Guidelines and Standard Operating Procedures

Illicit Discharge Detection and Elimination
and
Pollution Prevention/Good Housekeeping

for Stormwater Phase II Communities in New Hampshire

NOVEMBER 2006

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Chapter

1

1. INTRODUCTION

This section describes the regulatory basis, intended audience, and overall organization of this manual.

1.1 BASIS FOR THE MANUAL

KEY AREAS ADDRESSED BY THIS MANUAL

- Illicit Discharge Detection and Elimination
- Pollution Prevention and Good Housekeeping for Municipal Operations

In April 2003, the United States Environmental Protection Agency (USEPA) issued a National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). A total of 45 New Hampshire communities (six fully regulated and 39 partially regulated) became subject to Stormwater Phase II regulations based on their designation as Urbanized Areas according to the 2000 US Census. See Figure 1-1 for a map of the regulated communities.

The regulation specifies issuance of a General Permit every five years. The General Permit that is valid from May 2003 through April 2008 requires that each regulated community develop a five-year plan to:

> *"…(R)educe the discharge of pollutants from the MS4 to the maximum extent practicable; protect water quality, and satisfy the water quality requirements of the Clean Water Act and state water quality standards."*

Fourteen of the regulated communities in New Hampshire as well as three entities formed an informal coalition, the Seacoast Coalition, to collaborate on select requirements of the General Permit. The Seacoast communities of New Hampshire do not have standardized procedures for carrying out municipal operations that pertain to the management of stormwater. This Manual is the creation of such a standardization providing a commonly accepted set of technical standards and guidance on stormwater management measures controlling the quantity and quality of stormwater produced from municipal activities. This Manual can help jump start the communities' Illicit Discharge Detection and Elimination (IDDE) programs and provide a basis for future

training of employees. The Maine MS4s created a similar manual which was used as the basis for this Manual (Edwards and Kelcey, 2005).

This Manual not only assists the municipalities in meeting the Stormwater Phase II regulations, but encourages them to use targeted best management practices (BMPs) within the watershed with the long-term goal of consistent application by all regulated entities within the watershed. The manual of Guidelines and Standard Operating Procedures will help promote behavior that will improve the water quality of New Hampshire's lakes, ponds, streams, rivers, and estuaries.

1.2 OBJECTIVES OF THE MANUAL

The specific objectives of the manual are to:

- Provide a commonly-accepted set of technical standards and guidance on stormwater management measures that will control the quantity and quality of stormwater produced by municipal activities, new development and redevelopment;
- Assist municipalities in meeting Stormwater Phase II requirements;
- Encourage the use of targeted BMPs with the long-term goal of consistent application by all regulated entities within the watershed;
- Encourage cost-savings for MS4s through proper and timely maintenance of stormwater systems; and
- Promote behavior that will improve water quality in the coastal watersheds and other watersheds in New Hampshire.

1.3 CONTENT OF THE MANUAL

The content of the manual is based primarily on select requirements of the Stormwater Phase II program. Each community's five-year plan must address the following six minimum control measures:

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

This Manual addresses components for two of the minimum control measures, Illicit Discharge Detection and Elimination and Pollution Prevention/Good Housekeeping, as follows:

Illicit Discharge Detection and Elimination (IDDE) – This Manual describes the procedures that can be used to develop an IDDE program for a small MS4. Development of an IDDE program should be based on the specific needs of each municipality and the watersheds it falls within. Each community will develop its own unique IDDE program. This Manual offers Program Managers a six-step process to develop a customized IDDE program: 1. locate priority areas likely to have illicit discharges, 2. map the storm drain system, 3. develop an illicit discharge detection program, 4. develop procedures to trace the source of an illicit discharge, 5. develop procedures to remove a source, and 6. evaluate the IDDE program effectiveness. This Manual provides guidance on how to complete each of these six steps, resulting in an effective IDDE program that fulfills the intent of the General Permit.

Pollution Prevention/Good Housekeeping for Municipal Operations – This Manual provides the Program Manager and municipal staff with the resources and technical references to apply in creating and implementing their own Pollution Prevention/Good Housekeeping program. The General Permit requires the following Pollution Prevention/Good Housekeeping components as part of the five-year plan:

a) *A program with a goal of preventing and/or reducing pollutant runoff from municipal operations. The program must include an employee training component.*
b) *Maintenance activities for the following: parks and open space (area such as public golf courses and athletic field); fleet maintenance, building maintenance; new construction and land disturbance; roadway drainage system maintenance and storm sewer system maintenance.*
c) *Schedules for municipal maintenance activities in paragraph (b) above.*
d) *Inspection procedures and schedules for long term structural controls.*

Just as for the IDDE Minimum Control Measure (MCM), this manual addresses each of the pollution prevention/goodhousekeeping required areas so they can develop their own unique program according to community needs and available resources.

1.4 MANUAL AUDIENCE AND ORGANIZATION

The Stormwater Phase II Program requires the development of new programs as well as training for municipal employees to implement new programs during daily activities. For this reason the manual addresses two distinct audiences: (1) Program Managers, who will direct the development of new programs, and (2) municipal employees, such as public works personnel, who will implement the programs on a day-to-day basis.

Chapters 1, 2, and 3 are directed toward Program Managers. Chapter 1 provides an introduction and overview of the manual. Chapter 2, *Illicit Discharge Detection and Elimination*, presents procedures for Program Managers to use in identifying high priority areas, tracing illicit discharges, and eliminating illicit discharges. Chapter 3, *Pollution Prevention and Good Housekeeping*, provides general discussions of the many ways that municipal activities such as vehicle and facilities maintenance may adversely affect stormwater, and presents ways to modify municipal operations to better prevent and reduce stormwater pollution. Chapter 3 also guides the Program Manager through decisions they will need to make in developing procedures related to good housekeeping and pollution prevention.

The Appendices are intended for use by "hands-on" municipal employees. Appendix A contains guidelines and standard operating procedures (SOPs), and forms for use in the performance of illicit discharge detection and elimination. Appendix B contains guidelines, SOPs, and forms to use in applying pollution prevention and good housekeeping techniques during regular work duties.

The guidelines, which are designed to be concise and easy to use, are divided into three categories: Always, Whenever Possible, and Never. Program Managers should review the "Always" and "Whenever Possible" components to ensure the SOPs are appropriate for their facility. It should be noted that some "Always" components are regulatory and should be kept. However, Program Managers are encouraged to modify and maintain these forms to facilitate documentation of their programs. Copying the forms, for municipal employees use and program documentation, is permitted and encouraged. Specific training on the guidelines and SOPs will help to reinforce their importance and encourage implementation.

1.5 COMMON STORMWATER POLLUTANTS, SOURCES, AND IMPACTS

Stormwater runoff contains pollutants that can harm human health, degrade water quality and aquatic habitat, and impair ecosystem functions. On its way to streams, estuaries, and other receiving waterbodies, stormwater runoff accumulates pollutants such as oil, gas, and other hydrocarbons, heavy metals, deicers, pesticides, fine sediment, fertilizers, and bacteria, all of which can impair water quality. Runoff from fertilized lawns contributes excess nutrients to waterbodies, which can lead to algal blooms and in extreme cases, fish kill events due to low dissolved oxygen levels. Elevated fecal coliform levels impair water quality and can lead to restrictions on the use and enjoyment of natural resources such as shellfish beds and swimming areas. Other stormwater pollutants of concern are toxic contaminants, such as heavy metals and pesticides, which originate from vehicles and businesses or from homeowner activities.

All of these pollutants can wash into receiving waterbodies during storm events. Understanding the sources of these pollutants and the impacts each pollutant has can help inform municipal planning and assist in identifying priority goals and objectives when managing stormwater. Table 1-1 summarizes common stormwater pollutants, their sources and potential impacts.

TABLE 1-1:
COMMON STORMWATER POLLUTANTS, SOURCES AND IMPACTS

Pollutant	Sources	Impacts
Sediment	Construction sites; eroding stream banks and lakeshores; winter sand and salt application; vehicle/boat washing; agricultural sites.	Destruction of plant and fish habitat; transportation of attached oils, nutrients and other pollutants; increased maintenance costs, flooding.
Nutrients (phosphorus, nitrogen)	Fertilizers; malfunctioning septic systems; livestock, bird & pet waste; vehicle/boat washing; grey water; decaying grass and leaves; sewer overflows; leaking trash containers, leaking sewer lines.	Increased potential for nuisance or toxic algal blooms; increased potential for hypoxia/anoxia (low levels of dissolved oxygen which can kill aquatic organisms).
Hydrocarbons (petroleum compounds)	Vehicle and equipment leaks; vehicle and equipment emissions; pesticides; fuel spills; equipment cleaning; improper fuel storage & disposal.	Toxic to humans and aquatic life at low levels.
Heavy Metals	Vehicle brake and tire wear; vehicle/equipment exhaust; batteries; galvanized metal; paint and wood preservatives; batteries; fuels; pesticides; cleaners.	Toxic at low levels; drinking water contamination.
Pathogens (Bacteria)	Livestock, bird and pet wastes; malfunctioning septic systems; sewer overflows; damaged sanitary lines.	Risk to human health leading to closure of shellfish areas and swimming areas; drinking water contamination.

Toxic Chemicals	Pesticides; dioxins; PCBs; spills, illegal discharges and leaks.	Toxic to human and aquatic life at low levels.
Debris/Litter	Improper waste disposal and storage; fishing gear; leaking rubbish containers; cigarette butts; littering.	Potential risk to human and aquatic life, aesthetically displeasing.

PCBs: Polychlorinated Biphenyls

Chapter

2

USEPA defines an illicit discharge as any discharge to an MS4 that is not composed entirely of stormwater or the allowable non-stormwater discharges such as water from fire fighting activities, infiltrating groundwater, etc. (See list below.)

Allowable Non-Stormwater Discharges

1. Water line flushing
2. Landscape irrigation
3. Diverted stream flows
4. Rising ground waters
5. Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20))
6. Uncontaminated pumped ground water
7. Discharge from potable water sources
8. Foundation drains
9. Air conditioning condensation
10. Irrigation water, springs
11. Water from crawl space pumps
12. Footing drains
13. Lawn watering
14. Individual resident car washing
15. Flows from riparian habitats and wetlands
16. Dechlorinated swimming pool discharges
17. Street washwater
18. Residential building washwaters, without detergents

2. ILLICIT DISCHARGE DETECTION AND ELIMINATION

In most communities, the municipal separate storm drain systems discharge to receiving waterbodies without treatment. Therefore, it is particularly important that only stormwater is discharged and to ensure that illicit discharges are eliminated from the system. The General Permit requires that an IDDE program be developed by the regulated municipalities. While most municipalities have programs in place to inspect and address combined sewers or sanitary sewers, few municipalities have procedures in place related to an IDDE program. Two excellent IDDE guidance manuals were reviewed and used in developing this chapter: the Center for Watershed Protection's (CWP) Illicit Discharge Detection and Elimination – A Guidance Manual for Program Development and Technical Assessments (2004) and the New England Interstate Water Pollution Control Commission's (NEIWPCC) Illicit Discharge Detection and Elimination Manual – A Handbook for Municipalities (2003).

This chapter provides managers with the procedures necessary to create an effective IDDE program in accordance with the USEPA General Permit. Program Managers should first have a good understanding of the types of illicit discharges that may be encountered. Section 2.1 provides a description of various types of illicit discharges that may be present in a community. The next sections address additional steps to creating an effective IDDE program: locating priority areas within a community (Section 2.2), creating a map of the storm drain system (Section 2.3), detecting illicit discharges (Section 2.4), tracing the illicit discharge back to its source (Section 2.5), removing the illicit discharge (Section 2.6), and tracking illicit discharges (Section 2.7). Lastly, Section 2.8 provides an approach to evaluating the overall IDDE program.

2.1 TYPES AND SOURCES OF ILLICIT DISCHARGES

The USEPA defines an illicit discharge as *any discharge to a regulated small MS4 or to the waters of the State that does not consist entirely of stormwater or allowable non-stormwater discharges.* Illicit discharges are often categorized according to frequency, which provides information about the source and helps determine which tracing

techniques may be useful in locating the discharge. The following three categories provide a good basis for defining illicit discharges:

1. Transitory illicit discharges are typically one-time events resulting from spills, breaks, dumping, or accidents. Transitory illicit discharges are often reported to an authority through a citizen complaint line or following observation by a municipal employee during regular duties. Because they are not recurring, they are the most difficult to identify, trace, and remove. The best method to reduce transitory discharges is through general public education, education of municipal response personnel, tracking of discharge locations, and enforcement of an illicit discharge ordinance.
2. Intermittent illicit discharges occur occasionally over a period of time (several hours per day, or a few days per year). Intermittent discharges can result from legal connections to the storm drain system, such as a legal sump pump connection that is illegally discharging anything other than groundwater. Intermittent discharges can also result from activities such as drum washing in exterior areas. These types of discharges are more likely to be discovered, and are less difficult to trace and remove, but can still present significant challenges. These discharges can have large or small impacts on waterbodies depending on pollutant content and the size of the receiving water body.
3. Continuous illicit discharges are typically the result of a direct connection from a sanitary sewer, overflow from a malfunctioning septic system, inflow from a nearby subsurface sanitary sewer that is malfunctioning, or an illegal connection from a commercial or industrial facility. Continuous illicit discharges are usually easiest to trace and can have the greatest pollutant load (CWP 2004).

Common examples of illicit discharges in New Hampshire:

- Sewage line from a house/business is incorrectly connected to storm system.
- Cross-connection between sewer line and storm drainage system.
- Improper disposal of auto and household toxins.
- Laundry or car wash discharge flows or is directly connected to storm sewer system.

It is also important to consider land use when looking for illicit discharges. Table 2-1 provides a list of conditions and activities that may produce transitory and intermittent discharges, along with associated sources and land use. Table 2-2 lists possible sources of continuous discharges and their associated land use.

TABLE 2-1:
LAND USES, LIKELY SOURCE LOCATIONS AND ACTIVITIES THAT CAN PRODUCE TRANSITORY OR INTERMITTENT ILLICIT DISCHARGES

Land Use	Likely Source Locations	Condition or Activity that Produces Discharge
Residential	♦ Apartments ♦ Multi-family ♦ Single family detached	♦ Driveway cleaning ♦ Dumping/spills (e.g., leaf litter and RV/boat holding tank effluent) ♦ Equipment/vehicle wash-downs ♦ Septic system maintenance ♦ Swimming pool discharges
Commercial	♦ Campgrounds/RV parks ♦ Car dealers/rental car companies ♦ Car washes ♦ Commercial laundry/dry cleaning ♦ Gas stations/auto repair shops ♦ Marinas ♦ Nurseries and garden centers ♦ Oil change shops ♦ Restaurants ♦ Swimming pools	♦ Building maintenance (power washing) ♦ Dumping/spills ♦ Landscaping/grounds care ♦ Outdoor fluid storage ♦ Parking lot maintenance (power washing) ♦ Vehicle fueling ♦ Vehicle maintenance/repair ♦ Vehicle washing ♦ Wash-down of greasy equipment and grease traps
Industrial	♦ Auto recyclers ♦ Beverages and brewing ♦ Construction vehicle washouts ♦ Distribution centers ♦ Food processing ♦ Garbage truck washouts ♦ Marinas, boat building and repair ♦ Metal plating operations ♦ Paper and wood products ♦ Petroleum storage and refining ♦ Printing	♦ Industrial process water or rinse water ♦ Loading and un-loading area wash-downs ♦ Outdoor material storage
Municipal	♦ Airports ♦ Landfills ♦ Maintenance depots ♦ Municipal fleet storage areas ♦ Ports ♦ Public works yards ♦ Streets and highways ♦ Golf courses ♦ Schools	♦ Building maintenance (power washing) ♦ Dumping/spills ♦ Landscaping/grounds care ♦ Outdoor fluid storage ♦ Parking lot maintenance (power washing) ♦ Road maintenance ♦ Emergency response ♦ Vehicle fueling ♦ Vehicle maintenance/repair ♦ Vehicle washing ♦ Aircraft deicing

TABLE 2-2: LAND USES, LIKELY SOURCE LOCATIONS AND ACTIVITIES THAT CAN PRODUCE *CONTINUOUS* ILLICIT DISCHARGES	
Land Use	**Condition or Activity that Produces Discharge**
Residential	• Failed sanitary sewer infiltrating into storm drain • Sanitary sewer connection into storm drain • Failed septic systems discharging to storm drain system
Commercial/Industrial	• Failed sanitary sewer infiltrating into storm drain • Process water connections into storm drain • Sanitary sewer connection into storm drain
Municipal	• Failed sanitary sewer infiltrating into storm drain • Sanitary sewer connection into storm drain

SOURCE (Tables 2-1 and 2-2): Modified from Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments, Center for Watershed Protection, 2004, p. 12, Table 2.

Once a Program Manager understands the types of illicit discharges that might be present in his/her community, the manager can begin to review existing information that will identify where illicit discharges are likely to be found. An effective detection and elimination program will address all types of illicit discharges.

2.2 LOCATING PRIORITY AREAS

Section 2.2 provides a methodology for locating priority areas that have a high potential for illicit discharges. Municipalities should conduct this process once during their first permit cycle, and then evaluate and revise the process for each subsequent permit cycle as illicit discharges are removed (described in Section 2.6).

To locate priority areas within a community, the Program Manager should:

1. Become familiar with the community's waterbodies, its watersheds, local water quality classifications, and current water quality in order to divide the community into discrete areas that can be prioritized;
2. Gather and evaluate available information that will provide clues as to where in the community illicit discharges might be found (e.g., older neighborhoods, industrial parks, gentrified neighborhoods); and
3. Use the existing information to assess where illicit discharges may be found and what waterbodies are particularly sensitive (e.g., drinking water source, shellfish areas, town beaches).

The following subsections present further discussion of each of these areas. Although a Program Manager should take the time to prioritize watersheds prior to completing any mapping, some communities may complete their mapping first, then use the results of mapping to produce a more refined evaluation.

Natural Resource Conservation Service (NRCS) Watershed Numbering System

Level	Name	HUC Number
1	Region	2 digit
2	Sub-region	4 digit
3	Basin	6 digit
4	Sub-basin	8 digit
5	Watershed	10 digit
6	Subwatershed	12 digit
7	Drainage	14 digit
8	Site	16 digit

2.2.1 Identify Watersheds and Waterbodies

In order to identify priority areas where illicit discharges may occur, a decision must be made as to how to define an "area". The Center for Watershed Protection recommends defining watersheds for individual waterbodies. The New Hampshire Geographically Referenced Analysis and Information Transfer System (NHGRANIT) website (www.granite.sr.unh.edu) offers coverage files that show Level 6 subwatershed boundaries (which have 12 digit Hydrologic Unit Codes [HUCs]). Level 6 subwatersheds range in size from 10,000 to 200,000 acres of land (15 to 300 square miles).

The New Hampshire Department of Environmental Services (NHDES) categorizes waterbodies with an 18-digit Assessment Unit (AU) code that references the 12-digit HUC code. The AU codes are a good standard for municipalities to use in prioritizing waterbodies. Table 2-3 shows the NHDES AU naming convention.

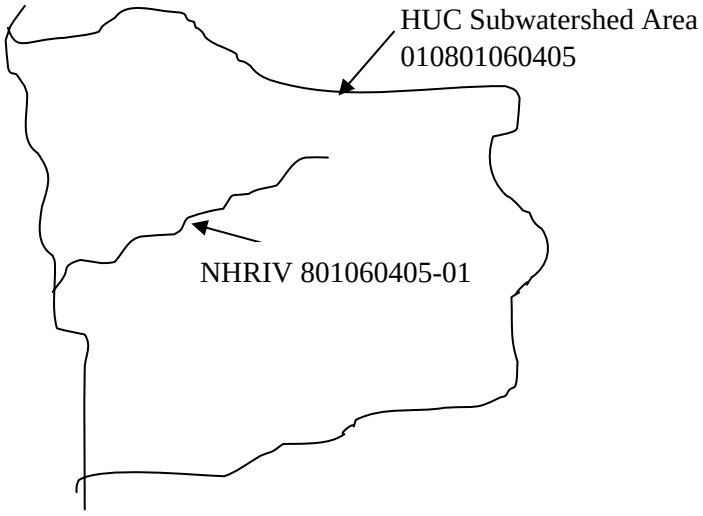
TABLE 2-3:
EXPLANATION OF NHDES ASSESSMENT UNIT NAMING CONVENTION

Example AU ID: NHRIV801060405-01-01

NH	RIV	801060405	- 01	- 01
State abbreviation to readily identify the waterbody as being in New Hampshire (NH)	3 letters to readily identify the waterbody type, where: RIV = Rivers and Streams LAK = Lakes and Ponds IMP = Impoundments EST = Estuary OCN = Ocean	Last 9 digits of the 12 digit HUC. Note that the first 3 digits of all NH HUCs are "010". The first 3 digits (010) were purposely left off in an effort to keep the AU ID as short as possible. Inclusion of the last 9 digits readily identifies the general location of the waterbody. 12 digit HUCs do not exist for the ocean (they do, however, exist for the estuaries). For the ocean, 000000000 was input into this field.	AU segment number. Segments were divided into homogenous units using the criteria above. For rivers, segment numbering starts upstream and proceeds downstream.	AU subsegment number. Used for further subdivision of AU if necessary. For example, this field was used if it were necessary to divide a lake into 2 or more segments.

