

Chapter 1

Introduction to the Stormwater Quality Manual





Volume I: Background

Chapter 1

Introduction

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I.1 Purpose of the Manual

The purpose of this Manual is to provide guidance on the measures necessary to protect the waters of the State of Connecticut from the adverse impacts of post-construction stormwater runoff. The guidance provided in this Manual is applicable to new development, redevelopment, and upgrades to existing development. The Manual focuses on site planning, source control and pollution prevention, and stormwater treatment practices. Related topics such as erosion and sediment control, stormwater drainage design and flood control, and watershed management are addressed in the Manual as secondary considerations. The Manual does not address agricultural runoff. Additional information on these topics can be found in other related guidance documents listed at the end of this chapter.

I.2 Users of the Manual

The Connecticut Department of Environmental Protection intends this Manual for use as a planning tool and design guidance document by the regulated and regulatory communities involved in stormwater quality management in the State of Connecticut. The Manual provides uniform guidance for developers and engineers on the selection, design, and proper application of stormwater Best Management Practices (BMPs). The Manual will also assist local and state government officials (i.e., town engineers, planners, Planning and Zoning Commissions, Conservation Commissions, Inland Wetlands Commissions, and Connecticut State agencies) design and review projects in a technically sound and consistent manner.

The information and recommendations in this Manual are provided for guidance and are intended to augment, rather than replace, professional judgement. The design practices described in this Manual should be implemented by individuals with a demonstrated level of professional competence, such as professional engineers licensed to practice in the State of Connecticut. Design engineers, as well as those responsible for operation and maintenance, are ultimately responsible for the long-term performance and success of these practices. However, the use of this Manual is not restricted to engineers or technical professionals. It is also intended to be used by other individuals involved in stormwater and land use management for reviewing and recommending practices contained in the Manual.

I.3 Organization of the Manual

The Manual is organized into two volumes, both contained in a single, comprehensive document. The organization of the Manual generally follows the recommended stormwater management planning process, which emphasizes preventive measures such as site planning and alternative site design, source controls, and pollution prevention over end-of-pipe structural controls.

Volume I provides an overview of the stormwater problem, approaches for preventing and mitigating stormwater impacts, and a description of site planning and source control practices for pollution prevention. The subsequent chapters in Volume I include:

Chapter Two – Why Stormwater Matters: The Impacts of Urbanization

This chapter introduces the concept of urban stormwater runoff and its impact on watershed hydrology, water quality, and ecology. Chapter Two summarizes why stormwater management measures are necessary to protect receiving waters from the adverse impacts of uncontrolled stormwater runoff.

Chapter Three – Approaches for Preventing and Mitigating Stormwater Impacts

Chapter Three presents an overview of approaches for preventing and mitigating stormwater impacts through site planning and pollution prevention, stormwater quantity controls, construction erosion and sedimentation controls, and post-construction stormwater quality management.



Chapter Four – Site Planning and Design

Chapter Four addresses site planning concepts such as alternative site design and Low Impact Development. These techniques can be incorporated into the design of new projects to reduce or disconnect impervious surfaces and retain and infiltrate stormwater on-site, thereby eliminating or reducing the need for structural stormwater quality controls.

Chapter Five – Source Control Practices and Pollution Prevention

Chapter Five describes source control and pollution prevention practices to limit the generation of stormwater pollutants at their source. This chapter focuses on common municipal, residential, commercial, and industrial practices applicable to new and existing development, such as street and parking lot sweeping, roadway deicing and salt storage, storm drainage system maintenance, illicit discharge detection and elimination, commercial and industrial pollution prevention, and lawn care and landscaping practices.

Volume II provides technical guidance on the selection, design, construction, and maintenance of structural stormwater treatment practices. Volume II also addresses procedures for developing a site stormwater management plan, and design issues associated with stormwater retrofits for existing development. Volume II includes the following chapters:

Chapter Six – Introduction to Stormwater Treatment Practices

Chapter Six introduces structural stormwater treatment practices that can be used alone as primary treatment, as pretreatment or supplemental treatment practices, or in combination (i.e., treatment train approach). This chapter also describes general categories of recently developed, emerging, and potential future stormwater treatment devices and technologies, as well as criteria for evaluating the performance and applicability of new treatment practices.

Chapter Seven – Hydrologic Sizing Criteria for Stormwater Treatment Practices

Chapter Seven explains the procedures and applicability of sizing criteria for structural stormwater treatment practices to meet pollutant reduction, groundwater recharge and runoff volume reduction, and peak flow control requirements. This chapter also includes guidance on the design of stormwater bypass structures and sizing examples for various types of stormwater treatment practices.

