Rhode Island's Coastal Nonpoint Pollution Control Program

An Interagency Partnership

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T	Rhode Island Sea Grant, Coastal Resources Center. 1994. *Environmental Guide for Marinas: Controlling Nonpoint Source and Storm Water Pollution in Rhode Island.* Narragansett, RI. RI Sea Grant. September.
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Executive Summary

Introduction

Since 1972, with the adoption of the Clean Water Act (CWA), Rhode Island has made significant progress in controlling water pollution from point sources such as sewage treatment plants and industrial discharges. Yet, in spite of this success, many water quality problems in Rhode Island persist and, in some areas, water quality has continued to decline. One of the main causes of this degraded water quality is nonpoint pollution, or polluted runoff.

In order to address the problems associated with nonpoint sources of pollution, Congress adopted Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990. Section 6217, entitled "Protecting Coastal Waters", requires each coastal state participating in the federal coastal management program to develop a Coastal Nonpoint Pollution Control Program (CNPCP) to be approved jointly by the EPA and the NOAA. The central purpose of Section 6217 is to enhance state and local efforts to manage land use activities that degrade coastal waters and coastal habitats. To do so, Section 6217 requires the authorities and expertise of state water quality and state coastal zone management agencies be brought together to address the problem of nonpoint pollution of coastal waters through enforceable policies and mechanisms. Therefore, the Rhode Island Department of Environmental Management (RIDEM), as the state's nonpoint source management agency under Section 319 of the Clean Water Act, and the Coastal Resources Management Council (CRMC), as Rhode Island's coastal zone management agency, have "a dual and co-equal role and responsibility in developing and implementing the coastal nonpoint program". In accordance with the statute, failure to develop an approved CNPCP by July of 1995 will result in fiscal penalties on each of these programs.

Rhode Island's proposed CNPCP is divided into two volumes and thirteen chapters. The proposed CNPCP contains all of the federally required components for state CNPCPs, including proposed approaches for meeting specific programmatic requirements. Chapter 1, Introduction, provides a brief description of federal requirements related to CNPCP development and implementation in accordance with Section 6217. Chapter 2 provides background information on the primary state programs relied upon to implement Rhode Island's proposed CNPCP. A response to NOAA/EPA's recommended 6217 management area is contained in Chapter 3. Chapters 4 through 9 describe the State's strategy for addressing the prescribed (g) measures. Chapters 10, 11 and 13 briefly address programmatic requirements related to additional management measures, technical assistance and water quality monitoring. Public participation in program development and statewide education and outreach efforts are summarized in Chapter 12.

Program Development

Rhode Island is faced with two separate, but related challenges for controlling nonpoint pollution, which stem from different federal mandates. The first of these is the development, approval and implementation of the CNPCP as required by Section 6217; the second is the update of *Rhode Island's Nonpoint Source Management Plan*. With regard to the latter, in accordance with requirements contained in Section 319 of the Clean Water Act, each state must identify and periodically review control measures and management approaches for categories of nonpoint pollutants identified in the state's nonpoint source assessment report as impacting or threatening water quality. The *Plan* outlines a framework for state and local coordination, as well as specific nonpoint source management objectives of the RIDEM. Accordingly, the CRMC and the RIDEM, in conjunction with the Rhode Island Department of Administration, Division of Planning (RIDOP), have focused their efforts on a coordinated approach for developing Rhode Island's CNPCP and updating the *Nonpoint Source Management Plan*.

When the *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance* (EPA and NOAA 1993) and the *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* (EPA 1993) were published in January 1993, the CRMC and the RIDEM created a steering committee which included representatives of the CRMC, RIDEM, RIDOP, Soil Conservation Service (SCS, now the Natural Resources Conservation Service), Cooperative Extension (CE) and the Coastal Resources Center at the University of Rhode Island (CRC). In April of 1993, the RIDEM sponsored an interagency workshop where all relevant federal and state agencies were represented. At this workshop it was agreed that the steering committee would be responsible for creating an advisory committee framework which could be used to both develop the CNPCP and update the *Rhode Island Nonpoint Source Management Plan*. As a result of the steering committee's efforts, the Interagency Nonpoint Source Advisory Committee (INSAC) was created. The INSAC is co-chaired by the CRMC, RIDEM, and RIDOP.

Since there are many sources of nonpoint pollution and an equally diverse range of agencies and organizations involved in nonpoint source issues, the RIDEM, CRMC, and RIDOP chose to utilize a series of technical advisory subcommittees. The subcommittees are organized around particular nonpoint sources (e.g., agriculture, forestry, ISDS, stormwater and erosion and sediment control, land use, and marinas) and additional federal requirements for Section 6217 and Section 319 (e.g., watershed prioritization, public outreach, and monitoring). The subcommittees are comprised of key officials from federal, state, and local levels of government as well as

members of nongovernmental organizations and the general public. The steering committee made a concerted effort to identify appropriate groups for representation on the various subcommittees. While the initial membership of the subcommittees was reviewed and approved by the INSAC subcommittee membership remained open to any interested person or organization.

In general, the subcommittees began their efforts early in 1994 by evaluating the actual and potential water quality problems associated with a particular source of nonpoint pollution in order to determine if the source presented a significant nonpoint pollution problem to Rhode Island's coastal waters. In cases where the subcommittees determined that a coastal water quality problem does exist as a result of a particular nonpoint source of pollution, the subcommittees focused their efforts on reviewing individual management measures and identifying the extent to which existing programs currently implement individual management measures through enforceable policies. This process led to the identification of areas where action was needed in order to conform with (g) measure requirements. The subcommittees then considered options for addressing (g) measures not currently addressed statewide through enforceable policies. In each case, consensus was developed as to the best approach for implementing those measures through enforceable policies. In cases where it was determined that a particular source does not present an actual or potential threat to coastal waters, the subcommittees focused there efforts on crafting solid arguments for exclusion from the measures, based on water quality and land use data.

All final documents and related proposed regulation changes developed by the CRMC and RIDEM were brought to relevant subcommittees for review. This entire process was greatly facilitated by the participation of subcommittee members from the private sector as well as the regulatory community who brought with them expertise in specific nonpoint source problems and existing regulatory and nonregulatory programs. Once reviewed by the subcommittees, final sections of the proposed RICNPCP were brought before the INSAC for further review and approval.

On August 24 and 25, 1994 representatives from NOAA and EPA met with representatives from the CRMC, RIDOP, and several divisions within the RIDEM for an informal threshold review of Rhode Island's proposed approaches for meeting the requirements contained in Section 6217. This meeting provided an opportunity for the state to ask questions and receive feedback on proposed approaches prior to the July, 1995 deadline for program submittal to EPA and NOAA. The following elements were addressed in the Threshold Review Document and were the subject of discussions with NOAA and EPA: implementation of management measures for sources and activities related to urban areas, marinas, hydromodifications, and wetlands;

proposed exclusions from the management measures related to agriculture and forestry; the Section 6217 management area; critical areas; public participation; and coordination and implementation.

On December 27th, 1994, Rhode Island received comments from NOAA and EPA on Rhode Island's proposed approaches addressed in the Threshold Review Document. In general, the comments provided by NOAA and EPA were quite positive and primarily focused on requests for additional information or clarification of information contained within the document.

Since then, sections of the threshold review document have been revised based on NOAA/EPA comments and reviewed by appropriate advisory committees to ensure accuracy and consensus. Additional components of the RICNPCP were also developed and reviewed by subcommittees and the INSAC.

Following the INSAC's final review and approval and in accordance with federal requirements, Rhode Island's final proposed RICNPCP was subsequently advertised for a thirty day public review period prior to submittal to NOAA/EPA.

Summary of the Rhode Island Coastal Nonpoint Pollution Control Program

The following is a brief summary of the requirements contained in the *Guidance Specifying Management Measures for Sources of Nonpoint Pollution to Coastal Waters* and the general approach proposed in the RICNPCP for meeting those requirements. These approaches have been developed by consensus, primarily at the subcommittee level and reviewed and approved by the INSAC. In many cases, particularly with regard to the measures for urban areas, the approaches, out of necessity, network and propose amendments to existing programs. Given the structure of local and state government in Rhode Island, the proposed approaches were determined by the subcommittees to be the most efficient and practical for meeting the requirements of Section 6217.

Agriculture

Primary sources of agricultural nonpoint source pollution are nutrients, sediment, animal wastes, salts, and pesticides. There are six management measures associated with agricultural activities. They focus on: erosion and sediment control; management of confined animal facilities (there are separate measures for large and small facilities); nutrient management; pesticide management; grazing management; and, irrigation management.

Based on available water quality and land use data, the Agriculture and Forestry Subcommittee determined that agriculture does not and is not reasonably expected to, individually or cumulatively, present significant adverse effects to living coastal resources or human health. This is the second scenario under which a state may request an exclusion from a particular category or subcategory of nonpoint pollutants. As a result, an exclusion from the management measures related to agriculture has been requested.

Forestry

Forestry (or silvicultural) activities may impact water quality by accelerating erosion, and by increasing nutrient and chemical runoff, the amount of organic matter in adjacent waters, water temperatures, and streamflows. Ten management measures provided under this source category include requirements for preharvesting plans, road management and revegetation of disturbed areas. The management measures apply generally on lands where forestry operations are planned or conducted.

While a significant amount of land area is forested (approximately 50%), there is very little commercial forestry activity in Rhode Island. Based on that fact and available water quality and land use data, the Agriculture and Forestry subcommittee determined that forestry is not a significant contributor to nonpoint source pollution to Rhode Island's coastal waters. Accordingly, an exclusion from the forestry management measures has been requested based on the second scenario under which an exclusion may be allowed; that is, forestry does not and is not reasonably expected to, individually or cumulatively, present significant adverse effects to living coastal resources or human health.

Urban Runoff

As the most densely populated state in the U.S., urban runoff is one of the major nonpoint sources of pollution to Rhode Island's coastal waters. Conversion of open space, and agricultural and forested lands to urban land uses results in more impervious surfaces, greater runoff volumes, and increases in pollutant loadings. Major pollutants associated with urban nonpoint source pollution are sediment, nutrients, road salts, heavy metals, petroleum hydrocarbons, pathogenic bacteria, and viruses. These pollutants generally enter coastal waters through stormwater runoff and onsite sewage disposal systems.

Fifteen management measures address this category of nonpoint source pollutants. Recognizing that once an area becomes urbanized it is often difficult and extremely expensive to install systems to control nonpoint pollution, the *Guidance* provides separate measures for existing and new urban development. Measures for existing development emphasize reducing nonpoint pollution resulting from ongoing activites, while those for new

development focus on preventing new contributions of nonpoint pollution by providing siting and design, construction, and post-development standards. The *Guidance* also contains specific measures for new and existing roads highways and bridges.

Implementation of the management measures primarily relies upon an approach which networks: the RIDEM's Freshwater Wetlands, Individual Sewage Disposal Systems (ISDS) and Water Quality regulations; the CRMC's Rhode Island Coastal Resources Management Program (RICRMP), related Special Area Management Plans, and harbor management requirements; and, where these programs may be inadequate, the Municipal Comprehensive Planning Program, related enabling acts related to land use planning, and the *State Guide Plan*.

Marinas and Recreational Boating

Nonpoint source pollution associated with marinas and recreational boating activities can result in increased water toxicity, elevated pollutant levels in aquatic organisms, and contamination of water quality as a result of pathogens. Recreational boating activities can also disrupt sediment and habitat, and cause shoaling and erosion.

There are fifteen management measures for marinas and recreational boating activities contained in the Section 6217 (g) guidance. These management measures are grouped under two broad categories: siting and design; and operation and maintenance. The measures will be implemented primarily through existing and minor changes to the RICRMP, amendments to the Harbor Management program, and the State's Water Quality regulations and Water Quality Certification process.

Hydromodifications

Hydromodifications include channelization and channel modification, dams, and streambank and shoreline erosion. Hydromodifications contribute to nonpoint source pollution by disrupting habitats, sedimentation patterns, erosion rates, and water flows. The Section 6217 (g) guidance contains six management measures for hydromodifications designed to address problems associated with the alteration of the physical characteristics of surface waters and the resulting impacts on instream and riparian habitats. Generally, the measures require impacts associated with these sources be minimized through operation and maintenance practices as well as the protection of water quality and instream and riparian habitats.

The RICNPCP proposes implementation of the hydromodifications management measures through the RIDEM's Freshwater Wetlands regulations and Dam Safety program, the State's Water Quality regulations

and Water Quality Certification program, and through existing requirements of, and proposed amendments to, the RICRMP.

Wetlands, Riparian Areas, and Vegetated Treatment Systems
The Section 6217 (g) guidance contains three management measures which do not address a specific source of nonpoint source pollution, but rather, promote the protection and restoration of wetlands and riparian areas as well as the use of vegetated treatment systems to control and minimize nonpoint source pollution. These management measures require states to protect wetlands and riparian areas which serve a nonpoint source abatement function, promote the use of vegetative filter strips and buffer zones, and to restore degraded wetlands and riparian areas. These measures are currently implemented by the CRMC and the RIDEM's Freshwater Wetlands programs.

Additional Required Components

- **Coordination with Existing State Programs:** Chapter 2 describes the programs which will be relied upon for RICNPCP implementation. The statute requires that state CNPCPs be closely coordinated with state and local water quality plans and programs developed under the Clean Water Act and the Coastal Zone Management Act. Accordingly, implementation of the RICNPCP will be primarily through existing regulatory programs administered by the CRMC and RIDEM. Supplementary to these mechanisms, the State will rely on the Municipal Comprehensive Planning program, State enabling acts related to land use planning, and the *State Guide Plan.* Together these provide an integrated approach for assuring implementation of management measures statewide.
- **The 6217 Management Area:** Section 6217(e) requires that NOAA, in consultation with EPA, review each state's existing coastal zone boundary and recommend any modification necessary to effectively manage land and water uses to protect coastal waters. To that end, NOAA has recommended to Rhode Island a 6217 management area which includes, with the exception of two small areas, the entire state. Lacking sufficient data and resources to conduct an independent assessment of the necessary 6217 management area, Rhode Island has accepted this recommendation. Chapter 3 contains Rhode Island's brief response to NOAA's boundary recommendation.
- **Additional Management Measures:** Section 6217(b) requires that state CNPCPs provide for the implementation of "additional management measures" where coastal water quality is impaired or threatened even after implementation of the (g) measures. States must: identify coastal waters impaired and threatened by nonpoint sources of pollution; identify land uses that, individually or cumulatively, cause or threaten water quality impairments in those coastal waters; identify critical coastal areas; develop a process for determining what additional measures, if any, are needed to attain or maintain water quality standards in threatened and impaired

waters; and, develop a program to ensure implementation of additional management measures.

Chapter 10 describes Rhode Island's proposed approach for addressing the additional management measure requirements of Section 6217. The RICNCP identifies several programs and related requirements which meet the criteria for additional management measures. The RICNPCP proposes implementation of (g) measures and the completion of existing projects which will complement and influence the implementation of additional management measures prior to the development of any new regulatory approaches or the identification of new critical coastal areas. Specific ongoing efforts include the revision of the CRMC's Special Area Management Plans for the Salt Pond and Narrow River regions, the Greenwich Bay initiative and the implementation of the revised *Rhode Island Nonpoint Source Mangement Plan.*

- **Technical Assistance:** Section 6217(b)(4) requires state programs to provide technical and other assistance to local governments and the public for implementing additional management measures. Chapter 11 of the CNPCP contains a description of numerous programs that will be used to assist municipalities and the general public with implementation of additional management measures.
- **Public Participation:** Section 6217(b)(5) requires states to provide for public participation in all aspects of the program. Rhode Island's approach for meeting the public participation requirements of Section 6217 and ensuring public involvement in all aspects of program development is briefly described above under "Program Development". Specific information on the State's efforts to ensure public invlovement in the development of the RICNPNP, including schedules of meetings and presentations, is contained in Chapter 12. This Chapter also contains a directory of subcommittees.
- **Water Quality Monitoring:** Section 6217(g) requires states to implement monitoring programs to assess the effectiveness of management measures over time. Due to funding constraints, Rhode Island is not proposing any new water quality monitoring associated with Section 6217 at this time. Existing monitoring programs and an assessment of needs related to water quality monitoring in Rhode Island are contained in Chapter 13.

Chapter 1
Introduction

Water pollution is classified into two categories. The first category is point source pollution which enters the water from a specific point such as a pipe (e.g., sewage treatment plants, industrial discharges, combined sewer overflows). The second category is nonpoint pollution which basically constitutes all other sources of water pollution. Nonpoint source pollution is diffuse in nature and difficult to define. In general, nonpoint pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural pollutants and pollutants resulting from human activity. Eventually, these pollutants are deposited in rivers, wetlands, coastal waters, and ground waters. Nonpoint pollutants include: nutrients (nitrogen and phosphorus); hydrocarbons (oil and grease); pathogens; pesticides; toxics; and sediment. These pollutants can cause significant environmental problems, particularly in poorly flushed estuaries (e.g., Rhode Island's Salt Ponds and the Narrow River). These problems include: increased nutrient loadings and eutrophication; increased turbidity of receiving waters; decreased oxygen concentrations in receiving waters; increased loadings of toxics, pesticides, and hydrocarbons; and changes in habitat and species diversity. Nationwide, the leading contributors of nonpoint pollutants are: urban runoff (including certain construction and development activities); individual sewage disposal systems (ISDSs); roads, bridges, and highways; agriculture; silviculture (forestry); hydromodifications, dams, and shoreline erosion; and marinas and recreational boating (Table 1.1).

Since 1972, point sources of water pollution (e.g., sewage treatment plants, industrial discharges) have been regulated pursuant to the federal Clean Water Act (CWA) and Rhode Island has made significant progress in controlling water pollution from point sources. However despite these efforts, many water quality problems remain. In many areas, particularly the poorly flushed estuaries and coastal embayments, water quality has continued to deteriorate (e.g., shellfish closures in Greenwich Bay and portions of the Salt Ponds). One of the main causes of this degraded water quality is nonpoint pollution.

In order to address what Congress characterized as a growing nonpoint pollution problem affecting the nation's coastal waters, Congress passed, as part of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990, Section 6217 entitled "Protecting Coastal Waters". Section 6217 requires each coastal state with a federally approved coastal management program to develop a Coastal Nonpoint Pollution Control Program (CNPCP) to be approved jointly by the Environmental Protection

Table 1.1 Leading Causes and Sources of Water Quality Impairment

	Rivers	Lakes	Estuaries
Leading Causes of Impairment	Siltation, Nutrients, Organic Enrichment, Pathogens, Metals	Metals, Nutrients, Organic Enrichment, Suspended Solids	Nutrients, Organic Enrichment, Pathogens, Priority Organics, Suspended Solids
Leading Sources of Impairment - Nonpoint	Agriculture, Hydrologic Modification, Resource Extraction, Stormwater/Runoff	Agriculture, Hydrologic Modification, Stormwater/Runoff, Land Disposal	Stormwater/Runoff, Land Disposal, Agriculture, Construction
Leading Sources of Impairment - Point	Sewage Treatment Plants, Industrial Discharges	Sewage Treatment Plants, Industrial Discharges	Sewage Treatment Plants, Industrial Discharges, CSOs

Source: Environmental Protection Agency. 1992. *National Water Quality Inventory: 1990 Report to Congress*. Washington, DC: Environmental Protection Agency, Office of Water. April.

Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) by July 1995 (Table 1.2). There are two incentives for program development. First, Rhode Island receives federal funding for program development. Second, failure to develop an approved CNPCP by July 1995 will result in fiscal penalties for both the Section 319 nonpoint source management program (RIDEM) and the state coastal management program (CRMC). Section 319 of the Clean Water Act (CWA) requires each state to develop a nonpoint source management plan every four years. The RIDEM has completed the implementation of its first nonpoint source management plan and is in the process of finalizing another four year plan.

The programmatic requirements for developing state CNPCPs are contained in the *Guidance Specifying Management Measures for Nonpoint Sources of Pollution in Coastal Waters* (EPA 1993a) and the *Coastal Nonpoint Pollution Control Program Development and Approval Guidance* (NOAA and EPA 1993). These programmatic requirements are not intended to result in a new nonpoint pollution control program. Instead, these requirements are to be implemented through changes to existing programs, most notably the CRMC's Rhode Island Coastal Resources Management Program and the RIDEM's Rhode Island Nonpoint Source Management Plan (EPA and NOAA 1993). The specific programmatic requirements are described in greater detail below.

Table 1.2 Schedule for State CNPCP Development, Approval, and Implementation

January 1993	Program Approval and (g) Measure Guidance Published
March 1993	NOAA Issues Boundary Recommendations
August 1994	Rhode Island Participates in Threshold Review Process
July 1995	CNPCPs Submitted to NOAA and EPA for Approval
January 1996	Implementation of the (g) Measures Begins
January 1999	Full Implementation of the (g) Measures
January 2001	Completion of 2 Year Monitoring Period
January 2004	Implementation of Additional Management Measures

Boundary Modifications

One of the most challenging requirements of Section 6217 pertains to modifications of state coastal zone management (CZM) program (e.g., CRMC) boundaries. Section 6217 requires the NOAA to evaluate whether the CRMC's existing boundary extends inland to the extent necessary to control nonpoint source pollution from land and water uses that will have a significant impact on a state's coastal waters. The NOAA is then required to recommend a boundary for a § 6217 management area if the CRMC's boundary is insufficient. The NOAA based its recommendations on the coastal watershed boundaries identified as the cataloging units on United States Geologic Survey (USGS) maps. In Rhode Island, the coastal watershed boundary encompasses almost the entire state. Therefore, the Rhode Island's CNPCP boundary will exceed the jurisdictional boundary of the CRMC. Accordingly, Rhode Island will have to utilize a "networked approach" which relies on various agencies and programs to administer the CNPCP's implementation throughout the management area. This will require significant coordination and integration on the part of various agencies at the state and local level.

Coordination and Integration

One of the central purposes of the Section 6217 requirements was to strengthen the coordination between federal and state coastal and water quality management programs in order to enhance state and local efforts to manage land use activities resulting in degraded coastal habitats and reduced water quality. Accordingly, a central challenge to developing a CNPCP has been to coordinate the wide range of

existing nonpoint source management efforts at the federal, state, and local level (Table 1.3 and 1.4).

There are several ways that coordination between water quality and CZM programs will continue to be achieved under the CNPCP. General mechanisms for continued coordination of state programs are described in Chapter 2 Specific mechanisms for the coordinated implementation of management measures are contained in the discussions under individual management measures. Also, the requirement that the CNPCP be jointly submitted to and approved by the NOAA and EPA, as well as the threat of fiscal penalties to both the water quality and CZM agency ensures future coordination. Further, since the implementation of Rhode Island's CNPCP is expected to be an iterative process requiring evaluation and modification over time, future coordination will be necessary. Finally, the final CNPCP will be included an amendments to the federally approved Rhode Island Coastal Resources Management Program (RICRMP) and by reference into the Rhode Island Nonpoint Source Management Plan (EPA and NOAA 1993, 41). This will subject the CNPCP's implementation to oversight by both the NOAA and the EPA.

Implement the (g) Measures

Essentially, Section 6217 is a two tiered program. The first tier involves using a technology based approach which consists of implementing the (g) management measures throughout the management area (EPA 1993a). Management measures are defined as:

> "economically achievable measures for the control of the addition of pollutants from existing and new categories and classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives."

The management measures are described in terms of systems rather than individual practices. Many of these systems include a combination of practices that reduce the generation of pollutants (a pollution prevention approach) as well as keep the pollutants from reaching surface waters through the use of structural and nonstructural methods (e.g., BMPs). This approach is analogous to the use of treatment "trains" or series of treatment steps used by point source systems.

The management measures apply to the following land use activities: agriculture, forestry, urban (new development, septic systems, roads, bridges, highways, etc.), marinas, and hydromodifications. There are also management measures to protect wetlands and riparian areas, and to promote the use of vegetative treatment systems (EPA 1993a). Rhode Island must implement all of the measures contained in the (g) guidance unless it can be demonstrated that the nonpoint source category is either:

Table 1.3 Selected Federal Nonpoint Source Pollution Control Initiatives

- **Environmental Protection Agency**
  - Nonpoint Source Management Program
  - National Estuary Program
  - Wetlands Protection Program
  - Water Quality Standards (NPDES)
  - NPDES General Permits
  - Near Coastal Waters Program
  - Clean Lakes Program
  - Pesticides Management Program
  - Underground Injection Control
  - Wellhead Protection Program

- **U.S. Department of Agriculture**

  Soil Conservation Service
  - Soil and Water Conservation Programs
  - Watershed Protection and Flood Prevention
  - Resource Conservation and Development

  Agricultural Stabilization and Conservation Service
  - Agricultural Conservation Program
  - Wetlands Reserve Program

  Forest Service
  - Nonpoint Source Pollution Management Programs
  - Watershed Restoration Programs

- **Department of Commerce**

  National Oceanic and Atmospheric Administration
  - State Coastal Zone Management Programs
  - National Estuarine Research Reserves

- **Department of Interior**
  - U.S. Fish and Wildlife Programs
  - National Irrigation Water Quality Program
  - Forestry Programs
  - Riparian Wetlands Initiative for the 1990s

- **U.S. Army Corps of Engineers**
  - §404 Wetlands Permit Program
  - §9 & §10 Rivers and Harbors Permit Program

Table 1.4 State, Local, and Nongovernmental Initiatives to Address Nonpoint Source Pollution

- **Department of Environmental Management (RIDEM)**
  - Office of Environmental Coordination
    - Nonpoint Source Mgt. Plan
    - Narragansett Bay Project CCMP
  - Division of Freshwater Wetlands
  - Division of Water Resources
    - RIPDES General Permits
    - Section 401 Water Quality Certifications
  - Division of Ground Water and ISDS
    - ISDS Permits
    - Underground Injection Control Program
  - Division of Agriculture
    - Agricultural Wetlands Program
    - Pesticides Registration Program
  - Division of Forest Resources
- **Coastal Resources Management Council (CRMC)**
  - Rhode Island Coastal Resources Mgt. Program
  - Harbor Management Program
  - Salt Ponds Special Area Management Plan
  - Narrow River Special Area Management Plan
- **Rhode Island Division of Planning (RIDOP)**
  - State Guide Plan
  - Local Comprehensive Planning Program
- **University of Rhode Island**
  - Cooperative Extension Service
  - Sea Grant
  - Coastal Resources Center
- **Conservation Districts**
- **Resource Conservation and Development Council**
- **Local Governments**
  - Municipal Comprehensive Land Use Plans
  - Harbor Management Plans
  - Wastewater Management Districts
  - Soil Erosion and Sediment Control Ordinances
- **Non Governmental Efforts**
  - Watershed Protection Organizations
  - Volunteer Monitoring Organizations

1) not present nor reasonably anticipated; or 2) the nonpoint source category or subcategory does not present significant adverse effects to living resources or human health. However, Rhode Island would be allowed to implement an alternative management measure provided that it can be demonstrated that the alternative measure is at least as effective as the "g" measure (EPA and NOAA 1993).

In addition to the management measures, the "g" guidance includes: the applicability criteria for the management measure; a description of activities and locations for which each measure is suitable; an identification of the pollutants that may be controlled by the measures; the factors that should be taken into account when applying the management measure; and, monitoring techniques that can be used to assess the effectiveness of the management measure's implementation.

Additional Management Measures

The second tier of Section 6217 is a more strategic water quality based approach to address known nonpoint source water quality problems. It requires developing additional management measures to protect and improve threatened and impaired coastal waters and critical areas. Additional management measures are both preventative (protect threatened waters) as well as corrective (already impacted waters). Additional management measures must also be developed to protect critical areas. A number of alternatives are available for selecting the additional management measures. For example, Rhode Island can select management measures not specified in the "g" guidance, apply "g" measures more intensively, or apply "g" measures more stringently (EPA and NOAA 1993).

In order to identify where additional management measures must be developed and implemented, states must: 1) identify coastal waters not attaining or maintaining applicable water quality standards or protecting designated uses, threatened coastal waters, and land uses causing or threatening water quality impairments; 2) develop a process for determining whether additional management measures are necessary to attain or maintain water quality standards in the waters identified above; 3) describe the additional management measures to be applied to the identified land uses and in critical coastal areas; and, 4) develop a program to ensure implementation of additional management measures (EPA and NOAA 1993).

Additional management measures and critical coastal areas must be addressed in the CNPCP when it is submitted to EPA and NOAA in July of 1995. However, Rhode Island has until January of 2004 to fully implement these additional management measures (EPA and NOAA 1993). Section 6217 also requires states to provide technical and other assistance to local governments and the public for implementing the additional management measures (EPA and NOAA 1993). This will require coordinating the technical assistance efforts of other federal and state

programs in order to make them more accessible to local municipalities, organizations, and individuals.

Enforceable Policies

One of the features which differentiates Section 6217 from many of the prior federal nonpoint pollution control initiatives is the requirements that the (g) measures and the additional management measures must be implemented through enforceable policies and mechanisms (EPA and NOAA 1993). Enforceable policies are defined as:

> "state policies which are legally binding through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions, by which a State exerts control over private and public land and water uses and natural resources in the coastal zone."

Enforceable policies include such things as constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions that enable a state to exert control over both private and public land and water uses and natural resources (EPA and NOAA 1993). The requirement that the CNPCP contains enforceable policies and mechanisms differs from many prior nonpoint pollution control programs which often rely on demonstration projects and the voluntary implementation of best management practices to manage nonpoint pollution. While the voluntary programs have often been very effective (EPA 1984; and, EPA 1992a), Congress determined that an enforceable program to control nonpoint pollution to coastal waters was necessary.

Implementation of the Section 6217 Programmatic Requirements

This document describes how Rhode Island implements, or plans to implement and address the requirements associated with Section 6217. Chapter 2 provides background information on various programs. It is intended to be used as a supporting document for other sections of the document. Chapter 3 contains Rhode Island's response to the NOAA's boundary recommendation. Chapter 4 and Chapter 5 discuss Agriculture and Forestry, respectively. These documents propose to exclude these categories and subcategories of nonpoint pollutants from the CNPCP. Chapter 6 and its supporting materials address the Urban measures. These measures are, or will be, implemented by various programs statewide. Chapter 7 and its supporting materials address the Marina measures. These requirements are, or will be, implemented by the CRMC and RIDEM, Division of Water Resources. Chapter 8 and its supporting materials address Hydromodifications. These requirements are, or will be, implemented by the CRMC and the RIDEM Division of Fresh Water Wetlands. Chapter 9 and its supporting materials address wetlands and

riparian areas. These requirements are currently implemented by the CRMC and the RIDEM Division of Freshwater Wetlands. Chapter 10 discusses how additional management measures will be addressed and includes a description of proposed critical areas. Chapter 11 provides a description of existing and planned technical assistance activities throughout the State. Chapter 12 reviews the public involvement and outreach activities that have been conducted during the development of the CNPCP and provides a general overview of planned outreach activities related to the CNPCP. More detailed descriptions of identified outreach and education needs and plans are included in discussions under relevant individual management measures. Chapter 13 provides an overview of state water quality monitoring efforts. Finally, the document's various appendices contain supporting materials which have been included to assist the federal review team.

Chapter 2
Program Descriptions/Coordination

Introduction

In order to comply with the requirements of Section 6217 of the 1990 Coastal Zone Act Reauthorization Amendments (CZARA), Rhode Island will rely on the following agencies/divisions and their associated programs to implement various management measures:

- Rhode Island Coastal Resources Management Program
  - Permit requirements
  - Harbor Management Program
- RIDEM, Division of Freshwater Wetlands
  - Permit Requirements
  - Dam Safety Program
- RIDEM, Division of Groundwater and ISDS
- RIDEM, Division of Water Resources
- Municipal Comprehensive Planning Program, State Enabling Acts related to Land Use Planning, and the *State Guide Plan*

It is important to recognize that the primary mechanisms for implementation of the proposed management measures for compliance with 6217(g) measures will be administered through the currently existing state regulatory agencies, namely the CRMC and the RIDEM, as noted above. Virtually any proposed construction activity within the proposed 6217 management area (entire State of Rhode Island) requires a review by at least one of the above noted regulatory programs. Therefore, enforceable policies that meet Section 6217 requirements exist for the implementation of management measures . Supplementary to these mechanisms, the State will rely upon the Municipal Comprehensive Planning Program, State Enabling Acts related to land use planning, and the *State Guide Plan* (currently an enforceable mechanism under the Rhode Island Coastal Resources Management Program).

The following sections provide general information on these programs in order to help the reader better understand how they function. Subsequent chapters in this document describe in more detail how these programs specifically implement individual management measures. This chapter also contains brief descriptions of other programs which complement the implementation of the management measures.

Rhode Island Coastal Resources Management Program

The Rhode Island Coastal Resources Management Council (CRMC) was created in 1971 pursuant to § 46-23 of the Rhode Island General Laws (R.I.G.L.) (Appendix A) for the purpose of managing the coastal resources of the state. The Council, which is comprised of sixteen members and a support staff, is charged with the responsibility

> ". . . to preserve, protect, and, where possible, to restore the coastal resources of the state for this and succeeding generations through comprehensive and long range planning and management designed to produce the maximum benefits for society from such coastal resources; preservation and restoration shall be the guiding principle upon which environmental alterations will be measured, judged and regulated (R.I.G.L. §46-23-1)."

To carry out this mandate, the CRMC is engaged in a wide range of planning and management programs. These programs include:

- CRMC's permit requirements pursuant to the RICRMP
- Municipal Harbor Management Program
- Special area management plans
- Rights-of-Way (ROW) Designation Program
- Dock Registration Program
- Marina Certification Program

The CRMC adopted the Rhode Island Coastal Resources Management Program (RICRMP) in 1976 and received its federal program approval pursuant to the federal Coastal Zone Management Act (CZMA) in 1978. The RICRMP was later substantially revised in 1983 and 1990 (Appendix E).

Nature of the RICRMP

The RICRMP is structured as a coastal zoning program and is regulatory in nature. It is based on six CRMC water types and the shoreline features (type of shoreline). The Council's six water types are:

- Type 1 Conservation Areas;
- Type 2 Low Intensity Use;
- Type 3 High Intensity Boating;
- Type 4 Multipurpose Waters;
- Type 5 Commercial and Recreational Harbors; and,
- Type 6 Industrial Waterfronts and Commercial Navigation Channels (RICRMP §200).

Maps containing the water type designations are contained at the end of the RICRMP. There are specific policies and prohibitions that correspond to each water type.

Approximately 70% of the State's shoreline is adjacent to either Type 1 or Type 2 waters. The policies for these water types are designed to protect these areas from commercial development and restrict the placement of in-water structures. For example, the construction of new marinas is prohibited in Type 1 and Type 2 waters. For other water types, the policies are less restrictive and encourage specific types of water dependent uses. For example, Type 3 waters have policies designed specifically to encourage recreational uses of the shoreline such as marinas, docks, and public launching ramps.

Like the water types, the CRMC also has policies for activities on or adjacent to shoreline features. The CRMC defines shoreline features as:

- Coastal Beaches;
- Barrier Islands and Spits;
- Dunes;
- Coastal Wetlands;
- Coastal Headlands, Bluffs, and Cliffs;
- Rocky Shores; and,
- Manmade Shorelines (RICRMP §210).

There are specific policies designed to protect each shoreline feature and manage upland development. For example, the CRMC has policies which severely restrict and prohibit any alterations to coastal wetlands, beaches, and dunes. In some instances, the coastal features have been further classified. For example, the CRMC has policies that pertain to developed, moderately developed, and undeveloped barrier beaches.

The RICRMP also contains policies that apply to certain types of activities (See RICRMP §300). For example, RICRMP Section 300.4 addresses recreational boating facilities and contains the CRMC's marina regulations. In addition to the regulations contained in the RICRMP, the CRMC has adopted by reference several guidance manuals which contain supplemental requirements for permit applicants. These include : *Rhode Island Soil Erosion and Sediment Control Manual* (Appendix L); *Rhode Island Stormwater Design and Installation Standards Manual* (Appendix K); and the CRMC's *Buffer Management Guidance* (Appendix I). The CRMC will also adopt the *Environmental Guide for Marinas: Controlling Nonpoint Source and Storm Water Pollution in Rhode Island* recently developed by the University of Rhode Island Coastal Resources Center (Appendix T).

The combination of policies associated with Water Type and coastal features combined with the policies and standards used to regulate specific activities creates an effective framework to reduce user conflicts and allocate resources while preserving and protecting sensitive coastal areas.

When are CRMC Assents Required?

In order to administer the RICRMP, the CRMC is authorized to approve, modify, set conditions for, or reject the design, location, construction, alteration, and operation of

specified activities under the Council's jurisdiction (R.I.G.L. 46-23-6(B)(3)). The CRMC's jurisdiction is generally defined by the area extending from the seaward limit of the territorial sea (3 miles offshore) to 200 feet inland of any coastal feature (RICRMP §100). In the watershed areas of poorly flushed estuaries (e.g., the Salt Ponds and Narrow River), the CRMC requires permits for any subdivision of six or more units, activities requiring more than one acre of parking, and structures requiring large septic systems (greater than 2,500 gallons/day) (RICRMP §100 & §320).

The CRMC also requires permits for certain inland activities regardless of location. These activities include:

- Solid waste disposal facilities
- Minerals extractions
- Chemical transfer, processing, and storage facilities
- Power generation facilities
- Petroleum transfer, processing, and storage facilities
- Sewage treatment and disposal facilities (See RICRMP §100 & §320)

Further, the CRMC can require any activity which has a reasonable probability of conflicting with the RICRMP's goals, management plans, or programs to obtain a Council Assent.

The CRMC also reviews federal activities and federal license and permit activities for consistency with the enforceable policies of the RICRMP pursuant to Section 307 of the 1972 CZMA. Currently, the CRMC reviews a wide range of federal activities and all federal license and permit activities within the first coastal town.

CRMC's Permit Process

Applicants proposing any activity within the Council's jurisdiction must apply for a CRMC Assent. The CRMC's permit process is described in some detail in the RICRMP's introduction entitled "Guidelines for Applicants" and in §100 of the RICRMP. Additional information can be found in *The Rhode Island Coastal Resources Management Program: A Handbook for Permit Applicants* . There are several types of Assents issued by the Council. They include:

- Findings of No Significant Impact (FONSIs) (See RICRMP §110.4)
- Maintenance Assents (See RICRMP §300.14)
- Category A Assents (See RICRMP §110.1)
- Category B Assents (See RICRMP §110.2)
- Emergency Assents (See RICRMP §180)

In addition, applicants can apply for a Preliminary Determination where the CRMC reviews the project as proposed and provides the applicant with comments such as identifying applicable policies and standards. All of the Assents are processed

administratively with the exception of Category B Assents. All Category B applications go out to public notice (as do some Category A Assents) and have a public hearing before the Council which makes the final decision. Table 1 and 1a of the RICRMP are used to determine if an activity is reviewed as a Category A or B application. These tables also give an indication as to whether a proposed activity is prohibited. If an activity is prohibited it must get a "Special Exception" in accordance with the burdens of proof contained in RICRMP §130. Special Exceptions can only be granted by the Council. If a proposed activity can not meet the policies and standards contained in the program, then the applicant must obtain a variance in accordance with the burdens of proof outlined in RICRMP §120. Some variances can be processed administratively.

Generally, before the applicant can apply he/she must have already obtained relevant local, state, and federal approvals identified in the prerequisites sections of the RICRMP. Once the applicant has satisfied or demonstrated that he/she will satisfy the prerequisites, the application process for most Category A and B Assents is as follows:

1) A complete application is submitted, given a file number and logged into the computer;
2) Category B and some Category A applications are put out to public notice;
3) Special subcommittee hearings are held if substantive objections are received (RICRMP §110.3);
4) Staff (Engineer and Biologist) complete site visits and meet with the applicant as necessary;
5) Staff prepare their reports and an Assent may be issued if it is a Category application;
6) If it is a Category B application the Council has a public hearing; and,
7) The Council votes to approve, modify, or deny the Category B application;

It should be noted that Category A applications are never denied administratively, but are brought before the Council. If the Council denies an application or an applicant is dissatisfied with the Council's decision, he/she is entitled to appeal the Council's decision in Court.

CRMC's Municipal Harbor Management Program

The CRMC's Municipal Harbor Management Program (MHMP) was created in 1988 pursuant to § 46-23 of the Rhode Island General Laws (R.I.G.L.). The MHMP addresses many of the unique problems which affect harbors along Rhode Island's coast. Examples of these problems include overcrowding of mooring fields, multiple-use conflicts, lack of public access, loss of water dependent uses due to waterfront development, water quality problems, and marine debris. The goal of the program is get each of the 21 coastal towns to develop and implement a local harbor management plan (HMP) and harbor ordinance. The CRMC provides significant flexibility to local officials concerning the content of a HMP. The intent is not for the CRMC to tell the

town what issues must be addressed, but rather, to help the town identify and address local problems and user conflicts as identified by public officials and town residents.

There has been a great deal of participation in the harbor management project. As of May, 1995, 12 municipalities have received Council approval for their HMPs. Of the remaining nine coastal towns: two municipalities have locally approved HMPs and are awaiting Council review/approval; three municipalities are in the process of developing HMPs for local approval; two municipalities have no harbor related ordinances which require Council approval, and are not required to develop HMPs; and, two are working with CRMC staff to begin the planning and development phases for their HMPs.

Each municipality's Harbor Management Plan and Harbor Ordinance(s) must be consistent with all of the policies contained in the RICRMP as well as the Council's *Guidelines for the Development of Municipal Harbor Management Plans* (Appendix F) which is currently being revised pursuant to a Section 309 Enhancement Grant from NOAA. The Harbor Ordinance must contain enforceable policies to implement appropriate elements of a Harbor Management Plan (e.g., siting of mooring fields, vessel operations, etc.). Municipalities may not enforce the requirements of their harbor ordinances or collect mooring fees without the CRMC's prior approval of the Harbor Ordinance.

If a municipality wishes to expand the perimeter of an existing mooring field or to develop a new mooring field, the municipality must first receive the Council's approval which takes the form of an approval of an amendment to the municipality's Harbor Management Plan and Harbor Ordinance.

RIDEM, Division of Freshwater Wetlands

The Freshwater Wetlands Program is a regulatory permitting program. The program is established to enforce the State of Rhode Island's Freshwater Wetlands policies as defined in the Fresh Water Wetlands Act(RIGL 2-1-18 - 2-1-24) and the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). A freshwater wetland is defined in the act to include, but not be limited to swamps, marshes, bogs, ponds, flood plains, rivers, river and stream flood plains and banks, areas subject to flooding or storm flowage, emergent and submergent plant communities in any fresh water, and the area of land within 50 feet of any marsh, bog, swamp or pond. A more complete definition can be found under definitions in the Freshwater Wetlands Regulations. Any project or activity that may alter freshwater wetlands requires a permit from the Director of RIDEM. In addition, any project in close proximity to a freshwater wetland will require a permit if it:

1. Changes the flow of surface runoff into or away from a freshwater wetland.
2. Diverts groundwater into or away from a freshwater wetland.

3. Modifies water quality in a way that could change the natural character of a freshwater wetland.

To ensure compliance with the Fresh Water Wetlands Act and the Freshwater Wetlands Regulations the Director of RIDEM has the authority to undertake enforcement actions. These actions are detailed in Rule 15.00 of the Freshwater Wetlands Regulations. Types of enforcement actions include:

1. Warning.
2. Immediate Compliance Order.
3. Cease and Desist Order.
4. Notice of Intent to Enforce.
5. Notice of Violation and Order.
6. Notice to Owner.
7. Notice of Intent to Revoke/Suspend.
8. Notice of Revocation/Suspension.

Under the Freshwater Wetlands Regulations projects taking place in, or in close proximity to freshwater wetlands must avoid or minimize impacts to the functions and values of freshwater wetlands. These functions and values include:

1. Wildlife and wildlife habitat.
2. Recreation and aesthetics.
3. Flood protection.
4. Groundwater and surface water supplies.
5. Water quality.
6. Soil erosion and sediment.

Rule 10.00 of the Freshwater Wetlands Regulations explains in detail how wetlands functions and values are to be determined.

The original Freshwater Wetlands Regulations became effective in 1972. The most recently developed regulations became effective as of April 7, 1994.

RIDEM, Division of Groundwater and ISDS

There are several programs administered by the RIDEM, Division of Groundwater and ISDS which address the management measures to varying degrees. They include:

- Individual Sewage Disposal System Program;
- Groundwater Protection Program;
- Wellhead Protection Program;
- Underground Injection Control Program;
- Regulation of Well Drilling;

- Groundwater Investigations; and,
- Technical Assistance to Communities.

These programs are discussed in more detail in the following sections.