Once an area is defined as a subwatershed, use of the New Hampshire AU naming convention will provide program managers with an easy way to link water bodies to their watersheds:

Using the NRCS watershed numbers to identify different areas of a community allows an easy link to NHDES impaired water lists.



More information about prime wetlands is available at the New Hampshire DES website:

www.des.nh.gov/wetlands

This is particularly useful when reviewing the New Hampshire 303(d) list of impaired waters.

Although wetlands are not included in New Hampshire's AU naming convention, prime wetlands are an especially important resource to consider when prioritizing for illicit discharge detection program development. Prime wetlands locations are available at the New Hampshire DES website: http://www.des.nh.gov/wetlands .

2.2.2 *Review Available Information*

Priority areas for IDDE will vary from one community to another depending on water quality conditions, land use, etc. A relatively simple desktop assessment of available community information can provide many clues as to where illicit discharges may be occurring. The following is a list of resources that should be collected and reviewed and a brief description of factors to consider during the prioritization process:

- Zoning maps – Industrial areas with high density development may have a high illicit discharge potential.
- Locations of previous illicit discharges – Areas with historical illicit discharge reports or previous citizen complaints should be considered high priority.
- Approximate density of known outfalls per stream mile – Areas with a high density of outfalls should be considered high priority.

- Age of infrastructure/development – Older areas of the community should be considered high priority.
- Location of public sanitary sewer/age of sewer/date of separation – Older areas that were put on public sewer or separated long ago should be considered high priority.
- Location of areas on septic systems – Older areas on septic systems should be considered high priority.
- Water Quality Information

Surface Waters in New Hampshire are classed as either Class A or Class B.

Class A waters are of generally higher quality and must meet more stringent requirements for:

- Dissolved Oxygen,
- Benthic Deposits,
- Oil and Grease,
- Color,
- Turbidity,
- Temperature,
- pH, etc.

Water Quality Classification – Class A waterbodies may be high priority because their designated uses require the best water quality.

NHDES 303(d) list – NHDES evaluates water quality of New Hampshire surface waterbodies and generates the 303(d) list of impaired waters every two years. The list includes a description of the use that is impaired, the cause of the impairment, and the source. In some cases, the NHDES has identified that illicit discharges or wet weather discharges are the cause. If a community contains surface waters that are impaired because of wet weather discharges, illicit discharges or connections, these waters should be identified as high priority. Impaired waters on the 303(d) list will be subject to a Total Maximum Daily Load (TMDL) for the pollutant of concern. This TMDL (when available) should be factored into the overall IDDE program. NHDES should be contacted for assistance in gathering water quality information and designated use assessments.

NHDES OneStop Data – The NHDES OneStop database (www.des.nh.gov/onestop.htm) provides access to water quality data that has been collected by NHDES or any group that has a NHDES approved quality assurance/quality control plan. Waterbodies that have ongoing water quality programs should have data that can be reviewed to determine if they should be considered high priority.

- Areas that drain to shellfish growing waters, public beaches, or drinking water sources – These areas should be designated as high priority for public health and economic reasons.

It should be noted that the above list is not exhaustive. Program Managers may be aware of additional data pertinent to locating high priority areas in their community. Similarly, Program Managers may want to exclude some of this information if it is not relevant to identifying priority areas in their community. The evaluation can be qualitative based on the Program Manager's personal knowledge and professional judgment.

2.2.3 Evaluate Illicit Discharge Potential

Once the Program Manager has an understanding of the waterbodies in the community, and has acquired and reviewed the available information, he/she can compile and evaluate the information to define which portions of the municipality are High, which are Medium, and which are Low priority. Table 2-4 provides an example of one method where each criterion is evaluated for each waterbody and assigned an illicit discharge potential (IDP) of 1 for low potential, 2 for medium potential, and 3 for high potential. The scores for each waterbody are then averaged to produce a resultant overall score for the waterbody that will range from 1 (low priority) to 3 (high priority). Table 2-5 provides a blank worksheet for Program Managers to use.

Once the IDDE prioritization process is complete the subsequent list can be used to determine:

- which areas should be mapped first (discussed in Section 2.3),
- which techniques will be used to develop community-specific detection techniques (Section 2.4), and
- how to prioritize storm drain system maintenance work (Section 3.3).

TABLE 2-4:
EXAMPLE PRIORITIZATION TABLE USING AVAILABLE INFORMATION

	Land Use	NHDES Category on 303(d) List	Stormwater Outfall Density (# of Outfalls per Stream Mile)	Average Age of Development (years)	Raw IDP Score	Normalized IDP Score**
Area A	Commercial (2)*	Impaired – Other Source (2)*	14 (2)*	40 (2)*	8	2
Area B	Residential (1)	Not Impaired (1)	10 (2)	10 (1)	5	1.25
Area C	Industrial (3)	Impaired – Illicit Discharge or Stormwater (3)	16 (2)	75 (3)	11	2.75
Area D	Residential (1)	Not Impaired (1)	9 (1)	15 (1)	4	1
Area E	Residential (1)	No data available	21 (3)	20 (1)	5	1.67

Notes:

* The number in parentheses is the Illicit Discharge Potential (IDP) "score" (with 3 defined as a high IDP) earned for that area for the category identified. Basis for assigning scores (based on benchmarks) to assess IDP is defined as follows:

Category Definitions	Land Use	NHDES Category	Stormwater Outfall Density	Average Age of Development
High (3)	Industrial	Impaired – illicit discharge or stormwater	>20	>50
Medium (2)	Commercial	Impaired – other source	10-20	25-50
Low (1)	Residential	Not impaired	<10	<25

** Normalizing the raw IDP scores (by dividing the raw score by the number of screening factors assessed) will produce scores that fall into the standard scale of 1 to 3 for low to high IDP, respectively.

SOURCE: Modified from Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments, Center for Watershed Protection, 2004, p. 53, Table 15.

NOTE: See Table 2-5 for a blank form for your community.

TABLE 2-5:
WORKSHEET TO PRIORITIZE AREAS

Area of Community [3]	Screening Factors [1] – Categories of Information Reviewed				Score	
					Raw Score[4]	Normalized IDP Score [5]

Category Definitions [2]

High (3)				
Medium (2)				
Low (1)				

Instructions: This form is for Program Managers to define areas of High, Medium, and Low Priority.

(1) Select all applicable screening factors from the list provided in Section 2.2.2.
(2) Determine the category definitions (High, Medium, Low) for each screening factor. Refer to section 2.2.2.
(3) Fill in the names of the different areas of your community. Refer to Section 2.2.1.
(4) To obtain a raw score, first assign a value to each screening factor based on the category definitions. Second, add up the values for each area.
(5) Take the raw score and divide it by the number of screening factors. Normalized scores should fall between 1 (low priority) and 3 (high priority).

Numbering Schemes

- Unique IDs for outfalls helps in documenting issues observed. (SWO-0001, SWO-0002)
- Skipping 10 numbers at a time can help when additional outfalls are found, or when linking drainage systems. (SWO-0010, SWO-0020, SWO-0030)

Equipment list for mapping:

1. Existing paper maps
2. Field sheets
3. Camera (preferably digital)
4. GPS Unit
5. Spray paint (or other marker)
6. Cell phones or hand-held radios
7. Clip boards and pencils
8. First aid kit
9. Flash light or head lamp
10. Surgical gloves
11. Tape measure/collapsible yardstick
12. Temperature probe
13. Waders
14. Watch with a second hand
15. Five 1-liter sample bottles
16. Dry erase board (for photos)
17. Hand sanitizer
18. Sampling pole
19. Mirror (for light)
20. Digital camera with flash on pole
21. Safety vests

2.3 MAPPING THE SYSTEM

This section will focus on developing a complete map of the storm drain system using geographic information systems (GIS), since most of Stormwater Phase II regulated communities currently plan to use GIS to create their maps.

A sample strategy for mapping a small MS4 community is as follows:

1. Review/Office Preparation:
   a. Check existing available mapping data in high priority areas first, then in medium priority areas, then low priority areas (planning board submittals or as-builts are a good resource for locations).
   b. Decide on and document a numbering or naming system for outfalls and other structures. Establishment of a simple unique numbering system (SWO-0001, SWO-0002, etc.) will facilitate future inspections and documentation of maintenance.
   c. Select a method to mark outfalls in the field (using spray paint, paint pen, or signs or markers), and place an order for necessary materials. (Marking the outfalls ensures they can be consistently identified in the field, but is not required.)
   d. Obtain equipment for mapping (see Equipment List).
   e. Develop a schedule for completing (use town or city parcel grid or watershed areas defined in Section 2.2).
   f. Conduct preliminary reconnaissance to evaluate if watercraft are necessary to view the banks of the waterbody.

2. Field check:
   a. Using existing paper maps as a basis for locations, field personnel should start a mapping program by walking all named waterbodies within a given area of the community and collecting outfall location and design information using global positioning system (GPS) equipment capable of sub-meter (approximately 3-foot) accuracy. Use of a data logger and data collection software, such as Pathfinder®, will allow the generation of GIS files that will be useful for many years. Appendix A contains an Outfall Characteristics Form.
   b. Collect dry weather inspection information whenever possible. A Dry Weather Outfall Inspection Form is contained in Appendix A. Dry weather discharge information can either be collected on the paper forms for manual entry into a separate database at a later time, or can be directly entered into a database on a laptop or the data logger on-site.
   c. Mark the outfall with its identifier for future location and easy reference using spray paint, paint markers, or pre-manufactured signs.

3. Develop Initial GIS Maps: If the storm drain system is being mapped as part of a larger GIS database for the municipality, the data collected can be

displayed with any of the existing data sets. If the storm drain system is not part of a larger data set, the Program Manager must determine what background the maps should be displayed on. Many communities prefer mapping to be displayed on aerial photographs. Aerial photographs are available on the NHGRANIT website (www.granit.sr.unh.edu). Aerial photographs are one of the most interesting background files to use to display information; however, their large file size (20 MB and larger) can make them impractical. An alternate way to display the mapped information consists of downloading either United States Geological Survey (USGS) quadrangles, or a set of roads, political boundaries, waterbodies, and watershed information (also available from the NHGRANIT website).

4. Review and field check other structures (catch basins, culverts, pipes, ditches, drain manholes, etc.):

    a. Scan and digitize any paper maps of the system into GIS-compatible files or use aerial photographs to identify point structures. An efficient way to do this is to send field staff along with catch basin cleaning crews to confirm catch basin locations, to observe the interior of structures, to determine which pipes enter and leave the structure, and to obtain design information on the pipes and structures. A GPS unit with a data logger can be used to record the location and design information related to the structures.
    b. Field check digitized data.
    c. Assign unique identifiers to remaining structures (CB-00X for catch basins, DMH-00X for drain manholes, etc.), and a set of attributes and allowable fields to describe the structure.

5. Incorporate field data into GIS and revise as necessary: Once the GPS data files have been converted into GIS layers, and revised maps have been produced, these maps should be proofed to assess their accuracy and completeness. The reviewer should document any additional data requirements, and correct any errors in the information collected. A relational database can help illustrate connections between pipes, outfalls, and other structures.

It should be noted that there are many possible mapping strategies for a given municipality depending on the amount and format of available storm drain system data and the resources that are available. The strategy described above is presented as one way to complete mapping. For a small to medium size community (6,000 to 10,000 people), this process could take approximately two years to complete, depending upon availability of resources and land use.

2.4 DETECTION

Illicit discharges can be detected in many ways. Determining which detection methods are appropriate for a community can be a relatively simple process. An example of this selection process is provided as Table 2-6. As Program Managers review sections 2.4.1 through 2.4.5, they should complete Table 2-7 to document which types of inspections are appropriate for different areas of the community, as well as the frequency of inspections.

Dry Weather Discharge

The CWP defines **dry weather** as a 48 hour period with no runoff-producing rain fall. NEIWPCC defines dry weather as a 48-72 hour period with less than 1/10-inch rainfall. Each community should refine the definition of dry weather to suit its specific conditions.

2.4.1 Dry Weather Inspections During Mapping (or initial inspections)

The Dry Weather Outfall Inspection Form (see Appendix A) can be used during mapping to detect continuous and intermittent discharges. The form should be completed whenever evidence of an illicit discharge, such as significant flow during dry weather, the presence of raw sewage indicators, staining, or residue, is observed. If the municipality is using paper forms to document inspections, they should complete a Dry Weather Outfall Inspection Form even if there is no evidence of an illicit discharge.

2.4.2 Long-Term Dry Weather Inspections

Long-term, regular inspections of outfalls are a primary part of an effective IDDE program. Regular inspections will not be significantly different from inspections conducted during mapping. The Dry Weather Outfall Inspection Form (see Appendix A) can be used, and the major difference will be that a crew or inspector will have historical data to work with to make assessments. These inspections can be recorded in an electronic database (recommended, especially for medium to large communities) or paper forms can be kept (which may be appropriate for smaller communities).

The Program Manager should develop a schedule of long-term inspections for outfalls. The CWP recommends inspecting all outfalls once, at a minimum, during the first permit cycle. Further inspections should be conducted as personnel and funds allow. Long-term inspections should be conducted during dry weather to maximize the potential to observe evidence of illicit discharges. While winter inspections can be productive, personnel should be aware of the potential for snowmelt during warmer days. Use of interns can be cost effective, but interns must be trained in safety and identification techniques.

Tidal Area Inspections

Plan to complete tidal area inspections at low tide when most pipes are exposed.

2.4.3 Opportunistic Inspections

Most public works crews conduct their regular duties in and around the storm drain system. A Program Manager may elect to have crews conduct outfall inspections on a formal basis (actually bringing an inspection form and equipment) while performing other work, or the Program Manager may elect to have crews informally “keep a look out” for illicit discharges. If an employee observes evidence of an illicit discharge during an informal or non-routine inspection, he/she should collect as much information about the potential illicit discharge as possible then contact his/her

Examples of indicators of an illicit discharge include:

- Odor
- Color
- Floatables
- Solids
- Turbidity
- Oil sheen
- Grey mat

supervisor or dispatch office so that appropriate action can be taken. The Incident Tracking Sheet (see Appendix A) can be used to collect the information observed. While it may not be reasonable to expect all public works employees to have copies of the form at all times, there are other ways to collect the information:

- The person observing the discharge can provide the information verbally to dispatch or the supervisor, who can then complete the Incident Tracking Sheet;
- The person can log as much information as they can recall onto the form upon returning to the office; or
- A third party (such as a code enforcement officer) dedicated to inspecting and tracing illicit discharges can be sent to the location as soon as possible where the potential illicit discharge was observed to collect the necessary information directly on the form.

It is important to collect as much information as possible at the time of initial observation because of the likelihood that a discharge may be transitory or intermittent. Initial identification of the likely or potential sources of the discharge is also very important.

TABLE 2-6: EXAMPLE WORKSHEET TO DEVELOP A DETECTION PROGRAM		
Type of Detection Program	**Retained/Eliminated from Municipal IDDE Program (Provide Discussion)**	**Frequency**
Inspections During Mapping or Initial Inspection		
Area A – Cloud Lake Watershed	Retained – Mapping scheduled for 2007	Not applicable
Area B		
Area C		
Longer Term Inspections		
Area A – Cloud Lake Watershed	Retained – Low priority watershed	Every 2 years
Area B		
Area C		
Opportunistic Inspections		
Citizen Call-In Program		
Septic System Inspections		
Area A – Cloud Lake Watershed	Eliminated – This area was recently sewered (2004) to eliminate all septic systems	
Area B – Bear Brook Watershed	Retained – High Priority Watershed	Opportunistic
Area C		

Instructions: This form is for Program Managers to determine which detection methods are appropriate for their community. **Review** Sections 2.4.1-2.4.5 of Chapter 2 as you **complete** this table. Fill in the names of the different areas of your community (boxes labeled Area A – Area C, as identified in section 2.2.1) for each detection program (e.g., inspections during mapping, longer term inspections, etc.). **Comment/ discuss** whether the detection programs for each area should be retained or eliminated. **Note** the frequency of inspections, if applicable.

TABLE 2-7: WORKSHEET TO DEVELOP A DETECTION PROGRAM		
Type of Detection Program	**Retained/Eliminated from Municipal IDDE Program (Provide Discussion)**	**Frequency**
Inspections During Mapping or Initial Inspection		
Area A		
Area B		
Area C		
Longer Term Inspections		
Area A		
Area B		
Area C		
Opportunistic Inspections		
Citizen Call-In Program		
Septic System Inspections		
Area A		
Area B		
Area C		

Instructions: This form is for Program Managers to determine which detection methods are appropriate for their community. **Review** Sections 2.4.1-2.4.5 of Chapter 2 as you **complete** this table. Fill in the names of the different areas of your community (boxes labeled Area A – Area C, as identified in section 2.2.1) for each detection program (e.g., inspections during mapping, longer term inspections, etc.). **Comment/ discuss** whether the detection programs for each area should be retained or eliminated. **Note** the frequency of inspections, if applicable.

2.4.4 Citizen Call-In Inspections

A citizen call-in program is an effective way to identify illicit discharges. Most municipalities have citizen comment or complaint lines that are publicized in the community. To maximize the effectiveness of citizen call-ins, dispatch personnel should be instructed on the use of the Illicit Discharge Hotline Incident Tracking Sheet (Appendix A) in order to collect as much information as possible at the time of the report. Dispatch personnel should also be instructed as to where to direct the information gathered from the tracking sheet so that appropriate action is taken. The Program Manager should identify on Table 2-7 who should be trained, and where the call-in line will be publicized in the discussion column. For communities with active websites and dedicated webmasters, an on-line forum could be incorporated into a stormwater page.

2.4.5 Septic System Inspections

Septic system inspections can be conducted in older rural or low density areas that are prone to failed septic systems. Some communities may elect to conduct screening inspections around populated lakes, which are particularly susceptible to the adverse effects of a failed septic system. The Program Manager should review his/her community prioritization and determine if any areas might need septic system inspections. If a Program Manager determines there are areas that may have high risk of failed septic systems discharging to the storm drain system, they may decide to initiate a screening program for the area.

Indicators of septic system failures include wet areas on the ground or disagreeable odors near the leach field. If municipal personnel observe these indicators near a leach field, they should coordinate with their local health officer to initiate enforcement, to have the owner repair the septic system (or connect to a sanitary sewer). Communities having difficulty with enforcement can refer the failure to NHDES for assistance.

2.5 TRACING ILLICIT DISCHARGES

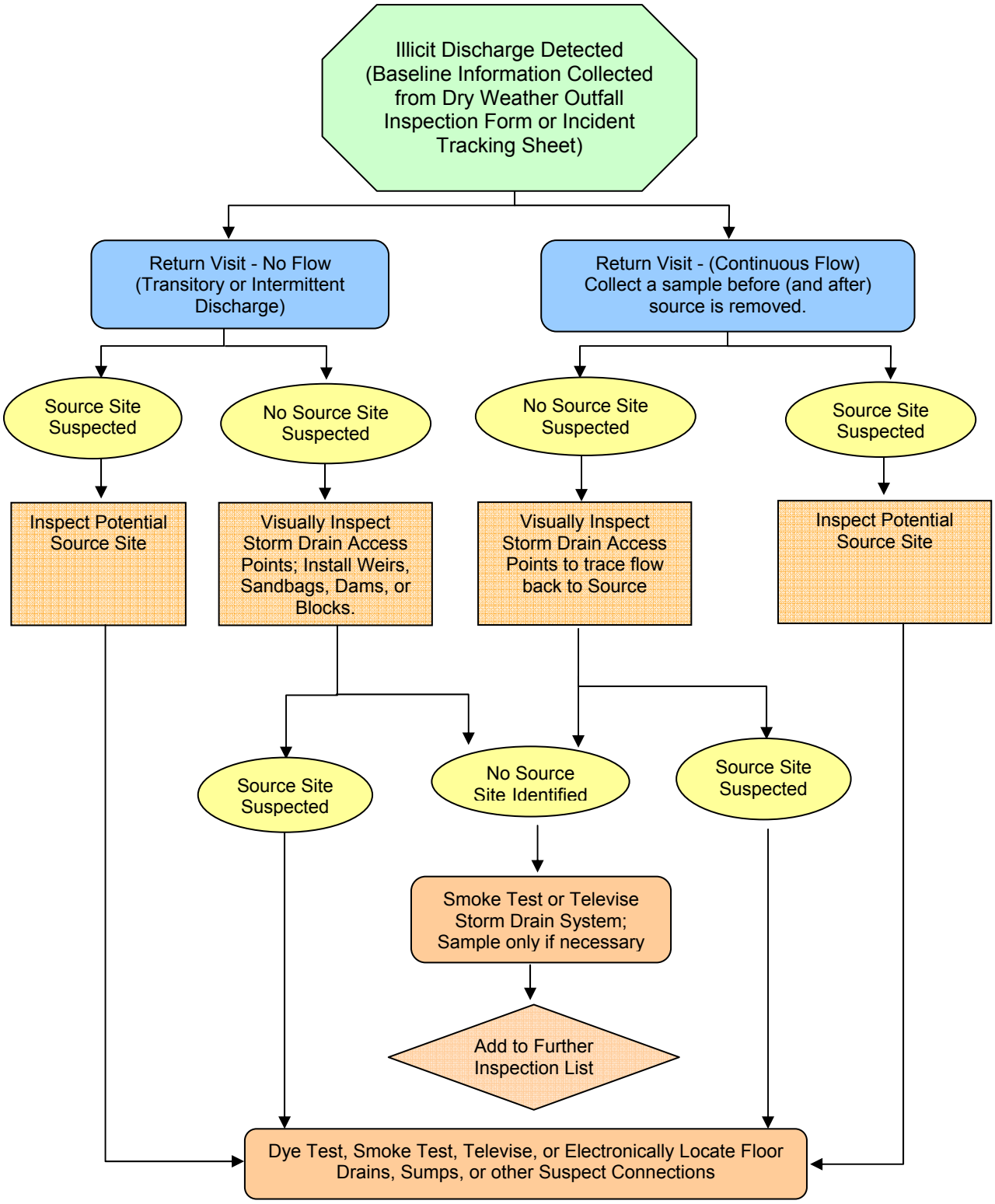
Once an illicit discharge has been reported or detected through an inspection, the next step is to locate the source. Selection of tracing techniques will depend on the type of illicit discharge detected, the information collected during initial discovery and observation (whether through an inspection by a municipal employee or through a citizen call-in) and the resources/technology available to the municipality. A single technique may be used or several techniques may need to be combined to identify the source of the discharge. Figure 2-1 presents a flow chart for selecting tracing techniques that can be applied to the two categories of potential illicit discharges: (1) transitory or intermittent discharges (where upon returning to the site, no flow is present at the location where the illicit discharge was initially reported), and (2) continuous discharges (where upon returning to the site a continuous flow is present and the flow may be more easily traced to its source). Each of these circumstances is described below.

