Stormwater Management Plan

Registration No. GSM 000091
Canton, Connecticut
Issued for Public Comment April 1, 2017
Effective July 1, 2017

MILONE & MACBROOM®
Engineering | Planning | Landscape Architecture | Environmental Science

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Prepared for:

Town of Canton
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MMI #1752-27-8-1

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Professional Engineer Certification

I hereby certify that I am a qualified professional engineer as defined in the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems. I am making this certification in connection with a registration under such general permit submitted to the Commissioner by the Town of Canton for an activity located at or within the Town of Canton. I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(*b*)(9)(A) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate, and complete to the best of my knowledge and belief. I certify, based on my review of all information described in Section 3(*b*)(9)(A) of such general permit and on the standard of care for such projects, that I have made an affirmative determination in accordance with Section 3(*b*)(9)(B) of this general permit. I understand that this certification is part of a registration submitted in accordance with Section 22a-430b of the Connecticut General Statutes and is subject to the requirements and responsibilities for a qualified professional in such statute. I also understand that knowingly making any false statement in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under Section 53a-157b of the Connecticut General Statutes and any other applicable law.

Edward A Hart	15502	3-17-17
Signature	P.E. Number	Date

1.0 INTRODUCTION

The town of Canton (the Town) is located in the north central section of Connecticut. It is approximately 25 square miles in size with a current population (according to the 2010 census) of approximately 10,292. Incorporated in 1806, the town has grown in population but has maintained some of its rural character. Land use is typically residential with commercial development limited to the Route 44 and Route 202 corridors and Collinsville.

The town retained Milone & MacBroom, Inc. (MMI) to review its existing Stormwater Management Plan (the SMP) and provide a summary of recommended modifications and updates for use in ongoing stormwater management activities. Modifications and updates are intended to comply with the requirements established by the Connecticut Department of Energy & Environmental Protection (CTDEEP) in Section 6 of its Municipal Separate Storm Sewer Systems (MS4) General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (the Permit). A copy of that Permit is included in Appendix A.

The MS4 General Permit is the product of a mandate by the U.S. Environmental Protection Agency (USEPA) as part of its Stormwater Phase II rules issued in 1999, which addressed runoff from small MS4s with populations less than 100,000. This General Permit requires each municipality to take steps to reduce and/or eliminate the discharge of pollutants through the storm sewer system to the maximum extent practicable.

The SMP specifically addresses stormwater discharges from Town-owned and operated facilities. The Connecticut Department of Transportation owns and operates drainage systems in Canton on state highways such as Route 179. The Town's jurisdiction for stormwater management begins and ends at the edge of the right-of-way for these state-owned facilities.

The updated General Permit focuses on Urbanized Areas (UA), which are the areas of the State of Connecticut so defined by the U.S. Census Bureau for the 2000 or 2010 census. The limits of the UA within Canton are shown in Figure 1-2. The urban area includes the southern part of town, with a narrow area extending north up Route 179. Approximately 7.3 square miles of the Town's total 25 square miles (29%) is located within the 2010 Census Urban Area of Hartford. MS4s located partially or entirely within a UA that have at least 1,000 residents in the UA are subject to the requirements of the MS4 Permit and the SMP.

Within that UA, the Permit directs the permittees to evaluate Directly Connected Impervious Areas (DCIAs) as the target areas for stormwater pollution control. DCIAs are impervious areas that cause runoff to directly enter waters of the state or impervious areas that discharge into an MS4 system that directly empties into waters of the state. Impervious areas that discharge through a system designed to retain the appropriate portion of the Water Quality Volume (WQV) are not considered DCIAs.

The current MS4 General Permit has been extended to June 30, 2017, as the modified MS4 General Permit will become effective July 1, 2017. The SMP should be reviewed periodically to help ensure that it remains relevant, and to incorporate changes in the land use regulations that may occur from time to time.

The National Pollutant Discharge Elimination System (NPDES) Program

In an effort to control the water quality impacts of human activities described in Section 2.1, in 1990, the United States EPA established Phase I of the NPDES stormwater program. The Phase I program required operators of large and medium municipal separate storm sewer systems (MS4s) (those serving populations of 100,000 or greater) to implement a stormwater management program as a means to control polluted discharges.

Phase I also required stormwater discharge permits to be developed for 11 categories of industrial activities, one of which was construction sites that disturb in excess of 5 acres. In response to that requirement, CTDEEP developed a General Permit for the Discharge of Stormwater from Industrial Activities and General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities.

In 1999, Congress promulgated Phase II of the NPDES program. Phase II covers any MS4 within a United States Census Bureau designated UA that was not included in the Phase I program. A UA is any location where the population exceeds 50,000 people and has a population density greater than 500 people per square miles. In simple terms, UAs are designated by locating areas where the population exceeds 50,000 and then moving outward from the central area until the population density drops below 500 people per square mile. Canton is located within the Hartford UA. Figure 1-2 depicts the Census Bureau designated UAs of Canton.

Connecticut's Phase II Program

In response to the Phase II requirements, CTDEEP developed a General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (the Permit). There are four basic requirements of this Permit, which are discussed below:

Part A – Registration

Registration forms have been developed and distributed (currently available on the CTDEEP website) to affected municipalities. The Town originally registered under the MS4 Permit in February 2004. Re-registration is required 90 days prior to the expiration of the existing permit, which is the effective date of the new General Permit (July 1, 2017). The "Part A" Registration Form is due to CTDEEP on or before April 1, 2017. The Town expects to submit its registration form for permit renewal on or before April 1, 2017.

Part B – Stormwater Management Plan

The SMP establishes goals, policies, and implementation actions that will achieve the Town's long-term objectives in a way that is understandable to the public, usable by the Town staff, and meets regulatory needs. The SMP establishes a means for measuring, reporting, and managing the Town's water resources by presenting benchmarks that will ensure compliance with applicable laws and permit requirements.

The SMP addresses stormwater quality management policies and management practices that are, or will be, implemented in Canton and its UAs. The scope of the SMP is determined by the state MS4 Permit requirements and includes the following six minimum control measures:

- PE: Public Education and Outreach on Stormwater Impacts
- PI: Public Involvement/Participation+
- ID: Illicit Discharge Detection and Elimination
- CSW: Construction Site Stormwater Runoff Control
- DS: Postconstruction Stormwater Management in New Development and Redevelopment
- OM: Pollution Prevention/Good Housekeeping for Municipal Operations

The SPM must be kept current. The SMP may need to be updated whenever (1) there is a change that has the potential to cause pollution of the waters of the state, (2) the actions required by the SMP fail to prevent pollution of the waters of the state or fail to otherwise comply with any other provision of the General Permits, or (3) the Commissioner requests a modification to the SMP.

Annual Reporting

Each permit holder is required to submit an annual report to CTDEEP on the progress they have made in implementing their plan. The annual report is intended to be a brief synopsis of those portions of the SMP that were implemented during the previous year and a brief assessment of the success of the implementation. The annual report must be submitted each year by April 1 and discuss each of the requirements described in Section 6, subsection (j) of the Permit.

Annual Sampling

The Permit requires MS4s to sample stormwater from six locations annually. Two samples each should be collected from primarily residential, commercial, and industrial areas of the MS4. Samples must be analyzed for the following parameters: pH, hardness, conductivity, oil and grease, chemical oxygen demand, turbidity, total suspended solids, total phosphorous, ammonia, total Kjeldahl nitrogen, nitrate plus nitrite nitrogen, and *Escherichia coli* (*E. coli*). While there are no effluent limits to compare sample results to (that is, you cannot fail this sampling program), the results need to be reported to CTDEEP. The Town has been diligent in submitting these annual stormwater sampling reports in compliance with its existing MS4 Permit.

Figure 1-1: Canton Location Map

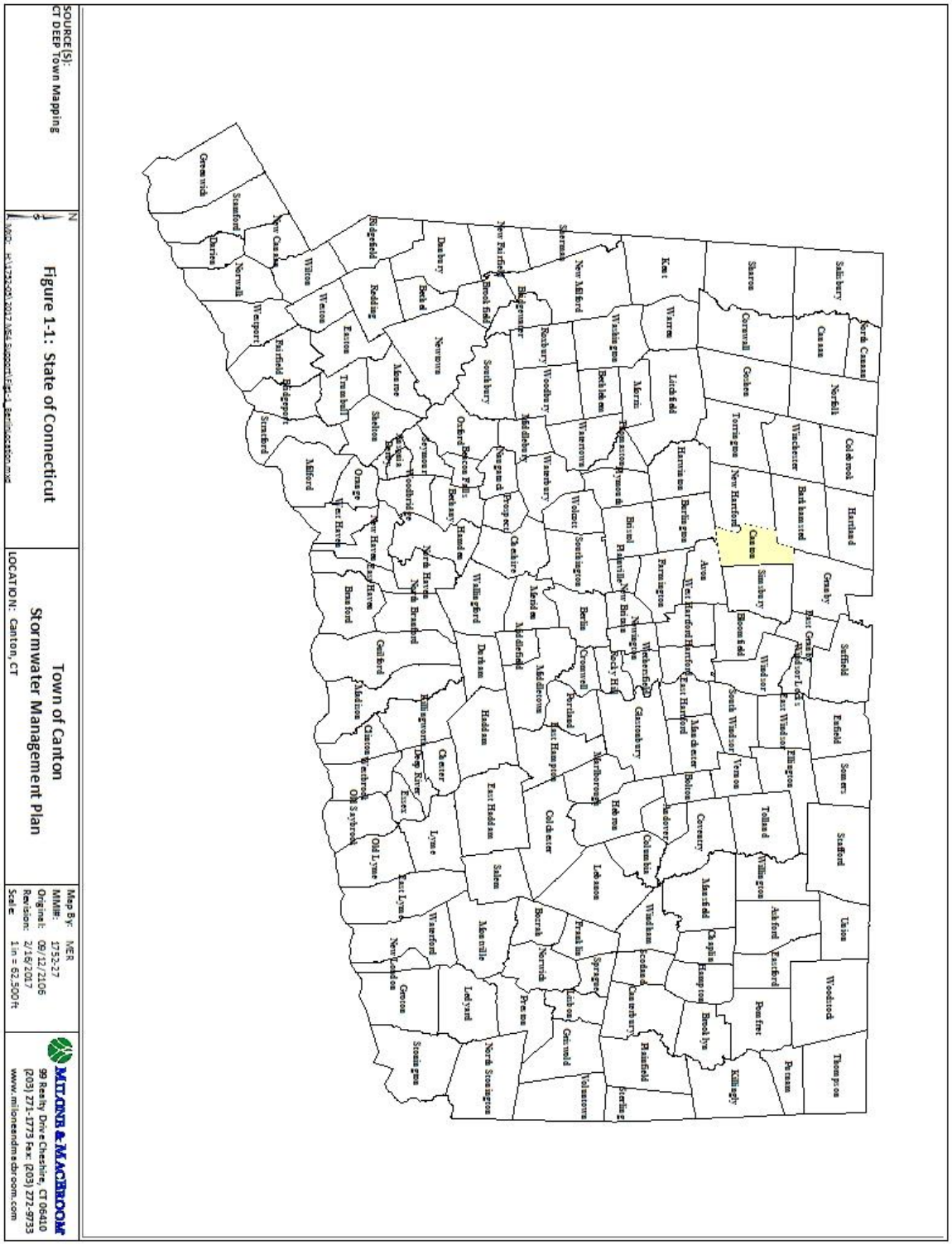
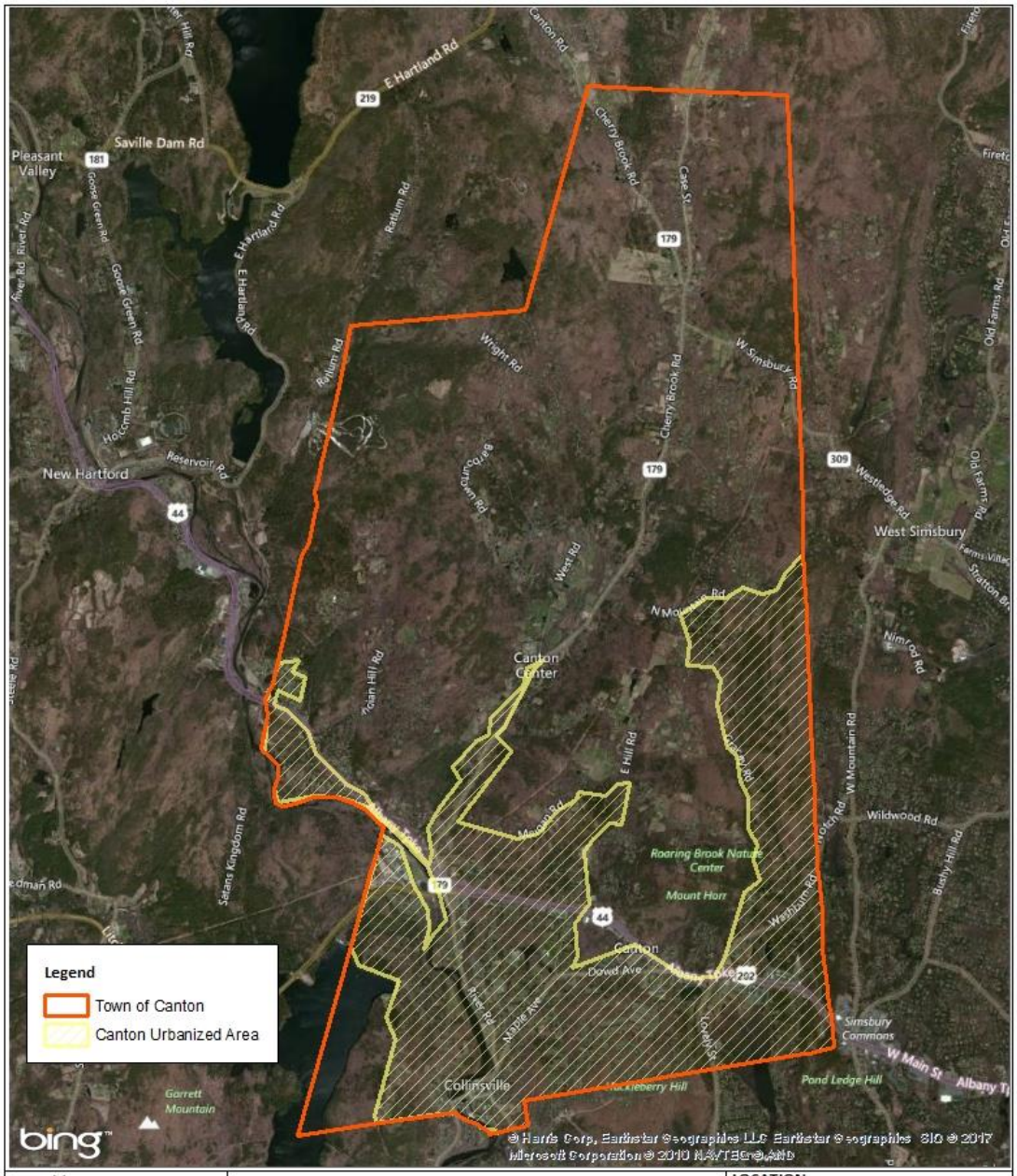


Figure 1-2: Urbanized Areas in Canton



SOURCE(S):	Figure 2-1: Urbanized Area in Canton, CT	LOCATION:
2010 Census (c) 2009 Microsoft Corporation	Town of Canton Stormwater Management Plan MXD: W:\Design\1752-21-DE\GIS\Fig2-1Urbanized area.mxd	Canton, CT Map By: MER MMI#: 1752-21 Original: 02/20/2017 Revision: Scale: 1 inch = 5,000 feet

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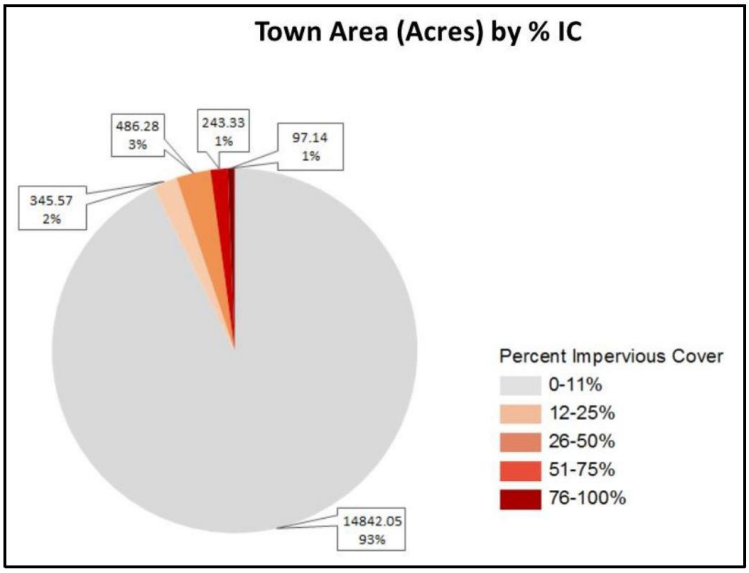
2.0 BACKGROUND INFORMATION

2.1 Stormwater Quality and Quantity

Rainstorms and snowmelt often produce runoff. Runoff is the overland flow of water that has not percolated into subsurface soils. A storm event will produce different volumes of runoff depending on soil types, vegetation, and topography of a particular region. Natural overland flow produced by stormwater runoff will often encounter obstructions as it flows toward the nearest stream or watercourse. Tree roots, underbrush, stones, and other organic material will slow overland flow velocities, allowing for percolation into the ground.

Amounts of Impervious Cover within the Town of Canton



In UAs, manmade impervious surfaces such as pavement or rooftops create high volumes of runoff. Because water cannot infiltrate impervious surfaces, all of the stormwater collected on such surfaces becomes runoff. A direct correlation has been identified between the amount of impervious land area in a watershed and the water quality in the associated rivers and streams. This connection is documented in a 2007 study by Christopher Bellucci of the CTDEEP entitled *Stormwater and Aquatic Life: Making the Connection between Impervious Cover and Aquatic Life Impairments for TMDL Development in Connecticut Streams*. The study documents that stormwater pollution from impervious cover is a likely cause of impairment for water bodies. Research suggests aquatic life will be harmed when impervious cover within a watershed exceeds 12%.

The CTDEEP Factsheet for the Town of Canton Water Quality and Stormwater includes the adjacent chart developed by CTDEEP to show the amount of impervious cover within the Town. The majority of the Town (93%) contains less than 11% impervious cover. The remaining 7% of land area ranges from 12% to 100% impervious cover. Stormwater runoff from parking lots, roads, and urban and agricultural land uses transports pollutants directly to surface waters without the benefit of the natural filtration that occurs when runoff discharges through grass and woods. Table 2-1 provides a summary of common land uses and the pollutants that result. A description of each pollutant source follows the table.

TABLE 2-1
Common Water Pollutant Sources

Source ⇒ Pollutant ⇓	Transportation-Related Activities	Urban Housekeeping and Landscaping Practices	Industrial Activities	Construction Activities	Nonstormwater Connections	Accidental Spills and Illegal Dumping
SEDIMENTS	X	X	X	X		
NUTRIENTS		X	X	X	X	X
BACTERIA		X		X	X	X
OXYGEN DEMANDING SUBSTANCES		X	X	X	X	X
HYDROCARBONS						
Oil and Grease	X	X	X	X	X	X
PAHs	X	X	X	X	X	X
HEAVY METALS						
Chromium	X	X	X			X
Copper	X	X	X			X
Lead	X	X	X			X
Zinc	X	X	X			X
Iron	X		X			X
Cadmium	X		X			X
Nickel	X		X			X
Manganese	X		X			X
Arsenic	X	X	X			
Paint		X	X	X	X	X
Wood Preservatives		X	X	X	X	X
ORGANICS						
PCBs	X				X	X
Pesticides	X	X	X	X	X	X
Herbicides	X	X		X	X	X
FLOATABLES		X	X	X		X
SALTS	X					
TEMPERATURE		X	X		X	

Transportation-Related Activities

Vehicular traffic has the potential to contribute lubricants, gasoline, hydraulic fluids, and coolants to nearby surface waters. Heavy metals contribute to the pollutant load through the wearing down of tires and brakes. Dust and dirt particulates are emitted from vehicle exhaust emissions and from brake and clutch lining materials. Transportation corridors (both road and rail rights-of-way) are sometimes maintained through the use of herbicides to minimize the growth of vegetation. These herbicides, if not properly used, can leach into surface waters and impact aquatic plant and animal life.

Urban Housekeeping and Landscaping Practices

Maintenance of lawn areas at private residences, public parks, and other recreational areas such as golf courses often involves the application of fertilizers, pesticides, herbicides, and insecticides. Many households also maintain materials that are classified as hazardous wastes (e.g., cleaners, solvents,

paint thinners) and have the potential to impact water quality if not properly applied, stored, and disposed.

If applied improperly, excess volumes of fertilizers, pesticides, herbicides, and insecticides leach into the groundwater and are carried by stormwater runoff into surface water systems. Generally, these materials increase the nitrogen and phosphorus concentrations in surface waters. Some insecticides also contain derivatives of arsenic, which may be transported in runoff as the use of these chemicals increases.

Industrial Activities

Industrial activities include traditional factories as well as quarry operations and mining. Impacts from these operations can result from the discharge of process wastewaters as well as from poor storage and housekeeping practices. In some industrial areas, particularly those that were developed in the early part of the 20th century, floor drains may be connected to storm sewers or pipes that discharge directly to a river or stream. While these connections should be eliminated, property owners may not be aware of their existence.

The storage of chemicals and waste materials outside, with little or no protection from rainwater and snow, increases the potential for pollutants to be transported by stormwater runoff into nearby surface waters. The storage of these chemicals at some facilities is regulated under CTDEEP's current General Permit for the Discharge of Stormwater from Industrial Activities. However, it is possible that some industrial operations are not aware of the requirements of this permit and have not registered.

Construction Activities

Construction activities impact water quality by contributing sediments and other pollutants to surface waters. The clearing of land for construction leaves soil materials unstable and prone to erosion. Maintenance and refueling of construction equipment can also impact water quality if it is not executed properly. Without the proper use of erosion and sedimentation controls along with good housekeeping practices, construction activities can severely impact surface waters.

Construction-related stormwater impacts are part of the focus of Phase II of the NPDES program. Phase I of the NPDES program required permits for construction sites that disturbed 5 acres or more. Phase II reduces that threshold to 1 acre. The introduction of permit requirements under the CTDEEP General Permit for Stormwater and Dewatering Wastewaters from Construction Activities (CTDEEP-WPED-GP-015) for discharge of stormwater and dewatering wastewater from construction activities that disturb 1 or more total acres of land area are intended to further minimize sedimentation.

Nonstormwater Connections

Nonstormwater connections may include industrial discharges, which are regulated under the NPDES program. They may also include basement sump pumps and footing drain discharges. Some of these connections may discharge clean water to storm drains. However, other connections may contribute various pollutants, depending on the source of the water.

Accidental Spills and Illegal Dumping

Accidental spills and illegal dumping can contribute almost any type of contaminant to the watershed and are difficult sources to control. Spills often occur due to traffic accidents but can also occur at industrial facilities due to mishandling of chemicals.

Fuel Storage Leaks and Spills

Leaking underground storage tanks are considered a major cause of groundwater and surface water contamination. Improperly designed or maintained aboveground storage tanks can also be a water quality threat. Regulatory initiatives have led to the replacement and/or upgrade of many tanks in recent years. However, there are still some sites where discharges are occurring due to leaking tanks.

Agricultural Runoff

Fecal contamination from agricultural animal runoff poses a threat to water quality. EPA data indicates that approximately one-third of agricultural nonpoint source pollution is caused by animal waste runoff from feedlots, holding areas, and pastures. Agricultural sources of *E. coli* are primarily from livestock operations and can be deposited directly into streams that discharge into Cherry Brook or deposited on the ground and carried to a stream by surface runoff. Best management practices (BMPs) for the proper disposal and control of farming wastes include containment in facilities or structures, management practices, and vegetative cover.

Failing Septic Systems

When septic systems fail to operate properly, untreated sewage can enter the groundwater supply or percolate to the surface and eventually enter streams that discharge to Cherry Brook. The amount of *E. coli* contributed from failing septic systems is difficult to quantify.

2.2 Overview of Canton's Stormwater Drainage System

The Town is responsible for implementing surface water management activities within its boundaries, including the planning, design, construction, operation, and maintenance of the stormwater drainage system. The Town performs all operations and maintenance on the public drainage system that is designed and constructed to public standards and located within easements or rights-of-way or real property that has been conveyed or dedicated to the Town.

The geographic area of focus covered by this SMP includes the approximately 7.3 square miles of land within the Town UA. Special attention is paid to the areas of land identified as DCIA, which have been identified as having a higher propensity for contributing to pollution runoff and the resultant impacts to impaired waters of the state. According to CTDEEP, a DCIA is "that impervious area from which stormwater runoff discharges directly to waters of the state or directly to a storm sewer system that discharges to waters of the state."

The Town commercial and industrial areas' stormwater drainage systems also include many private stormwater management facilities that help moderate and reduce the volume and pollutant content of stormwater leaving private property and entering the public stormwater drainage system and/or local

rivers and streams. These systems have been incorporated into newly developing properties since the late 1980s and include primarily mechanical pollutant removal devices and constructed landscape features that use natural processes to clean and reduce the volume of stormwater flows to the public system. These private facilities are vital to the long-term effectiveness and affordability of the Town's stormwater management program.

3.0 WATER RESOURCES AND STORMWATER MANAGEMENT

3.1 Water Resources

The major waterways in Canton include the Farmington River, the Nepaug River, Jim Brook, Ratlum Brook, and Cherry Brook. While the Farmington River, Nepaug River, and Cherry Brook all bear the name of their associated subregional basins, Jim Brook is a tributary to Roaring Brook and is part of the Roaring Brook subregional basin. Ratlum Brook is part of the East Branch Farmington River subregional basin. The entire town of Canton is part of the Farmington River regional basin.

The Town's UA also extends through Hop Brook subregional basin and Nod Brook subregional basin although the MS4 system currently does not extend into Nod Brook. There is no major waterway in either basin within the town of Canton. A Canton watershed map is shown in Figure 3-1.

Currently, there are two listed impairments in waterways in the town of Canton. The Nepaug River is listed as impaired due to flow regime alterations unassociated with MS4 activity, and Cherry Brook is impaired for recreational use due to the presence of *E. coli*. A map of the Cherry Brook watershed is presented in Figure 3-2.

3.1.1 Farmington River

The Farmington River and its tributaries form the surface water resources within the town of Canton. The Farmington Basin (#4300) is a 607.2-square-mile basin, which covers parts of approximately 20 towns in north central Connecticut and south central Massachusetts. The entire town of Canton is contained within the Farmington watershed.

The Farmington River is formed from the confluence of the East and West Branches, which meet in New Hartford. The East Branch is heavily impounded via the Barkhamsted and Compensating (Lake McDonough) Reservoirs. These reservoirs serve as public water supply for the Metropolitan District Commission, which serves most of north central Connecticut. Shortly after the confluence, the river flows through Canton where impoundments and other flow regime alterations are noted.

3.1.2 Farmington River Subwatersheds

Table 3-1 shows the subregional basins of the Farmington basin that exist within Canton.

TABLE 3-1
Subregional Basins of the Farmington Basin

Subwatershed Name	Total Drainage Area (acres)	Drainage Area in Canton (acres)	% of Drainage Basin in Canton
East Branch Farmington River	24,183	831	3.4
Cherry Brook	8,847	6,623	74.9
West Branch Salmon Brook	17,019	5.8	0.03
Hop Brook	8,716	762	8.7
Roaring Brook	4,834	1,855	38.4
Nod Brook	3,937	338	8.6
Farmington River	13,6703	5,042	3.7
Nepaug River	20,464	558	2.7

3.1.3 Water Quality

The water quality of surface water bodies within the town of Canton is generally good; however, the state has identified impairments within Cherry Brook. These impairments cause the brook to not meet standards acceptable for its intended use.

The Cherry Brook subregional basin (#4309) covers four towns, with the headwaters beginning in a wooded tract of land between Routes 179 and 219 in Barkhamsted and the watershed fanning out to encompass small areas of Granby and Simsbury. The entire watershed is approximately 13.8 square miles, with approximately 10.5 square miles in Canton. Many tributaries flow into Cherry Brook, with one named tributary, Barbour Brook, forming a confluence with Cherry Brook in the area of Barbourtown Road and Route 179.

Cherry Brook does not drain a large percentage of the Town's MS4 system, but the stream is listed as an impaired water by CTDEEP, with an established bacterial Total Maximum Daily Load (TMDL). This means that sections of Cherry Brook are not meeting their intended use due to bacterial contamination. This area should be the most thoroughly addressed when applying the BMPs here within.

In 2012, CTDEEP finalized a water quality review of the Cherry Brook watershed in an effort to comply with the state water quality standards. Cherry Brook is listed as in Inland Surface Waters Class A water body. This means that the water body could potentially be used for drinking water and does not receive any sewage discharge upstream. CTDEEP approved a TMDL allocation for Cherry Brook to address high levels of *E. coli* bacteria. Currently, a 2.05-mile segment of Cherry Brook is listed as impaired for recreational use due to indicator bacteria.

Water quality is determined by the types and levels of substances and organisms present in a body of water. Any number of pollutants can be found in surface water bodies. These pollutants are a direct result of surface runoff and include microscopic organisms, natural compounds, and human waste. The most common pollutants can be categorized into five main types: pathogens, nutrients, toxicants, litter, and suspended solids. The primary concern of this section is the control of *E. coli* in stormwater and surface water bodies. Also of concern are suspended solids as *E. coli* bacteria can adhere to suspended

solids and cause unsafe levels in water bodies. Therefore, the focus is on pathogens and suspended solids.

Pathogens:

Pathogens are microscopic organisms and include viruses, bacteria, fungi, and parasites. They can cause disease in plants and animals. While some occur naturally in soil and water, many are present in feces. The primary indicators of pathogens in water are the bacterium *E. coli* and fecal coliforms. Fecal coliforms and *E. coli* are not pathogens, and they generally do not pose an actual health risk. Rather, both of these bacterium are easy to detect and count and, thus, they are commonly used as indicators in water quality testing to detect fecal matter, which may carry numerous pathogenic (disease causing) organisms. The USEPA has determined that if levels of *E. coli* exceed 235 organisms, also known as Colony Forming Units (CFUs), per 100 milliliters (mL) of water, a health risk to humans may exist, and a recreational water quality advisory should be issued. Oftentimes, high levels of *E. coli* are encountered following heavy rains when stormwater runoff concentrates the pollutants.

Sources of *E. coli* include the following:

- Pet, livestock, wildlife, and human feces
- Garden fertilizers and manure
- Septic tanks and unsewered premises
- Sewer overflows and damaged sewers

Suspended Solids:

Suspended solids, or very fine particles, create turbid or muddy waters. Given enough particles in suspension, the water may become opaque and take on the color of the particles. Turbidity can retard plant growth and lower dissolved oxygen, threatening aquatic life. Contaminants such as *E. coli* can adhere to the surface of these suspended materials. Thus, it is important that water quality goals address the discharge of suspended solids into stormwater runoff.

Suspended solids in water may include particles of the following:

- Soil erosion
- Dirt from streets, households, and buildings
- Airborne particulate matter
- Organic matter from plants and animals including sewage
- Bacteria and other microorganisms

Table 3-2 below summarizes the impaired waters designation of Cherry Brook.

TABLE 3-2
Canton Impaired Water Body

Water Body ID	Water Segment Description	Water Segment Length (miles)	Impaired Use	Pollutant	Cause/Potential Source
Farmington River Watershed – Surface Water Quality Classification – A					
Cherry Brook	Mouth at confluence with Farmington River (just downstream of Albany Turnpike [Route 44] crossing), upstream to Barbourtown Road crossing, Canton.	2.05	Recreation	*E. coli*	Urban runoff/stormwater runoff, illicit discharge, permit source, failing septic system, nuisance wildlife/pets, other

3.2 Areas of Environmental Concern

3.2.1 Aquifer Protection Areas and Public Drinking Water Supply Watersheds

An area in the southeast portion of Canton lies within the aquifer protection area of a local water utility. This area includes parts of the Roaring Brook and Farmington River subregional basins. There are several documented MS4 outfalls in this area.

The contributing land area or aquifer recharge area to these aquifer protection areas should be given special consideration for issues such as land development planning and stormwater management. The Town should consult the state's *Connecticut's Aquifer Protection Area Program Municipal Manual 2011* for detailed instructions on the regulation aquifer protection areas.

A small area of the Nepaug River subregional basin is part of the Public Water Supply watershed of the Metropolitan District Commission. Due to the limits of the existing MS4 system mapping, it is unclear whether any outfalls from the Town's system drain into this area. The Town's MS4 system in the area of Freedom Drive and Country Lane does have storm drains adjacent to the watershed divide, so it is possible that some outfalls flow toward the public water supply watershed.

Figure 3-3 shows the areas of environmental concern along with the best available mapping of the Canton MS4 system.

3.2.2 Surficial Materials

Figure 3-4 is a map of surficial materials within Canton, with the limits of the UA overlaid. This figure is based on mapping developed in 1962 by the United States Geological Survey. Versions of this mapping are available electronically through the University of Connecticut's Geographic Information System (GIS), known as MAGIC.

Surficial materials can be an important consideration for stormwater management. For example, the use of infiltration-type stormwater management techniques would not be appropriate in areas of clay and silt deposits. While the design of stormwater management infrastructure needs to be based on site- specific data, review of general surficial materials maps can provide some detail about the appropriateness of some types of BMPs.