Individual Sewage Disposal System(ISDS) Program

This program is implemented by the RIDEM, Division of Groundwater and ISDS through the *Rules and Regulations Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* pursuant to Chapters 42-17.1-2(l),(m),(r),(s) and 23-19.4-5 of the R.I.G.L. The program includes a schedule of fees for permitting and enforceable policies.

Under these regulations, a newly constructed, altered, or rebuilt system must receive a Certificate of Conformance prior to use of the system and/or sale or occupation of the serviced construction. Also, a municipality may only grant a Certificate of Occupancy where the applicant presents a Certificate of Conformance. The Director of RIDEM may suspend or revoke any approval granted under the ISDS Regulations in the event that subsequent examination reveals that any of the data included in any application form, submittal, plan or sketch to be incorrect or not in compliance with the ISDS Regulations.

Systems for subdivisions in the State of Rhode Island are given special consideration and are required by regulation to undergo a special review process. Section 18.00 titled "Subdivisions" describes this process. Included among the requirements are:

1. Percolation tests in an adequate number, not less than 1 per an acre with a minimum of 2 tests in small areas, to indicate clearly the soil conditions throughout the property.
2. An adequate number of borings, excavations or observations to clearly establish the elevation of the groundwater table.
3. Where a substantial question exists regarding the cumulative impacts on the water quality of a unique or valuable body of ground water or surface water, the Director of RIDEM may require an assessment.

The ISDS Regulations contain requirements for proper maintenance of septic systems. Under Section 2.11 all building sewers and individual sewage disposal systems must be maintained in good repair by the owner. The Director of RIDEM may order the owner to clean or repair such sewers or systems within a reasonable time if he finds them to be in need.

The ISDS Program is fully implemented as described in the ISDS Regulations (Appendix D) and is described as it applies to the CNPCP in the OSDS Section of the Urban Chapter.

Groundwater Protection Program

In 1985, the Rhode Island General Assembly passed the Groundwater Protection Act of 1985 (Title 46 Chapter 13.1) which set forth for the first time a vigorous policy for protecting the groundwater resources of the State. The Act established that it is state policy "to restore and maintain the quality of groundwater to a quality consistent with its use for drinking supplies and designated beneficial uses" and to restore all groundwater of the state to the extent practicable to a quality consistent with this policy (46-13.1-2(4)). In addition, the Act prohibits the introduction of "pollutants into the groundwater of the state in concentrations which are known to be toxic, carcinogenic, mutagenic, or teratogenic", and mandates "to the maximum extent practical, efforts shall be made to require the removal of such pollutants from discharges where such discharges are shown to have already occurred" (46-13.1-2(5)).

In FY 1985, the Department of Environmental Management created a Groundwater Section to coordinate departmental activities related to groundwater protection and to develop and implement a comprehensive program to protect the groundwater resources of the state. The State of Rhode Island administers a number of different programs with groundwater protection as either the sole objective or one of several objectives. The need to coordinate and integrate these state programs, in addition to local government protection efforts, has been recognized in the Rhode Island Groundwater Protection Strategy (RIDEM 1989).

The Groundwater Protection Strategy, adopted in 1989, identified the programs that would be necessary to develop and implement in order to protect Rhode Island's groundwater resources. It includes both regulatory and non-regulatory approaches to groundwater protection. A large majority of the recommended actions outlined in the Strategy have been implemented by DEM and other agencies. Accordingly, DEM is now reviewing the Strategy and plans to update and revise it as appropriate to reflect shifts in priorities due to completion of tasks, changes in resources and institutions, and the emergence of new data on the State's groundwater resources. Once updated, the Strategy will continue to serve as a useful tool in guiding the continued development, refinement and implementation of an effective comprehensive groundwater protection program.

The primary responsibilities of the Groundwater Section of the DEM Division of Groundwater and ISDS to protect groundwater include the administration regulations for groundwater quality and underground injection control (UIC), implementation of groundwater classification, coordination of the wellhead protection (WHP) program, administration of private well drilling regulations, conducting certain groundwater investigations and providing technical assistance. These programs are briefly discussed below.

The Groundwater Protection Act mandates the development and implementation of a statewide groundwater classification system. Pursuant to the Act, DEM promulgated rules in mid-1992 which outlined the state groundwater classification system as well as ambient groundwater quality standards for each class. A four class system - GAA, GA, GB and GC - is specified in the Act and regulations and reflects a policy of differential protection. Classification of the State's groundwater was a pivotal step in the development of a comprehensive and integrated program to protect the groundwater resources of Rhode Island. The classification maps was updated in July 1993 to incorporate the designations of wellhead protection areas (WHPAs). See Figure 4E-1 for a generalized map.

Groundwater classification involves the assignment of designated uses of the State's groundwater resources. DEM Groundwater quality regulations specify the criteria and standards (narrative and numerical) necessary to protect the designated uses. A system of differential protection has been established in which the level of protection will be dependent on the quality and quantity of groundwater available for present and future uses. The classification system provides the framework for incorporating the value of groundwater into the State's regulatory and enforcement programs. The groundwater regulations link groundwater programs to other important DEM activities such as oversight of remedial actions and permitting of waste treatment and disposal facilities with respect to the DEM Groundwater Section will be tracking the improvement over time in groundwater quality at sites currently designated non-attainment areas.

Wellhead Protection Program

The Rhode Island WHP program, which was approved by the U.S. Environmental Protection Agency in 1990, was prepared in accordance with the federal Safe Drinking Water Act. The program provides a mechanism for increased protection of groundwater supplied by public systems through efforts at the state and local level. The primary emphasis of the state role is to set a high priority for source control and remediation efforts in wellhead protection areas (WHPAs) and to provide local governments and suppliers with the technical information and administrative tools necessary to use local authorities and initiatives to protect groundwater quality in WHPAs.

The focus of the WHP program is the area contributing water to a public well, which is called the wellhead protection area (WHPA). The WHP process is implemented through regulations adopted in July 1993. The three key elements of Rhode Island's WHP program are listed below:

1. Delineation of the WHPAs; initial delineations to be done by DEM.
2. Identification of known and potential sources of groundwater contamination within the WHPAs; to be done at the local level.

3. Development of management approaches by the local governments and by the suppliers to protect the groundwater within the WHPAs from sources of contamination.

Additionally, the WHP program involves development of a process for managing sources of contamination in WHPAs of new public water supply wells and a contingency planning element.

As previously mentioned, DEM has delineated the WHPAs for all public wells in the state and was the first such state to do so. The WHP program is now focused on identifying pollution sources in the WHPAs, evaluating compliance of state regulated facilities in WHPAs and developing guidance for local entities on wellhead protection plans. The Groundwater Section has expanded its technical outreach capability to respond to the needs of local governments and water suppliers with respect to their roles in WHP.

Additionally, DEM is coordinating with EPA at both the Regional and headquarters level to complete several special projects related to wellhead protection. The projects are designed to (1) refine certain WHPA delineations, (2) complete pollution source inventories (3) demonstrate local protection measures (4) foster outreach, awareness etc.

Finally, the DEM Groundwater Section has also undertaken an initiative, with support from the Nonpoint Source Pollution Management Program, to insure that the various potential pollution sources under DEM jurisdiction are reviewed for compliance in a timely and effective manner.

Underground Injection Control (UIC) Program

DEM issued rules and regulations for the Underground Injection Control (UIC) Program in 1984. The regulations prohibit injection wells in Classes I-IV and require orders of approval from DEM for Class V wells which include shallow injection wells when used for subsurface disposal of industrial wastes. As of 1993, 273 facilities with active or previously active underground waste disposal systems were part of the UIC inventory.

Discharge analyses from many of these sites have been reviewed by DEM to insure the protection of groundwater quality, and a uniform program for ranking and assessing discharges to groundwater has been implemented. DEM staff investigates sites that may be UICs based on referrals from other divisions of DEM, including the Division of Water Resources. Reports of well contamination from the R.I. Department of Health are also investigated to determine if the source of contamination is a UIC site. A number of enforcement actions have been taken under the UIC program. Overall the UIC program has issued more than 100 Orders of Approval, some of which require on-going effluent and/or groundwater monitoring programs. The program has also been responsible for

the oversight of 133 well closures and more than 35 sites are pending approval or closure of the UIC wells.

Regulation of Well Drilling

After working with the RI Well Drilling Board on their development, DEM adopted regulations regarding the drilling of private drinking water wells were adopted in early 1990 by DEM. The regulations include provisions for the registration of well drillers and pump installers, standards for well construction, and the submission of well completion reports to DEM and other agencies. The construction standards include protective setbacks, e.g., minimum distances allowed between the wall and certain polluting activities.

Groundwater Investigations

In certain instances, the DEM Groundwater Section responds to reports of groundwater contamination and investigates certain types of complaints concerning private well contamination. A recent reorganization of the DEM resulted in the creation of a new Division of Site Remediation. This division now handles all investigations of Groundwater contamination involving hazardous materials or petroleum products. The Groundwater Section will continue to respond to complaints of a non-point nature, e.s. nitrate, chlorides, etc.

Technical Assistance To Communities

On a routine basis, the DEM Groundwater Section Staff provide technical assistance to persons seeking information about the states' groundwater resources. This may include providing general information to the public, providing access to maps in DEM custody, explaining groundwater classification, etc. A library of published reports is maintained and includes most pertinent USGS publications.

DEM also works with local governments and local water suppliers. A variety of assistance may be provided including technical evaluations, review of ordinances, explanation of best management practices (BMP), etc. DEM has a made a number of presentations before local boards or organizations.

In FY 93, DEM began an expanded technical outreach effort arrived at directly assisting entities involved in wellhead protection at the local level. Project proposals were solicited and work is now underway to complete the first round of workplans which cover topics such as PSIs, groundwater overlay ordinance, groundwater brochure.

RIDEM Division of Water Resources

There are several programs administered by the RIDEM, Division of Water Resources which address the management measures to varying degrees. They include:

- Rhode Island Water Quality Regulations;
- Rhode Island Water Quality Certification Program;
- Narragansett Bay Project;
- Order of Approval for Means of Wastewater Treatment Program;
- Rhode Island Shellfish Growing Area Monitoring Program;
- Harbor Management Water Quality Assessment Policy; and,
- Pump-out Siting Plan.

These programs are discussed in more detail in the following sections.

Rhode Island Water Quality Regulations

The regulations are adopted in accordance with R.I.G.L. Chapters 46-12, 42-17.1, 42-17.6 and 42-35. The regulations implement provisions of the Clean Water Act to assure compliance with water quality standards and antidegradation. RIDEM, Division of Water Resources implements these regulations through various programs.

Rhode Island Water Quality Certification Program

This program is implemented to assure that proposed projects, which may result in a discharge to waters of the State of Rhode Island, comply with the Rhode Island Water Quality Regulations for Water Pollution Control. The program implements Section 401 of the Clean Water Act for projects requiring federal permits or licenses. It also provides review and certification of projects requiring permits approvals or licenses from Rhode Island state agencies. Water Quality Certification ensures that a proposed activity, which requires either federal or state approvals, is in compliance with the Water Quality Regulations and therefore, complies with the Rhode Island Water Quality Standards.

Narragansett Bay Project

The NBP's Comprehensive Conservation and Management Plan(CCMP) was developed pursuant to Section 320 of the Clean Water Act, National Estuary Program. The CCMP became an element of the *State Guide Plan* in December 1992 and was approved by the Governor of Rhode Island and EPA Administrator in January 1993. The Narragansett Bay Program was incorporated into the RIDEM, Division of Water Resources and currently implements recommendations of the CCMP. The Narragansett Bay Project

conducts projects involving bay restoration and protection, as well as information/education programs. The Narragansett Bay Project also coordinates RIDEM bay-related activities and cooperative projects with other state and federal agencies, as well as local community, government and watershed organizations.

Order of Approval for Means of Wastewater Treatment Program

This program reviews all proposed projects to construct any system or means of wastewater treatment for conformance with set requirements. The goal of the program is to assure that restrictions established in the RIPDES permit are met, resulting in attainment of water quality standards.

Rhode Island Shellfish Growing Area Monitoring Program

The purpose of this program is to maintain national health standards by regulating the interstate shellfish industry in accordance with the USFDA's National Shellfish Sanitation Program(NSSP). The State of Rhode Island is required to conduct continuous bacteriological monitoring of the shellfish harvesting waters of the state, in order to maintain certification of these waters for shellfish harvesting for direct human consumption.

Harbor Management Water Quality Assessment Policy

This policy establishes the procedure for water quality certification review for approval of Harbor Management Plans. This policy assures that the Interstate Shellfish Sanitation Conference formula is utilized in determining the allowable number of boats that may be concentrated in one area, before the integrity of neighboring shellfish harvesting waters is threatened by water quality degradation.

Marina Pump-out Facilities Siting Plan

This plan establishes the appropriate number and location of marine pump-out facilities needed in order for the State of Rhode Island to receive no discharge designation for Narragansett Bay from the USEPA based on the 1993 boating density.

Municipal Comprehensive Planning Program, Enabling Acts related to Land Use Planning, and the *State Guide Plan*

Portions of Rhode Island's proposed CNPCP will rely on the Rhode Island Comprehensive Planning and Land Use Regulation Act (R.I.G.L. 45-22.2), enabling acts related to land use planning and the *State Guide Plan.* These are implemented by Rhode

Island Department of Administration and together should be viewed as a single, integrated approach to state oversight over local land and water uses. Specific enabling acts related to land use planning, and their relationship to management measure implementation, are discussed in the various sections of this document.

Local comprehensive plans are currently subject to review by the director of the Department of Administration for consistency with the goals and policies of the state and its departments and agencies(R.I.G.L. 45-22.2-9). As part of the Department of Administration, Division of Planning's review of local comprehensive plans, the Rhode Island Department of Environmental Management (RIDEM) and the Coastal Resources Management Council (CRMC) review plans for consistency with respective agency goals and policies. In the past, inconsistencies identified during this review generally have been addressed satisfactorily.

Rhode Island is proposing to strengthen the existing review process by incorporating the updated Nonpoint Source Management Plan, developed in accordance with Section 319 of the Clean Water Act, as a new element of the *State Guide Plan*. Consistency with the *State Guide Plan* is specifically required of all community comprehensive plans (R.I.G.L. 45-22.2-6(A)). In addition, the *State Guide Plan* is currently an enforceable mechanism for implementing specific sections of Rhode Island's Coastal Resources Management Program. It was therefore determined to be an appropriate mechanism for implementing certain requirements of Section 6217.

State Guide Plan

The Statewide Planning Program was first created by an inter-agency agreement executed in May 1964, by the then Rhode Island Development Council and the Rhode Island Department of Public Works. The agreement provided for the two agencies to jointly undertake, under the auspices of the "Rhode Island Statewide Comprehensive Transportation and Land Use Planning Program", a comprehensive development program for the state to serve as a guide for future development policy by the state agencies, their federal funding sponsors, and other official agencies and instrumentalities in the planning area. The Rhode Island Public Transit Authority and the Rhode Island Department of Business Regulation became parties to the agreement in 1965. The agreement was modified in 1968 when the General Assembly passed legislation creating the Department of Community Affairs, which absorbed the functions of the former Development Council. In 1970, the General Assembly amended section 42-11-2 of the General Laws to include among the powers and duties of the Department of Administration the responsibility to "administer a statewide planning program including planning assistance to state departments and agencies." Accordingly, the planning functions of the Statewide Comprehensive Transportation and Land Use Planning Program were transferred to the Department of Administration. A 1970 Executive Order further clarified the program's role as the principal staff agency of the executive branch for coordinating plans for the comprehensive development of the state's human, economic, and physical resources, and created the State Planning

Council for the purpose of providing policy advice and guidance in state planning activities.

Statutory Authority
As noted above, the Rhode Island Statewide Planning Program (Program) was established and the Department of Administration was designated as the central planning agency for state government in 1970 through amendments to Chapter 42-11 of the General Laws. The work of the Program is guided by the State Planning Council, and the Division of Planning, a division of the Department of Administration, is the staff component of the Program.

In 1978, the General Assembly enacted section 42-11-10 of the General Laws which establishes the *State Guide Plan* as the repository of goals and policies adopted by the State Planning Council for the growth and development of the state. The legislation directs that the Statewide Planning Program shall prepare, adopt and amend a state guide plan, including goals and policies and long range system plans for the comprehensive development of the state's human, economic and physical resources. This legislation was superseded by 1985 legislation.

The objectives of the Program are to plan for the physical, economic, and social development of the state; to coordinate the activities of governmental agencies and private individuals and groups within the framework of plans and programs; and to provide planning assistance to the Governor, the General Assembly, and the agencies of state government. Utilizing as staff the Department of Administration, Office of State Planning, the Program prepares and maintains the *State Guide Plan* as the principal means for accomplishing these objectives. The Division of Planning, as the principle staff agency, prepares, continuously evaluates, and revises the *State Guide Plan,* and recommends to the State Planning Council specific guidelines, standards and programs to be adopted to implement the *State Guide Plan.*

The State Planning Council consists of: the director of the department of administration as chair; the director of the policy office in the office of the governor as vice-chair; the governor, or his or her designee; the budget officer; the director of the office of housing, energy and intergovernmental relations; the associate director of administration for planning, as secretary; the president of the league of cities and towns or his or her designee and one official of local government, who shall be appointed by the governor from a list of not less than three (3) submitted by the Rhode Island league of cities and towns; the executive director of the league of cities and towns; the speaker of the house or his or her designee; the senate majority leader or his or her designee; four (4) public members, three (3) who shall be appointed by the governor, and one of whom shall be appointed by the speaker of the house for terms of three (3) years. (R.I.G.L. 42-11-10.d)

Among its duties, the State Planning Council is responsible for: adopting strategic plans (as defined in the legislation) and the long-range state guide plan; coordinating the planning and development activities of all state agencies; recommending and

encouraging implementation of these plans by local governments, and other public and private bodies; and, adopting rules and issuing orders concerning any matters within its jurisdiction.

The 1978 legislation defines the content and purposes of the *State Guide Plan* as:

> "...functional elements or plans dealing with land use; physical development and environmental concerns; economic development; human services; and other factors necessary to accomplish the objective of this section. The *State Guide Plan* shall be a means for centralizing and integrating long range goals, policies and plans. State agencies concerned with specific subject areas, local governments, and the public shall participate in the State Guide Planning process, which shall be closely coordinated with the budgeting office. Short range and project plans and implementing programs in general shall be prepared on a decentralized basis by the agency or agencies responsible in each functional area, and shall be consistent with the framework of goals, policies and plans established by the *State Guide Plans*." (R.I.G.L. 42-11-10(c)).

As of June 1994, the *State Guide Plan* is comprised of 23 functional elements or plans dealing with issues including: land use; physical development and environmental concerns; transportation; and, economic development (Appendix S), *State Guide Plan Overview, 1992).*

In accordance with Rule I-12: Procedures for Council Action, adopted pursuant to Chapter 42-35 and Section 42-11-10(3)(4), any proposed new element or amendment to an existing element of the *State Guide Plan* is subject to public notice and hearing requirements contained in the Administrative Procedures Act and the Rules for Public Hearings, prior to Council action.

Implementation

The *State Guide Plan* is implemented in several ways: through coordination; through the specific recommendations of the State Planning Council to the Governor, the General Assembly, state agencies, local government, or other public or private bodies; through the state capital development program; and through consistency requirements written into other legislation.

In 1984, a specific list of state goals and policies contained in the *State Guide Plan* were amended into the Rhode Island CRMP. Incorporation of these sections permitted Federal Consistency provisions of the CZMA to be applicable to the *State Guide Plan's* enforceable policies (see FSEIS, Oct. 1985, p.4). At that time, the *State Guide Plan*, and the State Planning Council's coincident enforcement authority, were adopted into Rhode Island's coastal program as enforceable mechanisms for implementing control over public infrastructure projects statewide.

Since the adoption of the *State Guide Plan* as an enforceable mechanism in Rhode Island's coastal program, the general assembly has passed landmark legislation which has strengthened the state's role in the oversight of local land use decision making. Specifically, in 1988 the Rhode Island General Assembly adopted the Rhode Island Comprehensive Planning and Land Use Regulation Act (R.I.G.L. 45-22.2) and established the State Comprehensive Plan Appeals Board (R.I.G.L. 45-22.3).

The Rhode Island Comprehensive Planning and Land Use Regulation Act

The Rhode Island Comprehensive Planning and Land Use Regulation Act (Appendix A) of 1988, hereafter referred to as the Act, replaced the existing legislation contained in the General Laws of Rhode Island (R.I.G.L. 45-22) which addressed local Planning Boards and Commissions . The Act establishes a revised set of criteria and requirements governing the formulation, adoption and state acceptance of local comprehensive plans. In general, the Act:

- requires local comprehensive plans to be adopted conforming to the provisions of the Act within a prescribed time frame;
- establishes legislative findings, intent and goals as a basis for the Act;
- provides definitions for clarity;
- provides guidelines for the formulation of local comprehensive plans;
- specifies nine elements required to be addressed in comprehensive plans;
- contains provisions for the coordination of planning activities between two or more communities;
- outlines the procedure for the adoption of comprehensive plans and related zoning ordinance amendments;
- outlines the procedure for state review of comprehensive plans;
- provides a time frame for plan development, review and adoption, including related zoning ordinance changes;
- provides an appeals process;
- requires that all local comprehensive plans be consistent with all applicable elements of the *State Guide Plan* and embody the goals and policies of the state agencies;
- requires that state agencies incorporate the goals of the Act into their activities, and that their plans and activities be consistent with local plans;
- establishes a program for technical and financial assistance, including grants to cities and towns;
- provides for the update and amendment of the Act; and,
- provides that the Director prepare, and the State Comprehensive Plan Appeals Board adopt, a comprehensive plan for any city or town that fails to adopt and submit a plan or whose plan is disapproved by the Director and that decision is affirmed by the Board.

The Act assigns responsibility for comprehensive plan formulation to the local Planning Board/Commission and contains specific requirements for public participation in plan development and public hearings prior to plan adoption. Plans must be adopted first by the Planning Board/Commission and then by the City/Town Council. Once the City/Town Council has adopted the local comprehensive plan, the Council must submit the adopted plan to the Department of Administration, Division of Planning for review. The Department Director must approve the plan. Within eighteen months of state acceptance of the local comprehensive plan, the local zoning ordinance must be amended to comply with the plan.

Plans must be updated every five years. They may not be amended more than four times in one calendar year. Whenever the Act or the *State Guide Plan* is amended, local plans must be made to conform within one year.

At the time of the Act's adoption, specific schedules were provided for the formulation, adoption and review of comprehensive plans. These deadlines have been amended to allow for a staggered review by State Planning of comprehensive plans. All comprehensive plans were to have been submitted to the state by December 31, 1991.

Review Process

In order to ensure consistency of local comprehensive plans (and state plans) with the goals, findings and intent of the Act, a program of comprehensive planning review was established (R.I.G.L. 45-22.2-9). The Act designates the Director of the Department of Administration as the responsible official for carrying out its provisions and as the state agent for review and action on all comprehensive plans submitted for that purpose.

The Act requires that all comprehensive plans, elements of plans or amendments to plans be submitted to the Director within 15 days of their adoption by the City/Town Council. The Director then reviews the submission to make findings that:

a. the goals of the Act have been met;
b. all required elements of the Plan are complete;
c. all plans, elements and amendments are consistent with all elements, as applicable, of the State Guide Plan and embody the goals and policies of the state and its departments and agencies; and,
d. the submission complies with all rules and regulations adopted by the State Planning Council pursuant to Section 45-22.2-10(B) of the Act. (45-22.2-9(D))

The director also reviews the submission to insure that procedural requirements have been met.

The Division of Planning prepared a handbook on *State Agency Goals and Policies, a Handbook on the Local Comprehensive Plan* (the rules referred to above), and a *Data Catalogue* to assist in plan preparation.

Required Elements

Each local comprehensive plan is required to address, but is not limited to, nine specific elements. These elements and the requirements of each are contained in Section 45-22.2-6 and are summarized below. It is important to note that Elements 1 and 9 apply to all elements.

- *Element A* - Goals and Policies Statement: In accordance with the Act, this statement, "identifies the goals and policies of the municipality for its future growth and development. The statement shall enumerate how the plan is consistent with the overall goals and policies of this chapter, the state guide plan and related elements."

- *Element B* - Land Use Plan Element: "The Land Use Plan is the principal element of any local comprehensive plan. As a minimum, the Land Use Plan must consider the allocation of land for residence, business, industry, municipal facilities, public and private recreation, major institutional facilities, mixed uses, open space and natural and fragile areas. Optimum intensities and standards of development must be established for each use classification and location, based upon current development; natural land characteristics; and projected municipal, regional and state services and facilities. Allocations of land use must consider impacts on surface and groundwater resources, wetlands, coastal features, and other sensitive and fragile natural resources." A land use plan map must be included. The Land Use Plan element, like all the other required elements, must be consistent with the *State Guide Plan*. In addition, the land use plan must contain an analysis of the inconsistencies between the plan and the existing zoning ordinance. The Act requires that municipal zoning ordinances be amended to be consistent with this element within eighteen months of plan adoption.

- *Element C* - Housing Element: This element requires municipalities to address housing needs in formulating and adopting comprehensive plans.

- *Element D* - Economic Development Element: Municipalities must formulate economic development goals and policies and devise supporting implementation steps.

- *Element E* - Natural and Cultural Resources Element: Municipalities are required to inventory significant natural resource areas including, water, soils, prime agricultural lands, natural vegetation systems, wildlife, wetlands, aquifers, coastal features, flood plains and other natural resources and the policies for the protection and management of such areas. The policies and implementation techniques must be identified for inclusion in the implementation program element.

- *Element F* - Services and Facilities Element: Municipalities must provide an inventory of existing and forecasted needs for facilities and services used by the public such as, but not limited to, educational facilities, public safety, water, sanitary sewers, libraries and community facilities. The policies and implementation techniques must be identified for inclusion in the implementation program element.

- *Element G* - Open Space and Recreation Element: Municipalities must include an inventory of recreational resources, open space areas, and recorded access to these resources and areas. The element must also contain an analysis of forecasted needs and policies for management and protection of these resource areas. The policies and implementation techniques must be identified for inclusion in the implementation program element.

- *Element H* - Circulation Element: Municipalities must provide an inventory and analysis of existing and proposed major circulation systems, street patterns, and any other modes of transportation in coordination with the land use element. The policies and implementation techniques must be identified for inclusion in the implementation program element.

- *Element I* - Implementation Program: The implementation program element of a comprehensive plan must include:
  1. A statement which defines and schedules for a period of 5 years or more the specific public actions to be undertaken in order to achieve the goals and objectives of each element of the comprehensive plan.
  2. An identification of public actions necessary to implement the objectives and standards of each element of the comprehensive plan that require the adoption or amendment of codes and ordinances.
  3. An identification of other public authorities or agencies owning water supply facilities or providing water supply services to the municipality. Municipalities must coordinate the goals and objectives of the comprehensive plan with the actions of such public authorities or agencies with regard to the protection of watersheds as provided in section 46-15.3-1, et seq. (Public Drinking Water Protection Act of 1987).
  4. A schedule for municipal actions required to amend the zoning ordinance and map to conform to the comprehensive plan.

In addition to these nine elements, Section 5 of the Act sets forth the following basic requirement:

> Pursuant to the schedule established under this chapter, each municipality shall prepare and adopt a comprehensive plan which is consistent with the goals, findings, intent and other provisions of this chapter, or shall amend the existing comprehensive plan to conform with the requirements of this chapter.

The reference to "other provisions" relates to State Guide Plan consistency, local adoption, citizen participation, submission to the state for acceptance, the required plan elements, and the various time periods for compliance (Handbook on the Local Comprehensive Plan, 1989).

In cases where a community either fails to submit a complete comprehensive plan in accordance with the requirements of the Act, or a community's comprehensive plan (or any part thereof) has been disapproved by the Director and affirmed by the State Comprehensive Plan Appeals Board, the Act requires the Director to prepare a comprehensive plan that complies with the requirements of the Act for adoption by the State Comprehensive Plan Appeals Board (Section 45-22.2-13). Adoption of this plan by the Appeals Board is deemed to constitute an adopted comprehensive plan for the delinquent municipality.

Subsection 45-22.2-9(c)(7) of the Act provides for the appeal of the final decision of the Director to a new State Comprehensive Plan Appeals Board established by Chapter 45-22.3 of the General Laws.

As of June 30, 1994, 35 comprehensive plans had been submitted to the state. Five had not: Exeter, Glocester, Little Compton, West Greenwich, and the Narragansett Indian Land. The following four plans have been approved by the state: Cumberland, East Greenwich, East Providence, and Jamestown. No plan has been disapproved, as efforts have been made by municipalities and state agencies to reach mutual agreement on revisions that adequately addresses state comments. The review process has been very intensive, with more than thirty state agencies submitting a total of more than 600 comment letters.

Additional Programs Addressing Nonpoint Source Pollution

There are a wide range of federal, state, and local programs and planning efforts currently underway that address nonpoint sources of pollution. The following sections describe some of the programs which address the categories and sub-categories of nonpoint pollutants specified in the *Guidance Specifying Management Measures For Sources of Nonpoint Pollution to Coastal Waters* (EPA 1993). These programs rely on both enforceable and nonenforceable approaches to addressing the management measures or are designed to provide technical assistance or federal funding (e.g., demonstration projects) to address nonpoint pollution problems.

Federal Level

Agricultural Soil Conservation Service (ASCS)

This agency is the financial partner of SCS and CE. The ASCS administers most price-support programs, shares the cost of installing certain soil and water conservation practices and woodland management practices.

Soil Conservation Service (SCS)
This agency implements various nonpoint source programs. For example, the SCS works with farmers on soil erosion, water quality and water conservation problems by helping them to plan management systems, and designing and inspecting best management practices.

1990 Farm Bill
This program extends conservation requirements and possible loss of benefits to additional programs; creates new conservation incentive programs including the Water Quality Protection Program, Wetland Reserve Program and Environmental Easement Program.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
This program mandates registration and approval by EPA prior to use of any pesticide, sets labeling and applicator licensing requirements, and makes improper use of pesticides a misdemeanor. Licensing and enforcement responsibilities are passed on to the states.

1985 Food Security Act
In order to maintain eligibility for participation in specified USDA programs, persons must apply an approved conservation system on all highly erodable land which is used to produce an annual crop, and restrict activities within wetlands. Low level of participation .

Safe Drinking Water Act
It contains strict monitoring requirements for public drinking water supplies and authorizes the EPA to designate sole-source aquifers. No commitment of federal funds can be made for projects which will contaminate those aquifers

USDA Farmers Home Administration
This program provides low interest loans for farm ownership, farm operating expenses and soil and water conservation practices.

State Level

Rhode Island Pollution Discharge Elimination Program (RIPDES)
This regulatory program was adopted in accordance with R.I.G.L. 46-12, 42-17, and 42-35. It is administered by the RIDEM, Division of Water Resources. As a delegated state, RI is authorized to issue individual or general permits to regulate storm water discharges which require regulation under the RIPDES Program. A permit is required

for 11 categories of activities, including construction activities which disturb five or more acres of land. When storm water is either directly discharged from a point source to the waters of the State (including wetlands), or indirectly discharged through a separate storm sewer system, a storm water permit is required.

Rhode Island Nonpoint Source Management Plan
This program was adopted pursuant to Section 319 of the Clean Water Act. It is administered by the RIDEM, Office of Environmental Coordination. A revised Rhode Island Nonpoint Source Management Plan (RINSMP) is currently being developed and will become an element of the *State Guide Plan*. In order to be eligible for federal funding, states must develop an assessment report detailing the extent of nonpoint source pollution, and a management program specifying nonpoint source controls. Section 319 authorizes EPA to issue grants to states to assist them in implementing their nonpoint source management programs or portions of management programs that have been approved by EPA. This program often funds nonpoint source demonstration projects designed to implement best management practices.

Agricultural Freshwater Wetlands Regulations
The regulation of freshwater wetlands on agricultural lands is administered by the RIDEM, Division of Agriculture pursuant to R.I.G.L. 2-1-18 et seq. Alterations to freshwater wetlands on agricultural lands and proposed agricultural activities resulting in alterations to agricultural freshwater wetlands are reviewed by the RIDEM Division of Agriculture in cooperation with the RIDEM Division of Freshwater Wetlands and the Division of Water Resources.

RIDEM Conservation Officers
RIDEM's Conservation officers patrol the State and enforce RIDEM regulations. They also report violations to the Coastal Resources Management Council.

RIDEM Site Remediation Program
This program is administered by RIDEM, Division of Site Remediation. This program contains regulations pertaining to oil pollution control and underground storage facilities for petroleum products and hazardous materials. It also contains rules and regulations for the investigation and remediation of hazardous material releases.

RIDEM OSCAR Program
This program is administered by the RIDEM, Office of Environmental Coordination. The program focuses on public outreach and education related to recycling and pollution control.

Local Level

Rhode Island Land Development and Subdivision Review Act
This Act is implemented by the municipalities pursuant to R.I.G.L. 45-23. The act contains general requirements related to the coordinated review of all subdivisions

(major land development projects) and requires state agencies to participate in a coordinated permit review process.

1990 RI Erosion and Sediment Control Act
This Act is implemented by the municipalities pursuant to R.I.G.L. 45-46. It enables municipalities to adopt erosion and sediment control ordinances. Currently, 21 municipalities have adopted soil erosion and sediment control ordinances.

Rhode Island Septic System Maintenance Act of 1987
This Act is implemented by the municipalities pursuant to R.I.G.L. 45-24.5. It enables municipalities to adopt waste water management districts.

Farm, Forest and Open Space Act
This Act is implemented by the municipalities. It enables municipal tax assessors to assess lands according to current use rather than highest and best use. Landowners apply for the reduced assessment. Farmland must be designated by the RIDEM, Division of Agriculture and forest land must be designated by RIDEM, Division of Forest Environment. Requirements include a minimum of five acres and application for a conservation plan for farmland, and 10 acres and a management plan for forest land.

Conservation Districts
There are three conservation districts in Rhode Island. The provide technical assistance to municipal officials and land owners. For example, the conservation districts have expended great effort in getting municipalities to develop and implement soil erosion and sediment control ordinances. One of their more innovative initiatives is their site plan review program whereby they review projects for their erosion and sediment control and stormwater management impacts. In some, the conservation districts perform the technical review associated with implementing a municipalities soil erosion and sediment control ordinances.

Cooperative Extension (URI)
This program concentrates on providing technical assistance to land owners and municipal officials on various nonpoint pollution control issues.

Sea Grant (URI)
This program concentrates on providing technical assistance to land owners and municipal officials on various nonpoint pollution control issues.

USDA Water Quality Initiative CE and SCS combined efforts
These programs have been involved in several combined efforts to address nonpoint sources of pollution. For example, the programs have cooperatively worked together on the Pawcatuck River Hydrologic Unit Area (HUA). this project has worked on getting the voluntary implementation of best management practices within the Wood-Pawcatuck River Watershed. Another example is the USDA's implementation of the Narragansett Bay Project. The SCS has designated the Bay's watershed as a Special

Project Area. Accordingly, it is working on planning initiatives and funding demonstration projects such as conservation practices within the watershed.

RI Sustainable Agriculture Committee (RISA)

This committee was formed in 1990 to provide information about practices that are being used or researched in RI that reduce inputs, conserve natural resources and sustain productivity. Sponsors of these efforts include farmers, Cooperative Extension, the Conservation Districts, and the RIDEM, Division of Agriculture.

Chapter 3
Boundary Recommendation

In accordance with Section 6217 requirements, NOAA, in consultation with EPA, has recommended to Rhode Island that a 6217 management area which encompasses the entire State is necessary to "control sources of pollution that, individually or cumulatively, significantly impact the state's coastal waters". Due to resource and time constraints which prevent the State from conducting a separate analysis, Rhode Island has chosen not to propose an alternative management area at this time. Accordingly, Rhode Island's Coastal Nonpoint Pollution Control Program will be implemented statewide.

Rhode Island will be relying a number of programs to implement its Coastal Nonpoint Pollution Control Program (CNPCP) statewide (see Chapter 2). Those programs which will be utilized to implement Rhode Island's CNPCP will require additional funding and technical assistance. Therefore, Rhode Island reserves the option of modifying its Section 6217 management area based on the availabilty of adequate levels of implementation funds and the need to target existing resources in those areas where coastal nonpoint pollution problems are known to exist.

Chapter 4
Agriculture

Introduction

The *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance* allows for an exclusion under two scenarios:

> (1) if a nonpoint source category or subcategory is neither present nor reasonably anticipated in the 6217 management area, or (2) if a state can demonstrate that a category, subcategory or particular source of nonpoint pollution does not and is not reasonably expected to, individually or cumulatively, present significant adverse effects to living coastal resources or human health (EPA & NOAA, 1993, p. 13).

Because Rhode Island agriculture is limited, the second scenario applies to Rhode Island.

In support of this premise, the following plans and reports document that agriculture has exhibited no adverse effects on living coastal resources or human health in Rhode Island:

1. *The 208 Water Quality Management Plan for Rhode Island.*
2. The 1990, 1992, and the 1994 draft 305(b) Reports: *The State of the State's Waters.*
3. *Rhode Island's Nonpoint Source Management Program.*
4. Rhode Island's nine *Nonpoint Source Management Plans for Water Supply Watersheds.*
5. The *Special Area Management Plans* for Narrow River, the Coastal Ponds, Providence Harbor and the Pawcatuck River Estuary and Little Narragansett Bay.
6. *The State of Rhode Island Coastal Resources Management Program.*

In addition, due to the steady decline of agricultural land area in Rhode Island, agriculture is not anticipated to become a significant nonpoint source problem. Therefore, Rhode Island respectfully requests a categorical exclusion from the management measures for sources of nonpoint pollution in coastal waters. The following text elaborates and substantiates this position.

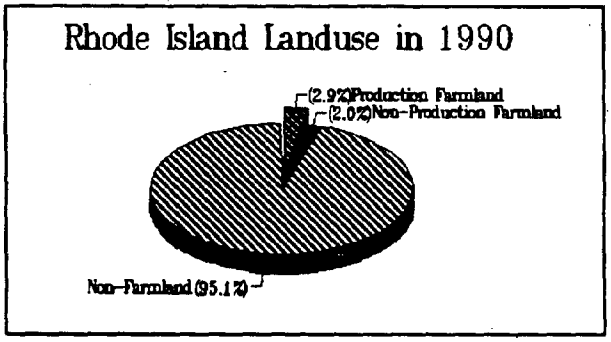

Figure 1 Farmers utilize only 2.9% of land for production. Adapted from *1990 Agricultural Facts*, RIDEM/DOA, 1990.

The Scale of Agriculture in Rhode Island

Table 1
Rhode Island Crops of Over 1000 Acres in 1990

Crop	Acres
Hay	5,702
Turf	3,384
Corn	2,430
Nursery Stock	2,082
Potatoes	1,232
X-mas Trees	1,200
Pasture Land	1,196
Other	2,400
Total	19,626

Note. Adapted from *1990 Agricultural Facts*, RIDEM/DOA, 1990.

Agriculture's limited effect on water quality in Rhode Island follows from its limited presence in the state. Farms in Rhode Island comprise approximately 5% of land use, but farmland in production[1] amounts to less than 3% (Figure 1). In 1990, farmers maintained only 399 operations averaging 44 acres in production and totaling under 20,000 acres statewide. Rhode Island farmers use much of their land for low intensity agricul-ture. Field crops like turf, pasture and hay account for 10,282 acres, or over half of productive farmland (Table 1). The Rhode Island Land Use Classification System, developed for the *Scituate Reservoir Watershed Management Plan*, a *State Guide Plan* element, and subsequently used in the nine *Nonpoint Source Management Plans for Water Supply Watersheds*, classifies field crops as the lowest risk form of agriculture and indicates that, overall, such crops pose only a slight risk to water quality, falling in the same risk category as public parks.

Though in other states "animal manure producing enterprises, particularly dairy, poultry and cattle feedlot operations are known to present significant threats to water quality" (EPA/NOAA, 1994) this is not the case for Rhode Island. In part, this is due to the limited size and extent of livestock operations (Table 2 and 3). Since 1990 numbers of livestock and livestock operations have continued to declined. This is reaffirmed by economic data that show livestock as declining in relation to other agricultural commodities between 1979 and 1993[2] (Figure 2). In 1993, all livestock in the State made up only 14% of agricultural revenues. Some recent estimates indicate that the number of dairy farms may have dropped by ten percent; hog farms by 20 percent. Other recent information indicates that Rhode Island's largest poultry farm, housing 200,000 chickens, was sold and converted to another use.

[1]Farmland in production refers to farmland used actively, including crops, nursery, turf and livestock operations.

[2]This data has not been adjusted for changes in the Consumer Price Index.

Table 2
Kind, Number and Size of Livestock Operations in Rhode Island

Farm Type	Number of Farms	Animal Head	Average Head Per Farm
Poultry	9	266,000	29,556
Dairy	39	3,628	93
Hog	17	9,600	565
Beef Cattle	30	1,016	34

Note. Adapted from 1990 Agriculture Facts, RIDEM/DOA, 1990.

Table 3
Location of Livestock Operations by Type and County in Rhode Island

Farm Type	Bristol County	Kent County	Newport County	Providence County	Washington County
Poultry	0	0	1	6	2
Dairy	5	4	8	9	13
Hog	1	2	4	9	1
Beef Cattle	0	5	3	15	7

Note. Adapted from 1990 Agriculture Facts, RIDEM/DOA, 1990.

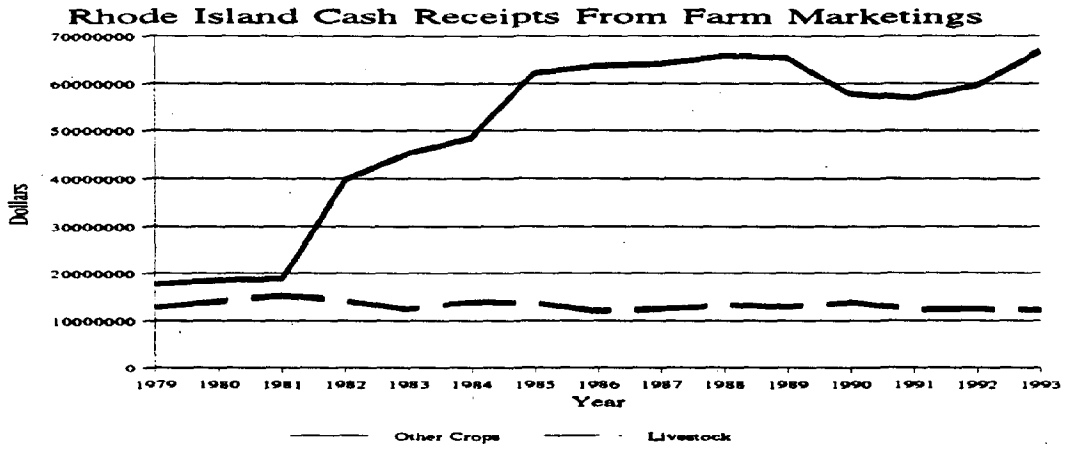

Figure 2 Livestock revenues have made up a decreasing portion agriculture revenues in Rhode Island.

Table 4
Status of Waste Management on Rhode Island Dairy Farms

Head of Dairy Cows	Status of Waste Management Structure
130	Structure in-place
80	Structure in-place
72	Structure in-place
50	No structure
60	Structure in-place
97	Structure in-place
50	No structure
50	Structure partially in-place
34	No structure
30	Structure in-place
51	No structure
58	No structure
61	Structure in-place
40	No structure
125	No structure
150	Structure in-place
45	Structure in-place
50	Structure planned
40	No structure
60	Structure in-place
45	No structure
70	Structure partially in-place
50	Structure in-place
65	No structure
30	No structure
50	Structure in-place
50	No structure
60	Structure in-place
115	Structure in-place
50	Structure in-place

Note. Adapted from NRCS, unpublished data.

Most animal manures in Rhode Island are carefully stored and subsequently utilized via managed crop application. Dairy operations typically store manure in a storage structure or field location and spread in spring and fall. The average application rate is 16 to 25 tons per acre for either the spring or fall application and the manure is typically surface applied with a broadcast manure spreader. Approximately two-thirds of the dairy farms in Rhode Island have concrete manure storage structures in-place. Many of the remainder are in discussion or have tentative plans with the NRCS for construction of a manure storage structure (see Table 4).

Of the eight poultry operations, two are below the threshold of the management measures and receive no further consideration here. Four of the remaining facilities house 67,000 head of poultry, however the distribution of poultry among these farms is unknown. As indicated in Table 5, all other facilities have in-place or are planning to build manure storage structures. Beef farms in Rhode Island are below the threshold of the animal facilities management measure and therefore are not considered here. No available information indicates that livestock operations in Rhode Island have a negative impact on coastal resources.