1. Transitory or intermittent discharges: These conditions may occur as a result of an inspection or a citizen complaint. While initial information may have been collected regarding the potential illicit discharge, a return trip may show that the discharge was either intermittent or transitory (e.g., no flow is present upon return to the site). The investigative techniques that should be used will depend on whether or not a potential source location was identified during the initial observation:

   Potential source identified - If a potential source for the illicit discharge was initially identified, steps should be taken to investigate the potential source site, such as inspecting the site and storm drain system in the vicinity of the site. If floor drains, sumps, or other suspect discharge locations are observed during this inspection, dye testing, smoke testing, electronic location of subsurface pipes, or televising may be used. These techniques should definitively show whether the suspect site was the source of the illicit discharge.

   Potential source not identified - If no source site is suspected, and only the general area of the illicit discharge is known, it may be possible to trace the evidence of the illicit discharge by visual inspection of the storm drain access points. If this catch basin/manhole inspection technique is not fruitful, some interim steps could be taken to try to trap water from an intermittent discharge. For example, sand bagging, damming or block testing of selected storm drain access points, combined with installation of an optical brightener trap to assess if detergents are present in a discharge, can help reveal the source of the discharge. If these techniques have no positive result (no water pools behind the weir or sand bag), the discharge was likely transitory (one time only), and it may not be possible to determine its origin. In this case, the location of the originally reported illicit discharge should be added to a regular inspection program to provide for the possibility of future incidents. If the original report of the illicit discharge was severe or gross pollution, then smoke testing or televising of the storm drain system may be warranted.

Figure 2-1
Flow Chart to Select Tracing Techniques



2. Continuous discharges: Tracing continuous discharges is typically more fruitful than tracing transitory or intermittent discharges. The primary difference between tracing a transitory or intermittent discharge and tracing a continuous discharge is that sandbagging and weirs are not required for a continuous discharge. Visual observation of the system access points should reveal where the flow is coming from. Just as for tracing a transitory or intermittent discharge, if visual inspections are not fruitful in identifying the source and the original report was severe or gross pollution, then televising, smoke testing, or sample collection would be warranted. NHDES recommends collecting a grab sample for bacterial analysis from any pipe with a significant flow, even if the discharge appears to be clear.

While these conditions may not cover the universe of discharges that may be discovered, they should provide general guidance on the selection of tracing techniques. The following subsection describes in more detail each of the techniques that can be applied, including their advantages and disadvantages.

2.5.1 Tracing Techniques

To select an effective tracing technique, one must have a good understanding of the technique and its limitations. The following is a brief summary of each of the tracing techniques that may be used to locate the source of an illicit discharge:

1. Visual Inspection at manholes/catch basins: This tracing technique is typically used when there is no suspected source site. It is the most cost effective and efficient method of tracing. Structures should be systematically inspected starting at the initial detection location, gradually working upstream through the system. If the crew is tracking a continuous discharge, the inspections may be relatively easy, and the flow can be tracked back to its source. If the crew is attempting to track a transitory or intermittent discharge, the crew should make the following observations depending on the information provided from the initial identification: color and clarity of any discharge, staining or deposits on bottom of structure; oil sheen, scum, or foam on any standing fluids in sump of structure; odors, staining or deposits on inlet pipes and outlet pipes. Depending on what the crew is looking for, and what they find, they will progressively inspect additional structures until either a potential source is found, or no further evidence is found. If no further evidence is found the crew may elect to further assess some of the structures by installing sandbags or other damming devices to determine if the discharge recurs. Crews should use standard safety procedures when conducting these inspections such as cone placement and safety vests in traffic areas, confined space entry techniques (if entry is necessary), steel-toed boots, etc.
2. Sampling flowing discharges: As shown in Figure 2-1, samples should be collected only in the event a discharge is flowing through the outfall. Stagnant pools of water or sump water should not be sampled. NHDES can assist with

the sampling. If the municipal staff will be collecting the sample, the staff should be trained in safety and proper collection techniques. Table 2-8 lists the parameters that a sample may be analyzed for and provides a general discussion of how the results may be interpreted. This table was taken from the CWP manual (2004) which provides a more detailed discussion of sampling procedures and analysis of results. Sampling and analysis for many of the compounds should be completed by personnel trained in collection, handling, and preservation techniques to ensure accurate data. NHDES recommends collecting a sample when the discharge is initially found and after any source is removed. The sample collected after removing an illicit discharge can indicate if other illicit discharges are present.

TABLE 2-8:
INDICATOR PARAMETERS USED TO DETECT ILLICIT DISCHARGES

Parameter	Discharge Types it can Detect				Laboratory/Analytical Challenges
	Sewage	Washwater	Tap Water	Industrial or Commercial Liquid Wastes	
Ammonia	●	◙	○	◙	Can change into other nitrogen forms as the flow travels to the outfall.
Boron	◙	◙	○	*	
Chlorine	○	○	○	◙	High chlorine demand in natural waters limits utility to flow with very high chlorine concentrations.
Color	◙	◙	○	◙	
Conductivity	◙	◙	○	◙	Ineffective in saline waters, generally highly variable.
Detergents - Surfactants	●	●	○	◙	Reagent is a hazardous waste.
E. coli Enterococci Total Coliform	◙	○	○	○	24-hour wait for results. Need to modify standard monitoring protocols to measure high bacteria concentrations.
Fluoride**	○	○	●	◙	Reagent is a hazardous waste. Exception for communities that do not fluoridate their tap water.
Hardness	◙	◙	◙	◙	
pH	○	◙	○	◙	
Potassium	◙	○	○	●	May need to use two separate analytical techniques, depending on the concentration.
Turbidity	◙	◙	○	◙	

● Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.

◙ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter.

○ Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water.

* Data are not available to assess the utility as a single parameter, but when combined with additional parameters (such as detergents, ammonia and potassium), it can almost always distinguish between sewage and washwater.

** Fluoride is a poor indicator when used alone, but can distinguish between washwater and sewage when combined with analysis for detergents, ammonia and potassium.

SOURCE: Modified from *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, Center for Watershed Protection, 2004, p. 122, Table 39

3. Sandbagging or damming: Sandbagging and damming is typically only conducted when the discharge flow has ceased since initial detection. Application of this technique will show whether the discharge is one time only (no water pools behind the sandbag or dam) or intermittent (water pools behind the sandbag). CWP provides the following explanation:

> This technique involves placement of sandbags or similar barriers such as caulk dams within strategic manholes in the storm drain network to form a temporary dam that collects any intermittent flows that may occur. Any flow collected behind the sandbag is then assessed using visual observations or by indicator sampling. Sandbags are lowered on a rope through the manhole to form a dam along the bottom of the storm drain, taking care not to fully block the pipe (in case it rains before the sandbag is retrieved). Sandbags are typically installed at junctions in the network to eliminate contributing branches from further consideration. If no flow collects behind the sandbag, the upstream pipe network can be ruled out as a source of the intermittent discharge. Sandbags are typically left in place for no more than 48 hours, and should only be installed when dry weather is forecast. Sandbags should not be left in place during a heavy rainstorm. They may cause a blockage in the storm drain, or, they may be washed downstream and lost. The biggest downside to sandbagging and damming is that it requires at least two trips to each manhole (CWP 2004, p. 157).

4. Optical brightener monitoring traps: Optical brightener monitoring (OBM) traps can be used to trace intermittent or transitory discharges that result from washwater with detergent. Detergents usually contain optical brighteners that can be detected at high concentrations using this method. However, the traps only detect highly concentrated discharges. The detergent concentration required to be detected by the light is approximately the same as pure washwater from a washing machine. Consequently, OBM traps may be best suited as a simple indicator of the presence or absence of intermittent flow or to detect the most concentrated flows. The traps can be made using easily acquired materials.

   The traps contain an absorbent, unbleached cotton pad or fabric swatch contained inside a wire mesh trap or section of small diameter (e.g., 2-inch) PVC pipe. The traps should be anchored to the inside of an outfall at the invert using wire or monofilament that is secured to the pipe itself. Rocks or bricks with holes can be used as temporary weights to hold the trap in place.

Field crews can retrieve the OBM traps after 24 to 72 hours of dry weather. OBM traps need to be retrieved before coming into contact with stormwater, which will contaminate the trap or wash it away. When placed under a long wave fluorescent ultraviolet or "black" light, an OBM trap will indicate if it has been exposed to detergents. CWP reports that OBM traps have been used with some success in Massachusetts (Sargeant et al. 1998) and northern Virginia (Waye 2000). For more detailed guidance on how to use OBM traps and interpret the results, see the Reference section for World Wide Web links to the studies and guidance manuals cited above.

5. Dye testing: Dye testing is typically conducted when a potential source site has been identified, and the crew is trying to determine whether the site has floor drains or other locations that connect and discharge to the storm drain system. Permission to access the site must be obtained before dye testing can be conducted. Verbal or written requests are both acceptable. The crew should review available sanitary sewer and storm drain maps before conducting the dye testing. The dye testing procedure consists of two steps: (1) discharging the dye into the suspect location, and (2) opening nearby storm drain and sanitary sewer manhole covers to determine where the dye discharges to. This procedure is fairly effective for confirming direct connections into the storm drain system for short reaches. If a longer pipe network is being evaluated, charcoal packets can be left in selected structures and later collected and analyzed for the presence of the dye. If dye testing porcelain structures, tablets or charcoal should be wrapped in tissue before depositing. When dye testing, the crew should keep in mind that each structure (sink, toilet, etc.) should be tested separately. Many times a single utility in a basement may be incorrectly connected to a stormdrain line instead of a sanitary line.

6. Televising: Televised video inspections are a useful technique when an illicit connection or infiltration from a nearby sanitary sewer is suspected, but little evidence of the illicit discharge remains behind. Two types of video cameras are available for use: (1) a small camera that can be manually pushed on a stiff cable through storm drains to observe the interior of the piping, or (2) a larger remote operated video camera on treads or wheels that can be guided through storm drains to view the interior of the pipe. Typically the operator of the camera has access to a keyboard or audio voice-over to record significant findings on the videotape that is produced for future review and evaluation.

7. Smoke testing: Smoke testing is a useful technique for tracing intermittent discharges or continuous discharges that have no apparent source site. Smoke is introduced into the storm drain system, and emerges at locations that are connected to the system. Smoke testing works best for short reaches of pipe, or in situations where pipe diameters are too small for video testing.

The Center for Watershed Protection provides the following discussion on planning and executing smoke testing:

> Notifying the public about the date and purpose of smoke testing before starting is critical. The smoke used is non-toxic, but can cause respiratory irritation, which can be a problem for some residents. Residents should be notified at least two weeks prior to testing, and should be provided the following information (Hurco Technologies, Inc. 2003):
>
> - Date testing will occur
> - Reason for smoke testing
> - Precautions they can take to prevent smoke from entering their homes or businesses
> - What they need to do if smoke enters their home or business, and any health concerns associated with the smoke
> - A number residents can call to relay any particular health concerns (e.g., chronic respiratory problems)
>
> Program managers should also notify local media to get the word out if extensive smoke testing is planned (e.g., television, newspaper, and radio). On the actual day of testing, local fire departments and 911 call centers should be notified to handle any calls from the public.
>
> The basic equipment needed for smoke testing includes manhole safety equipment, a smoke source, smoke blower, and sewer plugs. Two smoke sources can be used for smoke testing. The first is a smoke "bomb," or "candle" that burns at a controlled rate and releases very white smoke visible at relatively low concentrations. Smoke bombs are suspended beneath a blower in a manhole. Candles are available in 30 second to three minute sizes. Once opened, smoke bombs should be kept in a dry location and should be used within one year.
>
> The second smoke source is liquid smoke, which is a petroleum-based product that is injected into the hot exhaust of a blower where it is heated and vaporized. The length of smoke production can vary depending on the length of the pipe being tested. In general, liquid smoke is not as consistently visible and does not travel as far as smoke from bombs.

Smoke blowers provide a high volume of air that forces smoke through the storm drain pipe. Two types of blowers are commonly used: "squirrel cage" blowers and direct-drive propeller blowers. Squirrel cage blowers are large and may weigh more than 100 pounds, but allow the operator to generate more controlled smoke output. Direct-drive propeller blowers are considerably lighter and more compact, which allows for easier transport and positioning.

Three basic steps are involved in smoke testing. First, the storm drain is sealed off by plugging storm drain inlets. Next, the smoke is released and forced by the blower through the storm drain system. Lastly, the crew looks for any escape of smoke above-ground to find potential leaks. Septic vents on rooftops are clear indicators of cross connections to the stormdrain system.

One of three methods can be used to seal off the storm drain. (1) Sandbags can be lowered into place with a rope from the street surface. (2) Alternatively, beach balls that have a diameter slightly larger than the drain can be inserted into the pipe. The beach ball is then placed in a mesh bag with a rope attached to it so it can be secured and retrieved. If the beach ball gets stuck in the pipe, it can simply be punctured, deflated and removed. (3) Finally, expandable plugs are available, and may be inserted from the ground surface.

Blowers should be set up next to the open manhole after the smoke is started. Only one manhole is tested at a time. If a smoke candle is used, crews simply light the candle, place it in a bucket, and lower it in the manhole The crew then watches to see where smoke escapes from the pipe. The two most common situations that indicate an illicit discharge are when smoke is seen rising from internal plumbing fixtures (typically reported by residents) or from sewer vents. Sewer vents extend upward from the sewer lateral to release gas buildup, and are not supposed to be connected to the storm drain system (CWP 2004, p. 165-166).

2.6 REMOVING ILLICIT CONNECTIONS AND DISCHARGES

Regulated MS4 communities are required to adopt an ordinance or other regulatory mechanism to prohibit illicit discharges to their storm drain system. The USEPA has developed sample ordinances for use by the regulated MS4s which describe enforcement procedures that can be taken in the event of discovery of an illicit discharge. This section describes the procedures that should be taken for removal assuming an ordinance has been adopted by the community.

Table 2-9 summarizes the procedures that should be followed to ensure a timely and complete removal depending on the types of illicit discharges that may be discovered, and the various responsible parties. For most cases, the enforcement authority for the ordinance will coordinate discharge removal.

TABLE 2-9:
NOTIFICATION AND REMOVAL PROCEDURES FOR ILLICIT DISCHARGES INTO THE MUNICIPAL SEPARATE STORM SEWER SYSTEM

Financially Responsible Party	Source Identified	Enforcement Authority	Procedure to Follow
Private Property Owner	One-time illicit discharge (e.g., spill, dumping, etc.)	Ordinance enforcement authority (e.g., Code Enforcement Officer)	• Contact Owner • Issue Notice of Violation • Issue fine
Private Property Owner	Intermittent or continuous illicit discharge from legal connection	Ordinance enforcement authority (e.g., Code Enforcement Officer)	• Contact Owner • Issue Notice of Violation • Determine schedule for removal • Confirm removal
Private Property Owner	Intermittent or continuous illicit discharge from illegal connection or indirect (e.g., infiltration or failed septic)	Plumbing Inspector	• Notify plumbing inspector
Municipal	Intermittent or continuous illicit discharge from illegal connection or indirect (e.g., failed sewer line)	Ordinance enforcement authority (e.g., Code Enforcement Officer)	• Issue work order • Schedule removal • Remove connection • Confirm removal
Exempt 3rd Party (see Section 2.6.4)	Any	USEPA	• Notify exempt third party and USEPA of illicit discharge

The following subsections address the issues of financial responsibility for removal (Section 2.6.1), forms and procedures that can be used in association with issuing a Notice of Violation (NOV) (Section 2.6.2), circumstances in which a municipality can take emergency action for discharges that are a threat to human health or the environment (Section 2.6.3), and procedures to follow when an illicit discharge from an exempt party is identified (Section 2.6.4).

2.6.1 Financial Responsibility

Once an illicit discharge's source has been identified, the financial responsibility of removing it must be determined. The following describes three cases that might be encountered:

1. The illicit discharge was a private party dumping into the storm drain system (a transient discharge). In this case, the municipality's ordinance would allow a Notice of Violation to be issued and a fine to be imposed.
2. The illicit discharge originated from a legal connection to the storm drain system (transient, intermittent, or continuous). For example, a washing machine discharging through a basement sump that was a municipally approved connection to the storm drain system would be considered an illicit discharge. The connection was legal, and the municipality's ordinance does not require disconnection. The ordinance requires only that the washing machine be disconnected from the sump discharge. The sump connection to the storm drain system, that was legally made, can remain. A Notice of Violation could be issued and a fine could be imposed.
3. The illicit discharge resulted from an illegal connection (i.e., a connection that violates state plumbing codes). For intermittent or continuous discharges that are the result of an illegal direct connection into the storm drain system, the cost for disconnection will fall to either the property owner of the illegal connection or the municipality, depending on the circumstances of the connection. For example, if the connection was incorrectly applied during a separation project conducted by the municipality, the cost to correct the connection should be borne by the municipality. If the connection was the result of a private contractor working for the resident, the resident would be financially responsible for correcting the connection. Similarly, if the illicit discharge is the result of a failed sanitary sewer line, the party responsible for the failed sanitary sewer line must pay for the correction.

2.6.2 Notice of Violation

For violations of the municipal ordinance, most municipalities will want to issue a Notice of Violation. Although most code enforcement officers will have their own forms, a blank letter is provided for use in Appendix A. It should be noted that the NOV describes a schedule for the removal to be completed, as well as a summary of any agreements between the parties.

2.6.3 Emergency Suspensions

A community's ordinance might allow a suspension of access to the storm drain system for discharges that present "imminent and substantial danger to the environment or to the health or welfare of persons, or to the storm drain system". Suspension may include blocking pipes, constructing dams, or taking other measures on public ways or public property to physically block the discharge. The municipal

enforcement authority for the ordinance may want to call the NHDES Petroleum Spill Response at (603) 271-3644 or the NHDES Hazardous Material Response at (603) 271-3899 when making this determination for suspension.

2.6.4 Discharges from Exempt Parties

Several categories of facilities are regulated by the USEPA for stormwater discharges under other permits. Because these facilities are already responsible to one enforcement authority for stormwater discharges, the municipality can exempt them from their municipal ordinance. If a municipality encounters an illicit discharge that is suspected or determined to be coming from an exempt party that is regulated under some other stormwater regulation, the municipality should notify both the suspected discharger and the enforcement authority for that discharger. The notification can be verbal or in writing. Most municipalities have prior experience working with other enforcement authorities for suspected violations of either state or federal law.

The following is a brief list of parties that are regulated under an alternate stormwater program:

TABLE 2-10:
EXAMPLE EXEMPT FACILITIES

Exempt Facility	Alternate Regulation They Are Subject To	Enforcement Authority
New Hampshire Department of Transportation (NHDOT) (in selected urbanized areas)	NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), Part V	USEPA
University of New Hampshire (UNH) (Durham)**, Youth Development Center** (Manchester)**, Stafford County Complex** (Dover)	NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), Part IV	USEPA
Industrial Facilities with selected SIC codes (See Table 2-11 for a complete list)	Multi Sector General Permit for Industrial Activities	USEPA

As shown in Table 2-9, if a municipality identifies that an illicit discharge has come from one of these facilities, they should notify both the discharger and the enforcement authority verbally or in writing of the activity. Standard Industrial Classification (SIC) codes for NPDES Stormwater Multi-Sector General Permit (MSGP) Industrial Facilities are listed in Table 2-11.