Chapter Eight – Selection Criteria for Stormwater Treatment Practices

Chapter Eight provides guidance on selecting appropriate structural stormwater treatment practices for a development site based on the requirements and needs of the site. This chapter includes a recommended selection process and selection criteria.

Chapter Nine – Developing a Site Stormwater Management Plan

Chapter Nine describes how to prepare a site stormwater management plan for review by local and state regulatory agencies. The chapter includes a recommended plan format and contents, and a completeness checklist for use by the plan preparer and reviewer.

Chapter Ten – Stormwater Retrofits

Chapter Ten describes techniques for retrofitting existing developed sites to improve or enhance the water quality mitigation functions of the sites. Chapter Ten also discusses the conditions for which stormwater retrofits are appropriate and the potential benefits of stormwater retrofits.

Chapter Eleven – Design Guidance for Stormwater Treatment Practices

Chapter Eleven provides detailed technical design guidance for each of the stormwater treatment practices introduced in Chapter Six. This chapter includes guidance on the design, construction, and maintenance of these practices, as well as summary information on selection and sizing criteria addressed in previous chapters.

Appendices

Appendices containing supplemental information on the design, construction, and maintenance of structural stormwater management practices are included at the end of Volume II. A glossary of terms used in the Manual is also provided in Appendix F.

While providing detailed guidance on a number of recommended stormwater management practices and related topics, this Manual is not an exhaustive reference on each topic and does not address all aspects of stormwater management. Additional technical guidance can be found in numerous other documents, many of which are referenced in this Manual. References and recommended additional sources of information are listed at the end of each chapter.



1.4 Regulatory Basis and Use of the Manual

This Manual is intended for use as a guidance document to assist developers and the regulated community in complying with existing local, state, and federal laws and regulations. The Manual itself has no independent regulatory authority. Rather, it establishes guidelines that are implemented through a framework of existing laws and regulations. Although this Manual is non-regulatory in scope, it provides the technical basis for a comprehensive, statewide stormwater quality management strategy, including the consistent application of stormwater management practices throughout the state.

1.5 Relationship of the Manual to Federal, State, and Local Programs

The Connecticut Department of Environmental Protection (DEP) historically has been a national leader in developing and implementing water quality protection programs and policies. A number of federal and state regulatory programs are currently in place for stormwater quality management and water resource protection in the state. Consistent with a long-established tradition of home-rule-style government exerted by municipal authorities, many of these programs are implemented at the local level through local zoning, subdivision, and inland wetlands and watercourses regulations and ordinances. In addition, the State of Connecticut has been delegated authority from the federal government to implement federal regulations that pertain to water resources protection. **Table 1-1** summarizes existing regulatory programs that address management of stormwater discharges in Connecticut. Descriptions of these programs and their relationship to this Manual are found in Section 1.5.2.

1.5.1 Federal Programs

Clean Water Act

The Federal Water Pollution Control Act of 1948, the first major federal legislation governing pollution of the nation's surface waters (33 U.S.C. 1251-1387), was significantly amended in 1972 (P.L. 92-500) and then again in 1977 when it became commonly known as the Clean Water Act (CWA) of 1977 (P.L. 95-217). The CWA was subsequently amended under the Water Quality Act of 1987 (P.L. 100-4). There are four primary sections of the CWA that relate to stormwater discharges:

- *Section 303 – Water Quality Standards and Implementation Plans*
- *Section 319 – Nonpoint Source Management Program*

- *Section 401 – Water Quality Certification*
- *Section 402 – National Pollutant Discharge Elimination System (NPDES)*

Under Section 303 of the CWA, states are required to adopt surface water quality standards, subject to review and approval by the U.S. EPA, and identify surface waters that do not meet these water quality standards following the installation of minimum required pollution control technology for point sources discharging to surface water bodies. These impaired water bodies must be ranked by the states and a Total Maximum Daily Load (TMDL) must be established for the pollutant(s) that exceed the water quality standards. A TMDL both specifies a maximum amount of pollutant that the surface water body can receive and allocates that amount, or load, among point and nonpoint sources, including stormwater discharges.