Table 5
Manure Storage at Rhode Island Poultry Farms

Head of Poultry	Status of Waste Management
60,000	Structure in-place
9,000	Structure planned

Note. Adapted from NRCS (1995), unpublished data.

Water Quality Management Plans and Reports

The 208 Water Quality Management Plan for Rhode Island

Section 208(b)(2)(F) of the Clean Water Act requires each state to prepare an Areawide Waste Treatment Management Plan that includes "a process to identify, if appropriate, agriculturally related nonpoint sources of pollution." In 1979, subsequent to a $2.3 million study that included 40 separate issue reports, EPA formally adopted and approved *The 208 Water Quality Management Plan for Rhode Island*, which did not contain a chapter relating to agriculture. The only reference to agriculture in this comprehensive study is in a chapter regarding soil erosion and sedimentation. It is as follows:

> Agriculture occupies a rather small portion of the total land in Rhode Island, and most agricultural operations in the state are small and are interspersed among population centers and other non-agricultural activities. It is therefore difficult if not impossible to distinguish agricultural nonpoint source pollution from non-agricultural sources of contaminants in the state's waters. Despite the limited amount of agriculture which is carried on in the 208 area, erosion and sedimentation from farming are of some importance (Rhode Island Statewide Planning Program, 1979).

The 208 plan recommended that farmers use appropriate soil erosion best management practices on a voluntary basis working with the Conservation Districts and Agricultural Stabilization and Conservation Service's cost-share programs. Subsequent to the publication of the plan, many of the 208 identified areas have had some controls implemented to mitigate soil erosion.

The 305(b) Reports: The State of the State's Waters

The 1988 305(b) Report notes only minor localized agricultural nonpoint sources. The assessment identifies only three cases where agriculture might contribute to a non-attainment classification (partially supporting or not supporting). In each of these cases other point and nonpoint sources severely impair the ability of the water to attain its support status. The draft 1994 305(b) Report indicates that all agricultural operations that were thought to contribute to non-support or partial support have been mitigated through best management practices or were wrongfully identified as causing a nonpoint source impact in the 1988 Report (see Table 6).

Table 6
The Decline in Agricultural Nonpoint Inputs
to Non & Partially Supporting Waterbodies

Waterbody	1988	1994
Blackstone River	Slight	No threat noted
Lower Sprague River	Slight	No threat noted
Simmons Reservoir	Slight - 68 ac. with 39 T/A/Y soil loss	65 ac. with 5 T/A/Y soil loss

Note: Column 2 data adapted from *An Assessment of Nonpoint Sources of Pollution to Rhode Island's Waters*, RIDEM/OEC, 1988. Rows 1 and 2 in column 3 are adapted from *The 305(b) Report: State of the State's Waters*, RIDEM, in press. Row 3 in column 3 adapted from K. Stuart (1994) [A Snapshot of Rhode Island Agriculture], unpublished data.

Rhode Island's Nonpoint Source Management Program

Rhode Island's nonpoint source pollution program was developed in accordance with Section 319 of the Clean Water Act. The Act requires each state to prepare two key reports, a state assessment report describing nonpoint source pollution impacts to water quality in each state, and a state management program explaining what each state plans to do in the next four years to address its nonpoint source problems. Neither of the Rhode Island reports cited agriculture as a significant water quality problem in the state. The plan established seven goals for the management of nonpoint source pollution and none relates specifically to agriculture. Two key goals are to:

1. Establish state regulations to address nonpoint sources not presently regulated.
2. Strengthen existing regulatory programs to enhance control of nonpoint sources of pollution.

The plan, however, makes no recommendations to strengthen or establish new regulatory programs for agricultural nonpoint source pollution.

As noted in the *Rhode Island Threshold Review*:

> The 1988 Rhode Island Nonpoint Pollution Assessment Report included information provided by the SCS [currently NRCS], which estimate that 400,000 tons of agricultural soil loss occurs annually in the Narragansett Bay Watershed. (NOAA/EPA, 1994)

This amount appears to be in error and a significant overestimation. As discussed in a recent report by the NRCS entitled *An Attempt to Reconstruct How the 1988 Agricultural NPS Assessment Was Completed*:

> The NRCS has no data which verifies: 1) the Narragansett Bay total as stated on page 13 [of the 1988 Assessment], nor 2) the total soil loss and average soil loss per acre by basin as stated in the Addendum [of the Assessment]. (NRCS, 1995)

The report goes on to note two important inconsistencies in the evaluation of agricultural soil erosion in the Assessment:

> The two sections of the "Assessment" are not consistent. Adding the "Total Avg Soil Loss (t/y)" column of the table in the Addendum for those basins within Narragansett Bay (i.e. basins [waterbody unit numbers] beginning with 0007) gives a total of 1,591,142 tons, rather that the 400,000 tons noted on page 13. Summing the "Total Acres Inventoried" column for the same basins gives 2,195 acres, which divided into 400,000 tons gives an average soil loss of 182 tons per acre per year.
>
> Given that the "Areawide Water Quality Management Plan" ("208 Plan") of 1978 [sic] estimated average soil loss from untreated cropland at 11.2 tons per acre per year, and that the raw data shows the highest erosion rates on any one field to be less that 30 tons per acre per year, it is obvious that an error was made in the calculations. (NRCS, 1995)

The NRCS Report then reevaluates current soil losses and concludes:

> Page 13 of the 1988 Assessment should be revised to read, "The Natural Resources Conservation Service has calculated that in 1988 in the Narragansett Bay Basin alone, nearly 18,000 tons of soil per year were moving due to agriculturally-induced erosion (20% of which enters rivers and streams)."

As correctly reflected in the most recent 305(b) Report, agricultural erosion may produce localized water quality threats in Rhode Island, but these threats do not and have not lead to significant nonpoint source problems in the Rhode Island coastal zone.

Nonpoint Source Pollution Management Plans For Water Supply Watersheds

These nine plans were prepared as an element of the Fiscal Year 1990 Workplan for the Rhode Island Nonpoint Source Management Program. The purpose of these plans is to provide data and recommendations that can assist with the protection of drinking water supplies via enhanced management of land use within the watershed areas. Recommendations are given to help mitigate existing nonpoint source pollution problems and to help prevent future nonpoint source pollution problems. The surface water supply watersheds, for which these plans were developed, are: Jamestown, Newport, Stafford Pond, Wallum Lake, Block Island, Woonsocket, Pawtucket, Kickamuit and Sneech Pond

Only one plan, the *Nonpoint Source Pollution Management Plan For The Jamestown Water Supply Watershed*, makes any recommendation pertaining to agriculture. This recommendation holds that the three active agricultural operations in the watershed should continue to comply with the voluntary Soil Conservation Service programs.

Rhode Island's Coastal Resources Management Program and *Special Area Management Plans*

The Coastal Resource Management Council's enabling legislation requires the Council to review any activity that will significantly impact the coastal resources of the state. To this end, the Council reviews several categories of activity statewide. The Council does not review agricultural operations because there is no scientific evidence that suggests that these activities impact on coastal resources of the state. In addition, none of the Council's *Special Area Management Plans* finds any coastal water quality problems associated with agricultural activities. These plans cover the areas of: the Coastal Ponds, the Narrow River, the Providence Harbor, and the Pawcatuck River Estuary and Little Narragansett Bay.

The Future of Agriculture in Rhode Island

Agriculture's potential to create nonpoint source pollution is dwindling as agricultural land uses decline throughout the state. Production farmland has halved since 1972 and fallen by two-thirds since 1960 (see Figure 3). Two fundamental actions account for and perpetuate this decline:

1. The conversion of coastal farmland to residential development.
2. A move towards less intensive agricultural uses.

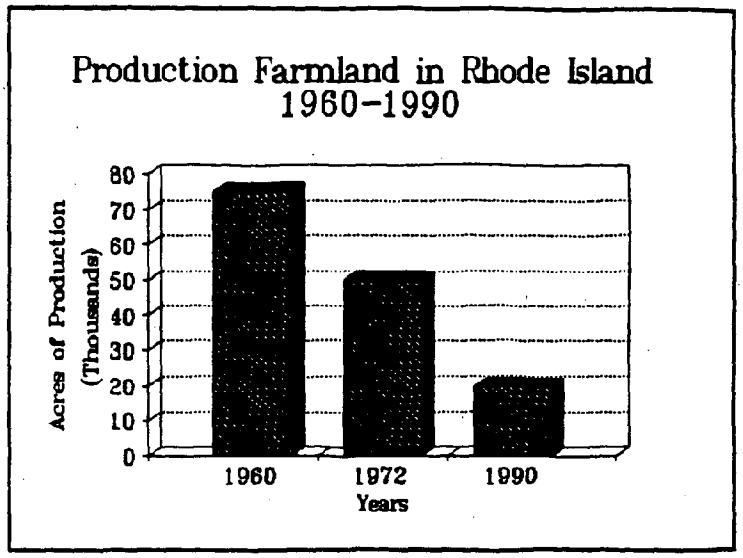

Figure 3 Area of farmland is a third of its size in 1960 (RIDEM, 1990).

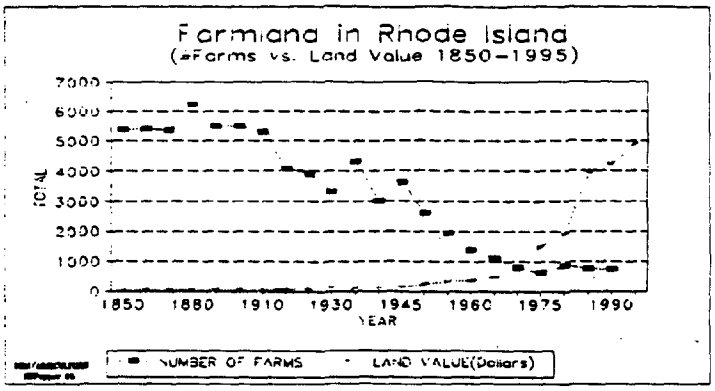

Figure 4 As land values in Rhode Island have increased the number of farms in the State has declined (RIDEM, unpublished data).

Population growth in the coastal region has spurred the conversion of farmland to residential development. The aesthetics of the coast heighten the market value of land for development. People like living along the water and tend to pay high prices for homes there (see Figure 4). Over recent years, this has transformed rural areas into urban land use. Today few coastal towns sustain large agricultural tracts.

At the same time, the type of agriculture practiced has been changing. As shown by Table 7, two major Rhode Island farm types, nurseries and potato farms, saw fairly sharp declines over the past decade, mainly because these two farm types have been converted to less intense agriculture such turf cropping. These development pressures are anticipated to continue. The state projects a population growth rate of 9.5% over the years 1985-2010, with the greatest increases expected in the coastal and rural communities (Division of Planning, 1992).

As turf has grown to become a significant form of agriculture in Rhode Island -- though only a tiny portion of Rhode Island's overall land use -- questions regarding its potential to impact coastal resources have arisen.

> Commercial turf operations have expanded significantly during the past decade. Fertilizer application to commercial turf usually contain high amounts of nitrogen, an element that can contribute to numerous indirect impacts to Narragansett Bay. (EPA/NOAA, 1994)

There is no evidence to indicate that turf farming in Rhode Island has a negative impact on coastal resources, inclusive of Narragansett Bay. Furthermore, studies of turf farming show that

Table 7
Change in Crop Acreage to Less Intense Uses From 1980 - 1990

Crop Type	Acres 1980	Acres 1990	Change
Potatoes	2,765	1,232	-55%
Nursery	2,400	2,082	-15%
Turf	1,724	3,849	123%

Note: Adapted from *1990 Agricultural Facts*, RIDEM/DOA, 1990.

only very small amounts of nitrate-nitrogen leach beyond the root zone and that turf is not a significant source of nitrogen to groundwater. As indicated in the conclusion of a 1990 study by Gross, Angle and Welterlen in the Journal of Environmental Quality:

> The current study demonstrates that very low concentrations of NO_3-N were found below the rootzone of turf. Sediment and attached nutrient losses from established turfgrass are also low due to the thick, densely matted nature of turfgrass and the hydraulic resistance provided by the erect turfstand. It is therefore believed that properly managed and judiciously fertilized turf is not a significant source of nutrients or sediment in surface or groundwater.

First and foremost, turf farmers generally do not over fertilize or over water as this leads to unnecessary expense. This is especially true of Rhode Island turf farmers who face very high pressure to develop their commercially valuable lands and cannot afford any economic disadvantage. A recent survey supports this:

> An informal survey by DEM's Division of Agriculture of Rhode Island turf growers and conversations with NRCS indicate that most turf growers have instituted irrigation water monitoring to prevent overwatering [sic]. This same survey also indicates that over fertilization is not occurring due to negative economic consequences of such a practice to the grower. (RIDEM/DOA, 1995)

Turf farmers in Rhode Island, thus operate in a manner that prevents loss of nitrogen. This is further confirmed by a recent evaluation of turf grower fertilization practices by RIDEM/DOA (1995). The evaluation states that when a crop is in the field -- typically growers rest approximately a third their growing fields each year -- turf growers on average apply 3 to 6 pounds of nitrogen per 1000 square feet per year or approximately 130 to 260 pounds per acre per year. The evaluation also states that growers apply fertilizers cautiously to maximize potential utility:

> Fertilizer types vary but are predominantly granular in form, quick release, and are surface applied with a broadcast spreader. Typically 3 to 6 applications are made per year which includes a fall application of 2lbs/1000 square feet using a slow release fertilizer. Growers generally apply from 0.5 to 1.0 lb of Nitrogen/1000 square feet for applications other than the fall application. Applications of nitrogen are deliberately frequent and low in rate in order [to] time nitrogen availability to plant growth and avoid over fertilization and leaching losses etc. Quick release fertilizers are typically used to provide for rapid greening (i.e. before harvest), but because they are applied at such a low rate[,] nitrogen losses are minimal. (RIDEM/DOA, personal communication, May 16, 1995)

Turf operations represent a very small part of Rhode Island land use--approximately half a percent. Currently, 14 turf growers operate in the state. Thirteen of them are within the Pawcatuck and/or Saugatucket watersheds (see Figure 5). Neither the *Coastal Resources Management Plan, Rhode Island's Salt Ponds: A Special Area Management Plan,* nor the Special Area Management Plan for the Pawcatuck River Estuary make mention of any nonpoint source pollution concerns from nutrients associated with turf farming in the area.

Turf Growers in Rhode Island Watersheds

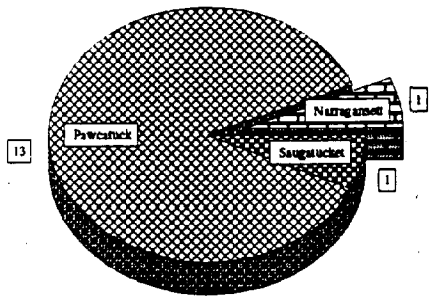

Figure 5 Only one turf grower in Rhode Island operates in side the Narragansett Bay Watershed

One turf operation in Portsmouth, on Aquidneck Island, is within the Bay watershed. As it happens, this operation is also within the watershed of the Newport Water Supply. Because of potential impacts to human health, waters of the Newport Water Supply receive constant monitoring and the greatest protection affordable. In a recently published management plan, *Nonpoint Source Pollution Management Plan for the Newport Surface Water Supply Watersheds*, the risks posed by all land uses within the watershed were evaluated. Recommendations were made to limit the potential adverse impact from all land uses. Pasture lands, which include in part turf crop areas, amounted 304.76 acres or 4.67 percent of land use. No recommendations were made for turf grower practices.

Existing voluntary cost-share and technical assistance programs also help to prevent the significant adverse effects to living coastal resources and human health. In accordance with the EPA-certified recommendations in *The 208 Water Quality Management Plan for Rhode Island*, Rhode Island has developed highly effective cost-share programs through the Consolidated Farm Services Agency (formerly Agricultural Stabilization and Conservation Service); and technical assistance programs through the Natural Resources Conservation Service (formerly Soil Conservation Service), the University of Rhode Island Cooperative Extension and the Conservation Districts. By working within these well-established programs, Rhode Island farmers continue to prevent the potential of Rhode Island agriculture to create <u>any sort</u> of significant adverse effect to living coastal resources or human health.

The voluntary Conservation District, the University of Rhode Island Cooperative Extension and Natural Resources Conservation Service programs play a primary role in preventing soil erosion and the occurrence of adverse effects in living coastal resources. Through the Natural Resources Conservation Service, soil erosion and sediment control management measures have been tracked in coastal watersheds (see Table 8).

Table 8
Tons of Erosion Saved By Using NRCS Practices Implemented Since 1988

Watershed Area	Tons Per Year Saved
Bristol County within 1000 ft of Coastal Features	168
Kickamuit River Watershed	72
Palmer River Watershed	31
Jamestown Water Supply Watershed	95
Adamsville Brook Watershed	63
Aquidneck Island Watershed	375

Note. Adapted from K. Stuart (1994), [A Snapshot of Rhode Island Agriculture], Unpublished data.

The Consolidated Farm Services Agency cost-share programs also help to prevent adverse effects from soil erosion and sediment. From October to December of 1993, the Consolidated Farm Services Agency helped to fund 123 soil erosion and sediment control best management practices around the state. By funding practices recommended in *Guidance Specifying Management Measures For Sources Of Nonpoint Pollution In Coastal Waters*, such as the Cover and Green Manure Crop Practice, the Agency's cost-share programs enabled farmers to save approximately 1,550 tons of soil on 740 acres. The Agency funded 75 percent of management costs for a total of $10,200, or about $6.60 per ton/year. This level of conservation would not have been possible without cost-share programs, and cost-shares are only available where compliance is voluntary.

Conclusion

The State of Rhode Island requests an exclusion from the Section 6217 Agriculture Management Measures on the basis that nonpoint source pollution from agriculture does not and will not present significant adverse effects to living coastal resources or human health. Justifying this request:

1. There are no reports or management plans denoting a significant water quality impact or threat to living coastal resources or human health from agriculture in Rhode Island.
2. Agriculture in Rhode Island has been excluded from several water quality reports and management plans, with the exception of encouraging voluntary efforts to control soil erosion.
3. Increased development continues to limit the extent and intensity of agricultural operations in Rhode Island.

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Chapter 5
Forestry

Introduction

The *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance* allows for an exclusion under two scenarios:

> (1) if a nonpoint source category or subcategory is neither present nor reasonably anticipated in the 6217 management area, or (2) if a state can demonstrate that a category, subcategory or particular source of nonpoint pollution does not and is not reasonably expected to, individually or cumulatively, present significant adverse effects to living coastal resources or human health, (EPA & NOAA, 1993, P. 13).

Because Rhode Island silvicultural activities are very limited in size and number, the second scenario applies to Rhode Island.

Supporting this, no Rhode Island plan or report documents impacts from silviculture:

1. The Rhode Island 305(b) Report, *The State of the State's Waters*, indicates no water quality impacts from silviculture.

2. The EPA excluded forestry from the *208 Water Quality Management Plan for Rhode Island* because of its low potential for causing adverse effects.

3. No Rhode Island nonpoint source plans denote a water quality threat or impact from silviculture. Such plans include:

   - *Rhode Island's Nonpoint Source Management Plan*
   - *Narragansett Bay Comprehensive Conservation Management Plan*
   - *Scituate Reservoir Watershed Management Plan* and all other *Management Plans for Water Supply Watersheds*
   - *Special Area Management Plans* for Narrow River and the Coastal Ponds
   - *The State of Rhode Island Coastal Resources Management Program*

Moreover, based on certain trends in Rhode Island silviculture, we anticipate no future adverse water quality effects from forestry.

1. Timber removal volumes have declined over the last two decades. From 1972 to 1992 Rhode Island's timber harvest volumes fell 92%.

2. Residential development has left little forestland for commercial cutting. From 1972 to 1985 the area of non-commercial forestland[1] in the state increased by 385%.

3. From 1972-1984 the number of forested tracts between one and nine acres in size increased nearly five fold. Small tracts of forestland are primarily in residential development and can not support profitable cutting operations.

Simply put, Rhode Island forestry activities do not impact coastal water quality, nor will they in the future. The remainder of this chapter elaborates on the limited scale of forestry activities, the lack of documented adverse water quality effects and the improbability of future adverse effects from forestry in Rhode Island.

Declining Trends and the Low Potential for Forestry Impacts

Eventhough forestland covers about 400,000 acres or 60 percent of the state, commercial forestry operates on a very small scale. The US Forest Service estimates that annual removals of growing stock in Rhode Island from 1972 to 1984 averaged 4.2 million cubic feet, inclusive of 10.4 million board feet of sawtimber; or approximately 10 cubic feet of growing stock removed per a forested acre. Minimizing land disturbance and soil erosion, Rhode Island loggers primarily use selective cutting (except when clearing for development).

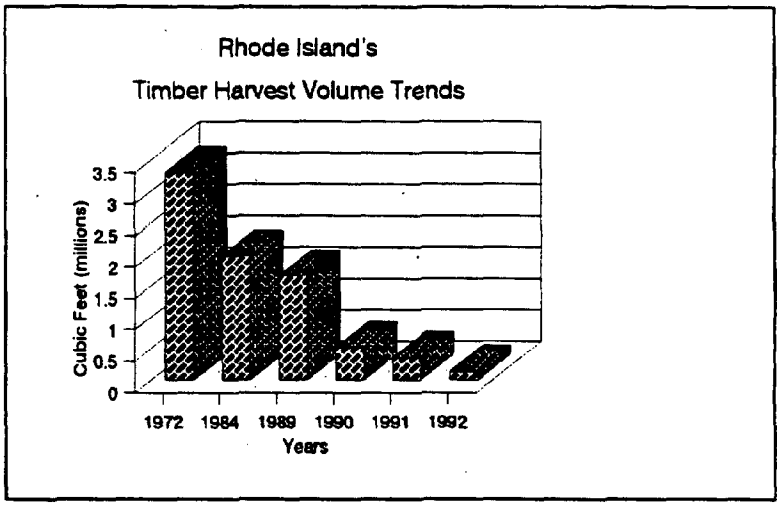

Figure 1 From 1972 to 1992 Rhode Island timber harvest volumes dropped 92% (Dickson & McAfee, 1988 & RIDEM, 1989-92)

In recent years, loggers have cut even less timber. From 1990-1992, timber harvests averaged approximately 330,000 cubic feet, a fourteenth of the average for 1972 to 1984. These harvests included on average, 680,000 board feet of sawtimber, a fifteenth of the average for 1972 to 1984. In 1992, Rhode Island loggers removed only 130,000 cubic feet of timber overall, this included 360,000 board feet of sawtimber. Table 5.1 shows Rhode Island's sawtimber, fuelwood and total removals for 1990, 1991 and 1992.

[1] non-commercial forestland refers to forested areas not subject to silvicultural activities.

Table 5.1
Timber Removals from 1990-1992

Year	Sawtimber (thousand board feet)	Fuelwood (cords)	Total Removals (thousand cubic feet)
1990	579	4,595	517
1991	901	2,682	348
1992	560	755	131

Source: Intent-to-cut forms, RIDEM 1990-1992.

Further limiting the potential to degrade living coastal resources, virtually no cutting occurred in any of the first coastal towns.[2] A map of cumulative "Removal Volumes by Town 1990 - 1992" (Figure 3), based on RIDEM data, indicates that while Scituate has a larger harvest volume than any first coastal town, the Scituate Reservoir sustained no documented impact despite constant water quality monitoring by the Providence Water Supply Board. Table 5.2, Timber Removals from Rhode Island Coastal Towns 1990-1992, shows all removals, the total number of timber removal operations and total acreage of harvest area in each Rhode Island coastal municipality for each year. During these years, the great majority of timber removals occured in non coastal towns (see Figure 2).

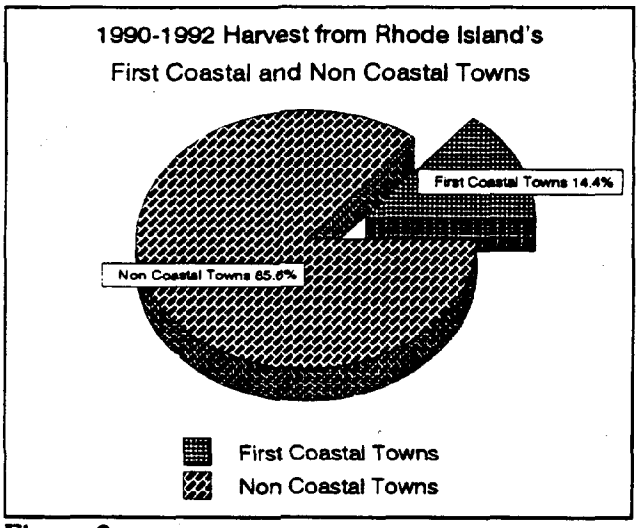

Figure 2 Over 85% of harvesting in Rhode Island takes place outside of coastal towns (RIDEM, 1989-92)

[2]First coastal towns refers those (21 Rhode Island) municipalities which border, at least in part, on tidal waters.

CUMULATIVE REMOVAL VOLUMES BY TOWN 1990-1992

FIGURE 5

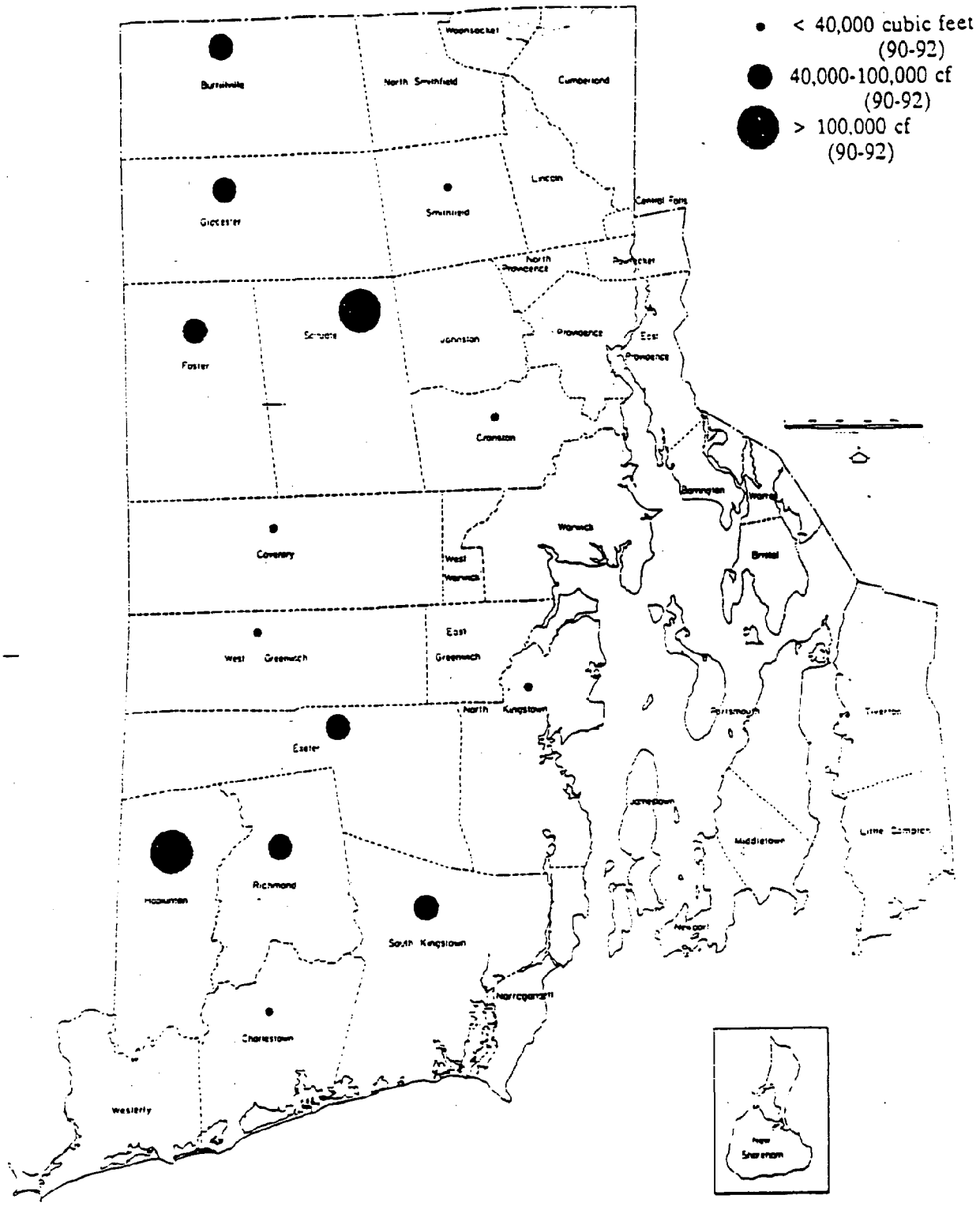

Table 5.2
Timber Removals from Rhode Island Coastal Towns

1990

Municipality	Number of Operations	Harvested Area (acres)	Sawtimber (thousand board feet)	Fuelwood (cords)
Charlestown	1	10	0	50
North Kingstown	1	55	0	200
South Kingstown	2	190	50	500
TOTAL	4	255	50	750

1991

Municipality	Number of Operations	Harvested Area (acres)	Sawtimber (thousand board feet)	Fuelwood (cords)
Charlestown	1	15	30	0
North Kingstown	1	35	0	140
TOTAL	2	50	30	140

1992

Municipality	Number of Operations	Harvested Area (acres)	Sawtimber (thousand board feet)	Fuelwood (cords)
Cranston	1	35	30	150
South Kingstown	3	205	185	105
TOTAL	4	240	215	255

Source: Intent-to-cut forms RIDEM 1990-1992

The primary influence restricting forestry activities is the growth of metropolitan regions. Most contiguous forest tracts have been divided into small residential lots. In 1985, private citizens owned over 320,000 acres -- approximately 87% -- of Rhode Island's harvestable forestland with lots averaging less than 10 acres. Many of these parcels are developed and in residential use. The owners of these parcels resist large-scale cutting operations. Because of this resistance and because smaller operations return negligible profits, loggers do little cutting in Rhode Island.

Additionally, much of Rhode Island's forestland is publicly owned -- 45 thousand acres -- while the forest industry owns almost none -- approximately one percent of all forestland. Table 5.3 shows public ownership, private forest industry ownership, and other private ownership of forestland as of 1985. Figure 4 shows percent owned by each ownership class.

Due to the limited extent and low intensity of timber cutting in the state; virtual non-ownership of forestland by the forest industry, it is reasonable to state that forestry will have no impact to living coastal resources in the future.

Table 5.3
Rhode Island Forestland Ownership in 1985

Ownership Class	Forestland Owned (in thousands of acres)
Public	45.2
Private -- Forest Industry	4.4
Private -- Non Forest Industry	322.2
ALL OWNERSHIP	371.8

Source: Dickson & McAffee, 1988

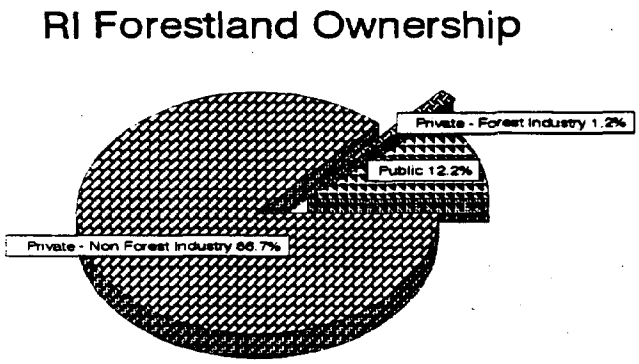

Figure 4 The forest industry owns approximately one percent of Rhode Island's forestland (Dickson & McAfee, 1988).

Water Quality Management Plans and Reports

As recently as 1994 and as far back as 1979, Rhode Island water quality reports document no threat or impact to water quality from forestry. The following water quality plans and reports document that silvicultural activity has not been a water quality concern in Rhode Island.

The 305(b) Report: State of the State's Waters

The *State of the State's Waters* is Rhode Island's most comprehensive water quality report. In addition to describing efforts to maintain clean water, it lists threats and impairments and the potential causes of these water quality problems. Because no 305(b) report indicates forestry as an impact or threat, we can conclude that forestry neither creates nor poses any adverse water quality effect within Rhode Island.

Rhode Island's Nonpoint Source Management Program

Rhode Island's nonpoint source program was developed in accordance with Section 319 of the Clean Water Act. The Act requires each state to prepare two key reports, a state assessment report describing the state's nonpoint source impacts to water quality, and a state management program explaining what the state plans to do in the next four years to address their nonpoint problems. Neither report cited silviculture as a water quality problem in Rhode Island. In addition Rhode Island's Nonpoint Source Management Plan did not contain any "Implementation Approaches" (policy recommendations) regarding silviculture.

The 208 Water Quality Management Plan for Rhode Island

Section 208(b)(2)(F) of the Clean Water Act, requires each state to prepare an Areawide Waste Treatment Management Plan that includes "a process to identify, if appropriate, silviculturally related nonpoint sources of pollution." In 1979, subsequent to a $2.3 million study and 40 published reports, EPA formally adopted and approved *The 208 Water Quality Management Plan for Rhode Island*, which did not contain a silviculture chapter, recommendations relative to nonpoint impacts from silviculture, or any reference to silviculture. Therefore, the EPA

Regional Administrator, upon approval of the 208 Water Quality Management Plan for Rhode Island, agreed that silviculture was not a nonpoint source of pollution in Rhode Island.

The Comprehensive Conservation and Management Plan for Narragansett Bay

Section 320 of the Clean Water Act empowered Rhode Island to develop and implement the Comprehensive Conservation Management Plan for Narragansett Bay. This plan compiles all applicable water quality and land use data and determines the best course for environmental policy in the bay's watershed. Areas studied stretch inland through most of Rhode Island and parts of Massachusetts and include Rhode Island's forestland. The plan has this to say about forestry:

> While forests are a major land type within the Bay watershed, less than one percent, or 3000 acres, of timberland is harvested each year. As a result, timber harvesting or silviculture appears to be an insignificant contributor of NPS pollution to the Bay. (RIDEM & RIDOA, 1992)

The Scituate Reservoir Watershed Management Plan

The Scituate Reservoir System provides Rhode Islanders with over 80 million gallons of drinking water a day. This supply yields some of the finest drinking water available anywhere. The Rhode Island Department of Administration wrote this plan to establish state policy to protect water quality in the Scituate Reservoir, its tributaries and groundwater. The plan lists these sources as possible contaminants: septic systems, stormwater runoff, soil erosion, underground storage tanks, road salt, landfills and hazardous materials, junk and salvage yards, vehicular spills and accidents, fertilizers and pesticides. The plan does not cite forestry as a potential water quality problem, despite the fact that forestland comprises 75% of the watershed.

Rhode Island's Coastal Resources Management Program and *Special Area Management Plans*

The Coastal Resource Management Council's enabling legislation, requires the Council to review any activity that will significantly impact the coastal resources of the state. To this end, the Council reviews several categories of activities statewide (CRMC, 1992, Section 300). The Council does not review silvicultural operations because there is no scientific evidence that suggests that these activities impact on coastal resources of the state. In addition, neither of the Council's *Special Area Management Plans* find any coastal water quality problems associated with forestry activities.

Conclusion

The State of Rhode Island requests an exclusion from the Section 6217 Forestry Management Measures on the basis that nonpoint source pollution from forestry does not and will not present significant adverse effects to living coastal resources or human health. Justifying our request:

1. No reports or management plans denote a water quality impact or threat to living coastal resources or human health from forestry in Rhode Island.

2. Forestry in Rhode Island has already been expressly excluded from several water quality reports and management plans.

3. Increased development continues to limit the extent and intensity of forestry operations in Rhode Island.

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Chapter 6
Urban Measures

Introduction

Rhode Island is the smallest state in the U.S. in terms of land area. It encompasses an area of 658,201 acres or 1,028.4 square miles. To put this into perspective, three Rhode Islands can fit into Yellowstone National Park, 253 Rhode Islands could fit into Texas, and 541 into Alaska. Within this small area are over 400 miles of coastline and 193 square miles of estuarine area which gives Rhode Island its nickname as the "Ocean State". The State also has rich freshwater resources, with 357 lakes and ponds which encompass over 16,749 acres, 21 major ground water aquifers, and 724 miles of rivers and streams (EPA 1994; RIDEM 1992; and, RIDOP 1989). Freshwater and coastal wetlands occupy an area greater than 65,000 acres (Tiner 1989) (See Chapter 9 for additional information on Rhode Island's wetlands resources).

According to the Rhode Island Department of Environmental Management (RIDEM), Division of Water Resources 1992 305(b) report *The State of the State's Waters - Rhode Island: A Report to Congress* (RIDEM 1992), 81% of the state's estuarine areas, 73% of its rivers, and 79% of its lakes fully support their designated uses (Table 6.1). Of the remaining waters in the state, 42% of rivers, 71% of lakes, and 7% of estuaries are fully supporting but threatened by point or nonpoint sources of pollution, and 5% of rivers, 18% of lakes, and 11% of estuaries are only partially supporting their designated uses. It should be noted that the threatened areas fully support their present designated uses. Twenty-two percent (22%) or rivers, 3% of lakes and 9% of estuaries are not supporting designated uses.

Nationally, the principle causes and sources of water quality impairments can be summarized as follows:

> "Metals, especially copper and lead, are the most significant causes of nonsupport in rivers and streams, followed by priority organics, pathogen indicators, low dissolved oxygen concentrations, and nutrients. Nutrients, metals, eutrophication-related low dissolved oxygen concentrations and pH impair lakes. In estuaries and coastal waters, the major causes of impairment include pathogen indicators, heavy metals, nutrients, and eutrophication related low dissolved oxygen concentrations. Major sources of pollutants in rivers and estuaries include industrial discharges, municipal discharges, combined sewer overflows, urban runoff, highway runoff, septic systems, and contaminated sediments. In lakes, septic systems and runoff are the leading sources of impairment. (EPA 1994, 146)."

Table 6.1 Rhode Island Rivers, Lakes, and Estuaries Overall Use Support

	Rivers (miles)	Lakes (acres)	Estuaries (sq. miles)
Total Waters	725	16,749	193
Assessed Waters	664	16,749	193
% Assessed	91.5%	100%	100%
Fully Supporting	73%	79%	81%
Threatened	42%	71%	7%
Partially Supporting	5%	18%	11%
Not Supporting	22%	3%	9%

Source: RIDEM. 1992. *The State of the State's Waters - Rhode Island: A Report to Congress.* Providence, RI: RIDEM, Division of Water Resources. August.

EPA. 1994. *National Water Quality Inventory: 1992 Report to Congress.* Washington, DC: EPA, Office of Water. March

These conclusions are based on monitored and evaluated data from approximately 92% of the rivers and 100% of the lakes and estuaries (EPA 1994; and, RIDEM 1992).

Based on the results of the RIDEM's 1992 305(b) report, it is clear that the vast majority of Rhode Island's point and nonpoint source water quality problems are due to urban related causes. This should not be surprising since, although Rhode Island ranks 42nd among the 50 states in population (968,200), it is the second most densely populated state, with approximately 950 persons per square mile. If the rest of the country had a population density equal to Rhode Island's, the United States would have a population equal to 3.3 billion people (RIDOP 1989).

This chapter provides a brief overview of land use in Rhode Island. To supplement this chapter, and to provide a more detailed analysis of land use and water quality, several documents/reports have been attached as Appendices. These include

Appendix O, *Land Use 2010: State Land Use Policies and Plan*
Appendix R, *The State of the State's Waters - Rhode Island: A Report to Congress*
Appendix P, *Comprehensive Conservation and Management Plan for Narragansett Bay*
Appendix G, *Rhode Island's Salt Pond Region: A Special Area Management Plan*
Appendix H, *Narrow River Special Area Management Plan*

The latter three management plans discuss land use and water quality problems within their respective watersheds.

Land Use in Rhode Island

The balance between conservation and new development in Rhode Island is a delicate one. The Narragansett Bay watershed is one of the most densely populated in the country with approximately 1.8 million people living in an estuarine drainage area of approximately 1300 square miles. In 1980, the density was approximately 1109 people per square mile. Compare this to Chesapeake Bay at 404 people per square mile, Buzzard's Bay at 780 people per square mile, and San Francisco Bay at 802 people per square mile (NOAA 1990).

In 1990, the population of Rhode Island reached 1,002,000 people, representing a 6% increase from 1980, with the greatest increase in suburban and coastal communities (RIDOP, 1991). Population projections suggest that an additional 6% increase in Rhode Island's population from 1990-2010 would increase the population to 1,106,000. Significantly higher growth rates are projected in rural and suburban communities.

Most of the population is situated in Rhode Island's coastal municipalities, especially those located within the Narragansett Bay Watershed (See Table 121-4(1) on page 4.1 and Figure 121-4(7) on page 4.7 in Appendix O). The areas where growth is projected to increase most are rural areas such as Charlestown and Richmond. Significant increases are expected in other rural communities as well. Accordingly, increasing urbanization of rural areas will result in the conversion of agricultural and forested lands into urban and suburban land uses. Infrastructure changes will result in additional point and nonpoint sources of pollutants due to additional areas of impervious surface, expanded sewage treatment facilities, and additional ISDS systems which will be necessary to service the increased population. Additionally, increasing urbanization threatens sensitive areas and natural wildlife habitats which play an important nonpoint source abatement function (e.g., wetland areas).

Much of the new development which takes place in Rhode Island is located in the twenty-one coastal towns. Permits for new single family houses in coastal towns totaled 1318 and 1107, for 1990 and 1991, respectively. Non-coastal permits for new homes equaled 947 and 943 for 1990 and 1991, respectively (RIBA 1990; and RIBA 1991). Statewide, land development activities, summarized in Table 6.2, continue to be the major source of pollutants to Narragansett Bay. The following sections describe several of the categories and subcategories of nonpoint pollutants present in Rhode Island and addressed in the Urban section of the *"g" Guidance.*

Urban Runoff

Since much of the state is urbanized, it is not surprising that urban runoff is a major source of nonpont pollution to Rhode Island's coastal waters. Urbanized land development and activities have been identified as a source of many of Rhode Island's

Table 6.2 Coastal residential and non-residential construction authorized by permit, 1970-1989

	Bristol County	Kent County	Newport County	Providence County	Washington County
Residential (1)	3,202	11,031	5,704	23,599	15,978
Residential (2-4)	76	586	662	4,518	1,202
Residential (5+)	907	7,554	1,736	21,272	2,255
SUBTOTAL	4,185	19,171	8,102	49,389	19,435
Retail	75	532	181	913	246
Office	15	242	137	526	95
Industrial	42	439	60	749	91
Hotel	5	24	38	11	44
Recreational	12	36	30	117	36
SUBTOTAL	149	1,273	446	2,316	512

Source: Culliton, Thomas J., et al.. 1992. *Building Along America's Coasts: 20 Years of Building Permits, 1970-1989.* Rockville, MD: National Oceanic and Atmospheric Administration, Strategic Assessment Division. August.

nonpoint source problems (305(b) Report, 1990). Identified urban sources of nonpoint pollution which are addressed in the *"g" Guidance* include sedimentation from construction sites, stormwater runoff from highways and developed areas, and septic systems (305(b) Report, 1990).

Runoff from heavily developed and industrialized areas of Providence, East Providence, Warwick, and Cranston are major non-point sources to the upper Bay. Pollutants found in this runoff include, but are not limited to, heavy metals, polycyclic aromatic hydrocarbons (PAH's), petroleum products, sediments, nutrients, bacteria, and suspended solids. Stormwater runoff and ISDSs are major sources of nonpoint source contamination to areas such as the Salt Ponds and Narrow River regions, as well as to Greenwich Bay.

Sewage Treatment and Disposal

1985 data estimates that approximately 63 percent of Rhode Island's population is served by sewers, however, in terms of land area, the majority is unsewered. Sewer service is provided for the most densely developed areas, as well as some areas of lower density including central Burrillville, Pascoag, North Kingstown (Quonset Point), Narragansett, South Kingstown, Coventry, and Westerly. Many of these areas have dense, localized populations that could have a detrimental impact on the coastal environment, if left unsewered. Individual Sewage Disposal Systems (ISDS) are

primarily used in areas where sewers are not available, in areas with sparse populations, or in areas where the majority of the population is seasonal.

Approximately 40 percent of the state population, or 143,900 Rhode Island households use ISDS (Roman 1990). Favorable soil conditions are required for ISDS absorption fields to function properly. Soil properties affecting effluent absorption include texture, drainage, slope, permeability, depth to seasonal high water table, depth to bedrock or other restrictive layers, and susceptibility to flooding. Table 121-5(4) on page 5.8 of Appendix O identifies the acreage of soils with severe limitations for septic systems by city and town. All new ISDS, as well as repairs to existing ISDS, must get a permit from the RIDEM, Division of Groundwater and ISDS, to ensure that the system has been designed in conformance with state requirements.