TABLE 2-11: SIC CODES FOR MSGP INDUSTRIAL ACTIVITIES		
Sector Name		**SIC Code Listing**
Sector A:	**Timber Products**	2411, 2421, 2426, 2429, 2431–2439 (except 2434), 2448, 2449, 2451, 2452, 2491, 2493, 2499
Sector B:	**Paper and Allied Products**	2611, 2621, 2631, 2652–2657, 2671–2679
Sector C:	**Chemical and Allied Products**	2812–2819, 2821–2824, 2833–2836, 2841–2844, 2851, 2861–2869, 2873–2879, 2891–2899, 3952 (limited to list)
Sector D:	**Asphalt Paving and Roofing Materials and Lubricants**	2951, 2952, 2992, 2999
Sector E:	**Glass Clay, Cement, Concrete, and Gypsum Products**	3211, 3221, 3229, 3231, 3241, 3251–3259, 3261–3269, 3271–3275, 3281, 3291, 3292, 3296, 3297, 3299
Sector F:	**Primary Metals**	3312–3317, 3321–3325, 3331–3339, 3341, 3351–3357, 3363–3369, 3398, 3399
Sector G:	**Metal Mining (Ore Mining and Dressing)**	1011, 1021, 1031, 1041, 1044, 1061, 1081, 1094, 1099
Sector H:	**Coal Mines and Coal Mining Related Facilities**	1221–1241
Sector I:	**Oil and Gas Extraction and Refining**	1311, 1321, 1381–1389, 2911
Sector J:	**Mineral Mining and Dressing**	1411, 1422–1429, 1442, 1446, 1455, 1459, 1474–1479, 1481, 1499
Sector K:	**Hazardous Waste Treatment, Storage, or Disposal Facilities**	HZ
Sector L:	**Landfills and Land Application Sites**	LF
Sector M:	**Automobile Salvage Yards**	5015
Sector N:	**Scrap Recycling Facilities**	5093
Sector O:	**Steam Electric Generating Facilities**	SE
Sector P:	**Land Transportation and Warehousing**	4011, 4013, 4111–4173, 4212–4231, 4311, 5171
Sector Q:	**Water Transportation**	4412–4499
Sector R:	**Ship and Boat Building or Repairing Yards**	3731,3732
Sector S:	**Air Transportation**	4512–4581
Sector T:	**Treatment Works**	TW
Sector U:	**Food and Kindred Products**	2011–2015, 2021–2026, 2032, 2041–2048, 2051–2053, 2061–2068, 2074–2079, 2082–2087, 2091–2099, 2111–2141
Sector V:	**Textile Mills, Apparel, and Other Fabric Product Manufacturing, Leather and Leather Products**	2211–2299, 2311–2399, 3131–3199 (except 3111)
Sector W:	**Furniture and Fixtures**	2434, 2511–2599
Sector X:	**Printing and Publishing**	2711–2796
Sector Y:	**Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries.**	3011, 3021, 3052, 3053, 3061, 3069, 3081–3089, 3931, 3942–3949, 3951–3955 (except 3952 facilities as specified in Sector C), 3961, 3965, 3991–3999
Sector Z:	**Leather Tanning and Finishing**	3111
Sector AA:	**Fabricated Metal Products**	3479, 3411–3499 , 3911–3915
Sector AB:	**Transportation Equipment, Industrial or Commercial Machinery**	3511–3599 (except 3571–3579), 3711–3799 (except 3731, 3732)
Sector AC:	**Electronic, Electrical, Photographic, and Optical Goods**	3571–3579, 3612–3699, 3812-3873
Sector AD:	**Non-Classified Facilities**	N/A

2.7 TRACKING ILLICIT DISCHARGES

Developing a long-term tracking program can help Program Managers better understand the origins of illicit discharges and identify maintenance issues for the storm drain system structures. A tracking program will also facilitate evaluation of the overall IDDE program and will expedite annual reporting. An effective tracking program should address illicit discharge and maintenance issues resulting from the following:

- Citizen complaints
- Opportunistic inspections
- Regular longer term inspections
- Removal actions taken for illicit discharges

Sample Organization for Three-Ring Binder:

Area A
- Outfall Structures (SWO-001, SWO-002, etc)
- Catch Basins (CB-001, CB-002, etc.)
- Drain Manholes (DMH-001, DMH-002, etc.)

Area B
- Outfall Structures (SWO-010, SWO-013, etc)
- Catch Basins (CB-104, CB-102, etc.)
- Drain Manholes (DMH-025, DMH-002, etc.)

2.7.1 Binder System

Most communities have an existing work order system that can be used to track illicit discharges and their status. For smaller communities, an effective tracking system can be as simple as maintaining a three-ring binder with paper copies of all the forms that document the citizen complaints, inspections, and follow up information. The binder should be organized by priority area, with a listing in the front of each section or a map showing all the structures that are contained in that section. Because each structure is assigned a unique identifier, the information within the sections can be ordered by structure type and then by unique identifier. This method could become cumbersome for a medium or larger community.

Databases provide an excellent way to organize large quantities of information, allowing retrieval at a later time of selected information as needed. Databases work nicely with GIS systems because the GIS database system can be related to a larger database that stores more rapidly changing data that will increase in volume over time.

2.7.2 Electronic Database

A distinct electronic database can be created that includes all the fields on the Dry Weather Outfall Inspection Form. The advantage to this tracking program is that the database can be easily linked to the GIS. Linking to a GIS allows mapping of illicit discharge locations, citizen complaint locations, and many other IDDE issues which can assist greatly in the overall program. Table 2-12 contains simple attributes that can be used in the database. Small to medium communities can use an electronic spreadsheet instead of a database. Larger communities with more data may benefit from a database form of electronic data storage.

TABLE 2-12:
STORMWATER PHASE II TRACKING SHEET

Date of Incident/ Date Reported:	**Report Initiated by:** Phone, drop-in, contact information (optional), etc.	**Location of Discharge**: If known - lat/long, stream address or outfall #, closest street address, nearby landmark, etc.	**Description of Discharge:** For example - dumping, wash water, suds, oil/solvents/chemicals, sewage, etc.	**Actions to be taken**: Who, What, Where, When, and How… (what should be done)	**Description of Resolution**: Outcome of actions taken and any necessary follow-up (what was done)	**Date Resolved**

2.8 EVALUATING THE PROGRAM

Program Managers should evaluate their IDDE program at the end of each year to assess if it is effective and efficient and to identify where improvements should be made. Table 2-13 is a worksheet that Program Managers can use to evaluate the following components:

1. Priority Areas: Are the priority areas initially identified still appropriate? Considerations should include reviewing the priority worksheet to assess if any changes have occurred since the initial evaluation was completed (such as: Have additional illicit discharges been discovered in any of the areas? Has a new 303(d) list come out naming new waterbodies as impaired?)
2. Detection Program: Is the detection program effective? Documenting the number of illicit discharges detected by the various detection mechanisms (inspections, citizen call-ins, opportunistic inspections) can help a Program Manager decide where to allocate resources.
3. Tracing Techniques: What tracing techniques were generally used? What tracing techniques were generally effective? In how many instances were visual inspections of the area sufficient to identify the source of the illicit discharge? Were there any times the equipment necessary to effectively trace an illicit discharge was not used because it was not available, or was too costly to obtain? Documenting the effectiveness of tracing techniques can help Program Managers be more efficient.

Although completing an evaluation of the overall IDDE program may be time consuming, its benefits may include reduced costs for future inspection and IDDE efforts. Keeping track of where illicit discharges are likely to occur and what techniques are useful can save a municipality time and money.

TABLE 2-13:

IDDE PROGRAM EVALUATION WORKSHEET

Priority Areas (1)	List any factors that have changed since initial priority was set (2)	Recommended Change (Circle) (3)	
A		Leave Priority Same	Re-evaluate
B		Leave Priority Same	Re-evaluate
C		Leave Priority Same	Re-evaluate

Detection Program (1)	# Mapping Inspections (4)		# Longer Term Inspections (4)		# Citizen Complaints (4)		# Opportunistic Inspections (4)	
Priority Areas	Identified	Resolved	Identified	Resolved	Identified	Resolved	Identified	Resolved
A								
B								
C								
Tracing Techniques Used (5)	**Effective**	**Ineffective (Comment below)**	**Effective**	**Ineffective (Comment below)**	**Effective**	**Ineffective (Comment below)**	**Effective**	**Ineffective (Comment below)**
Method:								
Method:								
Method:								

Comments/Recommended Changes (6)

Instructions: This worksheet is for Program Managers to evaluate their IDDE Program.

1. Fill in the names of the priority areas in your community.
2. List any factors that have changed since the initial prioritization (i.e. have additional illicit discharges been discovered in these areas, has a new 303(d) list come out naming new waterbodies as impaired, etc.).
3. Circle the applicable recommended change.
4. Fill in the number of illicit discharges identified and subsequently resolved for each detection mechanism used.
5. Fill in the different tracing techniques that were used (visual, sampling, sandbagging, OBM, dye/smoke testing, televising), and check whether they were effective or ineffective for each applicable detection mechanism that they were used for. If the method was ineffective, comment on why it was ineffective and how it could be improved.
6. Note any additional comments or recommended changes.

Chapter

3

3. POLLUTION PREVENTION AND GOOD HOUSEKEEPING

Many municipal activities can result in stormwater pollution if not conducted properly. Activities such as vehicle maintenance, fueling, and landscaping involve handling, storage, and use of chemicals and petroleum products that must be used properly to prevent stormwater from becoming polluted. In addition, construction activities conducted during general maintenance of infrastructure can result in sedimentation and erosion of soil that can be swept by stormwater into the storm drain system or directly into waterbodies.

The Pollution Prevention/Good Housekeeping components of the General Permit require that municipalities re-evaluate how they manage the municipal infrastructure and develop procedures that are protective of stormwater, and ultimately the waterbodies the stormwater discharges to. The specific language for required items is listed in Part III.B.6. of the General Permit. The permittee must:

a. *Develop and implement a program with a goal of preventing and/or reducing pollutant runoff from municipal operations. The program must include an employee training component.*
b. *Include, at a minimum, maintenance activities for the following: parks and open space (areas such as public golf courses and athletic fields); fleet maintenance, building maintenance; new construction and land disturbance; roadway drainage system maintenance and stormwater system maintenance.*
c. *Develop schedules for municipal maintenance activities described in paragraph (b) above.*
d. *Develop inspection procedures and schedules for long term structural controls.*

TABLE 3-1:
GOOD HOUSEKEEPING/POLLUTION PREVENTION SOPS/ACTIVITY MATRIX

SOP	Vehicle/ Equipment Maintenance	Facilities Maintenance (including Parks and Open Space)	Storm Drain System Maintenance	Construction Activities and Other Land Disturbances
B.1 Catch Basin Cleaning			X	
B.2 Storm Drain System Repair and Maintenance			X	
B.3 Erosion and Sediment Control		X	X	X
B.4 Landscape Design and Management		X		X
B.5 Storage and Disposal of Fertilizer and Pesticide		X		X
B.6 Fertilizing and Turf Health Application		X		X
B.7 Weed and Pest Control Application		X		
B.8 Mowing and Irrigation		X		
B.9 Vehicle and Equipment Storage	X	X	X	X
B.10 Vehicle and Equipment Washing	X	X		X
B.11 Vehicle and Equipment Fueling	X	X		X
B.12 Spill Clean-up	X	X		X
B.13 Parts Cleaning	X			
B.14 Spare Parts Storage	X	X		
B.15 Alternative Products Use/Storage/Disposal	X	X		
B.16 Petroleum and Chemical Disposal	X	X		
B.17 Petroleum and Chemical Handling	X	X		
B.18 Petroleum and Chemical Storage - Bulk	X	X		
B.19 Petroleum and Chemical Storage – Small Quantity	X	X		
B.20 Garbage Storage	X	X		
B.21 General Facility Housekeeping	X	X		
B.22 Floor Drains	X	X		
B.23 Painting	X	X		
B.24 Street Sweeping	X	X		X
B.25 Snow Disposal		X		
B.26 Deicing Material Storage		X		
B.27 Deicing Material Application		X		

To address these components, this Chapter is divided into four subsections that describe four major categories of operations completed by municipalities:

- Vehicle/Equipment Maintenance (Section 3.1),
- Facilities Maintenance including parks and open space (Section 3.2),
- Storm Drain System Maintenance (Section 3.3), and
- Construction Activities (Section 3.4).

Each of these four operational areas contains a diverse set of activities, for which SOPs are appropriate. SOPs associated with each of these operational areas are contained in Appendix B. The SOPs outline the management and maintenance procedures that are used to minimize impacts on stormwater. Some of the SOPs apply to more than one operational area. For example, both vehicle maintenance and facilities maintenance require handling, storage, and disposal of petroleum products. Therefore, the SOPs for petroleum handling, storage and disposal in Appendix B address both of these operational areas. Table 3-1 shows the relationship between the SOPs that are contained in Appendix B and the operational areas that are described in this Chapter.

What is a "regulated contaminant"?

State rules define a regulated contaminant as "any physical, chemical, biological, radiological substance or other matter, other than naturally occurring substances at naturally occurring levels, in water which adversely affects human health or the environment." Consult the Material Safety Data Sheets (MSDS) for the products you use; see the disposal information in the "Spills or Leaks" section of the MSDS.

New Hampshire state rules prohibit any discharge to the ground of non-domestic wastewater containing regulated contaminants.

3.1 VEHICLE AND EQUIPMENT MAINTENANCE

The SOPs related to vehicle maintenance activities have three basic themes:

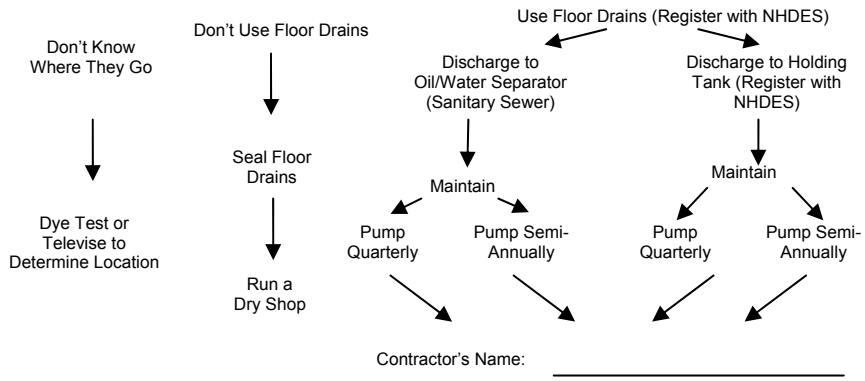
1. Store chemicals, wastes, and vehicles inside whenever possible to minimize their potential to pollute stormwater.
2. Handle with care to avoid spills. Preventing spills is the best way to minimize stormwater contact with chemicals and petroleum products.
3. Recycle whenever possible. When it is not possible to recycle, dispose of properly to ensure contact with stormwater is minimized.

Seven common vehicle maintenance activities are described below. To assist program managers in understanding what the best ways are to protect stormwater from becoming polluted by these activities, a worksheet-style aid is provided for each activity immediately following the description of the activity. It is recommended that the worksheets applicable for your facility be filled out as you review this section.

- *Floor Drains*: Program managers should be able to positively identify the discharge location of their floor drains. If the discharge location is unknown, it should be determined. Available methods to determine the discharge location include: televising or dye testing (see Section 2.5 for discussion of advantages and disadvantages of each method). Floor drains should either be connected to a regularly maintained holding tank (registered with NHDES) or to a regularly maintained oil/water separator that discharges to the sanitary sewer. The facility should connect the floor drains to the appropriate device or close and seal the floor

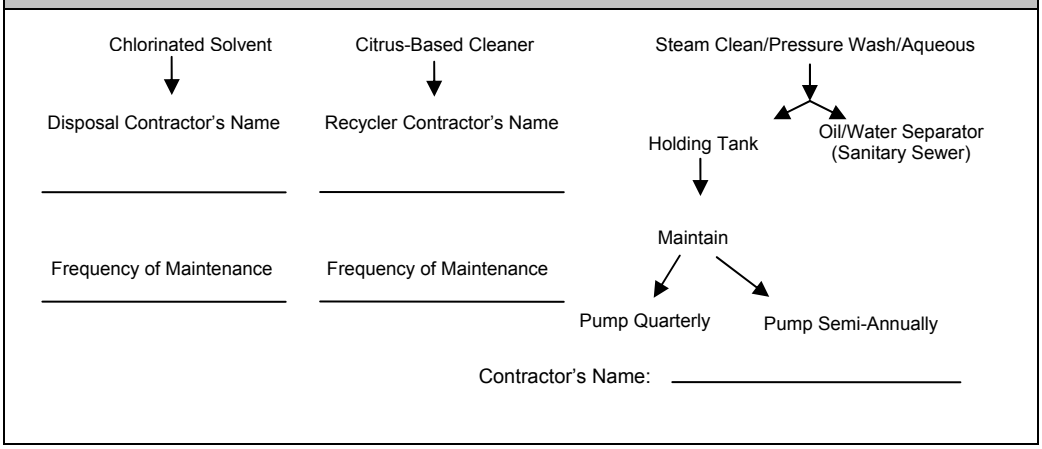
drains, and run a "dry shop". Public works facilities typically store or use "regulated contaminants" in the area served by the floor drain. Therefore, these floor drains must be either closed, rerouted to the sanitary sewer via an oil/water separator, or rerouted to a holding tank registered with the NHDES (603) 271-2858.

Figure 3– 1 Floor Drains – Available Options
(Circle all that apply and fill in blanks.)



- *Parts Cleaning*: Most vehicle maintenance facilities use one of three methods to clean parts: chlorinated solvents, citrus-based cleaners, or aqueous base cleaners. If chlorinated solvents are used, they should be disposed of as hazardous waste by a licensed hazardous waste contractor. Citrus based cleaners can be recycled by an off-site contractor reducing overall cost of its use. Steam cleaning or use of a commercial aqueous washer allows discharge to the sanitary sewer. Using non-hazardous chemicals reduces the risk of stormwater pollution.

Figure 3-2 Parts Cleaning – Available Options
(Circle all that apply and fill in the blanks.)

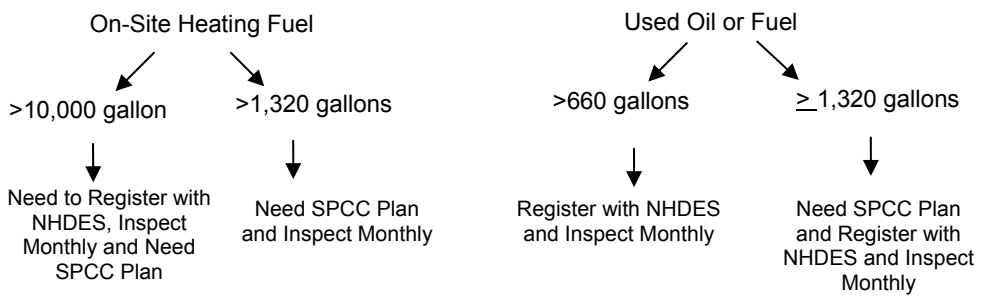


To register an AST:

Call NHDES Department of Environmental Services (603) 271-3644

- *Petroleum Storage*: NHDES regulates above-ground storage tanks (ASTs) when a facility is storing more than 660 gallons of used oil or fuel, or when a facility is storing more than 10,000 gallons of heating oil used for on-site heating. NHDES requires registration of ASTs and monthly inspections of the tanks. Federal regulations (40 CFR Part 112) require development of a Spill Prevention Control and Countermeasure Plan (SPCC) for facilities that store more than 1,320 gallons of any petroleum product. These regulations help protect stormwater by requiring regular inspections and development of spill prevention and clean-up procedures. Program managers should understand and follow the regulations that apply to their facility.

Figure 3-3 Petroleum Storage – Available Options
(Circle all that apply and fill in the blanks.)



