I. INTRODUCTION

What is an Onsite Wastewater Management Plan?

An Onsite Wastewater Management Plan (OWMP) is a toolbox of strategies designed to ensure the proper design, location, construction, function and maintenance of onsite wastewater treatment systems. In RI onsite wastewater treatment systems are commonly referred to as ISDS and include both septic systems and cesspools. When properly developed and implemented an OWMP can help preserve and improve the quality of valuable ground and surface water resources, and provide a cost-effective alternative to municipal sewers. The Foster/Scituate OWMP contains the following principal components:

1. Public outreach, education and technical assistance plan.
2. A septic system inspection and maintenance program.[1]
3. Summary of zoning and subdivision provisions related to septic system setbacks and performance standards.
4. A financial incentive program for the repair and upgrade of failing and substandard systems.

This OWMP also describes the nature of the problem, the impact of failed septic systems on ground and surface water and analyzes the causes of system failures. Furthermore, the Plan discusses the projected costs associated with the implementation of the OWMP and provides an environmental and economic perspective on the use of septic systems. The Scituate Reservoir Watershed Management Plan[2] and the Comprehensive Plan of each town support the development of the Foster/Scituate Onsite Wastewater Management Plan.

Why Develop an OWMP?

There are two main reasons to develop an OWMP. First, such a plan and accompanying ordinance and/or education program is designed to protect ground and surface waters by preventing pollution from failing and sub-standard septic systems. Secondly, once the OWMP has been approved by the state, the towns become eligible for the Community Septic System Loan Program (CSSLP). This program provides 4% loans for septic system repairs to residents that are repayable over a 10-year period. This enables families who might otherwise not be able to afford it to repair and upgrade their septic systems. This protects public health, the environment and the owner's investment in his or her property.

The program was developed by RI Clean Water Finance Agency (CWFA) in cooperation with the RI Department of Environmental Management. In order to qualify for CSSLP a municipality must first receive a Certificate of Approval from RIDEM for its Onsite Wastewater Management Plan.

The towns recognize the importance of inspecting, managing and where appropriate, establishing performance standards for septic systems in order to protect ground and surface water resources.

[1] The inspection and maintenance program would be voluntary with the exception of Scituate Village. Here, small lots, high-density housing, onsite wastewater treatment systems and private wells necessitate a mandatory septic system maintenance program.

[2] Scituate Reservoir Watershed Management Plan, December 1990 (element 125 of the State Guide Plan). The Plan recommends that all communities should adopt a mandatory septic system maintenance program within the watershed area.

The Foster/Scituate Onsite Wastewater Management Plan will collaboratively address the existing and potential impact of septic systems on groundwater and surface water quality in the towns of Foster and Scituate.

The focus of this project is on protection of groundwater resources for both individual and public wells, with greatest attention to managing onsite wastewater impact in the areas listed below:

- Community water supply wellhead protection areas (WHPA).
- Village centers, such as the villages of North Scituate, Hope and Clayville.
- WHPAs serving sensitive populations, such as public schools and nursing homes.
- WHPAs serving publicly owned facilities, such as town Halls, libraries, and public works.
- Activities in wetland buffers regulated by town zoning.

Protecting surface waters draining to the Scituate Reservoir, preserving rural environmental quality, and strengthening the economic viability of historic villages are secondary goals that are supported by the project.

What are RIDEM Plan Criteria?

Communities wishing to be approved for CSSLP financing must first meet RIDEM's established minimum criteria for OWMPs, which include the following:

1. A description of the management area.
2. A description of the community assistance plan for septic system repair and replacement.
3. Methods to encourage regular ISDS maintenance and proper use.
4. Financial analysis.
5. Description of program administration and implementation, including the method and location of septage disposal.

What are the goals of the plan?

The primary goals of the Foster and Scituate OWMP are to:[3]

- Protect public and private drinking water and other surface and groundwater resources through septic system inspection and management.
- Enable residents of the towns to qualify for low interest loans for septic system repair and replacement through the CSSLP.
- Through education, incentives and, where appropriate, regulations, help to ensure that all ISDS in Foster and Scituate are properly operated, regularly inspected, and routinely maintained to prevent system malfunction, insure maximum system longevity and reduce long term repair costs.
- Identify problem areas for ISDS functioning within the towns.
- Summarize ISDS issues, initiatives, goals, and regulations of local importance.

II. DESCRIPTION OF THE MANAGEMENT AREA

n Section III B and C of this plan.

A. OVERVIEW

Septic systems, when properly designed, installed and maintained, provide an efficient means for treating onsite wastewater. A program for the inventory, inspection and maintenance of septic systems within the towns provides an effective means for helping to maintain and, where necessary, improve the quality of ground and surface water. In rural towns such as Foster and Scituate, onsite treatment systems are more cost effective than sewers and in keeping with the towns' rural preservation initiatives. Conversely, improperly managed and maintained septic systems are a major cause of ground and surface water contamination.

The Foster/Scituate Wastewater Management Area encompasses all of Foster and Scituate. Together the two towns total just over 100 square miles (Foster 51.87, Scituate 54.79). Open water, primarily associated with the Scituate Reservoir, accounts for approximately 7 square miles of this total (Foster 0.73 Scituate 6.11).

The Providence Water Supply Board owns 14,579 acres in Scituate and 2,154 acres in Foster. The remaining land, however, must be managed by each town in order to ensure the long-term protection of ground and surface water quality for both private and public use. Although no one in the towns of Foster or Scituate derives their water from the Scituate Reservoir, it provides drinking water to an estimated 600,000 persons or roughly 57% of Rhode Island's population.[4]

Foster: Foster is home to 4,274 people. With a population density of 84 persons per square mile is one of the least populated communities in RI.[5] About two-thirds of Foster is within the watershed of the Scituate Reservoir. Over 88% of Foster is forested and about 80% is characterized as hilly.[6] According to the 2000 census there are 1,578 housing units, an increase of 53 units from 1990. Town records based on building permits indicate that there are 1,700 units. The majority of these (1,512) are single-family units.[7] According to the tax assessor's data there are 17 trailers and the total number of commercial and industrial uses are 47 and 3, respectively.[8] There are an estimated 1,650 ISDS in Foster.[9] Approximately 880 housing units (55.8%) predate ISDS regulations, and unless they have been subsequently upgraded are likely to be cesspools or another form of antiquated waste disposal.[10] In about the past 10 years there were 64 ISDS repairs and 10 alterations in the town of Foster.[11]

Scituate: Eighty-four percent of Scituate is located within the Scituate Reservoir Watershed. Approximately 50% of the area has soils with a seasonally-high watertable. Scituate's population in

[4] Blodgett, Richard, Providence Water Supply Board, January 2002. Personal communication.
[5] 2000, census figure
[6] RI Economic Development Corporation, 2001 Foster. Rhode Island Community Profile. www.riedc.com/mcds/Foster
[7] Foster tax assessor's data February 2002.
[8] Foster tax assessor's data, February 2002
[9] This figure was calculated using 2000 Census data for residential development and current tax assessor's records for industrial and commercial uses.
[10] RI Economic Development Corporation, Research Division "Five Page 1990 Census Summary."
[11] RIDEM, repair records (Excel spreadsheet) 1990 through April 2001. Repair records are not readily available from the 1970's and 80's.

the year 2000 was 10,324, a 5.39% increase (528 persons) from 1990. With 212 persons per square mile, its population density is about 2.5 times that of Foster. Although population density in both communities is relatively low, a risk of contamination by non-point pollutants exists in localized pockets of high-intensity land uses.

The total number of housing units in Scituate as of April 1, 2000 was 3,904. This represented an increase of 384 units from the 3,520 housing units in 1990. According to the 1990 census 3,108 of these units were single-family, 272 units were in were in 2 to 4 family structures, 17 dwelling units were in 5-9 unit apartments and there were 65 units in apartments housing over 10 units per structure. In addition there were 58 trailers or mobile homes.[12] Although the majority of units in town are single-family, there are a significant number of units where large, common septic systems are likely. Thirty of these were connected to a common septic system in the Village of Hope in the early 1990's. There are an estimated 3970 ISDS in Scituate.[13]

Scituate has a number of substandard and aging septic systems. Approximately 1,690 of the town's 3,268 single-family dwellings (51.7%), 203 of 227 apartment buildings (89.4%), 35 of 53 commercial units (66%) and 9 of 9 industrial uses (100%) were constructed prior to the beginning of the RI septic system regulations.[14] In all likelihood a substantial portion of these systems are cesspools or other type of substandard, aging system with a high potential for failure. In the past decade 222 septic systems in Scituate have been repaired due to failure and 19 upgraded as part of a home expansion project.[15]

B. NATURAL FEATURES

Interrelated features of the natural environment such as topography, geology, soils and hydrology affect the functioning, safe density, design and maintenance of ISDS.[16] Principal characteristics of these features for each town are discussed below.

1. Topography/bedrock outcrop

Septic systems often fail in areas of steep slopes and they must be carefully designed in order to prevent surface breakout. In addition to potential contamination from septic system effluent, construction on steep slopes adjacent to streams may cause runoff and sedimentation into aquatic habitats. Due to their impermeable nature, bedrock outcrops, which are often found in areas of steep slopes, can interfere with the functioning of septic systems.

Foster: In Foster steep slopes occur in the area of Mooseup River/West, Meadow Brook, along Quanduck Brook, Oak Hill, south of the Westconnaug Reservoir, and north of the Barden

[12] According to March 2002 tax assessor's data there are 3,268 single family homes, 227 apartments and 43 combination units.

[13] This figure was calculated using 2000 Census data for residential development and current tax assessor's records for industrial and commercial uses.

[14] Scituate tax assessor data, March 2002.

[15] RIDEM, repair records (Excel spreadsheet) 1990 through April 2001. Repair records are not readily available from the 1970's and 80's

[16] Unless otherwise noted information on the natural features is from the Natural and Cultural Resource section of the Comprehensive Plans of Foster and Scituate.

Reservoir. Most steep slopes are between 15 and 30 percent slope, and a few small areas exceed 30 percent. Bedrock outcrops are found primarily in the southern part of town.

Scituate: Elevations in Scituate range from 200 feet above sea level in the village of Hope to over 700 feet on Chopmist Hill. The main areas of steep slopes are concentrated in the southwest corner of the town, on Chopmist Hill and in the Rocky Hill Road and Huntinghouse Brook areas. There are 6,227 acres of soil where the slopes exceed 15 percent.[17] Bedrock outcrops exist just north of the Westconnaug Reservoir and along the western fork of the Scituate Reservoir.[18]

2. Soils

Different soil types and their accompanying limitations influence site selection and development design. More importantly, soils are an overriding factor in determining suitability for onsite sewage disposal systems. As such, they may determine whether or not development may take place and to some degree the potential impact of that development. Figures 1 and 2 depict soil hydrology for Foster and Scituate. The mapped categories are based on soil permeability and depth to watertable. These factors are crucial when evaluating septic system design, location, and maintenance requirements. The 7 categories correlate with the 4 basic hydrologic groups (A, B, C, D) used by soil scientists to categorize soil permeability and estimate runoff, with A being most permeable and D the least permeable. In the very dry/excessively permeable soils (hydrologic group A), effluent often moves too rapidly through the soil to allow for proper treatment. In Foster and Scituate many of the excessively permeable soils are associated with glacial outwash soils. They are often located adjacent to open water, streams or wetlands, increasing the likelihood that improperly treated waste will reach ground and surface waters. Restrictive soils are those with slow permeability, generally less than 0.2 inches per hour. These often include soils designated by the RI Soil Survey as belonging to hydrologic group C or D. These soils promote runoff and pose a higher risk for septic system failure, especially when a dense hardpan layer restricts the downward movement of water (or effluent). They are depicted on the soil maps as moderately moist, moist or very wet soils. The moderately dry soils with watertable depths of greater than 6 feet also belong to hydrologic group C and are characterized by slow permeability in the substratum. The very wet and many of the moist soils are indicative of wetlands and usually do not meet the minimum ISDS standards for separation to groundwater.

Soils with slow permeability, or impermeable layers, can cause effluent to pond on the ground's surface, presenting a public health threat. The ponded effluent can then flow untreated directly into a surface water body, via overland flow or discharge to a storm drain. High watertables exacerbate the effect of excessive and restrictive permeability on ISDS functioning. High watertables generate high runoff and require septic systems with either large raised leach fields or use of alternative technologies that provide better treatment with less land disturbance. Almost half of the soils in the Scituate Reservoir Watershed are characterized by high watertables. These soils are often located adjacent to streams and act as an extended drainage network into the reservoir.

[17] Scituate Comprehensive Plan, 2003 p G-9
[18] A map depicting bedrock outcrops appears on map G3 in the Scituate Comprehensive Plan.

Foster: According to the Natural Resource Element of the Comprehensive Plan, about 64% of the soils in Foster present constraints in the form of rocks, ledge, wet soils, poor drainage characteristics, or a combination thereof, some of which may be overcome by proper engineering. Excessively permeable soils are found around the Village of Clayville, along the Ponaganset River and along Foster Center Road from just south of Foster Center to the road's intersection with Route 6. Along Foster Road high watertable soils are often located adjacent to excessively permeable soils, providing a potential conduit for poorly treated effluent. In the southwestern corner of the town outwash soils associated with the Mooseup River Valley are also rapidly permeable.

Scituate: Glacial till soils, characterized by high watertables and slow percolation rates characterize most of Scituate. There are 6,665 acres of soil in Scituate with a seasonal high watertable and another 5,316 acres are classified as hydric soils.[19] Consequently, considerable care must be exercised in the location and design of septic systems. The Scituate Comprehensive Plan states that, "depending on the depth of seasonally high watertables in till soils, onsite systems should be prohibited or allowed only in association with a relatively large lot area."[20] Alternative systems can reduce the amount of land disturbance necessary to install septic systems in till soils.

Outwash deposits in Scituate are associated with rapidly percolating soils. They occur in the northern part of town in the vicinity of Lower Huntington Brook and Upper Regulating Reservoir and in the southern part of town, south of the dam along the Pawtuxet River. Soils adjacent to drainage systems in the southeast portion of the town outside of the reservoir watershed also have rapid permeability. Figure G-5 of the Scituate Comprehensive Plan depicts soils with constraints for septic system functioning.

Additional characteristics of the soils as they relate to water quality, land use and sub-watersheds of the Scituate Reservoir are discussed in the section on water quality and supply (II, B4).

3. Wetlands and Watersheds

There are approximately 5,975 acres of wetland in Foster and 5,316 acres in Scituate. Many of the wetlands are located along the drainage ways and associated tracts of high watertable soils depicted in Figures 1 and 2. These drainage systems can serve as conduits for septic-borne contaminants within the groundwater. This is particularly true in areas of higher density housing associated with aging or substandard septic systems or with other problematic land uses.