The Nonpoint Source Management Program was established under Section 319 of the CWA of 1987. Section 319 addresses the need for federal guidance and assistance to state and local programs for controlling nonpoint sources of pollution, including stormwater runoff. Under Section 319, states, territories and Indian Tribes receive federal grant money to support various activities that address nonpoint source pollution control. These activities include technical and direct financial assistance, education, training, technology transfer, demonstration projects, and monitoring to assess the effectiveness of specific nonpoint source implementation projects.

Section 401 of the CWA requires applicants for a federal license or permit to obtain a certification or waiver from the state water pollution control agency (DEP, or EPA for Indian reservation lands) for any activity which may result in a discharge into navigable waters of the state, including wetlands, watercourses, and natural and man-made ponds. This waiver certifies that the discharge will comply with the applicable provisions of the CWA and Connecticut's Water Quality Standards. Examples of federal licenses and permits for which water quality certification is required include U.S. Army Corps of Engineers Section 404 dredge and fill permits, Coast Guard bridge permits, and Federal Energy Regulatory Commission permits for hydropower and gas transmission facilities.

The NPDES program was established under Section 402 of the CWA and specifically targets point source discharges by industries, municipalities, and other facilities that discharge directly into surface waters. Stormwater discharges are addressed under the NPDES Stormwater Program. This two-phased national program targets non-agricultural sources of stormwater discharges that may adversely affect sur-



face water quality. The NPDES permitting program is administered in Connecticut by DEP through a series of permits as outlined in **Table 1-1**. Phase I of the NPDES Stormwater Program was developed under the 1987 amendments to the CWA and regulates stormwater discharges from:

- *“Medium” and “large” municipal separate storm sewer systems (MS4s) located in incorporated places or counties with populations of 100,000 or more; and*
- *Eleven categories of industrial activity, one of which is construction activity that disturbs five or more acres of land.*

Phase II of the program expands the scope of the regulated discharges to include:

- *Certain regulated “small” MS4s; and*
- *Construction activity disturbing between one and five acres of land (i.e., small construction activities).*

The Phase II Final Rule was published in December 1999. DEP issued a General Permit in 2004 to address small municipalities. At the time of writing, DEP was in the process of developing a General Permit for the Connecticut Department of Transportation and other state and federal facilities with significant drainage systems and stormwater discharges. Stormwater discharges associated with construction activities between one and five acres are regulated by DEP through a coordinated effort with municipalities under the Connecticut Erosion and Sedimentation Control Act.

Coastal Zone Act Reauthorization Amendments

Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 (16 U.S.C. §1455b) is designed to address the problem of nonpoint source pollution in coastal waters. Under Section 6217, states and territories with approved Coastal Zone Management Programs, including Connecticut, are required to develop Coastal Nonpoint Source Pollution Control Programs or face funding sanctions in both their coastal programs and their nonpoint programs established under Section 319 of the Clean Water Act. The program must describe how the state or territory will implement management measures to reduce or eliminate nonpoint source pollution, including stormwater runoff, to coastal waters. These management measures must conform to those described in the U.S. EPA publication *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*.

I.5.2 State Programs

Connecticut Clean Water Act

The Connecticut Clean Water Act (CCWA) of 1967 (P.A. 67-57) launched Connecticut’s modern water pollution control program. Under the CCWA, as amended, DEP has the regulatory authority to:

- *Abate, prevent or minimize all sources of water pollution, including nonpoint sources*
- *Develop state water quality standards*
- *Permit discharges, including stormwater discharges, to waters of the state*
- *Establish enforcement tools for pollution abatement and prevention*

This statute (Chapter 446k of the Connecticut General Statutes (CGS)) forms the authority for the DEP Bureau of Water Management’s Permitting and Enforcement Division (PED) to regulate discharges to surface waters, ground waters, and Publicly Owned Treatment Works (POTWs). Discharges to surface waters are regulated by DEP under both the CCWA and the federal NPDES Program, because Connecticut has been delegated authority to implement the federal NPDES Program. Consequently, stormwater discharges are regulated under a series of general permits based on the type of activity generating the discharge. The general permit program is authorized under CGS §22a-430b and is designed to authorize similar minor stormwater discharges by one or more applicants. The regulated sources are divided into four major categories:

Commercial Activities: This general permit applies to discharges from any conveyance which is used for collecting and conveying stormwater and which is directly related to retail, commercial, and/or office services whose facilities occupy 5 acres or more of contiguous impervious surface and which are described in the SIC Codes 50’s and 70’s.

Industrial Activities: This general permit applies to discharges from any conveyance which is used for collecting and conveying stormwater and which is directly related to manufacturing, processing or material storage areas at designated categories of industrial facilities.