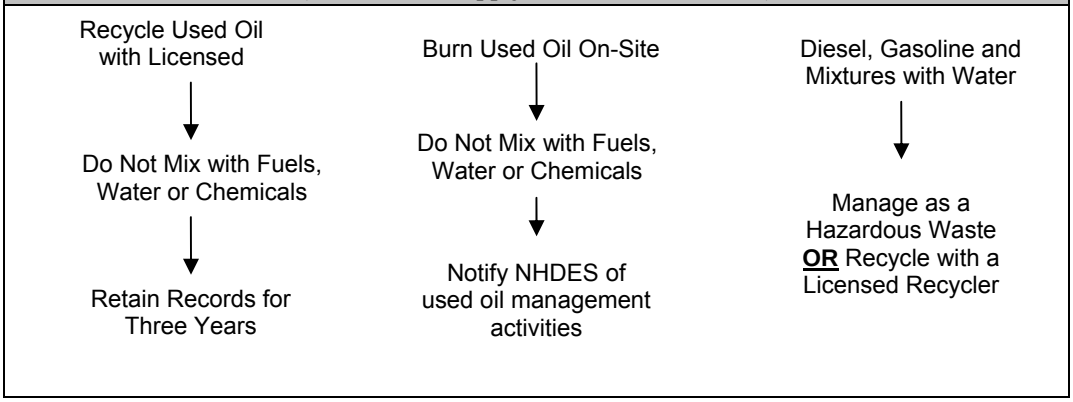
Municipalities burning used oil onsite must register with NHDES Reporting and Information Management Section

(603) 271-2921
Or
(603) 271-2901

- *Petroleum Disposal*: Proper disposal of petroleum products can minimize their impact on stormwater. Used oil can be recycled with a marketer who has registered with the NHDES. Used oil can also be burned on-site by a municipality for energy recovery as long as the oil has not been mixed with any other fuels or chemicals. Municipalities must notify NHDES of their used oil management activities if they are burning used oil on-site. Other wastes generated should be managed as follows:

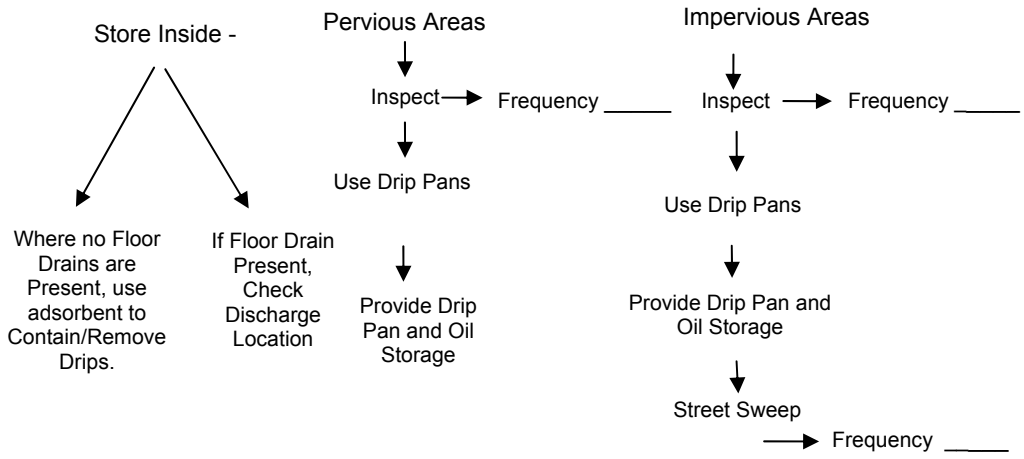
  - Diesel fuel and gasoline, or any mixture of oil and water, must be managed as a hazardous waste and should not be mixed with used oil.
  - Sludge from floor drains should be analyzed for Toxicity Characteristics Leaching Procedure (TCLP) prior to disposal to determine if it is a hazardous waste.
  - Residual solids from oil spills may be managed as a solid waste, unless the residuals are from a volatile fuel such as gasoline. Volatile fuel residuals must be managed as a hazardous waste.

Figure 3-4 Petroleum Disposal – Available Options
(Circle all that apply and fill in the blanks.)



- *Vehicle Storage*: Vehicles should be stored indoors in an area where there are no floor drains or where any floor drains have been properly connected and registered (see above). If vehicles cannot be stored indoors, they can be stored on impervious areas that are inspected on a regular basis and which can be cleaned with a street sweeper as necessary. Vehicles can be stored on pervious (unpaved) areas that are inspected on a regular basis to assess if drip pans are necessary. Drip pans should always be used to collect leaking fluids. A dedicated, convenient storage area should be provided and clearly labeled for the drip pans and for the fluids they will contain. Leaking vehicles should be repaired as soon as practical to minimize stormwater pollution.

Figure 3-5 Vehicle Storage – Available Options
(Circle all that apply and fill in the blanks.)



To Register a Holding Tank:

See NHDES Fact Sheet WD-WSEB-22-8 at www.des.nh.gov

To register a vehicle washing activity (when less than 30 vehicles per week):

Contact NHDES Water Supply Engineering Bureau at **(603) 271-2858**

- *Vehicle Washing*: If vehicles are washed regularly onsite, they should be washed in a dedicated area. The area can be:

  1. Indoors, if the washwater is discharged to floor drains that are properly connected to a holding tank or the sanitary sewer (see Figure 3-1),
  2. Outdoors, if you wash more than 30 vehicles per week and you obtain a NHDES Groundwater Discharge license, or
  3. Outdoors, if you wash fewer than 30 vehicles per week and discharge to the ground surface, if:
     - The Best Management Practices Rules are followed,
     - The activity is registered with NHDES, and
     - The wastewater:
       - is not from power washing, steam cleaning, engine cleaning or undercarriage cleaning;
       - does not contain soaps or other products which contain regulated contaminants; and
       - does not discharge to a surface water.

Figure 3-6 Vehicle Washing – Available Options
(Circle all that apply and fill in the blanks.)

Dedicated vehicle washing location is: Indoors Outdoors

Indoors

Make sure floor drains discharge to a holding tank or oil/water separator (see Figure 3-1).

Outdoors

If > 30 vehicles per week, need to obtain a NHDES Groundwater Discharge License.

If <30 vehicles/week, wash vehicles in an area where runoff discharges to ground surface, if:

- The Best Management Practice Rules (ENV-Wq 401) are followed, and
- The wastewater:
  - is not from power washing, steam cleaning, engine cleaning or undercarriage cleaning;
  - does not contain soap or other products which contain regulated contaminants, and
  - does not discharge to a surface water.

- *Vehicle Fueling*: Vehicle fueling areas are a significant generation point for petroleum contamination of stormwater. Vehicle fueling areas should be impervious surfaces, and should be inspected and swept with a street sweeper on a regular basis. A spill kit and covered garbage container should be located near the fueling area and should be well labeled for individuals to use when needed.

Figure 3-7 Vehicle Fueling – Available Options (Circle all that apply and fill in the blanks.)
Spill Kit Location: _____ Street Sweep ⟶ Frequency _____ Optional: Provide a canopy over area to minimize runon/runoff

An important component of stormwater protection at vehicle and equipment maintenance facilities is general good housekeeping. Conducting regular inspections of a facility can be an effective pollution prevention technique. The following is a list of areas Program Managers should consider when developing their own inspection checklist:

- Check refuse areas for trash on the ground that could contaminate stormwater.
- Check exterior vehicle and equipment areas for leaks, spills, drips, or excess dirt. Consider if street sweeping is necessary and if drip pan use is acceptable.
- Check fueling areas for leaks, spills, or drips.
- Check exterior petroleum storage areas for leaks, spills, or drips.
- Check clean-up of tracked sand and/or salt.
- Check calcium chloride tank for leaks, spills, or cracks.
- Check vehicle washing area for excess sediment and wastes.
- Check oil/water separator in floor drain system to ensure it is functioning, and clean, if necessary.
- Clear catch basin grates for entering stormwater.

Table 3-2 is an example inspection checklist that should be used on a regular (monthly or quarterly) basis to identify areas of potential stormwater pollution. Table 3-3 contains a blank form that the Program Manager should fill in for their facility.

TABLE 3-2:
EXAMPLE INSPECTION CHECKLIST

Date: ____/____/____ **Inspector: _____**

Inspection Area	Practice Followed	Comments	Date Resolved (if applicable)
Check refuse areas for trash on the ground that could contaminate stormwater or be washed away in stormwater	Acceptable/Needs Attention		
Check all exterior vehicle and equipment areas for leaks, spills, drips, or excess dirt – Street sweeping necessary?	Acceptable/Needs Attention		
Check all exterior vehicle and equipment areas for leaks, spills, drips, or excess dirt – Drip pan use acceptable?	Acceptable/Needs Attention		
Check fueling areas for leaks, spills or drips	Acceptable/Needs Attention		
Check exterior petroleum storage areas for leaks, spills, or drips	Acceptable/Needs Attention		
Clean-up of tracked sand that might allow stormwater transport of sand	Acceptable/Needs Attention		
Clean-up tracked salt that might result in stormwater transport	Acceptable/Needs Attention		
Check calcium chloride tank for leaks, spills or cracks	Acceptable/Needs Attention		
Check vehicle washing area for excess sediment or wastes	Acceptable/Needs Attention		
Other:	Acceptable/Needs Attention		
Other:	Acceptable/Needs Attention		

Instructions: See Table 3-3.

TABLE 3-3:
INSPECTION CHECKLIST

Date: ____/____/____ **Inspector: _____**

Inspection Area	Practice Followed	Comments	Date Resolved (if applicable)
	Acceptable/Needs Attention		
	Acceptable/Needs Attention		
	Acceptable/Needs Attention		
	Acceptable/Needs Attention		
	Acceptable/Needs Attention		
	Acceptable/Needs Attention		
	Acceptable/Needs Attention		
	Acceptable/Needs Attention		
	Acceptable/Needs Attention		
	Acceptable/Needs Attention		

Instructions: This form can be used for regular (monthly or quarterly) inspections at vehicle/equipment maintenance facilities. Program Managers should fill in the areas to be inspected for their facilities (refer to Section 3.1 and Table 3.2 Example Inspection Checklist). When the checklist is used during an inspection, the inspector needs to fill in the date as well as his/her name, circle either "Acceptable" or "Needs Attention", and note comments for each inspection area.

3.2 FACILITIES MAINTENANCE

Most municipalities own and maintain buildings, parks, and other green spaces. General maintenance activities include mowing and trimming, painting, pest control, weed control, and all of the chemical and petroleum handling that is associated with these activities. The SOPs contained in Appendix B provide best management practices to protect stormwater from the potential hazards associated with each of these maintenance activities. Facilities maintenance personnel should be trained in each of the SOPs associated with their job.

In addition to training municipal employees on the SOPs in Appendix B that affect their jobs, a formal street sweeping program can reduce pollutant loads from road salt and can reduce sand export to receiving waters. Street sweeping also reduces the amount of sediment, debris, and organic matter being washed away by stormwater.

USEPA does not recommend how frequently a community should sweep, but most municipalities commence street sweeping as soon as snow equipment has been put away for the season, sweeping all municipal lots and roadways at least once per year. An appropriate schedule for street sweeping should be determined. Program Managers could use the catch basin cleaning prioritization as a guide for the street sweeping schedule. Beach areas and heavy traffic areas can be swept weekly or monthly, depending on a community's available resources. Other locations, such as construction entrances, sand/salt loading areas, vehicle fueling areas, and vehicle and equipment storage areas should be swept on an as needed basis.

The State of New Hampshire allows municipalities to reuse street sweepings in accordance with the NHDES Environmental Fact Sheet – Management of Street Wastes (WMD-SW-32). Street sweepings may be reused as long as they do not contain visual evidence of wastewater, animal wastes, oil or other petroleum products. Catch basin residuals must be tested to determine if they may be reused. Table 3-4 lists the compounds, the S-1 limits which allow unrestricted reuse, and the S-3 limits which allow reuse as a road base or subbase. Visually contaminated street and catch basin residuals must also be tested to determine if they contain hazardous wastes.

Table 3-4 Soil Standards Catch Basin Cleanings Reuse Guidance			
	Maximum Contaminant Concentrations		
Regulated Contaminant	*S-1 Standards (mg/kg)*	*S-3 Standards (mg/kg)*	*USEPA SW-846 Test Method*
Metals			
Arsenic	11	11	6010B
Barium	750	3,400	6010B
Cadmium	32	230	6010B
Chromium	1000	5,000	6010B
Lead	400	400	6010B
Mercury	13	13	7471A
Selenium	260	260	6010B
Silver	45	200	6010B
VOCs			
Benzene	0.3	0.3	8260B
Dichloroethane, 1,2-	0.08	0.08	8260B
Isopropyl benzene	123	123	8260B
Methyl-t-butyl ether	0.13	0.13	8260B
Toluene	100	100	8260B
Xylene	500	1,100	8260B
Aklylbenzenes Butylbenzene, n- Butylbenzene, sec- Butylbenzene, tert- Isopropyl toluene, 4- Propylbenzene, n- Trimethylbenzene, 1,2,4- Trimethylbenzene, 1,3,5-	59 (total)	59 (total)	8260B
PAHs - Carcinogenic			
Benzo(a)anthracene	0.7	40	8270C
Benzo(a)pyrene	0.7	4	8270C
Benzo(b)fluoranthene	7	400	8270C
Benzo(k)fluoranthene	7	400	8270C
Chrysene	70	4,000	8270C
Dibenzo(a,h)anthracene	0.7	4	8270C
Indeno(1,2,3-cd)pyrene	0.7	40	8270C
PAHs – Noncarcinogenic			
Acenaphthene	270	270	8270C
Acenaphthylene	300	300	8270C
Anthracene	1,000	1,700	8270C
Fluoranthene	810	5,000	8270C
Fluorene	510	510	8270C
Methylnaphthalene,2-	150	150	8270C
Napthalene	5	5	8270C
Benzo(g,h,i)perylene Phenanthrene Pyrene	480 (total)	5,000 (total)	8270C

3.3 STORM DRAIN SYSTEM MAINTENANCE

Storm drain system maintenance consists of three components: cleaning, repairing (or retrofitting), and upgrading. Historically, storm drain systems have been repaired or upgraded only when catastrophic failures have occurred, such as those causing flooding, road failures, or severe erosion. The General Permit requires that each regulated municipality develop a maintenance schedule for the storm drain system, as well as inspection procedures and schedule for long term control structures.

3.3.1 Conveyance System Maintenance

Section 2.2 of this manual reviews how the Program Manager can divide a municipality into distinct areas and prioritize the areas based on their illicit discharge potential. A component of that evaluation considers the age and material of the infrastructure, which is an indicator of failure potential. This prioritization could be reviewed and used to develop a maintenance program for the system.

Additional useful resources include the municipal capital budget and the GASB 34 accounting information. All of these items should be reviewed and evaluated to identify where and when repairs, retrofits and upgrades should be conducted. The storm drain system maintenance program can be developed using a process that is similar to a pavement management program. The following paragraphs provide guidance to program managers in developing an operation and maintenance program.

1. Vitrified clay storm drain pipe or asbestos cement pipe in older areas should be replaced or retrofitted as part of other infrastructure work (street reconstruction, or combined sewer overflow (CSO) work). Televising and/or manual inspections should be performed to confirm the degree of repair or replacement necessary.
2. An inspection and replacement program should be developed for newer pipes and structures in order to conduct preventative maintenance that can affect long-term cost savings and avert catastrophic failures. The inspection and replacement program should consist of the following items:

   <u>Storm Drain Pipe/Outfall Cleaning and Inspections</u> – A cleaning and inspection prioritization should be established for storm drain pipes and outfalls. The Program Manager should consider conducting annual inspections on storm drains and outfalls in high priority areas. Less frequent inspections (every 2 to 3 years) should be completed for medium and low priority areas. Inspections for structural conditions should be combined with the inspections for illicit discharges as described in Section 2.4.2.

   <u>Catch basin Cleaning and Inspection</u> – A prioritization plan should also be established for catch basin cleaning. The prioritization can be completed by

the Program Manager using the following two considerations: (1) amount of winter sand spread in different areas, and (2) areas that have historically accumulated a large quantity of sediment or debris. Most communities that conduct separation activities for combined sewers have already developed a prioritization for cleaning as part of their master planning. This prioritization should be reviewed and updated, especially if separated areas have been dropped from the prioritization. The re-evaluation should use the same two criteria listed above (sand application and historical sediment accumulation). Program Managers should identify a reasonable frequency of cleaning based on need, municipal budgets, and personnel availability.

The Catch Basin Cleaning Form contained in Appendix A, should be used during cleaning as a method to inspect the catch basins to evaluate the integrity of the structure and identify necessary repairs. Any repairs identified on the forms should be incorporated into the municipality's work order system. Communities that outsource catch basin cleaning should either require that the contractor use the inspection form or should consider sending a public works employee, intern, or other municipal representative along with the contractor to evaluate structures.

The Waiver Approval DES-SW-SV-04-002 allows State of New Hampshire municipalities to dispose and reuse catch basin cleanings in accordance with NHDES Environmental Fact Sheet – Management of Street Wastes (WMD-SW-32).

Ditches and Swales Maintenance - Many regulated municipalities have rural areas, where the storm drain system consists of roadside ditches. Sediment, winter sand, leaves, excess vegetation and other debris periodically impedes the proper function of these ditches and should be removed approximately annually. Ditch cleaning can be conducted manually or using heavy equipment. Ditch cleaning should be conducted during low water periods, minimizing the disturbance of existing vegetation. If existing vegetation is removed during ditch cleaning, the ditch side slopes should be seeded and mulched as soon as possible after dredging. Ditch cleaning with heavy equipment should not be conducted in areas where the ditch carries a perennial stream.

3.3.2 Long Term Control Structure Inspection and Maintenance

In addition to the storm drain pipes, catch basins and outfalls, long term control structures such as detention ponds, vegetated filter strips, grassed swales, and constructed wetlands must be inspected and maintained.

NHDES produced a BMP manual (BMPs for Urban Stormwater Runoff) recommending inspection frequencies and maintenance for each of these devices (NHDES 1996). The recommended maintenance requirements are summarized in the table below:

TABLE 3-5:
RECOMMENDED MAINTENANCE ON COMMON LONG-TERM STORMWATER BMPS

Structure Type	Maintenance Requirements
Extended Detention Pond (Dry)	The embankment should be inspected annually to determine if rodent burrows, wet areas, or erosion of the fill are present. Trees and shrubs should be kept off the embankment and emergency spillway areas. The vegetation should be mowed once per year to discourage woody growth. Vegetation should be managed without the aid of fertilizers. If vegetation is sparse or non-existent, test soils for proper nutrients/growing conditions and re-vegetate with drought-tolerant. Pipe inlets and outlets should be inspected annually and after major storm events. Sediment should be continually checked in the basin and removed as necessary. The structure should be inspected by a qualified professional on a periodic basis.
Vegetated Filter Strips	A properly designed and constructed filter strip should require little maintenance. It should be inspected frequently during the first year of operation and then annually thereafter. Large accumulations of sediments should be removed, and all gullies filled in and stabilized. Areas of bare soil should be immediately stabilized.
Grassed Swales	Swales should be mowed at least once per year to prevent the establishment of woody vegetation. Sediments should be removed as required and swale reseeded if necessary. Grass should not be mowed to less than three inches in height.
Wet Ponds and Constructed Wetlands*	The embankment should be inspected annually to determine if rodent burrows, wet areas, or erosion of the fill are present. Trees and shrubs should be kept off the embankment and emergency spillway areas. The vegetation should be mowed once per year to discourage woody growth. Vegetation should be managed without the aid of fertilizers. Inspect vegetation for invasive species annually and remove if present. Supplement wetland plants if <50% surface is bare. Harvest wetland plants that have been “choked out” by sediment buildup. Pipe inlets and outlets should be inspected annually and after major storm events. Sediment should be continually checked in the basin and removed as necessary. The structure should be inspected by a qualified professional on a periodic basis.

*NOTE: Source of information for Constructed Wetlands is USEPA manual of BMPs.

The following worksheet can be used by Program Managers to document municipally owned control structures and their inspection and maintenance programs:

TABLE 3-6:
EXAMPLE INSPECTION AND MAINTENANCE TRACKING SHEET

Structure	Location	Inspection Date	Comments (Maintenance Completed or Required)
Inspected by: _____			

Electronic copies of the NHDES "Innovative Stormwater Treatment Technologies BMP Manual"

are available at:

www.des.nh.gov/wmb/was/manual

In May 2002 NHDES prepared a comprehensive BMP Manual describing innovative long term control structures, such as: swirl separators, catch basic systems, and filtration systems. The "Innovative Stormwater Treatment Technologies BMP Manual" describes the maintenance requirements for these innovative structural BMPs.

3.4 CONSTRUCTION ACTIVITIES AND OTHER LAND DISTURBANCES

As municipalities perform construction activities and other activities which disturb soil, they should take precautions to prevent erosion and runoff of sediment. Road crews and landscaping crews should be trained in erosion and sediment control methods. The NHDES has many publications and training sessions that describe a variety of methods that can be used to reduce the long term impact of sedimentation and erosion on water quality.

The following are State of New Hampshire resources dealing with erosion and sediment control for construction activities:

- Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire (1992);
- Best Management Practices for Routine Roadway Maintenance Activities in New Hampshire (2001); and
- Best Management Practices to Control Nonpoint Source Pollution – A Guide for Citizens and Town Officials (2004).
- The UNH Technology Transfer Center offers a course in Erosion Prevention and Sediment Control.

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5. GLOSSARY OF ACRONYMS

AST	Aboveground Storage Tank
AU	Assessment Unit
BMP	Best Management Practice
CWP	Center for Watershed Protection
GASB	General Accounting Standards Board
GIS	Geographic Information System
GPS	Geographic Positioning System
HUC	Hydrologic Unit Code
IDDE	Illicit Discharge Detection and Elimination
IDP	Illicit Discharge Potential
MCM	Minimum Control Measure
MSDS	Material Safety Data Sheet
MSGP	Multi Sector General Permit
MS4	Municipal Separate Storm Sewer System
NEIWPCC	New England Interstate Water Pollution Control Commission
NHDES	New Hampshire Department of Environmental Services
NHDOT	New Hampshire Department of Transportation
NHGRANIT	New Hampshire Geographically Referenced Analysis and Information Transfer System
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
OBM	Optical Brightener Monitoring
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
SIC	Standard Industrial Classification
SOP	Standard Operating Procedure
SPCC	Spill Prevention Control and Countermeasure

TCLP	Toxicity Characteristics Leaching Procedure
TMDL	Total Maximum Daily Load
UNH	University of New Hampshire
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

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APPENDIX A

ILLICIT DISCHARGE DETECTION AND ELIMINATION SOPS AND FORMS

Standard Operating Procedure for:	
A.1 IDDE: Inspections During Mapping	
Purpose of SOP:	This SOP provides a basic checklist for managers and field crews conducting illicit discharge inspections during mapping.