About one quarter of Scituate watershed land is within 200' of surface waters or tributary streams. These naturally vegetated buffers are critical zones protecting watershed health. If disturbed, these become high-risk areas for direct delivery of pollutants to surface waters.[21]

F*oster:* In Foster, notable areas of wetlands exist in Foster Center and on the north side of Mooseup Valley Road along the Mooseup River and east of Johnson Road. Another large

[19] Scituate Comprehensive Plan, 2003 p G-9
[20] Ibid. p G-10
[21] URI Cooperative Extension, 2003. SWAP Fact sheet Scituate Reservoir Watershed

wetland area exists on the east side of Route 12, north of its intersection with Matteson Road. The Mooseup River system is considered a highly valuable pristine system, and the wetland area in the vicinity of Foster Center has been mapped as critical habitat.[22]

The Scituate Reservoir Watershed and the two feeder reservoirs, the Barden and Westconnaug Reservoirs, occupy roughly the eastern two-thirds of Foster. The other drainage systems in Foster are the Mooseup River/Quanduck Brook located in the southwest portion of the town, and the Flat River Reservoir system (Figure 3).

Scituate: As in Foster, wetlands and adjacent high watertable soils in Scituate tend to follow natural drainage systems, most of which feed into the Scituate Reservoir. Feeder streams include Wilbur Hollow, Westconnaug, Swamp, Cork, Soakhide, Rush, Huntinghouse, Brandy, Quanopaug and Kent. The majority of the town (84%) is located within the Scituate River Drainage System (Figure 4). In the vicinity of Hope below the Gainer Dam, Cranberry and Colvin Brooks drain towards the North Branch of the Pawtuxet River. In the Potterville area Pierce and Boyd Brooks drain towards the South Branch of the Pawtuxet. Critical habitats in Scituate are often associated with streamside habitat and wetlands.[23]

4. Water Quality and Water Supply

The need to protect the water quality of the Scituate Reservoir is a high state priority. Vitally important, especially for residents of Foster and Scituate, is the protection of the estimated 5,000 private wells and 40 public wells. In addition to the Scituate Reservoir many of the towns' lakes, ponds and streams are also fed by surface water runoff. According to the Foster Comprehensive Plan, many of these water resources are connected and can be threatened by inappropriate development or poorly-designed septic systems.[24] These waterbodies enhance the scenic quality of the towns and provide important wildlife habitat and recreational opportunities. Fortunately many of the recommendations of the comprehensive plans and the Scituate Reservoir Watershed Management Plan, such as ensuring the proper design, maintenance and functioning of septic systems, also protect groundwater.

They are no major aquifer or recharge areas in either Foster or Scituate, but there are areas of outwash deposits that could provide a potential source of public water. Due to their high permeability and in some places associated high watertables, these water reserves are also susceptible to pollution. In Foster a large outwash deposit underlies and surrounds the Barden and Westconnaug Reservoirs, Paine Brook, and Foster Center. Other relatively large outwash deposits are located in southwestern Foster and the Mooseup River Valley. Although the water quality in Foster is generally good, there have been localized problem areas (groundwater contamination) and indications of potential problems (apparent degradation of ponds).[25] Scituate's outwash deposits are also alluvial in nature and occur along much of the northern portion of the eastern arm of the Scituate Reservoir, along the Pawtuxet in the vicinity of Hope, adjacent to Ponaganset Road and the villages of Rockland and Clayville, and between Matteson and Burnt Hill Roads.[26]

[22] Critical Resource Atlas http://www.edc.uri.edu/riatlas/town/Maps/small/fo_biodiv.GIF
[23] http://www.edc.uri.edu/riatlas/town/Maps/small/sc_biodiv.GIF
[24] Foster Comprehensive Plan, 1991. Natural Resource Element, p 94
[25] Ibid.
[26] Scituate Comprehensive Plan, 2003 Natural Resource Element, map G-4

The quality of both groundwater and surface water is directly related to land use and soils within the towns. Surface and groundwater throughout most of the two towns are connected. Rainfall seeping into the ground recharges groundwater and gradually flows towards wetlands and streams, providing a source of flow during dry weather and a conduit for water borne pollutants.

SWAP: The University of Rhode Island, as part of a statewide Source Water Assessment Program (SWAP) examined six sub-watersheds of the Scituate Reservoir to evaluate the combined effect of soil constraints and land use on water quality.[27] These include the Regulating and Moswansicut sub-watersheds which flow into the northeast arm of the watershed, the Ponaganset and Barden sub-watersheds which flow from the north into the western arm of the reservoir, the Westconnaug sub-watershed which flows from the south into the western arm and the part of the watershed that drains directly into the main portion of the Scituate Reservoir.[28] Figure 5 highlights the results of this analysis and Figure 6 depicts the accompanying watersheds.

The ability of pollutants to move through soils is a critical factor in determining the risk to ground and surface waters. Permeable soils are susceptible to contaminant movement *through* the soil, while impermeable or shallow soils tend to transport pollutants via surface runoff to nearby water bodies. In Barden sub-watershed approximately 64% of the soils belong to hydrologic group C or D and are characterized by seasonal high watertables and slow permeability. Regulating Reservoir sub-watershed is similar in that over 50% of its soils are characterized as hydrologic group C or D. Due to soil characteristics both of these sub-watersheds have a high risk of pollutant movement**.** In the vicinity of Upper Regulating Reservoir excessively permeable soils are also a potential problem. Degraded water quality is attributed to a combination of poor flushing and watershed land use. In Moswansicut Reservoir about 43% of watershed soils are slowly permeable. This sub-watershed also has the highest percentage of developed land, including significant development close to the reservoir.

Foster: In the Westconnaug sub-watershed, which encompasses the village of Clayville in Foster, 35% of the lots were developed before 1971. In addition, greater than 30% of the soils in this sub-watershed belong to hydrologic group C or D. Groundwater monitoring data collected by the RI Department of Health from 1988 to 1996 document that groundwater is affected by nitrogen inputs. Clayville's soils are primarily well drained and excessively well drained, which can increase the risk of groundwater contamination from effluent.

[27] Providence Water Supply Board and URI Cooperative Extension Source, January 2003 (draft) *Source Water Assessment Plan, Scituate Reservoir*. Additional information on sub-basin descriptions and water quality impact may be found in this report.

[28] Providence Water Supply Board, URI Cooperative Extension, January 2002. Draft Scituate Reservoir Source Water Protection Plan (SWAP).