ISDS have long been recognized as a nonpoint pollution source to coastal waters, particularly those which are poorly flushed. It should be noted, however, that water quality problems associated with ISDS are generally not due to the inadequacy of the existing regulatory programs. Rather, water quality problems are due to the existence of a large number of sub-standard systems installed prior to the adoption of the current RIDEM ISDS regulatory program. Problems are also exacerbated by the fact that in many areas, ISDS were installed at densities greater than necessary to ensure the proper treatment of sewage and prevention of surface and groundwater contamination.

The CRMC's Special Area Management (SAM) Plan for the Salt Pond Region (Appendix H) recognized failing and substandard ISDS as the single most important source of bacterial contamination and nutrients to the regions coastal waters. In this area, ISDS are the principal means of treatment and disposal of domestic waste.

In 1981 there were 5,502 ISDS units in the watershed of the salt ponds; most predate the adoption of State standards and are defined as cesspools. Indeed this is a chronic problem statewide where the vast majority of the ISDS predate the current regulatory standards. It should be noted that current regulations mandate that any failed system (cesspools are defined as a failed system because they are in nonconformance with current regulations) be replaced with a system that meets the current ISDS standards, and that all maintenance activities on cesspools are strictly prohibited.

Other plans such as the Narrow River SAM plan and the Narragansett Bay Project (NBP) Comprehensive Conservation and Management Plan (CCMP), have also identified ISDS as a major cause of coastal water quality problems.

Roads, Bridges, and Highways

Considering its relative size, Rhode Island has an extensive road and highway infrastructure. There are 6,275 miles of roads covering an area of 1,049 square miles that equals six road miles per square mile of land. This is a greater road density than any other state in the nation (RIDOP 1989). Many of the major roadways are located in

coastal municipalities and generate runoff which typically drains to coastal waters. Interstate highways, such as I-95, have been identified as major nonpoint source problems. Rhode Island also claims 725 bridges in this network (note a bridge is considered a structure over 20 feet long).

Almost every major road project is subject to the RIDEM's Division of Freshwater Wetlands jurisdiction, and in many cases, when the project is located in coastal areas, some portion of the project is subject to the CRMC review as well. These reviews help assure proper siting and design of structures, and ensure that erosion and sediment controls and stormwater management plans are adequate. Often, these major public infrastructure projects are subject to State Planning Council review to ensure consistency with the *State Guide Plan's* policies.

Water Quality Impacts

As previously noted, many of Rhode Island's coastal water quality problems are linked to urban sources of pollutants. These sources include both point sources (e.g., industrial dischargers, combined sewer overflows, and sewage treatment plants) and nonpoint sources (e.g., stormwater runoff and individual sewage disposal systems). Nonpoint loadings are often the cause of pathogen contamination, nutrient loadings, metals loadings, and eutrophication-related low dissolved oxygen levels (Table 6.3). Based on the results of the 305(b) monitoring report, 81% of the estuarine areas fully support their designated uses compared to only 56% nationwide (EPA 1994). Data from Tables 6.4 and 6.7 show 73% of Rhode Island rivers and 79% of lakes fully support their uses as compared to 56% of rivers and 43% of lakes nationwide (EPA 1994). It is important to note that as a "downstream" state, much of the river contamination within the Narragansett Bay watershed originates in Massachusetts. Additionally, many of the estuarine areas of Upper Narragansett Bay and Mount Hope Bay are impacted by pollution which originates within Massachusetts. Detailed information on the point and nonpoint sources of pollutants are found in Tables 6.5 - Table 6.12. Additional information can be found in the RIDEM's *The State of the State's Waters - Rhode Island: A Report to Congress* (Appendix R) and the EPA's *National Water Quality Inventory: 1992 Report to Congress* (EPA 1994).

Summary of the Land Use and Water Quality Data

Based on this brief summary of land use and water quality data in Rhode Island it can be concluded that the categories and subcategories of nonpoint sources addressed in the Urban Section of the *Guidance Specifying Management Measures For Sources of Nonpoint Pollution to Coastal Waters* (EPA 1993) either individually or cumulatively, present a strong potential for causing significant adverse effects to living coastal resources or human health. This conclusion is supported by the findings and recommendations of:

- *The State of the State's Waters - Rhode Island: A Report to Congress* (Appendix R)
- *Land Use 2010: State Land Use Policies and Plan* (Appendix O)

- *Comprehensive Conservation and Management Plan for Narragansett Bay* (Appendix P)
- *Rhode Island's Salt Pond Region: A Special Area Management Plan* (Appendix G)
- *Narrow River Special Area Management Plan* (Appendix H)

Accordingly, the rest of this chapter discusses Rhode Island's proposals for how each urban measure is, or will be, implemented.

Table 6.3 Leading Causes and Sources of Water Quality Impairment in Rhode Island

	Rivers	Lakes	Estuaries
Leading Causes of Impairment	Metals, Pathogens, Priority Organics, Nutrients, Organic Enrichment	Nutrients, In organics, Pathogens, Metals, Turbidity, Alkalinity	Pathogens, Nutrients, Organic Enrichment, Metals,
Leading Sources of Impairment - Nonpoint	Storm Sewers and Runoff, ISDS, In-Place Contaminants, Land Disposal	Atmospheric Deposition, Storm Sewers and Runoff, Agriculture, ISDS	Storm Sewers and Runoff, ISDS, In-Place Contaminants
Leading Sources of Impairment - Point	Industrial Discharges, Sewage Treatment Plants, CSOs	Municipal Discharges	Sewage Treatment Plants, Industrial Discharges, CSOs

Source: RIDEM. 1992. *The State of the State's Waters - Rhode Island: A Report to Congress.* Providence, RI: RIDEM, Division of Water Resources. August.

EPA. 1994. *National Water Quality Inventory: 1992 Report to Congress.* Washington, DC: EPA, Office of Water. March

Table 6.4 Summary of River Water Quality in Rhode Island

	Rivers - Rhode Island		Rivers - National	
	Miles	Percentage	Miles	Percentage
Total River Miles	777		3,551,247	
Total Miles Assessed	664	85%	642,881	18%
Evaluated	376	57%	388,241	60%
Monitored	288	43%	232,308	36%
Fully Supporting	487	73%	360,283	56%
Threatened	282	42%	41,066	6%
Partially Supporting	32	5%	161,025	25%
Not Supporting	145	22%	80,382	13%

Source: RIDEM. 1992. *The State of the State's Waters - Rhode Island: A Report to Congress.* Providence, RI: RIDEM, Division of Water Resources. August.

EPA. 1994. *National Water Quality Inventory: 1992 Report to Congress.* Washington, DC: EPA, Office of Water. March

Table 6.5 Impaired River Miles Affected by Causes of Pollution

Causes	Major	Mod/Min	Total River Miles	% of Impaired
Siltation	-	-	-	-
Nutrients	12	20	32	18%
Organic Enrichment	17	10	27	15%
Pathogens	56	27	83	47%
Metals	130	3	133	75%
Salinity/TDS/Chlorides	-	7	7	-
Habitat Modification	-	-	-	-
Priority Organics	27	27	54	30%
Suspended Solids	-	3	3	2%
Turbidity	-	7	7	4%
pH	-	-	-	-
Thermal Modification	-	-	-	-

Source: RIDEM. 1992. *The State of the State's Waters - Rhode Island: A Report to Congress.* Providence, RI: RIDEM, Division of Water Resources. August.

EPA. 1994. *National Water Quality Inventory: 1992 Report to Congress.* Washington, DC: EPA, Office of Water. March

Table 6.6 Impaired River Miles Affected by Sources of Pollution

Sources	Major	Mod/Min	Total River Miles	% of Impaired
Point Sources				
Municipal	14	28	42	24%
Industrial	-	27	27	15%
Combined Sewers	-	14	14	8%
Nonpoint Sources				
Agriculture	-	36	36	20%
In-Place Contaminants	-	24	24	23%
ISDS	17	47	64	36%
Storm sewers/Runoff	16	133	149	84%
Road Construction	-	4	4	2%
Highway Maintenance	8	5	13	7%
Land Development	-	15	15	8%
Recreational Activities	1	3	4	2%
Hazardous Waste	-	9	9	5%
Waste Water	-	2	2	1%
Septage Disposal	-	1	1	1%
Land Fills	2	6	8	5%
Land Disposal	6	31	37	21%
Other	28	74	102	58%
Unknown	-	10	10	6%

Source: RIDEM. 1992. *The State of the State's Waters - Rhode Island: A Report to Congress.* Providence, RI: RIDEM, Division of Water Resources. August.

EPA. 1994. *National Water Quality Inventory: 1992 Report to Congress.* Washington, DC: EPA, Office of Water. March

Table 6.7 Summary of Lake Water Quality in Rhode Island

	Lakes - Rhode Island		Lakes - National	
	Acres	Percentage	Acres	Percentage
Total Lake Acres	16,749		39,920,000	
Total Acres Assessed	16,749	100.0%	18,283,566	46%
Evaluated	15,628	93%	4,104,305	22%
Monitored	1,121	7%	11,544,595	63%
Fully Supporting	13,173	79%	7,905,576	43%
Threatened	11,896	71%	2,304,321	13%
Partially Supporting	3,020	18%	6,381,821	35%
Not Supporting	556	3%	1,699,439	9%

Source: RIDEM. 1992. *The State of the State's Waters - Rhode Island: A Report to Congress.* Providence, RI: RIDEM, Division of Water Resources. August.

EPA. 1994. *National Water Quality Inventory: 1992 Report to Congress.* Washington, DC: EPA, Office of Water. March

Table 6.8 Impaired Lake Acres Affected by Causes of Pollution

Causes	Major	Mod/Min	Total Lake Acres	% of Impaired
Siltation	109	284	393	11%
Nutrients	80	1,184	1,264	35%
Organic Enrichment/DO	600	-	600	17%
Pathogens	290	581	871	24%
Metals	441	371	812	23%
Salinity/TDS/Chlorides	-	605	605	17%
Noxious Aquatic Plants	133	-	133	4%
Turbidity	-	696	696	19%
Priority Organics	-	337	337	9%
Other Inorganics	-	1,055	1,055	30%
pH/Alkalinity	1,463	-	1,463	41%

Source: RIDEM. 1992. *The State of the State's Waters - Rhode Island: A Report to Congress.* Providence, RI: RIDEM, Division of Water Resources. August.

EPA. 1994. *National Water Quality Inventory: 1992 Report to Congress.* Washington, DC: EPA, Office of Water. March

Table 6.9 Impaired Lake Acres Affected by Sources of Pollution

Sources	Major	Mod/Min	Total Lake Acres	% of Impaired
Point Sources				
Municipal	-	233	233	7%
Nonpoint Sources				
Agriculture	-	562	562	16%
ISDS	-	532	532	15%
Storm sewers/Runoff	1,057	296	1,353	38%
Land Development	-	322	322	9%
Highway Maintenance	8	234	242	7%
Salt Storage	-	42	42	1%
Natural	1,463	215	1,678	47%
Recreational	-	133	133	4%
Atmospheric Deposition	1,463	-	1,463	41%
Land Fills	117	42	159	4%
Hazardous Waste	-	325	325	9%
Land Disposal	-	47	47	1%
Other	-	1,104	1,104	31%
Unknown	116	-	116	3%

Source: RIDEM. 1992. *The State of the State's Waters - Rhode Island: A Report to Congress.* Providence, RI: RIDEM, Division of Water Resources. August.

EPA. 1994. *National Water Quality Inventory: 1992 Report to Congress.* Washington, DC: EPA, Office of Water. March

Table 6.10 Summary of Estuary Water Quality in Rhode Island

	Estuaries - Rhode Island		Estuaries - National	
	Square Miles	Percentage	Square Miles	Percentage
Total Square Miles	193		36,890	
Total Square Miles Assessed	193	100%	27,227	74%
% Evaluated	52	27%	4,861	33%
% Monitored	141	73%	11,265	41%
Fully Supporting	155	81%	208	56%
Threatened	14	7%	353	12%
Partially Supporting	21	11%	6,132	23%
Not Supporting	17	9%	2,463	9%

Source: RIDEM. 1992. *The State of the State's Waters - Rhode Island: A Report to Congress.* Providence, RI: RIDEM, Division of Water Resources. August.

EPA. 1994. *National Water Quality Inventory: 1992 Report to Congress.* Washington, DC: EPA, Office of Water. March

Table 6.11 Impaired Estuary Square Miles Affected by Causes of Pollution

Causes	Major	Mod/Min	Total Estuary Sq. Miles	% of Impaired
Siltation	-	-	-	-
Nutrients	-	14	14	37%
Organic Enrichment	-	7	7	18%
Pathogens	28	4	32	84%
Metals	-	7	7	18%
Priority Organics	-	-	-	-
Pesticides	-	-	-	-
Suspended Solids	-	-	-	-
pH	-	-	-	-
Ammonia	-	-	-	-
Oil and Grease	-	-	-	-
Unknown	-	-	-	-

Source: RIDEM. 1992. *The State of the State's Waters - Rhode Island: A Report to Congress.* Providence, RI: RIDEM, Division of Water Resources. August.

EPA. 1994. *National Water Quality Inventory: 1992 Report to Congress.* Washington, DC: EPA, Office of Water. March

Table 6.12 Impaired Estuary Square Miles Affected by Sources of Pollution

Sources	Major	Mod/Min	Total Estuary Sq. Miles	% of Impaired
Point Sources				
Municipal	-	30	30	79%
Industrial	-	16	16	42%
Combined Sewers	23	7	30	79%
Nonpoint Sources				
Agriculture	-	1	1	3%
Silviculture	-	-	-	-
Storm sewers/Runoff	7	26	33	87%
ISDS	-	10	10	26%
In Place Contaminants	-	7	7	18%
Hydrologic/Habitat Mod	-	-	-	-
Recreational	3	2	5	13%
Land Disposal	-	-	-	-
Other	-	27	27	71%
Unknown	-	-	-	-

Source: RIDEM. 1992. *The State of the State's Waters - Rhode Island: A Report to Congress.* Providence, RI: RIDEM, Division of Water Resources. August.

EPA. 1994. *National Water Quality Inventory: 1992 Report to Congress.* Washington, DC: EPA, Office of Water. March.

Regulation of Activities Subject to the Urban Management Measures

The principal means of addressing the Urban Management Measures are through compliance with the following::

- Rhode Island Coastal Resources Management Program (Appendix E)
- RIDEM, Division of Groundwater and ISDS's Rules and Regulations (Appendix D)
- RIDEM, Division of Freshwater Wetlands Rules and Regulations (Appendix B)
- Rhode Island Comprehensive Planning and Land Use Regulation Act (R.I.G.L. 45-22.2) (Appendix A)
- Rhode Island Zoning Enabling Act of 1991 (R.I.G.L. 45-24) (Appendix A)
- Land Development and Subdivision Review Enabling Act of 1992 (R.I.G.L. 45-23) (Appendix A)
- RIDEM, Division of Water Resources, Water Quality Regulations and Water Quality Certification Program (Appendix C)
- State Guide Plan Element policies (Appendix S)

Essentially, the State Guide Plan (SGP) is mandated by law as a means for centralizing and integrating statewide long range goals and policies. It is not a single document but a collection of elements that have been adopted and amended since the 1960s. Under certain circumstances the Department of Administration, Division of Planning (DOP) has the jurisdiction to review new plans, policies, and proposals for compliance and consistency with SGP elements. It is therefore essential that new measures, implemented to comply with "g" guidance mandates, are also consistent with the recommendations and policies cited in the SGP. The Urban Measures addressed in this chapter may generally be considered consistent with the guide plan elements although no specific SGP recommendations address the level of detail as discussed herein.

The *Rhode Island Nonpoint Source Management Plan*, currently being revised by RIDEM, will be proposed as an element of the SGP. Once amended as an element of the SGP, a community has one year to amend their comprehensive plan to incorporate any revised or new element of the SGP (R.I.G.L. 45-22.1-10(F)).

In most cases, urban measures are subject to the requirements of the Coastal Resources Management Council's (CRMC's) *Rhode Island Coastal Resources Management Program* (RICRMP) and/or the RIDEM, Division of Freshwater Wetlands *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* and the RIDEM Division of Water Resources, Water Quality Regulations. Additionally, the RIDEM, ISDS Rules and Regulations ensure implementation of the management measures for new and existing onsite sewage disposal systems (OSDS). These programs, as well as the other aforementioned programs are discussed more fully in Chapter 2. It is important to note here that the State regulatory programs (RIDEM & CRMC) are the primary mechanisms for implementation of erosion control and stormwater requirements for most projects within the state. At the local level, municipal ordinances may be important for the few minor projects that may not require state review.

Rhode Island's proposed CNPCP is a networked program. Implementation of management measures outside of CRMC's jurisdictional area, but within the 6217 management area, will be administered by the RIDEM. RIDEM and DOA Division of Planning (responsible for overseeing the RI Comprehensive Planning program) are partners in the development and implemntation of the RICNPCP, and therefore management measures will be implemented as required under the 6217 program.

Specific conformance with the RI Comprehensive Planning and Land Use Regulation Act (R.I.G.L. 45-22.2) and related enabling legislation is cited in most of the urban management measures discussed herein. Citations are noted for stipulations of compliance with sections of each Act.

Rhode Island Pollution Discharge Elimination System

Any discussion of the regulation of runoff in Rhode Island would not be complete without mentioning the Rhode Island Pollution Discharge Elimination System (RIPDES) Program. As a delegated state by the Environmental Protection Agency, Rhode Island is authorized to issue individual and general permits under the RIPDES Program to cover discharges of industrial stormwater. The Rhode Island Department of Environmental Management (RIDEM), Division of Water Resources has developed two separate statewide general permits to cover all stormwater discharges associated with industrial activity and construction activities that disturb five or more acres of land. The RIDEM has promulgated the RIPDES regulations pursuant to Chapter 46-12, 42-17.1 and 42-35 of the General Laws of Rhode Island, as amended. The issuance of a RIPDES permit does not exempt the applicant from obtaining other state or federal permits that may be required. Accordingly, applicants may be subject to requirements additional to those contained in a RIPDES permit.

New Development

New Development

1) By design or performance:
   a) After construction has been completed and the site is permanently stabilized, reduce the average annual total suspended solid (TSS) loadings by 80%. For the purposes of this measure, an 80% TSS reduction is to be determined on an average annual basis*, or
   b) Reduce the postdevelopment loadings of TSS so that the average annual TSS loadings are no greater than predevelopment loadings, and
2) To the extent practicable, maintain postdevelopment peak runoff rate and average volume at levels that are similar to predevelopment levels.

*Based on the average annual TSS loadings from all storms less than or equal to the 2-year/24-hour storm. TSS loadings from storms greater than the 2-year/24-hour storm are not expected to be included in the calculation of the average annual TSS loadings.

Applicability

New development, redevelopment, and new and relocated roads, highways and bridges.

Programs Implementing the Measure

This management measure is or will be implemented by the:

- Rhode Island Coastal Resources Management Program; and,
- RIDEM, Division of Freshwater Wetlands Rules and Regulations.
- RIDEM, Division of Water Resources, Water Quality Regulations and Water Quality Certification Program
- State Acts Related to Land Use and Planning, and the *State Guide Plan*

Additionally, this measure may be addressed through Municipal Comprehensive Plans and their associated implementation techniques, ordinances, and regulations. The measure may also be partially implemented through the Rhode Island Department of Transportation, *Rules and Regulations Concerning Permission for use of State highway Rights-of-Way.*

These programs and how they implement or will implement the management measure are described in more detail below.

Rhode Island Coastal Resources Management Program

This management measure will be implemented by the Rhode Island Coastal Resources Management Council (CRMC) pursuant to R.I.G.L. 46-23 in accordance with the permit requirements as specified in the Rhode Island Coastal Resources Management Program (RICRMP). For more information on the nature of the program and the permit process see the discussion contained in Chapter 2.

Implementation of the Measures

The New Development Management Measure is currently implemented by the CRMC pursuant to Section 300.6 of the RICRMP (Appendix E). The requirements of this section apply to all small and large projects. Small projects are defined in RICRMP Section 300.6.A.8 as

> "all new development (residential, commercial, industrial), redevelopment (residential, commercial, and industrial). In addition, activities which are classified as maintenance, and projects which receive a finding of no significant impact (FONSI) are excluded from these requirements."

The CRMC has excluded maintenance and FONSI projects from the new development management measure because these activities are very minor in their scope of work. Most maintenance activities are repairs to existing and previously permitted structures. Maintenance includes only those activities that do not significantly alter the permitted design or purpose and the size of the structure. Typical maintenance activities would involve the repairing of previously approved rip-rap revetments or docks and the repair of a failed onsite sewage disposal system.

FONSI activities include, but are not limited to, interior renovations, construction of attached decks, dormers, porches, second story additions (no increase in structural footprint), roofing, siding or window and door alterations, installation of detached tool sheds, flag poles, fences along property bounds located landward of the coastal feature and minor landscaping work. Provided activities fit within the scope of the above listed projects, they are eligible for a FONSI permit. Maintenance and FONSI projects pose an insignificant threat to the State's coastal resources, and therefore, common sense dictates that these activities be excluded from the new development management measure.

Large projects are defined in RICRMP Section 300.6.A.7. as:

> "any one of the following: subdivision of six (6) units or more; any structure serviced by an on-site sewage disposal system serving 2000 gallons or more per day; any activity which results in the creation of one (1) acre or more of parking

facilities, roadways, or impervious surfaces; all new roads, highways, and bridges; all improvement projects to roads, highways, and bridges (excluded from these requirements are projects consisting only of pavement resurfacing, minor roadway repairs, or emergency roadway and drainage repairs); any activity which is subject to the RIPDES general permit requirements for construction activities or industrial activities; any activity subject to Section 300.8; any activity subject to Section 300.13; and any activity subject to Section 320."

This management measure is currently implemented by the CRMC through the following:

1. Requirements contained in RICRMP Section 300.6

Section 300.6 of the RICRMP contains the Council's principle stormwater management requirements. Some of the key requirements include:

"4. It is the Council's policy to require the proper management and treatment of stormwater through the preparation and implementation of a stormwater management plan which satisfies the requirements of the RICRMP. All activities which meet the definition of a large project must prepare and implement a stormwater management plan which satisfies the requirements of Section 300.6.E.2.. All activities which meet the definition of small project must satisfy the stormwater management standards contained in Section 300.6.E.3 (RICRMP Section 300.6.B.4)."

"6. After construction has been completed and the site has been permanently stabilized, the average annual total suspended solid loadings (TSS) shall be reduced by 80 percent. In addition, to the maximum extent practicable, the post development peak runoff rate and the average volume from 2-year, 25-year, and 100-year storm events shall be maintained at pre-development levels unless: i) the applicant has obtained local or state approval which certifies that the existing storm drain system has the capacity to accommodate the additional stormwater runoff; or ii) the stormwater runoff is conveyed, preferably without hardened channels, non-erosive to tidal waters (RICRMP Section 300.6.B.7)."

- It is important to note here that <u>all</u> projects must meet the 80 percent TSS removal standard even if a variance may be granted for peak discharge rates exceeding pre-development conditions, provided all variaince criteria are met in accordance with Section 120 of the RICRMP. In particular, the applicant must demonstrate that the "proposed alteration will not result in significnat adverse environmental impacts".

"7. All stormwater management plans required by the Council should clearly describe the Best Management Practices (BMP) as found in <u>the most recent</u>

> version of the *Rhode Island's Stormwater Design and Installation Standards Manual* that will be used to treat and mitigate adverse environmental impacts associated with stormwater runoff. In addition, all stormwater management plans shall take into consideration all potential impacts associated with the discharge of stormwater runoff into the coastal environment. Potential impacts include, but are not limited to, the following: (i) impacts to coastal wetlands such as changes in species composition due to the introduction of freshwater to high marsh areas; (ii) changes in the salinity of receiving waters; (iii) thermal impacts to receiving waters; (iv) effects of introducing stormwater runoff to receiving waters that has low dissolved oxygen concentrations; and (v) other potential water quality impacts (RICRMP Section 300.6.B.7)."

For more detailed standards, see Section 300.6.E.2 which contains the specific standards that apply to large projects and Section 300.6.E.3 which contains the standards that apply to small projects. It is also important to note that the stormwater management plan must be approved prior to the issuance of the Council's Assent, and following approval of the project, becomes a stipulation of the Assent. Major stipulations of Council Assents are registered on title in the land evidence records. Additional stipulations and requirements other than those specifically mentioned in the regulations (i.e., maintenance requirements for a specific project) may also be included in the Assent.

2. *Rhode Island Stormwater Design and Installation Standards Manual*

The *Rhode Island Stormwater Design and Installation Standards Manual* (Appendix K), which has been incorporated into the CRMC's RICRMP requirements by reference (Section 300.6.E), contains more detailed descriptions of the Council's standards and requirements for stormwater treatment. The document is intended to guide applicants in designing projects consistent with the Council's regulations. This manual should be viewed as supplemental requirements which must be incorporated, as needed, into all stormwater management plans.

With reference to this management measure, the *Manual* specifically states,

> "The CRMC and DEM have established a minimum **80 percent** removal rate, over an average annual basis, for total suspended solids (TSS) contained in stormwater runoff. This removal rate is based on criteria established by Section 6217(g) of the Coastal Zone Management Reauthorization Amendments of 1990 which mandates that the State of Rhode Island adopt and implement this minimum standard for reducing non-point source pollution within the coastal zone." (*Rhode Island Stormwater Design and Installation Standards Manual* , 6)

3. Other RICRMP requirements related to stormwater

Other RICRMP requirements which address stormwater management are policies and prohibitions governing water types (Section 200) and coastal features (Section 210). Examples include:

- Point source discharges of sewage and/or stormwater runoff are prohibited on unconsolidated coastal banks and bluffs (RICRMP Section 300.6.D.1).

- New and enlarged stormwater discharges to the high salt marsh environment bordering Type 1 and Type 2 waters and within salt marshes designated for preservation which border Type 3,4,5, and 6 waters are prohibited. Stormwater discharges to existing well flushed tidal channels within high marshes shall not be subject to this prohibition. However, all such discharges shall meet the standards contained in Section 300.6.E.2 (RICRMP Section 300.6.D.2).

- Matrices Contained in RICRMP Table 1, as they pertain to point discharges

- Section 200.1.C.4 prohibits new or enlarged discharges to Type 1 waters unless there is no reasonable alternative and the discharge will not significantly impact receiving waters.

- Section 200.2.C.5 is prohibits new and enlarged discharges to poorly flushed estuaries classified as Type 2 except when there is no reasonable alternative and the discharge will not significantly impact receiving waters.

- CRMC's buffer zone policies and standards contained in Section 150 require that riparian areas remain in an undisturbed state so that they can function, in part, as vegetative treatment systems for stormwater runoff.

These supplemental requirements help ensure that the measure is implemented and are best viewed as additional management measures.

Management Measure Oversight

Oversight with respect to this program lies with the Rhode Island Coastal Resources Management Council (CRMC) which monitors and enforces the policies and requirements as specified in the Rhode Island Coastal Resources Management Program (RICRMP). These issues are described in more detail below.

Enforcement

The CRMC has broad enforcement authority. The stipulations of a CRMC Assent are registered on title. The Council issues cease and desist orders when violations are detected. Cease and Desist orders are registered on title as deed restrictions. This is a very effective mechanism for ensuring long term enforcement of the program since it typically prevents title transfers and refinancing. The CRMC also has the authority to assess both administrative fees and fines. In addition, violators can be subject to criminal prosecution pursuant to R.I.G.L. 46-23-7.3. The CRMC will enforce the

measure's implementation using its existing enforcement and permit staff. Each permitting team (engineer and biologist) has distinct towns where he/she is responsible for reviewing applications. Accordingly, they perform routine field inspections and do enforcement while they perform site visits in conjunction with other applications. The enforcement staff both patrols and responds to reported violations. In addition to on-land enforcement activities, the CRMC also has boats which it uses to patrol areas on the water. In addition, RIDEM Conservation Officers often report violations as do local officials, the general public, and environmental groups such as Save-the-Bay.

Monitoring

The CRMC will monitor implementation of the management measures when it monitors the implementation of the CRMC Assent. The CRMC's permit staff routinely conduct field checks while a project is being constructed to ensure that the applicant adheres to all stipulations of the Assent. In addition, all major stipulations of the Assent are registered in the land evidence record and transfer with title.

It is possible that monitoring of a specific project could be included as a stipulation of a Council Assent. At this time, there is no additional water quality monitoring being proposed.

Financial Needs

Implementation of this measure creates two financial needs. First, the new stormwater requirements adopted by the Council in 1993 which were intended to implement this management measure have slightly increased the review time associated with some projects. This in turn translates into increased staff costs which requires additional financial resources. Second, effective enforcement of this measure requires the availability of additional enforcement staff. The CRMC currently has only two enforcement staff. While the Council's recent Section 312 Evaluation Findings identified some significant improvements in enforcement, it also identified the addition of more dedicated enforcement personnel as a priority when the financial resources become available (OCRM 1993, 12). Accordingly, the CRMC will need some additional financial resources pursuant to Section 6217 to enforce the Urban measures more effectively.

At this time, the RIDEM does not have adequate financial resources to expand their Section 305 (b) monitoring program. Accordingly, any additional water quality monitoring related to Section 6217 will have to be financed with a commensurate level of financial resources.

Technical Needs

The state already has an excellent Soil Erosion and Sediment Control Manual (Appendix L) and recently adopted the *Rhode Island Stormwater Design and Installation Standards Manual* (Appendix K). Based on the results of the threshold review, it is possible that minor changes or additions to these manuals may be needed. It is also possible that additional periodic staff training to update on new and improved

stormwater management and erosion and sediment control techniques would also be of benefit.

Overall Program Effectiveness

The CRMC's implementation of its federal program has been successful. The findings of the most recent Section 312 Evaluation concluded that the CRMC was implementing all of the provisions of its federally approved program (OCRM, 1993) including the *State Guide Plan* policies. It also noted a wide range of improvements that have been made including its improved enforcement capabilities. In addition, the CRMC has adopted some innovative programs to ensure compliance with its regulations such as the Council's dock registration program.

There is little evidence to suggest that any significant unauthorized construction has gone undetected since 1986-1987, when the Council hired on its own technical staff. The CRMC's existing regulatory requirements and enforcement authorities are more than adequate to ensure the measure's effective implementation within the CRMC's jurisdiction. The addition of financial resources to address the technical and financial needs associated with this measure would further enhance the effectiveness of the measure's implementation.

RIDEM Division of Freshwater Wetlands Rules and Regulations

This management measure will also be implemented by the Rhode Island Department of Environmental Management (RIDEM), Division of Freshwater Wetlands pursuant to R.I.G.L. 2-1 et. seq., 42-17.1-1 et. seq., 42-17.6-1 et. seq., and 42-35-1 et. seq. (Appendix A) in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). The Freshwater Wetlands Regulations are promulgated to administer and enforce the Fresh Water Wetlands Act (R.I.G.L. 2-1-18 - 2-1-24) pursuant to Section 2-1-20.1 of the Act. For more information on the nature of that program and its permit process and requirements, see the discussion contained in Chapter 2, and the discussions addressing the Wetlands Management Measures.

Implementation of the Measure

The New Development Management Measure is currently implemented by the RIDEM, Division of Freshwater Wetlands pursuant to the Fresh Water Wetlands Act (R.I.G.L. 2-1-18 - 2-1-24) and the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). The Division of Freshwater Wetlands regulates all projects that may alter the character of freshwater wetlands, as well as, any project in close proximity to a freshwater wetland if it:

1. Changes the flow of surface runoff into or away from a freshwater wetland.
2. Diverts groundwater into or away from a freshwater wetland.

3. Modifies water quality in a way that could change the natural character of a freshwater wetland.

The *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (effective April 7, 1994) apply statewide to any activities that could alter the character of a freshwater wetland (R.I.G.L. 2-1-21 and SD 4.03). Freshwater Wetlands include, but are not limited to, swamps, marshes, bogs, streams, flood plains, ponds, emergent and submergent plant communities in any fresh water, and the area of land within 50 feet of any marsh, bog, swamp or pond (R.I.G.L. 2-1-20(d)).

1. Requirements contained in the Fresh Water Wetlands Act (R.I.G.L. 2-1-19)

The Fresh Water Wetlands Act establishes the statutory authority for the enforcement of Rhode Island's freshwater wetland policies. The Act declares that in the interest of the health, welfare and general well being of the populace, it shall be the public policy of Rhode Island to "preserve the purity and integrity of the swamps, marshes and other freshwater wetlands of this state" (R.I.G.L. 2-1-19). The Act authorizes the Director of the RIDEM to:

1. Adopt, modify, repeal or promulgate rules and regulations in accordance with the Fresh Water Wetlands Act (R.I.G.L. 2-1-20.1).
2. Designate which areas of Rhode Island are to be known as freshwater wetlands (R.I.G.L. 2-1-20.2).
3. Inspect by entering, examining or surveying places as considered necessary to enforce the Act without warrant; any person willfully impeding such action shall upon conviction be liable for a fine of up to $100 or 30 days imprisonment or both (R.I.G.L. 2-1-20.3).

The Act is implemented through a permit process. Section 2-1-21 requires that any alteration to a freshwater wetland receive prior approval from the Director of the Rhode Island Department of Environmental Management.

> No person, firm, industry, company, corporation, city, town, municipal or state agency, fire district, club, nonprofit agency, or other individual or group, may excavate; drain; fill; place trash, garbage, sewage, highway runoff, drainage ditch effluents, earth, rock, borrow, gravel, sand clay, peat, or other materials or effluents upon; divert water flows into or out of; dike; dam; divert; change; add to or take from or otherwise alter the character of any fresh water wetland as herein defined without first obtaining the approval of the director of the department of environmental management.

2. Rules and Regulations Governing the Enforcement and Administration of the Freshwater Wetlands Act

Upholding the Freshwater Wetlands Act, the Rhode Island Department of Environmental Management, Division of Freshwater Wetlands has promulgated the *Rules and Regulations Governing the Enforcement and Administration of the Freshwater Wetlands Act*, which establish a permit process and designate, by definition, all freshwater wetlands in Rhode Island. This process complies fully with the management measure. The Regulations define freshwater wetlands as:

A. Bog, flood plain, pond, marsh, river bank, swamp, river, area of land within fifty feet (50'), area(s) subject to flooding, area(s) subject to storm flowage, floodway, flowing body of water, stream, intermittent stream, perimeter wetland, submergent and emergent plant communities, special aquatic sites, and shrub and forested wetland;
B. Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions; and
C. Any or all wetlands created as part of, or the result of, any activity permitted or directed by the Department after July 16, 1971 including, but not limited to: restored wetlands; value replacement wetlands created to compensate for wetland loss such as flood plain excavations; biofiltration areas; and any wetlands created, altered or modified after July 16, 1971. (SD 5.39)

The Director has sole authority to determine which areas are freshwater wetlands. (SD 5.39)

The Regulations also establish a permit process that includes enforceable policies and prevents significant impacts to all Rhode Island freshwater wetlands. The process requires that any project or activity that may alter freshwater wetlands receive a permit from the Director of the Rhode Island Department of Environmental Management (SD 7.01-A). Any project outside of, but in close proximity to, a freshwater wetland also requires a permit (SD 7.01-B), if it:

1. Changes the flow of surface runoff into or away from a freshwater wetland.
2. Diverts groundwater into or away from a freshwater wetland.
3. Modifies water quality in a way that could change the natural character of a freshwater wetland.

In accordance with Section 2-1-21 of the Fresh Water Wetlands Act, a permit will be denied if the proposed project would result in a random, unnecessary or undesirable alteration of a freshwater wetland. To determine if a proposed alteration is random, unnecessary or undesirable the Director considers:

1. Whether the applicant has demonstrated that the impacts to freshwater wetlands have been avoided to the maximum extent possible, and whether those impacts which are unavoidable have been reduced to the maximum extent possible in accordance with the review criteria (SD 11.02).

2. Whether the applicant has demonstrated that the proposed project eliminates or minimizes probable impacts to freshwater wetlands functions and values, and the environment, health, welfare and general well-being of the populace.
3. Whether the proposed project will contribute to adverse cumulative impacts on wetlands.

To demonstrate this to the Director, applicants must make a written evaluation that describes what steps were taken to avoid or minimize impacts. When an applicant is writing a report that describes how impacts are to be avoided, the applicant must address the considerations listed in Appendix 3A of the Freshwater Wetlands Regulations.

When an applicant is writing a report that describes how impacts are to be minimized, the applicant must address the considerations listed in Appendix 3B. When reviewing the project plan for minimization of impacts, the Director evaluates it in terms of the 26 review criteria as indicated in Rule 11.00 of the Freshwater Wetlands Regulations. These include criteria related to the minimization of adverse impacts to plants, wildlife, and wildlife habitat; recreational, scientific and cultural resources; hydrology, flood storage and water quality; and nonpoint source abatement functions like pollution filtering and nutrient removal capacity. The Freshwater Wetlands Regulation's review criteria also include the minimization of adverse impacts, such as nonpoint source impacts, caused:

> By modifying or changing: water elevations, temperature regimes, volumes, velocity of flow regimes of water; increasing turbidity; decreasing oxygen; causing any form of pollution; or modifying the amount of flow nutrients so as to negatively impact a wetland functions or values (SD 11.02(12)).

Moreover, projects must avoid or minimize adverse impacts to the functions and values of freshwater wetlands (SD 10.02(A)). Rule 10.00 explains how wetland functions and values are to be determined. These functions and values include:

1. Wildlife and wildlife habitat.
2. Recreation and aesthetics.
3. Flood protection.
4. Groundwater and surface water supplies.
5. Water quality.
6. Soil erosion and sediment control.

Of particular importance for this management measure, the Freshwater Wetlands Regulations delineate water quality as a "function and value" which must be evaluated. As defined in the Freshwater Wetlands Regulations, water quality functions and values include protection and/or maintenance of:

> Important water quality functions and values by nutrient retention or removal; pollution filtration; sediment removal; oxygen production; turbidity reduction; maintenance or modification of stream flow; temperature and oxygen regimes in both flowing and surface water bodies, and providing and maintaining safe drinking water supplies. (SD 10.02(B)(5))

Applicants are required to submit a written evaluation of wetland functions, values and impacts associated with the proposed project. Rule 10.03.B lists the various required elements for the written evaluation. Included among these, applicants must submit a water quality analysis that "calculates the quantities of pollutants in stormwater runoff for both pre- and post-project conditions by utilizing the most recent edition of *Rhode Island's Stormwater Design and Installation Standards Manual* or by another widely accepted method" (SD 10.03.G.3(a)). Alternative methods are subject to the Director's approval. The *Manual* specifically states:

> "The CRMC and DEM have established a minimum **80 percent** removal rate, over an average annual basis, for total suspended solids (TSS) contained in stormwater runoff. This removal rate is based on criteria established by Section 6217(g) of the Coastal Zone Management Reauthorization Amendments of 1990 which mandates that the State of Rhode Island adopt and implement this minimum standard for reducing non-point source pollution within the coastal zone." (*Rhode Island Stormwater Design and Installation Standards Manual* , p. 6)

Rule 10.03 also references Appendix 6 as identifying the content of each required element of the written evaluation. Appendix 6, Section E describes the required element "Proposed Measures to Reduce Impact", recommending practices as required by this management measure:

> Identify and describe the proposed measures, structural and/or non-structural methods, or best management practices that will be implemented to reduce or eliminate harm to wetland functions and values and detail why and how such measures will protect wetland functions and values. Such measures, methods, or best management practices include, but are not limited to:
> 1. Designing dense plantings of shrubs and trees between development and remaining natural areas to "buffer" impacts from loss of wildlife habitat and natural areas and to reduce the effects of noise, lighting and other disturbances upon wildlife and remaining natural areas;
> 2. Preserving natural areas in and around wetlands;
> 3. Minimizing the extent of disturbed areas and encouraging the preservation of land in its natural state;
> 4. Ensuring the maintenance of fish and other wildlife passage;
> 5. designing structures and alterations outside of flood plain, floodway, areas subject to flooding, flowing bodies of water or other freshwater wetlands;
> 6. Using best management practices for the stabilization of disturbed areas and the selection, use, and maintenance of temporary and/or permanent soil

erosion and sediment controls in accordance with or equivalent to the latest version of the *Rhode Island Soil Erosion and Sediment Control Handbook;*
7. Using best management practice selection design criteria in accordance with or equivalent to the *Rhode Island Stormwater Design and Installation Manual* to maximize the control, treatment and maintenance of stormwater flows;
8. Minimizing impervious surface areas such as roads, parking, paving or other surfaces;
9. Incorporating compensatory flood storage area(s) where necessary, and in compliance with these Rules;
10. Encouraging infiltration of non-contaminated run-off;
11. Preventing channelization or piping of run-off and encouraging sheet flow;
12. Landscaping with low slopes to maximize sheet flow and infiltration while minimizing channelization;
13. Incorporating structural methods such as detention basins, wet basins, infiltration basins and trenches, dry wells, galleys, vegetated swales and vegetated filter strips;
14. Minimizing or eliminating the use of, or any increase of, any pollutant, fertilizers, pesticides, herbicides, or any other chemical or organic application which increases pollutant and nutrient loadings;
15. Maximizing setbacks of septic systems and other land disturbances from wetlands; and
16. Minimizing the withdrawal of water from wetlands and minimizing any reduction in river or stream flow.

Management Measure Oversight
Oversight of this regulatory program is the responsibility of the RIDEM, Division of Freshwater Wetlands.

Enforcement
This management measure requires enforcement of policy. to ensure compliance with the Fresh Water Wetlands Act and the Freshwater Wetlands Regulations, the Rhode Island Department of Environmental Management's Director has the power to undertake enforcement actions, which may include a(n):

1. Warning (SD 15.02).
2. Immediate Compliance Order (SD 15.03).
3. Cease and Desist Order (SD 15.04).
4. Notice of Intent to Enforce (SD 15.05).
5. Notice of Violation and Order (SD 15.06)
6. Notice to Owner (SD 15.07).
7. Notice of Intent to Revoke/Suspend a determination or permit (SD 15.08).
8. Notice of Revocation/Suspension of a determination or permit (SD 15.09).

Rule 15.03 describes the purpose and proper issuance of a Warning. Section A states that the purpose of a Warning is to inform the responsible party of the presence of a regulated freshwater wetland and that the past or ongoing site activities may or have resulted in a violation.

Rule 15.04 describes Cease and Desist Orders. The purpose of such an order is to halt the activity resulting in the violation and prevent further damage to the wetland environment (SD 15.04.C). A Cease and Desist Order is issued when a site inspection by an authorized agent of the Department reveals a violation. The Director or authorized agent may write an order to the responsible party to cease and desist any activities resulting in the violation (SD 15.04.A).

Rule 15.05 describes the Notice of Intent to enforce. Such a notice notifies the responsible party of the alleged violation; indicates the type of alteration, the activity undertaken and the extent of the activity; and advises the responsible party of the intent to undertake additional enforcement if the party should fail to satisfy the requirements of the notice. The Notice of Intent to Enforce also inform s the responsible party of activities which must cease and of any corrective action or restoration that is necessary for compliance (SD 15.05.A).

The Notice of Violation and Order also informs the responsible party of an alleged violation and the intent of the Department to undertake further enforcement action if the activity in violation continues (SD 15.06.A.1-2). Under the Notice of Violation and Order the Director may issue specific orders as determined to be necessary (SD 15.06.A.3). These include but are not limited to:

1. An order to cease and desist.
2. An order to restore a freshwater wetland(s).
3. An order to pay an administrative penalty.
4. An order to immediately install protective measures to prevent further alteration.

Rule 15.07 discusses the Notice to Owner. The purpose of this enforcement action is to notify the current property owner that an alleged violation has occurred on the property and that the Department believes that others are responsible for the violation (SD 15.07.A-B)>

Rule 15.08 describes the Notice of Intent to Revoke/Suspend a determination or permit. This notice informs the permittee or subsequent transferee that the Department intends to revoke or suspend a permit or determination. This is done to afford the recipient an opportunity to show cause as to why a revocation or suspension should not take place (SD 15.08.A).

As described in Rule 15.09, the Director may revoke or suspend a permit or determination under three conditions. These conditions are:

1. The information or data submitted by the applicant or permittee either on the form(s) required or in any other material in support of the application is found to be false, misleading or erroneous. (SD 15.09.A.1)
2. The project is not undertaken in strict compliance with the conditions or provisions of any determination or permit issued by the Department. (SD 15.09.A.2)
3. The Department is in receipt of reliable information that the project, without immediate action to suspend or revoke the determination or permit, may result in probable harm to the environment or pose a threat to the health, safety and/or welfare of the public. In such cases, the Department may issue a summary suspension. (SD 15.09.A.3)

Monitoring

The Department of Environmental Management monitors the implementation of this management measure by monitoring the implementation of its permit requirements. Permits for large projects and projects of particular concern will often contain stipulations such as requirements for monitoring by an independent environmental consultant, and a schedule for field inspections. In addition, the Department has conservation officers who patrol the state for violations of its rules and regulations. The Enforcement Section of the Division of Freshwater Wetlands also investigates all complaints of possible violations.