Figure 3-1: Canton Watershed Map

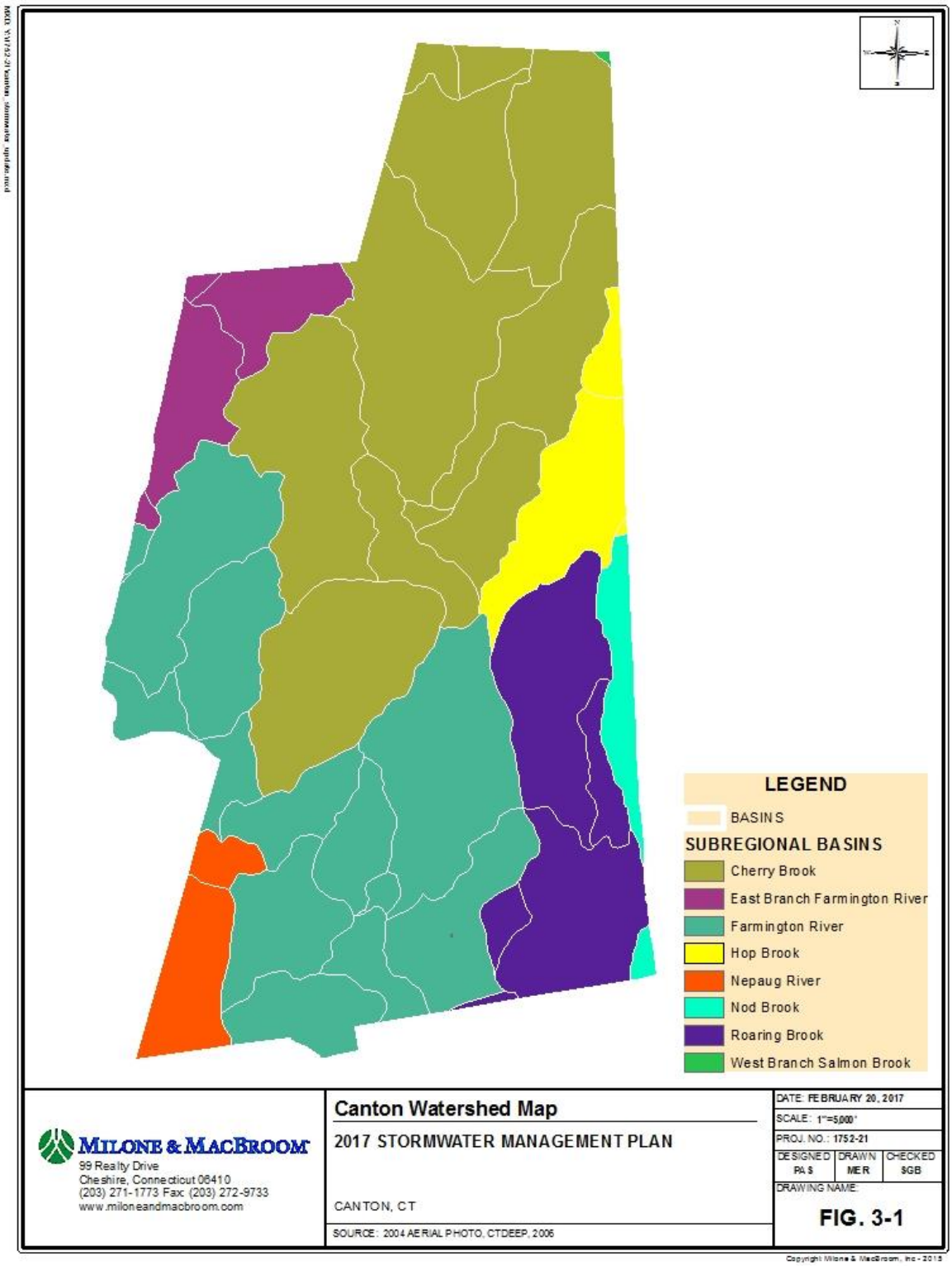
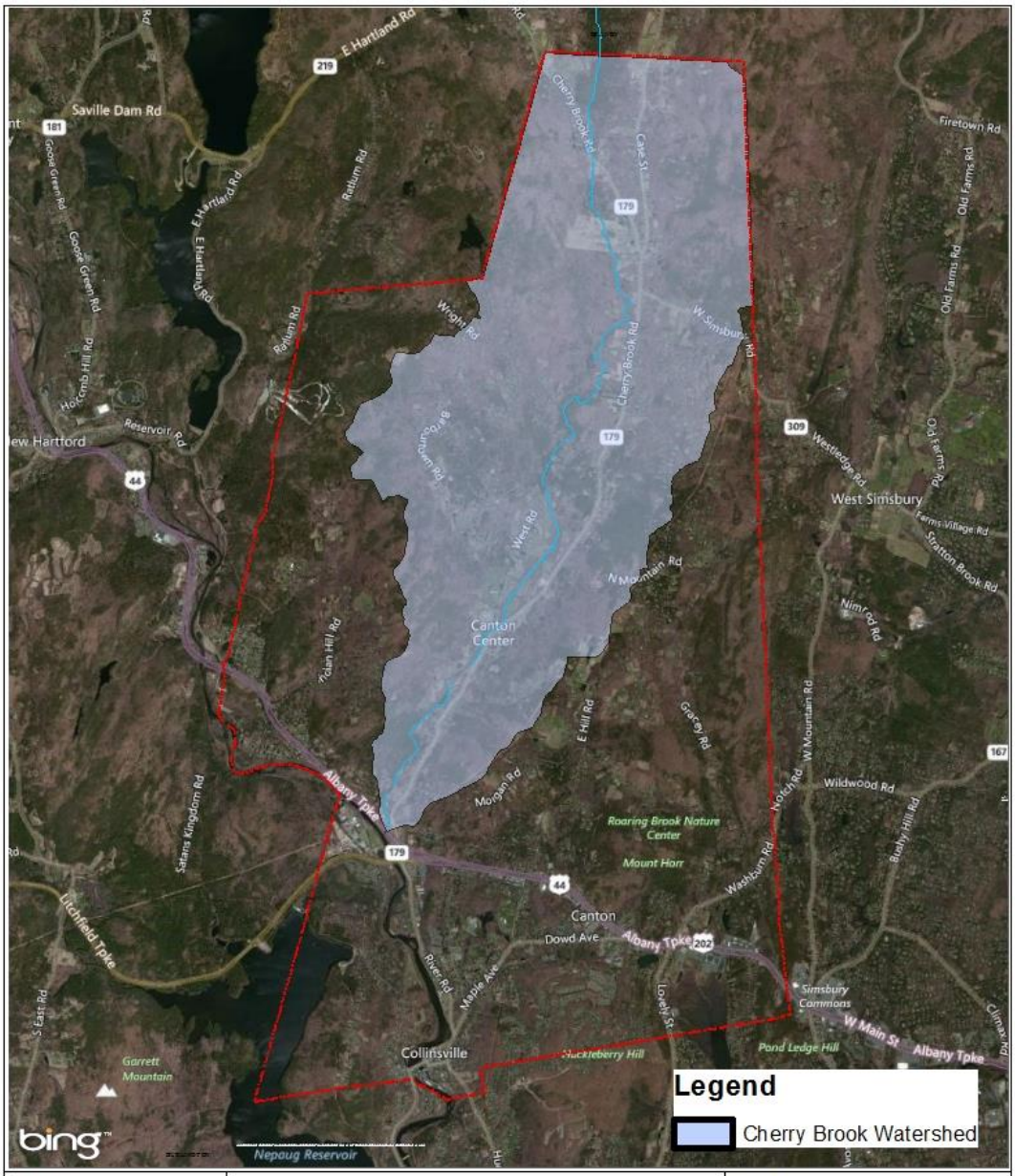


Figure 3-2: Cherry Brook Watershed Map



SOURCE(S):	Figure 3-2: Cherry Brook Watershed in Canton	LOCATION:
CT DEEP Drainage Basins (c)2009 Microsoft Corporation		Canton, CT

N Stormwater Management Plan MXD: H:\1752-05\GIS Maps\SMP_Fig1_CherryWS.mxd	Map By: MER MMI#: 1752-21 Original: 02/20/17 Revision: Scale: 1 inch = 5,000 feet	MILONE & MACBROOM 99 Realty Drive Cheshire, CT 06410 (203) 271-1773 Fax: (203) 272-9733 www.miloneandmacbroom.com

Figure 3-3: Areas of Environmental Concern

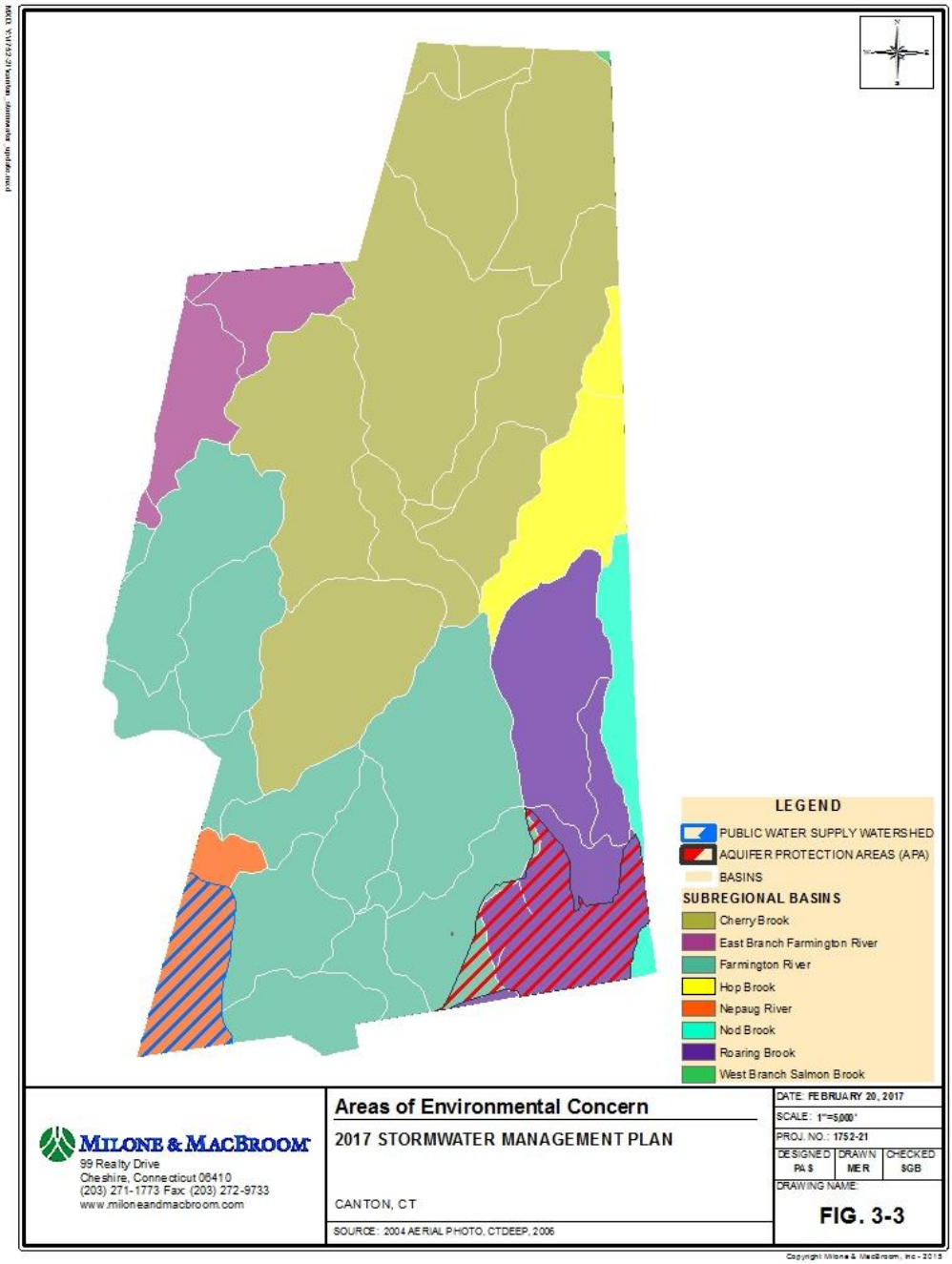
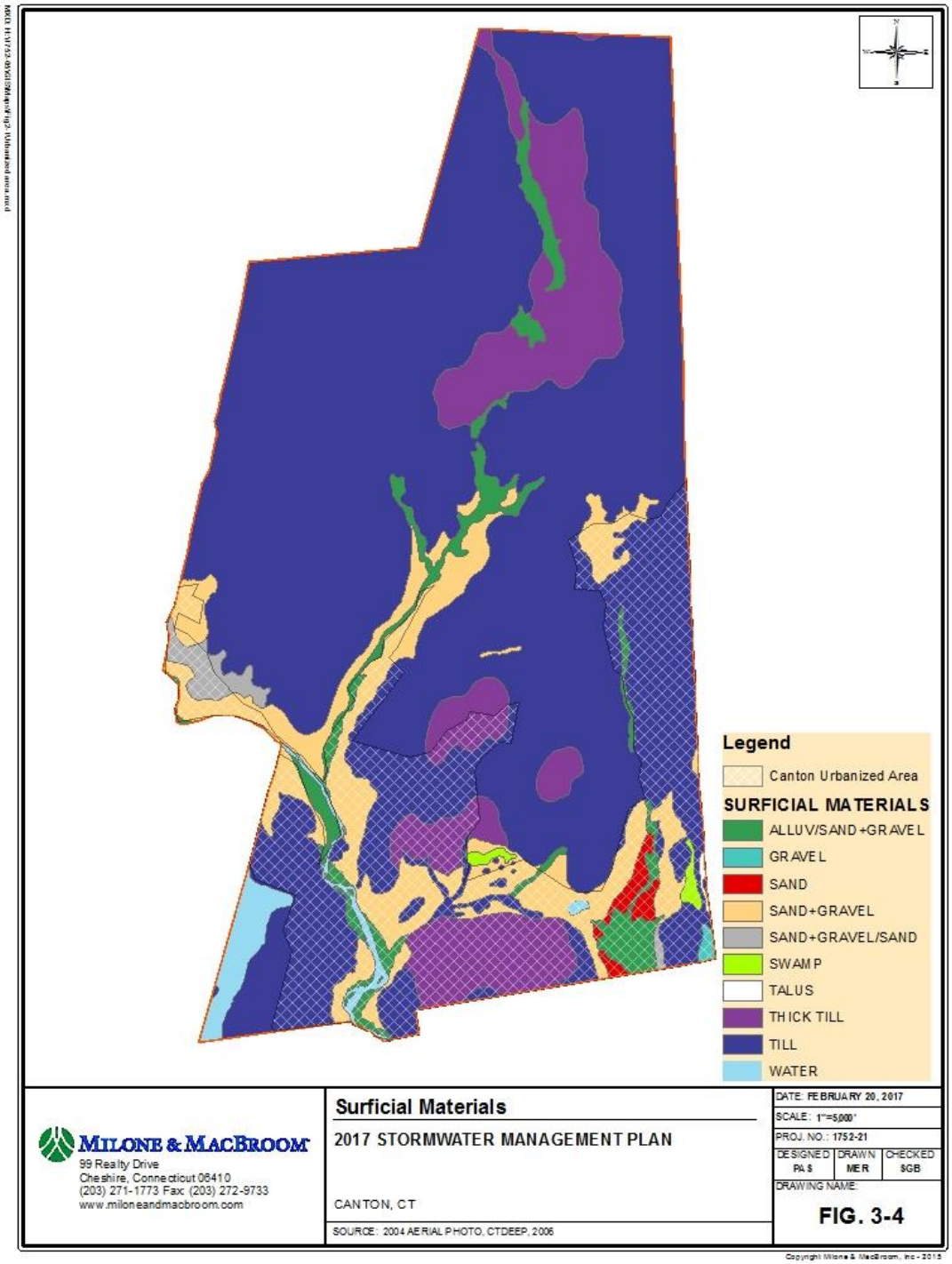


Figure 3-4: Surficial Materials



4.0 PUBLIC EDUCATION AND OUTREACH ON STORMWATER IMPACTS

4.1 Permit Requirements

The CTDEEP Permit requires that the Town develop and implement a public education program to distribute educational materials to the community or conduct other outreach activities explaining the impacts of stormwater discharges on water bodies and the steps that can be taken to reduce stormwater pollution. The public education program must reach residents and business owners throughout the community, not only those in the UAs.

The 2017 Permit lays out additional requirements for public education and outreach. The Town will collect and distribute stormwater educational materials that, at a minimum, address the impacts of the following on water quality: pet waste, impervious cover, application of fertilizers, pesticides and herbicides, and illicit discharges and improper disposal of wastes into the MS4. The Town must also disseminate materials such as flyers, brochures, door hangars, television public service announcements, or web-based tools.

This SMP and the requirements therein provide the basis for the public education plan.

The main water quality issue in the Town is *E. coli* in the waters of Cherry Brook. As a result, the 2017 Permit prescribes that educational materials distributed in the town should be tailored and targeted to educate on the sources, impacts, and available pollution reduction practices from the following:

- Septic systems
- Sanitary cross connection
- Waterfowl
- Pet waste
- Manure piles associated with livestock and horses

Additionally, since the Town's land use is a combination of residential, agricultural, commercial, and industrial development, its public education program will need to target a variety of audiences. Based on the land use and development within the Town, the following land uses and land use practices should be addressed as part of this public education program:

- Erosion and sediment control
- Herbicide and pesticide application
- Household hazardous waste disposal
- Stormwater management at industrial sites
- Stormwater management at commercial sites

4.2 Best Management Practices

Existing public education materials are directed to both private citizens and for commercial developments.

While residential development may seem to have limited impact on water quality, public education to encourage limited and proper use of fertilizer, herbicides, insecticides, and pesticides can help to minimize the introduction of landscaping-related pollutants into rivers and streams. In addition, the proper disposal of household hazardous wastes (e.g., cleaners, solvents, paint removers) can improve stormwater quality. In Canton, proper septic system maintenance is also important, particularly since water quality monitoring in the river has consistently demonstrated high levels of bacteria.

The industrial developments in town have the potential to contribute pollutants to stormwater through improper storage of chemicals and through floor drain discharges. Given the age of some of the manufacturing buildings, some industrial users may not be aware that the building they occupy has floor drains that are connected to the storm drainage system.

TABLE 4-1
Public Education and Outreach (PE)

Best Management Practice	Measurable Goals	Person(s) Responsible	Implementation Time Line
PE1: Implement a public education program for residents and students.	1. Provide materials on maintaining and improving water quality for the public on the Town's website, the library, and town hall.	Director of Public Works	Within the first year
	2. Collaborate with Farmington River Watershed Association and other local organizations to bring workshops on water resource protection to schools and the general public.		
PE2: Implement a stormwater program for industrial and commercial entities.	1. Public Works, tax assessor, and other government entities should coordinate to distribute educational materials to commercial operations in town.	Chamber of Commerce Public Works Director	Within the first year
	2. Exercises and Emergency Response Scenarios	Fire Marshal	Within the first year following July 1, 2017
PE3: Implement a public education program for land use officials and land use commissions.	1. NEMO workshops for town council and land use commissions	Town Engineer and Planner	Within the first year
	2. Annual review meetings with land use commissions and the town council		

PE1: Implement a public education program for residents and students

Two measureable goals have been established for the Town of Canton to satisfy the BMPs for this section. These goals will require the town to continue its existing education programs and increase education in schools to increase awareness of water quality issues.

PE1-1: Educational materials

There are several sources of educational materials available through both state agencies and local groups that can aid in public education in the town of Canton.

The Town's Conservation Commission maintains a web page linked to the town's main website. The previously submitted SMP is currently visible under the Public Works tab of the website and should continue to be available for public viewing.

The Town should also include a link to the University of Connecticut College of Agriculture and Natural Resources Nonpoint Education for Municipal Officials (NEMO) Program (www.nemo.uconn.edu). NEMO is a part of the Center for Land Use Education and Research.

Center for Land Use Education and Research (CLEAR) within the University of Connecticut College of Agriculture and Natural Resources. NEMO collaborates with other CLEAR programs on various projects in an effort to create the most useful tools and resources for municipal officials and other local community groups.

The following is a summary of additional public education information that is currently available that may be of use to the town. The goal of this BMP is to require that the Town Planner continue to maintain copies in his office of brochures that have been developed by NEMO (summarized below). This will serve to educate current and new residents of the community on stormwater-related issues such as fertilizer, herbicide and pesticide application, septic system maintenance, and pet/wildlife waste. All NEMO brochures can be downloaded from NEMO's website free of charge. A photocopy of each of these materials is included in Appendix B.

Caring for Your Septic System: This NEMO brochure provides a summary of how septic systems operate and the type of maintenance that is required to keep the system operating correctly. This brochure should also be kept on display at the Health Department and should be distributed by mail to residents.

Managing Your Household Chemicals: This NEMO brochure explains how to determine if your household cleaners contain hazardous materials and how these materials should be handled.

Integrated Pest Management and Biological Controls for the Homeowner: This NEMO publication explains methods for homeowners to minimize their use of pesticides while managing unwanted lawn and garden pests.

The Canton Land Conservation Trust (CLCT): The CLCT maintains an information table at the Sam Collins Day Fair. Since its founding in 1972, the Board of Selectmen; the Finance Committee; the Town Planner's Office; and the Conservation, Inland Wetlands, and Planning and Zoning Commissions have all been supporters of the CLCT and its goals.

Animal Waste and Water Quality: This NEMO publication explains the effects of both pet and wildlife waste on stormwater quality and the methods for residents to reduce these effects. The town should distribute and make available at town offices the NEMO brochure "Animal Waste and Water Quality." This brochure addresses the proper disposal of pet waste and the deleterious effects pet waste can have on surface waters and aquatic ecology. A copy of this brochure has been included in Appendix B.

The town should also consider providing dog waste stations and/or post signs informing pet owners that it is their responsibility to clean up after their pets in parks, along trails, and in public places where people often walk their dogs.

An example of such signs and stations are shown in the photographs to the left and right. Waste disposal stations can be stocked with biodegradable plastic bags. Town maintenance staff can empty the full waste can with the regular trash pickup. These signs and dog waste stations can be purchased from http://www.propertymanagementshop.com or http://www.parknpool.com/dog-waste-disposal.

PE 1-2: Educational programs in schools

Stormwater education in schools can be encouraged through classroom initiatives and on-site workshops in elementary through high school classes. Classes can focus on stormwater and riparian issues and themes. In conjunction with classes and on-site workshops, student information sheets can be prepared and distributed focusing upon these same issues.

Further involvement can be encouraged via stormwater school article contests. Stormwater Ambassador Programs have been successful in other locations as well. These programs partner schools and local government, using students selected by their schools as "ambassadors" to promote stormwater and water cycle awareness within the community. Ambassadors' activities have included regular newspaper columns and community newsletters, school assembly presentations, school competitions on stormwater-related issues, drain stenciling, and distributing stormwater awareness information within schools, to neighbors, and to the wider community.

Outreach organization often conduct programs, which can be invaluable resources to communities. The Farmington River Watershed Association (FRWA) conducts educational programs for 2nd, 7th, and 10th grade students. They use local, more tangible water resources to emphasize the importance of water conservation and water resource preservation. According to the FRWA website, there are 30 lessons available to students. They cover topics such as water use, water ecosystems, pollution and monitoring, and conservation. The Town should utilize this resource to satisfy the BMP.

PE2: Implement a public education program for industries and commercial entities

PE2-1: Educational mailings to businesses

Education of business and industry should be a component of the Town's SMP. Education materials should be targeted to owners and operators.

The Town should identify the business and industry owners in the commercial and industrial zones in the town. The Chamber of Commerce will develop this information from its existing resources (i.e., Tax Assessor).

The listing of local industries and businesses will be used to categorize businesses by typical categories such as industry, car wash facilities, car repair and automotive facilities, nurseries and landscape contractors, and food service providers. An example table for cataloging industries is presented in Appendix C.

The Public Works office should coordinate with the Chamber of Commerce to develop an educational mailing for the industries that use and store hazardous materials. Public education materials will be targeted to reach each category of business that is identified by the list described above. Example flyers are presented in Appendix D and can be modified to reflect specific Town requirements or needs.

Construction companies and general contractors have the potential to significantly impact water quality through improper stormwater management. The Town should coordinate with the Connecticut River Coastal Conservation District (CRCCD) to hold workshops for contractors on proper sediment and erosion control.

All individuals submitting land use applications to the Town will be provided with literature on stormwater and sediment and erosion controls by the Planning Department. More specifically, this literature will include a checklist of the site plan application, which references stormwater drainage systems, drainage maps, and location and details of sedimentation and erosion control measures.

PE2-2: Exercises and Emergency Response Scenarios

The Fire Marshal maintains a list of companies and businesses that use or store chemicals. The information is collected to ensure proper handling and disposal of materials. The list includes the names and locations of the industries and businesses, the quantity of the chemical used, and the hazard class. These businesses are included on all exercises and emergency response scenarios that pertain to public health and environmental health. Participating companies include Stanley Chemicals and the rail system.

Businesses identified by the Fire Marshal as using and storing chemicals will be included on all exercises and emergency response scenarios that pertain to public health and environmental health.

PE3: Implement a public education program for municipal officials and land use commissions

PE3-1: Annual review meetings with land use commissions and the Town Council

The Town of Canton recognizes that municipal officials and land use commissions play a critical role in stormwater management since they have review authority over development projects. Upon posting of this SMP, representatives of the Public Works Department will present a summary of the plan at a regularly scheduled Town Council meeting. A meeting will be held with the appropriate land use officials to review the SMP on an annual basis. At that meeting, the requirements of the CTDEEP's General Permit will be addressed, and the updated SMP will be presented.

PE3-2: NEMO Workshop

As part of the public education process, the Town will target its local land use boards, as well as municipal departments (Planning, Public Works) and any interested organizations (Town Council, land trusts, and Chamber of Commerce) by hosting presentations by NEMO. These presentations focus on a variety of aspects of land use decision making and planning and can be tailored to the individual municipality. The Town Planner will coordinate with NEMO representatives to develop a presentation program or programs that provide education on planning for stormwater, managing stormwater, open space planning, and/or rain garden design.

5.0 PUBLIC INVOLVEMENT/PARTICIPATION

5.1 Permit Requirements

The public involvement and participation element is intended to increase the chances of success of the SMP. The public participation element should attempt to attract a cross section of people in the community. For this control measure, the Permit requires the Town do the following:

- Comply with state and local public notice and Freedom of Information requirements when implementing a public involvement/participation program. When notice requirements are inconsistent, the notice provisions providing for the most notice and opportunity for public comment shall be followed.

- Develop a public involvement/participation program that includes the public in developing, implementing, and reviewing the stormwater management program.

In addition, Section 4(d) of the Permit requires that a draft copy of this SMP be made available for public review and comment 30 days before it is submitted to CTDEEP. The required annual reports that must be submitted to CTDEEP also must be made available for public comment 30 days before they are submitted.

The goal of this measure is to encourage public participation in an effort to successfully implement the overall plan. The public participation element should be aimed at all members of the community, including school children, homeowners, and business and industry owners and employees.

5.2 Best Management Practices

TABLE 5-1
Public Involvement/Participation Plan (PI)

Best Management Practice	Measurable Goals	Responsible Party	Implementation Time Line
PI1: Comply with public notice requirements for the SMP and annual reports.	1. Publish a public notice on the Town website to inform the public of the SMP and annual reports, and allow for a 30-day comment period.	Town Engineer/ Town Planner	Annually, no later than January 31
	2. Hold a public information meeting in coordination with the regularly scheduled Conservation Commission meeting.	Town Engineer	June 30, 2018
PI2: Involve the public in watershed activities.	1. Hold public presentations through the land use process and in conjunction with local environmental groups.	Town Planner	June 30, 2018
	2. Coordinate curb marker installation through youth programs.	Town Engineer	Ongoing

	3. Sponsor river cleanups with particular attention to Cherry Brook.	Town Engineer	June 30, 2018
	4. Support the Connecticut River Coastal Conservation District by providing information about volunteer opportunities and the Connecticut River Watch Program.	Town Planner	July 1, 2017

PI1: Allow public participation in developing and implementing the SMP

PI1-1: Public notice of SMP update and annual reports

The Town will publish a public notice on its website (http://www.townofcantonct.org/), through an email or mailing list, or in a newspaper. The notice will provide a contact name, phone number, address, and email to whom the public can send comments. Additionally, this SMP and the annual reports will be publicly accessible on the web at http://www.townofcantonct.org/ and in the town hall and/or library. The public notice will allow for a 30-day comment period, at a minimum. The Town has complied with the Connecticut Freedom of Information Act in regard to providing information prepared for the SMP. The town has complied with this provision in the past and will continue to do so. For example, the 2014 Zoning Regulations were made available for public review and comment.

Ongoing public participation in implementing the SMP and modifying it as needed will be achieved by placing draft copies of this SMP updated and annual stormwater monitoring reports on the Town's website for public review and comment. Notice of these annual reports will be provided in the same manner as for the original plan.

PI1-2: Public information meeting

The Town of Canton regularly holds public meetings and hearings as part of the local land use process. The Town will schedule a public hearing on this SMP as part of a regularly scheduled meeting of the Conservation Commission. At that meeting, the requirements of CTDEEP's General Permit will be addressed, and the proposed plan will be presented.

PI2: Involve the public in watershed activities

The following organizations aid the Town by coordinating public outreach and participation programs and facilitating meetings and workshops.

PI2-1: Public Presentations

The CLCT is a citizens' group that hosts cleanups, hikes, and education activities that are open to the public. Trailblazers is a CLCT program for kids ages 5 to 13 (and their parents) meeting once a month from October to April for hiking, games, and treats. The CLCT also maintains an information table at the Sam Collins Day Fair wherein information about watersheds and stormwater management is made available to the public.

PI2-2: Storm Drain Marker Installation

Five hundred **s**torm drain inlet markers indicating "Drains to Waterways and Long Island Sound" provided by CTDEEP have been installed in the Collinsville area by the Department of Public Works. The town intends to place markers on all new and replaced catch basin structures.

PI2-3: River Cleanups

The following groups provide environmental activism through a variety of means. These organizations should be called on to assist in paying special attention to the impairments in Cherry Brook.

The Farmington River Coordinating Committee (FRCC): The FRCC is integral to implementation of the Upper Farmington River Management Plan. The committee is comprised of representatives from the five river fronting towns, the State of Connecticut, the Metropolitan District Commission (MDC), the National Park Service (NPS), the Farmington River Watershed Association (FRWA), and the Farmington River Anglers Association (FRAA). The Town provides a link to their websites from the Town's website.

Farmington River Watershed Association (FRWA): The FRWA is a citizen-based, nonprofit organization that focuses on restoration and conservation issues. It works closely with federal, state, and local governments and citizens living in the watershed's 33 communities. The FRWA undertakes a variety of research, education, and advocacy projects throughout the watershed. Coordination between the FRWA and the Town includes the annual Farmington River cleanup on the first Saturday in October and the annual Macroinvertebrate Day in October to monitor streams of the watershed using the Rapid Bioassessment in Wadeable Streams and Rivers by volunteer monitors.

PI2-4: Support the Connecticut River Coastal Conservation District

The Connecticut River Watch Program (CRWP) involves volunteers in designing and implementing water quality and habitat assessment programs. The Town, through the Planning Department, will assist the CRCCD in recruiting volunteers to complete *E. coli* concentration monitoring as part of the CRWP. To meet this goal, the Planning Department will maintain information about the CRWP on public display in its office.

6.0 ILLICIT DISCHARGE DETECTION AND ELIMINATION

6.1 Permit Requirements

Illicit discharges are defined as "any discharge to a municipal separate storm sewer system that is not composed entirely of stormwater." (40 CFR 122.26(b)(2) Illicit discharges directly affect the quality of area waters. Storm sewers are intended to only accept stormwater runoff and, as such, often discharge to local rivers and streams with no treatment to remove potential pollutants.

In Section 3(a)(2) of the General Permit, CTDEEP has stated that the certain nonstormwater discharges may be allowable, provided they do not contribute to a violation of water quality standards. The Town requests authorization for the following allowable nonstormwater discharges: landscape irrigation, uncontaminated groundwater discharges (foundation drains, footing drains), irrigation water, lawn watering runoff, residual street wash water, firefighting wastewaters (except those generated during training exercises), and naturally occurring discharges such as elevated groundwater, springs, and diverted stream flows.

The control of illicit discharges is through both an implementation of ordinances or regulatory mechanisms prohibiting nonstormwater discharge and also information outreach programs to public employees, businesses, and the general public of the hazards associated with illegal discharges and improper disposal of waste.

6.2 Best Management Practices

Table 6-1 presents the Illicit Discharge and Detection Plan (IDDE) for the Town. The plan includes best management practices, measurable goals, and responsible parties.

TABLE 6-1
Illicit Discharge Detection and Elimination Plan (ID)

Best Management Practice	Measurable Goals	Responsible Party	Implementation Timeline
ID1: Develop an IDDE Program.	1. Prohibit future nonstormwater discharges to the storm drainage system by regulation.	Town Planner	By July 2018
	2. Establish legal authority for the IDDE program.	Town Planner	By July 2018
	3. Develop a program for citizen reporting of illicit discharges.	Town Engineer	Ongoing
	4. Eliminate existing illicit discharges.	Town Engineer	Ongoing

	5. Maintain a record of illicit discharge abatement activities and progress of mapping, prioritization, and investigations (include in annual report).	Town Engineer	By July 2018
ID2: Develop mapping of storm drainage system and outfalls.	1. Develop mapping of all stormwater discharges from a pipe or conduit located within and owned or operated by the Town and all interconnections with other MS4s (in GIS format).	Town Engineer	By July 2019
	2. Delineate catchments to all outfalls.	Town Engineer	By July 2019
ID3: Implement Catchment Investigation Procedures.	1. Assessment and priority rankings of catchments.	Town Engineer	By July 2019
	2. Investigate catchments for suspected illicit discharges. a. Dry weather screening of every MS4 outfall and interconnection b. Complete Catchment Investigation Procedure in problem catchments. c. Complete Catchment Investigation Procedure in catchments where information indicates sewer input based on outfall/interconnection screening. d. Complete Catchment Investigation Procedure in 40% of the area served by all MS4 catchments. e. Complete Catchment Investigation Procedure in 100% of the area served by all MS4 catchments.	Town Engineer	 October 2018 – July 2020 80% completion by July 2020; 100% completion by July 2022 By July 2022 By July 2022 By July 2027
	3. Removal and confirmation	Town Engineer	Within 1 year of identifying illicit discharges
	4. Annual employee training	Town Engineer	Ongoing

ID1: Develop an IDDE Program

The permit requires that the Town of Canton develop a written program designed to provide the legal authority to prohibit and eliminate illicit discharges to the MS4, find the source of any illicit discharges, eliminate those illicit discharges, and ensure ongoing screening and tracking to prevent and/or eliminate future illicit discharges. The IDDE protocol will apply within the UA and those catchment areas of the MS4 with either DCIA of greater than 11% or that discharge to impaired waters. Since bacteria is a major pollutant of concern in Canton, the IDDE program should give the highest priority to areas with the highest potential to discharge bacteria into the MS4 system. Such areas shall be identified based on

assessment of the following criteria: historic on-site sanitary system failures, proximity to bacteria-impaired waters, low infiltrative soils, and shallow groundwater.

ID1-1: Prohibit nonstormwater discharges to the storm drainage system

The Department of Public Works has developed a program to visually screen storm drainage inlets and outlets for illicit discharges. In the event of the discovery of a potential illicit discharge, the Farmington Valley Health District has agreed to provide the necessary laboratory time and, if necessary, enforcement under the Public Health Code. This policy has been in place for over 20 years.

Upon detection of illicit discharge, the Town should eliminate the source of discharge as soon as possible. When elimination of discharge in 60 days is not possible, the permittee should establish a schedule for remediation not to exceed 180 days.

ID1-2: Establish legal authority for the IDDE program

The 2017 permit requires towns to establish a legal authority for the IDDE program.

The ordinance should do the following:

- Prohibit illicit discharge to it storm sewer system
- Control discharge of spills and prohibit dumping from residential, industrial, agricultural, or other sources.
- Authorize fines and/or penalties to recoup costs incurred by the permittee from anyone creating an illicit discharge.

Section 8.2.C.5 of the Town's Zoning Regulations explicitly states that "No refuse or other waste materials and no liquids shall be dumped on any lot or dumped or discharged into any river, stream, estuary, water course, storm drain, pond, lake, swamp or marsh so as to constitute a source of water pollution."

The Town should also alert the CTDEEP of any violations, which in turn issues fines to offenders.

ID1-3: Develop a program for citizen reporting of illicit discharges

Citizens can aid in the observation by reporting dry weather discharges via the QAlert system on the Town's website. Any citizen-reported or Town-observed dry weather discharge outfalls should be inspected immediately and samples obtained and submitted for lab analysis if illicit flow is observed. A log for monitoring complaints is presented in Appendix E.

ID1-4: Eliminate illicit discharges

Upon detection of illicit discharges, the Town will eliminate the discharges as soon as possible and require the immediate cessation of such discharges upon confirmation of responsible parties.

As noted above, where elimination of an illicit discharge within 60 days of its confirmation is not possible, the Town will establish a schedule for its elimination not to exceed 180 days (6 months).

ID2: Develop mapping of storm drainage system and outfalls

The location of the 12-inch-diameter and larger pipe outlets throughout the town were identified starting in fall 2004 and completed in 2007. The information has been provided to MMI and has been incorporated into a town map. Townwide mapping depicting the location of the pipe outlets was completed by MMI in summer 2008 and is on file at the Public Works office.

As part of the provisions of the 2017 Permit, the Town must generate a database and map all stormwater discharges from a pipe or conduit located within and owned or operated by the Town and all interconnections with other MS4s (in GIS format).

ID2-1: Identify sanitary sewer overflows (SSOs)

The Town has not currently identified any combined sewers within the town. In the event that one is located or constructed, the Town is required to identify all known locations where SSOs have discharged to the MS4 within the previous 5 years, including SSOs resulting from inadequate conveyance capacities or where interconnectivity of the storm and sanitary sewer infrastructure allows for communication of flow between the systems.

ID2-2: Develop an outfall and interconnection inventory

The Town is required to develop an outfall and interconnection inventory that identifies each outfall and interconnection discharging from the MS4, records its location and condition, and provides a framework for tracking inspections, screenings, and other activities under the Town's IDDE program.

ID2-3: Develop stormwater system mapping

Mapping of Town-owned storm drainage infrastructure has been developed in GIS format.

By July 2019, the mapping will be updated to include the following:

a. Type, material, size, location of conveyance, outfall, or channelized flow
b. Name, water body ID, and Surface Water Quality Classification of immediate surface water body or wetland to which the stormwater runoff discharges
c. If the outfall does not discharge directly to a named water body, the name and water body ID of the nearest named water body to which the outfall eventually discharges
d. The name of the watershed, including the subregional drainage basin number in which the discharge is located

ID3: Implement catchment investigation procedures

The Town will implement outfall screening and an illicit discharge detection protocol to identify and prioritize separate storm sewer catchments for suspected illicit discharges of pollutants. The catchment

investigation procedure is a process by which MS4 catchments are evaluated, ranked, prioritized, and investigated. The procedure relies on the MS4 system mapping developed under ID2-2 and includes the following:

1) A review of mapping and historic plans and records for the catchment
2) A manhole inspection methodology
3) Procedures to isolate and confirm sources of illicit discharges

The locating of illicit connections requires a systematic inspection of junction manholes (manholes with two or more inflow pipes) starting at either the upstream end of a storm drain network and progressing downstream or vice versa. Key junction manholes must be opened, and visual and olfactory observations recorded. Some indicators of illicit discharges are the presence of excrement, toilet paper, sanitary products, or filamentous bacterial growth

ID3-1: Assessment and Priority Ranking of Catchments

The Town will assess and priority rank catchments in terms of their potential to have illicit discharges and the related public health significance. This ranking will determine the priority order for screening of outfalls and interconnections, catchment investigations for evidence of illicit discharges, and provides the basis for determining permit milestones. The initial illicit discharge potential assessment and priority ranking for all catchments within the UA will be completed by July 2019.

Identifying additional illicit discharges will be completed by assessing the frequency of past discharge complaints or reports, poor dry-weather water quality in the receiving waters, density of generating sites, age of developments, whether or not the area was converted from septic to sewer, whether or not the area was previously served by combined sewer, presence of older industrial uses, density of aging septic systems, and presence of culverted streams.

Each catchment will be classified into one of the following categories:

- Excluded Catchments – Catchments with no potential for illicit discharges (e.g., roadway drainage in undeveloped areas with no dwellings and no sanitary sewers, drainage for athletic fields, parks or undeveloped green space and associated parking without services, cross-county drainage alignments through undeveloped land)

- Problem Catchments – Catchments with known or suspected contributions of illicit discharges based on existing information. These will include catchments where previous outfall/interconnection screening indicates sewer input based on olfactory/visual evidence or sampling results (ammonia ≥0.5 gm/l, surfactants ≥0.25 mg/l), bacteria levels greater than the water quality criteria applicable to the receiving water), or detectable levels of chlorine.