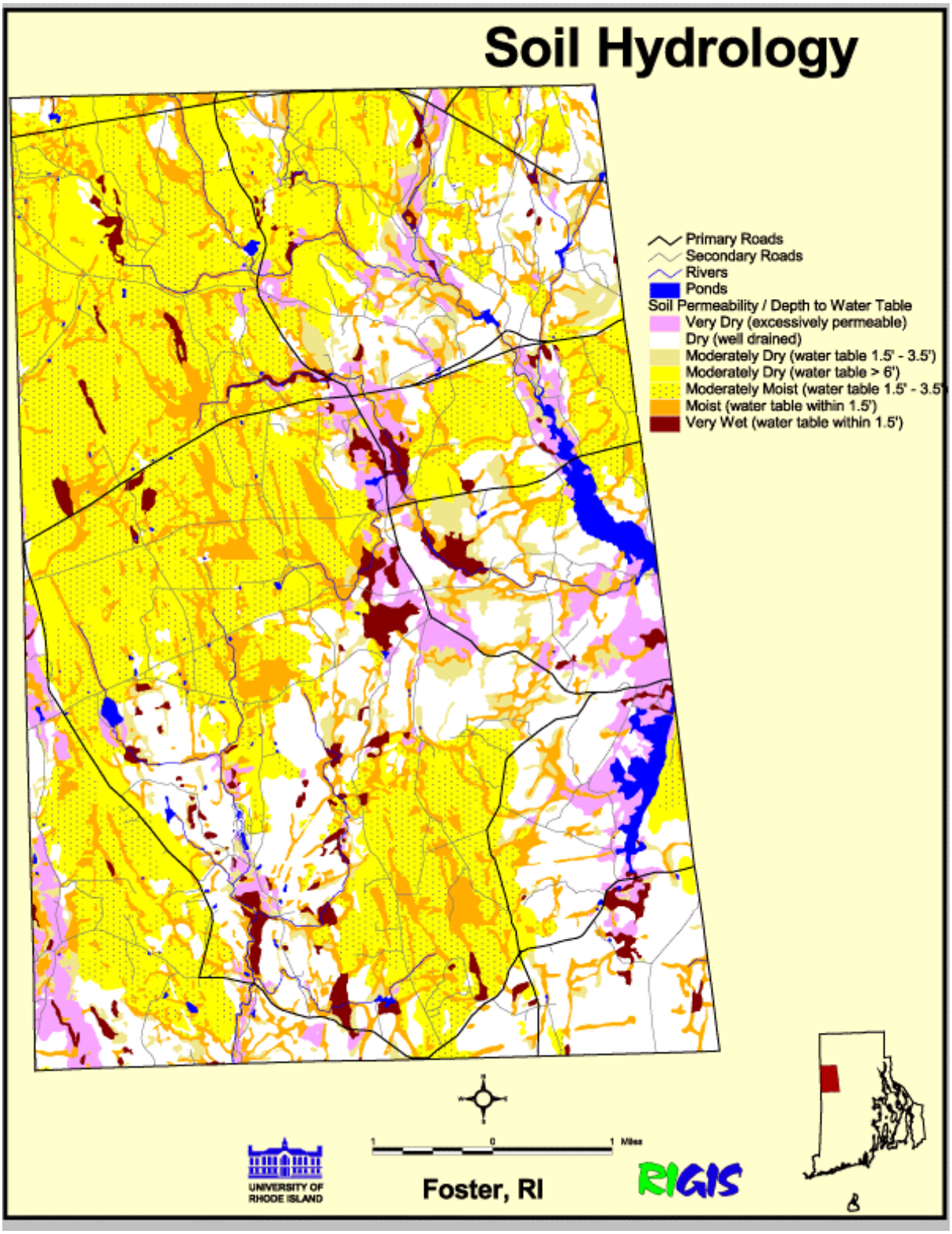

Figure 1: Soil Hydrology Foster, RI

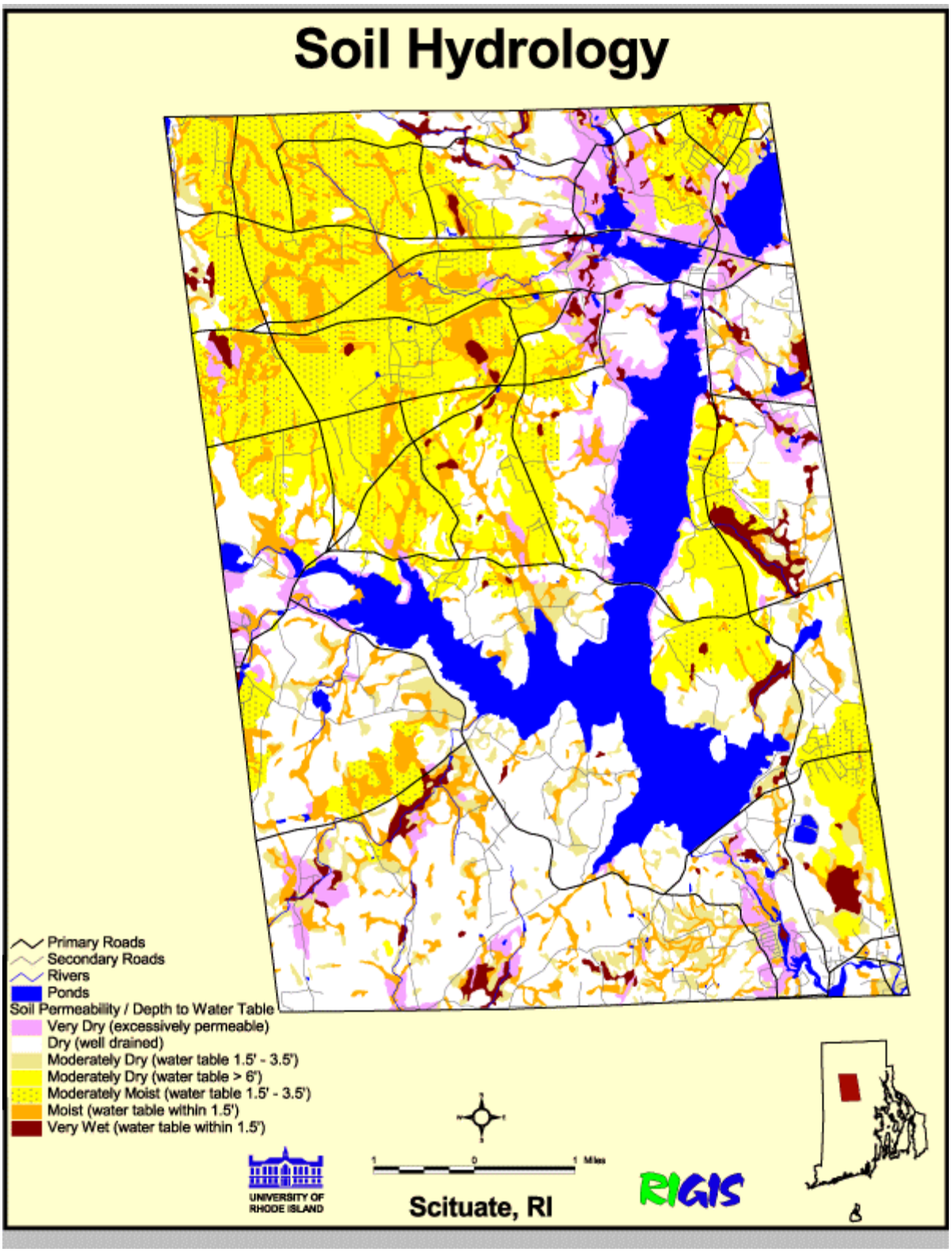

Figure 2: Soil Hydrology Scituate, RI

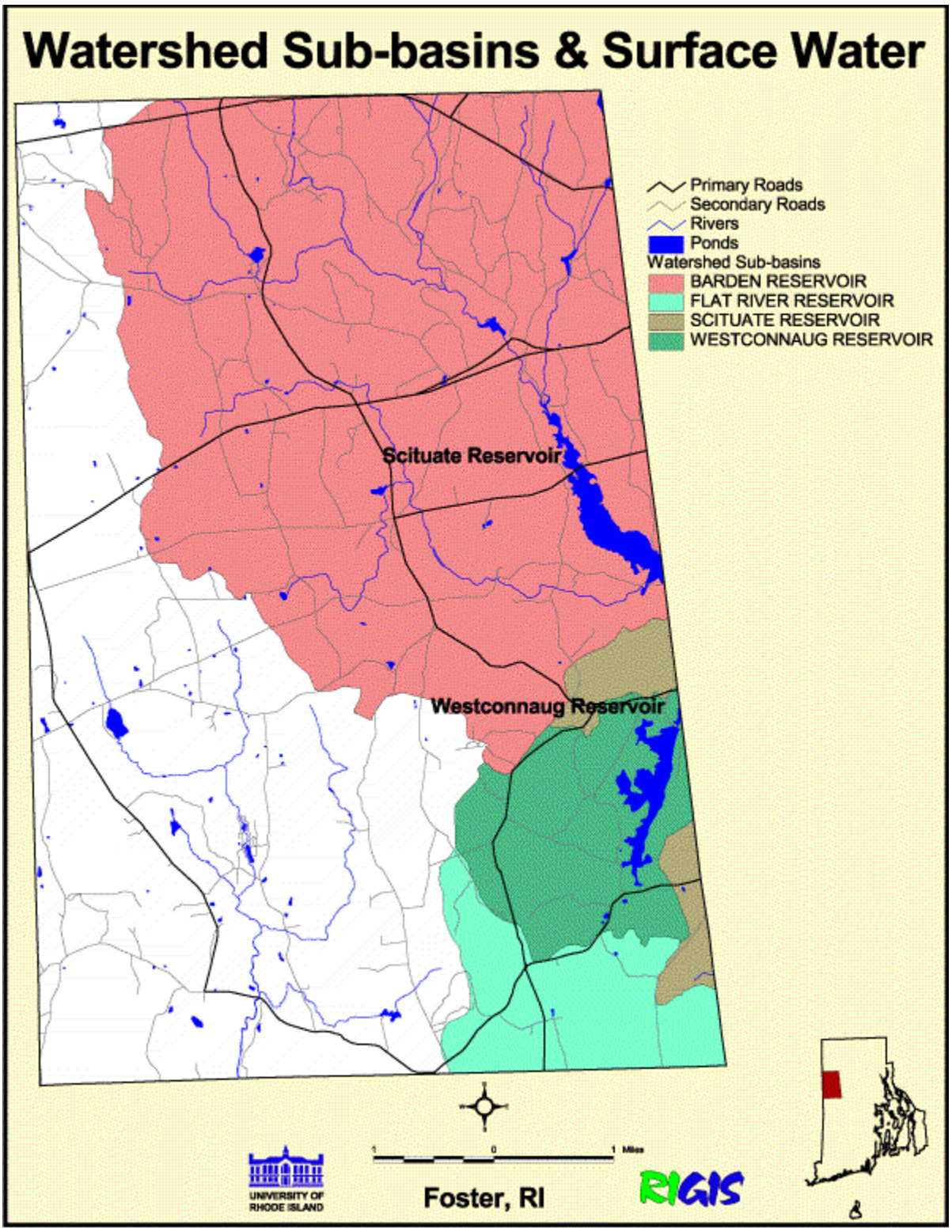

Figure 3: Watershed Sub-basins Foster, RI

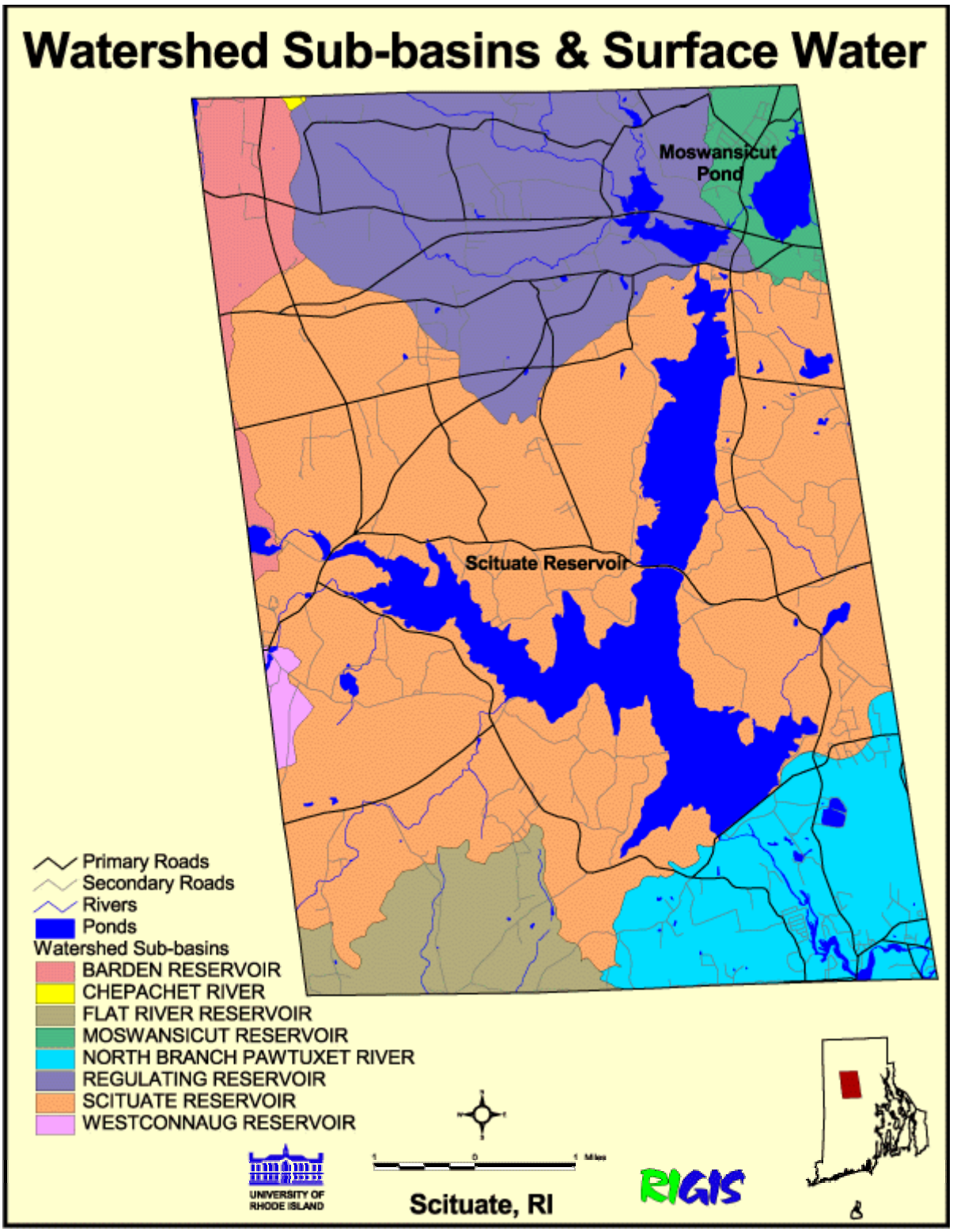

Figure 4:Watershed Sub-basins Scituate, RI

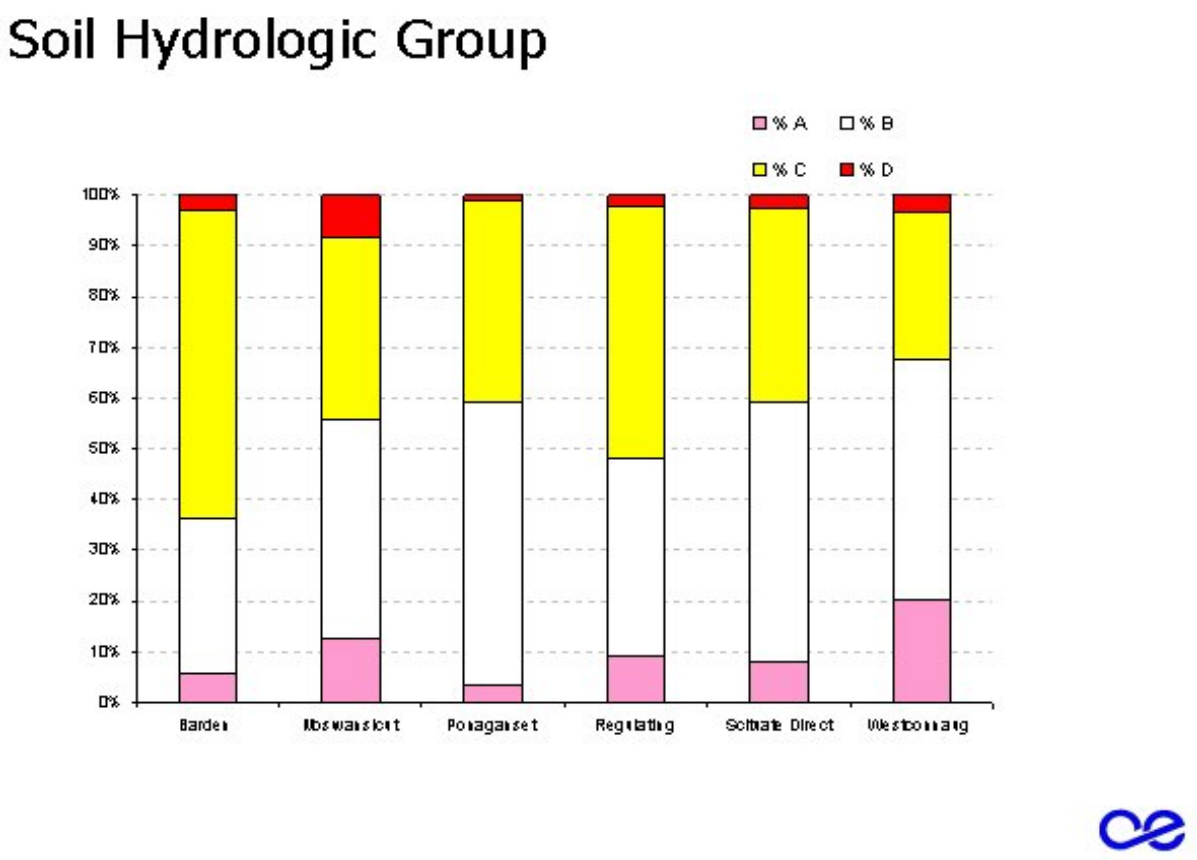

Figure 5 Soil Hydrological Group, URI Cooperative Extension 2002

Scituate: North Scituate Village sits at the critical junction of Lower regulating Reservoir, the Moswansicut and the main Scituate Reservoir. The SWAP Plan notes that Moswansicut and Regulating Reservoirs have elevated levels of sediment, nutrients and bacteria. In addition to problematic soils, likely causes for these problems are poor flushing, mixed commercial development and 1-acre residential clusters along Route 6. At 26 % the Moswansicut also has the highest runoff rate of any of the sub-watersheds.

According to the SWAP Plan aging septic systems in the densely populated village of North Scituate increase the risk of groundwater contamination. North Scituate Village is located within a community wellhead protection area where 70% of the lots were developed before 1971 and may have cesspools or other substandard system. In addition, excessive permeability is a concern in the North Scituate Village wellhead protection area where 36% of the soils are sandy with rapid drainage.[29] Well pollution problems from cesspools and septic systems have been reported in high-density areas in North Scituate and Hope.[30]

[29] University of RI, Cooperative Extension, Scituate Reservoir MANAGE Analysis, (Draft) January 2000.
[30] Scituate Comprehensive Plan, Services and Facilities Element, 2003, p I-14

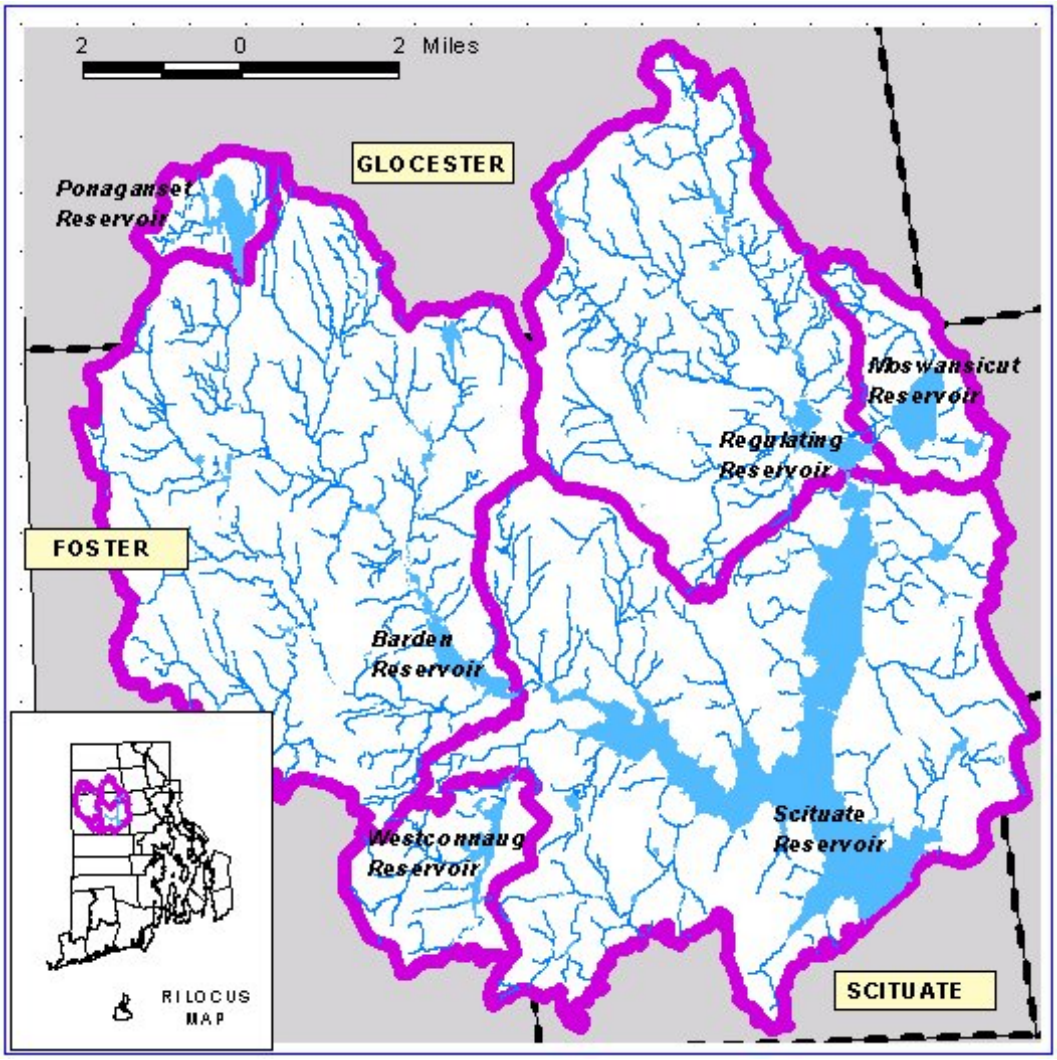

Figure 6 Sub-Basin Map Reservoir Area, URI Cooperative Extension 2003

The SWAP report found that the greatest potential threat from septic systems to water quality was in North Scituate Village where septic systems were estimated to contribute 80% of nitrates entering groundwater. Nitrogen moves easily in surface and groundwater, is indicative of fertilizer and onsite wastewater inputs, and signals the need to upgrade and maintain septic systems. Currently, groundwater quality in the village is acceptable, but there are high nitrogen levels in some of the public wells.[31] One community well in the village of North Scituate has nitrate-nitrogen concentrations of 4.5 mg/l, approaching the 5 mg/l planning threshold. North Scituate elementary school also had elevated nitrate levels.