Always:

- Characterize the outfall by recording information on the Storm Drain Characteristic Form.
- Conduct inspections during dry weather periods using the Dry Weather Outfall Inspection Form.
- Follow procedure below if an illicit discharge is encountered (such as raw sewage, paint, etc.).
- Conduct inspections with at least two staff per crew.
- Carry a list of emergency phone numbers.

Dry Weather Discharge

The CWP defines **dry weather** as a 48 hour period with no runoff-producing rainfall. NEIWPCC defines dry weather as a 48-72 hour period with less than 1/10-inch rainfall.

Whenever Possible:

- Conduct inspections during low groundwater and leaf off conditions.
- Photograph the outfall with a digital camera (use dry erase or chalk board to identify outfall).
- Identify and label the outfall with a unique identifier. For example "SWO-013".
- If dry weather flow is present at the outfall, and the flow does not appear to be an illicit discharge attempt to identify the source of the flow (intermittent stream etc.), then document the discharge for future comparison.
- Carry an authorization letter.
- Collect samples of flowing discharges before and after source removal. (Contact NHDES for technical assistance.)

Equipment list for mapping:

1. Existing paper maps
2. Field sheets
3. Camera (preferably digital) on pole
4. GPS Unit
5. Spray paint (or other marker)
6. Cell phones or hand-held radios
7. Clip boards and pencils
8. First aid kit
9. Flash light or head lamp
10. Surgical gloves
11. Tape measure
12. Temperature probe
13. Waders
14. Watch with a second hand
15. Five 1-liter sample bottles
16. Dry erase board (for photos)
17. Hand sanitizer
18. Sampling pole
19. Mirror (for light)
20. Safety vests

Never:

- Never put yourself in danger.
- Never enter private property without permission

Procedures to follow if illicit discharge is detected:

- □ Call dispatch / supervisor.
- □ Use the Dry Weather Outfall Inspection Form to document observations.
- □ Visually inspect general area for possible sources.
- □ Take photos.
- □ Estimate flow/collect samples if instructed to do so.

Dry Weather Outfall Inspection Form

Location Information

Date: _____ **Inspector:** _____

Time: _____

Outfall ID: _____

Outfall Location: _____

Receiving Waterbody: _____

Photo Taken: Yes No **Photo ID:** _____

Weather: Clear Cloudy **Approximate Temp:** _____ **Wind Present:** Yes No

Precipitation in the past 3 days: No Yes _____ inches

Pipe Flow: None Trickle Steady 1/4 pipe flow or more

Seepage Flow: None Trickle Steady 1/4 pipe flow or more

Color (if flow is present): _____

Inspection Information *Select all that are applicable*

Obvious Debris/Pollution:		**Odor:**		**Water Clarity:**	
None	0	None/Natural	0	Clear	0
Foam	3	Musty	5	Cloudy	5
Staining	5	Sewage/septic	10		
Floating Green Scum	8	Petroleum	10	Opaque	10
Oil / Film	9				
Vegetative Mat/or Gray Mat	9				
Sewage Solids	10				
TOTAL		**TOTAL**		**TOTAL**	

GRAND TOTAL SCORE = _____

Additional Information

Sediment Condition: Open 1/4 Full 1/2 Full 3/4 Full Plugged

Structure Condition: Excellent Good Fair Poor

Trash/litter present: Yes No **Yard waste observed:** Yes No

General Comments:

Potential Sources / Actions Taken:

Sample collected? Yes No

By whom? _____

Parameters:	**Results:**

Follow up required: Yes No

NOTE: Sketch site map/note on back.

NOTE: This information is to accompany the Dry Weather Outfall Inspection Form.

Odor – Most strong odors, especially gasoline, oils, and solvents are likely associated with high responses on the toxicity screening test.

Stale sanitary wastewater: sewage
Detergent, perfume: Laundromat or household laundry
Sulfur ("rotten eggs"): industries that discharge sulfide compounds or organics (meat packers, canneries, dairies)
Oil and gas: facilities associated with vehicle maintenance or petroleum product storage (gas stations) or petroleum refineries
Rancid-sour: food preparation facilities (restaurants, hotels)

Color – Important indicator of inappropriate industrial sources. Dark colors, such as brown, gray, or black are the most common.

Yellow: chemical plants, textile, and tanning plants
Brown: meat packers, printing plants, metal works, stone and concrete, fertilizers, and petroleum refining facilities [note: can be from natural organic acids if a wetland is upstream]
Green: chemical plants, textile facilities
Red: meat packers [note: can be from organic acids if a wetland is upstream]
Gray: dairies

Turbidity – The cloudy appearance of water caused by the presence of suspended or colloidal matter. In dry weather, high turbidity is often a characteristic of undiluted industrial discharges.

Cloudy: sanitary wastewater, concrete or stone operations, fertilizer facilities, automotive dealers
Opaque: food processors, lumber mills, metal operations, pigment plants

Floatable matter – a contaminated flow may contain floating solids or liquids directly related to industrial or sanitary wastewater pollution. Floatables of industrial origin may include animal fats, spoiled food, oils, solvents, sawdust, foams, packing materials, or fuel.

Oil sheen: petroleum refiners or storage facilities and vehicle service facilities. [note: there is a type of bacteria that looks like an oil sheen. If you take a stick and swirl around the sheen, it will break up into blocky pieces if it is the bacteria. A true oil sheen will quickly re-form and not look blocky.]
Toilet paper bits, fecal bits, food particles: sanitary wastewater
Soap suds: if white or a clear sheen, laundry discharge (check odor) [note: can also occur from natural surfactants; usually off-white or tan with an earthy-fishy odor.]

Deposits and Stains – Any type of coating near the outfall, usually a dark color. Deposits and stains will often contain fragments of floatable substances.

Lots of sediment: construction site erosion, sand and gravel pits, winter road applications
Oil stain: petroleum storage, vehicle service facilities, petroleum refineries
Rusty: precipitates from iron-rich water (natural or industrial) [note: if slimey and clumpy, it could be iron bacteria]
Grayish-black deposits and hair: leather tanneries
White crystalline powder: nitrogenous fertilizer waste

Vegetation – Vegetation surrounding an outfall may show the effects of industrial pollutants. Decaying organic materials coming from various food product wastes would cause an increase in plant life, while the discharge of chemical dyes and inorganic pigments from textile mills could noticeably decrease vegetation. It is important not to confuse the adverse effects on high storm water flows on vegetation with highly toxic dry-weather intermittent flows.

Excessive growth: food product facilities, fertilizer runoff (lawns, golf courses, and farms)
Inhibited growth: high storm water flows, beverage facilities, printing plants, metal product facilities, drug manufacturing, petroleum facilities, vehicle service facilities, and automobile dealers

Damage to Outfall Structures – Outfall damage can be caused by severely contaminated discharges that are very acidic or basic in nature. Primary metal industries have a strong potential to cause outfall structure damage because their batch dumps are highly acidic. Poor construction, hydraulic scour, and old age can also negatively affect the condition of al outfall structure.

Concrete or spalling (breaking off into chips or layers): industrial flows
Peeling paint: industrial flows
Metal corrosion: industrial flows

This sheet was courtesy of the NHDES (modified from Pitt et al., 1993 Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems: a User's Guide. EPA Office of research and Development, EPA/600/R-92/238).

Storm Drain Outfall Characteristics Form

Location Information

Date: _____ **Inspector:** _____

Time: _____

Outfall ID: _____

Outfall Location: _____

Receiving Waterbody: _____

Photo Taken: Yes No **Photo ID:** _____

Weather Clear Cloudy **Approximate Temp:** _____ **Wind Present:** Yes No

Precipitation in the past 3 days: No Yes _____ inches _____

Dry Weather Inspection Form Used: Yes No - No Discharge No – No Dry Weather No - Other

Pipe Flow: None Trickle Steady 1/4 pipe flow or more

Seepage Flow: None Trickle Steady 1/4 pipe flow or more

Outfall Description *Select all that are applicable, fill in as necessary*

Submerged in water- no partially fully _____

Type:	RCP	CMP	Dimension (inches) _____	
Open Pipe-	PVC	HDPE	Circular	Box
	Steel	Other _____	Elliptical	Other _____

Open Drainage-	Concrete	Trapezoidal	Depth (inches)_____
	Earthen	Parabolic	Top width (inches)_____
	Riprap	Other _____	Bottom width (inches)_____
	Other _____		

Additional Information

Sediment Condition:	Open	¼ Full	½ Full	¾ Full	Plugged
Structure Condition:	Excellent	Good	Fair	Poor	
Trash/litter present:	Yes	No			
Yard waste observed:	Yes	No			

General Comments: _____

_____

Actions Taken: _____

_____

Follow-up Required: Yes No

N↑

Standard Operating Procedure for:	
A.2 IDDE: Long-Term Inspections	
Purpose of SOP:	To provide supervisor and field crew with a punch list of things to remember during regularly scheduled inspections.

Always:

- Conduct inspections during dry weather periods.
- Check the outfall's dimensions, shape, and component material using the Storm Drain Characteristic Form.
- Characterize and record observations on basic sensory and physical indicators (e.g., odor, color, oil sheen).
- If an illicit discharge is encountered (such as raw sewage, paint, etc.), follow the procedure below.

Whenever Possible:

- Perform inspections of all the outfalls at least once per permit cycle (long term).
- Photograph the outfall with a digital camera (use dry erase board to identify outfall).
- Identify and label the outfall with a unique identifier. For example "SWO-013".
- Carry a letter of authorization with you during inspections that outline who you are and what you are doing.
- If dry weather flow is present at the outfall, and the flow does not appear to be an obvious illicit discharge (e.g., flow is clear, odorless, etc.), attempt to identify the source of the flow (intermittent stream, etc.) then document the discharge for future comparison.
- Collect samples before and after source removal. Contact NHDES for technical assistance.

Never:

- Never put yourself in danger.
- Never enter private property without permission.

Procedures to follow if illicit discharge is detected:

- □ Call dispatch / supervisor.
- □ Document observations using the Dry Weather Outfall Inspection Form.
- □ Visually inspect general area for possible sources.
- □ Take photos.
- □ Estimate flow/collect samples if instructed to do so.

Standard Operating Procedure for:	
A.3 IDDE: Opportunistic Inspections	
Purpose of SOP:	This SOP provides field personnel with a quick checklist of proper procedures to follow if they observe illicit discharges while conducting their regular duties.

Always:

- Call dispatcher, supervisor, or code enforcement if you see evidence of an illicit discharge.
- Assess the general area of the illicit discharge to see if you can identify its source.

Whenever Possible:

- Use the Incident Tracking Sheet to document observations.
- Take photographs of the illicit discharge.
- Carry a Dry Weather Outfall Inspection Form.
- Use the Catch Basin Cleaning Form to document observations during cleaning.

Never:

- Never enter private property without permission.
- Never put yourself in danger.

Standard Operating Procedure for:	
A.4 IDDE: Citizen Call-in Inspections	
Purpose of SOP:	To collect appropriate information from a citizen reporting a potential illicit discharge to increase the chances of identifying and removing its source.

Always:

- Use the Incident Tracking Sheet to collect the appropriate information.
- Promptly investigate reported incidents.
- Document any further action taken.

Whenever Possible:

- Train Dispatch Personnel in the use and importance of the Incident Tracking Sheet.
- Document and review incidents reported by citizens on an annual basis to look for patterns of illicit discharges and to evaluate the call-in inspection program.

Never:

- Never enter private property without permission.
- Never put yourself in danger.

ILLICIT DISCHARGE HOTLINE INCIDENT TRACKING SHEET

Copied with permission from: *Illicit Discharge Detection and Elimination-A Guidance Manual for Program Development and Technical Assessments*, CWP, 2004.

Incident ID:

Responder Information	
Call taken by:	Call date:
Call time:	Precipitation (inches) in past 24-48 hrs:
Reporter Information	
Incident time:	Incident date:
Caller contact information (*optional*):	

Incident Location *(complete one or more below)*

Latitude and longitude:
Or other coordinate system

Stream address or outfall #:

Closest street address:

Nearby landmark:

Primary Location Description	**Secondary Location Description:**		
☐ Stream corridor *(In or adjacent to stream)*	☐ Outfall	☐ In-stream flow	☐ Along banks
☐ Upland area *(Land not adjacent to stream)*	☐ Near storm drain	☐ Near other water source (storm water pond, wetland, etc.):	

Narrative description of location:

Upland Problem Indicator Description

☐ Dumping	☐ Oil/solvents/chemicals	☐ Sewage
☐ Wash water, suds, etc.	☐ Other: _____	

Stream Corridor Problem Indicator Description

Odor	☐ None	☐ Sewage	☐ Rancid/Sour	☐ Petroleum (gas)
	☐ Sulfide (rotten eggs); natural gas	☐ Other: Describe in "Narrative" section		
Appearance	☐ "Normal"	☐ Oil sheen	☐ Cloudy	☐ Suds
	☐ Other: Describe in "Narrative" section			
Floatables	☐ None:	☐ Sewage (toilet paper, etc)	☐ Algae	☐ Dead fish
	☐ Other: Describe in "Narrative" section			

Narrative description of problem indicators:

Suspected Violator (name, personal or vehicle description, license plate #, address, etc.):

Standard Operating Procedure for:	
A.5 IDDE: Septic System Inspections	
Purpose of SOP:	Failed septic systems can adversely impact water quality. This SOP provides a quick reference list to supervisors and field crews that are conducting an initial screening for failures in areas that are identified in the full IDDE program.

Always:

- Refer potential septic system failures to the local Health Officer for enforcement.

Whenever Possible:

- Screen high risk areas (older areas or areas near lakes or impaired waterbodies).
- Look for indicators of failures, such as wet areas or disagreeable odors near the leach field.
- Document septic system inspections in a summary report for future reference.
- Refer troublesome enforcement actions to NHDES.

Never:

- Never enter private property without permission.
- Never put yourself in danger.

Related Guidance:	
	• NHDES Health Officer's Manual ENV-Ws 1000 Subdivision and Individual Sewage Disposal System Design rules

Standard Operating Procedure for:	
A.6 IDDE: Tracing Illicit Discharges	
Purpose of SOP:	To provide a quick reference list of items to keep in mind during tracing activities to efficiently and systematically identify the source of an illicit discharge.

Always:

- Review / consider information collected when illicit discharge was initially identified (Incident Tracking Sheet or Dry Weather Outfall Inspection Form).
- Survey the general area / surrounding properties to identify potential sources of the illicit discharge as a first step.
- Trace illicit discharges using visual inspections of upstream points as a second step.
- Document tracing results for future reference.

Whenever Possible:

- Use weirs, sandbags, dams, or optical brightener monitoring traps to collect or pool intermittent discharges during dry weather.
- Smoke test or televise the storm drain system to trace high priority, difficult to detect illicit discharges.
- Dye test individual discharge points within suspected buildings.
- If the source cannot be found, add the location to a future inspection program.
- Collect bacterial samples of flowing discharges to confirm/refute illicit discharge.

Never:

- Never enter private property without permission.
- Never put yourself in danger.

Standard Operating Procedure for:	
A.7 IDDE: Removing Illicit Discharges	
Purpose of SOP:	Proper removal of an illicit discharge will ensure it does not recur. Using legal methods for the removal will minimize the municipality's liability. This SOP provides an overview of illicit discharge removal procedures.

Always:

- Determine who is financially responsible; and follow associated procedures on Table 2-9.
- Suspend access to storm drain if threats of death or serious physical harm to humans or the environment are possible.
- If the discharge is from an exempt facility (see Table 2-9) notify the facility operator and the appropriate enforcement authority.
- Repair/correct cause of discharge if municipality is responsible.
- Collect a confirmatory sample after the removal. Seek technical assistance from NHDES, if needed.

Whenever Possible:

- Issue a Notice of Violation for violations of the municipal ordinance.

Never:

- Never repair/correct cause of discharge on private property until directed to do so by the appropriate municipal authority (storm water program manager, etc.)

TABLE 2-9: NOTIFICATION AND REMOVAL PROCEDURES FOR ILLICIT DISCHARGES INTO THE MUNICIPAL SEPARATE STORM SEWER SYSTEM			
Financially Responsible Party	**Source Identified**	**Enforcement Authority**	**Procedure to Follow**
Private Property Owner	One-time illicit discharge (e.g., spill, dumping, etc.)	Ordinance enforcement authority (e.g.., Code Enforcement Officer)	• Contact Owner • Issue Notice of Violation • Issue fine
Private Property Owner	Intermittent or continuous illicit discharge from legal connection	Ordinance enforcement authority (e.g.., Code Enforcement Officer)	• Contact Owner • Issue Notice of Violation • Determine schedule for removal • Confirm removal
Private Property Owner	Intermittent or continuous illicit discharge from illegal connection or indirect (e.g., infiltration or failed septic)	Plumbing Inspector	• Notify plumbing inspector
Municipal	Intermittent or continuous illicit discharge from illegal connection or indirect (e.g., failed sewer line)	Ordinance enforcement authority (e.g., Code Enforcement Officer)	• Issue work order • Schedule removal • Remove connection • Confirm removal
Exempt 3rd Party • New Hampshire Department of Transportation (NHDOT) (in selected urbanized areas) • University of New Hampshire (UNH) (Durham) • Youth Development Center (Manchester) • Stafford County Complex (Dover) • Industrial Facilities with selected SIC codes	Any	USEPA	• Notify exempt third party and USEPA of illicit discharge

---SAMPLE---

NOTICE OF VIOLATION

Town of _____ , New Hampshire
Planning and Permitting
Services
Planning~Building~Electrical~Plumbing~Code Enforcement

Address here, New Hampshire 03210
TELEPHONE (603) XXX-XXXX FAX (603) XXX-XXXX

September 1, 2005

Citizen
22 Main Street
Town, NH 03210

RE: Tax Map #_____

Dear Citizen:

On August 30, 2004, _____, Planning Inspector and I responded to a report of a discharge to the storm drain system on property owned by you at _____ Street in _____, NH.

We did confirm the presence of _____. This is to confirm the conversation I had with you. You are in the process of _____ and we agreed you would have the correction completed by _____. We discussed you will _____.

This discharge is in violation of the Town of _____'s Non-Storm Water Discharge Ordinance, which is required by the Clean Water Act. Please keep me informed of how the correction is proceeding. Enclosed is a copy of the Ordinance for your review.

If I can be of further assistance please do not hesitate to contact my office. We are open Mondays from 7:00 a.m. to 5:30 p.m. and Tuesday through Friday, from 8:00 a.m. to 4:30 p.m. I can be reached at 555-5555, extension ___.

Sincerely,

Joe Inspector
Code Enforcement Officer

APPENDIX B

POLLUTION PREVENTION AND GOOD HOUSEKEEPING SOPS

Standard Operating Procedure for:	
B.1 Catch Basin Cleaning	
Purpose of SOP:	To protect storm water by maintaining the ability of catch basins to trap sediments, organic matter, and litter. This reduces clogging in the storm drain system as well as the transport of sediments and pollutants into receiving waterbodies.

Always:

- Inspect catch basins for structural integrity and evidence of illicit discharges during cleaning. Use the Catch Basin Cleaning Form.
- If gross contamination (sewage or oil), stop cleaning and report to supervisor for follow up.
- Stockpile and cover catch basin residuals on an impervious surface that discharges to a sanitary sewer or buffered area until test results are known.
- Test catch basin stockpile as follows:
    - If obviously (by visual and/or olfactory examination) contaminated with sanitary wastewater, animal wastes, oil, gasoline or other petroleum products, test the solids pursuant to the hazardous waste determination requirements in ENV-Hw 502 and dispose of as follows:
        - If non-hazardous – dispose at any permitted, lined solid waste landfill or other solid waste treatment facility permitted to accept this material.
        - If hazardous – dispose of in accordance with NH Hazardous Waste Rules, ENV-Hw 100-1100
    - If not obviously contaminated,
        - Test for metals, VOCs and PAHs.
        - Compare to NHDES Risk Characterization and Management Policy (RCMP) S-3 Soil Standards (see following page) for reuse as road base or subbase.
        - Compare to NHDES RCMP S-1 Soil Standards (see following page) for unrestricted reuse.

Whenever Possible:

- Inspect each catch basin at least annually, during catch basin cleaning.
- Create a checklist for catch basins to help classify which catch basins require maintenance and how often.
- Perform street sweeping on an appropriate schedule to reduce the amount of sediment, debris and organic matter entering the catch basins, which in turn reduces the frequency with which they will need to be cleaned.
- Discharge fluids collected during catch basin cleaning to a sanitary WWTP, or buffered detention area.