Financial Needs

Enforcement of this measure requires the availability of enforcement staff. The Division of Freshwater Wetlands currently has only 7 enforcement staff. Accordingly, the RIDEM may need some additional financial resources to effectively enforce the management measures of the Urban Chapter.

Technical Needs

The efficiency of enforcement of this management measure could be improved through the application of geographic information systems in the Freshwater Wetlands Program. The Program would also benefit from prom-wide computerization.

Overall Program Effectiveness

The original *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* became effective in 1971. The most recent amendments to the Rules and Regulations became effective as of April 7, 1994.

The Freshwater Wetlands Program is fully implemented as defined in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (SD 1.00-19.00).

RIDEM, Division of Water Resources, Water Quality Regulations and Water Quality Certification Program

This management measure will also be implemented by the Rhode Island Department of Environmental Management's (RIDEM), Division of Water Resources pursuant to R.I.G.L. 46-12, 42-17.1, 42-17.6 and 42-35, in accordance with the Rhode Island Water Quality Regulations for Water Pollution Control. The Rhode Island Water Quality Certification Program evaluates proposed projects to determine compliance with Rhode Island's water quality standards implemented under the Federal Clean Water Act.

Implementation of the Measure
Proposed projects requiring federal permits or licenses which may result in the discharge of pollutants to waters of the State must obtain water quality certification prior to issuance of the federal permit or license. In addition, proposed projects requiring state approvals are afforded review and certification initiated by the state agency issuing the approval. Water quality certification review assesses all aspects of the proposed project and their impacts to water quality. Certification of the project is granted when a determination has been made that under conditions specified in the certification the project is in compliance with the Rhode Island Water Quality Regulation for Water Pollution Control specifically:

-Discharges shall not violate water quality standards
-Discharges shall not further degrade low quality waters
-Discharges shall not degrade high quality waters
-Any existing instream water uses being achieved, and the water quality necessary to protect those existing uses shall be maintained and protected.

The Water Quality Regulations set specific criteria for all surface waters of the state. These criteria are numeric and narrative in nature. For example all waters must meet the EPA aquatic life criteria, human health criteria as well as state criteria for dissolved oxygen, color, turbidity, aesthetics, total and fecal coliform and nutrients. A water quality certification review assesses all the potential impacts on water quality in terms of these criteria.

Management Measure Oversight
Oversight of this program is the responsibility of the permitting agency as well as the RIDEM, Division of Water Resources.

Enforcement
In accordance with Section 401 of the Clean Water Act, a federal agency cannot issue a final license or permit prior to the applicant receiving a state water quality certification. Any conditions contained in a water quality certification must become part of the federal permit or license. Violation of those conditions can be enforced by the federal permitting agency or by the State pursuant to R.I.G.L. 42-17.1, 42-17.6 and 46-12. Fines may be levied by the federal agency in accordance with their statutory ability and by

the RIDEM Division of Water Resources in accordance with R.I.G.L. 46-12 of up to $25,000 per day. State agencies have the ability to require water quality certification as a condition of permit issuance. Conditions of a water quality certification incorporated into the issuing agency permit is enforceable by the issuing agency and the RIDEM Division of Water Resources pursuant to R.I.G.L. 42-17.1, 42-17.6 and 46-12. Fines may be levied by the State permitting agency in accordance with their statutory authority and by the RIDEM Division of Water Resources in accordance with R.I.G.L. 46-12 of up to $25,000 per day.

Monitoring

Monitoring of conditions of the water quality certification can be conducted by the permitting agency or by RIDEM, Division of Water Resources during construction and/or after construction to assure implementation of the management measure.

Financial Needs

Implementation and enforcement of this management measure may require additional staff. Accordingly, the RIDEM may need additional financial resources to implement this measure.

Technical Needs

The RIDEM, Division of Water Resources may require additional technical needs in the development of addition materials to aid in decision making in terms of impacts to existing uses.

Overall Program Effectiveness

Rhode Island had a water quality program prior to delegation by USEPA of implementation of the provision of the Clean Water Act in 1984. The Rhode Island Water Quality Regulations were most recently updated in 1988. As required per Section 303 of the Clean Water Act, the regulations are currently being updated. The proposed changes allow for more efficient implementation of the management measure.

State Acts Related to Land Use and Planning, and the *State Guide Plan*

Portions of the Rhode Island's proposed CNPCP will rely on the Rhode Island Comprehensive Planning and Land Use Regulation Act (R.I.G.L. 45-22.2), the Rhode Island Zoning Enabling Act of 1991 (R.I.G.L. 45-24), the Land Development and Subdivision Review Enabling Act of 1992 (R.I.G.L. 45-23), and the State Guide Plan (R.I.G.L. 42-11). The three planning Acts provide for a unified and consistent mandated approach to management of land and water resources. For a more detailed discussion of these statutes, their interrelationship, and their implementation, see Chapter 2.

Implementation of the Measure

1. The Rhode Island Comprehensive Planning and Land Use Regulation Act

The Rhode Island Comprehensive Planning and Land Use Regulation Act (Appendix A) of 1988 establishes a set of criteria and requirements governing the formulation, adoption and state acceptance of local comprehensive plans. In general, the Act:

- requires local comprehensive plans to be adopted, conforming to the provisions of the Act within a prescribed time frame;
- establishes legislative findings, intent and goals as a basis for the Act;
- provides definitions for clarity;
- provides guidelines for the formulation of local comprehensive plans;
- specifies nine elements required to be addressed in comprehensive plans;
- contains provisions for the coordination of planning activities between two or more communities;
- outlines the procedure for the adoption of comprehensive plans and related zoning ordinance amendments;
- outlines the procedure for state review of comprehensive plans;
- provides a time frame for plan development, review and adoption, including related zoning ordinance changes;
- provides an appeals process;
- requires that all local comprehensive plans be consistent with all applicable elements of the *State Guide Plan* and embody the goals and policies of state agencies;
- requires that state agencies incorporate the goals of the Act into their activities, and that their plans and activities be consistent with adopted local plans;
- establishes a program for technical and financial assistance, including grants to cities and towns;
- provides for the update and amendment of the Act; and,
- provides that the Director prepare and the State Comprehensive Plan Appeals Board adopt a comprehensive plan for any city or town that fails to adopt and submit a plan or whose plan is disapproved by the Director and that decision is affirmed by the Board.

The Act assigns responsibility for comprehensive plan formulation to the local Planning Board/Commission and contains specific requirements for public participation in plan development and public hearings prior to plan adoption. Plans must be adopted first by the Planning Board/Commission and then by the City/Town Council. Once the City/Town Council has adopted the local comprehensive plan, the Council must submit the adopted plan to the Department of Administration, Division of Planning for review. The Department Director must approve the plan. Within eighteen months of state acceptance of the local comprehensive plan, the local zoning ordinance must be amended to comply with the plan. Plans must be updated every five years. They may not be amended more than four times in one calendar year. Whenever the Act or the *State Guide Plan* is amended, local plans must be made to conform within one year.

Plan Review

In order to ensure consistency of local comprehensive plans (and state plans) with the goals, findings and intent of the Act, a program of comprehensive planning review was established (R.I.G.L. 45-22.2-9). The Act designates the Director of the Department of Administration as the responsible official for carrying out its provisions and as the state agent for review.

The Act requires that all comprehensive plans, elements of plans or amendments to plans be submitted to the Director within 15 days of their adoption by the City/Town Council. The Director reviews the submission to ensure procedural requirements are met (45-22.2-9(D)) and make findings that:

a. the goals of the Act have been met;
b. all required elements of the Plan are complete;
c. all plans, elements and amendments are consistent with all elements, as applicable, of the State Guide Plan and embody the goals and policies of the state and its departments and agencies; and,
d. the submission complies with all rules and regulations adopted by the State Planning Council pursuant to Section 45-22.2-10(B) of the Act.

Required Elements

Each local comprehensive plan is required to address, but is not limited to, nine specific elements. (R.I.G.L. 45-22.2-6) Elements relevant to the implementation of the New Development Management Measure are as follows:

• *Element A* - Goals and Policies Statement: In accordance with the Act, this statement, "identifies the goals and policies of the municipality for its future growth and development. The statement shall enumerate how the plan is consistent with the overall goals and policies of this chapter, the state guide plan and related elements. "

• *Element B* - Land Use Plan Element: "The Land Use Plan is the principle element of any local comprehensive plan. As a minimum, the Land Use Plan must consider the allocation of land for residence, business, industry, municipal facilities, public and private recreation, major institutional facilities, mixed uses, open space and natural and fragile areas. Optimum intensities and standards of development must be established for each use classification and location, based upon current development; natural land characteristics; and projected municipal, regional and state services and facilities. Allocations of land use must consider impacts on surface and groundwater resources, wetlands, coastal features, and other sensitive and fragile natural resources." (Handbook 16, RIDOP, IV-11) The Land Use Plan element, like all the other required elements, must be consistent with the state guide plan. In addition, the land use plan must contain an analysis of the inconsistencies between the plan and the existing zoning ordinance. The Act requires that municipal zoning ordinances be amended to be consistent with this element within eighteen months of plan adoption.

• *Element E* - Natural and Cultural Resources Element: Municipalities are required to inventory significant natural resource areas including, water, soils, prime agricultural lands, natural vegetation systems, wildlife, wetlands, aquifers, coastal features, flood plains and other natural resources and the policies for the protection and management of such areas. The policies and implementation techniques must be identified in the implementation program element.

• *Element I* - Implementation Program: The implementation program element of a comprehensive plans must include:

1. a statement which defines and schedules for a period of 5 years or more the specific public actions to be undertaken in order to achieve the goals and objectives of each element of the comprehensive plan.
2. an identification of public actions necessary to implement the objectives and standards of each element of the comprehensive plan that require the adoption or amendment of codes and ordinances.
3. an identification of other public authorities or agencies owning water supply facilities or providing water supply services to the municipality. Municipalities must coordinate the goals and objectives of the comprehensive plan with the actions of such public authorities or agencies with regard to the protection of watersheds as provided in section 46-15.3-1, et seq. (Public Drinking Water Protection Act of 1987).
4. a schedule for municipal actions required to amend the zoning ordinance and map to conform to the comprehensive plan.

It should be noted that Comprehensive Plans are currently reviewed by RIDEM for consistency with *Rhode Island's Nonpoint Source Management Plan.* In cases where a Comprehensive Plan is found to be inconsistent with the *Nonpoint Source Management Plan,* the RIDEM and the town/city will enter into discussions to resolve those inconsistencies.

2. Rhode Island Zoning Enabling Act of 1991

The Rhode Island Zoning Enabling Act requires all municipalities to amend or adopt zoning ordinances to conform with the Zoning Enabling Act of 1991. In addition, the Rhode Island Comprehensive Land Use and Regulation Act, requires communities to amend local zoning ordinances to comply with their comprehensive plans (R.I.G.L. 45-22.2-5.(A)(4)).

Zoning ordinances must address a series of general provisions. Relevant to the implementation of the New Development Management Measure, a zoning ordinance must address:

> (3) Permitting, prohibiting, limiting, and restricting buildings, structures, land uses, and other development by performance standards, or other

requirements, related to air and water and groundwater quality, noise and glare, energy consumption, soil erosion and sedimentation, and/or the availability and capacity of existing and planned public or private services;

(4) Regulating within each district and designating requirements for:
(h) Appropriate drainage requirements and methods to manage stormwater runoff;

(5) Permitting, prohibiting, limiting, and restricting development in flood plains or flood hazard areas and designated significant natural areas;

(7) Providing for the protection of existing and planned public drinking water supplies, their tributaries and watersheds, and the protection of Narragansett Bay, its tributaries and watershed;

(12) Providing standards for and requiring the provision of adequate and properly designed physical improvements, including plantings, and the proper maintenance of property;

(13) Permitting, prohibiting, limiting, and restricting land use in areas where such development is deemed to create a hazard to the public health or safety;

(20) Designating special protection areas for water supply and limiting or prohibiting development in these areas, except as otherwise provided by state statute. (R.I.G.L. 45-24-33)

3. Land Development and Subdivision Review Enabling Act of 1992

The Land Development and Subdivision Review Enabling Act requires municipalities to adopt local regulations and a standard review procedure for local land development and subdivision review and approval. Relevant to the New Development Management Measure, local regulations are required to address the following purposes:

(2) Promoting high quality and appropriate design and construction of land developments and subdivisions;

(3) Promoting the protection of the existing natural and built environment and the mitigation of all significant negative impacts of any proposed development on the existing environment;

(4) Promoting design of land developments and subdivisions which are well-integrated with the surrounding neighborhoods with regard to natural and built features, and which concentrate development in areas which can best support intensive use by reason of natural characteristics and existing infrastructure;

(5) Encouraging local design and improvement standards to reflect the intent of the community comprehensive plans with regard to the physical character of the various neighborhoods and districts of the municipality;

(6) Promoting thorough technical review of all proposed land developments and subdivisions by appropriate local officials.

The Department of Environmental Management is in the process of developing a model Stormwater Control Ordinance. It is expected that the model ordinance will be incorporated into local subdivision and zoning ordinances in order to implement requirements of the Zoning Enabling Act of 1991. Currently in draft form, the model ordinance sets, as one of its overall goals, a goal of 80 percent TSS removal. The draft model ordinance focuses on nonpoint source pollution prevention through proper site planning, source controls, and maintenance plans.

4. The Rhode Island *State Guide Plan*

A detailed discussion of the State Guide Plan is contained in Chapter 2. The revised *Rhode Island Nonpoint Source Management Plan* will be proposed as an element of the *State Guide Plan.* Once amended as an element of the State *Guide Plan,* a community has one year to amend their comprehensive plan accordingly.

Management Measure Oversight
State-level oversight with respect to the Comprehensive Planning and Land Use Regulation Act and associated enabling legislation lies with the Rhode Island Department of Administration's Division of Planning (RIDOP).

Monitoring
The RIDOP monitors the development and implementation of municipal Comprehensive Land Use Plans. It also coordinates the interagency review and comment procedures. Essentially, the RIDOP does not approve a Comprehensive Plan until all state agency objections and comments have been addressed. As discussed in Chapter 2, Rhode Island's municipalities are in the process of completing their first Comprehensive Plans pursuant to R.I.G.L. 45-22.2. The RIDOP will also be actively monitoring and reviewing the municipal zoning ordinance changes resulting from the approved comprehensive plans.

There is no planned water quality monitoring program designed to assess the effectiveness of this measure. It is envisioned that implementation monies targeted to water quality monitoring will be used to enhance the RIDEM's monitoring efforts.

Enforcement
This management measure will be included as a policy in the revised *Rhode Island Nonpoint Source Management Plan.* Incorporation of the revised *Rhode Island Nonpoint Source Management Plan* as an element of the *State Guide Plan* will ensure that all state

agencies and development projects that must be reviewed for *State Guide Plan* compliance are consistent with the measure, since these activities must be consistent with the *State Guide Plan*. It also ensures that the activities of local governments are consistent with these state policies due to the interrelationships which exist between the *State Guide Plan* and the Comprehensive Planning and Zoning Enabling Acts. The Rhode Island Zoning Enabling Act (R.I.G.L. 45-24) requires all municipalities to change their zoning ordinances to be consistent with the municipalities comprehensive plans by December 31, 1994. For a more detailed discussion of this process and its requirements see Chapter 2.

Financial Needs

There may be financial needs associated with this measure's implementation. First, the RIDOP may need additional financial resources to more effectively ensure this management measure's implementation. Additional financial resources may be necessary to further enhance the technical assistance efforts to municipalities during the development of Comprehensive Plans and the changes to their zoning ordinances. Finally, financial resources may be necessary to develop additional technical assistance materials for communities.

It is also possible that additional financial resources may be necessary at the local level to implement these measures. Resources will be necessary to revise their Comprehensive Plans in accordance with the statutory requirements. Staff resources may also be necessary to revise their existing ordinances or, in some cases, to develop new ordinances.

Technical Needs

It may be necessary for the RIDOP, or some other entity, to provide additional technical assistance to municipalities during the revisions to Comprehensive Plans and Zoning Ordinances. It may also be necessary to develop additional technical assistance materials (e.g., guidance manuals and model ordinances) targeted at local officials.

Overall Program Effectiveness

The municipal comprehensive planning program is a unique and powerful tool for implementing the requirements of Section 6217 in Rhode Island. Since this program is relatively new, is difficult to assess the effectiveness, at this time. However, the data contained in Chapter 2 regarding the status of the development of municipal comprehensive plans indicates that all parties involved have made a strong commitment to effectively implement the statute's requirements. It is still too early to even begin assessing the effectiveness of the Zoning Enabling Act but it should be noted that no major problems have been identified at this time.

There have been no formal assessments of the effectiveness of the *State Guide Plan*. However, the *State Guide Plan* is widely regarded as an important tool for ensuring interagency consistency in the implementation of various initiatives ranging from road

and highway development to environmental protection. Almost every major environmental plan has been incorporated into the *State Guide Plan*. In addition, many of the *State Guide Plan's* policies were incorporated into the CRMC's federally approved coastal zone management program in 1984 as enforceable policies. As such, these policies and their implementation have been subject to review pursuant to the National Oceanic and Atmospheric Administration's (NOAA's) Office of Ocean and Coastal Resource Management (OCRM) Section 312 evaluation process. It is important to point out that the most recent Section 312 findings (OCRM, 1993) found no deficiencies with the implementation of the *State Guide Plan* policies incorporated into the CRMC's program.

Rhode Island Department of Transportation *Rules and Regulations Concerning Permission for use of State Highway Rights-of-Way*

The *Rules and Regulations Concerning Permission for use of State Highway Rights-of-Way* administer Chapter 24-8 of the Rhode Island General Laws and prescribe conditions under which the Rhode Island Department of Transportation (RIDOT) will allow access for curbs, sidewalks, highway access, stormwater disposal, and construction within a state highway right-of-way. Section 2.0 of the Regulations contains the following policy statement:

> "It is the policy of the Rhode Island Department of Transportation that all construction and modification, over, on, under, or otherwise affecting the State Highway Right-of-Way will be regulated and controlled by the Rhode Island Department of Transportation for the best interest and safety of the public, and according to recognized engineering standards. In addition, it is the policy of the Rhode Island Department of Transportation to regulate and control all stormwater runoff to the state highway drainage system without regard to the location of the source of runoff."

The RIDOT and contractors working on RIDOT projects are subject to all applicable RIDEM , CRMC and local regulations regarding stormwater runoff and soil erosion controls ,and water quality improvement. Recent RIDOT projects have met water quantity and quality concerns through the installation of appropriate BMPs. Any RIDOT project within the 6217 boundary area has stormwater drainage that discharges to freshwater or coastal wetlands, therefore, they are subject to state and local review and permitting processes.

The Regulations define the state highway drainage system as the "network of culverts, ditches, pipes, swales, gutters, and other man-made and natural courses for draining stormwater runoff from State Highways. (Section 3.22). Given the extensive system of roads and highways in Rhode Island, it is likely that a significant amount of runoff drains to the state highway drainage system.

Any activities which place or alter curbs, make a connection to or pump or drain water to the State Highway drainage system, or in any way make an alteration to the State Highway system require a Physical Alteration Permit form the RIDOT (Section 4.2). In addition, failure to obtain any other necessary approvals (i.e., a Freshwater Wetlands Permit or a CRMC Assent) results in the revoking of the Physical Alteration Permit. Therefore, any roadwork activity undergoes a state regulatory review either through the DEM Freshwater Wetlands program or the CRMC. And as such, these activities must comply with state requirements for erosion control and stormwater management.

Watershed Protection

Watershed Protection

Develop a watershed protection program to:

1) Avoid conversion, to the extent practicable, of areas that are particularly susceptible to erosion and sediment loss;
2) Preserve areas that provide important water quality benefits and/or are necessary to maintain riparian and aquatic biota; and
3) Site development, including roads, highways and bridges, to protect to the extent practicable the natural integrity of waterbodies and natural drainage systems.

Applicability

New development or redevelopment including construction of new and relocated roads, highways and bridges that generate nonpoint source pollutants.

Programs Implementing the Measure

This management measure is or will be implemented by the following:

- Rhode Island Coastal Resources Management Program; and,
- RIDEM, Division of Freshwater Wetlands Rules and Regulations.
- State Acts Related to Land Use and Planning and the *State Guide Plan*
- Rhode Island Public Drinking Water Protection Act of 1987

In addition, there are currently several additional watershed protection programs which further enhance the implementation of this management measure. They include, but are not limited to the implementation of the:

- Salt Ponds Special Area Management Plan (Appendix G);
- Narrow River Special Area Management Plan (Appendix H);
- Narragansett Bay Project CCMP (Appendix P); and,
- Scituate Reservoir Watershed Management Plan (Appendix Q).

Also, the U.S. Department of Agriculture is involved in efforts to implement aspects of the nonpoint source recommendations of the Narragansett Bay Project's Comprehensive

Conservation and Management Plan and has a Hydrologic Unit Area (HUA) project focusing on the Wood-Pawcatuck River Watershed.

Furthermore, it should be noted that proper erosion and sediment controls are currently enforced through applicable state regulatory programs in all towns and municipalities throughtout the state. Therefore, all watersheds within the 6217 management area (i.e., entire state of Rhode Island) are subject to this management measure.

At this time, an integrated watershed management protection approach is addressed in the revised RI Nonpoint Source Plan (CWA, Section 319). As part of a watershed protection approach, the NPS plan will prioritize watersheds throughout the state and target specific watersheds based on protection needs and resources. The Nonpoint Source Management Program has developed a resource inventory/analysis (see *An Assessment of Nonpoint Sources of Pollution to Rhode Island's Waters*), developed a watershed management plan (see revised Nonpoint Source Management Plan's chapter on watershed management and priority selection), and has implemented and continues to implement the recommendations in the Nonpoint Source Management. In this way, the Program addresses all the management practices. In addition, the DEM Freshwater Wetlands Regulations, because they define freshwater wetlands very braodly, avoid conversion of areas that are particularly susceptible to erosion and sediment loss (as per the evaluation of soil erosion and sedimentation that they require); preserve areas that provide important water quality benfits (as per the evaluation of water quality that they require; site development in a manner that protects the natural integrity of waterbodies (as per the entire evaluation.

Rhode Island Coastal Resources Management Program

This management measure will be implemented by the Rhode Island Coastal Resources Management Council (CRMC) pursuant to R.I.G.L. 46-23 in accordance with the permit requirements as specified in the *Rhode Island Coastal Resources Management Program (RICRMP)*. For more information on the nature of the program and the permit process see the discussion contained in Chapter 2. For more information on the management measure's oversight and the program's overall effectiveness see the New Development Management Measure.

Implementation of the Measures

The Watershed Protection Management Measure will be implemented by the CRMC pursuant to various requirements contained in the RICRMP (Appendix E) as well as proposed amendments to the RICRMP (Appendix 6A). The requirements of this section apply to all development projects within CRMC jurisdiction subject to the applicability requirements of this measure. This measure will be implemented through the following:

1. **Requirements contained in RICRMP Section 300.6**

Section 300.6 of the RICRMP addresses the treatment of sewage and stormwater for all activities subject to the applicability criteria of this section. Specifically, the section requires that:

> 8. All sites should be planned, designed, and developed in order to: (1) Protect areas that provide important water quality benefits and/or are particularly susceptible to erosion and sediment loss; (2) limit increases of impervious surface areas, except where necessary; (3) limit land disturbance activities such as clearing and grading and cut and fill to reduce erosion and sediment loss; and (4) limit disturbance of natural drainage features and vegetation. (RICRMP 300.6.B.8).

2. Proposed amendments to RICRMP Section 300.2

Additional standards that apply to cases where filling, removing or grading activities, as defined in Section 300.2.A, is undertaken are proposed. The management measure will be addressed by the following proposed standard:

> (h) All sites should be planned, designed, and developed in order to: (1) Protect areas that provide important water quality benefits and/or are particularly susceptible to erosion and sediment loss; (2) limit increases of impervious surface areas, except where necessary; (3) limit land disturbance activities such as clearing and grading and cut and fill to reduce erosion and sediment loss; and (4) limit disturbance of natural drainage features and vegetation. (Proposed RICRMP 300.2.D)

Also, stipulations of a Council Assent are registered in the land evidence records and the conditions imposed on an Assent may include requirements other than those specifically mentioned in the regulations (i.e., specific maintenance requirements for a particular project).

3. *Rhode Island Soil Erosion and Sediment Control Manual*

The *Rhode Island Soil Erosion and Sediment Control Manual* (Appendix L) which will be incorporated into the RICRMP's requirements by reference in Section 300.2 (Proposed RICRMP Section 300.2 as contained in Appendix 6A), contains more detailed descriptions of the Council's standards and requirements as they pertain to soil erosion and sediment control practices. Many of these practices directly relate to site development.

4. *Rhode Island Stormwater Design and Installation Standards Manual*

The *Rhode Island Stormwater Design and Installation Standards Manual* (Appendix K), which has been incorporated into the CRMC's RICRMP requirements by reference, contains more detailed descriptions of the Council's standards and requirements. The document is intended to guide applicants in designing projects consistent with the Council's regulations. This manual should be viewed as supplemental requirements which must be incorporated, as needed, into all stormwater management plans.

It should be noted that all watersheds within the 6217 boundary area are subject to the same high level of protection. The Council's regulatory program, supplemented by the *Rhode Island Stormwater Design and Installation Standards Manual* and the *Rhode Island Soil Erosion and Sediment Control Handbook,,* adequately addresses the watershed protection management measures by requiring proper stormwater management and erosion control techniques which assist in maintaining and improving water quality. In addition, the disturbance or removal of vegetation adjacent to watercourses is severely restricted through state regulatory programs. Furthermore, the Council's buffer requiremetns, as contained in Section 150 of the RICRMP, provide important erosion control and improved water quality adjacent ot coastal wetlands and shoreline areas.

RIDEM Division of Freshwater Wetlands Rules and Regulations

The Watershed Protection Management Measure will also be implemented by the Rhode Island Department of Environmental Management (RIDEM), Division of Freshwater Wetlands pursuant to R.I.G.L. 2-1 et. seq., 42-17.1-1 et. seq., 42-17.6-1 et. seq., and 42-35-1 et. seq. (Appendix A) in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). For more information on the nature of that program and its permit process and requirements, see the discussion contained in Chapter 2, and the discussions addressing the Wetlands Management Measures. For more information on this management measure's oversight and overall effectiveness of the program see the discussion contained in the New Development Management Measure.

Implementation of the Measure

The Watershed Protection Management Measure is currently implemented by the RIDEM, Division of Freshwater Wetlands pursuant to the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). The *Rules* (effective April 7, 1994) apply statewide to any activities that could alter the character of a freshwater wetland and contiguous areas (R.I.G.L. 2-1-21 and SD 4.03)

In accordance with Section 2-1-21 of the Fresh Water Wetlands Act, a permit to alter a freshwater wetland will be denied if the proposed project would result in a random, unnecessary or undesirable alteration of a freshwater wetland. In accordance with Section 2-1-21 of the Freshwater Wetlands Act, a permit will be denied if the proposed

project would result in a random, unnecessary or undesirable alteration of a freshwater wetland. These terms are defined in the *Rules* as the following:

Random Alteration means any alteration for which the applicant does not specify in writing through design plans and drawing, the final developed use of the property upon which an application is predicated; or any alteration proposed which is arbitrary or without justification. (Rule 5.65)

Undesirable Alteration means any proposed activity or alteration which is likely to reduce or degrade any freshwater wetland functions and values as set forth herein. Any activity, alteration or proposed project will be considered "undesirable" unless the applicant shows that she or he has, to the maximum extent possible, mitigated for any damaging effects of the proposed project upon the functions and values provided by any freshwater wetlands. (Rule 5.88)

Unnecessary Alteration means any proposed alteration which is not essential, vital, or indispensable to the proposed project and which can be achieved without altering or disturbing freshwater wetlands. Any activity, alteration, or project will be considered "unnecessary", unless the applicant shows that:

A. Alterations of freshwater wetlands and the functions and values they provide have been avoided by exhausting all other non-wetland alternatives; and

B. The alterations planned for the wetland have been reduced to the maximum extent possible to prevent any damaging or detrimental effects upon wetland functions and values from activities which could otherwise be avoided. (Rule 5.89)

In order for the Director to determine whether a proposed alteration is random, unnecessary or undesirable applicants must demonstrate in a written evaluation that all probable impacts have been avoided to the maximum extent possible. To determine if a proposed alteration is random, unnecessary or undesirable the Director considers:

1. Whether the applicant has demonstrated that the impacts to freshwater wetlands have been avoided to the maximum extent possible, and whether those impacts which are unavoidable have been reduced to the maximum extent possible in accordance with the review criteria (SD 11.02).

Applicants must submit a written evaluation which includes the identification and description of wetland functions, values and impacts (SD 10.03). The evaluation must include a description of all measures to eliminate, avoid and/or reduce impacts to freshwater wetlands to the maximum extent possible. Relevant to the implementation of this management measure, applicants are required to identify and describe:

- the physical, chemical and biological impacts, both short- and long-term, to the wildlife habitat associated with the wetland from the proposed project. (Rule 10.03.C.4)

- all project components that may decrease the wetland's flood storage capacity, decrease the wetland's ability to meter out flood waters, and/or decrease the wetland's ability to maintain surface flows and natural drainage characteristics. Such project components include, but are not limited to: changes in topography from filling or excavation; changes in vegetative characteristics; additions of buildings or structures; and piping, culverting, bridging, excavating, channelization, relocation, filling, damming or diking. (Rule 10.03.E.3)

- the wetland's functions and values related to water quality. (Rule 10.03.G.2)

- all proposed project components and activities that may result in any degradation of water quality associated with freshwater wetlands by increasing pollutant sources; nutrient loading; increasing turbidity; decreasing oxygen; altering temperature regimes; reducing stream or river flows; altering a wetlands ability to retain or remove nutrients; or by withdrawing water from or near any wetlands. (SD 10.03.G.4)

- all proposed land disturbance activities; existing site conditions, including soil conditions, and topography; drainage characteristics of the proposed project site; any critical erosion areas; and all proposed non-structural and structural temporary and permanent erosion and sediment control methods. Further, describe how and why such erosion and sediment control measures will protect wetland functions and values and meet the review criteria as set forth in Rule 11.02. (Rule 10.03.H).

It is important to keep in mind that applicants must also identify and describe proposed measures for reducing any probable impacts to the maximum extent possible. These measures, methods and best management practices must protect wetlands functions and values, and minimize unavoidable impacts.

State Acts Related to Land Use and Planning

This management measure is currently implemented statewide through requirements contained in the Rhode Island Comprehensive Planning and Land Use Regulation Act R.I.G.L. 45-22.2), the Rhode Island Zoning Enabling Act of 1991(R.I.G.L. 45-24) and policies contained in the *State Guide Plan* (R.I.G.L. 42-11) . These three interrelated sets of statutory requirements are administered at the state level by the Rhode Island Department of Administration, Division of Planning (RIDOP). For a more detailed discussion of the interrelationships among these three sets of statutory requirements see Chapter 2. For a more detailed discussion of the management measure's oversight, as well as the program's overall effectiveness, see the discussion in the section addressing the New Development Management Measure.

Implementation of Measure

1. The Rhode Island Comprehensive Planning and Land Use Regulation Act

The Rhode Island Comprehensive Planning and Land Use Regulation Act specifically provides for the protection of watersheds. (R.I.G.L. 45-22.2-6) Comprehensive plans must also be coordinated with other municipalities and agencies for the management of resources and facilities that extend beyond the municipal boundaries such as rivers, aquifers, transportation facilities and others (R.I.G.L. 42-22.2-7). For a more detailed discussion of this Act and its implementation of this management measure, see the discussion contained in the New Development Management Measure.

2. Rhode Island Zoning Enabling Act of 1991

Every city and town in Rhode Island currently has a local zoning ordinance. In accordance with the Rhode Island Comprehensive Land Use and Regulation Act, communities are required to amend local zoning ordinances within 18 months of the adoption of their comprehensive plans (R.I.G.L. 45-22.2-5.(A)(4)). Zoning ordinances adopted pursuant to the Rhode Island Zoning Enabling Act of 1991(R.I.G.L. 45-24) must address a series of provisions. For a more detailed discussion of this Act, its provisions, and its implementation of this management measure, see the discussion contained in the New Development Management Measure.

3. The Rhode Island *State Guide Plan*

All municipalities are required to develop comprehensive land use plans and to change their zoning ordinances to be consistent with the comprehensive plans. Comprehensive plans must also be consistent with the policies contained in the *State Guide Plan* For example, the *State Guide Plan* contains policies which recommend avoiding the conversion of areas particularly susceptible to erosion, preserving areas that provide important water quality benefits, and other measures that help improve the siting of development projects.

In addition to being consistent with the policies contained in the *State Guide Plan*, the comprehensive plans must also be consistent with other state policies and watershed management plans that have been incorporated into

The Rhode Island Public Drinking Water Protection Act of 1987

The Rhode Island Public Drinking Water Protection Act of 1987 (Appendix A) states that,

"It is a paramount policy of the state to protect the purity of present and future drinking water supplies by protecting aquifers, recharge areas and watersheds."

The provisions of the Act are intended to implement the state's policy of maintaining and restoring the quality of public drinking water. Major aspects of the Act include:

- Designating the Water Resources Board as the body that has the responsibility for carrying out the provisions of the Act
- Setting up a one-cent per gallon water quality protection charge to be added to the sale price of water, to be used for protecting the quality and safety of public water supplies
- Creating water quality protection trust funds
- Establishing a formula for the use of trust funds
- Setting up a grant fund as matching funds for systems purchasing land
- Authorizing the borrowing of funds to implement the provisions of the Act
- Requiring every public water supplier to prepare a water quality protection plan for their sources of water

Ninety percent of the Water Quality Protection Charge collected by each supplier is submitted to the State water quality protection trust fund. The remaining ten percent may be used for administrative and operating coasts. Disbursements to a supplier from the Trust Fund for eligible expenses are proportional to the amount contributed by the supplier. Not less than 55 percent of trust fund expenditures by a supplier must be for acquisition of land, rights in land or physical improvement to acquired land necessary to protect the quality of raw water.

Approved Water Quality Protection Plans (WQPP), are required of all public water suppliers who obtain, transport, purchase or sell more than fifty million (50,000,000) gallons of water per year before they may apply for funds. The WQPPs must address the following minimum requirements:

- Determination of the boundaries of the watersheds of reservoirs serving the supplier or of the aquifers serving public wells
- Identification of sources of contamination of each reservoir or well field
- Identification of measures needed to protect each reservoir or well field from sources of contamination, including acquisition of buffer zones, diversion of stormwater or spills, and desirable land use control regulations
- A priority list of actions for implementing these protection measures

The plan must be adopted by the governing board of the water supplier following a public hearing, and must be updated at least every five years.

Site Development

Site Development

Plan, design, and develop sites to:

1) Protect areas that provide important water quality benefits and/or are particularly susceptible to erosion and sediment loss;
2) Limit increases of impervious areas, except where necessary;
3) Limit land disturbance activities such as clearing and grading, and cut and fill to reduce erosion and sediment loss; and
4) Limit disturbance of natural drainage features and vegetation.

Applicability

All site development activities including those associated with roads, highways and bridges.

Programs Implementing the Measure

This management measure is or will be implemented by the following:

- Rhode Island Coastal Resources Management Program; and,
- RIDEM, Division of Freshwater Wetlands Rules and Regulations.
- RIDEM Division of Water Resources, Water Quality Regulations and Water Quality Certification Program
- State Acts Related to Land Use Planning, and the *State Guide Plan*

Rhode Island Coastal Resources Management Program

This management measure will be implemented by the Rhode Island Coastal Resources Management Council (CRMC) pursuant to R.I.G.L. 46-23 in accordance with the permit requirements as specified in the *Rhode Island Coastal Resources Management Program (RICRMP)*. For more information on the nature of the program and the permit process see the discussion contained in Chapter 2. For more information on the management

measure's oversight and the program's overall effectiveness see the New Development Management Measure.

Implementation of the Measures

The Site Development Management Measure will be implemented by the CRMC pursuant to various requirements contained in the RICRMP (Appendix E) as well as proposed amendments to the RICRMP (Appendix 6A). The requirements of this section apply to all development projects within CRMC jurisdiction subject to the applicability requirements of this measure. This measure will be implemented through the following:

1. Requirements contained in RICRMP Section 300.6

Section 300.6 of the RICRMP addresses the treatment of sewage and stormwater for all activities subject to the applicability criteria of this section. Specifically, the section requires that:

8. All sites should be planned, designed, and developed in order to: (1) Protect areas that provide important water quality benefits and/or are particularly susceptible to erosion and sediment loss; (2) limit increases of impervious surface areas, except where necessary; (3) limit land disturbance activities such as clearing and grading and cut and fill to reduce erosion and sediment loss; and (4) limit disturbance of natural drainage features and vegetation. (RICRMP 300.6.B.8).

2. Proposed amendments to RICRMP Section 300.2

Additional standards that apply to cases where filling, removing or grading activities, as defined in Section 300.2.A, is undertaken are proposed. The management measure will be addressed by the following proposed standard:

(h) All sites should be planned, designed, and developed in order to: (1) Protect areas that provide important water quality benefits and/or are particularly susceptible to erosion and sediment loss; (2) limit increases of impervious surface areas, except where necessary; (3) limit land disturbance activities such as clearing and grading and cut and fill to reduce erosion and sediment loss; and (4) limit disturbance of natural drainage features and vegetation. (Proposed RICRMP 300.2.D)

Also, important stipulations of a Council Assent are registered in the land evidence records and the conditions imposed on an Assent may include requirements other than those specifically mentioned in the regulations (i.e., specific maintenance requirements for a particular project).

3. *Rhode Island Soil Erosion and Sediment Control Manual*

The *Rhode Island Soil Erosion and Sediment Control Manual* (Appendix L) which will be incorporated into the RICRMP's requirements by reference in Section 300.2 (Proposed RICRMP Section 300.2 as contained in Appendix 6A), contains more detailed descriptions of the Council's standards and requirements as they pertain to soil erosion and sediment control practices. Many of these practices directly relate to site development and can be incorporated witihn the CRMC assent.

4. *Rhode Island Stormwater Design and Installation Standards Manual*

The *Rhode Island Stormwater Design and Installation Standards Manual* (Appendix K), which has been incorporated into the CRMC's RICRMP requirements by reference, contains more detailed descriptions of the Council's standards and requirements. The document is intended to guide applicants in designing projects consistent with the Council's regulations. This manual should be viewed as supplemental requirements which must be incorporated, as needed, into all stormwater management plans.

5. Other RICRMP requirements related to site development

Other RICRMP requirements which also address this management measure. are policies and prohibitions governing water types (Section 200) and coastal features (Section 210). Examples include:

- Matrices Contained in RICRMP Table 1 as they pertain to specified activities, water types, and coastal features;
- Additional Category B requirements specified in Section 300.1 and other sections of the RICRMP;
- CRMC's buffer zone policies and standards contained in Section 150 require that riparian areas remain in an undisturbed condition so as to function, in part, as vegetative treatment systems for stormwater runoff.

These supplemental requirements help ensure that the measure is implemented and are best viewed as additional management measures.

RIDEM Division of Freshwater Wetlands Rules and Regulations

This management measure will also be implemented by the Rhode Island Department of Environmental Management (RIDEM), Division of Freshwater Wetlands pursuant to R.I.G.L. 2-1 et. seq., 42-17.1-1 et. seq., 42-17.6-1 et. seq., and 42-35-1 et. seq. (Appendix A) in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). For more

information on the nature of that program and its permit process and requirements, see the discussion contained in Chapter 2, and the discussions addressing the Wetlands Management Measures. For more information on this management measure's oversight and overall effectiveness of the program see the discussion contained in the New Development Management Measure.

Implementation of the Measure

The Site Development Management Measure is currently implemented by the RIDEM, Division of Freshwater Wetlands pursuant to the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). The *Rules* (effective March 18, 1994) apply statewide to any activities that could alter the character of a freshwater wetland and contiguous areas (R.I.G.L. 2-1-21 and SD 4.03)

In accordance with Section 2-1-21 of the Freshwater Wetlands Act, a permit to alter a freshwater wetland will be denied if the proposed project would result in a random, unnecessary or undesirable alteration of a freshwater wetland. To determine if a proposed alteration is random, unnecessary or undesirable the Director considers:

1. Whether the applicant has demonstrated that the impacts to freshwater wetlands have been avoided to the maximum extent possible, and whether those impacts which are unavoidable have been reduced to the maximum extent possible in accordance with the review criteria (SD 11.02).

Applicants must submit a written evaluation which includes the identification and description of wetland functions, values and impacts (SD 10.03). The evaluation must include a description of all measures to eliminate, avoid and/or reduce impacts to freshwater wetlands to the maximum extent possible. This evaluation must include a Soil Erosion and Sediment Control element which requires applicants to:

> "identify and describe all proposed land disturbance activities; existing site conditions, including soil conditions, and topography; drainage characteristics of the proposed project site; any critical erosion areas; and all proposed non-structural and structural temporary and permanent erosion and sediment control methods. Further, describe how and why such erosion and sediment control measures will protect wetland functions and values and meet the review criteria as set forth in Rule 11.02."(SD 20.03.H).

In addition to the identification and description of the wetland functions values and impacts associated with the proposed project, as required by Section 10.03, the written evaluation must address specific elements contained in Appendix 6 of the *Rules* . Applicants are required to identify and describe proposed measures to reduce unavoidable impacts. Such measures, methods, or best management practices include:

3) Minimizing the extent of disturbed areas and encouraging the preservation of land in its natural state;

6) Using best management practices for th stabilization of disturbed areas and the selection, use, and maintenance of temporary and/or permanent and sediment controls in accordance with or equivalent to the latest
7) Using best management practice selection design criteria in accordance with or equivalent to the *Rhode Island Stormwater Design and Installation Manual* to maximize the control, treatment and maintenance of stormwater flows;
8) Minimizing impervious surface areas such as roads, parking paving or other surfaces;
10) Encouraging infiltration of non-contaminated run-off.

State Enabling Acts Related to Land Use Planning

1. Municipal Comprehensive Plans, the Zoning Enabling Act, and the *State Guide Plan*

This management measure is currently implemented statewide through policies contained in the *State Guide Plan* (R.I.G.L. 42-11) and the requirements of the Comprehensive Planning Program (R.I.G.L. 45-22.2) and the Zoning Enabling Act (R.I.G.L. 45-24). These three interrelated sets of statutory requirements are administered at the state level by the Rhode Island Department of Administration, Division of Planning (RIDOP). For a more detailed discussion of the interrelationships among these three sets of statutory requirements see Chapter 2. For a more detailed discussion of the management measure's oversight, as well as the program's overall effectiveness, see the discussion in the section addressing the New Development Management Measure.

Implementation of the Measure
This management measure will be implemented through the combination of several programs statewide. First, the management measure's requirements will be incorporated as a policy of the updated Rhode *Island Nonpoint Source Management Plan (RINSMP)* currently being revised by the RIDEM, Office of Environmental Coordination. When complete, the *RINSMP* will be incorporated as an element of the *State Guide Plan* as an official state policy. As such, all state agency policies and development activities that must be reviewed for *State Guide Plan* compliance, including the programming of highway projects, must be done in a manner consistent with this policy. It also should be noted that the current *Rhode Island Nonpoint Source Management Plan* contains policies which partially implement this measure. Accordingly, community comprehensive plans are subject to review by the RIDEM for consistency with the policies contained in the Nonpoint Source Management Plan.

In addition, when the *RINSMP* becomes an element of the *State Guide Plan*, municipalities will be required to amend their Comprehensive Plans to be consistent with this policy within one year's time (R.I.G.L. 42-22.2-10.F). Each Comprehensive Plan is reviewed by all relevant state agencies and must be approved by the RIDOP for consistency with agency goals and policies and with the *State Guide Plan*. Each

Comprehensive Plan must be consistent with the policies contained in the *State Guide Plan*, as well as the goals and policies of relevant state agencies. In addition, the Rhode Island Zoning Enabling Act requires that the municipalities change their zoning ordinances to be consistent with all of the policies contained in their Comprehensive Plans. All of the municipal zoning ordinances must be submitted to the RIDOP. For more information on the enforcement mechanisms, see the discussion contained in Chapter 2.