- High Priority Catchments – Catchments that have not been classified as problem catchments and that are discharging to an area of concern to public health due to recreational areas or drinking water supplies; catchments determined by the Town as high priority based on outfall/ interconnection screening, and catchments where screening indicates sewer input based on olfactory/visual evidence or sampling results (ammonia ≥0.5 mg/l, surfactants ≥0.25 mg/l, bacteria

levels greater than the water quality criteria applicable to the receiving water, or detectable levels of chlorine)

- Low Priority Catchments – Catchments determined to be low priority based on outfall/ interconnection screening and catchment characteristics

Each of these catchments will be priority ranked (except for excluded catchments) based on screening factors that include the following:

- Past discharge complaints and reports
- Poor dry-weather receiving water quality (ammonia >0.5 mg/l, surfactants ≥0.25 mg/l)
- Density of generating sites with a potential to generate pollutants that could contribute to illicit discharge (e.g., car dealers, car washes, gas stations, garden centers, and industrial manufacturing areas)
- Age of surrounding development and infrastructure (Industrial areas older than 40 years and areas where the sanitary sewer system is older than 40 years have greater illicit discharge potential.)
- Catchments that were once serviced by septic systems but have been converted to sewer connections.
- Historic combined sewer systems
- Density of aging septic systems (>30 years old) – Consult with local or state health officials.
- Culverted streams – Any river or stream that is culverted for distances greater than a simple roadway crossing

The Town will document the presence or absence of these factors for each catchment, retain this documentation, and report this information in annual reports.

ID3-2: Investigate storm sewer catchments for suspected illicit discharges of pollutants

The storm drain network investigation involves observation, sampling, and evaluation of key junction manholes in the MS4 to narrow the location of suspected illicit discharges that may not be evident at the outfall. The manhole inspection methodology may either start from the outfall and work up to the system or start from the upper parts of the catchment and work down the system, or a combination of both practices. An investigation of each key junction manhole within the MS4 must be completed even where no evidence of an illicit discharge is observed at the outfall.

Dry-weather investigation

Dry-weather observations of the mapped outfalls will be incorporated into the Town's maintenance program. Dry-weather screening will be conducted when no more than 0.1 inches of rainfall has fallen in the preceding 24-hour period and can be done concurrently with the outfall inventory. The Town will inspect key junction manholes for visual and olfactory evidence of illicit connections. If flow is observed, a sample will be collected and analyzed for ammonia, chlorine, and surfactants using either a field kit or laboratory analysis. Where sampling results or field observations indicate potential illicit discharges, the area draining to the junction manhole will be flagged for further investigation. Manhole inspections shall also identify and document vulnerability factors that include twin invert manholes, directly piped

connections between storm drains and sanitary sewer infrastructure, common weir walls, sanitary sewer underdrain connections, and other structural vulnerabilities.

Wet-weather investigation

Where the review of mapping and historic plans and/or manhole inspections indicate system vulnerabilities, wet-weather inspections and sampling will be completed. The intent of wet-weather inspection is to determine whether wet-weather-induced high flows in sanitary sewer or high groundwater in areas served by septic systems results in discharges of sanitary flow to the MS4. The Town will conduct at least one wet-weather screening and sampling at the outfall for any catchment where one or more system vulnerability factors are present.

Wet-weather monitoring can be performed after any storm event of sufficient intensity to produce a discharge. If flow is observed, a sample must be taken and tested for ammonia and surfactants, at a minimum. If pollutants are above threshold levels, investigations shall continue until the suspected illicit discharge can be isolated to a single pipe run between two manholes. The source of the discharge can be determined by dye testing, smoke testing, pipe videography, or other methods.

Monitoring and screening will begin at outfalls in those catchments deemed as having the highest risk of illicit discharges. The Town will implement the investigation phase of the Catchment Investigation Procedure in every catchment of the MS4, even where dry-weather screening does not indicate evidence of illicit discharges, beginning with the problem catchments and those with the highest ranking in the Assessment of Priority Catchments (ID3-1).

The Town will complete dry-weather screening and sampling (where flowing) of every MS4 outfall and interconnection beginning by October 2018 and completing within 3 years of the effective date of the permit (July 2020).

The Town must complete the investigation procedure in a minimum of 80% of the MS4 area served by Problem Catchments within 3 years of the permit effective date (July 2020) and 100% of Problem Catchment within 5 years of the permit effective date (July 2022).

The Town must complete the investigation procedure in every catchment of the MS4 where information indicates sewer input based on outfall/interconnection screening within 5 years of the permit effective date (July 2022).

The Town must complete the investigation procedure in 40% of the area served by all MS4 catchments within 5 years of the permit effective date (July 2022) and in 100% of the area served by all MS4 catchments within 10 years of the permit effective date (July 2027).

All data and progress will be reported and tracked in each annual report.

ID3-3: Removal and confirmation

When the source of an illicit discharge is identified and confirmed, the Town will exercise its authority to require its removal. For each confirmed source, the Town will include in the annual report the location

of the discharge and its source, a description of the discharge, the method of discovery, the date of discovery, date of elimination, mitigation or enforcement action, and estimate of the volume of flow removed.

Within 1 year of removal of all identified illicit discharge sources within a catchment area, confirmatory outfall or interconnection screening will be conducted. This screening will be conducted in dry weather.

The Town will maintain a record of illicit discharge abatement activities including location (address or latitude/longitude), description, date(s) of inspection, sampling data, action(s) taken, date of removal or repair, and responsible party(ies). This information shall be included in the annual reports.

ID3-4: Annual employee training

Annual training of Town employees tasked with completing these procedures is an important component of this BMP, and completion of the training will be noted in each annual report.

7.0 CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

7.1 Permit Requirements

Construction sites contain a variety of potential pollutants: sediment, solid and sanitary wastes, fertilizers, pesticides, oil and grease, concrete truck washout, construction chemicals, and construction debris. The goal of this measure is to ensure that these pollutants do not enter downstream waters via storm runoff.

Sediment and erosion from construction sites may increase the amount of suspended solids within stormwater runoff. Pathogens like *E. coli* may adhere to these particles and be carried along to the final discharge point. Thus, recommendations in the SMP relative to stormwater quality must be continually enforced to achieve TMDL values set by CTDEEP. Preventative measures such as proper sediment and erosion control are the best deterrent to sediment loading in downstream watercourses.

Pollutants generated by construction site runoff directly discharge into and adversely affect surface waters. Among these pollutants are sediment, solid and sanitary wastes, fertilizers, pesticides, oil and grease, concrete truck washout, construction chemicals, and construction debris. During a short period of time, construction sites can contribute more sediment to streams than is deposited naturally during several decades (EPA, Fact Sheet 2.6, January 2000).

Sediment and erosion from construction sites may increase the amount of suspended solids within stormwater runoff. Pathogens like *E. coli* may adhere to these particles and be carried along to the final discharge point. Thus, recommendations in the SMP relative to stormwater quality must be continually enforced to achieve TMDL values set by the CTDEEP. Preventative measures such as proper sediment and erosion control are the best deterrent to sediment loading in downstream watercourses.

The EPA, under Phase I of the NPDES program, began to regulate stormwater discharges from construction sites. Phase I regulated construction sites that disturb 5 acres or more. Connecticut complied with the Phase I requirements by developing a General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities.

In Phase II of the NPDES program, construction site runoff is dealt with in two ways: (1) by requiring towns to develop measures for controlling construction site stormwater runoff, and (2) by reducing the threshold for the CTDEEP General Permit for the Discharge of Stormwater Associated with Construction Activities from 5 acres of disturbed area to 1 acre (DEEP-WPED-GP-015).

Under CTDEEP's General Permit, the Town must develop, implement, and enforce a program to reduce pollutants from construction activities that result in land disturbance greater than or equal to 1 acre. Activities that result in disturbance of less than 1 acre must be included if they are part of a larger development. This program applies to all areas of town and must include the following:

(a) An ordinance or other regulatory mechanism to require erosion and sediment controls and sanctions for noncompliance

(b) Procedures for notifying site developers of the requirements for registering under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities
(c) Requirements for construction site operators to implement erosion and sediment controls in accordance with the state guidelines
(d) Requirements for construction site operators to control wastes such as building materials, concrete truck washout, chemicals, litter, and sanitary wastes
(e) Procedures for site plan review that incorporate consideration of potential water quality impacts;
(f) Procedures for receipt and consideration of public comments
(g) Procedures for site inspection and enforcement of control measures

7.2 Best Management Practices

TABLE 7-1
Construction Site Stormwater Runoff Control Plan (CSW)

Best Management Practice	Measurable Goal	Responsible Party	Implementation Timeline
CSW1: Legal Authority	1. Require developers, construction site operators, or contractors to maintain consistency with the *2002 Guidelines for Soil Erosion and Sedimentation Control*, *Connecticut Stormwater Quality Manua*l, and all stormwater discharge permits issued by CTDEEP within the Town.	Town Planner	By July 2019
	2. Require the implementation of additional measures to protect/improve water quality as deemed necessary by the Town.	Town Planner	By July 2019
	3. Require the Town to carry out all inspection, surveillance, and monitoring procedures necessary to determine compliance with municipal regulations, ordinances, or programs related to the management of the Town's MS4. Inspections shall be conducted to inventory privately-owned retention ponds, detention ponds, and other stormwater basins that discharge to or receive drainage from the Town's MS4.	Zoning Enforcement Officer/Wetlands Agents	By July 2019
	4. Require the owner of site-seeking development approval from the Town to provide and comply with a long-term maintenance plan and schedule to ensure the performance and pollutant removal efficiency of privately owned retention ponds, detention ponds, and other stormwater basins that discharge to or receive discharge from the Town's MS4 including short-term and long-term	Town Planner	By July 2019

	inspection and maintenance measures to be implemented by the private owner.		
	5. Require the permittee to control through interagency or interjurisdictional agreements the contribution of pollutants between the Town's MS4 and MS4s owned or operated by others.	Town Planner	By July 2019
CSW2: Interdepartmental Coordination	1. Develop and implement a plan outlining how all municipal departments and boards with jurisdiction over the review, permitting, or approval of land disturbance and development projects within the MS4 will coordinate their functions with one another.	Town Engineer	By July 2019
CSW3: Site Review and Inspection	1. Conduct site plan reviews that incorporate consideration of stormwater controls or management practices to prevent or minimize impacts to water quality.	ZEO/IWA/Town Engineer	Ongoing
	2. Conduct site inspections and enforcement to assess the adequacy of the installation, maintenance, operation, and repair of construction and postconstruction control measures.	ZEO/IWA	Ongoing
CSW4: Public Involvement	1. Implement a procedure for receipt and consideration of information submitted by the public concerning proposed and ongoing land disturbance and development activities.	Town Planner	By July 2019
CSW5: State Permit Notification	1. Implement a procedure for notifying developments or contractors of their potential obligation to obtain authorization under CTDEEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities if the project disturbs 1 or more acres of land and results in a point source discharge to the surface waters of the state directly or through the Town's MS4. Include a provision informing developers/contractors of their obligation to provide a copy of the Stormwater Pollution Control Plan to the Town upon request.	Town Planner/ Town Engineer	By July 2019
CSW6: Additional measures for discharges to waters for which bacteria is a Stormwater Pollutant of Concern	1. Conduct site plan reviews that incorporate consideration of stormwater controls or management practices to prevent or minimize impacts to water quality.	Town Engineer	By July 2019

CSW1: Legal Authority

A review of land use regulations was incorporated into the Planning and Zoning Commissions' regulation rewrite that began in late fall 2005. A draft set of Zoning Regulations was issued in January 2013 for public review and comment. The updated Zoning Regulations were adopted on April 2, 2014, and become effective on May 12, 2014.

The revised regulations incorporated a detailed Stormwater Management Plan Requirement section (Section 7.13.D) to address all new developments and to ensure compliance with state and federal regulations. The regulations are intended to comply with the CTDEEP *2002 CT Erosion & Sedimentation Guidelines Manual*.

Section 7.13.D.17.b notes that all discharges to the municipal stormwater system shall "conform to all the requirements contained in the applicable General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, the General Permit for the Discharge of Stormwater Associated with Industrial Activity, or, the General Permit for the Discharge of Stormwater Associated with Commercial Activity, as originally issued and reissued." This section also addresses required Natural Resources mapping.

Section 8.2.c.5 of the Zoning Regulations Performance Standards requires that "No refuse or other waste materials and no liquids shall be dumped on any lot or dumped or discharged into any river, stream, estuary, watercourse, storm drain, pond, lake, swamp, or marsh so as to constitute a source of water pollution." This standard effectively addresses construction waste management.

The Zoning Commission or its designated agent is responsible for the review of all construction-related inspections throughout the development process. In addition, the Town's "QAlert-Citizen Service Request" program on the Town website provides citizens with the ability to report complaints, concerns, and service requests directly to Town staff. All complaints are logged, sorted by either the First Selectman or the Chief Administrative Officer, and are directed to the appropriate staff member. This system creates a log of all complaints and ensures that citizen notifications are answered within a set time line. It allows the Town to track and act on, as needed, information provided by the public relating to construction site maintenance in the Town. Access to the system is through a link on the home page.

CSW2: Interdepartmental Coordination

The Town is required to develop and implement a plan outlining how all municipal or institutional departments and boards with jurisdiction over the review, permitting, or approval of land disturbance and development projects within the MS4 will coordinate their functions with one another.

CSW3: Site Review and Inspection

According to the Town Zoning Regulations Section 7.6.D., "inspections shall be made by the Commission or its designated agent during development to ensure that control measures and facilities are properly performed or installed and maintained."

CSW4: Public Involvement

Construction-related complaints from the public should be recorded on a form and kept on file at the Town with the Zoning Enforcement Officer. Complaints should be tracked via a spreadsheet. An inspection program for construction sites against which complaints are logged has been developed and executed by engineering staff, wetlands staff, and the Zoning Enforcement Officer. Preconstruction kickoff meetings are held, and inspections take place on a regular basis during construction on major projects.

CSW5: State Permit Notification

Prior to the submission of any local land use application, a preapplication meeting should be held with Town staff and the applicant's engineers. During this meeting, all applicants will be made aware that they may need a CTDEEP General Permit for Stormwater Discharge. Applicants should also be made aware of the Town's responsibilities under the MS4 General Permit and should ensure that they do not do anything contrary to the SMP.

Section 7.6.C. of the Zoning Regulations alerts applicants of requirements for a CTDEEP Stormwater Permit.

The Town will amend its land use applications to include a statement to contractors notifying of the potential need for other project permits. The language should make clear that state and federal permitting is a separate process and that receipt of local permits is not contingent upon receipt of permits from other authorities. Sample language for this notation follows:

> "Applicants are advised that permits that are administered by other permitting agencies such as the Connecticut Department of Energy and Environmental Protection (DEEP) or the Army Corps of Engineers may be required for their project. Applicants are responsible for contacting these agencies to determine the appropriate permits for their project. Sites that disturb in excess of one acre of area must submit registration to DEEP for a General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities."

According to Section 7.6.B., all development requiring a zoning permit, special permit, or site plan approval shall employ proper provisions to adequately control accelerated erosion and sedimentation and reduce the danger from stormwater runoff on the proposed site based on the best available technology in order to result in a development as follows:

a. Minimizes erosion and sedimentation during construction
b. Is stabilized and protected from erosion when completed
c. Does not cause off-site erosion and/or sedimentation

A Soil Erosion and Sediment Control Plan shall be submitted for certification by the commission for any development activity that would result in a cumulative disturbed area of more than one-half acre.

CSW6: Additional measures for discharges to waters for which Bacteria is a Stormwater Pollutant of Concern

Sediment and erosion from construction sites may increase the amount of suspended solids within stormwater runoff. Pathogens like *E. coli* may adhere to these particles and be carried along to the final discharge point. Thus, recommendations in the SMP relative to stormwater quality must be continually enforced to achieve TMDL values set by CTDEEP. Preventative measures such as proper sediment and erosion control are the best deterrent to sediment loading in downstream watercourses.

8.0 POSTCONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT

8.1 Permit Requirements

New development and redevelopment increase the quantity of stormwater runoff (due to increased impervious coverage and decreased infiltration) and impact the quality of stormwater runoff (due to road sands, oil and grease, pesticides, and fertilizers). The goal of this measure is to ensure that programs to address stormwater runoff are developed, implemented, and enforced.

The quantity of water discharged from developed sites increases as a result of an increase in impervious surfaces. Imperviousness impedes infiltration and gradual percolation of stormwater through vegetation and soil. Instead, water is collected from surfaces such as asphalt and concrete and is routed to drainage systems where large volumes of runoff quickly flow to the nearest receiving water. This increase in quantity can cause downstream bank erosion and flooding.

The quality of water that runs off impervious surfaces is impacted by a variety of land uses. Residential developments contribute road sands, oil and grease from roads, and pesticides and fertilizers from lawn care activities. Commercial developments contribute oils and grease and sediments from sanding of parking lots. Industrial developments can contribute any number of pollutants depending on the nature of the industry and the type of materials stored on site.

8.2 Best Management Practices

TABLE 8-1
Postconstruction Stormwater Management (DS)
(New development or redevelopment)

Best Management Practice	Measurable Goal	Responsible Party	Implementation Time Line
DS1: Legal Authority	1. Establish ordinance, bylaw, regulation standard condition of approval, or other appropriate legal authority for Low Impact Development (LID) and runoff reduction site planning and development practices.	Town Planner	By July 2021
DS2: Enforce Runoff Reduction/Low Impact Development (LID) Measures	1. For redevelopment of sites that are currently developed with DCIA of 40% or more, retain on-site half the water quality volume for the site. 2. For new development and redevelopment of sites with less than 40% DCIA, retain the water quality volume for the site.	Town Planner Town Planner	By July 2019 By July 2019
DS3: Directly Connected Impervious Areas	1. Map and calculate DCIA in UA	Town Engineer	By July 2020

DS4: Ensure Long-Term Maintenance of BMPs	1. Incorporate locations of detention/retention basins in GIS stormwater mapping. 2. Inspect stormwater basins. 3. Require developers to submit GPS coordinates/GIS mapping of all stormwater structures/basins.	Town Engineer/ DPW	By July 2020 Annually By July 2020

DS1: Establish legal authority for the Town to require use of Low Impact Development (LID) in new development/redevelopment

All site development in the Town must comply with the Town's Zoning Regulations (effective date: May 12, 2014). The Town's Zoning Regulations are enforceable by the Zoning Enforcement Officer (ZEO). The ZEO can issue cease and desist orders to any property owner or property tenant, and penalties can be levied in accordance with 9.8.D.

The Town maintains a regulatory buffer for wetlands and watercourse protection. The Inland Wetlands Commission reviews all activities within 100 feet of wetlands or watercourses as these are believed to have the potential to impact resources. Updated Zoning Regulations were adopted in April 2014 and include detailed requirements for stormwater management and erosion control.

Section 3.4.F. of the Town's zoning regulations limits the amount of impervious coverage. The section reads as follows:

1. Building coverage in the Residential (R) districts shall not exceed the following, except as may be otherwise provided in these Regulations:

   Table 3.4.F.1 – Building Coverage
   District Maximum Building Coverage
   R-1 Fifteen percent (15%)
   R-2 Fifteen percent (15%)
   R-3 Ten percent (10%)
   R-4 Five percent (5%)

2. Except as may be otherwise provided in these Regulations, impervious coverage (in the Residential [R] districts) shall not exceed the following:

   Table 3.4.F.2 – Impervious Coverage
   Lot Area Maximum
   Impervious coverage
   Less than one (1) acre 50%
   One (1) to two (2) acres 40%
   Two (2) to four (4) acres 30%
   More than four (4) acres 20%

DS2: Promote Low Impact Development techniques for development and redevelopment projects as appropriate

The adopted Zoning Regulations and current Subdivision Regulations incorporate provisions for narrow travelway widths, alternative cul-de-sac configurations, permeable pavers, and utilizing ditches for stormwater conveyance. Specifically, Section 7.2.7 of the Zoning Regulations allows for the permanent reduction of required parking; Section 7.2.8 allows for deferral or installation of parking; and Section 7.2.D.2 allows for the approval of (and encourages the use of) porous pavement, porous pavers, and other permeable hard services to meet any parking requirements. Section 3.1 of the Appendix allows for the use of grass/pavement block systems in the Albany Turnpike Lawton Road Gateway District to reduce stormwater runoff.

DS3: Map directly connected impervious areas

Using existing townwide topographic and stormwater infrastructure mapping, the Town shall calculate the DCIA that contributes stormwater runoff to each of its MS4 outfalls within the mapped UA. This mapping will be used for future disconnections of impervious areas incorporated into site designs and retrofit programs as described in Section 9: Pollution Prevention/Good Housekeeping. The UConn CLEAR NEMO program is developing Impervious Cover data for its MS4 website. This data will be used to complete the drainage area and impervious area analyses required by the Permit.

DS4: Develop a mechanism to ensure long-term operation and maintenance of BMPs

The Town currently requires applicants to provide a stormwater operation and maintenance plan with all new developments (Section XIII, Site Plans).

DS4-1: Incorporate locations of detention/retention basins in GIS mapping

The Town has a number of stormwater detention and retention basins throughout the Town. Maintenance responsibility for these structures falls to the Town. The Town will develop an inventory of existing detention and retention basins that must be maintained by Town staff. The inventory will include the location of the basins, approximate size of the basins, approximate watershed area discharging to the basins, and the receiving water body. This information will be incorporated into the GIS database currently maintained for the Town's stormwater infrastructure.

DS4-2: Inspect stormwater basins

Section 7.13 of the Zoning Regulations sets forth a detailed set of requirements for stormwater management. This section also requires the development and submission of an Operation, Maintenance, and Inspection Plan Agreement and Schedule for all Stormwater Facilities. The checklist provided in the Zoning Regulation Appendix incorporates requirements detailed in the *2004 Connecticut Stormwater Quality Manual*.

The Department of Public Works should develop an inventory of existing detention and retention basins. Ownership of these basins should be identified as either privately or Town owned. The Department of Public Works should perform inspections of Town-owned detention and retention basins and should implement an operations and maintenance (O&M) plan for ongoing maintenance.

Each basin will be inspected by Public Works staff (or Town Engineer) on an annual basis. The number of basins inspected each year will be dependent on the total number of basins that are under the Town's jurisdiction. For example, if the Town identifies that it owns 20 detention basins, then inspection of each basin annually may be feasible. If the Town identifies that it owns 100 basins, then inspection of only 25 percent of the basins each year may be feasible.

Inspection of basins includes an estimate of the volume of sediment within each basin and its depth below the basin outlet structure and the condition of the inlet and outlet structures. The inspections will be used to prioritize maintenance activities.

As with construction stormwater management, the recommendations set forth in the Postconstruction Stormwater Management section of the plan should also be continued and enforced. LID techniques and water quality measures such as basins, swales, and mechanical separators should continue to be encouraged and required where feasible in all developments. Sediment and particles must be prohibited from entering the stormwater drainage system in order to decrease total suspended solids and the pathogens that attach to them.

DS4-3: GIS mapping of all new stormwater structures, basins, and outfalls

The Town will require developers to submit GPS coordinates or GIS mapping of all stormwater structures, basins, and outfall locations associated with subdivisions or site plans prior to the Town taking over any roads or stormwater structures. This information will be incorporated into the townwide GIS mapping system to ensure future maintenance and mapping of DCIAs.

9.0 POLLUTION PREVENTION/GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

9.1 Permit Requirements

CTDEEP's General Permit requires that the Town implement an O&M program for Town-owned or -operated MS4s that has a goal of preventing or reducing pollutant runoff and protecting water quality from all Town-owned or -operated MS4s. The goal of this measure focuses on municipal operations. Table 9-1 summarizes the requirements of the Permit.

CTDEEP's General Permit requires that the Town adopt work practices that minimize pollutant loading to surface water in the town. Specifically, the Town is required to do the following:

- Develop and implement an O&M program that includes training for municipal employees and contractors and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.

- The program described in item 2.6.1.1 above should include employee training to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance.

- Develop and implement a program to sweep all streets at least once per year as soon after snowmelt as possible.

- Develop and implement a program to evaluate and, if necessary, clean catch basins and other stormwater structures that accumulate sediment at least once per year, including a provision to identify and prioritize those structures that may require cleaning more than once per year.

- Develop and implement a program to evaluate and, if necessary, prioritize repairing, retrofitting, or upgrading the stormwater conveyances, structures, and outfalls.

- Within the UA, the Town is also required to develop and implement a program to evaluate and prioritize those streets that may require sweeping more than once per year.

9.2 Best Management Practices

TABLE 9-1
Pollution Prevention/Good Housekeeping (OM)

Best Management Practice	Goal	Person(s) Responsible	Time Line Implementation
OM1: Employee Training	1. Continue a formal employee training program.	Refer to Table 9-2	Annually
OM2: Infrastructure Repair, Rehabilitation, and Retrofit	1. Fund and implement program. 2. Develop retrofit program. 3. Track DCIA disconnection. 4. Retrofit planning. 5. Retrofit schedule.	Public Works Director	Annually Annually By December 2020
OM3: MS4 Property and Operations Maintenance	1. Maintain and update O&M Manual. 2. Parks and open space 3. Pet waste management 4. Waterfowl management 5. Building and facilities 6. Vehicles and equipment 7. Leaf management plan	Public Works Director	Annually
OM4: Road and Bridge Maintenance	1. Sweeping 2. Catch basin cleaning	Public Works Director	June 30, 2020
OM5: Snow Management Practices	1. Deicing material management 2. Snow and ice control practices	Public Works Director	No deadline given
OM6: Interconnected MS4s	1. Coordinate with CTDOT	Town Engineer	By July 2019
OM7: Sources contributing pollutants to the MS4	1. Control contribution of pollution from non-MS4 properties.	Land Use Commission	No deadline given

OM1: Employee Training

Although all municipal staff should have some knowledge of stormwater management methods, the program administrator will determine the level of detail that is presented to the managers, supervisors, and operators. A program has been developed for the Highway Garage, Transfer Station, and Water Pollution Control Facility for municipal employees. The training program is conducted on a periodic basis. It is not likely that all staff will need the same amount of training. Table 9-2 presents a summary matrix of staff for Town departments and the training programs that may benefit them.

TABLE 9-2
Town Staff Training Requirements

Training Topic	Municipal Department/Location			
	Highway and Public Works Department	Parks and Recreation	School Maintenance Staff	Recycling Center Staff
Stormwater System Maintenance	x			
Road and Highway Maintenance	x			
Vehicle Maintenance	x	x		
Landscaping and Lawn Maintenance	x	x	x	
Materials Handling	x	x	x	x
Good Housekeeping	x	x	x	x
New Construction/ Land Disturbance	x			

The Town should train employees and contractors on the proper handling of waste materials and the hazards of improper handling. Fact sheets on the proper procedures for catch basin cleaning and disposal of catch basin sediments can be distributed to Highway Department employees. The Town should also have a Hazardous Communications Plan, which includes the previously developed fact sheets and standard operating procedures for employees.

The Town maintains Material Safety Data Sheets in each department. Additionally, each department head provides training for department workers on the safe handling of hazardous materials. Highway Department and Building Maintenance employees should be provided training by the Fire Marshal on the handling of hazardous materials and waste products. This training can be held periodically at the discretion of the Public Works Director.

OM2: Infrastructure Repair, Rehabilitation, and Retrofit

- Annual street sweeping and sweeping after snowmelt have been normal operating practice for the Department of Public Works for over 20 years. All paved roadways are swept in the spring of the year, and catch basins and outlet are cleaned on an annual basis.
- The Town will pursue funding for storm drainage improvements that need to be completed. This may include money from the Town General Fund or other sources such as Section 319 Grants. Section 319 of the Clean Water Act of 1987 established a program to control nonpoint sources of water pollution. In Connecticut, the program is administered by CTDEEP. More information can be obtained from CTDEEP's Nonpoint Source Management Program at 860-424-3730.
- The Town should implement a stormwater outfall retrofit program, which will ensure the MS4 system functions properly. A retrofit and repair program should be in place by July 1, 2020, for the existing stormwater system. Catch basins outside the DCIA must be inspected within 5 years (July 1, 2022).

OM2-1: Funding

The Town will pursue funding for storm drainage improvements that need to be completed. This may include money from the Town General Fund or other sources such as Section 319 Grants. Section 319 of the Clean Water Act of 1987 established a program to control nonpoint sources of water pollution. In Connecticut, the program is administered by CTDEEP. More information can be obtained from CTDEEP's Nonpoint Source Management Program at 860-424-3730.

Some communities have established stormwater utilities to finance stormwater improvements. These utilities operate similar to a water or sewer utility, charging user fees based on the amount of impervious area on the property. Residential users are charged a flat fee that is established based on an average amount of impervious cover for all residential properties in Town. Commercial and industrial facilities are charged multiples of the residential fee based on the amount of impervious area on the property. Ultimately, the Town may consider implementing a stormwater utility to offset the costs associated with flood control and stormwater-related improvements.

OM2-2: Retrofit Program

The Town will evaluate catch basins and street sweeping priorities in other areas of the Town. Town staff will inspect up to one-third of the catch basins each year using the same evaluation system that has been developed by the CRCCD. The Town will then develop a database of the results of the Prioritization Program. The database will be the basis of the Town's catch basin cleaning and street sweeping operations by noting high priority areas and documenting when catch basins are cleaned and streets are swept. The Town will also inspect the stormwater outfalls that it owns that were not included in the CRCCD's program.

OM2-3: Retrofit Schedule

Disconnect 1% per year of the Town's DCIA for the fourth and fifth years of the General Permit (2021-2022) for a total of 2% by year 2022. If the 2% goal cannot be met, the Town will include in the annual

report a discussion of what percentage of DCIA will actually be disconnected and why the remainder of the 2% goal could not be achieved.

The Town will also provide in the 2022 annual report for continuation of the retrofit program and continue the program with a goal to disconnect 1% of DCIA in each year thereafter.

OM3: MS4 Property and Operations Maintenance

OM3-1: Update Operations and Maintenance Manual

The Public Works Department currently maintains an *Operation and Maintenance Manual* (2002) that identifies proper operation, maintenance, and repair of municipal stormwater facilities.

The following specific town-related tasks have the potential to impact stormwater quality:

- Fertilizer, pesticide, herbicide, and insecticide application
- Disposal of leaves and grass clippings
- Disposal of sand from roadway sweeping and catch basin cleaning
- Accidental spills of oils, gasolines, paints, and other chemicals
- Storage and application of road sands and salts
- Maintenance of vehicles
- Washing of vehicles
- Maintenance of pumps and other water distribution facilities

The Public Works division is responsible for all outdoor maintenance at the Town's parks, school grounds, and all other town-owned land. The Highway Division maintains over 70 miles of roads, including maintenance and resurfacing, drainage repairs, signage, winter plowing, street sweeping, mowing, tree removal and trimming, and maintenance of department equipment. The Parks Division of Public Works maintains over 100 acres of fields, parks, and ground; rails to trails, school grounds, Collinsville Fire Station and Police Department; and 19 athletic fields throughout the Town. The Transfer Station maintains municipal solid waste, single stream recycling, bulky waste, and all other recyclables.

The Town's Transfer Station collects waste oil and antifreeze to reduce the potential for discharges to water bodies. From 2008-2012, the Town participated in the MDC's Household Hazardous Waste Days and MDC's Electronic Waste Disposal Days. In 2013, due to the changes and rising costs, the towns of Canton, Avon, Granby, and Simsbury opted out of the MDC's collection program and will hold separate household hazardous waste collections for residents of those four towns. Canton anticipates holding collections on a semi-annual basis, in the spring and fall.

The Public Works Department maintains appropriate chemical manufacturers' Material Safety Data Sheets and posts these in each department. Additionally, each department head provides training for department workers on the safe handling of hazardous materials.

Landscaping and lawn care activities occur at all municipal facilities that maintain turf and garden areas. Parks, playing fields, cemeteries, golf courses, and schools require significant maintenance of turf areas. In 2005, Connecticut passed Public Act 05-252, which prohibits the application of lawn care pesticides at preschools and elementary schools.

OM3-2: Parks and Open Space

The Public Grounds division is responsible for all outdoor maintenance at the Town's parks, school grounds, and all other town-owned land. Landscaping and lawn care activities can result in contamination of stormwater by 1) improper fertilizer and pesticide management; and 2) improper disposal of yard wastes and leaves. Overapplication or misapplication of fertilizers can be a significant source of nutrients such as nitrogen and phosphorous in stormwater runoff. Pesticides can introduce chemicals into water supplies that are harmful to humans, wildlife, and biota. Disposal of lawn wastes such as grass clippings and leaves in watercourses or wetlands increases the nitrogen level in the water body, leading to excessive algae growth. Disposal of lawn wastes in roadways or catch basins can lead to localized flooding when storm drainage pipes become clogged.

The following BMPs related to lawn care are discussed in the following text:

- Optimizing Fertilizer Application
- Optimizing Pesticide Application
- Reducing Pesticide Application
- Proper Plant Management
- Integrated Pest Management Programs
- Proper Storage and Handling of Pesticides
- Promote Proper Disposal of Grass Clippings and Leaves

Optimizing fertilizer application

Overapplication or misapplication of fertilizers can be a significant source or nutrients such as phosphorous and nitrogen in stormwater runoff. The selection, rate, and timing of application of fertilizers are key for minimizing possible runoff contamination.

Soil testing should be done prior to fertilizer application to ensure that appropriate fertilizers are selected and that the rate of fertilizer application is suitable for the soil conditions. The following guidelines apply to the application of fertilizer:

- Use slow-release organic fertilizers as they are potentially less toxic than other types of commercial fertilizer and are less likely to enter stormwater runoff.
- Time fertilization so that it is most beneficial to the target species. For example, warm-season grasses such as Creeping Red Fescue (*Festuca rubra*), Big Bluestem (*Andropogon gerardii*), or Little Bluestem (*Schizachyrium scoparius*) should be fertilized in frequent small doses in the summer while cool-season grasses such as Kentucky bluegrass (*Poa pratensis*) benefit from fall fertilization.
- Fertilizer should not be applied on very windy days or before a heavy rain.
- Do not apply fertilizer after mid September as it has limited impact given Connecticut's climate.

Optimizing Pesticide Application

Pesticides (including insecticides, herbicides, and fungicides) contain a variety of chemicals used to control pests, insects, and weeds. Excess rain can wash pesticides from plants and soil, which can run off into streams. Pesticides can leach into the soil if plants are watered or rainfall occurs soon after application. Some pesticides resist degradation by microbes in the soil and will eventually leach into the groundwater. Pesticides can also reach groundwater through drains, sink holes, and other conduits.

Shorter grasses typical of golf courses are less resistant to insects and require application of pesticides to keep them healthy. Nonnative plant species can require increased amounts of pesticides, fertilizers, and watering to keep them healthy.

Optimizing the application of pesticides and fertilizers reduces the amount of chemicals applied to the ground and saves money by reducing the amount of pesticide purchased. Elements of a proper pesticide and fertilizer application program include the following:

- Calibration of equipment to allow for correct application
- Following manufacturers' directions regarding handling and application rates
- Using leaching-resistant or "slow release" pesticides
- Avoiding of wind drift by application in large water droplets
- Mixing and loading pesticides only over impervious surfaces that do not contain floor drains or storm drain inlets

Reducing Pesticide Application

The following are methods for reducing pesticide use:

- Select healthy seeds and seedlings that are known to resist diseases and are suited to the climate. Strong seed are likely to produce mature plants with little need for pesticides. Planting pest-resistant plant varieties and local plant species will also reduce pesticide needs.
- Manual activities such as spading, hoeing, hand-picking weeds and pests, setting traps, and mulching can all be used to eliminate pests without using pesticides.
- Proper plant management can improve plant health, reduce the need for pesticides, and reduce runoff and infiltration. Plants that attract predatory species, such as birds and bats, can enhance landscaping and naturally reduce pests.

Proper Plant Management

Plant management techniques can maintain healthy plants while minimizing the need for chemical treatment. This can be accomplished by mowing turf areas high and often, which lowers the stress on grasses and reduces watering needs. By setting the mower blades on 3 inches and mowing when the lawn is approximately 4 inches, clippings are less likely to mat and will provide nutrients for the lawn. Maintain proper drainage and aeration to encourage the growth of microbes that degrade pesticides.

Integrated Pest Management (IPM) Programs

IPM is the use of all means of pest control (chemical and nonchemical) in a compatible fashion to reduce pesticide use. Preparing a site correctly and selecting plants best adapted to local conditions and then watering, fertilizing, and caring for them properly forms the basis for IPM. Keeping a landscape healthy enables it to tolerate low levels of pests and makes the area a good habitat for beneficial organisms that control pests.

A sound IPM program is based on the acceptance and tolerance of pests. Control steps are not usually taken until careful monitoring of pest populations indicates that economic losses could exceed costs of control. In municipal landscapes such as golf courses, cemeteries and schools it may be more difficult to determine acceptable injury levels since damage may be aesthetic rather than economic. Deciding that damage has reached an action threshold will vary with individual preference, visibility of the area, and local policies.

Components of an IPM program include the following:

- *Regular monitoring* to check levels of pest population and their damage to determine management needs, be it pesticide application or other management actions. Monitoring can be accomplished by a trained employee such as a facility manager.
- *Nonchemical control measures* such as mechanical (hand-picking, hoeing), cultural (plant selection and placement), and biological controls (mulches, insects), sanitation, and pesticide-resistant plants are highly recommended.
- *Alternate plants and select pest-resistant plant varieties,* where possible. Alternating plants protects plants from pests that may have survived the winter.
- *Mulch gardens and flower beds* to reduce weeds.
- *Maximize biological controls* by using pesticides only when necessary.
- *Select specific pesticides* that are designed for the pests that you *wish to control.*
- *Use low-persistent pesticides* that do not last as long in the environment.