Construction Activities: This general permit applies to discharges of stormwater and dewatering wastewaters from construction activities which include, but are not limited to, clearing, grading, and excavating and which result in the disturbance of 5 or more acres of total land area on a site. As described above, under Phase II of the NPDES Stormwater Program, construction activities disturb-



Table I-1 Existing Stormwater Management Programs in Connecticut

Program/ DEP Contact	Programs Goals	Stormwater Regulation	Regulates Quantity	Regulates Quality	State or Local Regulations (Authorizing Statute)	Regulation of New or Existing Facilities¹
Commercial General Permit PED Stormwater (860) 424-3018	Regulates stormwater discharges from commercial activity	Requires permits from a commercial activity with 5 or more acres of contiguous impervious surfaces	No	Yes	State (CGS §§22a-416 through 22a-438)	Both
Industrial General Permit PED Stormwater (860) 424-3018	Regulates stormwater discharges from industrial activities	Requires permits for facilities having a stormwater discharge associated with industrial activity	No	Yes	State (CGS §§22a-416 through 22a-438)	Both
Construction General Permit PED Stormwater (860) 424-3018	Regulates stormwater discharges from construction activity	Requires permits from construction activities disturbing more than 5 total acres land area (projects disturbing 1 to 5 acres regulated at the local level under NPDES Phase II)	No	Yes	State (CGS §§22a-416 through 22a-438)	Both
Phase II General Permits PED Stormwater (860) 424-3018	Regulates stormwater discharges from municipal, state, and other designated stormwater drainage systems in urbanized areas	Requires municipalities and other entities to develop and implement a stormwater management program consisting of minimum control measures	Yes	Yes	State (CGS §§22a-416 through 22a-438)	Both
Inland Wetlands and Watercourses Act IWRD (860) 424-3019	Protects and regulates activities in inland wetlands, watercourse, and adjacent areas	Considers impacts to wetlands from stormwater or stormwater-related activities	Yes	Yes	State and Local (CGS §§22a-36 through 22a-45a)	Both
Erosion and Sediment Guidelines IWRD (860) 424-3019	Provides guidance on erosion controls	Guidelines for control of stormwater during construction	Yes	Yes (sediment)	State and Local (CGS §§22a-325 through 22a-329)	New
Flood Management IWRD (860) 424-3019	Regulates state actions in floodplains and changes in drainage patterns	Requires careful planning and siting of development projects and modifications to flood control facilities	Yes	Yes	State (CGS §§25-68b through 25-68h)	Both
Stream Channel Encroachment program IWRD (860) 424-3019	Regulates activities in certain floodplains	Considers impacts to wetlands and watercourses from stormwater or stormwater-related activities	Yes	Yes	State (CGS §§22a-342 through 22a-349a)	Both
401 Water Quality Certification IWRD (860) 424-3019	Regulates activities which require a federal license or permit for discharge into navigable waters of the state	Requires certification from DEP that the discharge will comply with the Federal Water Pollution Control Act and Connecticut Water Quality Standards	No	Yes	State/Federal (33 USC 1341)	Both
Water Diversion IWRD (860) 424-3019	Regulates withdrawal and use of groundwater and surface waters of the state, including stormwater diversions	Requires permitting for any activity that causes, allows, or results in the withdrawal from or the alteration, modification, or diminution of the instantaneous flow of water; including stormwater	Yes	Yes	State (CGS §§22a-365 through 22a-379a)	Both
Dam Safety IWRD (860) 424-3706	Regulates construction, alteration, and repair of dams, including stormwater impoundments	Requires registration and potentially permit approval/inspection for new stormwater impoundments (ponds, wetlands, infiltration basins, etc.)	No	No	State (CGS §§22a-401 through 22a-411)	Both



Table I-1 Existing Stormwater Management Programs in Connecticut (con't)