Related Guidance:	
	– NHDES Environmental Fact Sheet: • WMD-SW-32 Management of Street Wastes

Catch Basin Cleaning Form

Date:_____ **Precipitation in the last three days? No Yes**

Supervisor/Crew Leader:_____

Catch Basin ID	Basin Location	Problem Identified? (Check all that apply)				Comments
		Flow	Poor Condition	Oil Sheen	Excess Sediment	

Catch Basin Cleanings Reuse Guidance			
Maximum Contaminant Concentrations			
Regulated Contaminant	*S-1 Standards (mg/kg)*	*S-3 Standards (mg/kg)*	*USEPA SW-846 Test Method*
Metals			
Arsenic	11	11	6010B
Barium	750	3,400	6010B
Cadmium	32	230	6010B
Chromium	1000	5,000	6010B
Lead	400	400	6010B
Mercury	13	13	7471A
Selenium	260	260	6010B
Silver	45	200	6010B
VOCs			
Benzene	0.3	0.3	8260B
Dichloroethane, 1,2-	0.08	0.08	8260B
Isopropyl benzene	123	123	8260B
Methyl-t-butyl ether	0.13	0.13	8260B
Toluene	100	100	8260B
Xylene	500	1,100	8260B
Aklylbenzenes Butylbenzene, n- Butylbenzene, sec- Butylbenzene, tert- Isopropyl toluene, 4- Propylbenzene, n- Trimethylbenzene, 1,2,4- Trimethylbenzene, 1,3,5-	59 (total)	59 (total)	8260B
PAHs - Carcinogenic			
Benzo(a)anthracene	0.7	40	8270C
Benzo(a)pyrene	0.7	4	8270C
Benzo(b)fluoranthene	7	400	8270C
Benzo(k)fluoranthene	7	400	8270C
Chrysene	70	4,000	8270C
Dibenzo(a,h)anthracene	0.7	4	8270C
Indeno(1,2,3-cd)pyrene	0.7	40	8270C
PAHs – Noncarcinogenic			
Acenaphthene	270	270	8270C
Acenaphthylene	300	300	8270C
Anthracene	1,000	1,700	8270C
Fluoranthene	810	5,000	8270C
Fluorene	510	510	8270C
Methylnaphthalene,2-	150	150	8270C
Napthalene	5	5	8270C
Benzo(g,h,i)perylene Phenanthrene Pyrene	480 (Total)	5,000 (Total)	8270C

Standard Operating Procedure for:	
B.2 Storm Drain System Repair and Maintenance	
Purpose of SOP:	To protect storm water by replacing or repairing components of the storm drain system on a regular basis to prevent a failure of the storm drain system.

Always:

- Practice preventive maintenance for cracks, leaks, and other conditions that could cause breakdowns in the system by identifying condition issues:
  - For catch basins during catch basin cleaning (see SOP B.1)
  - For outfalls during IDDE inspection (see SOP A.1, A.2 and A.3)
- Repair defective structures or equipment identified during an inspection as soon as possible.
- Test and dispose of stockpiled materials as described in SOP B.1.
- Document inspections, cleanings and repairs and maintain complete records in a record-keeping system (SOP B.1 for catch basins, SOPs A.1 through A.3 for outfalls, and attached example form for pipes).
- Use appropriate erosion and sediment control practices when performing repairs.

Whenever Possible:

- Practice preventive maintenance for pipes by televising:
  - Prior to reconstruction of roadways, or
  - On a regular schedule beginning with high priority areas.
- Research and implement new technology that will improve the overall performance of the storm drain system.
- Perform street sweeping on a regular basis to reduce the amount of sediment, debris and organic matter entering the storm drain system, which in turn reduces the frequency with which the system will need to be cleaned.
- Use documentation of repairs and maintenance to develop a capital improvement and O&M plan for future system maintenance.

Never:

- Never allow defective equipment or structures to go unrepaired.

Related Guidance:	
	- USEPA National Menu of BMPs - NHDES BMPs to Control Nonpoint Source Pollution

Example of documentation of condition issues identified during televising.

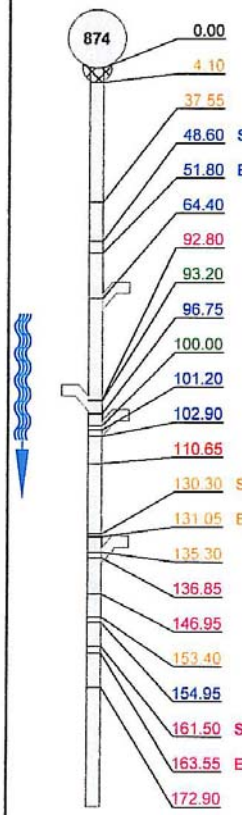
INSPECTION REPORT

DATE:	WORK #:	WEATHER:	OPERATOR:	SECTION NR:	SECTION NAME:
PRESENT:	VEHICLE:	CAMERA:	PRESET:	CLEANED:	RATE:

STREET:	MAP #1:	MH: 874
CITY:	MAP #2:	MH: 872
LOCALE:	TAPE #:	TV'D LGTH: 288.2 ft

INSPECT REASON:	PIPE SIZE: 6"
SECTION TYPE:	MATERIAL: Clay Tile JT LGTH: 2ft
AREA:	LINING: ...no data
	RSRVD:

REMARK: apparent defects in coating throughout line



1:495 POSITION		OBSERVATION	MPEG	PH	RATE
0.00		inspection begins at upstream manhole		1a	0
4.10		roots light		2a, b	3
37.55		roots light		3a, b	3
48.60	S1	sag begins, START		4a	2
51.80	E1	sag ends, END		5a	2
64.40		service connection, at 09 o'clock		6a, b	2
92.80		Infiltration Running at joint at 03 o'clock		7a, b	4
93.20		service connection, at 02 o'clock		8a, b	1
96.75		pipe material changes at this point to SDR 35		9a	2
100.00		service connection, at 09 o'clock		10a, b	1
101.20		pipe material changes at this point to clay tile		11a	2
102.90		offset joint, slight		12a, b	2
110.65		pipe Broken, from 02 to 09 o'clock		13a, b	5
130.30	S2	Longitudinal Crack, at 12 o'clock, START		14a, b	3
131.05	E2	Longitudinal Crack, at 12 o'clock, END		15a	3
135.30		service connection capped, at 09 o'clock, REMARK: roots medium		16a, b	3
136.85		Hole in pipe at 07 o'clock		17a, b	4
146.95		Hole in pipe at 04 o'clock		18a, b	4
153.40		Longitudinal Crack, at 12 o'clock		19a	3
154.95		Longitudinal Crack, at 03 o'clock		20a	2
161.50	S3	Multiple Cracks, from 07 to 03 o'clock, START		21a, b	4
163.55	E3	Multiple Cracks, from 07 to 02 o'clock, END		22a, b	4
172.90		Hole in pipe at 12 o'clock		23a, b	4

INSPECTION IMAGES

CITY:	STREET:	DATE:	SECTION NR:	SECTION NAME:
			1	

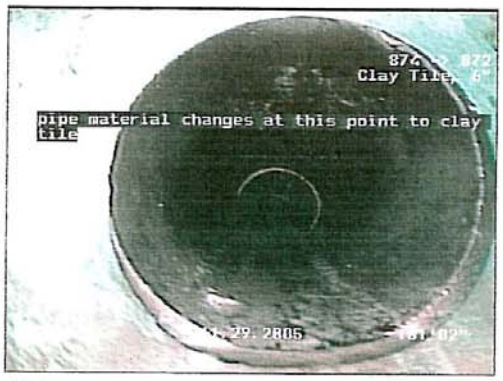


IMAGE: 11a, TAPE #: 11/29/2005
101.2FT, pipe material changes at this point to clay tile

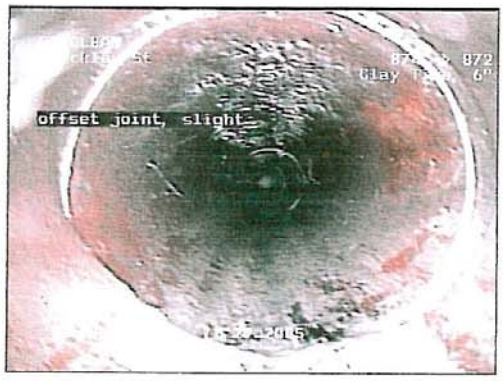


IMAGE: 12a, TAPE #: 11/29/2005
102.9FT, offset joint, slight

IMAGE: 12b, TAPE #: 11/29/2005
102.9FT, offset joint, slight

IMAGE: 13a, TAPE #: 11/29/2005
110.65FT, pipe Broken, from 02 to 09 o´clock

Standard Operating Procedure for:	
B.3 Erosion and Sediment Control	
Purpose of SOP:	To protect storm water from pollution by reducing or eliminating pollutant loading from land disturbing activities.

Always:

- Use erosion control techniques or devices to stabilize disturbed areas.
- Use effective site planning to avoid sensitive areas.
- Keep land disturbance to a minimum.
- Inspect and maintain erosion control devices.
- Install erosion control devices properly.
- Remove sediment accumulated during construction from permanent BMPs once construction is completed.
- Minimize the amount of bare soil by scheduling phases of construction and stabilization.
- Minimize slope lengths.
- Monitor practices and adjust, maintain, and repair them periodically and after every storm.
- Reduce the velocity of storm water runoff.
- Prevent erosion by covering bare soil with mulch or other cover.
- Protect existing storm water structures from sediment by using temporary sediment traps, silt fence, hay bales, or perforated risers.
- Divert clean water around construction site.

Whenever Possible:

- Limit construction activities during months with higher runoff rates.
- Install erosion control blankets when seeding drainage ways.
- Protect natural vegetation, especially near waterbodies, wetlands, and steep slopes.
- Establish vegetative cover with good root systems prior to freeze/thaw cycles.

Never:

- Never divert runoff into a sensitive area.
- Never remove temporary measures before construction is complete.

Related Guidance:	
	– NHDES BMPs to Control Nonpoint Source Pollution – NHDES/DOT BMPs for Routine Maintenance Activities in New Hampshire – Storm Water Management Erosion and Sediment Control Handbook for Urban and Developing Areas (The Green Book)

Standard Operating Procedure for:	
B.4 Landscape Design and Management	
Purpose of SOP:	To protect storm water by designing and managing landscaping in ways that minimize polluted runoff.

Always:

- Design landscaping by taking into account soil types, light, drainage, desired maintenance level and budget.
- Design for ease of maintenance.

Whenever Possible:

- Minimize erosion prone steep slopes by using techniques such as terracing.
- Use native plants that are pest resistant. Plant the right plant in the right area.
- Manage water runoff by rerouting gutters away from storm drains and maintaining groundcovers between developed areas and waterways (ditches, swales, shorelines).
- Reduce or eliminate mown lawn in unused areas.
- Convert excess lawn to meadow or forest.
- Establish set back distances from pavement, storm drains, and waterbodies. Allow these areas to serve as buffers with disease-resistant plants and minimal mowing.

Never:

- Never develop a landscape design without assessing its impact on water quality.
- Never cause unintended consequences such as
  - Planting large variety trees beneath overhead wires.
  - Blocking site distance at intersections
  - Planting trees with a high water demand (weeping willow) near sanitary sewer pipes and storm sewer pipes.

Related Guidance:	
	– USEPA National Menu of BMPs – CWP Urban Forestry Manual

Standard Operating Procedure for:	
B.5 Storage and Disposal of Fertilizer and Pesticides	
Purpose of SOP:	To protect storm water by properly storing and disposing of fertilizers and pesticides (herbicides and fungicides). Because storm drain water is not part of a wastewater treatment system, discharge of these chemicals flows untreated into ponds, lakes, rivers, streams, estuaries, and bays.

Always:

- Store fertilizers and pesticides in high, dry locations, according to manufacturer's specifications and applicable regulations.
- Clearly label secondary containers.
- Properly dispose of fertilizers and pesticides according to manufacturer's specifications and applicable regulations.
- Regularly inspect fertilizer and pesticide storage areas for leaks or spills.
- Clean up spills and leaks of pesticides and fertilizers to prevent the chemicals from reaching the storm drain system. (SOPs B.12 and B.16)

The EPA defines a pesticide as any substance intended for preventing, destroying, repelling, or mitigating any pest. Pest can include insects, animals, unwanted plants, fungi, bacteria, etc. The term applies to insecticides, herbicides, fungicides, etc.

Whenever Possible:

- Store pesticides in enclosed areas or in covered impervious containment, preferably in a locked cabinet.
- Order fertilizers and pesticides for delivery as close to time of use as possible to reduce amount stored at facility.
- Order only the amount needed to minimize excess or obsolete materials requiring storage and disposal.
- Use ALL herbicides or pesticides appropriately to minimize the amount of chemicals requiring disposal.
- Do an annual review of storage area and dispose of old, unusable or "obsolete" fertilizer or pesticides in accordance with applicable regulations (just before your local Household Hazardous Waste Day).

Never:

- Never dispose of fertilizers or pesticides in storm drains.
- Never leave unlabeled or unstable chemicals in uncontrolled locations.

Related Guidance:
- USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.6 Fertilizing and Turf Health Application	
Purpose of SOP:	To protect storm water by properly storing, applying, and disposing of fertilizers and by maintaining turf health to reduce diseases.

Always:

- Store, use, and dispose of all fertilizers and contaminated wastes according to manufacturer's specifications and applicable regulations.
- Choose seed based on soil types, intended use of area, latest variety research, and/or assessment of past site performance.
- Check 5-day weather forecast to avoid fertilizing before heavy rain or during a drought.

Whenever Possible:

- Apply fertilizers based on a soil testing program, soil type, turf function, and assessment by qualified personnel (conservation commission or municipal arborist, etc.).
- Avoid fertilizing during a drought or when the soil is dry.
- Apply fertilizers during periods of maximum plant uptake (usually fall and spring).
- Avoid combined products such as weed and feed, which do not necessarily target specific problems at the appropriate time.
- Calibrate application equipment to ensure proper application.
- If phosphorus fertilizer is used when re-seeding, mix phosphorus into root-zone.
- Use alternative or environmentally friendly products (See SOP B.15.).
- Use natural compost and organic fertilizers instead of synthetic fertilizers.
- Aerate grassed areas to improve drainage and bring more oxygen to the soil.

Never:

- Never fertilize before a forecasted heavy rainfall.
- Never apply phosphorus fertilizer on bare soil.
- Never deposit fertilizer in the water, into storm drains, or onto impervious surfaces (streets and sidewalks).
- Never apply fertilizer to frozen ground.
- Never clean up spilled fertilizer by rinsing it with water.

Related Guidance:	
	- USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.7 Weed and Pest Control Application	
Purpose of SOP:	To protect storm water by properly applying pesticides (herbicides and insecticides).

Always:

- Ensure that pesticides are only applied by personnel certified by NH Department of Agriculture to do so.
- Apply pesticides according to manufacturer's specifications, the New Hampshire Department of Agriculture Division of Pesticide Control, and any local requirements.
- Clean up any spilled chemicals (See SOPs B.12 and B.16.).
- Use pesticides only when necessary.
- Rinse equipment only when necessary and use rinse water to dilute next mix as long as application rates are not exceeded.
- Conform to Comprehensive Shoreland Protection Act setback distances from pavement, storm drains, and waterbodies; allow these areas to serve as buffers with disease-resistant plants and minimal mowing.

Whenever Possible:

- Use alternative methods to control weeds and pests such as Integrated Pest Management strategies, biorational insecticides (natural soaps and oils) or biological controls. (See SOP B.15.)
- Mix/load pesticides in an area where spills can be contained.
- Pull weeds by hand or mechanically.
- Spot treat affected areas only instead of entire location.
- Apply pest control at the life stage when the pest is most vulnerable.
- Choose the least toxic pesticides that still achieve results.
- Tolerate low levels of weeds.
- Allow grass to grow 2.5 to 3 inches high, reduce thatch build up and aerate soils.
- Reduce seed release of weeds by timing cutting at seed set.

Never:

- Never mix or prepare pesticides near storm drains.
- Never apply controlled pesticides unless certified to do so.
- Never apply pesticides before a heavy rainfall.
- Never discharge rinse water or excess chemicals to storm drain, sewer, or ground surface.

Related Guidance:
– USEPA National Menu of BMPs – NHDES Environmental Fact Sheet: • CO-15 Integrated Pest Management: Controlling Pests Safely • SP-6 Minimum Shoreland Protection Standards

Standard Operating Procedure for:	
B.8 Mowing and Irrigation	
Purpose of SOP:	To protect storm water by using proper mowing and watering techniques. Proper mowing and irrigation techniques will reduce organic matter and other pollutants from entering the storm drain system and waterbodies.

Always:

- Mow only as low as needed for the area's intended use.
- Vary mowing pattern to minimize ruts and promote even growth.
- Base irrigation amounts on monitoring for moisture content.
- Water at appropriate times (when no rain is forecasted and in cooler times of day).
- Manage leaves, clippings, and compost so that runoff does not enter storm drain system or waterbodies.
- Conform to Shoreland Zoning restrictions on mowing in buffers of waterbodies.

Whenever Possible:

- Allow areas to go to meadow or field and mow once or twice per year rather than every week.
- Keep mower blades sharpened to avoid damaging grass leaf tissue.
- Mow when the grass is dry to prevent spread of turf diseases.
- Sweep lawn clippings and debris instead of using water.
- Mulch grass clippings using a mulching mower.
- Fill gas tanks in a controlled location.

Never:

- Never irrigate based on timers/schedules instead of monitoring for moisture content.
- Never dump gas, wastes or contaminated water down storm drains.
- Never refuel or change the mower oil near storm drains.
- Never leave mower running in one location (to prevent burning and over-cutting of vegetation).

Related Guidance:	
	- USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.9 Vehicle and Equipment Storage	
Purpose of SOP:	To protect storm water from petroleum products that may drip or leak from vehicles and equipment being stored or from dirt and sediment that accumulate in the storage areas.

Always:

- Inspect parking areas for stains/leaks on a regular basis.
- Use drip pans or adsorbents for leaking vehicles (provide a labeled location to empty and store drip pans).
- Address any known leaks or drips as soon as possible.
- Clean up spills.

Whenever Possible:

- Store vehicles inside where floor drains have been properly connected and registered.
- Store vehicles on paved areas, and street sweep on a regular basis to remove drips/leaks/dirt, and dispose of street sweepings properly.
- Maintain vehicles to prevent leaks.

Never:

- Never store leaking vehicles over a storm drain.

Related Guidance:	
	– USEPA National Menu of BMPs – NHPPP Pitstops Manual

Standard Operating Procedure for:	
B.10 Vehicle and Equipment Washing	
Purpose of SOP:	To protect storm water using proper washing techniques, proper washing locations, and proper disposal of wash water for heavy and light-duty vehicles and equipment.

Always:

- Operate a closed system with wastewater recycling (like a floor drain discharge to a holding tank), or
- Discharge to a municipal sanitary sewer, or
- Obtain a groundwater discharge permit, or
- Wash fewer than 30 vehicles per week and discharge to the ground surface, if
    - The Best Management Practices Rules (see references Env-Wq 401) are followed,
    - The discharge is registered, and
    - The washwater:
        - is not from power washing, steam cleaning, engine cleaning, or undercarriage cleaning,
        - does not contain soaps or other products which contain regulated contaminants, and
        - does not discharge to a surface water.

Whenever Possible:

- Use a commercial car wash for light duty vehicles.
- Obtain and use drain guards (filter inserts) to catch sediments, petroleum products, etc. that might enter the storm drains as a result of vehicle washing.
- Minimize water and soap use when washing or rinsing vehicles.

Never:

- Never perform engine or undercarriage washing outside.
- Never wash vehicles over a storm drain or near drinking water wells.
- Discharge washwater to a surface water.

Related Guidance:	
	– NHDES Environmental Fact Sheet: • WD-WSEB-22-10 Wastewater Discharges from Vehicle Washing – NHDES BMP Rules Env-Wq 401 – NHDES Water Supply Engineering at (603) 271-2858

Standard Operating Procedure for:	
B.11 Vehicle and Equipment Fueling	
Purpose of SOP:	To prevent storm water contamination originating from vehicle and equipment fueling.

Always:

- Fuel carefully to minimize drips to the ground surface.
- Maintain clean fuel dispensing areas using dry cleanup methods.
- Clearly label and tag all valves to reduce human error.
- Train employees and subcontractors on proper fueling methods and spill cleanup techniques.
- Maintain fuel storage tanks in accordance with local, state and federal laws.
- Have absorbent spill cleanup kits and materials available at fueling areas.
- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.
- When fueling small equipment from portable containers, fuel in a designated area away from stormdrains and waterbodies.

Whenever Possible:

- Install a canopy or roof over aboveground storage tanks and fuel transfer areas.
- Regularly inspect fueling equipment for corrosion and structural failure, cracks in foundations, and physical damage to container systems.
- Use designated fueling areas built upon a level impervious surface (hard cement is best). If paved with asphalt, add a protective coating to create an impervious surface, inspect regularly, and street sweep quarterly at a minimum.
- Protect storm drains from fueling areas using berms and dikes.
- Use absorbent material or absorbent pads during fueling to collect leaks.

Never:

- "Top off" fuel tanks (post signs to remind employees).
- Hose down or bury a fuel spill.

Related Guidance:	
	– USEPA National Menu of BMPs – NHDES Fact Sheet: • WD-WSEB-22-6 BMPs for Fueling and Maintenance of Excavation and Earthmoving Equipment

Standard Operating Procedure for:	
B.12 Spill Cleanup	
Purpose of SOP:	To protect storm water by educating employees on proper spill cleanup procedures, state reporting requirements and preventative actions.