Proper Handling and Storage of Pesticides

Proper storage is important in preventing both surface water and groundwater contamination. Store pesticides in intact containers in a shed or covered structure or on an impervious surface such as concrete. Follow directions for storage as indicated on product labels. Do not store pesticides in areas prone to flooding. Keep pesticides in their original containers. If the label is unreadable, dispose of the product.

Spill cleanup as discussed in previous sections is another important pesticide management measure.

Disposal of pesticide containers can lead to groundwater contamination if the containers are not stored and cleaned properly. To prevent groundwater contamination, use returnable containers as often as possible, and take them back to the dealer. For nonreturnable containers, pressure rinse or triple rinse containers immediately after they are empty since residue can be difficult to remove after it dries, and apply the rinse water appropriately (i.e., on plants that require pesticides). Information about pesticide container recycling can be obtained from the Pesticide Management Division of CTDEEP.

Puncture nonreturnable containers and store them in a covered area until they can be disposed of. Shake out bags, bind or wrap them to minimize dust, and take them to a permitted landfill. Do not bury or burn pesticide containers or bags. If containers are full or partially full and the pesticide is in good condition, it may be given to another pesticide user. However, if the pesticide is labeled a restricted use pesticide, it can only be distributed and used by certified applicators.

Disposal of Leaves and Grass Clippings

No landscaping debris (grass clippings, leaves, brush, prunings, mulch, soil, etc.) should be deposited, dumped, blown, or swept directly into a watercourse, wetland, storm drainage system, or public right-of-way. The Town should limit the potential for improper disposal by providing leaf pickup services in the fall and providing for leaf disposal at the Public Works Garage.

Table 9-3 provides a summary of recommendations for proper pollution preventative measures regarding pesticide storage, application, and tank filling

TABLE 9-3
Recommendations for Pollution Prevention for Lawn Maintenance Activities

Activity	Recommendations
Pesticide Storage	▪ Buy only the amount needed for one growing season ▪ Store chemicals properly: seal and close; store in original containers; protect from weather in dry, well-ventilated area. ▪ Triple rinse all containers and empty all concentrate into sprayer tank, letting it drain thoroughly (at least 30 seconds) by adding diluent to about ¼ volume of the container, swirl thoroughly, then pour into spray tank. ▪ Purchase chemicals in reusable, returnable containers (dedicated, "mini-bulk" containers) when possible. ▪ When possible, purchase chemicals in containers that can be dissolved in the tank.
Pesticide Tank Filling	▪ Carefully calculate the volume you will use and load only this amount. ▪ Keep the end of the fill hose above the fluid level in the spray tank to prevent back siphoning.
Pesticide Application	▪ Employ Integrated Pest Management (IPM) techniques. ▪ Substitute less toxic, less persistent, or less "leachable" pesticides. ▪ Use well-timed spraying only as needed based on accurate pest identification. ▪ Do remedial spraying based on field scouting. Maintain filed maps/records of previous pest problem. ▪ Do not exceed recommended application rates. ▪ Calibrate application equipment. ▪ Make sure application rate is uniform over filed; avoid overlapping. ▪ Use row banding application techniques where appropriate (e.g., corn). ▪ Strategically spot treat where problem exists. ▪ Avoid wind drift. ▪ Make sure equipment is in good working order at all times; check for leaks.
Fertilizer Application	▪ Use slow-release organic fertilizers. ▪ Appropriately time fertilizer application for the specific plant species. ▪ Do not apply on very windy days or before a heavy rain.
Disposal of Leaves and Grass Clippings	▪ Do not dispose of landscaping debris in watercourses, wetlands, storm drainage systems, and public right-of-ways.

Xeriscaping

Another method of pesticide and fertilizer management is known as xeriscaping. Xeriscaping is landscaping to minimize water usage and incorporates two essential components as follows:

1. Using native plants that are adapted to Connecticut's climate and that require minimal watering, fertilizer, and pesticide application
2. Improving soils by adding soil amendments or using mulches to reduce the need for watering by increasing the moisture retained in the soil

In addition to promoting water conservation, minimizing water use and water loss will reduce the transport of pollutants into downstream surface waters. Because xeriscaping typically results in the reduced need of pesticides and fertilizers as part of landscape maintenance, this approach to lawn and turf management also reduces nutrient and pesticide contamination in stormwater runoff. This may be a method for consideration at the elementary schools where lawn pesticide application is prohibited starting June 2008.

Xeriscaping incorporates seven basic principles that are also generally applicable to lawn and turf management:

1. *Planning and Design*: Landscape planning should consider soil and topographic characteristics, light conditions, drainage, existing plantings to be preserved, and owner preferences such as the desired level of maintenance, budget constraints, and plant and color preferences.

2. *Soil Improvements*: Improving soil conditions will help to retain water in the soil. Addition of organic matter such as compost or peat moss will improve soil moisture retaining capabilities.

3. *Practical Turf Areas*: Because of the water requirements of many turf grasses, limit or reduce the amount of turf areas or convert existing turf areas to alternatives. Alternatives include groundcovers, planting beds, or permeable surfaces like wood decks and brick-on-sand walkways. Turf areas can be designed in rounded, compact shapes that are more efficient to mow.

4. *Appropriate Plant Selections*: Selecting trees, shrubs, flowers, grasses, and groundcovers that are either native to the region or noninvasive, nonnative-adapted species will reduce the amount of watering needed. Choose a variety of plants; monocultures tend to be more susceptible to pest or insect problems. CTDEEP's "Connecticut Native Tree and Shrub Availability List" provides a list of native trees and shrubs and nurseries where they can be purchased. This list is available at http://www.conncoll.edu/ccrec/greennet/arbo/treeavailability.pdf .

5. *Efficient Irrigation*: Watering only when needed and allowing the water to penetrate deeper into the soil will encourage deeper root growth, which encourages roots to reach deeper into the soil for moisture. Soaker hoses and drip irrigation systems result in less evaporative loss as does watering in the early morning and evening. Group plants by water need.

6. *Effective Use of Mulches*: Use of mulch helps to maintain soil moisture, reduce weed growth, and prevent erosion. Organic mulches such as peat moss, compost, wood chips, shredded bark or bark nuggets, pine needles, cocoa bean shells, leaves, and sawdust retain soil moisture and provide nutrients for plant growth. Inorganic mulches such as sheeting, stone, or gravel reduce moisture loss but do not provide nutrients and are recommended for unplanted areas.

7. *Appropriate Regular Maintenance*: Properly timed maintenance such as pruning, liming and fertilizing (only when indicated by soil testing), weeding, pest control, and mowing will encourage the long-term viability of the xeriscaped landscape.

OM3-3: Pet waste management

The Town will consider providing additional dog waste stations in parks, along trails, and in public places where people often walk their dogs. An example of such a station is shown in the adjacent photograph.

These waste disposal stations can be stocked with biodegradable plastic bags. Town maintenance staff can empty the full waste can with the regular trash pickup.

The town will post signs informing pet owners that it is their responsibility to clean up after their pets. These signs can be posted in parks, playgrounds, or residential communities. They should read "Please Clean Up After Your Pet." These signs, along with dog waste stations, can be purchased from http://www.propertymanagementshop.com or http://www.parknpool.com/dog-waste-disposal

OM3-4: Waterfowl management

Waterfowl populations within Town recreational areas may contribute to an increase in fecal material within water bodies. In addition to elimination of food handouts, additional nonlethal methods for geese control can be incorporated into the Town's operations. Because Canada geese prefer to feed, roost, and rest near water where they can escape if threatened, restricting a goose's ability to move between water and land will deter geese from an area. This method is termed exclusion. Physical barriers along the water's edge can be achieved by:

- Bordering ponds with a boardwalk or boulders over 2 feet in diameter
- Planting thick shrubs or hedges
- Placing a short fence (1 to 2 feet high) in the water and surrounding it with aquatic vegetation
- On small ponds, a grid of high tensile wire or UV-resistant polypropylene line stretched across the pond may deter geese from using the pond.

The Town will educate citizens about the feeding of waterfowl, specifically geese. Information brochures detailing the goals of geese reduction can be distributed with townwide mailings. Signs indicating that people should not feed the wildlife will also be placed throughout the town in parks and near water bodies within the Cherry Brook watershed. A ban on waterfowl feeding is the first step in any campaign to control problem goose populations and the deleterious effects their excrement may have on the water quality in the watershed.

OM3-5: General facilities

Waste generated at municipal facilities should be properly disposed of to prevent introduction into the storm sewer system. Materials that may adversely impact stormwater quality should be stored inside a building or covered and protected from rainfall. The following practices are recommended for facility management:

- Maintain site plumbing plans showing sanitary and storm sewer connections. Ensure wastewater is discharged only to the sanitary sewer and stormwater to the storm sewer.
- Label storm drain inlets to ensure they are used only for stormwater drainage.
- Inspect facilities for litter on a regular basis and clean up as needed.

Material Handling and Storage

Proper management and storage of materials, such as solvents, paints, cleaners, and automotive products, can significantly reduce polluted runoff by reducing the likelihood of accidental spills and releases. The following practices are recommended:

- Collect and recycle, to the maximum extent practicable, wastes generated by municipal operations.
- Provide for the proper disposal of all wastes generated or collected in the course of municipal operations, in accordance with all applicable local, state, and federal laws.
- Keep trash container lids closed to keep rain out. Do not dispose of liquid waste in trash containers.
- Ensure that the collection frequency of trash containers is appropriate to avoid overflows.
- Outdoor material stockpiles at both permanent locations and at job sites should be covered to protect from rainfall and prevent contamination of stormwater runoff.
- Material stockpiles that cannot feasibly be covered should be surrounded by a berm or otherwise contained so that stormwater runoff can be captured.
- Petroleum products, fuels, chemicals, hazardous and toxic materials, and all wastes should be properly labeled to ensure appropriate handling and disposal.
- Petroleum products, fuels, chemicals, hazardous and toxic materials, and all wastes should be stored and handled with appropriate safeguards to prevent contamination of stormwater from drips and spillage from the transfer of materials (for example, cover storage containers, use collection trays for drips, maintain spill kits and floor drain plugs to contain spills, etc.).
- Liquid containers should be stored under a roof indoors. If outdoors, containers should be kept clean and sealed watertight.

Material Spill Response Procedures

In the event of an accidental discharge of chemical material, notify the Town's Pollution Prevention Coordinator immediately to coordinate response procedures. Notify the Pollution Prevention Coordinator of releases regardless of spill quantity. If the spill represents an immediate health or explosion hazard, contact the Canton Fire Department immediately by dialing 911. Also report the spill to the CTDEEP Oil and Chemical Spills Unit at (860) 424-3338. A spill response record form is given in Appendix E.

Begin to contain the spill immediately using available manpower and materials. Sorbent material should be clearly marked and available at all potential spill locations. Contain the spill as close to the source as possible with absorbent materials. Remove these materials immediately and dispose of them in a proper manner. Remove expended sorbent and its associated fluid, and place it into a sorbent disposal drum. Locate the waste drum in an appropriate disposal area. Remove the drum to a qualified facility for proper treatment. In the event that containment of the spill is beyond the capability of the available manpower, notify the nearest available cleanup contractor.

The following procedures can be implemented to minimize and contain contamination due to chemical spills:

- Prevent spills of hazardous materials by selecting storage areas that avoid traffic to minimize accidental contact, and select areas that are away from storm drain inlets and streams to minimize the impact of a spill. Storage areas should be kept clean and organized.
- Contain and cleanup spills immediately. Ensure employees are familiar with spill response procedures and the location of spill kits to enable them to stop the spills at the source and contain spilled material. With training on hazards from a Material Safety Data Sheets (MSDS), minor spills can be addressed by employees. However, significant spills will require evacuation and contacting emergency responders.
- Keep MSDS for chemicals on site for information on reportable spill quantities, proper handling, and health and safety issues.

- Maintain and post a list of emergency contact numbers for spill reporting and spill cleanup contractor response. A list of emergency contact numbers can be found in Appendix F.
- Prepare for appropriately handling the cleanup and disposal of the spilled material. Do not hose down spills to the storm sewer system. Clean up spills with dry methods, using sorbent material to pick up fluids.
- Establish at all municipal facilities materials management and inventory controls to include the proper identification of hazardous and nonhazardous substances and proper labeling of all containers.
- Regularly inspect and inventory all material storage and use areas to ensure BMPs are being used.
- Develop and implement a spill response plan for each municipal facility. A plan was developed for the Town Farm Lane facility to comply with the General Permit for the Discharge of Stormwater from Industrial Activities.
- Equip floor drains with valves that can be closed in the event of a spill.
- Inspect containers for signs of leaks or corrosion on a specified schedule and replace as necessary.
- Develop a written program for all loading, unloading, and transfer operations such as maintenance and fueling of vehicles. Ensure that all employees are trained in the program's specified task.
- Identify all hazardous and nonhazardous substances present in a facility. (Reviewing all purchase orders for a facility and walking through the facility itself can accomplish this.) Compile a list of all chemicals present in a facility and obtain a MSDS for each one.
- Routinely maintain storage areas to keep any drainage from reaching stormwater management systems.

TABLE 9-4
List of Recommended Pollution Prevention Techniques for General Municipal Activities

Activity	Recommendation
Pools	• Discharge chlorinated water to the sanitary sewer whenever possible. Be sure to dechlorinate all water discharged to the storm sewer system. • Register pool discharges in accordance with CTDEEP's General Permit for the Discharge of Swimming Pool Wastewater. • Avoid using copper or silver-containing algaecides in pools, fountains, and ponds.
Facilities	• Label storm drain inlets to ensure they are used only for storm water drainage. • Maintain plumbing plans showing sanitary and storm sewer connections. • Inspect for litter on a regular basis, and clean as needed.
Grounds	• Utilize an Integrated Pest Management (IPM) Program to minimize the use of pesticides and herbicides. Eliminate use of lawn care pesticides at pre- and elementary schools by July 1, 2008. • Inspect for litter on a regular basis, and clean as needed.
Material Handling	• Collect and recycle all municipal waste, to the extent practicable. • Provide for the proper disposal of all waste. • Properly label all waste. • Use appropriate safeguards for drips and spillage from the transfer of materials, such as collection trays and floor drain plugs. • Collect trash containers to avoid overflows.

Material Storage	• Store containers of liquids under a roof indoors; if outdoors, keep containers clean and sealed water-tight. • Keep trash container lids closed to keep rain out. • Cover outdoor stockpiles; if not able to cover, surround with a berm or otherwise contain.
Spill Response	• Notify the Pollution Prevention Coordinator. • Notify the Canton Fire Department if the spill represents and immediate health or explosion hazard. • Report the spill to the DEEP Oil and Chemical Spills Unit (860) 424-3338 • Contact the nearest available clean-up contractor if necessary.
Spill Reduction and Containment	• Immediately contain the spill. • Have sorbent material readily available and clearly marked at all potential spill locations. • Properly dispose of spilled and sorbent material. • Select appropriate storage areas. • Do not hose down spills to the storm sewer. • Inspect containers for signs of leaks and corrosion on a specified schedule.

OM3-6: Vehicles and Equipment

Common activities at vehicle maintenance facilities that generate waste include the cleaning of parts, changing of vehicle fluids, and replacement and repair of equipment. Other activities include vehicle fueling, washing, and storage. Significant loads of hydrocarbons, trace metals, and other pollutants can be produced that affect the quality of stormwater runoff. Fluid spills and improper disposal of materials can result in pollutants, heavy metals, and toxic materials entering water supplies. Outdoor car washing has the potential to result in high loads of nutrients, metals, and hydrocarbons.

Some of the waste types generated at vehicle maintenance facilities include:

- Solvents
- Antifreeze
- Brake fluid and brake lining
- Batteries
- Motor oils
- Fuels (gasoline, diesel, kerosene)
- Lubricating grease

The implementation of good housekeeping practices may reduce or eliminate the need to implement other more costly or complicated procedures. Essentially, keeping materials such as hydraulic and brake fluids, oil, and gasoline out of contact with rainwater will prevent their introduction into the storm drainage system. BMPs for specific substances and components associated with vehicle maintenance, such as antifreeze and batteries, are given below:

- Conduct all vehicle and equipment maintenance at one location away from storm drains, preferably on a paved surface under cover.
- Inspect all vehicles and heavy equipment frequently for leaks.
- Utilize dry cleanup methods such as sweeping; try to avoid washing down work areas.
- Use drip pans and/or containers where needed.

- Provide secondary containment to prevent spills form entering groundwater or storm water.
- Monitor parked vehicles closely for leaks and place pans under any leaks to collect the fluids for proper disposal and recycling.
- Dispose of all waste products properly and recycle whenever possible.
- Keep equipment clean and free of excess oil and grease.
- Store idle equipment under cover.
- Remove fluids from retired, wrecked, or salvaged vehicles.

Washing of Vehicles and Shop Wastewater

Vehicle maintenance wastewater may contain chemicals such as oils, degreasers, gasoline, diesel fuel, detergents, heavy metals, and antifreeze. In some instances, it may contain solvents. If discharged through a dry well or septic system, these chemicals may render drinking water unfit for consumption.

The following are BMPs to follow for the handling of shop wastewater:

- Adopt a dry shop goal. Keep shop floor dry and clean.
    1. Clean snow and ice off the top of vehicles before bringing them inside.
    2. Prevent spills from ever reaching the floor by using the appropriate equipment such as funnel drum covers and overhead fluid delivery systems.
    3. Sweep or vacuum floors often.
    4. Make sure mechanics carry rags so that small spills can be wiped dry when they occur.
    5. Never hose down work areas.
- Consider sealing the shop floor with epoxy or other suitable sealant so spills will not be absorbed and cleanups will be quicker.
- If it becomes necessary to wash the floor, use only the quantity of water needed to produce an appropriate level of cleanliness. Direct all wastewater to a properly permitted floor drain. Flushing floor wastes outside constitutes an illegal discharge.
- Use self-closing faucets and nozzles to ensure no source is left running unattended.
- Post this notice by all sinks and drains – "Do not pour any vehicle fluids, paints, solvents, or other wastes down sinks or drains".
- Only use absorbents like speedi-dry or "kitty litter" when the spill cannot be cleaned with shop rags, dedicated mops, or squeegees. Use absorbent pads and mats to prevent large spills from spreading and entering floor drains.
- Clean up spills immediately so that the spilled materials does not get tracked outside the building.

Proper Handling of Waste Oil and Other Waste Materials

Oil: Used oil does not break down easily in the environment and can contain toxic chemicals and heavy metals. If spilled on the ground, poured down storm drains, or disposed of with trash, it can pollute surface water and groundwater.

- Do not mix oil with anything else, such as chlorinated solvents, or expose oil to electrical contact cleaner or carburetor cleaner, which can contaminate used oil.
- Purchase a nonspill vacuum system for "spill-proof" oil changes.
- Burn used oil in a used oil fuel space heater.
- Use oil absorbent materials to clean up small drips and spills.

- Locate any outdoor used oil storage tanks or containers in a fenced area, which will help prevent unauthorized access or vandalism, minimize the possibility of fire or explosion and accidental release of oil to the environment.
- Lock the tank or containers fill spout when not in use.
- Either use tanks with integral secondary containment, or provide a roof over outdoor tanks to protect the secondary containment from filling with rainwater.
- Visually inspect tanks or container on a weekly basis for leaks and malfunctions. Maintain written inspection records.
- Instruct all employees who handle used oil on the proper operation and management of the oil storage area. Assign one person the responsibility for monitoring oil storage.
- Keep records of used oil collection.

Antifreeze: Antifreeze, if ingested, is a serious health hazard to humans and animals. There are two types of antifreeze commonly in use today – ethylene glycol and propylene glycol. The most common is ethylene glycol, which is odorless, sweet tasting, and usually greenish-yellow in color. Propylene glycol antifreeze, usually pink, is less toxic than ethylene glycol. Extended life antifreeze, usually orange, contains additional additives, and is available in both ethylene and propylene bases.

- Segregate the antifreeze from other waste and label the container "Waste Antifreeze."
- Use the less toxic propylene glycol antifreeze if appropriate.
- Recycle antifreeze by:
  1. Contracting with an on-site mobile recycling service that is permitted by DEEP to recycle antifreeze. A list of permitted companies can be obtained from the DEEP by calling (860) 424-4193; or
  2. Contract with a hauler that recycles the antifreeze off-site. If recycling off-site, use a DEEP permitted hauler for transportation to a permitted facility for recycling, treatment, storage or disposal. A list of permitted transporters can be obtained from the DEEP by calling (860) 424-4193; or
  3. Purchase on-site recycling equipment and recycle at your facility. If recycling antifreeze on-site, make sure to keep the different types separated.
- Store antifreeze in a container that can be completely drained with a wide opening. Keep antifreeze storage containers closed at all times.
- Wear eye protection, clothing that covers exposed skin and rubber gloves when transferring antifreeze. Pour slowly and carefully to avoid splashing.

Refrigerants: The gases used as refrigerants in motor vehicle air conditioners and refrigerator systems (often referred to as CFCs or Freon™) become an environmental problem when the escape into the air. Some of the refrigerants are chlorofluorocarbons (CFC-12 or R-12). When released into the air, they rise into the upper atmosphere where they damage the protective ozone layer. The newer refrigerants (e.g., HFC-134a or R-134a) are hydro fluorocarbons, and although they are non-ozone depleting, they contribute to global warming when released into the air.

The Best Management Practice for handling refrigerant in motor vehicles is to encourage vehicle owners to have leaks repaired to reduce emissions and extend the useful life of their air conditioner, rather than to "top off" leaking systems. The refrigerator disposal site at the Town Garage should be covered to prevent exposure of the refrigerators to rainwater.

Lead Acid Batteries: If handled improperly, lead acid batteries removed from vehicles pose certain hazards. Battery components are toxic and corrosive, and can also be a fire and explosion hazard. Lead and sulfuric acid can contaminate the air, soil, and water. Direct contact with sulfuric acid can burn the skin and eyes. Exposure to lead in the environment can pose a serious health hazard to children. Lead is also very toxic to aquatic life. The following are BMPs for the storage, handling, and disposal of lead acid batteries:

- Continue to avoid long-term storage of lead acid batteries by sending accumulated batteries to a reclaimer within 6 months of receipt. Limit accumulation of large quantities of spent batteries.
- Store spent lead acid batteries upright in a secure location, protected from the elements.
- Never stack batteries directly on top of each other. Store on acid-resistant racks or shelving or layer with wood.
- Never drain batteries or crack the casings.
- Place cracked or leaking batteries in a sturdy, acid-resistant, leak-proof, sealed container (e.g., a sealable 5-gallon plastic pail). The container should be kept closed within the battery storage area.
- Strap batteries to pallets or wrap batteries and pallet in plastic during transport.
- Keep written records of inspections of spent lead acid batteries.

TABLE 9-5
Pollution Prevention Techniques during Vehicle Maintenance

Activity / Item	Recommendation
Good Housekeeping/ Preventative Maintenance	• Conduct all maintenance at one location away from storm drains, preferably on a paved surface under cover. • Inspect all vehicles frequently for leaks. • Utilize dry clean-up methods. • Use drip pans and containers. • Provide secondary containment for storage of liquid materials and wastes if they are stored outside • Dispose of wastes properly; recycle whenever possible. • Store idle equipment under cover. • Remove fluids from retired, wrecked, and salvaged vehicles. • Use absorbents to clean spills when the spill cannot be cleaned with shop rags, dedicated mops, or squeegees.
Vehicle Washing	• Perform all wash operations in the enclosed vehicle wash facility.
Shop Wastewater	• Direct all wastewater to properly permitted floor drains. • Post this notice by all sinks and drains – "Do not pour any vehicle fluids, paints, solvents, or other wastes down sinks or drains"
Oil	• Do not mix oil with any other chemicals. • Purchase vacuum-type system for oil changes. • Use oil absorbent material to clean up drips and spills.
Antifreeze	• Segregate antifreeze from other waste. • Use propylene glycol antifreeze where possible. • Recycle used antifreeze. • Store in container that can be completely drained. Keep storage containers closed at all times. • Wear eye protection, clothing that covers exposed skin and rubber gloves,
Refrigerants	• Encourage vehicle owners to have leaks repaired; do not "top off" leaking systems. • Keep the refrigerator disposal area covered
Lead Acid Batteries	• Avoid long-term storage. • Store upright protected from the elements, on acid-racks or shelving, or layer with wood. • Never drain batteries or crack the casings; place cracked and leaking batteries in acid-resistant, leak-proof, sealed containers. • Strap batteries to pallets or wrap batteries and pallets in plastic during transport. • Keep written records of inspections.

OM3-7: Leaf Management

Currently, the Town's transfer station charges for leaf disposal. Eliminating this charge would make residents more receptive to proper leaf disposal. The Town should also consider a leaf collection day. This would reduce loading of sediments, biomass, and potentially bacteria and other contaminants into the MS4 system.

OM4-1: Road and Bridge Maintenance

Specific requirements of Section 6(a)(6) of the General Permit for the Discharge of Stormwater from Small MS4s as mandated by CTDEEP are the following:

- To develop and implement a program to sweep all streets at least once a year as soon as possible after snowmelt
- To develop and implement a program to evaluate and prioritize those streets that may require sweeping more than once a year

OM4-1: Sweeping

Street sweeping is the first line of defense for managing sediments. Removal and proper disposal of sediment and debris from paved surfaces reduces the exposure of the materials to stormwater wash off and subsequent pollutant export to receiving waters. Street and parking lot sweeping generates materials such as sand, salt, leaves, broken glass, small pieces of metal, and other litter and debris. These sweepings may contain low levels of chemicals such as zinc, copper, lead, sodium, and compounds associated with asphalt and motor oils.

The General Permit requires that the Town establish and implement procedure for town-owned or operated streets and parking lots. All streets and parking lots within the UA and outside the UA within the catchment areas of the MS4 with either DCIA of greater than 11% or which discharge to impaired waters shall be inspected, swept, and/or cleaned with a minimum frequency of once per year in the spring following the cessation of water maintenance activities. The Town currently sweeps it streets once per year.

Disposal of Roadway Sweepings

The total volume of sediment generated during street sweeping operations can be estimated at 20.2 tons per mile of street. Street sweepings may contain low levels of chemical compounds such as lead, sodium, and compounds associated with asphalt and motor oils. They are also likely to contain debris such as leaves, broken glass, and small pieces of metal. Material removed from catch basins may have higher concentrations of pollutants and, therefore, it is not recommended that street sweepings be intermixed with sand and debris collected from catch basins.

Temporary storage of road sweepings prior to reuse or disposal should be located in an area where the sweepings will not wash into wetlands and watercourses. The CTDEEP lists acceptable storage sites as:

- Empty salt storage sheds
- Municipal sites where sand and salt are normally handled
- Paved areas that are more than 100 feet from a wetland or watercourse

If street sweepings are to be reused, materials such as trash, leaves, and debris should first be removed by screenings or another appropriate method. Such material should either be disposed of at a permitted solid waste facility, recycled (e.g., aluminum cans), or composted (e.g., leaves). Sweepings may then be reused in a manner consistent with their overall grain size and quality. In Connecticut, typical reuses are landfill cover; however, Massachusetts allows road sweepings to be used as roadway fill (provided sweepings are used above groundwater or in residential areas) and compost additive. Before determining an appropriate reuse, the material should be tested for contaminants such as heavy metals and hydrocarbons. Results of the testing should be compared to Connecticut's Remediation Standard Regulations, with sediments being disposed in areas only where the level of contaminants is consistent with the groundwater classification and land use.

OM4-2: Catch Basin Cleaning

Catch basins and other stormwater structures should be cleaned at least annually. The cleaning should include both removal of sediment from the sump and removal of any trash or debris from the grate. Additional maintenance is recommended in the fall to remove trash, leaves, and other debris. Catch basin sediments tend to have higher levels of pollutant loadings than do street sweepings. Materials removed from catch basins tend to have higher amounts of fine grained material such as silt and clay, which adsorb more metals and other pollutants than the coarser sands typically found in street sweepings.

One requirement of Section 6(a)(6) of the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems as mandated by CTDEEP is to develop and implement a program to evaluate and, if necessary, clean catch basins and other stormwater structures that accumulate sediment at least once a year, including a provision to identify and prioritize those structures that may require cleaning more than once a year.

Typically, a catch basin should be cleaned if the depth of deposits is greater than or equal to one-third the depth from the basin to the invert of the lowest pipe or opening into or out of the basin. Areas with higher pollutant loadings or discharging to sensitive water bodies should be cleaned more frequently. More frequent cleaning of drainage systems may also be needed in areas with relatively flat grades or low flows since they may not achieve sufficient self-flushing. Deviations from these recommended frequencies should be based on field observations of actual sediment and debris accumulation rates, including identification and prioritization of structures that may need more or less frequent cleaning.

Additional factors to consider for evaluation of cleaning frequency include traffic volume, number of accidents (which can contribute to spills), number of catch basins, proximity to watercourses and wetlands, litter frequency (which can lead to clogged catch basins), and overhead vegetation (e.g., tree canopies).

In addition to catch basin cleaning, storm drainage system maintenance should also include removal of debris from surface basins used for stormwater management.

Disposal of Catch Basin Sediments

The estimated volume of sediment accumulation in catch basins in UAs is estimated at 0.1 pounds-per-calendar-day. Material removed from catch basins is usually disposed of in conventional landfills. However, water, sediment, and debris removed from catch basins can potentially be classified as hazardous waste

and must be disposed of in a proper manner. Before disposal, a detailed chemical analysis of the material should be performed to determine proper methods for storage and disposal.

Catch basin cleanings that have been affected by spills of gasoline or other hazardous waste must be tested to determine if they are contaminated. Testing protocols will depend on the nature of material believed to be in the sediments. Typically, analysis should be considered for heavy metals such as zinc, copper, and lead; sodium from road salts; compounds associated with asphalt; and motor oils.

If catch basin materials are hazardous, they must be managed in accordance with hazardous waste disposal requirements. If such materials are not hazardous, they must be either disposed of at a permitted waste disposal facility in accordance with an authorization issued by CTDEEP under Section 22a-209-8 of the Regulations of Connecticut State Agencies or reused in accordance with the requirements for reuse of polluted soils under Section 22a-113k-2.

TABLE 9-6
Recommendations for Maintenance of Storm Drainage Systems

	Recommendation
Catch Basin Cleaning	• Clean catch basins and other stormwater structures at least once a year. • Identify and prioritize structures that may require cleaning more than once a year based on sediment and debris accumulation rates. • Cleaning includes removal of sediments from sump and removal of any trash and debris from grate.
Disposal of Catch Basin Sediments	• Complete a chemical analysis of the material. • Dispose of material in a proper manner. Uncontaminated material may be disposed of in a conventional landfill. Contaminated material will require special disposal.

OM5: Snow Management Practices

OM5-1: Deicing Material Management

The Town continues to use treated salt product instead of road sand to reduce ice on roads. Salt product is stored within a permanent structure at the Town Farm Lane Public Facilities Complex.

Proper placement and storage of deicing chemicals is important for preventing contamination of surface water runoff. The following guidelines apply to deicer and salt storage:

- Storage facilities should not be located within 250 feet of a well utilized for public drinking water, within a mapped Level A aquifer protection area, or within a mapped 100-year floodplain.
- Storage facilities should be at least at least 100 feet from wetlands and watercourses.
- Storage piles should be covered, preferably within a roofed structure, but at a minimum with an appropriately sized, weighted tarp.
- All stockpile storage should be on impermeable pads.

Table 9-7 gives recommendations to reduce the impacts of deicers.

TABLE 9-7
Recommendations to Reduce Deicer Impacts

Activity	Recommendations
Storage	▪ Salt storage piles should be completely covered by a permanent roof and, at a minimum, by a weighted tarp and stored on impervious surfaces ▪ Runoff should be contained in appropriate areas ▪ Spills should be cleaned up after loading operations. The material may be directed to a sand pile or returned to salt piles ▪ Avoid storage in drinking water supply areas, water supply aquifer recharge areas, and public wellhead protection areas
Application	▪ Application rate should be tailored to road conditions (i.e., high versus low volume roads) ▪ Trucks should be equipped with sensors that automatically control the deicer spread rate ▪ Drivers and handlers of salt and other deicers should receive training to improve efficiency, reduce losses, and raise awareness of environmental impacts
Sweeping	▪ Sweep streets at least once a year, as soon as possible after snowmelt ▪ Identify and prioritize streets that may need sweeping more than once a year. ▪ Consider upgrading to dry vacuum and regenerative air sweepers.
Disposal	▪ Locate temporary storage of road sweepings in appropriate areas, including empty salt storage sheds, sites where sand and salt are usually handled, and paved areas more than 100 feet from wetlands and watercourses. ▪ Do not combine street sweepings with material removed from catch basins. Catch basin material may have higher pollutant loadings. ▪ Remove trash, leaves, and debris before any reuse of street sweepings. Dispose of removed material appropriately.
Other	▪ Identify ecosystems such as wetlands that may be sensitive to salt ▪ Use calcium chloride and CMA in sensitive ecosystem areas ▪ To avoid over-application and excessive expense, choose deicing agents that perform most efficiently according to *pavement* temperature ▪ Monitor the deicing market for new products and technology

OM5-2: Snow and Ice Control Practices

- Implement and refine standard operating practices regarding snow and ice control to minimize the discharge of sand, anti-icing, or deicing chemicals
- Establish goals for the optimization of sand/chemical application rates through use of automated application equipment (zero-velocity spreaders), anti-icing and prewetting techniques, implementation of pavement management systems, and alternate chemicals
- Maintain records of application of sand, anti-icing, or deicing chemicals to document the reduction of chemicals to meet established goals
- Ensure proper training for deicing application for municipal employees, institutional staff, and private contractors.

The Town will manage and dispose of snow accumulations in accordance with CTDEEP's BMPs for Disposal of Snow Accumulations from Roadways and Parking Lots, revised February 4, 2011, and as amended. Snow accumulations refer to snow banks and snow piles that are removed by front-end loader or by loading on trucks for disposal. Snow accumulations removed from roadways, bridges, and parking lots should be placed in upland areas only where sand and other debris will remain after snowmelt for later removal. Care must be exercised not to deposit snow in the following areas:

- Freshwater wetlands or in areas immediately adjacent to such areas where sand and debris may be flushed during rainstorms
- On top of storm drain catch basins
- In storm drainage swales
- On stream or riverbanks that slope toward the water where sand and debris can get into the watercourse
- In areas immediately adjacent (within at least 100 feet) of private or public drinking water well supplies (due to the possible presence of road salt)

In normal winter conditions, the Town should follow the recommended management practices outlined above.

In extraordinary winter conditions, the CTDEEP commissioner may, upon public notification, offer towns the flexibility of limited in-water disposal. When such flexibility is offered, towns who have determined that extraordinary circumstances exist where all upland, land-based disposal options have been fully exhausted (i.e., disposal capacity is not available) and snow needs to be removed to meet public safety demands (e.g., clear access ways for police, emergency medical, and fire responders) may use certain waterways for snow disposal in accordance with the following conditions:

- Upland storage and disposal of snow (e.g., athletic fields, parks and other flat, open-field sites) and other snow management methods (e.g., snow melting equipment) must be the first alternatives explored and exhausted. Environmentally sensitive areas must be avoided.
- This guidance applies only to snow and ice that is not visibly contaminated with material other than salt and sand from road clearing activities.
- Disposal in rivers or streams must be limited to those water bodies that have adequate flow and mixing and are not prone to ice jams.
- The disposal must occur only in open water in areas that will not interfere with navigation.
- Disposal must be conducted in a manner so as to prevent ice dam formation or damage to bridges, docks, or other structures.
- Disposal in ponds and lakes is discouraged.
- There shall be no disposal in freshwater wetlands, eelgrass beds, vegetated shallows, vernal pools, public water supply reservoirs and their tributaries, or others areas designated as being environmentally sensitive.
- The activity must comply with local laws and requirements.
- Precautions must be taken to avoid stream bank damage or erosion from truck/equipment activity.
- The Town must notify the department by email (address email to kevin.sowa@ct.gov) prior to disposing of snow and ice in waterways or, if advance notification is not possible, then the department must be contacted as soon as possible after snow disposal has begun.

OM6: Interconnected MS4s

The Town is required to coordinate with operators of interconnected MS4s, such as neighboring municipalities and the DOT, regarding the contribution of potential pollutants from the storm sewer systems, contributing land use areas, and stormwater control measures in the respective MS4s. By July 2019, the Town will notify the DOT of interconnected MS4s along state roads within the Town's UA.

OM7: Sources Contributing Pollutants to the MS4

The Town is required to develop and implement a program to control the contribution of pollution to its MS4 from commercial, industrial, municipal, institutional, or other facilities not otherwise authorized by permit. This occurs during the land use approval process and via enforcement of the regulations of the CTDEEP General Permits for industrial and commercial stormwater discharges.

REFERENCES

Animal Waste and the Environment by Cecil Hammond, Former Extension Engineer, University of Georgia College of Agricultural and Environmental Sciences and the U.S. Department of Agriculture, Circular 827, October 1994.

Canton Zoning Regulations, Draft, Prepared for the Canton Zoning Commission, January 23, 2013.

Cherry Brook Watershed Summary, CT DEEP, September 2012.

http://www.glwi.uwm.edu/research/genomics/ecoli/sources_of_ecoli_in_water.php
Great Lakes Water Institute, University of Wisconsin, Milwaukee.