Program/ DEP Contact	Programs Goals	Stormwater Regulation	Regulates Quantity	Regulates Quality	State or Local Regulations (Authorizing Statute)	Regulation of New or Existing Facilities ¹
Coastal Management Act OLISP (860) 424-3034	Protects coastal resources and supports water-dependent uses	Regulates development that impacts coastal water and resources	Yes	Yes	State and Local (CGS §§22a-90 through 22a-112)	Both
Tidal Wetlands Act OLISP (860) 424-3034	Requires permits for dredging, draining, or filling within tidal wetlands	Discourages direct stormwater discharges	Yes	Yes	State (CGS §§22a-28 through 22a-35)	Both
Structures Dredging and Fill Act OLISP (860) 424-3034	Requires permits for structures, dredging, or fill in tidal, coastal, or navigable waters	Discourages direct stormwater discharges	Yes	Yes	State (CGS §§22a-359 through 22a-363f)	Both
Nonpoint Source Management Program PSD (860) 424-3020	Coordinates statewide efforts to prevent and manage nonpoint source pollution	Relies on existing regulations in place at federal, state, and local level	No	No	State	Both
Aquifer Protection Program PSD (860) 424-3020	Addresses potential groundwater contamination through various programs to ensure safe drinking water supplies	Management plans may include stormwater controls	No	Yes	State and Local (CGS §§22a-354a through 22a-354b)	Both
Source Water Assessment Program BWM/DPH (860) 424-3704	Assessment and protection of public drinking water supply sources	Requires assessment of delineated protection areas of potential sources of contamination. Relies primarily on existing regulations.	No	No	State and Federal	Both
Underground Injection Control Program BWM (860) 424-3018	Prohibits the use of Class V wells and limits the use of UIC drywells in existing or potential groundwater drinking supply areas	Requires safeguards for infiltration of stormwater in areas with high potential for spills and groundwater drinking supply areas	No	Yes	State and Federal	Both
Public Health Code – Sanitation of Watersheds DPH	Protects public water supply sources	Regulates stormwater discharges within 100 feet of an established watercourse within public water supply watersheds or groundwater aquifer recharge areas	Optional	Yes	PHC 19-13-B32i	New
Municipal Planning and Zoning Authorities	Reviews site development plans and protects environmental resources	Considers impacts to receiving waters	Optional	Optional	Local	Both

¹Refers to whether the program primarily applies to newly constructed facilities or new development (New), existing facilities or development (Existing), or both.

PED – Permitting and Enforcement Division, IWRD – Inland Water Resources Division, OLISP – Office of Long Island Sound Programs, PSD – Planning and Standards Division, BWM – Bureau of Water Management, DPH – Department of Public Health, CGS – Connecticut General Statutes



ing between one and five acres are also regulated by DEP through a coordinated effort with municipalities under the Connecticut Erosion and Sedimentation Control Act.

Municipal Separate Storm Sewer Systems (MS4s):

This general permit regulates discharges of stormwater from small MS4s and other similar facilities located in urbanized areas. Separate general permits address stormwater discharges from small municipalities and other state and public facilities, as well as the Connecticut Department of Transportation.

Inland Wetlands and Watercourses Act

The Inland Wetlands and Watercourses Act of 1972, as amended, establishes authority for DEP and municipalities to adopt programs regulating construction and other activities affecting inland wetlands and watercourses, including impacts due to stormwater or stormwater-related activities. The Wetlands Management Section of the DEP Inland Water Resources Division (IWRD) has responsibility for overseeing implementation of the Act and directly regulates the activities of Connecticut state agencies that are located in, or may affect, inland wetlands and watercourses. As discussed in more detail below, local inland wetland agencies are responsible for regulating private and municipal work located in, or affecting, wetlands or watercourses within each Connecticut municipality.

Soil Erosion and Sediment Control Act

The Soil Erosion and Sediment Control Act (CGS §§22a-325 to 22a-329, inclusive) requires that the Council on Soil and Water Conservation develop guidelines for soil erosion and sediment control on land being developed. The latest version of these guidelines was released in April of 2002. The goal of the guidelines is to reduce soil erosion from stormwater runoff, minimize nonpoint sediment pollution from land being developed, and conserve and protect the land, water, air and other environmental resources of the state.

Flood Management Certification

Under CGS §§25-68b through 25-68h, inclusive, any state agency proposing an activity within or affecting a floodplain or impacting natural or man-made storm drainage facilities must submit a flood management certification application to DEP.

Stream Channel Encroachment

Stream channel encroachment lines have been established for approximately 270 linear miles of riverine floodplain throughout Connecticut. Under CGS §§22a-342 through 22a-349a, DEP IWRD regulates the placement of encroachments and obstructions riverward of these encroachment lines. Any activity that

permanently alters the character of the floodplain or watercourse within these areas, including activities generating stormwater discharges, is subject to approval by DEP.

401 Water Quality Certification

Applicants for a federal license or permit for activities that may result in a discharge into navigable waters of the state, including stormwater discharges, must submit a water quality certification application to DEP.

