Chapter 1
Introduction

New Hampshire's surface waters are a valuable natural resource. Through their function and beauty, they power industry, provide vital habitat, supply drinking water, and offer recreational opportunities to residents and visitors throughout the state. However, as the population grows and development pressures increase to provide needed housing and services, it is becoming increasingly difficult to protect and maintain the quality of our surface waters for the fishing, swimming, and recreational activities that we are so used to enjoying in New Hampshire.

Pemigewasset River, New Hampshire

The responsibility falls on us all - federal, state, and local governments, developers, and private citizens - to plan and act responsibly and in a manner that protects and works with the landscape to meet both water quality and land use goals. Development and natural resource protection do not need to be at odds. Existing scientific knowledge and technology in the field of stormwater management provide us with tools that can minimize the impacts of development and balance the needs of a healthy environment with those of social and economic growth.

The New Hampshire Department of Environmental Services (NHDES) has developed this New Hampshire Stormwater Manual to provide communities, developers, designers, and regulatory personnel with a reference guide for the selection, design, and application of measures to manage stormwater from newly developed and redeveloped properties, while meeting environmental objectives in the New Hampshire regulatory setting. These measures include source controls, design techniques (including low impact development (LID) design approaches), structural practices, and construction practices designed to minimize adverse hydrologic and water quality impacts, protecting and enhancing the functions of our natural wetlands and waterways.

The remainder of this Chapter presents an overview of the three-volume New Hampshire Stormwater Manual, and summarizes the contents and organization of information presented in Volume 1.

1-1. About the New Hampshire Stormwater Manual

Odiorne State Park, Rye, New Hampshire

The New Hampshire Stormwater Manual is intended as a planning tool for the communities, developers, designers, and members of regulatory boards, commissions, and agencies involved in stormwater programs in New Hampshire. The Manual addresses measures to manage stormwater runoff through site design, pollutant source controls, structural Best Management Practices (including associated operation and maintenance measures), and construction-phase practices. These practices are expected to be applied to meet specific objectives under current state and federal regulatory programs. However, if any discrepancies are found between this manual and the New Hampshire Code of Administrative Rules for the programs discussed here, the Rules should be followed.

The Manual is issued in three volumes:

Volume 1: Stormwater and Antidegradation presents an overview of New Hampshire's stormwater program together with related federal program requirements, describes New Hampshire's "Antidegradation Provisions" with respect to controlling water quality impacts due to stormwater discharges, and provides an introduction to the non-structural and structural measures for managing stormwater.

Volume 2: Post-Construction Best Management Practices Selection and Design presents a detailed description of the structural Best Management Practices (BMPs) applicable for use in New Hampshire for the prevention, control, and treatment of stormwater. Volume 2 describes information applicable to the screening, selection, design, and application of particular post-construction BMPs.

Volume 3: Erosion and Sediment Controls During Construction provides a selection of practices applicable during the construction of projects, to prevent adverse impacts to water resources as a result of the land-disturbance activities typically associated with development and redevelopment projects.

NHDES intends the New Hampshire Stormwater Manual to serve as:

- A living document with the ability to be updated as needed to accommodate the changes in stormwater management as the wealth of information in this area grows, and as technology and research broaden its scope and our perspective.
- A resource for developers and engineers in site planning, source control, and pollution prevention measures, as well as the selection

and application of stormwater Best Management Practices (BMPs) to protect the surface waters of the state from potential adverse impacts of construction and post-construction stormwater runoff.

- A resource to local and state government officials, such as planning and zoning boards, town engineers, planners, conservation commissions, and New Hampshire state agencies involved in project review or approval to ensure that state and federal stormwater requirements are met, and that projects are reviewed in a consistent manner.

- A source of information on state and federal stormwater programs and their requirements that apply to development projects in New Hampshire, and a resource for selecting management measures to meet those requirements, including:

    - Stormwater management techniques commonly used, including BMPs and better site design techniques. Using better site design techniques in combination with traditional BMPs will result in more effective stormwater management systems to more easily meet the runoff volume and pollutant removal requirements of federal and state stormwater programs.

    - Selection criteria to assist in the selection of appropriate management techniques for a site and in the preparation of Stormwater Pollution Prevention Plans (SWPPPs) and other stormwater management planning documents.

    - Summaries of stormwater management techniques including the target pollutants, general site requirements, removal mechanisms, and pollutant removal efficiencies.

    - An explanation of various modeling tools that can be used as a surrogate to water quality monitoring to verify that pollutant loading requirements will be met in the post-development condition.

1-2. About Volume 1

Within this context, Volume 1 provides the foundation for understanding stormwater management requirements in New Hampshire, and planning for the implementation of measures to protect the environment from the adverse impacts caused by stormwater runoff from land development and redevelopment. Volume 1 provides information for municipalities involved in the regulation of stormwater, discusses underlying principles key to understanding stormwater management, describes the regulatory setting, and provides an introduction to the practices available for managing stormwater to meet regulatory objectives.

A key component of Volume 1 is the explanation of the Antidegradation Provisions of the New Hampshire Surface Water Quality Regulations (Env-Wq 1700). This Volume provides guidance in determining the applicability of these Regulations to a project. Where the regulations apply, this Volume describes the calculations required to show that stormwater discharges meet the requirements of the Antidegradation Provisions. Guidance is also offered about the non-structural site design techniques and structural management practices that can be implemented to meet the Alteration of Terrain (AoT) Program and Antidegradation Provisions. The chapters are organized as follows:

Chapter 2: Message for Municipalities provides a summary of the information contained in the manual that is applicable to municipal governments, as well as additional resources specifically geared toward municipalities. It is anticipated that municipalities will refer developers and project engineers to individual chapters for more detailed information on each topic.

Chapter 3: Understanding Stormwater Management discusses the fundamental concepts of stormwater management, including the relationship between land use and water quantity and quality, sources of stormwater pollutants, watershed planning, and traditional stormwater management concerns.

Chapter 4: State and Federal Permitting Programs discusses the state and federal permitting programs that apply to stormwater management in New Hampshire. These programs aim to balance the need for development with water quality protection. This chapter outlines water quality requirements that must be met in order to permit development activities.

Chapter 5: Antidegradation discusses the requirements of the Antidegradation Provisions of the New Hampshire Surface Water Quality Regulations (Env-Wq 1708). These methods include targets for effective impervious cover (EIC), undisturbed cover (UDC), and pollutant loading. The chapter includes a description of the Impervious Cover Method, developed by the Center for Watershed Protection, to calculate the total impervious cover of a site as well as the EIC and UDC.

Chapter 6: Non-Structural Site Design Techniques discusses the non-structural, better site design techniques, often referred to as low impact development (LID) techniques. These techniques minimize the amount of stormwater runoff generated on a site and reduce the treatment volume by maintaining and mimicking the natural hydrology of a site. This chapter also discusses how these techniques can be used to "disconnect" impervious surfaces on a site to lower the EIC and better meet the target for that parameter.

Chapter 7: Introduction to Best Management Practices provides a brief description of structural stormwater best management practices. It also provides an overview of the factors that should be considered when selecting or narrowing down stormwater management practices for a site including

land use, watershed resources, BMP capability, maintenance, and community and environmental factors.

Chapter 8: Pollutant Loading Calculations describes the calculations that should be used to determine if a project is in compliance with the Antidegradation Provisions. This chapter describes the Simple Method for calculating pollutant loads and includes a link to a Simple Method spreadsheet template. It also provides pollutant removal efficiencies for various BMPs.