Gosser, A. L., M. R. Conover, and T. A. Messmer. 1997. Managing Problems Caused by Urban Canada Geese, Berryman Institute Publication 13, Utah State University, Logan, 8pp.

Guidance and Recommendations for Connecticut Municipal Zoning Regulations and Ordinances for Livestock, Eastern Connecticut Resource Conservation and Development Areas, Inc., June 2012.

Subdivision Regulations of the Town of Canton, Connecticut Including Amendments through December 7, 2009; Adopted May 23, 1983; Effective Date May 23, 1983; Canton Planning Commission.

APPENDIX A

Registration Form General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

Stormwater Management Plan
Canton, Connecticut

Connecticut Department of
Energy & Environmental Protection
Bureau of Materials Management & Compliance Assurance
Water Permitting & Enforcement Division

General Permit Registration Form for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4)

CPPU USE ONLY
App #:
Doc #:
Check #:
Program: Stormwater Permits

Please complete this form in accordance with the general permit (DEEP-WPED-GP-021) in order to ensure the proper handling of your registration. Please print or type unless otherwise noted. The Registration fee must be submitted with this registration.

Part I: Registration Type

1. This registration is for a (check one): ☐ *New* general permit registration ☒ *Renewal* of an existing registration ☐ A *modification* of an existing registration	For renewals or modifications: Existing permit number: GSM **GSM000091**
2. Registrant Type (check one):	**Fees**
☐ state institution/agency	$625.00 **[513]**
☐ federal institution/agency	$625.00 **[513]**
☒ municipality	$312.50 **[513]**
3. Municipality name or Municipality where institution is located: **Canton**	
The registration will not be processed without the fee. The fee shall be non-refundable and shall be paid by check or money order to the Department of Energy and Environmental Protection or by such other method as the commissioner may allow.	

Part II: Registrant Information

1. Registrant (Name of Municipality or State or Federal Institution/Agency): Town of Canton

Mailing Address: 4 Market Street/PO Box 168

City/Town: Collinsville State: CT Zip Code: 06022

Business Phone: 8606937855 ext.:

Contact Person: George Wallace Phone: 8606937855 ext.

*E-mail: gwallace@townofcantonct.org

*By providing this e-mail address you are agreeing to receive official correspondence from DEEP, at this electronic address, concerning the subject registration. Please remember to check your security settings to be sure you can receive e-mails from “ct.gov” addresses. Also, please notify DEEP if your e-mail address changes.

Part II: Registrant Information (continued)

2. Billing contact, if different than the registrant.

Name:

Mailing Address:

City/Town: State: Zip Code:

Business Phone: ext.:

Contact Person: Phone: ext.

*E-mail:

3. Primary contact for departmental correspondence and inquiries, if different than the registrant.

Name:

Mailing Address:

City/Town: State: Zip Code:

Business Phone: ext.:

Contact Person: Phone: ext.

*E-mail:

4. Attorney or other representative, if applicable:

Firm Name:

Mailing Address:

City/Town: State: Zip Code:

Business Phone: ext.:

Attorney: Phone: ext.

*E-mail:

5. Facility Operator, if different than the registrant:

Name:

Mailing Address:

City/Town: State: Zip Code:

Business Phone: ext.:

Contact Person: Phone: ext.

*E-mail:

7. Engineer(s) or other consultant(s) employed or retained to assist in preparing the registration or in designing or constructing the activity. ☐ Check here if additional sheets are necessary, and label and attach them to this sheet.

Name: **Milone & MacBroom, Inc.**

Mailing Address: 99 Realty Drive

City/Town: Cheshire State: CT Zip Code: 06410

Business Phone: 2032711773 ext.:

Contact Person: Scott G. Bristol Phone: 2032711773 ext.

*E-mail: scottgb@miloneandmacbroom.com

Service Provided: **Stormwater Management Plan**

8. ☒ Check here if there are adjacent towns or other entities with which implementation of the Stormwater Management Plan is coordinated for a portion of the subject MS4. If so, provide the names of such towns or entities: State of Connecticut DOT

Part III: Watershed Information

Provide the following information about the receiving water(s) that receive stormwater runoff from your MS4:

The watershed ID and impaired waters status can be found on the CT ECO website: http://ctecoapp1.uconn.edu/advancedviewer/

a) To what receiving stream, watershed or waterbody does your MS4 discharge?	b) What is your watershed ID (freshwater) or 305b ID (estuary)?	c.1) Is the receiving water identified as an impaired water?	*If you answered yes to question c.1, then answer the question below.* c.2) Has any Total Maximum Daily Load (TMDL) been approved for your receiving waterbody? For more information, go to www.ct.gov/deep/tmdl	*If you answered yes to question c.2, then answer the question below.* If TMDL, identify the impairment
Cherry Brook	**4309**	☒ YES ☐ NO	☒ YES ☐ NO	Bacteria
Unnamed Tributary to Hop Brook	**4318**	☐ YES ☒ NO	☐ YES ☐ NO	
Jim Brook	**4312**	☐ YES ☒ NO	☐ YES ☐ NO	
Farmington River	**4300**	☐ YES ☒ NO	☐ YES ☐ NO	
Ratlum Brook	**4308**	☐ YES ☒ NO	☐ YES ☐ NO	
Nepaug River	**4310**	☒ YES ☐ NO	☐ YES ☒ NO	
		☐ YES ☐ NO	☐ YES ☐ NO	
		☐ YES ☐ NO	☐ YES ☐ NO	
		☐ YES ☐ NO	☐ YES ☐ NO	
		☐ YES ☐ NO	☐ YES ☐ NO	
		☐ YES ☐ NO	☐ YES ☐ NO	
		☐ YES ☐ NO	☐ YES ☐ NO	
		☐ YES ☐ NO	☐ YES ☐ NO	
		☐ YES ☐ NO	☐ YES ☐ NO	
		☐ YES ☐ NO	☐ YES ☐ NO	

☐ Check here if there are more receiving watersheds and attach an additional sheet listing them with the required information requested above.

Part IV: MS4 Information

1. Name of Municipality or State or Federal Institution/Agency : **Town of Canton**

Primary Address or Location Description: **4 Market Street/PO Box 168**

City/Town: **Collinsville** State: **CT** Zip Code: **06022**

2. **INDIAN LANDS:** Is there any activity included in, or proposed to be implemented by, your Stormwater Management Plan that will be located on federally recognized Indian lands? ☐ Yes ☒ No

3. **COASTAL BOUNDARY:** Is there any ***new*** activity included in, or proposed to be implemented by, your Stormwater Management Plan that will be located within the coastal boundary as delineated on DEEP approved coastal boundary maps?

☐ Yes ☒ No

If yes, and this registration is for a new authorization or a modification of an existing authorization where the physical footprint of the subject activity is modified, your Stormwater Management Plan must contain provisions to assure compliance with Connecticut's Coastal Management Act (CCMA), sections 22a-90 through 22a-112 of the Connecticut General Statutes (CGS), as amended.

Information on the coastal boundary is available at www.cteco.uconn.edu/map_catalog.asp (Select the town and then select coastal boundary. If the town is not within the coastal boundary you will not be able to select the coastal boundary map.) or the local town hall or on the "Coastal Boundary Map" available at DEEP Maps and Publications (860-424-3555).

4. **ENDANGERED OR THREATENED SPECIES:** According to the most current "State and Federal Listed Species and Natural Communities Map", is there any ***new*** activity included in, or proposed to be implemented by, your Stormwater Management Plan, that will be located within an area identified as a habitat for endangered, threatened or special concern species?

☐ Yes ☒ No Date of Map: **December, 2016**

If yes, your Stormwater Management Plan must contain provisions to assure compliance with the State Endangered Species Act CGS section 26-310(a).

For more information visit the DEEP website at www.ct.gov/deep/nddbrequest or call the NDDB at 860-424-3011.

5. **AQUIFER PROTECTION AREAS:** Is the MS4 or any portion of the MS4 located within a mapped Level A or Level B Aquifer Protection Area, as defined in CGS section 22a-354a through 22a-354bb?

☒ Yes ☐ No

If yes, your Stormwater Management Plan must contain provisions to assure compliance with the Aquifer Protection Regulations (section 22a-354i(1)-(10) of the Regulations of Connecticut State Agencies).

For more information on the Aquifer Protection Area Program visit the DEEP website at www.ct.gov/deep/aquiferprotection or contact the program at 860-424-3020.

6. **CONSERVATION OR PRESERVATION RESTRICTION:** Is there any ***new*** activity included in, or proposed to be implemented by, your Stormwater Management Plan that will be located within a conservation or preservation restriction area?

☐ Yes ☒ No

If Yes, your Stormwater Management Plan must contain provisions to assure compliance with CGS section 47-42d where proof of written notice of this registration to the holder of such restriction or a letter from the holder of such restriction verifying that this registration is in compliance with the terms of the restriction, must be kept on site.

Part IV: MS4 Information (Continued)

7. **STATE AND FEDERAL HISTORIC PRESERVATION**: Is there any activity included in, or proposed to be implemented by, your Stormwater Management Plan that may result in impacts or potential effects on historic properties? ☐ Yes ☒ No

   If Yes, your Stormwater Management Plan must contain provisions to assure consistency with the state Historic Preservation statutes, regulations, and policies including identification of any potential impacts on property listed or eligible for listing on the Connecticut Register of Historic Places. A review conducted for an Army Corps of Engineers Section 404 wetland permit would meet this qualification.

8. **DISCHARGE TO IMPAIRED WATERS:** Is there any activity included in, or proposed to be implemented by, your Stormwater Management Plan that will result in a ***new or increased*** discharge from the MS4 to waters listed as impaired in the most recent Connecticut Integrated Water Quality Report pursuant to Clean Water Act section 303(d) and 305(b)?

   ☐ Yes ☒ No

   If Yes, your Stormwater Management Plan must demonstrate that there is no net increase in loading to the impaired water of the pollutant for which the waterbody is impaired.

9. **DISCHARGE TO HIGH QUALITY WATERS:** Any ***new or increased*** stormwater discharge to high quality waters shall be discharged in accordance with the Connecticut Anti-Degradation Implementation Policy in the Water Quality Standards.

Part V: Supporting Documentation

Check the applicable box below for each attachment being submitted with this registration form. When submitting any supporting documents, please label the documents as indicated in this part (e.g., Attachment A, etc.) and be sure to include the registrant's name as indicated on this registration form.

☒	Attachment A:	Stormwater Management Plan: **(REQUIRED for ALL registrants)** ☐ Provide URL: http://www.townofcantonct.org/ ***or*** ☐ submit an electronic copy to the web address indicated at the end of this form.
☒	Attachment B:	An 8 1/2" X 11" copy of the relevant portion or a full-sized original of a USGS Quadrangle Map indicating the exact location of the MS4/Institution/Agency. Indicate the quadrangle name on the map. **(REQUIRED for ALL registrants)**
☒	Attachment C:	Best Management Practices Table (attached to this form) **(REQUIRED for ALL registrants)**

Part VI: Registrant Certification

The registrant *and* the individual(s) responsible for actually preparing the registration must sign this part. A registration will be considered insufficient unless *all* required signatures are provided ***and are the proper signatory authority.*** (If the registrant is the preparer, please mark N/A in the spaces provided for the preparer.)

"I hereby certify that I am making this certification in connection with a registration under the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4), submitted to the commissioner by the Town of Canton for an activity located at or within the Town of Canton and that all terms and conditions of the general permit are being met for all discharges which have been initiated and such activity is eligible for authorization under such permit. I further certify that a system is in place to ensure that all terms and conditions of this general permit will continue to be met for all discharges authorized by this general permit at the site. I certify that the registration filed pursuant to this general permit is on complete and accurate forms as prescribed by the commissioner without alteration of their text. I certify that I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(*b*)(8)(A) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I certify that I have made an affirmative determination in accordance with Section 3(*b*)(8)(B) of this general permit. I understand that the registration filed in connection with such general permit is submitted in accordance with and shall comply with the requirements of section 22a-430b of Connecticut General Statutes. I also understand that knowingly making any false statement made in the submitted information and in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

	Enter Date.
Signature of Registrant/Authorized Representative	Date
Leslee B. Hill	First Selectman
Printed Name of Registrant/Authorized Representative	Title (if applicable)
	Enter Date
Signature of Preparer (if different than above)	Date
Matthew Rose	Environmental Scientist
Printed Name of Preparer	Title (if applicable)

☐ Check here if additional signatures are required. If so, please reproduce this sheet and attach signed copies to this sheet. Signatures of any person preparing any report or parts thereof required in this registration (i.e., professional engineers, surveyors, soil scientists, consultants, etc.) must be included.

Part VII: Qualified Professional Certification

The qualified professional, as defined in the subject general permit, must sign this part. A registration will be considered insufficient unless *all* required signatures are provided ***and are the proper signatory authority.***

"I hereby certify that I am a qualified professional engineer, as defined in the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems. I am making this certification in connection with a registration under such general permit, submitted to the Commissioner by the Town of Canton for an activity located at or within the Town of Canton. I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(b)(9)(A) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I certify, based on my review of all information described in Section 3(b)(9)(A) of such general permit and on the standard of care for such projects, that I have made an affirmative determination in accordance with Section 3(b)(9)(B) of this general permit. I understand that this certification is part of a registration submitted in accordance with section 22a-430b of Connecticut General Statutes and is subject to the requirements and responsibilities for a qualified professional in such statute. I also understand that knowingly making any false statement in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

Nothing in this section shall be construed to authorize a professional engineer or a landscape architect to engage in any profession or occupation requiring a license under any other provision of the general statutes without such license.

	Enter Date
Signature of Qualified Professional	Date
Edward Hart	Director of Civil Engineering
Printed Name of Qualified Professional	Title (if applicable)
Enter License Number	
Qualified Professional License Number	
	Enter Date
Signature of Preparer (if different than above)	Date
Matthew Rose	Environmental Scientist
Printed Name of Preparer	Title (if applicable)

☐ Check here if additional signatures are required. If so, please reproduce this sheet and attach signed copies to this sheet. Signatures of any person preparing any report or parts thereof required in this registration (i.e., professional engineers, surveyors, soil scientists, consultants, etc.) must be included.

All completed and supporting materials (along with the fee) are to be submitted to:

CENTRAL PERMIT PROCESSING UNIT
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

An electronic copy must also be sent to DEEP.StormwaterStaff@ct.gov

Best Management Practices (BMPs)

For each Minimum Control Measure (MCM), list existing or proposed BMPs, the department/parties that will be responsible for implementing each BMP, the goals(s) you expect to achieve, and the month and year that the BMP will be implemented. Please note that certain mandatory minimum BMPs identified in the MS4 General Permit are already listed.

Name of City/Town: **Canton**

Name of Institution (if applicable): Address: **4 Market Street/PO Box 168**

Existing permit number (if applicable): GSM **GSM000091**

	MCM(1) Public Education and Outreach	Responsible Department/Parties	Measurable Goal	Month/Year of Implementation
1-1	Implement public education program			
1-2	Address education/outreach for pollutants of concern			
1-3				
1-4				
1-5	**SEE ATTACHED**			
1-5				
1-7				
1-8				
1-9				
1-10				
	MCM(2) Public Involvement/Participation	**Responsible Department/Parties**	**Measurable Goal**	**Month/Year of Implementation**
2-1	Comply with public notice requirements for the Stormwater Management Plan and Annual Reports			
2-2				
2-3				
2-4				
2-5	**SEE ATTACHED**			
2-6				
2-7				
2-8				
2-9				
2-10				

BMPs (continued)

	MCM(3) Illicit Discharge Detection & Elimination	Responsible Department/Parties	Measurable Goal	Month/Year of Implementation
3-1	Develop written IDDE program			
3-2	Develop list and maps of all MS4 stormwater outfalls in urbanized and priority areas			
3-3	Develop citizen reporting program			
3-4	Establish legal authority to prohibit illicit discharges			
3-5	Develop record keeping system for IDDE tracking			
3-6	Address IDDE in areas with pollutants of concern			
3-7				
3-8	**SEE ATTACHED**			
3-9				
3-10				
	MCM(4) Construction Site Runoff Control	**Responsible Department/Parties**	**Measurable Goal**	**Month/Year of Implementation**
4-1	Implement, upgrade (as necessary) and enforce land use regs or other legal authority to meet requirements of MS4 general permit			
4-2	Develop/implement plan for interdepartmental coordination in site plan review and approval			
4-3	Review site plans for stormwater quality concerns			
4-4	Conduct site inspections			
4-5	Implement procedure to allow public comment on site development			
4-6	Implement procedure to notifiy developers about DEEP construction stormwater permit			
4-7				
4-8				
4-9	**SEE ATTACHED**			
4-10				

BMPs (continued)

	MCM(5) Post-Construction Stormwater Management	Responsible Department/Parties	Measurable Goal	Month/Year of Implementation
5-1	Establish and/or update legal authority and guidelines regarding LID and runoff reduction in site development planning			
5-2	Enforce LID/runoff reduction requirements for development and redevelopment projects			
5-3	Implement long-term maintenance plan for stormwater basins and treatment structures			
5-4	DCIA mapping			
5-5	Address post-construction issues in areas with pollutants of concern			
5-6				
5-7				
5-8	**SEE ATTACHED**			
5-9				
5-10				
	MCM(6) Pollution Prevention/Good Housekeeping	**Responsible Department/Parties**	**Measurable Goal**	**Month/Year of Implementation**
6-1	Develop/implement formal employee training program			
6-2	Implement MS4 property and operations maintenance			
6-3	Implement coordination with interconnected MS4s			
6-4	Develop/implement program to control other sources of pollutants to the MS4			
6-5	Evaluate additional measures for discharges to impaired waters			
6-6	Track projects that disconnect DCIA			
6-7	Develop/implement infrastructure repair/rehab program			
6-8	Develop/implement plan to identify/prioritize retrofit projects			
6-9	Develop/implement street sweeping program			
6-10	Develop/implement catch basin cleaning program			
6-11	Develop/implement snow management practices			
	SEE ATTACHED			
	Monitoring Requirements	**Responsible Department/Parties**	**Measurable Goal**	**Month/Year of Implementation**
S-1	Outfall screening			
S-2	Inventory and mapping of discharges to impaired waters			
S-3	Follow-up investigations of drainage areas			
S-4	Annual monitoring of priority outfalls			
	SEE ATTACHED			

BEST MANAGEMENT PRACTICES (BMPs)
TOWN OF CANTON: 4 MARKET STREET, COLLINSVILLE, CT 06022
REGISTRATION NO. GSM 000091

Public Education and Outreach

Best Management Practice	Measurable Goals	Person(s) Responsible	Implementation Timeline
PE1: Implement a public education program for residents and students	1. Provide materials on maintaining and improving water quality for public on town's website, the library, and town hall	Director of Public Works	Within the first year
	2. Collaborate with Farmington River Watershed Association and other local organizations to bring workshops on water resource protection to schools, and the general public		
PE2: Implement stormwater program for industrial and commercial entities	1. Public Works, tax assessor, and other government entities should coordinate to distribute educational materials to commercial operations in town.	Chamber of Commerce Public Works Director	Within the first year
	2. Exercises and Emergency Response Scenarios	Fire Marshal	Within the first year following July 1, 2017
PE3: Implement public education program for land use officials and land use commissions.	1. NEMO workshops for town council and land use commissions	Town Engineer and Planner	Within the first year
	1. Annual Review Meetings with land use commissions and the town council		

BEST MANAGEMENT PRACTICES (BMPs)
TOWN OF CANTON: 4 MARKET STREET, COLLINSVILLE, CT 06022
REGISTRATION NO. GSM 000091

BMP PI: Public Involvement / Participation Plan

Best Management Practice	Measurable Goals	Responsible Party	Implementation Timeline
PI1: Comply with public notice requirements for the SMP and Annual Reports	1. Publish a public notice on the Town website to inform the public of the SMP and Annual Reports, and allow for a 30-day comment period.	Town Engineer / Town Planner	Annually, no later than January 31st.
	2. Hold public information meeting in coordination with regularly scheduled Conservation Commission meeting	Town Engineer	June 30, 2018
PI2: Involve the public in watershed activities	1. Hold public presentations through the land use process, and in conjunction with local environmental groups.	Town Planner	June 30, 2018
	2. Coordinate curb marker installation through youth programs.	Town Engineer	Ongoing
	3. Sponsor river cleanups with particular attention to Cherry Brook	Town Engineer	June 30, 2018
	4. Support the Connecticut River Coastal Conservation District by providing information about volunteer opportunities and the Connecticut River Watch Program.	Town Planner	July 1, 2017

BEST MANAGEMENT PRACTICES (BMPs)
TOWN OF CANTON: 4 MARKET STREET, COLLINSVILLE, CT 06022
REGISTRATION NO. GSM 000091

Illicit Discharge Detection and Elimination Plan (ID)

Best Management Practice	Measurable Goals	Responsible Party	Implementation Timeline
ID1: Develop an IDDE Program	1. Prohibit future Non-Stormwater Discharges to the storm drainage system by regulation.	Town Planner	By July 2018
	2. Establish legal authority for the IDDE Program	Town Planner	By July 2018
	3. Develop a program for citizen reporting of illicit discharges.	Town Engineer	Ongoing
	4. Eliminate existing Illicit Discharges	Town Engineer	Ongoing
	5. Maintain a record of illicit discharge abatement activities and progress of mapping, prioritization and investigations (include in Annual Report)	Town Engineer	By July 2018
ID2: Develop mapping of storm drainage system and outfalls	1. Develop mapping of all stormwater discharges from a pipe or conduit located within and owned or operated by the Town and all interconnections with other MS4s (in GIS format).	Town Engineer	By July 2019
	2. Delineate catchments to all outfalls.	Town Engineer	By July 2019
ID3: Implement Catchment Investigation Procedures	1. Assessment and priority rankings of catchments.	Town Engineer	By July 2019
	2. Investigate catchments for suspected illicit discharges. a. Dry weather screening of every MS4 outfall and interconnection b. Complete Catchment Investigation Procedure in problem catchments. c. Complete Catchment Investigation Procedure in catchments where information indicates sewer input based on outfall/interconnection screening. d. Complete Catchment Investigation Procedure in 40% of the area served by all MS4 catchments. e. Complete Catchment Investigation Procedure in 100% of the area served by all MS4 catchments.	Town Engineer	 October 2018 - July 2020 80% completion by July 2020; 100% completion by July 2022 By July 2022 By July 2022 By July 2027
	3. Removal and Confirmation	Town Engineer	Within 1 year of identifying ID
	4. Annual employee training	Town Engineer	Ongoing

BEST MANAGEMENT PRACTICES (BMPs)
TOWN OF CANTON: 4 MARKET STREET, COLLINSVILLE, CT 06022
REGISTRATION NO. GSM 000091

Construction Site Stormwater Runoff Control Plan (CSW)

Best Management Practice	Measurable Goal	Responsible Party	Implementation Timeline
CSW1: Legal Authority	1. Require developers, construction site operators, or contractors to maintain consistency with the 2002 Guidelines for Soil Erosion and Sedimentation Control, Connecticut Stormwater Quality Manual, and all stormwater discharge permits issued by the DEEP within the Town.	Town Planner	By July 2019
	2. Require the implementation of additional measures to protect/improve water quality as deemed necessary by the Town.	Town Planner	By July 2019
	3. Require the Town to carry out all inspection, surveillance and monitoring procedures necessary to determine compliance with municipal regulations, ordinances or programs related to the management of the Town's MS4. Inspections shall be conducted to inventory privately-owned retention ponds, detention ponds and other stormwater basins that discharge to or receive drainage from the Town's MS4.	Zoning Enforcement Officer / Wetlands Agents	By July 2019
	4. Require the owner of site-seeking development approval from the Town to provide and comply with a long term maintenance plan and schedule to ensure the performance and pollutant removal efficiency of privately-owned retention ponds, detention ponds and other stormwater basins that discharge to or receive discharge from the Town's MS4 including short-term and long-term inspection and maintenance measures to be implemented by the private owner.	Town Planner	By July 2019
	5. Require the permittee to control through interagency or inter-jurisdictional agreements, the contribution of pollutants between the Town's MS4 and MS4s owned or operated by others.	Town Planner	By July 2019
CSW2: Interdepartmental Coordination	1. Develop and implement a plan outlining how all municipal departments and boards with jurisdiction over the review, permitting, or approval of land	Town Engineer	By July 2019

	disturbance and development projects within the MS4 will coordinate their functions with one another.		
CSW3: Site Review and Inspection	1. Conduct site plan reviews that incorporate consideration of stormwater controls or management practices to prevent or minimize impacts to water quality.	ZEO / IWA / Town Engineer	Ongoing
	2. Conduct site inspections and enforcement to assess the adequacy of the installation, maintenance, operation, and repair of construction and post-construction control measures.	ZEO / IWA	Ongoing
CSW4: Public Involvement	1. Implement a procedure for receipt and consideration of information submitted by the public concerning proposed and ongoing land disturbance and development activities.	Town Planner	By July 2019
CSW5: State Permit Notification	1. Implement a procedure for notifying developments or contractors of their potential obligation to obtain authorization under the DEEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities if the project disturbs one or more acres of land and results in a point source discharge to the surface waters of the state directly or through the Town's MS4. Include a provision informing developers/contractors of their obligation to provide a copy of the Stormwater Pollution Control Plan to the Town upon request.	Town Planner / Town Engineer	By July 2019
CSW6: Additional measures for discharges to waters for which Bacteria is a Stormwater Pollutant of Concern.	1. Conduct site plan reviews that incorporate consideration of stormwater controls or management practices to prevent or minimize impacts to water quality.	Town Engineer	By July 2019

BEST MANAGEMENT PRACTICES (BMPs)
TOWN OF CANTON: 4 MARKET STREET, COLLINSVILLE, CT 06022
REGISTRATION NO. GSM 000091

Post-Construction Stormwater Management (DS)
(New development or redevelopment)

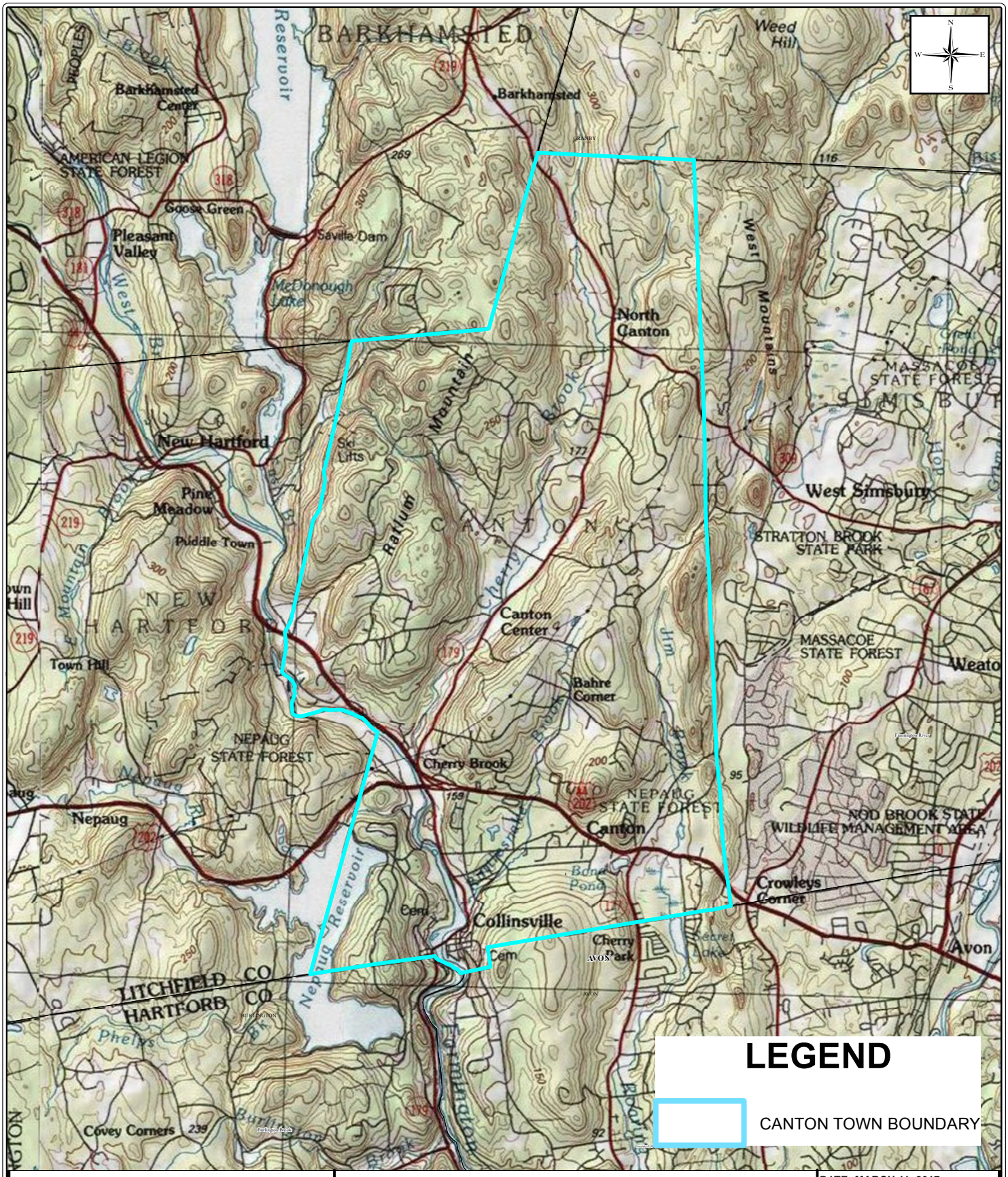
Best Management Practice	Measurable Goal	Responsible Party	Implementation Timeline
DS1: Legal Authority	1. Establish ordinance, bylaw, regulation standard condition of approval or other appropriate legal authority for Impact Development (LID) and runoff reduction site planning and development practices.	Town Planner	By July 2021
DS2: Enforce Runoff Reduction / Low Impact Development (LID) Measures	1. For redevelopment of sites that are currently developed with Directly Connected Impervious Areas (DCIA) of 40% or more, retain on-site half the water quality volume for the site. 2. For new development and redevelopment of sites with less than 40% DCIA, retain the water quality volume for the site.	Town Planner Town Planner	By July 2019 By July 2019
DS3: Directly Connected Impervious Areas	1. Map and calculate DCIA in Urbanized Area	Town Engineer	By July 2020
DS4: Ensure Long Term Maintenance of BMP's	1. Incorporate locations of detention/retention basins in GIS stormwater mapping 2. Inspect stormwater basins 3. Require developers to submit GPS coordinates/GIS mapping of all stormwater structures/basins	Town Engineer / DPW	By July 2020 Annually By July 2020

BEST MANAGEMENT PRACTICES (BMPs)
TOWN OF CANTON: 4 MARKET STREET, COLLINSVILLE, CT 06022
REGISTRATION NO. GSM 000091

Pollution Prevention / Good Housekeeping (OM)

Best Management Practice	Goal	Person(s) Responsible	Timeline Implementation
OM1: Employee Training	1. Continue a formal employee training program	Refer to Table 9-2	Annually
OM2: Infrastructure Repair, Rehabilitation and Retrofit	1. Fund and implement program 2. Develop Retrofit Program 3. Track DCIA Disconnection 4. Retrofit Planning 5. Retrofit Schedule	Public Works Director	Annually Annually By December 2020
OM3: MS4 Property and Operations Maintenance	1. Maintain and Update Operation and Maintenance Manual 2. Parks and Open Space 3. Pet Waste Management 4. Waterfowl management 5. Building and Facilities 6. Vehicles and Equipment 7. Leaf Management Plan	Public Works Director	Annually
OM4: Road and Bridge Maintenance	1. Sweeping 2. Catch basin cleaning	Public Works Director	June 30, 2020
OM5: Snow Management Practices	1. Deicing material management 2. Snow and ice control practices	Public Works Director	Ongoing
OM6: Interconnected MS4s	1. Coordinate with ConnDOT	Town Engineer	By July 2019
OM7: Sources contributing pollutants to the MS4	1. Control contribution of pollution from non-MS4 properties	Land Use Commission	Ongoing

MXD: W:\Design\1752-27-DEGIS\CANTON TOWN BOUNDARY.mxd



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Cheshire, Connecticut 06410
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CANTON MUNICIPAL BOUNDARY

MS4 REGISTRATION SUPPORTING DOCUMENTS

USGS QUADRANGLE:
20- NEW HARTFORD
21-TARIFFVILLE
35-COLLINSVILLE
36-AVON

CANTON, CT

0 3,200 Feet

SOURCE: 2004 AERIAL PHOTO, CTDEEP, 2006

DATE: **MARCH 11, 2017**		
SCALE: **1:80,000**		
PROJ. NO.: **1752-27**		
DESIGNED **PAS**	DRAWN **MER**	CHECKED **SGB**
DRAWING NAME:		

APPENDIX B

Public Education Materials

Stormwater Management Plan
Canton, Connecticut

Storm Sewers
The Rivers Beneath Our Feet

A SERIES OF WATER QUALITY FACT SHEETS ABOUT STORMWATER RUNOFF

If you look in the street outside of your home or office and search the parking lots around town, you will probably find storm sewer inlets. Did you ever wonder where they go?

A common misconception about storm sewers is that they go to a wastewater treatment plant. This is not the case. Storm sewers transport stormwater (rain and melting snow) to the nearest river, lake, stream or wetland.

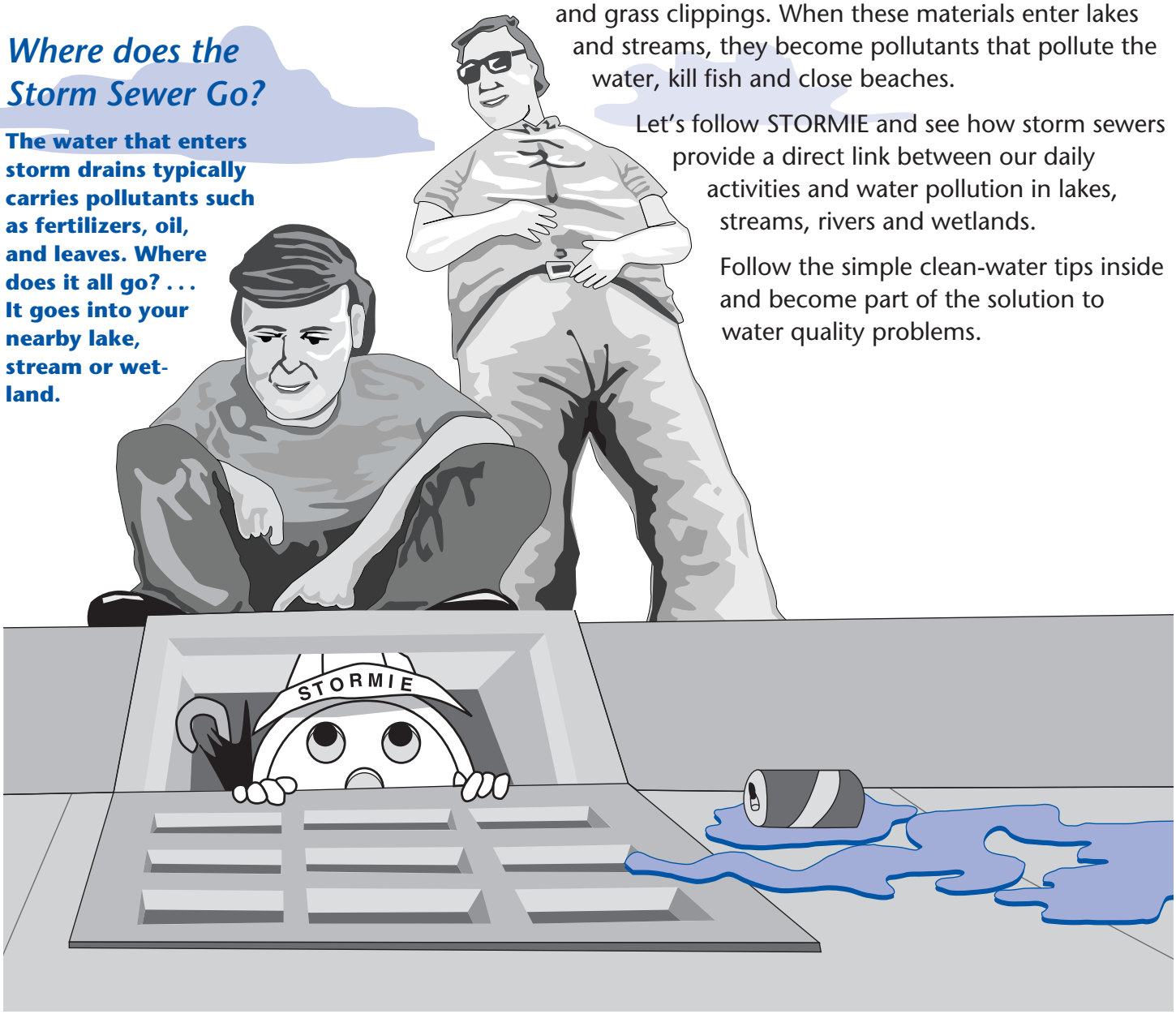
Stormwater often contains materials found on streets and parking lots such as oil, antifreeze, gasoline, soil, litter, pet wastes, fertilizers, pesticides, leaves and grass clippings. When these materials enter lakes and streams, they become pollutants that pollute the water, kill fish and close beaches.

Let's follow STORMIE and see how storm sewers provide a direct link between our daily activities and water pollution in lakes, streams, rivers and wetlands.

Follow the simple clean-water tips inside and become part of the solution to water quality problems.

Where does the Storm Sewer Go?