Water Diversion Policy Act

The Water Division Policy Act of 1982 (P.A. 82-402, as amended) grants the DEP IWRD limited authority to regulate the withdrawal and use of groundwater and surface waters of the state, including stormwater diversions. Under CGS §§22a-365 through 22a-379a, permitting is required for any activity that causes, allows, or results in the withdrawal from, or the alteration, modification, or diminution of, the instantaneous flow of water. Diversions must be consistent with other state policies that deal with long-range planning, management and use of the water resources of the state, including the State Plan for Conservation and Development, Water Quality Standards, Flood Management Act, Water Supply Planning Process, Inland Wetlands and Watercourses Act, Aquifer Protection Act, and Endangered Species Act.

Dam Safety Program

The Dam Safety Section of the DEP IWRD is responsible for administration and enforcement of Connecticut's dam safety laws under CGS §§22a-401 through 22a-411, inclusive. The Dam Safety Section regulates the construction, alteration, repair, and removal of dams, including stormwater impoundments through the use of embankments such as stormwater retention/detention ponds, stormwater wetlands, and infiltration basins. Registration with the Dam Safety Section is required for all new stormwater impoundments. A dam construction permit may also be required if the structure may endanger life or property in the event of failure or breaking away. Structures that pose a significant or high hazard to life or property are also subject to periodic inspections by DEP.

Connecticut Coastal Management Act

The Connecticut Coastal Management Act (CGS §§22a-90 through 22a-112, inclusive) establishes goals and policies for the protection of coastal resources. Under CGS §22a-98, the Commissioner of DEP must coordinate all regulatory programs under his jurisdiction with permitting authorities in the coastal area, including those related to wetlands and watercourses, stream channel encroachment, and the erection of structures or placement of fill in tidal, coastal, or navigable waters, to ensure that permits issued under



such regulatory authority are consistent with coastal management goals and policies. The coastal area is defined by statute (CGS §22a-94(a)) and encompasses the municipalities listed in Table 1-2. In addition, pursuant to CGS §22a-100(b), each state department, institution, or agency responsible for the primary recommendation or initiation of actions within the coastal boundary which may significantly affect the environment must also ensure that such actions are consistent with coastal management goals and policies and incorporate all reasonable measures mitigating any adverse impacts on coastal resources. The coastal boundary is defined by statute (CGS §22a-94(b)). Adverse impacts on coastal resources are also statutorily defined (CGS §22a-93(15)) and include degrading water quality through the significant introduction into either coastal waters or groundwater supplies of suspended solids, nutrients, toxics, heavy metals, or pathogens, all of which can be contained in stormwater. In addition, degrading water quality through the significant alteration of temperature, pH, dissolved oxygen, or salinity is also included in the statutory definition of adverse impacts, and these impacts can also result from stormwater runoff. Coastal permitting and assistance to municipalities is administered through the DEP Office of Long Island Sound Programs (OLISP).

Tidal Wetlands Act

The Tidal Wetlands Act of 1969 (CGS §§22a-28 through 22a-35, inclusive) gives DEP authority to regulate activities in tidal wetlands. The permitting program administered by OLISP requires that the applicant address possible impacts to coastal resources, including those associated with stormwater runoff, and discourages direct stormwater discharges to tidal wetlands.

Structures, Dredging and Fill Act

The Structures, Dredging, and Fill Act (CGS §§22a-359 through 22a-363f, inclusive) gives DEP the authority to regulate dredging, the erection of structures, and the placement of fill in tidal, coastal or navigable waters of the state waterward of the high tide line. The permitting program administered by OLISP requires that the applicant address possible impacts to coastal resources, including those associated with stormwater runoff, and discourages direct untreated stormwater discharges to tidal, coastal, or navigable waters.

Nonpoint Source Management Programs (pursuant to CWA Section 319 and CZARA Section 6217)

The Connecticut Nonpoint Source Management (NPS) Program is administered by the DEP Bureau of Water Management (BWM) Planning and Standards Division (PSD) and is a network of several federal, state, and local programs. The NPS Program includes all of the components required under Section 319 of the

Federal Clean Water Act. It establishes long- and short-term goals for the prevention and management of nonpoint sources of pollution, including those associated with urban runoff and stormwater. EPA defines NPS pollution as that which is “caused by diffuse sources that are not regulated as point sources and are normally associated with precipitation and runoff from the land or percolation.” EPA approved Connecticut’s upgraded Nonpoint Source Management Program in November 1999 (see Nonpoint Source Management Program at <http://www.dep.state.ct.us/wtr/nps/npsmgtp.pdf>).

