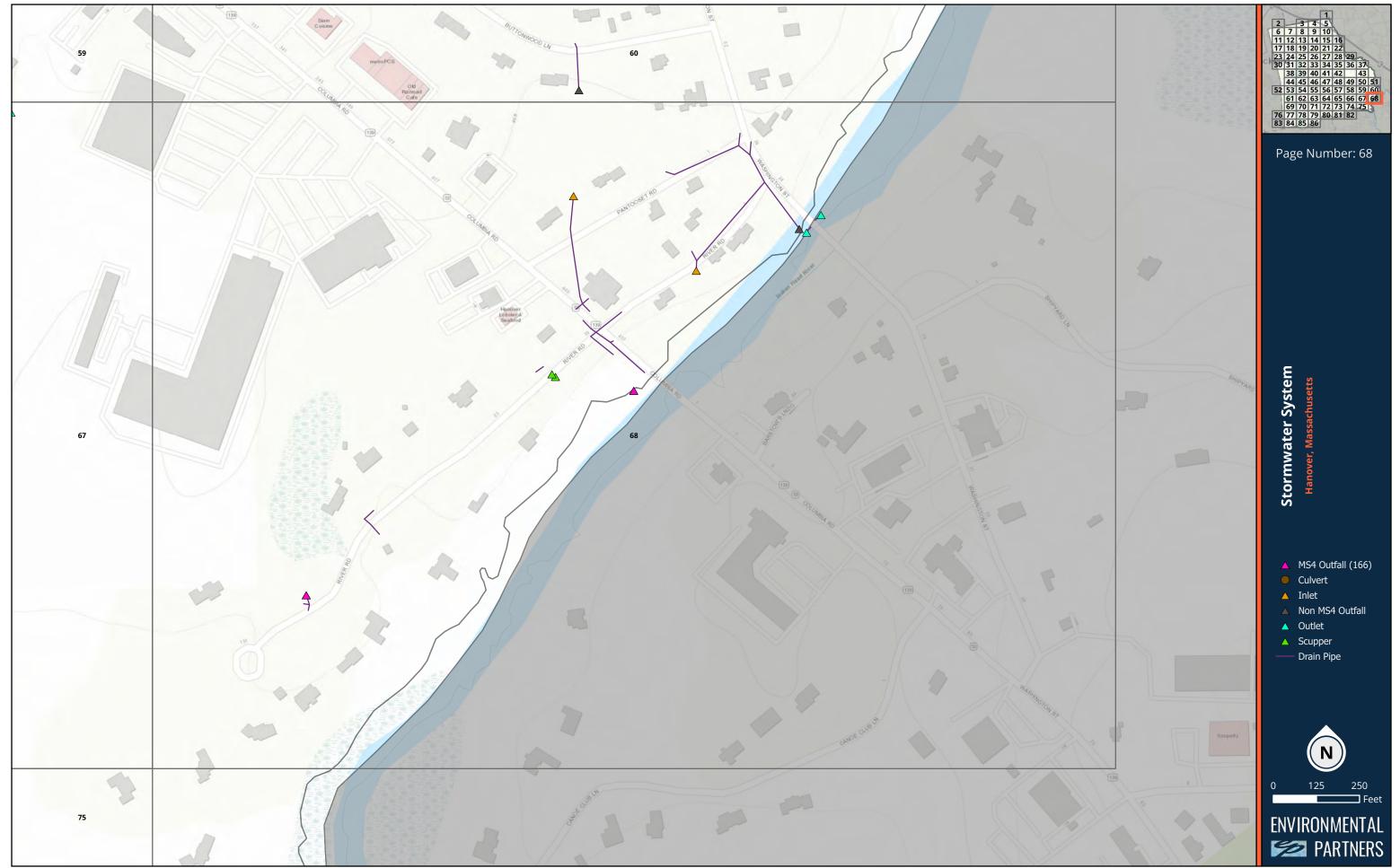


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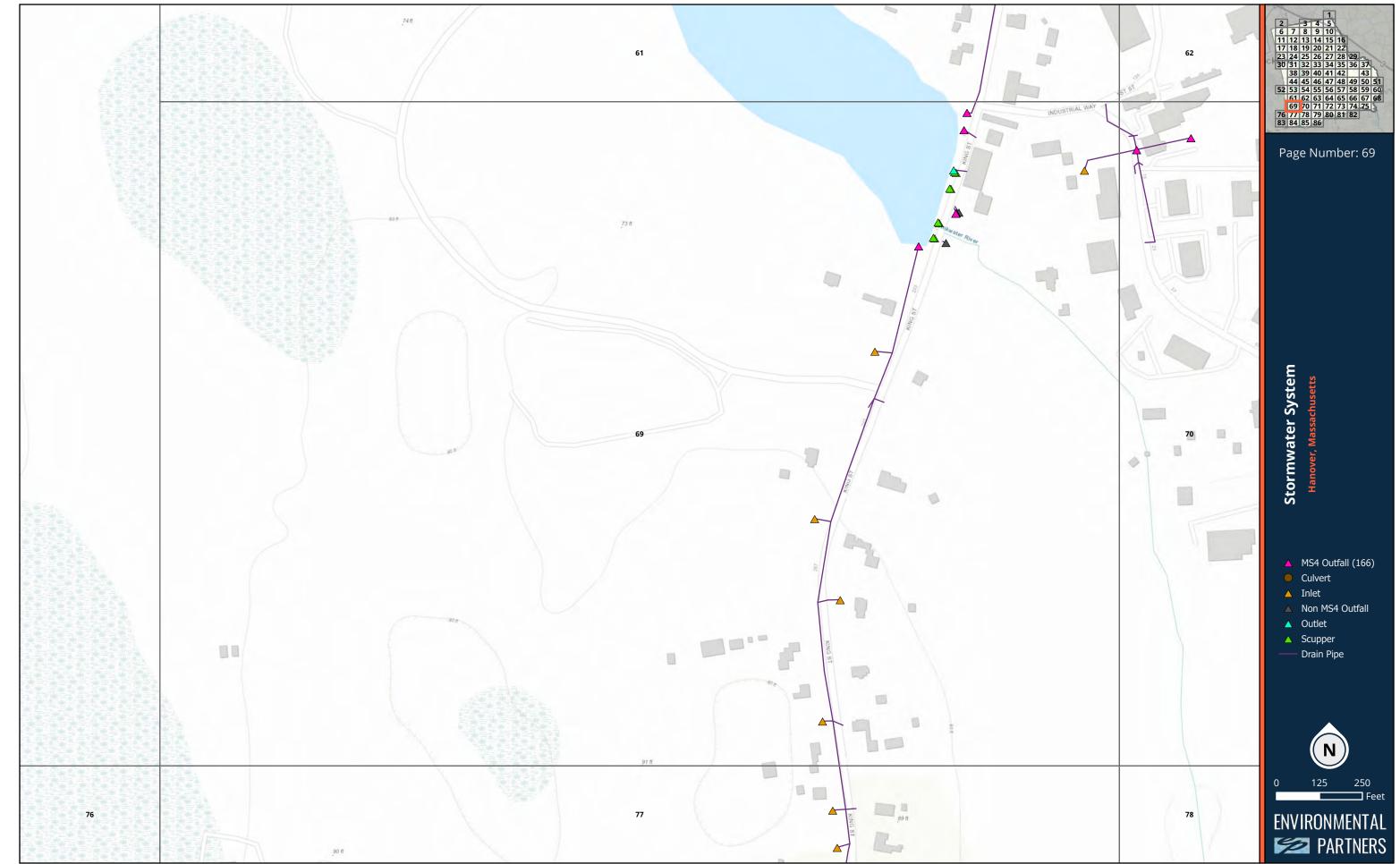


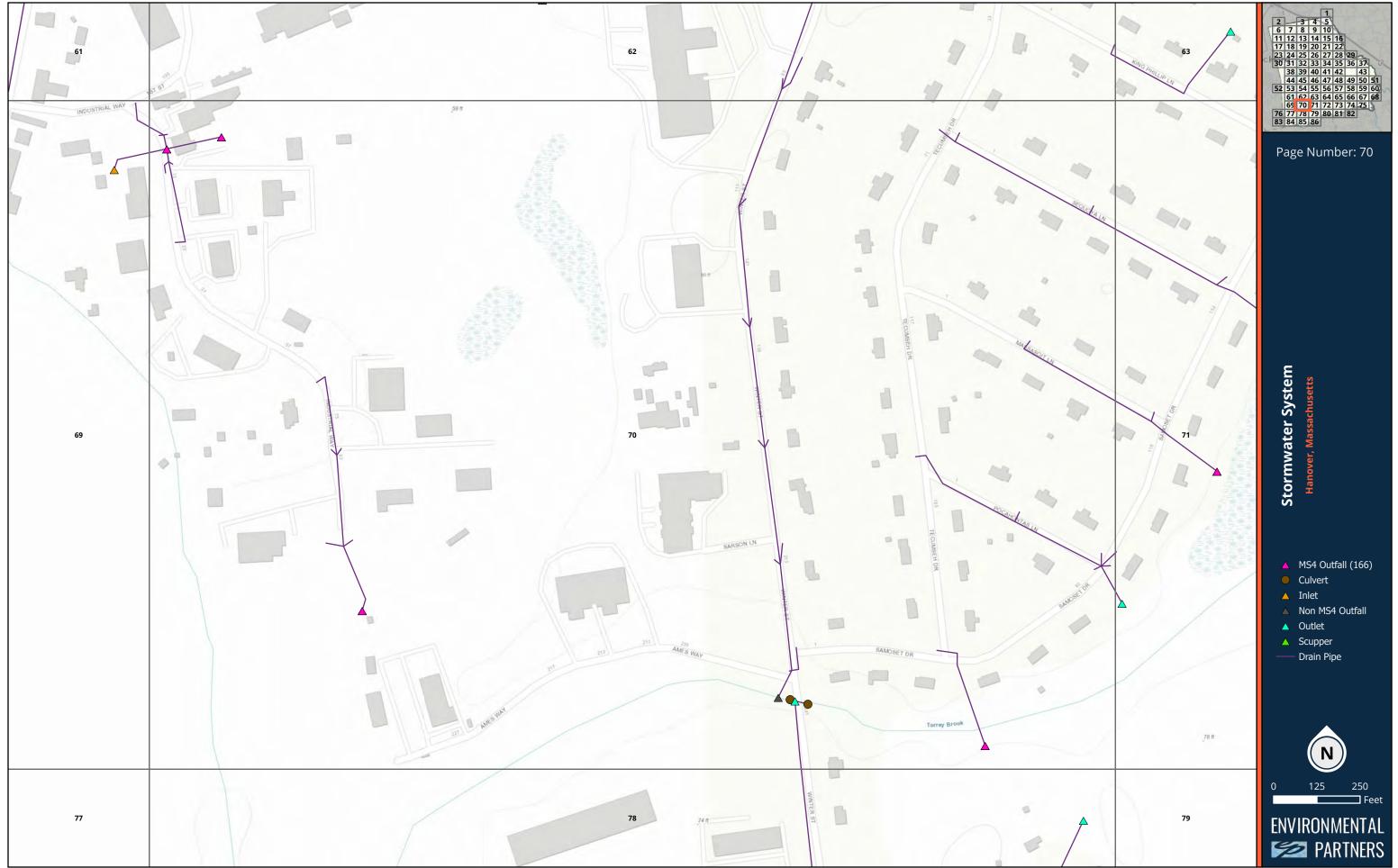


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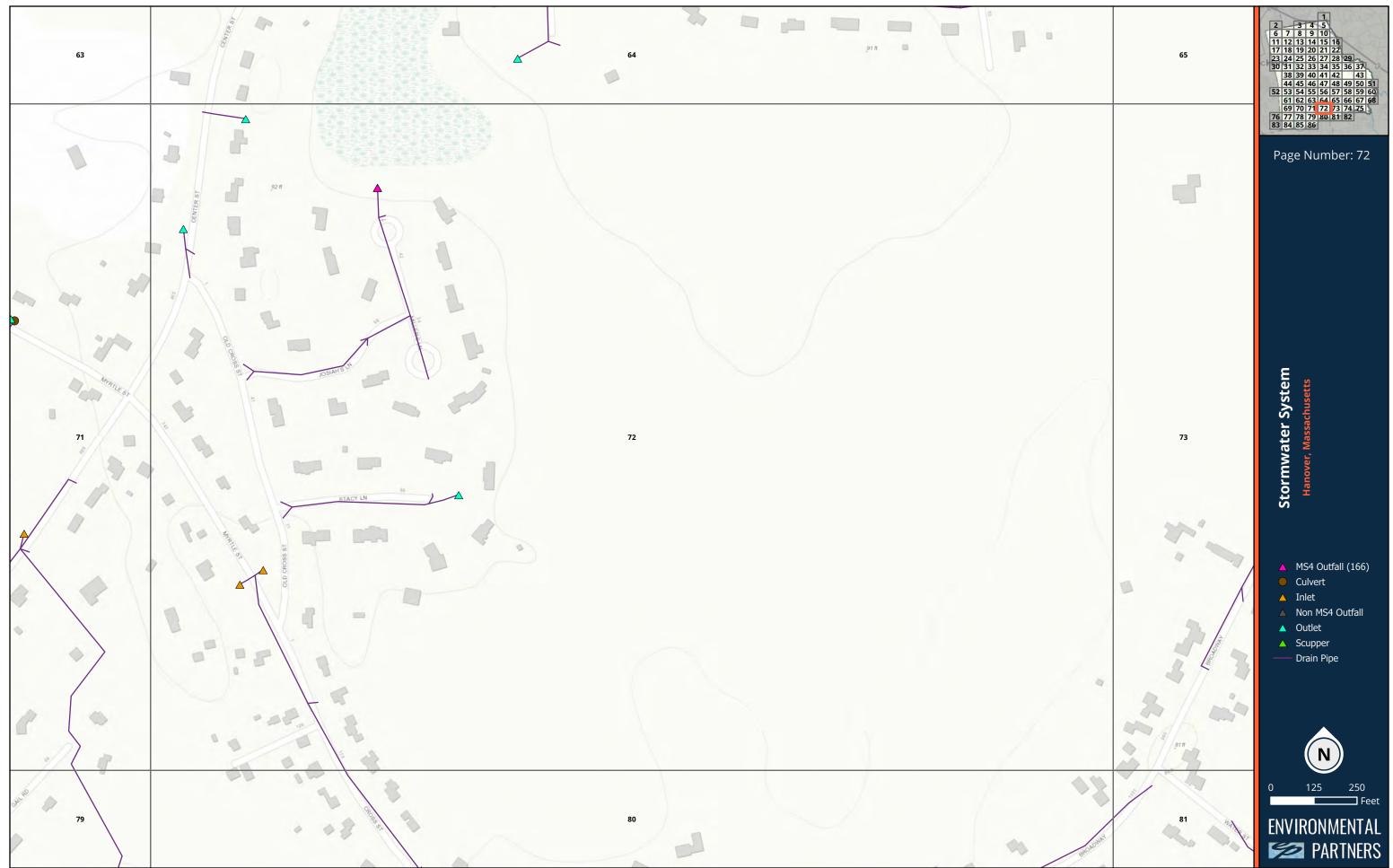
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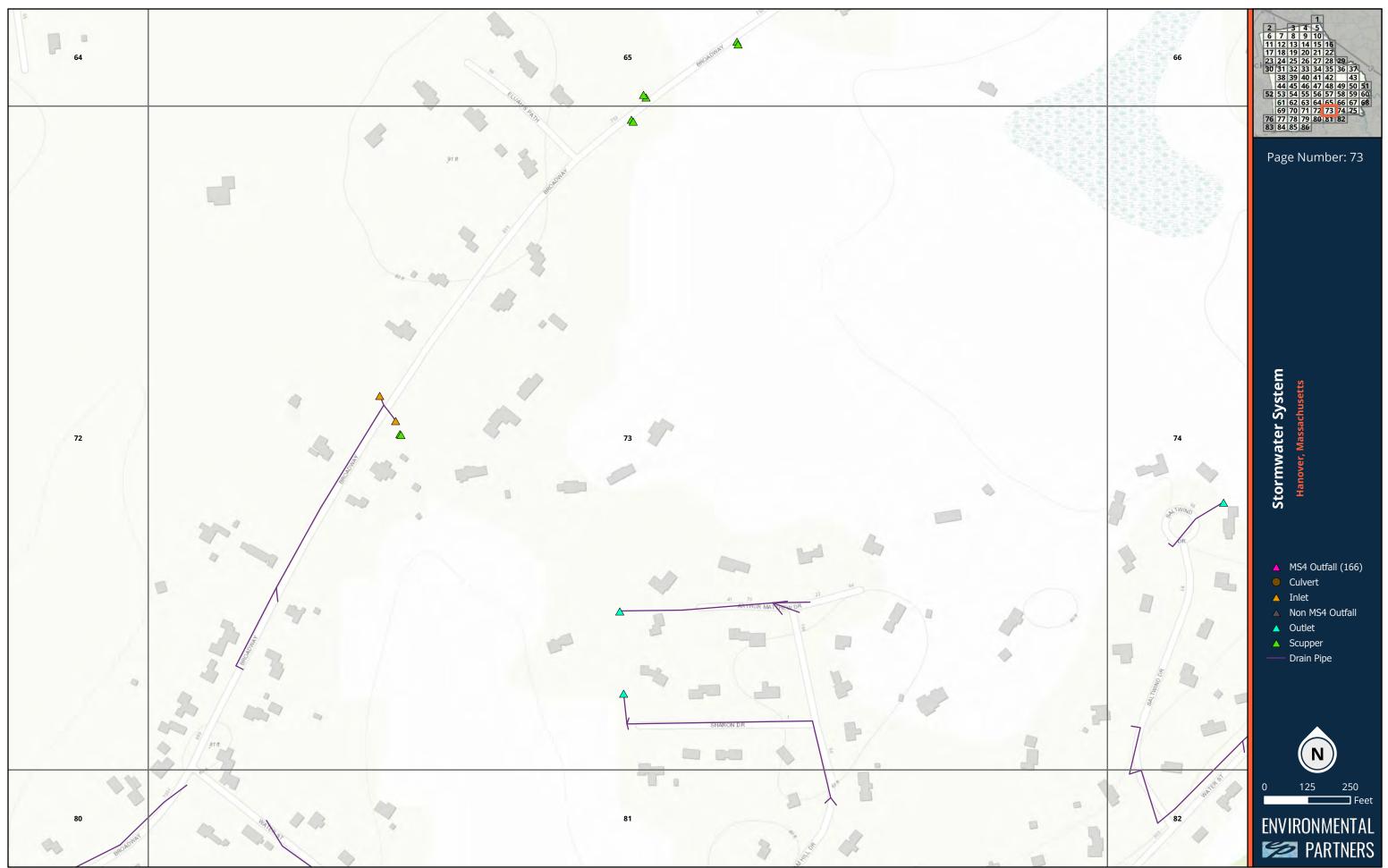




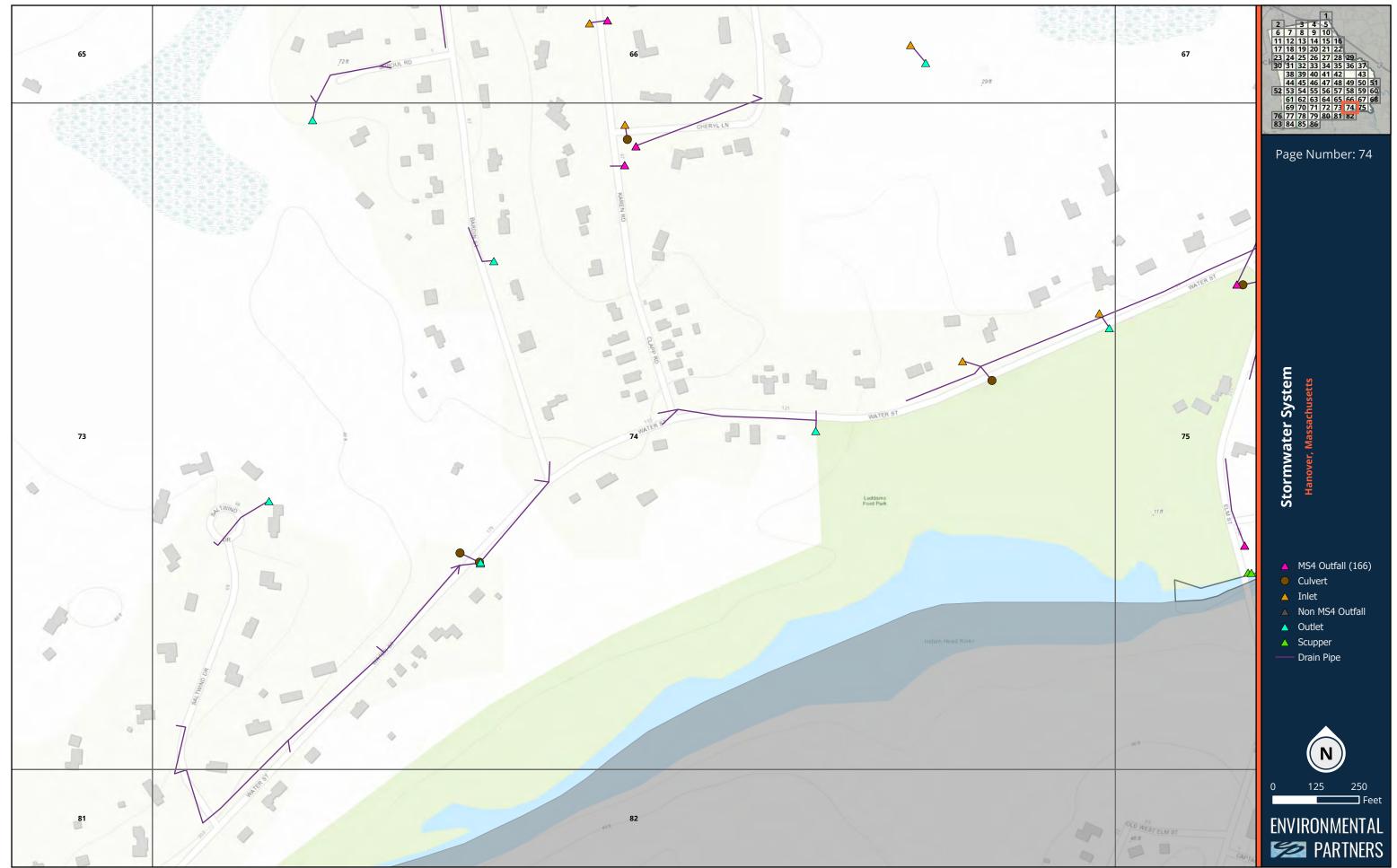


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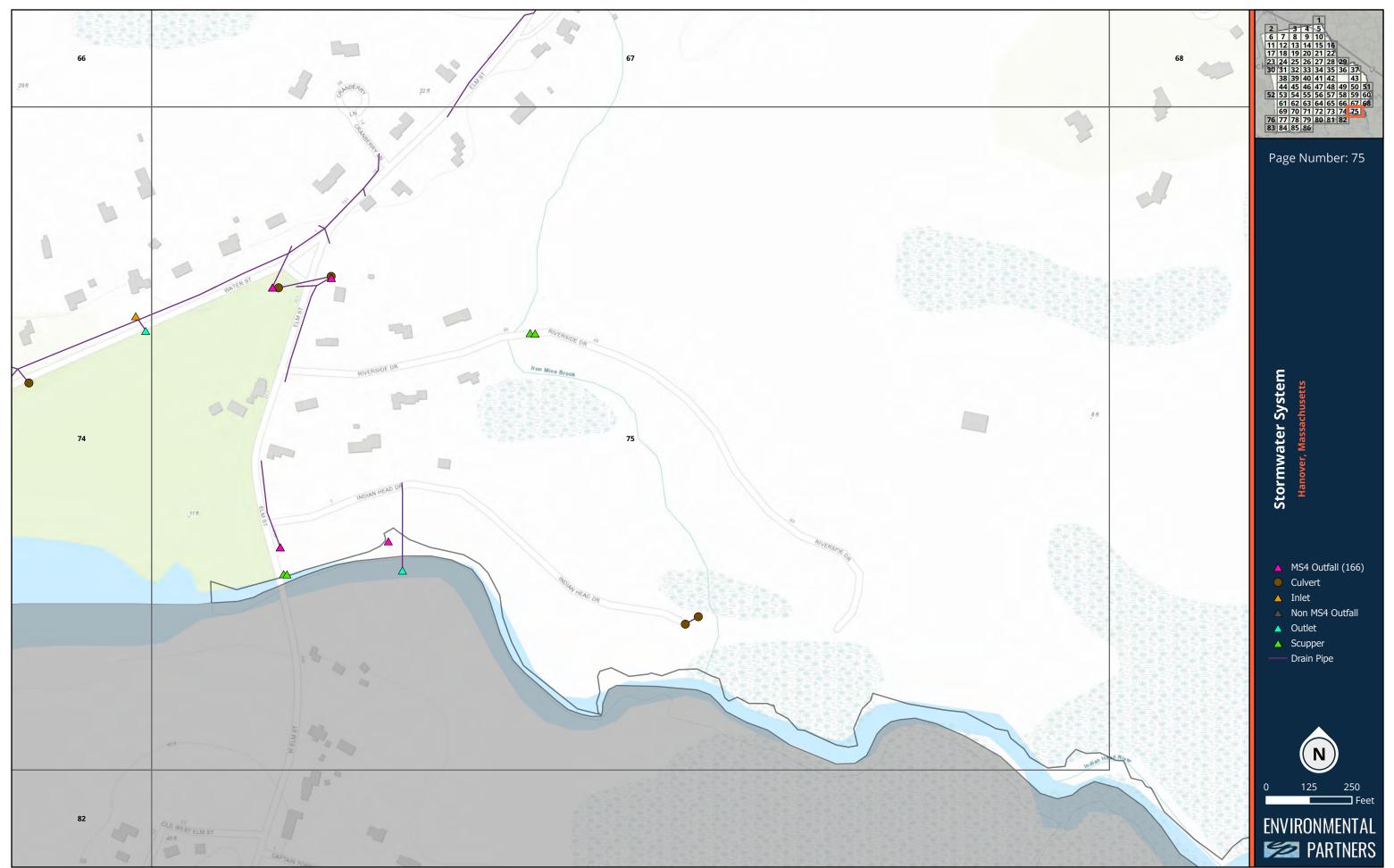


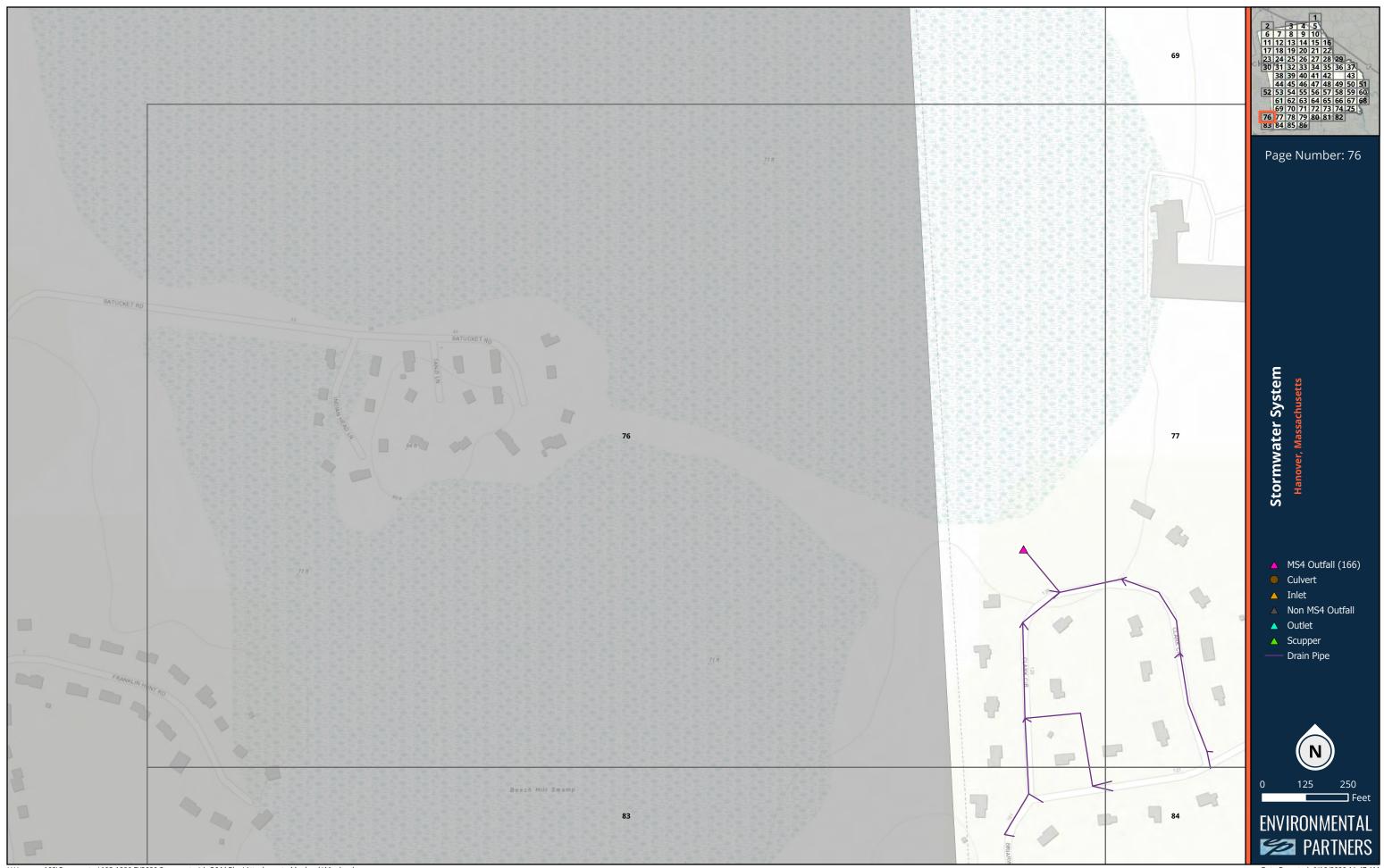


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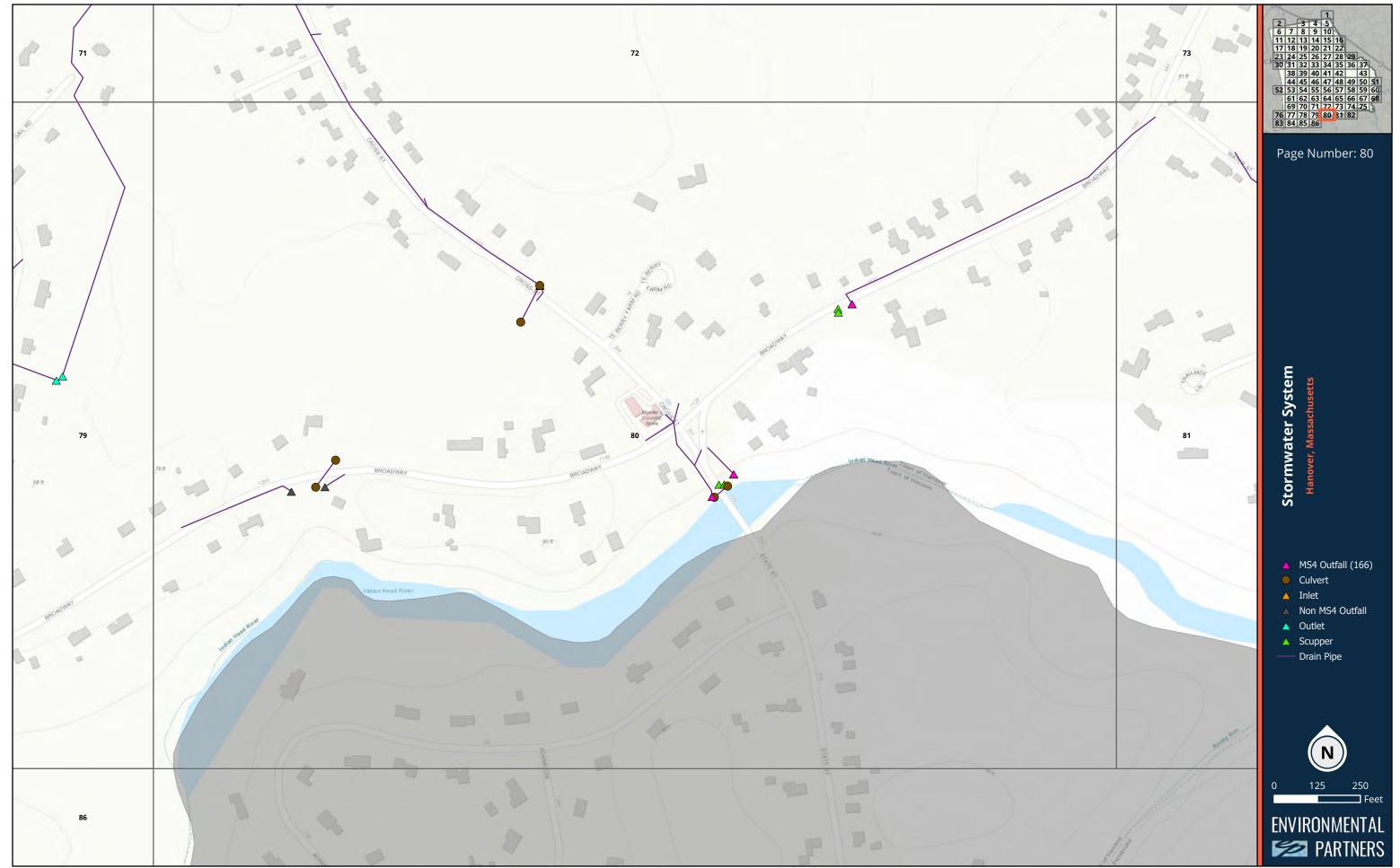
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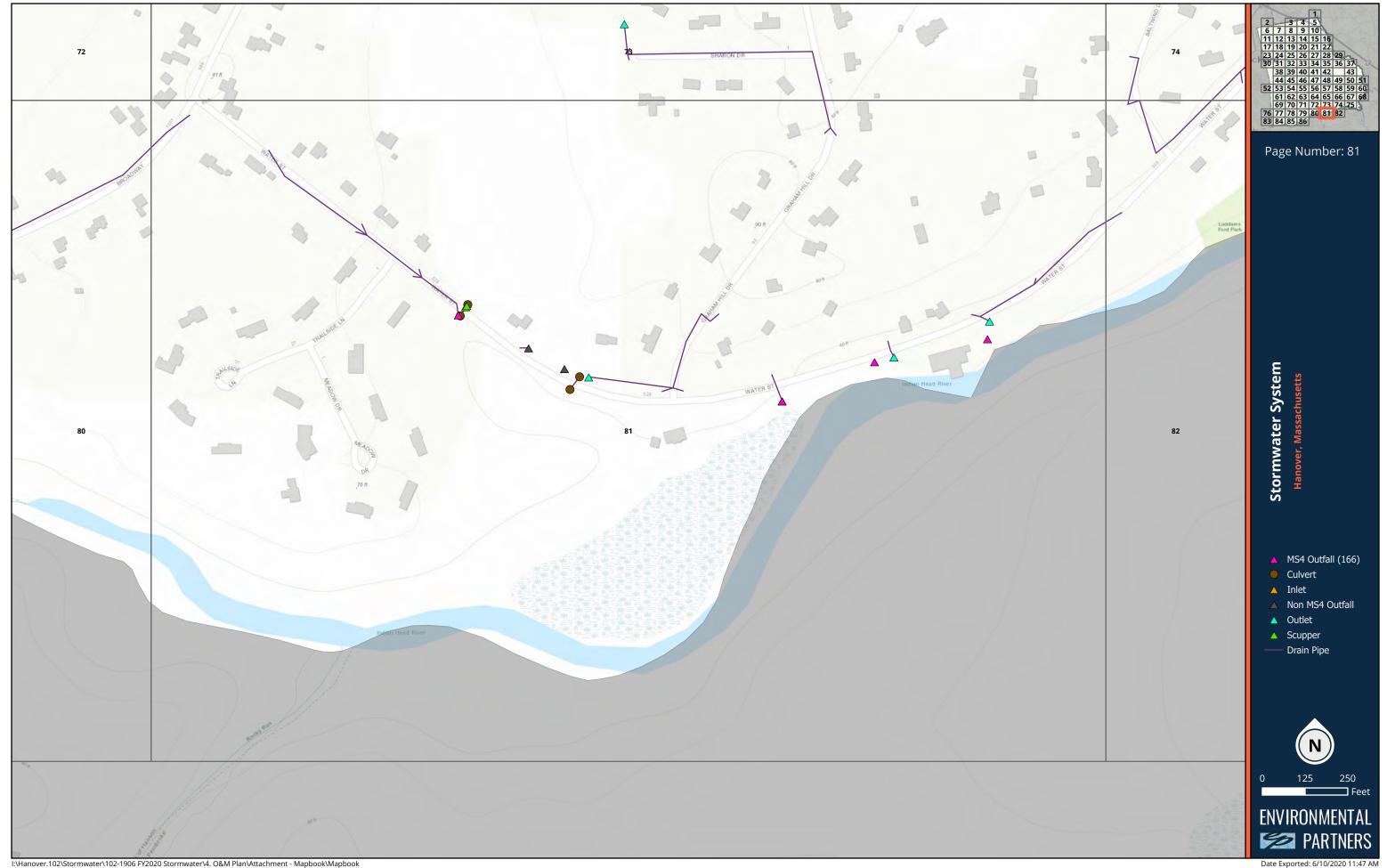
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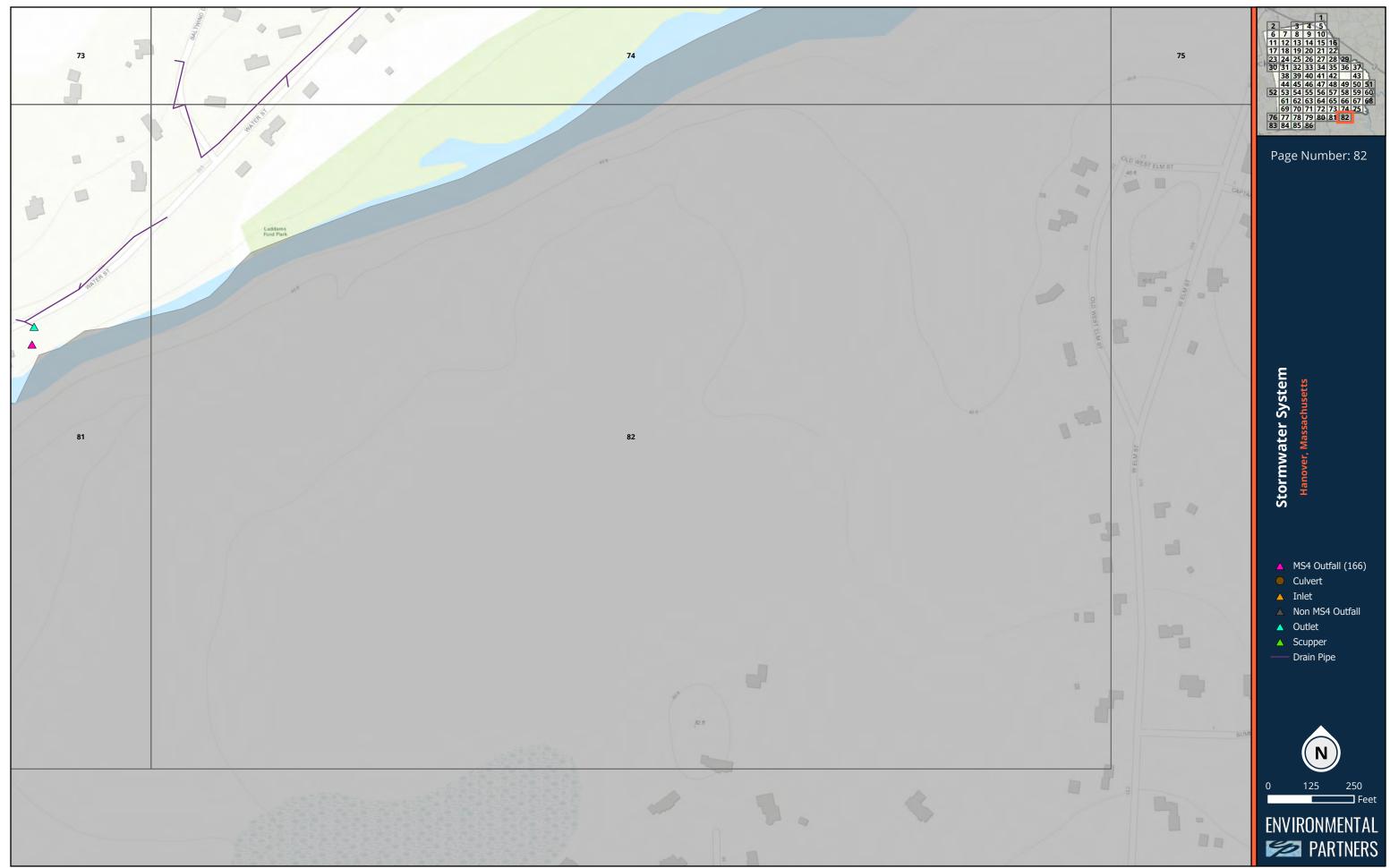