The water that enters storm drains typically carries pollutants such as fertilizers, oil, and leaves. Where does it all go? . . . It goes into your nearby lake, stream or wetland.



With thousands of storm sewer inlets around town, stormwater is a major contibutor to water pollution in urban areas. Although each storm sewer inlet contributes only a small number of pollutants, when added together, pollution concentrations often exceed the limits established for industries and wastewater treatment plants. If the pollutants entering each of these inlets can be reduced, so will the pollution in local streams and lakes.

Grass Clippings

Leaves

OXYGEN-CONSUMING MATERIALS, PHOSPHORUS,NITROGEN, BACTERIA

TOXIC MATERIAL

BACTERIA, OXYGEN-CONSUMING MATERIALS

Pet Wastes

Paint

LEAD

Fertilizer

PHOSPHORUS, NITROGEN

OXYGEN-CONSUMING MATERIALS, BACTERIA

Street Litter

Auto Exhaust, Motor Oil, Lubricants, Gasoline, Tire Wear

LEAD, CADMIUM, ZINC, HYDROCARBONS

Eroded Soil

SEDIMENTS, OXYGEN-CONSUMING MATERIALS

Metal Corrosion

ZINC, COPPER, CHROMIUM

Plastics

TOXIC MATERIALS

What cities can do to help:

- Adopt and enforce erosion control ordinances for construction sites.
- Require stormwater controls in all new developments.
- Install stormwater controls in existing areas where stormwater is very polluted.
- Increase spring and fall street sweeping.
- Require leaves and other yard wastes to be placed along the curb for collection rather than in the gutter.

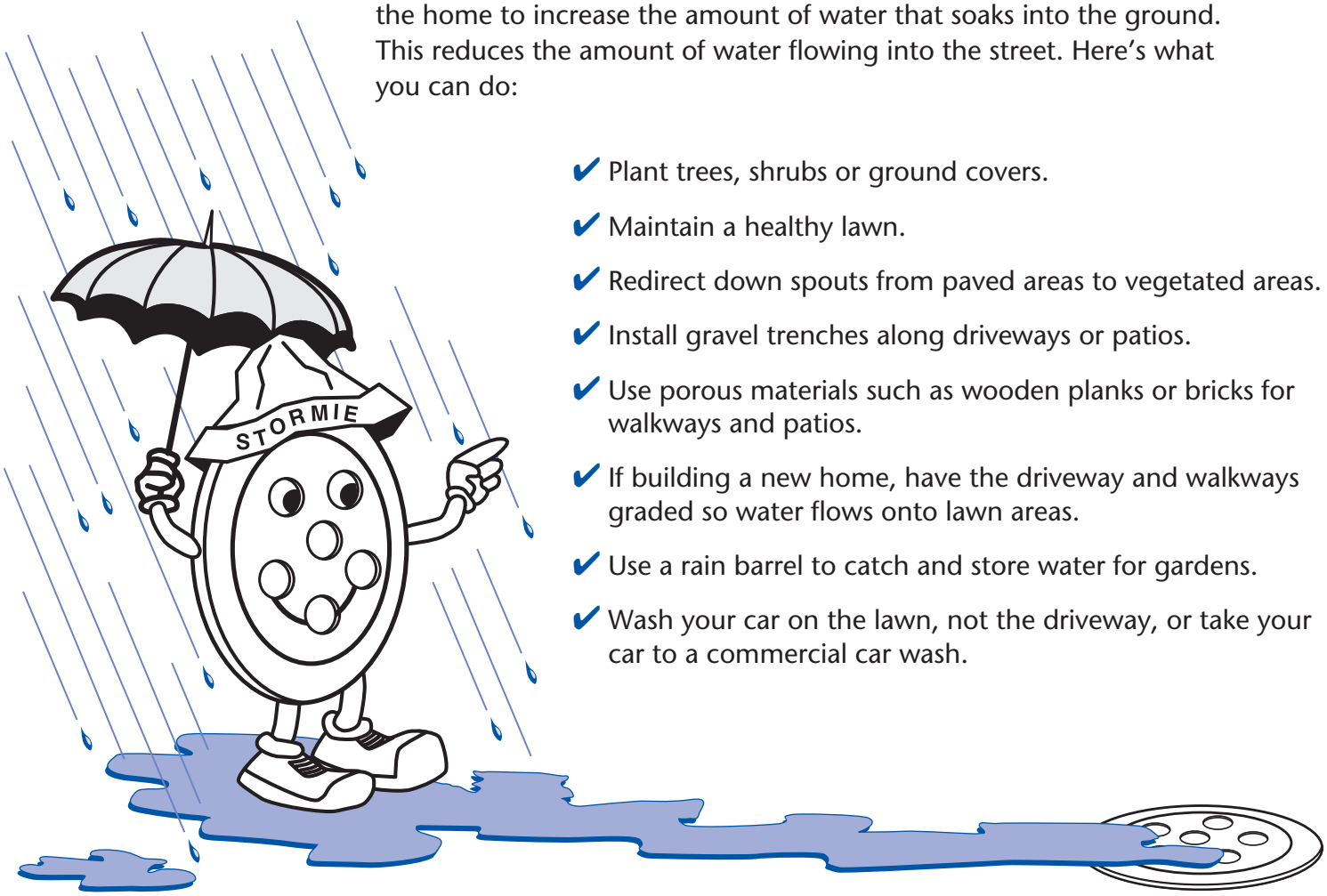
What you can do to help:

- Do not allow soil, leaves or grass clippings to accumulate on your driveway, sidewalk or in the street.
- Do not use the storm sewer for disposing motor oil, antifreeze, pesticides, paints, solvents, or other materials.
- Sweep (do not wash) fertilizer and soil off driveways and walkways onto the lawn. Any debris remaining on paved areas will quickly be washed into the nearest storm sewer during the next rainfall.
- Minimize your use of de-icing materials on sidewalks and driveways.
- Dispose of pet wastes by flushing them down the toilet or burying them.

To lake, river or wetland

CONTROLLING STORMWATER POLLUTION – WE CAN ALL HELP

According to federal regulations, many cities and industries must reduce water pollution from storm sewers. We can help by taking steps around the home to increase the amount of water that soaks into the ground. This reduces the amount of water flowing into the street. Here's what you can do:



- ✔ Plant trees, shrubs or ground covers.
- ✔ Maintain a healthy lawn.
- ✔ Redirect down spouts from paved areas to vegetated areas.
- ✔ Install gravel trenches along driveways or patios.
- ✔ Use porous materials such as wooden planks or bricks for walkways and patios.
- ✔ If building a new home, have the driveway and walkways graded so water flows onto lawn areas.
- ✔ Use a rain barrel to catch and store water for gardens.
- ✔ Wash your car on the lawn, not the driveway, or take your car to a commercial car wash.

For more information about stormwater pollution and what you can do to reduce it, contact the Deparment of Natural Resources or your county UW-Extension or Land Conservation office.

Printed on recycled paper

This publication is available from county UW-Extension offices, Cooperative Extension Publications – 1-877-947-7827, and from DNR Service Centers.

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GWQ004 Storm Sewers – The Rivers Beneath Our Feet

DNR WR-460-94

R-09-99-15M-25-S

Clean Waters

Starting in Your Home and Yard

Managing Your Household Chemicals

Your Home Contains Hazardous Chemicals

Household products are potentially hazardous if they pose risks to people, animals or the environment. Many of the chemicals that are used in everyday activities can be poisonous when they enter aquatic systems (lakes, ponds, streams or estuaries such as Long Island Sound) and can also contaminate area drinking water supplies. The U.S. Environmental Protection Agency estimates that the average household in America generates 20 pounds of hazardous household wastes annually. The typical home also stores 100 pounds of hazardous wastes.

How Do You Know if a Product is Hazardous?

Hazardous chemicals fit into one of the following categories:

CORROSIVE – able to eat through other materials;
FLAMMABLE – can ignite or burn readily;
REACTIVE – will undergo rapid chemical change such as bubbling or explosion if improperly used;
TOXIC – poisonous, can cause severe illness or death if inhaled or swallowed.

Many household products have cautionary labeling. The purpose of cautionary labeling is to alert consumers to potential human health hazards resulting from improper use. The Federal Hazardous Substance Act requires household cleaning products to be labeled by manufacturers as follows:

CAUTION or WARNING – Risk is minor; permanent damage not likely to result with first aid treatment
DANGER – Risk is substantial; typical for flammable, corrosive or toxic products
POISON – Extremely risky; a severe hazard; (uncommon on household products).

Cautionary labeling does not apply to environmental hazards resulting from improper use. Some products with no or low-level cautionary labeling may cause significantly more harm to the environment than they would to human health.

Protect Yourself, Your Family, Your Community

You can prevent human health and environmental problems, and save some time and money by making wise choices in the purchase and use of hazardous household products.

At the Store:
- Read labels thoroughly.
- Select products with the least cautionary labeling.
- Compare products.
- Seek the least hazardous products to accomplish the job.
- Products mixed with water are better for the environment.
- Select the right products.
- Buy products with safety closures.
- Choose products with environmental friendly packaging (i.e., recyclable symbols).
- Look for concentrates, which use less packaging.
- Purchase the smallest amounts needed.

At home:
- Follow directions on products.
- Consider using all-purpose products to accomplish multiple tasks.
- Discover safe, tested, alternative products that may also save you money.
- Store cleaning chemicals safely in locked cabinets in the kitchen, garage and hobby areas, away from children, the sun, heat, and ignitable sources.

Clean Waters is a collaboration of the Connecticut Sea Grant Extension Program and the University of Connecticut Cooperative Extension System's NEMO Project, educating individuals about the impacts of everyday activities on water quality and simple techniques that help protect water resources from the home well to Long Island Sound.

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Fact Sheet
December 1999

Judy Ricketts-White

- Store pressurized containers away from heat sources and moisture to prevent explosion and rusting.
- Use products in well-ventilated areas.
- Store products only in original containers.
- Dispose of containers when empty; don't reuse.
- Do not mix commercial chemicals.
- Use appropriate landscaping techniques to reduce chemical applications.
- Do not use septic system additives. Some may actually damage your system.
- Wear protective clothing – long pants, long sleeved shirts, gloves, goggles, closed shoes and hats (in some cases) as recommended on the label.
- Dispose of cleaning rags in a safe manner to avoid spontaneous combustion.
- Keep fire extinguishers handy throughout your home. (Check with your fire department for recommended type.)
- Do not burn or bury leftover oil, chemicals, paints, pesticides or containers.
- Do not pour leftover products down storm drains or on the ground.
- Do not wash chemicals down impervious surfaces (paved driveways and sidewalks).
- Never pour chemicals down the sink or storm drain .
- Do not apply pesticides on windy days.

If chemical spills do occur, clean up with an absorbent material like kitty litter or sawdust to avoid dispersion.

You can reduce the amount of cleaners used by following some practical household tips:

- Clean up messes when they occur. Stronger cleaning products may be required to remove stains once they set.
- Use water or a dampened cloth whenever possible to polish or eliminate spills.
- Reduce mildew in bathrooms by installing an exhaust fan. Squeegee shower walls after bathing.
- Pour fat/grease in metal containers, not down the drain.
- Wipe up oven spills promptly after cooking.
- Vacuum rugs frequently to reduce the necessity of shampooing.
- Regularly bathe pets and comb with a flea comb.

In Your Community:

- Follow your community recycling guidelines.
- Share unused products with others (in a clearly labeled container).
- Participate in community hazardous chemical collection days.
- Think about how your actions could affect others.
- Be a neighborhood advocate for safe home management and product practices.

Make Your Own Non/Low Toxic Household Cleaners

By making your own cleaning products, you can: promote a healthy environment, reduce chemicals going to landfills or incinerators, save money, eliminate cluttered cabinets, and easily prepare the right amount of cleaner for any job.

Follow these safety tips when making and using homemade cleaners:

- Ventilate the area.
- Wear gloves.
- Wear protective clothing and shoes.
- Avoid contact with skin and eyes.
- Store cleaners in labeled, non-food containers.
- Lock cleaners in a cabinet out of children's reach.
- Rinse surfaces thoroughly with water before applying a different product.
- Do not mix different products.
- Keep products away from heat, cigarettes, and flammable sources.
- Keep the telephone number of the nearest poison control center handy.
- Dispose of empty containers by following recycling instructions in your community.

Cleaning Supply List

These items can be purchased at most supermarkets and discount or hardware stores.

Products	Supplies
Baking Soda	Aluminum Foil
Chlorine Bleach*	Bucket
Lemon Oil	Cleaning Cloths
Mineral Oil	Gloves
Salt	Measuring Cups
Soap Flakes	Measuring Spoons
White Vinegar	Non-food Containers
Whiting**	

* Chlorine bleach compounds are toxic to aquatic organisms in very low concentrations but are less toxic than many other cleaning products. Consider using chlorine as a cleaning agent only when necessary for heavy cleaning jobs.
**Whiting (calcium carbonate) is available at hardware and paint stores.

Air Fresheners

- Open windows
- Circulate air with a fan or air conditioner
- Place cut lemons or baking soda in a dish
- Boil cinnamon and cloves in water

All Purpose Cleaners

- Mix 1/4 cup baking soda and 1 quart warm water. Wipe surface with sponge, then dry.
- Soap Jelly can be made by adding 1 cup of shaved soap flakes or leftover soap pieces to 1 quart of boiling water. Stir until dissolved. Pour into jar and let cool. Mix with water as needed.

Aluminum Cleaners

- Soak in a solution of 1/4 cup white vinegar to 1 quart water; boil if necessary.
- Soak in a solution of 2 teaspoons cream of tartar in 1 quart of water; boil if necessary.

Bathroom Cleaners

- Mix 1/2 cup chlorine bleach and 1 cup water. Spray on tile to remove mildew. Let stand for ten minutes. Rinse with water.
- Mix 1/4 cup baking soda and 1 quart water. Wash with sponge, wipe dry.
- Remove tub stains by scrubbing with a paste of cream of tartar and hydrogen peroxide.
- Remove copper stains (green) by using salt and vinegar or salt and lemon juice.
- Remove lime deposits with vinegar.

Brass and Copper Cleaner

- Mix 2 tablespoons salt, 1 tablespoon lemon juice and 1 tablespoon vinegar. Rub with sponge and let dry. Rinse with hot water, then dry with soft cloth.

Chrome Cleaner

- Mix 1/4 cup baking soda with enough water to make a paste. Rub on, rinse with water, then dry.
- Apply whiting on a damp cloth.

Disinfectants

- Mix 1/4 cup bleach to 1 quart water
- Mix 1/2 cup borax to 1 gallon hot water.

Drain Cleaners

- Use drain traps.
- Pour boiling water down the drain.
- Use a plunger or plumber's snake.
- Mix 1/2 cup baking soda, 1/2 cup vinegar and 1/2 cup boiling water. Pour into drain. Let stand.

Floor Wax Remover
- Mix 3/4 cup dry detergent, 1 gallon hot water and 1/3 cup ammonia. Spread solution on a small area and let stand a few minutes. Scrub to remove wax. Rinse floor thoroughly. Let dry.

Furniture Polish
- Mix 1 teaspoon lemon oil and 1 pint mineral oil. Spray on furniture; wipe clean with soft cloth.
- Mix 1/4 cup linseed oil, 1/4 cup vinegar and 1/2 cup lemon juice. Rub into wood with soft cloth.

Household Insecticides (For Plants)
- Mix 1/2 teaspoon shaved soap flakes and 1 quart water. Wash leaves with soap solution, rinse with water. Large plants can be rinsed in the shower. (Do not use on plants located in low light.)

Household Pests
- Contact the UConn Home and Garden Center (toll free) @ 1-877-486-6271.

Marble
- Mix 1 tablespoon baking soda and 1 quart water. Wash with sponge, wipe dry.

Mothballs
- Store clean clothing in airtight chests or containers.

Oven Cleaner
- Make a paste of equal parts of salt, baking soda and water. Apply to walls of oven. Let stand for five minutes, wipe clean with a damp cloth. (Use a brush on heavy spills). Do not allow baking soda to touch wiring or heating elements.

Paint Brushes
- Place hardened paintbrushes in a bowl of hot vinegar for ten minutes. Rinse thoroughly.

Painted Surfaces
- Dust and vacuum surface before applying liquid solutions. Use a well-wrung cloth dipped in the cleaning solution. Starting from the baseboard, work upwards toward the ceiling to prevent streaking. Clean small areas at a time. Rinse with water, then dry.
- Mix 1/4 cup soap jelly (see all-purpose cleaners) and 1 gallon hot water. Wash walls with cloth dipped in this mixture.
- Mix four parts whiting to one part soap jelly to clean heavily soiled areas. Rub carefully on soiled areas. Rinse with water and let dry.

Refrigerator
- Mix 1/2 cup bleach and 1 gallon water. Wash refrigerator interior, wipe dry.

Silver Cleaners
- Line an aluminum pan with a piece of aluminum foil.
- Mix 1 teaspoon baking soda, 1 teaspoon salt and 1 quart hot water. Add silver and boil for three minutes. Remove silver, wash with detergent, rinse and dry. (Do not use on silver jewelry).

Toilet Bowl Cleaner
- Add 1/2 cup bleach to toilet. Let stand for a half-hour. Scrub bowl with brush and flush.

Upholstery Shampoo
- Mix 2 teaspoons mild detergent, 1 teaspoon water softener and 1 pint warm water. Whip into a foam with electric beater. Vacuum furniture. Test foam for color fastness in an inconspicuous area. Apply foam gently with a sponge or soft brush in a circular motion. Rub until foam disappears. Do not saturate fabric. Dry rapidly with fans.

Whiting
- Sprinkle whiting on surface. Rub with soft damp cloth to polish chrome or porcelain and remove metal marks on stoneware.

Window Cleaner
- Add 2 tablespoons vinegar to 1 quart warm water. Spray on windows and wipe dry.

Written by –
Mary Ellen Welch
Extension Educator
University of Connecticut
Cooperative Extension System

For more information contact: Connecticut Sea Grant, 1084 Shennecossett Rd. Groton, CT 06340
www.seagrant.uconn.edu

Sea Grant Connecticut

The Connecticut Sea Grant College Program, based at the University of Connecticut, is part of a national network of university-based programs sponsoring coastal and marine-related research, outreach and education.

NEMO

Fact Sheet #2

Clean Waters

Starting in Your Home and Yard

Integrated Pest Management and Biological Controls for the Homeowner

Clean Waters *is a collaboration of the Connecticut Sea Grant Extension Program and the University of Connecticut Cooperative Extension System's NEMO Project, educating individuals about the impacts of everyday activities on water quality and simple techniques that help protect water resources from the home well to Long Island Sound.*

Does the word "pest" bring to mind your little sister or a nosy neighbor? A pest, by definition, is any unwanted organism. In garden, landscape or lawn management, insects, animals, bacteria, fungi, viruses and weeds may all be pests. Integrated pest management, or IPM, is a pest management strategy that has received increased attention in recent years. As a homeowner, you can practice IPM on your own property, whether you are growing and maintaining trees and shrubs, turfgrass, herbaceous perennials, flowering annuals, or a fruit and vegetable garden.

What is IPM?

IPM is a decision-making process that uses biological, chemical and cultural practices to manage pest problems in the production and maintenance of plants, in a way that minimizes risks to human health, society and the environment.

- Biological control is the use of naturally occurring predators, parasites and pathogens to manage pests. A common example is using lady beetles to reduce aphid populations before they cause plant damage.
- Chemical control is the use of commercially available pesticides to protect plant material.
- Cultural control involves selecting the appropriate plant material for the growing conditions on your property, and then maintaining the plant's health through proper fertilization, irrigation and pruning practices. Healthy plants are less susceptible to insect and disease attack.

The most common misconception about IPM is that it does not include chemical pesticides, which would be an "organic" approach. This is not true. IPM may involve the use of chemical pesticides, but in a way that minimizes the overall reliance on them as the only pest control method. A more intelligent use of these products reduces their negative impacts on the applicator and the overall environment. An example of the IPM approach is to spot spray only the problem plants, rather than treating the entire area.

Homeowners taking care of their property, whether it is the lawn, landscaping or gardens, can have a significant impact on the overall health of the landscape. Many people may not be aware of simple cultural practices that can prevent or reduce their most troublesome pest problems without using chemicals. The following information will assist with pest control, while also protecting the environment and water quality.

Accurate pest identification is needed for successful pest management, especially if you want to use biological control organisms that are host specific. First, determine if there is really a problem. Most insects have no negative effect on plants and many provide important services like pollination. Frequent inspections or scouting of valuable plants, once every one to two weeks, will enable you to catch pest problems early when they can be more easily treated. If you cannot diagnose the problem, have a sample analyzed for correct identification. For example, it is completely ineffective to treat unusual leaf spots with a fungicide if bacteria, insects, or poor environmental conditions are actually causing the problem. Your local Cooperative Extension office or Agricultural Experiment Station can help you make proper identification of your pest problems.

Where Do I Begin? – Cultural Practices

IPM begins with the establishment of the proper growing environment. Soil preparation and cultural practices such as proper mowing, pruning,

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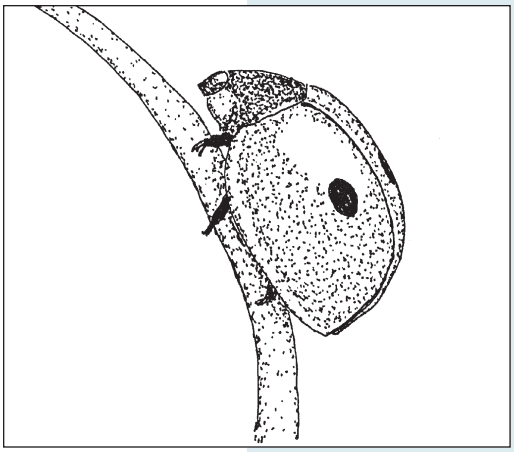

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fertilization and irrigation are extremely important to plant health. If a plant is not in the correct growing conditions (improper soil, too much or too little moisture, and excessive or inadequate sunlight), it will be prone to problems. Also, try not to wound plants unnecessarily. Mow and prune correctly and avoid mower and other mechanical injury to healthy trees and shrubs. It is also necessary to recognize the fact that plants, like other living organisms, age. Plants that are old and dying, or stressed, are more susceptible to pest problems.

Do not allow pests to become established. Purchase plant material that is free of disease or insect problems. You may never have a problem with certain insects if you do not introduce them into your landscape. Given the opportunity, use pest-resistant plant varieties to reduce pesticide usage in your landscape.

Proper sanitation will help prevent many pest problems. Many pests survive the winter among weeds or in plant debris. Remove weeds and any decaying plant material. If possible, when a plant has died due to a pest problem, replace it with a pest-resistant variety of the same species or with a different species to prevent repeating the problem. Exclusion barriers, such as plastic netting for birds and Japanese beetles, or plastic or woven landscape fabric for weeds, can also prevent or reduce pest damage. Soil solarization, the practice of covering soil with clear plastic to raise the soil temperature for two to three weeks, will kill many weed seeds.

Calling in Reinforcements – Biological Controls

Landscapes and gardens have natural populations of helpful organisms at work. These "workers" are the beneficial predators, parasites and pathogens that naturally target pest organisms in the environment. Beneficial organisms include a wide assortment of organisms such as: bacterial and/or fungal diseases; spiders; mites; centipedes; nematodes; various lady beetles; ground beetles; rove beetles; lacewings; predacious bugs (minute pirate bugs, big-eyed bugs, damsel bugs, stink bugs); and numerous parasitic wasps. Most pest management practices are designed to manage against the pests; instead, manage for beneficial organisms that are already providing valuable pest control.

Why is biological control important? The preservation and use of common beneficial organisms ensures that the natural ecological balance is maintained and promotes a safe home landscape by reducing pesticide use. The misuse of pesticides can impact directly on beneficial organism/pest interactions. Pesticide resistance develops in pest organisms that were once killed by a specific application of pesticide and through genetic evolution can now survive the application. Increased rates of application may not provide greater control either, making a once reliable pest control weapon useless. Pest resurgence occurs when natural biological control organisms are reduced by broad-spectrum pesticides, either by one that persists in the environment for long periods of time or by numerous applications of chemicals with short residual times, to a level where they can no longer keep the pests in balance. This causes an increase in the pest populations.

A disruption of natural enemies can also lead to secondary pest outbreaks. Pesticides reduce the natural enemy populations and a pest insect, that was not causing the original problem, increases in population to a damaging level. Pesticides also affect non-target organisms such as wildlife, pets and humans.

One method of biological control is augmentation. This practice involves the purchase and release of beneficial organisms, usually insects, into the infested area. In order for this practice to be effective, the correct organism must be purchased and released at the appropriate time. Many beneficial insects choose specific hosts or prey as food sources. Anyone considering this

tactic must have the knowledge to select the proper beneficial insects.

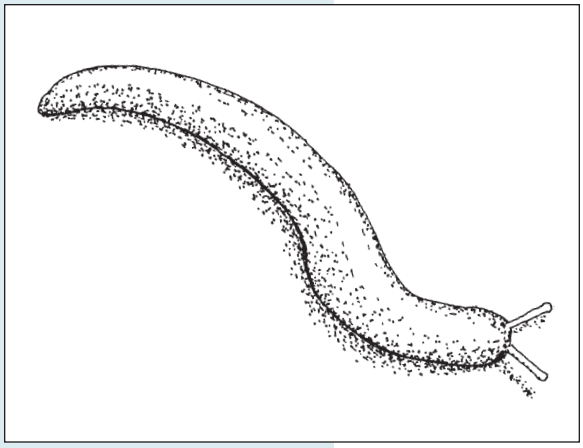
Conservation of natural enemies present in the environment is the easiest and most cost-effective method of biological control available for gardeners. Conservation involves changing and improving management practices to either reduce harmful effects on beneficial organisms or to improve the environment to increase their populations. Reducing pesticide impacts would be the first and most important change to conserve natural enemies. Many insecticides and some fungicides directly affect natural controls by killing them at the time of application. Others have long residual activity and harm beneficial organisms that later move into the treated area. Pesticides can also indirectly harm beneficial organisms by causing lengthened development time of the immature stages, reduced prey consumption, reduced reproductive capability, and repellency, where beneficial organisms are driven away from the treated plants by the chemical pesticide. An easy and colorful method of promoting beneficial insects is to grow a wide variety of plant materials in the home landscape or garden. An herbaceous perennial border, with a variety of species that flower at different times during the growing season, will provide alternate food sources (i.e. pollen) for some beneficial insects when there are no prey insects available.

The Last Resort: Chemical Pesticides

If you have a pest problem serious enough to require the use of a chemical pesticide, check the product label to be sure both the plant and pest are listed. Read The Entire Label Carefully and, above all, Follow The Directions Exactly. Remember that The Label Is The Law, literally, for pesticide application. By using higher application rates than the directions call for, you will only waste money and risk contaminating the environment without eliminating any more of the pests.

The following recommendations can reduce pesticide impacts.

- Use the fewest number of applications possible, and use only when necessary.
- When possible, use insecticidal soap or horticultural oil rather than a longer residual synthetic insecticide.
- If synthetic insecticide is to be used, try to use one with a short residual activity.
- Use granular formulations or systemics (which are absorbed into the plant through the roots or leaf surfaces) instead of long-lasting foliar sprays.
- If possible, time pesticide applications for when natural enemy populations will not be harmed, such as during pupation or when they are on another host plant.
- Use reduced rates whenever possible and treat only infested plants, not entire areas.



Judy Ricketts-White

When selecting and using chemical pesticides, keep in mind that low toxicity does NOT mean non-poisonous! It means that these pesticides pose the least environmental risk, as they tend to break down rapidly into non-toxic components when exposed to air, high temperatures, and sunlight.

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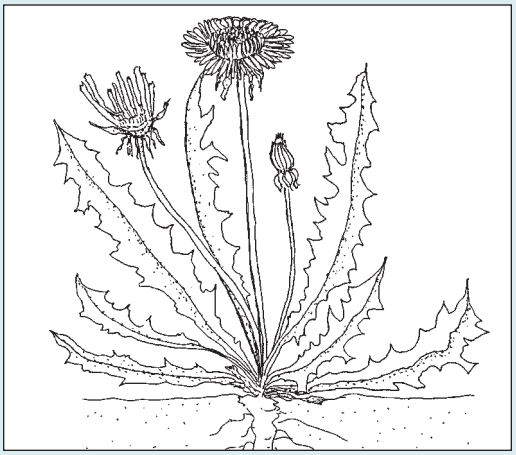

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WEED MANAGEMENT

Control Method	Target
Soil solarization	most weed seeds
Hand pulling	all weeds
Mulch, plastic or fabric barriers	all weeds
Repeated cutting back	all weeds
Boiling water	all weeds
Glyphosate	all weeds

DISEASE MANAGEMENT

Control Method	Target
Soil solarization	club root, corky root, some fusarium and verticillium wilt, crown gall
Bordeaux mix	brown rot, shot hole (tree fruit), some grape diseases, apple scab, apple black rot, anthracnose, early blight, and late blight
Fungicidal soap	brown rot, peach scab, apple scab, powdery mildew, downy mildew
Horticultural oil	powdery mildew
Lime sulfur	powdery mildew, anthracnose, apple scab, brown rot, peach leaf curl
Sulfur	brown rot, peach scab, apple scab, powdery mildew, and downy mildew
Terramycin	some bacterial diseases

INSECT, MITE AND SLUG MANAGEMENT

Control Method	Target
Physical barrier (row covers, etc.)	a wide variety of insects
Hard stream of water	mites
Hand picking	all visible insects and eggs
Bacillus thuringensis "BT"	Colorado potato beetle, elm leaf beetle, many moth larvae, and mosquitoes
Diatomaceous earth	household pests, slugs, many crawling insects
Insecticidal soap	mites, aphids, mealy bugs, thrips, fungus
Horticultural oils	aphids, psylla, scale, mites, mealy bugs, leafhoppers
Pyrethrum	many flying insects
Neem	beetles, moth larvae, whiteflies, leafminers, gypsy moths, and mites
Rotonone	beetles, weevils, slugs, loopers, mosquitoes, thrips, flies
Nematodes	borers, grubs, cutworms
Ryania	codling moth, thrips, corn borers
Sabadilla	bugs, leafhoppers, striped cucumber beetles, caterpillars, thrips

The materials listed above are registered for use on specific pests, plants, or areas of the country. Information is for educational purposes only. The recommendations on this fact sheet are based on available knowledge at the time of printing. Any reference to commercial products, trade names or brand names is for information only; no endorsement or approval is intended. Registrations change frequently.

USE PESTICIDES ONLY IN ACCORDANCE WITH CURRENT FEDERAL AND STATE LAWS.

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NEMO

Fact Sheet #4

Clean Waters

Starting in Your Home and Yard

Clean Waters *is a collaboration of the Connecticut Sea Grant Extension Program and the University of Connecticut Cooperative Extension System's NEMO Project, educating individuals about the impacts of everyday activities on water quality and simple techniques that help protect water resources from the home well to Long Island Sound.*

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Fact Sheet

December 1999

Caring for Your Septic System

When you flush your toilet, or pour something down your drain, do you know where it goes? If your home is not on a municipal or community system, your wastewater probably goes into an on-site sewage disposal system, commonly called a septic system. A septic system is designed to collect, treat and dispose of wastewater on site so that it can percolate into the ground without clogging the soil or contaminating ground or surface waters.

In Connecticut, nearly 40% of homes use some form of on-site sewage disposal system to treat and dispose of household wastewater. When properly sited, designed, installed and maintained, a septic system can be a cost-effective method of wastewater treatment. However, since wastewater disposal is something most of us don't spend much time thinking about, many systems are out of date, not functioning properly, or clearly failing.

Domestic wastewater contains several kinds of pollutants. The major pollutant is the pathogens (disease-causing microorganisms) like the bacteria and viruses that cause dysentery, hepatitis, and typhoid fever. Fortunately, soil and soil bacteria can effectively remove most pathogens from wastewater treated by a properly functioning septic system.

When nutrients such as nitrogen and phosphorus are discharged from septic systems into the groundwater, they can contaminate drinking water supplies, and also represent a potentially important nonpoint source of pollution to ponds, streams, and estuaries such as Long Island Sound. In freshwater systems, phosphorus causes excessive aquatic weed growth that can limit the uses of ponds and lakes. In the Sound, excess nitrogen fuels massive algal blooms, which in turn die, using up oxygen as they decompose.

The improper use of septic systems has been shown to contribute to contamination of groundwater by toxic chemicals. Contaminants that may enter groundwater through septic systems include heavy metals and toxic chemicals from small commercial establishments, toxic household products, and organic chemicals typically found in septic tank cleaning products.

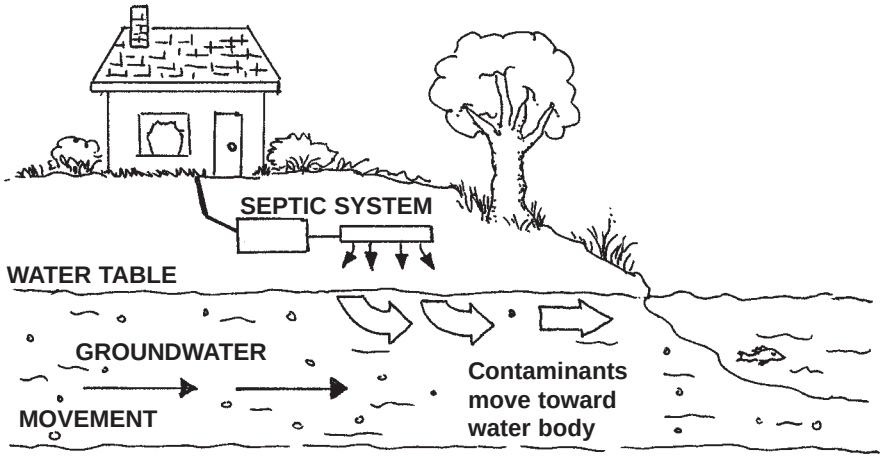
How Does A Septic System Operate?

Most systems have two main components: the septic tank and the leach field. A distribution box is often found between these two components to distribute wastewater to all parts of the leach field.

The septic tank receives the wastewater and provides a site for the solids to separate and settle and for some decomposition of solids and contaminants to occur. Heavy solids settle to the bottom of the tank forming a layer of sludge. Lighter solids, like grease, float to the top forming a layer of scum. The wastewater in the middle is pushed out into the leach field as more wastewater moves into the tank. Solids need time to settle to prevent them from being pushed out into the leach field and they also need to be periodically pumped from the tank. A properly sized tank will hold 2-3 days worth of wastewater to allow for proper settling. A two-chambered tank allows for more complete settling of solids because there is less turbulence in the second chamber, resulting in cleaner water leaving the tank.

The leach field consists of trenches or a bed, often lined with gravel or coarse sand, and is buried one to three feet below the surface of the ground.

Perforated pipes or drain tiles run through the trenches. Wastewater trickles from the perforat-



Groundwater can transport biological, chemical and nutrient contaminants to nearby surface waters.

redrawn from LISS fact sheet #13

ed pipes through the gravel and into the soil, which acts as a biological filter. Microorganisms found in the soil, and the soil itself, continue the treatment process begun in the tank by removing harmful organisms, organic matter and some nutrients.

Care and Maintenance of the System

Proper siting, design and installation are all critical to the proper functioning and long life of a septic system. The owner/user of that system plays an equally important role. Using preventive practices, maintaining the system and watching for signs of failure are key.

Preventive practices include (a) improving the quality of wastewater; (b) reducing the amount of wastewater, and (c) protecting the leach field. Simply put, use care in what you put into the system. It was designed for one purpose and one purpose only...to treat wastewater exiting the home.

Do not use the wastewater disposal system as a wastebasket, household chemical disposal site, or use unnecessary additives in your system. Also, the use of a garbage disposal further taxes the system. IF you use a garbage disposal, your septic tank should be pumped more frequently.

Conserve water where possible. The less water entering the system, the less turbulence and better settling that will occur. For example, decrease the amount of water going into the tank by spreading out water-using activities (like laundry) during the course of the week. Install low-flow showerheads, use a "toilet tummy" or a half-gallon milk jug filled with water in the toilet tank and encourage short showers in the household.

Lastly, protect the leach field. Avoid compacting the soil or crushing the pipes. Don't let heavy vehicles or animals cross the leach field; don't place heavy objects like swimming pools or storage sheds over the field. Also, avoid planting trees within the leach field as the roots can cause damage to the system. Grass is the best thing to grow over the leach field.

Maintenance means inspection and pumping of the tank. An inspection should include checking sludge and scum levels as well as checking baffles to be sure that they have not been damaged.

Tank pumping is needed to remove the solids that cannot be broken down by bacteria and which should not enter the leach field. Frequency of pumping will depend upon the number of members in the household as well as the tank size. The state of Connecticut Department of Public Health recommends pumping every 3-5 years. Some towns in Connecticut require routine pumping. Keep maintenance records, using something like the attached record-keeping chart, to avoid the "out of sight, out of mind" problem.

A failing system can result in the spread of disease from improperly treated wastewater/ sewage. You should be able to recognize the signs of a failed system and be prepared to act to correct problems. If you experience sewage backup in drains or toilets, slowly draining sinks, tubs and toilets, foul odors, repeated intestinal illnesses in household members, standing waste-

water or soggy areas on the ground above or near the septic system, or excessive growth of lush, green plants over the leach field even during dry weather, your septic system is probably failing.