2. Rhode Island Soil Erosion and Sediment Control Act

The Soil Erosion and Sediment Control Act (Appendix A) authorizes cities and towns to adopt, in accordance with a model local ordinance contained in the statute, ordinances and programs to control erosion and sedimentation and to prevent erosion-related damage to the man-made and natural features of the state. (R.I.G.L. 45-46-2) Local ordinances must require the review and approval, by the local building official or similar authority, of erosion and sediment control plans developed in accordance with *Rhode Island Soil Erosion and Sediment Control Handbook* (Appendix L). The following activities are excluded from the requirement for an erosion and sediment control plan:

(a) Construction, alteration, or use of any additions to existing single family or duplex homes or related structures, provided the ground coverage of such addition is less than 1,000 square feet, and such construction, alteration and use does not occur within 100 feet of any watercourse or coastal feature, and the slopes at the site of land disturbance do not exceed 10 percent.
(b) Use of a home garden in association with onsite residential use.
(c) Accepted agriculture management practices and harvesting activities.
(d) Excavations for improvements that: do not result in total displacement of more than 50 cubic yards of material; has no slopes steeper than approximately 10 percent; and have all disturbed surface areas promptly and effectively protected to prevent soil erosion and sedimentation.
(e) Minor maintenance grading.
(f) Work on streets, roads, or right-of-ways, provided adequate and acceptable erosion and sediment controls are incorporated in engineering plans and specifications, and are employed.

Soil Erosion and Sediment Control Plans must be prepared by a certified professional and contain a series information requirements

In accordance with the model ordinance, noncompliance with an approved Erosion and Sediment Control Plan may result in a lien being placed on the site and fines of up to $250 per day.

Twenty-three of Rhode Island's 39 cities and towns have adopted Erosion and Sediment Control Ordinances. In addition, six towns are currently in the process of adopting ordinances.

The Rhode Island Conservation Districts implement a site plan review and inspection program. This is a fee-for-service program for which 25 municipalities currently have Memoranda of Understanding to participate. Essentially, project proposals are passed by planning boards or building officials to the Conservation Districts. As part of their services, the Conservation District conducts field visits to ensure adequate controls are in place prior to construction, and to inspect during construction. Enforcement of ordinances is conducted at the local level by individual cities/towns.

Construction Site Erosion and Sediment Control

Construction Site Erosion and Sediment Control
1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction, and
2) Prior to land disturbance, prepare and implement an approved erosion and sediment control plan or similar administrative document that contains erosion and sediment control provisions.

Applicability

This management measure applies to all construction activities on sites less than 5 acres in areas that do not have a NPDES permit in order to control erosion and sediment loss from those sites. This management measure does not apply to: 1) construction of a detached single family home on a site of 1/2 acre or more or 2) construction that does not disturb over 5,000 sq. ft. of land on a site.

Programs Implementing the Measure

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program
- RIDEM, Division of Freshwater Wetlands Rules and Regulations
- RIDEM Division of Water Resources, Water Quality Regulations and Water Quality Certification Program
- State Enabling Acts Relating to Land Use Planning, and the *State Guide Plan*

The measure is also implemented at the local level through R.I.G.L. 45-46, Soil Erosion and Sediment Control. The measure is also partially implemented through the Rhode Island Department of Transportation, *Rules and Regulations Concerning Permission for use of State Highway Rights-of-Way*. These programs and how they implement or will implement the management measure are described in more detail below. It should be noted that, although some gaps may exist in the implementation of this management measure, it is unlikely that those gaps will result in any impacts to coastal water quality. Any proposed activity within the coastal zone requires a review by the CRMC. Therefore, proper erosion controls will be apropriately stipulated (in accordance with Section 300.2 of the RICRMP) where necessary to meet this management measure.

Rhode Island Coastal Resources Management Program

This management measure will also be implemented by the Rhode Island Coastal Resources Management Council (CRMC) pursuant to R.I.G.L. 46-23 in accordance with the permit requirements as specified in the *Rhode Island Coastal Resources Management Program (RICRMP)*. For more information on the nature of the program and the permit process see the discussion contained in Chapter 2. For more information on the management measure's oversight and the program's overall effectiveness see the New Development Management Measure

Implementation of the Measure
The Construction Site Erosion and Sediment Control Management Measure will be implemented by the CRMC pursuant to various requirements contained in the RICRMP (Appendix E) as well as proposed amendments to the RICRMP (Appendix 6A). The requirements of this section apply to all development projects within CRMC jurisdiction subject to the applicability requirements of this measure. This measure will be implemented through the following:

1. Requirements contained in RICRMP Section 300.2

Section 300.2 of the RICRMP contains specific standards that apply in all cases where filling, removing, or grading is undertaken. In cases where the Council determines that additional measures are warranted in order to protect the environment of the coastal region, upland and shoreline earthwork standards are required and are listed on Assents as stipulations. Additional measures that apply for upland earthwork relevant to this management measure include:

(b) For upland earthwork, measures shall be taken to minimize erosion:
  (1) A line of staked hay bales or other erosion-preventing devices (including diversion ditches, check dams, holding ponds, filter barrier fabric, jute or straw mulch) shall be placed at the downslope perimeter of the proposed area of construction prior to any grading, filling, construction, or other earthwork. Hay bales shall be toed in to a depth of 3 to 4 inches, and maintained by replacing bales where necessary until permanent re-vegetation of the site is completed. No soils or other materials should pass beyond the bale line.
  (2) All slopes shall be returned to the original grade unless otherwise specified.
  (3) Where natural or manmade slopes are or have become susceptible to erosion, the slopes shall be graded to a suitable slope and re-vegetated with a thick rooting brush vegetation. Mulch shall be applied as necessary to provide protection against erosion until the vegetation is established (RICRMP Section 300.2.C.2.b).

For further information on the standards associated with filling, removing, and grading activities, consult RICRMP Section 300.2.

2. Proposed amendments to RICRMP Section 300.2

Amendments to Section 300.2 will further and more explicitly implement the management measure. The proposed amendments include the following policies:

1. All filling, removing, or grading activities shall be done in accordance with the policies and standards of this section and the standards and specifications set forth in the most recent edition of the *Rhode Island Soil Erosion and Sediment Control Handbook.*

2. All new activities subject to section 300.3 (residential, commercial, and industrial structures), Section 300.13, Section 320, or those activities which disturb more than 5,000 square feet of land on a site shall prepare and implement an erosion and sediment control plan approved by the Council which references all necessary practices for erosion and sediment control. All erosion and sediment control plans shall be consistent with applicable policies and standards contained in the Rhode Island Coastal Resources Management Program and the standards and specifications set forth in the most recent edition of the *Rhode Island Soil Erosion and Sediment Control Handbook.* All erosion and sediment control plans shall be strictly adhered to.

3. The Council recognizes the most recent version of the *Rhode Island Soil and Erosion and Sediment Control Handbook,* and its amendments, published jointly by the Rhode Island Department of Environmental Management and the United States Department of Agriculture (USDA), Soil Conservation Service (SCS) as containing appropriate "Best Management Practices" (BMP) for use within the CRMC's jurisdiction. All erosion and sediment control plans shall be consistent with this manual. Applicants are also encouraged to consult the most recent version of the *Rhode Island Stormwater Design and Installation Standards Manual* during the preparation of their erosion and sediment control plan in order to ensure consistency with the Council's stormwater management requirements (Section 300.6).

It is also important to mention that the important stipulations of a Council Assent are registered in the land evidence records and the conditions imposed on an Assent may include requirements other than those specifically mentioned in the regulations (i.e., specific maintenance requirements for a particular project).

3. *Rhode Island Soil Erosion and Sediment Control Manual*

The *Rhode Island Soil Erosion and Sediment Control Manual* (Appendix L) which will be incorporated into the RICRMP's requirements by reference in Section 300.2 (Proposed RICRMP Section 300.2), contains more detailed descriptions of the Council's standards and requirements as they pertain to soil erosion and sediment control practices. Many of these practices directly relate to site development.

4. *Rhode Island Stormwater Design and Installation Standards Manual*

The *Rhode Island Stormwater Design and Installation Standards Manual* (Appendix K), which has been incorporated into the CRMC's RICRMP requirements by reference, contains more detailed descriptions of the Council's standards and requirements. The document is intended to guide applicants in designing projects consistent with the Council's regulations. This manual should be viewed as supplemental requirements which must be incorporated, as needed, into all stormwater management plans.

5. Other RICRMP requirements related to site development

See discussion under Site Development Management Measure.

RIDEM Division of Freshwater Wetlands Rules and Regulations

This management measure will also be implemented by the Rhode Island Department of Environmental Management (RIDEM), Division of Freshwater Wetlands pursuant to R.I.G.L. 2-1 et. seq., 42-17.1-1 et. seq., 42-17.6-1 et. seq., and 42-35-1 et. seq. (Appendix A) in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). For more information on the nature of that program and its permit process and requirements, see the discussion contained in Chapter 2, and the discussions addressing the Wetlands Management Measures. For more information on this management measure's oversight and overall effectiveness of the program see the discussion contained in the New Development Management Measure.

Implementation of the Measure
The Construction Site Erosion Control Management Measure is currently implemented by the RIDEM, Division of Freshwater Wetlands pursuant to the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). The *Rules* (effective March 18, 1994) apply statewide to any activities that could alter the character of a freshwater wetland and contiguous areas (R.I.G.L. 2-1-21 and SD 4.03) A description of the implementation of this measure by the Division of Freshwater Wetlands, see the discussion contained in the Site Development Management Measure.

RIDEM Division of Water Resources, Water Quality Regulations and Water Quality Certification Program

See discussion contained in the New Development Management Measure

State Acts Related to Land Use Planning, and the *State Guide Plan*

This management measure is currently implemented statewide through policies contained in the *State Guide Plan* (R.I.G.L. 42-11) and the requirements of the Comprehensive Planning Program (R.I.G.L. 45-22.2) and the Zoning Enabling Act (R.I.G.L. 45-24). These three interrelated sets of statutory requirements are administered at the state level by the Rhode Island Department of Administration, Division of Planning (RIDOP). For a more detailed discussion of the interrelationships among these three sets of statutory requirements see Chapter 2. For a more detailed discussion of the management measure's oversight, as well as the program's overall effectiveness, see the discussion in the section addressing the New Development Management Measure.

Implementation of the Measure
See discussion contained in the Site Development Management Measure.

The Soil Erosion and Sediment Control Act

See discussion contained in the Site Development Management Measure.

Rhode Island Department of Transportation, *Rules and Regulations Concerning Permission for use of State Highway Rights-of-Way*

See discussion contained in the Site Development Management Measure.

Construction Site Chemical Control

Construction Site Chemical Control

1) Limit application, generation, and migration of toxic substances;
2) Ensure the proper storage and disposal of toxic materials; and,
3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters.

Applicability

This management measure applies to all construction sites less than 5 acres in area and to new, resurfaced, restored, and reconstructed road, highway, and bridge construction projects. This management measure does not apply to: 1) construction of a detached single family home on a site of 1/2 acre or more or 2) construction that does not disturb over 5,000 sq. ft. of land on a site.

Programs Implementing the Measure

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program; and,
- RIDEM, Division of Freshwater Wetlands Rules and Regulations.
- RIDEM Division of Water Resources, Water Quality Regulations and Water Quality Certification Program
- State Acts Related to Land Use Planning, and the *State Guide Plan*

These programs and how they implement or will implement the management measure are described in more detail below.

Rhode Island Coastal Resources Management Program

This management measure will also be implemented by the Rhode Island Coastal Resources Management Council (CRMC) pursuant to R.I.G.L. 46-23 in accordance with the permit requirements as specified in the *Rhode Island Coastal Resources Management Program (RICRMP).* For more information on the nature of the program and the permit

process see the discussion contained in Chapter 2. For more information on the management measure's oversight and the program's overall effectiveness see the New Development Management Measure.

Implementation of the Measure
The Construction Site Chemical Control Management Measure will be implemented by the CRMC pursuant to requirements contained in RICRMP section 300.6 and proposed amendments to the RICRMP 300.2.

1. Requirements in RICRMP Section 300.6

Section 300.6 contains the following general policy which partially implements the measure and applies to all development projects subject to the applicability requirements of this measure:

> It is the Council's policy to minimize the amount of ISDS - derived nitrates and other potential contaminants which may leach into salt ponds and all other Type 1, 2, and 3 waters. (RICRMP Section 300.2.B.2).

2. Proposed amendments to RICRMP Section 300.2

Proposed amendments to RICRMP Section 300.2 would apply to all filling, removing and grading activities at construction sites subject to the applicability requirements of this measure. The proposed amendments include the following additional standards:

- Disturbed uplands adjacent to a construction site shall be graded and re-vegetated or otherwise stabilized to prevent erosion during or immediately after construction. Nutrients shall be applied at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters. (Proposed RICRMP Section 300.2.D.1(c))

- Limit the application, generation, and migration of toxic substances and ensure that toxic substances are properly stored and disposed of onsite in accordance with all applicable federal, state, and local requirements. (Proposed RICRMP Section 300.2.D.1(m)).

Important stipulations of a Council Assent are registered in the land evidence records and the conditions imposed on an Assent may include requirements other than those specifically mentioned in the regulations (i.e., specific maintenance requirements for a particular project). As an example, the CRMC has required residential subdivisions to form homeowner associations and sign consent agreements limiting the application of lawn chemicals to a lawn maintenance contractor only. This assent stipulation prevents the possiblity of individual homeowners from applying excessive chemicals (nutrients & pesticides) to lawn areas, and reduces the potential for water quality impacts.

Educational components implemented through the State's regulatory and state-wide recycling programs will also assist in meeting this management measure.

3. *Rhode Island Soil Erosion and Sediment Control Manual*

The *Rhode Island Soil Erosion and Sediment Control Manual* (Appendix L) which will be incorporated into the RICRMP's requirements by reference in Section 300.2 (Proposed RICRMP Section 300.2 as contained in Appendix 6A), contains more detailed descriptions of the Council's standards and requirements as they pertain to soil erosion and sediment control practices. Many of these practices directly relate to site development.

4. *Rhode Island Stormwater Design and Installation Standards Manual*

The *Rhode Island Stormwater Design and Installation Standards Manual* (Appendix K), which has been incorporated into the CRMC's RICRMP requirements by reference, contains more detailed descriptions of the Council's standards and requirements. The document is intended to guide applicants in designing projects consistent with the Council's regulations. This manual should be viewed as supplemental requirements which must be incorporated, as needed, into all stormwater management plans.

5. Other RICRMP requirements related to construction site chemical control

See discussion under Site Development Management Measure.

RIDEM Division of Freshwater Wetlands Rules and Regulations

This management measure will also be implemented by the Rhode Island Department of Environmental Management (RIDEM), Division of Freshwater Wetlands pursuant to R.I.G.L. 2-1 et. seq., 42-17.1-1 et. seq., 42-17.6-1 et. seq., and 42-35-1 et. seq. (Appendix A) in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). For more information on the nature of that program and its permit process and requirements, see the discussion contained in Chapter 2, and the discussions addressing the Wetlands Management Measures. For more information on this management measure's oversight and overall effectiveness of the program see the discussion contained in the New Development Management Measure.

Implementation of the Measure

The Construction Site Chemical Control Management Measure is currently implemented by the RIDEM, Division of Freshwater Wetlands pursuant to the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B).

In accordance with Rule 10.03 applicants to alter a freshwater wetland must provide a written evaluation of wetland functions, values and impacts and describe all structural and/or nonstructural best management practices, best available technologies, schedules and management plans which will be employed to eliminate, avoid and/or reduce impacts to freshwater wetlands to the maximum extent possible. The written evaluation, where applicable, must include and address a water quality analysis which calculates the pollutant concentrations or loadings from land uses or pollutant sources other than stormwater run-off (which must be addressed separately in the written evaluation) including chemical matter for both pre- and post- project conditions. Applicants must also identify and describe any degradation of water quality associated with freshwater wetlands by increasing pollutant sources and nutrient loading and take steps to avoid and minimize those impacts.

In addition to the requirements contained in Rule 10.03, the written evaluation must address a series of elements contained in Appendix 6 of the *Rules*. Specific to the implementation of this management measure, applicants must describe measures that will be implemented to minimize or eliminate the use of, or any increase of, any pollutant, fertilizers, pesticides, herbicides, or any other chemical or organic application which increases pollutant and nutrient loadings.

RIDEM Division of Water Resources, Water Quality Regulations and Water Quality Certification Program

See discussion contained in the New Development Management Measure

State Acts Related to Land Use Planning, and the *State Guide Plan*

This management measure is currently implemented statewide through policies contained in the *State Guide Plan* (R.I.G.L. 42-11) and the requirements of the Comprehensive Planning Program (R.I.G.L. 45-22.2) and the Zoning Enabling Act (R.I.G.L. 45-24). These three interrelated sets of statutory requirements are administered at the state level by the Rhode Island Department of Administration, Division of Planning (RIDOP). For a more detailed discussion of the interrelationships among these three sets of statutory requirements see Chapter 2. For a more detailed discussion of the management measure's oversight, as well as the program's overall effectiveness, see the discussion in the section addressing the New Development Management Measure.

Implementation of the Measure

See discussion contained in the Site Development Management Measure.

Existing Development

Existing Development

Develop and implement watershed management programs to reduce runoff pollutant concentrations and volumes from existing development:

1) Identify priority local and/or regional watershed pollutant reduction opportunities, e.g., improvements to existing urban runoff control structures;
2) Contain a schedule for implementing appropriate controls;
3) Limit destruction of natural conveyance systems;
4) Where appropriate, preserve, enhance, or establish buffers along surface waterbodies and their tributaries.

Applicability

This management measure applies to all urban areas and existing development in order to reduce surface water pollutant loadings from such areas.

Programs Implementing the Measure

This management measure is currently implemented by the combination of requirements contained in the RIDEM's Water Quality Regulations, the RIDEM's Freshwater Wetlands Program, the Rhode Island Coastal Resources Management Program, Sections 303, 304, 305 and 319 of the Clean Water Act, the Municipal Comprehensive Plans and related enabling legislation, and the Rhode Island Public Drinking Water Protection Act of 1987 (R.I.G.L. 46-15.3-1, et seq.) At this time, it is anticipated that the Interagency Nonpoint Source Advisory Committee will assume a role in the implementation of the first two items of the management measures. The Committee would identify pollution reduction, prevention and education programs, and assist in the coordination and development of new programs. In addition, there are currently several additional watershed protection programs which further enhance the implementation of this management measure. They include, but are not limited to the implementation of the:

- Salt Ponds Special Area Management Plan (Appendix G);
- Narrow River Special Area Management Plan (Appendix H);
- Narragansett Bay Project CCMP (Appendix P); and,

- Scituate Reservoir Watershed Management Plan (Appendix Q).

Furthermore, the U.S. Department of Agriculture is involved in efforts to implement aspects of the nonpoint source recommendations of the Narragansett Bay Project's Comprehensive Conservation and Management Plan and has a Hydrologic Unit Area (HUA) project focusing on the Wood-Pawcatuck River Watershed.

Programs Implementing the Measure

State Acts Related to Land Use and Planning, and the *State Guide Plan*

This management measure is currently implemented through the Comprehensive Planning Program, Zoning and Subdivision Enabling Acts, and the *State Guide Plan*. See the discussion contained in the Watershed Protection Management Measure for a description of management measure implementation.

Sections 303, 304, 305 and Section 319 requirements of the Clean Water Act

RIDEM's responsibilities under Section 303, 304, and 305 of the Clean Water Act along with RIDEM's Nonpoint Source Management Plan, developed in accordance with the requirements contained in Section 319 of the Clean Water Act, currently aid in implementing the first two items contained in this management measure. Pursuant to Sections 303, 304 and 305 of the Clean Water Act, RIDEM is required to identify those waters which are threatened or impaired, identify the cause(s) of impairment and establish a total maximum daily load (TMDL) necessary to implement the applicable water quality standards.

In accordance with requirements contained in Section 319 of the Clean Water Act, the RIDEM must identify high priority watersheds and specific strategies for abating nonpoint source pollution in its nonpoint source management plan. This plan is revised every five years. The current RI Nonpoint Pollution Management Plan contains both an implementation schedule and a priority watershed selection process. These elements of the NSMP have been used together to identify all nonpoint source pollution priorities state-wide. Primarily, this selection process has targeted existing problems and problems from existing development, and thus complies with the management measure.

The revisions to the NSMP include both an updated implementation schedule and an updated priority system. The implementation schedule has been developed to encompass all source-based recommendations in the Plan. In part, these recommendations include watershed management programs to reduce nonpoint source pollution from existing development. The updated watershed priority system is applied to determine the relative priority of managing watersheds, primarily focusing

on existing nonpoint source pollution problems. Water quality management discussed in this plan includes, where necessary, reduction of nonpoint source pollution from existing development. Therefore, Rhode Island will address this management measure through the Nonpoint Source Management Plan.

RIDEM, Water Quality Regulations

The Rhode Island Water Quality Regulations for Water Pollution Control set the water quality standards for all surface waters of the state. The standards consist of narrative as well as numeric criteria. For example, all waters must meet the EPA aquatic life criteria, human health criteria, as well as state criteria for dissolved oxygen, color, turbidity, aesthetics, total and fecal coliform and nutrients. These criteria are the comparative factor in making the assessment of supporting, threatened or impaired with respect to water quality standards. Therefore, these regulations are an important factor in implementing the first two items contained in this management measure.

Rhode Island Coastal Resources Management Program

This management measure will also be implemented by the Rhode Island Coastal Resources Management Council (CRMC) pursuant to R.I.G.L. 46-23 in accordance with permit requirements as specified in the *Rhode Island Coastal Resources Management Program* (RICRMP). For more information on the nature of the program and the permit process see the discussion contained in Chapter 2. For more information on the management measure's oversight and the program's overall effectiveness see the New Development Management Measure.

The second two items contained in this management measure are implemented by the CRMC within its jurisdiction through the following requirements:

1. Requirements contained in RICRMP Section 300.6

Section 300.6 of the RICRMP addresses the treatment of sewage and stormwater for all activities subject to the applicability criteria of this section. Specifically, the section requires that:

> 8. All sites should be planned, designed, and developed in order to: (1) Protect areas that provide important water quality benefits and/or are particularly susceptible to erosion and sediment loss; (2) limit increases of impervious surface areas, except where necessary; (3) limit land disturbance activities such as clearing and grading and cut and fill to reduce erosion and sediment loss; and (4) limit disturbance of natural drainage features and vegetation. (RICRMP 300.6.B.8).

2. Proposed amendments to RICRMP Section 300.2

Additional standards that apply to cases where filling, removing or grading activities, as defined in Section 300.2.A, is undertaken are proposed. The management measure will be addressed by the following proposed standard:

> (h) All sites should be planned, designed, and developed in order to: (1) Protect areas that provide important water quality benefits and/or are particularly susceptible to erosion and sediment loss; (2) limit increases of impervious surface areas, except where necessary; (3) limit land disturbance activities such as clearing and grading and cut and fill to reduce erosion and sediment loss; and (4) limit disturbance of natural drainage features and vegetation. (Proposed RICRMP 300.2.D)

Also, important stipulations of a Council Assent are registered in the land evidence records and the conditions imposed on an Assent may include requirements other than those specifically mentioned in the regulations (i.e., specific maintenance requirements for a particular project).

3. Policies contained in RICRMP Section 150 Coastal Buffers

Section 150 of the implements this management measure through enforceable requirements. This Section contains the following relevant policies:

1. The establishment of a Coastal Buffer Zone is based upon the CRMC's legislative mandate to preserve, protect and, where possible, restore ecological systems. The determination of the inland boundary of the Coastal Buffer Zone must balance this mandate with the property owner's rights to develop and use the property.

2. The Council shall require Coastal Buffer Zones in accordance with the requirements of this section for the following: a) new residential development; b) commercial and industrial development; c) activities subject to Section 300.8 and Section 300.13; and d) inland activities identified in Section 320. For existing residential structures, the Council shall require a Coastal Buffer Zone for category "A" and "B" activities when the RIDEM requires the modification or expansion of an existing septic system or when the footprint of the structure is expanded.

3. The vegetation within a buffer zone must be either retained in a natural, undisturbed condition, or properly managed in accordance with the standards contained in this section. In cases where native flora (vegetation) does not exist within a buffer zone, the Council may require restoration efforts which include, but are not limited to, replanting the Coastal Buffer Zone with native plant species.

These policies are implemented through specific buffer zone standards and maintenance requirements (RICRMP Section 150.D, E).

RIDEM's Freshwater Wetlands Program

This management measure will also be implemented by the Rhode Island Department of Environmental Management (RIDEM), Division of Freshwater Wetlands pursuant to R.I.G.L. 2-1 et. seq., 42-17.1-1 et. seq., 42-17.6-1 et. seq., and 42-35-1 et. seq. (Appendix A) in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). For more information on the nature of that program and its permit process and requirements, see the discussion contained in Chapter 2, and the discussions addressing the Wetlands Management Measures. For more information on this management measure's oversight and overall effectiveness of the program see the discussion contained in the New Development Management Measure.

A general discussion of RIDEM's Freshwater Wetlands Program, and how it implements the second two items of this management measure is contained in the New Development Management Measure. As noted in Rule 10.03.A.2 of the Freshwater Wetlands Regulations, all applicants submitting an application to alter a freshwater wetland must also submit a written evaluation. Rule 10.03.B lists the various required elements for the written evaluation. Included among these is the "identification of the proposed measures to reduce impact" (SD 10.03.B). This Rule also references Appendix 6 as identifying the content of each required element. Appendix 6 section E describes the required element "Proposed Measures to Reduce Impact", recommending the following relevant practices:

> Identify and describe the proposed measures, structural and/or non-structural methods, or best management practices that will be implemented to reduce or eliminate harm to wetland functions and values and detail why and how such measures will protect wetland functions and values. Such measures, methods, or best management practices include, but are not limited to:
> 1. Designing dense plantings of shrubs and trees between development and remaining natural areas to "buffer" impacts from loss of wildlife habitat and natural areas and to reduce the effects of noise, lighting and other disturbances upon wildlife and remaining natural areas;
> 2. Preserving natural areas in and around wetlands;
> 3. Minimizing the extent of disturbed areas and encouraging the preservation of land in its natural state;
> 6. Using best management practices for the stabilization of disturbed areas and the selection, use, and maintenance of temporary and/or permanent soil erosion and sediment controls in accordance with or equivalent to the latest version of the *Rhode Island Soil Erosion and Sediment Control Handbook;*

7. Using best management practice selection design criteria in accordance with or equivalent to the *Rhode Island Stormwater Design and Installation Manual* to maximize the control, treatment and maintenance of stormwater flows;
8. Minimizing impervious surface areas such as roads, parking, paving or other surfaces;
11. Preventing channelization or piping of run-off and encouraging sheet flow;
12. Landscaping with low slopes to maximize sheet flow and infiltration while minimizing channelization;
15. Maximizing setbacks of septic systems and other land disturbances from wetlands; and

In addition, the DEM Division of Freshwater Wetlands regulations include by document reference, the *RI Stormwater Design and Installations Standards Manual.* All permit applicants must include, as part of the written evaluation of their projects, a detailed discussion of how they will maintain any stormwater management practices. Maintenance schedules in the stormwater manual are considered as "Review Criteria" when written evaluations are reviewed by the Division of Freshwater Wetlands. Such evaluations (a) must discuss how projects will avoid and/or minimize alterations to water quality, and (b) are subjetc to a review by the Division of Water Resources under the Water Quality regulations. Thus both the Freshwater Wetlands regulations and the Water Quality regulations play a role in limiting impacts from existing development, both where permits have been obtained and where they will be obtained.

Management Measure Oversight
For information on the oversight of this management measure, see the Management Measure for the Protection of Wetlands and Riparian Areas.

The Rhode Island Public Drinking Water Protection Act of 1987

See the discussion contained in the Watershed Protection Management Measure.

New Onsite Disposal Systems

New Onsite Disposal Systems

1) Ensure that new OSDS are located, designed, installed, operated, inspected and maintained to prevent the discharge of pollutants to the surface and reduce the discharge of pollutants into ground waters. Where necessary (a) discourage the installation of garbage disposals; and (b) install low-volume plumbing fixtures or reduce total hydraulic loadings by 25%. Implement OSDS inspection schedules for preconstruction, construction and postconstruction.
2) Direct placement of OSDS away from unsuitable areas;
3) Establish protective setbacks from surface waters, wetlands, and floodplains for conventional as well as alternative OSDS;
4) Establish protective separation distances between OSDS system components and groundwater which is closely hydrologically connected to surface waters;
5) Where nitrogen limited surface waters may be adversely affected by ground water nitrogen loadings, require the installation of OSDS that reduce total nitrogen loadings by 50% to ground water.

**See (g) guidance for full text of the management measure*

Applicability

This management measure applies to all new OSDS including package plants and small-scale or regional treatment facilities not covered by the Rhode Island Pollution Discharge Elimination System (RIPDES) regulations in order to manage the siting, design, installation, operation and maintenance of all such OSDS.

Program Implementing the Measure

RIDEM Division of Groundwater and ISDS Regulations

Introduction

The New Onsite Disposal System (OSDS) Management Measure requires coastal states to apply enforceable policies in their Section 6217 Management Area that implement the management measure. These requirements can be summarized as follows:

Item 1
Prevent the discharge of pollutants to the surface of the ground and reduce the discharge of pollutants into groundwaters hydrologically connected with surface water. Where necessary to meet these objectives:

(a) discourage the installation of garbage disposals to reduce hydraulic and nitrogen loadings.

(b) where low-volume plumbing fixtures have not been installed in new developments or redevelopments, reduce total hydraulic loadings to the OSDS by 25 percent.

Implement OSDS inspection schedules for preconstruction, construction, and post-construction.

Item 2
Place OSDS away from unsuitable areas.

Item 3
Establish protective setbacks.

Item 4
Establish protective separation distances.

Item 5
Require installation of OSDS that reduce nitrogen loading to groundwater by 50 percent where conditions indicate that nitrogen-limited surface waters may be adversely affected.

Rhode Island is currently in compliance with items 1-4 in accordance with its *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems*[1] These regulations address the Coastal Nonpoint Pollution Control Program New Onsite Disposal System Management

[1] The *Rules and Regulations Establishing Minimum Standards Relating to Location, Design, Construction, and Maintenance of Individual Sewage Disposal Systems* referred to in this text, is the most recent version,amended May 29, 1992.

Measure on a statewide basis by mandating a permit for septic systems as a prerequisite to any building permit and/or a change of use permit for structures discharging sewage, as well as any repair and/or alteration to any OSDS throughout Rhode Island. These regulations are pending revisions to comply with item 5. The following text discusses how Rhode Island complies or plans to establish enforceable policies that implement the New Onsite Disposal System Management Measure.

GENERAL INFORMATION:

Applicability Criteria:

This management measure must apply to the entire Section 6217 Management Area. The proposed management area includes all of Rhode Island.

In Rhode Island, the *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* apply to all new construction, renovation and/or change of use to a structure serviced by a septic system and/or alteration and repair to any septic system statewide (SD 2.00)[2]. A newly constructed, altered or rebuilt system must receive a Certificate of Conformance prior to use of the system and/or sale or occupation of the serviced construction. A municipality may only grant a Certificate of Occupancy where the applicant presents a Certificate of Conformance (SD 2.06). The Regulations apply to all package plants and small-scale or regional treatment facilities not covered by the *Regulations For the Rhode Island Pollutant Discharge Elimination System* (RIPDES), in order to manage the siting, design, installation, operation and maintenance of all such septic systems.

Agency/Program Responsible:

The Individual Sewage Disposal System (ISDS) Program is enforced and implemented by the Rhode Island Department of Environmental Management, Division of Groundwater and ISDS.

Statutory And Regulatory Authority:

Statutory authority enabling the regulation of OSDS is set forth by Rhode Island General Laws (RIGL) Sections 42-17.1-2(l),(m),(r),(s) and 23-19.5-4, 1977. These provisions of the general laws are implemented through the *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems*, and Rhode Island Building Code, Plumbing Code Regulation SBC-3, 1503.8 (1990).

Nature of the program:

This program is a regulatory permit program and includes a fee schedule (SD 23.00).

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[2] (SD and a number) denotes an applicable section from the *Rules and Regulations Establishing Minimum Standards Relating to Location, Design, Construction, and Maintenance of Individual Sewage Disposal Systems* (RIDEM, 1992) For complete Regulations, see Appendix D.

Enforceable Policies:
This program is enforceable through the Regulations. All new onsite disposal systems require written approval by the Director of the Rhode Island Department of Environmental Management, before construction begins (SD 2.00). All applications for new systems must be made in conformance with all requirements under these Regulations (SD 2.01(a)(1)). These regulations include enforceable minimum standards relating to location, design, construction and maintenance (SD 1.00-24.00).

To ensure compliance, a newly constructed, altered or rebuilt system must receive a Certificate of Conformance prior to use of the system and/or sale or occupation of the serviced construction and a municipality may only grant a Certificate of Occupancy where the applicant presents a Certificate of Conformance (SD 2.06).

Enforcement Mechanisms:
Enforcement takes place through the permitting process. No structure, which is serviced by a newly constructed, repaired or altered OSDS, may be occupied or sold until a Certificate of Conformance has been issued (SD 2.06). This certificate is the culmination of the permitting process. A processed permit consists of three components:

1. Site plan and details:
   - Blueprint of property with OSDS size, configuration, and location.
   - Information on water table, topography, hydrology, soil, and percolation rate.
   - RIDEM verification of seasonal high water table elevation.

2. Permit application:
   - Application disposition: approved, renewed, transferred, or denied.
   - Terms of approval: additional stipulations or restrictions.

3. Best professional judgement of wetlands by ISDS Program staff:
   - Best professional judgement of wetlands present on site.
   - Best professional judgement of a wetland edge present on site.

ITEMIZED BREAKDOWN OF THE MANAGEMENT MEASURE:

Item (1) Text:
Ensure that new OSDS are located, designed, installed, operated, inspected and maintained to prevent the discharge of pollutants to the surface of the ground and to the extent practicable reduce the discharge of pollutants into groundwaters that are closely hydrologically connected to surface waters. Where necessary to meet these objectives: (a) discourage the installation of garbage disposals to reduce hydraulic and nutrient loadings; and (b) where low-volume plumbing fixtures have not been installed in new developments or redevelopments, reduce total hydraulic loadings to the OSDS by 25 percent. Implement OSDS inspection schedules for preconstruction, construction, and post-construction.

Item (1) Current Implementation:
The Regulations require all new septic systems to be located, designed, installed, operated, maintained and inspected to prevent the discharge of pollutants to the surface of the ground. The Regulations clearly state that discharge of pollutants to a watercourse[3] (SD 2.07) or the surface of the ground (SD 2.08) is prohibited.

The discharge of pollutants to groundwaters that are closely hydrologically connected to surface waters is reduced via required setbacks and separation distances from: watercourses, critical areas[4] and other areas of concern (see Table 1[from SD 3.05]); and groundwater and other underground features (see Table 2 [from SD 2.16]).

The discharge of pollutants to groundwaters closely hydrologically connected to surface waters is also reduced through design specifications (SD 3.00-13.09).

TABLE 1 MINIMUM SETBACKS FOR OSDS FROM CRITICAL AREAS IN FEET

CRITICAL AREAS REQUIRING SETBACKS	SETBACKS REQUIRED
Coastal Pond and Narrow River shoreline features and tributaries including storm and subsurface drains directly discharging thereto	150
Other watercourses in the watershed or recharge of a critical resource not directly connected	100
Subsurface drains designed, or having the potential, to lower the groundwater in the vicinity of the leachfield (a) Upgradient of leachfield (b) Downgradient of leach field	 25 75
Private well where individual sewage disposal system is located in permeable soil (faster than 3 minutes per inch perc rate)	150
All watersheds to surface water reservoirs including perennial streams discharging thereto and any storm or subsurface drains directly discharging thereto	200

Note. Adapted from the *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* (RIDEM, 1992).

TABLE 2 VERTICAL SEPARATIONS IN FEET FROM UNDERGROUND FEATURES

Types of Area	Water Table	Restrictive Layer
Standard	3	5
Critical Resource Areas	4	6

Note. Adapted from the *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* (RIDEM, 1992).

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[3] Watercourse - any river, stream, brook, pond, lake, swamp, marsh, bog, fen, wet meadow, tidewater or any other standing or flowing body of water (SD 1.00).

[4] Critical areas or critical resource areas - those areas deemed by the Director to be particularly sensitive to the detrimental effects of nutrients, pathogens, organic chemicals, etc. These areas currently include the Salt Pond Region and Narrow River watersheds, and the Scituate Reservoir watershed. New areas may be added, but only by amending the Regulations.

Preconstruction, construction and post-construction inspections take place to ensure proper installation, construction and design. Site inspections are undertaken prior to construction to ensure that each OSDS is located in appropriate soils (SD 15.00-15.06). Furthermore, the accuracy of these soil inspections is certified and recorded (SD 15.06). The construction, alteration, or reconstruction of any sewage disposal system must be performed by a licensed installer. The installer must certify, via a Certificate of Construction, that the system was installed in conformance with the permit and plans as approved by the Director of RIDEM (SD 2.05). Also, a newly constructed, altered or rebuilt system must receive a Certificate of Conformance prior to use of the system and/or sale or occupation of the serviced construction (SD 2.06).

To ensure that all disposal systems continue to operate in accordance with these requirements, the regulations require all disposal systems to be operated according to the use requirements (SD 2.04) and maintained in good repair; or if these requirements are not met, the Director may order cleaning or repair of the system (SD 2.11).

Finally, to aid in further reducing the discharge of pollutants to groundwaters low-volume plumbing fixtures are required statewide in new construction and when old fixtures are replaced (Plumbing Code Regulation 1503.8).

Item (1) Proposed Implementation Going Beyond the Management Measure

To maintain leach fields and prevent pollution discharges, revisions to the DEM ISDS regulations will require the use of double-compartment septic tanks and effluent filters in septic tanks for all new septic systems and all septic systems being repaired or upgraded.

Item (2) Text:
Direct placement of OSDS away from unsuitable areas. Where OSDS placement in [sic] unsuitable areas is not practicable, ensure that the OSDS is designed or sited at a density so as not to adversely affect surface waters or groundwater that is closely hydrologically connected to surface water. Unsuitable areas include, but are not limited to, areas with poorly or excessively drained soils; areas with shallow water tables or areas with high seasonal water tables; areas overlaying fractured bedrock that drain directly to groundwater; areas within floodplains; or areas where nutrient and/or pathogen concentrations in the effluent cannot be sufficiently treated or reduced before the effluent reaches sensitive waterbodies.

Item (2) Current Implementation:
The Regulations control the placement of new septic systems away from unsuitable areas. Where this can not be accomplished, specific design standards are required as a permit condition.

Site suitability is determined by: subsoil exploration (SD 15.00-15.06), groundwater table elevation determination (SD 16.00-16.03), and at least one percolation test (SD 17.00-17.02). Subsoil explorations include (SD 15.01):

- Consideration of the type of soil.
- Percolation test(s).
- Determination of maximum groundwater elevation.
- Determination of the occurrence of impervious surfaces.

To consider soil type and occurrence of impervious surface, determinations are conducted through the use of exploration holes (SD 15.04). Determinations of groundwater elevation can take place in both wet (SD 17.01) and dry (SD 17.02) seasons according to specific methods.

To ensure that OSDS discharge does not adversely affect groundwater or closely connected surface water, standard separation distances from water tables and restrictive layers have been established. In critical resource areas more stringent separations are established. Table 1 under Item 1 of this management measure indicates these separations (SD 15.02, SD 19.02.5).

Item (3) Text:
Establish protective setbacks from surface waters, wetlands, and floodplains for conventional as well as alternative OSDS. The lateral setbacks should be based on soil type, slope, hydrologic factors, and type of OSDS. Where uniform protective setbacks can not be achieved, site development with OSDS so as not to adversely affect waterbodies and/or contribute to a public health nuisance.

Item (3) Current Implementation:
Rhode Island complies with this item through the Regulations, which establish protective setbacks from surface waters, wetlands and floodplains for all types of septic systems and septic system components (SD 3.05) statewide. Additional protective setbacks are established, where warranted by special conditions.

To ensure that OSDS discharge does not adversely affect water quality or contribute to a public nuisance, the Regulations establish standard protective setbacks for OSDS components from various features based on the slope of the land, system/component type and the presence of special hydrologic features. Standard setbacks are listed in Table 3 (SD 3.05).

TABLE 3 MINIMUM HORIZONTAL DISTANCE IN FEET BETWEEN OSDS PARTS AND VARIOUS ITEMS

Items Requiring Setbacks	Distr. Box, Dosing Tank, Septic Tank	Trench Bed, Chambers	Seepage Pit	Bldg Sewer	Privy
Private well	75	100	200	50	50
Water Supply Line (pressurized)	10	25	25	10	25
Water Supply Line (suction)	30	40	40	25	40
Surface drinking water supplies/tributary	200	200	200	200	200
Watercourse	50	50	50	25	50
Subsurface, foundation, storm Drain	25	25	50	25	25
Edge of land level lower than distribution line	10	25	25	25	10
Public Drinking water Supply Well	400	400	400	400	400

Note. Adapted from the *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* (RIDEM, 1992).

Alternative systems also must be located according to Table 5 criteria. To ensure proper functioning of alternative systems, special construction, maintenance and acceptability requirements for such systems have been set (SD 14.00-14.07).

Because certain areas require extra consideration, Table 1 in Item of this management measure lists special setbacks for any OSDS component in the presence of Critical Resource Areas (SD 19.02.6).

The regulations also recognize the need to protect riparian areas, flood plains and other wetland areas. If any ISDS Program personnel believes an OSDS project to be sited on or near a freshwater wetland, ISDS Program personnel will refer the ISDS permit applicant to the Rhode Island Department of Environmental Management, Division of Freshwater Wetlands (SD 2.16). The Division of Freshwater Wetlands must issue a permit, pursuant to the Freshwater Wetlands Act, or make a determination that a permit is not required prior to the applicant receiving a permit from the ISDS Program (SD 2.16). As stated in Rule 2.16:

> (a) Approval for individual sewage disposal systems that are located within fifty (50) feet of a marsh, swamp, bog or pond, or within one hundred (100) feet of a river of less than ten (10) feet in width during normal flow, or within two hundred (200) feet of a river of ten (10 feet or more in width during normal flow, or within a flood plain or other freshwater wetland as defined in the Rhode Island General Laws Section 2-1-20, will not be issued until the Freshwater Wetlands Section [Division of Freshwater Wetlands] of the Department of Environmental Management issues a wetlands permit or determines that the

Wetlands Act does not apply to the proposed construction, alteration, installation or repair.

NOTE: If there is any question concerning the location of freshwater wetlands or applicability of the proposed individual sewage disposal system and related building or site improvements to the Freshwater Wetlands Act, the Department strongly recommends that application for wetlands determination be made to the Wetlands Section [Division] prior to approval to avoid delays in individual sewage disposal system permit review. If freshwater wetlands are located in the vicinity of the proposed individual sewage disposal system, related improvements that are not limited to: 1) Construction or alteration of a building served by the individual sewage disposal system. 2) Earth removal, filling or grading associated with proposed site improvements, building construction or individual sewage disposal system improvements. 3) Alteration of groundwater or surface water flow resulting in discharge of flow in or near a wetland.

(b) If the Individual Sewage Disposal System Section determines that there is a reasonable doubt as to the location of a freshwater wetlands boundary or applicability of the Wetlands Act to the proposed alteration, construction, installation or repair of an individual sewage disposal system or to any related improvements, the Individual Sewage Disposal System Section shall require that the applicant request a preliminary applicability determination form the Wetlands Section [Division] in which case the individual sewage disposal system approval shall not be granted without submittal of either a determination that the Wetlands Act does not apply or an approved wetlands permit, and a copy of the current, approved plans, stamped by the Wetlands Division.

Under the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Freshwater Wetlands Regulations SD 5.39), the term freshwater wetland means:

A. Bog, flood plain, pond, marsh, river bank, swamp, river, area of land within fifty feet (50'), areas(s) subject to flooding, area(s) subject to storm flowage, floodway, flowing body of water, stream, intermittent stream, perimeter wetland, submergent and emergent plant communities, special aquatic sites, and shrub and forested wetland;

B. Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions; and

C. Any or all wetlands created as part of , or the result of, any activity permitted or directed by the Department after July 16, 1971 including, but not limited to: restored wetlands; value replacement wetlands created to compensate for wetland loss such as flood plain excavations; biofiltration areas; and any wetlands created, altered or modified after July 16, 1971.

The Director has sole authority to determine which areas are freshwater wetlands.

Under the Freshwater Wetlands Regulations, any project or activity that may alter the character of freshwater wetlands requires a permit from the Director of the Rhode Island Department of Environmental Management (Freshwater Wetlands Regulations SD 7.01-A). Appendix 2, Section C of the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* indicates the general categories of "significant alteration." Item 7 of this section discusses OSDS projects that present a "significant alteration":

> Projects which propose construction of a "New" individual sewage disposal system (ISDS) or an "Alteration" of an existing ISDS, as governed by the most recent Rules and Regulations Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems (ISDS Regulations), where the leaching field of the ISDS is:
>
> > (a)Within one hundred feet (100') of or within any bog; pond; or flowing body of water; and/or
> > (b)Within fifty feet (50') of, or within, any marsh; swamp; emergent, shrub, or forested wetland; special aquatic site; area subject to flooding; or area subject to storm flowage.