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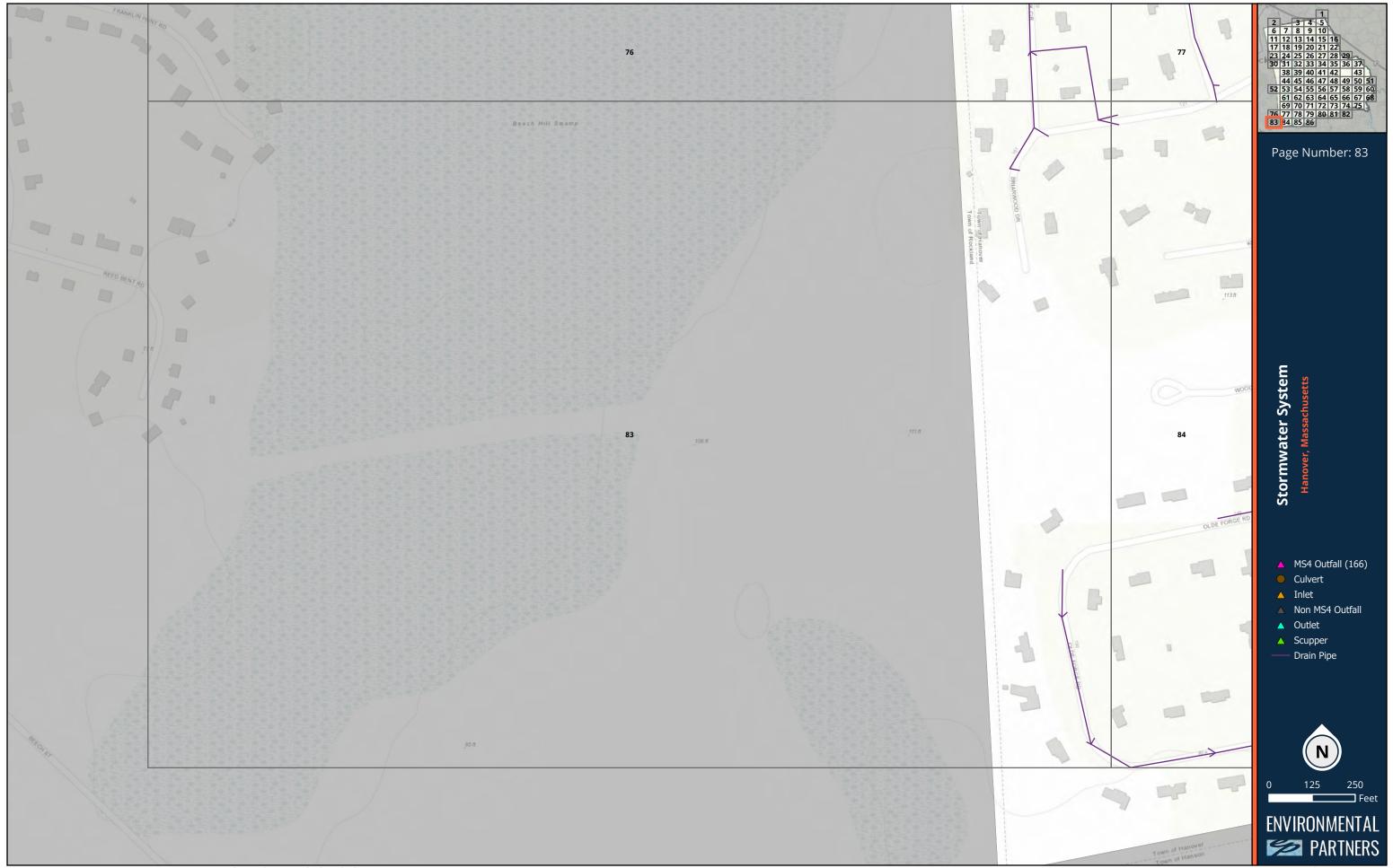


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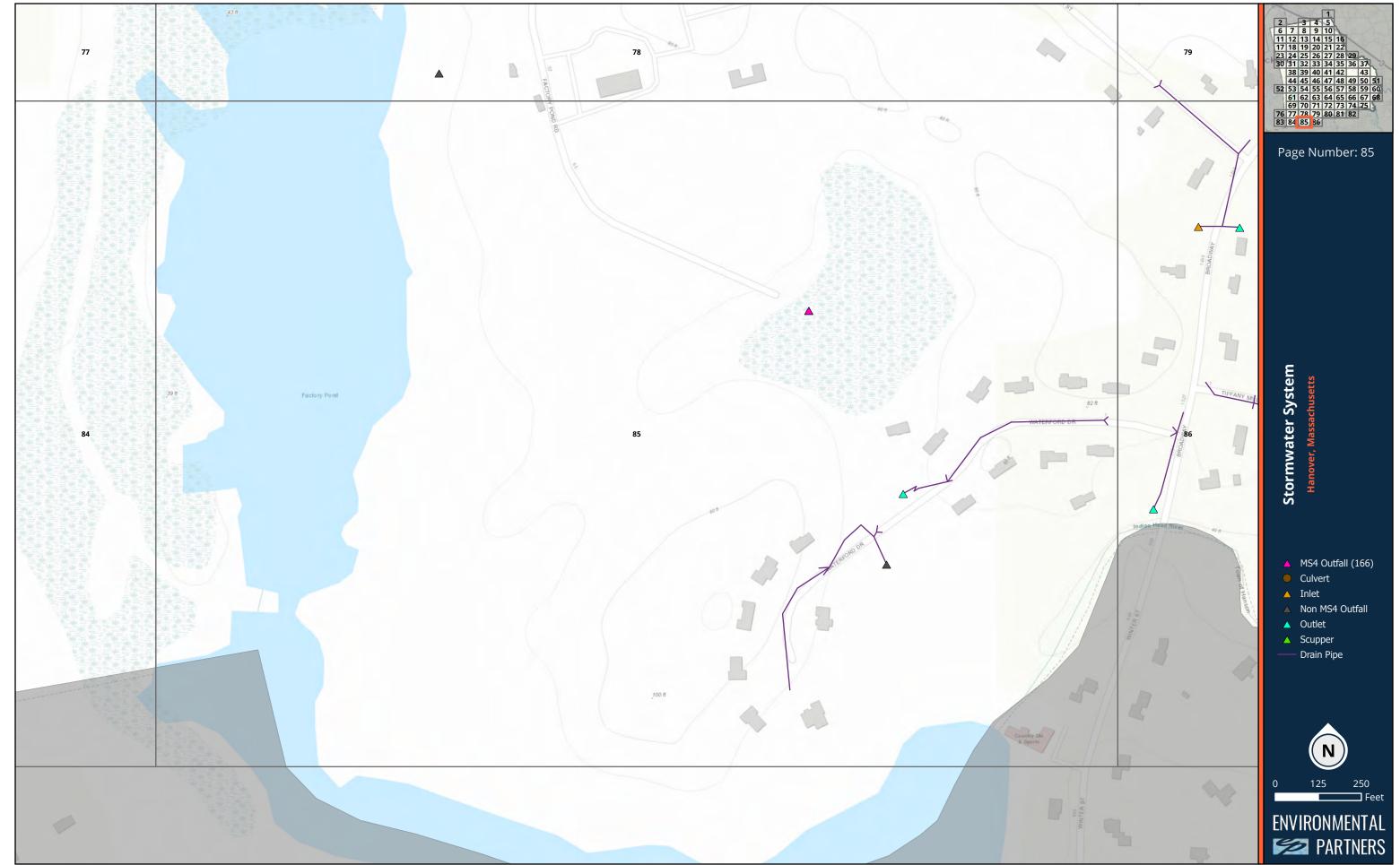


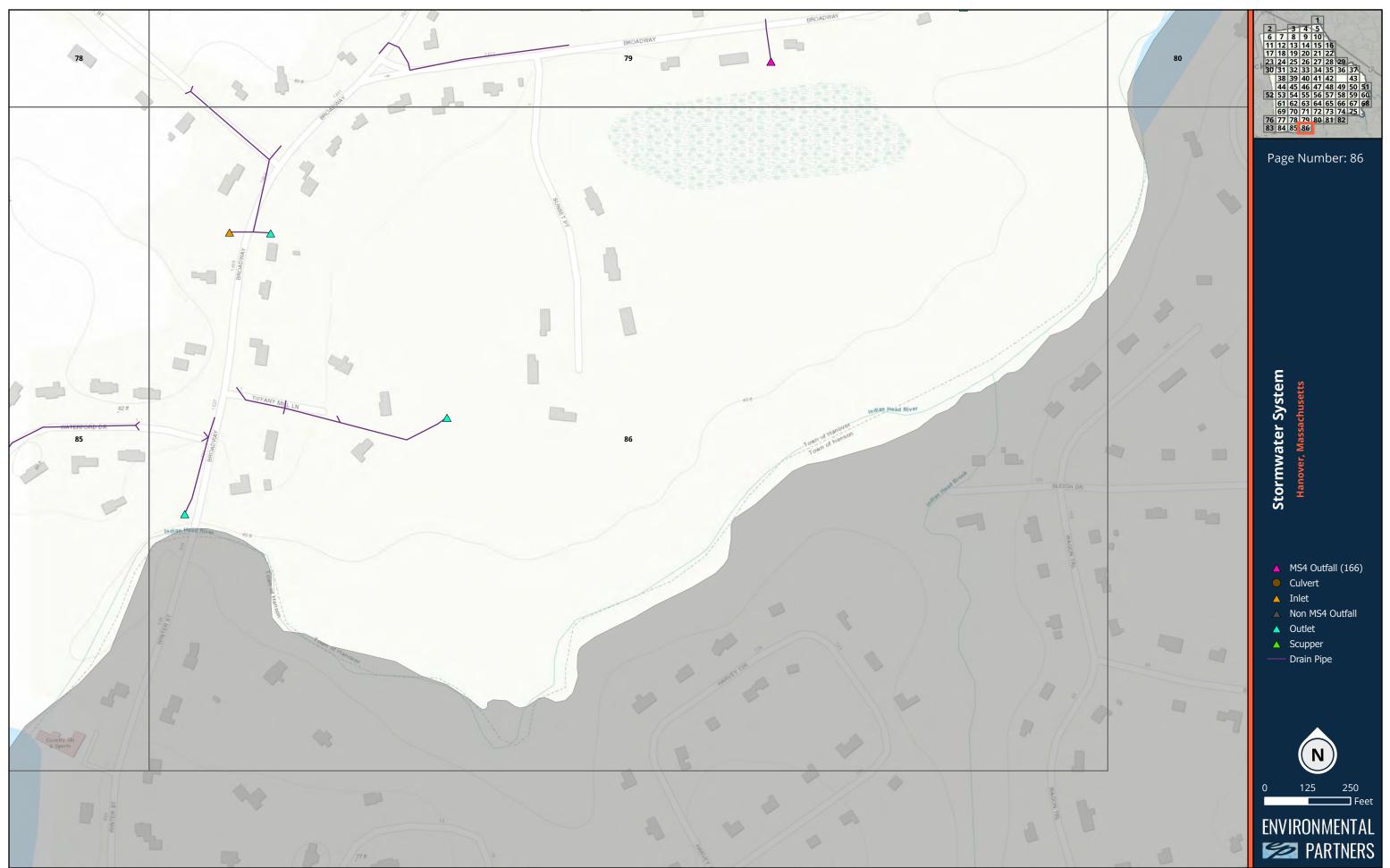
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STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

Department of Public Works Highway Garage & Storage Yard

Town of Hanover

June 2020 Revised September 2020





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Figure 2-2: Site Map

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Appendix A: Standard Operating Procedures

Appendix B: Spill Documentation Forms

Appendix C: Training Documentation and Attendance Sheets

Appendix D: Facility Inspection Forms

SECTION 1 INTRODUCTION

This Stormwater Pollution Prevention Plan (SWPPP) has been developed for the Town of Hanover 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.

The 2016 Massachusetts MS4 Permit requires 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); and
- 6. Good Housekeeping and Pollution Prevention for Permittee Owned Operations.

Under Measure 6, Good Housekeeping and Pollution Prevention for Permittee Owned Operations, the permittee is required, per Section 2.3.7.b of the 2016 Massachusetts MS4 Permit (page 50-54), to:

...develop and fully implement a SWPPP for each 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 as determined by the permittee.

The SWPPP shall contain the following elements:

- 1. Pollution Prevention Team
- 2. Description of the facility and identification of potential pollutant sources.
- 3. Identification of stormwater controls
- 4. Management practices including: minimize or prevent exposure, good housekeeping, preventative maintenance, spill prevention and response, erosion and sediment control, management of runoff, management of salt storage piles or piles containing salt, employee training, and maintenance of control measures.
- 5. Site inspections

This SWPPP accomplishes these requirements by:

• Providing an inventory of the materials and equipment at a facility that have the potential to cause stormwater pollution, and identifying locations where these materials are stored;

- Describing how stormwater is managed at a facility, including: engineered storm drain system conveyance; on-site pretreatment, treatment and infiltration systems; and discharges to surface water directly from the site;
- Reviewing activities that occur at the facility that represent a potential for stormwater pollution;
- Describing the Best Management Practices (BMPs) that will be implemented at the facility to reduce, eliminate and prevent the discharge of pollutants to stormwater;
- Identifying the employees responsible for developing, implementing, maintaining, and revising, as necessary, this SWPPP;
- Establishing a schedule and description of site inspections to be conducted at the facility to determine if the SWPPP is effective in preventing the discharge of pollutants;
- Serving as a tool for the facility employees, including a place to maintain recordkeeping associated with these requirements.

SECTION 2 DETAILED FACILITY ASSESSMENT

2.1 FACILITY SUMMARY

The Hanover Department of Public Works (DPW) Highway Garage and Storage Yard is located at 229 Ames Way, Hanover, MA 02339 and is owned and operated by the Town of Hanover. The Locus Map in Figure 2-1 shows the location of the facility within the Town of Hanover.

The Department of Public Works is primarily responsible for activities at, and maintenance of, the facility.

2.2 SITE INSPECTION

The site inspection associated with the development of this SWPPP was completed on October 17, 2019. The inspection was conducted by Vern Lincoln, of Environmental Partners and was a good housekeeping and Best Management Practices facility audit; not specifically for SWPPP development.

During the site inspection, information related to activities at the site, vehicles stored at the site, fueling operations, material storage, transport of oil and other materials, and spill history was gathered. Information from this facility audit are supplemented with information from the Deputy Superintendent of Public Works (field operations)

2.3 POLLUTION PREVENTION TEAM

A Pollution Prevention Team for the Hanover DPW has been prepared and designated the task of developing, implementing, maintaining, and revising, as necessary, the SWPPP for this facility. Listed below are Pollution Prevention Team members and their respective responsibilities.

Responsibilities assigned to one or more members of the Pollution Prevention Team include:

- Implementing, administering and revising the SWPPP
- Regularly inspecting stormwater control structures
- Conducting stormwater training
- Recordkeeping

Leader: Kurt Kelley Title: Deputy Superintendent of Public Works Office Phone: 781-826-3189

Responsibilities: Considers all stages of plan development, inspections, and implementation; coordinates employee training programs; maintains all records and ensures that reports are submitted; oversees sampling program. Responsible for certifying the completeness and accuracy of the SWPPP.

Member: Stephen McNamara Title: Foreman Office Phone: 781-826-3189

Responsibilities: Implements the preventative maintenance program; oversees good housekeeping activities; serves as spill response coordinator; conducts inspections; assists with employee training programs; conducts sampling/visual monitoring.

Member: John Olson Title: Foreman Office Phone: 781-826-3189

Responsibilities: Assists in all components of the stormwater program, as needed. Maintains spill kits at the Hanover DPW.

2.4 FACILITY DESCRIPTION

The primary purpose of the Highway Garage is to provide the Town of Hanover personnel with a heated, covered area in which to complete minor maintenance, oil changes and preparation of vehicles, equipment and tools for use at locations around the Town of Hanover. The Storage Yard is used for the storage of road deicing material, yard debris, compost, and other materials used throughout the Town of Hanover. Activities at the site are described in SECTION 2.7

The facility covers approximately 10.52 acres, and contains the structures and other features shown on the Site Map in Figure 2-2 and described in detail in the following sections. Components shown on the site map, if present, include:

- Location of the engineered drainage system, including catch basins, ditches, drain manholes, and treatment BMPs
- Outfalls to a receiving water, and the name of the receiving water
- Direction of surface water flow
- Structural stormwater pollution control measures
- Location of floor drains
- Vehicle washing areas
- Vehicle fueling areas
- Aboveground storage tanks (indoors and outdoors)
- Underground storage tanks
- Chemical storage areas
- Pesticide and fertilizer storage areas
- Salt storage areas
- Materials stockpiles
- Waste disposal areas.

2.5 FACILITY STRUCTURES

Vehicle Storage and Maintenance

The Highway Garage building is used to provide the Town of Hanover personnel with a heated, covered area in which to complete minor maintenance, oil changes and preparation of vehicles, equipment and tools for use at locations around the Town of Hanover. This building contains floor drains in bathrooms and garage bays, which discharge to tight tank.

Waste Oil Burner

The Highway Garage portion of the property contains a waste oil furnace used and operated by the Town of Hanover.

This structure provides fully-enclosed storage for waste oil drums, and serves as a heated, enclosed workspace for maintenance of the Town of Hanover vehicles. Latex paint, spray paint, and similar products in this building were observed to be properly stored in flammable materials storage cabinets.

Storage of Deicing Materials

Road salt is stored in a salt shed, located next to the Highway Garage. Magnesium chloride wetting agent is stored in tanks next to the salt shed. The salt shed is covered, enclosed, and the materials are fully contained within the building. The good housekeeping measure used to minimize the exposure resulting for adding to or removing stored materials include sweeping the loading/unloading area regularly or when salt has accumulated on the paved surface.

Storage of Road Deicing Equipment

The Town of Hanover utilizes 11 salt spreaders and 25 snow plows on its vehicles to adequately maintain roads. In the off-season, this equipment is stored at the Highway Garage in two outside locations, as shown on Figure 2.

2.5.1 Additional Site Features

Aboveground Storage Tanks

An aboveground storage tank (AST) at the Highway Garage is used for storage of magnesium chloride. An inventory of significant materials is included in SECTION 2.12.

Two ASTs are located at the center portion of the property for storage of magnesium chloride. The AST is not covered and is within concrete secondary containment.

Fuel Islands

A covered island containing two fuel pumps for gasoline and diesel is located at the southern portion of the property, and is used on a 24-hour basis for fueling of Town of Hanover vehicles. Access to these fuel pumps is secured behind gates at the entrance to the facility. The location of the fuel island is such that all users are visible to personnel at the Highway Garage.

Tight Tanks

The Town of Hanover maintains one tight tank at the Highway Garage.

The tight tank is located near the center portion of the property, as shown on Figure 1. This pretreatment structure has a cleanout manhole, and is pumped on an annual basis. The Department of Public Works is responsible for contracting this work, and maintains records on the pump out activities. This tight tank provides treatment of flow from the Highway Garage. Floor drains in all areas where oil materials are used and/or where vehicles are stored discharge to this tight tank

Materials for Use by Residents

The Town of Hanover maintains an area for storage of yard debris and compost for use by the Town of Hanover residents. This area is located at the western portion of the property and is uncovered.

Parking Areas

There are two designated parking areas at the Highway Garage, some of which are impervious surface. These parking areas are used primarily for the storage of Town of Hanover-owned trucks and for daily use by the Hanover DPW employees. In the spring, summer and fall months a total of approximately 12 vehicles are parked outside at these locations.

In the winter time all vehicles are stored inside at the Highway Garage or inside the Operations Building that abuts the property to the east.

2.6 SITE DRAINAGE

No stormwater from adjacent properties impact the Hanover Highway Garage property.

Sheet Flow

Drainage from the impervious surfaces at the Highway Garage and Storage Yard is directed partially to the single catch basin on-site.

Engineered Drainage

Engineered drainage at the Hanover DPW includes approximately one catch basin. Maintenance of the catch basin structure, including sediment removal, is completed by the Department of Public Works or a subcontractor.

2.6.1 Receiving Waters

The discharge location for the one catch basin onsite (shown on Figure 2), is not known. This catch basin may infiltrate onsite or discharge to one of the nearby water bodies, likely to Torrey Brook to the south. Overland flow from the site may discharge to the Drinkwater River to the north and west of the Hanover Highway Garage or to Torrey Brook to the south. The Drinkwater River to the north of the site is not categorized as an impaired water body. The Drinkwater River to the west of the Hanover Highway Garage has been categorized as a 303(d) List (Impaired) surface water Category 5,

with Total Maximum Daily Load (TMDL) required. The impairment of this river, assigned the unique identifier MA94-21, is considered a Category 5, meaning that a TMDL will be required.

Impairments of this water body are shown in Table 1, below.

Table 1: Impaired Waters Receiving Drainage from the FacilityHighway Garage

Water Body Name	ID	Category	Impairment(s)
Drinkwater River	MA94-21	5	 Debris*), (Non-Native Aquatic Plants*), (Trash*), Algae, Chlorophyll-a, Dissolved Oxygen, Dissolved Oxygen, Supersaturation, Mercury in Fish Tissue, Phosphorus, Total Transparency / Clarity
			• Escherichia Coli (E. Coli) (TMDL 61724)
			• Fecal Coliform (TMDL 61724)

The activities and stored materials at the Highway Garage may have the potential to affect these impairments.

The good housekeeping practices, preventative maintenance and Best Management Practices implemented at the facility are methods to limit potential negative impacts to stormwater. These practices are discussed in SECTION 3 of this SWPPP.

2.6.2 Applicable TMDLS

Water bodies identified as Category 5, as shown in Table 1, are impaired or threatened for the defined uses. TMDLs are required for the impairment shown. The following TMDLs have been developed:

- Escherichia Coli (E. Coli) TMDL No. 61724 (Final Pathogen TMDL for the South Coastal Watershed, August 2014)
- Fecal Coliform TMDL No. 61724 (Final Pathogen TMDL for the South Coastal Watershed, August 2014)

2.7 SITE ACTIVITIES

The following activities occur at the facility:

- Compost Production or Storage
- Facility or Building Maintenance
- Fueling Operations
- Landscaping Equipment Storage
- Sand storage
- Salt storage
- Tool storage
- Vehicle and equipment storage
- Vehicle and equipment maintenance/repair (including oil changes)

- Vehicle and equipment washing
- Waste oil storage

Below is a discussion of site activities and the potential pollutant sources associated with each, as well as measures taken to minimize pollution. Locations of each activity are shown on the Site Plan (Figure 2).

There is a small Safety-Kleen solvent-based parts washers in the maintenance garage. Any hazardous materials are collected by a third party vendor contracted by the Town of Hanover. Other waste materials from the Highway Garage include used motor vehicle fluids that cannot be utilized for the waste oil burner, such as used antifreeze and brake fluid. Any oil that may be contaminated with antifreeze, brake fluid, paint, or other additive that makes it unburnable in the waste oil furnace is also collected for disposal by a third party vendor. These materials must be properly labeled and stored using appropriate Best Management Practices between the time of generation and disposal.

The Department of Public Works does not apply or utilize fertilizers, herbicides, or pesticides at any facility owned or managed by the Town of Hanover. All fertilizer, herbicide, or pesticide applications are contracted out to a third party. As such, no fertilizers, herbicides, or pesticides are stored at the Highway Garage.

2.7.1 Compost Production or Storage

Potential Sources of Stormwater Pollution

Compost production and storage locations present the threat to contaminate stormwater with pathogens, including bacteria and viruses, nutrients, including phosphorus and nitrogen, fertilizers, pesticides and sediments.

Pollution Prevention

Compost storage areas shall be located and properly labeled within a designated stockpile area that is covered and contained to prevent exposure to precipitation. If the storage area is unable to be covered it should be contained within an area contained by silt fence or concrete barriers and located in an area that does not receive a substantial amount of runoff from upland areas and does not drain directly to a waterbody. The compost shall be kept in neat, separate piles from all other materials.

2.7.2 Stockpiles and Sand Storage

Potential Sources of Stormwater Pollution

Sand stored in piles for use during construction and during winter plowing and deicing activities represents a potential source to stormwater pollution. Stockpiled materials such as gravel, loam, and crushed rock represent a similar source of pollution. When stored unprotected outdoors, sand piles and material stockpiles are exposed to precipitation. When the resulting eroded material enters the stormwater system, the sediment can quickly fill the sumps of catch basin structures, rendering them ineffective.

Mixing sand and salt for use in deicing activities poses an additional element of stormwater pollution, particularly if the mixing area is not fully enclosed and protected from the elements.

Salt storage at the Hanover Highway Garage is stored in a completely covered structure.

Pollution Prevention

To avoid contamination of stormwater by sand and other stockpiled materials, erosion and sediment control measures should be implemented at each storage site. When planning a location for a stockpile, a relatively level site away from slopes, catch basins, and water features should be selected.

Stockpiles can be stabilized by seeding or mulching if they are to remain exposed for more than two weeks, or can be covered with impermeable sheeting to protect the material from rainwater. If the stockpile location becomes a permanent storage site for sand, a roofed structure should be considered to reduce erosion.

Sediment barriers should be placed around the perimeter of the storage site to prevent any runoff carrying sand from entering storm drains and surface waters. If the weather becomes dry and windy, regular light watering of the stockpile and surrounding area will provide effective dust control. Please refer to SOP 6, "Erosion and Sedimentation Control," included in Appendix A, for more information.

Sand that has been mixed with salt for use during winter plowing and deicing activities should always be stored in an enclosed and covered salt shed. Salt sheds should be constructed on level ground with an impervious base on which to store the salt/sand mixture. Under no circumstances should loose salt/sand mix be stored outside and unprotected. All mixing of salt and sand should take place within the salt shed or other covered, enclosed area.

Ensuring that the storage area is regularly swept and kept clean is an important good housekeeping practice.

2.7.3 Salt Storage

Road salt at the Hanover Highway Garage is stored in a salt shed, located next to the Highway Garage. The salt shed is covered, enclosed, and the materials are fully contained within the building. Following are good housekeeping procedures for salt storage.

Potential Sources of Stormwater Pollution

Salt stored in piles for use during winter plowing and deicing operations represents a potential major contributor to stormwater pollution. When stored unprotected outdoors, salt is exposed to precipitation, causing leachate with high chloride that can be discharged to the receiving water. Salt delivery and loading activities can contribute pollutants to stormwater if the material is not handled with care, and if spills from handling operations are not promptly cleaned up.

Pollution Prevention

To prevent stormwater pollution, all salt piles should be enclosed and covered in sheds to prevent exposure to precipitation. Salt sheds should be constructed on level ground with an impervious

base on which to store the salt. The shed should prevent disturbance or migration of the salt by wind.

During delivery and loading activities, salt should be transferred to and from vehicles within the salt shed, whenever possible. Any spills during unloading and loading events should be tended to without delay. Ensuring that the salt storage area is regularly swept and kept clean is an important good housekeeping practice.

If it is not feasible to fully enclose the salt pile, the salt should be stored on an impervious base and covered with an impermeable membrane material. Under no circumstances should loose salt be stored outside and exposed to precipitation.

The area should not be hosed down to a storm drain as a cleaning method. To further limit stormwater pollution, an independent runoff collection system may be installed in the area of the salt storage to collect and convey runoff either directly to a treatment best management practice or to a sanitary sewer system, with approval from the operator of the sanitary sewer system.

2.7.4 Solid Waste Management

Potential Sources of Stormwater Pollution

The Town does not store or handle solid waste at the Highway Garage other than materials used in day-to-day operations.

Solid waste production and storage locations present the threat to contaminate stormwater with pathogens, including bacteria and viruses, nutrients, including phosphorus and nitrogen, metals and sediments.

Solid waste may be classified as both hazardous and non-hazardous waste consisting of agricultural, construction and demolition, dead animals, industrial, municipal, and tire waste.

Pollution Prevention

To prevent or reduce the potential for stormwater pollution from solid waste management practices the following preventative maintenance procedures are recommended:

- 1. All staff shall be properly trained in correct solid waste management practices, including waste disposal and spill prevention and response. All employees shall also be knowledge of the potential hazards associated with solid waste handling and storage.
- 2. Each waste storage location shall be properly labeled and all significant sources of pollution shall be kept in a secure, covered and contained area.
- 3. The facility and storage containers shall remain locked at all times other than during normal hours of operation.
- 4. All waste storage containers and waste handling equipment shall be routinely inspected for signs of spills, leaks, corrosion or general deterioration.
- 5. The facility shall maintain spill response materials in accordance with SOP 4, "Spill Response and Cleanup".

2.7.5 Snow Dump

Potential Sources of Stormwater Pollution

The Town does not use the Highway Garage for snow dumps.

Snow collected from plowing and road clearing activities and managed in snow dumps can contaminate engineered storm drain systems and receiving waters if disposal sites are not properly selected and maintained. As snow is removed from roadways, parking lots, sidewalks, and other paved areas, contaminants such as sand, salt, litter, and automotive oil are collected along with the snow. These pollutants are ultimately transported to the storage site and eventually to receiving waters once the snow melts.

Infiltration of pollutants in snow, such as chlorides from road salt, can impact groundwater, including drinking water aquifers.

When snow, including sand and debris contained within it, is stored directly on top of catch basins, when combined with sand and debris, discharge to the engineered drainage system can be blocked, causing localized flooding.

Pollution Prevention

To avoid contamination of stormwater and drinking water supplies by snow dumps, storage sites should be selected and prepared before the snow season begins. The snow dump should be located on a pervious surface in an upland area away from water resources and wells, so that meltwater can be filtered through the soil.

Selected sites should have a combined capacity large enough to cope with the estimated snowfall totals for the season. Snow should not be dumped within a Zone II or Interim Wellhead Protection Area of a public water supply, or within 75 feet of a private well. Sanitary landfills are not appropriate locations for snow dumps because the infiltration of meltwater will result in greater amounts of contaminated leachate. High groundwater levels also make gravel pits poor sites for snow storage.

Proper preparation and maintenance of snow disposal sites will also prevent stormwater pollution. Before winter begins, a silt fence or sediment barrier should be placed on the down-gradient side of the snow dump to collect any sediment in snow meltwater. If the site is located near a body of water, a 50-foot vegetated buffer strip (at minimum) should be maintained during the growth season to filter pollutants out of meltwater. Prior to using the site for snow disposal, all debris should be cleared.

Debris and litter left after the snow has melted should be cleared and disposed of at the end of the snow season, no later than May 15 of each year.

Except under the most extraordinary of circumstances, when all land-based snow disposal options have been exhausted, snow should not be dumped into any body of water. When this option is necessary, requirements of "Snow Disposal Guidance" (BRPG01-01) issued by MassDEP on March 8, 2001, shall be followed.

2.7.6 Use or Storage of Pesticides or Fertilizers

Potential Sources of Stormwater Pollution

The Town does not utilize or store pesticides or fertilizers at the Highway Garage.

Pollution Prevention

The Town does not utilize or store pesticides or fertilizers at the Highway Garage.

2.7.7 Vehicle and Equipment Storage

Potential Sources of Stormwater Pollution

Vehicle and equipment storage activities are a potential source of pollution due to the diesel fuel, gasoline, oil, hydraulic fluid, antifreeze and similar hazardous material or fuel the machinery may contain. In addition, vehicles or machinery may pick up pollutants during the course of offsite activities or at other facilities, and then deposit these pollutants at the storage facility.

Pollution Prevention

Regular visual inspection and maintenance of vehicles and equipment can greatly reduce the potential for pollution by finding and addressing leaks before pollution of the environment occurs. When in storage, vehicles and equipment should be kept on a covered slab or within a building with a common drain. Discharge to this drain shall be managed by an oil/ water separator (refer to SOP 11, "Oil/Water Separator Maintenance", included in Appendix A) to remove oils and gasoline. Vehicle washing activities shall not be completed in areas served by an oil/water separator.

No equipment should be kept in an area where leaks could result in pollutants entering catch basins, channels leading to outfalls, or the engineered storm drain system. If vehicles and equipment are stored outdoors, catch basins or engineered drainage system structures should include devices intended to remove oils and sediments prior to entering the system. These treatment devices should be inspected and replaced at the frequency recommended by the manufacturer.

2.7.8 Vehicle and Equipment Maintenance/Repair

Potential Sources of Stormwater Pollution

Vehicle and equipment maintenance and repair often requires the use of harmful liquids such as fuels, oils, and lubricants, and has the potential for producing dust, scrap and by-products that may contain pollutants. Both accidental and purposeful spillage, i.e., a leaky oil pan needing repair vs. draining the pan during an oil change, can lead to situations where pollutants can potentially enter stormwater runoff if the situations are not approached properly. Although there is little potential for effecting stormwater, it should be noted that hazardous gases can be produced during maintenance and repair as well.

Pollution Prevention

Proper maintenance and repair for vehicles and equipment shall include a preliminary assessment of potential pollutant sources. This assessment shall be used to determine the best means of containing any potential spills or by-products of the situation at hand. Approved containers shall be used to capture hazardous liquids to then be disposed of according to applicable MassDEP and USEPA guidelines. If the project may produce hazardous dust that could come in contact and mix with any liquids, the proper containment shall be utilized.

Due to heavy metal accumulation in antifreeze, brake fluid, transmission fluid, and hydraulic oils, it is not recommended that any of these liquids are disposed of in the sanitary sewer system. Contaminated parts removed or replaced on any vehicles or equipment shall be disposed of properly.

All work shall take place on a covered slab or within a building with a common drain. Discharge to this drain shall be managed by an oil/ water separator (refer to SOP 11, "Oil/Water Separator Maintenance", included in Appendix A) to remove oils and gasoline.

Maintenance and repairs shall not take place in areas prone to stormwater runoff or where pollutants could enter catch basins, channels leading to outfalls, or an engineered storm drain system. All catch basins or engineered drainage systems on site that could be affected by accidental spills should include devices intended to remove oils and sediments prior to entering the system. These treatment devices should be inspected and replaced at the frequency recommended by the manufacturer.

2.7.9 Vehicle and Equipment Washing

Potential Sources of Stormwater Pollution

Vehicle and equipment washing is performed at the Highway Garage. Light equipment and small vehicles may be washed inside the maintenance garage. Heavy equipment is washed outside in the yard on pervious ground surface.

Vehicle and equipment washing activities are a potential source of pollution not only from petroleum products and pollutants deposited on the exterior of the equipment, but also from nutrients and sediment being washed into water bodies from the act of washing itself. Although some cleaning agents are becoming environmentally friendly, many still contain regulated contaminants. Due to the possibility for multiple types of pollutants, vehicle and equipment washing activities have a high potential for degrading stormwater quality.

Pollution Prevention

Outdoors, the use of a tight tank or other similar structure that can contain the wash water is ideal. If the wash water cannot be contained, it shall not be allowed to directly enter water bodies. Use phosphate free detergents that do not contain regulated contaminants, and avoid using solvents where the wash water may enter a sanitary sewer. Impervious surfaces may be used to promote infiltration and treatment before wash water enters the groundwater, but wash water coming from impervious pavement shall be treated to remove nutrients and petroleum products before entering an engineered storm drain system. Infiltration shall not be used within wellhead protection areas or other protected resource areas. Power washing, steam cleaning and engine and undercarriage washing shall not occur outdoors. Heavily soiled or vehicle dirtied from salting shall not be washed outdoors. All adjacent catch basins shall have a sump and be cleaned periodically, (refer to SOP 3, "Catch Basin Inspection and Cleaning", included in Appendix A). All debris and particulate accumulation shall be removed and swept clean in all outdoor washing areas.

Washing vehicles and equipment indoors in the proper facilities is preferred over washing outdoors whenever possible. Indoor facilities shall have a common drain and it shall utilize a tight tank or other containment device to hold the wash water. The use of detergents shall be avoided and when the use of detergents cannot be avoided, use detergents free from phosphates and regulated contaminants. Detergents shall not be used when the discharge of this drain is controlled by an oil/ water separator (refer to SOP 11, "Oil/Water Separator Maintenance", included in Appendix A). All drains that discharge directly to a water body of engineered storm drain system shall be plugged or abandoned. Dry clean-up methods such as vacuuming and sweeping shall be used whenever possible to avoid washing down floors with water.

For both outdoor and indoor washing, maintain absorbent pads and drip pans to collect spills and leaks observed during washing activities. Refer to SOP 4, "Spill Response and Cleanup Procedures" included in Appendix A for more information.

Washing of large facility vehicles is completed outside of the Highway Garage. Washing of smaller vehicles is performed inside the Highway Garage, where water from the floor drain system is discharged to a tight tank that is maintained by the Department of Public Works.

Salt and sand spreaders stored at the Highway Garage are occasionally pressure washed at that location.

2.7.10 Waste Handling and Disposal

Potential Sources of Stormwater Pollution

Waste handling and disposal facilities and activities present a potential to contaminate stormwater with pathogens (including bacteria and viruses), nutrients, including phosphorus and nitrogen, fertilizers, pesticides and sediments.

There are several classifications of waste that contribute to stormwater pollution, including:

- 1. Solid Waste
- 2. Hazardous Materials and Waste
- 3. Pesticides and Fertilizers
- 4. Detergents

Pollution Prevention

A variety of measures are considered appropriate to prevent pollution from waste handling and disposal activities, based on the waste classifications noted previously.

Solid Waste

- 1. Designate a waste collection area on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a receiving water.
- 2. Ensure that containers have lids so they can be covered before periods of rain, and keep containers in a covered area whenever possible.
- 3. Schedule waste collection to prevent the containers from overfilling.
- 4. Clean up spills immediately and in accordance with SOP 4, "Spill Response and Cleanup Procedures" included in Appendix A.

Hazardous Materials and Wastes

- 1. To prevent leaks, empty and clean hazardous waste containers before disposing of them.
- 2. Never remove the original product label from the container. Follow the manufacturer's recommended method of disposal, printed on the label.
- 3. Never mix excess products when disposing of them, unless specifically recommended by the manufacturer.
- 4. Clean up spills immediately and in accordance with SOP 4 "Spill Response and Cleanup".

Pesticides, Fertilizers and Petroleum Products

- 1. Do not handle the materials more than necessary.
- 2. Store materials in a dry, covered, contained area.
- 3. Clean up spills immediately and in accordance with SOP 4, "Spill Response and Cleanup".

Detergents

1. Never dump wastes containing detergents to a storm drain system. All wastes containing detergents shall be directed to a sanitary sewer system for treatment at a wastewater treatment plant.