As described in the discussion of federal programs above, Section 6217 of the 1990 CZARA requires the development of a Coastal Nonpoint Pollution Control Program (CNPCP) to implement management measures to reduce or eliminate nonpoint source pollution within the coastal boundary. The CNPCP is a networked program administered by OLISP with assistance from BWM and relies on other regulatory programs described in this section including state and local permitting authorities.

Aquifer Protection Area Act

The Aquifer Protection Area Act of 1989 requires the development of aquifer protection land use regulations applicable within DEP-approved aquifer protection areas (areas recharging large public water supply wells). As part of the regulations, issued in 2004, municipalities containing aquifer protection areas are required to adopt regulations, subject to approval by DEP, requiring permitting for all regulated activities within aquifer protection areas. In addition, regulated activities within an aquifer protection area may require a stormwater management plan to assure that stormwater runoff generated by the proposed activity is managed in a manner to prevent pollution of ground water.

Source Water Assessment Program (SWAP)

The Connecticut Source Water Assessment Program (SWAP) was initiated in 1997 in response to the 1996 Amendments to the Federal Safe Drinking Water Act. The Connecticut Department of Public Health (DPH), in partnership with DEP, is responsible for the development of the SWAP, which is designed to assess and protect public drinking water supply sources in the state. The SWAP completes its work based upon an EPA-approved Work Plan dated September 1999. The SWAP includes the delineation of a protection area surrounding the drinking water source, the identification of potential pollution sources within and around the protection area, and the determination of a water supply’s susceptibility to contamination. The SWAP will build on existing surface water and wellhead protection programs administered by DPH and DEP. As part of the program, DEP and DPH will recommend a variety of source protection strategies aimed



**Table 1-2
Municipalities Within The Coastal Area**

Branford	Groton Long Point	Norwich
Bridgeport	Guilford	Old Saybrook
Chester	Hamden	Old Lyme
Clinton	Ledyard	Orange
Darien	Lyme	Preston
Deep River	Madison	Shelton
East Haven	Milford	Stamford
East Lyme	Montville	Stonington
Essex	New London	(Borough and Town of)
Fairfield	New Haven	Stratford
Fenwick	Noank	Waterford
Greenwich	North Haven	West Haven
Groton (City and Town of)	Norwalk	Westbrook
		Westport

at reducing potential impacts from non-point pollution sources including stormwater runoff to municipalities and water companies. Additional information on the SWAP can be found at http://www.dph.state.ct.us/BRS/WSS/swap_reports.htm.

Underground Injection Control (UIC) Program

The Federal Safe Drinking Water Act established the UIC program to provide safeguards so that injection (or infiltration) wells used for waste disposal do not endanger water quality, especially groundwater drinking sources. In Connecticut, the DEP Water Management Bureau has been given primacy for this program. A well under the UIC Program is any well whose depth is greater than the largest surface dimension (this could include certain infiltration trenches with vertical pipe connections) that is used to discharge waste to the ground. Historically the type of UIC wells used in Connecticut were “Class V” (not hazardous wastes). They were typically drywell-type structures, and were most commonly used for automotive service drains. In Connecticut these types of wells are no longer allowed, and groundwater discharges of wastes other than domestic sewage or clean water are not allowed to the ground in existing or potential groundwater drinking supply area. Stormwater structures such as infiltration drywells or trenches, which are susceptible to spills, leaks, or other chemical releases, especially at industrial or petro-chemical commercial sites, may be considered UIC wells.

Care must be taken to ensure that stormwater drywells or infiltration trenches do not threaten groundwater quality, especially drinking water sources. Later chapters in this Manual provide guidance about

sites where the use of stormwater infiltration structures should be avoided due to groundwater quality concerns, and sites where they could be used to recharge stormwater with pretreatment or other safeguards.

Public Health Code – Sanitation of Watersheds

Connecticut Public Health Code §19-13-B32i requires that stormwater discharges terminate at least one hundred feet from an established watercourse located within lands tributary to public drinking water supplies, including both surface and groundwater sources. If such termination is not possible, discharges that terminate within 100 feet of a watercourse require review by the Department of Public Health. Discharges within 100 feet must include adequate flow energy dissipation and must not adversely impact stream quality. This requirement applies to surface drinking water supply watershed areas, approximately 16.5 percent of Connecticut’s land area, and to streams tributary to public drinking water supply wells.