In addition, any project in close proximity to a freshwater wetland, inclusive of any OSDS project may require a permit (Freshwater Wetlands Regulations SD 7.01-B), if it:

1. Changes the flow of surface runoff into or away from a freshwater wetland.
2. Diverts groundwater into or away from a freshwater wetland.
3. Modifies water quality in a way that could change the natural character of a freshwater wetland.

Though any OSDS project that involves alteration to a freshwater wetland requires a permit from the Division of Freshwater Wetlands, septic systems are not prohibited in the jurisdiction of the Division of Freshwater Wetlands.

The policies of the Division of Freshwater Wetlands are enforceable via the Freshwater Wetlands Regulations. To enforce permits, denials and other determinations from the Division of Freshwater Wetlands, the Director of the Rhode Island Department of Environmental Management has the power to undertake enforcement actions, which may include a(n):

1. Warning. (Freshwater Wetlands Regulations SD 15.02)
2. Cease and desist order. (Freshwater Wetlands Regulations SD 15.04)
3. Order to restore. (Freshwater Wetlands Regulations SD 15.06-A-3(b))

4. Revocation or suspension of a permit. (Freshwater Wetlands Regulations SD 15.08-09)

An OSDS project in the jurisdiction of the Coastal Resources Management Council, falls under the exclusive purview of the Council. The Coastal Resources Management Council has jurisdiction over all land up to 200 feet inland of the inland edge of all coastal features (SD 2.17). As stated in Rule 2.17:

> The Coastal Resources Management Council has authority over any construction proposed in the coastal region of the state. The coastal region includes: All saltwater beaches, barrier beaches and all land within two hundred (200) feet of tidal waters, salt water ponds, salt water marshes, salt water wetlands or on other land subject to Coastal Resources Management council jurisdiction. After receiving a permit for an individual sewage disposal system from the Director, the applicant should consult with the Coastal Resources Management Council before undertaking any construction on the property. The applicant shall have the responsibility to obtain a Coastal Resource Management Council permit if necessary.

In addition to these requirements, as per SD 18.08, an assessment is required to be submitted by the applicant "where in the opinion of the Director, a substantial question exists regarding the cumulative impact of the operation of sewage disposal systems on individual lots within the subdivisions on the water quality of a unique or valuable body of ground water or surface water."

Item (4) Text:
Establish protective separation distances between OSDS system components and groundwater which is closely hydrologically connected to surface waters. The separation distances should be based on soil type, distance to groundwater, hydrologic factors, and type of OSDS.

Item (4) Current Implementation:
Rhode Island complies with this item through the Regulations, which establish standard separation distances to water tables and restrictive layers. In critical resource areas, the Regulations establish more stringent separation distances and where appropriate management measures are required. Table 4 indicates separations for standard and critical resource areas (SD 15.02, SD 19.02.5).

TABLE 4 VERTICAL SEPARATIONS IN FEET TO VARIOUS FEATURES

Types of Area	Water Table	Restrictive Layer
Standard	4	6
Critical Resource Areas	5	7

Note. Adapted from the *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* (RIDEM, 1992).

For areas not meeting the required vertical separations for existing grade, RIDEM will allow OSDS to be sited in an area where the groundwater table is within 2-4 feet or an impervious layer is within 4-6 feet, if and only if, appropriate fill material is used to achieve required vertical seperation and the following nine special conditions are met:

1. Only disposal trenches shall be constructed on such property and the minimum sidewall to sidewall trench spacing shall be 10 feet with no credit allowed for sidewall area.

2. The trench design percolation rate shall be based on percolation tests run in the original ground; however, in no case shall the design percolation rate be faster than 10 minutes/inch.

3. At least two soil exploration holes shall be dug over the area of the proposed disposal system. The soil exploration holes shall assess the soil and ground water table conditions on both the uphill and downhill sides of the proposed system.

4. All applicable tests may be witnessed by the director.

5. The excavation preparation procedures given in SD 11.06 shall be followed.

6. The design shall consider the need for diversion of surface water runoff so as not to increase stormwater runoff to adjacent properties.

7. Where excavation into the groundwater table is a potential problem the excavation work shall not be permitted, unless otherwise authorized by the director.

8. Use of the Dry Season determination of SD 17.02 shall not be allowed in areas not meeting the requirements of SD 15.02(a).

9. The system design must be stamped by a registered professional engineer or registered land surveyor and the system installation must be supervised and certified by the designer.

If these conditions are met, such separation is considered to be adequate.

To further ensure that OSDS discharge does not adversely affect groundwater or connected surface waters, installation must comply with the setbacks in Table 3 in Item 3 of this management measure (SD 3.05). Where limiting conditions such as flow restrictive layers occur in critical resource areas, additional setbacks must be maintained (SD 19.02.5 (b)).

Item (5) Text:
Where conditions indicate that nitrogen-limited surface waters may be adversely affected by excess nitrogen loadings from groundwater, require the installation of OSDS that reduce total nitrogen loadings by 50 percent to groundwater that is closely hydrologically connected to surface water.

Item (5) Current Implementation:
To limit the potential adverse effects from OSDS in nitrogen-limited waters, nitrogen-reduction systems are allowed in critical resource areas, which include the watersheds of nitrogen-limited surface waters[5] (SD 14.00-14.07).

Item (5) Proposed Compliance Strategy:
To further implement this management measure, the *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* are currently being revised to mandate the installation of denitrification systems to achieve reduced total nitrogen loadings by 50 percent, in areas where nitrogen-limited surface waters are demonstrated to be adversely affected by excess nitrogen loadings from groundwater[6]. The new Regulations will address those nitrogen sensitive coastal areas as previously identified by the CRMC (i.e. watersheds of poorly-flushed coastal ponds). Cooperatively, the CRMC and RIDEM are monitoring the effectiveness of a nitrogen removal requirement, presently codified within CRMC regulations, for the Green Hill Pond area. As part of this requirement, any alternative system proposed must remove a minimum of 50 percent of the total nitrogen content as measured at the septic tank outlet. This applies to all new and upgraded system installations. Additionally, the installations must meet all other applicable CRMC and RIDEM regulatory standards.

Additionally, the use of ultra low-flow plumbing fixtures in critical resource areas and areas where special conditions limit OSDS capacity is being considered. This proposed regulatory inclusions will not negate the need for applicants to meet the requirements of

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[5] Nitrogen-limited surface waters are those surface waters in which nitrogen loading from groundwater is documented to cause a significant adverse effect.

[6] Nitrogen-limited surface waters are those surface waters in which nitrogen loading from groundwater is documented to cause a significant adverse effect. Currently, the only areas demonstrated to be adversely affected by nitrogen loading from groundwater are those areas defined in *The State of Rhode Island Coastal Resources Management Program* Special Area Management Plans(Salt Pond Region and Narrow River). The currently identified nitrogen sensitive areas have been targeted due to ecosystem importance and their poor tidal flushing characteristics along with high density development in the surrounding watershed. Other areas will be included as Critical Resource Areas, if nitrogen loading from groundwater is documented to create a significant adverse effect. Water quality monitoring will only be one component for determining specific areas for nitrogen removal requirements. Watershed modeling and landuse nitrogen loadings will be assessed for determining critical areas. This data will be compared to nutrient loading models developed by the URI Graduate School of Oceanography.

SD 19.00 for siting and design of systems in critical resource areas (see discussions under items 2, 3 and 4 of the Threshold Review Document). These stringent requirements already establish siting prohibitions, special setbacks, mandatory monitoring and assessment, and other strategies to reduce loadings.

OVERALL PROGRAM EFFECTIVENESS:

Length of time program in existence:
The *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* were promulgated in 1968 and were most recently amended May 29, 1992. The amended Regulations became effective June 18, 1992.

Degree of Implementation:
The program is fully implemented as defined in the *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* (SD 1.00-24.00). With the addition of the Proposed Compliance Strategy, detailed in Item 5, the Regulations will fully implement this management measure.

Operating Onsite Disposal Systems Management Measure

Operating Onsite Disposal Systems

1) Establish and implement policies and systems to ensure that existing OSDS are operated and maintained to prevent the discharge of pollutants to the surface of the ground and to the extent practicable reduce the discharge of pollutants into ground waters that are closely hydrologically connected to the surface waters. Where necessary, encourage the reduced use of garbage disposals, encourage the use of low-volume plumbing fixtures, and reduce the total phosphorous loadings to the OSDS by 15%. Establish and implement policies that require an OSDS to be repaired, replaced, or modified where the OSDS fails, or threatens or impairs surface waters;
2) Inspect OSDS at a frequency adequate to ascertain whether OSDS are failing;
3) Consider replacing or upgrading OSDS to treat influent so that the total nitrogen loadings in the effluent are reduced by 50%.

**See (g) guidance for full text of the management measure*

Applicability

This management measure applies to all operating OSDSs.

P: `gram Implementing the Measure

RIDEM Division of Groundwater and ISDS Regulations

Introduction

The Operating Onsite Disposal Systems (OSDS) Management Measure requires coastal states to apply enforceable policies in their Section 6217 Management Area that:

> Item (1)
> Prevent the discharge of pollutants to the surface of the ground and reduce the discharge of pollutants into ground waters that are closely hydrologically connected with surface waters. Where necessary to meet these objectives use low-volume plumbing fixtures.
>
> Item (2)
> Regularly Inspect to ascertain whether OSDS are failing.
>
> Item (3)
> Consider OSDS replacement/upgrading to reduce effluent nitrogen by 50 percent where:
>
> > (a) Nitrogen-limited surface waters may be adversely affected by groundwater nitrogen loadings from OSDS.
> > (b) Nitrogen loadings from OSDS are delivered to ground water that is closely hydrologically connected to surface waters.

The existing Rhode Island *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems (1992)* are in full compliance with Item 1 and partially with Item 2. Parts of Item 2 will also be enforced through Rhode Island's *State Guide Plan* and the Enabling Acts Relating to Land Use Planning of the *Rhode Island General Laws (RIGL)*[1]. Item 3 and the remainder of Item 2 will be addressed with pending revisions to the Regulations.

General Information

Applicability Criteria:
To comply with Section 6217 of the Coastal Zone Management Act, this management measure must apply to the entire Section 6217 Management Area. The proposed management area includes all of Rhode Island. The Rhode Island *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance*

[1] A more in depth discussion of the enforcement mechanisms in the *State Guide Plan* and the Enabling Acts Relating to Land Use Planning, and how these will be used to enforce Item 2, can be found in the section entitled "Item (2) Current Implemntation."

of Individual Sewage Disposal Systems apply to both new and existing construction, renovation and/or change of use of septic systems statewide (SD 2.00). This includes all package plants and small-scale or regional treatment facilities not covered by the *Regulations For the Rhode Island Pollutant Discharge Elimination System* (RIPDES), in order to manage the siting, design, installation, operation and maintenance of all such septic systems.

Agency/Program Responsible:
The Individual Sewage Disposal System (ISDS) Program is implemented by the Rhode Island Department of Environmental Management, Division of Groundwater and ISDS.

Statutory And Regulatory Authority:
Statutory authority enabling the regulation of OSDS is from the Rhode Island General Laws Sections 42-17.1-2(l),(m),(r),(s) and 23-19.5-4, 1977. The management measure will be implemented through the *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* (SD 1.00-24.00) (1992), and Rhode Island Building Code, Plumbing Code Regulation SBC-3, 1503.8 (1990), as well as the *State Guide Plan.*

Nature of the Program:
This program is a regulatory permit program and includes a fee schedule (SD 23.00).

Enforceable Policies:
To enforce the Section 6217 management measures, the regulations require all new construction, alterations, renovation and repairs to onsite disposal systems to receive written approval from the Director before construction begins (SD 2.00). Also, all applications for new construction, alterations, renovations and repairs to systems shall be made in conformance with all requirements under these Regulations to the greatest extent possible (SD 2.01(1-3)). These regulations include enforceable minimum standards relating to location, design, construction and maintenance of septic systems (SD 1.00-24.00).

Regulatory Enforcement Mechanisms:
The management measure, items 1-3, will be enforced pursuant to the *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* and proposed revisions thereto. In addition, the Rhode Island Comprehensive Planning and Land Use Regulation Act (RIGL 45-22.2) will be used to require communities to address wastewater management.[2]

Programmatic Enforcement Mechanisms:
Also to aid in maintaining compliance, The Rhode Island ISDS Program -- through an EPA-funded, Fiscal Year 1992 Nonpoint Source Program Workplan project -- has

[2] Refer to the Item Current Implementation sections for items 1-3 for further information.

ι ·dertaken a septic system maintenance enfo·cement initiative in the Greenwich Bay Watershed. When work in the Greenwich Bay Watershed has been completed the project will proceed to the Coastal Salt Ponds Watershed.

ITEMIZED BREAKDOWN OF THE MANAGEMENT MEASURE:

Item (1) Text:
Establish and implement policies and systems to ensure that existing OSDS are operated and maintained to prevent the discharge of pollutants to the surface of the ground and to the extent practicable reduce the discharge of pollutants into ground waters that are closely hydrologically connected to the surface waters. Where necessary to meet these objectives, encourage the use of low-volume plumbing fixtures, and reduce total phosphorous loadings to the OSDS by 15 percent (if the use of low-level phosphate detergents has not been required or widely adopted by OSDS users). Establish and implement policies that require an OSDS to be repaired, replaced, or modified where the OSDS fails, or threatens or impairs surface waters.

Item (1) Current Implementation:
To ensure that all existing OSDS are operated and maintained in a manner that prevents the discharge of pollutants to surface and ground water, the Regulations state that all disposal systems must be operated according to the use requirements (SD 2.04) and must be maintained in good repair in accordance with the Regulations; if these requirements are not met the Director may order cleaning or repair of the system (SD 2.11). In addition, the discharge of pollutants to a watercourse[3] (SD 2.07) or the surface of the ground (SD 2.08) is prohibited. Moreover, the use of acid and organic chemical solvents in any OSDS is prohibited by the Regulations (SD 2.12). To ensure that acid and organic chemical solvents are not used in septic systems the director maintains the authority to enforce this policy as per the ISDS Regulations. Enforcement actions continue to effectively deter these practices. Additionally, RIDEM, URI and other agencies have produced and distributed various public outreach materials regarding the proper maintenance of septic systems. In part, these outreach materials document both the ineffectiveness and pitfalls of acid and organic chemical solvents.

To ensure that systems can be practicably operated and maintained in a manner consistent with the protection of surface and ground water, the discharge of pollutants to groundwaters that are closely hydrologically connected to surface waters is reduced through location, where septic systems are located according to setbacks and separation distances from: watercourses, critical areas[4] and other areas of concern (see Table

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[3] Watercourse - any river, stream, brook, pond, lake, swamp, marsh, bog, fen, wet meadow, tidewater, or any other standing or flowing body of water (SD 1.00).

[4] Critical areas or critical resource areas - those areas deemed by the Director to be particularly sensitive to the detrimental effects of nutrients, pathogens, organic chemicals, etc. These areas currently include the Salt Pond Region and Narrow River watersheds, and the Scituate Reservoir watershed. New areas may be added, but only by amending the Regulations.

1[from SD 3.05]); and groundwater and other underground features (see Table 2 [from SD 2.16]).

TABLE 1 MINIMUM SETBACKS FOR OSDS FROM CRITICAL AREAS IN FEET

CRITICAL AREAS REQUIRING SETBACKS	SETBACKS REQUIRED
Coastal Pond and Narrow River shoreline features and tributaries including storm and subsurface drains directly discharging thereto	150
Other watercourses in the watershed or recharge of a critical resource not directly connected	100
Subsurface drains designed, or having the potential, to lower the groundwater in the vicinity of the leachfield (a) Upgradient of leachfield (b) Downgradient of leach field	 25 75
Private well where individual sewage disposal system is located in permeable soil (faster than 3 minutes per inch perc rate)	150
All watersheds to surface water reservoirs including perennial streams discharging there to and any storm or subsurface drains directly discharging thereto	200

Note. Adapted from the *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* (RIDEM, 1992).

TABLE 2 VERTICAL SEPARATIONS IN FEET TO UNDERGROUND FEATURES

Types of Area	Water Table	Restrictive Layer
Standard	3	5
Critical Resource Areas	4	6

Note. Adapted from the *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* (RIDEM, 1992).

Discharge of pollutants to ground waters closely hydrologically connected to surface waters is also reduced through design specifications (SD 3.00-13.09). These regulatory sections detail a variety of specifications pertaining to siting, excavation, construction, inflows and outflows, sizing, minimum areas, accessibility etc.

To aid in further reducing the discharge of pollutants to ground waters where drainage fields are of a small size or soil examination indicates special conditions, low-volume plumbing fixtures are required throughout the state (Plumbing Code Regulation 1503.8).

In addition to these requirements, owners must connect to an existing public sanitary sewer where feasible(SD 2.10). When problems are encountered in the operation of an OSDS and public sewage service is reasonably accessible, the Director may require the owner or occupant of an existing building to be connected (SD 2.10).

Item (1) Proposed Implementaiton Going Beyond the Management Measure:

To maintain leachfields and prevent pollution discharge, revisions to the DEM ISDS regulations will require the use of double-compartmrnt septic tanks and effluent filters in septictanks for all new septic systems and all septic systems being repaired or upgraded.

Item (2) Text:
Inspect OSDS at a frequency adequate to ascertain whether OSDS are failing

Item (2) Current Implementation:
To ensure that systems come on line in a fully functioning condition, preconstruction, construction and post-construction inspections take place to ensure proper installation, construction and design. Site inspections are ordinarially undertaken prior to construction to ensure that each OSDS is located in suitable areas (SD 15.00-15.06). Furthermore, the accuracy of these soil inspections is certified and recorded (SD 15.06). The construction, alteration, or reconstruction of any sewage disposal system must be performed by a licensed installer. The installer must certify, via a Certificate of Construction, that the system was installed in conformance with the permit and plan as approved by the Director of RIDEM (SD 2.05).

Any, altered or rebuilt system must receive a Certificate of Conformance, prior to use of the system and/or sale or occupation of the serviced construction (SD 2.06) and a municipality may only grant a Certificate of Occupancy where an applicant provides a Certificate of Conformance (SD 2.06(b)). Thus, a system receives an inspection after each and every alteration, repair and renovation.

To ensure that all existing OSDS are operated and maintained properly, the Regulations state that all disposal systems must be operated according to the use requirements (SD 2.04) and must be maintained in good repair in accordance with the Regulations; if these requirements are not met, the Director may order cleaning or repair of the system (SD 2.11). The Regulations further state that an application for repair shall be filed when any part of an OSDS fails (SD 2.01(3)). Therefore, to maintain compliance, systems must be inspected at a frequency adequate to ascertain failure.

Moreover, whenever a structure, which is serviced by a septic system, undergoes a substantial renovation or change of use the owner must file for a suitability determination (SD 2.00(2)). Under such a determination cesspools are deemed to be substandard and must be replaced by a new OSDS in accordance with the current code (SD 2.00(4)).

Also to aid in maintaining compliance, The Rhode Island ISDS Program -- through an EPA-funded, Fiscal Year 1992 Nonpoint Source Program Workplan project -- has undertaken a septic system maintenance enforcement initiative in the Greenwich Bay Watershed and the Green Hill Pond area. Dye tracing techniques incorporating activated charcoal are used at various selected sites. Stream grab-sampling procedures have been conducted using total and fecal coliform parameters. Over 1,500 (1,128 in the

Greenwich Bay area and 400 in the Green Hill Pond area) inspections have been completed with an approximate observed failure rate of 15 percent. As a result of these failures 150 Notices of Violation were delievered in the Greenwich Bay area and approximately 20 were delievered in the Green Hill Pond area. Most of these failures involved minor problems, however, approximately 20 septic system owners were required to file Applications for Repair. Virtually all the violators have taken appropriate action to address the failures. In instances of noncompliance more vigilent enforcement was pursued as necessary. Inspection and enforcement will continue contingent on the availability of funds and resources. Priority will be given to those areas identified through the priority-setting procedure of the revised Section 319 Plan. This process is more thoroughly described in the revised Section 319 Plan, which has been provided in the Appendices.

In addition, state enabling legislation authorizing communities to adopt and implement Wastewater Management Districts, was approved in 1987. A handbook entitled *Wastewater Management Districts...A Starting Point*, prepared by the Rhode Island Department of Administration, Division of Planning, sets forth a step by step approach to establishing and administering a Wastewater Management District. Moreover, a model ordinance is contained in the handbook to facilitate community adoption of this program.

In accordance with the Rhode Island Comprehensive Planning and Land Use Regulation Act (RIGL §45-22.2), all Rhode Island communities must prepare and adopt comprehensive plans that are consistent with the *Rhode Island State Guide Plan* and state agency policy plans such as *Rhode Island's Nonpoint Source Management Plan*. The existing and draft revised nonpoint plans establish a policy for communities to "establish local Wastewater Management Districts to improve septic system maintenance and management." Once a nonpoint source pollution management element of the *State Guide Plan* has been adopted, cities and towns that have unsewered areas can be required to include a strategy to deal with OSDS maintenance, to have their comprehensive plans approved by the Division of Planning. Thus, adoption of the Nonpoint Source Pollution Management Plan as an element of the State Guide Plan will provide a stronger and more direct link between State nonpoint source pollution policy and municipal nonpoint source pollution policy. The Rhode Island Department of Environmental Management, Nonpoint Source Pollution Management Program currently reviews all comprehensive plans for consistency with *Rhode Island's Nonpoint Source Management Plan*. If the Nonpoint Source Pollution Management Program finds a comprehensive plan to be inconsistent, the finding indicates to the Division of Planning that problems exist which should be rectified in order for the plan to receive approval from the state. The Nonpoint Source Pollution Management Program currently recommends the inclusion of Wastewater Management Districts or another suitable OSDS inspection and maintenance program for any and all plans that do not contain a policy for the adoption of a Wastewater Management District or a policy mandating the regular inspection and maintenance of OSDS. As a result of this and

other efforts, two Rhode Island municipalities have adopted ordinances for wastewater management: Narragansett and Charlestown.

To be certain that communities have the specific technical knowledge required to ensure implementation of this management measure, RIDEM's Nonpoint Source Program has initiated a "Coastal Nonpoint Program Implementation" project as part of the FY 1995 Nonpoint Pollution Management Program Work Plan. Through the project, the Nonpoint Source Pollution Program provides technical assistance to communities that includes, but is not limited to, developing educational materials, developing community ordinances, establishing strong administrative mechanisms, and programmatic troubleshooting.

The Nonpoint Source Pollution Program is currently working with the town of Charlestown, which adopted a wastewater management district ordinance in November of 1994 and is now working to implement it. The Town of Narragansett has also developed and implemented a septic system maintenance ordinance that requires pump-out every four years. Other Rhode Island communities will be assisted on an as needed basis, giving highest priority to those communities with pollution problems linked to septic systems.

Item (2) Proposed Compliance Strategy:
To further implement this management measure, Rhode Island is considering regulatory revisions that require an operating permit for large systems[5] and alternative systems, which will mandate maintenance for new and existing large and alternative septic systems. This will administered by the State. To maintain leachfields and prevent pollution discharge, revisions to the DEM ISDS regulations will require the use of double-compartmrnt septic tanks and effluent filters in septictanks for all new septic systems and all septic systems being repaired or upgraded.

Rhode Island is also currently considering a change of ownership requirement. This is documented in the revised Rhode Island Nonpoint Source Pollution Management Plan. The Plan states this in recommendation 44 for Policy 1.5 of the On-Site Sewage Disposal Systems section:

> Consider legislation or some other appropriate mechanism to require upgrades of substandard or failed OSDS when properties are sold.

Item (3) Text:
Consider replacing or upgrading OSDS to treat influent so that the total nitrogen loadings in the effluent are reduced by 50 percent. This provision applies only:

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[5] A large system is any system or combination of systems designed, installed or operated as a single unit to treat more than 5000 gallons per day.

(a) where conditions indicate that nitrogen-limited surface waters may be adversely affected by significant ground water nitrogen loadings from OSDS, and
(b) where nitrogen loadings from OSDS are delivered to ground water that is closely hydrologically connected to surface water.

Item (3) Current Implementation:
To allow for system replacement and upgrade where excessive nitrogen loadings may be delivered to ground or surface waters, the Regulations require that during any building renovation or change of use and during any system repair or alteration that the Director must make a suitability determination (SD 2.00(3)). To receive a positive determination a system must be able to adequately dispose of the proposed sewage flows so as to protect public health and the environment (SD 2.00(3)(A)). Where feasible, owners must connect to an existing public sewer service (SD 2.10).

To ensure that existing OSDS have the least potential to adversely affect the quality of surface or ground waters, applicants must, to the greatest extent possible, demonstrate compliance with the Regulations when undertaking a renovation or change of use and/or during alteration or repair to an OSDS (SD 2.01(3)(D) and SD 2.01(2)(E)) and repairs shall be made when any part of a system fails (SD 2.01(3)).

To help prevent the discharge of excessive nutrients to nitrogen-limited waters and other areas of concern, the Regulations allow alternative systems, such as nitrogen-reduction OSDS, in Critical Resource Areas (SD 14.00-14.07). Critical Resource Areas include the Coastal Ponds, Narrow River Watershed and the Scituate Reservoir Watershed (SD 19.00). This is inclusive of nitrogen-limited surface waters[6]. At the present, the only large scale composting toilet facility in the State is located at a recreational beach pavilion operated by the State. The composted waste is removed once per season and is added to the compost pile at a local municipal composting facility. RIDEM will be adding composting maintenance measure requirements within the revised codes.

Additionally, alternative absorption fields are required in a building being served by a private well (SD 2.14) and low-flow toilets are required for all new and replacement systems (Plumbing Code Regulation §1503.8).

Item (3) Proposed Compliance Strategy:
To further implement this management measure, Rhode Island proposes to require the installation of alternative OSDS in nitrogen-limited waters.

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[6] Nitrogen-limited surface waters are those surface waters in which nitrogen loading from groundwater is documented to cause a significant adverse effect. Currently, the only areas demonstrated to be adversely affected by nitrogen loading from groundwater are those areas defined in *The State of Rhode Island Coastal Resources Management Program* Special Area Management Plans(Salt Pond Region and Narrow River). Other areas will be included as Critical Resource Areas, if nitrogen loading from groundwater is documented to create a significant adverse effect.

OVERALL PROGRAM EFFECTIVENESS:

Length of time program in existence:
The *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* were promulgated in 1968 and were most recently amended May 29, 1992. The amended Regulations became effective June 18, 1992.

Degree of Implementation:
The program is fully implemented as defined in the *Rules and Regulations Establishing Minimum Standards Relating To Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* (SD 1.00-24.00).

Pollution Prevention

Pollution Prevention

Implement pollution prevention and education programs to reduce nonpoint source pollutants generated from the following activities, where applicable:

- the improper storage, use, and disposal of household hazardous chemicals, including automobile fluids, pesticides, paints, solvents, etc.;
- lawn and garden activities, including the application and disposal of lawn and garden care products, and the improper disposal of leaves and yard trimmings;
- turf management on golf courses, parks, and recreational areas;
- improper operation and maintenance of onsite disposal systems;
- discharge of pollutants into storm drains including floatables, waste oil, and litter;
- commercial activities including parking lots, gas stations, and other entities not under NPDES purview; and,
- improper disposal of pet excrement.

**This management measure does not have to be implemented with enforceable policies*

Applicability

This management measure applies to all areas within the 6217 management area.

Programs Implementing the Measure

A number of programs in Rhode Island currently address some aspect of this measure. These programs are administered by state agencies as well as private non-profit groups. At this time, the Interagency Nonpoint Source Advisory Committee expects to assume a coordinating role. The Committee would identify pollution reduction, prevention and education programs, gaps with regard to implementation of this measure, and assist in the coordination and development of new programs.

To ensure proper disposal of household hazardous waste, including automobile fluids, pesticides, paints, solvents, etc., Rhode Island has recently opened a household hazardous waste collection facility called the **Eco-Depot**. This $400,000 facility is open to Rhode Island residents, two Saturdays a month, by appointment. The Eco-Depot is located at Fields Point in Providence, central to residents of Greater Providence area and outlying Rhode Island municipalities. A hazardous waste transporter/contractor, contracted by RIDEM, is responsible for facility operations that include removing wastes from vehicles; identification, classification, consolidation, containerization and transportation; treatment and disposal of wastes through approved facilities; required documentation and reports; and staff training. An RIDEM staff member is present on each collection day for supervision and oversight, and for information/education.

To prevent lawn and garden activities from generating nonpoint source pollutants, the revised Nonpoint Source Management Plan includes a section, entitled "Lawn Care and Grounds Management." This section of the plan contains six recommendations that promote public education, technical training programs for grounds managers, and the development and distribution of guidance materials. Rhode Island has already developed and circulates a variety of outreach materials such as fact sheets, brochures, and booklets that describe proper lawn care and grounds management. Some of these are as follows.

Materials	**Author**
Home Lawns	*Land Management Project*
Low-Maintenance Landscaping	"
Vegetated Buffer Strips	"
Alternative Turf	"
OSCAR's Guide to Waste Reduction: Watch Your Waste	*DEM Office of Environmental Coordination*
OSCAR's Guide to Home Composting: Turning Your Spoils to Soil (video available)	"
OSCAR's Guide to Lawn Care: Don't Trash Grass (Video available)	"
Reducing Pollution Around the House	"
Vegetative Buffers in the Coastal Zone	*University of Rhode Island/Coastal Resources Center*
Buffer Zone Management Guidance	*Coastal Resources Management Council*

Going beyond the management measure, Rhode Island has developed enforceable policies through both the Coastal Resources Management Program and the Freshwater Wetlands Program that require vegetative buffers around all wetlands (in Rhode Island wetlands are inclusive of all surface waters and areas subject to storm flowage) and special enlarged buffers around critical coastal areas, surface drinking water bodies and other areas considered to be sensitive to the effects of water pollution. These policies are more fully discussed in the Wetlands Management Measures.

In Rhode Island, municipal recycling has become both an effective tool for public education, as well as a way to reduce land filling. Over 95 percent of Rhode Islanders participate in either mandatory or voluntary municipal recycling programs. These programs include not only curb-side collection of newspapers, glass food and drink containers, tin cans, aluminum cans, and plastic milk jugs and soda bottles, but also centralized facilities for used-motor-oil recycling and yard-waste composting.

Going beyond the management measure, the State has also developed a mandatory commercial-waste recycling program that requires all Rhode Island businesses to recycle corrugated cardboard, office paper, newspaper, telephone directories, glass food and beverage containers tin-coated steel cans/steel cans, aluminum, and HDPE and PET plastic beverage containers. To implement the program, all employers of over 50 people have been required to submit a plan for reduction and recycling of solid waste. To assist employers, RIDEM developed and distributed various recycling guides and handbooks.

To ensure that commercial activities such as parking lots, gas stations, and other entities not under RIPDES purview do not create nonpoint source pollution problems, the revised Nonpoint Source Pollution Management Plan includes recommendations for proper management. These recommendations are within the source-specific sections of the Statewide Management Strategies part of the plan, entitled "Underground Discharges," "Storage Tanks," and "Hazardous Materials."

The revised Nonpoint Source Pollution Management Plan also covers improper disposal of pet excrement in the section entitled "Domestic and Wild Animals." This section recommends: municipal ordinances to require pet owners to clean up and properly dispose of pet droppings; efforts to discourage the feeding of waterfowl at sensitive areas; and the implementation of proper animal waste storage for backyard livestock operations that are below the regulatory threshold of RIPDES and CZARA.

Also as part of this management measure, Rhode Island implements an enforceable prohibition on the use of septic system additives and has developed a technical assistance and outreach project, as part of the 319 Program's FY 1995 Work Plan, to assist communities with implementing Wastewater Management Districts. These are more fully discussed in the OSDS Management Measures.

Planning, Siting, and Developing Roads and Highways

Planning, Siting, and Developing Roads and Highways
Plan, site and develop roads and highways to:
1) Protect areas that provide important water quality benefits or are particularly susceptible to erosion or sediment loss;
2) Limit land disturbance such as clearing and grading and cut and fill to reduce erosion and sediment loss; and,
3) limit disturbance of natural drainage features and vegetation.

Applicability

Site development and land disturbing activities for new, relocated, and reconstructed (widened) roads (including residential streets) and highways.

Programs Implementing the Measure

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program; and,
- RIDEM, Division of Freshwater Wetlands Rules and Regulations.
- RIDEM Division of Water Resources, Water Quality Regulations and Water Quality Certification Program
- State Acts Related to Land Use Planning
- State Guide Plan

These programs and how they implement or will implement the management measure are described in more detail below. It should be noted that many of the projects to which this management measure applies are subject to the RIPDES Program and permit requirements. In addition, state road projects are generally subject to local endorsement and a minimum of two public hearings prior to being undertaken. Furthermore, all development activities, including road and highway projects are subject to state and local regulations. Road and highway projects undergo public hearings, as noted above, and coordination between the regulatory agencies and affected local communities. Therefore, the management measure will be implemented through the existing state regulatory programs and applicable State Guide Plan elements. For a more detailed

description of this management measure's implementation state-wide for all site development activitysee the Site Development management measure section.

Rhode Island Coastal Resources Management Program

This management measure will also be implemented by the Rhode Island Coastal Resources Management Council (CRMC) pursuant to R.I.G.L. 46-23 in accordance with the permit requirements as specified in the *Rhode Island Coastal Resources Management Program (RICRMP)*. For more information on the nature of the program and the permit process see the discussion contained in Chapter 2. For more information on the management measure's oversight and the program's overall effectiveness see the New Development Management Measure

Implementation of the Measure
The Planning, Siting, and Developing Roads and Highways Management Measure will be implemented by the CRMC pursuant to various requirements contained in the RICRMP (Appendix E). The requirements of this section apply to all new and alterations to existing roadways, highways, , bridges, parking lots, railroad lines and airports. There are several important ways that this measure will be implemented within CRMC jurisdiction, including the poorly flushed estuaries addressed Special Area Management Plan areas.

1. **Requirements contained in RICRMP Section 300.13**

Section 300.13 of the RICRMP contains policies and standards for public roadways, bridges, parking lots, railroad lines and airports. The Council requires that:

> All roadways, highways, parking lots, railroads lines, and airports shall be planned, sited, and designed to:
>
> i) protect areas that provide important water quality benefits or are particularly susceptible to erosion and sediment loss;
> ii) limit land disturbances such as clearing and grading and cut and fill to reduce erosion and sediment loss;
> iii) limit disturbances of natural drainage features and vegetation; and,
> iv) limit the increase of impervious surface areas, except where necessary.(RICRMP Section 300.13.C.1).

In addition, the conditions imposed on an Assent may include requirements other than those specifically mentioned in the regulations (i.e., specific maintenance requirements for a particular project).

2. ***Rhode Island Soil Erosion and Sediment Control Manual***

See the discussion contained in the Site Development Management Measure.

3. *Rhode Island Stormwater Design and Installation Standards Manual*

See the discussion contained in the Site Development Management Measure.

4. **Other RICRMP requirements related to site development**

See the discussion contained in the Site Development Management Measure

RIDEM Division of Freshwater Wetlands Rules and Regulations

This management measure will also be implemented by the Rhode Island Department of Environmental Management (RIDEM), Division of Freshwater Wetlands pursuant to R.I.G.L. 2-1 et. seq., 42-17.1-1 et. seq., 42-17.6-1 et. seq., and 42-35-1 et. seq. (Appendix A) in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). For more information on the nature of that program and its permit process and requirements, see the discussion contained in Chapter 2, and the discussions addressing the Wetlands Management Measures. For more information on this management measure's oversight and overall effectiveness of the program see the discussion contained in the New Development Management Measure.

Implementation of the Measure
In consideration of existing land use and development patterns, as well as the natural features of the State, it would be virtually impossible to construct, relocate, or reconstruct any road in Rhode Island without a permit from the RIDEM, Division of Freshwater Wetlands or the CRMC. Activities subject to the requirements of this measure and which fall under the authority of the Division of Freshwater Wetlands are required to meet the same permit requirements as any project which: proposes to alter a freshwater wetland; will occur, either partially or wholly within freshwater wetlands; due to their close proximity to wetlands, or to the size or nature of the project or activity, will, in all likelihood, result in an alteration of the natural character of any freshwater wetland. Accordingly, this management measure is implemented by the Freshwater Wetlands Program in the same manner as the Site Development management measure.

RIDEM Division of Water Resources, Water Quality Regulations and Water Quality Certification Program

See discussion contained in the New Development Management Measure

State Acts Related to Land Use Planning

This management measure is currently implemented statewide through the requirements of the Comprehensive Planning Program (R.I.G.L. 45-22.2), the Zoning Enabling Act (R.I.G.L. 45-24), the Land Development and Subdivision Review Enabling Act of 1992 and the Rhode Island Soil Erosion and Sediment Control Act. These three interrelated sets of statutory requirements are administered at the state level by the Rhode Island Department of Administration, Division of Planning (RIDOP). For a more detailed discussion of these Acts see Chapter 2. For a more detailed discussion of the management measure's oversight, as well as the program's overall effectiveness, see the discussion in the section addressing the New Development Management Measure.

Implementation of the Measure

1. The Rhode Island Comprehensive Planning and Land Use Regulation Act

Pursuant to the Comprehensive Planning Program, all municipalities are required to develop comprehensive land use plans which, at a minimum, address a specific series of elements, and to change their zoning ordinances to be consistent with the comprehensive plan. In addition, the comprehensive plans must be consistent with the policies contained in the *State Guide Plan*, and the goals and policies of relevant state agencies. The *State Guide Plan* contains policies such as avoiding the conversion of areas particularly susceptible to erosion, and preserving areas that provide important water quality benefits (Element 121: State Land Use Policies and Plan).

Rhode Island's Comprehensive Planning and Land Use Regulation Act (1988) requires the Director of the Department of Administration to develop standards to assist municipalities in the incorporation of the State's goals and policies into local comprehensive plans (R.I.G.L. 45-22.2-10(B)). At a minimum, a community is required to inventory highways, parking facilities, rail marine, special pedestrian or bicycle facilities, and accident records to assess and forecast needs. In particular, the Act requires the circulation element of local plans to consider the impact of transportation facilities on sensitive natural and cultural resources within municipalities. Local policies should address the role of local development and other controls in the improvement of transportation systems elements.

Comprehensive plans must also contain a natural and cultural resources element which requires communities to provide for the protection and management of natural resources, including water, watersheds, natural vegetation systems, wetlands, soils, and other natural resources (R.I.G.L. 45-22.2-6.E). Accordingly, the comprehensive plans identify areas of potential concern (e.g., poor soils, wetlands, sensitive habitats, etc.) and also recommend zoning these areas in a manner which protects them. Comprehensive plans also recommend such pollution prevention techniques as setback and buffer

standards, cluster zoning, limiting impervious surfaces, purchasing development rights, land acquisition, slope restrictions and establishing land trusts.

2. Rhode Island Zoning Enabling Act of 1991

Further requirements are indicated for communities in the Rhode Island Zoning Enabling Act of 1991 R.I.G.L. 45-24-27 - 45-24-72). Among the standard provisions of the Act relating to the development of roads, highways and bridges in Rhode Island are requirements for the following:

(3) Permitting, prohibiting, limiting, and restricting buildings, structures, land uses, and other development by performance standards, or other requirements, related to air and water and groundwater quality, noise and glare, energy consumption, soil erosion and sedimentation, and/or the availability and capacity of existing and planned public or private services;

(4) Regulating within each district and designating requirements for:
(f) Parking areas, road design, and, where appropriate, pedestrian, bicycle, and other circulator systems;
(h) Appropriate drainage requirements and methods to manage stormwater runoff;

(7) Providing for the protection of existing and planned public drinking water supplies, their tributaries and watersheds, and the protection of Narragansett Bay, its tributaries and watershed;

(12) Providing standards for and requiring the provision of adequate and properly designed physical improvements, including plantings, and the proper maintenance of property;

(13) Permitting, prohibiting, limiting, and restricting land use in areas where such development is deemed to create a hazard to the public health or safety;

(20) Designating special protection areas for water supply and limiting or prohibiting development in these areas, except as otherwise provided by state statute. (R.I.G.L. 45-24-33.A)

In addition, a zoning ordinance may contain special provisions for:

(3) Regulating development adjacent to designated scenic highways, scenic waterways, major thoroughfares, public greenspaces, or other areas of special public investment or valuable natural resources. (R.I.G.L. 45-24-33.B)

3. Land Development and Subdivision Review Enabling Act of 1992

The general provisions of the 1992 Land Development and Subdivision Review Act applies other requirements to all land development projects, industrial, commercial, and subdivisions of land within municipalities. Relative to the development of the infrastructure for roads, highways and bridges, the provisions include physical design requirements (R.I.G.L. 45-23-44), public design and improvement standards (R.I.G.L. 45-23-45), and a requirement for construction and/or improvement guarantees that address the maintenance issues cited in several of the Urban management measures (R.I.G.L. 45-23-46).

4. Rhode Island Soil Erosion and Sediment Control Act

See the discussion contained in the Site Development Management Measure.

The *State Guide Plan*

As previously stated, the *State Guide Plan* (SGP) is a collection of elements that address statewide systems planning for physical development and environment, economy and human services. The policies below give a brief overview of some of the recommendations cited within various elements of the SGP that address the management measure for planning, siting and developing roads, highways, and bridges within the Rhode Island.

The two fundamental SGP objectives guiding the formulation of plans and implementation of programs useful in guiding the future development of the state's environment are as follows:

1. achievement of a harmonious relationship between population and the natural environment; develop land use plans which accommodate patterns of urbanization and economic development in a manner which considers environmental capacity and offers a range of alternative locations consistent with wise use and balanced uses of natural resources,

2. provide a balanced and integrated multi-modal intrastate transportation system which provides efficient and economical movement between component parts of the state and offers maximum possible mobility to all elements of our society.

The stated purpose of the *State Land Use Policies and Plan* (Appendix O) is to "guide future land use and development by recommending policies to guide municipalities in implementing their comprehensive planning, zoning, and other land use responsibilities, as well as guide the state and its agencies in activities directly or indirectly affecting land use." Highway projects included in the state's Transportation Improvement Program (a prerequisite for federal transportation funding) must be consistent with the *State Guide Plan*. Other elements of the SGP such as the *Ground*

Transportation Plan (Element 611), the *Comprehensive Conservation and Management Plan for Narragansett Bay* (CCMP) (Appendix P), the Scituate Reservoir Watershed Management Plan (Appendix Q) also promote the development of strategies and programs that contribute to the implementation of environmental policies.

In addition to being consistent with the policies contained in the *State Guide Plan*, the comprehensive plans must also be consistent with other state policies and watershed management plans. These regional watershed management plans include the Salt Ponds Special Area Management Plan (Appendix G) and the Narrow River Special Area Management Plan (Appendix H). These regional watershed plans and management programs also contain policies and recommendations which implement this measure.

Comprehensive plans must also be coordinated with other municipalities and agencies for the management of resources and facilities that extend beyond the municipal boundaries such as rivers, aquifers, transportation facilities and others (R.I.G.L. 42-22.2-7).

Rhode Island will further and more explicitly implement this management measure by incorporating the updated Nonpoint Source Management Plan (developed and revised in accordance with the requirements contained in Section 319 of the Clean Water Act) as a new element of the *State Guide Plan*.

Bridges

Bridges
Site, design, and maintain bridge structures so that sensitive and valuable aquatic ecosystems and areas providing important water quality benefits are protected from adverse effects.

Applicability

This management measure applies to new, relocated, and rehabilitated bridge structures.

Programs Implementing the Measure

This management measure is or will be implemented by three programs:

- Rhode Island Coastal Resources Management Program; and,
- RIDEM, Division of Freshwater Wetlands Rules and Regulations.
- RIDEM, Division of Water Resources, Water Quality Regulations and Water Quality Certification Program
- State Acts Related to Land Use Planning
- State Guide Plan

Rhode Island Coastal Resources Management Program

This management measure will also be implemented by the Rhode Island Coastal Resources Management Council (CRMC) pursuant to R.I.G.L. 46-23 in accordance with the permit requirements as specified in the *Rhode Island Coastal Resources Management Program (RICRMP)*. For more information on the nature of the program and the permit process see the discussion contained in Chapter 2. For more information on the management measure's oversight and the program's overall effectiveness see the New Development Management Measure. Please note that all bridge construction and subsequent maintenance activities are subject to the applicable state regulatory permits and attached permit conditions.