Additional Recommendations

In addition to the pollution prevention requirements a waste management plan is recommended. The plan shall include employee training and signage informing individuals of the hazards associated with improper storage, handling and disposal of wastes. It is imperative that all employees are properly trained and follow the correct procedures to reduce or eliminate stormwater pollution. Routine visual inspection of storage and use areas is critical. The visual inspection process shall include identification of containers or equipment which could malfunction and cause leaks or spills. The equipment and containers shall be inspected for the following:

- 1. Leaks
- 2. Corrosion
- 3. Support or Foundation Failure
- 4. Other Deterioration

In the case a defect is found, immediately repair or replace.

2.7.11 Waste Oil Storage

Potential Sources of Stormwater Pollution

When not stored properly, waste oil can be a potential source of petroleum in stormwater. Waste oil containers can leak, and spills can occur while during transportation activities.

Pollution Prevention

All waste oil containers should be properly labeled and stored with secondary containment. Containers should be regularly inspected for rust, leaks, or other signs of deterioration. Defective containers should be promptly removed and replaced. A spill response kit should be located wherever waste oil is stored. Facility personnel should know where the spill kit is located and be familiar with the procedures outlined in SOP 4 "Spill Response and Cleanup Procedures" in Appendix A. Used oil filters should also be properly disposed.

Care should be taken when transferring used oil to and from storage containers. For additional information see SOP 7 "Fuel and Oil Handling Procedures" found in Appendix A.

Waste oil should be stored indoors or under a covered structure to prevent exposure to precipitation. Floor drain in waste oil storage areas should drain to an oil/water separator rather than the storm drain system. See SOP 11 "Oil/Water Separator Maintenance" in Appendix A for further information.

When possible, steps should be taken to recycle waste oil or reduce the amount generated.

2.8 VEHICLE AND EQUIPMENT INVENTORY

Vehicles and major equipment stored and maintained at the facility are shown in Table 2.

Vehicle Type	Number on Site
CDL Class Dump Trucks	14
Non-CDL Class Dump Trucks	8
Pickups/Vans	5
Backhoes	2
Front End Loaders	2
Tracked Dozers	2
Trackless MulitTractors	3

Table 2: Vehicle Inventory

2.9 LOCATION OF LEAK AND SPILL CLEANUP MATERIALS

Leak and spill cleanup materials are stored at Highway Garage at the southwest corner of the building in order to facilitate rapid response. Locations and types of leak and spill cleanup materials are identified in Table 3.

Building or Area	Location	Materials Available		
Highway Garage	Southwest Corner	1//2 Pallet Speedy Dry		
Highway Garage	Southwest Corner	24x24 Absorbent pads		
Highway Garage	Southwest Corner	Absorbent booms		

Table 3: Leak and Spill Cleanup Materials

2.10 ALLOWABLE NON-STORMWATER DISCHARGES

A non-stormwater discharge is defined as any discharge or flow to the engineered storm drain system that is not composed entirely of stormwater runoff.

Allowable non-stormwater discharges that occur at this facility include:

- Water line flushing
- Rising ground water
- Uncontaminated ground water infiltration (as defined at 40 CFR § 35.2005(20))
- Uncontaminated pumped ground water
- Discharge from potable water sources
- Foundation drains
- Air conditioning condensation
- Water from crawl space pumps
- Footing drains
- Street wash waters

It has been determined that the above non-stormwater discharges at the Highway Garage do not represent a significant contribution of pollution to the MS4 or the waters of the United States. Therefore, these are considered to be authorized under the current MS4 permit.

2.11 EXISTING STORMWATER MONITORING DATA

Records for any stormwater monitoring data collected from the Highway Garage shall be properly documented in Table 4, below and kept on file at the Highway Garage and DPW Office.

Table 4: Existing Stormwater Monitoring Data Highway Garage

Building or Area	Location	Type of Monitoring			

2.12 SIGNIFICANT MATERIAL INVENTORY

Materials stored include those specified in SECTION 2.7, "Site Activities". An inventory of these materials at the Highway Garage is included in Table 5. The Town will fill in the information for each item, including: the likelihood for each identified material to come in contact with stormwater; the type of container; the type of material i.e., oil, gasoline, and other petroleum-based materials are listed separately in the table.

Material	Storage Location	Quantity	Potential Pollutant	Covered (C) or Enclosed (E)	Likelihood of Contact with Water
Petroleum-Based Co	ompounds	•	•		
Diesel fuel	UST	10,000 gal	Petroleum hydrocarbons		
Gasoline	UST	10,000 gal	Petroleum hydrocarbons		
Hydraulic Fluid	Indoor	110 gal	Petroleum hydrocarbons		
Motor Oil	Indoor	275 gal	Petroleum hydrocarbons		
Lubricants	Indoor	Small quantity	Petroleum hydrocarbons		
Transmission Fluid	Indoor	Small quantity	Petroleum hydrocarbons		
Waste Oil	Indoor	275-500 gal	Petroleum hydrocarbons		
Other:					
Total Volume of Oil	at Facility =				
Non-Petroleum Sigr	nificant Materials	5			
Antifreeze	Indoor	12 gal	Ethylene glycol; potential source of BOD		
Spray Lubricant	Indoor	Small quantity	Petroleum hydrocarbons		
Adhesives and sealants	Indoor	Small quantity	Volatile and semivolatile organic compounds		
Aggregates	Outdoor	69 cyds	Sediments		
Asphalt (cold patch)	Indoor	10-12 cyds	Sediments		
Brake Fluid	Indoor	2 gal	Volatile organic compounds; non- petroleum based oil		
Coolant (new or used)			Volatile organic compounds		

Table 5: Significant Material Inventory Highway Garage

Material	Storage Location	Quantity	Potential Pollutant	Covered (C) or Enclosed (E)	Likelihood of Contact with Water
Deicer- Magnesium Chloride (liquid)	Outdoor	8,000 gal	Chlorides		
Deicer- Road Salt	Salt Shed	1,500 tons	Chlorides		
Detergents	Indoor	Small Quantity	Surfactants		
Paint, Latex	Indoor	20 gal	Petroleum constituents, including volatile and semivolatile organic compounds		
Paint, Oil-Based	Indoor	10 gal	Petroleum constituents, including volatile and semivolatile organic compounds		
Paint, Spray	Indoor	Small Quantity	Petroleum constituents, including volatile and semivolatile organic compounds		
Sand	Outdoor	10 cyds	Sediments		
Solvent – parts washer	Indoor	Safety Kleen	Volatile organic compounds		
Spill response material (Speedy Dry or similar)	Indoor	1/2 Palet	Particulate matter, solids, residual oil.		

2.13 APPLICABILITY OF SPILL PREVENTION, CONTROL AND COUNTERMEASURE (SPCC) REQUIREMENTS

Under federal regulations 40 CFR Part 112 (and Amendments), a Spill Prevention, Control, and Countermeasure (SPCC) Plan is required when a facility has an aboveground oil storage capacity greater than 1,320 gallons, when including containers with a capacity of 55 gallons or more. The Hightway Garage does not have aboveground oil storage capacity that exceeds 1,320 gallons.

2.14 DESCRIPTION OF SIGNIFICANT MATERIAL STORAGE AREAS

Many activities at the Highway Garage that involve the materials included in Table 5 occur within contained garages or bays. These activities may include minor equipment/vehicle repair, oil changes, repainting, lubrication, and parts replacement.

Fueling of all Town of Hanover vehicles occurs at the Fuel Island located at the Highway Garage. All bulk delivery of fuel to the Fuel Island is monitored by a Town of Hanover employee.

The Hightway Garage emergency generator is fueled with diesel. The fuel is stored in an accessory tanks that holds 200 gallons of diesel. There is a block containment around the diesel storage tank. All bulk delivery of fuel to the emergency generator is monitored by a Town of Hanover employee.

Waste oil and other used motor fluids are stored in the Highway Garage. Waste oil is stored in tanks and drums also located within the Highway Garage, all of which have internal containment or are located on appropriate containment pallets. All delivery of waste oil to the facility occurs within the Highway Garage and is monitored by a Hanover DPW employee. The Highway Garage has a small Safety-Kleen parts washer.

Magnesium chloride, for winter road maintenance is stored outside of the salt shed inside an AST and fully contained. Delivery of all chemicals to the Highway Garage is monitored by a DPW employee.

Within the salt shed, deicing materials including road salt are stored. Delivery of deicing materials to the salt shed is monitored by a Hanover DPW employee.

2.15 LIST OF SIGNIFICANT LEAKS OR SPILLS

No significant leaks or spills have occurred at the Highway Garage in the last three years. Significant spills should be updated in Table 6, below.

Table 6: Significant Leaks or Spills Highway Garage

Building or Area	Location	Type of Monitoring			

Forms included in Appendix B will be used to document any spill or leak that occurs at the facility in the future.

2.16 STRUCTURAL BMPS

Structural BMPs include onsite constructed systems that provide pretreatment or treatment of stormwater flows. Structural BMPs are not identified at the Highway Garage. A vegetated swale is identified to the east of the Highway Garage, at the Town Operations Building to retain runoff from the parking lot.

2.16.1 Pretreatment Structural BMPs

- Deep sump catch basins
- Oil/Grit Separators
- Proprietary Separators

- Vortex Separators/ Hydrodynamic devices
- Sediment Forebays
- Vegetated Filter strip
- Infiltration trench
- Level Spreader

2.16.2 Treatment Structural BMPs

- Rain Garden/Bioretention Area
- Constructed wetland
- Pervious (Porous) pavement
- Media Filter/ Subsurface Infiltration Bed
- Sand & Organic Filter
- Extended Wet Basin
- Dry well
- Vegetated swale
- Infiltration berm & retentive grading
- Vegetated Roof
- Dry extended detention basin

2.16.3 Other Structural BMPs

- Riparian buffer restoration
- Landscape restoration
- Soil amendment and restoration
- Floodplain restoration

2.17 SEDIMENT AND EROSION CONTROL

Site topography at the Highway Garage and Storage Yard slopes towards a small stream to the north, Torrey Brook to the south, and Drinkwater River to the west. The Town is evaluating BMPs to address sediment and erosion control.

SECTION 3 NON-STRUCTURAL CONTROLS

3.1 GOOD HOUSEKEEPING

Good housekeeping practices are activities, often conducted daily, that help maintain a clean facility and prevent stormwater pollution problems. The following is a list of good housekeeping measures that are practiced at the facility:

- All washing of vehicles is performed within the designated vehicle wash bay.
- All fluid products and wastes are kept indoors.
- Fueling of small equipment is completed indoors.
- All floor drains present within garage bays drain to an oil/water separator.
- Spill materials and cleanup kits are maintained at all locations where oil materials are used, stored, or may be present, including at Fuel Islands.
- Used spill cleanup materials are disposed of properly.
- Materials are stored indoors or in covered areas to minimize exposure to stormwater.
- No fertilizers, herbicides, or pesticides are stored or used at the facility.
- Lead-acid batteries are stored indoors and within secondary containment.
- Hazardous materials storage lockers with spill containment are used. Storage areas are located away from vehicle and equipment paths to reduce the potential of accident related leaks and spills.
- Storage drums and containers are not located close to storm drain inlets.
- All hazardous material storage areas and containers have proper signage, labels, restricted access, locks, inventory control, overhead coverage, and secondary containment.
- All materials, waste oil storage containers, and gas cans are properly labeled.
- Oil/water separators and catch basins are maintained regularly and properly.
- Speedi Dri (or similar absorbent) is readily available and used for appropriate spills.
- Spill kits are located in areas where fluids are stored or where activities may result in a spill.
- Tools and materials are returned to designated storage areas after use.
- Waste materials are properly collected and disposed of.
- Different types of wastes are separated as appropriate.
- Regular waste disposal is arranged.
- Work areas are clean and organized.
- Work areas are regularly swept or vacuumed to collect metal, wood, and other particulates and materials.
- Obtain only the amount of materials required to complete a job.
- Materials are recycled when possible.
- Staff is familiar with manufacturer directions for proper use of materials and associated Safety Data Sheets (SDSs).
- Staff is familiar with proper use of equipment.
- Bollards, berms, and containment features are in place around areas and structures where fluids are stored.
- Drip pans are used for maintenance operations involving fluids and under leaking vehicles and equipment waiting repair.

The facility maintains a supply of spill cleanup materials at many buildings on site, and will maintain this inventory. An inventory of spill containment, control, and cleanup materials and spill kits maintained at the Highway Garage was shown in Table 3.

3.2 PREVENTATIVE MAINTENANCE

Preventative Maintenance can minimize the occurrence of stormwater pollution by addressing issues before they become problems. Vehicles and equipment should be regularly inspected to prevent leaks of fuel, oil, and other liquids. Structural stormwater controls should be regularly maintained to prevent inadequate performance during storm events.

The following is a list of preventative maintenance procedures practiced at the facility

- All staff members are aware of spill prevention and response procedures.
- All staff members have received formal spill prevention and response procedure training.
- All equipment fueling procedures are completed by qualified personnel trained in spill response procedures.
- Hydraulic equipment is kept in good repair to prevent leaks.
- Vehicle storage areas are inspected frequently for evidence of leaking oil.
- Material storage tanks and containers are regularly inspected for leaks.
- All material and bulk deliveries are monitored by facility employees.
- All waste oil is fully contained and the containers are inspected regularly.

3.3 BEST MANAGEMENT PRACTICES

In a SWPPP, existing and planned BMPs are identified that will prevent or reduce the discharge of pollutants in stormwater runoff for each area of concern listed in SECTION 2.

To prevent or reduce the potential of stormwater contamination from petroleum products, the following BMPs shall continue to be followed:

- 1. Follow Standard Operating Procedures (s) during delivery of waste oil to the equipment/waste oil storage bay. These SOPs are included in Appendix A.
- 2. Follow Standard Operating Procedures during delivery of bulk oil to the emergency generator and bulk fuel to the Fuel Island. These SOPs are included in Appendix A.
- 3. Minimize the volume of gasoline stored within the buildings and on the site.
- 4. Clean up any oil spills observed in the parking lot, garages, or other surfaces in a timely manner.
- 5. Monitor all material deliveries.
- 6. Inspect all storage tanks prior to filling activities for spills, leaks and corrosion.

3.4 SPILL PREVENTION AND RESPONSE

The following procedures apply to the facility:

• All personnel are instructed in location, use, and disposal of spill response equipment and supplies maintained at the site such as oil absorbent materials.

- The Pollution Prevention Team leader will be advised immediately of all spills of hazardous materials or regulated materials, regardless of quantity.
- Spills will be evaluated to determine the necessary response. If there is a health hazard, fire or explosion potential, 911 will be called. If a spill exceeds five gallons <u>or</u> threatens surface waters, including the storm drain system, state or federal emergency response agencies will be called.
- Spills will be contained as close to the source as possible with oil-absorbent materials. Additional materials or oil-absorbent socks will be utilized to protect adjacent catch basins.

SECTION 4 PLAN IMPLEMENTATION

4.1 EMPLOYEE TRAINING

Regular employee training is required for employees who work in areas where materials or activities are exposed to stormwater, or who are responsible for implementing activities identified in the SWPPP, including all members of the Pollution Prevention Team.

The Department of Public Works is responsible for stormwater management training for the Highway Garage employees. This position coordinates training related to stormwater management on at least an annual basis to review specific responsibilities for implementing this SWPPP, what and how to accomplish those responsibilities, including BMP implementation.

Additionally, general awareness training is provided regularly (preferably annually) to all employees whose actives may impact stormwater discharges. The purpose of this training is to educate workers on activities that can impact stormwater discharges and to help implement BMPs.

All employees responsible for the fueling or lubrication of vehicles or equipment stored at the facility will be trained regularly (preferably annually). The topics below will be covered at employee training sessions.

- 1. Spill prevention and response.
- 2. Good housekeeping.
- 3. Materials management practices

Pollution Prevention Team members will meet at least twice a year to discuss the effectiveness of and improvement to the SWPPP. Appendix C contains copies of training documentation from these training activities including attendance sheets, instructor name and affiliation, date, time, and location of the training.

4.2 SITE INSPECTION REQUIREMENTS

It is required that the entire Highway Garage and Storage Yard be inspected at least once each calendar quarter when the facility is in operation (at least one inspection must be conducted during a period when stormwater discharge is occurring). The Stormwater Pollution Prevention Team Leader is responsible for ensuring that inspections are performed. The Highway Garage Foreman is responsible for completing the quarterly inspection.

The inspection must check for evidence of pollution, evaluate non-structural controls in place at the site, and inspect equipment. The site inspection report must include:

- The inspection date and time
- The name of the inspector
- Weather information and a description of any discharge occurring at the time of the inspection
- Identification of any previously unidentified discharges from the site
- Any control measures needing maintenance or repair

- Any failed control measures that need replacement
- Any SWPPP changes required as a result of the inspection
- Signed certification statement.

The inspection form for these inspections, and copies of completed inspection forms, are included in Appendix D.

Corrective actions may be required based on evidence of past stormwater pollution or the high potential for future stormwater pollution to occur. Information about any issues and the respective corrective actions must be included in a Compliance Evaluation report. The permittee must repair or replace control measures in need of repair or replacement before the next anticipated storm event if possible, or as soon as practicable. In the interim, the permittee shall have back-up measures in place. The Compliance Evaluation report must be kept with the SWPPP and must state the problem, the solution, and when the solution was implemented.

4.3 RECORDKEEPING AND REPORTING

The permittee must keep a written record (hardcopy or electronic) of all activities required by the SWPPP including but not limited to maintenance, inspections, and training for a period of at least five years.

This SWPPP shall be kept at the DPW Facility on Pond Street and shall be updated if any of the conditions in SECTION 2.21 occur. The SWPPP and records shall be made available to state or federal inspectors and the general public upon request.

The 2016 Massachusetts MS4 Permit requires that each permittee report on the findings from Site Inspections in the annual report to USEPA and MassDEP.

Inspections of the Highway Garage and Storage Yard should be performed at least quarterly (at least one during stormwater discharge) and described in the Annual Report, including any corrective actions taken, to demonstrate that operation of the Highway Garage and Storage Yard is in compliance with the 2016 Massachusetts MS4 Permit.

4.4 TRIGGERS FOR SWPPP REVISIONS

The Town of Hanover shall review this SWPPP regularly to determine if any update or revision is required. Changes that may trigger revision include:

- An increase in the quantity of any potential pollutant stored at the facility;
- The addition of any new potential pollutant (not already addressed in this SWPPP) to the list of materials stored or used at the facility;
- Physical changes to the facility that expose any potential pollutant (not presently exposed) to stormwater;
- Presence of a new authorized non-stormwater discharge at the facility; or
- Addition of an activity that introduces a new potential pollutant.

Changes in activity may include an expansion of operations, or changes in any significant material handling or storage practices which could impact stormwater.

The amended SWPPP will describe the new activities that could contribute to increased pollution, as well as control measures that have been implemented to minimize the potential for pollution.

This SWPPP will be amended if a state or federal inspector determines that it is not effective in controlling stormwater pollutants discharged to waterways.

SECTION 5 SWPPP 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 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.

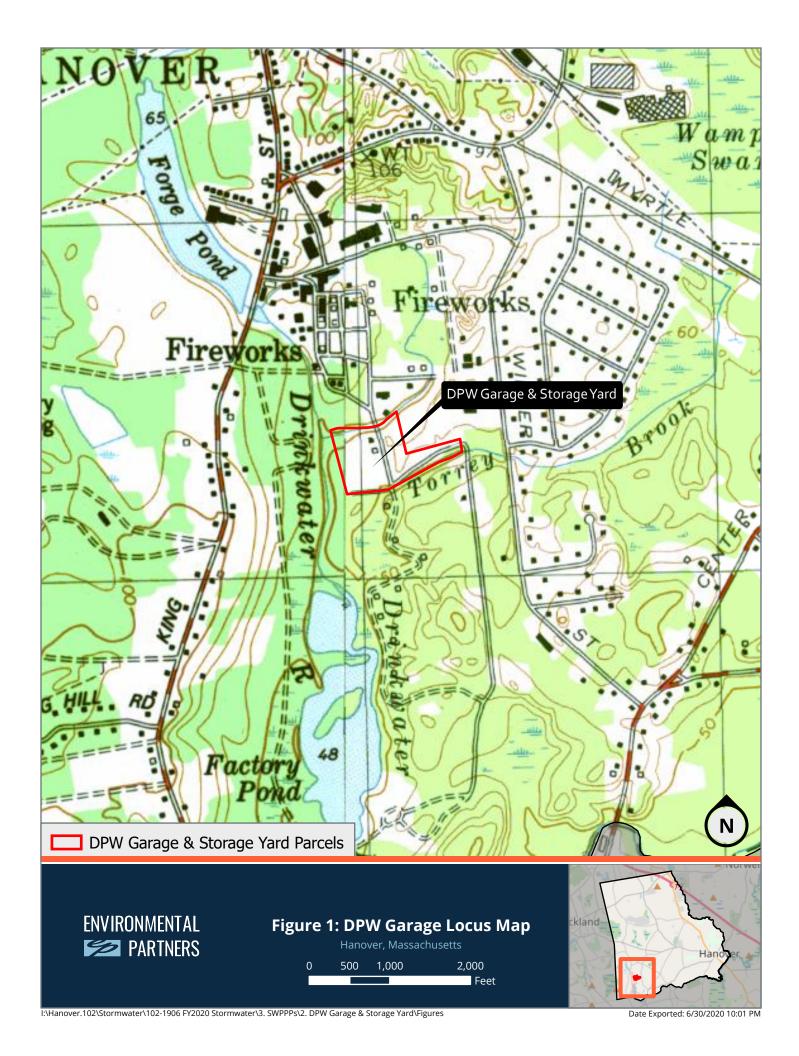
Authorized Official

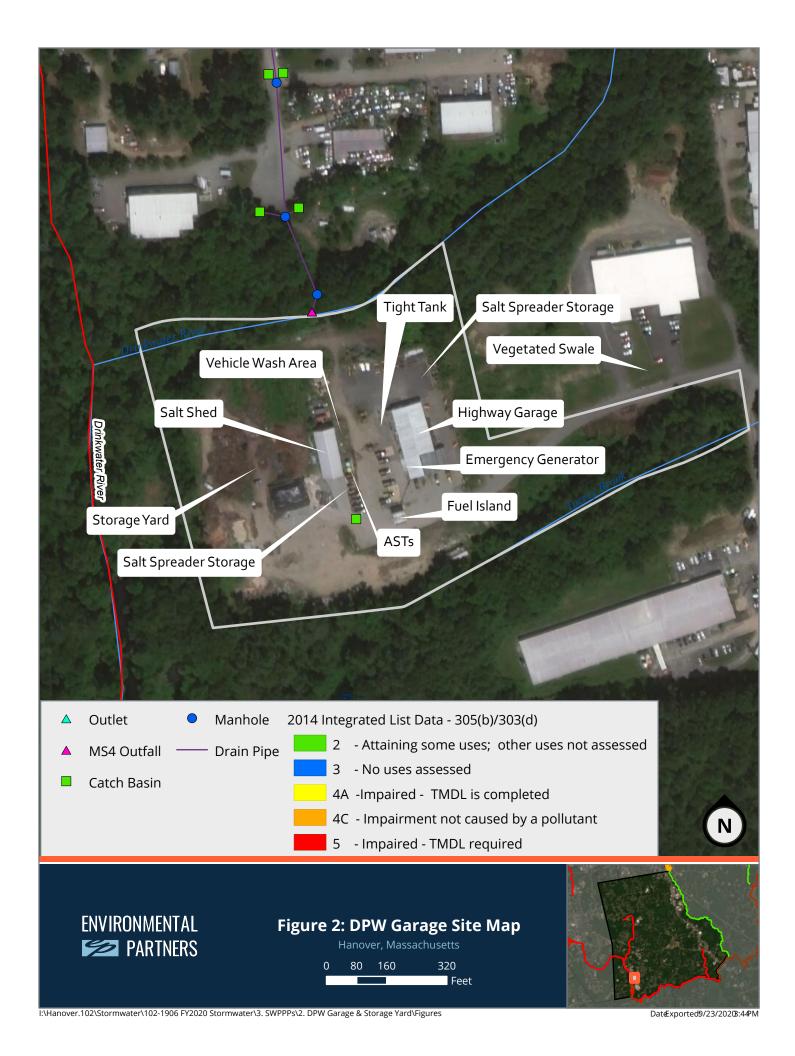
Acting TOWN MANAger

9-23-2020

Date

FIGURES





APPENDIX A

Standard Operating Procedures



STANDARD OPERATING PROCEDURE 3: CATCH BASIN INSPECTION AND CLEANING

Introduction

Catch basins help minimize flooding and protect water quality by removing trash, sediment, decaying debris, and other solids from stormwater runoff. These materials are retained in a 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 and debris

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 a 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 may require more frequent cleaning. 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). 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 (see "SOP 10: Addressing Illicit Discharges").
- 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.

Attachments

1. Catch Basin Inspection Form

Job No.: Town:

Inspector:

Date:



CATCH BASIN INSPECTION FORM

Catch Basin I.D.					Final Discharge from Structure? Yes No If Yes, Discharge to Outfall No:				
Catch Basin Label:	Stencil 🗌 Ground Inset 🗌 Sign 🗌 Non					e Other			
Basin Material:	Concrete Corrugated metal Stone Brick Other:			Cat	Catch Basin Condition:		Good Door Good Fair Crumbling		
Pipe Material:	Concrete Image: Concrete HDPE Image: Concrete PVC Image: Concrete Clay Tile Image: Concrete Other: Image: Concrete		Pip	Pipe Measurements:		Inlet Dia. (in): d= Outlet Dia. (in): D=			
Dequired Maintonance	Droblom	ahaal	all that annly	.).					
Required Maintenance/ Problems (check all that apply): Tree Work Required New Grate is Required Pipe is Blocked Frame Maintenance is Required Remove Accumulated Sediment Pipe Maintenance is Required Basin Undermined or Bypassed Catch Basin Grate Type : Bar: 0-6 (in): Cascade: 6-12(in): Other: 12-18 (in): Properly Aligned: Yes 24 + (in):				Di Di Co Era Re Ne Others	Cannot Remove Cover Ditch Work Corrosion at Structure Erosion Around Structure Remove Trash & Debris Need Cement Around Grate ther:				
*If the outlet is submer above the outlet invert.				roxin	nate hei	ght of water	Yes		No 🗌
Flow		ervations	-				Circle those present:		
Standing Wate	r Color:			Foam Oil Sheen		Oil Sheen			
(check one or both)					Sanitary Waste Bacterial Sh		Bacterial Sheen		
Weather Conditions : Dry > 24 hours Wet Sample of Screenings Collected for Analysis? Yes No					-				
Comments:				Orange Staining Floatables		Floatables			
							Excessive sediment Other:	;	Pet Waste Optical Enhancers

STANDARD OPERATING PROCEDURE 4: SPILL RESPONSE AND CLEANUP PROCEDURES

Introduction

Municipalities are responsible for any contaminant spill or release that occurs on property they own or operate. Particular areas of concern include any facilities that use or store chemicals, fuel oil or hazardous waste, including schools, garages, DPW yards, and landfills. Implementation of proper spill response and cleanup procedures can help to mitigate the effects of a contaminant release.

Responding to a Spill

In the event of a spill, follow these spill response and cleanup procedures:

- 1. Notify a member of the facility's Pollution Prevention Team, the facility supervisor, and/or the facility safety officer.
- 2. Assess the contaminant release site for potential safety issues and for direction of flow.
- 3. With proper training and personal protective equipment, complete the following:
 - a. Stop the contaminant release;
 - b. Contain the contaminant release through the use of spill containment berms or absorbents;
 - c. Protect all drains and/or catch basins with the use of absorbents, booms, berms or drain covers;
 - d. Clean up the spill;
 - e. Dispose of all contaminated products in accordance with applicable federal, state and local regulations.
 - i. Products contaminated with petroleum shall be handled and disposed of as described in MassDEP policy WCS-94-400, Interim Remediation Waste Management Policy for Petroleum Contaminated Soils, http://www.mass.gov/dep/cleanup/laws/94-400.pdf.
 - ii. Products saturated with petroleum products or other hazardous chemicals require special handling and disposal by licensed transporters. Licensed transporters will pick up spill contaminated materials for recycling or disposal. Save the shipping records for at least three years.
 - iii. Waste oil contaminated products:
 - 1. Perform the "one drop" test to ensure absorbents do not contain enough oil to be considered hazardous. Wring absorbents through a paint filter. If doing so does not generate one drop of oil, the materials are not hazardous.
 - 2. If absorbents pass the "one drop" test they may be discarded in the trash, unless contaminated with another hazardous waste.
 - a. It is acceptable to mix the following fluids and handle them as waste oil:
 - i. Waste Motor Oil;

- ii. Hydraulic Fluid;
- iii. Power Steering Fluid;
- iv. Transmission Fluid;
- v. Brake Fluid;
- vi. Gear Oil.
- a. Do not mix the following materials with waste oil, store each separately:
 - i. Gasoline;
 - ii. Antifreeze;
 - iii. Brake and Carburetor Cleaners;
 - iv. Cleaning Solvents;
 - v. Other Hazardous Wastes.
- 3. If absorbents do not pass the "one drop" test they should be placed in separate metal containers with tight fittings lids, labeled "Oily Waste Absorbents Only".
- 4. If you need assistance containing and/or cleaning up the spill, or preventing it from discharging to a surface water (or an engineered storm drain system), contact your local fire department using the number listed below, however in the case of an emergency call 911;
 - a. Auburn: (508)-832-7800
 - b. Charlton: (508)-248-2299
 - c. Dudley: (508)-949-8040
 - d. Holden: (508)-210-5650
 - e. Leicester: (508)-892-7022
 - f. Millbury: (508)-865-5328
 - g. Oxford: (508)-987-6012
 - h. Paxton: (508)-791-6600
 - i. Shrewsbury: (508)-841-8522
 - j. Spencer: (508)-885-3555
 - k. Sturbridge: (508)-347-2525
 - l. Webster: (508)-949-3876
 - m. West Boylston: (508)-835-3233
- 5. Contact the MassDEP 24-hour spill reporting notification line, toll-free at (888)-3104-1133;
 - n. The following scenarios are exempt from MassDEP reporting requirements:
 - i. Spills of less than 10 gallons of petroleum and do not impact a water body;
 - Spills of less than one pound of hazardous chemicals and do not present an imminent health or safety hazard;
 - iii. Spills from passenger vehicle accidents;
 - iv. Spills within a vault or building with a watertight floor and walls that completely contain all released chemicals.

Procedures for Reporting Spill Response

When contacting emergency response personnel or a regulatory agency, or when reporting the contaminant release, be prepared to provide the following information:

- 1. Your name and the phone number you are calling from.
- 2. The exact address and location of the contaminant release.
- 3. Specifics of release, including:
 - a. What was released;
 - b. How much was released, which may include:
 - i. Pounds;
 - ii. Gallons;
 - iii. Number of containers.
- 4. Where was the release sent/what was contaminated, addressing:
 - a. a. Pavement;
 - b. b. Soil;
 - c. c. Drains;
 - d. d. Catch Basins;
 - e. e. Water Bodies;
 - f. f. Public Street; and
 - g. g. Public Sidewalk.
- 5. The concentration of the released contaminant.
- 6. What/who caused the released contaminant.
- 7. Is the release being contained and/or cleaned up, or is the response complete.
- 8. Type and amount of petroleum stored on site, if any.
- 9. Characteristics of contaminant container, including
 - a. Tanks;
 - b. Pipes;
 - c. Valves.

Maintenance and Prevention Guide

Prevention of spills is preferable to even the best response and cleanup. To mitigate the effects of a contaminant release, provide proper maintenance and inspection at each facility.

To protect against contaminant release adhere to the following guidance:

- Ensure all employees are properly trained to respond in the case of a spill, understand the nature and properties of the contaminant and understand the spill control materials and personnel safety equipment. Maintain training records of current personnel on site and retain training records of former personnel for at least three years from the date last worked at the facility;
- Provide yearly maintenance and inspection at all municipal facilities, paying particular attention to underground storage tanks. Maintain maintenance and inspection records on site;
- 3. Implement good management practices where chemicals and hazardous wastes are stored;
 - d. Ensure storage in closed containers inside a building and on an impervious surface;

- e. If storage cannot be provided inside, ensure secondary containment for 110 percent of the maximum volume of the storage container;
- f. Locate storage areas near maintenance areas to decrease the distance required for transfer;
- g. Provide accurate labels, MSDS information and warnings for all stored materials;
- a. Regularly inspect storage areas for leaks;
- b. Ensure secure storage locations, preventing access by untrained or unauthorized persons;
- c. Maintain accurate records of stored materials.
- Replace traditional hazardous materials such as pesticides and cleansers with nonhazardous products such as bio-lubricants which can reduce response costs in the case of a spill;
- 5. Maintain a oil and grease spill response kit with the following materials, at a minimum, at each facility:
 - a. 6.5 gallon bucket with screw top lid and handle
 - b. 10 gallons of sand
 - c. 200 pounds of Speedi Dry absorbent
 - d. Drain covers
 - e. Spill containment berms
 - f. (4) 3' absorbent socks
 - g. (16) 16" x 18" absorbent pads
 - h. Goggles
 - i. Nitrile gloves
 - j. Disposable bags to dispose of used materials
 - k. Laminated contacts list shall include the following names and numbers:
 - i. Safety Officer;
 - ii. Facility Supervisor;
 - iii. Local Fire Department;
 - iv. MassDEP spill report notification line;
 - v. MassDEP Regional Office;
 - vi. Hazardous Waste Compliance Assistance Line;
 - vii. Household Hazardous Products Hotline;
 - viii. Massachusetts Department of Fire Services;
 - ix. Licensed Site Professionals Information.

Attachments

1. Spill Response and Cleanup Contact List

SPILL RESPONSE AND CLEANUP CONTACT LIST

	Phone Number	Date and Time contacted
Safety Officer:		
Facility Supervisor:		
Fire Department:		
MassDEP 24-Hour Spill Reporting	(888)-304-1133	
MassDEP Regional Offices:		
Northeast Regional Office	(978) 694-3200	
Southeast Regional Office	(508) 946-2700	
Central Regional Office	(508) 792-7650	
Western Regional Office	(413) 784-1100	
Hazardous Waste Compliance Assistance Line	(617) 292-5898	
Household Hazardous Products Hotline	(800) 343-3420	
Massachusetts Department of Fire Services	(978) 567-3100 or (413) 587-3181	
Licensed Site Professionals Association (Wakefield, MA)	(781) 876-8915	
Licensed Site Professionals Board	(617) 556-1091	

STANDARD OPERATING PROCEDURE 6: EROSION AND SEDIMENTATION CONTROL

Introduction

Erosion and sedimentation from land-disturbing human activities can be a significant source of stormwater pollution. This Standard Operating Procedure describes methods for reducing or eliminating pollutant loading from such activities.

Controlling Erosion and Sediment through Design and Planning

Prevention of erosion and sedimentation is preferable to installing treatment devices. Consistent application and implementation of the following guidelines during the design and review phases can prevent erosion and sedimentation:

- 2. Avoid sensitive areas, steep slopes, and highly erodible soils to the maximum extent possible when developing site plans.
- 3. Identify potential problem areas before the site plan is finalized and approved.
- 4. Plan to use sediment barriers along contour lines, with a focus on areas where short-circuiting (i.e., flow around the barrier) may occur.
- 5. Use berms at the top of a steep slopes to divert runoff away from the slope's edge.
- 6. Design trapezoidal or parabolic vegetated drainage channels, not triangular.
- 7. Use vegetated channels with rip rap check dams, instead of impervious pavement or concrete, to reduce the water velocity of the conveyance system.
- 8. Design a check dam or sediment forebay with level spreader at the exit of outfalls to reduce water velocity of the discharge and collect sediment.
- 9. Use turf reinforcement matting to stabilize vegetated channels, encourage vegetation establishment, and withstand flow velocities without scouring the base of the channel.
- 10. Plan open channels to follow land contours so natural drainage is not disrupted.
- 11. Use organic matting for temporary slope stabilization and synthetic matting for permanent stabilization.
- 12. Provide a stable channel, flume, or slope drain where it is necessary to carry water down slopes.

Controlling Erosion and Sediment on Construction Sites

During the construction phase, it is important to inspect active sites regularly to ensure that practices are consistent with approved site plans and the site's Stormwater Pollution Prevention Plan (SWPPP) or other document, as required by the municipality's legal authority. The following guidelines apply:

- 1. Erosion and sediment control features should be constructed before initiating activities that remove vegetated cover or otherwise disturb the site. These shall be installed consistent with the approved site plans and with manufacturer's instructions.
- 2. Erosion and sediment control devices shall be inspected by the contractor regularly, and maintained as needed to ensure function.
- 3. In the SWPPP or other document, the contractor shall clearly identify the party responsible for maintaining erosion and sediment control devices.
- 4. An inspection should be completed of active construction sites every month, at a minimum, to check the status of erosion and sedimentation controls. Refer to SOP 5, "Construction Site Inspection", for construction site stormwater inspection procedures.
- 5. Existing vegetation should be maintained on site as long as possible.
- 6. Construction should proceed progressively on the site in order to minimize exposed soil, and disturbed areas should be restored as soon as possible after work has been completed.
- 7. Stockpiles shall be stabilized by seeding or mulching if they are to remain for more than two weeks.
- 8. Disturbed areas shall be protected from stormwater runoff by using protective Best Management Practices (BMPs).
- 9. Clean water shall be diverted away from disturbed areas on construction sites to prevent erosion and sedimentation.
- 10. Sediment traps and sediment barriers should be cleaned out regularly to reduce clogging and maintain design function.
- 11. Vegetated and wooded buffers shall be protected.
- 12. Soils shall be stabilized by mulching and/or seeding when they would be exposed for more than one week during the dry season, or more than two days during the rainy season.
- 13. Vegetation shall be allowed to establish before introducing flows to channels.
- 14. Regular light watering shall be used for dust control, as this is more effective than infrequent heavy watering.
- 15. Excessive soil compaction with heavy machinery shall be avoided, to the extent possible.
- 16. Construction activities during months with higher runoff rates shall be limited, to the extent possible.

Controlling Erosion and Sediment by Proper Maintenance of Permanent BMPs

Many construction phase BMPs can be integrated into the final site design, but ongoing inspection and maintenance are required to ensure long-term function of any permanent BMP. Refer to SOP 9, "Inspection of Constructed Best Management Practices", for more information. The following guidelines summarize the requirements for long-term maintenance of permanent BMPs.

- 1. Responsibility for maintaining erosion and sediment control devices shall be clearly identified.
- 2. Erosion and sediment control devices shall be inspected following heavy rainfall events to ensure they are working properly.
- 3. Erosion control blankets shall be utilized when seeding slopes.
- 4. Vegetated and wooded buffers shall be protected, and left undisturbed to the extent possible.
- 5. Runoff shall not be diverted into a sensitive area unless this has been specifically approved.

- 6. Sedimentation basins shall be cleaned out once sediment reaches 50% of the basin's design capacity.
- 7. Snow shall not be plowed into, or stored within, retention basins, rain gardens, or other BMPs.
- 8. Easements and service routes shall be maintained, to enable maintenance equipment to access BMPs for regular cleaning.

STANDARD OPERATING PROCEDURE 7: FUEL AND OIL HANDLING PROCEDURES

Introduction

Spills, leaks, and overfilling can occur during handling of fuels and petroleum-based materials, even in small volumes, representing a potential source of stormwater pollution. This Standard Operating Procedure addresses a variety of ways by which fuels and petroleum-based materials can be delivered, as well as steps to be taken when petroleum products (such as waste oil) are loaded onto vehicles for offsite disposal or recycling. Delivery, unloading, and loading of waste oils are hereafter referred to as "handling".