Always:

- Stop the source of the spill, if possible to safely do so.
- Contain any liquids, if possible to safely do so.
- Contact the appropriate emergency response number (see below) during normal working hours (8:00 a.m. – 4:00 p.m., Monday - Friday) to report spills.
  NHDES Petroleum Products Spill Response (603) 271-3644
  NHDES Hazardous Material (non-oil spill) (603) 271-3899
  United States Coast Guard – Coastal Oil Spills (207) 780-3251
  National Response Center – Chemical or Oil Spills that Impact Surface Water (800) 424-8802
  USEPA – 24-hour Emergency Inland Spills Response (617) 918-1279
  All other times, nights-weekends-holidays, contact NHDES via the New Hampshire State Police (800) 346-4009 or out of state (603) 271-3636
- Cover the spill with absorbent material such as kitty litter, sawdust, or oil absorbent pads. Do not use straw or water. (See SOP B.16 for adsorbent disposal.)
- Petroleum spills involve, but are not limited to: crude oil, gasoline, heating oil, various fuel oils, lubricating oil, hydraulic oil, asphaltic residuals.
- Report a petroleum spill if:
  - The spill is greater than 25 gallons, or
  - The spill cannot be immediately contained, or
  - The spill and/or contamination cannot be completely removed within 24 hours, or
  - There is an impact or potential impact to ground/surface water.
  - IF IN DOUBT, REPORT THE SPILL
- Hazardous materials spills involve non-oil spills that pose a threat to human health or the environment, such as chemical releases.
- Report any discharge of hazardous waste immediately, (within one hour) to local emergency officials [fire department], then contact NHDES Hazardous material Department (as described above).
- Contact local fire department _____ (phone #).
- Develop and maintain a Spill Prevention, Control, and Countermeasure (SPCC) Plan if the facility stores more than 1,320 gallons of petroleum.
- Fit petroleum and chemical storage containers with secondary containment structures.
- Keep a spill kit in areas where petroleum or hazardous materials are stored.
- Train employees in spill response procedures and equipment.
- Deploy containment booms if spill could potentially reach a storm drain or waterbody.
- Position mats to contain drips from equipment or vehicles until they can be repaired.

Whenever Possible:

- Seal the floor with paint to prevent absorption of fluids into concrete.
- Install low-level or low-pressure alarms and/or cut-off systems on hydraulic equipment.

Never:

- Never wash a spill into the storm drain or a water body.
- Never leave a spill without cleaning it up.

Related Guidance:	
	– NHDES Fact Sheets: o WMD-REM-13 Requirements for Reporting Oil and Hazardous Waste Spills and Groundwater Contamination to DES – NHPPP Pitstops Manual

Standard Operating Procedure for:	
B.13 Parts Cleaning	
Purpose of SOP:	To protect storm water by practicing proper parts cleaning techniques and disposing of waste cleaners properly.

Always:

- Perform all cleaning in a designated area to minimize the potential for spills.
- Store waste cleaners in properly labeled containers in accordance with regulations.
- Dispose of all waste cleaners properly with a licensed contractor, on a regular basis.
- Close parts-cleaner lid when it is not in use.

Whenever Possible:

- The variety of cleaners should be minimized to make recycling and disposal simpler.
- Use citrus-based cleaners and dispose of properly.
- Use steam cleaning, pressure washing, or aqueous washers instead of solvents; however wastewater must be discharged to an oil/water separator and the wastewater treatment plant notified, or to a NHDES registered holding tank.

Never:

- Never dispose of spent cleaners down the floor drains, sinks, storm drain, on the ground or into the air. Disposal by evaporation violates the New Hampshire Hazardous Waste Rules.
- Never mix or add spent or fresh solvents to used oil.
- Never use gasoline as a cleaner or solvent.
- Never burn spent parts cleaning fluids in a used oil burner.
- Never use a hand-held cleaner in/near the parts cleaner; never mix cleaners.

Related Guidance:	
	– NHPPP Pitstops Manual

Standard Operating Procedure for:	
B.14 Spare Parts Storage	
Purpose of SOP:	To protect storm water by properly storing spare parts. Improper storage of materials can result in pollutants and toxic materials entering ground and surface water supplies.

Always:

- Store spare parts in a designated area.
- Use drip pans for any parts that are dripping.

Whenever Possible:

- Store spare parts inside or under cover.
- Monitor storage areas for staining/leaks on a schedule decided on by the appropriate personnel.
- Clean the majority of petroleum products from the parts that are to be stored.

Related Guidance:	
	– USEPA Manual of BMPs

Standard Operating Procedure for:	
B.15 Alternative Products Use/Storage/Disposal	
Purpose of SOP:	To protect storm water by using alternative products that are more environmentally friendly.

Always:

- Ask product suppliers, peers, or regulatory agents if there is a more environmentally friendly alternative, when ordering any product.

Whenever Possible:

- Use alternative products when deemed appropriate:
  - Instead of solvent-based parts cleaners use citrus–based cleaners or steam/pressure wash to an oil/water separator/holding tank.
  - Instead of herbicides use bark mulch.
  - Instead of fertilizer use compost or manure.
  - Instead of pesticides plant marigolds, onion, or garlic as deterrents; release or attract beneficial insects.
  - Instead of synthetic adsorbents, use corncob or cellulose products for petroleum spills that can be burned for energy recovery.
- Train employees on the benefits of using alternative products.
- Minimize waste by purchasing recyclable products that have minimal packaging.
- Use less harmful deicers such as calcium magnesium acetate, potassium acetate, or organic deicers such as Magic Salt™.
- Use a "pre-mix" of 4 to 1 sodium chloride and calcium chloride, which is the most cost-effective alternative to straight salt.
- Substitute synthetic fertilizers with natural compost and organic fertilizers to improve soil pH, texture and fertility, and cause less leaching to groundwater.
  - Use no-phosphorus lawn fertilizer (phosphorus is rarely lacking in New Hampshire soils).
  - Use natural or certified organic fertilizers with low phosphorus levels (8-2-4, 6-2-4, 9-1-1, 6-1-1).
- Use slow-release nitrogen fertilizers.
- Reduce or eliminate mown lawn in areas that are not actively used.
- Consider converting unused turf to meadow or forest.

Related Guidance:	
	– USEPA National Menu of BMPs – NHPPP Pitstop Manual

Standard Operating Procedure for:	
B.16 Petroleum and Chemical Disposal	
Purpose of SOP:	To protect storm water from petroleum and chemical products due to improper disposal practices.

Always:

- Maintain tracking and manifest, where necessary, of chemicals and petroleum products being disposed or recycled off-site.
- Transport used petroleum and chemical products with a licensed transporter and maintain records for three years.
- Train employees on proper disposal practices.
- Drain used oil filters for 24-hours before crushing and disposal (disposal in regular trash allowed).
- Analyze floor drain solids (from sediment trap) for TCLP to determine if hazardous waste or not.
- Contaminated cloth wipe may be laundered onsite or offsite, liquid free, and stored in a closed, labeled container.

Whenever Possible:

- Minimize the number of solvents used to reduce the variety of waste generated and to make recycling easier.
- Use safer alternatives. (see Alternative Products SOP)
- If burning used oil for on-site heat, analyze for NHDES Used Oil Standards (Arsenic, Lead, Cadmium, Chromium, F- listed Halogens, Flashpoint, PCBs) approximately once every 1,000 gallons.

Never:

- Never place hazardous waste in solid waste dumpsters.
- Never pour liquid waste down floor drains, sinks or outdoor storm drain inlets.
- Never mix petroleum waste and chemical waste.
- Never dispose of any gasoline-contaminated waste in the regular trash. Dispose of it only as a hazardous waste.

Related Guidance:	
	– NHDES Environmental Fact Sheets: • WMD-HW-6 Contaminated Clothwipes for Laundering • WMD-HW-5 Federal and State Regulations: Hazardous Materials and Waste • WMD-HW-4 Waste Antifreeze - NHPPP Pitstop Manual

Standard Operating Procedure for:	
B.17 Petroleum and Chemical Handling	
Purpose of SOP:	To protect storm water by properly managing petroleum products and chemicals used by municipalities.

Always:

- Train employees in hazardous material handling, safety, spill cleanup and reporting on an annual basis.
- Handle petroleum products and chemicals according to manufacturer's specifications.
- Conduct oil changes indoors for equipment that fits indoors.
- Use proper protective equipment.
- Maintain Material Safety Data Sheets (MSDS) for all chemicals used.
- Make MSDS sheets available on materials that require special handling, storage and/or disposal.
- Create a sign-off sheet for employees stating that they know the location of the MSDS(s).
- Train new employees within six months of hire.

Whenever Possible:

- Assess hazardous material needs to minimize the amount and variety of hazardous material in storage.
- Keep an inventory of hazardous materials on hand.
- Transfer materials from one container to another indoors in a well ventilated area. Properly label containers.

Never:

- Never treat or dispose of hazardous materials unless licensed to do so.
- Never mix petroleum or chemicals unless directed by manufacturer's instructions.

Related Guidance:
– USEPA National menu of BMPs – NHPPP Pitstops Manual

Standard Operating Procedure for:	
B.18 Petroleum and Chemical Storage - Bulk	
Purpose of SOP:	To protect storm water by properly storing bulk petroleum products and chemicals (containers larger than 55 gallons).

Always:

- Store materials away from high traffic areas, posted with appropriate signage.
- Store materials according to manufacturer's specifications in approved containers and conditions.
- Be prepared for possible spills by having a spill kit nearby.
- Register ASTs if your facility stores more than 660 gallons of petroleum products (10,000 gallons if used for on-site heating).
- Develop and use a Spill Prevention Control and Countermeasure (SPCC) plan if storing more than 1,320 gallons of petroleum (required).
- Store incompatible hazardous materials in separate areas.
- Inspect storage areas for leaks or drips frequently.
- Store bulk items within secondary containment areas if bulk items are stored outside.
- Conduct annual employee training to reinforce proper storage techniques for petroleum and chemical products.

Whenever Possible:

- Store bulk chemicals and petroleum products inside or under cover.
- Provide secondary containment for interior storage.
- Cover transfer areas.

Never:

- Never store bulk chemicals or petroleum products near a storm drain.

Related Guidance:	
	– NHDES Environmental Fact Sheet: • WMD-REM-3 Monthly Inspection Guidelines for ASTs • WMD-OIL-17 Registration of Aboveground Petroleum Storage Tanks

Standard Operating Procedure for:	
B.19 Petroleum and Chemical Storage – Small Quantity	
Purpose of SOP:	To protect storm water from pollution by properly storing petroleum products or chemicals (containers 55 gallons and smaller).

Always:

- Store materials away from high traffic areas.
- Store materials according to manufacturer's specifications (e.g. in a flammable materials storage cabinet).
- Dispose of unused or waste materials properly.
- Train employees on proper storage procedures for petroleum and chemical products.
- Store materials in their original containers to maintain appropriate labeling.
- Be prepared for spills by having a spill kit nearby.
- Frequently inspect the storage areas for leaks or spills.
- Conduct annual employee training to reinforce proper storage techniques for petroleum and chemical products.

Never:

- Never store petroleum or chemical products near a floor drain or storm water inlet.

Related Guidance:	
	– NHDES Environmental Fact Sheet: • WMD-SW-29 Best Management Practices for 55-Gallon Drums

Standard Operating Procedure for:	
B.20 Garbage Storage	
Purpose of SOP:	To protect storm water from contamination by properly storing garbage. Garbage and leachate can be transported by storm water and enter the storm drain system and receiving waterbodies.

Always:

- Cover rubbish bins to keep rubbish and leachate in and wind and rain out.

Whenever Possible:

- Store garbage containers beneath a covered structure or inside to prevent contact with storm water.
- Install berms, curbing or vegetation strips around storage areas to control water entering/leaving storage areas.
- Locate dumpsters on a flat, concrete surface that does not slope or drain directly into the storm drain system.
- Locate dumpsters and trash cans in convenient, easily observable areas.
- Provide properly-labeled recycling bins to reduce the amount of garbage disposed.
- Inspect garbage bins for leaks regularly, and have repairs made immediately by responsible party.
- Keep bins free of improperly discarded trash.
- Provide training to employees to prevent improper disposal of general trash.
- Minimize waste by purchasing recyclable products that have minimal packaging.
- Request/use dumpsters without drain holes.

Never:

- Never place hazardous wastes in a dumpster or trash bin.
- Never place gasoline-contaminated wastes in a rubbish bin (but small quantities of adsorbents from virgin oil spills are acceptable).
- Never place oil-contaminated materials that release free draining oil into a rubbish bin.

Related Guidance:	
	– USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.21 General Facility Housekeeping	
Purpose of SOP:	To protect storm water by maintaining a clean, organized facility.

Always:

- Keep open areas clean and orderly.
- Pick up litter.
- Conduct regular employee training and public education to reinforce proper housekeeping.
- Remove unused scrap/junk materials.
- Store hazardous materials as specified by the manufacturer.

Whenever Possible:

- Store materials and wastes inside or under cover if outside.
- Substitute less or non-toxic materials for toxic ones.
- Perform a routine cleaning of the facility.
- Inspect facility (interiors, exterior, parking areas, etc.) for stains.

Related Guidance:	
	– USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.22 Floor Drains	
Purpose of SOP:	To protect storm water from pollution caused by discharges of hazardous materials to the subsurface, ground surface, waterway, or storm sewer through floor drains.

Always:

- Keep a spill kit in the vicinity of the floor drains.
- Obtain and use drain mats, adsorbent booms or covers to keep larger spills out of drains.
- Use floor drains that are (1) connected to a holding tank or (2) connected to the sanitary sewer via an oil/water separator.
- Register floor drains that have regulated contaminants stored or used near them with the NHDES (603) 271-2858.
- Register holding tanks with the NHDES.

Whenever Possible:

- Minimize water use <u>or</u> run a dry shop.

Never:

- Never dump hazardous materials down the floor drains.
- Never use floor drains if you are unsure of their discharge location.
- Never store regulated contaminants near a floor drain that discharges directly to the environment.

Related Guidance:	
	– NHDES Environmental Fact Sheet: • WD-WSEB-22-8 Holding Tanks for Floor Drains • WD-WSEB-22-9 Protecting Groundwater from Floor Drains and Other Typical Discharges – NHPPP Pitstops Manual

Standard Operating Procedure for:	
B.23 Painting	
Purpose of SOP:	To protect storm water by properly storing, using and disposing of paint and preparation materials.

Always:

- Store waste paints, solvent, and rags in sealed containers.
- Perform abrasive blasting and spray painting in accordance with regulations.
- Properly clean, store, and dispose of paint and associated waste materials.
- Train employees on Best management Practices concerning painting activities, cleanup, and disposal.

Whenever Possible:

- Replace solvent-based paint with less toxic paints such as latex or water-based paints.
- Practice "source reduction" – buy only the paint that is needed.
- Use up, donate or recycle unused paint.
- Use drop cloths under any painting or preparation activity such as scraping or sandblasting.
- Use techniques such as brushing and rolling to avoid overspray.
- Use vacuum sanders to collect paint dust.
- Perform abrasive blasting and spray painting in an enclosed or covered area that is safe for personnel.

Never:

- Never dispose of paint or waste paint products into the storm drain system, a waterbody, or onto the ground.

Related Guidance:
– NHPPP Pitstops Manual – NHDES Environmental Fact Sheets: • WMD-HW-14 Pollution Prevention Tips for Paint • WMD-HW-6 Contaminated Cloth Wipes for Laundering

Standard Operating Procedure for:	
B.24 Street Sweeping	
Purpose of SOP:	To remove sediment, debris and other pollutants from streets, parking areas, and paved surfaces through regular, properly timed sweeping schedules.

Always:

- Sweep all publicly accepted paved streets and parking lots at least once per year as soon as possible after snowmelt.
- Dispose of street sweepings properly (reuse is unrestricted if visual evidence of litter, animal waste, and petroleum contamination is absent).

Whenever Possible:

- Start at the "top" of town and work down.
- Sweep downtown areas more frequently (daily).
- Perform additional sweeping on a seasonal schedule and document areas swept.
- Sweep in locations that generate debris, such as construction entrances, sand/salt loading areas, vehicle fueling areas, and vehicle and equipment storage areas on an as needed basis.
- Street sweep before a major rain event.
- Use dry vacuum assisted street sweepers (the most effective).
- Maintain street sweeping equipment for maximum effectiveness.
- Cover storage areas or locate storage areas where runoff discharges to a buffer.
- Clean catch basins after streets are swept.

Never:

- Never store street sweepings in areas where storm water could transport fines to the storm drain system or a waterbody.
- Never purposely sweep into the storm drain system.

Related Guidance:	
	– NHDES Environmental Fact Sheet: • WMD-SW-32 Management of Street Wastes

Standard Operating Procedure for:	
B.25 Snow Disposal	
Purpose of SOP:	To protect storm water by minimizing the impact of snow piles which contain sand, salt, and trash and which generate concentrated releases of pollutants during spring snowmelt conditions.

Always:

- Identify sensitive ecosystems prior to disposal and avoid snow disposal in these areas.
- Store snow at least 25 feet from the high water mark of a surface water.
- Store snow at least 75 feet from any private water supply, at least 200 feet from any community water supply, and at least 400 feet from any municipal wells.
- Install a double row of silt fence or equivalent barrier securely between the snow storage area and the high water mark, and inspect periodically throughout the winter season.
- Clear debris in storage area each year prior to snow storage use.
- Clear all debris in snow storage area and properly dispose of no later than May 15 or immediately after snowmelt occurs of each year the storage area is in use.

Whenever Possible:

- Select storage locations that do not drain into surface waters and where environmental impacts of spring melt are minimal.
- Store snow on areas that are well above the groundwater table on a flat, vegetated slope.
- Avoid disposal on pavement, concrete, and other impervious surfaces.
- Do not pile snow in wooded areas, around trees or in vegetative buffers.
- Divert run-on of water from areas outside the snow piles.
- Use less harmful deicers such as calcium magnesium acetate, potassium acetate, or organic deicers such as Magic Salt™.

Never:

- Never dispose of snow in wetlands, lakes, streams, rivers, shellfish beds, or mudflats, or near drinking water sources.
- Never store snow in well-head protection areas (class GAA groundwater).

Related Guidance:	
	– NHDES Environmental fact Sheet: • WMB-3 Snow Disposal Guidelines – NHDES BMPs to Control Nonpoint Source Pollution

Standard Operating Procedure for:	
B.26 Deicing Material Storage	
Purpose of SOP:	To protect storm water by properly storing deicing materials. Sand, salt and other deicing materials used during winter can be transported by runoff into the storm drain system and eventually into waterbodies if not stored properly.

Always:

- Locate sand/salt piles and deicing fluid tanks on flat, impervious sites that are easily protected from overland runoff and away from surface waters.
- Cover sand/salt and salt piles with a tarp (polyethylene) during non-freezing spring and summer months when indoor storage facilities are not available.

Whenever Possible:

- Contain wash water from trucks used for salting and sanding in a holding tank for disposal or discharge into sanitary sewers.
- Allow rinse water/melt water to drain into vegetated buffers (away from stormdarins).
- Locate deicing material stockpiles and tanks at least 100 feet from streams and flood plains.
- Contain storm water runoff from areas where salt is stored by using buffers to diffuse runoff before entering waterbodies.
- Use diversion berms to minimize run-on to storage areas.
- Cleanup "track out" after storm events.

Never:

- Never dispose of wash water from sanding and salting trucks into the storm drain system, a waterbody, or septic system drain fields.

Related Guidance:
– NHDES Environmental Fact Sheet: • WMB-4 Road Salt and Water Quality – NHDES BMPs to Control Nonpoint Source Pollution

Standard Operating Procedure for:	
B.27 Deicing Material Application	
Purpose of SOP:	To protect storm water by improving application techniques of salt, sand, and other deicing materials.

Always:

- Apply as little sand and salt as needed, and no more than the NHDOT recommended application rates (based on level of service):

Condition	Highways carrying greater than 5,000 vehicles daily	Highway/roads carrying less than 5,000 vehicles daily
Snow - 20°F and greater	250 lbs salt per lane mile	250 lbs salt per lane mile
Snow – below 20° F	250 lbs salt per lane mile	Abrasive chemical mix
Sleet/freezing rain	300 lbs salt per lane mile	300 lbs salt per lane mile

Whenever Possible:

- Inform salt applicators of sensitive areas, such as public water supplies, lakes, ponds, etc b installing permanent signs.
- Use de-icing alternatives such as calcium magnesium acetate, sand, etc. in sensitive areas.
- Use the minimum amount of salt and sand needed to get the job done.
- Use coarse, clean "washed" sand, which is free of fine particles and dust and easier to clean in the spring.
- Equip all spreaders with ground-speed controllers.
- Train drivers to improve application techniques and reduce losses.
- Consider applying salt in a 4-8 foot strip along centerline of a two-lane road (for less traveled roads).
- Know when to plow and reapply salt. Allow maximum melting by salt before plowing.
- Remove snow manually from driveways and sidewalks.
- Street sweep accumulated salt and sand at the end of the season.

Related Guidance:
– NHDES Environment Fact Sheet: • WMB-4 Road Salt and Water Quality – NHDES BMPs to Control Nonpoint Source Pollution – NHDOT Winter Maintenance Snow Removal and Ice Control Policy