Use of Additives

There are several types of septic system additives available. Generally, additives are marketed to: digest or "liquify/gasify" the solids in a septic tank; rejuvenate stressed bacterial populations in the tank; and/or increase "settleability" of solids in the tank. Though some of the products may do what they suggest, the necessity of such additives is not proven. Others, though harmless to the system, are ineffective. Others still may actually prove damaging, particularly to the leach field and the soils.

In Connecticut, the State Department of Public Health does not recommend the use of additives. The U.S. Environmental Protection Agency also does not recommend the use of these products.

If you have questions about the location of your septic system, contact your local health department. Also, be sure to maintain records of location, pumping, maintenance or repair should you decide to sell your property. A savvy buyer will want to have confidence in the status of your home's septic system.

Use the record sheet on the back page to keep track of your septic system's location and maintenance.

Tank size (gals.)	Household Size (number of people) 1	2	3	4	5	6
500	5.8	2.6	1.5	1.0	0.7	0.4
750	9.1	4.2	2.6	1.8	1.3	1.0
900	11.0	5.2	3.3	2.3	1.7	1.3
1000	12.4	5.9	3.7	2.6	2.0	1.5
1250	15.6	7.5	4.8	3.4	2.6	2.0
1500	18.9	9.1	5.9	4.2	3.3	2.6
1750	22.1	10.7	6.9	5.0	3.9	3.1
2000	25.4	12.4	8.0	5.9	4.5	3.7
2250	28.6	14.0	9.1	6.7	5.2	4.2
2500	31.9	15.6	10.2	7.5	5.9	4.8

Estimated septic tank pumping frequencies in years.
These figures assume there is no garbage disposal unit in use.
(Source: Pennsylvania State University Cooperative Extension Service)

Sources:
Long Island Sound Study, "The Impact of Septic Systems on the Environment," Fact Sheet #13, September 1991.

The University of Rhode Island Department of Natural Resources Science, "Maintaining Your Septic System", Fact Sheet 88-2, April 1988.

"Small Flows" Newsletter, Spring 1997, Vol. 11, No. 2, 'Septic Tank Additives', page 10.

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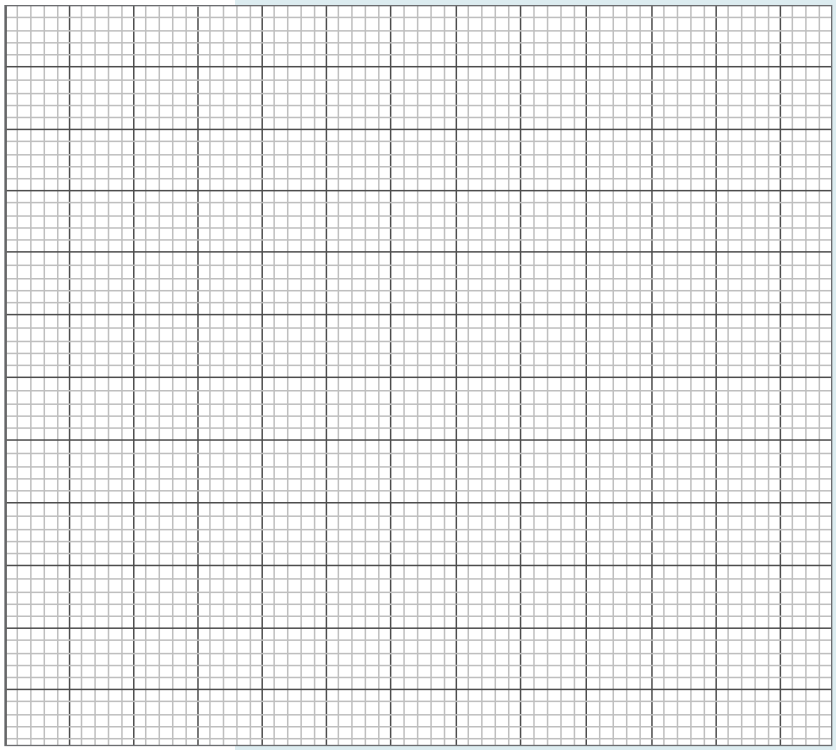
NEMO

Fact Sheet #3

Record Sheet



Septic System Layout

If you do not have a sketch of your septic system to place in this file, you should fill in the space provided, showing the relative location of your septic system components in relation to your house.

Date	Work Done	Firm	Cost

Preventive Maintenance Record

Keeping a record of your septic system maintenance experience will help you anticipate when the next cleaning may be needed.

If you should move, leaving a copy of this record will help the new homeowner.

Your Septic System Pumper

Name_____

Address_____

Date Installed_____

Phone_____

Your Septic System Installer

Name_____

Address_____

Date Installed_____

Phone_____

Clean Waters

Starting in Your Home and Yard

Animal Waste and Water Quality

Clean Waters *is a collaboration of the Connecticut Sea Grant Extension Program and the University of Connecticut Cooperative Extension System's NEMO Project, educating individuals about the impacts of everyday activities on water quality and simple techniques that help protect water resources from the home well to Long Island Sound.*

It's first thing in the morning and the dog wants to go out right NOW, the cats are standing by their litter box waiting for some fresh kitty litter, and your toddler is demanding a trip to the park to feed the ducks. While none of these activities may sound like a major threat to the environment, animal waste is one of the many little sources of pollution that can add up to big problems for water quality and may cause human health problems as well. While most people connect animal waste problems to agriculture, studies have shown that pets, waterfowl and other urban wildlife waste can cause significant water pollution problems.

Animal waste contains several types of pollutants that contribute to water quality problems: nutrients, pathogens and a naturally toxic material, ammonia. When animal waste ends up in a lake, stream, or Long Island Sound, it decomposes, using up oxygen and releasing its pollutant load. During summer months when the water is warm, the combination of low oxygen levels and ammonia can kill fish and other aquatic organisms. The nutrients cause excessive growth of aquatic weeds and algae. When these conditions make the water murky green and smelly, or when the surface of the water is completely covered with a thick mat of vegetation, the area becomes unattractive or unusable for swimming, boating or fishing.

Pathogens, the disease-causing bacteria and viruses associated with animal waste, can also make water unsafe for human use. If pathogens or the indicator bacteria associated with animal waste are found during water testing, shellfish beds may be closed to harvest, beaches may be closed to swimming and drinking water supplies may require expensive filtration or disinfection.

Fortunately, there are some simple practices everyone can do to help prevent pollution by keeping animal waste out of the water. While it may seem easier to ignore the problem of animal waste, remember that you are protecting not only the environment but also your own health.

Keeping Animal Waste Out of the Water

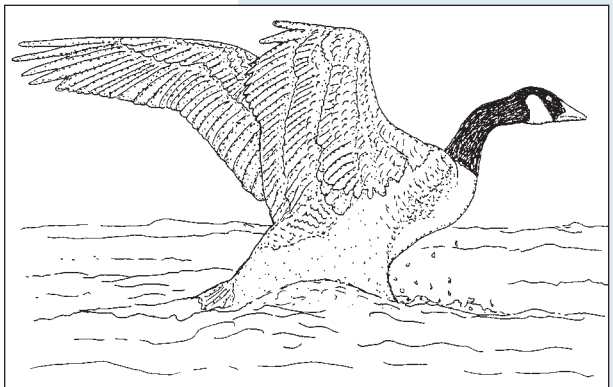
1. Pick up after your pet. Preventing water pollution can be as simple as remembering to take along a plastic bag or pooper scooper when you walk your dog. For both "quality of life" and public health reasons, many communities actually have laws requiring anyone taking their animal off of their property to immediately clean up the waste after the pet relieves itself. Your choices once you have picked up the waste include:

• Flush it down the toilet so the septic system or sewage treatment plant will treat it in the same manner as human waste.

• Put it in the trash. This is less effective, as waste that ends up in a landfill may still cause pollution problems. Putting animal waste in the trash is actually against the law in some communities.

PLEASE CLEAN UP AFTER YOUR PET

• Bury it in your yard. The microorganisms in the soil will break down the waste and release the nutrients to nearby plants. Make sure the hole is at least five inches deep and located away from vegetable gardens, children's play areas, or any lake, stream, wetland, well or ditch. CAUTION: Don't bury waste in your compost pile. The pile does not get hot



Judy Ricketts-White

DON'T FEED WATERFOWL

enough to kill the pathogens and using the compost could cause illness.

• Install an underground pet waste digester. These function like small septic tanks. Before buying one, check for local laws that may restrict their use or location.

2. Keep your yard clean. While there are no laws requiring you to clean up animal waste on your own property, there are good reasons to be careful where you leave it to decay. Some diseases can be transmitted from pet waste to humans through soil contact. Children who play outside and adults that garden are most at risk for infection, so cleaning up waste from play and garden areas is especially important. Washing hands with anti-bacterial soap and water after working or playing in the dirt is the best protection from disease.

Some of the more common waste-borne diseases and their symptoms are the following. *Camplyobacteriosis* causes diarrhea in humans. *Salmonellosis* has symptoms including fever, headache, vomiting and diarrhea. *Toxocariasis* is a roundworm that may cause a rash, fever, and cough or vision loss. *Toxoplasmosis*, a protozoan parasite that can cause severe birth defects if a woman becomes infected during pregnancy, is the reason pregnant women are told to avoid handling used kitty litter. This parasite can also cause problems for people with weak immune systems. Symptoms include headache, muscle aches and lymph node enlargement.

3. Don't feed waterfowl. While one of the pleasures of a trip to the park has always been taking stale bread to feed the ducks, the environmental and health impacts of this activity for both humans and birds can be serious. While ducks, geese and swans all love bread, it lacks in the nutrients and roughage of their natural diet. Feeding these birds bread is similar to feeding a small child a diet of candy and soda; they may love it, but it does them no good and may cause long-term health problems.

Feeding waterfowl also tends to cause the birds to concentrate in numbers higher than can be supported by the natural food supplies. This can cause problems in the winter months when fewer people come to the park or shore with food. There have been cases along the Connecticut shoreline where swans were so used to being fed at a particular location that they remained in the area long after the feeding stopped, became too weak to fly someplace with a better food supply, and eventually died of starvation. These large flocks of birds also create large quantities of waste and the serious water pollution problems described earlier in this fact sheet.

4. Dispose of kitty litter properly. When cleaning out the litter box, a two-step approach is most effective. Cat waste may be scooped out and flushed down the toilet, and the used litter should be bagged, sealed and placed in the trash. Dumping the entire contents of the litter box down your toilet will cause plumbing problems and prematurely fill up your septic tank or sewer system with indigestible material, but sending untreated cat waste to the landfill can cause pollution problems.

While it may not seem like a big deal if one more dog, cat or bird "contributes" some waste to the neighborhood environment, think about how many animals there are out there. Animal waste may not be the biggest or most toxic pollutant going into your local waters, but it is one of those little problems that, when all the pieces are added together, leads to serious environmental and health problems. So please think twice about your pet's bathroom habits and do your part to help keep our waters and environment clean.

Reference: J.A. Hill and C.D. Johnson. *Pet Waste and Water Quality*. Wisconsin Nonpoint Source Water Pollution Abatement Program. January 1992.

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Sea Grant Connecticut

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NEMO

Fact Sheet #6

After the Storm

A Citizen's Guide to Understanding Stormwater

EPA 833-B-03-002

January 2003

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What is stormwater runoff?

Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

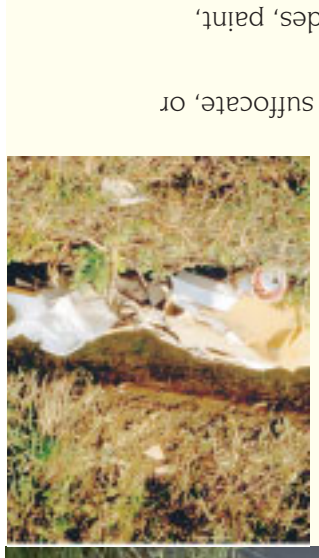
Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

Why is stormwater runoff a problem?

The effects of pollution

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.
- Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.



Stormwater Pollution Solutions

Residential

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

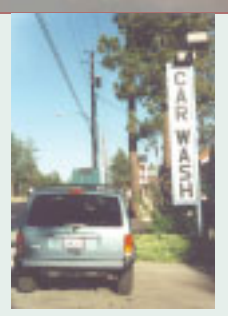
- Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- Cover piles of dirt or mulch being used in landscaping projects.

Septic systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.

- Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- Don't dispose of household hazardous waste in sinks or toilets.

Auto care



Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Pet waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.

- When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.

Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

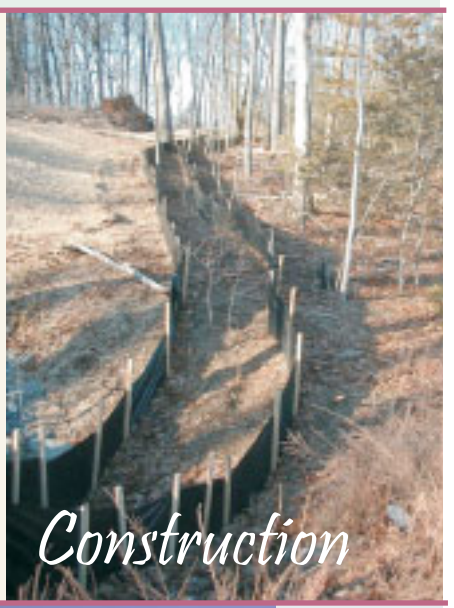
Commercial

Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- Cover grease storage and dumpsters and keep them clean to avoid leaks.
- Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- Divert stormwater away from disturbed or exposed areas of the construction site.
- Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.



Construction

Agriculture

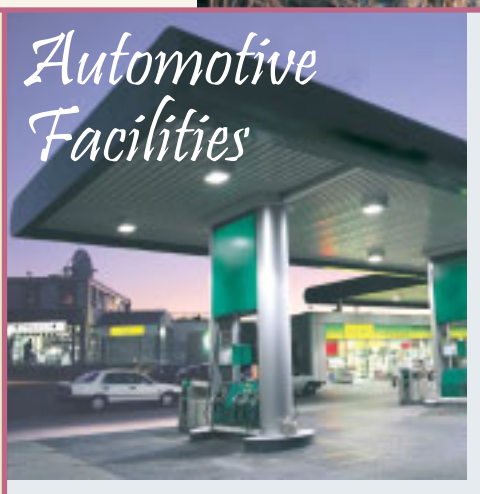
Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.

- Keep livestock away from streambanks and provide them a water source away from waterbodies.
- Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- Vegetate riparian areas along waterways.
- Rotate animal grazing to prevent soil erosion in fields.
- Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.

Forestry

Improperly managed logging operations can result in erosion and sedimentation.

- Conduct preharvest planning to prevent erosion and lower costs.
- Use logging methods and equipment that minimize soil disturbance.
- Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- Construct stream crossings so that they minimize erosion and physical changes to streams.
- Expedite revegetation of cleared areas.



Automotive Facilities

Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- Clean up spills immediately and properly dispose of cleanup materials.
- Provide cover over fueling stations and design or retrofit facilities for spill containment.
- Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- Install and maintain oil/water separators.

APPENDIX C

Sample Table for Cataloging Local Industrial and Commercial Operations

Stormwater Management Plan
Canton, Connecticut

Business and Industry Contact Information
Town of Canton

Zoning Class	Map/Block/Lot	Property Address	Property Owner Name	Property Owner Address	Business Name	Type of Business[1]
		.				

Notes: 1. For example: Metal finishing, agriculture (including production of landscape materials), construction storage or staging, chemical manufacturing or storage, machine shops, general retail, auto repair

APPENDIX D

Stormwater Management Flyers for Businesses

Stormwater Management Plan
Canton, Connecticut

Stormwater Management

A Guide for Auto Recycler Owners and Operators

Only Rain in the Drain

Stormwater Protection
Starts With You

The facility operator's attitude toward stormwater management can make all the difference. It's your responsibility to communicate to your employees that stormwater management is a priority. Make sure your employees understand why stormwater management is important, both to your business and to the environment. Start by having them review the enclosed video and fact sheet.

Protecting stormwater can benefit your business in several important ways:

- **Professionalism and pride in your business** – Both workers and customers appreciate a clean and responsible facility.
- **It's the law** – Not complying with stormwater rules can put your business in jeopardy. Regulators and environmental groups across the country are increasingly targeting auto dismantlers for stormwater violations.
- **Environmental protection** – We all want clean streams, rivers, lakes, bays, and oceans for our families and for our future. Your business can protect the environment by following some straightforward and commonsense practices.

Protect the environment to protect your business

The following practices describe options that your facility can implement to help address its stormwater issues. Although following all of the practices described below may help improve performance with regard to stormwater management, it does not guarantee that your facility will be in compliance with all applicable stormwater rules. Check with your state regulatory agency or EPA for more information.

The Stormwater Permit

All vehicle dismantling facilities in the United States (except those in a combined sewer service area or facilities that do not discharge stormwater from their property) are required by the Clean Water Act to obtain a stormwater permit either from the U.S. Environmental Protection Agency or from an appropriate state agency. You must first file a Notice of Intent (NOI) with the appropriate state agency. You must also prepare a Storm Water Pollution Prevention Plan (SWPPP) to describe how you will address your facility's stormwater issues.

The practices below are organized by facility area or activity. Links and contact information to obtain additional information about stormwater and other environmental issues related to auto dismantling are listed at the end of this document.

What are Best Management Practices (BMPs)?

The term "BMP" is used to describe management practices that many different industries use to address a range of environmental issues. We'll use BMP to describe the practices that you can implement to address your auto dismantling facility's stormwater issues.

› Training

Employee training is critical! Train appropriate employees on relevant stormwater management procedures, especially during the wet season and prior to rain or snow events. All employees must be trained upon their initial hire and at least once per year thereafter. Be sure to document employee training. Also, place signs around activity areas as reminders to your workers; for example, "No fluids in the drain" or "Sweep up loose absorbent daily." Make up your own signs that make sense for your operation.

› Incoming Vehicles

Inspect all incoming vehicles for leaking fluids and unwanted materials as they enter your facility. Promptly contain leaks with drip pans or absorbent materials.

› Fluid Removal

Establish a procedure for processing vehicles and stick to it. First, before any vehicle is placed in the yard for long-term storage or crushed, and before fluid-containing parts are dismantled, drain the following fluids from the vehicle in the order that best fits your operation:

- Fuel
- Motor oil
- Transmission fluid
- Brake fluid
- Antifreeze
- Freon

Draining these fluids before placing the vehicle in the yard reduces 1) the possibility of spills when parts are removed later, and 2) time and cost to your business of cleaning up leaks and spills.

› Fluid Draining and Vehicle Dismantling Area

Ideally, these activities should be conducted in the same area, which should be covered with a roof. Your fluid draining and vehicle dismantling areas have more potential to contaminate stormwater than any other areas of your facility. Properly covering this area can eliminate contact with rainfall and is a great way to get a big bang for your buck in preventing stormwater pollution. Rain or snow can carry harmful materials like oil or gasoline into the soil and nearby streams, rivers, and lakes. Roofs not only keep out rain and snow, but also make the work area more comfortable for your workers.

If you don't currently dismantle fluid-containing parts and drain fluids under cover, you don't necessarily have to put up an entirely new and expensive building. One low-cost roofing option available is the "VersaTube" offered by Tuff Shed. (See http://www.tuffshed.com/versatube.htm or call (800) BUY-TUFF for more information.)

Another option includes building your own temporary cover using low-cost materials. Plans and materials for such temporary roofs can be obtained from vendors like South Bay Canopy (408) 998-8280.

You should also have a concrete pad in the draining and dismantling area, and you should drain all vehicles on this surface. Draining over concrete makes spills and leaks easier to clean up and minimizes the chance of environmental harm. Use appropriate fluid removal and handling equipment, such as suction systems, drain racks, and funnels for the containers.

Prevent stormwater pollution by minimizing the exposure of dismantling and fluid removal activities to stormwater. In addition to overhead cover, possible options include installing intercept trenches, berming the perimeter of the area, or using channels, swales, or grade breaks to divert the flow of stormwater around these areas.

› Fluid Storage

Storing fluids properly helps cut down on the amount of contaminants that end up in stormwater. When you remove fluids, transfer them to the proper container. Confine fluid storage to designated areas that are covered and have adequate secondary containment. Keep drums containing fluids away from storm drains; consider storing fluids near the location where fluids are drained. Maintain good integrity of all storage containers. Do not leave open drain pans that contain fluids around the shop.

You are responsible for ensuring that your fluids are handled by an authorized processor, transporter, and treatment/disposal facility.

› Spill Cleanup

Clean up spills promptly and thoroughly. Keep appropriately sized and stocked "spill kits" available in the areas where you conduct the following activities:

- Dismantling and fluid removal
- Fluid storage
- Battery and parts storage
- Fueling
- Equipment maintenance

For smaller spills, use shop rags and oil dry. Used absorbents should be placed in a designated container for proper disposal.

What should be in your spill kit?

- Absorbent socks or booms
- Absorbent pillows and pads
- Oil dry
- Broom and shovel
- Disposal bags or other containers
- Safety goggles
- Plastic gloves

- **Never use vehicle fluids for dust control!**
- **Don't mix your used oil with solvents, brake cleaner, or antifreeze.**
  This creates a hazardous waste, which can't be recycled and is very expensive to get rid of.
- **Don't pour fluids into your septic system, sanitary sewer, dry well, on the ground, or in the trash.**

› Parts Storage

Store engines, transmissions, and other oily parts (resale, core, or scrap) in a way that avoids exposure to rain or snowfall. This can include:

1) Storing parts indoors
2) Storing parts under a permanent roof on impervious surface
3) Storing parts in weather-proof, leak-proof, covered containers
4) Placing parts in vehicle bodies
5) Providing temporary cover (like tarps) for these parts as an interim measure

Lead acid battery components are toxic and corrosive and can contaminate the soil and water if handled improperly. Store batteries inside a building or outside in covered, non-leaking containers. Separate batteries from other wastes like paper, rags, garbage and flammable or hazardous chemicals. Monitor your battery storage area for leaks or deterioration, and take quick action to address any spills or leaks. Lime can be used to neutralize spilled battery acid. *Never pour battery acid on the ground or into a storm drain!*

Radiators removed from vehicles should be stored under a roof, tarp, or other cover, and raised up off the ground such that there is no contact with rainfall and surface drainage.

› Crushing

Never crush a vehicle without draining all the fluids and removing gas tanks, tires, and batteries. Capture and properly dispose of residual fluids released during crushing. You're responsible for ensuring fluids are captured and don't run off your property, even if you use a contractor to crush your vehicles.

› Vehicle Storage

If engines or fluid-containing parts remain in the vehicle when it is placed in the yard, place a hood or other cover, such as a well-secured tarp, over the vehicle engine. Use drip pans under stored vehicles with leaks.

Don't place vehicles on the ground where there is a heavy stormwater flow or close to a storm drain.

After vehicles are moved, scrape up dirt or gravel that was stained from leaks and drips. Manage the contaminated material in accordance with applicable regulations.

- Never wash spills into storm drains!
- Sweep up absorbent material and properly dispose at least daily.

› Equipment Maintenance

Schedule and perform periodic inspections of equipment. Regular maintenance of equipment such as forklifts reduces risk of breakdown and fluid release. Check for leaks and spills and for malfunctioning, worn, or corroded parts. Equipment maintenance should be done indoors or, where practical, on an impervious surface. If maintenance can't be done under cover, take adequate spill control and/or cleanup measures.

› Fueling

Pave refueling areas with concrete to prevent contamination of the soil and to enable cleanup. Don't leave vehicles unattended while fueling.

› Housekeeping

Sweep and clean paved surfaces daily to reduce sediment and contaminant buildup. Routine housekeeping is important. Catchments, inlets, oil-water separators, oil booms, waddles, tarps, and other pollutant-collecting materials need to be maintained regularly or they can become ineffective. Clean out drain inlets periodically, especially before the wet season, during the wet season, and after the wet season ends.

› Erosion Control

Tackle TSS! You may have heard of TSS or total suspended solids – in other words, dirt. Controlling the amount of dirt that runs off your property is important because metals and other harmful pollutants can attach themselves to the dirt particles and end up flowing off the property with stormwater. Eroded soil can also smother aquatic life.

Implement appropriate vegetative, structural, or stabilization measures such as basins, sediment traps, geotextiles, buffer strips, or filter berms in areas without much vegetation where soil erosion is evident.

› Non-Stormwater Discharges

Wash water from equipment, work areas, or shop floors cannot come into contact or mix with rainfall or surface drainage, or drain offsite. Vehicle and hand wash water is OK to be discharged to the sanitary sewer where allowed (be sure to check with your local sanitary sewer district). Most states prohibit all non-stormwater discharges from your property, including, but not limited to, discharges of wash water, rinse water and spilled fluids. If you are permitted to use sewers, make sure your drain is connected to the sanitary sewer. If this is not possible in your area, the wash water must be managed on-site. Management options include recycling, re-use, or off-site disposal. If you let the water soak into the ground (infiltration), take appropriate steps to prevent groundwater contamination and infestation by mosquitoes or other pests. For additional information consult your local regulatory agency.

- Residues from dried wash water cannot come into contact with rainfall or surface drainage.

- **Know where your drains go. Plug any floor drains that would let a spill run into septic systems or storm drains.**
  Automotive fluids and solvents can contaminate drinking water if they end up in drains that discharge to soil.

- Following washing, collect and clean up any accumulated sediments, oil deposits, debris, and paint particles.
- Do not steam clean or pressure wash parts without proper wash water management.
- Do not hose down the shop floor if water will run into a storm drain or off the property.

› Stormwater Filter Systems

Inexpensive filter systems or absorbents can provide an extra level of defense against stormwater pollution. Examples include: absorbent socks or booms, silt fences, straw bales, rock filters, and inlet filters. Regular maintenance of these products is essential – if they're not maintained, they won't work. Further, these measures are not a substitute for good stormwater management practices.

› Inspection

Inspect your site regularly to ensure all appropriate BMPs are being implemented. Increase inspections during periods of rainy weather. Based on permit or management needs, maintain a record of visual inspections.

Inspect oil containers, fresh water systems, irrigation lines, fueling areas, and other piping systems for leaks. If evidence of leaks is found, promptly repair or replace damaged parts to prevent polluted runoff and non-stormwater discharges.

› Customer Education

Inform customers who remove parts to do so properly and to appropriately dispose of fluids. For example, make fluid receptacles readily available, post signs that require the use of drip pans for parts removal, and prohibit waste generating activities like vehicle maintenance in parking lots.

Mercury Switches

Mercury switches are an important issue. Many older vehicles contain mercury, which is highly toxic and can cause learning disabilities and mental retardation in newborn children. When vehicles are crushed and mercury remains inside, it can get onto the ground and into waterways. Also, mercury can be released into the air and water bodies after scrapped vehicles go to the shredder.

What to do about mercury

Mercury switches are commonly found under vehicle hoods and trunks and less frequently in automatic braking systems (ABS). These switches can easily be removed to prevent contamination of the environment and human health problems.

Information on removing mercury from vehicles is available online at:

epa.gov/glnpo/bnsdocs/hgsbook/auto.pdf

epa.gov/region5/air/mercury/autoswitch.htm

switchout.ca

Some states require mercury switches to be removed before vehicles are crushed. Some auto dismantlers remove the switches even if they are not required to do so. If you choose to address this important environmental issue and remove mercury switches before your vehicles are crushed, store the switches in a leak-proof, clearly marked, closed container. Also take care to ensure that the switches do not break during handling or storage. A licensed metals recycler that reclaims mercury can dispose of the switches. Contact your state environmental agency for more information.

You
>> CAN <<
Make a Difference!

Auto recyclers do their part to conserve natural resources by recycling valuable materials. Build on this good work and protect the environment from polluted runoff by implementing the BMPs described in this fact sheet. Make sure that your employees understand that stormwater management is important and are trained to implement your BMPs.

Remember,
stormwater protection
starts with YOU!

"It's critical for owners to set an example and be actively involved in implementing BMPs." – Brian Werth, Select Auto & Truck Recyclers

Where to find more information

Check out the following sources for additional information on BMPs for auto recyclers:

Manuals

- An Environmental Compliance Workbook for Automotive Recyclers, Florida DEP
  www.dep.state.fl.us/central/home/ps/asyca/fl_gyb.pdf
- Environmental Compliance Guide for Motor Vehicle Salvage Yards, OH Small Bus. Assistance Office
  www.epa.state.oh.us/other/sbao/salvageguide.pdf
- Vehicle Recycling Manual: A Guide for Vehicle Recyclers, Washington State Department of Ecology
  www.ecy.wa.gov/pubs/97433.pdf
- Automotive Recyclers Guide to a Cleaner Environment, New York DEC
  www.dec.state.ny.us/website/reg8/press/autorec/autorec0.pdf
- Certified Auto Recycler (CAR) Guidance Manual, Automotive Recyclers Association
  www.autorecyc.org (Available to members only)

Other Sources

- The National Compliance Assistance Clearinghouse is your guide to compliance information on the Internet. It provides quick access to compliance tools and contacts from EPA and other compliance assistance providers. The clearinghouse has an entire section devoted to the auto salvage industry.
  cfpub.epa.gov/clearinghouse
- A list of state and local environmental contacts can be found on the internet at:
  www.epa.gov/epapages/statelocal/envrolst.htm
- The EPA Small Business Ombudsman can help you understand environmental regulations, or refer you to local contacts. Their toll-free small business hotline provides regulatory and technical assistance information: (800) 368-5888

Vendors

Call for catalogs or more information

Low-Cost Roofs:		**Fluid Removal and Storage Equipment**:		**Spill Kits and Absorbent Materials**:	
Tuff Shed	(800) BUY-TUFF	Hy-Tec Environmental	(800) 336-4499	Stormtech	(888) 549-5374
South Bay Canopy	(408) 998-8280	Spill Cleanup Direct	(800) 356-0783	New Pig	(800) 468-4647

Note: Sustainable Conservation and U.S. EPA do not endorse any of these products.
This list is not complete: other vendors may provide similar or identical products and services.

Developed by

Sustainable Conservation
www.suscon.org

Stormwater and the **Construction Industry**

Protect Natural Features

Bad

Good

- Minimize clearing.
- Minimize the amount of exposed soil.
- Identify and protect areas where existing vegetation, such as trees, will not be disturbed by construction activity.
- Protect streams, stream buffers, wild woodlands, wetlands, or other sensitive areas from any disturbance or construction activity by fencing or otherwise clearly marking these areas.

Construction Phasing

Bad

Good

- Sequence construction activities so that the soil is not exposed for long periods of time.
- Schedule or limit grading to small areas.
- Install key sediment control practices before site grading begins.
- Schedule site stabilization activities, such as landscaping, to be completed immediately after the land has been graded to its final contour.

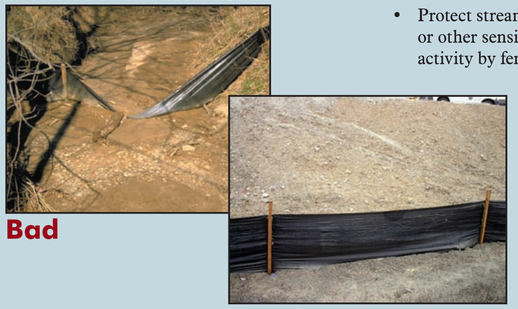
Vegetative Buffers

Bad

Good

- Protect and install vegetative buffers along waterbodies to slow and filter stormwater runoff.
- Maintain buffers by mowing or replanting periodically to ensure their effectiveness.

Silt Fencing



Bad

Good

- Inspect and maintain silt fences after each rainstorm.
- Make sure the bottom of the silt fence is buried in the ground.
- Securely attach the material to the stakes.
- Don't place silt fences in the middle of a waterway or use them as a check dam.
- Make sure stormwater is not flowing around the silt fence.

Maintain your BMPs!

www.epa.gov/npdes/menuofbmps

Site Stabilization

Bad

Good

- Vegetate, mulch, or otherwise stabilize all exposed areas as soon as land alterations have been completed.

Construction Entrances

Bad

Good

- Remove mud and dirt from the tires of construction vehicles before they enter a paved roadway.
- Properly size entrance BMPs for all anticipated vehicles.
- Make sure that the construction entrance does not become buried in soil.

Slopes

Bad

Good

- Rough grade or terrace slopes.
- Break up long slopes with sediment barriers, or under drain, or divert stormwater away from slopes.

Dirt Stockpiles

Bad

Good

- Cover or seed all dirt stockpiles.

Storm Drain Inlet Protection

Bad

Good

- Use rock or other appropriate material to cover the storm drain inlet to filter out trash and debris.
- Make sure the rock size is appropriate (usually 1 to 2 inches in diameter).
- If you use inlet filters, maintain them regularly.

Stormwater and the Construction Industry

Planning and Implementing Erosion and Sediment Control Practices

The construction industry is a critical participant in the nation's efforts to protect streams, rivers, lakes, wetlands, and oceans. Through the use of best management practices (BMPs), construction site operators are the key defense against erosion and sedimentation.

As stormwater flows over a construction site, it picks up pollutants like sediment, debris, and chemicals. High volumes of stormwater can also cause stream bank erosion, and destroy downstream aquatic habitat. Preventing soil erosion and sedimentation is an important responsibility at all construction sites.

In addition to the environmental impact, uncontrolled erosion can have a significant financial impact on a construction project. It costs money and time to repair gullies, replace vegetation, clean sediment-clogged storm drains, replace poorly installed BMPs, and mitigate damage to other people's property or to natural resources.

Best Management Practice (BMP)
A BMP is a method used to prevent or control stormwater runoff and the discharge of pollutants, including sediment, into local waterbodies. Silt fences, inlet protection, and site-stabilization techniques are typical BMPs on a construction site.

Operator
An operator is someone who has control over and the ability to modify construction plans and specifications (e.g. owner, general contractor)

or

Someone who has control over the day-to-day operations at a site (e.g., owner, general contractor) that are necessary to ensure compliance with the permit requirements. It is the responsibility of a construction site owner or operator to contain stormwater runoff and prevent erosion during **all** stages of a project.

There may be more than one person at a site who meets these definitions and must apply for permit coverage. (States may have different definitions of the term "operator.")

So what's being done about polluted runoff?

The Clean Water Act includes the National Pollutant Discharge Elimination System (NPDES) permitting program. As of January 2003, 44 states and territories are authorized to issue NPDES stormwater permits. If your state isn't authorized to operate the NPDES stormwater permit program, EPA issues the permits. Permits vary from state to state, so contact your state or EPA for specific information. Your permitting authority has specific information on your state's NPDES stormwater permit program. In general, construction permits require construction operators to do all of the following:

- Develop and implement a stormwater pollution prevention plan
- Submit a permit application or notice of intent (NOI)
- Comply with the permit, including maintaining BMPs and inspecting the site

Under the NPDES program, construction activities that disturb 1 or more acres are required to obtain stormwater permit coverage. States have different names for the plans that construction operators must develop, such as

- Stormwater pollution prevention plan
- Erosion and sediment control plan
- Erosion control and stormwater management plan
- Stormwater management plan
- Water pollution control plan
- Pollution prevention plan

This document uses the term "*Plan*."

I think I need a permit... Where do I start?

All land-disturbing activities, including clearing, grading, and excavation, that disturb **1 or more acres** are required to be covered under a state or EPA-issued NPDES construction stormwater permit **prior to land disturbance**. Permit requirements vary by state. Begin by researching the specific requirements in your state. You might already be subject to local erosion and sediment control requirements, but that doesn't release you from the requirements of the NPDES program at the state or EPA level. Although you must comply with both sets of requirements, in most cases they have been designed to be complementary. Contact your permitting authority to find out exactly what you need to do. A good place to start your search is the Construction Industry Compliance Assistance web site at http://www.envcap.org/cica.

The NPDES permit requirements include small construction activities that are part of a larger common plan of development or sale, such as a single lot within a larger subdivision. For developments with multiple operators, all operators must have permit coverage for their individual parts of the larger development, no matter how large or small each operation happens to be. When there are multiple operators at one site, they're encouraged to develop and share one comprehensive Plan and obtain permit coverage as co-permitees.

Construction sites that discharge unpermitted stormwater are in violation of the Clean Water Act and may be subject to fines of up to $27,500 a day per violation.

The **owner or operator** of the construction site is responsible for complying with the requirements of the permit. Responsibilities include developing a Plan, obtaining permit coverage, implementing BMPs, and stabilizing the site at the end of the construction activity.

Determine your eligibility

All construction activity that disturbs 1 or more acres of land, as well as activity that disturbs less than 1 acre but is part of a larger common plan of development, must obtain permit coverage.

Read and understand your stormwater permit requirements

Get a copy of the permit for construction activities and a permit application (or notice of intent form) from your state or EPA permitting authority.

Develop a Plan

Most states do not require you to submit your Plan. However, you do need to keep the Plan on site. If that's impractical, you may post a notice that tells where the Plan is kept so it can be accessed by the permitting authority and other interested parties.

You'll need to post a copy of your completed application on site. Put it in a place where the public can see it so they'll know your site is covered by an NPDES permit!

Apply for permit coverage

Once you understand your permit requirements and have developed a Plan, you can submit a stormwater permit application (or notice of intent) to your permitting authority. This must be done before beginning any land disturbance on the site. Some states require a few days of lead time, so check with your permitting authority. Once you've submitted the application, you must satisfy the conditions of the permit.

Implement the Plan

Be prepared to implement the BMPs in your Plan before construction begins. Ensure that BMPs are properly maintained, and upgrade and repair them as necessary.