RI Department of Health testing from 1996 to 2001 shows that nitrate levels in public wells in both Scituate and Foster are elevated above the naturally occurring levels in Rhode Island groundwater, which is typically less than 1 mg/l and often less than 0.2 mg/l. The US Geological Survey considers any nitrogen levels above 1 mg/l as evidence of human influence. Septic

[31] RI Department of Health, Public Well Data, 1996-2001.

system inspection and management in the village of North Scituate can help protect the town's drinking water and save the costly expense of a village-wide water distribution system

Wellhead Protection Areas (WHPAs): There are a more than 40 wellhead protection areas in the two towns as shown in Figures 6 and 7. Most of the WHPAs are clustered in villages or in highway commercial zones. Many of the wells, particularly in Scituate, are located in permeable, outwash soils. Excessive permeability is a concern in the North Scituate Village, WHPA and the Upper Regulating Reservoir sub-watershed. In these areas 36% and 47% of soils, respectively, are sandy with rapid drainage.

According to the Foster Comprehensive Plan, the wellhead protection zones and outwash deposits are considered high constraints. Their use or potential use as public water supplies should be protected with strict performance standards or other land use controls. The Scituate Comprehensive Plan also recommends special septic system regulations for permeable soils that may transport water too quickly without the attenuation of pollutants.[32]

Septic systems should be inspected and maintained in WHPA areas, particularly those:

- Located in village centers
- Serving sensitive populations, such as public schools and nursing homes, and
- Serving publicly owned facilities, such as town Halls, libraries, and public works.

In addition, performance standards for enhanced effluent treatment should be developed for commercial systems in WHPAs and those private systems located in close proximity to the well, as well as in problem soils such as those with high watertables and excessive or restrictive permeability.

C. THE HUMAN ENVIRONMENT[33]

Human factors such as growth, zoning, land use, water and sewer use and treatment plant capacity either directly or indirectly affect the number, location and functioning of onsite sewage disposal systems. Figures 9 and 10 depict the land use of Foster and Scituate respectively.

1. Land Use and Zoning

Foster: Foster is primarily rural in nature with small villages located in Foster Center, Clayville and Mooseup Valley. The minimum lot size in Foster is 4.6 acres, therefore land suitable for subdivision must be at least 9.2 acres. Vacant land large enough to subdivide represents 36% of Foster's land. While almost half (43.4%) of the properties listed in the Foster Tax Assessor's records are used for single-family residences, this accounts for only 11.4% of the actual land use. There are only 22 properties comprising multi-family properties, which comprise 75 units of housing. Thirty of these units are located at Hemlock Village, the town's only senior housing. Primary agriculture accounts for about 700 acres or about only 2.1% of Foster's land use. Many small-scale farms, however, exist on smaller properties. Commercial development is mostly

[32] Scituate Comprehensive Plan, 2003. p G-6

[33] Unless otherwise noted the information contained in this section is from the land use or facilities element of the Foster and Scituate Comprehensive Plan.

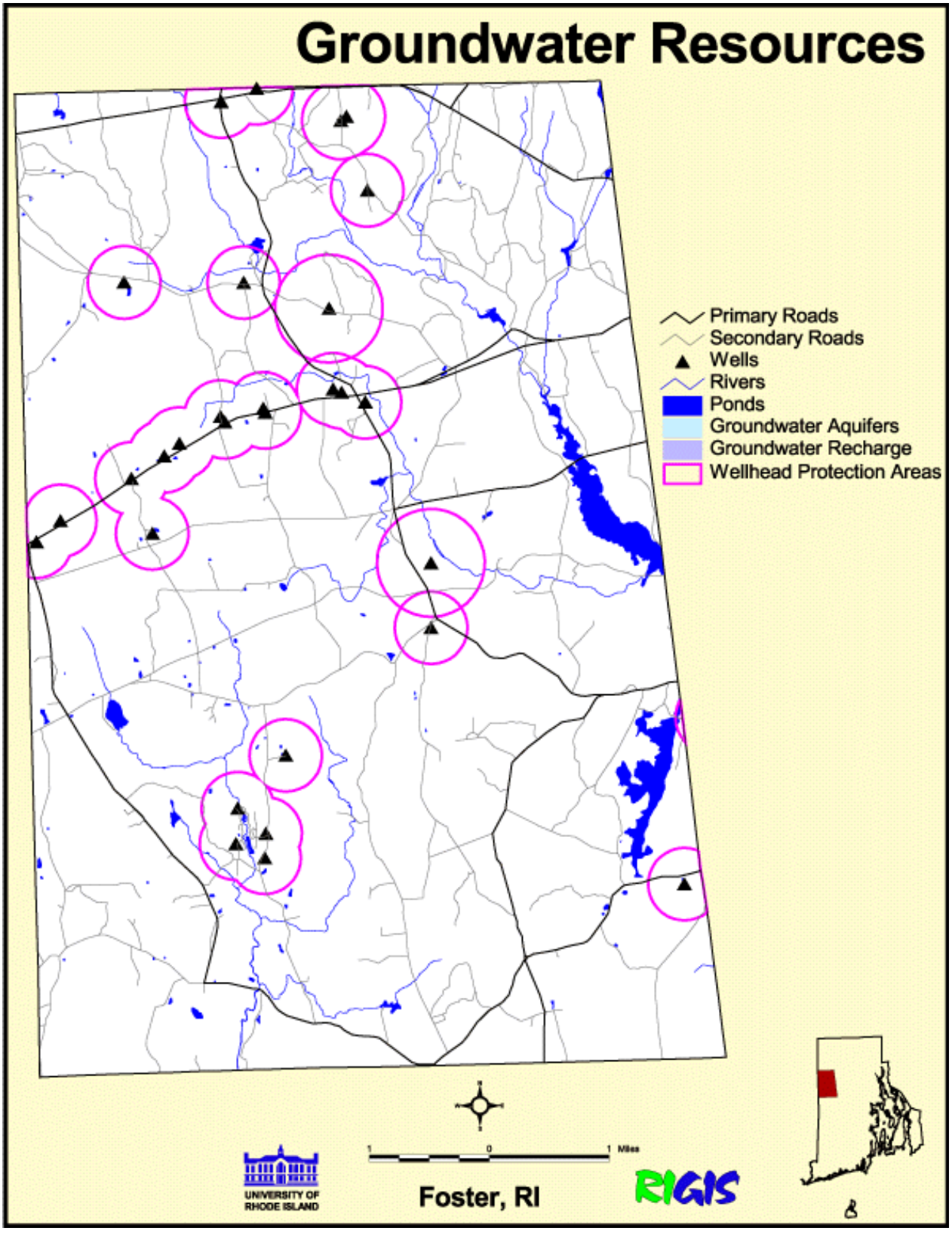

Figure 7: Groundwater Resources Foster RI

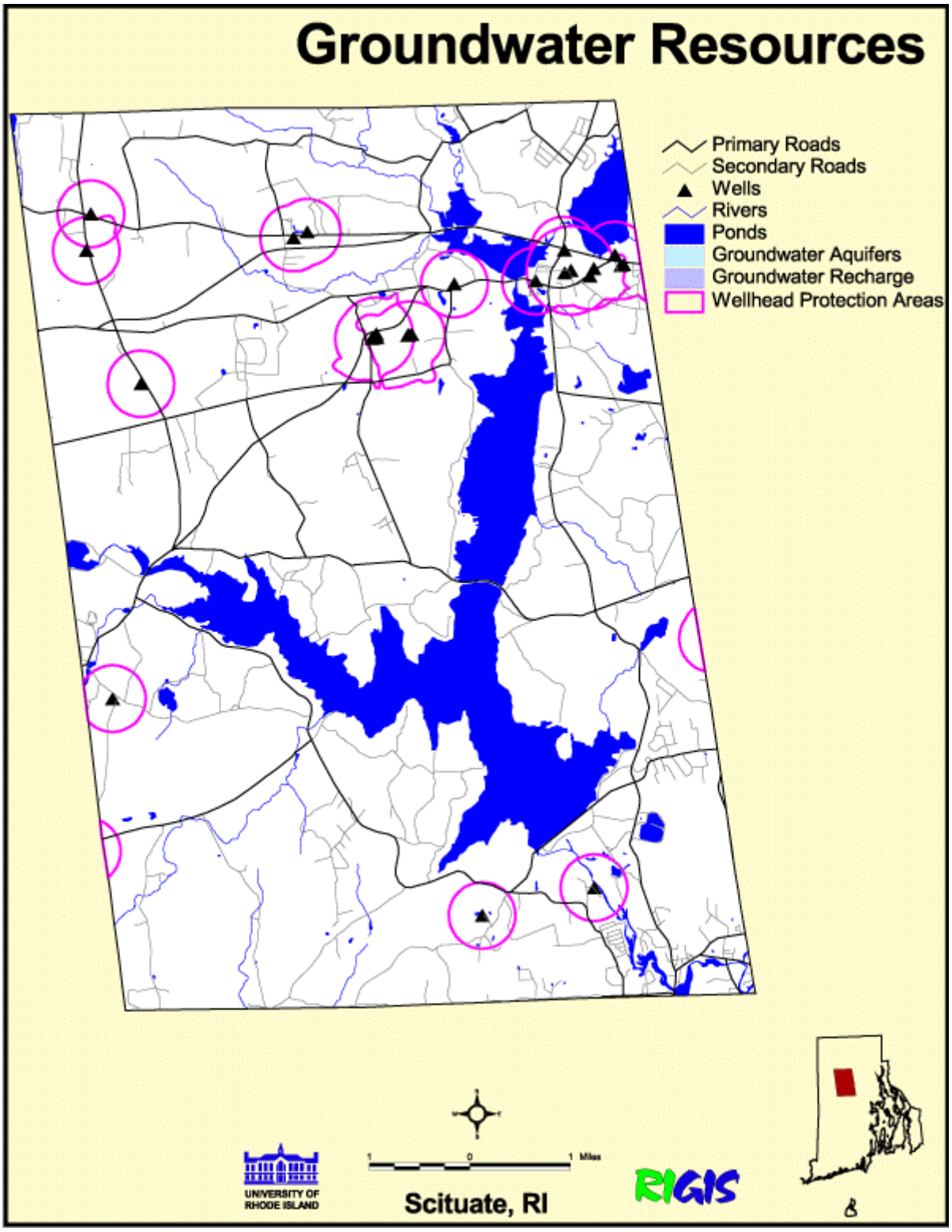

Figure 8: Groundwater Resources Scituate RI

located along Route 6 and over half of the town's commercial establishments are grandfathered non-conforming uses. There are 4 principal small village centers in Foster: Foster Center, Hopkins Mills, Clayville and Mooseup Valley. These areas may be more susceptible to septic system failures due to smaller lot sizes and the relative age of the septic systems. Only three properties in Foster are listed as being used for industrial purposes. The largest of these is Turnquist Lumber Company, the town's largest employer.

The findings of the land use element of Foster's Comprehensive Plan address the fact that the current zoning ordinance is *not* an effective tool in the preservation of the town's unique rural character. Although well intentioned, the current regulations actually *promote* suburban sprawl, strip commercial development, loss of farmland and steady erosion of town character. In addition, the regulations do little to promote the type of growth that will protect water quality.

Scituate: [34] Scituate can be divided into three principal areas: the reservoir land, the villages and rural Scituate. The reservoir and land owned by PWSB covers 14,436 (38%) of the town's 34,000 acres. In addition over 85% of the town is within the reservoir's watershed. There are 9,000 acres of vacant residential land available for development within the watershed and 1,500 acres outside the watershed. Village centers include North Scituate and Hope with smaller village clusters in Clayville and Potterville. Most of the development pressure is on the vacant residential land outside of the village centers, land that in all likelihood will never be sewered. There are an estimated 3,300 homes that could be developed in Scituate.[35] Commercial development is located primarily in North Scituate and along Route 6 between Route 116 and the Johnston Line. There are also a few commercial uses along the Danielson and Hartford Pikes and in the village of Hope. Industry is limited and the principal uses can be found in the Hope Mill.

Scituate Reservoir Watershed Management Plan: The *Scituate Reservoir Watershed Management Plan*, adopted by the RI State Planning Council in 1990, states that the primary challenges facing the Scituate Reservoir Watershed are rapid growth and changing land use patterns. Both Foster and Scituate have adopted rural residential (3 to 4.5-acre minimum lot size) zoning in most of the town. The Scituate Reservoir Watershed Zoning Project was developed to assist the towns of Foster, Glocester and Scituate with the development and implementation of "flexible zoning" to achieve two mutually compatible goals: the preservation of rural character and the prevention of new pollution sources affecting water quality.

Design guidelines and performance standards that permit common wells and alternative septic systems engineered for more than one home can increase the effectiveness of flexible zoning. Development can be concentrated in smaller areas with the balance of the property preserved as open space or agricultural land. Scituate has adopted flexible zoning and Foster is considering it.

The Plan recommends that all communities should adopt a mandatory septic maintenance program within the watershed area. Soil-based overlay zones with associated performance standards are also recommended.

[34] A more detailed description of Scituate's land use appears in the comprehensive plan.

[35] Based on a 1990 build-out analysis and modified using 2000 census data for the number of homes constructed. Due to site constraints, the comprehensive plan estimates that this number might be about 25 % lower.