For all manners of fuel and oil handling described below, a member of the facility's Pollution Prevention Team (or another knowledgeable person familiar with the facility) shall be present during handling procedures. This person shall ensure that the following are observed:

- 1. There is no smoking while fuel handling is in process or underway.
- 2. Sources of flame are kept away while fuel handling is being completed. This includes smoking, lighting matches, carrying any flame, or carrying a lighted cigar, pipe, or cigarette.
- 3. The delivery vehicle's hand brake is set and wheels are chocked while the activity is being completed.
- 4. Catch basins and drain manholes are adequately protected.
- 5. No tools are to be used that could damage fuel or oil containers or the delivery vehicle.
- 6. No flammable liquid shall be unloaded from any motor vehicle while the engine is operating, unless the engine of the motor vehicle is required to be used for the operation of a pump.
- 7. Local traffic does not interfere with fuel transfer operations.
- 8. The attending persons should watch for any leaks or spills
 - a. Any small leaks or spills should be immediately stopped, and spilled materials absorbed and disposed of properly. Refer to SOP 4, "Spill Response and Cleanup Procedures", for examples of spill cleanup and response materials.
 - b. In the event of a large spill or one that discharges to surface waters or an engineered storm drain system, the facility representative shall activate the facility's Stormwater Pollution Prevention Plan (SWPPP) and report the incident as specified within.

Delivery by Bulk (Tanker) Truck

Procedures for the delivery of bulk fuel shall include the following:

- 1. The truck driver shall check in with the facility upon arrival.
- 2. The facility representative shall ensure that the appropriate spill cleanup and response equipment and personal protective equipment are readily available and easily accessible.

Refer to SOP 4, "Spill Response and Cleanup Procedures", for examples of spill cleanup and response materials.

- 3. The facility representative shall check to ensure that the amount of delivery does not exceed the available capacity of the tank.
 - a. A level gauge can be used to verify the level in the tank.
 - b. If a level gauge is not functioning or is not present on the tank, the tank should be stick tested prior to filling.
- 4. The truck driver and the facility representative shall both remain with the vehicle during the delivery process.
- 5. The truck driver and the facility representative shall inspect all visible lines, connections, and valves for leaks.
- 6. When delivery is complete and the hoses are removed, buckets should be placed underneath connection points to catch drippings.
- 7. The delivery vehicle shall be inspected prior to departure to ensure that the hose is disconnected from the tank.
- 8. The facility representative shall inspect the fuel tank to verify that no leaks have occurred, or that any leaked or spilled material has been cleaned and disposed of properly.
- 9. The facility representative shall gauge tank levels to ensure that the proper amount of fuel is delivered, and collect a receipt from the truck driver.

Delivery of Drummed Materials

Drummed materials may include motor oil, hydraulic fluid, transmission fluid, or waste oil from another facility (as approved). Procedures for the delivery of drummed materials shall include the following:

- 1. The truck driver shall check in with the facility upon arrival.
- The facility representative shall ensure that the appropriate spill cleanup and response equipment and personal protective equipment are readily available and easily accessible. Refer to SOP 4, "Spill Response and Cleanup Procedures", for examples of spill cleanup and response materials.
- 3. The facility representative shall closely examine the shipment for damaged drums.
 - a. If damaged drums are found, they shall be closely inspected for leaks or punctures.
 - b. Breached drums should be removed to a dry, well-ventilated area and the contents transferred to other suitable containers.
 - c. Drums shall be disposed of in accordance with all applicable regulations.
- 4. Drummed materials shall not be unloaded outdoors during wet weather events.
- 5. The truck driver and the facility representative shall both remain with the vehicle during the delivery process.
- 6. Drums shall be handled and unloaded carefully to prevent damage.
- 7. Upon completion of unloading, the facility representative shall inspect the unloading point and the drums to verify that no leaks have occurred, that any leaked or spilled material has been cleaned up and disposed of properly, and that the unloaded drums are not leaking.
- 8. The facility representative shall check to ensure that the proper amount of fuel is delivered, and collect a receipt from the truck driver.

Delivery of Drummed Materials

When waste oil or similar oil products need to be removed from the premises, only haulers certified to transport waste oil should be utilized. Procedures for the draining of bulk oil tanks shall include the following:

- 1. The disposal truck driver shall check in with the facility upon arrival.
- The facility representative shall ensure that the appropriate spill cleanup and response equipment and personal protective equipment are readily available and easily accessible. Refer to SOP 4, "Spill Response and Cleanup Procedures", for examples of spill cleanup and response materials.
- 3. The facility representative shall verify that the volume of waste oil in the tank does not exceed the available capacity of the disposal hauler's vehicle.
- 4. The truck driver and the facility representative shall both remain with the vehicle during the tank draining process.
- 6. When draining is complete and the hoses are removed, buckets should be placed underneath connection points to catch drippings.
- 7. The disposal hauler vehicle shall be inspected prior to departure to ensure that the hose is disconnected from the tank.
- 8. The facility representative shall inspect the loading point and the tank to verify that no leaks have occurred, or that any leaked or spilled material has been cleaned up and disposed of properly.
- 9. The facility representative shall collect a receipt from the truck driver.

Attachments

1. Fuel Delivery Checklist

STANDARD OPERATING PROCEDURE 11: OIL/WATER SEPARATOR (OWS) MAINTENANCE

Introduction

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.

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.

General OWS Maintenance Requirements

- 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:

- 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

1. Quarterly OWS Inspection Checklist

OIL/WATER SEPARATOR (OWS) QUARTERLY INSPECTION CHECKLIST

	Are there any signs of spills or leaks in the general area?	Yes 🗌	No 🗌
Visual Inspection	Is there any evidence of petroleum bypassing the OWS?	Yes 🗌	No 🗌
Visual Inspection	Are there any unauthorized substances entering the OWS?	Yes 🗌	No 🗌
	Does the OWS exhibit any signs of leaks or malfunctions?	Yes 🗌	No 🗌

If you answered "Yes" to any of the above questions, further inspection, repair, and/or cleaning may be necessary.

	А	Distance from rim of access cover to bottom of structure
	В	Distance from rim of access cover to top of sludge layer
Maagunamanta	$\mathbf{C} = \mathbf{A} - \mathbf{B}$	Depth of sludge layer
Measurements	D	Distance from rim of access cover to the oil/water interface
	Е	Distance from rim of access cover to the top of the liquid surface
	$\mathbf{F} = \mathbf{D} - \mathbf{E}$	Depth of oil layer

If the values for "C" and/or "F" are greater than those in the manufacturer's recommendations, the OWS must be cleaned by a licensed OWS maintenance company.



STANDARD OPERATING PROCEDURE 12: STORAGE AND USE OF PESTICIDES AND FERTILIZERS

Introduction

Use and improper storage of pesticides and fertilizers can contribute to loading of nutrients and toxic compounds to surface waters. This SOP addresses Best Management Practices for storing these materials, and guidelines for safe and appropriate application. In this SOP, the term "pesticide" includes products used as herbicides.

Storage of Pesticides and Fertilizers

Procedures for the storage of pesticides and fertilizers shall include the following, many of which are included on the Massachusetts Pesticide Safety Checklist, attached:

- 1. Store pesticides and fertilizers in high, dry locations in accordance with the manufacturer's specifications.
- 2. Store in cool, well-ventilated, and insulated areas to protect against temperature extremes.
- 3. Store in an area which has been constructed in accordance with local fire codes for storing flammable or combustible materials.
 - a. Flammable products shall be stored separately from non-flammable products, preferably in a fire-proof cabinet.
 - b. Small quantities (less than 500 lbs or 220 gallons) of pesticides can be stored in cabinets constructed of double-walled 18-gauge sheet metal.
 - c. Large quantities (greater than 500 lbs or 220 gallons) of pesticides can be stored in a prefabricated Hazardous Material Storage Building or in a purpose-built storage facility. It is not anticipated that many municipal facilities will store quantities in excess of 500 lbs or 220 gallons of pesticides.
 - d. Building walls should have a two hour fire rating and be impervious to the stored materials.
 - e. Floors should be water tight, impervious, and provide spill containment. Refer to SOP 4, "Spill Response and Cleanup Procedures", for more information on spill cleanup.
- 4. Store materials in an enclosed area or in covered, impervious containment, such as a locked cabinet. The cabinet shall be located in a first story room or one which has direct access to the outdoors.
- 5. For pesticides, storage cabinets should be kept locked and the door to the storage area should contain a weather proof sign warning of the existence and danger of pesticides inside. The door should be kept locked. The sign should be visible at a distance of twenty five feet and should read as follows:

DANGER PESTICIDE STORAGE AREA ALL UNAUTHORIZED PERSONS KEEP OUT KEEP DOORS LOCKED WHEN NOT IN USE

The sign should be posted in both English and the language or languages understood by workers if this is not English.

- 6. Pesticides shall not be stored in the same place as ammonium nitrate fertilizer.
- 7. Separate pesticides and fertilizers from other chemical storage and other flammable materials.
- 8. Label all containers with date of purchase, and use the older materials first.
- 9. Clearly label all secondary containers.
- 10. Never leave unlabeled or unstable pesticides and fertilizers in uncontrolled locations.
- 11. Maintain a current written inventory of all pesticides and fertilizers at the storage site.
- 12. Order for delivery as close to time of use as possible to reduce the amount of chemical stored at the facility.
- 13. Order only the amount of materials needed in order to minimize excess or obsolete materials, which require storage and disposal.
- 14. Regularly inspect storage area for leaks and spills.
- 15. Storage area should be equipped with easily accessible spill cleanup materials and portable firefighting equipment.
- 16. Emergency eyewash stations and emergency drench showers should be located near the storage area.
- 17. Ensure that contaminated waste materials are kept in designated containers and stored in a labeled, designated, covered, and contained area.
- 18. Dispose of excess or obsolete pesticides/fertilizers and associated waste materials in accordance with the manufacturer's specifications and all applicable regulations.

Storage of Pesticides and Fertilizers

All fertilizer products manufactured or distributed in the State of Massachusetts must be registered with the Department of Agricultural Resources. There is no licensing or certification required for individuals in order to purchase or apply fertilizers.

Procedures for the use of fertilizers include the following:

- 1. Fertilizers should only be applied by properly trained personnel.
- 2. Perform soil testing before evaluating and choosing a fertilizer. The quantity of available nutrients already present in soil will determine the type and amount of fertilizer that is recommended. The soil test will also determine soil pH, humic matter and exchangeable acidity, which will indicate whether pH adjustment is required for a fertilizer to work efficiently. A soil test should be completed at each facility, as soil type and quality can vary

widely within a single community. Type of turf and turf use should also be considered in fertilizer selection.

- 3. Fertilizer selection shall take into account any surface waters within the watershed that are impaired for nutrients. Future regulatory actions may limit use of many fertilizers within these watersheds.
- 4. Calibrate application equipment regularly to ensure proper application and loading rates.
- 5. Never apply fertilizers in quantities exceeding the manufacturer's instructions.
- 6. Time fertilizer application periods for maximum plant uptake, usually in the fall and the spring.
- 7. Do not over-apply fertilizer in late fall to "use it up" before winter. The effectiveness of fertilizer will not reduce when stored.
- 8. Do not fertilize during a drought or when the soil is dry.
- 9. Never apply fertilizer to frozen ground.
- 10. Never apply fertilizer if it is raining or immediately before expected rain.
- 11. Mix fertilizers and clean application equipment under cover in an area where accidental spills will not enter surface water or groundwater and will not contaminate soil.
- 12. Do not hose down paved areas after fertilizer application if drainage will enter to an engineered storm drain system or drainage ditch.
- 13. Apply fertilizers in amounts appropriate for the type of vegetation to minimize losses to surface water and groundwater
- 14. Where applicable, till fertilizers into the soil rather than dumping or broadcasting (proper application techniques will depend on the types of soil and vegetation).
- 15. If phosphorous fertilizer is used when re-seeding, mix the phosphorous into root zone. Do not apply directly to the soil surface.
- 16. Use alternatives to chemical fertilizers, such as natural compost and organic fertilizers, which are beneficial to soil organisms.
- 17. Avoid combined products such as "weed and feed," which do not target specific problems at the appropriate time.
- 18. Use slow-release fertilizer for turf grass.

Storage of Pesticides and Fertilizers

The State of Massachusetts has a stringent program for registration of pesticides and certification of those authorized to apply them. Once a pesticide has been approved for use by the U.S. EPA, it must be registered by the Massachusetts Pesticide Board Subcommittee prior to being distributed, purchased, or used in Massachusetts. Pesticide classification in Massachusetts is based on the potential adverse effects the pesticide may have on humans or the environment. "Restricted Use" pesticides can only be sold by Licensed Dealers to Certified Applicators, while "State Limited Use" pesticides may be restricted to use by certain individuals or require written permission from the Department of Agricultural Resources prior to use.

Legal application of pesticides must be performed by an individual licensed or certified by the Massachusetts Department of Agricultural Resources. A Commercial Applicator License is required for applying general use pesticides, and a Commercial Applicator Certification is required for applying restricted and state limited use products. Procedures for the use of pesticides include the following:

- 1. Pesticides should only be applied by licensed or certified applicators.
- 2. Calibrate application equipment regularly to ensure proper application and loading rates.
- 3. Ensure that pesticide application equipment is capable of immediate shutoff in case of emergency.
- 4. Conduct spray applications according to specific label directions and applicable local regulations.
- 5. Never apply pesticides in quantities exceeding the manufacturer's instructions.
- 6. Apply pesticides at the life stage when the pest is most vulnerable.
- 7. Never apply pesticides if it is raining or immediately before expected rain.
- 8. Do not apply pesticides within 100 feet of open waters or of drainage channels.
- 10. Establish setback distances from pavement, storm drains, and water bodies, which act as buffers from pesticide application with disease-resistant plants and minimal mowing.
- 11. Spot treat infected areas only instead of the entire location.
- 12. Mix pesticides and clean application equipment under cover in an area where accidental spills will not enter surface water or groundwater and will not contaminate soil.
- 13. Do not hose down paved areas after pesticide application to a storm drain or drainage ditch.
- 14. Recycle rinsate from equipment cleaning back into product.
- 15. Choose the least toxic pesticide that is still capable of reducing the infestation to acceptable levels.
- 16. Use alternatives to pesticides, such as manual weed control, biological controls, and Integrated Pest Management strategies (learn more at http://www.mass.gov/agr/pesticides/ publications/docs/IPM_kit_for_bldg_mgrs.pdf).
- 17. For use of herbicides, reduce seed release of weeds by timing cutting and pesticide application at seed set. Select vegetation and landscaping that is low-maintenance, in order to tolerate low levels of weeds without interfering with aesthetics.

Attachments

1. Massachusetts Pesticide Safety Checklist

STANDARD OPERATING PROCEDURE 14: MUNICIPAL VEHICLE WASHING PROCEDURES

Introduction

Vehicle washing activities can result in the discharge of nutrients, sediment, petroleum products, and other contaminants to a surface water body or to an engineered drainage system.

Consistent with the 2003 USEPA NPDES Phase II Small Municipal Separate Storm Sewer System (MS4) Permit, municipal vehicle washing activities should not discharge pollutants to the MS4 system.

Outdoor Vehicle Washing Procedures

Procedures for the storage of pesticides and fertilizers shall include the following, many of which are included on the Massachusetts Pesticide Safety Checklist, attached:

Outdoor washing of municipal vehicles should be avoided unless wash water is contained in a tight tank or similar structure. Where no alternate wash system is available, and full containment of wash water cannot be achieved, the following procedures shall be followed:

- 1. Avoid discharge of any wash water directly to a surface water (e.g., stream, pond, drainage swale, etc.)
- 2. Minimize use of water to the extent practical.
- 3. Where use of detergent cannot be avoided, use products that do not contain regulated contaminants. Use of a biodegradable, phosphate-free detergent is preferred.
- 4. Do not use solvents except in dedicated solvent parts washer systems or in areas not connected to a sanitary sewer.
- 5. Do not power wash, steam clean or perform engine cleaning or undercarriage cleaning.
- 6. Grassy and pervious (porous) surfaces may be used to promote direct infiltration of wash water, providing treatment before recharging groundwater and minimizing runoff to an adjacent stormwater system. Pervious surfaces or other infiltration-based systems shall not be used within wellhead protection areas or within other protected resources.
- 7. Impervious surfaces discharging to engineered storm drain systems shall not discharge directly to a surface water unless treatment is provided. Treatment can include a compost-filled sock designed specifically for removal of petroleum and nutrients, such as the Filtrexx[™] FilterSoxx product, or equal. The treatment device shall be positioned such that all drainage must flow through the device, preventing bypassing or short-circuiting.
- 8. All adjacent engineered storm drain system catch basins shall have a sump. These structures shall be cleaned periodically (refer to SOP 3, "Catch Basin Inspection and Cleaning").

- 9. Solids and particulate accumulation from the washing area shall be completed through periodic sweeping and/or cleaning.
- 10. Maintain absorbent pads and drip pans to capture and collect spills or noticeable leaks observed during washing activities. Clean up any spills using the procedures described in SOP 4, "Spill Response and Cleanup Procedures".

Heavily soiled vehicles or vehicles dirtied from salting or snow removal efforts shall not be washed outside, without exception.

Indoor Vehicle Washing Procedures

Indoor vehicle washing procedures shall include the following:

- 1. Where use of detergent cannot be avoided, use products that do not contain regulated contaminants. Use of a biodegradable, phosphate-free detergent is preferred.
- 2. Detergents shall not be used in areas where oil/water separators provide pre-treatment of drainage (refer to SOP 11, "Oil/Water Separator Maintenance", for more information).
- 3. Floor drains shall be connected to a sanitary sewer or tight tank. Floor drains discharging to adjacent surface water bodies or engineered storm drain systems shall be permanently plugged or otherwise abandoned before any vehicle wash activities are completed.
- 4. Designate separate areas for routine maintenance and vehicle cleaning. This helps prevent contamination of wash water by motor oils, hydraulic lubricants, greases, etc.
- 5. Dry clean-up methods, such as sweeping and vacuuming, are recommended within garage facilities. Do not wash down floors and work areas with water.
- 6. Bring smaller vehicles to commercial washing stations.
- 7. Maintain absorbent pads and drip pans to capture and collect spills or noticeable leaks observed during washing activities. Clean up any spills using the procedures described in SOP 4, "Spill Response and Cleanup Procedures".

Heavy Equipment Washing Procedures

Heavy equipment washing procedures shall include the following:

- 1. Mud and heavy debris removal shall occur on impervious pavement or within a retention area.
- 2. Maintain these areas with frequent mechanical removal and proper disposal of spoils.
- 3. All adjacent engineered storm drain system components shall have a sump. These structures shall be cleaned periodically (refer to SOP 3, "Catch Basin Inspection and Cleaning").
- 4. Impervious surfaces with engineered storm drain systems shall not discharge directly to a surface water.
- 5. Floor drains shall be connected to a sanitary sewer or tight tank. Floor drains discharging to adjacent surface water bodies or engineered storm drain systems shall be permanently plugged or otherwise abandoned before any vehicle wash activities are completed.
- 6. Where use of detergent cannot be avoided, use products that do not contain regulated contaminants. Use of a biodegradable, phosphate-free detergent is preferred.

- 7. Detergents shall not be used in areas where oil/water separators provide pre-treatment of drainage (refer to SOP 11, "Oil/Water Separator Maintenance", for more information).
- 8. Maintain absorbent pads and drip pans to capture and collect spills or noticeable leaks observed during washing activities. Clean up any spills using the procedures described in SOP 4, "Spill Response and Cleanup Procedures".

Engine Washing and Steam Procedures

Engine and steam washing procedures shall include the following:

- 1. Do not wash parts outdoors.
- 2. Maintain drip pans and smaller containers to contain motor oils, hydraulic lubricants, greases, etc. and to capture and collect spills or noticeable leaks observed during washing activities, to the extent practicable. Clean up any spills using the procedures described in SOP 4, "Spill Response and Cleanup Procedures".
- 3. Where use of detergent cannot be avoided, use products that do not contain regulated contaminants. Use of a biodegradable, phosphate-free detergent is preferred.
- 4. Avoid cleaning with solvents except in dedicated solvent parts washer systems. Make use of pressure washing and steam cleaning.
- 5. Recycle clean solutions and rinse water to the extent practicable.
- 6. Wash water shall discharge to a tight tank or a sanitary sewer via an oil/water separator. Detergents shall not be used in areas where oil/water separators provide pre-treatment of drainage (refer to SOP 11, "Oil/Water Separator Maintenance", for more information).

APPENDIX B

Spill Documentation Forms

Significant Spills, Leaks or Other Releases

Instructions:

- Include the descriptions and dates of any incidences of significant spills, leaks, or other releases that
 resulted in discharges of pollutants to waters of the U.S., through stormwater or otherwise; the
 circumstances leading to the release and actions taken in response to the release; and measures taken to
 prevent the recurrence of such releases.
- Provide information, as shown below, for each incident, and attach additional documentation (e.g., photos, spill cleanup records) as necessary. Repeat as necessary by copying and pasting the fields below.

Date of incident: Insert Date of Incident Location of incident: Insert Location of Incident Description of incident: Insert Description of Incident Circumstances leading to release: Describe circumstances leading to release Actions taken in response to release: Describe actions taken in response to release Measures taken to prevent recurrence: Describe measures taken to prevent recurrence

Date of incident: Insert Date of Incident Location of incident: Insert Location of Incident Description of incident: Insert Description of Incident Circumstances leading to release: Describe circumstances leading to release Actions taken in response to release: Describe actions taken in response to release Measures taken to prevent recurrence: Describe measures taken to prevent recurrence

Date of incident: Insert Date of Incident Location of incident: Insert Location of Incident Description of incident: Insert Description of Incident Circumstances leading to release: Describe circumstances leading to release Actions taken in response to release: Describe actions taken in response to release Measures taken to prevent recurrence: Describe measures taken to prevent recurrence

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APPENDIX C

Training Documentation and Attendance Sheets

Employee Training

Instructions:

- Keep records of employee training, including the date of the training.
- For in-person training, consider using the tables below to document your employee trainings. For computer-based or other types of training, keep similar records on who was trained and the type of training conducted.

Training Date: Insert Date of Training				
Training Description (including duration and s	Training Description (including duration and subjects covered): Insert Description of Training			
Trainer: Insert Trainer(s) names				
Employee(s) trained	Employee signature			
Insert Name				

Training Date: Insert Date of Training			
Training Description (including duration and subjects covered): Insert Description of Training			
Trainer: Insert Trainer(s) names			
Employee(s) trained	Employee signature		
Insert Name			

Training Date: Insert Date of Training				
Training Description (including duration and subjects covered): Insert Description of Training				
Trainer: Insert Trainer(s) names				
Employee(s) trained	Employee signature			
Insert Name				





APPENDIX D

Facility Inspection Form

Site Inspection Reports

Instructions:

- Include in your records copies of all routine facility inspection reports completed for the facility.
- The sample inspection report is consistent with the requirements in the 2016 Massachusetts MS4 Permit relating to site inspections. If MassDEP provides you with an inspection report, use that form.

Using the Sample Site Inspection Report

- This inspection report is designed to be customized according to the specific control measures and
 activities at your facility. For ease of use, you should take a copy of your site plan and number all of the
 stormwater control measures and areas of industrial activity that will be inspected. A brief description of
 the control measures and areas that were inspected should then be listed in the site-specific section of the
 inspection report.
- You can complete the items in the "General Information" section that will remain constant, such as the facility name and inspector (if you only use one inspector). Print out multiple copies of this customized inspection report to use during your inspections.
- When conducting the inspection, walk the site by following your site map and numbered control
 measures/areas of industrial activity to be inspected. Also note whether the "Areas of Materials or
 Activities exposed to stormwater" have been addressed (customize this list according to the conditions at
 your facility). Note any required corrective actions and the date and responsible person for the correction.





	Stormwater Site Inspection Report					
	General Information					
Facil	lity Name	Insert Name	e			
Date	of Inspection	Insert Date	Start	/End Time	Insert Start/End Time	
Insp	ector's Name(s)	Insert Name	9			
Insp	ector's Title(s)	Insert Title				
Insp	ector's Contact Informatio	Insert Conta	act Info			
Insp	ector's Qualifications	Insert qualit	fications or add refe	rence to the S	SWPPP	
		We	eather Information			
Cl	5	□ Sleet □ Te	emperature:	High Winds	inspection? Tyes No	
	s, describe: Describe	u uischarges or	ponutants occurred	since the last		
	there any discharges occur s, describe: Describe	ring at the time of	of inspection? UYes	⊔No		
II ye	s, describe: Describe					
	trol Measures					
	Number the structural storm					
	list them below (add as many numbered site map with you o					
	required control measures at		CHORD, IND USI WIII	crisure inui yoi	n are inspecting an	
• 1	Describe corrective actions i		npleted, and note the	person that cor	npleted the work in	
t	the Corrective Action Log.	a . -		a		
	Structural Control Measure	Control Measure is	If No, In Need of Maintenance,		Action Needed and Notes led maintenance and repairs, or	
	ivicasui c	Operating	Repair, or		ntrol measures that need	
		Effectively?	Replacement?	replacement)	na or mousures mut need	
1	Insert Control Measure	□Yes □No	Maintenance	. /	rrective Actions	
	Name		Repair			
2	Incent Control Manager	□Yes □No	Replacement	Deserite Or	manative Antione	
2	Insert Control Measure		MaintenanceRepair	Describe Co	prrective Actions	
	Name		Replacement			
3	Insert Control Measure	□Yes □No	Maintenance	Describe Co	rrective Actions	
	Name		Repair		-	
4			Replacement		11 A 11	
4	Insert Control Measure	□Yes □No	MaintenanceRepair	Describe Co	prrective Actions	
	Name		Replacement			
5	Insert Control Measure	□Yes □No	Maintenance	Describe Co	prrective Actions	
	Name		Repair			
			Replacement			
6	Insert Control Measure	□Yes □No	☐ Maintenance	Describe Co	prrective Actions	
	Name		 Repair Replacement 			
7	Insert Control Measure	□Yes □No	Maintenance	Describe Co	prrective Actions	







	Structural Control	Control	If No, In Need of	Corrective Action Needed and Notes
	Measure	Measure is	Maintenance,	(identify needed maintenance and repairs, or
		Operating	Repair, or	any failed control measures that need
		Effectively?	Replacement?	replacement)
	Name		Repair	
			Replacement	
8	Insert Control Measure	□Yes □No	Maintenance	Describe Corrective Actions
	Name		Repair	
			Replacement	
9	Insert Control Measure	□Yes □No	Maintenance	Describe Corrective Actions
	Name		Repair	
	Nume		Replacement	
10	Insert Control Measure	□Yes □No	Maintenance	Describe Corrective Actions
	Name		🗖 Repair	
	nunio		Replacement	

Areas of Materials or Activities exposed to stormwater

Below are some general areas that should be assessed during routine inspections. Customize this list as needed for the specific types of materials or activities at your facility.

	Area/Activity	Inspected?	Controls Adequate (appropriate, effective, and operating)?	Corrective Action Needed and Notes
1	Material loading/unloading and storage areas	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
2	Equipment operations and maintenance areas	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
3	Fueling areas	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
4	Outdoor vehicle and equipment washing areas	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
5	Waste handling and disposal areas	Yes No N/A	Yes No	Describe Corrective Actions
6	Erodible areas/construction	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
7	Non-stormwater/ illicit connections	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
8	Salt storage piles or pile containing salt	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
9	Dust generation and vehicle tracking	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
10	(Other)	□Yes □No □N/A	□Yes □No	Describe Corrective Actions





	Area/Activity	Inspected?	Controls Adequate (appropriate, effective, and operating)?	Corrective Action Needed and Notes
11	(Other)	□Yes □No □ N/A	QYes QNo	Describe Corrective Actions
	(0)			
12	(Other)	□Yes □No □N/A	□Yes □No	Describe Corrective Actions

Non-Compliance

Describe any incidents of non-compliance observed and not described above: Describe Non-compliance

Additional Control Measures

Describe any additional control measures or changes to the SWPPP needed to comply with the permit requirements: Describe Additional Controls Needed

Notes





Use this space for any additional notes or observations from the inspection: **Additional Notes**

Print inspector name and title:

Signature:_____Date:_____





Quarterly Visual Assessment Reports – additional form when stormwater discharge is occurring

Instructions:

- Include in your records copies of all quarterly visual assessment reports completed for the facility. An
 example quarterly visual assessment report can be found on the following page.
- At least one quarterly inspection per year must occur while stormwater is discharging.





Quarterly Visual Assessment Form- additional form when stormwater discharge is occurring (Complete a separate form for each outfall you assess)				
Name of Facility: Name of Facility Outfall Name: Name "Substantially Iden Person(s)/Title(s) collecting sample: Name/Title		entify substantially identical outfalls):		
Person(s)/Title(s) examining sample: Name/Title				
Date & Time Discharge Began (approx.): Enter date and time	Date & Time Visual Sample Collec Enter date and time	ted: Date & Time Visual Sample Examined: Enter date and time		
Nature of Discharge: 🗌 Rainfall 📃 Snowmel	t			
	Parameter			
Color None Other (describe): Odor None Musty Sewage Solvents Other (describe): Clarity Clear Slightly Cloudy Floating Solids No Yes (describe) Settled Solids* No Yes (describe) Suspended Solids No Yes (describe) Foam (gently shake sample) No Yes (describe) Oil Sheen None Flecks Globs Other (describe): Other (describe): Other (describe) No Other Obvious Indicators No Yes (describe) Yes (describe)	Cloudy Opaque Other):): (describe): Sheen Slick	eum/Gas		
* Observe for settled solids after allowing the sample to sit for	approximately one-half hour.			
Detail any concerns, additional comments, de sheets as necessary). Insert details	scriptions of pictures taken, and	any corrective actions taken below (attach additional		
A. Name:	В.	Title:		
C. Signature:	D. I	Date Signed:		







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STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

Transfer Station

Town of Hanover

June 2020 Revised September 2020





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SECTION 1 INTRODUCTION

This Stormwater Pollution Prevention Plan (SWPPP) has been developed for the Town of Hanover 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.

The 2016 Massachusetts MS4 Permit requires 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); and
- 6. Good Housekeeping and Pollution Prevention for Permittee Owned Operations.

Under Measure 6, Good Housekeeping and Pollution Prevention for Permittee Owned Operations, the permittee is required, per Section 2.3.7.b of the 2016 Massachusetts MS4 Permit (page 50-54), to:

...develop and fully implement a SWPPP for each 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 as determined by the permittee.

The SWPPP shall contain the following elements:

- 1. Pollution Prevention Team
- 2. Description of the facility and identification of potential pollutant sources.
- 3. Identification of stormwater controls
- 4. Management practices including: minimize or prevent exposure, good housekeeping, preventative maintenance, spill prevention and response, erosion and sediment control, management of runoff, management of salt storage piles or piles containing salt, employee training, and maintenance of control measures.
- 5. Site inspections

This SWPPP accomplishes these requirements by:

- Providing an inventory of the materials and equipment at a facility that have the potential to cause stormwater pollution, and identifying locations where these materials are stored;
- Describing how stormwater is managed at a facility, including: engineered storm drain system conveyance; on-site pretreatment, treatment and infiltration systems; and discharges to surface water directly from the site;

- Reviewing activities that occur at the facility that represent a potential for stormwater pollution;
- Describing the Best Management Practices (BMPs) that will be implemented at the facility to reduce, eliminate and prevent the discharge of pollutants to stormwater;
- Identifying the employees responsible for developing, implementing, maintaining, and revising, as necessary, this SWPPP;
- Establishing a schedule and description of site inspections to be conducted at the facility to determine if the SWPPP is effective in preventing the discharge of pollutants;
- Serving as a tool for the facility employees, including a place to maintain recordkeeping associated with these requirements.

SECTION 2 DETAILED FACILITY ASSESSMENT

2.1 FACILITY SUMMARY

The Town of Hanover Transfer Station is located at 118 Rockland Street, Hanover, MA 02339 and is owned and operated by the Town of Hanover. The Locus Map in Figure 1 shows the location of the facility within the Town of Hanover.

The Department of Public Works is primarily responsible for activities at, and maintenance of, the facility.

2.2 SITE INSPECTION

The site inspection associated with the development of this SWPPP was completed on June 2, 2020. The inspection was conducted by Ann Marie Petricca and Vern Lincoln, of Environmental Partners.

During the site inspection, information related to activities at the site, vehicles stored at the site, fueling operations, material storage, transport of oil and other materials, and spill history was gathered.

2.3 POLLUTION PREVENTION TEAM

A Pollution Prevention Team for the Hanover Transfer Station has been prepared and designated the task of developing, implementing, maintaining, and revising, as necessary, the SWPPP for this facility. Listed below are Pollution Prevention Team members and their respective responsibilities.

Responsibilities assigned to one or more members of the Pollution Prevention Team include:

- Implementing, administering and revising the SWPPP
- Regularly inspecting stormwater control structures
- Conducting stormwater training
- Recordkeeping

Leader: Kurt Kelley **Title:** Superintendent of Public Works Office Phone: 781-826-3189

Responsibilities: Considers all stages of plan development, inspections, and implementation; coordinates employee training programs; maintains all records and ensures that reports are submitted; oversees sampling program. Responsible for certifying the completeness and accuracy of the SWPPP.

Member: Ken Storey Title: Foreman

Responsibilities: Implements the preventative maintenance program; oversees good housekeeping activities; serves as spill response coordinator; conducts inspections; assists with employee training programs; conducts sampling/visual monitoring. Maintains spill kits at the Hanover Transfer Station.

2.4 FACILITY DESCRIPTION

The primary purpose of Town of Hanover Transfer Station is to operate the Town's waste transfer and recycling operations. Activities at the site are described in SECTION 2.7

The facility covers approximately 13.49 acres, and contains the structures and other features shown on the Site Map in Figure 2 and described in detail in the following sections. Components shown on the site map, if present, include:

- Location of the engineered drainage system, including catch basins, ditches, drain manholes, and treatment BMPs
- Outfalls to a receiving water, and the name of the receiving water
- Direction of surface water flow
- Structural stormwater pollution control measures
- Location of floor drains
- Vehicle washing areas
- Vehicle fueling areas
- Aboveground storage tanks (indoors and outdoors)
- Underground storage tanks
- Chemical storage areas
- Pesticide and fertilizer storage areas
- Salt storage areas
- Materials stockpiles
- Waste disposal areas.

2.5 FACILITY STRUCTURES

Carpentry, electrical, and minor maintenance activities are completed in the Maintenance Shed. Small equipment, signage, and tools are stored in this building as well. The Maintenance Shed contains no floor drains and is fully enclosed.

Latex paint, primer, spray paint, and similar products are stored in a Miscellaneous Recyclables Area. These enclosures and building contains no floor drains and are partially to fully enclosed.

2.5.1 Additional Site Features

Aboveground Storage Tanks

Aboveground storage tanks (ASTs) at the Hanover Transfer Station are used for storage of waste oil and waste anti-freeze. An inventory of significant materials is included in SECTION 2.12.

Both ASTs are located at the eastern portion of the property for collection and storage of waste oil and waste anti-freeze. The ASTs are partially covered, and roof drainage discharges to the north.

Tight Tanks

There are no know tight tanks at the Hanover Transfer Station.

Parking Areas

There are no designated parking areas at the Hanover Transfer Station. The traffic pattern is designed for residents to drive through the facility, drop off their waste and recycling, and exit the property without extended parking. The entire waste collection and recycling area is impervious surface.

2.6 SITE DRAINAGE

No stormwater from adjacent properties impact the Hanover Transfer Station property.

Sheet Flow

Drainage from the impervious surfaces at the Hanover Transfer Station is directed partially to the catch basins located around the site, including, at the solid waste hauling station beneath the solid waste drop off area and within the recycling area at the south end of the property.

Engineered Drainage

Additional assessment is required at the Transfer Station to determine the nature and discharge of onsite catch basins and drainage system. Existing solid waste transfer station inspection reports indicate that the catch basins infiltrate onsite. Although older site plans show the catch basins discharge along the west end of the property.

Engineered drainage at the Transfer Station includes approximately five catch basins, three drain manholes, and two BMPs along Rockland Street. Maintenance of the catch basin structures, including sediment removal, is completed by the Department of Public Works or their contractor.

2.6.1 Receiving Waters

The good housekeeping practices, preventative maintenance and Best Management Practices implemented at the facility are methods to limit potential negative impacts to stormwater. These practices are discussed in SECTION 3 of this SWPPP. Additional investigations of the engineered drainage need to be performed to determine if the catch basins infiltrate onsite or, if they discharge offsite, where the outfall(s) are located. The unnamed stream to the west of the transfer station property is a tributary to Iron Mine Brook, which is identified as a Category 5 Total Maximum Daily Load (TMDL) Required.

2.6.2 Applicable TMDLS

Additional investigations of the engineered drainage need to be performed to determine if the catch basins infiltrate onsite or, if they discharge offsite, where the outfall(s) are located.

2.7 SITE ACTIVITIES

The following activities occur at the facility:

- Landscaping
- Residential drop off solid waste and segregated items, (including paint, propane and other compressed gases) and handling, and storage by Transfer Station Staff.
- Solid waste management (including scrap metal, and residential C&D materials)
- Tool storage
- Vehicle and equipment storage
- Waste Handling and Disposal
- Waste oil and anti-freeze storage.

Below is a discussion of site activities and the potential pollutant sources associated with each, as well as measures taken to minimize potential pollution. Locations of each activity are shown on the Site Plan (Figure 1).

No solvent-based parts washers were observed in any structure at the Transfer Station. The Town of Hanover is a member of the South Shore Recycling Cooperative and holds a hazardous waste collection day at the Hanover Transfer Station two times per year. All hazardous waste is hauled offsite that day. Any oil and/or hazardous materials are collected by a third party vendor contracted by the Town of Hanover on an annual basis, at a minimum. These materials are properly labeled and stored using appropriate Best Management Practices.

The Department of Public Works does not apply, utilize or store fertilizers, herbicides, or pesticides at the Transfer Station.

2.7.1 Solid Waste Management

Potential Sources of Stormwater Pollution

Solid waste production and storage locations present the threat to contaminate stormwater with pathogens, including bacteria and viruses, nutrients, including phosphorus and nitrogen, metals and sediments.

Solid waste may be classified as both hazardous and non-hazardous waste and include municipal solid waste, residential C&D materials, TV/VCRs*, White Goods and Metals*, Refrigerators/Freezers*, Mattresses, Batteries, Sofas/Stuffed Chairs, Tires*, Computers, Microwave Ovens, Propane Tanks, Fluorescent Bulbs, and Wood and Asphalt, Brick, Concrete materials from Construction within Hanover. Most of these materials are sent offsite for recycling.

Pollution Prevention

To prevent or reduce the potential for stormwater pollution from solid waste management practices the following preventative maintenance procedures are recommended:

1. All staff shall be properly trained in correct solid waste management practices, including waste disposal and spill prevention and response. All employees shall also be knowledge of the potential hazards associated with solid waste handling and storage.

- 2. Each waste storage location shall be properly labeled and all significant sources of pollution shall be kept in a secure, covered and contained area.
- 3. The facility and storage containers shall remain locked at all times other than during normal hours of operation.
- 4. All waste storage containers and waste handling equipment shall be routinely inspected for signs of spills, leaks, corrosion or general deterioration.
- 5. The facility shall maintain spill response materials in accordance with SOP 4, "Spill Response and Cleanup" included in Appendix A.

2.7.2 Use or Storage of Pesticides or Fertilizers

Potential Sources of Stormwater Pollution

The Town does not utilize or store pesticides or fertilizers at the Transfer Station.

Pollution Prevention

The Town does not utilize or store pesticides or fertilizers at the Transfer Station.

2.7.3 Vehicle and Equipment Storage

Potential Sources of Stormwater Pollution

Vehicle and equipment storage activities are a potential source of pollution due to the diesel fuel, gasoline, oil, hydraulic fluid, antifreeze and similar hazardous material or fuel the machinery may contain. In addition, vehicles or machinery may pick up pollutants during the course of offsite activities or at other facilities, and then deposit these pollutants at the storage facility.