Implementation of the Measure

The Bridges Management Measure will be implemented by the CRMC pursuant to various requirements contained in Section 300.13 of the RICRMP (Appendix ?) The requirements of this section apply to all new, or alterations or improvements to existing bridges. There are several important ways that this measure will be implemented.

1. Requirements contained in RICRMP Section 300.13

The requirements of this section apply to all new, and alterations and improvements to existing roadways, highways, bridges, parking lots, railroad lines, and airports. Specifically, it is the Council's policy that:

> All bridge structures shall be sited, designed, and maintained so that sensitive coastal habitat areas such as coastal wetlands and areas providing important water quality benefits are protected from adverse effects. (RICRMP Section 300.13.C.2)

It is also important to mention that conditions imposed on an Assent may include requirements other than those specifically mentioned in the regulations (i.e., specific maintenance requirements for a particular project).

2. *Rhode Island Soil Erosion and Sediment Control Manual*

See the discussion contained in the Site Development Management Measure.

3. *Rhode Island Stormwater Design and Installation Standards Manual*

See the discussion contained in the Site Development Management Measure.

4. Other RICRMP requirements related to site development

See the discussion contained in the Site Development Management Measure.

RIDEM Division of Freshwater Wetlands Rules and Regulations

This management measure will also be implemented by the Rhode Island Department of Environmental Management (RIDEM), Division of Freshwater Wetlands pursuant to R.I.G.L. 2-1 et. seq., 42-17.1-1 et. seq., 42-17.6-1 et. seq., and 42-35-1 et. seq. (Appendix A) in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). For more information on the nature of that program and its permit process and requirements, see the discussion contained in Chapter 2, and the discussions addressing the Wetlands Management Measures. For more information on this management measure's oversight

and overall effectiveness of the program see the discussion contained in the New Development Management Measure.

Implementation of the Measure

The Management Measure for bridges is currently implemented by the RIDEM, Division of Freshwater Wetlands pursuant to the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). As noted in the Site Development management measure for roads, bridges and highways, it is impossible to construct, relocate, or reconstruct any bridge in Rhode Island without a permit from the RIDEM, Division of Freshwater Wetlands or the CRMC. Activities subject to the requirements of this measure and which fall under the authority of the Division of Freshwater Wetlands are required to meet the same permit requirements as any project which: proposes to alter a freshwater wetland; will occur, either partially or wholly within freshwater wetlands; due to their close proximity to wetlands, or to the size or nature of the project or activity, will, in all likelihood, result in an alteration of the natural character of any freshwater wetland. Accordingly, this management measure is implemented by the Freshwater Wetlands Program through the requirements for impact analysis, elimination, avoidance and minimization (Rule 10.03) and through the review criteria contained in the *Rules*. Specifically, applications are subject to review criteria which include demonstrating to the Director that the project will not result in

1. Significant reduction in the overall wildlife production and/or diversity of a wetland;

12. Any reduction in water quality functions and values or negative impacts to natural water quality characteristics, either in the short- or long-term, by modifying or changing: water elevations, temperature regimes, volumes, velocity of flow regimes of water; increasing turbidity; decreasing oxygen; causing any form of pollution; or modifying the amount of flow of nutrients so as to negatively impact wetland functions and values.

RIDEM Division of Water Resources, Water Quality Regulations and Water Quality Certification Program

See discussion contained in the New Development Management Measure

State Enabling Legislation Related to Land Use Planning

1. Rhode Island Comprehensive Planning and Land Use Regulation Act

See the discussion contained in the Management Measure for Planning, Siting, and Developing Roads and Highways.

2. Rhode Island Zoning Enabling Act of 1991

See the discussion contained in the Management Measure for Planning, Siting, and Developing Roads and Highways.

3. Land Development and Subdivision Review Enabling Act of 1992

See the discussion contained in the Management Measure for Planning, Siting, and Developing Roads and Highways.

4. Rhode Island Soil Erosion and Sediment Control Act

See the discussion contained in the Site Development Management Measure.

The *State Guide Plan*

See the discussion contained in the Management Measure for Planning, Siting, and Developing Roads and Highways.

Construction Projects

Construction Projects

1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction and

2) prior to land disturbance, prepare and implement an approved erosion control plan or similar administrative document that contains erosion and sediment control provisions.

Applicability

This management measure applies to new, replaced, restored, and rehabilitated road, highway, and bridge construction projects.

Programs Implementing the Measure

This management measure is or will be implemented by the following programs:

- Rhode Island Coastal Resources Management Program; and,
- RIDEM, Division of Freshwater Wetlands Rules and Regulations.
- RIDEM Division of Water Resources, Water Quality Regulations and Water Quality Certification Program
- State Acts Related to Land Use Planning
- State Guide Plan

Rhode Island Coastal Resources Management Program

This management measure will also be implemented by the Rhode Island Coastal Resources Management Council (CRMC) pursuant to R.I.G.L. 46-23 in accordance with the permit requirements as specified in the *Rhode Island Coastal Resources Management Program (RICRMP)*. For more information on the nature of the program and the permit process see the discussion contained in Chapter 2. For more information on the management measure's oversight and the program's overall effectiveness see the New Development Management Measure.

Implementation of the Measure

The Construction Projects Management Measure will be implemented by the CRMC pursuant to various requirements contained in Section 300.13 of the RICRMP. The requirements of this section apply to new, or alterations or improvements to existing roadways, highways, bridges, parking lots, railroad lines, and airports. There are several important ways that this measure will be implemented.

1. Requirements contained in RICRMP Section 300.13

In accordance with Council requirements, as contained in Section 300.13:

> Applicants shall reduce erosion and, to the maximum extent practicable, retain sediment on-site during and after construction. Applicants shall prepare and implement an erosion and sediment control plan in accordance with all of the policies and standards contained in Section 300.2., Filling Removing or grading of Shoreline Features (RICRMP Section 300.13.D.3).

It is also important to mention that the important conditions imposed on an Assent may include requirements other than those specifically mentioned in the regulations (i.e., maintenance requirements for a specific project).

2. *Rhode Island Soil Erosion and Sediment Control Manual*

See the discussion contained in the Site Development Management Measure.

3. *Rhode Island Stormwater Design and Installation Standards Manual*

See the discussion contained in the Site Development Management Measure.

4. Other RICRMP requirements related to site development

See the discussion contained in the Site Development Management Measure.

RIDEM Division of Freshwater Wetlands Rules and Regulations

This management measure will also be implemented by the Rhode Island Department of Environmental Management (RIDEM), Division of Freshwater Wetlands pursuant to R.I.G.L. 2-1 et. seq., 42-17.1-1 et. seq., 42-17.6-1 et. seq., and 42-35-1 et. seq. (Appendix A) in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). For more information on the nature of that program and its permit process and requirements, see the discussion contained in Chapter 2, and the discussions addressing the Wetlands Management Measures. For more information on this management measure's oversight

and overall effectiveness of the program see the discussion contained in the New Development Management Measure.

Implementation of the Measure

The Construction Projects Management Measure for road, highway and bridge construction projects is currently implemented by the RIDEM, Division of Freshwater Wetlands pursuant to the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). It is again important to note that is highly probable that projects subject to the applicability criteria of this management measure will require a permit from either the RIDEM, Division of Freshwater Wetlands or the CRMC. Activities subject to the requirements of this measure and which fall under the authority of the Division of Freshwater Wetlands are required to meet the same permit requirements as any project which: proposes to alter a freshwater wetland; will occur, either partially or wholly within freshwater wetlands; due to their close proximity to wetlands, or to the size or nature of the project or activity, will, in all likelihood, result in an alteration of the natural character of any freshwater wetland. Accordingly, this management measure is implemented by the RIDEM , Division of Freshwater Wetlands in the same manner as the Construction Site Erosion and Sediment Control Management Measure.

RIDEM Division of Water Resources, Water Quality Regulations and Water Quality Certification Program

See discussion contained in the New Development Management Measure

State Acts Related to Land Use Planning

1. Rhode Island Comprehensive Planning and Land Use Regulation Act

See the discussion contained in the Management Measure for Planning, Siting, and Developing Roads and Highways.

2. Rhode Island Zoning Enabling Act of 1991

See the discussion contained in the Management Measure for Planning, Siting, and Developing Roads and Highways.

3. Land Development and Subdivision Review Enabling Act of 1992

See the discussion contained in the Management Measure for Planning, Siting, and Developing Roads and Highways.

4. Rhode Island Soil Erosion and Sediment Control Act

See the discussion contained in the Site Development Management Measure.

The *State Guide Plan*

See the discussion contained in the Management Measure for Planning, Siting, and Developing Roads and Highways.

Construction Site Chemical Control (Roads, Bridges, Highways)

Construction Site Chemical Control

1) Limit the application, generation, and migration of toxic substances;
2) ensure the proper storage and disposal of toxic materials; and,
3) apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface water.

Applicability

This management measure applies to all new, resurfaced, restored, and rehabilitated road, highway, and bridge construction projects.

Programs Implementing the Measure

This management measure is or will be implemented by three programs:

- Rhode Island Coastal Resources Management Program
- RIDEM, Division of Freshwater Wetlands Rules and Regulations
- RIDEM, Division of Water Resources, Water Quality Regulations and Water Quality Certification Program
- State Acts Related to Land Use Planning
- State Guide Plan

These programs and how they implement or will implement the management measure are described in more detail below.

Rhode Island Coastal Resources Management Program

This management measure will also be implemented by the Rhode Island Coastal Resources Management Council (CRMC) pursuant to R.I.G.L. 46-23 in accordance with the permit requirements as specified in the *Rhode Island Coastal Resources Management Program (RICRMP)*. For more information on the nature of the program and the permit process see the discussion contained in Chapter 2. For more information on the

management measure's oversight and the program's overall effectiveness see the New Development Management Measure

Implementation of the Measure
The Construction Site Chemical Control (Roads, Bridges, and Highways) Management Measure will be implemented by the CRMC pursuant to various requirements contained in Section 300.13 of the RICRMP (Appendix E) as well as proposed amendments to Section 300.2 (Appendix 6A). The requirements of this section apply to all new, and alteration and improvements to existing roadways, highways, bridges, parking lots, railroad lines, and airports.

1. Requirements contained in RICRMP Section 300.13

Section 300.13 of the RICRMP requires applicants for projects proposing new or alterations to existing roadways, highways, bridges, parking lots, railroad lines, and airports to meet the standards contained in Section 300.2 (Filling, Removing, or Grading of Shoreline Features).

2. Amendments to RICRMP Section 300.2

Proposed amendments to Standards contained in Section 300.2 will require applicants to:

> Limit the application, generation, and migration of toxic substances and ensure that toxic substances are properly stored and disposed of onsite in accordance with all applicable federal, state, and local requirements.

More detail on these and other related requirements can be found in Section ? of the RICRMP. It is also important to mention that the important stipulations of a Council Assent are registered in the land evidence records and the conditions imposed on an Assent may include requirements other than those specifically mentioned in the regulations (i.e., specific maintenance requirements for a particular project).

3. *Rhode Island Soil Erosion and Sediment Control Manual*

See the discussion contained in the Site Development Management Measure.

4. *Rhode Island Stormwater Design and Installation Standards Manual*

See the discussion contained in the Site Development Management Measure.

5. Other RICRMP requirements related to site development

See the discussion contained in the Site Development Management Measure.

RIDEM Division of Freshwater Wetlands Rules and Regulations

This management measure will also be implemented by the Rhode Island Department of Environmental Management (RIDEM), Division of Freshwater Wetlands pursuant to R.I.G.L. 2-1 et. seq., 42-17.1-1 et. seq., 42-17.6-1 et. seq., and 42-35-1 et. seq. (Appendix A) in accordance with the requirements specified in the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). For more information on the nature of that program and its permit process and requirements, see the discussion contained in Chapter 2, and the discussions addressing the Wetlands Management Measures. For more information on this management measure's oversight and overall effectiveness of the program see the discussion contained in the New Development Management Measure.

Implementation of the Measure

The Construction Site Chemical Control Management Measure for roads, bridges and highways is currently implemented by the RIDEM, Division of Freshwater Wetlands pursuant to the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Appendix B). It is again important to note that is highly probable that projects subject to the applicability criteria of this management measure will require a permit from either the RIDEM, Division of Freshwater Wetlands or the CRMC. Activities subject to the requirements of this measure and which fall under the authority of the Division of Freshwater Wetlands are required to meet the same permit requirements as any project which: proposes to alter a freshwater wetland; will occur, either partially or wholly within freshwater wetlands; due to their close proximity to wetlands, or to the size or nature of the project or activity, will, in all likelihood, result in an alteration of the natural character of any freshwater wetland. Accordingly, this management measure is implemented by the RIDEM , Division of Freshwater Wetlands in the same manner as the Construction Site Chemical Control Management Measure.

RIDEM Division of Water Resources, Water Quality Regulations and Water Quality Certification Program

See discussion contained in the New Development Management Measure

State Acts Related to Land Use Planning

1. Rhode Island Comprehensive Planning and Land Use Regulation Act

See the discussion contained in the Management Measure for Planning, Siting, and Developing Roads and Highways.

2. Rhode Island Zoning Enabling Act of 1991

See the discussion contained in the Management Measure for Planning, Siting, and Developing Roads and Highways.

3. Land Development and Subdivision Review Enabling Act of 1992

See the discussion contained in the Management Measure for Planning, Siting, and Developing Roads and Highways.

4. Rhode Island Soil Erosion and Sediment Control Act

See the discussion contained in the Site Development Management Measure.

The *State Guide Plan*

See the discussion contained in the Management Measure for Planning, Siting, and Developing Roads and Highways.

Operation and Maintenance

Operation and Maintenance
Incorporate pollution prevention procedures into the operation and maintenance of roads, highways, and bridges to reduce pollutant loadings to surface waters.

Applicability

This management measure applies to all existing, restored, and rehabilitated roads, highways, and bridges.

Program Implementing the Measure

The Water Quality Certification Program of the RIDEM, Division of Water Resources, in accordance with the Rhode Island Water Quality Regulations for Water Pollution Control can implement this management measure. See Chapter 2 for a description of this program. For more information on the management measure's oversight and the program's overall effectiveness, see the New Development Management Measure. Pleae note that new roads, highways and bridges are subject to the state-wide stormwater management requirements aimed at reducing pollutant loadings to surface waters. These stormwater management requiremetns are implemnted through the applicable RIDEM and CRMC regulatory programs.

The RIDEM, Division of Freshwater Wetlands and the CRMC may require the implementation of this management measure through permit conditions. Additionally, specific pollution prevention procedures related to the de-icing of roads are currently required within the Scituate Reservoir Watershed and several other drinking water supply reservoirs.

Road, Highway, and Bridge Runoff Systems

Road, Highway, and Bridge Runoff Systems
Develop and implement runoff management systems for existing roads, highways, and bridges to reduce runoff pollutant concentrations and volumes entering surface waters.
1) Identify priority and watershed pollutant reduction opportunities (e.g., improvements to existing runoff control structures); and,
2) establish schedules for implementing appropriate controls.

Applicability

This management measure applies to all existing, resurfaced, restored, and rehabilitated roads, highways, and bridges.

Programs Implementing the Measure

This management measure is currently implemented by the combination of requirements contained in Municipal Comprehensive Plans and related enabling legislation, Sections 303, 304, 305 and 319 of the Clean Water Act, the RIDEM Water Quality Regulations, and the *State Guide Plan*. In addition, there are currently several additional watershed protection programs which further enhance the implementation of this management measure. They include, but are not limited to the implementation of the following:

- Salt Ponds Special Area Management Plan (Appendix G);
- Narrow River Special Area Management Plan (Appendix H);
- Narragansett Bay Project CCMP (Appendix P); and,
- Scituate Reservoir Watershed Management Plan (Appendix Q).

These plans contain recommendations for priority and watershed pollutant reduction opportunities. Furthermore, the implementation of the Rhode Island Coastal Resources Management Program (Section 300.6), the Salt Ponds and Narrow River Special Area Management Plans, and the RIDEM, Division of Freshwater Wetlands Rules and Regulations, especially as it pertains to stormwater management, often require improvements to existing runoff control structures (See discussion in the New

Development Management Measure). These programs and how they implement or will implement the management measure are described in more detail below.

Municipal Comprehensive Plans and Related Enabling Legislation

See the discussion contained in the Watershed Protection Management Measure.

Sections 303, 304, 305 and 319 of the Clean Water Act

The current RI Nonpoint Pollution Management Plan contains both an implementation schedule and a priority watershed selection process. These elements of the NSMP have been used together to identify all nonpoint source pollution priorities, statewide. Primarily, this selection process has targeted existing problems, such as problems associated with roads, highways and bridges, and thus complies with the management measure

The revisions to Rhode Island's Nonpoint Pollution Management Plan include both an updated implementation schedule and an updated priority system. The implementaiton schedule has been developed to encompass all source-based recommendations in the Plan. In part, these recommendations include watershed management programs to reduce nonpoint source pollution from roads, highways and bridges. The updated wtaershed priority system is applied to determine the relative priority of managing watersheds, and targets existing nonpoint pollution problems. Waterquality management discussed in the NSMP includes, where necessary, reduction of nonpoint source pollution from roads, highways and bridges. Therefore, Rhode Island addresses this management measure through the Nonpoint Source Management Plan.

In addition, please see the discussion contained in the Existing Development Management Measure.

RIDEM, Water Quality Regulations

See the discussion contained in the Existing Development Management Measure.

The *State Guide Plan*

See the discussion contained in the Management Measure for Planning, Siting, and Developing Roads and Highways.

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Appendix 6A
Proposed Changes to the RICRMP: Urban

300.2. Filling, Removing, or Grading of Shoreline Features

A. DEFINITIONS

1. Filling is the deposition of materials of upland origin onto shoreline features or their contiguous areas (see Section 300.9 for inland disposal of dredged materials).

2. Removing is the process of taking away, including excavation, blasting, or mining, any portion of a shoreline or its contiguous area.

3. Grading is the process whereby fill or the soils of a shoreline or its contiguous area are redistributed or leveled.

   Established agricultural practices in areas contiguous to shoreline features are excluded from this section.

   ~~Filling, removing, or grading activities shall be reviewed at the Category B level when (a) the filling or removing involves more than 2,000 cubic yards of material, (b) the affected area is greater than one acre, or (c) the affected area is a designated historic area or archaeologically sensitive site.~~

4. Erosion and Sediment Control Plan: An erosion and sediment control plan is a description of the proposed best management practices, detailed site plans, and written narrative that, when implemented, provides protection and restoration of coastal resources by reducing erosion and controlling sediment onsite as well as minimizing other negative impacts associated with land development activities.

B. POLICIES

1. All filling, removing, or grading activities shall be done in accordance with the policies and standards of this section and the standards and specifications set forth in the most recent edition of the *Rhode Island Soil Erosion and Sediment Control Handbook*.

2. All new activities subject to section 300.3 (residential, commercial, and industrial structures), Section 300.13, Section 320, or those activities which disturb more than 5,000 square feet of land on a site shall prepare and implement an erosion and sediment control plan approved by the Council which references all necessary practices for erosion and sediment control. All erosion and sediment control plans shall be consistent with applicable policies and standards contained in the Rhode Island Coastal Resources Management Program and the standards and specifications set forth in the most recent edition of the *Rhode Island Soil Erosion and Sediment Control Handbook*. All erosion and sediment control plans shall be strictly adhered to.

3. The Council recognizes the most recent version of the *Rhode Island Soil and Erosion and Sediment Control Handbook*, and its amendments, published jointly by the Rhode Island Department of Environmental Management and the United States Department of Agriculture (USDA), Soil Conservation Service (SCS) as containing appropriate "Best Management Practices" (BMP) for use within the CRMC's jurisdiction. All erosion and sediment control plans shall be consistent with this manual. Applicants are also encouraged to consult the most recent version of the *Rhode Island Stormwater Design and Installation Standards Manual* during the preparation of their erosion and sediment control plan in order to ensure consistency with the Council's stormwater management requirements (Section 300.6).

4. Routine filling, removing, or grading of bulk materials (e.g., coal, salt, etc.) that occurs as part of the normal operations of an existing bulk transfer facility (e.g., the Port of Providence) which is adjacent to Type 6 waters is excluded from the provisions of this section provided that all filling, removing, or grading activities are done in accordance with all applicable guidance manuals which specify the appropriate best management practices for Rhode Island. Any filling, removing, or grading that will result in a modification of an existing bulk transfer facility's infrastructure shall be subject to the policies and standards in this section.

~~B~~ C. PROHIBITIONS

1. Filling, removing, or grading is prohibited on beaches, dunes, undeveloped barrier beaches, coastal wetlands, cliffs and banks, and rocky shores adjacent to Type 1 and 2 waters unless the primary purpose of the alteration is to preserve or enhance the feature as a conservation area or natural buffer against storms.

2. Filling, removing, or grading on coastal wetlands is prohibited adjacent to Type 1 and 2 waters, and in coastal wetlands designated for preservation adjacent to Type 3, 4, 5 and 6 waters, unless a consequence of an approved mosquito-control ditching project (Section 300.12).

3. On-site beach materials (cobbles, sand, etc.) may not be used as construction material.

4. Mining is prohibited on coastal features.

~~C~~D. STANDARDS

1. The following standards apply in all cases where filling, removal, or grading is undertaken:

   (a) Fill slopes shall have a maximum grade of 30 percent.
   (b) All excess excavated materials, excess fill, excess construction materials, and debris shall be removed from the site and shall not be disposed in tidal waters or on a coastal feature.
   (c) Disturbed uplands adjacent to a construction site shall be graded and re-vegetated or otherwise stabilized to prevent erosion during or immediately after construction. Nutrients shall be applied at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters.
   (d) Removal or placement of sediments along jetties or groins may be permitted only as part of an approved dredging or beach nourishment project (see Section 300.9).
   (e) All fill shall be clean and free of materials which may cause pollution of tidal waters.
   (f) Cutting into rather than filling out over a coastal bank is the preferred method of changing upland slopes.
   (g) Avoid alteration, to the extent practicable, of areas that are particularly susceptible to erosion and sediment loss.
   (h) Site development in order to protect and preserve areas that: 1) provide important water quality benefits; 2) serve as natural drainage systems; 3) are particularly susceptible to sediment loss; or, 4) serve as riparian or aquatic habitats.
   (i) Limit increases in impervious surfaces, except where necessary.
   (j) Limit land disturbance activities such as clearing and grading, and cut and fill to reduce erosion and sediment loss and, to the extent practicable, retain sediment onsite during and after construction.
   (k) Limit disturbance of natural drainage features and conveyance systems.
   (l) Limit disturbances to natural vegetation whenever possible.
   (m) Limit the application, generation, and migration of toxic substances and ensure that toxic substances are properly stored and disposed of onsite in accordance with all applicable federal, state, and local requirements.

2. The following upland and shoreline earthwork standards shall be required in those cases where the Council determines that additional measures are warranted in order to protect the environment of the coastal region. Such requirements shall be listed on Assents as stipulations.

(a) For Earthwork on shoreline features:

(1) Prior to initiation of construction, the contractor ~~shall~~ may be required to meet on-site with the CRMC staff to discuss and clarify the conditions of the permit.
(2) A re-vegetation plan shall be submitted for review and approval when construction is undertaken on a barrier beach. This plan shall describe plant material, methods of planting, time of planting, soil amendments, and maintenance.
(3) Construction materials and excavated soils shall not be placed or stored on any shoreline feature excepting developed barrier beaches and manmade shorelines.
(4) All disturbed soils shall be graded smooth to a maximum 3:1 slope and re-vegetated immediately after construction, or temporarily stabilized with mulch, jute matting, or similar means until seasonal conditions permit such re-vegetation.
(5) In sensitive areas, work shall be carried out from areas above slope from coastal features. ~~Machinery~~ Construction equipment shall normally not be allowed to operate on a coastal wetland. For unavoidable work on a coastal wetland, a protective cover shall be deployed to minimize disturbance.
(6) In instances where the CRMC permits temporary disturbance of a coastal feature, shoreline slope, buffer zone, or area of beach grass, the disturbed area shall be completely restored by the owner under the guidance of CRMC staff.
(7) Concrete structures which will come in contact with salt water shall be constructed with concrete which utilizes a Type II or Type V air-entraining Portland cement or an equivalent that is resistant to sulfate attacks of seawater.

(b) For upland earthwork, measures shall be taken to minimize erosion:

(1) A line of staked hay bales or other erosion-preventing devices (including diversion ditches, check dams, holding ponds, filter barrier fabric, jute or straw mulch) shall be placed at the downslope perimeter of the proposed area of construction prior to any grading, filling, construction, or other earthwork. Hay bales shall be toed in to a depth of 3 to 4 inches, and maintained by replacing bales where necessary until permanent re-vegetation of the site is completed. No soils or other materials are authorized to ~~should~~ pass beyond the bale line.
(2) All slopes shall be returned to the original grade unless otherwise specified.
(3) Where natural or manmade slopes are or have become susceptible to erosion, the slopes shall be graded to a suitable slope and re-vegetated with a thick rooting brush vegetation. Mulch shall be applied as necessary to provide protection against erosion until the vegetation is established.

(4) Construction shall be timed to accommodate stream and/or runoff flow and not allow flows over exposed, un-stabilized soils, or into or through the excavation. Flows shall not be restricted in such a manner that flooding or inhibition or normal flushing occurs.
(5) Any pumping of groundwater which may be necessary for de-watering shall be discharged into sediment traps consisting of a minimum of staked hay bale rings enclosing crushed stone or trap rock of a size sufficient to disperse inflow velocity. Hay bales shall be recessed 4 to 6 inches into the soil and maintained.
(6) There shall be no discharge of sediment-laden waters into storm drains. Storm drains shall be surrounded by staked hay bales to intercept sediment.

(c) For any disturbance of steep slopes (over 15 percent):

(1) Where such construction is allowed, the following shall be observed: (1) no fill shall be allowed on the slope; (2) excavation shall be kept to an absolute minimum; and (3) vegetative cover on the slope shall be permanently maintained to the maximum extent physically possible.
(2) Where the potential for damage to a slope exists from runoff, staked hay bales, berms, or similar diversions shall be placed at the top and toe of the slope. Collected water shall be suitably discharged through properly constructed drains or swales. Wherever possible, drainage swales shall be constructed along and adjacent to property lines so as to avoid drainage onto adjacent properties. Swales shall be capable of handling runoff from a 10-year-rainfall occurrence.
(3) For excavations on slopes or directly adjacent to coastal features, the excavated materials shall be cast upslope of the trench or excavation so as to minimize downslope runoff of sediment.
(4) Pedestrian access over steep shoreline slopes and banks shall be in the form of field stone or similar stabilized paths or elevated stairs. Access over bluffs shall be with elevated stairs only.

300.6. Treatment of Sewage and Stormwater

A. DEFINITIONS

1. Sewage: The Council has adopted the definition of sewage set forth under Title 46, Chapter 12, Section 1 or the General Laws, to wit: "... any human or animal excremental liquid or substance, any decomposed animal or vegetable matter, garbage, offal, filth, waste, chemicals, acid, dyestuff, starch, coloring matter, oil and tar, radioactive substances and any compound solution, mixture or product thereof, and every substance which may be injurious to public health or comfort, or which would injuriously affect the natural and healthy propagation, growth or development of any fish or shellfish in the waters of this state, or of the

nourishment of the same, or which would injuriously affect the flavor, taste, or value of food of any such fish or shellfish or which would defile said waters or injure or defile any vessel, boat, wharf, pier, or any public or private property upon, in or under said waters or any shore thereof.

For purposes of the Coastal Resources Management Program, "sewage" is further defined to include freshwater discharges including runoff that may significantly alter the salinity of tidal waters or salt ponds. The term "sewage" also includes discharges of heated waters.

2. Individual sewage disposal system (ISDS): any arrangement for sanitary sewage disposal by means other than discharge into a public sewer system.

3. Point source discharges: any conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, container, transport vehicle or vessel from which sewage is or may be discharged.

4. Sewage treatment plants: sewage collection and treatment facilities, including state, municipal, or privately owned and operated collection, pumping, treating, disposal or dispersion facilities designed for the treatment of sewage from residences, commercial buildings, industrial plants and institutions, together with any groundwater, surface water, or surface runoff that may be present in the waste stream.

5. Stormwater runoff: that portion of precipitation that does not naturally infiltrate into the landscape (e.g., without human influence) but rather travels overland as surface flow. It is also commonly referred to as "stormwater". Stormwater runoff can be a significant contributor of pollutants including sediments, bacteria, nutrients (e.g., nitrogen and phosphorus), hydrocarbons (e.g., oil and grease), metals, and other substances which can adversely affect water quality and the coastal environment. In addition, significant discharges of stormwater may alter salinity and thereby adversely impact the coastal environment, especially in poorly flushed estuaries and embayments.

6. Stormwater management plan: A stormwater management plan is a description of the proposed best management practices, detailed site plans, and written narrative that, when implemented, provides protection and restoration of receiving waters by reducing pollutant loadings and other negative impacts associated with changes in land use (i.e., urbanization).

7. Large Projects: For the purposes of the stormwater management requirements contained in this section, large projects are defined as any one of the following: subdivision of six (6) units or more; any structure serviced by an on-site sewage disposal system serving 2000 gallons or more per day; any activity which results in the creation of one (1) acre or more of parking facilities, roadways, or impervious surfaces; all new roads, highways, and bridges; all improvement

projects to roads, highways, and bridges (excluded from these requirements are projects consisting only of pavement resurfacing, minor roadway repairs, or emergency roadway and drainage repairs); any activity which is subject to the RIPDES general permit requirements for construction activities or industrial activities; any activity subject to Section 300.8; any activity subject to Section 300.13; and any activity subject to Section 320.

8. Small Projects: For the purposes of the stormwater management requirements contained in this section, small projects are defined as all new development (residential, commercial, industrial), redevelopment (residential, commercial, and industrial). In addition, activities which are classified as maintenance, and projects which receive a finding of no significant impact (FONSI) are excluded from these requirements.

B. POLICIES

1. It is the Council's policy to maintain and, where possible, improve the quality of groundwater and tidal and salt pond surface waters.

2. It is the Council's policy to minimize the amount of ISDS-derived nitrates and other potential contaminants which may leach into salt ponds and all other Type 1, 2, and 3 waters.

3. Applicants for Assents for ISDSs are encouraged to meet on site with CRMC staff prior to undertaking of ISDS groundwater and soil tests to discuss the location of the system and buffer zones.

4. It is the Council's policy to require the proper management and treatment of stormwater through the preparation and implementation of a stormwater management plan which satisfies the requirements of the RICRMP. All activities which meet the definition of a large project must prepare and implement a stormwater management plan which satisfies the requirements of Section 300.6.E.2.. All activities which meet the definition of small project must satisfy the stormwater management standards contained in Section 300.6.E.3.

5. The most recent version of the *Rhode Island Stormwater Design and Installation Standards Manual* provides the appropriate methods for the preparation of stormwater management plans and the treatment of stormwater with "Best Management Practices" (BMP) within the CRMC's jurisdiction. However, applicants are encouraged to consult other appropriate guidance and technical stormwater design manuals such as Schueler (1987) and Schueler (1992). The Council also recognizes that the most recent version of the *Rhode Island Soil and Erosion and Sediment Control Handbook*, and its amendments, published jointly by the Rhode Island Department of Environmental Management and the United States Department of Agriculture (USDA), Soil Conservation Service (SCS) provides additional guidance and supplemental information with respect

to the management and treatment of stormwater.

6. After construction has been completed and the site has been permanently stabilized, the average annual total suspended solid loadings (TSS) shall be reduced by 80 percent. In addition, to the maximum extent practicable, the post development peak runoff rate and the average volume from 2-year, 25-year, and 100-year storm events shall be maintained at pre-development levels unless: i) the applicant has obtained local or state approval which certifies that the existing storm drain system has the capacity to accommodate the additional stormwater runoff; or ii) the stormwater runoff is conveyed, preferably without hardened channels, non-erosive to tidal waters.

7. All stormwater management plans required by the Council should clearly describe the Best Management Practices (BMP) as found in the most recent version of the *Rhode Island's Stormwater Design and Installation Standards Manual* that will be used to treat and mitigate adverse environmental impacts associated with stormwater runoff. In addition, all stormwater management plans shall take into consideration all potential impacts associated with the discharge of stormwater runoff into the coastal environment. Potential impacts include, but are not limited to, the following: (i) impacts to coastal wetlands such as changes in species composition due to the introduction of freshwater to high marsh areas; (ii) changes in the salinity of receiving waters; (iii) thermal impacts to receiving waters; (iv) effects of introducing stormwater runoff to receiving waters that has low dissolved oxygen concentrations; and (v) other potential water quality impacts.

8. All sites should be planned, designed, and developed in order to: (1) Protect areas that provide important water quality benefits and/or are particularly susceptible to erosion and sediment loss; (2) limit increases of impervious surface areas, except where necessary; (3) limit land disturbance activities such as clearing and grading and cut and fill to reduce erosion and sediment loss; and (4) limit disturbance of natural drainage features and vegetation.

C. PREREQUISITES

1. Applicants for Council Assents to construct, alter, or extend individual sewage disposal systems or point source discharges shall first obtain a permit from the Department of Environmental Management.

2. All federal water pollution control requirements established by the Federal Water Pollution Control Act (Clean Water Act), as amended, or established by the federal government or by any state or local government pursuant to such act, are the water pollution control requirements of the Rhode Island Coastal Resources Management Program. Accordingly, all discharge standards, effluent limitations and/or pretreatment standards established pursuant to the Clean Water Act for discharges of pollutants to the waters of Rhode Island under the Rhode Island

Pollutant Discharge Elimination System (RIPDES) shall be met (Rhode Island is an EPA delegated state with respect to the NPDES program). In addition, applicants shall obtain an Underground Injection Control (UIC) permit from the Rhode Island Department of Environmental Management when applicable. Applicants subject to RIPDES general permit requirements for construction activities and industrial activities shall apply to the Council prior to submitting an application to the RIDEM.

3. The Council shall formally review proposed actions only after all other applicable state/local requirements have or will be met. However, the Council will comment on preliminary plans for major facilities to assist in the planning process.

D. PROHIBITIONS

1. Point source discharges of sewage and/or stormwater runoff are prohibited on unconsolidated coastal banks and bluffs.

2. New and enlarged stormwater discharges to the high salt marsh environment bordering Type 1 and Type 2 waters and within salt marshes designated for preservation which border Type 3,4,5, and 6 waters are prohibited. Stormwater discharges to existing well flushed tidal channels within high marshes shall not be subject to this prohibition. However, all such discharges shall meet the standards contained in Section 300.6.E.2.

E. STANDARDS

1. For individual sewage disposal systems (ISDS):

   (a) See standards given in "Filling, Removing, or Grading" (Section 300.2).
   (b) Grading around the ISDS shall direct the flow of surface runoff water away from the ISDS.
   (c) Subdrains constructed to lower groundwater levels in an area where an ISDS shall be built shall (1) have a minimum pipe diameter of 6 inches, (2) have no piping located between the anticipated ISDS and the shore, (3) be constructed so as to prevent clogging by soil fines, and (4) have outfalls suitably protected against shoreline erosion and scour.
   (d) When existing buildings are changed from seasonal to year-round use, or expanded by adding one or more rooms, certification shall be obtained from the Department of Environmental Management's ISDS Office that the existing ISDS is capable of treating sewage effluent adequately.
   (e) Connections to ISDSs and cesspools that are abandoned shall be removed, blocked, or otherwise disconnected, and abandoned cesspools and septic tanks shall be pumped dry and filled with clean fill.
   (f) Where necessary, barriers shall be constructed to prevent vehicles from passing over septic systems.

2. Stormwater Management for Large Projects

(a) All stormwater management plans shall be consistent with the Best Management Practices (BMP) and the stormwater design and performance standards found in the *Rhode Island Stormwater Design and Installation Standards Manual*. In addition, all stormwater management plans shall take into consideration all potential impacts associated with the discharge of stormwater runoff into the coastal environment. Potential impacts include, but are not limited to, the following: (i) impacts to coastal wetlands such as changes in species composition due to the introduction of freshwater to high marsh areas; (ii) changes in the salinity of receiving waters; (iii) thermal impacts to receiving waters; (iv) effects of introducing stormwater runoff to receiving waters that has low dissolved oxygen concentrations; and (v) other potential water quality impacts.

(b) After construction has been completed and the site is permanently stabilized, the average annual total suspended solid loadings (TSS) shall be reduced by 80 percent. In addition, to the maximum extent practicable, the post development peak runoff rate and the average volume from 2-year, 25-year, and 100-year storm events shall be maintained at pre-development levels unless: i) the applicant has obtained local or state approval which certifies that the existing storm drain system has the capacity to accommodate the additional discharge of stormwater runoff; or ii) the stormwater runoff is conveyed, preferably without using hardened channels, ~~non-erosive~~ in a non-erosive manner to tidal waters.

(c) The discharge from any stormwater facility must be conveyed through properly constructed watercourses to provide for non erosive flows during all storm events. The proposed stormwater conveyance system consisting of open channels, pipes, etc. shall, at a minimum, accommodate the runoff associated with a 10-year storm event or greater if required by other local, state, or federal regulations. These stormwater conveyance systems shall provide for non-erosive flows to receiving waters.

(d) All stormwater detention basins shall be constructed to safely withstand or pass through the discharge from the 100-year runoff flows from the contributing drainage area. Specifically, detention basins shall be constructed to "withstand" the 100-year runoff flows and shall be capable of controlling these flows without failure or damage to the basin and/or detaining berms. Certification by the design engineer as to meeting this requirement shall be provided on the design plans for the proposal.

(e) New or enlarged stormwater discharges to salt marshes and well flushed tidal channels within high marshes shall only be permitted when the applicant can clearly demonstrate that no reasonable alternatives exist (e.g., no other discharge locations having a gravity flow outlet are available and impervious surfaces have been kept to an absolute minimum) and when no adverse impacts to the salt marsh environment will result. In these instances, the applicant shall, at a minimum, meet all applicable standards contained in the *Rhode Island Stormwater Design and Installation Standards Manual*. This

standard does not apply to low salt marsh environments with an average width along the property of less than 35 feet.

(f) If the Council determines that any proposed stormwater discharge will result in an unacceptable discharge of pollutants to the waters of Rhode Island, the Council shall require the applicant to mitigate the pollutant loads to acceptable levels. Frequently, this can be accomplished using appropriate Best Management Practices in series in order to achieve higher pollutant removal efficiencies.

(g) Whenever possible, existing natural vegetation shall be left intact along natural drainage easements so as to minimize bank erosion.

(h) No connections to storm, surface, or subsurface drains shall be made to either a individual building sanitary sewer or individual (on-site) sewage disposal system (ISDS), nor shall any such drains be constructed within 25 feet of an existing ISDS.

(i) Wet ponds must have a permanent pool volume equal to the water quality volume calculated by multiplying one-inch by the impervious surface area.

(j) Extended detention dry ponds must detain the water quality volume over a 36-hour period (brim draw-down time).

(k) Infiltration methods must be designed to retain and exfiltrate the water quality volume over a maximum 72-hour period.

(l) During the preparation of the stormwater management plan, the applicant shall: 1) protect areas that provide important water quality benefits and/or are particularly susceptible to erosion and sediment loss; 2) limit increases of impervious surface areas, except where necessary; 3) limit land disturbing activities to reduce erosion and sediment loss; and 4) limit disturbances of natural drainage features and vegetation.

(m) All stormwater management plans shall have a maintenance plan which satisfies the recommended maintenance procedures outlined in the most recent version of the *Rhode Island Stormwater Design and Installation Standards Manual*.

3. Stormwater Management for Small Projects

(a) The post development loadings of average annual total suspended solid (TSS) loadings shall be reduced such that the post development loadings are no greater than the pre-development loadings or the average annual TSS loadings must be reduced by 80% after the site has been permanently stabilized.

(b) To the maximum extent practicable, the post development peak runoff rate and average volume shall be maintained at levels similar to pre-development levels.

(c) In order to reduce the inflow of pollutants carried by surface water runoff, all activities or alterations shall be required to minimize and/or mitigate any significant adverse impacts associated with surface runoff from the project. All applicants must provide appropriate measures to this end such as the use of infiltration devices, permeable surfaces, and the use of overland flow.

(d) Concentrated runoff shall be minimized to the maximum extent practicable. The use of sheet flow through natural vegetated areas shall be employed whenever practicable to prevent erosive flows. All drainage structures shall be designed to adequately convey the runoff from a ten year storm event at a minimum or the design storm as specified by local municipalities if it is greater than a ten year storm event. The design of any drainage structure shall consider all impacts on adjacent properties and mitigate any adverse impacts.

(e) Whenever possible, existing natural vegetation shall be left intact along natural drainage easements so as to minimize bank erosion.

(f) No connections to storm, surface, or subsurface drains shall be made to either a individual building sanitary sewer or individual (on-site) sewage disposal system (ISDS), nor shall any such drains be constructed within 25 feet of an existing ISDS.

(g) When applicable, the design and installation standards contained in Section 300.6.E.2 shall be met and the management of stormwater from small projects shall be consistent with the BMPs and the design and installation standards contained in the most recent version of the *Rhode Island Stormwater Design and Installation Standards Manual.*

4. For catch basins:

(a) Catch basins shall be employed when necessary to reduce runoff-induced infiltration of particulates into water bodies.

(b) A maintenance and cleaning program for catch basins shall be detailed.

(c) Catch basins shall have a minimum sump depth of 3 feet.

(d) Wherever possible, catch basins with permeable sides and/or bottoms shall be used so as to minimize outflow.

5. For outfalls:

(a) Work on outfalls, drainage channels, etc., shall proceed from the shoreline toward the upland in order that no unfinished or un-stabilized lower channel portions be subjected to erosion-producing velocities from upstream. If this cannot be accomplished, all flow shall be diverted from the unfinished areas until stabilization is completed.

(b) Where possible, outfall pipe slopes shall be designed for an exit velocity of less than 5 feet per second.

(c) Screens or grates shall be placed over the end of large outfalls to trap debris.

(d) Beaches or other coastal features in front of outfalls shall be returned to original grade.

(e) Riprap placed on beaches shall not increase the grade of the beach higher than one foot in order to maintain lateral access below mean high water.

(f) Riprap shall be compact, hard, durable, angular stone, with an approximate unit weight of 165 lbs./cubic foot.

(g) Riprap shall be placed with an adequate bedding of crushed rock or other suitable filtering material.

300.13. Public Roadways, Bridges, Parking Lots, Railroad Lines and Airports

A. DEFINITION

1. For the purposes of this program, public roadways shall be defined as all roadways other than private driveways used to access either public or private roads.

2. The requirements of this section apply to all new roadways, highways, bridges, parking lots, railroad lines, and airports. Alterations and improvements to roadways, highways, bridges, parking lots, railroad lines, and airports are subject to the erosion control requirements contained in this section and Section 300.3.. Alterations and improvements to roadways, highways, bridges, parking lots, railroad lines, and airports that result in new stormwater discharges or increase stormwater discharge volumes beyond pre-development levels are subject to the stormwater management requirements contained in Section 300.6 (excluded from these requirements are projects consisting only of pavement resurfacing, minor roadway repairs, or emergency drainage repairs).

B. PROHIBITIONS

1. The construction of new public transportation facilities in tidal waters and on coastal features is prohibited with the following exceptions:

   (a) construction on developed barrier beaches may be permitted, subject to the requirements of Section 210.2;
   (b) unpaved vehicle trails and parking areas may be permitted on undeveloped barrier beaches (Section 210.2); and
   (c) construction may be permitted on manmade shorelines subject to the requirements of Section 210.6.

C. POLICIES

1. All roadways, highways, parking lots, railroads lines, and airports shall be planned, sited, and designed to:

   i) protect areas that provide important water quality benefits or are particularly susceptible to erosion and sediment loss;
   ii) limit land disturbances such as clearing and grading and cut and fill to reduce erosion and sediment loss;
   iii) limit disturbances of natural drainage features and vegetation; and,
   iv) limit the increase of impervious surface areas, except where necessary.

2. All bridge structures shall be sited, designed, and maintained so that sensitive coastal habitat areas such as coastal wetlands and areas providing important water quality benefits are protected from adverse effects.

D. STANDARDS

1. See standards given in "Filling, Removing, or Grading of Shoreline Features" (Section 300.2).

2. Permeable materials shall be utilized, where practicable, to surface roadways and parking lots on shoreline features adjacent to Type 1, 2, and 3 waters.

3. Applicants shall reduce erosion and, to the maximum extent practicable, retain sediment on-site during and after construction. Applicants shall prepare and implement an erosion and sediment control plan in accordance with all of the policies and standards contained in Section 300.2.

4. Applicants shall prepare and implement a stormwater management plan in accordance with the policies and standards contained in Section 300.6.

5. See the standards contained in "Treatment of Sewage and Stormwater (Section 300.6)".