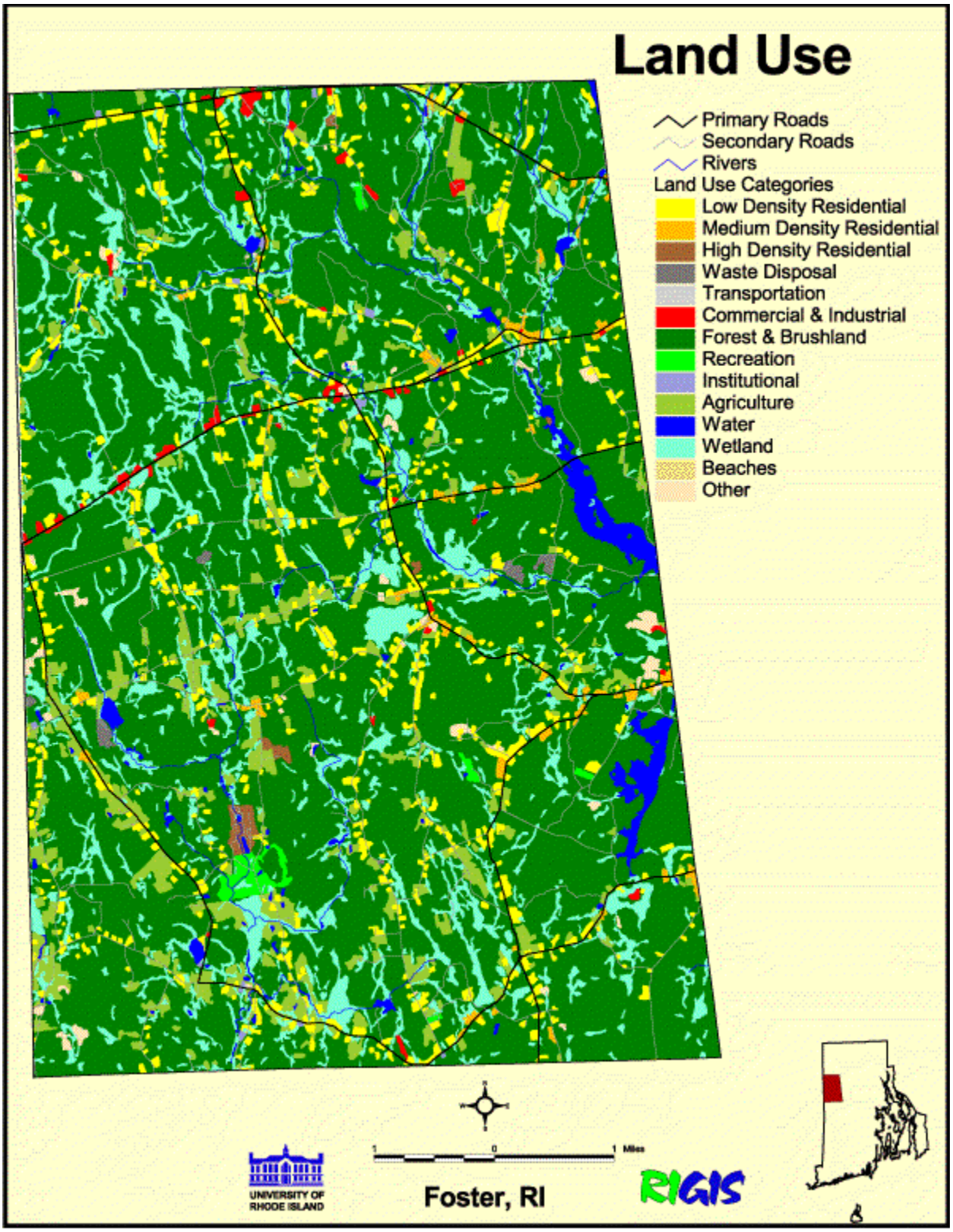

Figure 9 Foster Land use

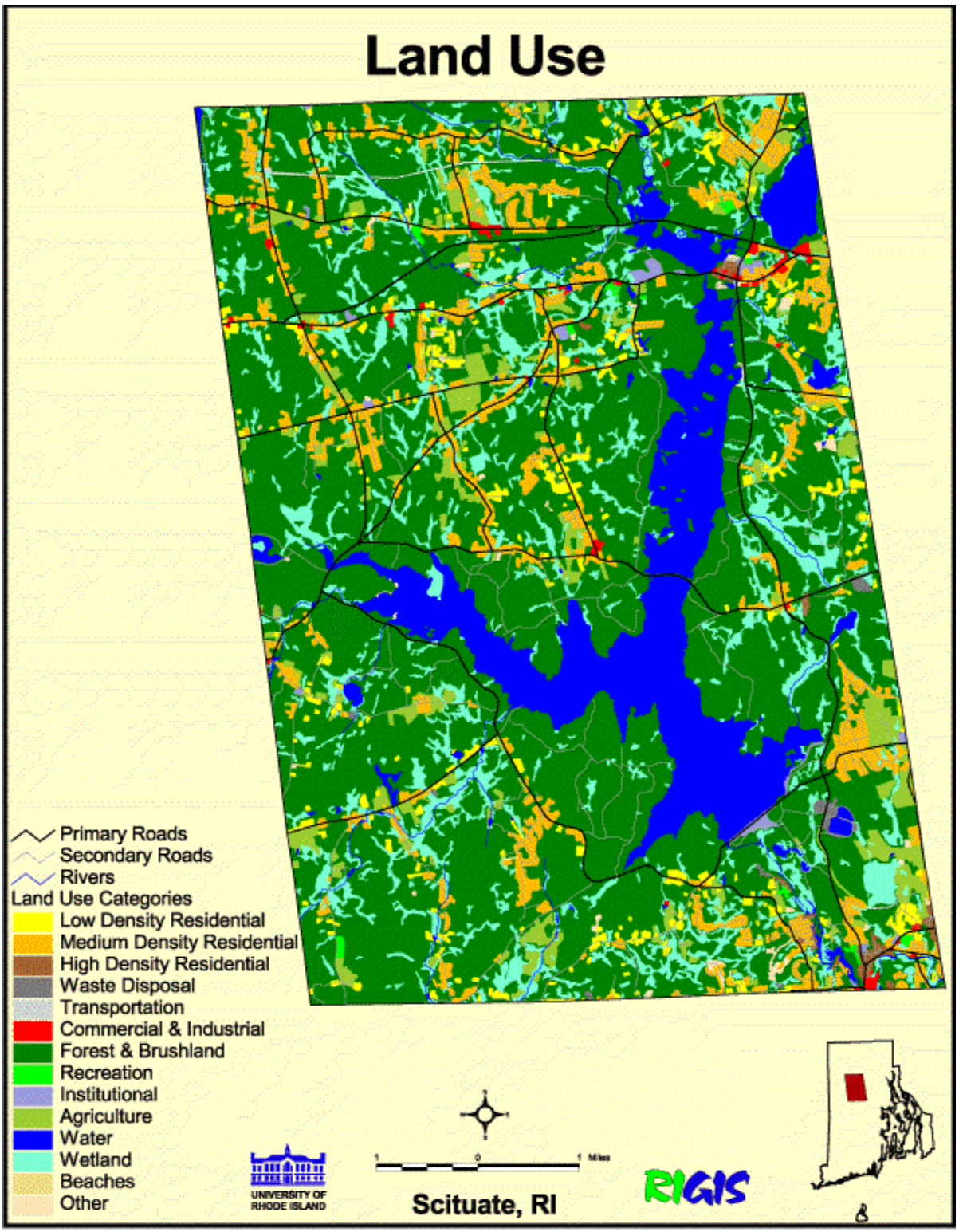

Figure 10 Scituate Land Use

SWAP: The *Scituate Reservoir Watershed Source Water Assessment Plan* identifies three primary threats relating to septic systems and land use in the watershed area.[36] The first is homes in shoreline areas or within 200 feet of a tributary stream where there is an increased risk that bacteria and nutrients from failing or substandard systems will reach surface waters. The second is aging septic systems on smaller lots such as those in North Scituate Village. These systems can contaminate wells with pathogens and nutrients. Lastly, the report cites the mixed commercial and residential development which, together with poor flushing, are the likely causes of elevated levels of sediments, nutrients and bacteria found in the Moswansicut and Regulating Reservoirs.

Watershed-wide, about 66% of vacant land zoned for commercial and industrial development is mapped as slowly permeable and most of this is characterized by a high watertable. Commercial septic systems will require careful design to avoid failure, especially for large flow and high strength wastes such as those generated by restaurants.

In the future, the amount of nutrients entering the groundwater from various land uses is predicted to remain about the same. The relative amount attributable to septic systems, however, will increase from approximately 35% to 65%. This is due to the anticipated increase in residential development in both towns and throughout the watershed. Currently there are an estimated 5,600 septic systems in the Scituate Reservoir Watershed, but this number is projected to climb to 14,390 at build-out. About 3,000 future systems (34%) will likely be located in high watertable soils.[37] This highlights the need for proper septic system siting and maintenance, particularly for advanced wastewater treatment systems used to build on marginal sites. About one quarter of watershed land is within 200 feet of surface waters or a tributary stream and is likely to be marginal. The naturally vegetated buffers are critical for protecting watershed health, but most are on private land.

The recommendations of the *Scituate Reservoir Watershed SWAP* both echo and add to the principal recommendations of the *Scituate Reservoir Watershed Management Plan*.

Recommendations relating to land use and zoning include:

- The development of a regional open space management plan.
- Using creative subdivision techniques such as conservation zoning to preserve forests.
- Limiting impervious areas to 10% for new and expanded development, and establishing stormwater controls to maintain runoff at pre-development levels.
- Implement regular septic system inspection and maintenance, phase out cesspools in densely developed areas and develop minimum standards for new septic systems on marginal sites.
- Expand existing water quality monitoring to address the nutrient status of the reservoirs.

[36] University of RI Cooperative Extension, 2003. *Protect Your Drinking Water: Fact Sheet on the Scituate Reservoir Drinking Water Assessment Results.* Prepared for and published by the RI Department of Health. (Charts form SWAP plan.)

[37] University of RI Cooperative Extension, 2003. The Scituate Reservoir Watershed Source Water Management Plan (working draft) p 31.

2. Sewer and Water

Septage: Septage is the material that accumulates in a septic tank or cesspool over a period of time. It is much more concentrated than sewage and is processed differently at the sewage treatment plant. Septage generated in Foster and Scituate may be processed at the West Warwick Treatment Plant, but may also be disposed of at other state-licensed facilities. The towns of Foster and Scituate have expressed a desire to negotiate with The Narragansett Bay Commission or other neighboring septage receiving facilities to obtain long-term, cost effective disposal solutions. An estimated 1,650 onsite wastewater treatment systems exist in Foster and another 3,970 exist in Scituate.[38] For the purposes of estimating septage volumes it is reasonable to assume that 25% of the systems within the town will be pumped in any given year and that 1,000 gallons will be pumped from each tank. Given these assumptions the amount of septage generated on an annual basis by Foster would be 412,500 gallons and by Scituate 992,500 gallons.

Foster: Currently, public sewer and public water serve no portion of Foster, and there is not expected to be a need for such services in the foreseeable future.[39]

Scituate: There are no sewers in Scituate and the town has no plans to own or operate a sewage treatment facility of its own. As part of a regional agreement, however, it has reserved 78,000 gallons per day for future flows into the West Warwick Treatment Plant. The capacity of this plant is being increased from 5 million gallons per day (mgd) to 7.89 mgd.

According to the Scituate Comprehensive Plan, when sewers are brought to the town border by the West Warwick Regional Sewer System, they should be extended into Hope. The emphasis should be on protection of public health and the elimination of problem systems and areas. The expected service area would consider residential needs as well as commercial sites such as the Hope Mill and the former Falvey Linen location. West Warwick warns that due to funding constraints, the sewering of Hope could take several years. Until such time as sewers become available, inspection and maintenance of onsite systems is crucial to the protection of the public health.

A community onsite sewage disposal system serving 35 homes was constructed in Hope in 1993 and is owned and operated by the Hope Sanitary District. The system serves homes on Mill Street with random collection beyond Mill Street.

With the exception of a small section of the village of Hope and 6 homes on Peck Hill Road, all residents in both towns rely on wells for their drinking water. According to the Scituate Comprehensive Plan, the town is interested in developing agreements with the Providence Water Supply Board and the Kent County Water Authority that would allow limited expansion of water service in the Village of Hope. As a growth management tool, expansion of the line would be limited to where wells have been contaminated.

[38] These estimates are based on information from the local tax assessors and the 2000 census.

[39] To its credit, however, the town in its Comprehensive Plan recognizes the need to protect its outwash deposits as a potential source of future drinking water.

A referendum that would have provided water to the Village of North Scituate was defeated in 2001. In North Scituate Village, septic systems and wells often exist on undersized lots with problem soils. A septic system management plan can help to ensure the quality of groundwater. There are no public sewers in Foster, so all of its residential, commercial and industrial development relies on onsite wastewater treatment systems. On Abbey Lane, a common well and septic system service 16 homes that are part of a private condominium association.[40]

D. LOCATION, CAUSES AND IMPACT OF ISDS FAILURE

The ground and surface waters are important natural and recreational resources that are vital to the economic, environmental, and public health of Foster and Scituate. ISDS are prone to failure due to age, outmoded design, overuse, and improper installation, repair, and maintenance. Site factors such as poor soils or a high watertable can contribute to ISDS failure. Improperly treated effluent from failed and poorly functioning systems poses a risk to public health and is a source of contamination to surface and groundwater.

Foster: There are an estimated 1,650 ISDS in Foster, which together discharge over 350,000 gallons per day of effluent into the groundwater.[41] As previously noted, around 880 housing units predate ISDS regulations and are likely to be substandard. From 1990 through 2001 there were 64 ISDS repairs and 10 alterations in the town of Foster.[42]

According to RIDEM repair reports from 1990 through 2001, principal areas of septic system failure include South Killingly Road, Danielson Pike, and Foster Center Road. The older village clusters (Foster Center, Hopkins Mills, Clayville and Mooseup Valley) also present potential trouble in terms of the age and density of housing as well as problematic soils.

In the Westconnaug sub-watershed, which encompasses the village of Clayville, 35% of the lots were developed before 1971 and may have substandard systems. Clayville has primarily well drained and excessively well drained soils. Groundwater monitoring data collected by the RI Department of Health from 1988 to 1996 documents that groundwater is affected by nitrogen inputs.[43] Other potential trouble spots in Foster include areas of problematic soils shown in Figure 1 and discussed in section II B of this report.

Scituate: Scituate's estimated 3,970 ISDS discharge an estimated 850,000 gallons of effluent per day into the groundwater.[44] A substantial number are likely to be substandard systems with a high potential for failure. According to the Scituate Comprehensive Plan the most severe onsite septic system problems are in the villages of Hope and North Scituate, in the Frosty Valley and Ring Rock Acre neighborhoods along the Pawtuxet River and in the Grant's Cabins seasonal housing area. [45]

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[40] Foster tax assessor's data February, 2002

[41] This figure was arrived at by multiplying the 2002 census figure of 2.84 persons per dwelling unit (1,578 du) times RIDEM's figure of 75 gallons per person, per day of water use. An additional 20,000 gallons per day was added to account for the towns 47 commercial and 3 industrial uses.

[42] RIDEM, repair records (Excel spreadsheet) 1990 through April 2001. Repair records are not readily available from the 1970's and 80's.

[43] URI Cooperative Extension, 2002. Source Water Assessment Plan Scituate Reservoir Watershed (Draft)

[44] This figure was arrived at by multiplying the 2002 census figure of 2.84 persons per dwelling unit (3904 du) times RIDEM's figure of 75 gallons per person, per day of water use. An additional 24,000 gallons per day was added to account for the town's 57 commercial and 3 industrial uses.

[45] Scituate Comprehensive Plan, 1993 and 2003.

In the village of North Scituate, which is located within a community wellhead protection area, 70% of lots were developed before 1971 and may have cesspools or other substandard system (Figure 11).

In addition to North Scituate other villages that present a high potential for failure due to problematic soils, and the age and density of the housing include Clayville (which straddles the line between the two towns), Hope, Chopmist, Saundersville and Rockland. The high-density housing and commercial development that surrounds Moswansicut and Regulating Reservoirs are other hot spots identified in the SWAP plan and the accompanying MANAGE analysis.[46] In the Moswansicut Reservoir watershed 40% of the soils are slowly permeable. In Upper and Lower Regulating watersheds 47% and 34% of the soils, respectively, are excessively permeable and 38% and 27%, respectively, are slowly permeable.

RIDEM records for Scituate indicate problem areas along Danielson Pike, Central Pike, Main Street, Plainfield Pike, Rockland Road, Trimtown Road and William Henry Road. Other potential trouble spots in Scituate include areas of problematic soils shown in Figure 2 and discussed in section II B of this report.