1.5.3 Local Programs

State-Mandated Programs

Several of the state programs discussed above require the implementation of municipal regulations and permitting processes, including:

Inland Wetlands and Watercourses Act: CGS §22a-42(c) requires that each municipality establish an Inland Wetlands and Watercourses Agency and local regulations regulating private and municipal work located in or affecting wetlands or watercourses. The regulations must conform to model regulations developed by DEP and contain certain criteria and procedures for application review. The application must address measures to prevent or minimize pollution, including those associated with stormwater runoff.

Erosion and Sediment Control Act: The Erosion and Sediment Control Act requires that municipalities adopt regulations requiring that a soil erosion and sediment control plan be submitted with any application for development within the municipality when the disturbed area of such development is more than one-half acre.

Coastal Management Act/Coastal Site Plan Review: Under the CCMA, coastal municipalities are required to implement Connecticut’s Coastal Management Program through their existing planning and zoning authorities. Most activities within the coastal boundary, as defined by DEP according to CGS §22a-94, require municipal Coastal Site Plan Review (CSPR). In this review process, the applicant must describe the proposed project and identify coastal resources in the project area and potential



impacts to those resources. Local planning and zoning authorities must decide whether potential adverse impacts to water quality or other coastal resources are acceptable. A description of stormwater management measures may be required depending on the size of a project and the municipality concerned. CGS §22a-101 allows coastal municipalities to develop Municipal Coastal Programs, which are revisions to plans of conservation and development and zoning regulations to focus on the coastal resources and coastal management issues unique to each town.

Municipal Planning/Zoning: Public Act 91-170 (codified in CGS §8-2(b) and CGS §8-35a) and Public Act 91-395 (codified in CGS §8-23(a)) require that the zoning regulations and plans of conservation and development for any municipality contiguous to Long Island Sound, and the regional plans of development of each region contiguous to Long Island Sound, be made with reasonable consideration for the restoration and protection of the ecosystem and habitat of Long Island Sound. These documents must also contain recommendations and practices to reduce hypoxia, pathogens, toxic contaminants, and floatable debris in Long Island Sound.

Aquifer Protection Act: Under the aquifer protection land use regulations, issued in 2004, municipalities containing aquifer protection areas are directed to adopt regulations requiring local permitting for all regulated activities within aquifer protection areas. In addition, regulated activities within an aquifer protection area may require a stormwater management plan to ensure that stormwater runoff generated by the proposed activity is managed in a manner to prevent pollution of ground water.

Municipal Planning/Zoning

Development projects and other activities subject to approval by municipal planning and zoning authorities are typically subject to review for potential impacts to environmental resources. Depending upon the local regulations, stormwater quantity and/or quality may be regulated. In addition, some municipalities have developed or are considering developing local stormwater quality ordinances.

Additional Information Sources

Watershed Management

Center for Watershed Protection. 2000. *The Practice of Watershed Protection*, Ellicott City, Maryland.

Davenport, T.E. 2002. *The Watershed Project Management Guide* Lewis Publishers/CRC Press.

U.S. Environmental Protection Agency, Office of Water. 2001. *Protecting and Restoring America's Watersheds: Status, Trends, and Initiatives in Watershed Management*. EPA-840-R-00-001.

Agricultural Runoff

Connecticut Department of Environmental Protection and U.S. Department of Agriculture, Natural Resources Conservation Service. 1993. *Guidelines for Protecting Connecticut's Water Resources*.

U.S. Environmental Protection Agency, Office of Water. 1993. *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*.

U.S. Department of Agriculture, Natural Resource Conservation Service. *National Handbook of Conservation Practices*.

Drainage Design and Flood Control

Connecticut Department of Transportation (DOT). 2000. *Connecticut Department of Transportation Drainage Manual*.

Natural Resource Conservation Service (formerly Soil Conservation Service). 1986. *Urban Hydrology for Small Watersheds*, TR-55.

Water Environment Federation (WEF) and American Society of Civil Engineers (ASCE). 1992. *Design and Construction of Urban Stormwater Management Systems (Urban Runoff Quality Management (WEF Manual of Practice FD-20 and ASCE Manual and Report on Engineering Practice No. 77))*.

Erosion and Sediment Control

Connecticut Council on Soil and Water Conservation and the Connecticut Department of Environmental Protection. 2002. *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*, DEP Bulletin 34.