Pollution Prevention

Regular visual inspection and maintenance of vehicles and equipment can greatly reduce the potential for pollution by finding and addressing leaks before pollution of the environment occurs. When in storage, vehicles and equipment should be kept on a covered slab or within a building with a common drain. Discharge to this drain shall be managed by an oil/ water separator (refer to SOP 11, "Oil/Water Separator Maintenance", included in Appendix A) to remove oils and gasoline. Vehicle washing activities shall not be completed in areas served by an oil/water separator.

No equipment should be kept in an area where leaks could result in pollutants entering catch basins, channels leading to outfalls, or the engineered storm drain system. If vehicles and equipment are stored outdoors, catch basins or engineered drainage system structures should include devices intended to remove oils and sediments prior to entering the system. These treatment devices should be inspected and replaced at the frequency recommended by the manufacturer.

2.7.4 Waste Handling and Disposal

Potential Sources of Stormwater Pollution

Waste handling and disposal facilities and activities present a potential to contaminate stormwater with pathogens (including bacteria and viruses), nutrients, including phosphorus and nitrogen, fertilizers, pesticides and sediments.

There are several classifications of waste that contribute to stormwater pollution, including:

- 1. Solid Waste
- 2. Hazardous Materials and Waste
- 3. Pesticides and Fertilizers
- 4. Petroleum Products
- 5. Detergents

Pollution Prevention

A variety of measures are considered appropriate to prevent pollution from waste handling and disposal activities, based on the waste classifications noted previously.

Solid Waste

- 1. Designate a waste collection area on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a receiving water.
- 2. Ensure that containers have lids so they can be covered before periods of rain, and keep containers in a covered area whenever possible.
- 3. Schedule waste collection to prevent the containers from overfilling.
- 4. Clean up spills immediately and in accordance with SOP 4, "Spill Response and Cleanup Procedures" included in Appendix A.

Hazardous Materials and Wastes

- 1. To prevent leaks, empty and clean hazardous waste containers before disposing of them.
- 2. Never remove the original product label from the container. Follow the manufacturer's recommended method of disposal, printed on the label.
- 3. Never mix excess products when disposing of them, unless specifically recommended by the manufacturer.
- 4. Clean up spills immediately and in accordance with SOP 4 "Spill Response and Cleanup".

Pesticides, Fertilizers and Petroleum Products

- 1. Do not handle the materials more than necessary.
- 2. Store materials in a dry, covered, contained area.
- 3. Clean up spills immediately and in accordance with SOP 4, "Spill Response and Cleanup".

Detergents

1. Never dump wastes containing detergents to a storm drain system. All wastes containing detergents shall be shipped offsite for proper disposal or be directed to a sanitary sewer system for treatment at a wastewater treatment plant.

Additional Recommendations

In addition to the pollution prevention requirements, a waste management plan is recommended. The plan shall include employee training and signage informing individuals of the hazards associated with improper storage, handling and disposal of wastes. It is imperative that all employees are properly trained and follow the correct procedures to reduce or eliminate stormwater pollution. Routine visual inspection of storage and use areas is critical. The visual inspection process shall include identification of containers or equipment that could malfunction and cause leaks or spills. The equipment and containers shall be inspected for the following:

- 1. Leaks
- 2. Corrosion
- 3. Support or Foundation Failure
- 4. Other Deterioration

In case a defect is found, immediately repair, replace or properly dispose.

2.7.5 Waste Oil Storage

Potential Sources of Stormwater Pollution

When not stored properly, waste oil can be a potential source of petroleum in stormwater. Waste oil containers can leak, and spills can occur while during transportation activities.

Pollution Prevention

All waste oil containers should be properly labeled and stored with secondary containment. Containers should be regularly inspected for rust, leaks, or other signs of deterioration. Defective containers should be promptly removed and replaced. A spill response kit should be located wherever waste oil is stored. Facility personnel should know where the spill kit is located and be familiar with the procedures outlined in SOP 4 "Spill Response and Cleanup Procedures" in Appendix A. Used oil filters should also be properly disposed.

Care should be taken when transferring used oil to and from storage containers. For additional information see SOP 7 "Fuel and Oil Handling Procedures" in Appendix A.

Waste oil should be stored indoors or under a covered structure to prevent exposure to precipitation, unless specifically designed for outdoor storage. If stored outdoors, then care must be taken to ensure that the outside of the tank is clean to avoid discharge of waste oil to stormwater receptors. Floor drains, in waste oil storage areas, should drain to an oil/water separator rather than the storm drain system. See SOP 11 "Oil/Water Separator Maintenance" in Appendix A for further information.

When possible, waste oil should be recycled or reduce the amount generated.

2.7.1 Anti-Freeze Storage

Potential Sources of Stormwater Pollution

When not stored properly, anti-freeze can be a potential source of hazardous material in stormwater. Anti-freeze containers can leak, and spills can occur while during transportation activities.

Pollution Prevention

All anti-freeze storage containers should be properly labeled and stored with secondary containment. Containers should be regularly inspected for rust, leaks, or other signs of deterioration. Defective containers should be promptly removed and replaced. A spill response kit should be located wherever anti-freeze is stored and facility personnel should be familiar with the procedures outlined in SOP 4 "Spill Response and Cleanup Procedures" in Appendix A. Anti-freeze should be properly disposed.

Anti-freeze should be stored indoors or under a covered structure to prevent exposure to precipitation, unless specifically designed for outdoor storage. If stored outdoors, then care must be taken to ensure that the outside of the tank is clean to avoid discharge of anti-freeze to stormwater receptors.

2.8 VEHICLE AND EQUIPMENT INVENTORY

Vehicles and major equipment stored and maintained at the facility are shown in Table 1.

Vehicle/Equipment Type	Number on Site
Roll-off Containers	
CAT Backhoe	1
Yard-All (for moving transfer trailers)	1
International 6 wheel 25000 GBW for moving containers	1
Small Compactors	3

Table 1: Vehicle Inventory

2.9 LOCATION OF LEAK AND SPILL CLEANUP MATERIALS

Leak and spill cleanup materials are stored at Transfer Station in order to facilitate rapid response. Speedy-dry and sorbent pads are stored down below in the building at the solid waste compactor pit.

2.10 ALLOWABLE NON-STORMWATER DISCHARGES

A non-stormwater discharge is defined as any discharge or flow to the engineered storm drain system that is not composed entirely of stormwater runoff. No allowable non-stormwater discharges are identified at the Transfer Station facility.

2.11 EXISTING STORMWATER MONITORING DATA

Records for any stormwater monitoring data collected from the Transfer Station shall be properly documented in a Table 2, below and kept on file at the Transfer Station and DPW Office.

Table 2: Existing Stormwater Monitoring DataTransfer Station

Building or Area	Location	Type of Monitoring

2.12 SIGNIFICANT MATERIAL INVENTORY

Materials stored include those specified in SECTION 2.7, "Site Activities". An inventory of these materials at the Transfer Station is included in Table 3, which also reviews the likelihood for each identified material to come in contact with stormwater. The type of container has also been identified. Oil, gasoline, and other petroleum-based materials are listed separately in the table.

The locations of these material storage areas are provided on the Site Plan in Figure 2.

Material	Storage Location	Quantity	Potential Pollutant	Covered (C) or Enclosed (E)	Likelihood of Contact with Water
Petroleum-Based Co	ompounds				
Diesel fuel			Petroleum hydrocarbons		
Gasoline			Petroleum hydrocarbons		
Hydraulic Fluid (for compactors)			Petroleum hydrocarbons	Enclosed	Low
Motor Oil			Petroleum hydrocarbons		
Fuel Oil, No. 2			Petroleum hydrocarbons		
Fuel Oil, No. 6			Petroleum hydrocarbons		
Lubricants (onsite equipment)			Petroleum hydrocarbons	Enclosed	Low
Transmission Fluid			Petroleum hydrocarbons		

Table 3: Significant Material Inventory Transfer Station

Material	Storage Location	Quantity	Potential Pollutant	Covered (C) or Enclosed (E)	Likelihood of Contact with Water				
Waste Oil	Miscellaneous		Petroleum	Tank	Low				
	Recyclables Area		hydrocarbons						
Other:									
	То	tal Volume o	f Oil at Facility =						
Non-Petroleum Significant Materials									
Antifreeze	Miscellaneous		Ethylene glycol;	Tank	Low				
	Recyclables Area		potential source of BOD						
Spray Lubricant			Petroleum						
			hydrocarbons						
Adhesives and			Volatile and						
sealants			semi volatile						
			organic						
			compounds						
Aggregates			Sediments						
Animal Wastes			Fecal						
Asphalt	C&D Area		Sediments	Open Roll-off	Low				
Batteries, Used	Miscellaneous		Lead, sulfuric		Low				
Lead Acid	Recyclables Area		acid; possible						
			particulate						
			matter and						
			residual oil						
Brake Fluid			Volatile organic						
			compounds;						
			non-petroleum						
			based oil						
Coolant (new or			Volatile organic						
used)			compounds						
Deicer- Calcium Chloride (liquid)			Chlorides						
Deicer- Road Salt			Chlorides						
Detergents			Surfactants						
Paint, Latex	Miscellaneous		Petroleum	Covered	Low				
,	Recyclables Area		constituents,						
			including						
			volatile and						
			semi volatile						
			organic						
			compounds						
Paint, Oil-Based			Petroleum						
			constituents,						
			including						
			volatile and						

Material	Storage Location	Quantity	Potential Pollutant	Covered (C) or Enclosed (E)	Likelihood of Contact with Water
			semi volatile		
			organic		
			compounds		
Paint, Spray			Petroleum		
			constituents,		
			including		
			volatile and		
			semi volatile		
			organic		
			compounds		
Sand			Sediments		
Solvents			Volatile organic		
			compounds		
Solid Waste,	Recycling Area		Miscellaneous	Enclosed	Low
Recyclable			debris/solids,		
			particulate		
			matter, metals		
Solid Waste, for	Solid Waste Pit		Particulate	Covered	Low
Disposal			matter, solids,		
			metals		
Solid Waste, C&D	C&D Disposal Area		Particulate	Open Roll-off	Yes
	(Residential Only)		matter, solids,		
			metals		
Spill response	Solid Waste		Particulate	Enclosed	
material (Speedy compactor pit		matter, solids,			
Dry or similar)			residual oil.		

2.13 APPLICABILITY OF SPILL PREVENTION, CONTROL AND COUNTERMEASURE (SPCC) REQUIREMENTS

Under federal regulations 40 CFR Part 112 (and Amendments), a Spill Prevention, Control, and Countermeasure (SPCC) Plan is required when a facility has an aboveground oil storage capacity greater than 1,320 gallons, when including containers with a capacity of 55 gallons or more. The Hanover Transfer Station does have aboveground oil storage capacity that exceeds 1,320 gallons and, therefore, a SPCC Plan is not required.

2.14 DESCRIPTION OF SIGNIFICANT MATERIAL STORAGE AREAS

Many activities at the Transfer Station that involve the storage of materials are included in Table 5 and occur within contained garages or bays. Waste oil and anti-freeze are stored in aboveground storage tanks next to the administrative building. Residents drop off waste oil and anti-freeze and these materials are only handled and transferred to the above ground storage tank by a Hanover DPW employee.

2.15 LIST OF SIGNIFICANT LEAKS OR SPILLS

No significant leaks or spills have occurred at the Transfer Station in the last three years. Any significant leaks or spills should be recorded in the following Table 4.

Table 4: Significant Leaks or Spills Transfer Station

Building or Area	Location	Type of Monitoring

Forms included in Appendix B will be used to document any spill or leak that occurs at the facility in the future.

2.16 STRUCTURAL BMPS

Structural BMPs include onsite-constructed systems that provide pretreatment or treatment of stormwater flows. The following structural BMPs are presently used at the Transfer Station to maintain water quality.

2.16.1 Pretreatment Structural BMPs

• Deep sump catch basins (if the solid waste transfer station inspection reports are correct)

2.16.2 Treatment Structural BMPs

• Vegetated infiltration basin

2.17 SEDIMENT AND EROSION CONTROL

The transfer station is mostly paved. The facility is clean and well swept, minimizing any sedimentation from entering the Town of Hanover storm drain system. Additional assessment is required to determine if the storm drain system at the Transfer Station discharges to a nearby surface water body or if the catch basins infiltrate stormwater onsite.

SECTION 3 NON-STRUCTURAL CONTROLS

3.1 GOOD HOUSEKEEPING

Good housekeeping practices are activities, often conducted daily, that help maintain a clean facility and prevent stormwater pollution problems. The following is a list of recommended good housekeeping measures at the facility:

- All fluid products and wastes are kept indoors or in tanks designed for outdoor storage.
- Fueling of small equipment is completed indoors.
- Spill materials and cleanup kits are maintained at all locations where oil materials are used, stored, or may be present.
- Used spill cleanup materials are disposed of properly.
- Materials are stored indoors or in covered areas to minimize exposure to stormwater.
- No fertilizers, herbicides, or pesticides are stored or used at the facility.
- Lead-acid batteries are stored indoors and within secondary containment.
- Hazardous materials storage lockers with spill containment are used. Storage areas are located away from vehicle and equipment paths to reduce the potential of accident related leaks and spills.
- Storage drums and containers are not located close to storm drain inlets.
- All hazardous material storage areas and containers have proper signage, labels, restricted access, locks, inventory control, overhead coverage, and secondary containment.
- All materials, waste oil storage containers, and gas cans are properly labeled.
- Oil/water separators and catch basins are maintained regularly and properly.
- Speedi Dri (or similar absorbent) is readily available and used for appropriate spills.
- Spill kits are located in areas where fluids are stored or where activities may result in a spill.
- Tools and materials are returned to designated storage areas after use.
- Waste materials are properly collected and disposed of.
- Different types of wastes are separated as appropriate.
- Regular waste disposal is arranged.
- Work areas are clean and organized.
- Work areas are regularly swept or vacuumed to collect metal, wood, and other particulates and materials.
- Obtain only the amount of materials required to complete a job.
- Materials are recycled when possible.
- Staff is familiar with manufacturer directions for proper use of materials and associated Safety Data Sheets (SDSs).
- Staff is familiar with proper use of equipment.
- Bollards, berms, and containment features are in place around areas and structures where fluids are stored.
- Drip pans are used for maintenance operations involving fluids and under leaking vehicles and equipment waiting repair.

The facility maintains a supply of spill cleanup materials on site, and will maintain this inventory. Spill containment, control, and cleanup materials and spill kits are maintained at the Transfer Station down below in the building at the solid waste compactor pit.

3.2 PREVENTATIVE MAINTENANCE

Preventative Maintenance can minimize the occurrence of stormwater pollution by addressing issues before they become problems. Vehicles and equipment should be regularly inspected to prevent leaks of fuel, oil, and other liquids. Structural stormwater controls should be regularly maintained to prevent inadequate performance during storm events.

The following is a list of preventative maintenance procedures practiced at the facility

- All staff members are aware of spill prevention and response procedures.
- All staff members have received formal spill prevention and response procedure training.
- All equipment fueling procedures are completed by qualified personnel trained in spill response procedures.
- Hydraulic equipment is kept in good repair to prevent leaks.
- Vehicle storage areas are inspected frequently for evidence of leaking oil.
- Material storage tanks and containers are regularly inspected for leaks.
- All material and bulk deliveries are monitored by facility employees.
- All waste oil is fully contained and the containers are inspected regularly.
- Waste anti-freeze is fully contained and the containers are inspected regularly.

3.3 BEST MANAGEMENT PRACTICES

In a SWPPP, existing and planned BMPs are identified that will prevent or reduce the discharge of pollutants in stormwater runoff for each area of concern listed in SECTION 2.

To prevent or reduce the potential of stormwater contamination from petroleum products, the following BMPs shall continue to be followed:

- 1. Follow Standard Operating Procedures during delivery of waste oil to the waste oil storage tank. These SOPs are included in Appendix A.
- 2. Minimize the volume of gasoline stored within the buildings and on the site.
- 3. Clean up any oil spills observed in the parking lot, garages, or other surfaces in a timely manner.
- 4. Monitor all material deliveries.
- 5. Inspect all storage tanks prior to filling activities for spills, leaks and corrosion.

3.4 SPILL PREVENTION AND RESPONSE

The following procedures apply to the facility:

• All personnel are instructed in location, use, and disposal of spill response equipment and supplies maintained at the site such as oil absorbent materials.

- The Pollution Prevention Team leader will be advised immediately of all spills of hazardous materials or regulated materials, regardless of quantity.
- Spills will be evaluated to determine the necessary response. If there is a health hazard, fire or explosion potential, 911 will be called. If a spill exceeds five gallons <u>or</u> threatens surface waters, including the storm drain system, state or federal emergency response agencies will be called.
- Spills will be contained as close to the source as possible with oil-absorbent materials. Additional materials or oil-absorbent socks will be utilized to protect adjacent catch basins.

SECTION 4 PLAN IMPLEMENTATION

4.1 EMPLOYEE TRAINING

Regular employee training is required for employees who work in areas where materials or activities are exposed to stormwater, or who are responsible for implementing activities identified in the SWPPP, including all members of the Pollution Prevention Team.

Superintendent of Public Works is responsible for stormwater management training for the Transfer Station employees. This position coordinates training related to stormwater management on at least an annual basis to review specific responsibilities for implementing this SWPPP, what and how to accomplish those responsibilities, including BMP implementation.

Additionally, general awareness training is provided regularly (preferably annually) to all employees whose actives may impact stormwater discharges. The purpose of this training is to educate workers on activities that can impact stormwater discharges and to help implement BMPs.

All employees responsible for the fueling or lubrication of vehicles or equipment stored at the facility will be trained regularly (preferably annually). The topics below will be covered at employee training sessions.

- 1. Spill prevention and response.
- 2. Good housekeeping.
- 3. Materials management practices

Pollution Prevention Team members will meet at least twice a year to discuss the effectiveness of and improvement to the SWPPP. Appendix C contains copies of training documentation from these training activities including attendance sheets, instructor name and affiliation, date, time, and location of the training.

4.2 SITE INSPECTION REQUIREMENTS

It is required that the entire Transfer Station be inspected at least once each calendar quarter when the facility is in operation (at least one inspection must be conducted during a period when stormwater discharge is occurring). The Stormwater Pollution Prevention Team Leader is responsible for ensuring that inspections are performed. The Transfer Station Foreman is responsible for completing the quarterly inspection.

The inspection must check for evidence of pollution, evaluate non-structural controls in place at the site, and inspect equipment. The site inspection report must include:

- The inspection date and time
- The name of the inspector
- Weather information and a description of any discharge occurring at the time of the inspection
- Identification of any previously unidentified discharges from the site
- Any control measures needing maintenance or repair

- Any failed control measures that need replacement
- Any SWPPP changes required as a result of the inspection
- Signed certification statement.

The inspection form for these inspections, and copies of completed inspection forms, are included in Appendix D.

Corrective actions may be required based on evidence of past stormwater pollution or the high potential for future stormwater pollution to occur. Information about any issues and the respective corrective actions must be included in a Compliance Evaluation report. The permittee must repair or replace control measures in need of repair or replacement before the next anticipated storm event if possible, or as soon as practicable. In the interim, the permittee shall have back-up measures in place. The Compliance Evaluation report must be kept with the SWPPP and must state the problem, the solution, and when the solution was implemented.

4.3 RECORDKEEPING AND REPORTING

The permittee must keep a written record (hardcopy or electronic) of all activities required by the SWPPP including but not limited to maintenance, inspections, and training for a period of at least five years.

This SWPPP shall be kept at the DPW Main Office on Pond Street and shall be updated if any of the conditions in SECTION 2.21 occur. The SWPPP and records shall be made available to state or federal inspectors and the general public upon request.

The 2016 Massachusetts MS4 Permit requires that each permittee report on the findings from Site Inspections in the annual report to USEPA and MassDEP.

Inspections of the Transfer Station should be performed at least quarterly (at least one during stormwater discharge) and described in the Annual Report, including any corrective actions taken, to demonstrate that operation of the Transfer Station is in compliance with the 2016 Massachusetts MS4 Permit.

4.4 TRIGGERS FOR SWPPP REVISIONS

The Town of Hanover shall review this SWPPP regularly to determine if any update or revision is required. Changes that may trigger revision include:

- An increase in the quantity of any potential pollutant stored at the facility;
- The addition of any new potential pollutant (not already addressed in this SWPPP) to the list of materials stored or used at the facility;
- Physical changes to the facility that expose any potential pollutant (not presently exposed) to stormwater;
- Presence of a new authorized non-stormwater discharge at the facility; or
- Addition of an activity that introduces a new potential pollutant.

Changes in activity may include an expansion of operations, or changes in any significant material handling or storage practices that could impact stormwater.

The amended SWPPP will describe the new activities that could contribute to increased pollution, as well as control measures that have been implemented to minimize the potential for pollution.

This SWPPP will be amended if a state or federal inspector determines that it is not effective in controlling stormwater pollutants discharged to waterways.

SECTION 5 SWPPP 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 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.

Authorized Official

Title

Date

SECTION 5 SWPPP 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 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.

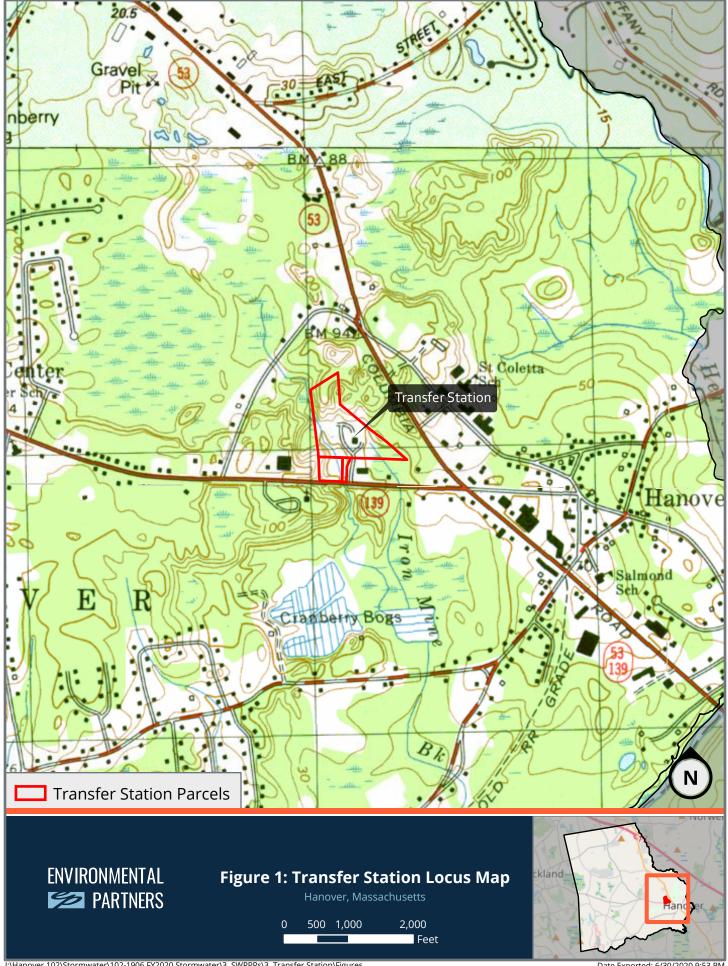
Authorized Official

Acting Town MANAger

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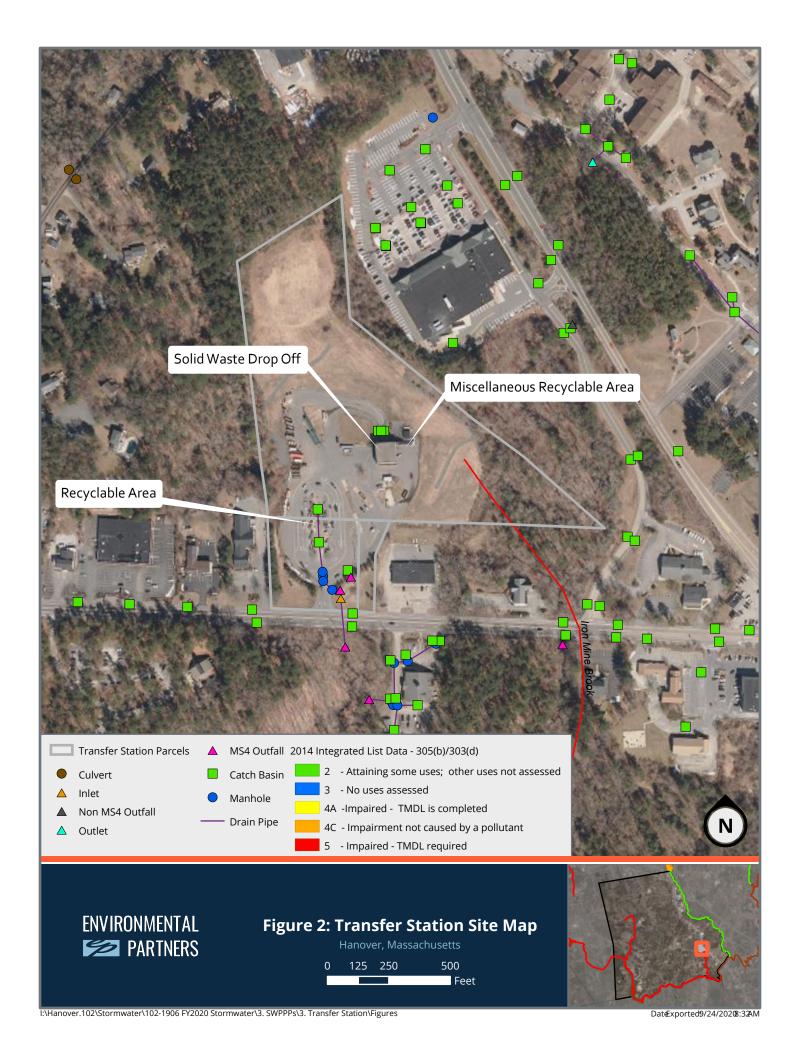
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FIGURES



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APPENDIX A

Standard Operating Procedures



STANDARD OPERATING PROCEDURE 3: CATCH BASIN INSPECTION AND CLEANING

Introduction

Catch basins help minimize flooding and protect water quality by removing trash, sediment, decaying debris, and other solids from stormwater runoff. These materials are retained in a 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 and debris

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 a 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 may require more frequent cleaning. 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 (<u>https://www.mass.gov/files/documents/2016/08/xl/310cmr30_7883_54357.pdf</u>). 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 (see "SOP 10: Addressing Illicit Discharges").
- 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.

Attachments

1. Catch Basin Inspection Form

Job No.: Town:

Inspector:

Date:



CATCH BASIN INSPECTION FORM

Catch Basin I.D.			_			arge from Struc charge to Outfal		s 🗌	No 🗌	
Catch Basin Label:		Ground Inset Sign No			ne 🗌	e Other				
Basin Material: Corrugated Stone Brick Other:		ed metal	I metal		n Condition:	Good Door D Fair Crumbling D				
Pipe Material: Concrete HDPE PVC Clay Tile Other:				Pipe Measurements:				Inlet Dia. (in): d= Outlet Dia. (in): D=		
Required Maintenance	/ Problems	(check)	all that annly) •						
					Dir Dir Co Era Re Ne Other:	nnot Remove Co tch Work prosion at Structu osion Around Str move Trash & D ced Cement Arou Description of Heavy Moderate Slight Trickling	ure ucture ebris nd Grate			
*If the outlet is submer above the outlet invert.				roxin	nate hei	ght of water	Yes		No 🗌	
Flow		ervations					Circle the	ose pres	ent:	
Standing Wate	r Colo					Foam Oil Sheen		Oil Sheen		
(check one or both) Odor:					Sanitary Waste Bacterial Shee		Bacterial Sheen			
Weather Conditions :Dry > 24 ISample of Screenings Collected for Analysis? Yes			nours		Wet		waste	Dacterial Sheen		
Sample of Screenings Collected for Analysis? Yes No Comments:						Orange Staining Floatables		Floatables		
				Excessive sediment Other:		Pet Waste Optical Enhancers				

STANDARD OPERATING PROCEDURE 4: SPILL RESPONSE AND CLEANUP PROCEDURES

Introduction

Municipalities are responsible for any contaminant spill or release that occurs on property they own or operate. Particular areas of concern include any facilities that use or store chemicals, fuel oil or hazardous waste, including schools, garages, DPW yards, and landfills. Implementation of proper spill response and cleanup procedures can help to mitigate the effects of a contaminant release.

Responding to a Spill

In the event of a spill, follow these spill response and cleanup procedures:

- 1. Notify a member of the facility's Pollution Prevention Team, the facility supervisor, and/or the facility safety officer.
- 2. Assess the contaminant release site for potential safety issues and for direction of flow.
- 3. With proper training and personal protective equipment, complete the following:
 - a. Stop the contaminant release;
 - b. Contain the contaminant release through the use of spill containment berms or absorbents;
 - c. Protect all drains and/or catch basins with the use of absorbents, booms, berms or drain covers;
 - d. Clean up the spill;
 - e. Dispose of all contaminated products in accordance with applicable federal, state and local regulations.
 - i. Products contaminated with petroleum shall be handled and disposed of as described in MassDEP policy WCS-94-400, Interim Remediation Waste Management Policy for Petroleum Contaminated Soils, http://www.mass.gov/dep/cleanup/laws/94-400.pdf.
 - ii. Products saturated with petroleum products or other hazardous chemicals require special handling and disposal by licensed transporters. Licensed transporters will pick up spill contaminated materials for recycling or disposal. Save the shipping records for at least three years.
 - iii. Waste oil contaminated products:
 - 1. Perform the "one drop" test to ensure absorbents do not contain enough oil to be considered hazardous. Wring absorbents through a paint filter. If doing so does not generate one drop of oil, the materials are not hazardous.
 - 2. If absorbents pass the "one drop" test they may be discarded in the trash, unless contaminated with another hazardous waste.
 - a. It is acceptable to mix the following fluids and handle them as waste oil:
 - i. Waste Motor Oil;

- ii. Hydraulic Fluid;
- iii. Power Steering Fluid;
- iv. Transmission Fluid;
- v. Brake Fluid;
- vi. Gear Oil.
- a. Do not mix the following materials with waste oil, store each separately:
 - i. Gasoline;
 - ii. Antifreeze;
 - iii. Brake and Carburetor Cleaners;
 - iv. Cleaning Solvents;
 - v. Other Hazardous Wastes.
- 3. If absorbents do not pass the "one drop" test they should be placed in separate metal containers with tight fittings lids, labeled "Oily Waste Absorbents Only".
- 4. If you need assistance containing and/or cleaning up the spill, or preventing it from discharging to a surface water (or an engineered storm drain system), contact your local fire department using the number listed below, however in the case of an emergency call 911;
 - a. Auburn: (508)-832-7800
 - b. Charlton: (508)-248-2299
 - c. Dudley: (508)-949-8040
 - d. Holden: (508)-210-5650
 - e. Leicester: (508)-892-7022
 - f. Millbury: (508)-865-5328
 - g. Oxford: (508)-987-6012
 - h. Paxton: (508)-791-6600
 - i. Shrewsbury: (508)-841-8522
 - j. Spencer: (508)-885-3555
 - k. Sturbridge: (508)-347-2525
 - l. Webster: (508)-949-3876
 - m. West Boylston: (508)-835-3233
- 5. Contact the MassDEP 24-hour spill reporting notification line, toll-free at (888)-3104-1133;
 - n. The following scenarios are exempt from MassDEP reporting requirements:
 - i. Spills of less than 10 gallons of petroleum and do not impact a water body;
 - Spills of less than one pound of hazardous chemicals and do not present an imminent health or safety hazard;
 - iii. Spills from passenger vehicle accidents;
 - iv. Spills within a vault or building with a watertight floor and walls that completely contain all released chemicals.

Procedures for Reporting Spill Response

When contacting emergency response personnel or a regulatory agency, or when reporting the contaminant release, be prepared to provide the following information:

- 1. Your name and the phone number you are calling from.
- 2. The exact address and location of the contaminant release.
- 3. Specifics of release, including:
 - a. What was released;
 - b. How much was released, which may include:
 - i. Pounds;
 - ii. Gallons;
 - iii. Number of containers.
- 4. Where was the release sent/what was contaminated, addressing:
 - a. a. Pavement;
 - b. b. Soil;
 - c. c. Drains;
 - d. d. Catch Basins;
 - e. e. Water Bodies;
 - f. f. Public Street; and
 - g. g. Public Sidewalk.
- 5. The concentration of the released contaminant.
- 6. What/who caused the released contaminant.
- 7. Is the release being contained and/or cleaned up, or is the response complete.
- 8. Type and amount of petroleum stored on site, if any.
- 9. Characteristics of contaminant container, including
 - a. Tanks;
 - b. Pipes;
 - c. Valves.

Maintenance and Prevention Guide

Prevention of spills is preferable to even the best response and cleanup. To mitigate the effects of a contaminant release, provide proper maintenance and inspection at each facility.

To protect against contaminant release adhere to the following guidance:

- Ensure all employees are properly trained to respond in the case of a spill, understand the nature and properties of the contaminant and understand the spill control materials and personnel safety equipment. Maintain training records of current personnel on site and retain training records of former personnel for at least three years from the date last worked at the facility;
- Provide yearly maintenance and inspection at all municipal facilities, paying particular attention to underground storage tanks. Maintain maintenance and inspection records on site;
- 3. Implement good management practices where chemicals and hazardous wastes are stored;
 - d. Ensure storage in closed containers inside a building and on an impervious surface;

- e. If storage cannot be provided inside, ensure secondary containment for 110 percent of the maximum volume of the storage container;
- f. Locate storage areas near maintenance areas to decrease the distance required for transfer;
- g. Provide accurate labels, MSDS information and warnings for all stored materials;
- a. Regularly inspect storage areas for leaks;
- b. Ensure secure storage locations, preventing access by untrained or unauthorized persons;
- c. Maintain accurate records of stored materials.
- Replace traditional hazardous materials such as pesticides and cleansers with nonhazardous products such as bio-lubricants which can reduce response costs in the case of a spill;
- 5. Maintain a oil and grease spill response kit with the following materials, at a minimum, at each facility:
 - a. 6.5 gallon bucket with screw top lid and handle
 - b. 10 gallons of sand
 - c. 200 pounds of Speedi Dry absorbent
 - d. Drain covers
 - e. Spill containment berms
 - f. (4) 3' absorbent socks
 - g. (16) 16" x 18" absorbent pads
 - h. Goggles
 - i. Nitrile gloves
 - j. Disposable bags to dispose of used materials
 - k. Laminated contacts list shall include the following names and numbers:
 - i. Safety Officer;
 - ii. Facility Supervisor;
 - iii. Local Fire Department;
 - iv. MassDEP spill report notification line;
 - v. MassDEP Regional Office;
 - vi. Hazardous Waste Compliance Assistance Line;
 - vii. Household Hazardous Products Hotline;
 - viii. Massachusetts Department of Fire Services;
 - ix. Licensed Site Professionals Information.

Attachments

1. Spill Response and Cleanup Contact List

SPILL RESPONSE AND CLEANUP CONTACT LIST

	Phone Number	Date and Time contacted
Safety Officer:		
Facility Supervisor:		
Fire Department:		
MassDEP 24-Hour Spill Reporting	(888)-304-1133	
MassDEP Regional Offices:		
Northeast Regional Office	(978) 694-3200	
Southeast Regional Office	(508) 946-2700	
Central Regional Office	(508) 792-7650	
Western Regional Office	(413) 784-1100	
Hazardous Waste Compliance Assistance Line	(617) 292-5898	
Household Hazardous Products Hotline	(800) 343-3420	
Massachusetts Department of Fire Services	(978) 567-3100 or (413) 587-3181	
Licensed Site Professionals Association (Wakefield, MA)	(781) 876-8915	
Licensed Site Professionals Board	(617) 556-1091	

STANDARD OPERATING PROCEDURE 7: FUEL AND OIL HANDLING PROCEDURES

Introduction

Spills, leaks, and overfilling can occur during handling of fuels and petroleum-based materials, even in small volumes, representing a potential source of stormwater pollution. This Standard Operating Procedure addresses a variety of ways by which fuels and petroleum-based materials can be delivered, as well as steps to be taken when petroleum products (such as waste oil) are loaded onto vehicles for offsite disposal or recycling. Delivery, unloading, and loading of waste oils are hereafter referred to as "handling".

For all manners of fuel and oil handling described below, a member of the facility's Pollution Prevention Team (or another knowledgeable person familiar with the facility) shall be present during handling procedures. This person shall ensure that the following are observed:

- 1. There is no smoking while fuel handling is in process or underway.
- 2. Sources of flame are kept away while fuel handling is being completed. This includes smoking, lighting matches, carrying any flame, or carrying a lighted cigar, pipe, or cigarette.
- 3. The delivery vehicle's hand brake is set and wheels are chocked while the activity is being completed.
- 4. Catch basins and drain manholes are adequately protected.
- 5. No tools are to be used that could damage fuel or oil containers or the delivery vehicle.
- 6. No flammable liquid shall be unloaded from any motor vehicle while the engine is operating, unless the engine of the motor vehicle is required to be used for the operation of a pump.
- 7. Local traffic does not interfere with fuel transfer operations.
- 8. The attending persons should watch for any leaks or spills
 - a. Any small leaks or spills should be immediately stopped, and spilled materials absorbed and disposed of properly. Refer to SOP 4, "Spill Response and Cleanup Procedures", for examples of spill cleanup and response materials.
 - b. In the event of a large spill or one that discharges to surface waters or an engineered storm drain system, the facility representative shall activate the facility's Stormwater Pollution Prevention Plan (SWPPP) and report the incident as specified within.

Delivery by Bulk (Tanker) Truck

Procedures for the delivery of bulk fuel shall include the following:

- 1. The truck driver shall check in with the facility upon arrival.
- 2. The facility representative shall ensure that the appropriate spill cleanup and response equipment and personal protective equipment are readily available and easily accessible.

Refer to SOP 4, "Spill Response and Cleanup Procedures", for examples of spill cleanup and response materials.

- 3. The facility representative shall check to ensure that the amount of delivery does not exceed the available capacity of the tank.
 - a. A level gauge can be used to verify the level in the tank.
 - b. If a level gauge is not functioning or is not present on the tank, the tank should be stick tested prior to filling.
- 4. The truck driver and the facility representative shall both remain with the vehicle during the delivery process.
- 5. The truck driver and the facility representative shall inspect all visible lines, connections, and valves for leaks.
- 6. When delivery is complete and the hoses are removed, buckets should be placed underneath connection points to catch drippings.
- 7. The delivery vehicle shall be inspected prior to departure to ensure that the hose is disconnected from the tank.
- 8. The facility representative shall inspect the fuel tank to verify that no leaks have occurred, or that any leaked or spilled material has been cleaned and disposed of properly.
- 9. The facility representative shall gauge tank levels to ensure that the proper amount of fuel is delivered, and collect a receipt from the truck driver.

Delivery of Drummed Materials

Drummed materials may include motor oil, hydraulic fluid, transmission fluid, or waste oil from another facility (as approved). Procedures for the delivery of drummed materials shall include the following:

- 1. The truck driver shall check in with the facility upon arrival.
- The facility representative shall ensure that the appropriate spill cleanup and response equipment and personal protective equipment are readily available and easily accessible. Refer to SOP 4, "Spill Response and Cleanup Procedures", for examples of spill cleanup and response materials.
- 3. The facility representative shall closely examine the shipment for damaged drums.
 - a. If damaged drums are found, they shall be closely inspected for leaks or punctures.
 - b. Breached drums should be removed to a dry, well-ventilated area and the contents transferred to other suitable containers.
 - c. Drums shall be disposed of in accordance with all applicable regulations.
- 4. Drummed materials shall not be unloaded outdoors during wet weather events.
- 5. The truck driver and the facility representative shall both remain with the vehicle during the delivery process.
- 6. Drums shall be handled and unloaded carefully to prevent damage.
- 7. Upon completion of unloading, the facility representative shall inspect the unloading point and the drums to verify that no leaks have occurred, that any leaked or spilled material has been cleaned up and disposed of properly, and that the unloaded drums are not leaking.
- 8. The facility representative shall check to ensure that the proper amount of fuel is delivered, and collect a receipt from the truck driver.