General: In addition to high-density housing and poor soils another potential problem is that of non-conforming lots of record. These lots, which are substandard under current zoning, have grandfather rights to construct a dwelling with an ISDS. In many instances the lot is too small for the construction of a conventional ISDS and/or has multiple site constraints such as an inadequate separation distance from the ISDS to well, proximity to a critical resource, high watertables and soils that percolate either too slowly or too quickly.

Another of the major causes of ISDS failure is the structural erosion of the steel septic tanks. These tanks were commonly installed during the 1970's. According to the 1990 census report prepared by the Rhode Island Economic Development Commission, there were 548 housing units built in Scituate between 1970 and 1979 and another 279 units built in Foster during this same period.[47]

[46] URI Cooperative Extension, Scituate Reservoir MANAGE Analysis (Draft) January 2000.

[47] RI Economic Development Commission, Research Division and US Department of Commerce, Bureau of the Census. Five page 1990 Census Summaries for Scituate and Foster.

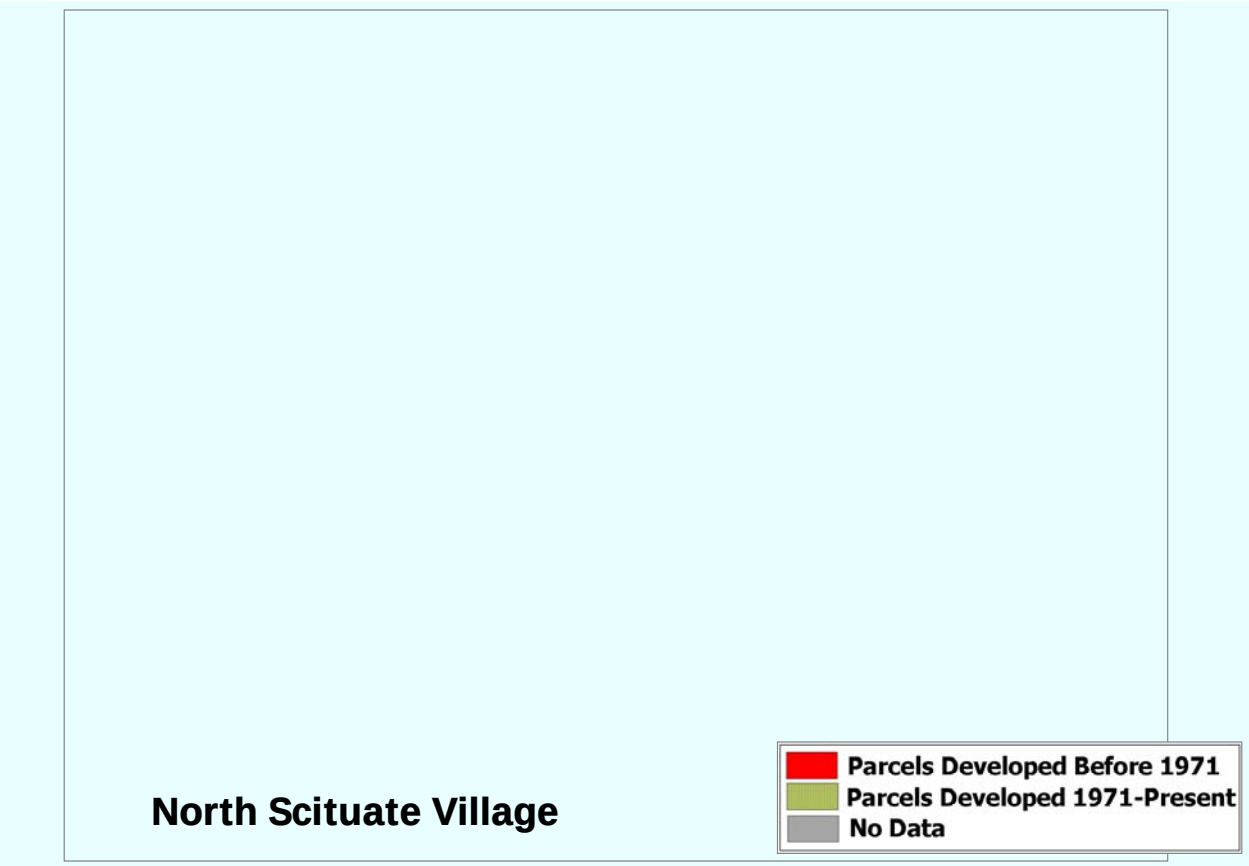

Figure 11: North Scituate Village Parcels Developed Prior to 1971 (URI Cooperative Extension, 2003).

III. METHODS TO ENSURE REGULAR SEPTIC SYSTEM MAINTENANCE

A. EXISTING WASTEWATER MANAGEMENT INITIATIVES

Several management initiatives at both the state and local level will help to ensure regular septic system maintenance in Foster and Scituate.

1. State Plans and Regulations

The Scituate Reservoir Watershed Management Plan, State Guide Plan Element 125: This Plan establishes a long-term program to protect the water quality of the Scituate Reservoir. The plan recommends that all watershed communities adopt a mandatory septic system maintenance program within the watershed area. *Wastewater Management Districts: A Starting Point* is one of a series of reports prepared to support *The Scituate Reservoir Watershed Management Plan.*[48] The key finding of this report was the inadequacy of RIDEM 's ISDS regulations and resources with respect to the regular maintenance of ISDS. Another important finding was the need for public education

[48] RI Department of Administration, Division of Planning, 1987. Scituate Reservoir Wastewater Management Plan: Wastewater Management Districts A Staring Point.

relative to proper homeowner care of septic systems. The net result was the passage of state legislation, which enabled RI municipalities to establish Wastewater Management Districts.

State Enabling Legislation for Septic System Maintenance: In 1987 the RI General Assembly passed *An Act Relating to Septic System Maintenance.*[49] This act authorizes cities and towns to pass ordinances for the creation of wastewater management districts, within which the inspection and maintenance of onsite wastewater treatment systems is required. According to the enabling legislation, such ordinances shall be established to prevent and eliminate contamination of ground and surface water caused by malfunctioning systems. In addition the districts shall be designed to operate as an alternative to municipal sewers. The General Assembly in passing this legislation recognized that municipalities were in a much better position to ensure adequate maintenance of septic systems than was RIDEM.

RIDEM ISDS Regulations:[50] RIDEM's regulations are considered the minimum regulations and RI municipalities have the right to establish stricter requirements when necessary.[51] Inspections conducted by RIDEM are generally restricted to complaints and installations. Installation inspections are normally required for each system. Annually, the program undertakes approximately 2,300 suitability assessments, 5,000 permit reviews, and 11,600 inspections.[52] Additionally, the program has developed a process for approving innovative septic system technology.

Section 2.11 of the ISDS regulations only superficially addresses the regular inspection and maintenance of septic systems. This section states that it is the owner's responsibility to:

a)Ensure that the system is used only for sanitary wastewater in amounts that do not exceed the design flow.
b) Properly maintain the system, including but not limited to, inspection of the system every 2 to 3 years with pumping of the septic tank as needed.
c) Protect the system from physical disturbance.

RIDEM does not conduct maintenance inspections, yet inspection and maintenance are essential to ensure proper system functioning. Although RIDEM does not have the resources, staff or organizational structure to enforce these provisions, they are consistent with, and add credence to, existing programs developed by many RI municipalities.

The Scituate Reservoir Watershed is identified in RIDEM's septic system regulations as a Critical Resource Area and as such, more stringent regulations are required.[53] Septic systems are prohibited from areas where the watertable is within 2 feet of the original ground's surface, and sub-drains to lower the watertable are not allowed. All septic systems in the watershed must maintain a separation distance of at least 4 feet from the bottom of the system to the groundwater table. There is also a 200-foot minimum setback requirement from the reservoir and its tributaries for all new septic systems.

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[49] RI General Assembly, January 1987. *An Act Relating to Septic System Maintenance.*

[50] Rules and Regulations Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of ISDS, 2-6-02 (commonly referred to as the ISDS Regulations)

[51] In Gara Realty Vs. The Town of South Kingstown's Zoning Board of Review, the RI Supreme Court ruled that "clearly the intent of Chapter 131 was to grant municipalities the option of providing additional restrictions concerning the construction of individual wastewater facilities." Indeed even the title of the RI ISDS regulations contains the words "*Minimum Standards.*"

[52] http://www.state.ri.us/dem/programs/benviron/water/permits/isds/index.htm

[53] Section 19.03 ISDS Regulations

Septic System Checkup: In an effort to assist municipalities and to standardize an otherwise arbitrary process, RIDEM has developed an easy-to-understand, detailed protocol for inspection and maintenance. This manual is useful to homeowners and buyers, as well as to professionals who maintain septic systems. "The handbook provides newly developed standards for septic system inspection and maintenance. It describes two types of inspections: a maintenance inspection to determine the need for pumping and minor repairs, and a functional inspection for use during property transfers. It includes detailed instructions for locating septic system components, diagnosing in-home plumbing problems, flow testing and dye tracing, and scheduling inspections. Several Rhode Island communities, including New Shoreham, North Kingstown and Glocester, currently use *Septic System Checkup* as their inspection standard. The University of Rhode Island offers a training course for professionals interested in becoming certified in the inspection procedures."[54] Many RI communities have incorporated this State-approved inspection procedure into their Onsite Wastewater Management Ordinances.

The Onsite Wastewater Training Center: The Onsite Wastewater Training Center at the University of RI is one of a handful of centers nationwide that provide training and research related to onsite wastewater management.[55] The OWT Center provides a variety of workshops and courses specifically designed to meet the needs of varied interest groups such as homeowners, municipal officials, realtors, engineers, land surveyors and independent contractors. It is operated in partnership with RIDEM, EPA and over 40 private sector contractors. The Center has 22 full-scale systems constructed above ground for hands-on learning and 50 demonstration and research systems installed in 7 communities. System designs include a peat filter, drip irrigation, re-circulating geotextile, FAST system, trickling filters, single pass sand filter and a re-circulating sand filter. These systems will provide an excellent educational opportunity for southern RI for innovative wastewater management. Data obtained from these systems provides towns with the information required to appropriately select, locate and manage enhanced wastewater treatment systems within their own communities.

2. State Financial Incentives

Grants: RIDEM does not require that towns develop Onsite Wastewater Management Plans and Ordinances, but it has provided many incentives for towns to do so. RIDEM has promoted the development of local OWMPs and related projects with over $700,000 dollars in financial aid to 21 communities, establishing itself as a facilitator of local initiatives. Money has been available primarily through the Federal Clean Water Act, Section 319, The Clean Water Act Environmental Trust Fund, and State bond referendums. Grant awards have been for both the development and implementation of local septic system management initiatives as well as other non-point source projects. The grant cycle usually begins in early winter of year with applications due in the spring.[56] These grant programs allow communities maximum flexibility

[54] From **:** http://www.state.ri.us/dem/news/2000/pr/1212001.htm A link to a copy of the inspection procedure Septic System Check-Up is provided at this site.

[55] For a listing of courses and programs, the Onsite Wastewater Training Center link is http://www.uri.edu/ce/wq/owtc/html/owtc.html

[56] A copy of request for proposals and a fact sheet summarizing the non-point source pollution grant program are available on DEM's website at www.state.ri.us/dem under Grants on the Topics page. The request for proposals is also posted on the State Office of Purchases web site at www.purchasing.state.ri.us. For further information, please contact Jim Riordan, DEM's non-point source program coordinator, at 222-4700 ext. 4421.

and help to overcome the most significant barrier to replacing failed systems, lack of money.

Community Septic System Loan Fund: The RI Clean Water Finance Agency, in cooperation with RIDEM, has developed the Community Septic System Loan Program (CSSLP). The program, which became operational in 1999, is to be used exclusively for the upgrade and repair of septic systems. In order to qualify for the Program communities must have an OWMP approved by the State. Details regarding implementation of the loan program at the local level may be found in Section V of this report.

3. Comprehensive Plan Opportunities

Foster: Foster's Comprehensive Plan both directly and indirectly supports onsite wastewater management. In high and moderate risk areas it also supports the use of enhanced wastewater treatment systems through the development of performance standards.[57] The plan states that a phased septic system management program should be considered. It suggests that the program begin with public education followed by a septic system maintenance program. According to the Comprehensive Plan, "the program could be funded by individual homeowners, homeowners' associations, developers or with incentives provided by the Providence Water Authority."[58]

The plan identifies several concerns with septic systems, notably:

- Improperly designed septic systems in areas of a high watertable could cause health risks.
- Dense residential or commercial development could pose a pollution risk from runoff of parking areas or septic systems.
- All residents rely on groundwater for potable water. Many ground and surface waters are connected and inappropriate development or poorly designed septic systems can threaten all.

The Plan recommends the development of a farmland/conservation overlay zone. In this overlay zone, which is currently a reserved section in the zoning ordinance, development in high and moderate constraint areas would be subject to performance standards, which would include protection for hydric soils, wetlands, groundwater resources, wellheads, unique habitats, agricultural soils, farmland, scenic and historic areas.[59] The constraint system developed in the Natural Resource Element of the Comprehensive Plan would serve as a starting point in the development of these performance standards. Septic system inspection and maintenance and the development of specific resource-related performance standards for septic systems should be incorporated into this overlay district.

Foster's 4.5-acre agricultural zone covers over 90% of the town. According to the town's zoning ordinance the agricultural zone is meant to "help preserve the rural character of the town" and "protect land now used for agriculture and forestry from haphazard encroachment." The Comprehensive Plan expresses concern that the objectives of the zone are not being met and that frontage development is eroding the character of the villages and landscape.

[57] Foster Comprehensive Plan, 1991. Natural Resource Element, p 98
[58] Foster Comprehensive Plan, 1991. Natural Resource Element, p 101
[59] Foster Comprehensive Plan, 1991. Natural Resource Element, pp. 85 to 91.

Septic system management and the use of alternative septic systems, together with flexible zoning and other smart growth strategies, could help the AR zone better accomplish its objectives. With innovative zoning such as the Creative Land Development (CLD) mentioned in the Comprehensive Plan, setbacks and lot sizes are reduced and sometimes flexible, but overall site density remains the same. This allows buildings to be clustered in the part of the lot most suited for development with the balance of the property remaining as open space. Alternative systems provide more design flexibility for both commercial and residential development. They require less site disturbance, have a longer life span and can be designed to serve a single home or group of homes. A septic system that serves a group of homes can often provide the design flexibility needed for optimum system location. Maintenance, however, is key.

The Comprehensive Plan recommends the development of Special Area Management (SAM) for the town's village clusters. Once developed, septic system inspection and maintenance and the promotion of alternative systems for retrofits on small lots should be included as components of these plans. Simply put, well-designed and managed septic systems facilitate the type of innovative zoning that will enable the town to better preserve its character and resources.

Foster's plan also states that non-point source pollution control should be required for all new development and that incentives for non-point source pollution control should be provided for existing development. The implementation of a septic system management plan is an important component of non-point source pollution control.

According to the Foster Comprehensive Plan, "In many communities there is an over reliance on Federal and State regulatory programs to protect resources that should or must be protected at the local level."[60] Any wastewater management program for Foster should comply with the following three guidelines found in the Foster Comprehensive Plan:

- Environmental controls must be strengthened.
- The town's small staff and boards must be able to enforce the regulations.
- The rights of property owners should be protected.