Developing and Implementing a Plan

You must have a Plan that includes erosion and sediment control and pollution prevention BMPs. These Plans require

- Advance planning and training to ensure proper implementation of the BMPs
- Erosion and sediment control BMPs in place until the area is permanently stabilized
- Pollution prevention BMPs to keep the construction site "clean"
- Regular inspection of the construction site to ensure proper installation and maintenance of BMPs

Fortunately, the practices and measures that must be included in your Plan are already part of the standard operating procedures at many construction sites.

Six steps are associated with developing and implementing a stormwater Plan. There's a wealth of information available on developing pollution prevention plans. Please contact your permitting authority for help in finding additional guidance materials, or visit www.epa.gov/npdes/stormwater. A sample construction plan is available at www.epa.gov/npdes/pubs/sample_swppp.pdf.

1. *Site Evaluation and Design Development*

- **Collect site information**
- **Develop site plan design**
- **Prepare pollution prevention site map**

The first step in preparing a Plan is to define the characteristics of the site and the type of construction that will occur. This involves collecting site information, identifying natural features that should be protected, developing a site plan design, describing the nature of the construction activity, and preparing a pollution prevention site map.

2. *Assessment*

- **Measure the site area**
- **Determine the drainage areas**
- **Calculate the runoff coefficient**

The next step is assessing the impact the project will have on stormwater runoff. Determine the drainage areas and estimate the runoff amounts and velocities. For more information on calculating the runoff coefficient, go to www.epa.gov/npdes/pubs/chap02_conguide.pdf, page 11.

3. *Control Selection and Plan Design*

- **Review and incorporate state or local requirements**
- **Select erosion and sediment controls**
- **Select other controls**
- **Select stormwater management controls**
- **Indicate the location of controls on the site map**
- **Prepare an inspection and maintenance plan**
- **Coordinate controls with construction activity**
- **Prepare sequence of major activities**

In the third step you'll actually document your procedures to prevent and control polluted stormwater runoff. You must delineate areas that will not be disturbed, including critical natural areas like streamside areas, floodplains, and trees. You must also identify the measures (or BMPs) you'll use to protect these areas.

Phasing your project to minimize the amount of exposed soil at any given time is a highly effective way to prevent erosion. Erosion control measures designed to prevent soil from being mobilized include diversions to route stormwater away from exposed soils and stabilization with vegetation, mulch, and geotextiles. Sedimentation control measures designed to remove sediment from stormwater or prevent it from leaving the site include silt fences, sediment traps, and diversions.

You'll need to select erosion and sediment controls—including stabilization measures for protecting disturbed areas and structural controls for diverting runoff and removing sediment—that are appropriate for your particular site. The appropriateness of the control measures will depend on several factors, but will be influenced most directly by the site characteristics. Some stabilization measures you might consider are temporary seeding, permanent seeding, and mulching. Structural control measures include earth dikes, silt fences, and sediment traps. No single BMP will meet all of the erosion and sedimentation control needs of a construction site. A combination of BMPs is necessary. For more information on the types of BMPs appropriate for your construction site, see the BMP fact sheet series available at www.epa.gov/npdes/menuofbmps.

Soil erosion control tips...

- Design the site to infiltrate stormwater into the ground and to keep it out of storm drains. Eliminate or minimize the use of stormwater collection and conveyance systems while maximizing the use of stormwater infiltration and bioretention techniques.
- Minimize the amount of exposed soil on site.
  - To the extent possible, plan the project in stages to minimize the amount of area that is bare and subject to erosion. The less soil exposed, the easier and cheaper it will be to control erosion.
  - Vegetate disturbed areas with permanent or temporary seeding immediately upon reaching final grade.
  - Vegetate or cover stockpiles that will not be used immediately.
- Reduce the velocity of stormwater both onto and away from the project area.
  - Interceptors, diversions, vegetated buffers, and check dams are a few of the BMPs that can be used to slow down stormwater as it travels across and away from the project site.
  - Diversion measures can also be used to direct flow away from exposed areas toward stable portions of the site.
  - Silt fences and other types of perimeter filters should never be used to reduce the velocity of runoff.
- Protect defined channels immediately with measures adequate to handle the storm flows expected.
  - Sod, geotextile, natural fiber, riprap, or other stabilization measures should be used to allow the channels to carry water without causing erosion. Use softer measures like geotextile or vegetation where possible to prevent downstream impacts.
- Keep sediment on site.
  - Place aggregate or stone at construction site vehicle exits to accommodate at least two tire revolutions of large construction vehicles. Much of the dirt on the tires will fall off before the vehicle gets to the street.
  - Regular street sweeping at the construction entrance will prevent dirt from entering storm drains. Do not hose paved areas.
  - Sediment traps and basins are temporary structures and should be used in conjunction with other measures to reduce the amount of erosion.
- Maintaining all BMPs is critical to ensure their effectiveness during the life of the project.
  - Regularly remove collected sediment from silt fences, berms, traps, and other BMPs.
  - Ensure that geotextiles and mulch remain in place until vegetation is well established.
  - Maintain fences that protect sensitive areas, silt fences, diversion structures, and other BMPs.

Other BMPs and Activities to Control Polluted Runoff

You'll need to select other controls to address potential pollutant sources on your site. Construction materials, debris, trash, fuel, paint, and stockpiles become pollution sources when it rains. Basic pollution prevention practices can significantly reduce the amount of pollution leaving construction sites. The following are some simple practices that should be included in the Plan and implemented on site:

- Keep potential sources of pollution out of the rain as practicable (e.g., inside a building, covered with plastic or tarps, or sealed tightly in a leak-proof container).
- Clearly identify a protected, lined area for concrete truck washouts. This area should be located away from streams, storm drain inlets, or ditches and should be cleaned out periodically.
- Park, refuel, and maintain vehicles and equipment in one area of the site to minimize the area exposed to possible spills and fuel storage. This area should be well away from streams, storm drain inlets, or ditches. Keep spill kits close by and clean up any spills or leaks immediately, including spills on pavement or earthen surfaces.
- Practice good housekeeping. Keep the construction site free of litter, construction debris, and leaking containers. Keep all waste in one area to minimize cleaning.
- Never hose down paved surfaces to clean dust, debris, or trash. This water could wash directly into storm drains or streams. Sweep up materials and dispose of them in the trash. Never bury trash or debris!
- Dispose of hazardous materials properly.

4. *Certification and Notification*

- **Certify the Plan**
- **Submit permit application or notice of intent**

Once the Plan has been developed, an authorized representative must sign it. Now is the time to submit the permit application or notice of intent. Your permit might require that the Plan be kept on site, so be sure to keep it available for the staff implementing the Plan.

Erosion and sedimentation control practices are only as good as their installation and maintenance.

5. *Implementing and Maintaining a Plan*

- **Implement controls**
- **Inspect and maintain controls**
- **Update/change the Plan**
- **Report releases of hazardous materials**

A Plan describes the practices and activities you'll use to prevent stormwater contamination and meet the NPDES permit requirements. Make sure that the Plan is implemented and that the Plan is updated as necessary to reflect changes on the site.

Erosion and sedimentation control practices are only as good as their installation and maintenance. Train the contractors that will install the BMPs and inspect immediately to ensure that the BMPs have been installed correctly.

Regularly inspect the BMPs (especially before and after rain events) and perform any necessary repairs or maintenance immediately. Many BMPs are designed to handle a limited amount of sediment. If not maintained, they'll become ineffective and a source of sediment pollution.

It's also important to keep records of BMP installation, implementation, and maintenance. Keep track of major grading activities that occur on the site, when construction activities cease (temporarily or permanently), and when a site is temporarily or permanently stabilized.

If construction plans change at any time, or if more appropriate BMPs are chosen for the site, update the Plan accordingly.

6. *Completing the Project: Final Stabilization and Termination of the Permit*

- **Final stabilization**
- **Notice of Termination**
- **Record retention**

Many states and EPA require a Notice of Termination (NOT) or other notification signifying that the construction activity is completed. An NOT is required when

- Final stabilization has been achieved on all portions of the site for which the permittee is responsible.
- Another operator has assumed control over all areas of the site that have not been finally stabilized. That operator would need to submit a new permit application to the permitting authority.
- For residential construction only, temporary stabilization of a lot has been completed prior to transference of ownership to the homeowner, with the homeowner being made aware of the need to perform final stabilization.

Permittees must keep a copy of their permit application and their Plan for at least 3 years following final stabilization. This period may be longer depending on state and local requirements.

Preconstruction Checklist

- A site description, including
  - Nature of the activity
  - Intended sequence of major construction activities
  - Total area of the site
  - Existing soil type and rainfall runoff data
  - A site map with:
    - Drainage patterns
    - Approximate slopes after major grading
    - Area of soil disturbance
    - Outline of areas which will not be disturbed
    - Location of major structural and nonstructural soil erosion controls
    - Areas where stabilization practices are expected to occur
    - Surface waters
    - Stormwater discharge locations
  - Name of the receiving water(s)
- A description of controls:
  - Erosion and sediment controls, including
    - Stabilization practices for all areas disturbed by construction
    - Structural practices for all drainage/discharge locations
  - Stormwater management controls, including
    - Measures used to control pollutants occurring in stormwater discharges after construction activities are complete
    - Velocity dissipation devices to provide nonerosive flow conditions from the discharge point along the length of any outfall channel
  - Other controls, including
    - Waste disposal practices that prevent discharge of solid materials
    - Measures to minimize offset tracking of sediments by construction vehicles
    - Measures to ensure compliance with state or local waste disposal, sanitary sewer, or septic system regulations
  - Description of the timing during the construction when measures will be implemented
- State or local requirements incorporated into the Plan
- Inspection and maintenance procedures for control measures identified in the Plan
- Contractor certification and Plan certification

Implementation Checklist

- Maintain records of construction activities, including
  - Dates when major grading activities occur
  - Dates when construction activities temporarily cease on the site or a portion of the site
  - Dates when construction activities permanently cease on the site or a portion of the site
  - Dates when stabilization measures are completed on the site
- Prepare inspection reports summarizing
  - Name of person conducting BMP inspections
  - Qualifications of person conducting BMP inspections
  - BMPs/areas inspected
  - Observed conditions
  - Necessary changes to the Plan
- Report releases of reportable quantities of oil or hazardous materials
  - Notify the National Response Center at 800-424-8802 immediately
  - Report releases to your permitting authority immediately, or as specified in your permit. You must also provide a written report within 14 days.
  - Modify the Plan to include
    - The date of release
    - Circumstances leading to the release
    - Steps taken to prevent reoccurrence of the release
- Modify Plan as necessary
  - Incorporate requests of the permitting authority to bring the Plan into compliance
  - Address changes in design, construction operation, or maintenance that affect the potential for discharge of pollutants

An ounce of prevention is worth a pound of cure! It's far more efficient and cost-effective to prevent pollution than it is to try to correct problems later. Installing and maintaining simple BMPs and pollution prevention techniques on site can greatly reduce the potential for stormwater pollution and can also save you money!

Visit www.epa.gov/npdes/stormwater for more information.

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THE YEAR OF CLEAN WATER
Celebration & Commitment

APPENDIX E

Transfer Station Policy

Stormwater Management Plan
Canton, Connecticut

Transfer Station Policy - 2017
TOWN OF CANTON, CONNECTICUT

Transfer Station Hours:

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Closed	Closed	7am-3pm	Closed	7am-3pm (Sept 16-April 14) 11am-7pm (April 15-Sept 15)	Closed	7am-3pm
The Transfer Station is also closed on Holidays.						

The Transfer Station is located on Ramp Road, adjacent to Powder Mill Road and Route 202.

Residents may now purchase annual permit stickers for use of the Transfer Station in calendar year 2017 from the Town Clerk's office during regular business hours (Monday, Tuesday, and Thursday 8:15 am to 4:30 pm; Wednesday 8:15 am to 6:45 pm; and Friday 8:15 am to 12 noon). *Special hours will be held for the convenience of residents to purchase stickers on Saturday, January 07, 2017, from 8 a.m. to 2 p.m.* You may also receive the annual permit sticker if you send a check payable to the "Town of Canton" with a self-addressed, stamped envelope. A copy of your vehicle registration MUST also be included. The permit sticker fee is $140.00 for residents. For an additional $1.00 you may purchase a duplicate sticker for use on another vehicle in your household with proof of registration. The permit sticker is valid during calendar year 2017. We request that the Transfer Station permit be placed in the lower left hand side of the front windshield.

Once a resident is permitted, a fee is charged for the disposal of bulky waste based on the size of the vehicle in accordance with the schedule on the following page. In addition to the Town Clerk's office, this fee can now be paid directly at the Transfer Station with either a personal check or a debit/credit card. Cash will not be accepted at the Transfer Station.

Only trash generated at residences or from locations owned by the Town may be brought to and deposited at the Transfer Station. Businesses are not permitted to use the Transfer Station and must make arrangements to have their trash disposed of at the CRRA Connecticut Solid Waste Project in Hartford by collectors licensed by the Town. Should a business or institution choose to have a permanent dumpster to store their trash on site, they should contact the Zoning Enforcement Officer to review the proposed location for conformance with zoning regulations.

Canton residents will be able to purchase at the same rate as bulky waste disposal (based on the size of the vehicle) a special permit to be provided to a contractor hired to dispose of such material. The resident must certify that the material came from their residence and the permit will grant Transfer Station entry to the contractor on behalf of the homeowner. Only the material that was designated by the homeowner will be able to be disposed of by the contractor.

The Transfer Station is located on Ramp Road, adjacent to Powder Mill Road and Route 202. It is open Tuesday and Saturday between 7:00 a.m. and 3:00 p.m., Thursday 7:00 a.m. and 3:00 p.m. (4/15 to 9/15 11:00 a.m. to 7:00 p.m.). The town accepts household refuse, single stream recycling, propane tanks, scrap metal, white metal, furniture and other bulky waste, waste motor oil, anti-freeze, leaves and brush. No permit sticker or token is required to dispense of electronics, batteries or e-Waste and clean mattresses and box springs. The "Swap Shack" allows a resident to "recycle" unwanted items. However, there is no scavenging of disposed material other than the Swap Shack. There is also a collection bin for donations to the Salvation Army.

In lieu of purchasing the annual permit sticker, a resident who intends only occasional use of the transfer station may pay for a single day entry at a cost of $10.00 per day. Additional tokens may be required depending on what you have to dispose. See the "BULKY WASTE" chart below for additional fees. These fees may be paid for at the Transfer Station (credit/debit card and personal check only).

New residents (within the past month) or those residents who document that they have suspended private collection services may purchase the annual permit sticker on a pro rata basis as follows:

Between January 1 and March 31	$140.00
Between April 1 and June 30	$105.00
Between July 1 and September 30	$70.00
Between October 1 and December 31	$35.00

USER FEES
There will be an annual charge of $140 to residents for use of the Transfer Station.

BULKY WASTE
a) Once a resident is permitted, there will be a fee charged based on the vehicle type at the time of each bulky waste drop-off, load size will be determined by transfer station attendant. The schedule of type of vehicle and fees is as follows:

Type of Vehicle		Disposal Fee
Car		$10
Station Wagon/Mini Van/Truck/SUV/Trailer	½ load	$15
Station Wagon/Mini Van/Truck/SUV/Trailer	full load	$30
Dump Truck	½ load	$50
Dump Truck	full load	$100

b) There will be a charge for individual items as follows:

Unacceptable Mattresses or Box Springs	$30 each
Regular Tires	$5 each
Truck Tires	$15 each

c) There will be a charge for brush, limbs and leaves:

Type of Vehicle	Disposal Fee
Car	$5
Mini Van, Pick-up and/or 8 Foot Trailer	$10
Greater than 8 Foot Trailer and/or Dump Truck	$20

*Christmas trees can be dropped off free of charge Dec 27, 2016 thru Jan 31, 2017. Proof of Canton residency required.
PLEASE NOTE: ONE DAY PASSES AND TOKENS ARE NON-REFUNDABLE
Bulky waste and one-day use fees can now be paid for directly at the Transfer Station with either a personal check or a debit/credit card. Cash will not be accepted.

Recycling List

Permit Sticker Needed:

Single Stream Recycling

- Paper (newspapers, junk mail, magazines, catalogs, envelopes) – no bundling required!
- Clean cardboard and boxboard (cracker boxes, pasta boxes, shoe boxes and other similar materials) – no bundling required!
- Paper egg cartons
- Paper bags
- Office and school papers
- Empty glass jars and bottles
- Aluminum cans and clean foil
- Empty tin and steel cans, including aerosol cans
- All plastic containers labeled #1 & #2
- All other plastic food, beverage, soap and shampoo containers labeled #3 - #7

Propane Tanks

- We accept 20 lb tanks that typically come from your gas grills.

Scrap Metal

- Aluminum, copper, brass, lead, electrical wires, cast iron & heavier steel

White Goods with/without Freon

Waste motor oil & anti-freeze

No Permit Sticker or Token is Required:

E-Waste Materials

- Cell phones, computers, copiers, fax machines, iPods, PDAs, modems, monitors, printers, stereo & radio equipment, telephones, televisions, typewriters, video cassette recorders, keyboards, mouse, batteries and light bulbs.

Clean Mattresses & Box Springs

APPENDIX F

Sample O & M Plans for Basins and Swales

Stormwater Management Plan
Canton, Connecticut

Operations and Maintenance Plan

Basins

Facility Description. A basin is a densely planted, gently sloping depression. Stormwater enters via pipe or sheet flow, temporarily ponds, and infiltrates within 24hrs. Some basins include an overflow outlet to a drywell or storm or sewer line.

What To Look For	What To Do
Structural Components, including the inlets and outlets/overflows, shall freely convey stormwater.	
➢ Clogged inlets or outlets	➢ Remove sediment and debris to maintain 50% conveyance capacity at all times.
➢ Cracked drain pipes	➢ Replace when cracks are greater than 1".
Vegetation, including all plants on the Portland Plant List, shall cover 90% of the facility.	
➢ Dead or strained vegetation	➢ Manually remove sediment accumulation at base of plants. ➢ Replant per planting plan or substitute w/ Portland Plant List, per current SWMM. Vegetation should consist of 50% grasses or grass-like plants. o Irrigate as needed. Mulch annually. Do not apply fertilizers.
➢ Weeds	➢ Manually remove weeds. Do not use pesticides. Remove all plant debris.
➢ Tall Grass	➢ Mow grass to 4-9" in height.
Growing/Filter Medium, including soil, pea gravel, or like material, shall sustain healthy plant cover and infiltrate w/in 24hrs.	
➢ Exposed soil	➢ Cover with plants and mulch.
➢ Erosion	➢ Fill, lightly compact, and restore splash block/rock at inlet(s)
➢ Slope slippage	➢ Stabilize 3:1 slopes with plantings from Portland Plant List.
➢ Ponding	➢ Rake, till, or amend to restore infiltration rate.

Maintenance Schedule:

Summer. Make necessary structural repairs. Improve filter medium as needed. Remove sediment. Irrigate as needed. Mow.
Fall. Replant exposed soil and replace dead plants. Mow. Remove sediment and plant debris.
Winter. Monitor infiltration rate. Clear inlets and outlets/overflows before & after winter.
Spring. Remove sediment and plant debris. Weed as necessary. Replant exposed soil and replace dead plants. Mulch. Correct erosion w/ splash block and/or additional plants.

Maintenance Records. Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities.

Monitoring Log.

Access. Maintain ingress/egress to design standards.
Infiltration/Flow Control. All facilities should drain w/in 24hrs. Record time/date and weather & site conditions when ponding occurs.
Pollution Prevention. All sites should implement best management practices to prevent hazardous or solid wastes, or excessive oil and sediment from contaminating stormwater. Contact SPCR at 503-823-7180 for immediate assistance responding to spills. Record time/date and weather & site conditions if site activities contaminate stormwater.
Vectors (mosquitoes & rodents). Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Multnomah County Vector Control at 503-988-3464 for immediate assistance to eradicate vectors. Record time/date and weather & site conditions when vector activity observed.

Operations and Maintenance Plan

Swales

Facility Description. Swales are elongated, gently sloping depressions with dense vegetation. As runoff flows along the length of the swale, the vegetation slows, filters, and infiltrates stormwater. Check dams slow flow and prevent erosion. High flows of stormwater may connect to storm or sewer lines or drywell.

What To Look For	What To Do
Structural Components, including the inlets and outlets/overflows, shall freely convey stormwater.	
➢ Clogged inlets or outlets ➢ Cracked drain pipes	➢ Remove sediment and debris from catch basins, trench drains, curb inlets and pipes to maintain 50% conveyance capacity at all times. ➢ Replace when cracks are greater than 1".
Vegetation, including all plants on the Portland Plant List, shall cover 90% of the facility.	
➢ Dead or strained vegetation	➢ Manually remove sediment accumulation from base of plants. ➢ Replant per planting plan or substitute w/ Portland Plant List, per current SWMM. Vegetation should consist of 50% grasses or grass-like plants. o Irrigate as needed. Mulch banks annually. Do not apply fertilizers.
➢ Tall grass	➢ Mow to 4-6" 1-2 times each year.
➢ Weeds	➢ Manually remove weeds. Do not use pesticides. Remove all plant debris.
Growing/Filter Medium, including soil, pea gravel or like material, shall sustain healthy plant cover and infiltrate w/in 48hrs.	
➢ Exposed soil	➢ Cover with plants.
➢ Gullies	➢ Fill, lightly compact, and install flow spreader/plant vegetation to disperse flow. o Replace 3-5" deep rock check dams at 12-20f t intervals.
➢ Slope slippage	➢ Stabilize 3:1 slopes with plantings from Portland Plant List.
➢ Ponding	➢ Rake, till, or amend to restore infiltration rate.

Maintenance Schedule:

Summer. Make necessary structural repairs. Improve filter medium as needed. Clear drain. Mow. Irrigate as needed.
Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter. Monitor infiltration/flow through rates. Clear inlets and outlets/overflows to maintain conveyance.
Spring. Remove sediment and plant debris. Weed as necessary. Replant exposed soil and replace dead plants. Mulch.

Maintenance Records. Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the City inspector.

Monitoring Log.

Access. Maintain ingress/egress to design standards.
Infiltration/Flow Control. All facilities should drain w/in 48 hrs. Record time/date and weather & site conditions when ponding occurs.
Pollution Prevention. All sites should implement best management practices to prevent hazardous or solid wastes, or excessive oil and sediment from contaminating stormwater. Contact SPCR at 503-823-7180 for immediate assistance responding to spills. Record time/date and weather & site conditions if site activities contaminate stormwater.
Vectors (mosquitoes & rodents). Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Multnomah County Vector Control at 503-988-3464 for immediate assistance to eradicate vectors. Record time/date and weather & site conditions when vector activity observed.

APPENDIX G

Sample Illicit Discharge Ordinance

Stormwater Management Plan
Canton, Connecticut

Model Illicit Discharge and ConnectionStormwater Ordinance

ORDINANCE NO. _____

SECTION 1. PURPOSE/INTENT.

The purpose of this ordinance is to provide for the health, safety, and general welfare of the citizens of (_____) through the regulation of non-storm water discharges to the storm drainage system to the maximum extent practicable as required by federal and state law. This ordinance establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system (MS4) in order to comply with requirements of the National Pollutant Discharge Elimination System (NPDES) permit process. The objectives of this ordinance are:

(1) To regulate the contribution of pollutants to the municipal separate storm sewer system (MS4) by stormwater discharges by any user

(2) To prohibit Illicit Connections and Discharges to the municipal separate storm sewer system

(3) To establish legal authority to carry out all inspection, surveillance and monitoring procedures necessary to ensure compliance with this ordinance

SECTION 2. DEFINITIONS.

For the purposes of this ordinance, the following shall mean:

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

Best Management Practices (BMPs): schedules of activities, prohibitions of practices, general good house keeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

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

Construction Activity. Activities subject to NPDES Construction Permits. Currently these include construction projects resulting in land disturbance of 5 acres or more. Beginning in March 2003, NPDES Storm Water Phase II permits will be required for construction projects resulting in land disturbance of 1 acre or more. Such activities include but are not limited to clearing and grubbing, grading, excavating, and demolition.

Hazardous Materials. Any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

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

Illicit Connections. An illicit connection is defined as either of the following:

Any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the storm drain system including but not limited to any conveyances which allow any non-storm water discharge including sewage, process wastewater, and wash water to enter the

storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency or,
Any drain or conveyance connected from a commercial or industrial land use to the storm drain system which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency.
Industrial Activity. Activities subject to NPDES Industrial Permits as defined in 40 CFR, Section 122.26 (b)(14).
National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit. means a permit issued by EPA (or by a State under authority delegated pursuant to 33 USC § 1342(b)) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.
Non-Storm Water Discharge. Any discharge to the storm drain system that is not composed entirely of storm water.
Person. means any individual, association, organization, partnership, firm, corporation or other entity recognized by law and acting as either the owner or as the owner's agent.
Pollutant. Anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordinances, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.
Premises. Any building, lot, parcel of land, or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.
Storm Drainage System. Publicly-owned facilities by which storm water is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.
Storm Water. Any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.
Stormwater Pollution Prevention Plan. A document which describes the Best Management Practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to Stormwater, Stormwater Conveyance Systems, and/or Receiving Waters to the Maximum Extent Practicable.
Wastewater means any water or other liquid, other than uncontaminated storm water, discharged from a facility.

SECTION 3. APPLICABILITY.
This ordinance shall apply to all water entering the storm drain system generated on any developed and undeveloped lands unless explicitly exempted by an authorized enforcement agency.

SECTION4. RESPONSIBILITY FOR ADMINISTRATION.
The_____ [authorized enforcement agency] shall administer, implement, and enforce the provisions of this ordinance. Any powers granted or duties imposed upon the authorized enforcement agency may be delegated in writing by the Director of the authorized enforcement agency to persons or entities acting in the beneficial interest of or in the employ of the agency.

SECTION 5. SEVERABILITY.

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

SECTION 6. ULTIMATE RESPONSIBILITY.

The standards set forth herein and promulgated pursuant to this ordinance are minimum standards; therefore this ordinance does not intend nor imply that compliance by any person will ensure that there will be no contamination, pollution, nor unauthorized discharge of pollutants.

SECTION 7. DISCHARGE PROHIBITIONS.

Prohibition of Illegal Discharges.

No person shall discharge or cause to be discharged into the municipal storm drain system or watercourses any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than storm water.

The commencement, conduct or continuance of any illegal discharge to the storm drain system is prohibited except as described as follows:

(a) The following discharges are exempt from discharge prohibitions established by this ordinance: water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, non-commercial washing of vehicles, natural riparian habitat or wet-land flows, swimming pools (if dechlorinated - typically less than one PPM chlorine), fire fighting activities, and any other water source not containing Pollutants.

(b) Discharges specified in writing by the authorized enforcement agency as being necessary to protect public health and safety.

(c) Dye testing is an allowable discharge, but requires a verbal notification to the authorized enforcement agency prior to the time of the test.

(d) The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

Prohibition of Illicit Connections.

(a) The construction, use, maintenance or continued existence of illicit connections to the storm drain system is prohibited.

(b) This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

(c) A person is considered to be in violation of this ordinance if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.

SECTION 8. SUSPENSION OF MS4 ACCESS.

Suspension due to Illicit Discharges in Emergency Situations

The _____ [authorized enforcement agency] may, without prior notice, suspend MS4 discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or to the MS4 or Waters of the United States. If the violator fails to comply with a suspension order issued in an emergency, the authorized enforcement agency may take such steps as deemed necessary to prevent or minimize damage to the MS4 or Waters of the United States, or to minimize danger to persons.

Suspension due to the Detection of Illicit Discharge

Any person discharging to the MS4 in violation of this ordinance may have their MS4 access terminated if such termination would abate or reduce an illicit discharge. The authorized enforcement agency will notify a violator of the proposed termination of its MS4 access. The violator may petition the authorized enforcement agency for a reconsideration and hearing.

A person commits an offense if the person reinstates MS4 access to premises terminated pursuant to this Section, without the prior approval of the authorized enforcement agency.

SECTION 9. INDUSTRIAL OR CONSTRUCTION ACTIVITY DISCHARGES.

Any person subject to an industrial or construction activity NPDES storm water discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the [authorized enforcement agency] prior to the allowing of discharges to the MS4.

SECTION 10. MONITORING OF DISCHARGES.

A. Applicability.

This section applies to all facilities that have storm water discharges associated with industrial activity, including construction activity.

B. Access to Facilities.

(a) The _____ [authorized enforcement agency] shall be permitted to enter and inspect facilities subject to regulation under this ordinance as often as may be necessary to determine compliance with this ordinance. If a discharger has security measures in force which require proper identification and clearance before entry into its premises, the discharger shall make the necessary arrangements to allow access to representatives of the authorized enforcement agency.

(b) Facility operators shall allow the [authorized enforcement agency] ready access to all parts of the premises for the purposes of inspection, sampling, examination and copying of records that must be kept under the conditions of an NPDES permit to discharge storm water, and the performance of any additional duties as defined by state and federal law.

(c) The _____ [authorized enforcement agency] shall have the right to set up on any permitted facility such devices as are necessary in the opinion of the authorized enforcement agency to conduct monitoring and/or sampling of the facility's storm water discharge.

(d) The _____ [authorized enforcement agency] has the right to require the discharger to install monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure stormwater flow and quality shall be calibrated to ensure their accuracy.

(e) Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the operator at the written or oral request of the [authorized enforcement agency] and shall not be replaced. The costs of clearing such access shall be borne by the operator.

(f) Unreasonable delays in allowing the [authorized enforcement agency] access to a permitted facility is a violation of a storm water discharge permit and of this ordinance. A person who is the operator of a facility with a NPDES permit to discharge storm water associated with industrial activity commits an offense if the person denies the authorized enforcement agency reasonable access to the permitted facility for the purpose of conducting any activity authorized or required by this ordinance.

(g) If the _____ [authorized enforcement agency] has been refused access to any part of the premises from which stormwater is discharged, and he/she is able to demonstrate probable cause to believe that there may be a violation of this ordinance, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this ordinance or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the authorized enforcement agency may seek issuance of a search warrant from any court of competent jurisdiction.

SECTION 11. REQUIREMENT TO PREVENT, CONTROL, AND REDUCE STORM WATER POLLUTANTS BY THE USE OF BEST MANAGEMENT PRACTICES.

_____[Authorized enforcement agency] will adopt requirements identifying Best Management Practices for any activity, operation, or facility which may cause or contribute to pollution or contamination of storm water, the storm drain system, or waters of the U.S. The owner or operator of a commercial or industrial establishment shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the municipal storm drain system or watercourses through the use of these structural and non-structural BMPs. Further, any person responsible for a property or premise, which is, or may be, the source of an illicit discharge, may be required to implement, at said person's expense, additional structural and non-structural BMPs to prevent the further discharge of pollutants to the municipal separate storm sewer system. Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of storm water associated with industrial activity, to the extent practicable, shall be deemed compliance with the provisions of this section. These BMPs shall be part of a stormwater pollution prevention plan (SWPP) as necessary for compliance with requirements of the NPDES permit.

SECTION12. WATERCOURSE PROTECTION.

Every person owning property through which a watercourse passes, or such person's lessee, shall keep and maintain that part of the watercourse within the property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse. In addition, the owner or lessee shall maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

SECTION 13. NOTIFICATION OF SPILLS.

Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials which are resulting or may result in illegal discharges or pollutants discharging into storm water, the storm drain system, or water of the U.S. said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of non-hazardous materials, said person shall notify the authorized enforcement agency in person or by phone or facsimile no later than the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to the [authorized enforcement agency] within three business days of the phone notice. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

SECTION 14. ENFORCEMENT.

A. Notice of Violation.

Whenever the [authorized enforcement agency] finds that a person has violated a prohibition or failed to meet a requirement of this Ordinance, the authorized enforcement agency may order compliance by written notice of violation to the responsible person. Such notice may require without limitation:

(a) The performance of monitoring, analyses, and reporting;

(b) The elimination of illicit connections or discharges;

(c) That violating discharges, practices, or operations shall cease and desist;

(d) The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property; and

(e) Payment of a fine to cover administrative and remediation costs; and

(f) The implementation of source control or treatment BMPs.

If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by a designated governmental agency or a contractor and the expense thereof shall be charged to the violator.

SECTION 15. APPEAL OF NOTICE OF VIOLATION.

Any person receiving a Notice of Violation may appeal the determination of the authorized enforcement agency. The notice of appeal must be received within ___ days from the date of the Notice of Violation. Hearing on the appeal before the appropriate authority or his/her designee shall take place within 15 days from the date of receipt of the notice of appeal. The decision of the municipal authority or their designee shall be final.

SECTION 16. ENFORCEMENT MEASURES AFTER APPEAL.

If the violation has not been corrected pursuant to the requirements set forth in the Notice of Violation, or , in the event of an appeal, within ___ days of the decision of the municipal authority upholding the decision of the authorized enforcement agency, then representatives of the authorized enforcement agency shall enter upon the subject private property and are authorized to take any and all measures necessary to abate the violation and/or restore the property. It shall be unlawful for any person, owner, agent or person in possession of any premises to refuse to allow the government agency or designated contractor to enter upon the premises for the purposes set forth above.

SECTION 17. COST OF ABATEMENT OF THE VIOLATION.

Within ___ days after abatement of the violation, the owner of the property will be notified of the cost of abatement, including administrative costs. The property owner may file a written protest objecting to the amount of the assessment within ___ days. If the amount due is not paid within a timely manner as determined by the decision of the municipal authority or by the expiration of the time in which to file an appeal, the charges shall become a special assessment against the property and shall constitute a lien on the property for the amount of the assessment.

Any person violating any of the provisions of this article shall become liable to the city by reason of such violation. The liability shall be paid in not more than 12 equal payments. Interest at the rate of ___ percent per annum shall be assessed on the balance beginning on the __st day following discovery of the violation.

SECTION 18. INJUNCTIVE RELIEF.

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this Ordinance. If a person has violated or continues to violate the provisions of this ordinance, the authorized enforcement agency may petition for a preliminary or permanent injunction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

SECTION 19. COMPENSATORY ACTION.

In lieu of enforcement proceedings, penalties, and remedies authorized by this Ordinance, the authorized enforcement agency may impose upon a violator alternative compensatory actions, such as storm drain stenciling, attendance at compliance workshops, creek cleanup, etc.

SECTION 20. VIOLATIONS DEEMED A PUBLIC NUISANCE.

In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this Ordinance is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken.

SECTION 21. CRIMINAL PROSECUTION.

Any person that has violated or continues to violate this ordinance shall be liable to criminal prosecution to the fullest extent of the law, and shall be subject to a criminal penalty of _____ dollars per violation per day and/or imprisonment for a period of time not to exceed ____ days. The authorized enforcement agency may recover all attorney's fees court costs and other expenses associated with enforcement of this ordinance, including sampling and monitoring expenses.

SECTION 22. REMEDIES NOT EXCLUSIVE.

The remedies listed in this ordinance are not exclusive of any other remedies available under any

applicable federal, state or local law and it is within the discretion of the authorized enforcement agency to seek cumulative remedies.

SECTION 23. ADOPTION OF ORDINANCE.

This ordinance shall be in full force and effect __ days after its final passage and adoption. All prior ordinances and parts of ordinances in conflict with this ordinance are hereby repealed.

PASSED AND ADOPTED this ____ day of _____, 19__, by the following vote:

APPENDIX H

Construction Site Inspection Checklist

Stormwater Management Plan
Canton, Connecticut

CERTIFICATE OF OCCUPANCY CHECKLIST - COMMERCIAL, R. B., ETC.

This form is to be initiated by the Building Dept. and circulated through the Engineering Dept. and the Water and Sewer Dept. prior to the issuance of a Certificate of Occupancy. (C.O.) Original and As-Built Plans attached.

Address_____ _____ _____
Building No. Street Lot # Block # Permit No.

Owner_____
Name Address

Builder_____
Name Address

To Be Completed By Building Department

	Yes	No	Not Required
As-Built Plot Plan Filed	☐	☐	☐
Necessary Permits Obtained	☐	☐	☐
Inland-Wetlands or Others	☐	☐	☐
Driveway / Lawn / Grade / Waiver / Letter Filed	☐	☐	☐
Property Graded In Accordance w/Plot Plan	☐	☐	☐
House Numbers on Building	☐	☐	☐

_____ _____
Building Inspector or Agent Date

To Be Completed By Engineering Department

	Yes	No	Not Required
Street Paved to Premises	☐	☐	☐
Sidewalk Installed to Specifications	☐	☐	☐
Driveway Permit Filed	☐	☐	☐
Storm Drain Connection Waiver / Permit Filed	☐	☐	☐
Street Excavation Permit on File	☐	☐	☐
Easements Filed with Town Clerk	☐	☐	☐
Well Permit Filed with Water Test Results	☐	☐	☐
Septic System Permit / Inspection Report Filed	☐	☐	☐
Site stabilized and E&S controls in place	☐	☐	☐
Other_____	☐	☐	☐

_____ _____
Town Engineer or Agent Date

To Be Completed By Water and Sewer Department

	Yes	No	Not Required
Water Permit Filed	☐	☐	☐
Water Assessment / Connection Charges Paid	☐	☐	☐
Water Service Inspected & Located	☐	☐	☐
Sewer Permit Filed	☐	☐	☐
Sewer Assessment / Connection Charges Paid	☐	☐	☐
Sewer Lateral Inspected & Located	☐	☐	☐
Liens Filed with Town Clerk	☐	☐	☐
Easements Filed with Town Clerk	☐	☐	☐
Water Meter Installed	☐	☐	☐
Other _____			

_____ _____
Water & Sewer Department Manager or Agent Date

_____ _____
Fire Marshal Date