Delivery of Drummed Materials

When waste oil or similar oil products need to be removed from the premises, only haulers certified to transport waste oil should be utilized. Procedures for the draining of bulk oil tanks shall include the following:

- 1. The disposal truck driver shall check in with the facility upon arrival.
- The facility representative shall ensure that the appropriate spill cleanup and response equipment and personal protective equipment are readily available and easily accessible. Refer to SOP 4, "Spill Response and Cleanup Procedures", for examples of spill cleanup and response materials.
- 3. The facility representative shall verify that the volume of waste oil in the tank does not exceed the available capacity of the disposal hauler's vehicle.
- 4. The truck driver and the facility representative shall both remain with the vehicle during the tank draining process.
- 6. When draining is complete and the hoses are removed, buckets should be placed underneath connection points to catch drippings.
- 7. The disposal hauler vehicle shall be inspected prior to departure to ensure that the hose is disconnected from the tank.
- 8. The facility representative shall inspect the loading point and the tank to verify that no leaks have occurred, or that any leaked or spilled material has been cleaned up and disposed of properly.
- 9. The facility representative shall collect a receipt from the truck driver.

Attachments

1. Fuel Delivery Checklist

STANDARD OPERATING PROCEDURE 11: OIL/WATER SEPARATOR (OWS) MAINTENANCE

Introduction

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.

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.

General OWS Maintenance Requirements

- 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:

- 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

1. Quarterly OWS Inspection Checklist

OIL/WATER SEPARATOR (OWS) QUARTERLY INSPECTION CHECKLIST

	Are there any signs of spills or leaks in the general area?	Yes 🗌	No 🗌
Visual Inspection	Is there any evidence of petroleum bypassing the OWS?	Yes 🗌	No 🗌
Visual Inspection	Are there any unauthorized substances entering the OWS?	Yes 🗌	No 🗌
	Does the OWS exhibit any signs of leaks or malfunctions?	Yes 🗌	No 🗌

If you answered "Yes" to any of the above questions, further inspection, repair, and/or cleaning may be necessary.

	А	Distance from rim of access cover to bottom of structure
	В	Distance from rim of access cover to top of sludge layer
	$\mathbf{C} = \mathbf{A} - \mathbf{B}$	Depth of sludge layer
Measurements	D	Distance from rim of access cover to the oil/water interface
	Е	Distance from rim of access cover to the top of the liquid surface
	$\mathbf{F} = \mathbf{D} - \mathbf{E}$	Depth of oil layer

If the values for "C" and/or "F" are greater than those in the manufacturer's recommendations, the OWS must be cleaned by a licensed OWS maintenance company.



APPENDIX B

Spill Documentation Forms

Significant Spills, Leaks or Other Releases

Instructions:

- Include the descriptions and dates of any incidences of significant spills, leaks, or other releases that
 resulted in discharges of pollutants to waters of the U.S., through stormwater or otherwise; the
 circumstances leading to the release and actions taken in response to the release; and measures taken to
 prevent the recurrence of such releases.
- Provide information, as shown below, for each incident, and attach additional documentation (e.g., photos, spill cleanup records) as necessary. Repeat as necessary by copying and pasting the fields below.

Date of incident: Insert Date of Incident Location of incident: Insert Location of Incident Description of incident: Insert Description of Incident Circumstances leading to release: Describe circumstances leading to release Actions taken in response to release: Describe actions taken in response to release Measures taken to prevent recurrence: Describe measures taken to prevent recurrence

Date of incident: Insert Date of Incident Location of incident: Insert Location of Incident Description of incident: Insert Description of Incident Circumstances leading to release: Describe circumstances leading to release Actions taken in response to release: Describe actions taken in response to release Measures taken to prevent recurrence: Describe measures taken to prevent recurrence

Date of incident: Insert Date of Incident Location of incident: Insert Location of Incident Description of incident: Insert Description of Incident Circumstances leading to release: Describe circumstances leading to release Actions taken in response to release: Describe actions taken in response to release Measures taken to prevent recurrence: Describe measures taken to prevent recurrence

Date of incident: Insert Date of Incident Location of incident: Insert Location of Incident Description of incident: Insert Description of Incident Circumstances leading to release: Describe circumstances leading to release Actions taken in response to release: Describe actions taken in response to release Measures taken to prevent recurrence: Describe measures taken to prevent recurrence





APPENDIX C

Training Documentation and Attendance Sheets

Employee Training

Instructions:

- Keep records of employee training, including the date of the training.
- For in-person training, consider using the tables below to document your employee trainings. For computer-based or other types of training, keep similar records on who was trained and the type of training conducted.

Training Date: Insert Date of Training				
Training Description (including duration and s	ubjects covered): Insert Description of Training			
Trainer: Insert Trainer(s) names				
Employee(s) trained	Employee signature			
Insert Name				
Insert Name	Insert Name			

Training Date: Insert Date of Training				
Training Description (including duration and	Training Description (including duration and subjects covered): Insert Description of Training			
Trainer: Insert Trainer(s) names	Trainer: Insert Trainer(s) names			
Employee(s) trained	Employee signature			
Insert Name				

Training Date: Insert Date of Training				
Training Description (including duration and s	ubjects covered): Insert Description of Training			
Trainer: Insert Trainer(s) names				
Employee(s) trained	Employee signature			
Insert Name				





APPENDIX D

Facility Inspection Form

Site Inspection Reports

Instructions:

- Include in your records copies of all routine facility inspection reports completed for the facility.
- The sample inspection report is consistent with the requirements in the 2016 Massachusetts MS4 Permit relating to site inspections. If MassDEP provides you with an inspection report, use that form.

Using the Sample Site Inspection Report

- This inspection report is designed to be customized according to the specific control measures and
 activities at your facility. For ease of use, you should take a copy of your site plan and number all of the
 stormwater control measures and areas of industrial activity that will be inspected. A brief description of
 the control measures and areas that were inspected should then be listed in the site-specific section of the
 inspection report.
- You can complete the items in the "General Information" section that will remain constant, such as the facility name and inspector (if you only use one inspector). Print out multiple copies of this customized inspection report to use during your inspections.
- When conducting the inspection, walk the site by following your site map and numbered control
 measures/areas of industrial activity to be inspected. Also note whether the "Areas of Materials or
 Activities exposed to stormwater" have been addressed (customize this list according to the conditions at
 your facility). Note any required corrective actions and the date and responsible person for the correction.





	Stormwater Site inspection Report					
General Information						
	ity Name		Insert Name			
Date	of Inspection	Insert Date	Insert Date Start/End Time Insert Start/End Time			
Inspe	ector's Name(s)	Insert Name				
Inspe	ector's Title(s)	Insert Title				
Inspe	ector's Contact Information	Insert Conta	act Info			
Inspe	ector's Qualifications	Insert qualif	ications or add refe	rence to the SWPPP		
		We	ather Information			
Cl Ot	her:	□ Sleet □ Te	emperature:	I High Winds since the last inspection? □Yes □No		
If yes Are t	s, describe: Describe there any discharges occurr s, describe: Describe		-	-		
l n r • 1	ist them below (add as many numbered site map with you o required control measures at	control measure. luring your inspe your facility.	s as are implemented actions. This list will	our SWPPP on your site map and on-site). Carry a copy of the ensure that you are inspecting all person that completed the work in		
	Structural Control Measure	Control Measure is Operating Effectively?	If No, In Need of Maintenance, Repair, or Replacement?	Corrective Action Needed and Notes (identify needed maintenance and repairs, or any failed control measures that need replacement)		
1	Insert Control Measure Name	□Yes □No	MaintenanceRepairReplacement	Describe Corrective Actions		
2	Insert Control Measure Name	□Yes □No	 Maintenance Repair Replacement 	Describe Corrective Actions		
3	Insert Control Measure Name	□Yes □No	MaintenanceRepairReplacement	Describe Corrective Actions		
4	Insert Control Measure Name	□Yes □No	 Maintenance Repair Replacement 	Describe Corrective Actions		
5	Insert Control Measure Name	□Yes □No	 Maintenance Repair Replacement 	Describe Corrective Actions		
6	Insert Control Measure Name	□Yes □No	MaintenanceRepairReplacement	Describe Corrective Actions		
7	Insert Control Measure	□Yes □No	□ Maintenance	Describe Corrective Actions		







	Structural Control	Control	If No, In Need of	Corrective Action Needed and Notes
	Measure	Measure is	Maintenance,	(identify needed maintenance and repairs, or
		Operating	Repair, or	any failed control measures that need
		Effectively?	Replacement?	replacement)
	Name		Repair	
			Replacement	
8	Insert Control Measure	□Yes □No	Maintenance	Describe Corrective Actions
	Name		Repair	
	Nume		Replacement	
9	Insert Control Measure	□Yes □No	Maintenance	Describe Corrective Actions
	Name		Repair	
	Nume		Replacement	
10	Insert Control Measure	□Yes □No	□ Maintenance	Describe Corrective Actions
	Name		🗖 Repair	
	Truino		Replacement	

Areas of Materials or Activities exposed to stormwater

Below are some general areas that should be assessed during routine inspections. Customize this list as needed for the specific types of materials or activities at your facility.

	Area/Activity	Inspected?	Controls Adequate (appropriate, effective, and operating)?	Corrective Action Needed and Notes
1	Material loading/unloading and storage areas	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
2	Equipment operations and maintenance areas	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
3	Fueling areas	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
4	Outdoor vehicle and equipment washing areas	Yes No N/A	□Yes □No	Describe Corrective Actions
5	Waste handling and disposal areas	Yes No N/A	□Yes □No	Describe Corrective Actions
6	Erodible areas/construction	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
7	Non-stormwater/ illicit connections	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
8	Salt storage piles or pile containing salt	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
9	Dust generation and vehicle tracking	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
10	(Other)	□Yes □No □N/A	Yes No	Describe Corrective Actions





	Area/Activity	Inspected?	Controls Adequate (appropriate, effective, and operating)?	Corrective Action Needed and Notes
11	(Other)	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions
12	(Other)	□Yes □No □ N/A	□Yes □No	Describe Corrective Actions

Non-Compliance

Describe any incidents of non-compliance observed and not described above: Describe Non-compliance

Additional Control Measures

Describe any additional control measures or changes to the SWPPP needed to comply with the permit requirements: Describe Additional Controls Needed

Notes





Use this space for any additional notes or observations from the inspection: **Additional Notes**

Print inspector name and title:

Signature:_____Date:_____





Quarterly Visual Assessment Reports – additional form when stormwater discharge is occurring

Instructions:

- Include in your records copies of all quarterly visual assessment reports completed for the facility. An
 example quarterly visual assessment report can be found on the following page.
- At least one quarterly inspection per year must occur while stormwater is discharging.





Quarterly Visual Assessment Form- additional form when stormwater discharge is occurring (Complete a separate form for each outfall you assess)					
Name of Facility: Name of Facility Outfall Name: Name "Substantially Iden					
Person(s)/Title(s) collecting sample: Name/Title					
Person(s)/Title(s) examining sample: Name/Title					
Date & Time Discharge Began (approx.): Enter date and time	Date & Time Visual Sample Collec Enter date and time	ted: Date & Time Visual Sample Examined: Enter date and time			
Nature of Discharge: 🗌 Rainfall 📃 Snowmel	t				
	Parameter				
Parameter Color None Other (describe): Odor Musty Sewage Sulfur Sour Solvents Other (describe): Other (describe): Clarity Clear Slightly Cloudy Cloudy Opaque Floating Solids No Yes (describe): Settled Solids* No Yes (describe): Suspended Solids No Yes (describe): Foam (gently shake sample) No Yes (describe): Oil Sheen Flecks Globs Sheen Other (describe): Other (describe): Other (describe): Other Obvious Indicators No Yes (describe):					
* Observe for settled solids after allowing the sample to sit for	* Observe for settled solids after allowing the sample to sit for approximately one-half hour.				
Detail any concerns, additional comments, descriptions of pictures taken, and any corrective actions taken below (attach additional sheets as necessary). Insert details					
A. Name:	В.	Fitle:			
C. Signature:	D. 1	Date Signed:			







1900 Crown Colony Drive, Suite 402 Quincy, MA 02169 P: 617.657.0200 F: 617.657.0201

envpartners.com



November 22, 2019

Mr. Victor Diniak Director, Public Works Town of Hanover 40 Pond Street Hanover, MA 02339

RE: NPDES Phase II Stormwater Assistance Pollution Prevention & Good Housekeeping for Municipal Operations Municipal Facility Audit Report

Dear Mr. Diniak,

In accordance with our January 17, 2019 Agreement for engineering services, Environmental Partners (EP) is forwarding this report on our audit of municipal facilities for compliance with the Town of Hanover'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 May 20, May 23, and May 28, EP performed facility audits at thirty (30) municipal facilities owned and operated by the Town of Hanover within the MS4 Regulated Area, shown on Figure 1.

These included:

- 1. Fire Department HQ
- 2. Town Hall
- 3. John Curtis Free Library
- 4. Council on Aging
- 5. Fire Station #1
- 6. Fire Station #2
- 7. Forge Pond Park
- 8. DPW Garage
- 9. DPW Maintenance Garage
- 10. DPW Storage Yard
- 11. Facility Garage
- 12. Transfer Station
- 13. Police Station
- 14. Broadway Water Treatment Facility
- 15. Philip C. Beal Water Treatment Facility

- 16. Pond Street Water Treatment Facility
- 17. Broadway Well Building #1
- 18. Broadway Well Building #2
- 19. Philip C. Beal Well Building #1
- 20. Philip C. Beal Well Building #2
- 21. Hanover Street Well Building #1
- 22. Hanover Street Well Building #2
- 23. Pond Street Well Building #1
- 24. Pond Street Well Building #2
- 25. Pond Street Well Building #3
- 26. Hanover Street Well Backup Generator
- 27. Center School
- 28. Hanover Middle School
- 29. Hanover High School
- 30. Cedar 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 in the Town of Hanover 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 Hanover 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.

Sincerely,

Environmental Partners Group, Inc. Ann Marie Petricca, C.P.G. Director of Geosciences P: 617.657.0299 E: amp@envpartners.com

Ven Lunk

Environmental Partners Group, Inc. Vern S. Lincoln Project Scientist P: 617.657.0275 E: vsl@envpartners.com

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

Certification

Authorized Representative (Optional): All reports, including SWPPPs, inspection reports, annual reports, monitoring reports, reports on training and other information required by this permit must be signed by a person described in Appendix B, Subsection 11.A or by a duly authorized representative of that person in accordance with Appendix B, Subsection 11.B. If there is an authorized representative to sign MS4 reports, there must be a signed and dated written authorization.

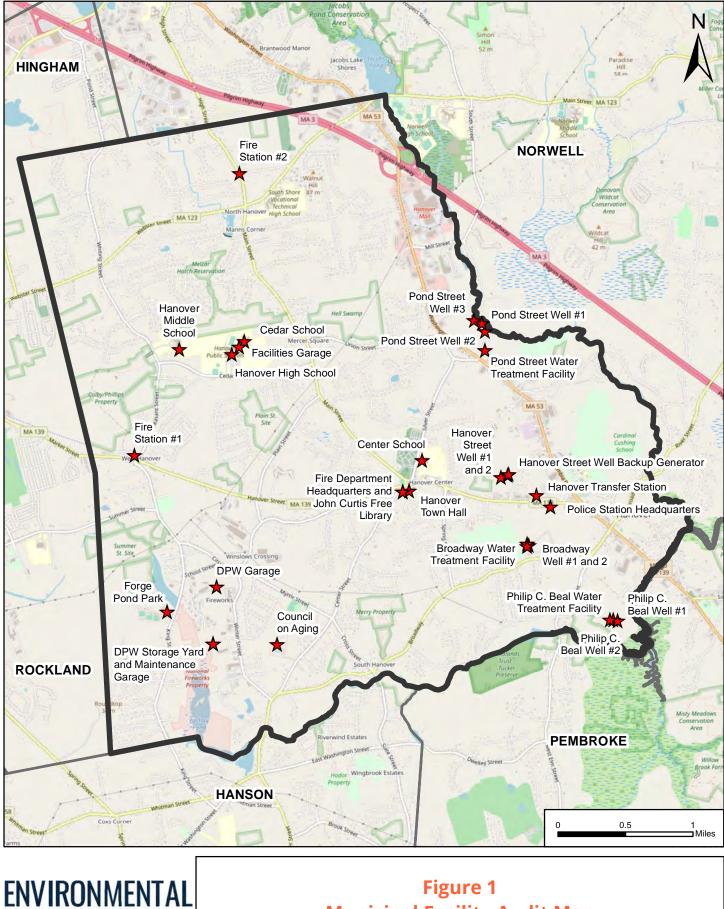
The authorization letter is:

□ Publicly available at the website below

"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	Ann Las	
Signature	J- hu	Date 9-25-2025

Facility Inventory Hanover, MA November 2019



PARTNERS

Figure 1 Municipal Facility Audit Map Town of Hanover, MA

I:\Hanover.102\Stormwater\102-1901 FY2019 Stormwater\5. Facility Audit\Report\Figures\Municipal Facility Audit Map.mxd

Appendix A:

Municipal Facility Audit Summary



Town of Hanover, 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
Police Station	129 Rockland Street	Public Safety	May 20, 2019	Floor drains in boiler room and bathrooms, discharge to septic. Floor drain in garage, unconfirmed discharge location.	Uncapped 55-gallon drums of waste hydraulic fluid stored outside, uncovered.	Confirm hazardous waste generator status and label/store waste oil and other chemicals in accordance with EPA requirements and DEP guidelines (guidelines attached as Appendix D).	Store gasoline containers in flammable cabinet in shed.
Fire Department HQ	32 Center Street	Public Safety	May 20, 2019	Floor drains in truck bay, discharges to tight tank. Floor drains in locker room and furnace room, discharge to septic.	Dumpster uncovered.	Keep dumpster covers closed to minimize runoff to storm drains.	Organize chemicals and store neatly to avoid spills Gas cans/flammables should be stored in a flammables storage locker.
Council on Aging	60 Stockbridge Road	Recreation	May 20, 2019	Floor draings in boiler room, bathrooms, and kitchen. Discharge to septic.	Dumpster uncovered.	Keep dumpster covers closed to minimize runoff to storm drains.	Organize chemicals and store neatly to avoid spills Gas cans/flammables should be stored in a flammables storage locker.
John Curtis Free Library	32 Center Street	Library	May 20, 2019	Floor drains in bathrooms and boiler room. Discharge to septic.	None	None	None
Town Hall	550 Hanover Street	Iunicipal Administratio	May 20, 2019	Floor drains in bathrooms and boiler room. Discharge to septic.	None	None	Organize chemicals and store neatly to avoid spills Gas cans/flammables should be stored in a flammables storage locker.
Fire Station #1	925 Circuit Street	Public Safety	May 22, 2019	Floor drain in truck bay. Discharge to tight tank.	None	None	None
Fire Station #2	1161 Main Street	Public Safety	May 22, 2019	Floor drain in truck bay. Discharge to tight tank.	None	None	None
Forge Pond Park	241 King Street	Recreation	May 22, 2019	Floor drains in bathrooms, kitchen, and boiler room. Discharge to septic.	None	None	None
DPW Garage	416 Circuit Street	DPW Operations	May 23, 2019	Floor drain in bathroom to septic. Floor drain in garage to tight tank.	None	None	None
DPW Maintenance Garage	229 Ames Way	DPW Operations	May 23, 2019	Floor drains in bathroom and service bay, discharge to tight tank.	Oil and hazardous waste storage.	Confirm hazardous waste generator status and label/store waste oil and other chemicals in accordance with EPA requirements and DEP guidelines (guidelines attached as Appendix D).	Organize chemicals and store neatly to avoid spills Gas cans/flammables should be stored in a flammables storage locker. Dispose of empty drums that are currently stored outside.
DPW Storage Yard	229 Ames Way	DPW Operations	May 23, 2019	None	Single catchbasin collects runoff from salt pile, catchbasin cleanings, and street sweepings. This discharges to nearby stream.	New storm drainage and updated storage solutions need to be developed.	None
Facility Garage	265 Cedar Street	DPW Operations	May 23, 2019	None	None	None	Organize chemicals and store neatly to avoid spills. Gas cans/flammables should be stored in a flammables storage locker.
Transfer Station	90 Rockland Street	DPW Operations	May 23, 2019	None	Waste oil and anti-freeze containers uncovered. Used oil drums and batteries stored outside, uncovered. Salt pile uncovered and dumpsters with no covers.	Cover oil, chemical,and anti-freeze containers and place in secondary containment. Confirm hazardous waste generator status and label/store waste oil and other chemicals in accordance with EPA requirements and DEP guidelines (guidelines attached as Appendix D).	
Broadway Water Treatment Facility	507 Broadway Street	DPW Operations	May 23, 2019	Floor drains discharge to tight tank.	None	None	None
Philip C. Beal Water Treatment Plant	100 Riverside Drive	DPW Operations	May 23, 2019	Floor drains discharge to tight tank.	None	None	None
Pond Street Water Treatment Facility	40 Pond Street	DPW Operations	May 23, 2019	Floor drains discharge to tight tank.	None	None	None
Broadway Well #1	507 Broadway Street	DPW Operations	May 23, 2019	Sump discharge outside building.	None	None	None
	•			•			





Town of Hanover, 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
Broadway Well #2	507 Broadway Street	DPW Operations	May 23, 2019	Sump discharge outside building.	None	None	None
Philip C. Beal Well #1	100 Riverside Drive	DPW Operations	May 23, 2019	None	None	None	None
Philip C. Beal Well #2	100 Riverside Drive	DPW Operations	May 23, 2019	None	None	None	None
Hanover Street Well #1	121 Hanover Street	DPW Operations	May 23, 2019	None	None	None	None
Hanover Street Well #2	121 Hanover Street	DPW Operations	May 23, 2019	None	None	None	None
Hanover Street Well Backup Generator	121 Hanover Street	DPW Operations	May 23, 2019	None	None	None	None
Pond Street Well #1	87 Pond Street	DPW Operations	May 23, 2019	Sump discharge outside building.	None	None	None
Pond Street Well #2	87 Pond Street	DPW Operations	May 23, 2019	Sump discharge outside building.	None	None	None
Pond Street Well #3	87 Pond Street	DPW Operations	May 23, 2019	Sump discharge outside building.	None	None	None
Center School	65 Silver Street	School	May 28, 2019	Floor drains in boiler room, bathrooms, and kitchen. Discharge to septic.	Dumpster uncovered.	Keep dumpster covers closed to minimize runoff to storm drains.	Organize chemicals and store neatly to avoid spills. Gas cans/flammables should be stored in a flammables storage locker.
Hanover Middle School	45 Whiting Street	School	May 28, 2019	Floor drains in boiler room, kitchen, bathrooms, and locker rooms. Discharge to septic.	None	None	None
Hanover High School	287 Cedar Street	School	May 28, 2019	Floor drains in kitchen, bathrooms, boiler room, and concession building. Discharge to septic.	None	None	None
Cedar School	265 Cedar Street	School	May 28, 2019	Floor drains in kitchen, boiler room, and bathrooms. 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

Well Building, Broadway Well #1

Clinet	
General	
Location	42.1099485, -70.8271085
Updated	2019-10-17 10:53:28 EDT by Vern Lincoln
Created	2019-05-23 09:21:21 EDT by Vern Lincoln

Inspections	
Facility Name	Broadway Well #1
Facility Type	Well Building
Address	507 Broadway Hanover, Massachusetts 02339
Time	09:21
Date	2019-05-23
Client	Town of Hanover

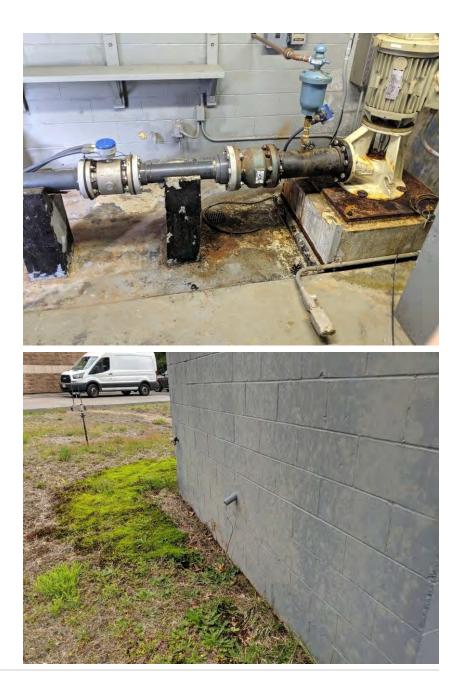
No

Main Inspection

Observed Instance of Non-Conformance



Photos





DPW, DPW Storage Yard

Created	2019-05-23 10:35:23 EDT by Vern Lincoln
Updated	2019-10-17 10:52:23 EDT by Vern Lincoln
Location	42.0996831, -70.8726532

General

Client	Town of Hanover
Date	2019-05-23
Time	10:35
Address	229 Ames Way Hanover, Massachusetts 02339
Facility Type	DPW
Facility Name	DPW Storage Yard

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos

Yes









































Transfer Station, Hanover Transfer Station

Created	2019-05-23 09:53:33 EDT by Vern Lincoln
Updated	2019-10-17 10:54:07 EDT by Vern Lincoln
Location	42.115318, -70.8259386

General

Centeral	
Client	Town of Hanover
Date	2019-05-23
Time	09:53
Address	90 Rockland Street Hanover, Massachusetts 02339
Facility Type	Transfer Station
Facility Name	Hanover Transfer Station

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos

Yes























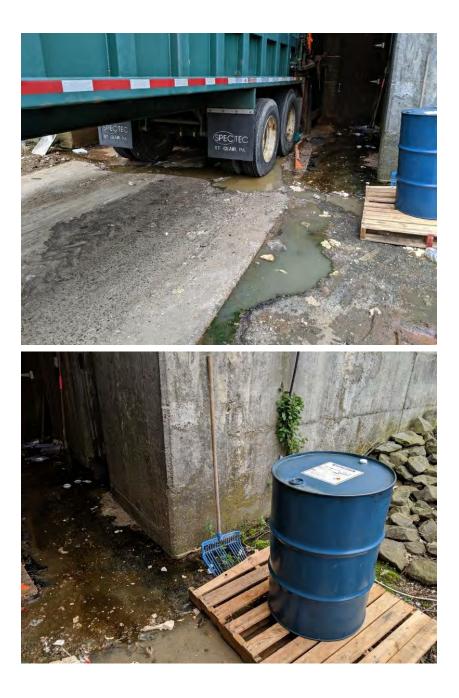










































Well Building, Pond Street Well #3

Created	2019-05-23 08:52:25 EDT by Vern Lincoln
Updated	2019-10-17 10:55:31 EDT by Vern Lincoln
Location	42.1340904, -70.8347582

General

Client	Town of Hanover
Date	2019-05-23
Time	08:52
Address	1 White Violet Lane Plymouth, Massachusetts 02360
Facility Type	Well Building
Facility Name	Pond Street Well #3

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos

No













School, Center School

Created	2019-05-28 12:55:45 EDT by Vern Lincoln
Updated	2019-10-17 10:57:18 EDT by Vern Lincoln
Location	42.119144, -70.8423569

General

Client	Town of Hanover
Date	2019-05-28
Time	12:55
Address	65 Silver Street Hanover, Massachusetts 02339
Facility Type	School
Facility Name	Center School

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos

No





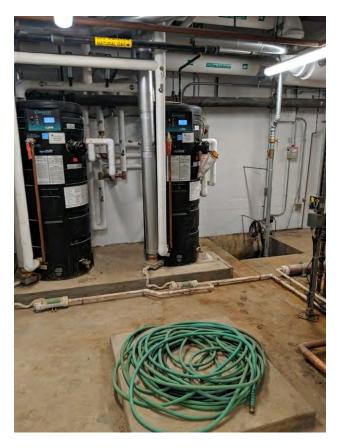


drains to septic





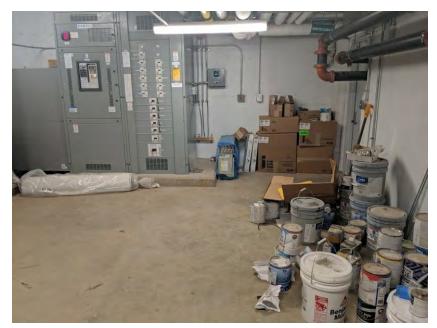
storm

















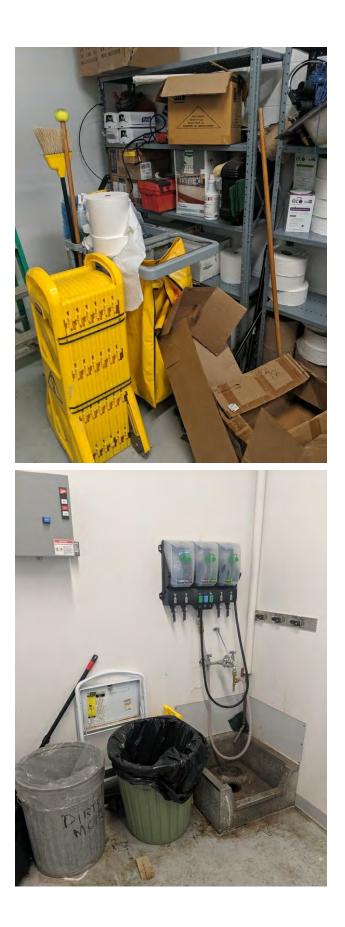










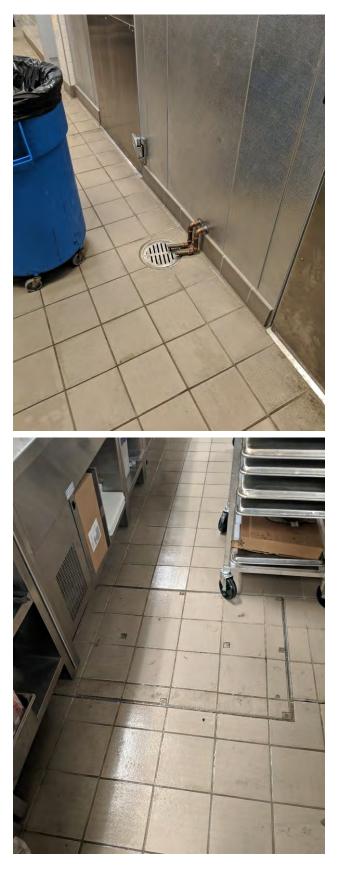






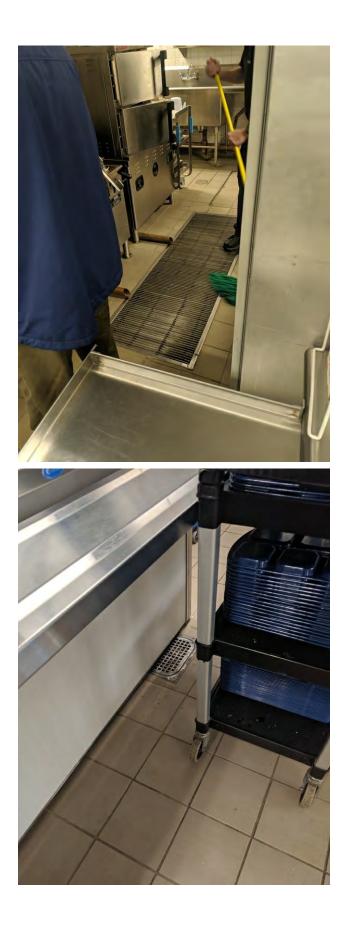
near door leading outside, sloped down





grease trap





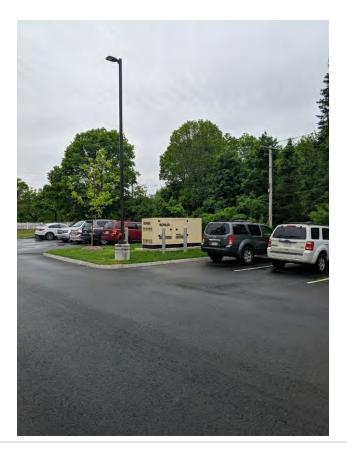














Well Building, Pond Street Well #2

Created	2019-05-23 08:49:47 EDT by Vern Lincoln
Updated	2019-10-17 10:55:22 EDT by Vern Lincoln
Location	42.133803, -70.8335789

General

Client	Town of Hanover
Date	2019-05-23
Time	08:49
Address	95 Pond Street Hanover, Massachusetts 02339
Facility Type	Well Building
Facility Name	Pond Street Well #2

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos













Town Hall, Hanover Town Hall

Created	2019-05-20 08:56:24 EDT by Vern Lincoln
Updated	2019-10-17 10:52:57 EDT by Vern Lincoln
Location	42.1159198, -70.8443108

General

Client	Town of Hanover
Date	2019-05-20
Time	08:56
Address	550 Hanover Street Hanover, Massachusetts 02339
Facility Type	Town Hall
Facility Name	Hanover Town Hall

Inspections

Main Inspection

Observed Instance of Non-Conformance

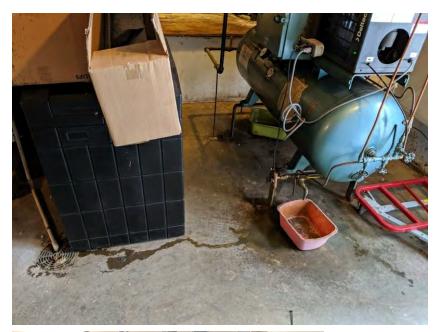
Photos





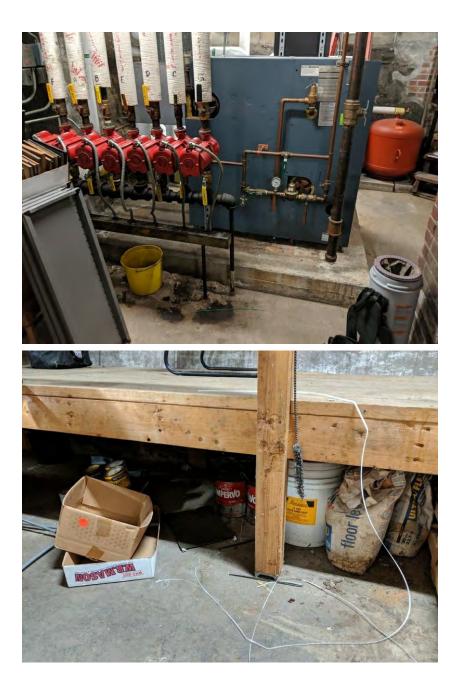
























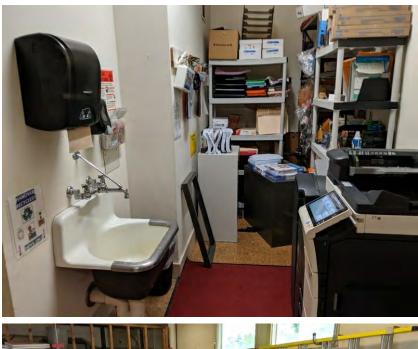






























Fire Station, Fire Station #1

Created	2019-05-22 09:37:02 EDT by Vern Lincoln
Updated	2019-10-17 10:52:04 EDT by Vern Lincoln
Location	42.1199377, -70.8837872

General

Client	Town of Hanover
Date	2019-05-22
Time	09:37
Address	925 Circuit Street Hanover, Massachusetts 02339
Facility Type	Fire Station
Facility Name	Fire Station #1

Inspections

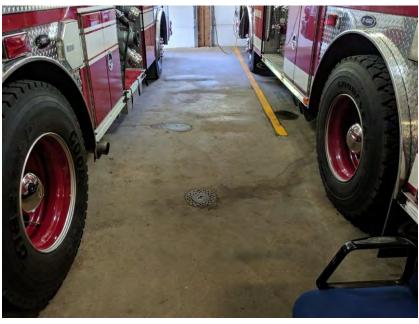
Main Inspection

Observed Instance of Non-Conformance

Photos



















School, Cedar School

Created	2019-05-28 13:57:52 EDT by Vern Lincoln
Updated	2019-10-17 10:57:25 EDT by Vern Lincoln
Location	42.1320394, -70.867873

General

Client	Town of Hanover
Date	2019-05-28
Time	13:57
Address	265 Cedar Street Hanover, Massachusetts 02339
Facility Type	School
Facility Name	Cedar School

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos







kitchen floor drain



grease trap in kitchen, dish washer

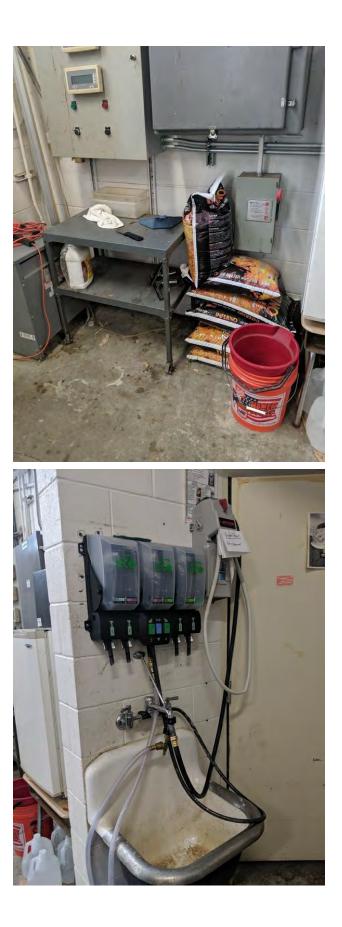






































Well Building, Pond Street Well #1

Created	2019-05-23 08:46:06 EDT by Vern Lincoln
Updated	2019-10-17 10:55:13 EDT by Vern Lincoln
Location	42.1329115, -70.8332084

General

Client	Town of Hanover
Date	2019-05-23
Time	08:46
Address	87 Pond Street Hanover, Massachusetts 02339
Facility Type	Well Building
Facility Name	Pond Street Well #1

Inspections

Main Inspection

Observed Instance of Non-Conformance

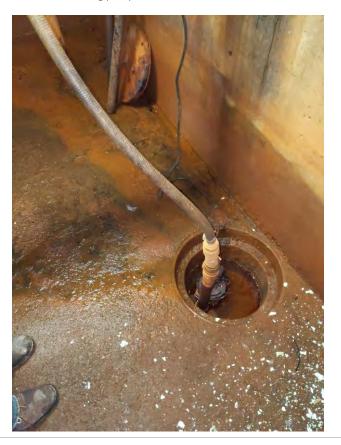
Photos







Water from cooling pump





Police Station, Police Station Headquarters

Created	2019-05-20 10:12:16 EDT by Vern Lincoln
Updated	2019-10-17 10:52:49 EDT by Vern Lincoln
Location	42.1140447, -70.8239344

General

Cerreran	
Client	Town of Hanover
Date	2019-05-20
Time	10:12
Address	129 Rockland Street Hanover, Massachusetts 02339
Facility Type	Police Station
Facility Name	Police Station Headquarters