Scituate: The Natural Resource Element of the Scituate Comprehensive Plan states that the town should work with the State in considering the establishment of a Wastewater Management District. Preferably any such plan would be implemented on a regional basis with the participation of other communities.[61] According to the Comprehensive Plan the Wastewater Management District would cover the entire town and potential problem areas should be monitored carefully.[62] The Plan specifically states that, "aspects of development, for example septic systems, will be monitored to preclude adverse impacts on surface and groundwater.[63] The hydric soil overlay proposed in the Comprehensive Plan would provide an excellent opportunity to incorporate performance standards for septic systems.[64] As part of this overlay, the Plan envisions septic system setbacks from water

[60] Foster Comprehensive Plan, 1991. Natural Resource Element, p 92

[61] Foster, Glocester and Coventry are nearby communities with wastewater management initiatives that could potentially share resources in the implementation of their programs.

[62] Scituate Comprehensive Plan, 2003. Natural Resource Plan, section G 3.1.1

[63] Scituate Comprehensive Plan, 2003. Natural Resource Plan, section G 3.0, page G-3

[64] Block Island, Little Compton and Jamestown have resource- based performance standards for septic systems that require a specific level of treatment based on site constraints.

bodies, prohibition of septic systems in areas with watertables less than two feet from original grade, and mounded systems in areas with watertables from two to three feet. Enhanced wastewater treatment systems would provide a preferable alternative to mounded systems in areas of high watertable soils. They would provide better treatment, require less site disturbance and would be similar in cost to mounded systems that required large amounts of fill.

In order to protect groundwater the Plan recommends the development of septic system regulations that address outwash and permeable soils.[65] The Plan also notes that there is a problem in areas where slow percolation is combined with a high watertable. "Depending on the depth of seasonally high watertables in till soils, septic systems should be prohibited or allowed only in association with a relatively large lot area."[66] A single Soil Overlay District could address site disturbance, the construction of septic systems and buildings in high watertable, slowly permeable and rapidly permeable soils. Stormwater management controls recommend by the Plan, could also be incorporated into such an ordinance.

4. Local ordinances

An onsite wastewater management ordinance requiring inspection and maintenance, is enabled under The RI Act Relating to Septic System Maintenance and as such is separate from the zoning ordinance. Performance standards and setbacks are enabled under the RI Zoning Enabling Act.

Foster: In addition to RIDEM requirements Foster's Zoning Ordinance contains the following setbacks:[67]

- 100- foot setback from a shallow surface leaching field to a dug well.
- 100 -foot setback from leaching field to property line, 60 feet where the property borders a public road.
- 150-foot setback from cesspool or seepage pit to a well.
- 150-foot setback from a cesspool or seepage pit to a lot line, 110 feet where the property borders a public road.
- 200-foot setback from any ISDS to a pond, stream, spring or brook.

The 100-foot setback from a well is the same as RIDEM regulations. An applicant would need both a zoning variance and a variance from the ISDS Regulations, thus giving the town the opportunity to place any special conditions on the granting of the zoning variance.

These regulations could be made more effective by reducing the lot line setbacks to be more compatible with any flexible zoning or cluster ordinance developed. Consideration should be given to eliminating the setback requirement to a public street and adding wetlands to the 200-foot setback for ponds, stream, spring or brook. The setbacks from cesspools and seepage pits provide the town with an opportunity to require system upgrade for building proposals or subdivisions where relief from these provisions would be required. In many cases shallow leaching fields provide more

[65] The 2002 RIDEM, ISDS regulations increased the maximum percolation rate for new septic systems from 5 minutes per inch to 10 minutes per inch

[66] Scituate Comprehensive Plan, 2003. Natural Resource Plan, p G-10.

[67] Town of Foster Zoning Ordinance, June 21, 2001, Article VI, Section 6

effective treatment than deeper leaching fields. Performance standards for septic systems in high and moderate constraint areas could also be developed.

Scituate: Scituate currently has a flexible zoning ordinance and a Village Overlay District. Septic system management and the development of performance standards for septic systems could enhance the effectiveness of these ordinances by increasing the design flexibility and ensuring the inspection and maintenance of septic systems in areas of higher density. Scituate has established the following setbacks in their zoning and subdivision regulations:

- 150 feet from the edge of any pond, stream, spring or wetland.
- 25 feet from the edge of a property line
- 50 feet from the boundary of a street
- 100 feet to a subsurface drain.

The Comprehensive Plan recommends that the existing subdivision regulations and the zoning requirements for flexible zoning, the Village Overlay, setbacks and design standards be reviewed and revised as necessary. This would provide an excellent opportunity for the inclusion of more effective performance standards. Provisions for required inspection and maintenance of septic systems could be cross-referenced in these regulations. They may also be required as part of plan approvals where it can be demonstrated that such measures help to meet the performance standards or design guidelines.

B. PROGRAM GOALS

The overall goals of this plan are described in Section I. The goals described below and the implementation plan that follow provide more specific details about the programs proposed for each town. Town actions that would best protect local groundwater supplies include: regular septic system inspection with maintenance as needed, phase out of cesspools in densely developed areas and minimum standards for new septic systems on marginal sites.[68] Certain program goals apply to both towns and others are specific to each town. This is due to differences in the nature and extent of the problem between the towns and to the resources available to implement specific aspects of the program. Additionally many of the goals are to be phased in over a period of several years. The towns wish to begin slowly by providing public education and financial incentives to homeowners to inspect and repair their septic systems. In addition maintenance contracts are to be required on all alternative systems and any system that requires relief from zoning or subdivision regulations. Scituate is proposing a wastewater management ordinance. If the ordinance does not pass the program would proceed on a voluntary basis. The need for additional measures will be evaluated at the end of three years based on the success or failure of these efforts.

[68] RI Dept of Health, URI Cooperative Extension, 2003. Protect Your Drinking Water: The Scituate Reservoir Drinking Water Assessment Results (Fact Sheet)

1. Common Goals (General):

a. Recognize the interdependence of resource protection and economic development by promoting septic system management as a means of protecting drinking water and other surface and groundwater resources.

b. Through education and incentives help to ensure that all ISDS in Foster and Scituate are properly operated, regularly inspected, and routinely maintained in order to prevent system malfunction, ensure maximum system longevity and reduce long-term repair costs.

c. Outline recommended procedures for ISDS inspections, repairs, and maintenance.

d. Consider the fiscal and personnel resources of each town in the in the design of Onsite Wastewater Management Programs.

e. Provide financial assistance for the repair, retrofit and replacement of failing or substandard systems. Initiate CSSLP; continue septic system repair/replacement programs through Community Development Block Grant (CDBG) and the Western RI Home Repair Program; investigate other potential sources of funding.

f. Where practical, reduce program costs through collaboration with neighboring communities.

g. Use septic system design, and management to help facilitate village commercial development, flexible zoning and other smart growth initiatives identified in the Comprehensive Plans.

h. Incorporate performance standards for septic systems into a soil and resource-based overlay zone as described in the comprehensive plans.

i. Require maintenance contracts on all alternative systems and any system that requires relief from zoning or subdivision regulations.

2. Water Supply Protection Goals (Foster and Scituate):

a. By promoting the inspection and management of ISDS ensure the quality and continued use of public and private water supplies.

b. Where necessary develop specific performance standards for septic systems in order to help achieve water quality protection goals.

c. Wherever possible, incorporate the recommendations of the Source Water Assessment Program (SWAP) and the Scituate Reservoir Watershed Plan into the implementation of the Onsite Wastewater Management Program.

d. Evaluate and where necessary manage onsite wastewater impacts in wellhead protection areas (WHPA's) particularly those serving public facilities and sensitive populations such as schools, nursing homes and elderly housing.

2. Education Goals (Foster and Scituate):

a. Through education and other incentives motivate residents and visitors to assume responsibility for the adequate treatment of their own wastewater.

b. Provide needed information in a variety of formats such as, brochures, workshops, press releases, mailings with the tax bills and links on town web sites to appropriate information. Wherever possible use or adapt existing materials available through URI, Small Flows Clearing House, other RI communities, RIDEM, EPA, etc.

c. Working with URI's Onsite Wastewater Training Center develop a workshop that could be presented a couple of times each year and revised as needed. The workshop should address, but not necessarily be limited to the following:

- Environmental and health risks associated with failing and sub-standard ISDS
- Proper use and maintenance of ISDS including water conservation and household hazardous waste
- RIDEM's standard inspection procedure "Septic System Check-Up"
- What a homeowner should know about ISDS inspection
- Appropriate design and repair options, including alternative systems
- Retrofitting with access risers and effluent filters
- Financial resources available to homeowners for ISDS repairs

d. Though URI's Onsite Wastewater Training Center periodically offer tours of demonstration systems in neighboring communities

4. Town Specific Goals

Foster:

a. Encourage homeowners to inspect and maintain their ISDS through education and incentives

b. Publicize and implement the Community Septic System Loan Program (CSSLP).

Scituate:

a. Implement the Community Septic System Loan Program.

b. Adopt OWM ordinance. If the ordinance does not pass the program will proceed on a voluntary basis.

c. Educate residents and businesses regarding specific program requirements

d. Incorporate resource-based septic system performance standards into the development of a soil overlay zone. In addition to setback and buffer requirements this should include specific performance standards to minimize nutrient loading and pathogen contamination

e. Revise the village overlay district, the flexible zoning regulations and the setback and design standards to include more effective performance standards for septic systems.

f. Investigate software programs for septic system management and tracking that reduce the administrative workload of either a voluntary or mandatory program. Ideally, the selected software should have the capacity to link with GIS and the tax assessor's data.

C. IMPLEMENTATION OF PROPOSED SEPTIC SYSTEM MANAGEMENT STRATEGIES

The outline below provides an overview of program administration and implementation for the remainder of FY 2004 and FY 2005. A description of implementation activities for 2006 will be developed in the fall of 2005.

1. Administration

Foster: Foster would like to restrict its program to a voluntary one based on education and outreach. The Town Planner will oversee the program.

Scituate: General administration for the program shall be the responsibility of the Town of Scituate. The Scituate Building Official/Town Engineer's office will manage and administer the OWMP, with the Scituate Building Official or his designee serving as program administrator. Should the ordinance pass, the Tax Collector shall be responsible for collecting all fees and fines associated with the ordinance.

2. Education

Although program requirements will differ between the two towns, Foster and Scituate will coordinate selected education initiatives, whenever possible. Coordinated activities could include workshops, staff and citizen training, displays, press releases, etc. The Conservation Commissions of both towns will assist the town councils, the building officials and the Foster town planner in public outreach initiatives.

URI's Onsite Wastewater Training Center, Small Flows Clearinghouse, RIDEM and others have developed many excellent educational items. Wherever possible, the towns should use or adapt these materials to suit their needs. In addition, URI can assist the towns by organizing and conducting workshops and tours of demonstration sites. A retrofit and inspection/maintenance workshop, for instance could be conducted in some of the more problematic areas such as North Scituate Village and Clayville.

The towns will distribute public outreach materials through letters to property owners, press releases, displays, newspaper ads and pamphlets. Links will also be provided on town websites to information pertaining to the onsite wastewater management. Town-specific information will be added when necessary.

Foster: The primary focus of Foster's public outreach program will be to publicize the benefits of ISDS inspection and maintenance and the availability and application process for the CSSLP funds. Foster could easily adapt materials developed by other RI communities in order to accomplish these items. (2004-2006)

Scituate: In addition to the two implementation items listed above for Foster, Scituate's outreach program should also include information on the proposed ordinance and how to comply with its provisions. A fact sheet and press release on the reasons for and cost of program and what a property owner must do to comply with the ordinance, should be prepared prior to the hearing on the ordinance. (2004-2006)

3. Implementation Tasks

Foster:

Foster's primary tasks during the first few years of its Onsite Wastewater Program are:

- to encourage homeowners to properly use and maintain their ISDS,
- to have their ISDS inspected by an inspector qualified in the use of the standard RI inspection procedure
- to implement the Community Septic System Loan Program (CSSLP).

This program, which is described in more detail in section IV of this document, provides low interest loans to homeowners for the repair of failed ISDS. Access to the CSSLP funds will be granted according to the criteria outlined in this plan. Press releases, displays in the library and Town Hall, links on the Town's web site and letters mailed with the tax bills will be the principal way of publicizing Foster's OWMP and the availability of CSSLP funds. Village Centers, high constraint areas and WHPA's will be targeted in public outreach materials.

The Town Planner with assistance from the Conservation Commission is responsible for implementation of the program. The program's success or failure will be evaluated at the end of three years.

Zoning Revisions: The following recommendations are items that are consistent with the Foster Comprehensive Plan and are to be considered when revising the Zoning Ordinance.

a. Amend Article VI, Section 6 of the zoning ordinance (Sewage Disposal) to better protect water quality and provide more design flexibility.

b. Incorporate septic system inspection and maintenance and the promotion of alternative systems for retrofits on small lots as components of the envisioned Special Area Management Plans for the villages.

c. Incorporate resource-based septic system performance standards into the development of the farmland/conservation overlay zone and/or soils overlay zone. In addition to setback and buffer requirements this should include specific performance standards to minimize nutrient loading and/or pathogen contamination. The focus of this ordinance would be to limit ISDS to areas with a minimum of a 24" water table and would include other performance standards for new development.

d. Require that maintenance contracts for all alternative systems and for all systems that require variances from the zoning regulations be filed with the Zoning Official and recorded in the land evidence records.

Foster (FY 2004 and 2005)

a. Pass the Onsite Wastewater Management Plan (Fall 2004)

b. Initiate CSSLP approval as soon as approval of the Onsite Wastewater Management Plan has been received from RIDEM. Drafts of loan agreements could be prepared ahead of time.[69] (Fall 2004)

c. Publicize the need for septic system inspection and maintenance and the availability of CSSLP funds. (begin January 2005)

d. Begin implementation in the most critical areas. (Spring 2005)

e. Amend zoning ordinance to require maintenance contracts on all alternative systems and on any system that requires relief from the zoning or subdivision requirements. (Spring 2005)

f. Evaluate zoning amendments for the inclusion of performance-based standards for ISDS based on goals for the protection of critical resources and the results of any modeling studies or other scientific data. (Spring 2006)

Scituate:

The proposed Scituate Onsite Wastewater Management Ordinance provides a framework for the efficient inspection, repair and maintenance of ISDS. It requires that all onsite sewage treatment systems be periodically inspected and that the maintenance of the system be based upon the results of the inspection. The purpose of ISDS inspections is to a) assess the condition of the ISDS b) determine what maintenance is required and when it should be undertaken c) set the date of the next inspection d) determine the need for system repair or replacement. Information from the inspections will be used to complete a town-wide ISDS inventory and to track system inspections, maintenance, and upgrades. Inspection procedure follows that outlined in DEM's *Septic System Check-up*: *The Rhode Island Handbook for Inspection.*[70]

The town will notify a homeowner when it is time to schedule an inspection. The owner then hires a private, town-approved ISDS inspector.[71] After a system has been inspected, the owner and the town will receive a report from the inspector detailing maintenance requirements and the timeframe for the next inspection. The owner is responsible for ensuring that any maintenance or repair required by the inspection report is completed on time. Immediate pumping is required when there is a threat to the public health or an environmental hazard. Receipts for completed work are submitted to the town.

If a system fails inspection, a notice of non-compliance is issued by the Building Official's Office. In accordance with RIDEM regulations, failed systems must be repaired. A notice of non-compliance may also be issued for failing to comply with the provisions of the ordinance and penalties may be attached.

Tanks that are inaccessible for inspection and maintenance must be retrofitted with access risers within 30 days of the First Maintenance Inspection. Cesspools must be upgraded within 1 year of the sale of a property and should be phase out in densely developed areas. Effluent filters are

[69] Sample loan agreements can be obtained from RI Clean Water Finance Agency or other towns such as South Kingstown, Block Island, Charlestown and North Kingstown who have already qualified for the CSSLP program.

[70] Riordan, James 2000. Septic System Check-Up: The RI Handbook for Inspection. Funded by RIDEM with an EPA Clean Water Act section 319 grant.

[71] Town-approved inspectors are those who have successfully completed the training course in the RI Inspection Handbook. URI currently maintains a list of qualified inspectors .

recommended at the outlet end of the tank. All new tanks must be certified watertight and be equipped with access risers and effluent filters. The ordinance also provides an administrative meeting as a first step for resolving differences of opinion and a hearing procedure if the administrative meeting is unsuccessful.

The ordinance will be implemented in phases over a period of 3 to 6 years beginning first in North Scituate Village. Assuming a 185-day work year,[72] inspecting 7.2 systems per day would enable all 3,970 systems to be inspected within the first three years. If 5.4 systems per day were inspected the ordinance could be fully implemented within four years. The six-year timeframe would require the inspection of 3.6 systems per day. From an administrative perspective, consideration must also be given to the time required to conduct public education, send notices, complete any required follow-up, attend administrative conferences, track repairs and retrofits, etc. In addition, establishing a data base and becoming familiar with the software will require a lot of time, at least during the first year.

Scituate Program Implementation 2004-2006

1. Pass the Onsite Wastewater Management Plan (Fall 2004)
2. Initiate CSSLP approval as soon as approval of the Onsite Wastewater Management Plan has been received from RIDEM. Drafts of loan agreements could be prepared ahead of time.[73] (Fall 2004)
3. Publicize the need for septic system inspection and maintenance and the availability of CSSLP funds. (Fall 2004/winter 2005)
4. Develop budget and implementation plan for FY 2005/6 (January 2005)
5. Public Hearing on Onsite Wastewater Management Ordinance (Spring 2005)
6. Develop associated program guidelines (Spring/summer 2005)
7. Amend zoning ordinance to require maintenance contracts on all alternative systems and on any system that requires relief from the zoning or subdivision requirements. (Spring 2005)
8. Develop or purchase appropriate ISDS management software in order to build the town's data base, schedule inspections and track maintenance records and septic upgrades. (Spring/summer 2005)
9. Hire a part time onsite wastewater specialist (Summer 2005)
10. Develop a phased implementation schedule that begins in the most critical areas first. (Summer 2005)
11. Track inspection and maintenance results.(Summer 2005)
12. Evaluate zoning amendments for the inclusion of performance-based standards for ISDS based on goals for the protection of critical resources and the results of any modeling studies or other scientific data. (Spring 2006)

[72] This 185- day estimate eliminates weekends, holidays and 3 months during the winter.

[73] Sample loan agreements can be obtained from RI Clean Water Finance Agency or other towns such as South Kingstown, Block Island, Charlestown and North Kingstown who have already qualified for the CSSLP program.

IV. FINANCIAL ANALYSIS

A. ESTIMATED COSTS FOR REPAIRED SYSTEMS AND SEWER EXTENSIONS

There have been on average 6.4 failed systems per year in Foster and 22.2 in Scituate. Assuming a repair cost of $11,000 per system the annual costs are $70,400 and $244,000 respectively.

There are no figures available to estimate the cost of extending sewers into troublesome areas of Foster and Scituate. As discussed in section II.C.2 sewers are neither desirable nor practical in Foster or, with the exception of certain sections in the Village of Hope, in Scituate. Estimates from other towns, however, can provide us with figures that can be compared to the cost of septic system maintenance and repair. Costs to expand sewer lines typically range from $50–$70 dollars per foot, depending on the degree of necessary road repair.[74] These are construction costs only and do not include engineering or design. Sewer hook-up and user fees can also be substantial. In Jamestown for instance, hook-up fees are $1,500 per lot and the average annual sewer use bill is around $370 per year. In South Kingstown, estimated costs to extend sewers to the South Shore area alone were on the order of $12,000,000.[75]

B. ESTIMATED COSTS FOR WASTEWATER MANAGEMENT PROGRAM

1. Administrative Costs

Foster:

Public outreach is the principal cost associated with Foster's proposed onsite wastewater management program.

Scituate:

The principal administrative costs will be the salary of a technical/administrative person in the Public Works Department and the development of the septic system tracking software and database. It is estimated that a half time will cost about $25,000 per year, including partial benefits. A septic system tracking program will cost $8,000 to $10,000 depending on the amount of technical support desired by the town. The Town of South Kingstown has developed its own tracking program, which may provide a cheaper alternative for other communities to use. An estimated $5,000 would be needed in year one for a computer and office equipment, and another $3,500 in printing and mailing, bringing total program costs up to about $43,500. This works out about to about $7.60 per system per year.

2. Homeowner Costs

The homeowner costs are highest in year one due to the First Maintenance (baseline) Inspection. The First Maintenance Inspection is more detailed than subsequent Routine Maintenance Inspections. This is because the septic tank component of a conventional septic system must be

[74] Town of Tiverton, Wastewater Management Commission, personal communication, 2002.

[75] Jon Schock, SK Utilities Director. Sutton, Paul South Kingstown Wastewater Management Study, 1994. SK Planning Department

pumped to adequately assess the condition of the tank itself (i.e. is the tank watertight and structurally sound) and the inspection itself is more detailed. The maintenance and inspection schedules are determined based upon the results of the First Maintenance and subsequent Routine Maintenance Inspection(s). Table 1 shows a five year cost cycle for inspection and maintenance on a typical system.

Alternative Systems: Alternative systems would have an annual maintenance contract with a cost of about $200 per year. This includes a spring and fall inspection, servicing and cleaning, but does not include pumping costs. This assumes one pumping every five years and $40 per year increase in the electric bill. The five-year average annual fee for an alternative system would be $270.

Retrofits: The cost to retrofit a tank with access risers and effluent filters as recommended by the ordinance by is about $450. Access risers are needed on tanks to facilitate inspection and maintenance. Effluent filters will help to extend the life of the drain field. The town could develop financial incentives for homeowners to retrofit their tanks. This could include such things as buying equipment in bulk and passing on the cost savings to the consumers, or obtaining prices from contractors who agree to do the work for a set fee per system for Foster and Scituate residents. In addition grant funds could be applied for to help offset the cost of tank retrofits.

Repairs: CSSLP funds would be available for septic system repair and for replacement of cesspools. CDBG funds are available for qualifying income brackets.

Table 1 Conventional Systems: Five-Year Average Annual Cost for Inspection and Maintenance

	Year 1[76]	Year 2	Year 3	Year 4	Year 5
First Maintenance Inspection	150[77]	------	-----	-------	-------
Pumping[78]	150	-------	------	175	
Routine Maintenance[79] Inspection	------	-------		70	
5-Year Average Annual Cost					$109

[76] Year 1 corresponds to the year of the First Maintenance Inspection, not year 1 of the grant. Implementation of the program (i.e. the date of the First Maintenance Inspection) would be phased in over 3 to 6 years. Phasing plan to be detailed in the regulations.

[77] Assumes the system is accessible. If system is not accessible or its whereabouts unknown this price will be more. Costs are dependent on how deep the system is and how long it takes to locate the system. If the system is more than a couple of feet down a backhoe may be necessary. In a case where the system is tough to find and a backhoe was needed for a few hours, the inspection could run about $575 ($125 finding system $300 excavating $150 inspecting.) If a system was difficult to access, it should be retrofitted with risers and filters at the time of the First Maintenance Inspection when everything is unearthed.

[78] This assumes a 4-year pumping cycle, could go 10-12 years.

[79] The RI Inspection Manual *Septic System Check-up* recommends no more than a 5 –year cycle.

V. COMMUNITY ASSISTANCE PLAN FOR SEPTIC SYSTEM REPAIR

According to RIDEM plan criteria, communities must identify a source of funding for repair/replacement of failed septic systems.

A. COMMUNITY SEPTIC SYSTEM LOAN PROGRAM (CSSLP)

The RI Clean Water Finance Agency (CWFA), in cooperation with RIDEM, has developed the Community Septic System Loan Program (CSSLP), a revolving loan fund exclusively for the upgrade and repair of onsite wastewater treatment systems. There are no income limitations on accessibility to CSSLP funds.

After the town has received approval of its OWMP from RIDEM and the loan agreement and line of credit from RICWFA, property owners may be eligible for loan monies for the repair of failed ISDS. Program funds are available to single-family and multi-family residences up to 4 units. A septic system that serves more than one lot (cluster system) is not eligible under CSSLP, but may be eligible under other CWFA programs, provided the town has identified them on its annual project priority list submitted to RIDEM. Highlights of CSSLP include:

1. A line of credit to the community with the obligation to repay only in the case of homeowner default.

2. A 2 percent interest rate to the community that must be passed on to the homeowner.

3. The use of a financial intermediary, RI Housing and Mortgage Finance Corporation (RI Housing) to handle homeowner loan applications, fund balance reporting, collection procedures, etc., thus eliminating a potential administrative burden to the community.

4. The ability of the community to add its own features such as means testing, technical assistance or supplemental grants and loans.

1. Foster and Scituate Eligibility Criteria for CSSLP Financing:

Failed System: The Onsite Wastewater Management Area encompasses all of Foster and Scituate. Any failed residential ISDS that meets the CSSLP eligibility criteria may qualify for the 2% loan funds. This plan relies upon RIDEM's definition of "failed system" when determining a system failure.

Currently, RIDEM defines a failed system as: "Any sewage disposal system that does not adequately treat and dispose of sewage so as to create a public or private nuisance or threat to public health and/or environmental quality, as evidenced by, but not limited to, one or more of the following conditions:

1. Failure to accept sanitary sewage into the building sewer.

2. Discharge of sanitary sewage to a basement, sub-surface drain, surface drain or surface water unless expressly permitted by the Department.

3. Sanitary sewage rising to the surface of the ground over or near any part of an individual sewage disposal system or seeping down-gradient from the absorption area at any change in grade, bank or road cut.

4. Any deterioration or damage to any individual sewage disposal system that would preclude adequate treatment and disposal of wastewater. (For example, contact between the bottom of the ISDS and the water table.)

Only for the purpose of a homeowner accessing the CSSLP funds the definition of failed system also includes the following. [80]

1. Any system, which in order to function, has been pumped or is in need of pumping two or more time in a calendar year.

2. Any substandard ISDS or cesspool which the owner wishes to upgrade, even if that system would not have been declared "failed" under the provisions of the ordinance (i.e. steel tanks, cesspools.)

CSSLP Eligibility Criteria: In addition to meeting the above definitions of "failed system," the following conditions also apply when determining loan eligibility:

1. System design is an eligible expense.

2. Property owners who have repaired their failed ISDS during calendar year 2003 or 2004, but prior to the official start of the CSSLP may refinance the repair using CSSLP funds.

3. When a system is failed, but the repair also calls for an increase in the number of bedrooms, the loan amount shall be limited to that required to repair or replace a system suitable for the original number of bedrooms.

4. Replacing a tank even when no drain field repairs are necessary is considered a legitimate expense of CSSLP funds.

5. Alternative systems may be required in areas where site conditions warrant, such as a wetland buffer, high watertable soils, small lots, densely developed neighborhoods and inadequate separation distance from a well, or in cases where local variances are needed.

6. Unless otherwise authorized, maximum loan amounts for a single family shall be $20,000. Multi-family units will be evaluated on a case-by-case basis.

[80] A town may define "failed system" broadly in order that these systems may qualify for CSSLP funds. This does not mean that these systems have failed as per RIDEM regulations.

7. All applications and proposed septic system plans must conform to any applicable zoning and subdivision regulations.

8. When the available lines of credit with the towns have decreased to $50,000 or less, hardship situations and emergency repairs will be given priority.

Persons submitting an application for loan funds must have an approved septic system plan from RIDEM. The towns should each request $300,000 for this project from RI Clean Water Finance Agency. The towns must submit a Project Priority Application to RIDEM for septic system inspection and repair. The project must be on RIDEM's Project Priority List before the towns can qualify for CSSLP. Applications are usually in early spring. This would be enough repair 25 to 30 systems per town. When available funds have been reduced to $50,000 the town can request additional loan money through an addendum to its loan agreement with RI Clean Water Finance Agency. The town will publicize this program through the development of program fact sheets, press releases and a letter to septic system owners. Special press releases will provide information about the CSSLP funds and application procedures. A goal of this project is to establish a permanent mechanism for helping to fund the cost of system repairs.

Application Procedure: A homeowner wishing to access the funds must obtain a letter from the applicable town stating that the system is eligible. The homeowner hires the appropriate professional to design the system repair and then submits the application to RIDEM for design approval on the repair. Once RIDEM permit approval has been received the homeowner applies for a CSSLP loan through RI Housing. Following loan approval, RI Housing issues a two-party check to the contractor and homeowner. The homeowner begins repayment of the loan one month after the check is received.

B. OTHER POTENTIAL SOURCES

The CSSLP is an integral component of the town's onsite wastewater management strategy. It is worth noting, however, that additional sources of grant and loan monies may be needed to help homeowners finance some of the costs of bringing sub-standard onsite wastewater treatment systems up to state and local standards. The towns should explore the possibility of expanding CDBG funds available through the Western RI Home Repair Program for septic system repair. The US Department of Agriculture's Rural Development Program could also provide a potential funding source for septic system repair for low and moderate-income households.

The Scituate Reservoir Watershed Management suggests that the surcharge on public drinking water be increased to generate funds for the implementation of a comprehensive watershed protection plan. Since wastewater management is a necessary component of watershed protection, the surcharge could provide another potential source of funding.

VI. CONCLUSION

Onsite Wastewater Management Plans are both fiscally and environmentally proactive. Regular septic system inspections and maintenance, cesspool phase out in densely developed areas, and

minimum standards for new septic systems on marginal sites[81] protect local groundwater not only for residents of Foster and Scituate, but for 600,000 Rhode Islanders (or roughly 60%) who depend on the Scituate Reservoir for their drinking water. Passage and implementation of an OWMP will provide the towns with the opportunity to upgrade substandard systems while protecting and preserving our vital natural resources.

[81] RI Department of Health and URI Cooperative Extension, 2003, Scituate Reservoir Drinking Water Assessment Results (Fact Sheet).