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos

Yes





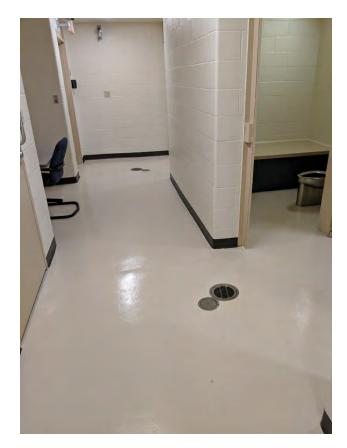












Cell drains





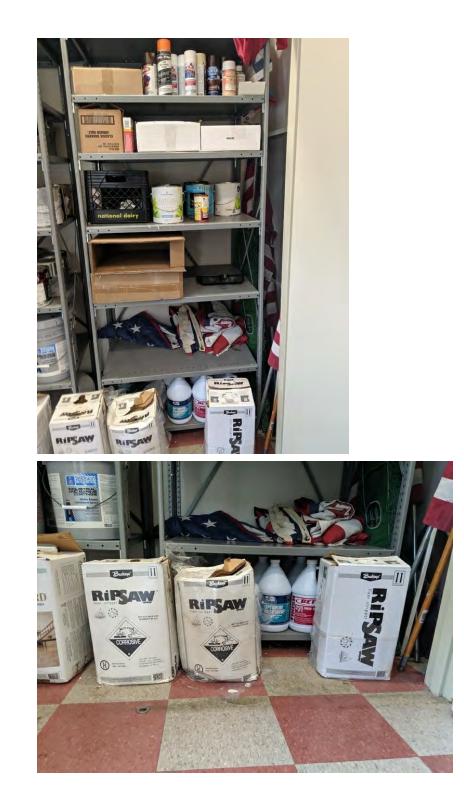










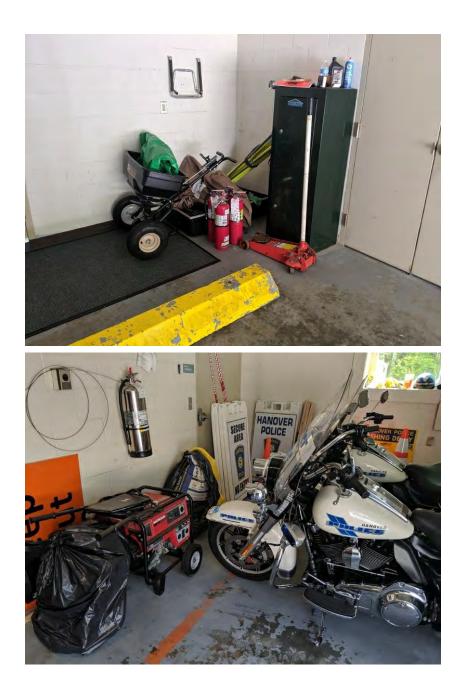






















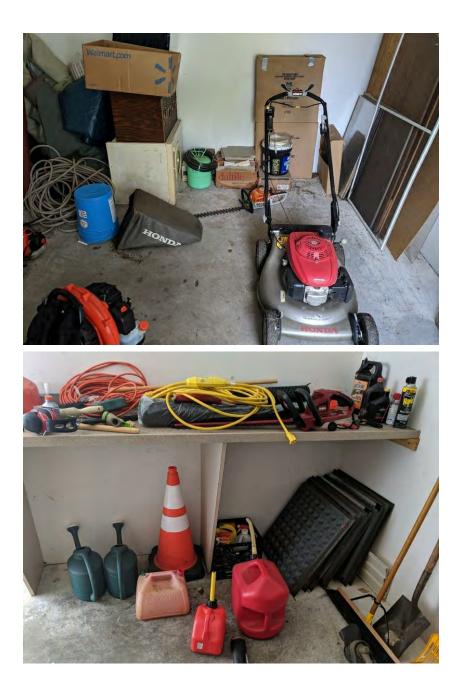


















Well Building, Philip C. Beal Well #2

Created	2019-05-23 09:42:01 EDT by Vern Lincoln
Updated	2019-10-17 10:55:45 EDT by Vern Lincoln
Location	42.1017822, -70.8144234

General

Client	Town of Hanover
Date	2019-05-23
Time	09:42
Address	100 Riverside Drive Hanover, Massachusetts 02339
Facility Type	Well Building
Facility Name	Philip C. Beal Well #2

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos





Well Building, Philip C. Beal Well #1

Created	2019-05-23 09:40:05 EDT by Vern Lincoln
Updated	2019-10-17 10:53:43 EDT by Vern Lincoln
Location	42.1018645, -70.8150543

General

Client	Town of Hanover
Date	2019-05-23
Time	09:40
Address	100 Riverside Drive Hanover, Massachusetts 02339
Facility Type	Well Building
Facility Name	Philip C. Beal Well #1

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos





Well Building, Hanover Street Well #2 - Not in Use

Created	2019-05-23 09:04:54 EDT by Vern Lincoln
Updated	2019-10-17 10:53:58 EDT by Vern Lincoln
	-
Location	42.1174861, -70.830087
General	
Client	Town of Hanover
Date	2019-05-23
Time	09:04
Address	149 Hanover Street
	Hanover, Massachusetts 02339
Facility Type	Well Building
Facility Name	Hanover Street Well #2 - Not in Use
Inspections	
Main Inspection	
Observed Instance of Non-Conformance	No



Photos





Library, John Curtis Free Library

Created	2019-05-20 09:56:48 EDT by Vern Lincoln
Updated	2019-10-17 10:51:23 EDT by Vern Lincoln
Location	42.1157745, -70.8451797

General

Client	Town of Hanover
Date	2019-05-20
Time	09:56
Address	32 Center Street Hanover, Massachusetts 02339
Facility Type	Library
Facility Name	John Curtis Free Library

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos



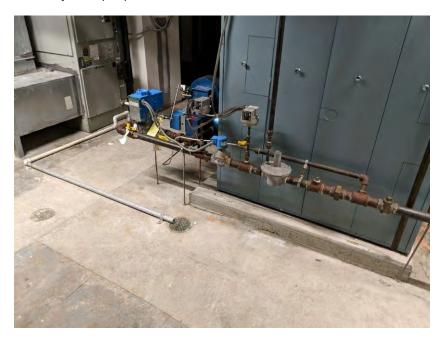




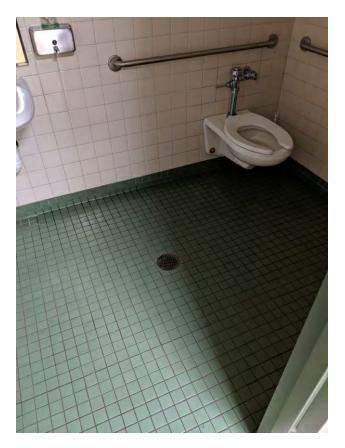




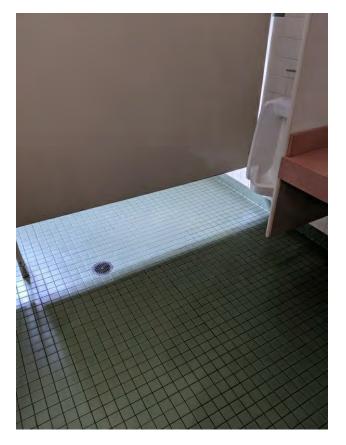
Elevator hydraulic pump







Staff restroom



1st floor bathroom













Council on Aging, Council on Aging

Created	2019-05-20 10:46:36 EDT by Vern Lincoln
Updated	2019-10-17 10:52:37 EDT by Vern Lincoln
Location	42.0995372, -70.8634367

General

Client	Town of Hanover
Date	2019-05-20
Time	10:46
Address	60 Stockbridge Road Hanover, Massachusetts 02339
Facility Type	Council on Aging
Facility Name	Council on Aging

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos



























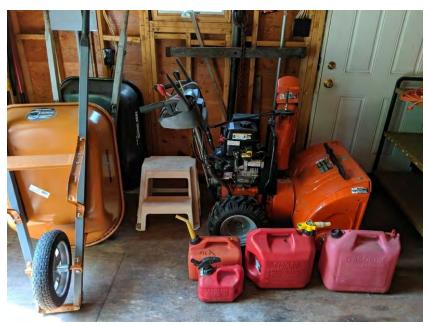


attic floor drain for condensation

















DPW, DPW Garage

Created	2019-05-23 10:16:33 EDT by Vern Lincoln
Updated	2019-10-17 10:55:53 EDT by Vern Lincoln
Location	42.1073761, -70.8692391

General

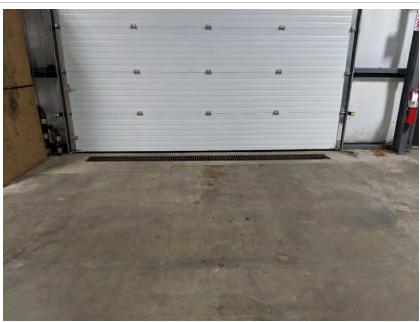
Client	Town of Hanover
Date	2019-05-23
Time	10:16
Address	416 Circuit Street Hanover, Massachusetts 02339
Facility Type	DPW
Facility Name	DPW Garage

Inspections

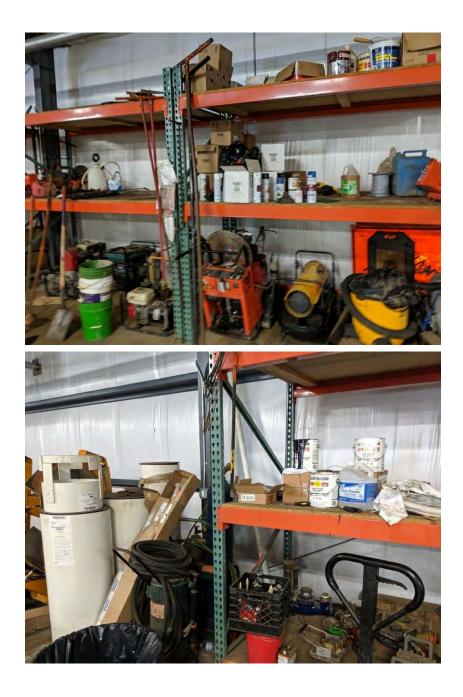
Main Inspection

Observed Instance of Non-Conformance

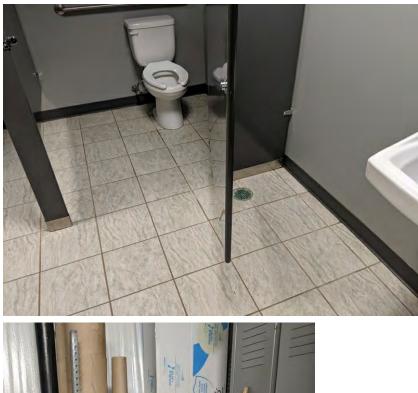
Photos





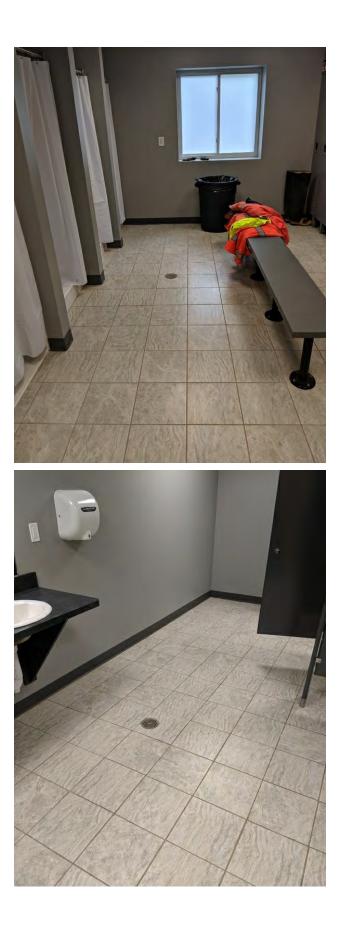




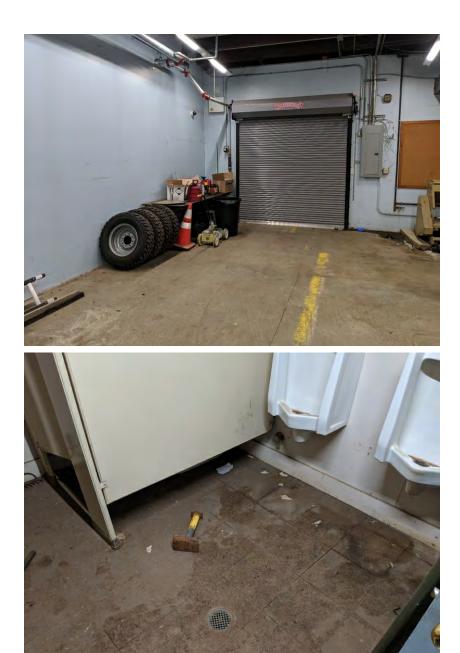








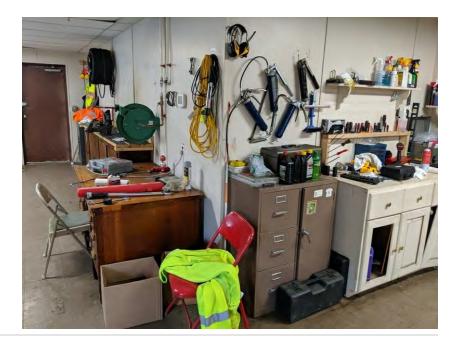














Facility Garage

Created	2019-05-28 15:55:48 EDT by Vern Lincoln
Updated	2019-05-28 15:59:11 EDT by Vern Lincoln
Location	42.1314476, -70.8686006

General

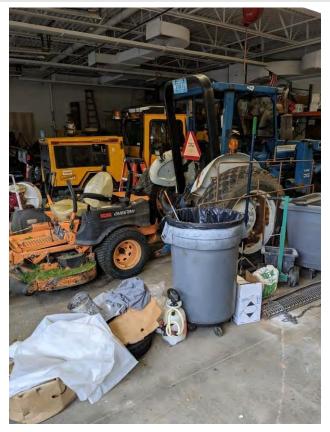
Client	Town of Hanover
Date	2019-05-28
Time	15:55
Address	265 Cedar Street Hanover, Massachusetts 02339
Facility Type	Facility Garage

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos



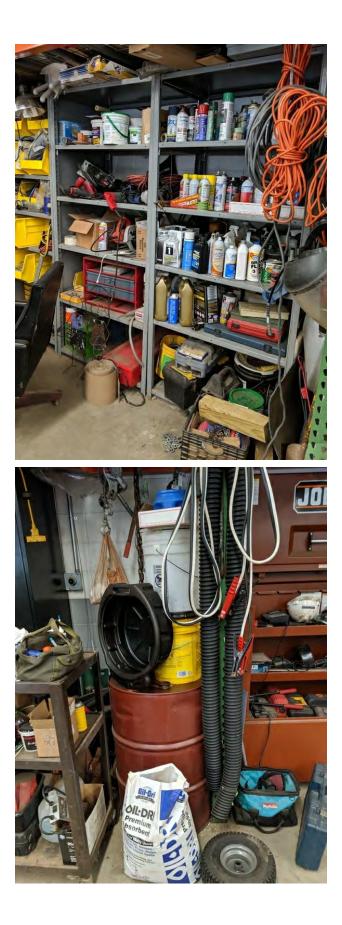


















Well Building, Hanover Street Well #1

Created	2019-05-23 09:01:28 EDT by Vern Lincoln
Updated	2019-10-17 10:58:25 EDT by Vern Lincoln
Location	42.1172397, -70.8310435
General	
Client	Town of Hanover
Date	2019-05-23
Time	09:01
Address	121 Hanover Street Hanover, Massachusetts 02339
Facility Type	Well Building
Facility Name	Hanover Street Well #1
Inspections	
Main Inspection	
Observed Instance of Non-Conformance	No



Photos





Water Treatment Plant, Philip C. Beal Water Treatment Facility

Created	2019-05-23 09:36:13 EDT by Vern Lincoln
Updated	2019-10-17 10:58:14 EDT by Vern Lincoln
Location	42.1019227, -70.815524

General

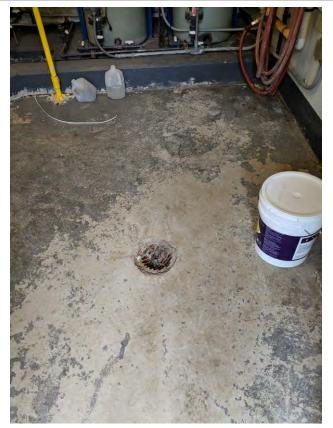
General	
Client	Town of Hanover
Date	2019-05-23
Time	09:36
Address	100 Riverside Drive Hanover, Massachusetts 02339
Facility Type	Water Treatment Plant
Facility Name	Philip C. Beal Water Treatment Facility

Inspections

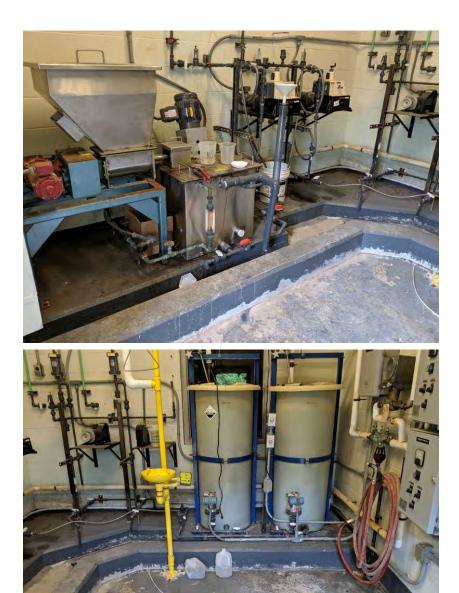
Main Inspection

Observed Instance of Non-Conformance

Photos











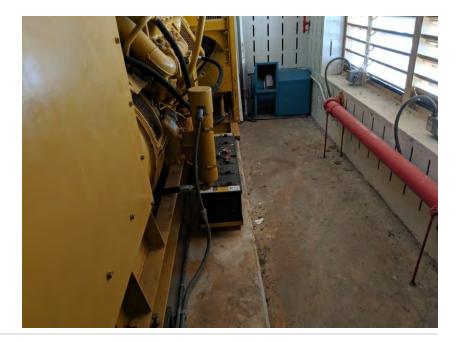














School, Hanover Middle School

Created	2019-05-28 14:32:47 EDT by Vern Lincoln
Updated	2019-10-17 10:57:42 EDT by Vern Lincoln
Location	42.1312504, -70.8772114

General

Client	Town of Hanover
Date	2019-05-28
Time	14:32
Address	45 Whiting Street Hanover, Massachusetts 02339
Facility Type	School
Facility Name	Hanover Middle School

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos











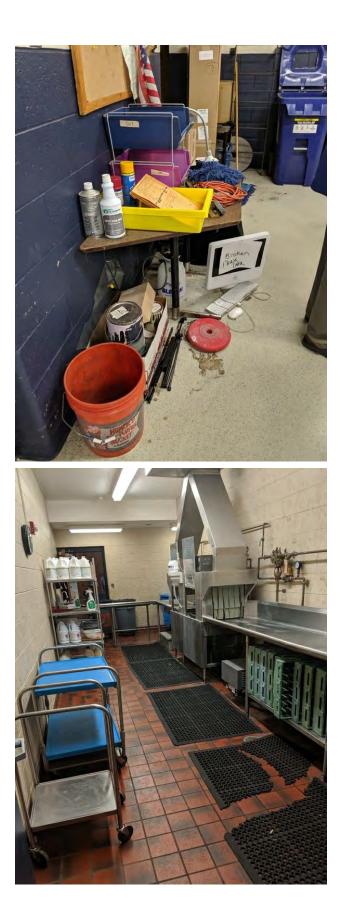


































Park, Forge Pond Park

Created	2019-05-22 08:52:40 EDT by Vern Lincoln
Updated	2019-05-22 09:37:01 EDT by Vern Lincoln
Location	42.1031504, -70.8792372

General

Client	Town of Hanover
Date	2019-05-22
Time	08:52
Address	241 King Street Hanover, Massachusetts 02339
Facility Type	Park
Facility Name	Forge Pond Park

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos





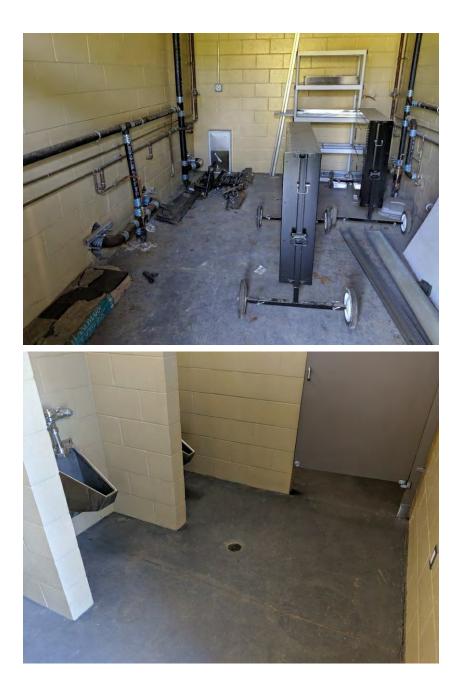


















Fire Station, Fire Station #2

Created	2019-05-22 09:59:59 EDT by Vern Lincoln
Updated	2019-10-17 10:52:12 EDT by Vern Lincoln
Location	42.1500792, -70.8683647

General

Client	Town of Hanover
Date	2019-05-22
Time	09:59
Address	1161 Main Street Hanover, Massachusetts 02339
Facility Type	Fire Station
Facility Name	Fire Station #2

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos









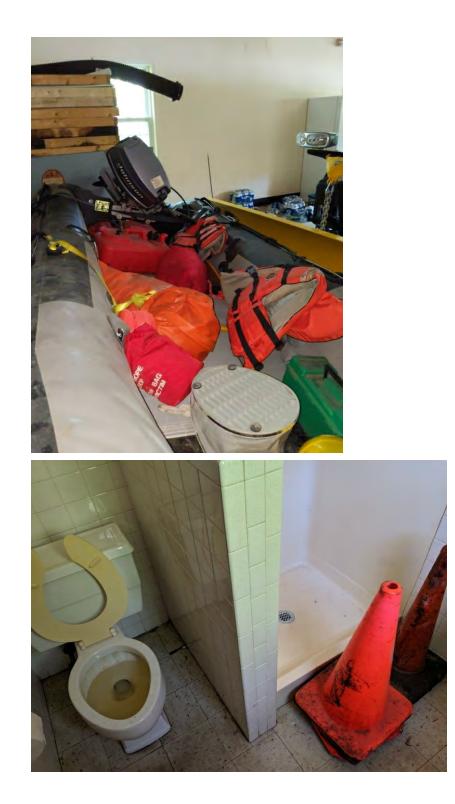






















Well Building, Broadway Well #2

Created	2019-05-23 09:24:41 EDT by Vern Lincoln
Updated	2019-10-17 10:58:39 EDT by Vern Lincoln
Location	42.1101125, -70.8273689

General

Client	Town of Hanover
Date	2019-05-23
Time	09:24
Address	507 Broadway Hanover, Massachusetts 02339
Facility Type	Well Building
Facility Name	Broadway Well #2

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos

No













DPW, DPW Maintenance Garage

Created	2019-05-23 10:24:37 EDT by Vern Lincoln
Updated	2019-10-17 10:56:00 EDT by Vern Lincoln
Location	42.0996831, -70.8726532

General

Client	Town of Hanover
Date	2019-05-23
Time	10:24
Address	229 Ames Way Hanover, Massachusetts 02339
Facility Type	DPW
Facility Name	DPW Maintenance Garage

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos



























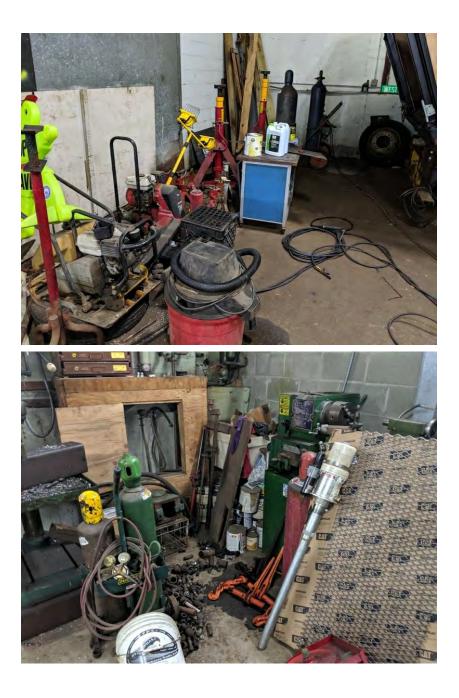










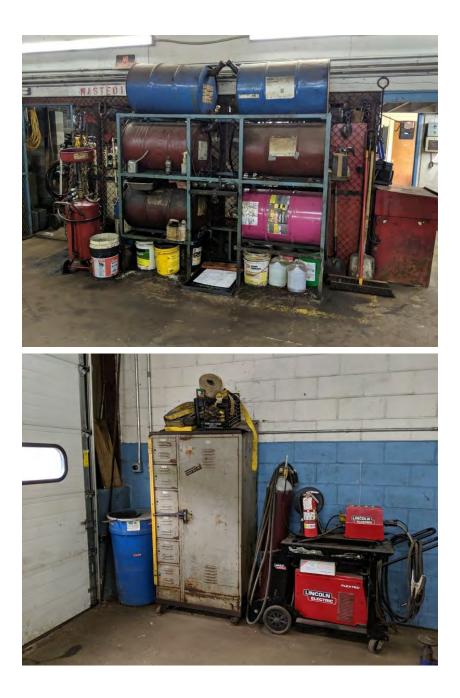




















School, Hanover High School

Created	2019-05-28 15:03:48 EDT by Vern Lincoln
Updated	2019-10-17 10:57:52 EDT by Vern Lincoln
Location	42.1306492, -70.8696851

General

Client	Town of Hanover
Date	2019-05-28
Time	15:03
Address	287 Cedar Street Hanover, Massachusetts 02339
Facility Type	School
Facility Name	Hanover High School

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos

No





























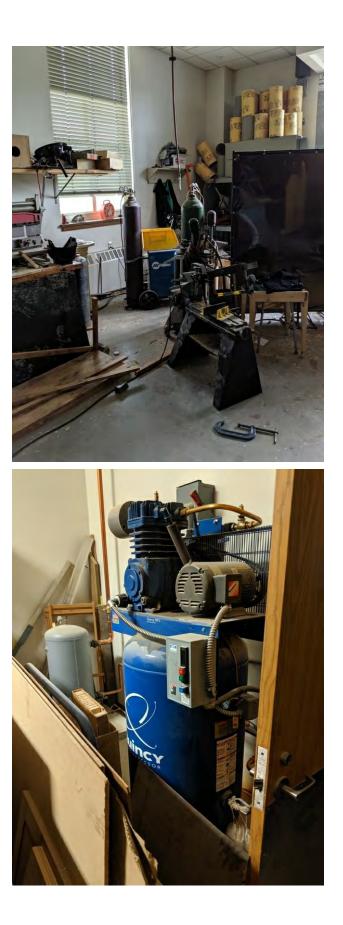




















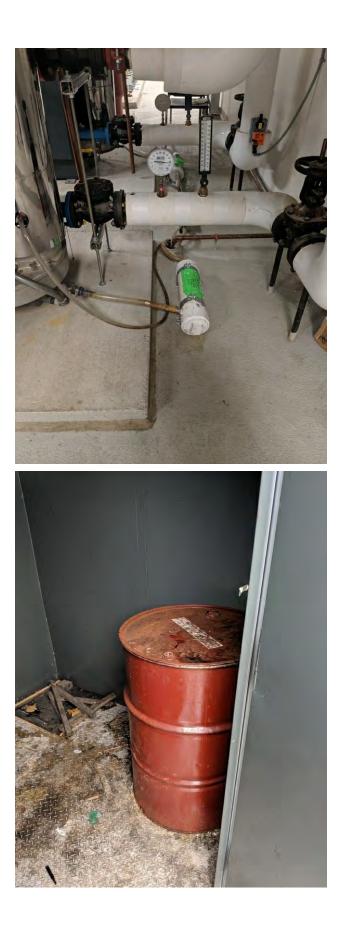








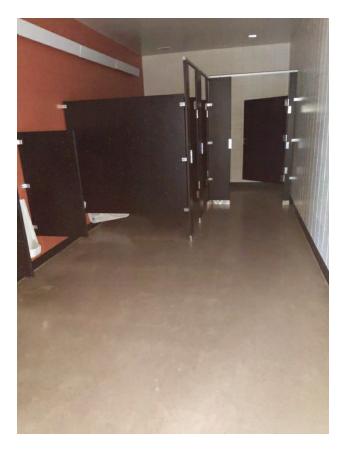












concession bathroom













Water Treatment Plant, Pond Street Water Treatment Facility

Created	2019-05-23 08:28:35 EDT by Vern Lincoln
Updated	2019-10-17 10:56:22 EDT by Vern Lincoln
Location	42.130909, -70.833203

General

Client	Town of Hanover
Date	2019-05-23
Time	08:28
Address	40 Pond Street Hanover, Massachusetts 02339
Facility Type	Water Treatment Plant
Facility Name	Pond Street Water Treatment Facility

Inspections

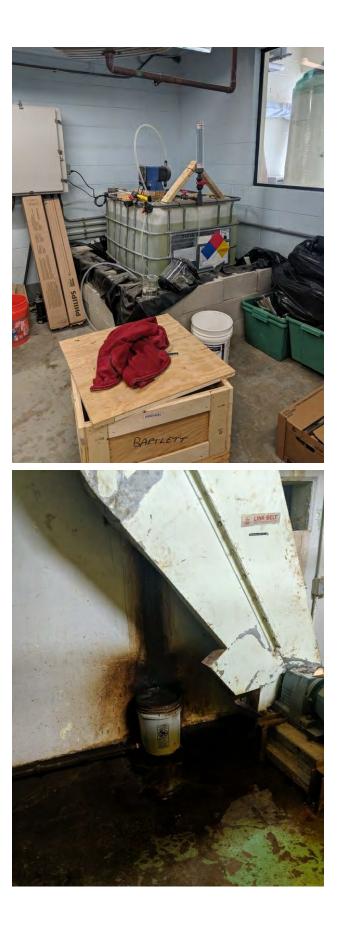
Main Inspection

Observed Instance of Non-Conformance

Photos















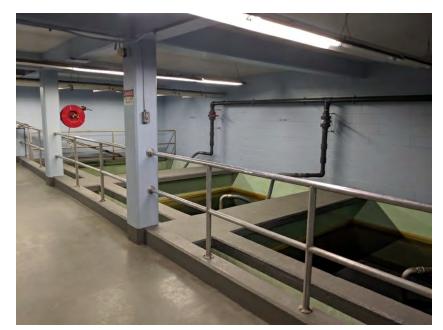






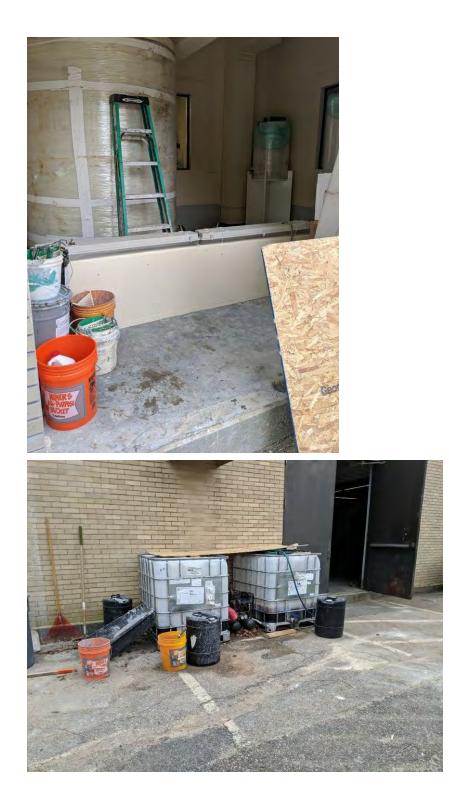














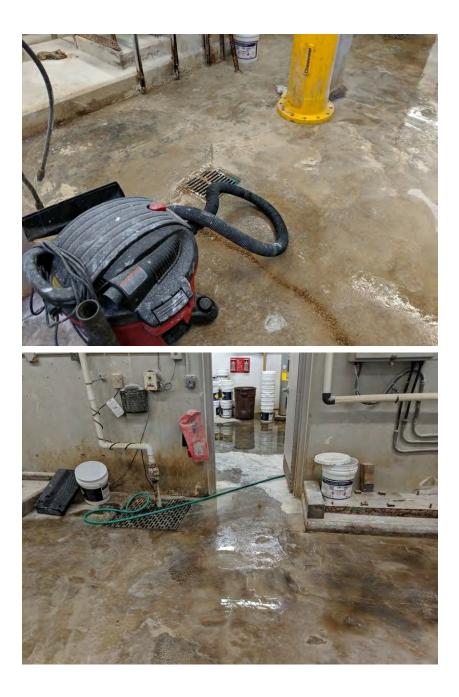






















Water Treatment Plant, Broadway Water Treatment Facility

Created	2019-05-23 09:22:11 EDT by Vern Lincoln
Updated	2019-10-17 10:56:37 EDT by Vern Lincoln
Location	42.1098518, -70.8273312

General

Client	Town of Hanover
Date	2019-05-23
Time	09:22
Address	507 Broadway Hanover, Massachusetts 02339
Facility Type	Water Treatment Plant
Facility Name	Broadway Water Treatment Facility

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos































Well Building, Hanover Street Well Backup Generator

Created	2019-05-23 09:03:43 EDT by Vern Lincoln
Updated	2019-10-17 10:56:52 EDT by Vern Lincoln
Location	42.1175921, -70.8299556

General

Client	Town of Hanover
Date	2019-05-23
Time	09:03
Address	149 Hanover Street Hanover, Massachusetts 02339
Facility Type	Well Building
Facility Name	Hanover Street Well Backup Generator

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos





Fire Station, Fire Department Headquarters

Created	2019-05-20 09:31:39 EDT by Vern Lincoln
Updated	2019-10-17 10:51:45 EDT by Vern Lincoln
Location	42.1157668, -70.8452131

General

Centeral	
Client	Town of Hanover
Date	2019-05-20
Time	09:31
Address	32 Center Street Hanover, Massachusetts 02339
Facility Type	Fire Station
Facility Name	Fire Department Headquarters

Inspections

Main Inspection

Observed Instance of Non-Conformance

Photos









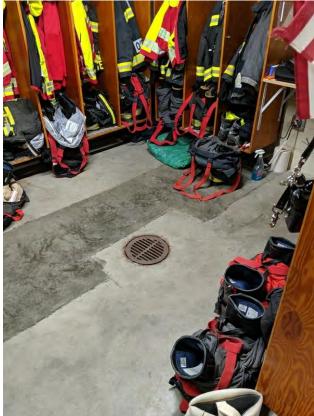


















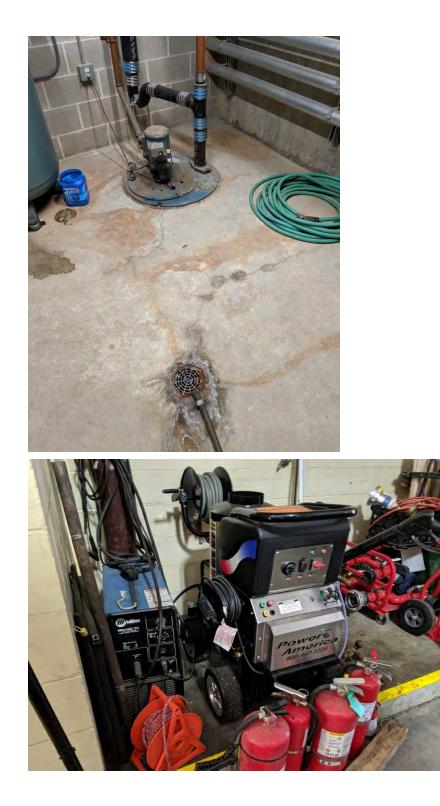














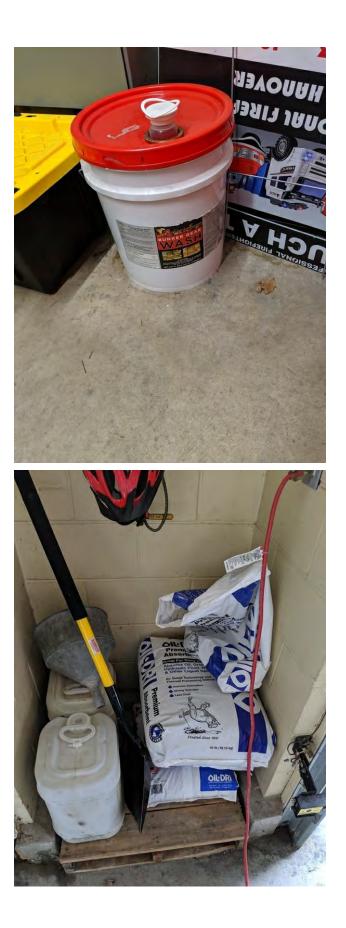












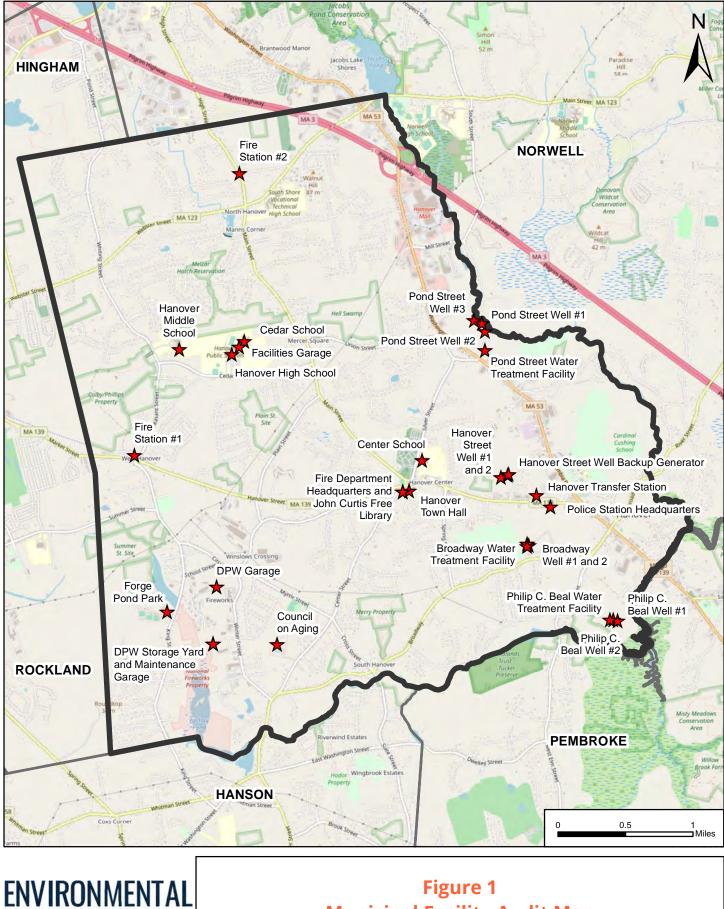






Appendix C:

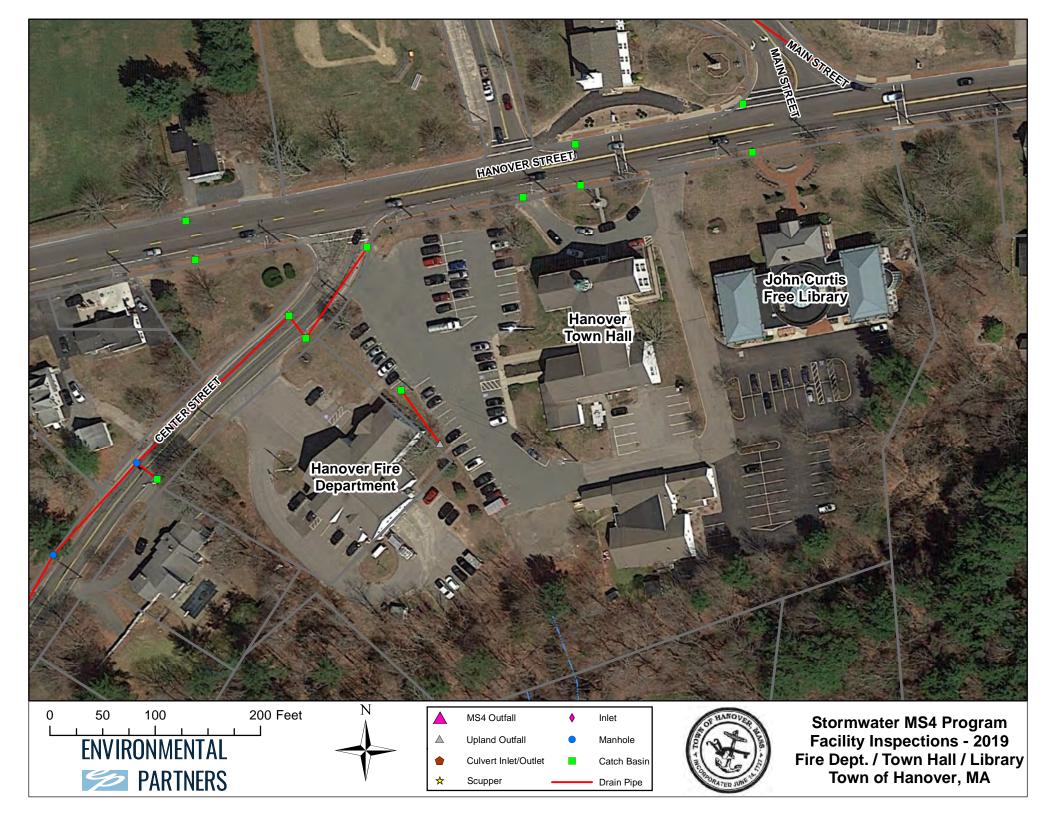
Facility Figures

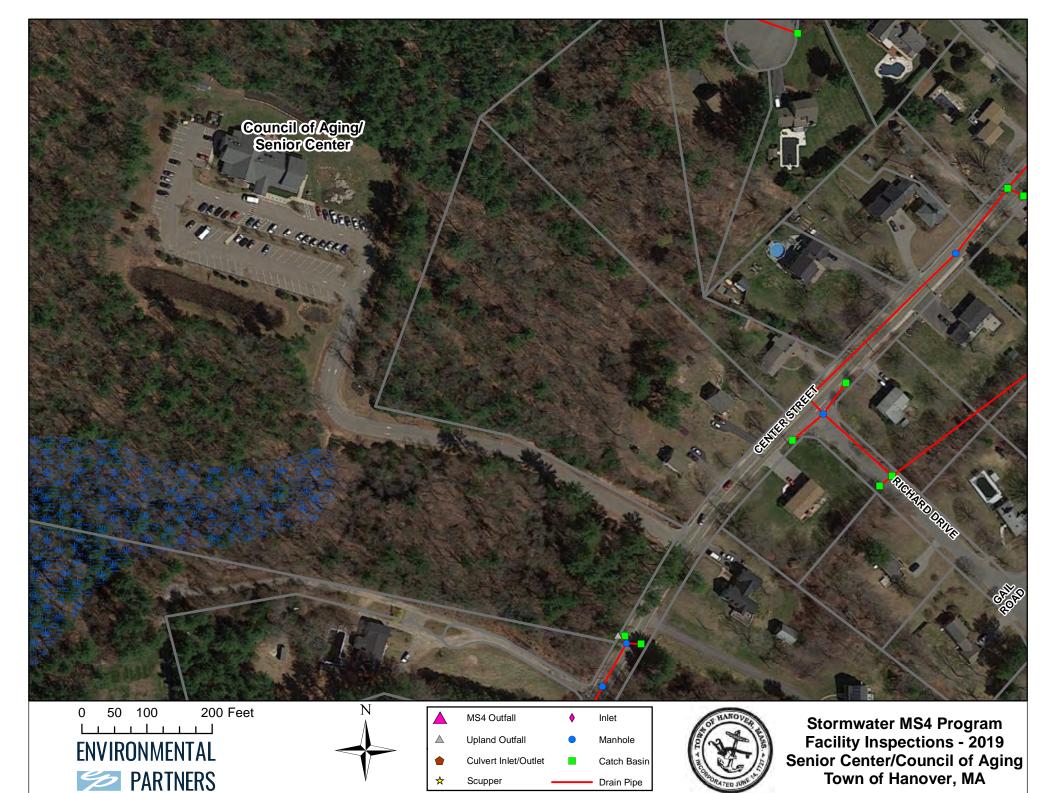


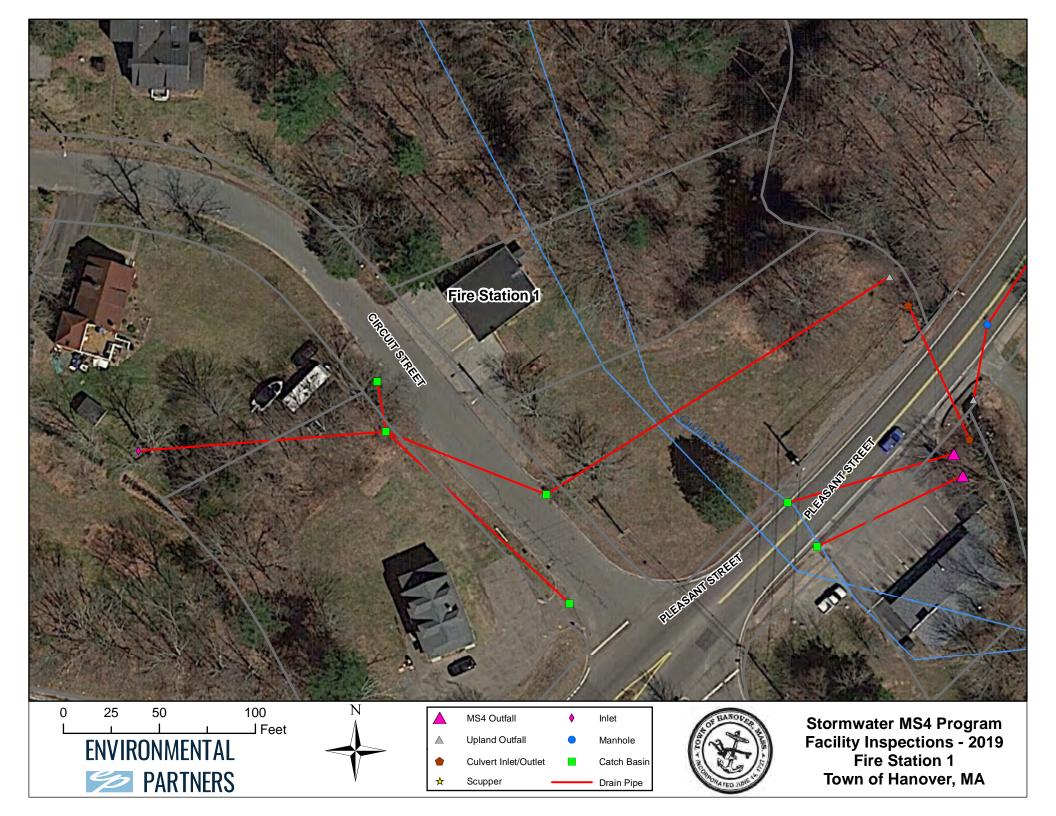
PARTNERS

Figure 1 Municipal Facility Audit Map Town of Hanover, MA

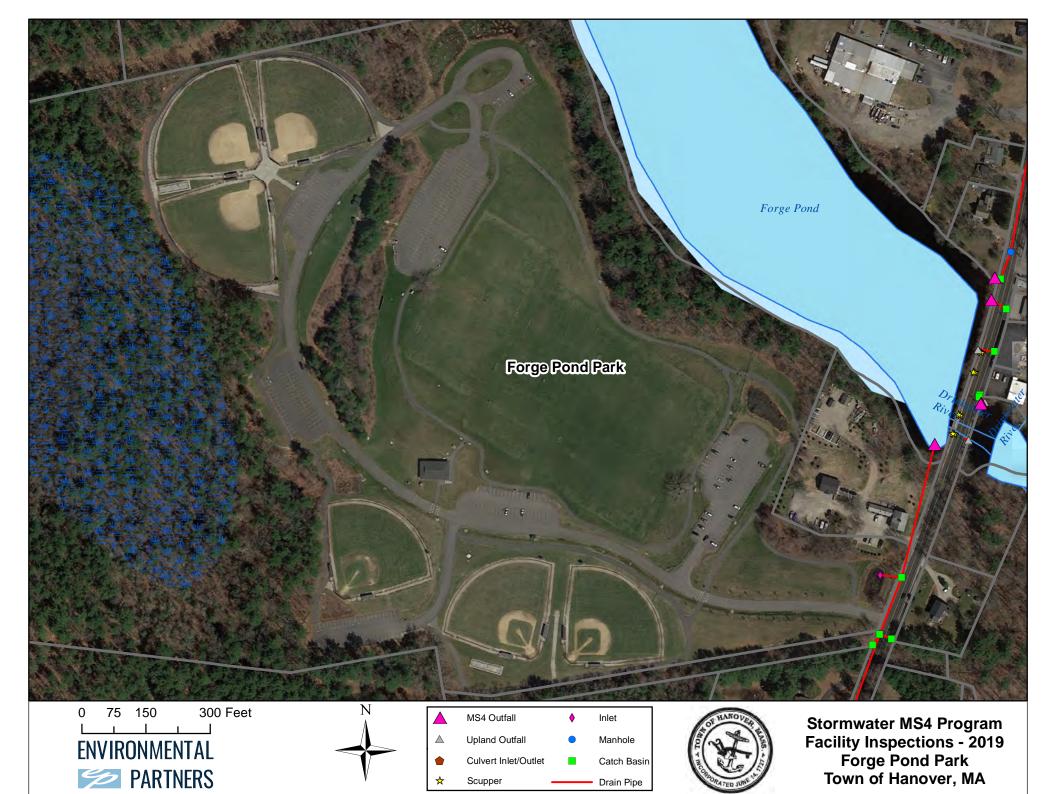
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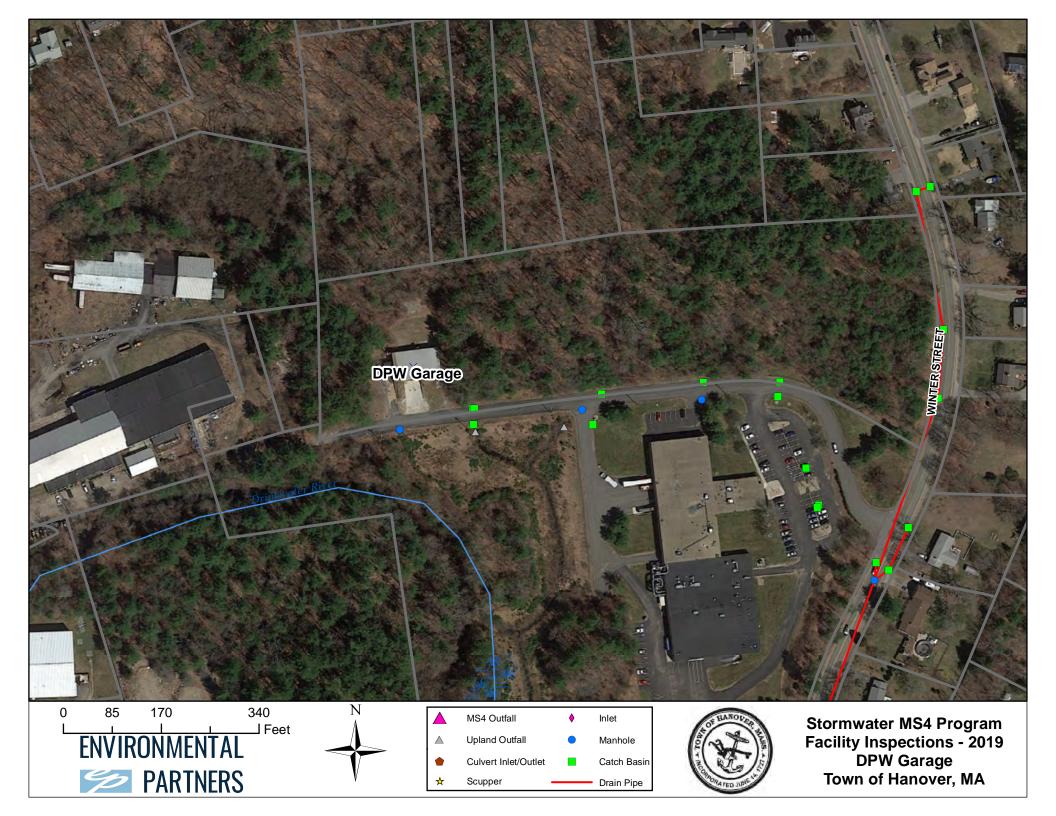


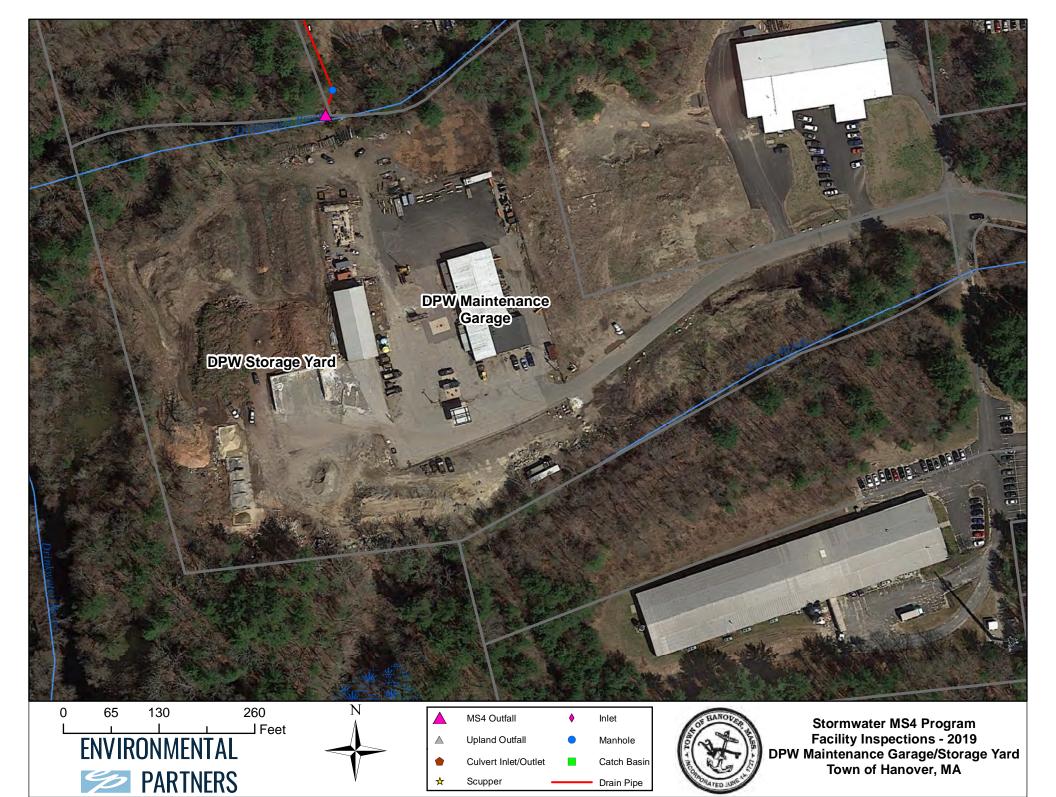


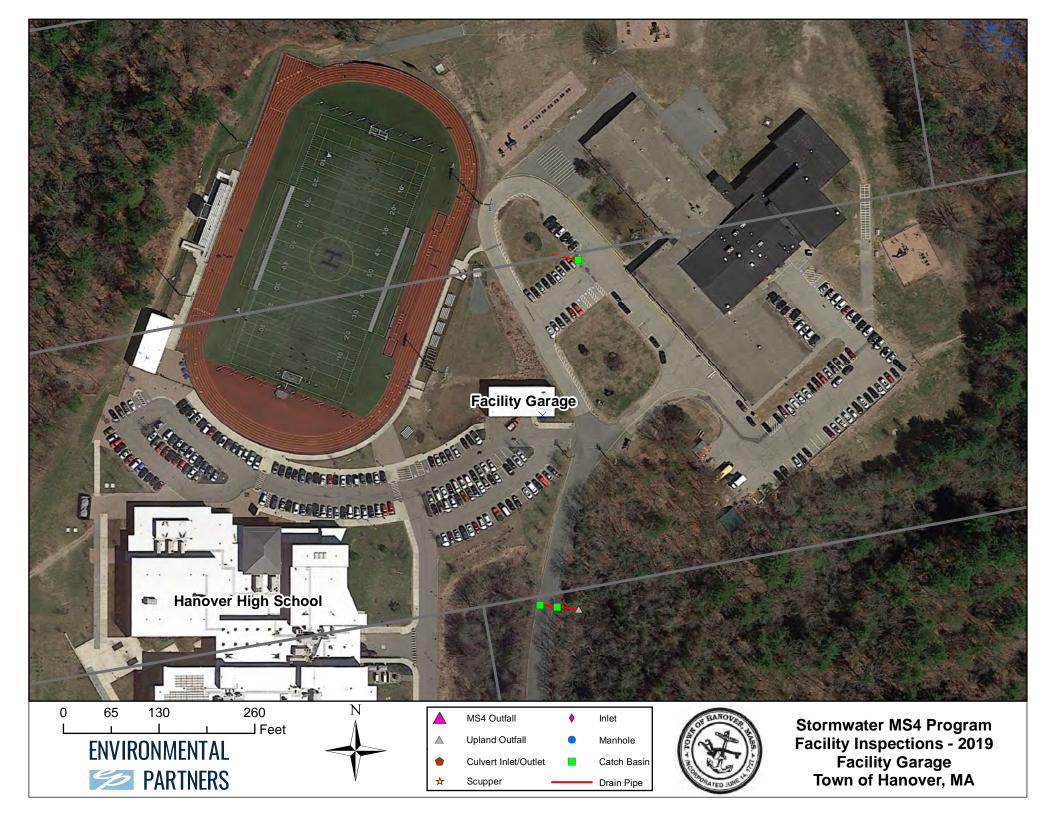


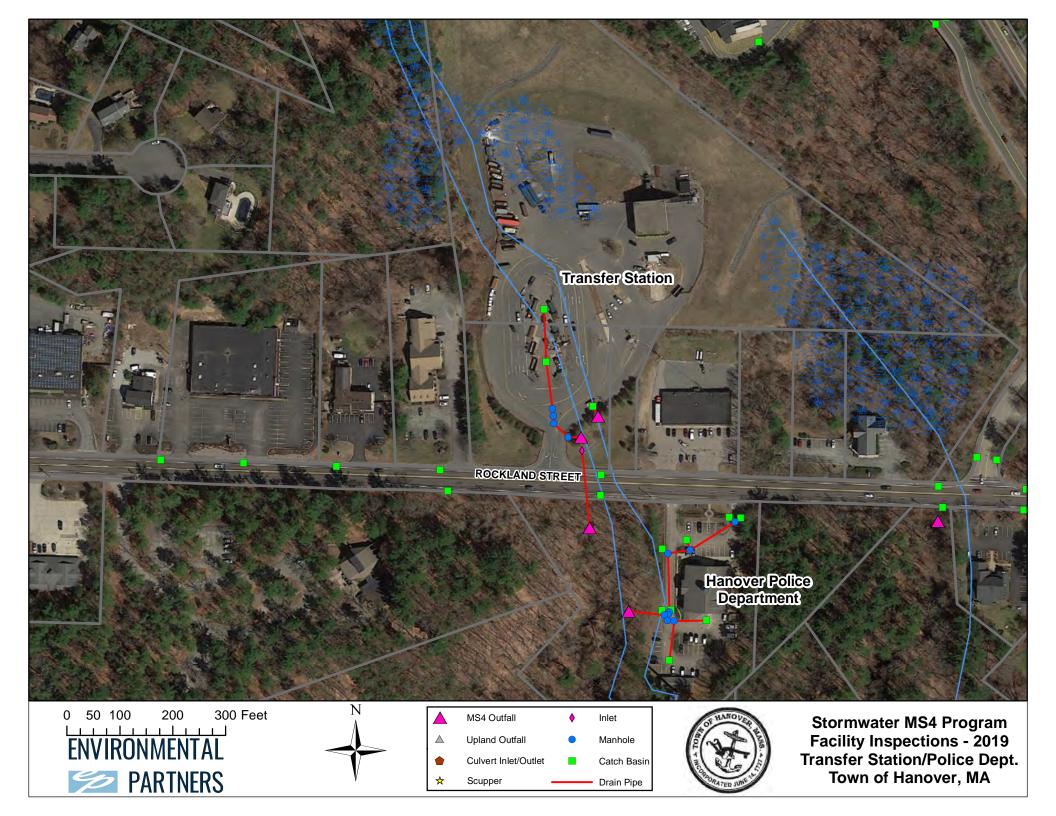


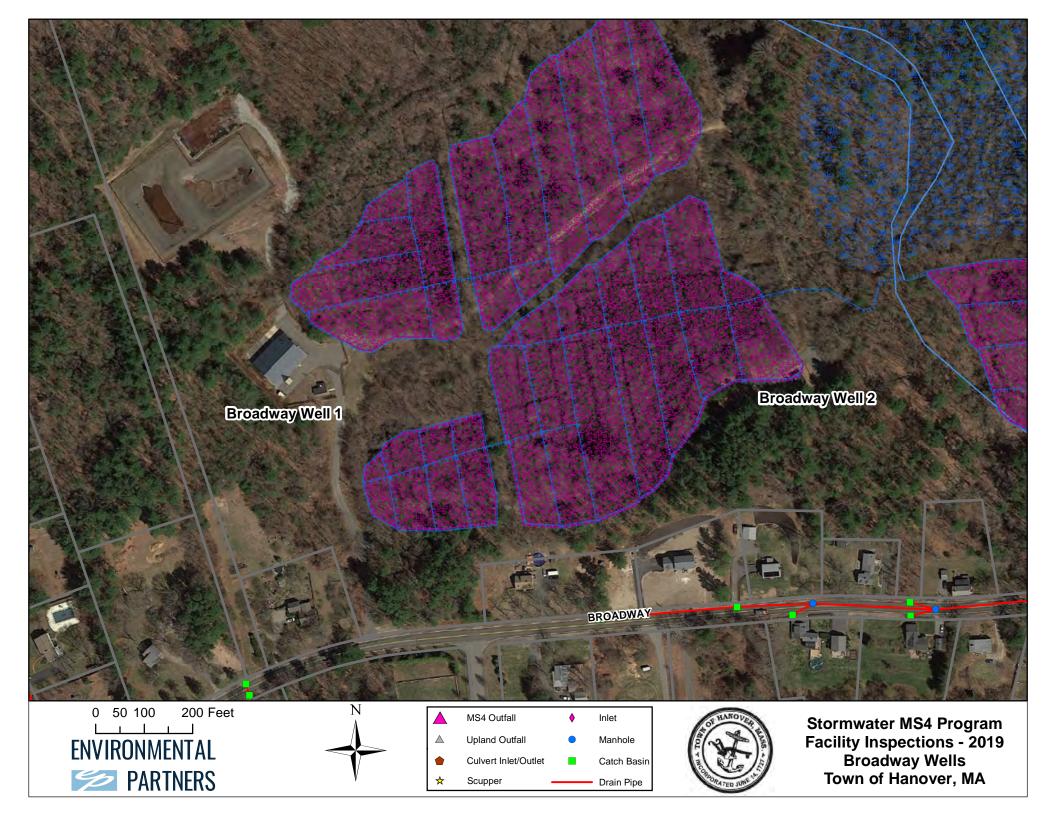


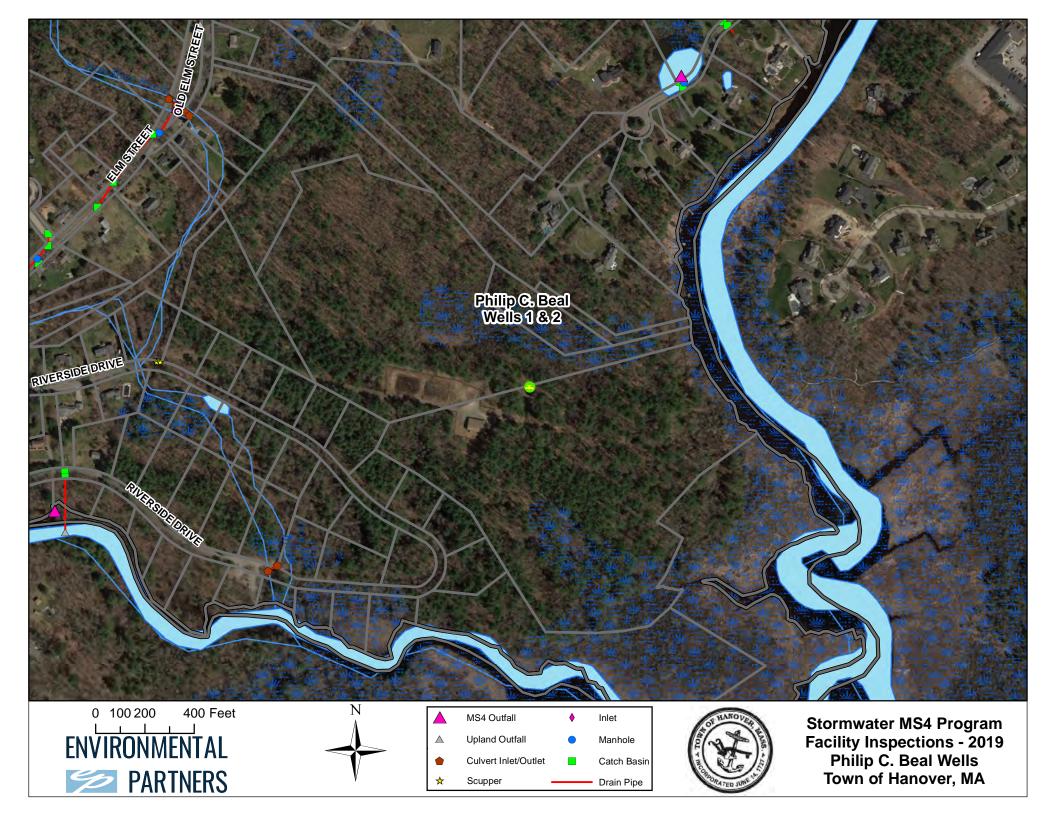


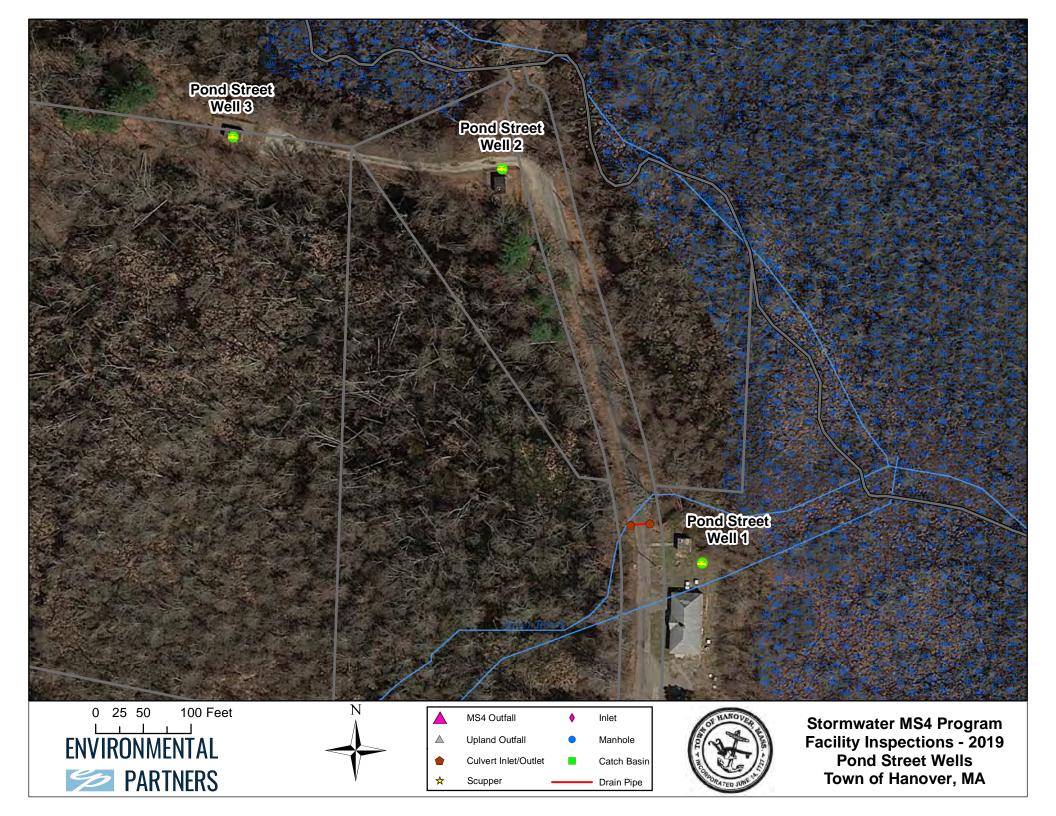


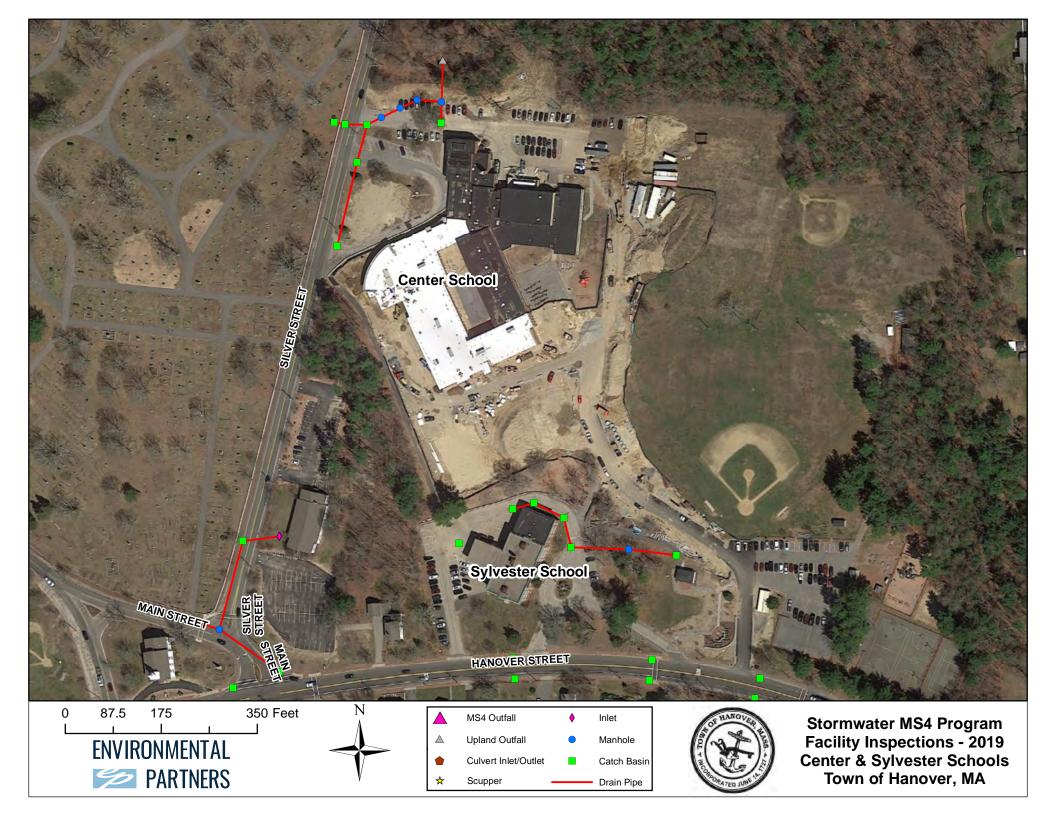


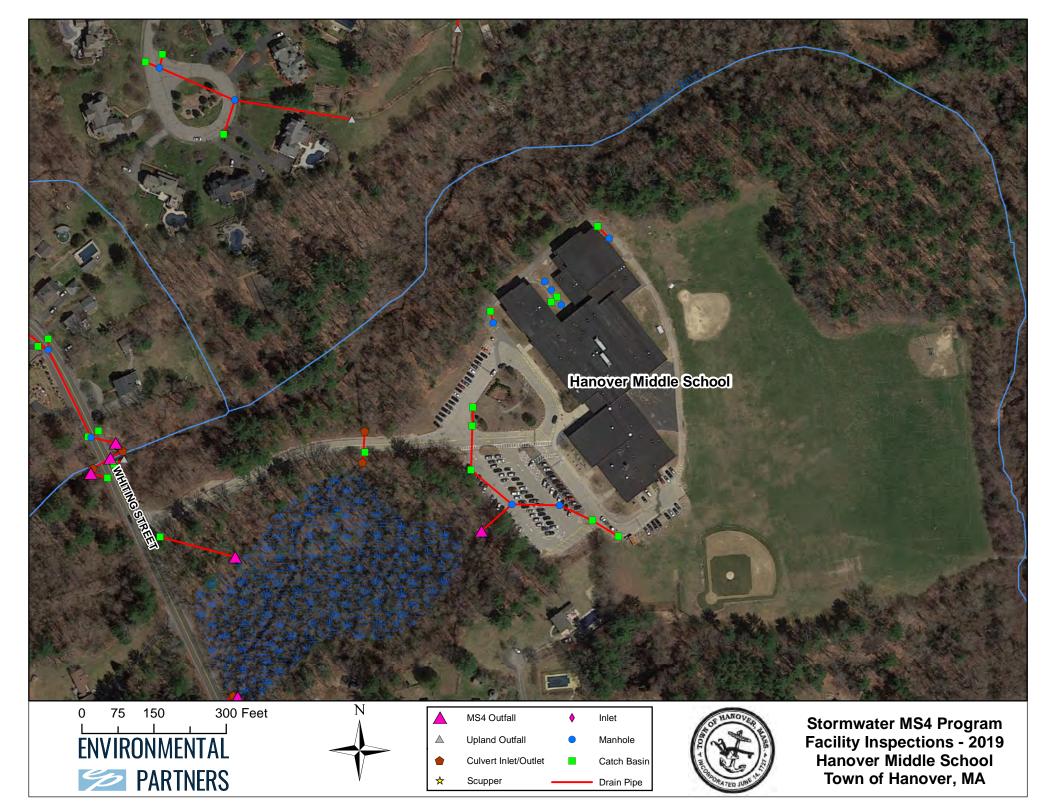


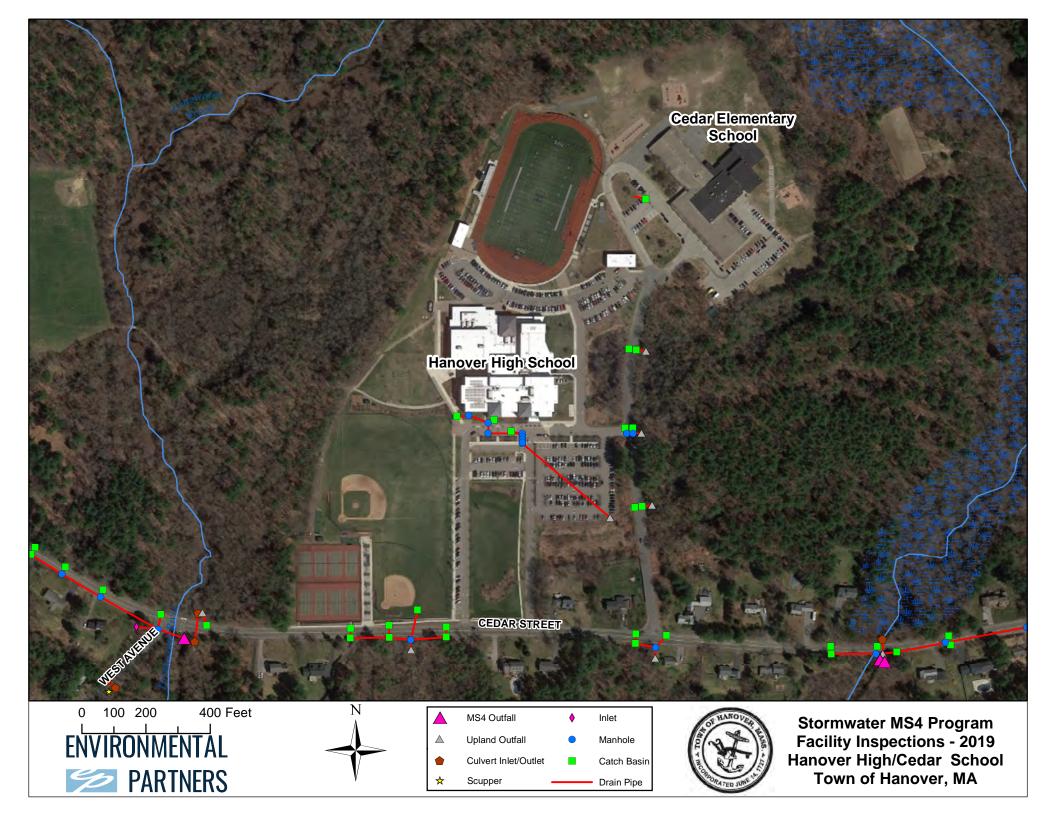












Appendix D:

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 <u>www.mass.gov/dep/</u>

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 nonhouseholds (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 ≤ 2 or ≥ 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. <u>The Guide to Determining</u> <u>Status and Regulatory Requirements</u> 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 <u>Guide</u> (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.

	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
	LQG	LQG	90	NO LIMIT	90	NO LIMIT	YES		YES		YES
	LQG	SQG	90	NO LIMIT	180	6000	YES		YES		YES
LON	LQG	VSQG	90	NO LIMIT	NO LIMIT	1000	YES*	YES _(WO)	YES		YES
NOTIFIC	LQG	NONE	90	NO LIMIT	N/A	N/A	YES		YES		YES
CATION TO EPA	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(WO)	YES	YES	
	SQG	NONE	180	6000	N/A	N/A	YES		YES	YES	
	VSQG	LQG	NO LIMIT	1000	90	NO LIMIT	YES*	YES _(HW)	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 _(HW)	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		

This matrix does not reflect ACUTELY Hazardous waste

* - A manifest must be used for the VSQG category unless self transported.

Definitions:	<u>Regulatory</u> <u>Status</u>	Kilograms/ Month (Generation)	Conversions::	<u>Kilograms</u>	Pounds	<u>Gallons</u> (varies by substance)
	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 <u>http://www.mass.gov/dep/bwp/dhm/files/hwepaid.pdf</u> 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 <u>www.mass.gov/dep/</u> 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[•] 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.

[•] 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 fo	or Containers and Tanks [310 CMR 30.341(2), 30.680, 30.690]
VSQG SQG ONLY	 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) date on which accumulation began.
VSQG	 Each container must be in good condition

8

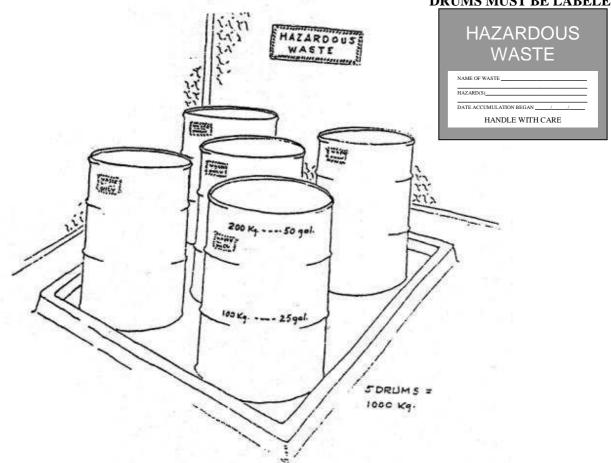
- Wastes of different types must be segregated. This includes not mixing waste oil or used fuel oil with other wastes. Be careful not to put incompatible wastes in the same container or put wastes in unwashed containers that previously held incompatible wastes.
- VSQG
- VSQG

Separate containers of incompatible wastes by a berm, dike, or similar structure.

• 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.



DRUMS MUST BE LABELED

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 foamproducing 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
 - Smelting non-ferrous metals 7692 Welding 333
 - 334

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

2731 Book publishing

226 Screenprinting

7

2754 Commercial gravure 2752 Lithographic printing

2711 Newspaper publishers

7384 Photofinishing laboratories

2721 Periodical publishers 2793 Photoengraving

7334 Blueprinting, photocopying